Conservation Commission
AGENDA

Thursday, May 14, 2026 - 6:00 PM

Regular Meeting
Agawam Senior Center
954 Main Street
Agawam, MA 01001

A. Conservation Commission

1) 6:00PM Public Hearing-Amendment to Order of Conditions-184 River Road-Kanegsberg

2) 6:05PM-Public Hearing-Notice of Intent-233 Main Street-HP Hood, LLC

3) Discussion-Plan Changes-Lot 2 Suffield Street (Formerly 1298 Suffield Street)-TCR Properties, LLC

4) Discussion-Plan Changes-497 South Westfield Street-Bretta

5) Public Hearing Cont.-Abbrevaited Notice of Resource Area Delineation-311

6) Request for Certificate of Compliance-24 Sequoia Drive

7) Request for Certificate of Compliance-4 Hunter's Greene Circle

8) Approval of Minutes-April 23, 2026

9) Correspondence and Complaints

Town of Agawam
Department Of Public Works

DPW
1000 Suffield Street
Agawam, MA 01001
Phone: 413-821-0600
Fax: 413-821-0631

MEMORANDUM

To:	Conservation Commission
CC:	File
From:	Engineering Division
Date:	April 30, 2026
Subject:	CC 342 – NOI – #184 River Road

Per your request, we have reviewed the revised Notice of Intent for the proposed residential construction at #184 River Road; prepared by R Levesque Associates, Inc; dated April 16, 2026. Engineering has no comments at this time.

Engineering reserves the right to make additional comments as new information is submitted. If you have any questions, please do not hesitate to contact this division.

Sincerely,

Michael F. Albro, P.E.
Assistant Town Engineer

Ryan P. Rivest, E.I.T.
Civil Engineer I

Amended Order of Conditions (DEP File #087-0582)

Under Massachusetts Wetlands Protection Act 310 CMR 10.00

Proposed Residential Construction

Project Location:
184 River Road
Agawam, Massachusetts 01001
(Parcel ID: L5-6-6)

Submitted To:
Town of Agawam Conservation Commission
1000 Suffield Street
Agawam, Massachusetts 01001

Applicant & Property Owner:
Howard Kangesberg
184 River Road
Agawam, Massachusetts 01001

RLA Project File No. 110503
April 16, 2026

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

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LIST OF APPENDICES

APPENDIX A: SITE PLAN

I. REQUEST TO AMEND ORDER OF CONDITIONS

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

April 16, 2026

Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
1000 Suffield Street
Agawam, Massachusetts 01001

RE: Request to Amend Order of Conditions (DEP File #087-0582)
184 River Road
Agawam, Massachusetts 01001
RLA Project File No. 110503

Dear Chairman Kozloski and Commissioners:

On behalf of the applicant and property owner, Howard Kangesberg, R Levesque Associates, Inc. is submitting a request to amend an Order of Conditions. The applicant previously received an Order of Conditions from the Town of Agawam Conservation Commission (DEP File #087-0582) for the proposed reconstruction of a residential dwelling and garage within the 200' Riverfront Area to the Connecticut River.

This request is submitted to reflect revisions to the building plans, specifically modifications to the architectural plans of the proposed house and the foundation footprint. The revised design results in a minor increase in disturbance/impervious surface area within Riverfront Area as compared to what was previously permitted, however no additional vegetation clearing is proposed since the project will remain within maintained lawn area. The project will remain in the same general area of the existing home as previously reviewed and approved.

The Applicant respectfully submits that approving this amendment at this time is reasonable and consistent with the intent of the Wetlands Protection Act and the Wetlands Program Policy 85-4: Amended Orders, as it allows for a minor revision to an already approved project. The overall project intent, use, and functional design remain consistent with the original filing, and the revised plans continue to incorporate erosion and sedimentation controls and other impact minimization measures as previously approved. The requested amendment reflects plan revisions that do not alter the underlying findings of the original Order.

As required, a copy of this Request for Amended Order of Conditions has been submitted electronically via email to the Town of Agawam Conservation Commission and MassDEP. We are requesting to be

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

placed on the Commission's next available agenda. Should you have any questions or comments regarding this filing, please contact me at ryann@rlaland.com

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Wetland/Soil Scientist & Project Manager

2. COPY OF PREVIOUS PERMIT

2.1 ORDER OF CONDITIONS – 087-0582

Bk 20378 Ps598 #38011

08-06-2014 @ 12:54p

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

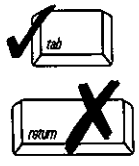
Provided by MassDEP:
87-0582
MassDEP File #

eDEP Transaction #

Agawam
City/Town

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Agawam
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Howard
a. First Name

Kanegsberg
b. Last Name

c. Organization

184 River Road
d. Mailing Address

Agawam
e. City/Town

MA
f. State

01001
g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

Howard Kanegsberg and Marianne A. St. Andre
c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

184 River Road
a. Street Address

Agawam
b. City/Town

L5
c. Assessors Map/Plat Number

6/6
d. Parcel/Lot Number

Latitude and Longitude, if known: 42.04956d m s - 72.60925d m

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Hampden
a. County

b. Certificate Number (if registered land)

11038
c. Book

192
d. Page

7. Dates: 7-18-11 a. Date Notice of Intent Filed; 8-25-11 b. Date Public Hearing Closed; 8-25-11 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Notice of Intent Filing Plan, Kanegsberg Property, Parcel L5 6 6, 184 River Road, Agawam, MA

R. Levesque Associated
b. Prepared By

Robert M. Levesque, RLA
c. Signed and Stamped by

8-10-11
d. Final Revision Date

1" = 20'
e. Scale

f. Additional Plan or Document Title

g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☐ Private Water Supply
e. ☐ Fisheries
f. ☐ Protection of Wildlife
g. ☐ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☐ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and Bank or Bordering Vegetated Wetland boundary (if available) — a. linear feet

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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B. Findings (cont.)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
9. ☒ Riverfront Area	499 a. total sq. feet	499 b. total sq. feet		
Sq ft within 100 ft	151 c. square feet	151 d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	348 g. square feet	348 h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

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B. Findings (cont.)

22. ☐ Restoration/Enhancement:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

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Bureau of Resource Protection - Wetlands
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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 87-0582 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is** (1) ☐ **is not** (2) ☒ **subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

SEE ATTACHED CONDITIONS



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS
#87-0582 - Kangegsberg - River Road

20. This Order supersedes all previous Orders of Conditions issued for this work.

21. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

22. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

23. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

24. The Commission shall be notified at least seventy-two hours prior to the start of construction and after erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

25. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

26. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

27. At no time shall any construction materials, soils, fills, sediments, dredging or any other substances be stockpiled or stored in any area of statutory interest.

28. All work within the area of statutory interest shall be performed so as to create minimum disturbance to the existing vegetative cover and contours.

29. The construction site shall be left in a stable condition at the close of each day. Erosion and sedimentation controls shall be continuously monitored to ensure proper operation.

30. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

31. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

32. This parcel shall carry the following restrictions, and a covenant so noted on its deed:

"This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

33. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

34. Members and Agents of the Agawam Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the construction site to evaluate compliance with the order and to require the submittal of any additional information deemed necessary.

35. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

36. The petitioner shall have recorded in the Hampden County Registry of Deeds an "Order of Conditions Form" provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

37. A construction sequence is to be submitted to the Conservation Commission and shall include a description of when and where the silt fence/silt sock is to be placed.

38. Improvements and mitigation shall include removal of invasive species from entire bank down to the River; and removal of debris from tow of bank to the River. This work is to be done by hand - no excavation or machinery is allowed.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 87-0582
MassDEP File #

eDEP Transaction #

Agawam
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☐ No
2. The Conservation Commission hereby finds (check one that applies):
   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

      1. Municipal Ordinance or Bylaw — 2. Citation

      Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

      1. Municipal Ordinance or Bylaw — 2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File #

eDEP Transaction #

City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

8-25-11
1. Date of Issuance

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Henry A. Krzyluk

Magda Galeaton

Jim Messick

Sheryl Bale

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date August 30, 2011

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
87-0582
MassDEP File #

eDEP Transaction #

Agawam
City/Town

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Agawam
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Agawam
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

184 River Road
Project Location

87-0582
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Hampden
County

Book

Page

for:
Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

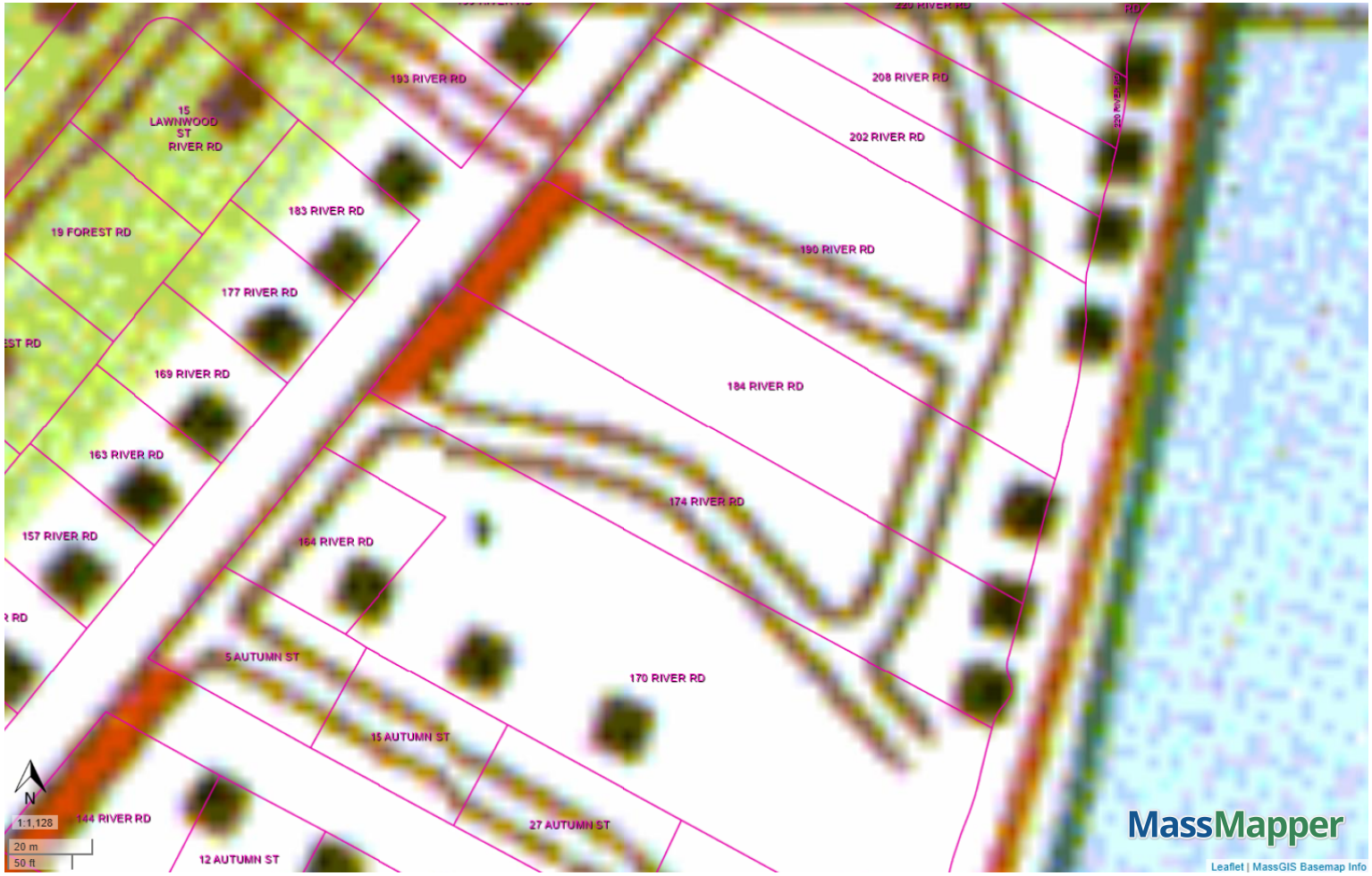
Signature of Applicant

DONALD E. ASHE, REGISTER
HAMPDEN COUNTY REGISTRY OF DEEDS

3. FIGURES

3.1 FIGURE 1 – USGS TOPOGRAPHIC MAP
3.2 FIGURE 2 – FEMA FLOODPLAIN MAP
3.3 FIGURE 3 – NRCS SOILS MAP

USGS Topographic Map

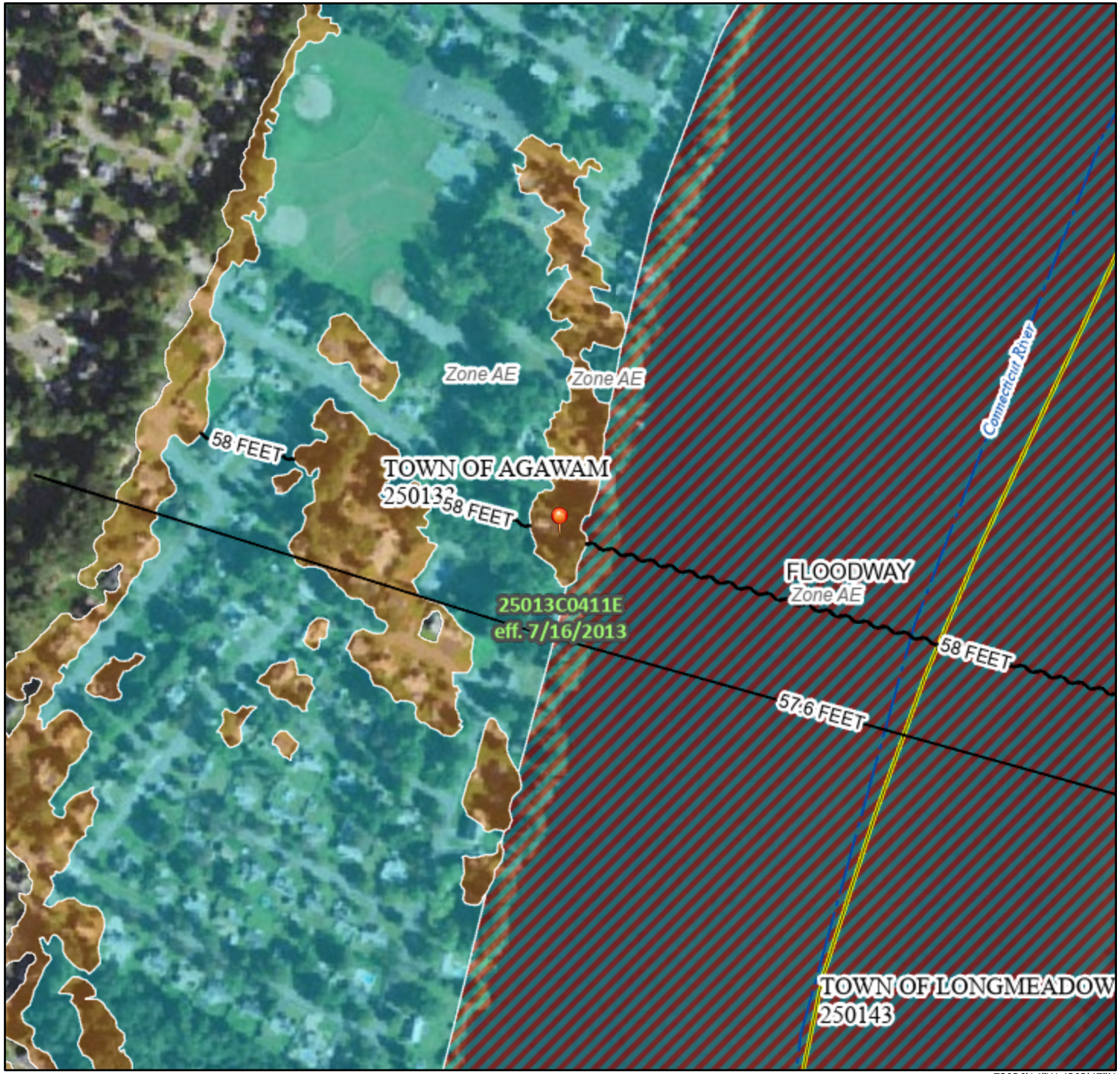


Property Tax Parcels
USGS Topographic Maps

National Flood Hazard Layer FIRMette

FEMA

72°36'52"W 42°3'14"N



72°36'14"W 42°2'47"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/30/2026 at 3:09 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Hampden County, Massachusetts, Central Part
(GISDATA_L3_TAXPAR_POLY_ASSESSPolygon)



Map Scale: 1:832 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 19, Sep 5, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
96A	Hadley very fine sandy loam, 0 to 3 percent slopes	0.7	69.5%
98A	Winooski silt loam, 0 to 3 percent slopes, occasionally flooded	0.3	30.5%
Totals for Area of Interest		**1.1**	**100.0%**

4. ADMINISTRATIVE FORMS

5.1 ABUTTER LIST – 100'

5.2 ABUTTER NOTIFICATION LETTER (TO BE SENT UPON CONFIRMATION OF HEARING)

L5 6 5
ADAMCZYK ROBERT P
190 RIVER RD
AGAWAM, MA 01001 2816

L6 5 7
CAPUTO DOUGLAS J
199 RIVER RD
AGAWAM, MA 01001

L5 6 6
KANEGSBERG HOWARD A TR
184 RIVER RD
AGAWAM, MA 01001

L5 6 6
KANEGSBERG HOWARD A TR
184 RIVER RD
AGAWAM, MA 01001

L5 2 12
LEDOUX FREDERICK W
183 RIVER RD
AGAWAM, MA 01001 2813

L5 6 7
PLAZA LLC
170 RIVER RD
AGAWAM, MA 01001

L6 5 6
POIRIER MILDRED K
193 RIVER RD
AGAWAM, MA 01001 2815

L5 6 8
PRIVEDENYUK PETR
170 RIVER RD
AGAWAM, MA 01001 2816

L5 2 11
STARNES JONNIE M
177 RIVER RD
AGAWAM, MA 01001

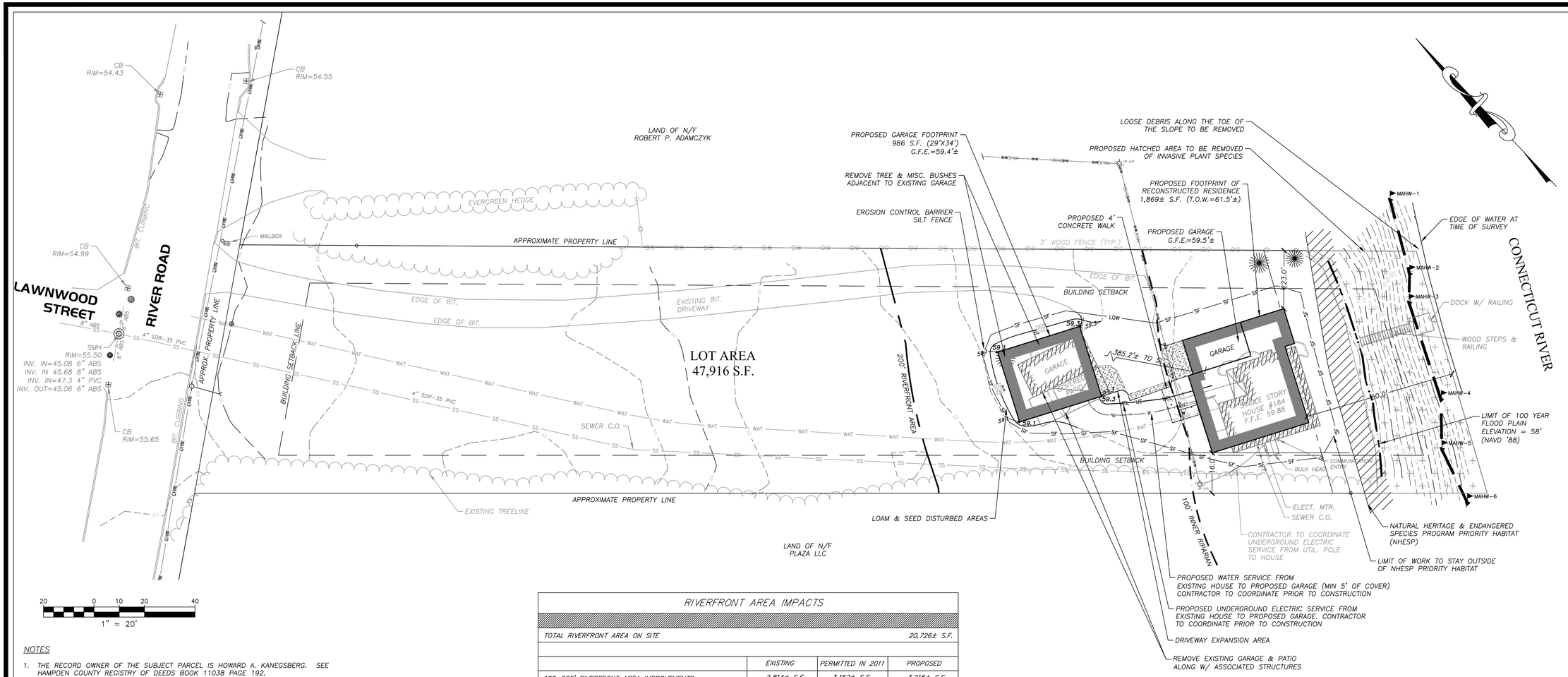
APPENDIX A: SITE PLAN

SITE PLAN ENTITLED “REVISED NOTICE OF INTENT FILING PLAN”

PREPARED FOR HOWARD KKANEGSBERG

PREPARED BY R LEVESQUE ASSOCIATES, INC.

DATED APRIL 16, 2026



NOTES

1. THE RECORD OWNER OF THE SUBJECT PARCEL IS HOWARD A. KANEGSBERG. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 11038 PAGE 192.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON THE TOWN OF AGAWAM GIS AND ARE APPROXIMATE.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR SITE PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCEL CONTAINS 47,916 S.F.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. THE MEAN ANNUAL HIGH WATER (M.A.H.W.) OF THE CONNECTICUT RIVER WAS DELINEATED BY R LEVESQUE ASSOCIATES IN THE SPRING OF 2011.
8. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC. IN THE SPRING OF 2011.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AVAILABLE RECORD DATA, AND THE TOWN OF AGAWAM GIS INFORMATION. R LEVESQUE ASSOCIATES, INC. MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. R LEVESQUE ASSOCIATES, INC. FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS.
11. SUBJECT PARCEL IS ZONED RESIDENCE A-2 ACCORDING TO THE TOWN OF AGAWAM ZONING MAP.
12. A PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN SPECIAL FLOOD ZONE AE: ELEVATION 58' (NAVD '88) ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 2501C0411E – EFFECTIVE DATE: 7/16/2013.
13. THE SUBJECT PROPERTY IS PARTIALLY LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

RIVERFRONT AREA IMPACTS

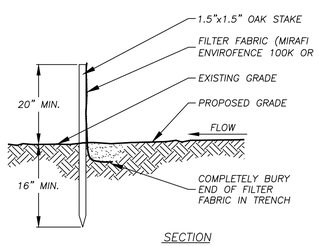
TOTAL RIVERFRONT AREA ON SITE			20,726± S.F.
	EXISTING	PERMITTED IN 2011	PROPOSED
100-200' RIVERFRONT AREA IMPROVEMENTS:	2,814± S.F.	3,162± S.F.	3,215± S.F.
0-100' INNER RIPARIAN ZONE IMPROVEMENTS:	1,329± S.F.	1,480± S.F.	2,036± S.F.
TOTAL RIVERFRONT AREA IMPROVEMENTS:	4,143± S.F.	4,642± S.F.	5,251± S.F.

NOTE:

THE PROPOSED RESIDENTIAL STRUCTURE SHOWN HEREON IS DIFFERENT FROM THE BUILDING ENVELOPE SHOWN ON THE ORIGINAL NOTICE OF INTENT FILING PLAN. THE WETLAND IMPACT INFORMATION TABLE HAS BEEN UPDATED TO REFLECT THE NEW FOOTPRINT AREAS AND ASSOCIATED IMPACTS. OWNER/CONTRACTOR SHALL SECURE APPROVAL FOR SAID CHANGES UNDER THE CURRENT ORDER OF CONDITIONS OR SHALL FILE A NEW PERMIT APPLICATION WITH THE LOCAL CONSERVATION COMMISSION AND MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION.

GENERAL NOTES:

1. THIS PLAN HAS BEEN CREATED BY R LEVESQUE ASSOCIATES, INC. FOR WETLAND FILING PURPOSES ONLY AND SHALL NOT BE USED FOR LAND CONVEYANCE OR OTHER PURPOSES.
2. THE CONTRACTOR SHALL CALL DIG SAFE AT 1-800-344-7233 PRIOR TO ANY CONSTRUCTION ACTIVITY IN ORDER TO MARK UTILITIES. THE CONTRACTOR SHALL ALSO NOTIFY LOCAL UTILITY COMPANIES TO MARK APPLICABLE UTILITIES.
3. SEDIMENTATION CONTROL BARRIERS SHALL BE IN PLACE PRIOR TO AND DURING ALL PHASES OF CONSTRUCTION.
4. SEE DETAIL 1 FOR EROSION CONTROL AND OTHER SPECIFICATIONS.
5. THE EC BARRIERS SHOWN ON THE PLAN SHALL ALSO BE THE LIMIT OF WORK LINES DURING AND AFTER CONSTRUCTION. THUS, NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF THESE LINES WITHOUT THE APPROVAL OF THE AGAWAM CONSERVATION COMMISSION (ACC).
6. ALL EC BARRIERS SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED TO PREVENT EROSION AND SILTATION TO RESOURCE AREAS.
7. IF SILTATION TO THE RESOURCE AREAS OCCURS, THE OWNER SHALL IMMEDIATELY NOTIFY THE ACC, REMOVE THE SILT, AND RESTORE THE AREA TO PRE-EXISTING CONDITION.
8. SCHEDULE ALL WORK IN A CAREFUL MANNER WITH ALL NECESSARY CONSIDERATION FOR NEIGHBORS AND THE PUBLIC.



SECTION

SILT FENCE DETAIL
NO SCALE

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENGINEERS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

REVISED NOTICE OF INTENT FILING PLAN

184 RIVER ROAD AGAWAM, MA 01001 PARCEL ID L5-6-6

COMMONWEALTH OF MASSACHUSETTS
JAMES M. TAGLIENTI
NO. 1998
REGISTERED LANDSCAPE ARCHITECT
4/16/25

PREPARED FOR:
Howard Kanegsberg
184 River Rd
Agawam, MA 01001

ISSUANCE DATE: April 16, 2026

REVISIONS:	DATE:

DRAFTED BY: J.M.T.

UNAUTHORIZED ALTERATION OF
THIS DOCUMENT IS A VIOLATION
OF MASSACHUSETTS STATE LAW

SCALE: As Noted

RLA PROJ. NUMBER: 110503

DRAWING#	REV.
W-1	-

S:\Projects\2011\110503_Kanegsberg_River_Rd_Agawam\Design\Dwg\110503 - SITE.dwg

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE
436 DWIGHT STREET, SPRINGFIELD, MA 01103 413-784-1100

MAURA T. HEALEY
Governor

KIMBERLEY DRISCOLL
Lieutenant Governor

REBECCA L. TEPPER
Secretary

BONNIE HEIPLE
Commissioner

DATE: May 6, 2026

Municipality AGAWAM
(city/town)

RE: NOTIFICATION OF WETLANDS PROTECTION ACT FILE NUMBER

The Department of Environmental Protection has received a Notice of Intent filed in accordance with the Wetlands Protection Act (M.G.L. c. 131, §40):

Applicant:	HP HOOD, LLC	Owner:	HP HOOD, INC.
Address:	6 KIMBALL LANE LYNNFIELD, MA 01940	Address:	6 KIMBALL LANE LYNNFIELD, MA, 01940
LOCUS:	233 MAIN STREET		

This project has been assigned the following file # : WE 087-0713

A FILE NUMBER ONLY INDICATES THAT THE APPLICATION CONTAINS THE MINIMAL SUBMITTAL REQUIREMENTS AND IS ADMINISTRATIVELY COMPLETE - NOT THAT THE INFORMATION IN THE APPLICATION IS ADEQUATE FOR ISSUANCE OF AN ORDER OF CONDITIONS.

Although a file # is being issued, please note the following:

[1] Where a Buffer Zone has already been developed, the Issuing Authority may consider the extent of existing development in its review of subsequent proposed work and, where prior development is extensive, may consider measures such as the restoration of natural vegetation adjacent to a Resource Area to protect the interest of M.G.L. c. 131, § 40.

[2] The commission should review Volume 2, Chapter 3 of the Stormwater Management Handbook, which is a checklist to be used when reviewing stormwater redevelopment projects.

If you have any questions regarding this letter, please contact: MARK STINSON @ (413)-961-9583

Cc: Agawam Conservation Commission, DPW Inspection Services 1000 Suffield Street, Agawam, MA, 01001
Owner: HP HOOD, INC., 6 KIMBALL LANE, LYNNFIELD, MA, 01940
Representative: R LEVESQUE ASSOCIATES, INC., 40 SCHOOL STREET, WESTFIELD, MA, 01085

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD# 1-866-539-7622 or 1-617-574-6868.
http://www.mass.gov/dep
Printed on Recycled Paper

HP HOOD, LLC
6 KIMBALL LANE
LYNNFIELD, MA 01940

Site Plans

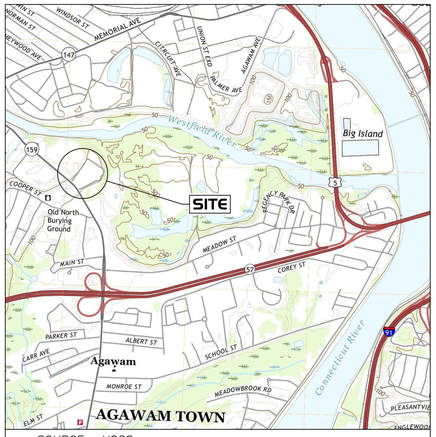
Proposed Building Addition

233 Main Street
Agawam, MA 01001
Parcel ID: K14-2-8

AS PREPARED FOR:

H.P. Hood LLC

Six Kimball Lane
Lynnville, MA 01940



SOURCE: USGS

April 28, 2026

DRAWING INDEX		
SHEET NO.	SHEET NAME	ISSUE DATE
T-1	TITLE SHEET	4/28/26
EX-1	EXISTING CONDITIONS PLAN	4/7/26
C-1	NOTES, SYMBOL & LINE LEGEND, AND ABBREVIATIONS	4/28/26
C-2	CONSTRUCTION NOTES	4/28/26
C-3	DEMOLITION AND REMOVALS PLAN	4/28/26
C-4	LAYOUT AND MATERIALS PLAN	4/28/26
C-6	GRADING, EROSION & SEDIMENTATION PLAN	4/28/26
SL-1	PHOTOMETRIC PLAN	4/16/26
SL-2	LIGHTING FIXTURE DETAILS	4/16/26
D-1	DETAILS	4/28/26

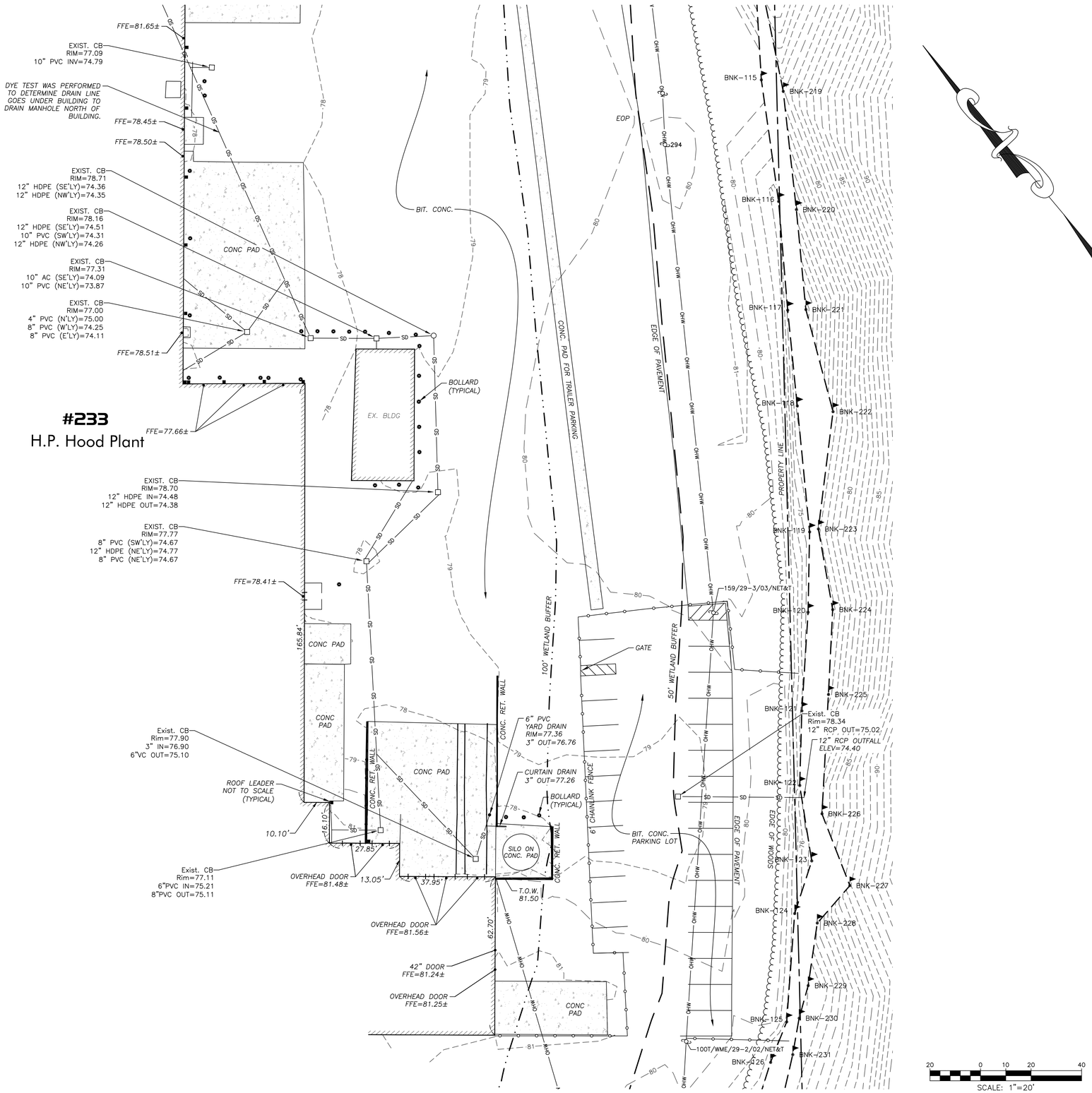
BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY

40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

RLA Project Number: 201016

PERMITTING
NOT FOR CONSTRUCTION



NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCELS ARE:
   265 MAIN STREET – HP HOOD, LLC (L.C. CTF. #39127 & DEED BK. 23606 PG. 527)
   233 MAIN STREET – H.P. HOOD, INC. (L.C. CTF. #25079 & DEED BK. 13330 PG. 509)
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON THE FOLLOWING PLANS:
   LAND COURT PLAN #1369A – #1369E
   PLAN BOOK 305 PAGES 118+119
   AND OTHER UNRECORDED PLANS AS FURNISHED BY THE CLIENT
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR SITE PLANNING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCELS CONTAIN APPROXIMATELY 16.74 ACRES (TOTAL).
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. RESOURCE AREA FLAGGING WAS PERFORMED BY R LEVESQUE ASSOCIATES, INC. IN DECEMBER 2020.
8. ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM MUNICIPAL GIS WEBSITE GIS.
9. SUBJECT PARCELS ARE ZONED INDUSTRIAL A (IA) ACCORDING TO THE AGAWAM ZONING MAP.
10. A PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN THE ESTABLISHED FLOOD HAZARD ZONE AE ACCORDING TO FLOOD INSURANCE RATE MAP #25013C0403E DATED 07/16/2013. THE FLOOD ZONE ELEVATION FOR THE SITE IS 60.2.
11. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
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PARTIAL EXISTING CONDITIONS PLAN

233 MAIN ST.
Paecel ID: K14-2-8
AGAWAM, MA

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 33610
PROFESSIONAL LAND SURVEYOR

PREPARED FOR:

H.P. Hood, LLC
Six Kimball Lane
Lynnfield, MA 01940

ISSUANCE DATE: April 7, 2026

REVISIONS:	DATE:

DRAFTED BY: t.a.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 201016

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EX-1	-

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SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- EXISTING MAILBOX
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- EXISTING CABLE TV BOX
- EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VALVE
- PROPOSED HYDRANT
- EXISTING GAS VALVE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- TP-1 TEST PIT LOCATION
- P-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- EXISTING STONE WALL
- TREE LINE
- × 102.4 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- × 94.7 PROPOSED SPOT GRADE
- 214 PROPOSED CONTOUR
- EDGE OF WETLAND
- FENCE LINE
- GUARDRAIL
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF SILT FENCE LINE

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FFE	–	FINISH FLOOR ELEVATION
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
PCB	–	PROPOSED CATCH BASIN
PDMH	–	PROPOSED DRAIN MANHOLE
PFES	–	PROP. FLARED END SECTION
POCS	–	PROP. OUTLET CONTROL STRUCT.
PROP.	–	PROPOSED
PSMH	–	PROP. SANITARY SEWER MANHOLE
PWQU	–	PROP. WATER QUALITY UNIT
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.

A. SITE PREPARATION
- COMPLETE ALL ROUGH GRADING ACTIVITIES
- REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
- EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
- SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
- THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.

B. ESTABLISHMENT
- EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
- UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
- APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
- VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.

C. MAINTENANCE
- ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION. APPLICATION STANDARDS:
   - REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
   - SCARIFY SURFACE PRIOR TO SEED APPLICATION.
   - APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:
   A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
   B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
   C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENGINEERS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE (AS REQ'D)

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SITE PREP

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
3. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
4. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
5. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
6. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
7. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
8. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
9. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE ENGINEER.
10. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
11. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE ENGINEER.
12. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2)REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
11. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
12. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
13. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
   A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RATE OF 50 LBS/1,000 S.F.
   B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
   C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
   D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F. SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

   E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F.UNLESS HYDROSEEDING WAS USED.
   F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHED IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.

PERMITTING
NOT FOR CONSTRUCTION

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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS

233 Main Street
Agawam, MA
Parcel ID: KI4-2-8

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
4/28/26

PREPARED FOR:
H.P. Hood LLC
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ISSUANCE DATE: April 28, 2026

REVISIONS:	DATE:

DRAFTED BY: R.E.L.

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.

2. THE OWNER AND R LEVESQUE ASSOCIATES, INC. AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.

3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.

4. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150.

5. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

6. ALL WORK IN THE CITY/TOWN RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.

7. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.

8. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.

9. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.

10. THE CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.

11. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.

12. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.

13. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.

14. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.

15. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.

16. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.

18. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.

19. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

20. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.

21. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

22. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.

23. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.

24. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.

25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.

26. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. ALL CONSTRUCTION IN CITY/TOWN RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.

2. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.

3. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.

4. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.

5. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASSDOT , ETC. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.

6. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

7. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.

8. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.

10. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASSDOT AND/OR THE CITY/TOWN REGULATIONS.

11. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.

12. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.

3. STORM PIPE SHALL BE AS NOTED ON PLANS.

4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.

5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.

6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.

7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.

9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20).

10. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

11. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.

12. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.

13. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

14. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT.

15. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.

SITE UTILITY NOTES

GENERAL:

1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.

2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.

3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.

4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.

5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.

6. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.

7. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

8. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.

9. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.

10. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.

11. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.

12. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

14. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.

15. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

CONSTRUCTION NOTES

233 Main Street
Agawam, MA
Parcel ID: KI4-2-8

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
4/28/26

PREPARED FOR:
H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

ISSUANCE DATE: April 28, 2026

REVISIONS:	DATE:

DRAFTED BY: R.E.L.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 201016

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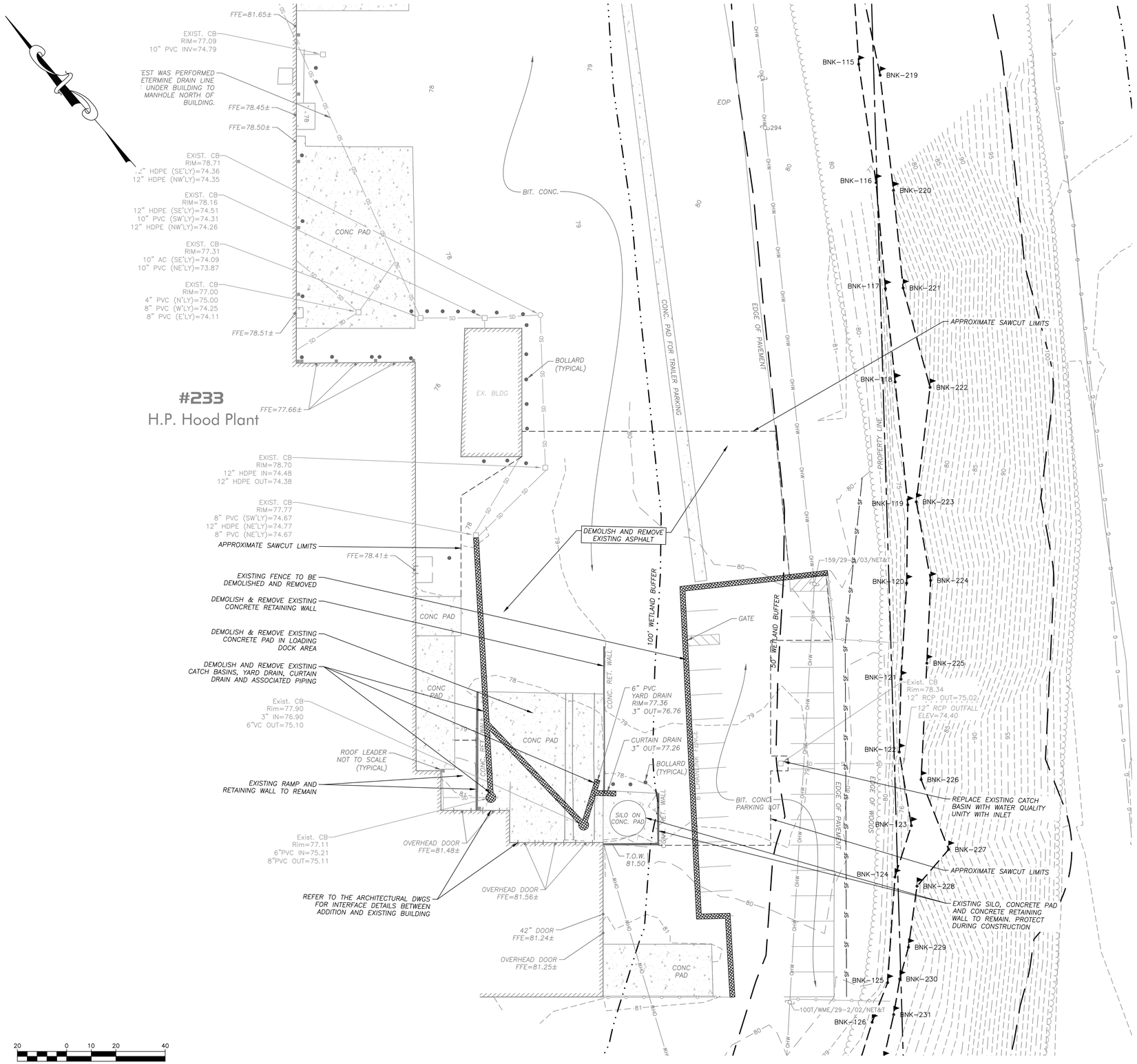

DEMOLITION NOTES

1. THE INFORMATION SHOWN HEREON IS NOT INTENDED TO BE AN EXHAUSTIVE SURVEY OF ALL APPURTENANCES THAT MAY OR MAY NOT BE IN PLACE TO SERVE THE EXISTING ON-SITE STRUCTURES AND USE. SEPTIC SYSTEM COMPONENTS, UNDERGROUND TANKS, AND OTHER SUB-SURFACE STRUCTURES MAY BE IN PLACE AND MAY REQUIRE ATTENTION BEFORE CONSTRUCTION MAY PROCEED.
2. CONTRACTOR SHALL CONDUCT A PRE-DEMOLITION SURVEY TO IDENTIFY ANY AND ALL UTILITIES AND UTILITY COMPONENTS TO BE DISCONTINUED, REMOVED, OR DEMOLISHED IN PLACE AND THE PRESENCE OR ABSENCE OF ANY HAZARDOUS MATERIALS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION, REMOVAL OR RELOCATION, INCLUDING BUT NOT LIMITED TO: ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES' SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COSTS SHALL BE INCLUDED IN BASE BID.
4. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
5. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES AND LANDSCAPING TO REMAIN.
6. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS. ANY DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. ALL UTILITY DISCONNECTION SHALL BE PERFORMED TO THE SATISFACTION OF THE RELEVANT UTILITY COMPANY AND COMPLY WITH ANY LOCAL, STATE AND/OR FEDERAL REGULATORY AGENCIES.
8. CONTRACTOR SHALL PROMPTLY TRANSPORT AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS OFF OWNERS PROPERTY. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DISPOSAL.
9. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
10. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. NO ACTIVITY SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINE AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER AND LANDOWNER.
13. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 A MINIMUM OF 72 HOURS (M-F) PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.
14. THE LANDSCAPE ARCHITECT/ENGINEER IS NOT RESPONSIBLE FOR ANY ITEMS THAT MAY BE DISCOVERED ON-SITE DURING DEMOLITION OR CONSTRUCTION THAT WAS NOT PREVIOUSLY INDICATED ON THE SURVEYS OR INFORMATION PROVIDED.
15. PAVEMENT SHALL BE SAWCUT AT THE LIMIT OF WORK. ALL PAVING, FOOTINGS, UTILITIES, CURBING AND OTHER EXISTING IMPROVEMENTS SHALL BE REMOVED OR SUITABLY MILLED TO THE SATISFACTION OF THE OWNER AND GENERAL CONTRACTOR.

CONSTRUCTION SEQUENCE

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. CONTACT THE TOWN OF AGAWAM AT LEAST FORTY-EIGHT HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
3. CONSTRUCT ANTI-TRACKING PAD AT ENTRANCES AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE ALIGNMENT OF THE ROADWAY TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

DEMOLITION & REMOVALS PLAN

233 Main Street
Agawam, MA
Parcel ID: K14-2-8

FILIPE J. CRAVO CIVIL No. 48376 REGISTERED PROFESSIONAL ENGINEER
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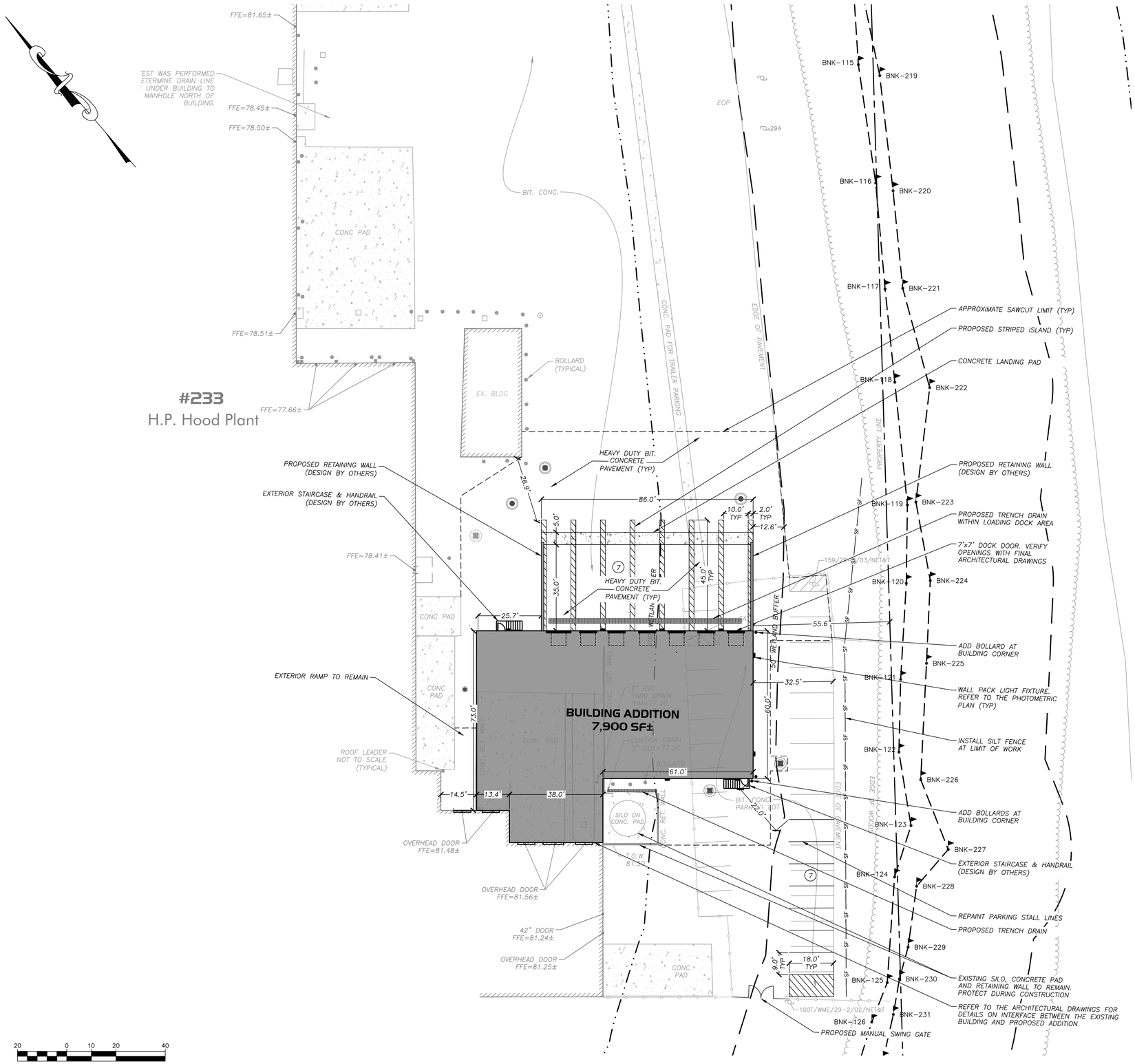

20 0 10 20 40
1" = 20'

ZONING REVIEW - Industrial A (IA)

TYPE (MINIMUM)	REQUIRED	EXISTING/PROPOSED
AREA	40,000 FT^2	729,194 FT^2±
FRONTAGE	100 FT	527.5 FT±
FRONT YARD	40 FT	151 FT±
SIDE YARD	25 FT	55.6 FT±
REAR YARD	25 FT	331 FT±
BUILDING HEIGHT / STORIES (MAX)	40 FT / 2 STORIES	< 30 FT± / 1 STORY
LOT COVERAGE BY BUILDING (MAX)	50%	15.6%±/16.6%±
PARKING*	95	192 / 170

* PARKING CALCULATION
PER THE TOWN OF AGAWAM PARKING GUIDELINES:
ONE (1) PARKING SPACE FOR EACH ONE AND ONE-HALF (1 ½) EMPLOYEES ON MAJOR SHIFT, AND ONE (1) SPACE FOR EVERY VEHICLE USED IN CONNECTION WITH THE BUSINESS, PLUS SUFFICIENT ADDITIONAL PARKING FOR CUSTOMERS AND VISITORS AS REASONABLY DETERMINED BY THE PLANNING BOARD.
1 SPACE X 112 EMPLOYEES/1.5 = 75 SPACES
10 PASSENGER BUSINESS VEHICLES = 10 SPACES
10 VISITOR/CUSTOMER PARKING SPACES
TOTAL REQUIRED PARKING = 95 SPACES

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

LAYOUT & MATERIALS PLAN

233 Main Street
Agawam, MA
Parcel ID: K14-2-8

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
48376
REGISTERED PROFESSIONAL ENGINEER
4/28/26

PREPARED FOR:
H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

ISSUANCE DATE: April 28, 2026

REVISIONS:	DATE:

DRAFTED BY: R.E.L.

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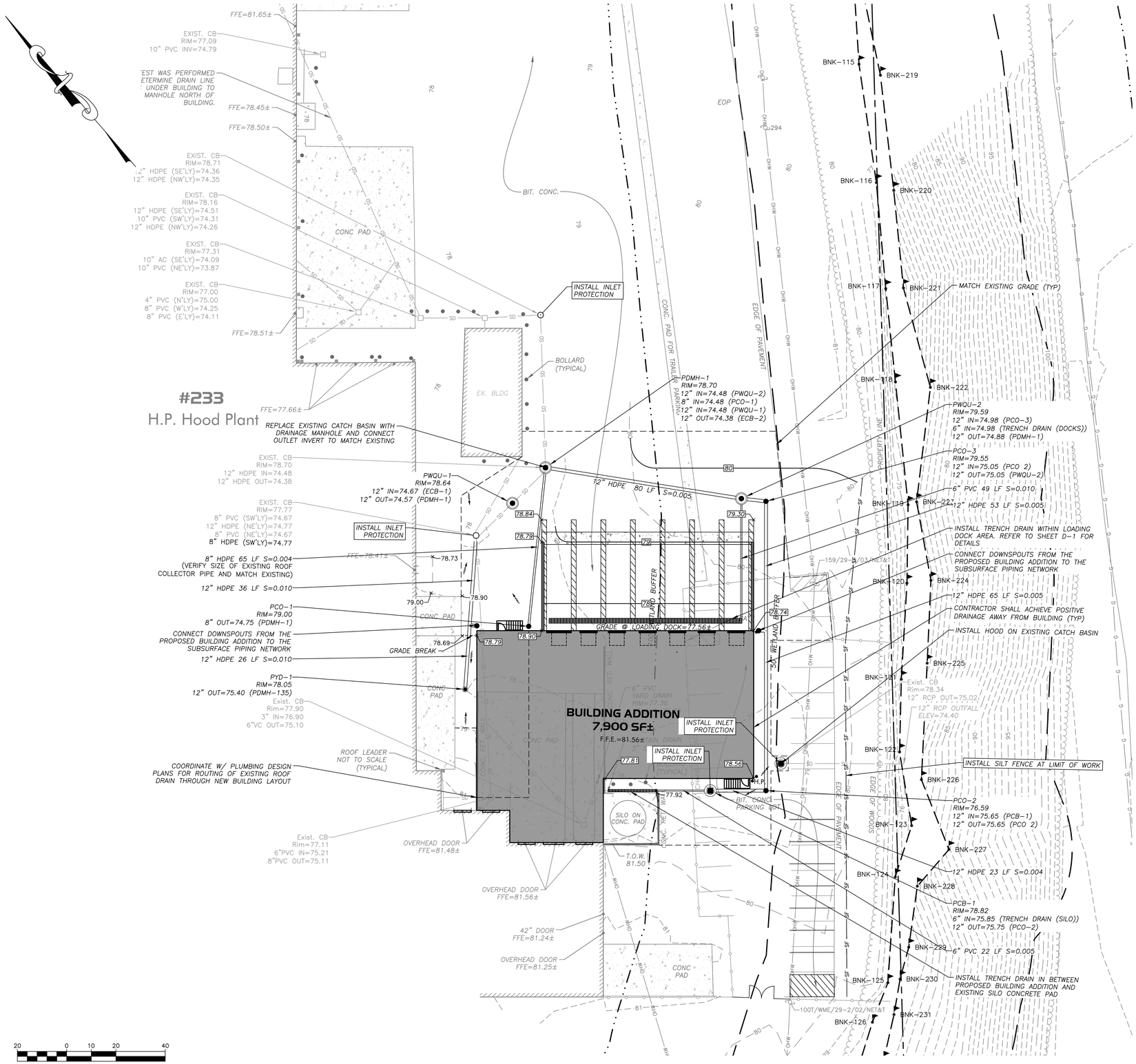
SCALE: AS NOTED

RLA PROJ. NUMBER: 201016

DRAWING#	REV.
C-4	-

S:\Projects\2020\201016 - Hood - 233 & 265 Main St, Agawam\Civil 3D\201016 - SITE.dwg



SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

GRADING & DRAINAGE NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING GRADING AND DRAINAGE.
2. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
3. CONTRACTOR SHALL NOTIFY DESIGNER/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.
4. ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, THE OWNER/SITE CONTRACTOR SHALL COORDINATE WITH R LEVESQUE ASSOCIATES, INC. (RLA) TO CONDUCT A POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENTS TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.
5. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE CITY/TOWN DEPARTMENT SPECIFICATIONS.

ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

CONSTRUCTION NOTES

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, i.e. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

GRADING, EROSION & SEDIMENTATION CONTROL PLAN

233 Main Street
Agawam, MA
Parcel ID: KI4-2-8

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
48376
REGISTERED PROFESSIONAL ENGINEER
4/28/26

PREPARED FOR:
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DRAWING#	REV.
C-5	-

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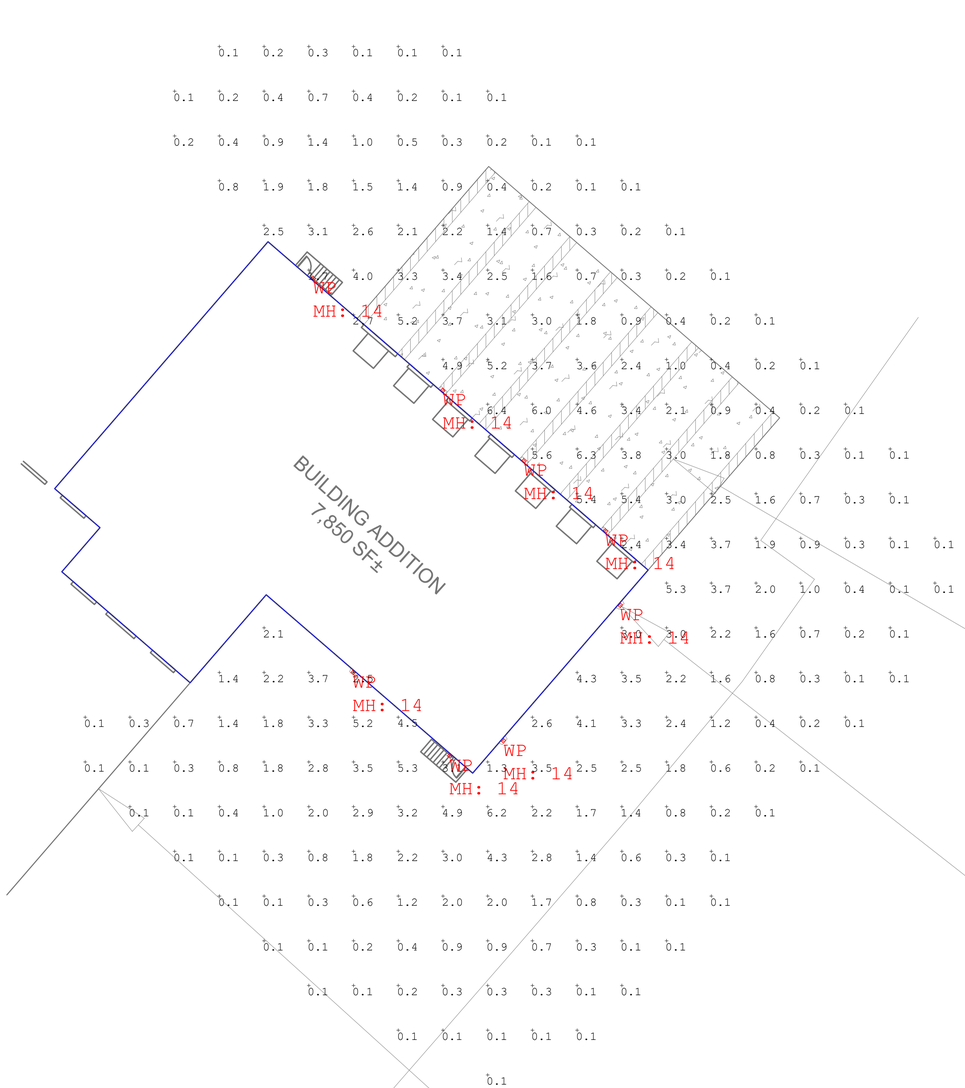
Calculation Summary							
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	Grid Height
Building Addition	Fc	1.48	6.4	0.1	14.80	64.00	0

Luminaire Schedule						
Qty	Label	Watts	Arrangement	LLF	Description	Tag
8	WP	46.5	Single	0.900	BEACON RWL1-48L-45-3K7-4W-U-finishTBD	



LOA

Project:
26090 - 233 Main Street, Agawam

Contact:
Myles Simon
Specification Sales
(860) 655-8099
msimon@illuminatene.com

Detail: Photometric Calculation
Date: 4-14-2026
Revision:----
Scale: 3/4" = 1'-0"
Drawn By: SB

illuminate
263 Winn Street
Burlington, MA 01803
(781) 935-8500

333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

Drawing Number:

SL-1

Sheet 1 of 2

WP - WALL PACK

BEACON design . performance . technology

RATIO Wall

RWL1/RWL2 LED WALLPACK

DATE: LOCATION:

TYPE: PROJECT:

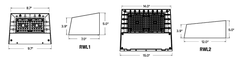
CATALOG #:

MICRO STRIKE | OPTICS STRIKE

FEATURES

- Low profile LED wall luminaire with a variety of IES distributions for lighting applications such as retail, commercial and industrial building mount
- Featuring Strike and Micro Strike Optics which maximizes target zone illumination with minimal losses at the house-side, reducing light trespass issues
- Visual comfort standard
- Control options including photo control, occupancy sensing, NX Distributed Intelligence™, LightGRID+ and 7-Pin with networked controls
- Battery Backup options available for emergency code compliance
- Quick-mount adapter allows easy installation/maintenance
- 347V and 480V versions for industrial applications and Canada





CONTROL TECHNOLOGY

NX | LIGHTGRID+

SERVICE PROGRAM

QS10

	Weight
RWL1	6.5 lbs / 2.95 kg
RWL2	16.5 lbs / 7.48 kg

SPECIFICATIONS

CONSTRUCTION

- Die-cast housing with hidden vertical heat fins that are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with powder coat paint finish
- Powder paint finish provides durability in outdoor environments. Tested to meet 1000 hour salt spray rating

OPTICS

- Entire optical aperture illuminates to create a larger luminous surface area resulting in a low glare appearance without sacrificing optical performance
- 48 or 160 midpower LEDs
- 3000K, 4000K or 5000K (70 CRI/80 CRI) CCT
- Zero uplight distributions
- LED optics provide IES type II, III and IV distributions. Type II only available in RWL2 configurations

INSTALLATION

- Quick-mount adapter provides easy installation to wall or to recessed junction boxes (4" square junction box)
- Designed for direct J-box mount.
- Integral back box contains 1/2" conduit hubs
- Integral backbox provided as standard with selection of some options

ELECTRICAL

- 120V-277V universal voltage 50/60Hz 0-10V dimming drivers
- 347V and 480V dimmable driver option for all wattages above 35W
- Ambient operating temperature -40°C to 40°C
- Driver RoHS and IP66

ELECTRICAL (CONTINUED)

- 10kV Surge Protector optional
- Drivers have greater than .90 power factor and less than 20% Total Harmonic Distortion
- Dual Driver option provides 2 drivers within luminaire but only one set of leads exiting the luminaire, where Dual Power Feed provides two drivers which can be wired independently as two sets of leads are extended from the luminaire. Both options can not be included in one same fixture.
- Dimming drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than 6" standard.

CONTROLS

- Photo control, occupancy sensor and wireless available for complete on/off and dimming control
- Button photocontrol is suitable for 120-277V operation
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)
- NX Distributed Intelligence™ available with in fixture wireless control module, features dimming and occupancy sensor LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor
- Integral Battery Backup provides emergency lighting for the required 90 minute path of egress
- Battery Backup suitable for operating temperatures -25°C to 40°C. RWL1 battery is 12.5W RWL2 battery is 18W

CONTROLS (CONTINUED)

- Dual Driver and Dual Power Feed options creates product configuration with 2 internal drivers for code compliance
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application.
- LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor. Also available in 7-pin configuration

CERTIFICATIONS

- Certified to UL 1598 and CSA 22.2#250.0-24 for wet locations
- IP65 rated housing
- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations listed in this document are DLC® qualified. Refer to http://www.designlights.org for the most up-to-date list.
- Emergency battery backup options are California Energy Commission (CEC) Title 20 Compliant
- Meets IDA requirements using 3K CCT configuration at 0 degrees or tilt

WARRANTY

- 5 year limited warranty

Current

currentlighting.com/beacon

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BEACON design . performance . technology

RATIO Wall

RWL1/RWL2 LED WALLPACK

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

Gray Shading = Service Program Limit of 15 luminaires QS10

ORDERING GUIDE

CATALOG # _____

Example: RWL1–48L-10–3K7–2–UNV–BLS–E

Series	# LEDs - Wattage	CCT/CRI	Distribution	Voltage	Color
RWL1 Micro Strike Optics	**48L-10** 1,000 Lumens	**3K7** 3000K, 70 CRI	**2** IES TYPE II	**UNV** 120-277V	**BLT** Black Matte Textured
	48L-15 2,000 Lumens	**4K7** 4000K, 70 CRI	**3** IES TYPE III	**120** 120V	**BLS** Black Gloss Smooth
	48L-20 2,500 Lumens [3,4]	**5K7** 5000K, 70 CRI	**4F** IES TYPE IV Forward	**208** 208V	**DBT** Dark Bronze Matte Textured
	48L-25 3,500 Lumens	**3K8** 3000K, 80 CRI	**4W** IES TYPE IV Wide	**240** 240V	**DBS** Dark Bronze Gloss Smooth
	48L-35 4,500 Lumens	**4K8** 4000K, 80 CRI		**277** 277V	**GTT** Graphite Matte Textured
	48L-45 5,500 Lumens [3,4]	**5K8** 5000K, 80 CRI		**347** 347V	**LGS** Light Grey Gloss Smooth
RWL2 Micro Strike Optics	**160L-45** 6,500 Lumens			**480** 480V	**LGT** Light Grey Matte Textured
	160L-50 7,500 Lumens				**PSS** Platinum Silver Smooth
	160L-65 9,500 Lumens				**WHT** White Matte Textured
	160L-80 11,000 Lumens				**WHS** White Gloss Smooth
	160L-95 13,000 Lumens				**VGT** Verde Green Textured
	160L-115 15,000 Lumens				**Color Option**
	160L-135 17,500 Lumens				**CC** Custom Color
	160L-155 19,500 Lumens				
RWL2 Strike Optics	**36L-35** 5,500 Lumens, Strike				
	36L-55 7,500 Lumens, Strike				
	36L-85 10,000 Lumens, Strike				
	36L-105 12,500 Lumens, Strike				
	36L-120 14,000 Lumens, Strike				

Control Options Network	
NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [3,7,12]
NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [3,7,12]
NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [3,7,12]
WIR	LightGRID+ In-Fixture Module [3,8]
Stand Alone Sensors	
SCP-8F	Remote control programmable line voltage sensor [4,5,6,8]
SCP-20F	Remote control programmable line voltage sensor [4,5,6,8]
BTS-14F	Bluetooth® Programmable, PIR Occupancy/Daylight Sensor [4,5,6,7,8]
BTS-40F	Bluetooth® Programmable, PIR Occupancy/Daylight Sensor [4,5,6,7,8]
BTSO-12F	Bluetooth® Programmable, PIR Occupancy/Daylight Sensor, up to 12' mounting height [4,5,6,7,8]
Control Options	
7PR_	7-Pin Receptacle [8,9]

Distribution	
F	Fusing [4]
E	Emergency Battery Backup [3,8,9]
EH	Emergency Battery w/ Heater Option [3,8,9]
2DR	Dual Driver [8,9,10]
2PF	Dual Power Feed [3,8,10]
PC	Button Photocontrol [3,4,11]
SP	10kA Surge Protector [11]

Notes:
1 Not available in RWL1
2 Cannot be combined with E, EH, 2DR, 2PF due to space constraints
3 Cannot be combined with Controls due to space constraints
4 Must specify voltage
5 Not available in 347V
6 Not available in 480V
7 Available in 480V in 95W, 115W, 155W only
8 Cannot be combined with 2DR or 2PF
9 Located in integral backbox which will be automatically added to the fixture if selected
10 Not available in RWL1-48L in 10W, 15W, or 20W
11 SP and PC cannot be combined due to space constraints
12 SP and PC cannot be combined due to space constraints
* Based on space limitations, some options may not be combined. Consult Factory.

CONTROLS

Control Options	
Standalone	
SCPREMOTE	Order at least one per project location to program and control

ACCESSORIES AND REPLACEMENT PARTS - MADE TO ORDER

	Catalog Number	Description
☐	**WP-BB-XXX**	Accessory for conduit entry [1]

Notes:
1 replace "xxx" with color option

Current

currentlighting.com/beacon

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Project:
26090 - 233 Main Street, Agawam

Contact:
Myles Simon
Specification Sales
(860) 655-8099
msimon@illuminatene.com

Detail: Photometric Calculation
Date: 4-14-2026
Revision:----
Scale:
Drawn By: SB

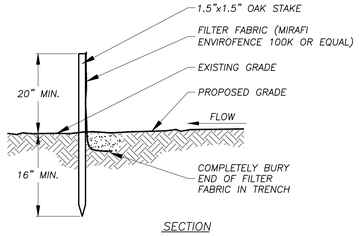
illuminate
263 Winn Street
Burlington, MA 01803
(781) 935-8500

333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

Drawing Number:

SL-2

Sheet 2 of 2



SILT FENCE DETAIL

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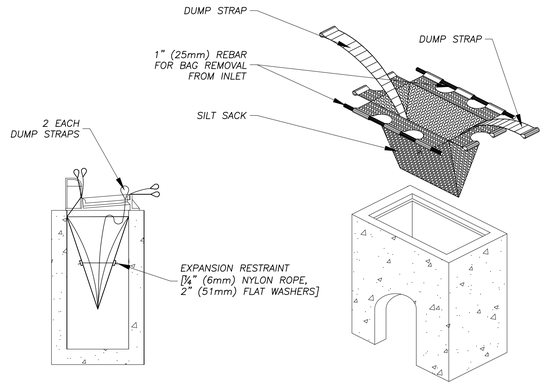

INLET PROTECTION - SEDIMENT FILTER SACK

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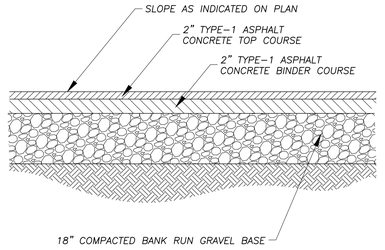
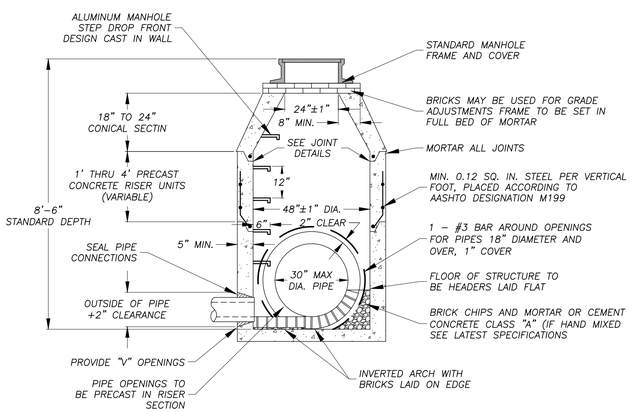


NOTE:
PAVING CROSS-SECTION TO BE USED IN TRUCK PARKING/ MANEUVERING AREAS - SEE PLAN SET FOR LOCATIONS

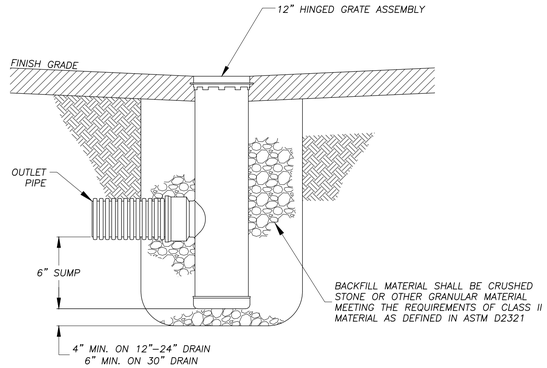
'HEAVY DUTY' BIT. CONC. PAVING DETAIL

NO SCALE



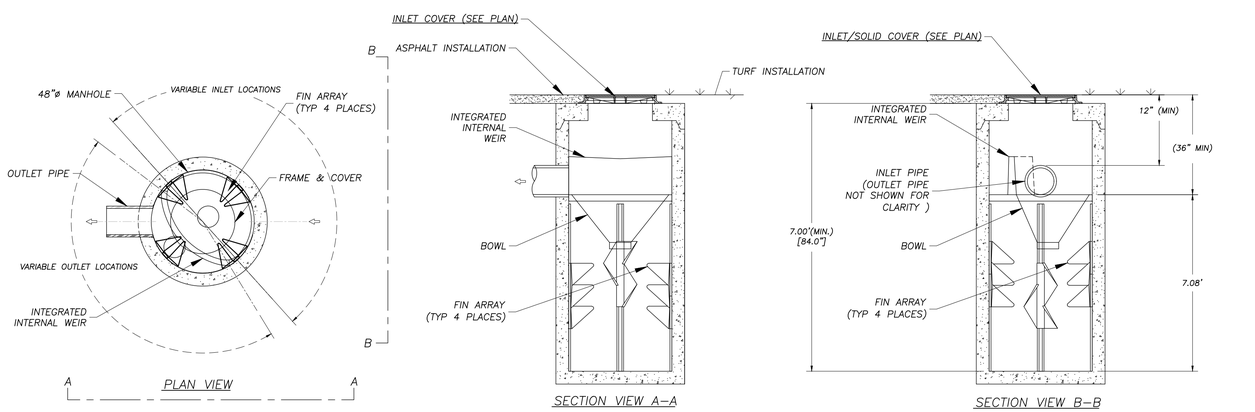
PRECAST CONCRETE MANHOLE

NO SCALE



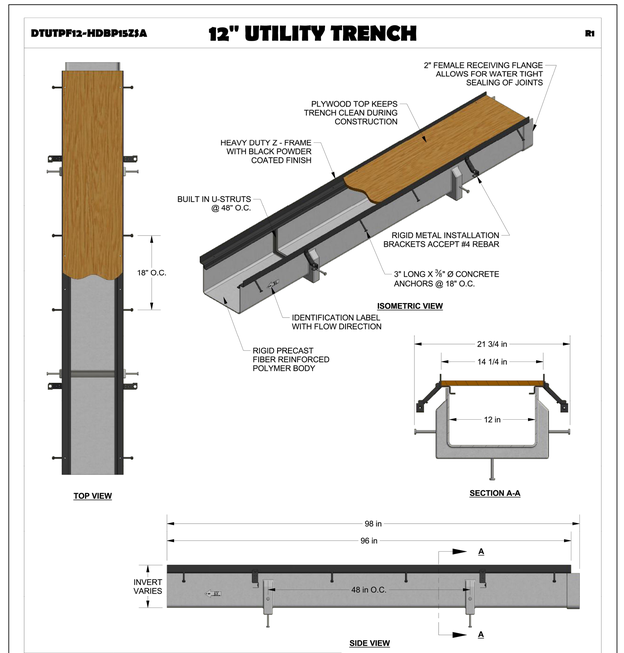
ADS NYLOPLAST YARD DRAIN BASIN

NO SCALE



WATER QUALITY UNIT - BARRACUDA S4 (PWQU-1 & PWQU-2)

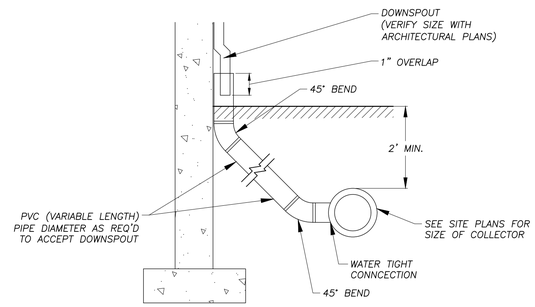
NO SCALE



NOTE: CONTRACTOR MAY SUBSTITUTE WITH AN EQUAL PRODUCT

LOADING DOCK - TRENCH DRAIN DETAIL

NOT TO SCALE



DOWNSPOUT COLLECTOR DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
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rlaland.com

DETAILS

233 Main Street
Agawam, MA
Parcel ID: KI4-2-8

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 46576
REGISTERED PROFESSIONAL ENGINEER
4/28/26

PREPARED FOR:

H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

ISSUANCE DATE: April 28, 2026

REVISIONS:	DATE:

DRAFTED BY: R.E.L.

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: AS NOTED

RLA PROJ. NUMBER: 201016

DRAWING#	REV.
D-1	-

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Stormwater Drainage Report

Proposed Building Addition

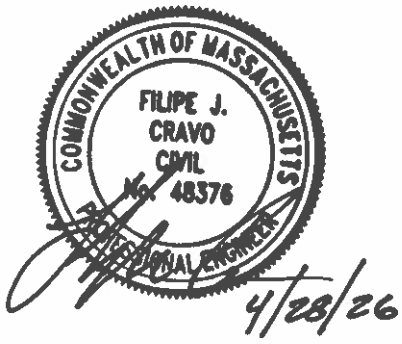
233 Main Street
Agawam, MA 01001
(Parcel ID: K14-2-8)

Submitted To:

Town of Agawam Planning Board
1000 Suffield Street
Agawam, MA 01001

Applicant/Owner:

HP Hood, LLC
6 Kimball Lane
Lynnfield, MA 01940



RLA Project File #:201016
April 28, 2026

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
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I. INTRODUCTION

The applicant, HP Hood, LLC, is proposing to construct an addition to the existing industrial facility on Parcel K14-2-8 in Agawam, Massachusetts. The proposed project will include the construction of a 7,900 square foot building addition at the southeastern corner of the main building, a loading dock area and modifications to the existing stormwater management system to accommodate the building addition and enhance water quality. Parcel K14-2-8 is the current site for Hood and is developed with various buildings, parking areas, drive aisles and other associated site improvements. There are existing stormwater best management practices consisting of catch basins, yard drains, trench drains and subsurface piping networks to mitigate stormwater runoff from the existing impervious areas. For the purposes of this report, reference to the project site shall mean only the area to be improved.

The entirety of the project site has been historically developed and is entirely impervious. Due to the site maintaining existing impervious areas, the project qualifies as a redevelopment project and is only subject to the MassDEP Stormwater Handbook standards to the maximum extent practicable. Under current conditions, stormwater generated from the paved areas in the vicinity of the proposed addition sheet flows to one of several inlet structures at intermediate low points. The existing roof leaders also connect directly into the subsurface stormwater management system. The inlet structures are interconnected via a subsurface piping network which eventually discharge to one of several outfalls tributary to the Westfield River. The proposed site improvements will generally maintain the existing drainage patterns of the site, sending stormwater runoff from the impervious areas to the various surrounding drainage structures. The existing stormwater management system will be modified to enhance water quality through the use of new proprietary sedimentation devices.

The proposed site improvements include:

- Construction of a 7,900± square foot building addition;
- Construction of a loading dock area associated with the building addition within the existing paved area;
- Modifications to the existing stormwater management system to accommodate the building addition and enhance water quality.

The purpose of this report is to present information regarding the technical aspects of the stormwater management system for the proposed project. All work is intended to be in full compliance with the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook. The stormwater management system includes approved best management practices (BMPs) to meet the requirements.

2. SITE DESCRIPTION

2.1 Predevelopment Conditions

The project site is located at 233 Main Street and the area to be redeveloped is in the southeastern corner of Parcel K14-2-8 as listed by the Chicopee Assessor's Office. For the purposes of this report, reference to the project site shall mean only the area to be improved. The entirety of the project site is zoned Industrial A as referenced from the Town of Agawam's GIS database. The parcel is bounded to the north by the Westfield River, to the East and west by industrially developed properties and to the south by Main Street. The total project site is approximately 16.9 acres in size. Figure 1 – USGS Map illustrates the location of the project.

The site has been previously developed with various industrial buildings and associated site improvements including paved driveway and parking areas. Existing utility services including water service, sewer service, gas service, and electric/telecommunication services are connected to the site via frontage on Main Street. The existing topography is characterized by gentle slopes that direct surface runoff away from the buildings and towards the on-site stormwater management systems. Grades range from 78 to 80 in the area to be developed. Please refer to the existing conditions plan submitted herewith for more detailed topographical information and Figure 4 "Pre-Development Watershed Plan" for sub-catchment area boundaries.

2.2 Resource Areas

Portions of the proposed site improvements are located within jurisdictional buffer zone area associated with the intermittent stream located along the base of the slope to the east of the area to be developed. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the on-site resource areas.

2.2.1 Floodplain

R. Levesque Associates, Inc. performed due diligence research on the property in regard to FEMA flood zone mapping. As demonstrated by the most recent FEMA Flood Insurance Rate Maps, portions of the property are located within the flood hazard areas as defined by the most recent FEMA Flood Insurance Rate Maps, see Figure 2 – FEMA FIRM Map. No impact to the flood elevations are proposed as part of this project.

2.2.2 Natural Heritage and Endangered Species Program

R. Levesque Associates, Inc. performed due diligence research on the property in regard to Natural Heritage and Endangered Species Program (NHESP) areas. The parcel is not located within an area delineated by NHESP as priority habitat of endangered species; see Figure 3 – NHESP & Zone II Map.

2.2.3 Zone II – Wellhead Protection Area

R. Levesque Associates, Inc. performed due diligence research on the property in regard to wellhead protection overlay districts. The parcel is not located within an area delineated as a Zone II Wellhead Protection Area; see Figure 3 – NHESP & Zone II Map.

2.3 Soils

R. Levesque Associates, Inc. researched the soils located on site with information readily available by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Based on a review of the USDA Soil Survey of Hampden County, Massachusetts, Central Part, the site is comprised of the following soil types:

Table 2.4: Hydrologic Soil Group Classification

Soil Description	Map Unit Symbol	Hydrologic Soil Group
Limerick Silt Loam	8A	B/D
Belgrade Silt Loam	225B	C
Unadilla Very Fine Sandy Loam	230B	C
Merrimac Fine Sandy Loam	254C	A
Enfield Silt Loam	265A	B
Urban Land	602	D
Saco Variant Silt Loam	718A	B/D

See Appendix B - Soils Information for supplemental information.

2.4 Post Development Conditions

The proposed project involves the construction of a 7,900-square-foot building addition at the southeastern corner of the existing Hood facility, along with a new loading dock area to support operations. All improvements will occur within the limits of the existing paved footprint; thereby, classifying the proposed site improvements as a redevelopment project. Per the MassDEP Stormwater Handbook, a redevelopment project is required to meet the standards to the maximum extent practicable. Notwithstanding this allowance, the proposed design has been developed with the intent of fully meeting applicable standards wherever feasible.

Redevelopment of this area will incorporate several stormwater management measures designed to control runoff from the disturbed surfaces, improve water quality, and enhance overall site conditions. The proposed stormwater management system will include the following components:

- Trench drains
- Yard drain
- Deep-sump hooded catch basin
- Proprietary sedimentation devices

Construction of the building addition will introduce several new low points around the structure. To address these conditions, a yard drain will be installed at the low point near the base of the existing ramp west of the addition. A trench drain will be installed along the northern side of the addition at the base of the loading dock, and a deep-sump hooded catch basin will be installed on the southern side. In addition, the existing trench drain between the silo area and the southern side of the addition will be replaced with a new trench drain.

All proposed inlet structures will collect and convey runoff to one of two new proprietary sedimentation devices for treatment prior to discharge into the existing stormwater management system. Roof drainage will also be updated, with existing and proposed roof leader connections modified or constructed to tie into the existing system.

Overall, the proposed improvements will maintain the site's general drainage patterns while providing enhanced stormwater treatment and water quality benefits. Additional details are provided in the accompanying site plans.

3. STORMWATER MANAGEMENT SYSTEM

R. Levesque Associates, Inc. has prepared the following drainage system calculations for the proposed project site. These calculations were performed to document compliance with the guidelines set forth by the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook (MassDEP Handbook).

3.1 Hydraulic Analysis

R. Levesque Associates, Inc. utilized the Hydraflow Storm Sewer Extension for AutoCAD Civil 3D 2022 software program, developed by Autodesk, Inc., in order to analyze the hydraulic capacity of the proposed underground infrastructure. The analysis was conducted in order to verify that the proposed conveyance piping has sufficient capacity to convey up to and including the 24-hour, 10-year storm event. The data from the analysis was used to properly size the conveyance piping such that there is no surcharge of stormwater above the rim elevations within the paved areas. As part of the input parameter required for the hydraulic analysis, the tributary inlet areas were delineated based on topography and any additional connected discharges. Additionally, the characteristic land use coverages and flow paths were identified. Please refer to Appendix C for the hydraulic analysis of the proposed stormwater management system.

3.2 MassDEP Stormwater Management Standards

R. Levesque Associates, Inc. has designed the proposed stormwater management system to be in compliance with the MassDEP Stormwater Management Standards. Chapter 1, Volume 3 of the MassDEP Handbook outlines specific calculations, and other information, that must be submitted with each report to document compliance. The following summary highlights elements of the proposed project and how they apply to each standard.

- *Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

  The proposed project provides best management practices designed to the guidelines of the MassDEP Handbook. Therefore, no new untreated stormwater is discharged.

- *Standard #2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

  A redevelopment project is required to meet Standard 2 only to the maximum extent practicable. The proposed project replaces existing impervious surfaces with new impervious surfaces of similar extent. As a result, contributing drainage areas and time of concentration

remain effectively unchanged. Therefore, post-development peak discharge rates are expected to be equivalent to pre-development conditions, and the project meets the requirements of this standard.

- *Standard #3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook.*

  As a redevelopment project, compliance with this standard is required only to the maximum extent practicable. Since there is no new impervious area, no new infiltration practices are proposed as part of the project; however, site constraints associated with the existing developed conditions limit the feasibility of incorporating such measures.

- *Standard #4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. It is presumed that this standard is met when:*

  a. Suitable practices for source control and pollution prevention are identified in a long term pollution prevention plan, and thereafter are implemented and maintained;

  b. Structural stormwater BMPs practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

  c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

  While redevelopment projects are required to comply with Standard 4 only to the maximum extent practicable, measures have been incorporated to improve the quality of runoff from the affected portion of the site. The proposed stormwater management system includes the installation of two proprietary sedimentation devices to provide treatment prior to discharge to the existing system. Refer to Appendix D for the Water Quality Volume calculations.

- *Standard #5 - For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by MassDEP to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land*

uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This standard is not applicable.

- *Standard #6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater BMPs determined by MassDEP to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

  This standard is not applicable.

- *Standard #7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural BMPs requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

  The proposed site improvements classify as a redevelopment project and proprietary sedimentation devices are being installed to enhance water quality and improve existing conditions.

- *Standard #8 – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention) shall be developed and implemented.*

  A Construction Period Erosion Control Plan has been provided in Appendix E.

- *Standard #9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

A Long-term Operation & Maintenance Plan has been provided in Appendix F.

- *Standard #10 - All illicit discharges to the stormwater management system are prohibited.*

  An illicit discharge statement will be provided prior to discharge of stormwater to post-construction BMPs. See Appendix G for a copy of the Illicit Discharge Statement.

3.3 Stormwater Best Management Practices

The proposed stormwater management system was designed utilizing stormwater best management practices (BMP) as set forth by the MassDEP Handbook. The BMPs utilized as part of the stormwater management system include deep-sump hooded catch basins and proprietary sedimentation devices. All of the BMPs were designed to meet the requirements of the MassDEP Handbook and will provide water quality treatment in order to mitigate the impacts of the proposed site improvements. See Appendix D – MassDEP Calculations for the calculations required to document compliance. The following section provides a description of the best management practices (BMPs) being utilized on site.

3.3.1 Deep Sump Catch Basins

Deep-sump catch basins equipped with an oil/gas hoods are being utilized as structural pretreatment devices within the proposed stormwater management system. The catch basins will be constructed with a 4'-0" deep sumps to act as settling chambers and allow for adequate storage of collected sediments. Catch basins are typically first in the line of water quality treatment.

3.3.2 Proprietary Sedimentation Devices

Proprietary sedimentation devices are being utilized on site for the pretreatment of stormwater runoff, in addition to the catch basins, prior to discharging off-site. Treatment of the stormwater runoff is essential to improve water quality. Maintenance of the proprietary device is crucial to the long-term effectiveness of the stormwater management system. The stormwater management system is utilizing proprietary treatment devices in order to ensure that the amount of sediment reaching the outfalls is minimal.

3.4 Protection of Stormwater Best Management Practices during Construction

Protection of the stormwater best management practices during construction will ensure the proper functioning of the stormwater management system and provide protection to the undisturbed areas until the site has been stabilized. Certain specific erosion and sedimentation controls and good practices to be performed by the site contractor have been documented in a Construction Period Erosion Control Plan. See Appendix E – Construction Period Erosion Control Plan.

3.5 Inspection and Maintenance of Stormwater Best Management Practices

Frequent maintenance of the stormwater best management practices is essential to ensuring that the stormwater management system will function properly long-term. The MassDEP provides guidelines for the regular inspection and maintenance of the proposed stormwater best management practices. A Long-Term Stormwater Operation and Maintenance Plan has been prepared which dictates the inspection frequency and maintenance operations for each BMP. See Appendix F – Long-Term Operation and Maintenance Plan.

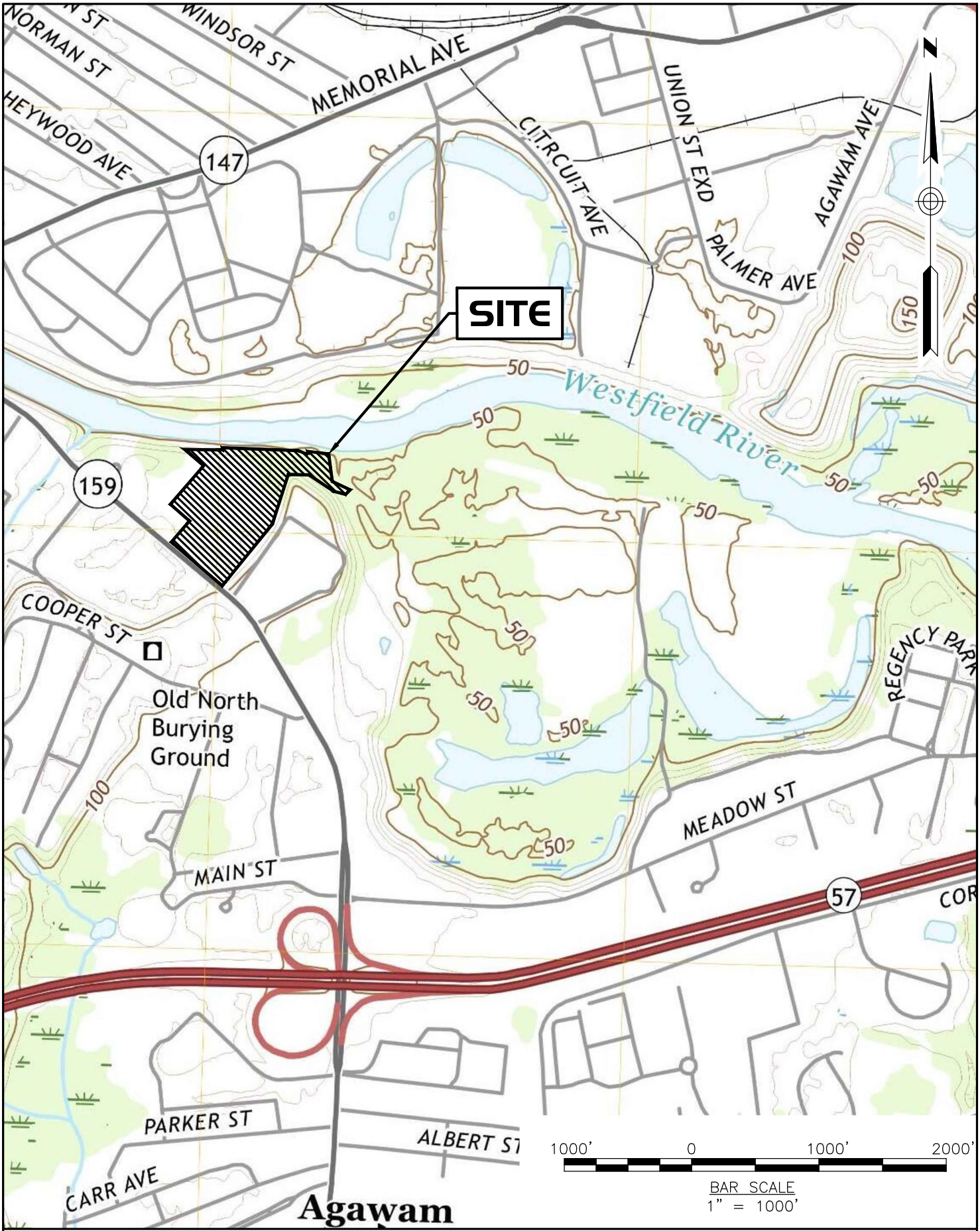
3.6 Illicit Discharge Compliance Statement

RLA has prepared an Illicit Discharge Compliance Statement to document compliance with the Massachusetts Department of Environmental Protection Stormwater Management Handbook, see Appendix G.

4. CONCLUSION

Since all improvements will occur within the limits of the existing paved footprint, this project is classified as a redevelopment project per the MassDEP Stormwater Handbook and is required to meet the standards to the maximum extent practicable. Notwithstanding this allowance, the proposed design has been developed with the intent of fully meeting applicable standards wherever feasible. The proposed modifications to the existing stormwater management system have been designed to mitigate the impacts of the proposed site improvements by providing a control for runoff water quality and water quantity. The proposed site improvements, including the stormwater management system, will utilize best management practices approved by the MassDEP Stormwater Handbook. The best management practices have been incorporated to provide water quality treatment. Implementation of stormwater best management practices such as deep-sump hooded catch basins and proprietary sedimentation devices allow for a stormwater drainage design that is in conformance with the criteria set forth in the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

Figure 1: Site Locus – USGS Map



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SITE LOCUS
USGS MAP

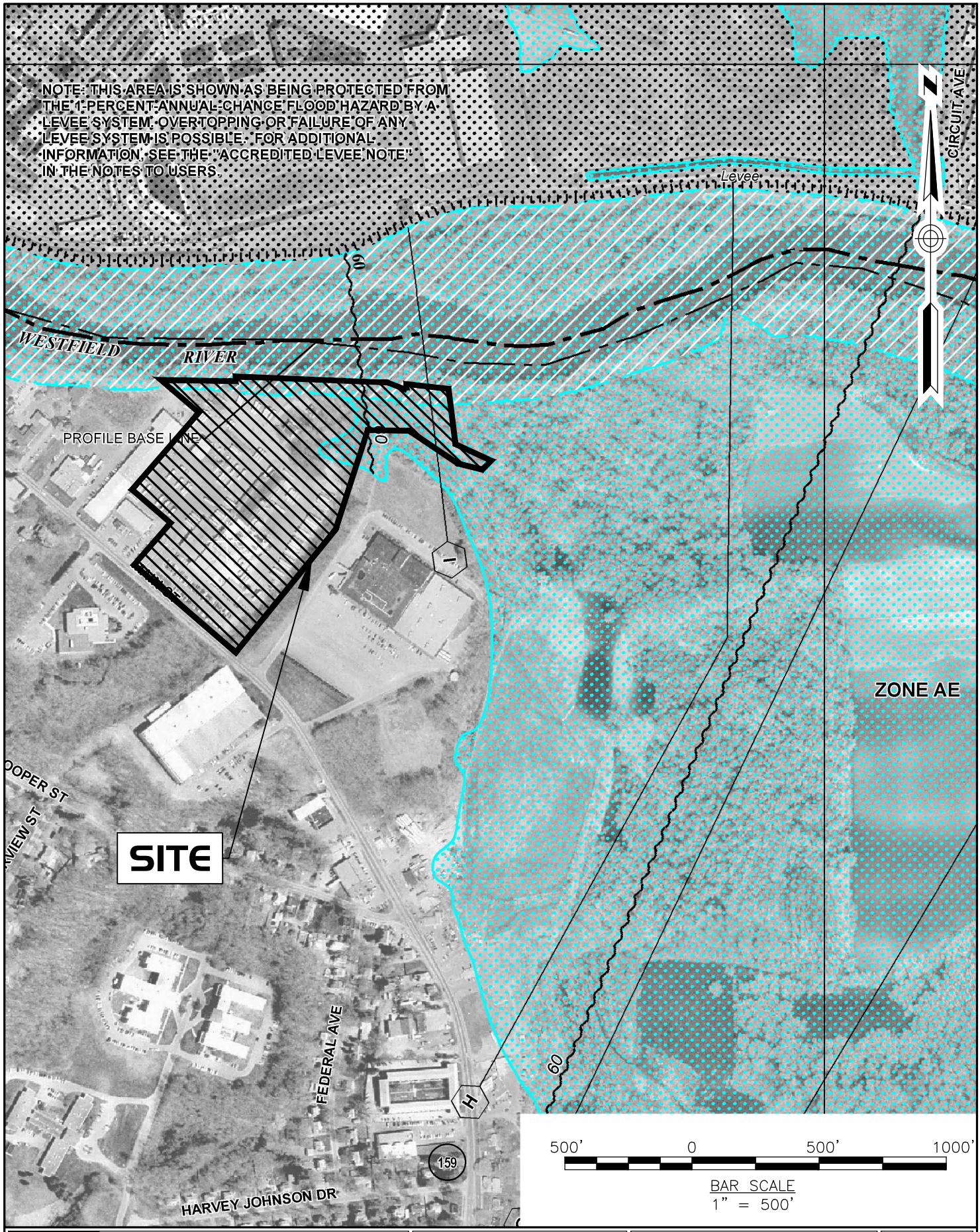
H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

Proposed Building Addition
233 Main Street
Agawam, MA

JOB NO: 201016
DATE: 4/28/26
SCALE: AS NOTED

FIG-1

Figure 2: FEMA Flood Map



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FLOOD RATE INSURANCE MAP

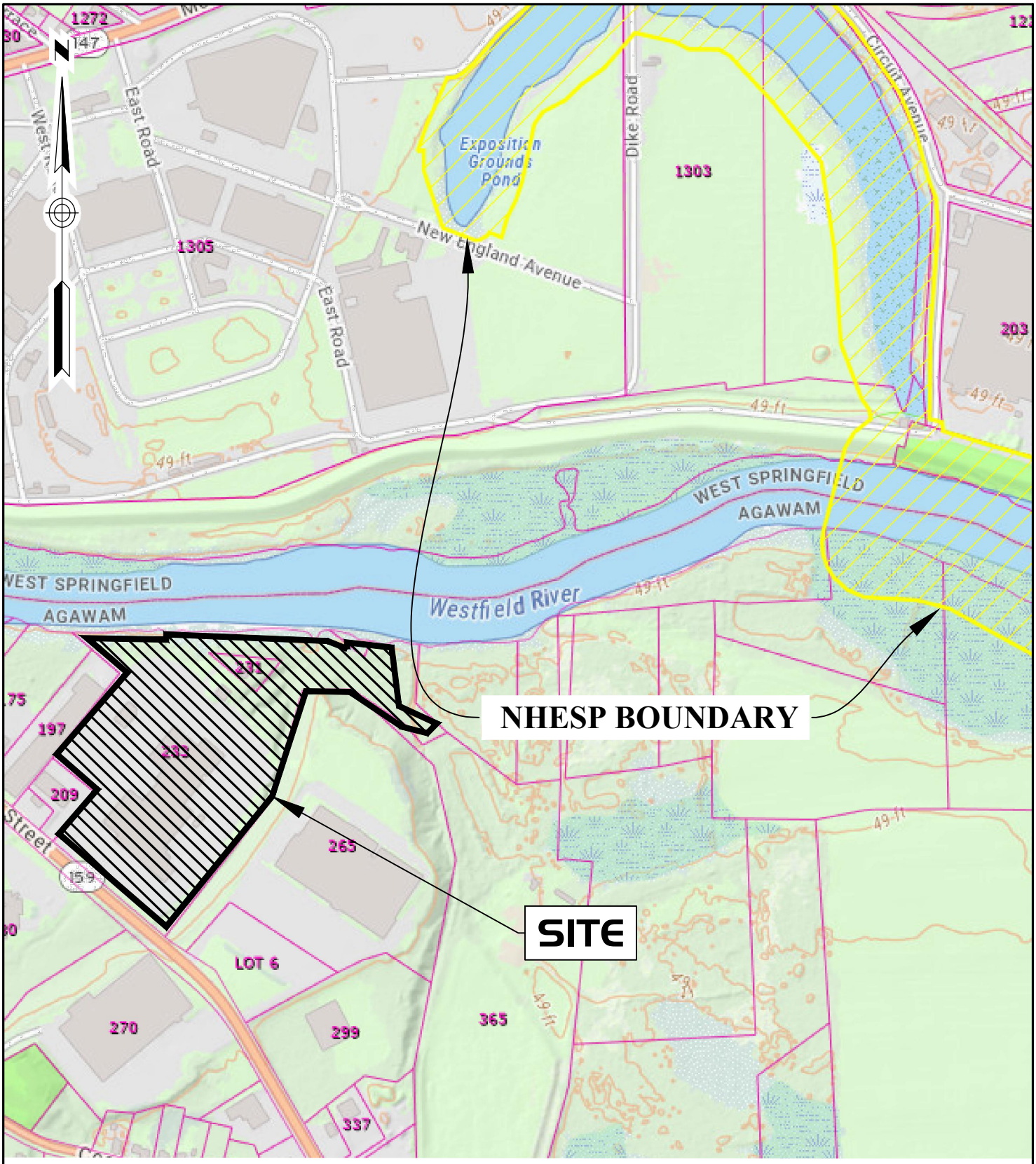
H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

Proposed Building Addition
233 Main Street
Agawam, MA

JOB NO: 201016
DATE: 4/28/26
SCALE: AS NOTED

FIG-2

Figure 3: NHESP & Zone II Map

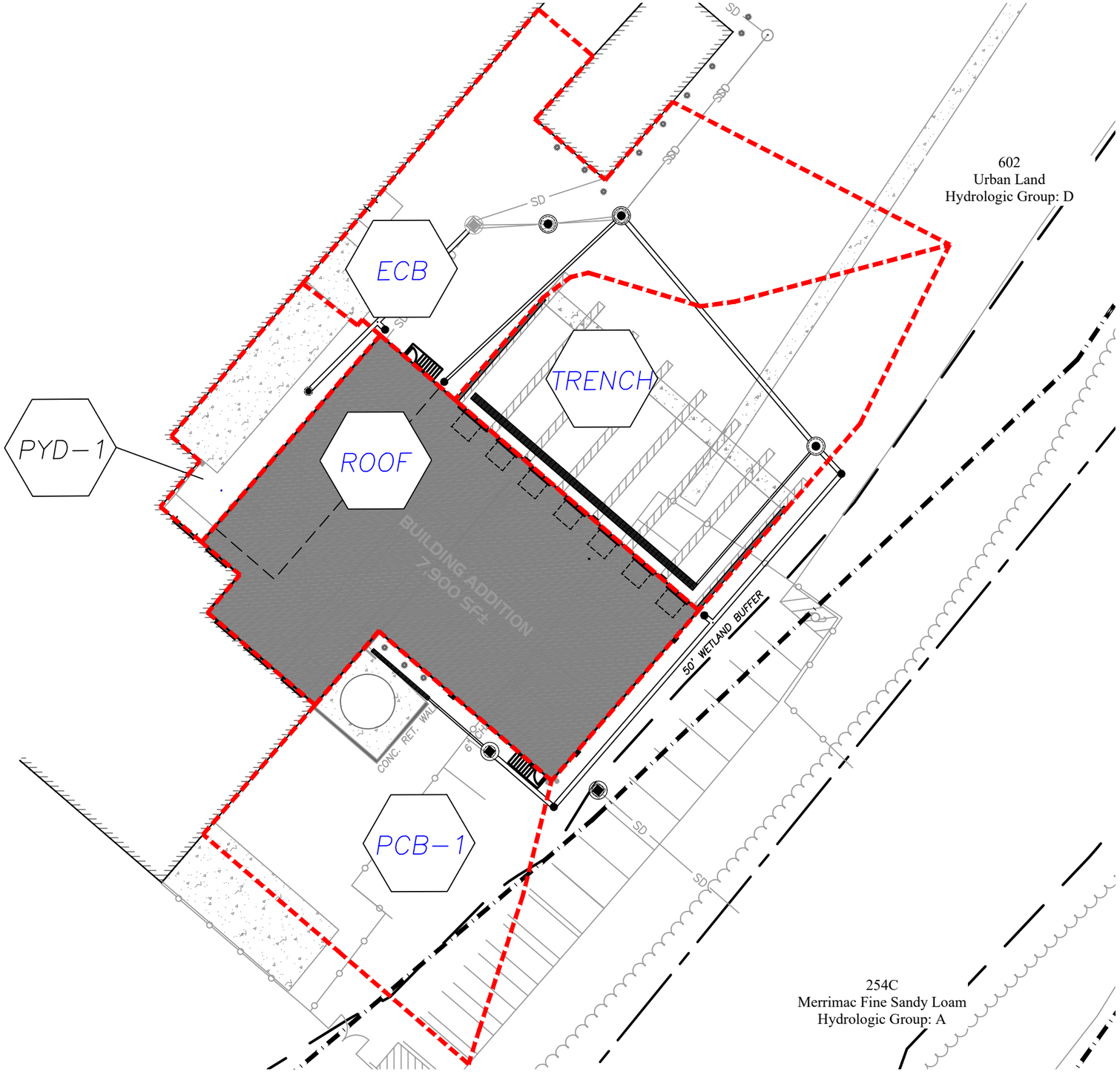


500' 0 500' 1000'

BAR SCALE
1" = 500'

R LEVESQUE ASSOCIATES, INC A Land Planning Services Company 40 School Street · P.O. Box 640 · Westfield, MA 01085 ph: 413.568.0985 fax: 413.568.0986 rlaland.com	NHESP & Zone II Map	H.P. Hood LLC Six Kimball Lane Lynnfield, MA 01940 Proposed Building Addition 233 Main Street Agawam, MA	JOB NO: 201016 DATE: 4/28/26 SCALE: AS NOTED FIG-3

Figure 4: Inlet Area Plan



LEGEND

PCB–1 STRUCTURE NAME

INLET AREA BOUNDARY

1" =30'

15 0 30

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Inlet Area Plan

Proposed Building Addition
233 Main Street
Agawam, Massachusetts

H.P. Hood LLC
Six Kimball Lane
Lynnfield, MA 01940

JOB NO.: 200116

DATE: 4/28/26

SCALE: As Noted

FIG-4

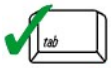
Appendix A: Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date 4/28/26

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Proprietary Sedimentation Devices

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☒ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B: Soils Information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part



April 21, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:2,870 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 19, Sep 5, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8A	Limerick silt loam, 0 to 3 percent slopes, frequently flooded	0.1	0.5%
225B	Belgrade silt loam, 0 to 8 percent slopes	4.7	26.9%
230B	Unadilla very fine sandy loam, 3 to 8 percent slopes	1.0	5.8%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	1.9	10.7%
265A	Enfield silt loam, 0 to 3 percent slopes	0.4	2.4%
602	Urban land	9.3	53.4%
718A	Saco Variant silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	0.1	0.3%
Totals for Area of Interest		**17.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden County, Massachusetts, Central Part

8A—Limerick silt loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2zvdd
Elevation: 50 to 500 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Limerick and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Limerick

Setting

Landform: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty alluvium

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 24 inches: silt loam
H3 - 24 to 60 inches: stratified very fine sand to very fine sandy loam to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 10 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 13.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F144AY015NY - Wet Silty Low Floodplain
Hydric soil rating: Yes

Minor Components

Winooski

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: No

Saco variant

Percent of map unit: 5 percent
Landform: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

225B—Belgrade silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99mt
Elevation: 50 to 1,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Belgrade and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belgrade

Setting

Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Friable coarse-silty eolian deposits over soft coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 28 inches: silt loam
H3 - 28 to 60 inches: stratified very fine sand to silt

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Unadilla

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

230B—Unadilla very fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99rn
Elevation: 50 to 1,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Unadilla and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Unadilla

Setting

Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Hard coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 23 inches: very fine sandy loam
H3 - 23 to 60 inches: stratified very fine sand to silt

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY024NY - Well Drained Eolian Outwash
Hydric soil rating: No

Minor Components

Belgrade

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Landscape: Valleys, outwash plains
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landscape: Valleys, outwash plains
Landform: Eskers, Outwash plains, Moraines, Kames, Outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 5 percent
Landscape: Outwash plains, valleys
Landform: Deltas, Kames, Eskers, Outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landscape: Lake plains, valleys
Landform: Deltas, Terraces, Outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landscape: Valleys
Landform: Outwash plains, Dunes, Deltas, Outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

265A—Enfield silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99nw
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Convex

Parent material: Friable coarse-silty eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 25 inches: silt loam
H3 - 25 to 60 inches: stratified sand to very gravelly fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Ninigret

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sudbury

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

602—Urban land

Map Unit Setting

National map unit symbol: 99rq
Frost-free period: 150 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Toeslope
Anthropogenic Feature: Urban land

718A—Saco Variant silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2zvdh
Elevation: 0 to 3,280 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Saco variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saco Variant

Setting

Landform: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty alluvium

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 22 inches: silt loam
H3 - 22 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: F144AY016MA - Very Wet Low Floodplain
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Limerick

Percent of map unit: 5 percent
Landform: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

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Appendix C: Hydraulic Analysis

NOAA Atlas 14, Volume 10, Version 3
Location name: Agawam, Massachusetts, USA*
Latitude: 42.0856°, Longitude: -72.618°
Elevation: 78 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.338** (0.261-0.433)	**0.406** (0.314-0.522)	**0.518** (0.398-0.668)	**0.612** (0.468-0.793)	**0.740** (0.549-1.01)	**0.837** (0.609-1.16)	**0.937** (0.663-1.36)	**1.05** (0.704-1.56)	**1.21** (0.780-1.86)	**1.33** (0.844-2.11)
10-min	**0.478** (0.370-0.614)	**0.576** (0.445-0.739)	**0.735** (0.566-0.947)	**0.867** (0.664-1.12)	**1.05** (0.778-1.42)	**1.18** (0.862-1.65)	**1.33** (0.939-1.92)	**1.49** (0.998-2.21)	**1.71** (1.11-2.64)	**1.89** (1.20-2.98)
15-min	**0.563** (0.435-0.722)	**0.677** (0.523-0.870)	**0.864** (0.666-1.11)	**1.02** (0.780-1.32)	**1.23** (0.915-1.68)	**1.39** (1.01-1.94)	**1.56** (1.10-2.26)	**1.75** (1.18-2.60)	**2.01** (1.30-3.10)	**2.22** (1.41-3.51)
30-min	**0.760** (0.588-0.975)	**0.916** (0.708-1.18)	**1.17** (0.901-1.51)	**1.38** (1.06-1.79)	**1.67** (1.24-2.27)	**1.89** (1.38-2.63)	**2.12** (1.50-3.07)	**2.37** (1.60-3.53)	**2.73** (1.77-4.22)	**3.02** (1.91-4.77)
60-min	**0.958** (0.741-1.23)	**1.16** (0.892-1.48)	**1.48** (1.14-1.90)	**1.74** (1.34-2.26)	**2.11** (1.57-2.87)	**2.39** (1.74-3.32)	**2.68** (1.89-3.87)	**3.00** (2.01-4.46)	**3.45** (2.23-5.33)	**3.81** (2.41-6.02)
2-hr	**1.22** (0.953-1.56)	**1.47** (1.14-1.87)	**1.87** (1.45-2.39)	**2.20** (1.70-2.84)	**2.66** (1.99-3.60)	**3.00** (2.20-4.17)	**3.36** (2.40-4.88)	**3.79** (2.55-5.61)	**4.42** (2.87-6.80)	**4.95** (3.14-7.79)
3-hr	**1.40** (1.10-1.78)	**1.69** (1.32-2.14)	**2.15** (1.67-2.74)	**2.53** (1.96-3.25)	**3.06** (2.30-4.14)	**3.45** (2.55-4.80)	**3.88** (2.79-5.64)	**4.39** (2.97-6.48)	**5.17** (3.36-7.94)	**5.84** (3.71-9.16)
6-hr	**1.76** (1.38-2.21)	**2.13** (1.68-2.69)	**2.75** (2.15-3.48)	**3.26** (2.54-4.16)	**3.96** (3.00-5.35)	**4.48** (3.34-6.21)	**5.05** (3.68-7.35)	**5.76** (3.91-8.48)	**6.89** (4.50-10.5)	**7.88** (5.03-12.3)
12-hr	**2.15** (1.70-2.69)	**2.66** (2.10-3.33)	**3.49** (2.76-4.40)	**4.19** (3.28-5.30)	**5.14** (3.92-6.91)	**5.84** (4.38-8.08)	**6.61** (4.86-9.62)	**7.61** (5.17-11.1)	**9.20** (6.02-14.0)	**10.6** (6.79-16.5)
24-hr	**2.53** (2.02-3.14)	**3.18** (2.53-3.96)	**4.24** (3.37-5.31)	**5.13** (4.05-6.45)	**6.34** (4.88-8.50)	**7.23** (5.46-9.97)	**8.22** (6.09-12.0)	**9.52** (6.50-13.9)	**11.6** (7.63-17.6)	**13.5** (8.67-20.9)
2-day	**2.88** (2.31-3.55)	**3.65** (2.93-4.51)	**4.91** (3.92-6.09)	**5.96** (4.73-7.44)	**7.40** (5.72-9.86)	**8.44** (6.42-11.6)	**9.61** (7.18-14.0)	**11.2** (7.66-16.2)	**13.8** (9.08-20.8)	**16.1** (10.4-24.8)
3-day	**3.15** (2.54-3.87)	**3.99** (3.21-4.91)	**5.36** (4.30-6.63)	**6.50** (5.18-8.09)	**8.07** (6.27-10.7)	**9.20** (7.04-12.6)	**10.5** (7.87-15.2)	**12.2** (8.39-17.7)	**15.1** (9.95-22.7)	**17.7** (11.4-27.1)
4-day	**3.39** (2.74-4.15)	**4.28** (3.46-5.25)	**5.74** (4.62-7.08)	**6.95** (5.56-8.63)	**8.62** (6.72-11.4)	**9.83** (7.53-13.4)	**11.2** (8.41-16.2)	**13.0** (8.96-18.8)	**16.1** (10.6-24.1)	**18.8** (12.1-28.8)
7-day	**4.04** (3.29-4.93)	**5.05** (4.10-6.16)	**6.69** (5.41-8.20)	**8.05** (6.47-9.93)	**9.92** (7.76-13.1)	**11.3** (8.67-15.3)	**12.8** (9.64-18.4)	**14.8** (10.2-21.3)	**18.2** (12.0-27.1)	**21.1** (13.7-32.2)
10-day	**4.70** (3.83-5.70)	**5.76** (4.69-7.00)	**7.49** (6.08-9.15)	**8.94** (7.21-11.0)	**10.9** (8.56-14.3)	**12.4** (9.51-16.7)	**14.0** (10.5-19.9)	**16.1** (11.1-23.0)	**19.4** (12.9-28.9)	**22.4** (14.5-34.1)
20-day	**6.74** (5.54-8.12)	**7.86** (6.46-9.50)	**9.70** (7.94-11.8)	**11.2** (9.12-13.7)	**13.3** (10.5-17.2)	**14.9** (11.4-19.7)	**16.6** (12.4-23.0)	**18.6** (13.0-26.4)	**21.7** (14.5-32.1)	**24.4** (15.9-36.9)
30-day	**8.46** (6.98-10.2)	**9.62** (7.93-11.6)	**11.5** (9.44-13.9)	**13.1** (10.7-15.9)	**15.2** (12.0-19.4)	**16.8** (12.9-22.1)	**18.5** (13.8-25.4)	**20.5** (14.3-28.9)	**23.3** (15.6-34.3)	**25.6** (16.7-38.7)
45-day	**10.6** (8.79-12.7)	**11.8** (9.77-14.1)	**13.8** (11.3-16.5)	**15.4** (12.6-18.6)	**17.6** (13.9-22.3)	**19.3** (14.9-25.1)	**21.1** (15.6-28.4)	**22.9** (16.1-32.2)	**25.3** (17.0-37.1)	**27.2** (17.8-41.0)
60-day	**12.4** (10.3-14.8)	**13.6** (11.3-16.3)	**15.7** (13.0-18.8)	**17.4** (14.3-21.0)	**19.7** (15.6-24.8)	**21.5** (16.5-27.7)	**23.3** (17.2-31.1)	**25.0** (17.6-35.0)	**27.2** (18.3-39.8)	**28.8** (18.8-43.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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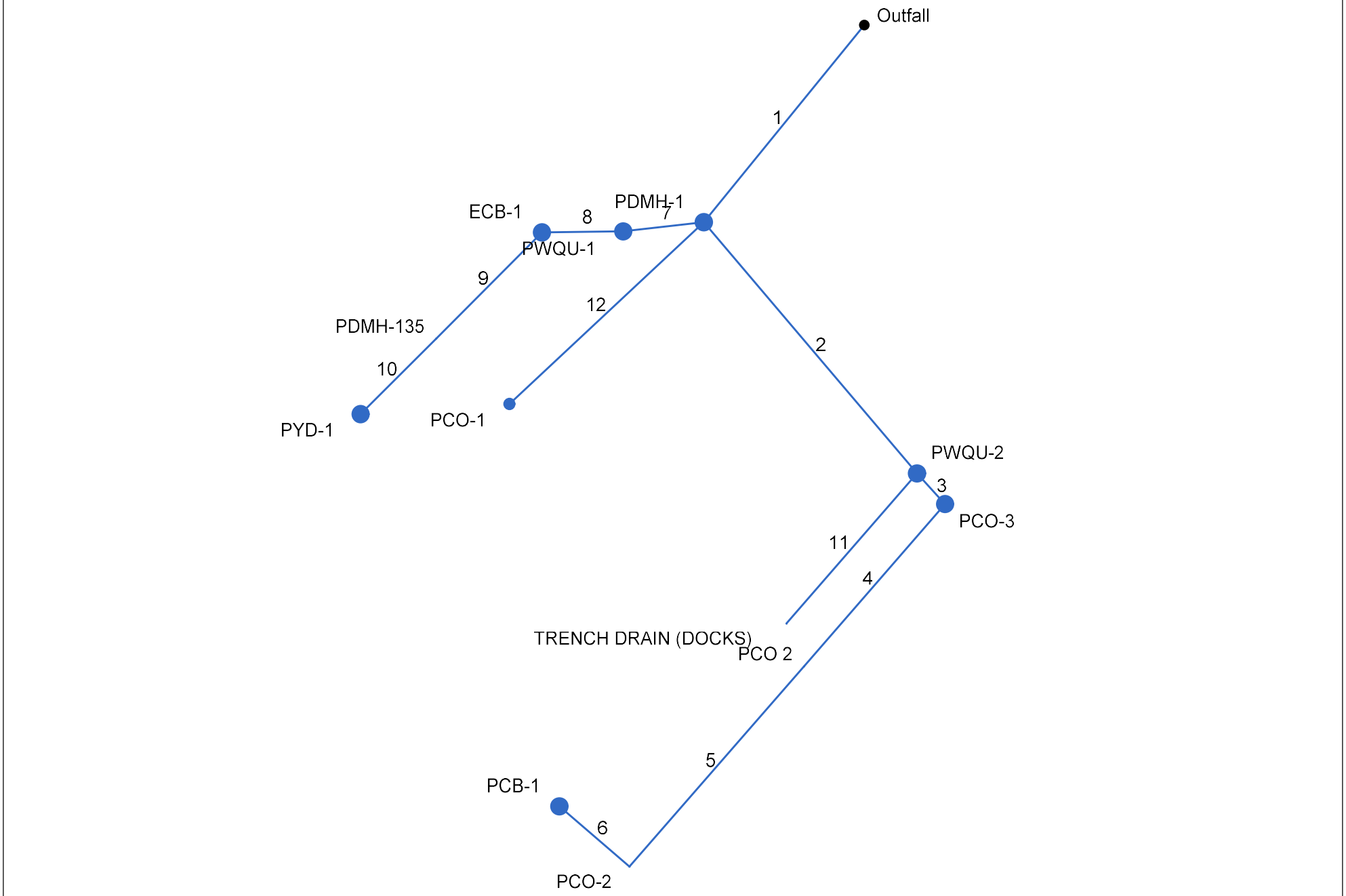
PF graphical

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



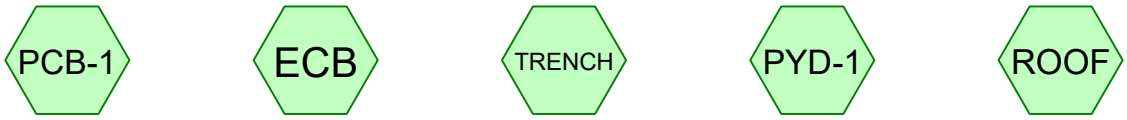
Project File: CAD export.stm	Number of lines: 12	Date: 4/29/2026

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	62.092	0.00	0.00	0.00	0.00	0.00	0.0	10.6	0.0	3.20	0.64	4.22	12	0.03	74.36	74.38	75.24	75.76	78.71	78.70	P-D-PIPE-(131)
2	1	80.448	0.00	0.00	0.00	0.00	0.00	0.0	9.3	0.0	1.30	2.51	1.66	12	0.50	74.48	74.88	76.01	76.12	78.70	79.59	P-D-PIPE-(123) (1
3	2	10.060	0.00	0.00	0.00	0.00	0.00	0.0	9.1	0.0	0.60	2.97	0.76	12	0.70	74.98	75.05	76.16	76.16	79.59	79.55	P-D-PIPE-(123)
4	3	52.505	0.00	0.00	0.00	0.00	0.00	0.0	7.9	0.0	0.60	2.55	0.80	12	0.51	75.05	75.32	76.17	76.19	79.55	80.23	P-D-PIPE-(121) (1
5	4	64.937	0.00	0.00	0.00	0.00	0.00	0.0	6.5	0.0	0.60	2.55	1.08	12	0.51	75.32	75.65	76.19	76.21	80.23	76.59	P-D-PIPE-(121)
6	5	22.584	0.00	0.00	0.00	0.00	0.00	6.0	6.0	0.0	0.60	3.35	2.00	12	0.89	75.65	75.85	76.23	76.17	76.59	78.82	P-D-PIPE-(120)
7	1	19.704	0.00	0.00	0.00	0.00	0.00	0.0	10.4	0.0	1.00	2.41	1.27	12	0.46	74.48	74.57	76.01	76.03	78.70	78.64	P-D-PIPE-(130)
8	7	19.775	0.00	0.00	0.00	0.00	0.00	6.0	10.1	0.0	1.00	2.53	1.27	12	0.51	74.67	74.77	76.03	76.05	78.64	76.87	P-D-PIPE-(129)
9	8	36.497	0.00	0.00	0.00	0.00	0.00	0.0	7.7	0.0	0.20	3.57	0.26	12	1.01	74.77	75.14	76.06	76.07	76.87	80.27	P-D-PIPE-(119) (1
10	9	26.056	0.00	0.00	0.00	0.00	0.00	6.0	6.0	0.0	0.20	3.56	1.15	12	1.00	75.14	75.40	76.07	75.58	80.27	78.05	P-D-PIPE-(119)
11	2	48.612	0.00	0.00	0.00	0.00	0.00	6.0	6.0	0.0	0.70	0.72	3.57	6	0.99	74.98	75.46	76.16	76.61	79.59	77.56	P-D-PIPE-(124)
12	1	64.789	0.00	0.00	0.00	0.00	0.00	6.0	6.0	0.0	0.90	2.54	1.15	12	0.51	74.48	74.81	76.01	76.05	78.70	79.00	P-D-PIPE-(127)

Project File: CAD export.stm | Number of lines: 12 | Run Date: 4/29/2026

NOTES:Known Qs only ; c = cir e = ellip b = box



Subcat Reach Pond Link

Routing Diagram for 201016 - INLET
Prepared by R Levesque Associates, Printed 4/28/2026
HydroCAD® 10.20-8a s/n 02175 © 2025 HydroCAD Software Solutions LLC

Summary for Subcatchment ECB:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,829 cf, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.13"

Area (sf)	CN	Description
6,938	98	Paved parking, HSG D
6,938	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-1:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,279 cf, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.13"

Area (sf)	CN	Description
709	98	Paved parking, HSG A
4,881	98	Paved parking, HSG D
5,590	98	Weighted Average
5,590	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-1:

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 648 cf, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.13"

Area (sf)	CN	Description
1,588	98	Paved parking, HSG D
1,588	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment ROOF:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,221 cf, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.13"

Area (sf)	CN	Description
7,899	98	Roofs, HSG D
7,899	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment TRENCH:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,655 cf, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.13"

Area (sf)	CN	Description
6,510	98	Paved parking, HSG D
6,510	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Appendix D: MassDEP Calculations

- Water Quality Flow Rate – PWQU-1
- Water Quality Flow Rate – PWQU-2
- Water Quality Flow Rate Conversion Table
- Barracuda Max Info Sheet

Standard 4: Water Quality - PWQU-I

Water Quality Volume Conversion to Flow Rate

Note: Required water quality volume based on 0.5-inch of runoff

$$Q = (qu)\,(A)\,(WQV)$$

where: Q = peak flow rate associated with first 0.5-inch of runoff (c.f.s.)

qu = unit peak discharge (csm/in) - value taken from table based on t_c

A = impervious surface drainage area (sq. mi.)

WQV = water quality volume in watershed inches (0.5-inch)

· Proposed Water Quality Unit (PCB-1)

t_c =	0.100	hrs	
qu =	752	csm/in	(from table)
A =	0.00031	sq. mi.*	
WQV =	0.5	inch	

$Q_{0.5}$ = 0.11 c.f.s

The Barracuda Max Model S4 provides treatment of flows up to 1.52 c.f.s

* Only inlcudes impervious area tributary to PWQU-1

Standard 4: Water Quality - PWQU-2

Water Quality Volume Conversion to Flow Rate

Note: Required water quality volume based on 0.5-inch of runoff

$$Q = (qu)\,(A)\,(WQV)$$

where: Q = peak flow rate associated with first 0.5-inch of runoff (c.f.s.)

qu = unit peak discharge (csm/in) - value taken from table based on t_c

A = impervious surface drainage area (sq. mi.)

WQV = water quality volume in watershed inches (0.5-inch)

· Proposed Water Quality Unit (PCB-1)

t_c =	0.100	hrs	
qu =	752	csm/in	(from table)
A =	0.00043	sq. mi.*	
WQV =	0.5	inch	

$Q_{0.5}$ = 0.16 c.f.s

The Barracuda Max Model S4 provides treatment of flows up to 1.52 c.f.s

* Only inlcudes impervious area tributary to PWQU-2

Figure 2: For First ½-inch of Runoff, Table of qu values for Ia/P Curve = 0.0.058, listed by tc, for Type III Storm Distribution

Tc (Hours)	qu (csm/in)
0.01	821
0.03	821
0.05	813
0.067	794
0.083	773
0.1	752
0.116	733
0.133	713
0.15	694
0.167	677
0.183	662
0.2	646
0.217	632
0.233	619
0.25	606
0.3	572
0.333	552
0.35	542
0.4	516
0.416	508
0.5	472
0.583	443
0.6	437
0.667	417
0.7	408
0.8	383
0.9	361
1	342
1.1	325
1.2	311
1.3	297
1.4	285
1.5	274
1.6	264
1.7	254
1.8	246
1.9	238
2	230
2.1	223
2.2	217
2.3	211
2.4	205
2.5	200
2.6	194
2.7	190
2.8	185
2.9	181
3	176
3.1	173
3.2	169
3.3	165
3.4	162
3.5	158
3.6	155
3.7	152
3.8	149
3.9	147
4	144
4.1	141
4.2	139
4.3	136
4.4	134
4.5	132
4.6	130
4.7	128
4.8	126
4.9	124
5	122
5.1	120
5.2	118
5.3	116
5.4	115
5.5	113
5.6	112
5.7	110
5.8	109
5.9	107
6	106
6.1	104
6.2	103
6.3	102
6.4	100
6.5	99
6.6	98
6.7	97
6.8	96
6.9	94
7	93
7.1	92
7.2	91
7.3	90
7.4	89
7.5	88
7.6	87
7.7	86
7.8	85
7.9	84
8	84
8.1	83
8.2	82
8.3	81
8.4	80
8.5	79
8.6	79
8.7	78
8.8	77
8.9	76
9	76
9.1	75
9.2	74
9.3	74
9.4	73
9.5	72
9.6	72
9.7	71
9.8	70
9.9	70
10	69

Barracuda® Max

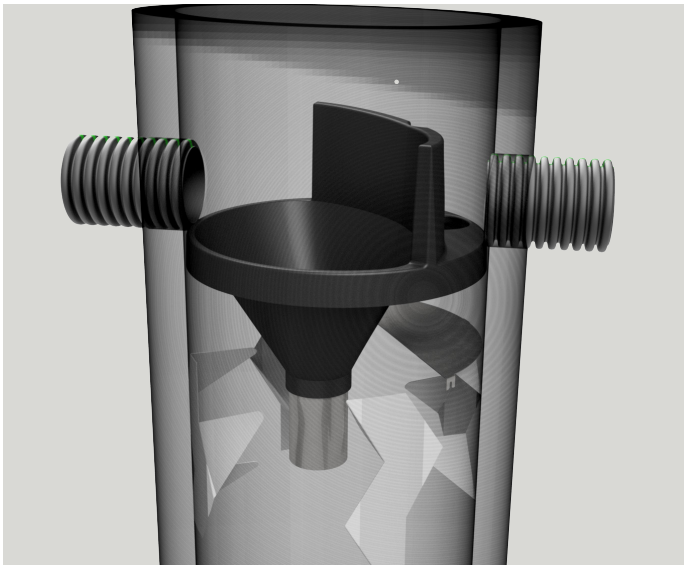
The Barracuda Max is market-changing stormwater quality technology. This high-performance vortex hydrodynamic separator is designed to remove total suspended solids in order to protect our precious receiving waters. The Barracuda Max is also an outstanding value that offers multiple pipe configurations, and quick installation. The “Max” version of the Barracuda is built on the base platform of the original ADS Barracuda with improved removal efficiencies and installation components.

Features

- Single manhole design
- No elevation loss between the inlet and outlet
- Variable inlet/outlet angle configurations (not just 180 degree orientation)
- Internal bypass for inline installation (where applicable)
- Revolutionary, patent pending “teeth” mitigate turbulence in the sump area to prevent resuspension of captured contaminants
- Available with grated drop inlet configuration
- Available with trash and/or oil capture add-ons

Benefits

- Internal components are in stock for quick delivery
- The S3, S4, S6, and S8 can be installed in a standard 36” (900 mm), 48” (1200 m), 72” (1800 m), and 96” (2400 m) precast manhole, respectively
- The S3 & S4 can be provided factory installed within a 36” (900 mm) and 48” (1200 mm) ADS HP manhole and delivered to the jobsite
- The Barracuda Max “teeth” and deflector plate apparatus are fabricated and designed for quick and easy field assembly
- Designed for easy maintenance using a vacuum truck or similar equipment.
- Inspection and maintenance are performed from the surface with no confined space entry





Barrucuda Specification

Materials and Design

- Concrete Structures: Designed for H-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.
- 36” (900 mm) and 48” (1200 mm) HP Manhole Structures: Made from an impact modified copolymer polypropylene meeting the material requirements of ASTM F2764. The eccentric cone reducer shall be manufactured from polyethylene material meeting ASTM D3350 cell class 213320C. Gaskets shall be made of material meeting the requirements of ASTM F477.
- Separator internals shall be substantially constructed of stainless steel, polyethylene or other thermoplastic material approved by the manufacturer.

Performance

- The stormwater treatment unit shall be an inline unit capable of conveying 100% of the design peak flow. If peak flow rates exceed maximum hydraulic rate, the unit shall be installed offline.
- The Barracuda Max unit shall be designed to remove at least 80% of the suspended solids on an annual aggregate removal basis. Said removal shall be based on full-scale third party testing using OK-110 media gradation or equivalent and 300 mg/L influent concentration. Said full scale testing shall have included sediment capture based on actual total mass collected by the stormwater treatment unit.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS using a media mix with d_{50}=75 micron and 200 mg/L influent concentration.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS per current NJDEP/NJCAT HDS protocol.
- The stormwater treatment unit internals shall consist of (1) separator cone assembly, and (1) sump assembly, which includes the “teeth”.

Barracuda Max Model	Manhole Diameter	OK-110 (80% removal)	Pretreatment for Infiltration[1]
S3	36” (900 mm)	0.86 CFS (24.1 L/s)	1.65 CFS (46.7 L/s)
S4	48” (1200 mm)	1.52 CFS (43.0 L/s)	2.94 CFS (83.3 L/s)
S6	72” (1800 mm)	3.42 CFS (96.8 L/s)	6.62 CFS (187.5 L/s)
S8	96” (2400 mm)	6.08 CFS (172.2 L/s)	11.76 CFS (333.0 L/s)

* Peak bypass flows are dependent on final design

[1] 50% removal of OK-110.

Installation

Installation of the stormwater treatment unit(s) shall be performed per manufacturer’s installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems at 800-821-6710 or by logging on to www.adspipe.com.

ADS “Terms and Conditions of Sale” are available on the website, www.ads-pipe.com . The ADS logo, Barracuda logo, and the Green Stripe are registered trademarks of Advanced Drainage Systems, Inc.
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Appendix E: Construction Period Erosion Control Plan

Construction Period Erosion Control Plan

Proposed Building Addition

233 Main Street
Agawam, MA 01001
(Parcel ID: K14-2-8)

Submitted To:

Town of Agawam Planning Board
1000 Suffield Street
Agawam, MA 01001

Applicant/Owner:

HP Hood, LLC
6 Kimball Lane
Lynnfield, MA 01940

RLA Project File #:201016
April 28, 2026

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

The project shall implement a construction period erosion control plan. The following provides descriptions and guidelines to ensure that the areas surrounding the project site will be protected from excessive sedimentation and runoff during construction.

1.1 Construction Period Pollution Prevention And Erosion Control Measures

1.1.1 Preconstruction Notifications And Meetings

Prior to the start of construction, the contractor shall call together a pre-construction meeting including a representative from the Town, the design engineer, contractor, and any pertinent persons that should be in attendance. These requirements shall be the responsibility of the Contractor to arrange, attend, and document.

1.1.2 Sediment Barrier And Work Limit

Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the owner or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine, provided all other ground cover is left intact. No excavation, grading, filling, or removal of vegetative ground cover shall begin until sediment barriers have been installed as shown on the plans and have been inspected by the owner or their representative.

1.1.3 Silt Fence

The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with compacted soil or crushed stone. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

1.1.4 Straw Bales

Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose hay.

1.1.5 Filter Sock (Filtrexx Or Equivalent)

In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, mulch or crushed stone shall be placed along the up-slope face to control and filter underflow. Additional layers of Filter Sock may be required for adequate freeboard. The filter sock shall be staked at 10 feet on-center or in cases where they cannot be staked, utilize heavy concrete blocks to hold in place.

1.1.6 Temporary Sedimentation Basins

Temporary sediment basins may be excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion. If the temporary basin is to be located within an area of future infiltration as part of the stormwater management system, the excavation for the temporary sedimentation basin shall be limited to one foot above final grade of the infiltration structure.

1.1.7 Stocking Additional Materials

A stock of additional erosion control materials shall be available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

Straw Bales – 10 (kept dry) with 20 oak stakes

Or

Silt Fence – 30 Linear feet.

Or

Filter Sock – 4 – 8 foot sections (kept dry)

Washed Stone – One (1) cubic yard, ¾" to 2" diameter

1.1.8 Trench Protection

Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

1.1.9 Site Stabilization – Temporary

Where a portion of the site will not be subject to construction activity for over 14 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

1.1.10 Site Stabilization – Permanent

Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover (season permitting) in accordance with USDA NRCS guidelines or equivalent.

1.1.11 Roadway Sweeping

The entrance to the site and affected portions of the access drive or paved project areas shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

1.2 Short-Term Erosion Control Maintenance

The following provides short-term erosion control maintenance guidelines and requirements.

1. The contractor or subcontractor will be responsible for implementing each control shown on the sedimentation and erosion control plan.
2. All erosion and sediment control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control measures will be installed during construction in order to control erosion and/or off-site sedimentation if deemed necessary by on-site inspection.
3. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
4. All sediment and erosion control devices shall be inspected at least once every seven (7) calendar days and after any storm event greater than 0.5 inches of precipitation during any 24-hour period, and the inspection shall be documented in writing. Damaged or ineffective devices shall be repaired or replaced, as necessary.
5. The contractor shall take all reasonable precautions to avoid excess erosion of the site due to the construction of this project.
6. Silt shall be removed from behind barriers if greater than 6-inches deep or as needed. Sediment that is collected in structures shall be disposed of properly and covered if stored on-site
7. Damaged or deteriorated items will be repaired immediately after identification.
8. All ditches shall be stabilized as soon as is practicable to minimize erosion.
9. The contractor shall maintain all erosion control devices in a good, working state of repair. Upon complete stabilization of any tributary areas, the erosion control devices shall be removed and disposed of so as to cause no off-site siltation.
10. Inspect and maintain construction entrance stone such that sediment does not track onto the street. Any sediment tracked onto the street shall be swept daily.
11. After catch basins have been constructed, the contractor shall protect the inlets by constructing inlet protection as shown on the plans.
12. Once the site has been paved, all catch basin inlets shall receive a silt sack type protection.
13. Erosion control measures shall remain in place until all disturbed earth has been substantially stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Appendix F: Long-Term Operation and Maintenance Plan

- Long-Term Operation & Maintenance Plan Narrative
- O&M Checklist
- Barracuda Max Maintenance Guide

Long-Term Operation & Maintenance Plan

Proposed Building Addition

233 Main Street
Agawam, MA 01001
(Parcel ID: K14-2-8)

Submitted To:

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I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner/Responsible Party*:

HP Hood, LLC
6 Kimball Lane
Lynnfield, MA 01940

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Roadway to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Deep-Sump Catch Basins	Four times per year	Four times per year	• Remove sediment once deposits reach one half the depth from the bottom sump to the lowest invert.
Stormwater Piping	Once per year	Once per year	• Inspect pipe entrances in catch basins and manholes and remove any blockages
Roof Leaders	Once per year	Once per year	• Inspect downspout connections at grade and remove any blockages • Open and inspect cleanout locations and remove any blockages
Proprietary Sedimentation Device*	As specified by the manufacturer	As specified by the manufacturer	• Clean the unit using the method specified by the manufacturer. Vactor trucks are typically used to clean these units.
Yard Drains	Four times per year	As necessary	• Remove debris from inlet grate; • Inspect and remove sediment from bottom of unit and clear any pipe blockage.
Trench Drain	Four times per year	As necessary	• Remove debris from inlet grate; • Inspect and remove sediment from bottom of trench and clear any pipe blockage.

*See attached Device Operation and Maintenance Guide

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Heavy-duty stormwater drain manhole covers and catch basin grates have been designed to withstand H20 loading;

C. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

D. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$50	1	$200
Proprietary Sedimentation Device	2/year	$100	2	$400
Trench Drain	4/year	$50	2	$400
Yard Drain	4/year	$50	1	$200
Total Estimated Annual Cost of Inspections				$1,200

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$200	1	$800
Proprietary Sedimentation Device	2/year	$200	2	$800
Trench Drain	4/year	$100	2	$800
Yard Drain	4/year	$100	1	$400
Total Estimated Annual Cost of Maintenance				$2,800

Project: Proposed Building Addition

Address: 233 Main Street, Agawam, MA 01001

BPM Name:

Responsible Party:

Date:

Page: 1 of 1

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Stormwater Piping	Blockage of inlet/outlet pipes due to debris or sediment accumulation.	Remove any debris and sediment via proper means. Dispose of debris/sediment in accordance with local & state regulations			
Proprietary Treatment Device	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Remove sediment and disposed of in accordance with local and state regulations.			
Roof Leaders	Downspout connections have been damaged or disconnected.	Repair and reconnect downspout connections.			
	Roof leaders are surcharging at the downspout connections	Open and insepct at cleanout locations and remove any blockages.			
Deep-Sump Catch Basins	Sediment has accumulated to a depth greater than the original design depth for sediment storage, approximately 2-feet of sediment.	Remove the sediment and dispose of in accordance with local and state regulations.			
Yard Drain	Blockage of inlet grate due to debris or vegetation.	Remove debris from inlet grate and cut back vegetation around frame.			

Inspector's Signature

Date

Barracuda® Max & Barracuda Maintenance Guide

One of Barracuda's advantages is the ease of maintenance. Like any system that collects pollutants, the Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

The entire maintenance procedure typically takes 2 to 4 hours, depending on the system's size, the captured material, and the vacuum truck's capacity.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

Inspection and Cleaning Cycle

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and then on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

Determining When to Clean

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

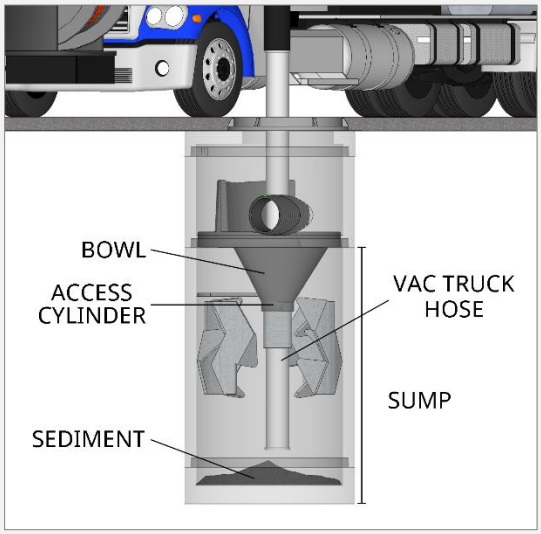
Barracuda Storage Capacities

Model	Manhole Diameter in. (mm)	Total System Volume Gallons (Liters)	Treatment Chamber Capacity Gallons (Liters)	Standard Sediment Capacity (20" depth) Yards^3 (meters^3)	NJDEP Sediment Capacity (50% of standard depth) Yards^3 (meters^3)
S3	36 (900)	264 (999)	212 (803)	0.44 (0.34)	0.22 (0.17)
S4	48 (1200)	665 (2517)	564 (2135)	0.78 (0.60)	0.39 (0.30)
S6	72 (1800)	1497 (5667)	1269 (4804)	1.75 (1.34)	0.88 (0.67)
S8	96 (2400)	4196 (15884)	3835 (14517)	3.10 (2.37)	1.55 (1.19)

Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. Access this area through the 8" (200 mm), 10" (250 mm), 15" (375 mm) or 20" (500 mm) diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
   a. Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
   b. Some localities treat the pollutants as leachate. Check with local regulators about disposal requirements.
   c. Additional local regulations may apply to the maintenance procedure.

Figure 1



ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com
The ADS logo, Barracuda® and the Green Stripe are registered trademarks of Advanced Drainage Systems, Inc.
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Appendix G: Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

The owners of the land/responsible party will be responsible for prohibiting illicit discharges to the stormwater management system during construction and during its life of operation. The stormwater management system is comprised of the components for conveying, treating, and infiltrating stormwater runoff on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. An illicit discharge shall constitute any connection or discharge to the stormwater management system including, but not limited to, wastewater discharges, discharge of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Responsible Party*:

HP Hood, LLC
c/o Bob Hale
6 Kimball Lane
Lynnfield, MA 01940

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

Signature of Responsible Party Representative — Date: 4/22/26

Signature of Responsible Party Representative** — Date

**Required upon transfer of ownership

Notice of Intent

Under the Wetlands Protection Act 310 CMR 10.00

Proposed Building Addition

Project Location:

233 Main Street
Agawam, Massachusetts 01001
(Parcel ID: K14-2-8)

Submitted to:

Town of Agawam Conservation Commission
1000 Suffield Street
Agawam, Massachusetts 01001

Applicant:

HP Hood, LLC
6 Kimball Lane
Lynnfield, Massachusetts 01940

Property Owner:

HP Hood, Inc.
6 Kimball Lane
Lynnfield, Massachusetts 01940

RLA Project File No. 201016

April 28, 2026

R LEVESQUE ASSOCIATES, INC.

A LAND PLANNING SERVICES COMPANY

40 School Street, Westfield, MA 01085

p 413.568.0985 · f 413.568.0986 · www.rlaland.com

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2. ADMINISTRATIVE FORMS
   - 2.1 WPA FORM 3 – NOTICE OF INTENT
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4. FIGURES
   - 4.1 FIGURE 1 – USGS TOPOGRAPHIC MAP
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5. PUBLIC NOTICE
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LIST OF APPENDICES

APPENDIX A: SITE PLAN SET

APPENDIX B: STORMWATER REPORT

I. COVER LETTER

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

April 28, 2026

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
1000 Suffield Street
Agawam, Massachusetts 01001

RE: Notice of Intent Application
233 Main Street
Agawam, Massachusetts 01001
(Parcel ID: K14-2-8)
RLA Project File No. 201016

Dear Chairman Kozloski and Commissioners:

On behalf of the applicant, HP Hood, LLC, please find the requisite number of copies of a Notice of Intent application and supporting documentation. The applicant proposes the construction of a building addition with associated site improvements. Portions of the site improvements are within the buffer zone to Bank of an intermittent stream.

Included within this submission package is the requisite filing fee. As required, a copy of this application has been submitted electronically via email to the Town of Agawam Conservation Commission and through eDEP to the Massachusetts Department of Environmental Protection.

We are requesting to be placed on the Commission's next available agenda. Should you have any questions or comments regarding this filing, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Wetland/Soil Scientist & Project Manager

2. ADMINISTRATIVE FORMS

2.1 WPA FORM 3 – NOTICE OF INTENT

2.2 NOI WETLAND FEE TRANSMITTAL FORM

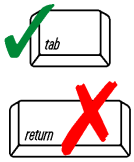
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Agawam
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

233 Main Street — a. Street Address
Agawam — b. City/Town
01001 — c. Zip Code

Latitude and Longitude:
42.085102 — d. Latitude
72.612290 — e. Longitude

K14 — f. Assessors Map/Plat Number
2-8 — g. Parcel /Lot Number

2. Applicant:

Bob — a. First Name
Hale — b. Last Name
HP Hood, LLC — c. Organization
6 Kimball Lane — d. Street Address
Lynnfield — e. City/Town
MA — f. State
01940 — g. Zip Code
540-868-7760 — h. Phone Number
i. Fax Number
bob.hale@hphood.com — j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

Gary — a. First Name
Kaneb — b. Last Name
HP Hood, Inc. — c. Organization
6 Kimball Lane — d. Street Address
Lynnfield — e. City/Town
MA — f. State
01940 — g. Zip Code
540-868-7760 — h. Phone Number
i. Fax Number
bob.hale@hphood.com — j. Email address

4. Representative (if any):

Robert — a. First Name
Levesque — b. Last Name
R Levesque Associates, Inc. — c. Company
40 School Street — d. Street Address
Westfield — e. City/Town
MA — f. State
01085 — g. Zip Code
(413) 568-0985 — h. Phone Number
i. Fax Number
robl@rlaland.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$1,050.00 — a. Total Fee Paid
$512.50 — b. State Fee Paid
$537.50 — c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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A. General Information (continued)

6. General Project Description:

The applicant proposes the construction of a building addition with associated site improvements, portions of which are within the buffer zone to Bank of an intermittment stream. Please refer to the attached project narrative for greater detail.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☒ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

a. County	b. Certificate # (if registered land)
Hampden	
c. Book	d. Page Number
13330	509

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☒ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☐ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☐ Riverfront Area	1. Name of Waterway (if available) - **specify coastal or inland**	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   02/23/2026
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 – Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Bourne to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Plymouth to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☐ Is this an aquaculture project? d. ☐ Yes ☒ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☒ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

"Proposed Building Addition"
a. Plan Title

R Levesque Associates, Inc.
b. Prepared By

Robert M. Levesque, RLA, ASLA & Filipe J. Cravo, P.E.

04-28-2026
d. Final Revision Date

As shown
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

1240
2. Municipal Check Number

04/13/2026
3. Check date

4423609
4. State Check Number

4/15/2026
5. Check date

Robert
6. Payor name on check: First Name

Hale
7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2. Date: 4/15/26

3. Signature of Property Owner (if different)

4. Date: 4/15/26

5. Signature of Representative (if any): Nina Fazio
On behalf of R Levesque Associates, Inc.

6. Date: 04-23-2026

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

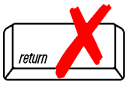
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A. Applicant Information

1. Location of Project:

233 Main Street	Agawam
a. Street Address	b. City/Town
4423609	$512.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Bob		Hale	
a. First Name		b. Last Name	
HP Hood, LLC			
c. Organization			
6 Kimball Lane			
d. Mailing Address			
Lynnfield	MA	01940	
e. City/Town	f. State	g. Zip Code	
540-868-7760		bob.hale@hphood.com	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

Gary		Kaneb	
a. First Name		b. Last Name	
HP Hood, Inc.			
c. Organization			
6 Kimball Lane			
d. Mailing Address			
Lynnfield	MA	01940	
e. City/Town	f. State	g. Zip Code	
540-868-7760		bob.hale@hphood.com	
h. Phone Number	i. Fax Number	j. Email Address	

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 3b	1	$1,050.00	$1,050.00

Step 5/Total Project Fee: $1,050.00

Step 6/Fee Payments:

Total Project Fee:	$1,050.00 (a. Total Fee from Step 5)
State share of filing Fee:	$512.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$537.50 (c. 1/2 Total Fee **plus** $12.50)

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

3. PROJECT NARRATIVE

PROJECT NARRATIVE TO NOTICE OF INTENT

For

PROPOSED BUILDING ADDITION
233 MAIN STREET
AGAWAM, MASSACHUSETTS 01001
(PARCEL ID: K14-2-8)

INTRODUCTION

On behalf of the applicant, HP Hood, LLC, R Levesque Associates, Inc. is providing this Project Narrative as a supplement to the Notice of Intent application. The applicant proposes the construction of a building addition with associated site improvements adjacent to the existing building at 233 Main Street. Portions of the proposed project are located within the buffer zone to Bank of an intermittent stream. All proposed work is located within existing impervious area.

PROPERTY DESCRIPTION

The subject property is located northeast of Main Street and consists of approximately 16.7 ± acres as shown on the associated site plan prepared by R Levesque Associates, Inc. The subject property is owned by HP Hood, Inc. and is recorded in the Hampden County Registry of Deeds in Book 13330, Page 509.

Examination of GIS information from the Massachusetts Natural Heritage Atlas revealed the subject property is not located within Natural Heritage and Endangered Species Program jurisdiction.

EXISTING CONDITIONS & TOPOGRAPHY

The subject property is currently improved with an existing industrial building with associated site improvements. The topography of the project area is generally flat, gradually sloping from the west to east. Steep embanked exists east of the intermittent stream. A USGS Topographic Map of the site is included within this application packet under Section 4, as Figure 1.

SOILS

According to the NRCS Web Soil Survey, the soil types mapped in the general area of the proposed project consist of Merrimac fine sandy loam, 8 to 15 percent slopes (254C) and Urban Land (602). Please see the attached NRCS Web Soil Survey in Section 4, as Figure 3, of this application packet which depicts the location of the defined soils below.

The Merrimac series consists of very deep, somewhat excessively drained soils formed in outwash. They are nearly level through very steep soils on outwash terraces and plains and other glaciofluvial landforms. Slope ranges from 0 through 35 percent.

PROJECT DESCRIPTION

The applicant proposes the construction of a building addition with associated site improvements. Associated site improvements include, but are not limited to, stormwater management, utility connections, and site landscaping. All proposed work is located within existing impervious area.

The proposed project work will proceed in the following general sequence:

1. Installation of erosion controls along the permitted limit of work;
2. Demolition and removal of existing site improvements, as needed;
3. Extension of existing utility connections from existing infrastructure;
4. Installation of stormwater management structures;
5. Construction of a 7,900 ± SF building addition;
6. Construction of new concrete truck pad; and
7. Site stabilization and removal of erosion controls at the direction of the Town of Agawam Conservation Commission.

WETLAND RESOURCE AREAS

Wetland resource areas were delineated by R Levesque Associates, Inc. in Spring 2021 and have previously been determined as accurate under MassDEP File #087-0671. The definition of each applicable resource area is presented below in *italic text* followed by a description of the project presented below in **boldface text**.

Please note any resource areas delineated off-site have been shown to accurately portray Riverfront Area onto the subject property and the determination of such is not the subject of this filing.

Bank

In 310 CMR 10.54(2) it states, "*A Bank is the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland.*"

Bank is associated with an intermittent stream located easterly of the subject property and has been marked in the field with sequentially numbered flagging labeled "BNK-100" through "BNK-131" and "BNK-200" through "BNK-247". Said stream originates off-site to the south and flows northerly to its confluences within the Westfield River. There are no proposed disturbances to Bank.

Bordering Vegetated Wetlands (BVW)

As defined in 310 CMR 10.55 (2) (a), "*Bordering Vegetated Wetlands are freshwater wetlands which border on creeks, rivers, streams, ponds, and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps, and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants…*".

A Bordering Vegetated Wetland (BVW) is present within the rear of 233 Main Street and has been marked in the field with sequentially numbered flagging labeled "A-100" through "A-131". The BVW series is located within a deeply incised ravine adjacent to the intermittent stream. The BVW has not been shown on the associated site plan due to its distance from the proposed site improvements. There are no proposed disturbances to the BVW.

Buffer Zone

Buffer Zone as defined in 310 CMR 10.04 is *"the area of land extending 100 feet horizontally outward from the boundary of any areas specified in 310 CMR 10.02(1)(a)".*

Buffer Zone associated with the Bordering Vegetated Wetland (BVW) and Bank has been shown offset 50' and 100' from the outermost boundary of the delineated resource area,

which is Bank in this instance. Portions of the proposed building addition and associated site improvements are located within the 100' buffer zone of Bank. Proposed site improvements are not located closer to the resource area than existing degraded area.

Bordering Land Subject to Flooding (BLSF)

As stated in 310 CMR 10.57(2)(a), *"Bordering Land Subject to Flooding is an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds, or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland."* .

A portion of the subject property is located within the 100-year Flood Hazard Zone AE according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Hampden County, Massachusetts, Map Number 25013C0403E, effective date of July 16, 2013. The 100-year Flood Zone Elevation for the site is 60.2 The FEMA Floodplain Map is included as Figure 2 in Section 4 of this application packet. However, BLSF is located outside the project site area, therefore no disturbance to BLSF is proposed as part of this project.

EROSION CONTROL

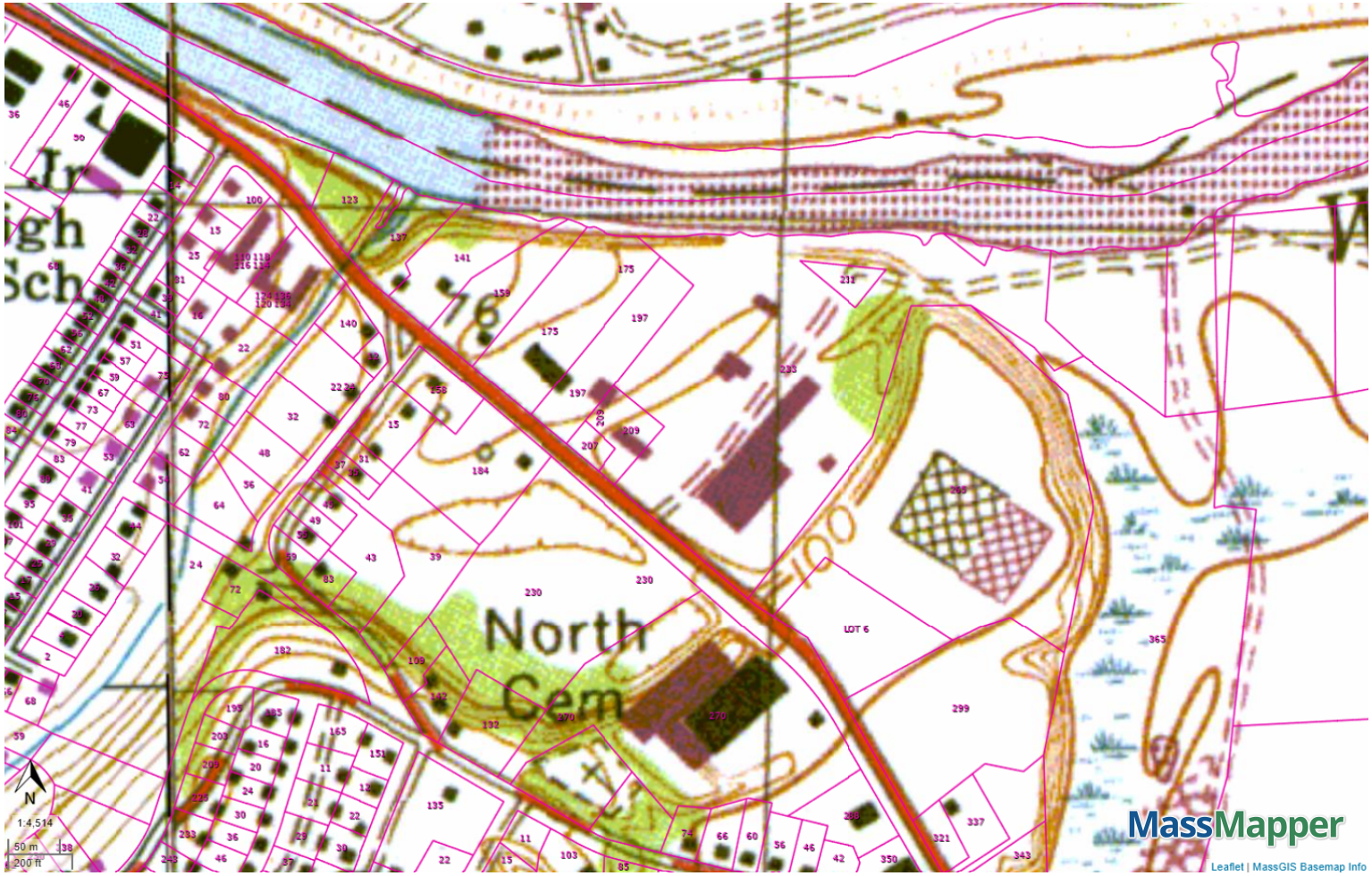
Erosion controls are proposed to protect the site against soil migration and to protect the Resource Area from siltation. All exposed soils on the site will be stabilized as soon as possible. Barrier controls will not be removed until a Certificate of Compliance has been issued by the Town of Agawam Conservation Commission. Please see the accompanying project plan which depicts the location of barrier controls in greater detail.

[END OF PROJECT NARRATIVE]

4. FIGURES

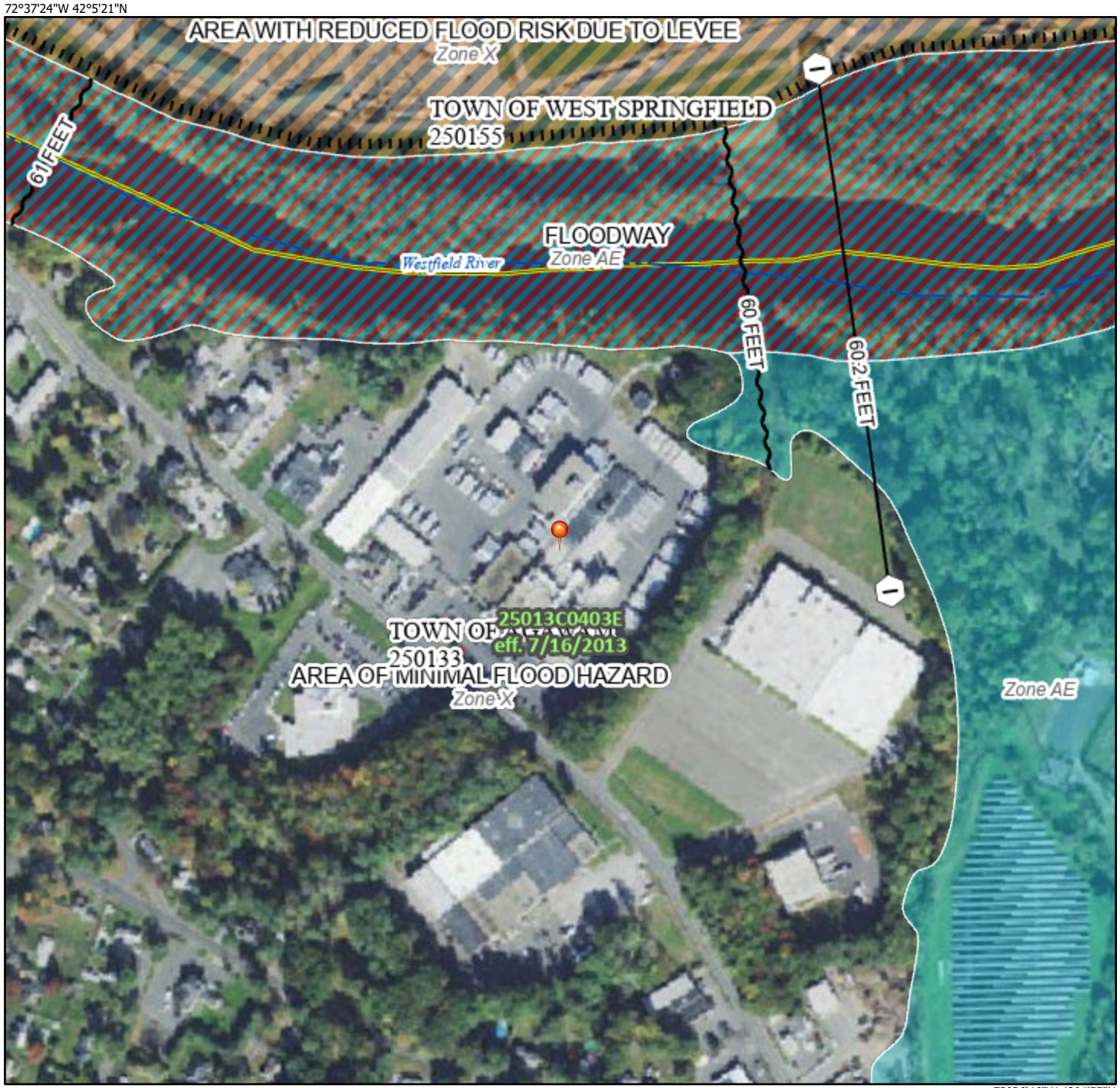
4.1 FIGURE 1 – USGS TOPOGRAPHIC MAP
4.2 FIGURE 2 – FEMA FLOODPLAIN MAP
4.3 FIGURE 3 – NRCS SOILS MAP

USGS Topographic Map



Property Tax Parcels
USGS Topographic Maps

National Flood Hazard Layer FIRMette



Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/25/2026 at 9:11 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Hampden County, Massachusetts, Central Part
(GISDATA_L3_TAXPAR_POLY_ASSESSPolygon)



Map Scale: 1:2,870 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 19, Sep 5, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8A	Limerick silt loam, 0 to 3 percent slopes, frequently flooded	0.1	0.5%
225B	Belgrade silt loam, 0 to 8 percent slopes	4.7	26.9%
230B	Unadilla very fine sandy loam, 3 to 8 percent slopes	1.0	5.8%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	1.9	10.7%
265A	Enfield silt loam, 0 to 3 percent slopes	0.4	2.4%
602	Urban land	9.3	53.4%
718A	Saco Variant silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	0.1	0.3%
Totals for Area of Interest		**17.4**	**100.0%**

5. PUBLIC NOTICE

5.1 ABUTTER NOTIFICATION LIST – 100'

5.2 ABUTTER NOTIFICATION LETTER

K14 2 7
BISCALDI MICHAEL L
301 PEASE RD
EAST LONGMEADOW, MA

K14 2 5
CARANDO GOURMET FROZEN
175 MAIN ST
AGAWAM, MA 01001 1804

K13 1 5
DRAGON PARADISE LLC
90 MERRILL RD
SPRINGFIELD, MA 01119

K14 3 1
EPC HAMMES LLC
4500 DORR ST
TOLEDO, OH 43615

K14 2 8
HP HOOD INC
6 KIMBALL LN
LYNNFIELD, MA 01940

K14 2 8
HP HOOD INC
6 KIMBALL LN
LYNNFIELD, MA 01940

K13 2 1
HP HOOD LLC
6 KIMBALL LN
LYNNFIELD, MA 01940

K14 2 12
HP HOOD LLC
6 KIMBALL LN
LYNNFIELD, MA 01940

K13 2 11
HP HOOD LLC
6 KIMBALL LN
LYNNFIELD, MA 01940

K14 2 6
MCLEAN REALTY CO
197 MAIN ST
AGAWAM, MA 01001

K13 2 9
MUSHY`S GOLF CENTER LLC
369 MAIN ST
AGAWAM, MA 01001

L14 1 11
O`MALLEY JOSEPH CO-TR
29 CONLIN RD
OXFORD, MA 01540

K14 2 9
TOWN OF AGAWAM
36 MAIN ST
AGAWAM, MA 01001 1837

K14 2 13
TOWN OF AGAWAM
36 MAIN ST
AGAWAM, MA 01001 1837

Notification to Abutters

By Hand Delivery, Certified Mail (return receipt requested), or Certificates of Mailing

This is a notification required by law. You are receiving this notification because you have been identified as the owner of land abutting another parcel of land for which certain activities are proposed. Those activities require a permit under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40).

In accordance with the second paragraph of the Massachusetts Wetlands Protection Act, and 310 CMR 10.05(4)(a) of the Wetlands Regulations, you are hereby notified that:

A. A Notice of Intent was filed with the Town of Agawam Conservation Commission on or about April 28, 2026 seeking permission to remove, fill, dredge, or alter an area subject to protection under M.G.L. c. 131 §40. The following is a description of the proposed activity/activities:

The applicant proposes the construction of a building addition with associated site improvements. Portions of the site improvements are within the buffer zone to Bank of an intermittent stream.

B. The name of the applicant is: HP Hood, LLC

C. The address of the land where the activity is proposed is: 233 Main Street, Agawam, MA 01001 (Parcel ID: K14-2-8)

D. Copies of the Notice of Intent may be examined or obtained at the office of the Town of Agawam Conservation Commission office, located at 1000 Suffield Street, Agawam, MA 01001. The regular business hours of the Commission are Monday-Friday 8:30am-4:30pm, and the Commission may be reached at 413-786-0400.

E. Copies of the Notice of Intent may be obtained from the applicant or their representative by calling R Levesque Associates, Inc. at 413-569-0985. An administrative fee of $95.00 is applied for providing copies of the application materials and site plans.

F. Information regarding the date, time, and location of the public hearing regarding the Notice of Intent may be obtained from the Town of Agawam Conservation Commission. Notice of the public hearing will be published at least five business days in advance, in the local newspaper.

Notification provided pursuant to the above requirement does not automatically confer standing to the recipient to request Departmental Action for the underlying matter. See 310 CMR 10.05(7)(a)4.

APPENDIX A: SITE PLAN SET

SITE PLAN SET ENTITLED “PROPOSED BUILDING ADDITION”

PREPARED FOR HP HOOD, LLC

PREPARED BY R LEVESQUE ASSOCIATES, INC.

DATED APRIL 28, 2026

APPENDIX B: STORMWATER REPORT

STORMWATER DRAINAGE REPORT

PREPARED FOR HP HOOD, LLC

PREPARED BY R LEVESQUE ASSOCIATES, INC.

DATED APRIL 28, 2026

Chapter 3

Checklist for Redevelopment Projects

Standard 7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Redevelopment is defined to include

- Maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving;
- Development rehabilitation, expansion and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area; and
- Remedial projects specifically designed to provide improved stormwater management, such as projects to separate storm drains and sanitary sewers, and stormwater retrofit projects.

Components of redevelopment projects that include development of previously undeveloped sites do not meet this definition. The portion of the project located in a previously developed area must meet Standard 7, but project components within undeveloped areas must meet all the Standards.

MassDEP recognizes that site constraints often make it difficult to comply with all the Standards at a redevelopment site. These constraints are as follows:

Lack of space. Because of the presence of existing structures, on-site subsurface sewage disposal systems, stormwater best management practices, and water bodies and wetlands, and easements, the space available for the installation of additional stormwater BMPs may be quite limited. On many suites it may be difficult or impossible to use space-intensive BMPs such as wet detention basins.

Soils: The presence of bedrock or clay can limit the effectiveness of infiltration or detention BMPs. Often soils at redevelopment sites have been compacted by buildings and heavy traffic, impairing their ability to infiltrate stormwater into the ground.

Underground utilities. The presence of underground utilities including gas and water mains, sewer pipes and electric cable conduits can greatly reduce the amount of land available for BMPs.

This chapter provides specific guidance and checklists to ensure that the applicant has met his/her obligations under Standard 7. Because it may be difficult for a redevelopment project to comply with all the Stormwater Management Standards, Standard 7 provides that a redevelopment project is required to comply with the following Standards only "to the maximum extent practicable": Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing outfalls shall be brought into compliance with Standard 1 only to the maximum extent practicable.

As set forth in Standard 7, the phrase "to the maximum extent practicable" means that:

(1) Proponents of redevelopment projects have made all reasonable efforts to meet the requirements of Standards 2 and 3 and the pretreatment and structural stormwater best management practices requirements of Standards 4, 5, and 6 and to bring existing outfalls into compliance with Standard 1.

(2) They have made a complete evaluation of possible stormwater management measures, including environmentally sensitive site design that minimizes land disturbance and impervious surfaces, low impact development techniques and structural stormwater BMPs; and

(3) If not in full compliance with Standard 1 for existing outfalls, Standards 2 and 3 and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6, they are implementing the highest practicable level of stormwater management.

Generally, an alternative is practicable if it can be implemented within the site being redeveloped, taking into consideration cost, land area requirements, soils and other site constraints. However, offsite alternatives may also be practicable. Proponents must document the evaluation of practicable alternatives with sufficient information to support the conclusions of the analysis.

At the same time, stormwater runoff from redevelopment projects must be properly managed. To this end, Standard 7 provides that redevelopment projects shall comply with all other requirements of the Stormwater Management Standards, including, without limitation, the pollution prevention requirements of Standards 4, 5, and 6, the erosion and sedimentation control requirements of Standard 8, the operation and maintenance requirements of Standard 9, and the prohibition of illicit discharge set forth in Standard 10. Proponents must also improve existing conditions.

Proponents of redevelopment projects shall document their compliance with these requirements. To assist proponents and reviewers in determining whether a redevelopment project complies with Standard 7, MassDEP has prepared the following redevelopment checklist.

[*Proponents of MassHighway redevelopment projects and Conservation Commissions reviewing such projects may follow the guidelines for redevelopment provided in the MassHighway Stormwater Handbook for Highways and Bridges (May 2004 or latest version) in lieu of the guidance set forth in this chapter.*[1] *The MassHighway Stormwater Handbook was developed by the Massachusetts Highway Department and issued by joint correspondence of May 7, 2004 by MassHighway and MassDEP. It provides detailed guidance on the evaluation and implementation of stormwater management practices for MassHighway road and bridge redevelopment projects, including a methodology for screening and selecting Best Management Practices (BMPs). Proponents and reviewers of other public roadway redevelopment projects may find useful information in the MassHighway Stormwater Handbook.*]

[1] The MassHighway Handbook published in 2004 must be revised to make it consistent with this Handbook.

Redevelopment Checklist

Existing Conditions

- On-site: For all redevelopment projects, proponents should document existing conditions, including a description of extent of impervious surfaces, soil types, existing land uses with higher potential pollutant loads, and current onsite stormwater management practices.
- Watershed: Proponents should determine whether the project is located in a watershed or subwatershed, where flooding, low streamflow or poor water quality is an issue.

The Project

Is the project a redevelopment project?

- Maintenance and improvement of existing roadways
- Development of rehabilitation, expansion or phased project on redeveloped site, or
- Remedial stormwater project

For non-roadway projects, is any portion of the project outside the definition of redevelopment?

- Development of previously undeveloped area
- Increase in impervious surface

If a component of the project is not a redevelopment project, the proponent shall use the checklist set forth below to document that at a minimum the proposed stormwater management system fully meets each Standard for that component. The proponent shall also document that the proposed stormwater management system meets the requirements of Standard 7 for the remainder of the project.

The Stormwater Management Standards

The redevelopment checklist reviews compliance with each of the Stormwater Management Standards in order.

Standard 1: (Untreated discharges)
No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.
Same rule applies for new developments and redevelopments.

Full compliance with Standard 1 is required for new outfalls.

- What BMPs are proposed to ensure that all new discharges associated with the discharge are adequately treated?
- What BMPs are proposed to ensure that no new discharges cause erosion in wetlands or waters of the Commonwealth?
- Will the proposed discharge comply with all applicable requirements of the Massachusetts Clean Waters Act and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00?

Existing outfalls shall be brought into compliance with Standard 1 to the maximum extent practicable.

- Are there any existing discharges associated with the redevelopment project for which new treatment could be provided?
- If so, the proponent shall specify the stormwater BMP retrofit measures that have been considered to ensure that the discharges are adequately treated and indicate the reasons for adopting or rejecting those measures. (See Section entitled "Retrofit of Existing BMPs".)
- What BMPs have been considered to prevent erosion from existing stormwater discharges?

Standard 2: (Peak rate control and flood prevention)

Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for land subject to coastal storm flowage.

Full compliance for any component that is not a redevelopment

Compliance to the Maximum Extent Practicable:

- Does the redevelopment design meet Standard 2, comparing post-development to pre-development conditions?
- If not, the applicant shall document an analysis of alternative approaches for meeting the Standard. (See Menu of Strategies to Reduce Runoff and Peak Flows and/or Increase Recharge Menu included at the end of this chapter.)

Improvement of existing conditions:

- Does the project reduce the volume and/or rate of runoff to less than current estimated conditions? Has the applicant considered all the alternatives for reducing the volume and/or rate of runoff from the site? (See Menu.)
- Is the project located within a watershed subject to damage by flooding during the 2-year or 10-year 24-hour storm event? If so, does the project design provide for attenuation of the 2-year and 10-year 24-hour storm event to less than current estimated conditions? Have measures been implemented to reduce the volume of runoff from the site resulting from the 2 year or 10 year 24 hour storm event? (See Menu.)
- Is the project located adjacent to a water body or watercourse subject to adverse impacts from flooding during the 100-year 24-hour storm event? If so, are portions of the site available to increase flood storage adjacent to existing Bordering Land Subject to Flooding (BLSF)?
- Have measures been implemented to attenuate peak rates of discharge during the 100-year 24-hour storm event to less than the peak rates under current estimated conditions? Have measures been implemented to reduce the volume of runoff from the site resulting from the 100-year 24-hour storm event? (See Menu.)

Standard 3: (Recharge to Ground water)

Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures, including environmentally sensitive site design, low impact development techniques, best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusettss Stormwater Handbook.

Full compliance for any component that is not a redevelopment

Compliance to the Maximum Extent Practicable:

- Does the redevelopment design meet Standard 3, comparing post-development to pre-development conditions?
- If not, the applicant shall document an analysis of alternative approaches for meeting the Standard?
- What soil types are present on the site? Is the site is comprised solely of C and D soils and bedrock at the land surface?
- Does the project include sites where recharge is proposed at or adjacent to an area classified as contaminated, sites where contamination has been capped in place, sites that have an Activity and Use Limitation (AUL) that precludes inducing runoff to the groundwater, pursuant to MGL Chapter 21E and the Massachusetts Contingency Plan 310 CMR 40.0000; sites that are the location of a solid waste landfill as defined in 310 CMR 19.000; or sites where groundwater from the recharge location flows directly toward a solid waste landfill or 21E site?[2]
- Is the stormwater runoff from a land use with a higher potential pollutant load?
- Is the discharge to the ground located within the Zone II or Interim Wellhead Protection Area of a public water supply?
- Does the site have an infiltration rate greater than 2.4 inches per hour?

Improvements to Existing Conditions:

- Does the project increase the required recharge volume over existing (developed) conditions? If so, can the project be redesigned to reduce the required recharge volume by decreasing impervious surfaces (make building higher, put parking under the building, narrower roads, sidewalks on only one side of street, etc.) or using low impact development techniques such as porous pavement?
- Is the project located within a basin or sub-basin that has been categorized as under high or medium stress by the Massachusetts Water Resources Commission, or where there is other evidence that there are rivers and streams experiencing low flow problems? If so, have measures been considered to replace the natural recharge lost as a result of the prior development? (See Menu.)
- Has the applicant evaluated measures for reducing site runoff? (See Menu.)

Standard 4: (80% TSS Removal)

Stormwater management systems must be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when:

a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan and thereafter are implemented and maintained;

b. Stormwater BMPs are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Full compliance for any component that is not a redevelopment
Full compliance with the long-term pollution plan requirement for new developments and redevelopments.

- Has the proponent developed a long-term pollution plan that fully meets the requirements of Standard 4?
- Does the pollution prevention plan include the following source control measures?
    - Street sweeping

[2] A mounding analysis is needed if a site falls within this category. See Volume 3.

- Proper management of snow, salt, sand and other deicing chemicals
- Proper management of fertilizers, herbicides and pesticides
- Stabilization of existing eroding surfaces

Compliance to the Maximum Extent Practicable for the other requirements:

- Does the redevelopment design provide for treatment of all runoff from existing (as well as new) impervious areas to achieve 80% TSS removal? If 80% TSS removal is not achieved, has the stormwater management system been designed to remove TSS to the maximum extent practicable?
- Have the proposed stormwater BMPs been properly sized to capture the prescribed runoff volume?
  - One inch rule applies for discharge
    - within a Zone II or Interim Wellhead Protection Area,
    - near or to another critical area,
    - from a land use with a higher potential pollutant load
    - to the ground where the infiltration rate is greater than 2.4 inches per hour
- Has adequate pretreatment been proposed?
  - 44% TSS Removal Pretreatment Requirement applies if:
    - Stormwater runoff is from a land use with a higher potential pollutant load
    - Stormwater is discharged
      - To the ground within the Zone II or Interim Wellhead Protection Area of a Public Water Supply
      - To the ground with an infiltration rate greater than 2.4 inches per hour
      - Near or to an Outstanding Resource Water, Special Resource Water, Cold-Water Fishery, Shellfish Growing Area, or Bathing Beach.

- If the stormwater BMPs do not meet all the requirements set forth above, the applicant shall document an analysis of alternative approaches for meeting the these requirements. (See Section on Retrofitting Existing BMPs (the "Retrofit Section").

Improvements to Existing Conditions:

- Have measures been provided to achieve at least partial compliance with the TSS removal standard?
- Have any of the best management practices in the Retrofit Section been considered?
- Have any of the following pollution prevention measures been considered?
  - Reduction or elimination of winter sanding, where safe and prudent to do so
  - Tighter controls over the application of fertilizers, herbicides, and pesticides
  - Landscaping that reduces the need for fertilizer, herbicides and pesticides
  - High frequency sweeping of paved surfaces using vacuum sweepers
  - Improved catch basin cleaning
  - Waterfowl control programs
- Are there any discharges (new or existing) to impaired waters? If so, see TMDL section.

<u>Standard 5 (Higher Potential Pollutant Loads (HPPL)</u>

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot

be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific stormwater BMPs determined by the Department to be suitable for such use as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.
Full compliance for any component that is not a redevelopment.
Full compliance with pollution prevention requirements for new developments and redevelopments.

Pollution Prevention

- Has the proponent considered any of the following operational source control measures?
    - Formation of a pollution prevention team,
    - Good housekeeping practices,
    - Preventive maintenance procedures,
    - Spill prevention and clean up,
    - Employee training, and
    - Regular inspection of pollutant sources.

- Has the proponent considered implementation of any of the following operational changes to reduce the quantity of pollutants on site?
    - Process changes,
    - Raw material changes,
    - Product changes, or
    - Recycling.

- Has the proponent considered making capital improvements to protect the land uses with higher potential pollutant loads from exposure to rain, snow, snow melt, and stormwater runoff?

    - Enclosing and/or covering pollutant sources (e.g. placing pollutant sources within a building or other enclosure, placing a roof over storage and working areas, placing tarps under pollutant source)

    - Installing a containment system with an emergency shutoff to contain spills?

    - Physically segregating the pollutant source to prevent run-on of uncontaminated stormwater?

Treatment

- If applicable, compliance with the treatment and pretreatment requirements of Standard 5 only to the Maximum Extent Practicable by directing the stormwater runoff from land uses with higher potential pollutant loads to appropriate stormwater BMPs?

    - Are the BMPs selected capable of removing the pollutants associated with the higher potential pollutant load land ("LUHPPL") use?

    - Is the land use likely to generate stormwater with high concentrations of oil and grease? If so has an oil grit separator, sand filter, filtering bioretention area or equivalent been proposed for pretreatment?

Improvement of Existing Conditions.

- If the redevelopment converts a site from a non-LUHPPL use to a LUHPPL use, the applicant shall document how the stormwater BMPs shall be modified or replaced to come into compliance with Standard 5.

- What specific measures have been considered to offset the anticipated impacts of land uses with higher potential pollutant loads?

- If the redevelopment proposal is a brownfield project, the applicant shall demonstrate how the stormwater management measures have been designed to prevent mobilization or remobilization of soil and groundwater contamination. (See Brownfield section)

Other Requirements

- Does the discharge comply with all applicable requirements of the Massachusetts Clean Waters Act, 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00?

Standard 6 (Critical Areas)

Stormwater discharges to a Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or any other critical area require the use of the specific source control and pollution prevention measures and the specific stormwater best management practices determined by the Department to be suitable for managing discharges to such area, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters or Special Resource Waters shall be set back from the receiving water and receive the highest and best practical method of treatment. A "stormwater discharge," as defined in 314 CMR 3.04(2)(a)1. or (b), to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of the public water supply.

Full compliance for component of project that is not a redevelopment
Full compliance with pollution prevention requirements for new developments and redevelopments.

If applicable, compliance to the Maximum Extent Practicable with the pretreatment and treatment requirements of Standard 6:

- Does the redevelopment project utilize the pretreatment, treatment and infiltration BMPs approved for discharges near or to critical areas?
- If the redevelopment project does not comply with Standard 6, the applicant shall document an analysis of alternative measures for meeting Standard 6. (See Section on Specific Redevelopment Projects.)

Improvements to Existing Conditions:

- Have measures to protect critical areas been considered, including additional pollution prevention measures and structural and non-structural BMPs?

Other Requirements

- Does the discharge comply with the Massachusetts Clean Waters Act, 314 CMR 3.00, 314 CMR 4.00, and 314 CMR 5.00?

Standard 8: (Erosion, Sediment Control)

A plan to control construction-related impacts, including erosion sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan), must be developed and implemented.

All redevelopment projects shall fully comply with Standard 8.

- Has the proponent submitted a construction period erosion, sedimentation and pollution prevention plan that meets the requirements of Standard 8?

Standard 9: (Operation and Maintenance)
A long-term operation and maintenance plan must be developed and implemented to ensure that stormwater management systems function as designed.
All redevelopment projects shall fully comply with Standard 9.

- Has the proponent submitted a long-term Operation and Maintenance plan that meets the requirements of Standard 9?

Standard 10 (Illicit Discharges)
All illicit discharges to the stormwater management system are prohibited.
All redevelopment projects shall fully comply with Standard 10.

- Are there any known or suspected illicit discharges to the stormwater management system at the redevelopment project site?
- Has an illicit connection detection program been implemented using visual screening, dye or smoke testing?
- Have an Illicit Discharge Compliance Statement and associated site map been submitted verifying that there are no illicit discharges to the stormwater management system at the site?

Improvements to Existing Conditions:

- Once all illicit discharges are removed, has the proponent implemented any measures to prevent additional illicit discharges?

Figure 5-1

Menu of Strategies to Reduce Runoff or Peak Flows and/or Increase Recharge

- Rehabilitate the soils
- Plant trees and other vegetation
- Install a green roof
- Maximize naturally vegetated areas
- Reduce impervious surfaces
- Disconnect roof runoff from direct discharge to the drainage system
- Disconnect other existing paved areas from direct discharge to the drainage system, allowing controlled flow over pervious areas or through BMPs providing at least partial recharge
- Install porous pavement and/or other recharge measures (where sustainable and maintainable for promoting infiltration)
- Apply LID techniques for runoff reduction
- Install additional structural BMPs that are appropriate for redevelopment sites including infiltration trenches, subsurface structures, oil-grit separators, proprietary BMPs
- Retrofit existing BMPs

Retrofitting Existing BMPs

Many BMPs can be effectively retrofitted depending on site conditions and the water quantity or quality objectives trying to be achieved.[3] The objective of stormwater retrofitting is to remedy problems associated with, and improve water quality mitigation functions of, older, poorly designed, or poorly maintained stormwater management systems. Prior to the development of the stormwater standards, site drainage design did not require stormwater detention for controlling post-development peak flows. As a result, drainage, flooding, and erosion problems can be common in many older developed areas of the state. Furthermore, a majority of the dry detention basins throughout the state have been designed to control peak flows, without regard to water quality mitigation. Therefore, many existing dry detention basins provide only minimal water quality benefit. Incorporating stormwater retrofits into existing developed sites or into redevelopment projects can reduce the adverse impacts of uncontrolled stormwater runoff.

Bioretention Area Retrofits - can be used as a stormwater retrofit, by modifying existing landscaped areas, or if a parking lot is being resurfaced. In highly urban watersheds, they are one of the few practical retrofit options.

Catch Basin Retrofits or Reconstruction - Older catch basins without sumps can be replaced with catch basins having four foot-deep sumps. Sumps provide storage volume for coarse sediments, assuming that accumulated sediment is removed on a regular basis. Hooded outlets, which are covers over the catch basin outlets that extend below the standing water line, can also be used to trap litter and other floatable materials. Leaching catch basins can be installed adjacent to deep sump catch basins to achieve 80% TSS removal. Be aware, however, that many products are being touted as catch basin inserts, but the effectiveness of these devices can vary significantly.

Dry Detention Basin Retrofits - Traditional dry detention basins can be modified to become extended dry detention basins, wet basins, or constructed stormwater wetlands for enhanced pollutant removal. This is one of the most commonly and easily implemented retrofits, since it typically requires little or no additional land area, capitalizes on an existing facility for which there is already some resident acceptance of stormwater management, and involves minimal impacts to environmental resources (Claytor, Center for Watershed Protection, 2000).

There are numerous retrofit options that will enhance the removal of pollutants in detention basins:

- Excavate the basin bottom to create more permanent pool storage.
- Raise the basin embankment to obtain additional storage for extended detention.
- Modify the outfall structure to create a two-stage release to better control small storms while not significantly compromising flood control detention for large storms.
- Increase the flow path from inflow to outflow and eliminate short-circuiting by using baffles, earthen berms or micro-pond topography to increase residence time.
- Incorporate stilling basins at inlets and outlets.
- Regrade the basin bottom to create a wetland area near the basin outlet or revegetate parts of the basin bottom with wetland vegetation to enhance pollutant removal, reduce mowing, and improve aesthetics.
- Create a wetland shelf along the perimeter of a wet basin to improve shoreline stabilization, enhance pollutant filtering, and enhance aesthetic and habitat functions.
- Create a low maintenance “no-mow” wildflower ecosystem in the drier portions of the basin.

[3] Additional information on retrofitting stormwater BMPs can be found in the Urban Stormwater Retrofit Practices Manual. See http://www.cwp.org/Downloads/ELC_USRM3app.pdf.

- Provide a high flow bypass to avoid resuspension of captured sediments/pollutants during high flows.
- Eliminate low-flow bypasses.

Drainage Channel Retrofits - Existing channelized streams and drainage conveyances such as drainage channels can be modified to reduce flow velocities and enhance pollutant removal. Weir walls or riprap check dams placed across a channel create opportunities for ponding, infiltration, and establishment of wetland vegetation upstream of the retrofit. In-stream retrofit practices include stream bank stabilization of eroded areas and placement of habitat improvement structures (i.e., flow deflectors, boulders, pools/riffles, and low-flow channels) in natural streams and along stream banks. In-stream retrofits may require an evaluation of potential flooding and floodplain impacts resulting from altered channel conveyance, as well as requirements for local, state, or federal approval for work in wetlands and watercourses.

Parking Lots and Roadways- Parking lots offer ideal opportunities for a wide range of stormwater retrofits:

1. Incorporate bioretention areas into parking lot islands and landscaped areas; tree planter boxes can be converted into functional bioretention areas, rain gardens, or treebox filters to reduce and treat stormwater runoff.
2. Remove curbing and add slotted curb stops. Curbs along the edges of parking lots can sometimes be removed or slotted to re-route runoff to vegetated filter strips, water quality swales, grass channels, or bioretention facilities. The capacity of existing swales may need to be evaluated and expanded as part of this retrofit option.
3. Incorporate new treatment practices such as bioretention areas, sand filters, and constructed stormwater wetlands at the edges of parking lots.
4. In overflow parking or other low-traffic areas, asphalt can be replaced with porous pavement.

Sand Filter Retrofits - are suitable where space is limited, because they consume little surface space and have few site restrictions. Since sand filters cannot treat large drainage areas, retrofitting many small individual sites may be the only option. This option may be expensive.

Storm Drain Outfalls - New stormwater treatment practices can be constructed at the outfalls of existing drainage systems. The new stormwater treatment practices are commonly designed as *off-line devices* to treat the first flush volume and bypass larger storms. Water quality swales, bioretention areas, sand filters, constructed stormwater wetlands, and wet basins are commonly used for this type of retrofit. Other stormwater treatment practices may also be used if there is enough space for construction and maintenance.

Specific Redevelopment Projects

Redevelopment projects present unique challenges for controlling stormwater. It is possible that site constraints may prevent a redevelopment project from complying with one or more of the Stormwater Management Standards. Even if a redevelopment project cannot meet all of the Standards, there may be ample opportunity to improve existing site conditions depending on the other water quality or quantity issues in the watershed. The following special considerations provide unique opportunities for identifying how existing conditions may be improved:

A. Groundwater Recharge Areas - Redevelopment projects located within these areas (Zone II, Interim Wellhead Protection Areas (IWPA), aquifer protection districts, etc.) should place a high priority on ground water recharge BMPs.
   1) Disconnecting Rooftop Runoff – In some instances, building roof drains connected to the stormwater drainage system can be disconnected and re-directed to vegetated filter strips, bioretention facilities, or infiltration structures (dry wells or infiltration trenches).
   2) Use of Porous Paving Materials - Existing impermeable pavement in overflow parking or other low-traffic areas can sometimes be replaced with alternative permeable materials such as modular concrete paving blocks, modular concrete or plastic lattice, or cast-in-place concrete grids. Site-specific factors including traffic volumes, soil permeability, maintenance, sediment loads, and land use must be carefully considered prior to selection.

B. Cold-Water Fisheries - Redevelopment projects adjacent to these areas should place a high priority on mitigating potential thermal impacts. Techniques to consider include:

   1) Maintain Time of Concentration - Time of concentration (Tc) is based on the flow path and length, ground cover, slope and channel shape. When development occurs, Tc is often shortened due to the impervious area, causing greater flows to occur over a shorter period of time. Increasing the Tc will help to reduce the thermal impact of stormwater runoff from warm surface areas. Options to consider include:
      - Increasing the length of the runoff flow path
      - Increasing the surface roughness of the flow path
      - Detaining flows on site
      - Minimizing land disturbance
      - Creating flatter slopes.
   2) Disconnecting impervious areas – Breaking up large impervious expanses with vegetated zones will reduce the potential temperature increases of stormwater flowing across hot pavement.

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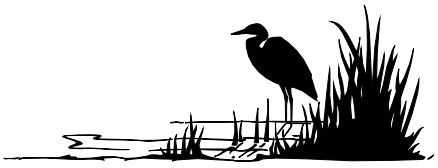
C. Brownfield Redevelopment – Redeveloping urban and non-urban brownfield sites (which in Massachusetts includes most “disposal sites” under the Massachusetts Contingency Plan [MCP]) are a Commonwealth priority, with ramifications for urban sprawl as well as the remediation of historically contaminated properties. Proponents of brownfield redevelopment projects should evaluate BMPs that will prevent the significant uncontrolled mobilization or remobilization of soil or ground water contamination. BMP considerations at these sites should consider such factors as:
   - The location of stormwater infiltration units with respect to contaminated areas
   - Ground water mounding effects on the rate and direction of migration of ground water contaminants
   - The location of outfalls
   - Water quality BMPs.

D. Runoff to Impaired Water Bodies – If MassDEP has issued a Total Maximum Daily Load (TMDL) that establishes a waste load allocation for stormwater discharge and/or a TMDL Implementation Plan that identifies remedies aimed at reducing the amount of pollutants from stormwater discharges, proponents may be required to install stormwater BMPs that are consistent with the TMDL.

E. Runoff to Areas of Localized Flooding – Project proponents must also understand the potential impacts of stormwater runoff in areas prone to localized flooding. When completing the checklist, proponents should consider the capacity of the receiving water and/or storm drainage system. When evaluating discharges to areas subject to localized flooding, the proponent should evaluate the ability to maintain and/or improve existing site cover and reduce runoff volume.



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS

Suffield Street | TCR Properties | DEP File #087-0688

1. This Order supersedes all previous Orders of Conditions issued for this work.

2. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

3. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

4. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

5. The Commission shall be notified at least seventy-two hours prior to the start of site work (including tree cutting or clearing).

6. The Commission shall be notified when the erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

7. The project engineer/designer shall be held responsible and accountable for the true and accurate implementation and construction of his/her design or plan. Should any accidental deviation from the approved plan occur, the engineer/designer shall notify the Commission immediately to determine of a new Notice of Intent is required. If any changes to the approved plan are anticipated, the engineer/designer shall likewise notify the Commission to determine if a new Notice of Intent is required. In any case the Commission may deny any deviation, accidental or intended, from the approved plan.

8. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

9. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

10. The construction site shall be left in a stable condition at the close of each day. Erosion and sedimentation controls shall be continuously monitored to ensure proper operation.

11. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

12. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

    The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

13. Periodic maintenance/cleaning of the bioretention area shall be conducted by the owner and all successors in interest or control of the property. The applicant, his successors or assigns shall have the continuing responsibility of this maintenance.

14. Parcels abutting or containing wetland or resource areas shall carry the following restrictions, and a covenant so noted on each deed:

    "This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

15. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

16. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

17. The petitioner shall have recorded in the Hampden County Registry of Deeds an “Order of Conditions Form” provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

18. Stormwater features shall be maintained per Stormwater Standard #9. A log book of the required maintenance activities must be kept and made available for commission or MassDEP. This log book shall be submitted to the Commission every four months.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE
436 DWIGHT STREET, SPRINGFIELD, MA 01103 413-784-1100

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lieutenant Governor

KATHLEEN A. THEOHARIDES
Secretary

MARTIN SUUBERG
Commissioner

DATE: January 19, 2023

Municipality AGAWAM
(city/town)

RE: NOTIFICATION OF WETLANDS PROTECTION ACT FILE NUMBER

The Department of Environmental Protection has received a Notice of Intent filed in accordance with the Wetlands Protection Act (M.G.L. c. 131, §40):

Applicant:	TCR PROPERTIES, LLC	Owner:	TCR PROPERTIES, LLC
Address:	1298 SUFFIELD STREET AGAWAM, MA 01001	Address:	1298 SUFFIELD STREET AGAWAM, MA, 01001
LOCUS:	1298 SUFFIELD STREET		

This project has been assigned the following file # : WE 087-0688

A FILE NUMBER ONLY INDICATES THAT THE APPLICATION CONTAINS THE MINIMAL SUBMITTAL REQUIREMENTS AND IS ADMINISTRATIVELY COMPLETE - NOT THAT THE INFORMATION IN THE APPLICATION IS ADEQUATE FOR ISSUANCE OF AN ORDER OF CONDITIONS.

Although a file # is being issued, please note the following:

[1] The commission has the legal ability to review the stormwater features as a Riverfront Redevelopment project, per 310 CMR 10.58(5). In order for the stormwater to be Riverfront Area exempt, there must be no practicable alternative to siting these structures within the riverfront area and provided a wildlife corridor is maintained (e.g. detention basins shall not be fenced). In the event that the commission reviews this under Riverfront Redevelopment, there is always a requirement for an improvement over existing conditions and there may be a requirement for restoration and/or mitigation.

[2] The commission should consider an ongoing condition, noted as a special condition in the Order, when it issues the Certificate of Compliance, requiring the stormwater features be maintained per Stormwater Standard #9. A log book of the required maintenance activities must be kept and made available for commission or MassDEP review upon request. This item should be discussed at the hearing as this requirement is frequently not met by an owner.

If you have any questions regarding this letter, please contact: MARK STINSON @ (413)-961-9583

Cc: Agawam Conservation Commission, TOWN HALL, 36 MAIN STREET, Agawam, MA, 01001

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD# 1-866-539-7622 or 1-617-574-6868.
http://www.mass.gov/dep
Printed on Recycled Paper

TCR PROPERTIES, LLC
1298 SUFFIELD STREET
AGAWAM, MA 01001

Owner: TCR PROPERTIES, LLC, 1298 SUFFIELD STREET, AGAWAM, MA, 01001
Representative: R LEVESQUE ASSOCIATES, INC., 40 SCHOOL STREET, WESTFIELD, MA, 01085

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD# 1-866-539-7622 or 1-617-574-6868.
http://www.mass.gov/dep
Printed on Recycled Paper

Town of Agawam
Department Of Public Works

DPW
1000 Suffield Street
Agawam, MA 01001
Phone: 413-821-0600
Fax: 413-821-0631

MEMORANDUM

To:	Planning Board; Conservation Commission
CC:	File
From:	Engineering Division
Date:	February 23, 2023
Subject:	SP 660 – Proposed Commercial Development – TCR Properties LLC

Per your request, we have reviewed the Site Plans for the entitled "Proposed Commercial Development, 1298 Suffield Street, Agawam, Massachusetts; Prepared by: R Levesque Associates Inc, 40 School Street, Westfield, MA; Scale: 1"=20'; Dated: January 6, 2023; Revised February 21, 2023" and we do not have the comments at this time.

Engineering reserves the right to make additional comments as new information is submitted. If you have any questions, please do not hesitate to contact this division.

Sincerely,

Benjamin Ashley, E.I.T.
Civil Engineer II

Michael F. Albro, P.E.
Assistant Town Engineer

Michelle C. Chase, P.E.
Town Engineer

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Site Plans

Proposed Commercial Development

Suffield Street
Agawam, MA 01001
Parcel ID: Portion of 14 - 1 - 4

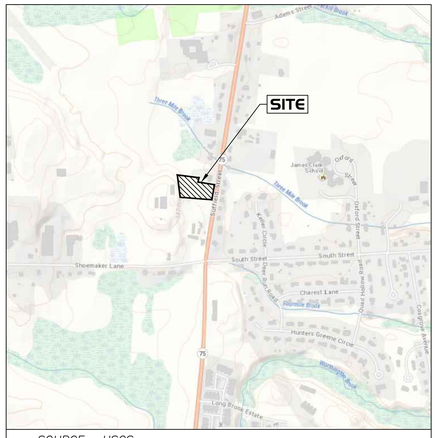
AS PREPARED FOR

TCR Properties LLC
c/o T.J. Galis

1298 Suffield Street
Agawam, MA 01001

ZONING REVIEW - Industrial B (IB)		
TYPE (MINIMUM)	REQUIRED	PROPOSED
AREA	1 ACRE	1.17 ACRE±
FRONTAGE	100 FT	134.4 FT±
FRONT YARD	75 FT	76.0 FT±
SIDE YARD	25 FT	38.4 FT± / 31.0 FT±
REAR YARD	25 FT	135.6 FT±
BUILDING HEIGHT / STORIES (MAX)	40 FT / 2 STORIES	< 40 FT± / 2 STORIES
PARKING*	11 SPACES	12 SPACES

*SERVICE INDUSTRIAL: 1 SPACE FOR EACH 500 S.F. OF GROSS FLOOR AREA: 5,250 S.F. / 500 S.F. = 10.5 ~ 11 SPACES



SOURCE: USGS

NORTH

January 6, 2023
Rev: April 29, 2026

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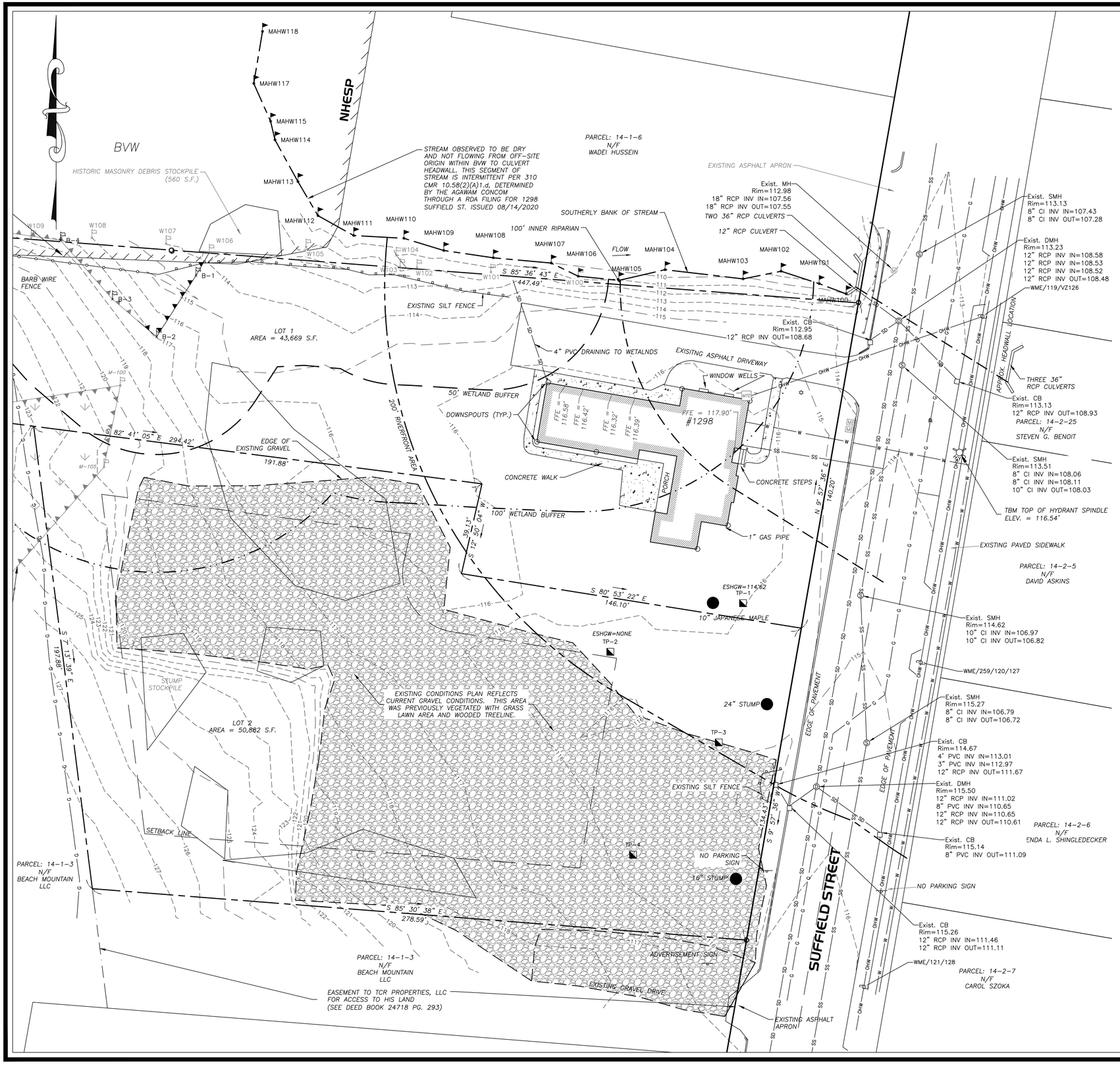
BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY

40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

RLA Project Number: 190615

PERMITTING
NOT FOR CONSTRUCTION



NOTES

1. THE RECORD OWNER OF THE SUBJECT PARCEL IS TCR PROPERTIES, LLC. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 22409 PAGE 375 ALSO BOOK 24718 PAGE 293.
2. THE PROPERTY LINES LOT 1 AND LOT 2 SHOWN HEREON DERIVED FROM PLAN DONE BY THIS OFFICE DATED 6-21-2022 RECORDED IN PLAN BOOK 395 PAGE 94.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR SITE PLANNING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT LOT 1 CONTAINS 50,882 S.F.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLANDS DELINEATED BY R. LEVESQUE ASSOCIATES, INC. ON 6/10/2019 .
8. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC. 6/26/2019. HORIZONTAL AND VERTICAL DATUM ARE BASED UPON THE MASSACHUSETTS CO-ORDINATE SYSTEM, MAINLAND ZONE.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AVAILABLE RECORD DATA, AND TOWN OF AGAWAM, MA GIS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM TOWN OF AGAWAM, MA GIS.
11. SUBJECT PARCEL IS ZONED IB ACCORDING TO THE TOWN OF AGAWAM, MA GIS.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0392E – EFFECTIVE DATE: 7/16/2013.
13. A PORTION OF THE SUBJECT PROPERTY IS LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

SYMBOL & LINE LEGEND

- EXISTING SIGN
- EXISTING MAILBOX
- UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING HYDRANT
- GUTTER DOWNSPOUT
- EXISTING GAS VALVE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- EXISTING MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- W# WETLAND FLAG LOCATION
- MAHW# M.A.H.W. FLAG LOCATION
- EXISTING FLAGPOLE
- MTE EXISTING ELECTRICAL METER
- EXISTING TREE
- 219 EXISTING CONTOUR
- EDGE OF WETLAND
- FENCE LINE
- SILT FENCE LINE
- GUARDRAIL
- OHW OHW EXISTING OVERHEAD WIRES
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- 50' WETLANDS BUFFER
- 100' WETLANDS BUFFER
- DISTURBANCE AREA
- NHESP BOUNDARY

ABBREVIATIONS

APPROX. – APPROXIMATE
CB. – CATCH BASIN
ELEV. – ELEVATION
FFE – FINISHED FLOOR ELEVATION
M.A.H.W. – MEAN ANNUAL HIGH WATER
MH. – MANHOLE
N/F – NOW OR FORMERLY
NHESP. – NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM
RCP – REINFORCED CONCRETE PIPE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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EXISTING CONDITIONS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 14-1-4

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 33610
PROFESSIONAL LAND SURVEYOR

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:
A. Per Town Comment	2/10/23
B. Per Town Comment	2/21/23

DRAFTED BY: R.M.N./F.J.C.

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

DRAWING#	REV.
EX-1	B

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SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- EXISTING MAILBOX
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- EXISTING CABLE TV BOX
- EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VALVE
- PROPOSED HYDRANT
- EXISTING GAS VALVE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- TP-1 TEST PIT LOCATION
- P-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- EXISTING STONE WALL
- TREE LINE
- × 102.4 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- × 94.7 PROPOSED SPOT GRADE
- 214 PROPOSED CONTOUR
- EDGE OF WETLAND
- FENCE LINE
- GUARDRAIL
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF SILT FENCE LINE

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FFE	–	FINISH FLOOR ELEVATION
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
PCB	–	PROPOSED CATCH BASIN
PDMH	–	PROPOSED DRAIN MANHOLE
PFES	–	PROP. FLARED END SECTION
POCS	–	PROP. OUTLET CONTROL STRUCT.
PROP.	–	PROPOSED
PSMH	–	PROP. SANITARY SEWER MANHOLE
PWQU	–	PROP. WATER QUALITY UNIT
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.

A. SITE PREPARATION
- COMPLETE ALL ROUGH GRADING ACTIVITIES
- REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
- EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
- SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
- THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.

B. ESTABLISHMENT
- EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
- UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
- APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
- VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.

C. MAINTENANCE
- ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION. APPLICATION STANDARDS:
- REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
- SCARIFY SURFACE PRIOR TO SEED APPLICATION.
- APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:

A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENGINEERS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE (AS REQ'D)

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SITE PREP

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
3. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
4. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
5. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
6. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
7. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
8. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
9. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE ENGINEER.
10. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
11. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE ENGINEER.
12. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2)REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
11. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
12. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
13. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
    A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RATE OF 50 LBS/1,000 S.F.
    B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
    C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
    D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F. SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

    E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F.UNLESS HYDROSEEDING WAS USED.
    F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHED IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
16/22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.
2. THE OWNER, R LEVESQUE ASSOCIATES, INC., AND PAUL S. SMITH LAND SURVEYING AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.
4. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150.
5. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
6. ALL WORK IN THE CITY/TOWN RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
7. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.
8. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
9. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.
11. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.
12. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.
13. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
14. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.
15. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.
16. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.
18. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
19. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
20. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.
21. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
22. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.
23. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.
24. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.
25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.
26. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. ALL CONSTRUCTION IN CITY/TOWN RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.
2. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
3. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.
4. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASSDOT , ETC. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.
6. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
7. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.
8. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.
10. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASSDOT AND/OR THE CITY/TOWN REGULATIONS.
11. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.
12. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
3. STORM PIPE SHALL BE AS NOTED ON PLANS.
4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20).
10. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
11. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
12. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
13. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
14. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT.
15. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.

SITE UTILITY NOTES

GENERAL:

1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.
3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.
7. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
8. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
9. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.
10. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.
11. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
12. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
14. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.
15. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:

1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.
2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.
3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.
4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.
5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.
6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.

WATER:

1. CONTRACTOR SHALL CONTACT THE CITY/TOWN WATER DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.
2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.
3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).
4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.
5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).
6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.
7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER CITY/TOWN WATER DEPARTMENT STANDARDS.
9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.
10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE MANUFACTURER'S SCHEDULE.
11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.
12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.
13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.
14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.
15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.
16. ALL WATER MAINS SHALL BE LAID PER THE PLANS TO MAINTAIN THE MAXIMUM SEPARATION FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.
17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.
18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.
19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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CONSTRUCTION NOTES

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
No. 1398
REGISTERED LANDSCAPE ARCHITECT
1/6/22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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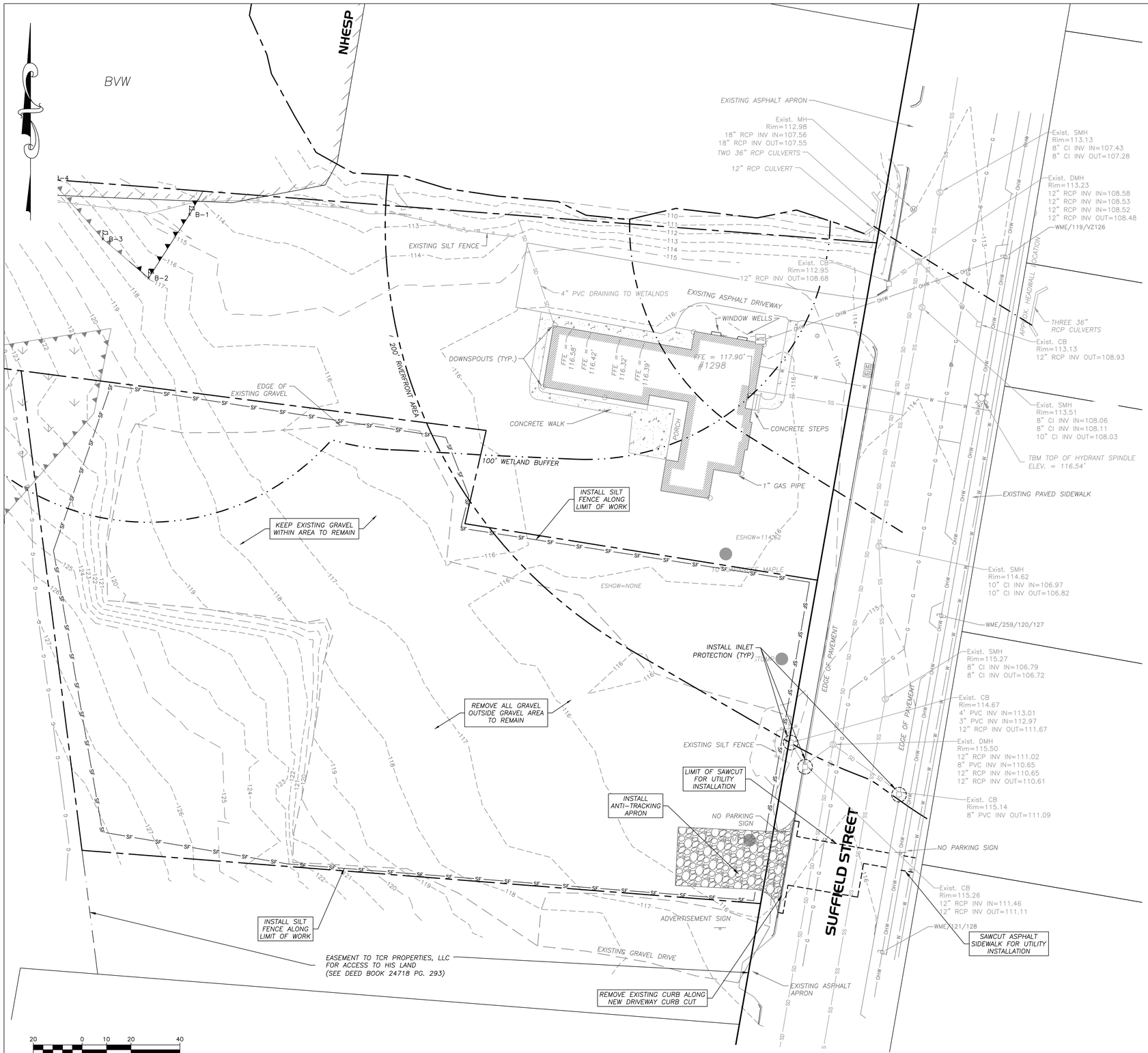

DEMOLITION NOTES

1. THE INFORMATION SHOWN HEREON IS NOT INTENDED TO BE AN EXHAUSTIVE SURVEY OF ALL APPURTENANCES THAT MAY OR MAY NOT BE IN PLACE TO SERVE THE EXISTING ON-SITE STRUCTURES AND USE. SEPTIC SYSTEM COMPONENTS, UNDERGROUND TANKS, AND OTHER SUB-SURFACE STRUCTURES MAY BE IN PLACE AND MAY REQUIRE ATTENTION BEFORE CONSTRUCTION MAY PROCEED.
2. CONTRACTOR SHALL CONDUCT A PRE-DEMOLITION SURVEY TO IDENTIFY ANY AND ALL UTILITIES AND UTILITY COMPONENTS TO BE DISCONTINUED, REMOVED, OR DEMOLISHED IN PLACE AND THE PRESENCE OR ABSENCE OF ANY HAZARDOUS MATERIALS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION, REMOVAL OR RELOCATION, INCLUDING BUT NOT LIMITED TO: ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES' SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COSTS SHALL BE INCLUDED IN BASE BID.
4. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
5. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES AND LANDSCAPING TO REMAIN.
6. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS. ANY DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. ALL UTILITY DISCONNECTION SHALL BE PERFORMED TO THE SATISFACTION OF THE RELEVANT UTILITY COMPANY AND COMPLY WITH ANY LOCAL, STATE AND/OR FEDERAL REGULATORY AGENCIES.
8. CONTRACTOR SHALL PROMPTLY TRANSPORT AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS OFF OWNERS PROPERTY. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DISPOSAL.
9. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
10. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. NO ACTIVITY SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINE AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER AND LANDOWNER.
13. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 A MINIMUM OF 72 HOURS (M-F) PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.
14. THE LANDSCAPE ARCHITECT/ENGINEER IS NOT RESPONSIBLE FOR ANY ITEMS THAT MAY BE DISCOVERED ON-SITE DURING DEMOLITION OR CONSTRUCTION THAT WAS NOT PREVIOUSLY INDICATED ON THE SURVEYS OR INFORMATION PROVIDED.
15. PAVEMENT SHALL BE SAWCUT AT THE LIMIT OF WORK. ALL PAVING, FOOTINGS, UTILITIES, CURBING AND OTHER EXISTING IMPROVEMENTS SHALL BE REMOVED OR SUITABLY MILLED TO THE SATISFACTION OF THE OWNER AND GENERAL CONTRACTOR.

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DEMOLITION & REMOVALS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

ROBERT E. LEVESQUE
MASSACHUSETTS
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
2/10/23

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
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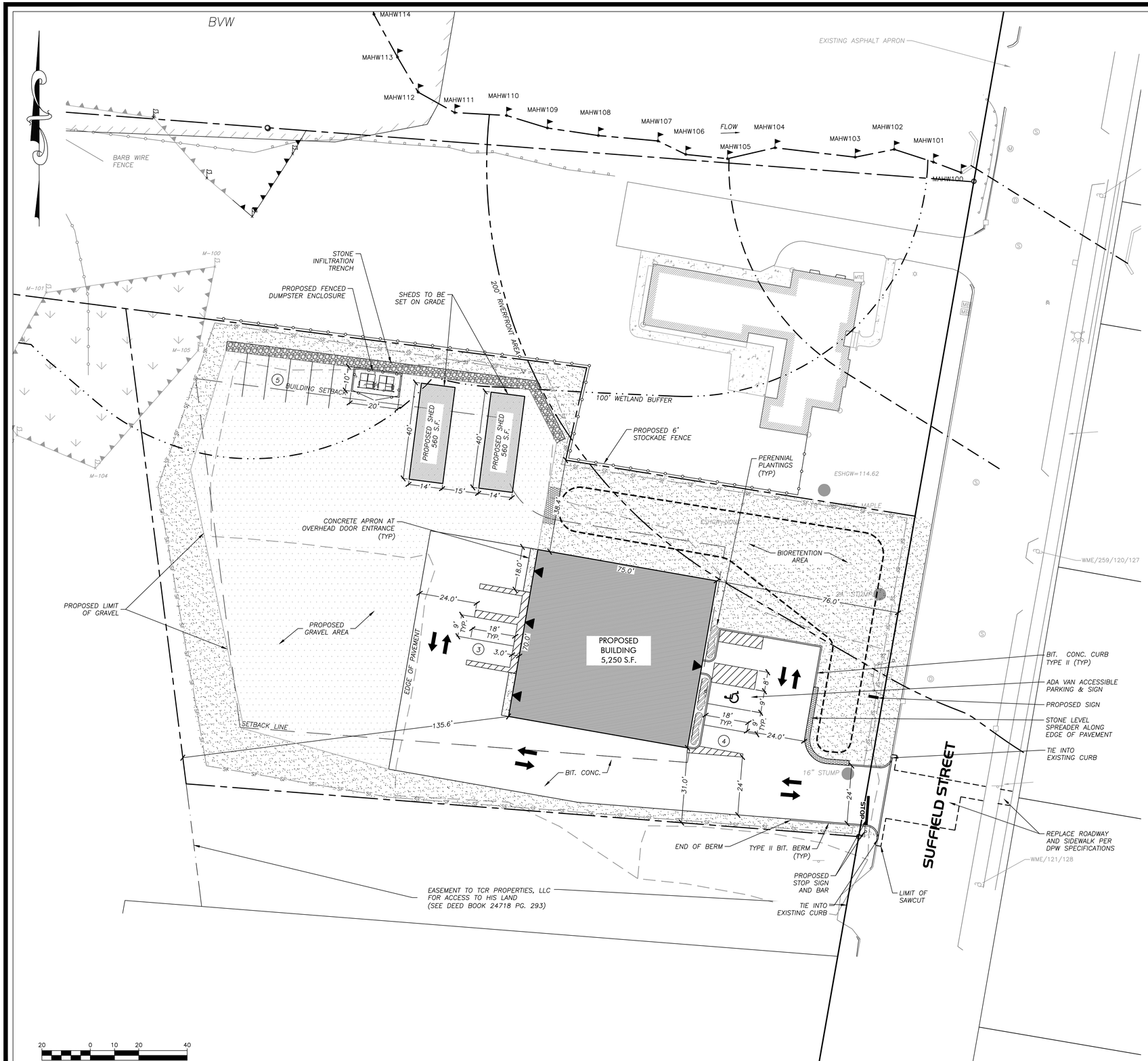

ZONING REVIEW - Industrial B (IB)

TYPE (MINIMUM)	REQUIRED	PROPOSED
AREA	1 ACRE	1.17 ACRE±
FRONTAGE	100 FT	134.4 FT±
FRONT YARD	75 FT	76.0 FT±
SIDE YARD	25 FT	38.4 FT± / 31.0 FT±
REAR YARD	25 FT	135.6 FT±
BUILDING HEIGHT / STORIES (MAX)	40 FT / 2 STORIES	< 40 FT± / 2 STORIES
PARKING*	11 SPACES	12 SPACES

*SERVICE INDUSTRIAL: 1 SPACE FOR EACH 500 S.F. OF GROSS FLOOR AREA: 5,250 S.F. / 500 S.F. = 10.5 – 11 SPACES

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

LANDSCAPE NOTES

1. SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.
2. IT SHALL BE THE SITE CONTRACTOR'S RESPONSIBILITY TO CROSS-REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH THE LANDSCAPE INFORMATION SHOWN HEREON.
3. ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING AND SOURCE IT APPROPRIATELY.
4. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
5. LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATING CONTRACTOR, "DIGSAFE", AND ANY APPLICABLE NON-[DIGSAFE] MEMBER UTILITIES MARK ALL UNDERGROUND UTILITIES AND PRIOR TO ANY PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE AND STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

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LAYOUT & MATERIALS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
PROFESSIONAL ENGINEER
4/29/26

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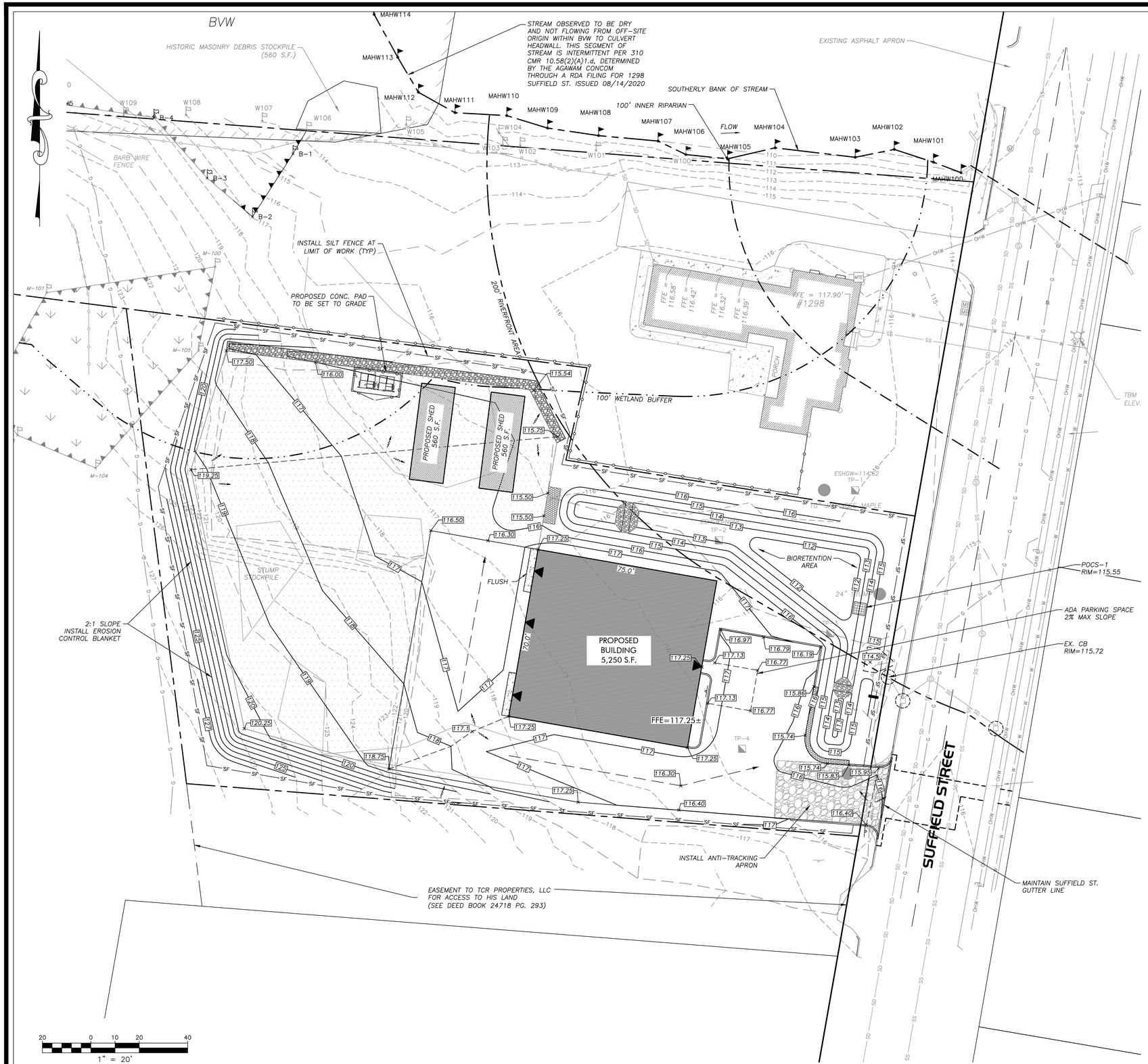

SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

GRADING & DRAINAGE NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING GRADING AND DRAINAGE.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH GRADING AND DRAINAGE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. CONTRACTOR SHALL NOTIFY DESIGNER/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.
5. ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, THE OWNER/SITE CONTRACTOR SHALL COORDINATE WITH R LEVESQUE ASSOCIATES, INC. (RLA) TO CONDUCT A POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENTS TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.
6. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

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GRADING, EROSION & SEDIMENTATION CONTROL PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 14-1-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
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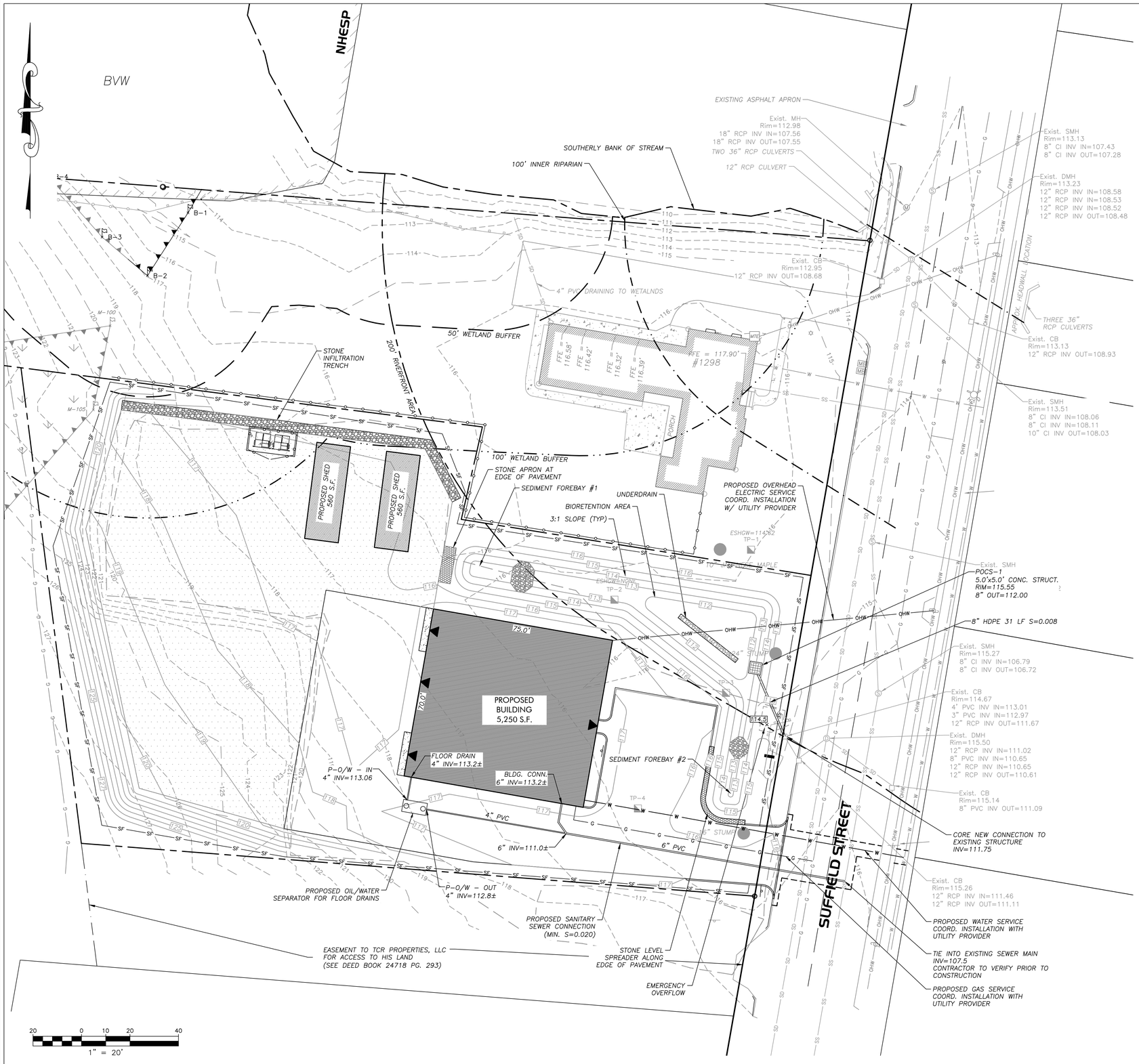

UTILITY NOTES

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2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH GRADING AND DRAINAGE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. CONTRACTOR TO VERIFY ALL UTILITY CONNECTIONS AND INVERTS FROM EXISTING/PROPOSED BUILDING TO SERVICES IN THE STREET. IF ANY DISCREPANCIES EXISTS BETWEEN PLAN AND INFORMATION FOUND IN THE FIELD, CONTACT ENGINEER AND LANDSCAPE ARCHITECT IMMEDIATELY.
5. SEE ARCHITECTURAL PLANS FOR BUILDING CONNECTIONS OF ALL UTILITIES.
6. UTILITY CONNECTIONS (NATURAL GAS, ELECTRICAL, TELECOMMUNICATIONS, ETC) SHOWN HEREON ARE SCHEMATIC IN NATURE TO DEPICT CONNECTION OF SAID UTILITIES TO THE SUBJECT BUILDING(S). THE RESPECTIVE UTILITY PROVIDER SHALL BE RESPONSIBLE FOR THE FINAL DESIGN OF THE RELEVANT UTILITY.
7. CONTRACTOR SHALL NOTIFY DESIGNER/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.
8. ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, THE OWNER/SITE CONTRACTOR SHALL COORDINATE WITH R LEVESQUE ASSOCIATES, INC. (RLA) TO CONDUCT A POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENTS TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.
9. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

GRADING & DRAINAGE NOTES

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6. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

CONSTRUCTION NOTES

1. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
2. ALL LAYOUT WORK REQUIRED SHALL BE PERFORMED BY A LICENSED SURVEYOR OR ENGINEER EMPLOYED BY THE CONTRACTOR.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. CALCIUM CHLORIDE/WATER FOR DUST CONTROL TO BE AVAILABLE AT ALL TIMES.
10. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
11. ALL CONSTRUCTION METHODS TO CONFORM TO TOWN PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
12. TOWN BOARD OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
13. ALL CATCH BASINS TO HAVE 48" SEALED SUMPS AND HOODS.
14. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

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DRAINAGE & UTILITIES PLAN

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B. Per Town Comment	2/21/23
C. Proposed Sheds	4/29/26

DRAFTED BY: R.M.N./F.J.C.

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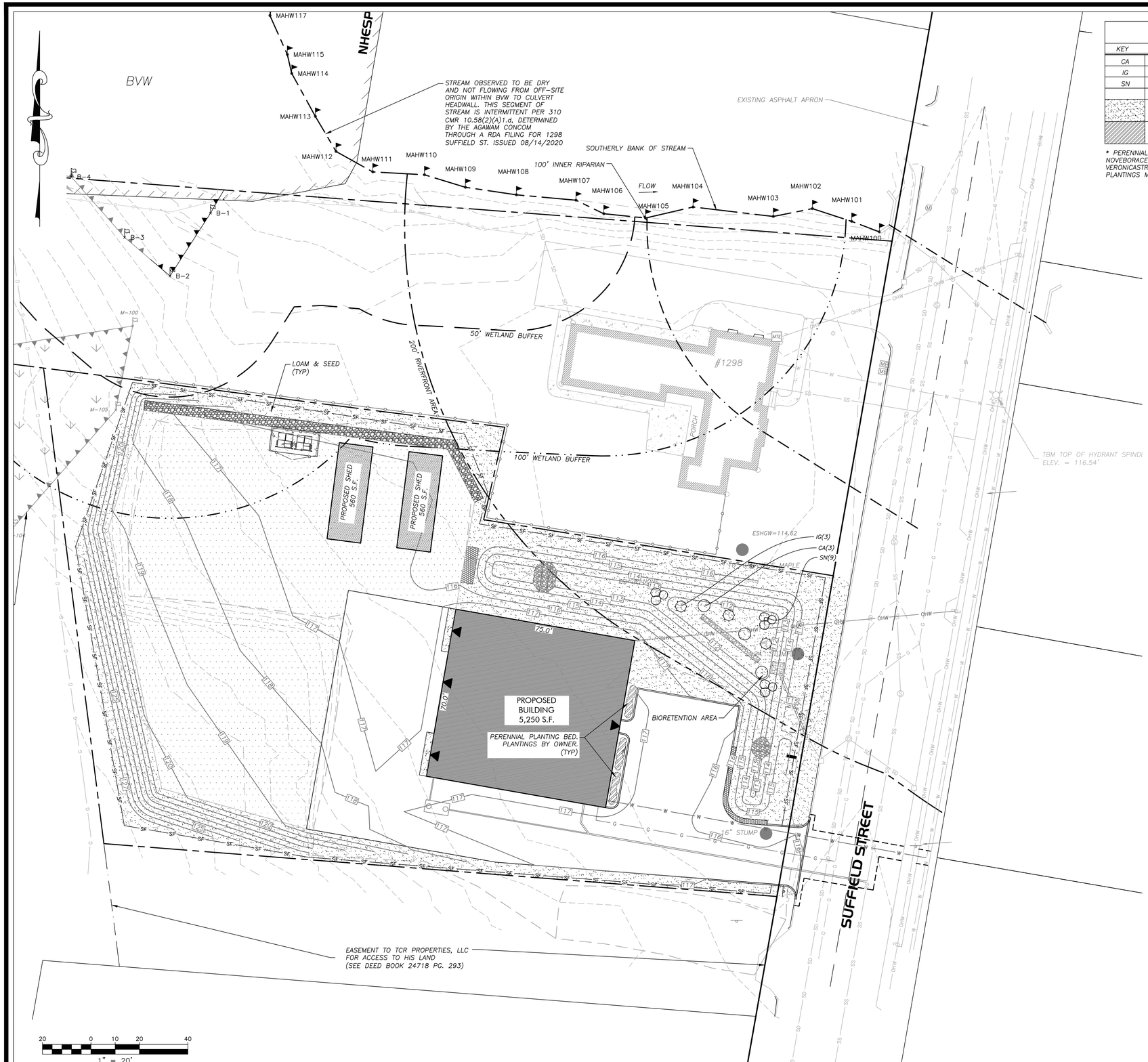
SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

DRAWING#	REV.
C-6	C

S:\Projects\2019\190615 - TCR Properties LLC - 1298 Suffield St, Agawam\Civil 3D\190615 - SITE.dwg



PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE/SPACING
CA	3	CORNUS AMOMUM	SILKY DOGWOOD	MIN. 2.5" CAL.
IG	1	ILEX GLABRA	INKBERRY	MIN. 2.5" CAL.
SN	9	SORGHASTRUM NUTANS	INDIANGRASS	MIN. 2.5" CAL.
	–	LAWN AREA (MIN. 4" LOAM & SEED)	–	RATE PER SUPPLIER REC.
	–	MULCH PLANTING BED	–	RATE PER SUPPLIER REC.

* PERENNIAL PLANTING BEDS MAY TYPICALLY INCLUDE NATIVE AND NON-INVASIVE VARIETIES SUCH AS VERNONIA NOVEBORACENSIS, PHLOX PANICULATA, ACHILLEA MILLEFOLIUM, ASTILBE VAR., HEUCHERA VAR., SAPONARIA OCYMOIDES, VERONICASTRUM VIRGINICUM ALBUM, RUDBECKIA HIRTA, AND ORNAMENTAL NON-SPREADING GRASSES. ANNUAL PLANTINGS MAY BE CHOSEN TO PROVIDE ADDITIONAL SEASONAL INTEREST.

LANDSCAPE NOTES

1. SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.
2. IT SHALL BE THE SITE CONTRACTOR'S RESPONSIBILITY TO CROSS-REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH THE LANDSCAPE INFORMATION SHOWN HEREON.
3. ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING AND SOURCE IT APPROPRIATELY.
4. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
5. LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATING CONTRACTOR, "DIGSAFE", AND ANY APPLICABLE NON-[DIGSAFE] MEMBER UTILITIES MARK ALL UNDERGROUND UTILITIES AND PRIOR TO ANY PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE AND STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

SITE LANDSCAPING PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
PROFESSIONAL ENGINEER
4/29/26

PREPARED FOR:

TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023	
REVISIONS:	**DATE:**
A. Per Town Comment	2/10/23
B. Proposed Sheds	4/29/26

DRAFTED BY: R.M.N./F.J.C.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

DRAWING#	REV.
C-7	B

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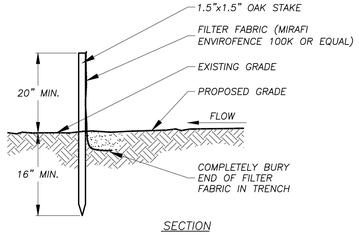
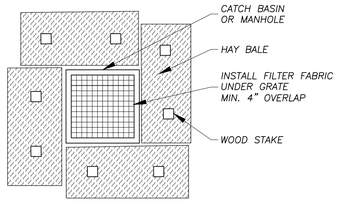


SECTION

SILT FENCE DETAIL

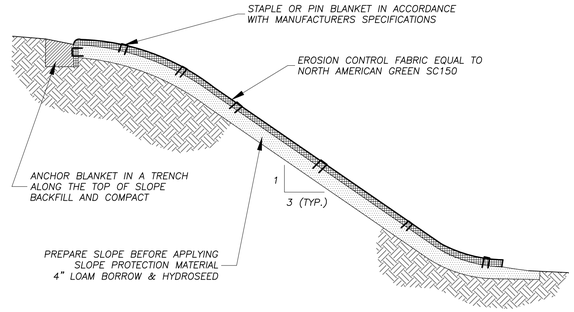
NO SCALE



NOTE
INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.

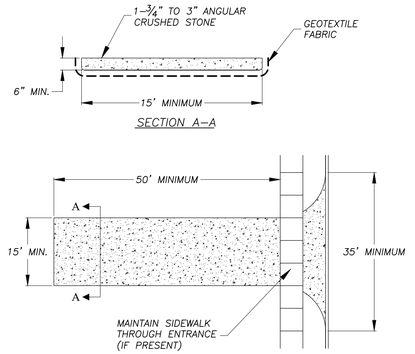
INLET PROTECTION - HAY BALES

NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION (AS REQ'D)

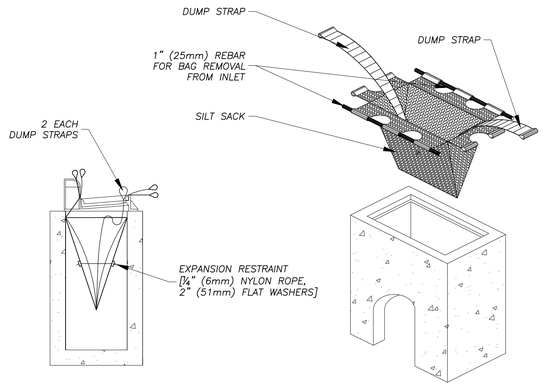
NO SCALE



NOTES
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. PLACE GEOTEXTILE OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
4. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMMEDIATELY.
5. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
6. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
7. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

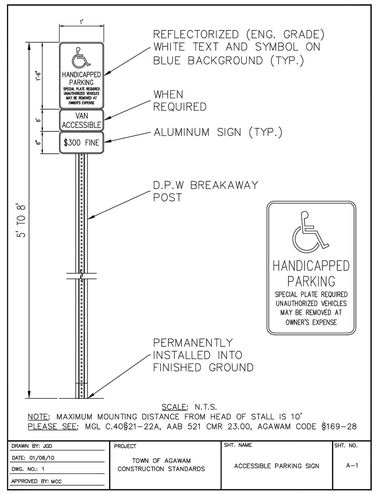
ANTI-TRACKING APRON (AS REQ'D)

NO SCALE



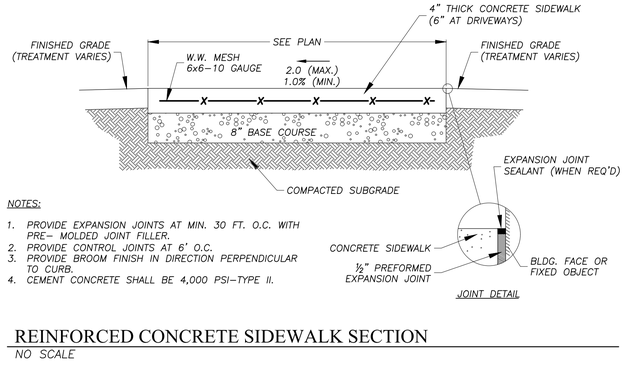
INLET PROTECTION - SEDIMENT FILTER SACK

NO SCALE



SCALE: N.T.S.
NOTE: MAXIMUM MOUNTING DISTANCE FROM HEAD OF STALL IS 10'
PLEASE SEE: MGL C.40§21–22A, AAB 521 CMR 23.00, AGAWAM CODE §169–28

DRAWN BY: JGD DATE: 01/08/10 DWG. NO.: 1 APPROVED BY: MCC	PROJECT: TOWN OF AGAWAM CONSTRUCTION STANDARDS	SHT. NAME: ACCESSIBLE PARKING SIGN	SHT. NO.: A–1

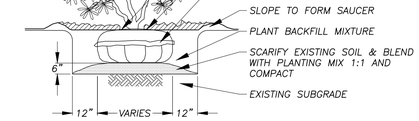


JOINT DETAIL

NOTES:
1. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE– MOLDED JOINT FILLER.
2. PROVIDE CONTROL JOINTS AT 6' O.C.
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
4. CEMENT CONCRETE SHALL BE 4,000 PSI–TYPE II.

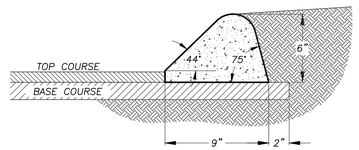
REINFORCED CONCRETE SIDEWALK SECTION

NO SCALE



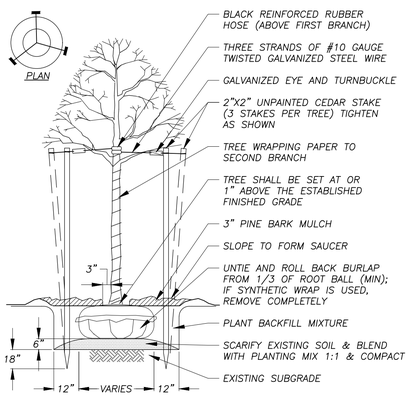
SHRUB PLANTING DETAIL

NO SCALE



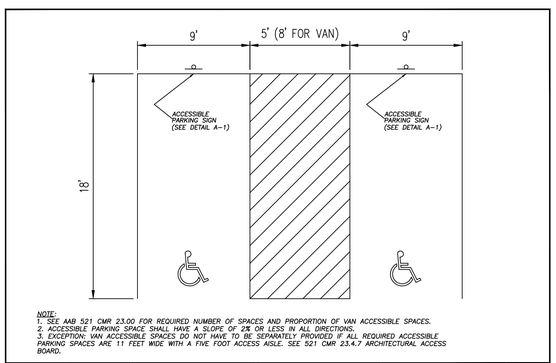
BITUMINOUS CONCRETE BERM (TYPE-2)

NO SCALE



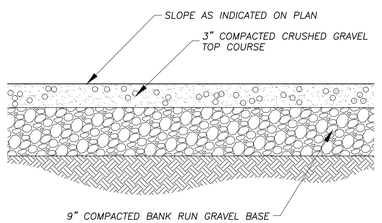
TREE PLANTING DETAIL

NO SCALE



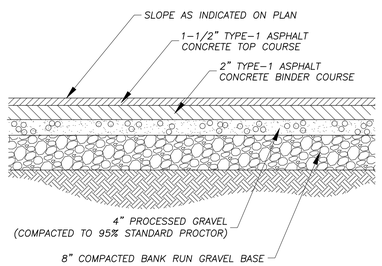
NOTE:
1. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER OF SPACES AND PROPORTION OF VAN ACCESSIBLE SPACES.
2. ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
3. EXCEPTION: VAN ACCESSIBLE SPACES DO NOT HAVE TO BE SEPARATELY PROVIDED IF ALL REQUIRED ACCESSIBLE PARKING SPACES ARE 11 FEET WIDE WITH A FIVE FOOT ACCESS AISLE. SEE 521 CMR 23.4.7 ARCHITECTURAL ACCESS BOARD.

DRAWN BY: JGD / VJC DATE: 07/16/13 REV: DWG. NO.: APPROVED BY: MCC	REVISIONS	PROJECT: TOWN OF AGAWAM CONSTRUCTION STANDARDS	SHT. NAME: ACCESSIBLE PARKING SPACE	SHT. NO.: A–2



GRAVEL PAVING DETAIL

NO SCALE



BITUMINOUS CONCRETE PAVING DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
2/10/23

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:
A. Per Town Comment	2/10/23

DRAFTED BY: R.M.N./F.J.C.

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RLA PROJ. NUMBER: 190615

DRAWING#	REV.
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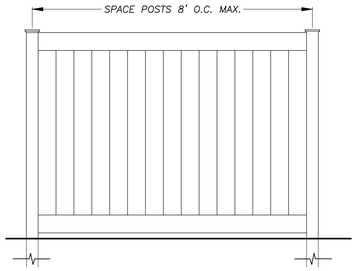
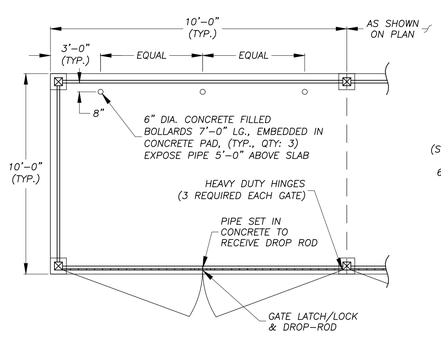
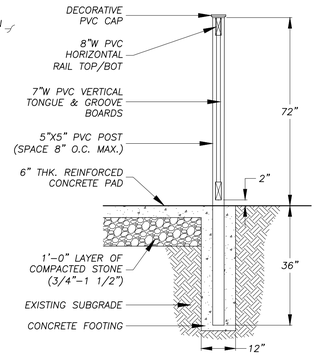


TYPICAL DUMPSTER ENCLOSURE ELEVATION

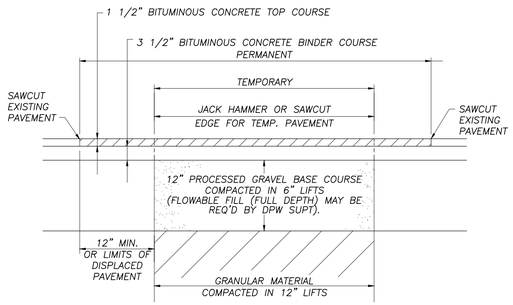


TYPICAL ENCLOSURE PLAN VIEW



TYPICAL ENCLOSURE DUMPSTER SECTION

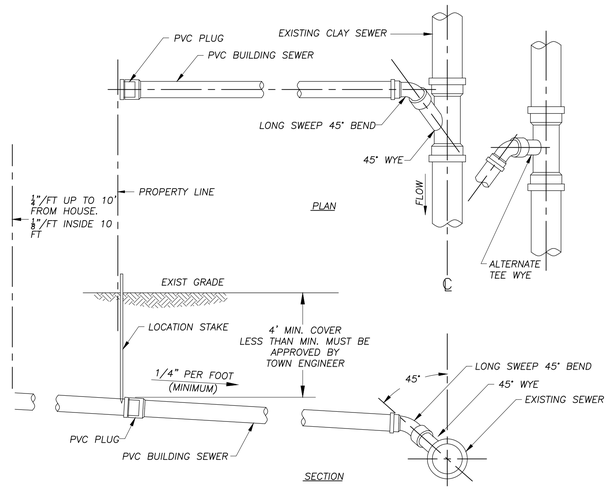
DUMPSTER ENCLOSURE
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I-1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'-0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

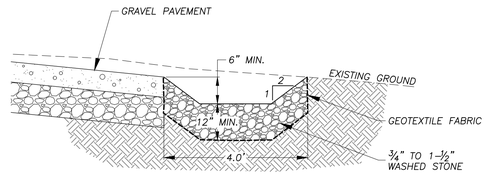
PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE



NOTES:

1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL
NO SCALE



STONE INFILTRATION TRENCH
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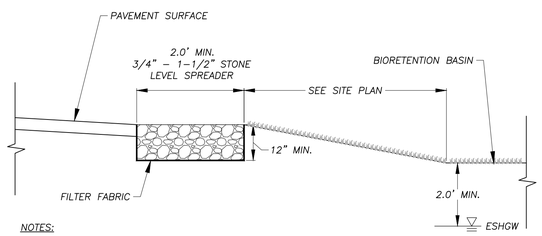

NOTES:

1. GRADE STONE DIAPHRAGM TO BE COMPLETELY LEVEL ACROSS THE ENTIRE LENGTH.
2. FILTER STRIP TO BE SEEDED WITH "NEW ENGLAND CONSERVATION/WILDLIFE MIX" FROM NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT.

STONE APRON DETAIL
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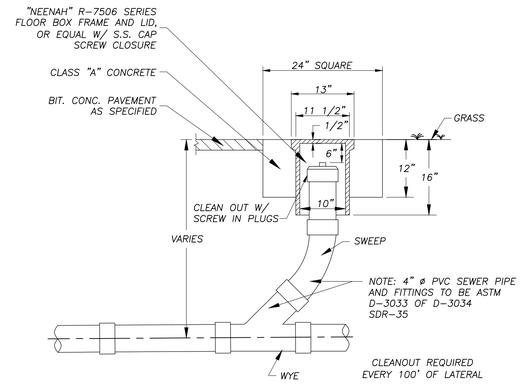

TYPICAL SANITARY CLEANOUT
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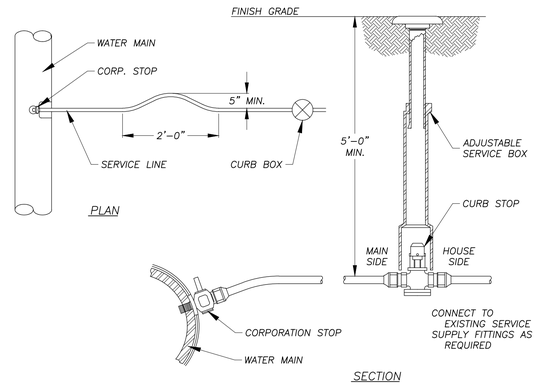

TYPICAL WATER SERVICE CONNECTION
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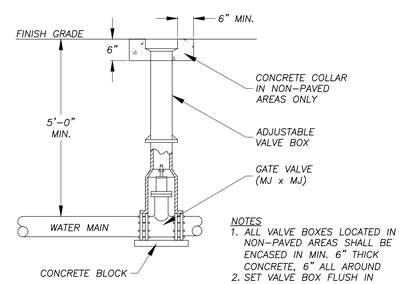

NOTES

1. ALL VALVE BOXES LOCATED IN NON-PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONCRETE, 6" ALL AROUND
2. SET VALVE BOX FLUSH IN PAVED AREAS

TYPICAL BURIED VALVE
NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

DRAWING#	REV.
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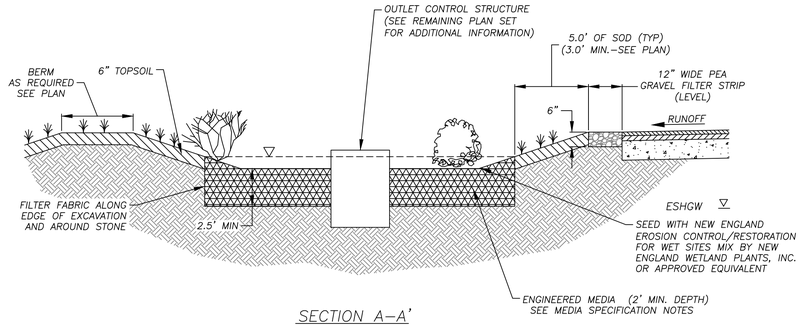
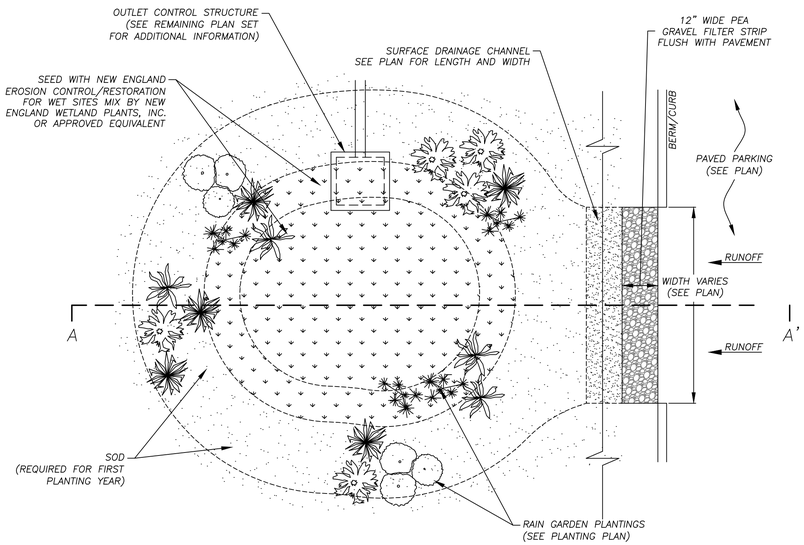
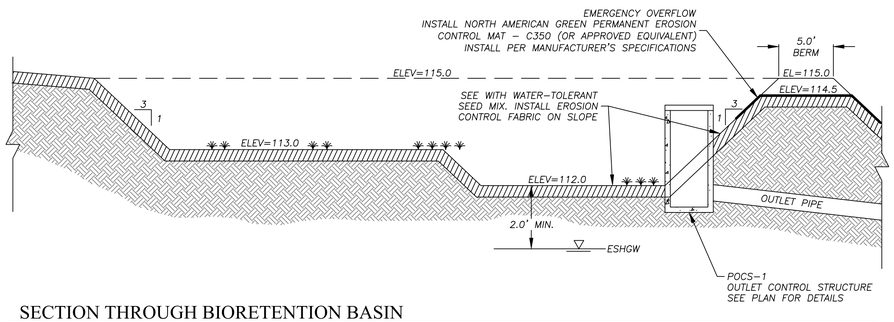


SECTION A–A'



TYPICAL BIORETENTION BASIN DETAIL

NO SCALE



SECTION THROUGH BIORETENTION BASIN

NO SCALE

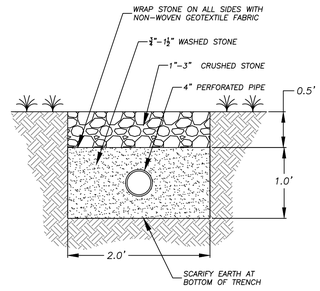
RAIN GARDEN/BIORETENTIONS BASIN NOTES

1. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE RAIN GARDEN/BIORETENTION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
3. IF RAIN GARDEN/BIORETENTION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
4. ALL DRAINAGE AREAS TO A RAIN GARDEN/BIORETENTION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF AMENDED SOILS, SEED MIX, MULCH OR PLANTINGS.
5. AMENDED SOIL WILL ONLY BE PERMITTED WITH A VALID SOIL ANALYSIS REPORT
6. FOR BIORETENTION BASIN, WRAP PERFORATED UNDERDRAIN WITH FILTER FABRIC PRIOR TO BACKFILLING.
7. UNDERDRAIN PIPE SHOULD HAVE ⅜" PERFORATIONS SPACED AT 6" CENTERS, MIN. 4 HOLES PER ROW. MAXIMUM SPACING OF UNDERDRAIN PIPE IS 10 FEET ON CENTER.
8. FILTER MEDIA FOR RAIN GARDENS AND BIORETENTIONS BASINS SHALL BE AS FOLLOWS:

   20–30% MODERATELY FINE SHREDED BARK OR WOOD FIBER MULCH WITH <5% FINES PASSING NO. 200 SIEVE

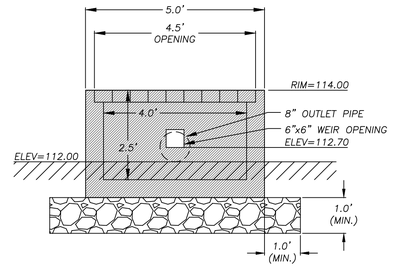
   70–80% COURSE LOAMY SAND MEETING THE FOLLOWING GRADATION:

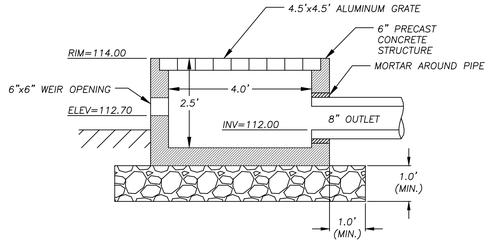
SIEVE NO.	PERCENT BY WEIGHT PASSING STANDARD SIEVE INDICATED
10	85–100
20	70–100
60	15–40
200	8–15

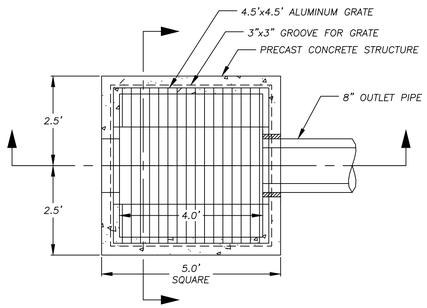


UNDERDRAIN DETAIL

NO SCALE







OUTLET CONTROL STRUCTURE (POCS-1)

NO SCALE

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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
2/10/23

PREPARED FOR:

TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:
A. Per Town Comment	2/10/23

DRAFTED BY: R.M.N./F.J.C.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

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Site Plans

Proposed Commercial Development

Suffield Street
Agawam, MA 01001
Parcel ID: Portion of 14 - 1 - 4

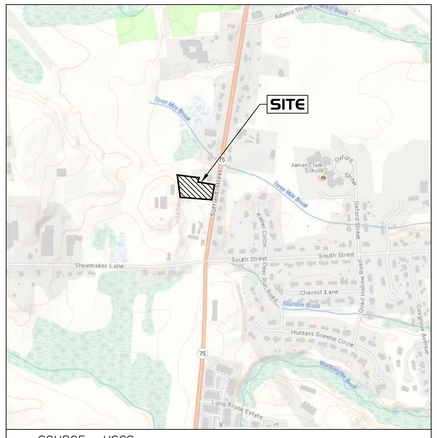
AS PREPARED FOR

TCR Properties LLC
c/o T.J. Galis

1298 Suffield Street
Agawam, MA 01001

ZONING REVIEW - Industrial B (IB)		
TYPE (MINIMUM)	REQUIRED	PROPOSED
AREA	1 ACRE	1.17 ACRE±
FRONTAGE	100 FT	134.4 FT±
FRONT YARD	75 FT	76.0 FT±
SIDE YARD	25 FT	38.4 FT± / 31.0 FT±
REAR YARD	25 FT	135.6 FT±
BUILDING HEIGHT / STORIES (MAX)	40 FT / 2 STORIES	< 40 FT± / 2 STORIES
PARKING*	11 SPACES	12 SPACES

*SERVICE INDUSTRIAL: 1 SPACE FOR EACH 500 S.F. OF GROSS FLOOR AREA: 5,250 S.F. / 500 S.F. = 10.5 ~ 11 SPACES



SOURCE: USGS

NORTH

January 6, 2023

DRAWING INDEX			
SHEET NO.	SHEET NAME	ISSUE DATE	REVISION DATE
T-1	TITLE SHEET	1/6/23	
EX-1	EXISTING CONDITIONS PLAN	1/6/23	
C-1	NOTES, SYMBOL & LINE LEGEND, AND ABBREVIATIONS	1/6/23	
C-2	CONSTRUCTION NOTES	1/6/23	
C-3	DEMOLITION AND REMOVALS PLAN	1/6/23	
C-4	LAYOUT AND MATERIALS PLAN	1/6/23	
C-5	GRADING, EROSION & SEDIMENTATION CONTROL PLAN	1/6/23	
C-6	DRAINAGE AND UTILITIES PLAN	1/6/23	
D-1	DETAILS	1/6/23	
D-2	DETAILS	1/6/23	
D-3	DETAILS	1/6/23	

BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY

40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

RLA Project Number: 190615

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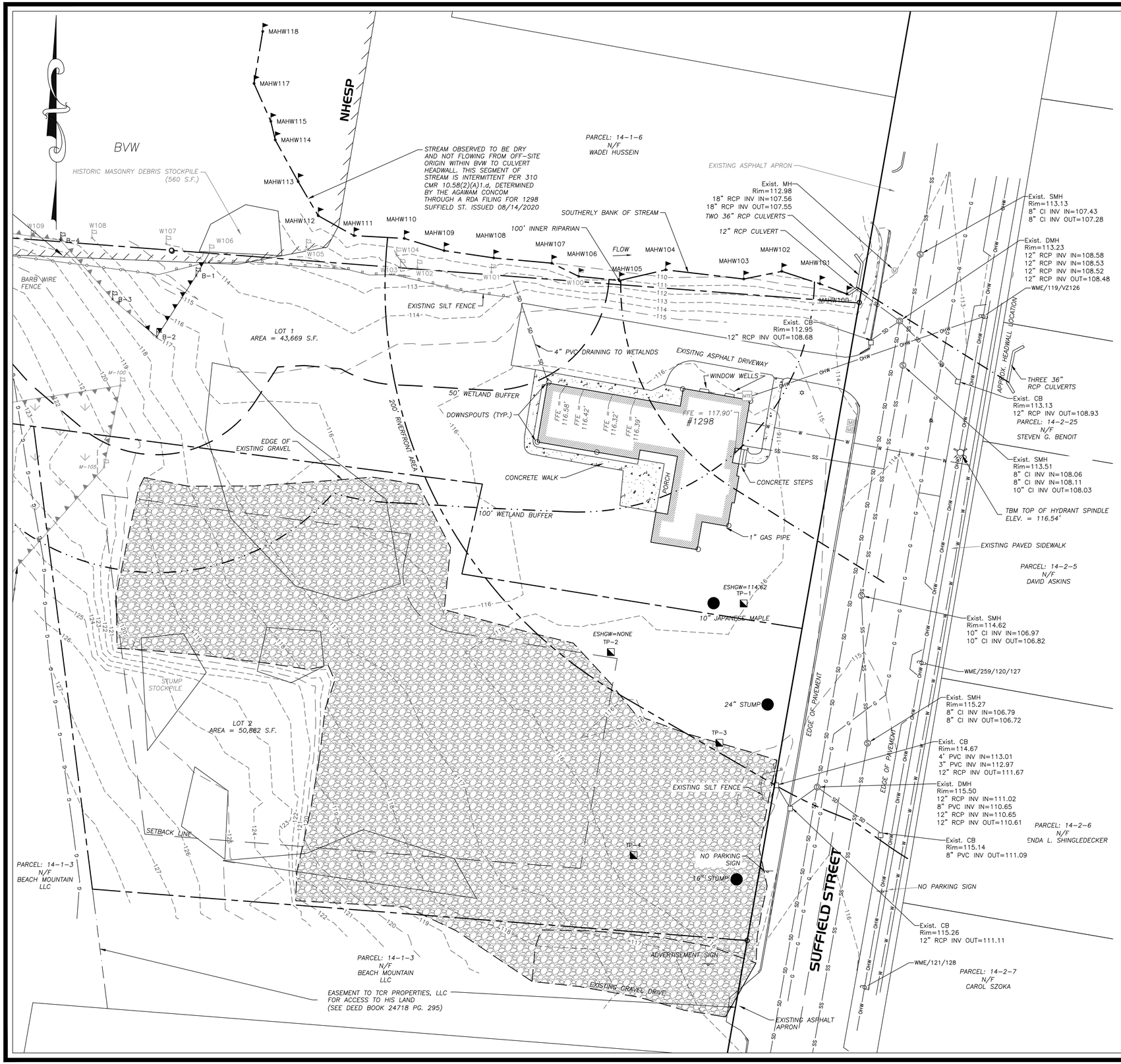

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NOTES

1. THE RECORD OWNER OF THE SUBJECT PARCEL IS TCR PROPERTIES, LLC. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 22409 PAGE 375 ALSO BOOK 24718 PAGE 293.
2. THE PROPERTY LINES LOT 1 AND LOT 2 SHOWN HEREON DERIVED FROM PLAN DONE BY THIS OFFICE DATED 6-21-2022 RECORDED IN PLAN BOOK 395 PAGE 94.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR SITE PLANNING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT LOT 1 CONTAINS 50,882 S.F.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLANDS DELINEATED BY R. LEVESQUE ASSOCIATES, INC. ON 6/10/2019 .
8. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC. 6/26/2019. HORIZONTAL AND VERTICAL DATUM ARE BASED UPON THE MASSACHUSETTS CO-ORDINATE SYSTEM, MAINLAND ZONE.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AVAILABLE RECORD DATA, AND TOWN OF AGAWAM, MA GIS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM TOWN OF AGAWAM, MA GIS.
11. SUBJECT PARCEL IS ZONED IB ACCORDING TO THE TOWN OF AGAWAM, MA GIS.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0392E – EFFECTIVE DATE: 7/16/2013.
13. A PORTION OF THE SUBJECT PROPERTY IS LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

SYMBOL & LINE LEGEND

- EXISTING SIGN
- EXISTING MAILBOX
- UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING HYDRANT
- GUTTER DOWNSPOUT
- EXISTING GAS VALVE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- EXISTING MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- W# WETLAND FLAG LOCATION
- MAHW# M.A.H.W. FLAG LOCATION
- EXISTING FLAGPOLE
- MTE EXISTING ELECTRICAL METER
- EXISTING TREE
- 219 EXISTING CONTOUR
- EDGE OF WETLAND
- FENCE LINE
- SILT FENCE LINE
- GUARDRAIL
- OHW OHW EXISTING OVERHEAD WIRES
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- 50' WETLANDS BUFFER
- 100' WETLANDS BUFFER
- DISTURBANCE AREA
- NHESP BOUNDARY

ABBREVIATIONS

APPROX. – APPROXIMATE
CB. – CATCH BASIN
ELEV. – ELEVATION
FFE – FINISHED FLOOR ELEVATION
M.A.H.W. – MEAN ANNUAL HIGH WATER
MH. – MANHOLE
N/F – NOW OR FORMERLY
NHESP. – NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM
RCP – REINFORCED CONCRETE PIPE

20 0 10 20 40
SCALE: 1"=20'

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EXISTING CONDITIONS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 14-1-4

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 33610
PROFESSIONAL LAND SURVEYOR

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

DRAWING#	REV.
EX-1	-

SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- EXISTING MAILBOX
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- EXISTING CABLE TV BOX
- EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VALVE
- PROPOSED HYDRANT
- EXISTING GAS VALVE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- TP-1 TEST PIT LOCATION
- P-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- EXISTING STONE WALL
- TREE LINE
- × 102.4 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- × 94.7 PROPOSED SPOT GRADE
- 214 PROPOSED CONTOUR
- EDGE OF WETLAND
- FENCE LINE
- GUARDRAIL
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF SILT FENCE LINE

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FFE	–	FINISH FLOOR ELEVATION
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
PCB	–	PROPOSED CATCH BASIN
PDMH	–	PROPOSED DRAIN MANHOLE
PFES	–	PROP. FLARED END SECTION
POCS	–	PROP. OUTLET CONTROL STRUCT.
PROP.	–	PROPOSED
PSMH	–	PROP. SANITARY SEWER MANHOLE
PWQU	–	PROP. WATER QUALITY UNIT
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.

A. SITE PREPARATION
- COMPLETE ALL ROUGH GRADING ACTIVITIES
- REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
- EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
- SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
- THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.

B. ESTABLISHMENT
- EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
- UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
- APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
- VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.

C. MAINTENANCE
- ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION. APPLICATION STANDARDS:
- REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
- SCARIFY SURFACE PRIOR TO SEED APPLICATION.
- APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:

A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENGINEERS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE (AS REQ'D)

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SITE PREP

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
3. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
4. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
5. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
6. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
7. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
8. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
9. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE ENGINEER.
10. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
11. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE ENGINEER.
12. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2)REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
11. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
12. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
13. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
    A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RATE OF 50 LBS/1,000 S.F.
    B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
    C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
    D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F. SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

    E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F.UNLESS HYDROSEEDING WAS USED.
    F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHED IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
1/6/22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.
2. THE OWNER, R LEVESQUE ASSOCIATES, INC., AND PAUL S. SMITH LAND SURVEYING AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.
4. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150.
5. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
6. ALL WORK IN THE CITY/TOWN RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
7. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.
8. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
9. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.
11. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.
12. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.
13. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
14. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.
15. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.
16. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.
18. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
19. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
20. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.
21. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
22. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.
23. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.
24. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.
25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.
26. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. ALL CONSTRUCTION IN CITY/TOWN RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.
2. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
3. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.
4. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASSDOT , ETC. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.
6. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
7. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.
8. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.
10. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASSDOT AND/OR THE CITY/TOWN REGULATIONS.
11. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.
12. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
3. STORM PIPE SHALL BE AS NOTED ON PLANS.
4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20).
10. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
11. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
12. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
13. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
14. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT.
15. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.

SITE UTILITY NOTES

GENERAL:

1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.
3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.
7. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
8. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
9. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.
10. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.
11. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
12. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
14. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.
15. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:

1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.
2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.
3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.
4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.
5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.
6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.

WATER:

1. CONTRACTOR SHALL CONTACT THE CITY/TOWN WATER DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.
2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.
3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).
4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.
5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).
6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.
7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER CITY/TOWN WATER DEPARTMENT STANDARDS.
9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.
10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE MANUFACTURER'S SCHEDULE.
11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.
12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.
13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.
14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.
15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.
16. ALL WATER MAINS SHALL BE LAID PER THE PLANS TO MAINTAIN THE MAXIMUM SEPARATION FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.
17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.
18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.
19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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CONSTRUCTION NOTES

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

PAUL S. SMITH
REGISTERED LAND SURVEYOR
No. 13951
ROBERT M. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
1/6/22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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DEMOLITION NOTES

1. THE INFORMATION SHOWN HEREON IS NOT INTENDED TO BE AN EXHAUSTIVE SURVEY OF ALL APPURTENANCES THAT MAY OR MAY NOT BE IN PLACE TO SERVE THE EXISTING ON-SITE STRUCTURES AND USE. SEPTIC SYSTEM COMPONENTS, UNDERGROUND TANKS, AND OTHER SUB-SURFACE STRUCTURES MAY BE IN PLACE AND MAY REQUIRE ATTENTION BEFORE CONSTRUCTION MAY PROCEED.
2. CONTRACTOR SHALL CONDUCT A PRE-DEMOLITION SURVEY TO IDENTIFY ANY AND ALL UTILITIES AND UTILITY COMPONENTS TO BE DISCONTINUED, REMOVED, OR DEMOLISHED IN PLACE AND THE PRESENCE OR ABSENCE OF ANY HAZARDOUS MATERIALS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION, REMOVAL OR RELOCATION, INCLUDING BUT NOT LIMITED TO: ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES' SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COSTS SHALL BE INCLUDED IN BASE BID.
4. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
5. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES AND LANDSCAPING TO REMAIN.
6. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS. ANY DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. ALL UTILITY DISCONNECTION SHALL BE PERFORMED TO THE SATISFACTION OF THE RELEVANT UTILITY COMPANY AND COMPLY WITH ANY LOCAL, STATE AND/OR FEDERAL REGULATORY AGENCIES.
8. CONTRACTOR SHALL PROMPTLY TRANSPORT AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS OFF OWNERS PROPERTY. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DISPOSAL.
9. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
10. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. NO ACTIVITY SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINE AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER AND LANDOWNER.
13. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 A MINIMUM OF 72 HOURS (M-F) PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.
14. THE LANDSCAPE ARCHITECT/ENGINEER IS NOT RESPONSIBLE FOR ANY ITEMS THAT MAY BE DISCOVERED ON-SITE DURING DEMOLITION OR CONSTRUCTION THAT WAS NOT PREVIOUSLY INDICATED ON THE SURVEYS OR INFORMATION PROVIDED.
15. PAVEMENT SHALL BE SAWCUT AT THE LIMIT OF WORK. ALL PAVING, FOOTINGS, UTILITIES, CURBING AND OTHER EXISTING IMPROVEMENTS SHALL BE REMOVED OR SUITABLY MILLED TO THE SATISFACTION OF THE OWNER AND GENERAL CONTRACTOR.

PERMITTING
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DEMOLITION & REMOVALS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1398
6/22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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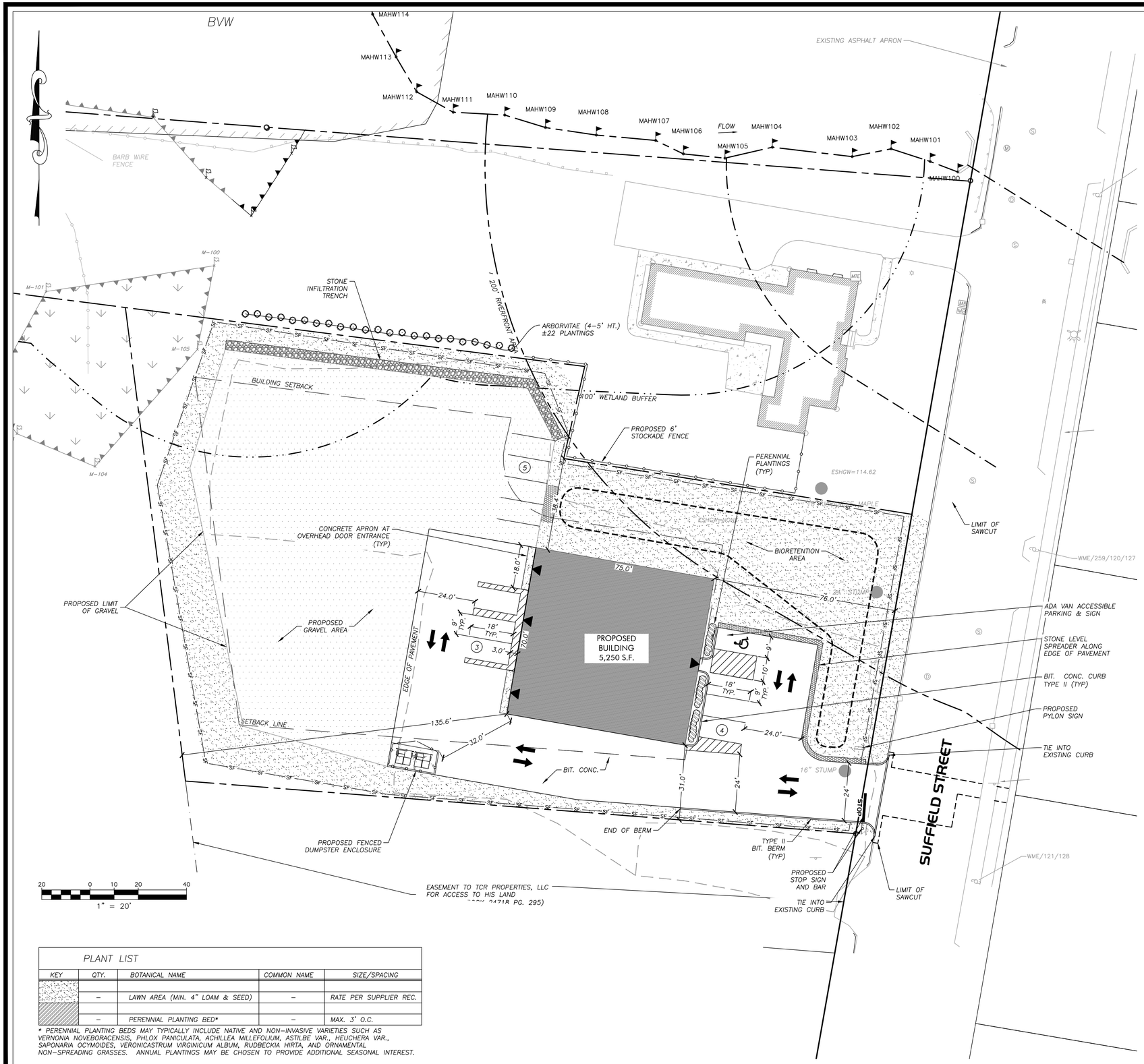

ZONING REVIEW - Industrial B (IB)

TYPE (MINIMUM)	REQUIRED	PROPOSED
AREA	1 ACRE	1.17 ACRE±
FRONTAGE	100 FT	134.4 FT±
FRONT YARD	75 FT	76.0 FT±
SIDE YARD	25 FT	38.4 FT± / 31.0 FT±
REAR YARD	25 FT	135.6 FT±
BUILDING HEIGHT / STORIES (MAX)	40 FT / 2 STORIES	< 40 FT± / 2 STORIES
PARKING*	11 SPACES	12 SPACES

*SERVICE INDUSTRIAL: 1 SPACE FOR EACH 500 S.F. OF GROSS FLOOR AREA: 5,250 S.F. / 500 S.F. = 10.5 – 11 SPACES

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

LANDSCAPE NOTES

1. SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.
2. IT SHALL BE THE SITE CONTRACTOR'S RESPONSIBILITY TO CROSS-REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH THE LANDSCAPE INFORMATION SHOWN HEREON.
3. ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING AND SOURCE IT APPROPRIATELY.
4. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
5. LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATING CONTRACTOR, "DIGSAFE", AND ANY APPLICABLE NON-[DIGSAFE] MEMBER UTILITIES MARK ALL UNDERGROUND UTILITIES AND PRIOR TO ANY PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE AND STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE/SPACING
	–	LAWN AREA (MIN. 4" LOAM & SEED)	–	RATE PER SUPPLIER REC.
	–	PERENNIAL PLANTING BED*	–	MAX. 3' O.C.

* PERENNIAL PLANTING BEDS MAY TYPICALLY INCLUDE NATIVE AND NON-INVASIVE VARIETIES SUCH AS VERNONIA NOVEBORACENSIS, PHLOX PANICULATA, ACHILLEA MILLEFOLIUM, ASTILBE VAR., HEUCHERA VAR., SAPONARIA OCYMOIDES, VERONICASTRUM VIRGINICUM ALBUM, RUDBECKIA HIRTA, AND ORNAMENTAL NON-SPREADING GRASSES. ANNUAL PLANTINGS MAY BE CHOSEN TO PROVIDE ADDITIONAL SEASONAL INTEREST.

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LAYOUT & MATERIALS PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

ROBERT M. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1395
16 22

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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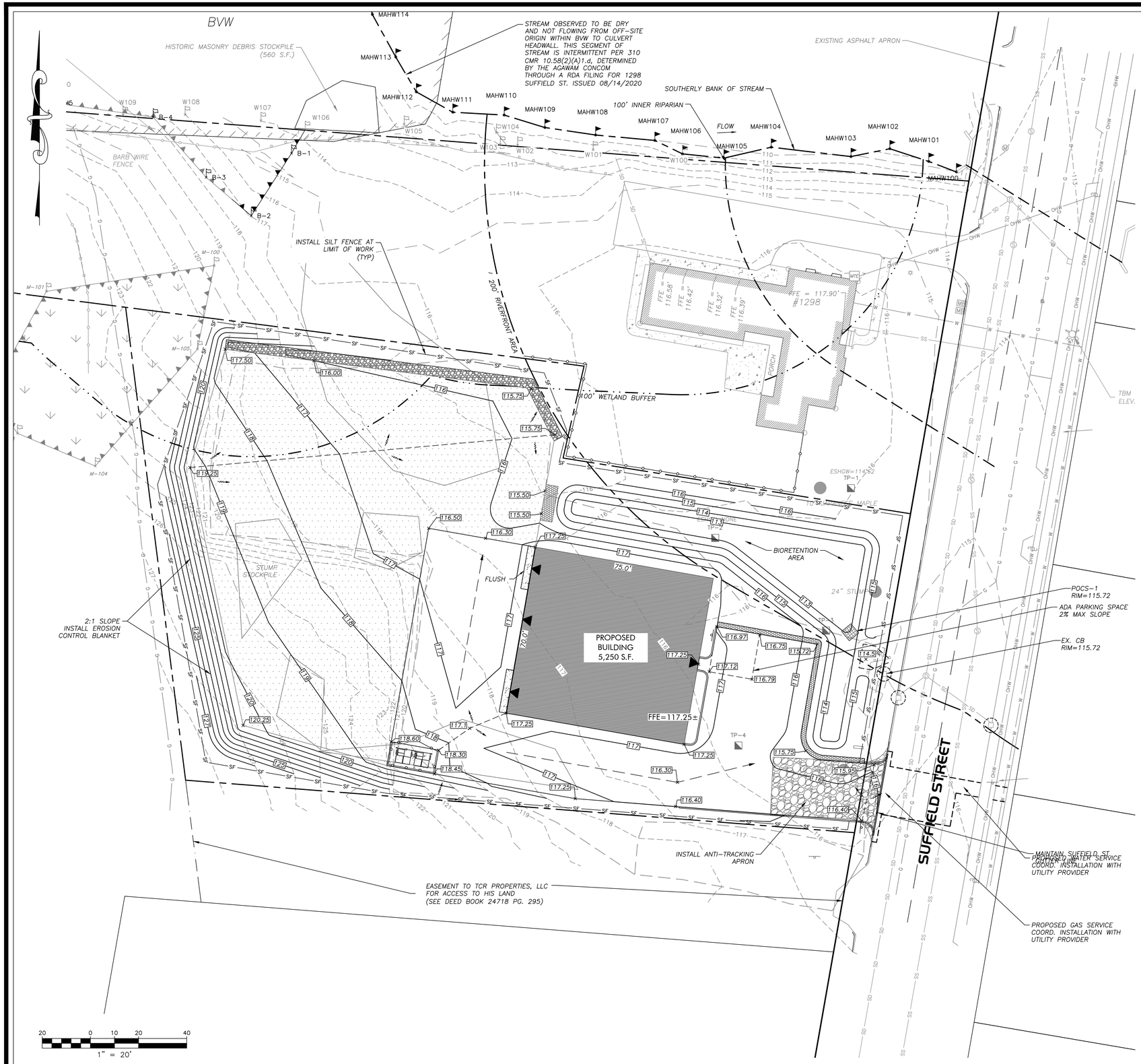

SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

GRADING & DRAINAGE NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING GRADING AND DRAINAGE.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH GRADING AND DRAINAGE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. CONTRACTOR SHALL NOTIFY DESIGNER/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.
5. ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, THE OWNER/SITE CONTRACTOR SHALL COORDINATE WITH R LEVESQUE ASSOCIATES, INC. (RLA) TO CONDUCT A POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENTS TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.
6. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

PERMITTING
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GRADING, EROSION & SEDIMENTATION CONTROL PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
1/6/23

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

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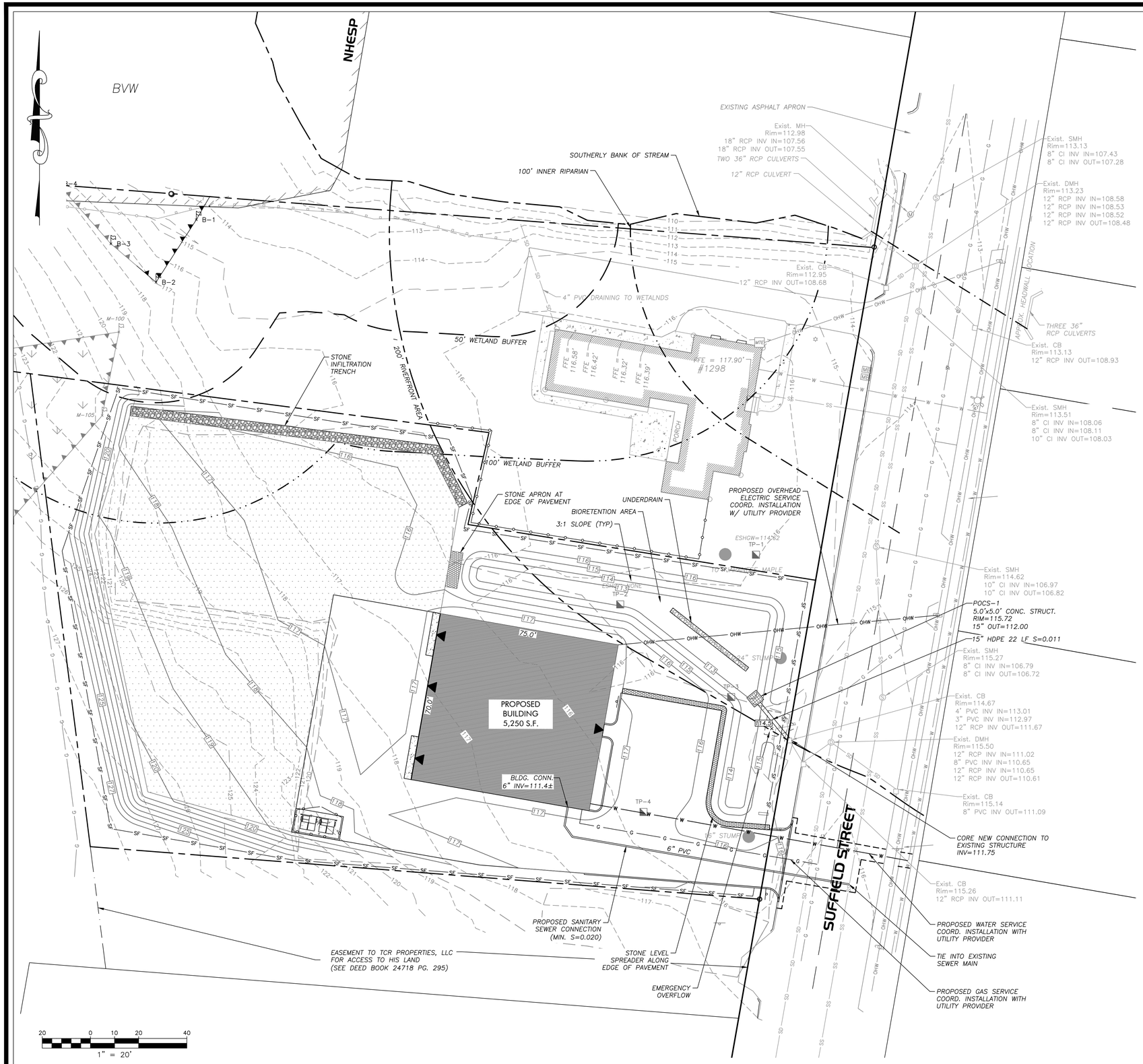

UTILITY NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING GRADING AND DRAINAGE.
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3. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. CONTRACTOR TO VERIFY ALL UTILITY CONNECTIONS AND INVERTS FROM EXISTING/PROPOSED BUILDING TO SERVICES IN THE STREET. IF ANY DISCREPANCIES EXISTS BETWEEN PLAN AND INFORMATION FOUND IN THE FIELD, CONTACT ENGINEER AND LANDSCAPE ARCHITECT IMMEDIATELY.
5. SEE ARCHITECTURAL PLANS FOR BUILDING CONNECTIONS OF ALL UTILITIES.
6. UTILITY CONNECTIONS (NATURAL GAS, ELECTRICAL, TELECOMMUNICATIONS, ETC) SHOWN HEREON ARE SCHEMATIC IN NATURE TO DEPICT CONNECTION OF SAID UTILITIES TO THE SUBJECT BUILDING(S). THE RESPECTIVE UTILITY PROVIDER SHALL BE RESPONSIBLE FOR THE FINAL DESIGN OF THE RELEVANT UTILITY.
7. CONTRACTOR SHALL NOTIFY DESIGNER/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.
8. ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, THE OWNER/SITE CONTRACTOR SHALL COORDINATE WITH R LEVESQUE ASSOCIATES, INC. (RLA) TO CONDUCT A POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENTS TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.
9. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

GRADING & DRAINAGE NOTES

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6. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THEIR RESPECTIVE TOWN DEPARTMENT SPECIFICATIONS.

CONSTRUCTION NOTES

1. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
2. ALL LAYOUT WORK REQUIRED SHALL BE PERFORMED BY A LICENSED SURVEYOR OR ENGINEER EMPLOYED BY THE CONTRACTOR.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. CALCIUM CHLORIDE/WATER FOR DUST CONTROL TO BE AVAILABLE AT ALL TIMES.
10. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
11. ALL CONSTRUCTION METHODS TO CONFORM TO TOWN PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
12. TOWN BOARD OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
13. ALL CATCH BASINS TO HAVE 48" SEALED SUMPS AND HOODS.
14. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

DRAINAGE & UTILITIES PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
1/6/23

PREPARED FOR:
TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

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SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

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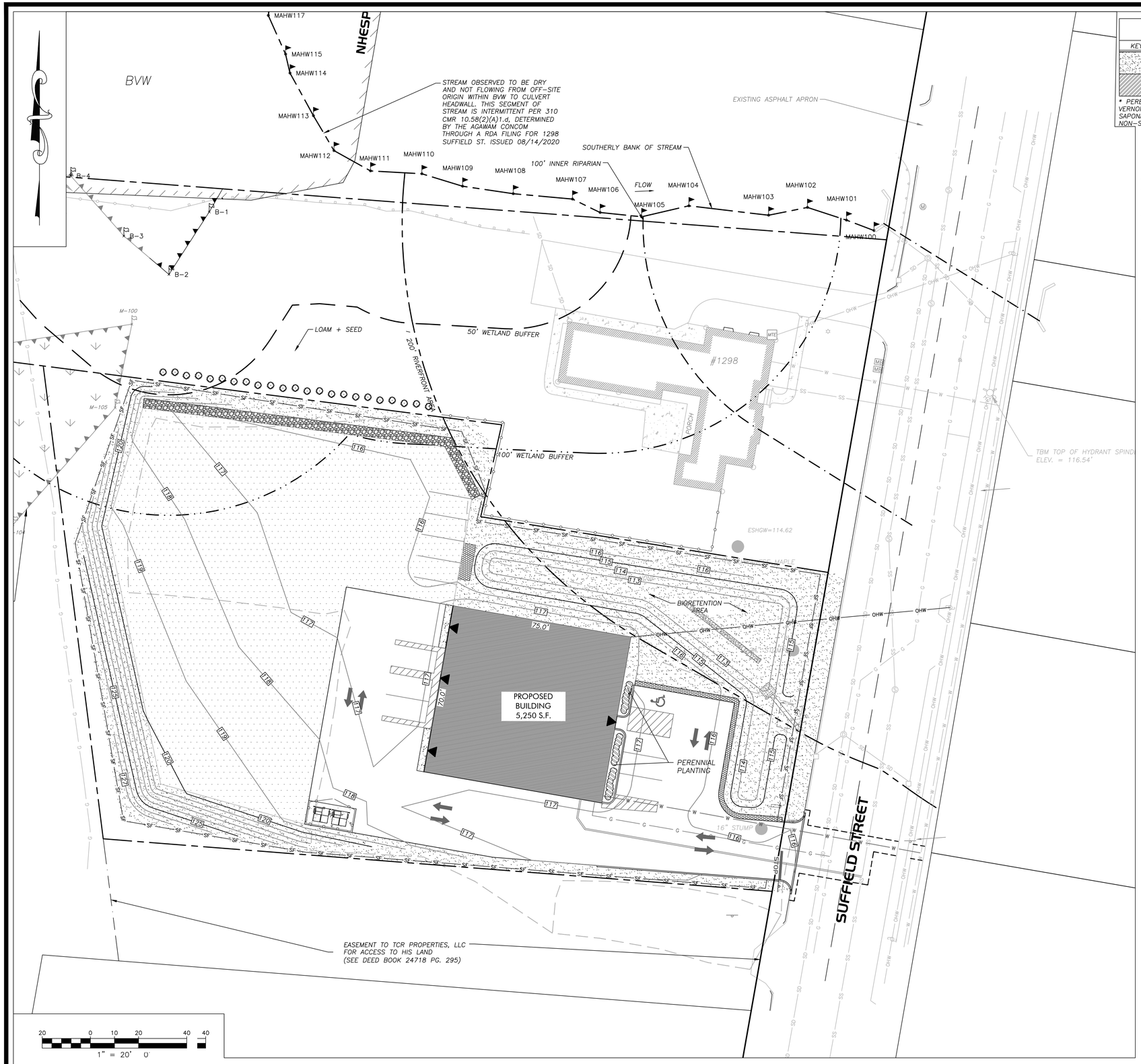

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE/SPACING
	–	LAWN AREA (MIN. 4" LOAM & SEED)	–	RATE PER SUPPLIER REC.
	–	PERENNIAL PLANTING BED*	–	MAX. 3' O.C.

* PERENNIAL PLANTING BEDS MAY TYPICALLY INCLUDE NATIVE AND NON-INVASIVE VARIETIES SUCH AS VERNONIA NOVEBORACENSIS, PHLOX PANICULATA, ACHILLEA MILLEFOLIUM, ASTILBE VAR., HEUCHERA VAR., SAPONARIA OCYMOIDES, VERONICASTRUM VIRGINICUM ALBUM, RUDBECKIA HIRTA, AND ORNAMENTAL NON-SPREADING GRASSES. ANNUAL PLANTINGS MAY BE CHOSEN TO PROVIDE ADDITIONAL SEASONAL INTEREST.

LANDSCAPE NOTES

1. SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.
2. IT SHALL BE THE SITE CONTRACTOR'S RESPONSIBILITY TO CROSS-REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH THE LANDSCAPE INFORMATION SHOWN HEREON.
3. ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING AND SOURCE IT APPROPRIATELY.
4. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
5. LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATING CONTRACTOR, "DIGSAFE", AND ANY APPLICABLE NON-[DIGSAFE] MEMBER UTILITIES MARK ALL UNDERGROUND UTILITIES AND PRIOR TO ANY PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE AND STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

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SITE LANDSCAPING PLAN

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 14-1-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
6/22

PREPARED FOR:
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c/o T. J. Galis
1298 Suffield Street
Agawam, MA

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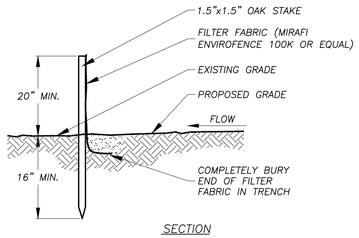
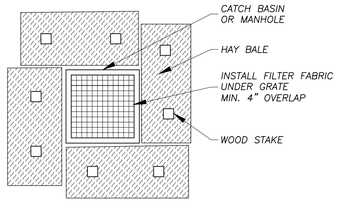


SECTION

SILT FENCE DETAIL

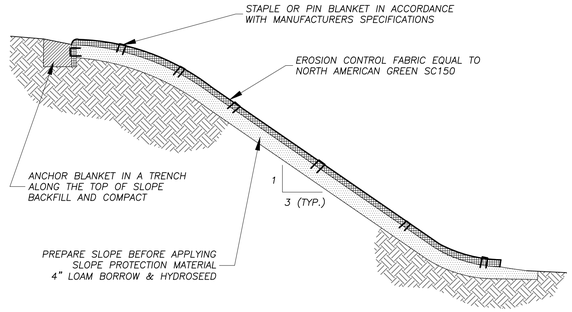
NO SCALE



NOTE
INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.

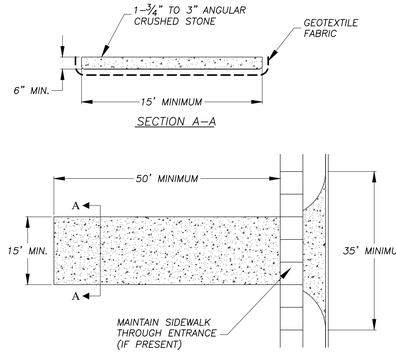
INLET PROTECTION - HAY BALES

NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION (AS REQ'D)

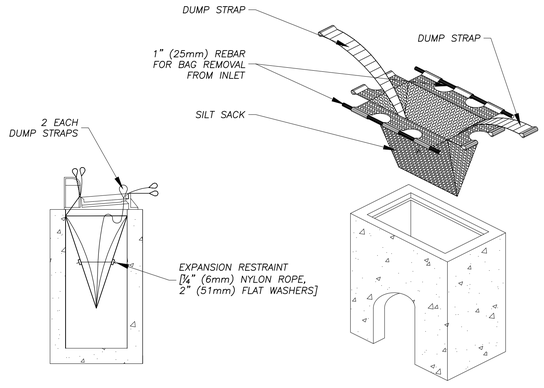
NO SCALE



NOTES
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. PLACE GEOTEXTILE OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
4. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMMEDIATELY.
5. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
6. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
7. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

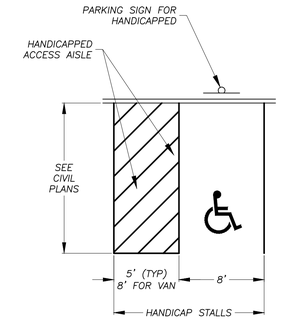
ANTI-TRACKING APRON (AS REQ'D)

NO SCALE



INLET PROTECTION - SEDIMENT FILTER SACK

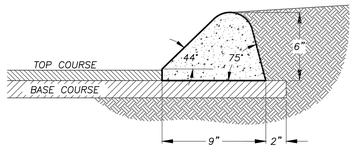
NO SCALE



NOTES:
1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" SOLID WHITE PAVEMENT MARKING PAINT UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO ENSURE HANDICAP ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
4. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER AND PROPORTION OF VAN ACCESSIBLE SPACES.

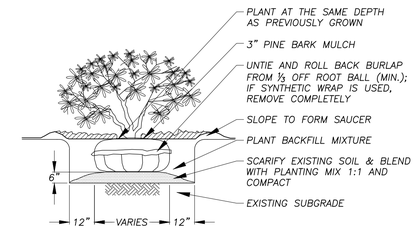
HANDICAP PARKING STALL

NO SCALE



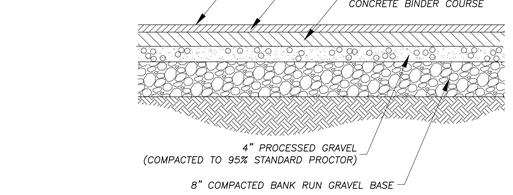
BITUMINOUS CONCRETE BERM (TYPE-2)

NO SCALE



SHRUB PLANTING DETAIL

NO SCALE



BITUMINOUS CONCRETE PAVING DETAIL

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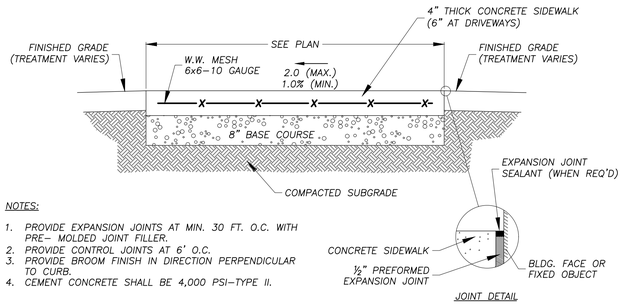
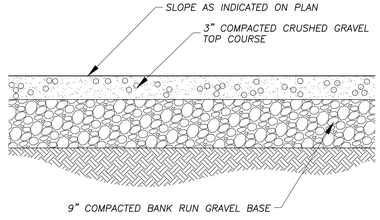


NOTES:
1. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE– MOLDED JOINT FILLER.
2. PROVIDE CONTROL JOINTS AT 6' O.C.
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
4. CEMENT CONCRETE SHALL BE 4,000 PSI–TYPE II.

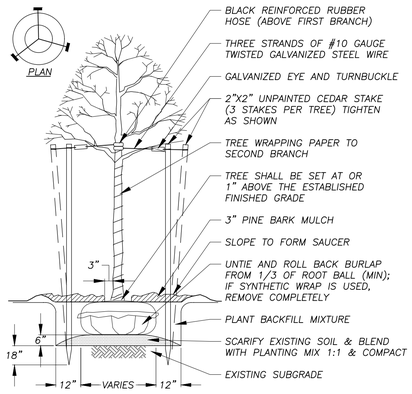
REINFORCED CONCRETE SIDEWALK SECTION

NO SCALE



GRAVEL PAVING DETAIL

NO SCALE



TREE PLANTING DETAIL

NO SCALE

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PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
6/22

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c/o T. J. Galis
1298 Suffield Street
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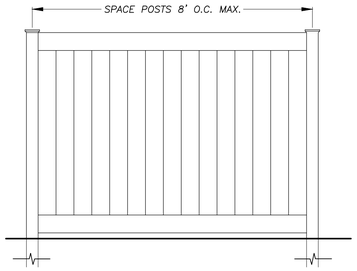
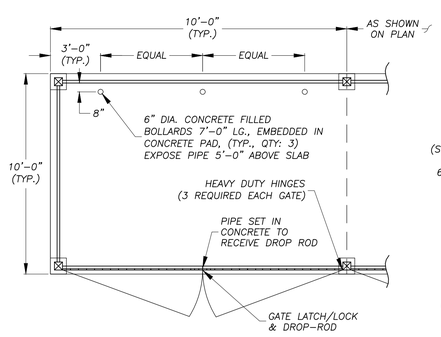
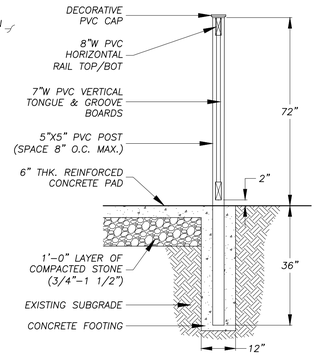


TYPICAL DUMPSTER ENCLOSURE ELEVATION

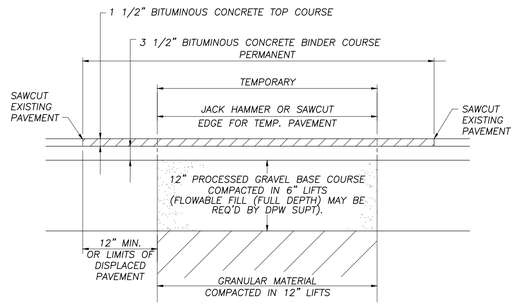


TYPICAL ENCLOSURE PLAN VIEW



TYPICAL ENCLOSURE DUMPSTER SECTION

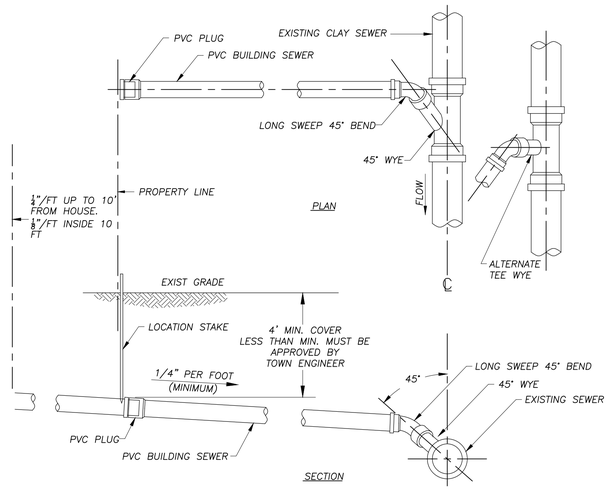
DUMPSTER ENCLOSURE
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I-1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'-0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

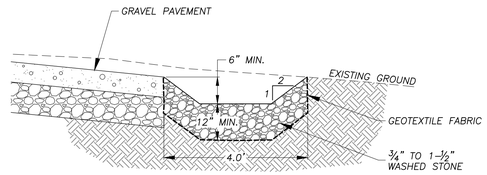
PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE



NOTES:

1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL
NO SCALE



STONE INFILTRATION TRENCH
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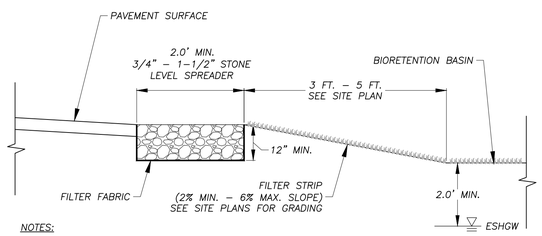
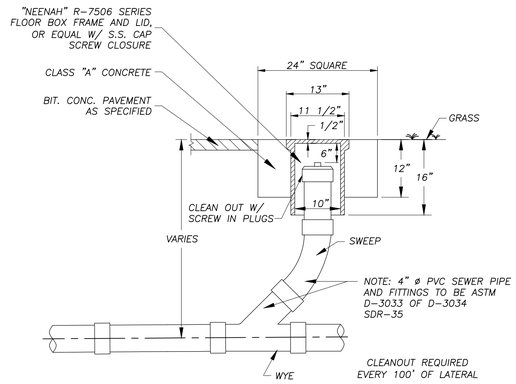


NOTES:

1. GRADE STONE DIAPHRAGM TO BE COMPLETELY LEVEL ACROSS THE ENTIRE LENGTH.
2. FILTER STRIP TO BE SEEDED WITH "NEW ENGLAND CONSERVATION/WILDLIFE MIX" FROM NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT.

VEGETATED FILTER STRIP WITH STONE LEVEL SPREADER
NO SCALE



TYPICAL SANITARY CLEANOUT
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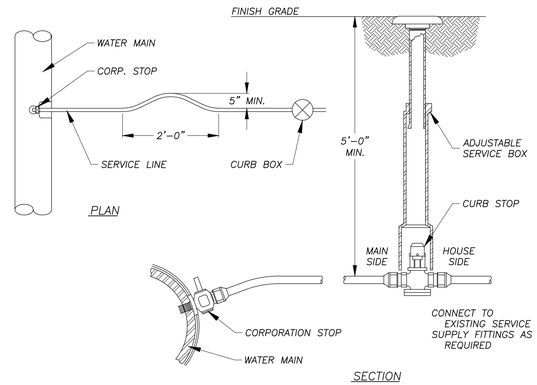

TYPICAL WATER SERVICE CONNECTION
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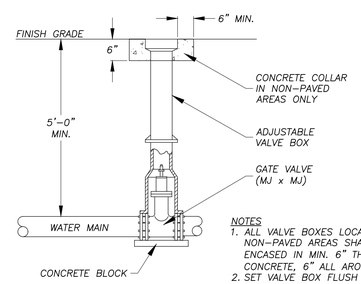

NOTES

1. ALL VALVE BOXES LOCATED IN NON-PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONCRETE, 6" ALL AROUND
2. SET VALVE BOX FLUSH IN PAVED AREAS

TYPICAL BURIED VALVE
NO SCALE

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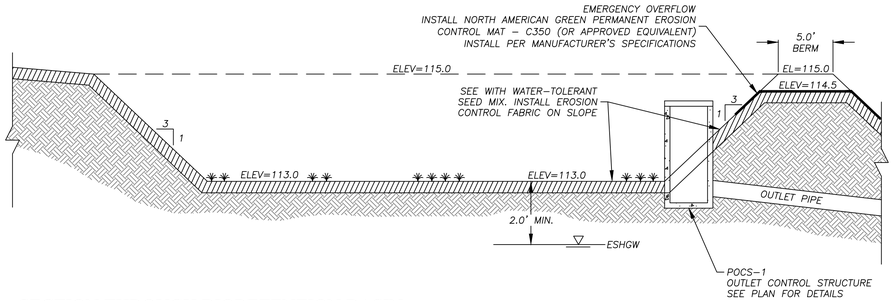


SECTION THROUGH BIORETENTION BASIN

NO SCALE

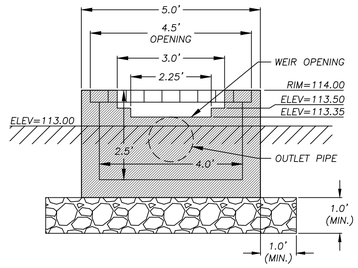
INFILTRATION BASIN NOTES

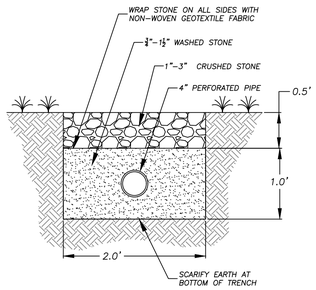
1. INFILTRATION BASIN BOTTOM TO BE LOCATED A MINIMUM OF 2.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW).
2. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER–TOLERANT GRASS.
3. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE INFILTRATION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
6. IF INFILTRATION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
7. ALL DRAINAGE AREAS TO AN INFILTRATION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF TOPSOIL/COMPOST MIX AND SEED MIX.
8. INFILTRATION BASIN BOTTOMS AND EMBANKMENTS TO BE SEEDED AS NOTED ON PLANS. NO TREES OR SHRUBS TO BE PLANTED WITHIN INFILTRATION BASINS OR EMBANKMENTS. DO NOT USE SOD.

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER–TOLERANT GRASS





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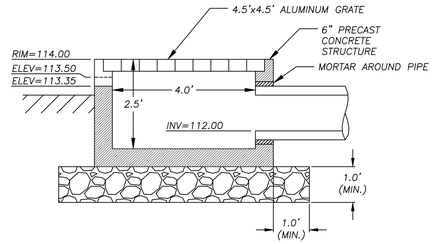

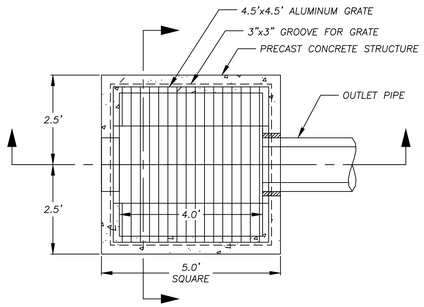

OUTLET CONTROL STRUCTURE (POCS-1)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
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Civil Engineers · Land Surveyors
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DETAILS

SUFFIELD STREET
AGAWAM, MASSACHUSETTS
PARCEL ID 141-4

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
1/6/22

PREPARED FOR:

TCR Properties, LLC
c/o T. J. Galis
1298 Suffield Street
Agawam, MA

ISSUANCE DATE: January 6, 2023

REVISIONS:	DATE:

DRAFTED BY: R.M.N./F.J.C.

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: AS NOTED

RLA PROJ. NUMBER: 190615

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Stormwater Drainage Report

Proposed Commercial Building

Project Location:
Suffield Street
Agawam, Massachusetts
(Parcel I: Portion of parcel I4-1-4)

Applicant & Owner:
TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001



RLA Project File: 190615
January 6, 2023

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I. INTRODUCTION

The purpose of this report is to present information regarding the technical aspects of the stormwater management system for the proposed project. All work is intended to be in full compliance with the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook. The stormwater management system includes approved best management practices (BMPs) to meet the requirements.

The project applicant, TCR Properties, LLC, is proposing to construct a new commercial building and associated site improvements on a parcel which was partitioned from the original parcel with the address of 1298 Suffield Street in Agawam Massachusetts. This property has been historically cleared of mature vegetation and is currently vacant. There are various existing site improvements including a gravel yard area and vegetated lawn area. Adjacent resource areas include offsite bordering vegetated wetlands to the north, riverfront area, and an isolated wetland to the west. There is an existing yard-drain/catch-basin located along the right-of-way property line with Suffield Street which collects runoff from the southern portions of the site and connects to the drainage infrastructure in Suffield Street.

The proposed project involves the following:

1. Removal of on-site vegetation and gravel within the limit of work;
2. Construction of the new commercial building;
3. Construction of associated site improvements including access drives, parking areas, and landscaping;
4. Installation of underground utilities including sanitary sewer, electric, gas, and water services;
5. Construction of a stormwater management system including roof drain leaders and a bioretention basin.

Under proposed conditions, a stormwater management system has been designed to mitigate the impacts of the proposed site improvements. The proposed stormwater management system will utilize surface conveyance to direct runoff to a surface bioretention basin to mitigate the impacts of the proposed site improvements. The proposed development will generally maintain the existing drainage patterns of the site and direct stormwater runoff either to the same bordering vegetated wetland as in pre-development conditions or to the existing yard-drain/catch-basin adjacent to Suffield Street. The proposed stormwater management system has been designed to treat and attenuate runoff from storm events including the 2-, 10-, and 100-year storm event.

2. SITE DESCRIPTION

2.1 Predevelopment Conditions

The property to be developed is located a recently created parcel which was partitioned from the original parcel with the address of 1298 Suffield Street and identified as I4-1-4 by the Town of Agawam's GIS database. The property is zoned Industrial B as referenced from the Town of Agawam's zoning map. The property is bounded northerly by residentially developed properties within the industrial zone, westerly by mostly cleared vegetated open space used for agriculture and animal grazing which has recently been approved for a self-storage facility, easterly by Suffield Street, and southerly by existing commercially developed properties used for agriculture. The property to be developed is approximately 1.17 Acres. Figure 1 – USGS Map illustrates the location of the project.

The site has been historically developed and cleared of mature vegetation. The property is currently vacant and consists mostly of gravel and grassed lawn area. Off-site to the north exists a bordering vegetated wetland and riverfront area. Additionally, just offsite to the west, an isolated wetland is present. Existing site topography can generally be described as moderately sloped from west to east/northeast. On site elevations are highest along the westerly property line ranging from about elevation 128 at the southwest corner of the property to about 116 along the northerly property line. Along the frontage with Suffield Street, the elevations are generally flat at about elevation 116. The existing topography is such that the site is generally bisected by a slight ridge line from the higher elevations at the southwesterly corner toward the existing single-family residence on the adjacent property to the north. The areas on the north side of the ridge sheet flow northerly toward the off-site wetland area while the areas on the southerly side of the ridge sheet flow toward Suffield Street. There is an existing yard-drain/catch basin located on the right-of-way property line which collects the portion of the gravel/yard area and conveys the runoff to the drainage system in Suffield Street. Please refer to the existing conditions plan submitted herewith for more detailed topographical information.

2.2 Resource Areas

Portions of the proposed site improvements are located within jurisdictional buffer zones and riverfront areas to bordering vegetated wetlands and a perennial stream located offsite to the west and north. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the resource area impacts.

2.2.1 Floodplain

R. Levesque Associates, Inc. performed due diligence research on the property in regard to FEMA flood zone mapping. As demonstrated by the most recent FEMA Flood Insurance Rate Maps, the

portion of the property to be improved is not located within any flood hazard areas, see Figure 2 – FEMA FIRM Map.

2.2.2 Natural Heritage and Endangered Species Program

R. Levesque Associates, Inc. performed due diligence research on the property in regard to Natural Heritage and Endangered Species Program (NHESP) areas. A habitat polygon is located just off-site to the northwest, however, none of the proposed site improvements are located within an area delineated by NHESP as estimated or priority habitats of endangered species, see Figure 3 – NHESP Map.

2.3 Soils

R. Levesque Associates, Inc. researched the soils located on site with information readily available by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Based on a review of the USDA Soil Survey of Hampden County, Massachusetts, Central Part, the site is comprised of the following soil types:

Table 2.4: Hydrologic Soil Group Classification

Soil Description	Map Unit Symbol	Hydrologic Soil Group
Windsor Loamy Sand	255B	A
Amostown Fine Sandy Loam	258B	C/D
Buxton Variant Silt Loam	729B	C
Scantic Variant Silt Loam	736A	C/D

A total of four test pits were conducted by Ryan Nelson, SE#14394 to verify the existing site soil characteristics and evaluate the ability of the site to support the proposed stormwater drainage system components. The test pits were located in areas of proposed stormwater basin in an effort to establish the elevation of the estimated seasonal high groundwater and soil conditions. Upon development of the final site plan, the stormwater management system components were located such that they were in proximity to at least two of the test pits performed. The location of the proposed basin was selected due to the presence of well-drained sandy soils and the lack of estimated seasonal high groundwater evidence. Overall, the on-site soils investigations corroborated the NRCS mapping. See Appendix B for additional soils information.

2.4 Post Development Conditions

The proposed site improvements include a new stormwater management system to properly meet the requirements set forth by the Agawam Stormwater Management Ordinance. The proposed stormwater features include:

- Grassed Channel; and
- Bioretention Area

The property owner is proposing to construct a new commercial building with associated site improvements including access drives, parking areas, utility connections and a stormwater management system. All utilities, including water, sewer, gas, and electric services will be brought on site via the frontage with Suffield Street. All utility connections will be coordinated with the utility provider and are subject to provider specifications. Utilities will then be run within the property boundary to the building as shown on the site plans. Final building utility connections will be coordinated with final architectural/mechanical plans and are subject to modification as necessary.

In order to mitigate for the impact of the project, a new stormwater management system has been designed. The proposed stormwater management system will incorporate BMPs in order to provide water quality treatment, peak-rate attenuation, and groundwater recharge in accordance with the regulations. Due to the ridge line bisecting the site, the site can be analyzed at two distinct design points; one being the bordering vegetated wetlands to the north and the second as the Suffield Street drainage system. The treatment train will remain exactly as existing conditions to the northerly design point. There is no need for additional BMPs to treat runoff toward this design point due to the lack of any new impervious area, a reduction in the gravel area, and establishment of grassy vegetation. Runoff being directed toward the Suffield Street drainage system will be treated with BMPs approved by MADEP including a bioretention area. The proposed bioretention area was designed to provide the required on-site peak discharge rate attenuation, groundwater recharge, and water quality treatment. Runoff from the new impervious area of the site will be conveyed on the surface and discharged to the bioretention area via sheet flow from the paved areas and via a grassed channel on the northerly side of the new building. Roof drainage from the new building will be discharged toward the bioretention area via underground infrastructure. The remaining roof area will be discharged on grade. The bioretention area has been equipped with an outlet control structure that discharges to the existing yard-drain structure which ultimately conveys runoff to the drainage infrastructure in Suffield Street. The outlet control structure has been designed to ensure that the water quality volume is held for the required detention time in order to achieve the best total suspended solids removal efficiency as laid out by the Massachusetts Stormwater Handbook.

The proposed basin has been designed to attenuate peak discharge rates for storm events up to and including the 100-year 24-hour storm event. The proposed site improvements will maintain the general drainage patterns of the site by discharging runoff to the same design points in post-development as pre-development conditions. Each component of the proposed stormwater management systems has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

3. STORMWATER MANAGEMENT SYSTEM

R Levesque Associates Inc. has prepared the following drainage system calculations for the proposed project site. These calculations were performed to document compliance with the guidelines set forth by the Town of Agawam Stormwater Management Permit requirements and the Massachusetts Department of Environmental Protection Stormwater Management Handbook (MassDEP Handbook). A detailed hydrologic analysis of the system was completed in order to evaluate the performance of the stormwater management system components, see Appendix C – Pre- and Post-Development Hydrologic Analysis. The proposed stormwater management system will collect runoff from on-site impervious areas and utilize stormwater best management practices to provide water quality treatment, groundwater recharge, and peak discharge rate attenuation.

3.1 Drainage Calculations

R Levesque Associates Inc. utilized the HydroCAD software program, Version 10.00-25, developed by HydroCAD Software Solutions LLC, in order to create and analyze the site hydrology. The HydroCAD software is based upon the Soil Conservation Service (SCS) "Technical Release 20 – Urban Hydrology for Small Watersheds" and "Technical Release 55 – Urban Hydrology for small Watersheds" which are generally accepted industry standard methodologies. The analysis was conducted in order to establish the peak discharge rates and estimated run-off volume from the project site. This was accomplished to properly evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters.

Drainage calculations were performed for the Pre- and Post-Development conditions for the 24-hour, 2, 10, and 100-year Type III storm events. The total rainfall for each of the storm events was based upon data provided by the United States Department of Commerce Technical Paper No. 40 – Rainfall Frequency Atlas of the United States. The total rainfall values used in the hydrologic modeling for each event are shown in the following table:

Table 3.1: Design Rainfall Data - Hampden County		
2-year, 24-hour storm	10-year, 24-hour storm	100-year, 24-hour storm
3.00 inches	4.60 inches	6.50 inches

3.1.1 Design Points

In order to compare the difference between pre- and post-development peak flows, existing and proposed watersheds were delineated. Two Design Points (DP) were established with flow paths representing the longest time of concentration of run-off in each tributary watershed. For this analysis, the design point was determined as follows:

- DP-1 (Offsite to North): This design point represents stormwater flow tributary toward the northerly property line.
- DP-2 (Suffield Street Drainage): This design point represents stormwater flow from the site tributary to Suffield Street.

3.1.2 Pre-Development Hydrology

The project area under existing conditions was broken down into two sub-catchments discharging to the design points described above. The sub-catchments were delineated based on the existing developed areas and the existing topography of the parcel and surrounding areas. The existing watershed areas are shown on the attached Figure 4 entitled "Pre-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.3 Post-Development Hydrology

The project area under proposed conditions was broken down into three sub-catchments discharging to the same design points as in existing conditions. The proposed watershed areas are shown on the attached Figure 5 entitled "Post-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.4 Peak Discharge Rates

The table below summarizes the Pre- and Post-Development peak discharge rates for each Design Point:

Table 3.1.4 Pre- and Post-Development Peak Discharge Rates

	2-year storm (cfs)		10-year storm (cfs)		100-year storm (cfs)	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Design Point 1	0.6	0.3	0.9	0.5	1.4	0.8
Design Point 2	2.0	1.7	3.5	3.1	5.4	4.9

As depicted in table 3.1.4, the post-development peak discharge rates do not increase over pre-development peak discharge rates for each of the storm events presented. This is accomplished by providing onsite attenuation through the proposed bioretention area.

3.2 MassDEP Stormwater Management Standards

R. Levesque Associates, Inc. has designed the proposed stormwater management system to be in compliance with the MassDEP Stormwater Management Standards. Chapter 1, Volume 3 of the MassDEP Handbook outlines specific calculations, and other information, that must be submitted with each report to document compliance. The following summary highlights elements of the proposed project and how they apply to each standard.

- *Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

  The proposed project provides best management practices designed to the guidelines of the MassDEP Handbook. Therefore, no new untreated stormwater is discharged.

- *Standard #2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

  The proposed stormwater management system has been designed such that the post-development peak discharge rates do not exceed the pre-development peak discharge rates

for the 2-year, 10-year, and 100-year 24-hour storms. See Appendix C for the Hydrologic Analysis.

- *Standard #3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook.*

  The proposed bioretention area has been designed with the capacity to infiltrate the required recharge volume for the tributary impervious areas. See Appendix D for the Required Recharge Volume Calculations.

- *Standard #4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. It is presumed that this standard is met when:*

  a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;

  b. Structural stormwater BMPs practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

  c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

  The treatment train for the proposed stormwater management system includes a bioretention area with grass/gravel pretreatment in order to meet the water quality standards. See Appendix E for the Water Quality and Total Suspended Solids Removal Calculations.

- *Standard #5 - For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by MassDEP to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

This standard is not applicable.

- *Standard #6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater BMPs determined by MassDEP to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

  This standard is not applicable.

- *Standard #7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural BMPs requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

  This standard is not applicable.

- *Standard #8 – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention) shall be developed and implemented.*

  A Construction Period Erosion Control Plan has been provided in Appendix F.

- *Standard #9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

  A Long-term Operation & Maintenance Plan has been provided in Appendix G.

- *Standard #10 - All illicit discharges to the stormwater management system are prohibited.*

  An illicit discharge statement will be provided prior to discharge of stormwater to post-construction BMPs. See Appendix H for a copy of the Illicit Discharge Statement.

3.3 Stormwater Best Management Practices

The proposed stormwater management system was designed utilizing stormwater best management practices (BMP) as set forth by the MassDEP Handbook. The BMPs utilized as part of the stormwater management system include a grassed channel and bioretention area. All of the BMPs were designed to meet the requirements of the MassDEP Handbook and will provide water quality treatment, groundwater recharge, and peak rate attenuation in order to mitigate the impacts of the proposed site improvements. Please see Appendix G – Long term Operation and Maintenance for the Massachusetts Department of Environmental Protection Stormwater Management Handbook Volume 2 Chapter 2 design and maintenance requirements.

The following section provides a description of the best management practices (BMPs) being utilized on site.

3.3.1 Bioretention Area

A bio-retention area is being utilized on site as part of the stormwater management system treatment train process to enhance water runoff quality, provide groundwater recharge, and attenuate peak-discharge rates. Bio-retention areas utilize soils, plants, and microbes to treat stormwater before discharge and infiltrate stormwater to provide groundwater recharge. The proposed bio-retention areas associated with this project will provide aesthetically pleasing vegetation within the site.

3.4 Protection of Stormwater Best Management Practices during Construction

Protection of the stormwater best management practices during construction will ensure the proper functioning of the stormwater management system and provide protection to the undisturbed areas until the site has been stabilized. Certain specific erosion and sedimentation controls and good practices to be performed by the site contractor have been documented in a Construction Period Erosion Control Plan. See Appendix F – Construction Period Erosion Control Plan.

3.5 Inspection and Maintenance of Stormwater Best Management Practices

Frequent maintenance of the stormwater best management practices is essential to ensuring that the stormwater management system will function properly long-term. The MassDEP provides guidelines for the regular inspection and maintenance of the proposed stormwater best management practices. A Long-Term Stormwater Operation and Maintenance Plan has been prepared which dictates the inspection frequency and maintenance operations for each BMP. See Appendix G – Long-Term Operation and Maintenance Plan.

3.6 Illicit Discharge Compliance Statement

RLA has prepared an Illicit Discharge Compliance Statement to document compliance with the Massachusetts Department of Environmental Protection Stormwater Management Handbook, see Appendix H.

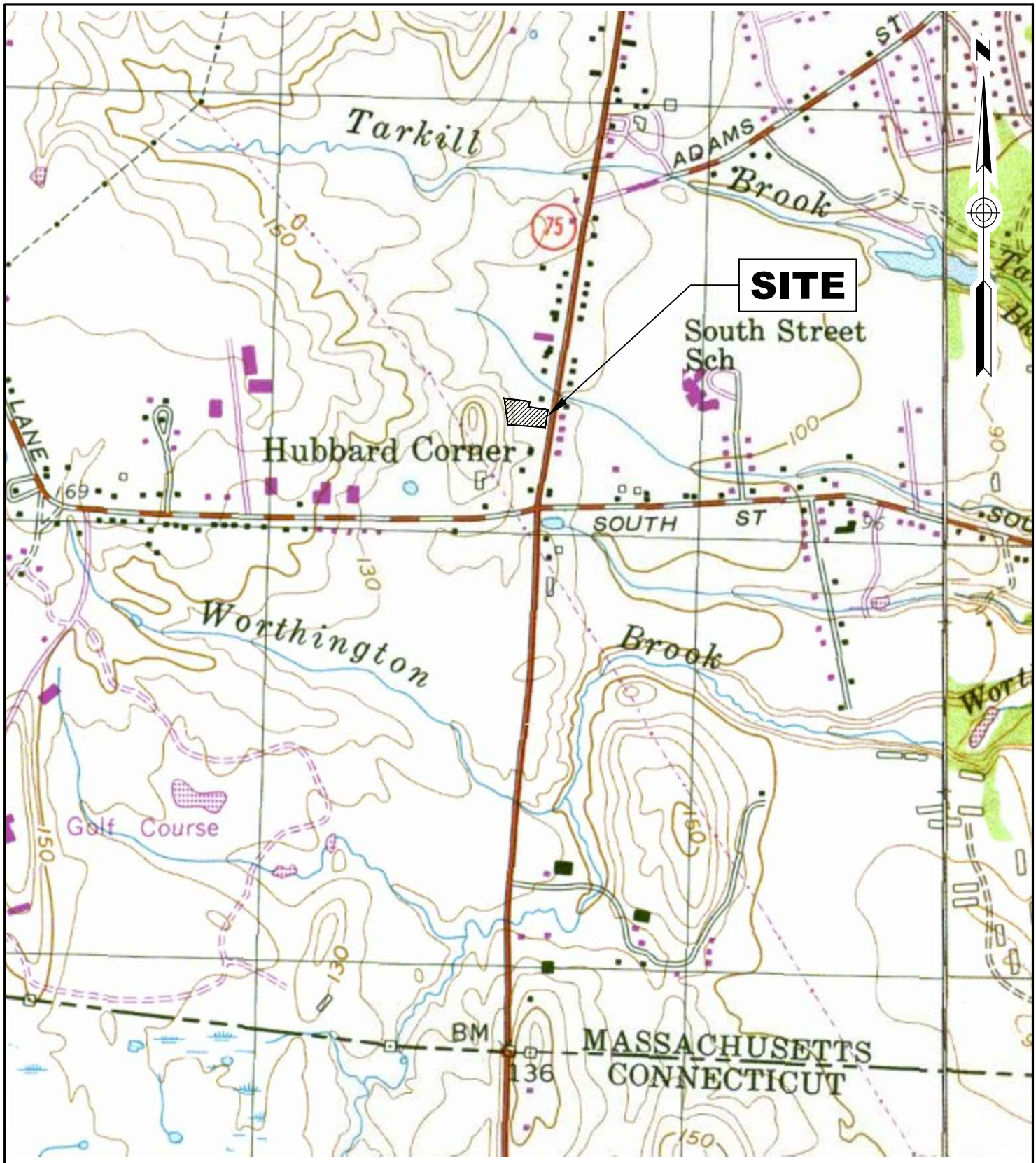
3.8 Low-Impact Development Considerations

RLA has prepared a Low-Impact Development Alternatives Analysis Narrative as part of the Stormwater Drainage Report, see Appendix I.

4. CONCLUSION

The proposed stormwater management system has been designed to mitigate the impacts of the proposed site improvements by providing a control for runoff water quality and water quantity. Implementation of Low-Impact-Development stormwater best management practices including a bioretention area with grass/gravel pretreatment allows for a stormwater drainage design that is in conformance with the criteria set forth in the Town of Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

Figure 1: Site Locus – USGS Map



1000' 0 1000' 2000'

BAR SCALE
1" = 1000'

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SITE LOCUS
USGS MAP

TCR Properties LLC
1298 Suffield Street
Agawam, MA 01001

Proposed Commercial Building
Suffield Street
Agawam, MA 01001

JOB NO: 190615
DATE: 1/6/23
SCALE: AS NOTED

FIG-1

Figure 2: FEMA Flood Map



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FLOOD RATE INSURANCE MAP

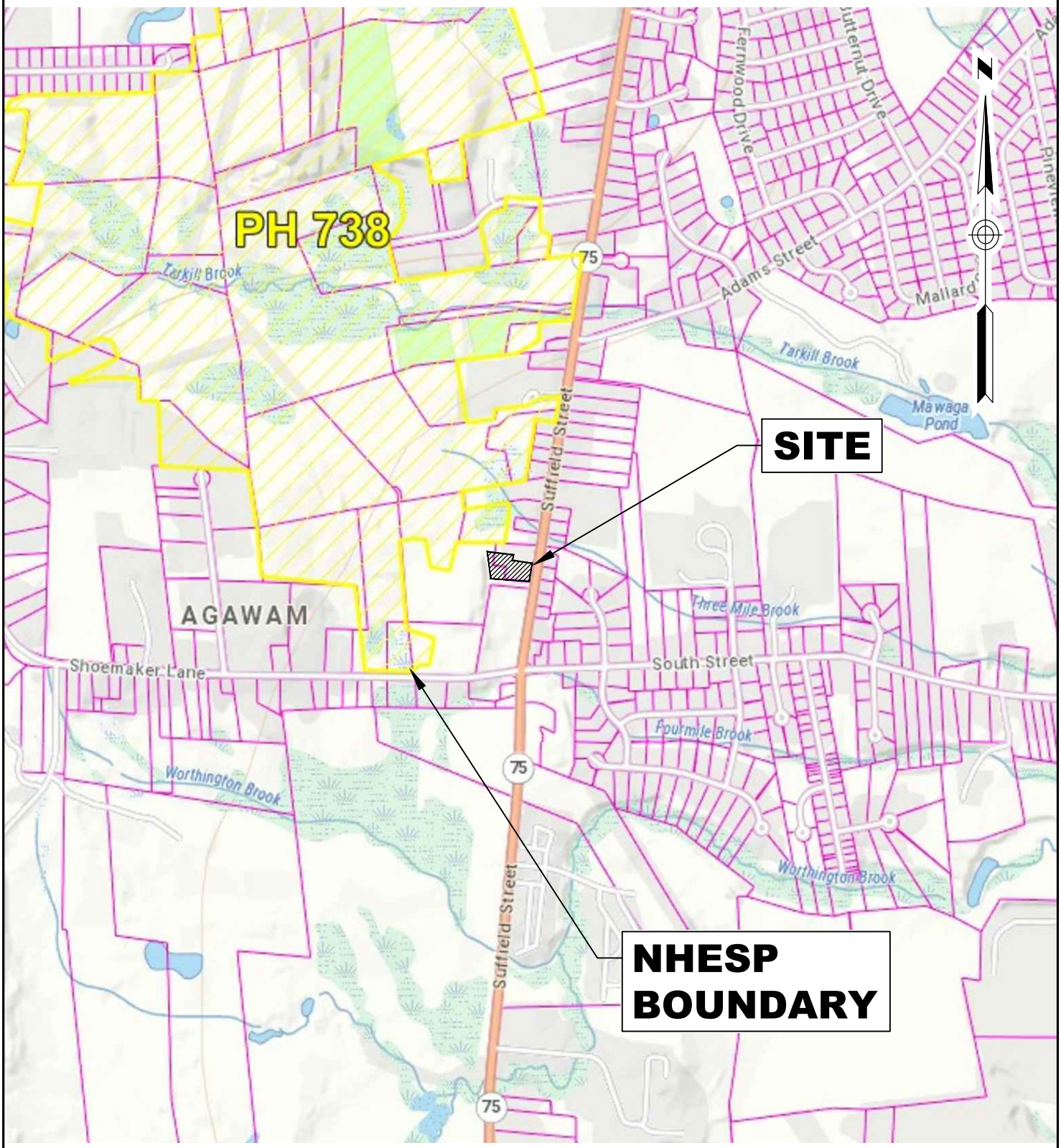
TCR Properties LLC
1298 Suffield Street
Agawam, MA 01001

Proposed Commercial Building
Suffield Street
Agawam, MA 01001

JOB NO: 190615
DATE: 1/6/23
SCALE: AS NOTED

FIG-2

Figure 3: NHESP Map

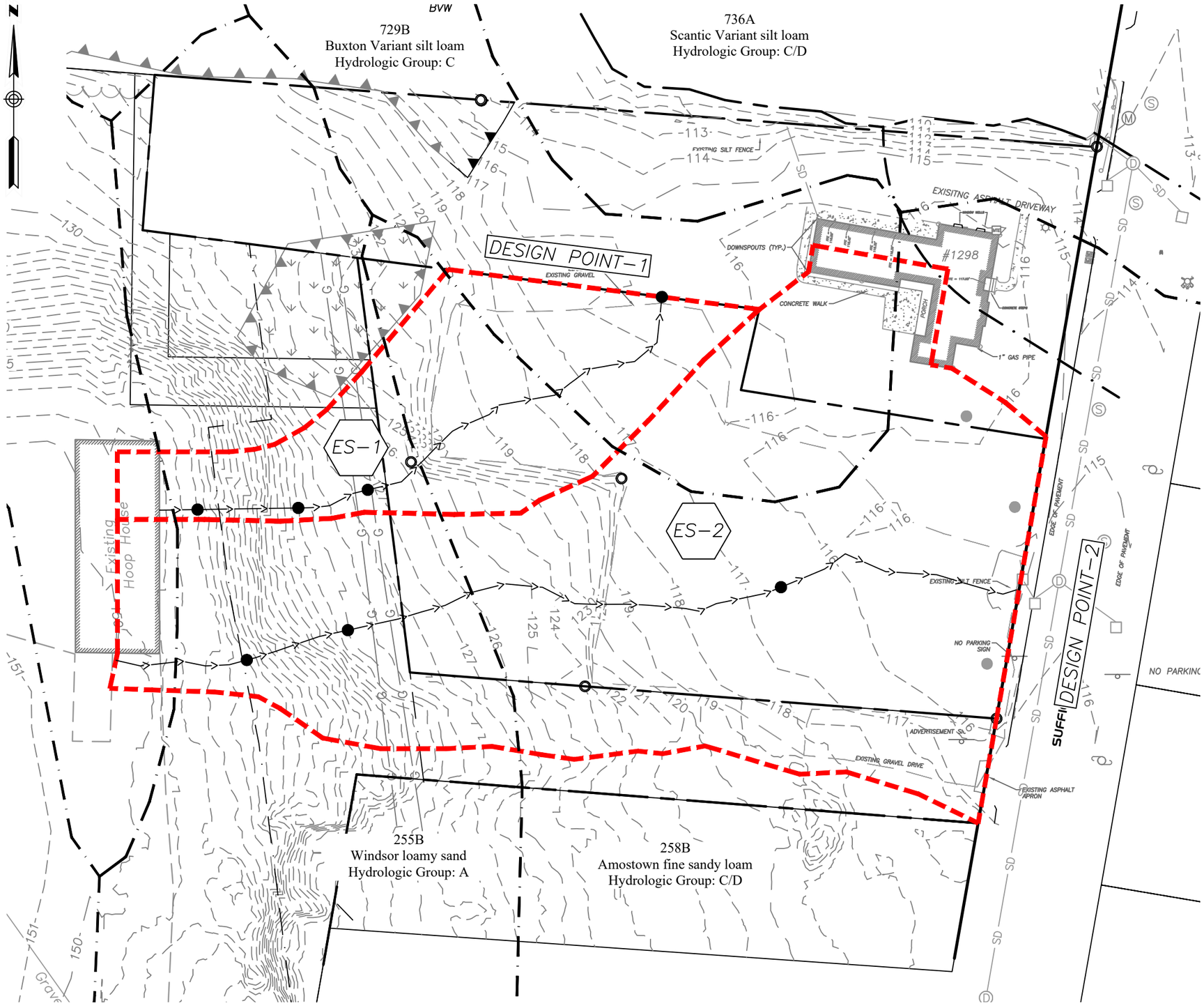


1000' 0 1000' 2000'

BAR SCALE
1" = 1000'

R LEVESQUE ASSOCIATES, INC A Land Planning Services Company 40 School Street · P.O. Box 640 · Westfield, MA 01086 ph: 413.568.0985 fax: 413.568.0986 rlaland.com	NHESP & Zone II Map	TCR Properties LLC 1298 Suffield Street Agawam, MA 01001 Proposed Commercial Building Suffield Street Agawam, MA 01001	JOB NO: 190615 DATE: 1/6/23 SCALE: AS NOTED FIG-3

Figure 4: Pre-Development Watershed Plan



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Pre-Development Watershed Plan

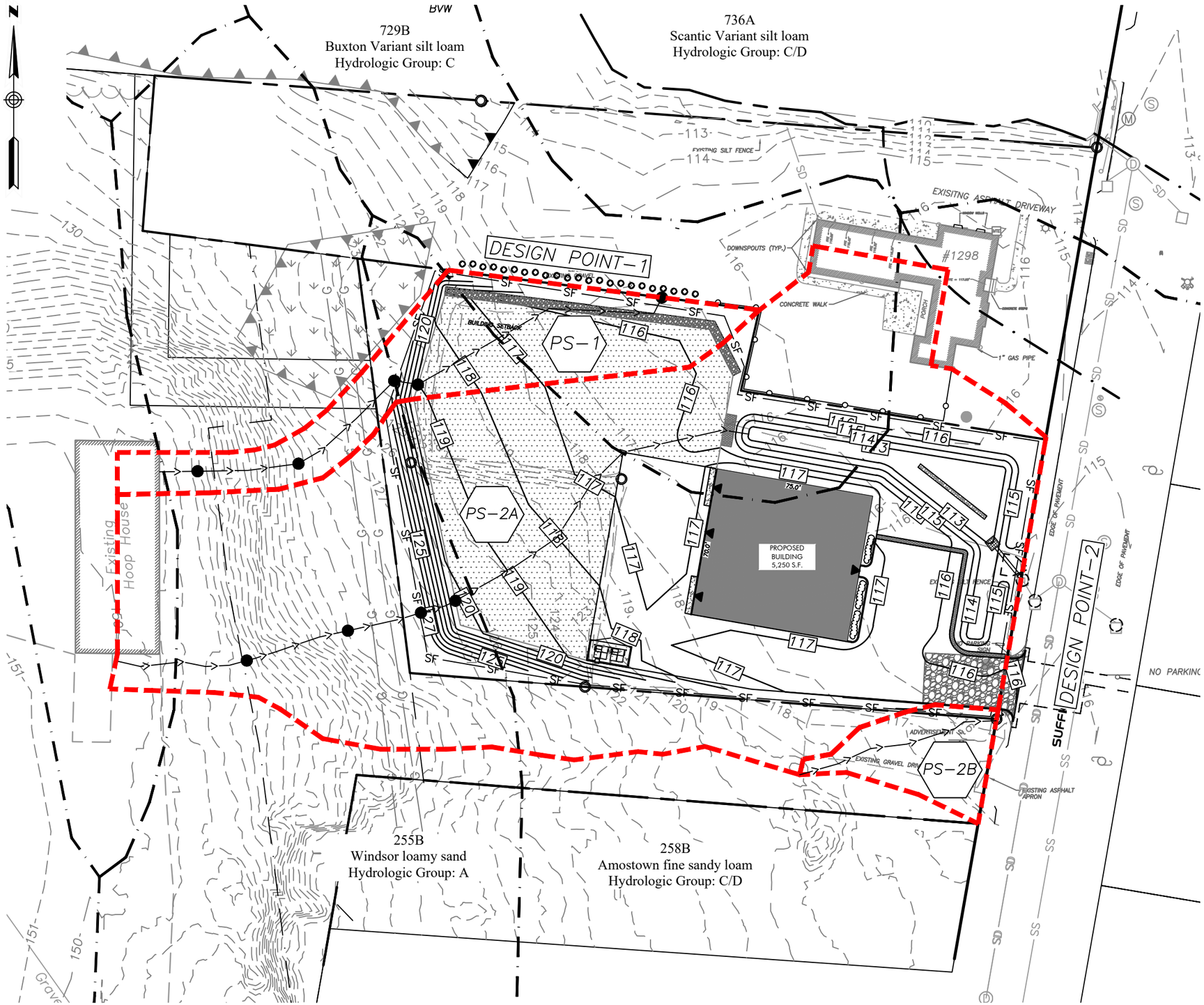
Proposed Commercial Building
1298 Suffield St.
Agawam, MA

TJ Galis
TCR Properties, LLC
1298 Suffield St., Agawam, MA

JOB NO.: 190615
DATE: 1/6/23
SCALE: As Noted

FIG-4

Figure 5: Post-Development Watershed Plan



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A Land Planning Services Company
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Post-Development Watershed Plan

Proposed Commercial Building
1298 Suffield St.
Agawam, MA

TJ Galis
TCR Properties, LLC
1298 Suffield St., Agawam, MA

JOB NO.: 190615
DATE: 1/6/23
SCALE: As Noted

FIG-5

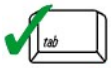
Appendix A: Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



1/6/23

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B: Soils Information

- NRCS Soils Report
- Soil Evaluation Logs

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part

1298 Suffield Street



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:735 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 15, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 25, 2013—Sep 27, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
255B	Windsor loamy sand, 3 to 8 percent slopes	0.0	0.1%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.9	52.4%
729B	Buxton Variant silt loam, 0 to 8 percent slopes	0.6	35.9%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	0.2	11.6%
Totals for Area of Interest		**1.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden County, Massachusetts, Central Part

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Dunes, outwash plains, deltas, outwash terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

258B—Amostown fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 99ms
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Amostown and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amostown

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over hard silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 32 inches: fine sandy loam

H3 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Minor Components

Pollux

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Enosburg

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

729B—Buxton Variant silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99n7
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Buxton variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton Variant

Setting

Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft coarse-silty glaciolacustrine deposits derived from mica schist over hard clayey glaciolacustrine deposits derived from mica schist

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 24 inches: silt loam
H3 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 30 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Minor Components

Belgrade

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scantic variant

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: Yes

736A—Scantic Variant silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99rb
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scantic variant and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic Variant

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Buxton variant

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

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Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TJ Galis
Owner Name

1298 Suffield St
Street Address

14-1-4
Map/Lot #

Agawam
City

MA
State

Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS (Source) 258 B, 729 B (Soil Map Unit)
   Amostown fine sandy loam
   Buxton Variant silt loam
   Soil Name
   Depth to water table 12-30 inches; 20-30" to strongly contrasting textural stratifica
   Soil Limitations
   Friable sandy glaciofluvial deposits over hard silty glaciolacustrine deposits
   Soil Parent material
   Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: 2018 Stone et. al. (Year Published/Source) (Map Unit)
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: (Wetland Type)

7. Current Water Resource Conditions (USGS): MA WVW 152 Westfield 7/22/21 (Month/Day/ Year) Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 1 (Hole #) 8-3-21 (Date) 10:45 AM (Time) _____ (Weather) _____ (Latitude) _____ (Longitude:)

1. Land Use: lawn near house (e.g., woodland, agricultural field, vacant lot, etc.) grass (Vegetation) ~ (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 2 (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ Landform _____ BS Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body >100 feet; Drainage Way >25 feet; Wetlands >100 feet; Property Line >50 feet; Drinking Water Well >25 feet; Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ~ Depth Weeping from Pit ~ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-17	A	SL	10YR 4/3	-	-	-	-	-	granular	friable	-
17-96"+	C	Silt loam	10YR 5/4	17"	10YR 6/6 5Y 6/1	30% 30%	-	-	massive	friable	Relic mottling or fill? Not indicative of current conditions

Additional Notes: Smooth silt loam C horizon unlike other 3 test pits

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 2 (Hole #) | 8-3-21 (Date) | 10:00 AM (Time) | 75°F Clear (Weather) | ____ (Latitude) | ____ (Longitude:)

1. Land Use: lawn (e.g., woodland, agricultural field, vacant lot, etc.) | grass (Vegetation) | – (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2 (Slope (%))

Description of Location: ____

2. Soil Parent Material: ____ | ____ (Landform) | BS (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >100 feet | Drainage Way >25 feet | Wetlands >100 feet
Property Line >25 feet | Drinking Water Well >25 feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: – Depth Weeping from Pit | – Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	SL	10YR 4/3	–	–	–	–	–	granular	friable	
12-96"	C	gravelly SL	5YR 4/4	–	–	–	25	5	massive	firm	

Additional Notes: ____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 3 (Hole #) | 9:30 AM (Date) | 8-3-21 (Time) | 75°F clear (Weather) | (Latitude) | (Longitude:)

1. Land Use: lawn (e.g., woodland, agricultural field, vacant lot, etc.) | grass (Vegetation) | grass (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2 (Slope (%))

Description of Location:

2. Soil Parent Material: | (Landform) | BS (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >100 feet | Drainage Way >25 feet | Wetlands >100 feet | Property Line >25 feet | Drinking Water Well >25 feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: - Depth Weeping from Pit - Depth Standing Water in Hole

Soil Log

Depth (In)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	SL	10YR 4/3	-	-	-	-	-	granular	friable	
10-19	B/C	gravelly sandy loam	7.5YR 4/4	-	-	-	25	-	massive	firm	
19-96"+	C	gravelly sandy loam	5YR 4/4	-	-	-	25	5	"	"	

Additional Notes: No groundwater

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 4 (Hole #) | 8-3-21 (Date) | 8:50 AM (Time) | 75°F Clear (Weather) | Latitude | Longitude:

1. Land Use: Gravel lot (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | gravel (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2% (Slope (%))

Description of Location:

2. Soil Parent Material: | Landform | BS (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands >100 feet | Property Line >50 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 43" Depth Weeping from Pit | - Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	Gravel	-	-	-	-	-	100	-	Massive	-	Geotextile fabric underneath
8-35	Bw	Silt loam	10YR 5/4	8"	10YR 6/6 5Y 6/1	20% 30%	-	-	"	friable	Relic mottling or fill?
35-100"+	C	gravelly SL	5YR 4/4	-	-	-	25	1	"	firm	~~loose in hand~~ clasts

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Ryan McGor — Signature of Soil Evaluator

8-3-21 — Date

Ryan Nelson SE# 14394 — Typed or Printed Name of Soil Evaluator / License #

11/1/2022 — Expiration Date of License

N/A — Name of Approving Authority Witness

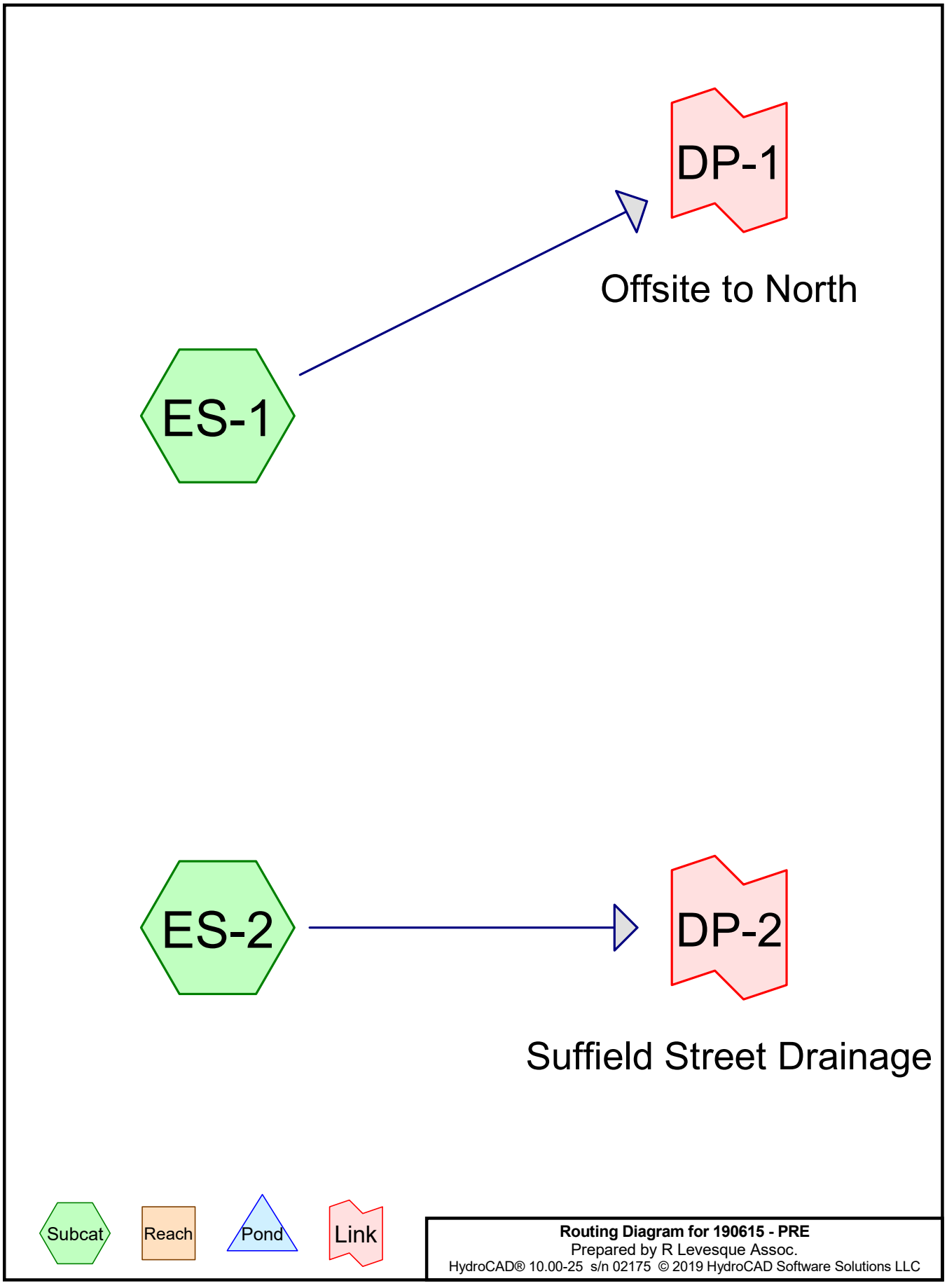
N/A — Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Stakeout plan prepared by RLA

Appendix C: Pre- and Post- Development Hydrologic Analysis (2, 10, 100 Year Storm Events)


DP-1
Offsite to North
ES-1
ES-2
DP-2
Suffield Street Drainage
Subcat
Reach
Pond
Link
Routing Diagram for 190615 - PRE
Prepared by R Levesque Assoc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=18,938 sf 3.37% Impervious Runoff Depth=1.43"
Flow Length=279' Tc=12.3 min CN=WQ Runoff=0.6 cfs 2,253 cf

Subcatchment ES-2: Runoff Area=64,253 sf 4.23% Impervious Runoff Depth=1.42"
Flow Length=444' Tc=10.1 min CN=WQ Runoff=2.0 cfs 7,621 cf

Link DP-1: Offsite to North Inflow=0.6 cfs 2,253 cf
Primary=0.6 cfs 2,253 cf

Link DP-2: Suffield Street Drainage Inflow=2.0 cfs 7,621 cf
Primary=2.0 cfs 7,621 cf

Total Runoff Area = 83,191 sf Runoff Volume = 9,874 cf Average Runoff Depth = 1.42"
95.97% Pervious = 79,838 sf 4.03% Impervious = 3,353 sf

Summary for Subcatchment ES-1:

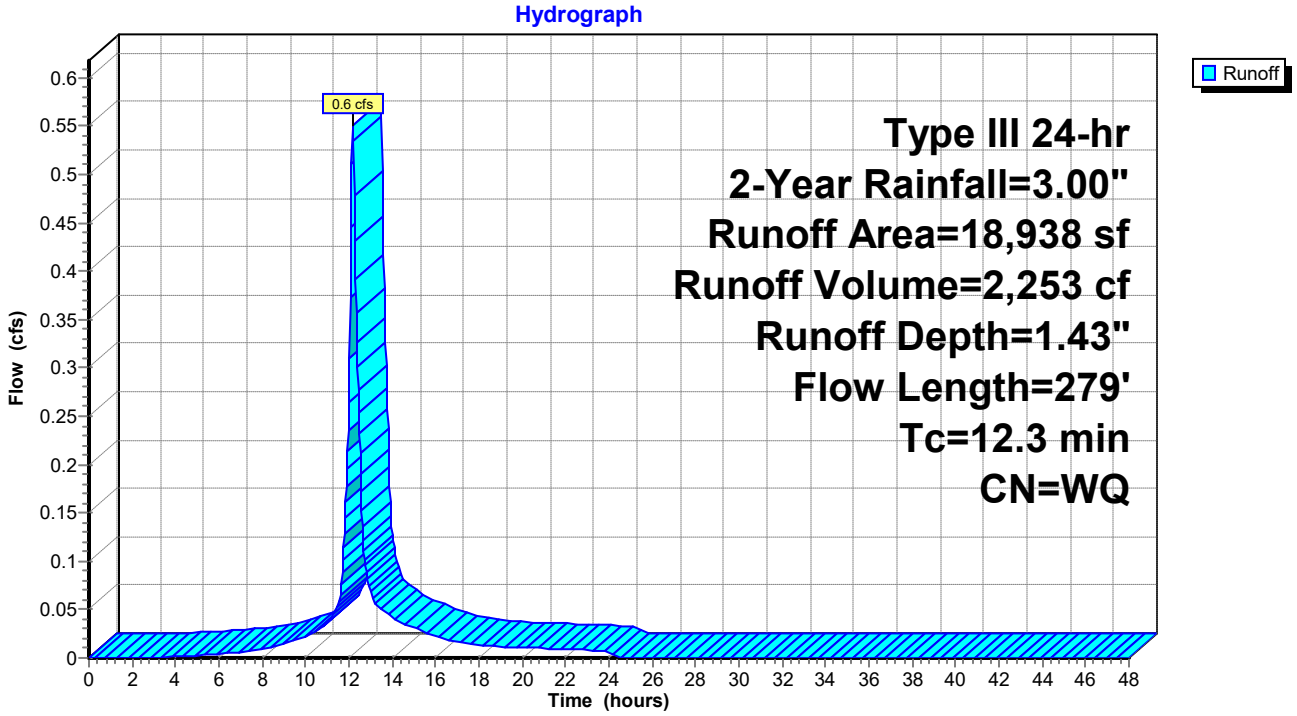
Runoff = 0.6 cfs @ 12.17 hrs, Volume= 2,253 cf, Depth= 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
5,454	39	>75% Grass cover, Good, HSG A
4,480	74	>75% Grass cover, Good, HSG C
116	80	>75% Grass cover, Good, HSG D
8,250	96	Gravel surface, HSG C
0	98	Roofs, HSG A
638	98	Roofs, HSG D
18,938		Weighted Average
18,301	74	96.63% Pervious Area
638	98	3.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	16	0.1110	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
6.7	48	0.0333	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
3.2	34	0.1030	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.7	181	0.0663	4.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.3	279	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

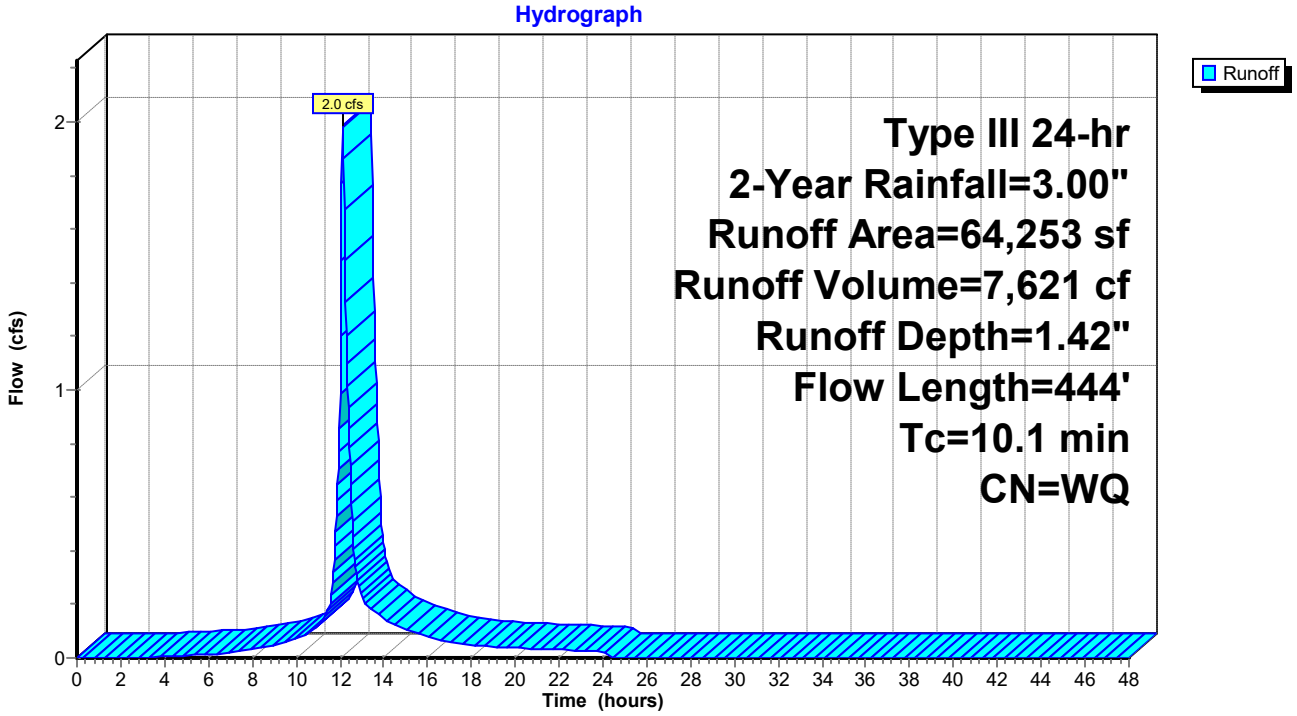
Runoff = 2.0 cfs @ 12.14 hrs, Volume= 7,621 cf, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,472	39	>75% Grass cover, Good, HSG A
21,192	74	>75% Grass cover, Good, HSG C
1,033	80	>75% Grass cover, Good, HSG D
24,841	96	Gravel surface, HSG C
473	98	Paved parking, HSG C
982	98	Roofs, HSG C
1,261	98	Roofs, HSG D
64,253		Weighted Average
61,538	75	95.77% Pervious Area
2,715	98	4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.6	331	0.0453	3.43		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.1	444	Total			

Subcatchment ES-2:

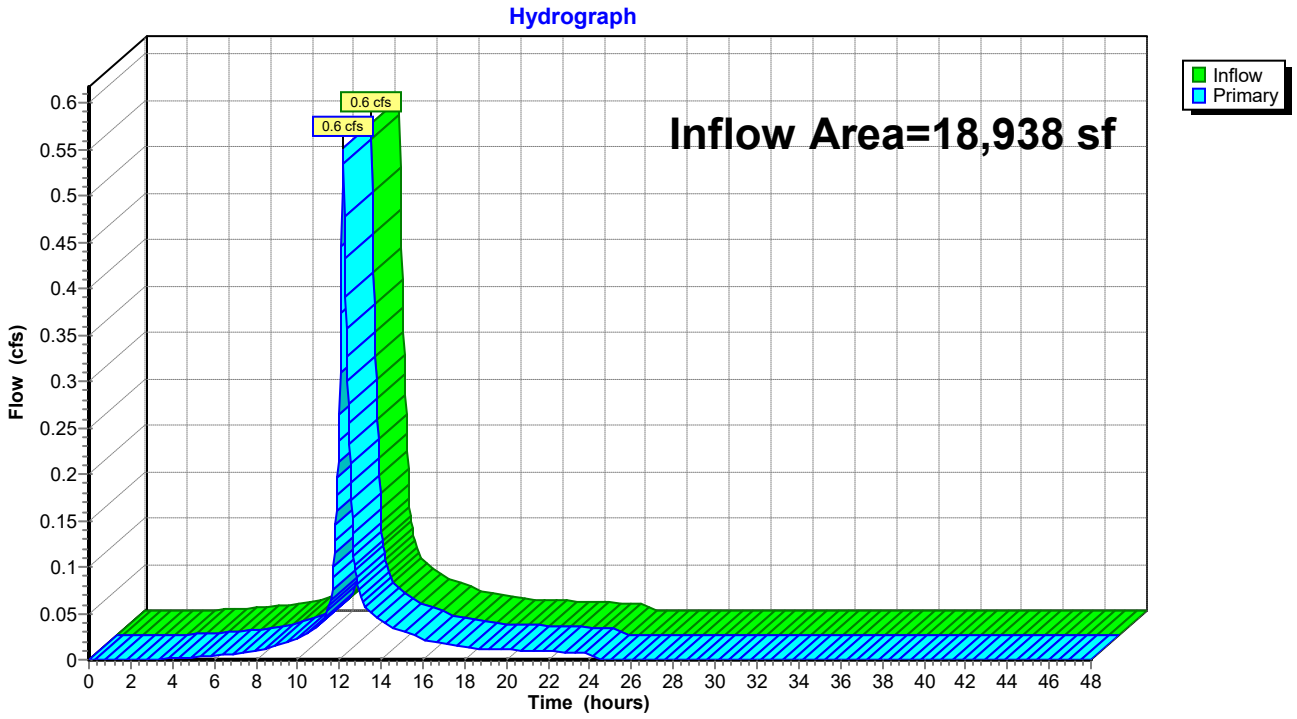


Summary for Link DP-1: Offsite to North

Inflow Area = 18,938 sf, 3.37% Impervious, Inflow Depth = 1.43" for 2-Year event
Inflow = 0.6 cfs @ 12.17 hrs, Volume= 2,253 cf
Primary = 0.6 cfs @ 12.17 hrs, Volume= 2,253 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to North

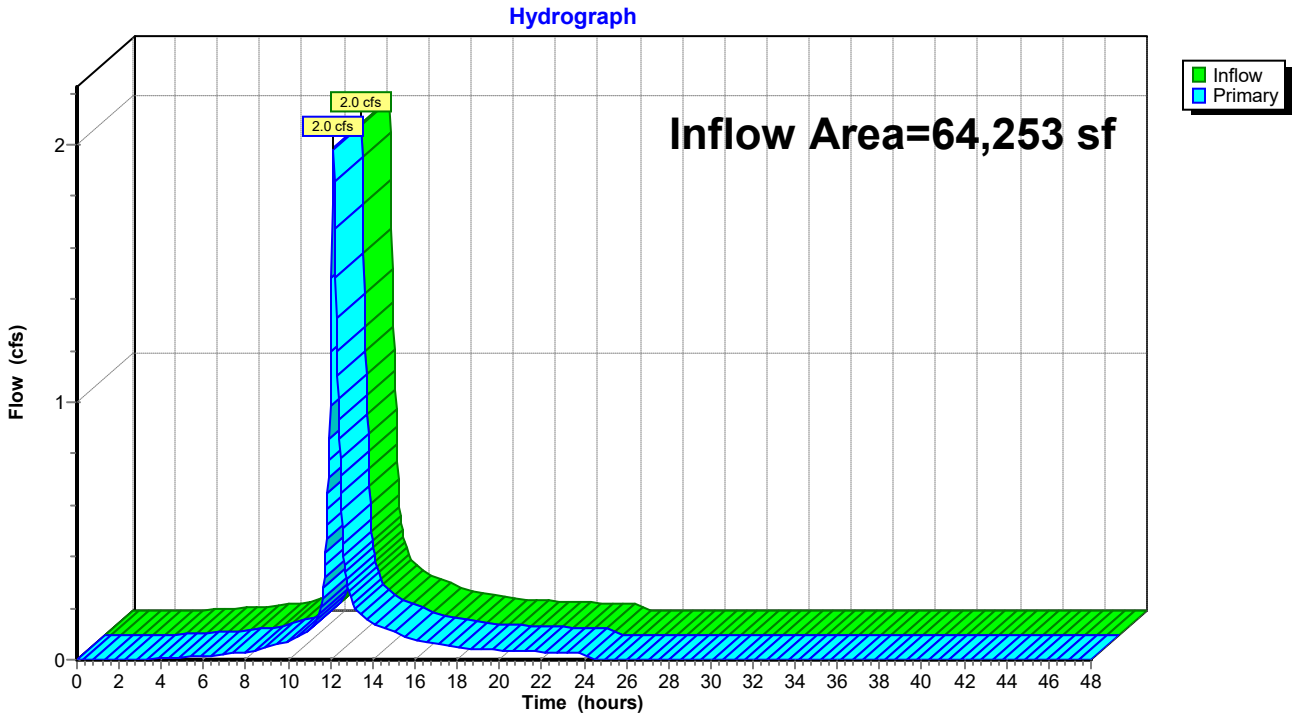


Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 64,253 sf, 4.23% Impervious, Inflow Depth = 1.42" for 2-Year event
Inflow = 2.0 cfs @ 12.14 hrs, Volume= 7,621 cf
Primary = 2.0 cfs @ 12.14 hrs, Volume= 7,621 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage



Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=18,938 sf 3.37% Impervious Runoff Depth=2.49"
Flow Length=279' Tc=12.3 min CN=WQ Runoff=0.9 cfs 3,922 cf

Subcatchment ES-2: Runoff Area=64,253 sf 4.23% Impervious Runoff Depth=2.53"
Flow Length=444' Tc=10.1 min CN=WQ Runoff=3.5 cfs 13,539 cf

Link DP-1: Offsite to North Inflow=0.9 cfs 3,922 cf
Primary=0.9 cfs 3,922 cf

Link DP-2: Suffield Street Drainage Inflow=3.5 cfs 13,539 cf
Primary=3.5 cfs 13,539 cf

Total Runoff Area = 83,191 sf Runoff Volume = 17,461 cf Average Runoff Depth = 2.52"
95.97% Pervious = 79,838 sf 4.03% Impervious = 3,353 sf

Summary for Subcatchment ES-1:

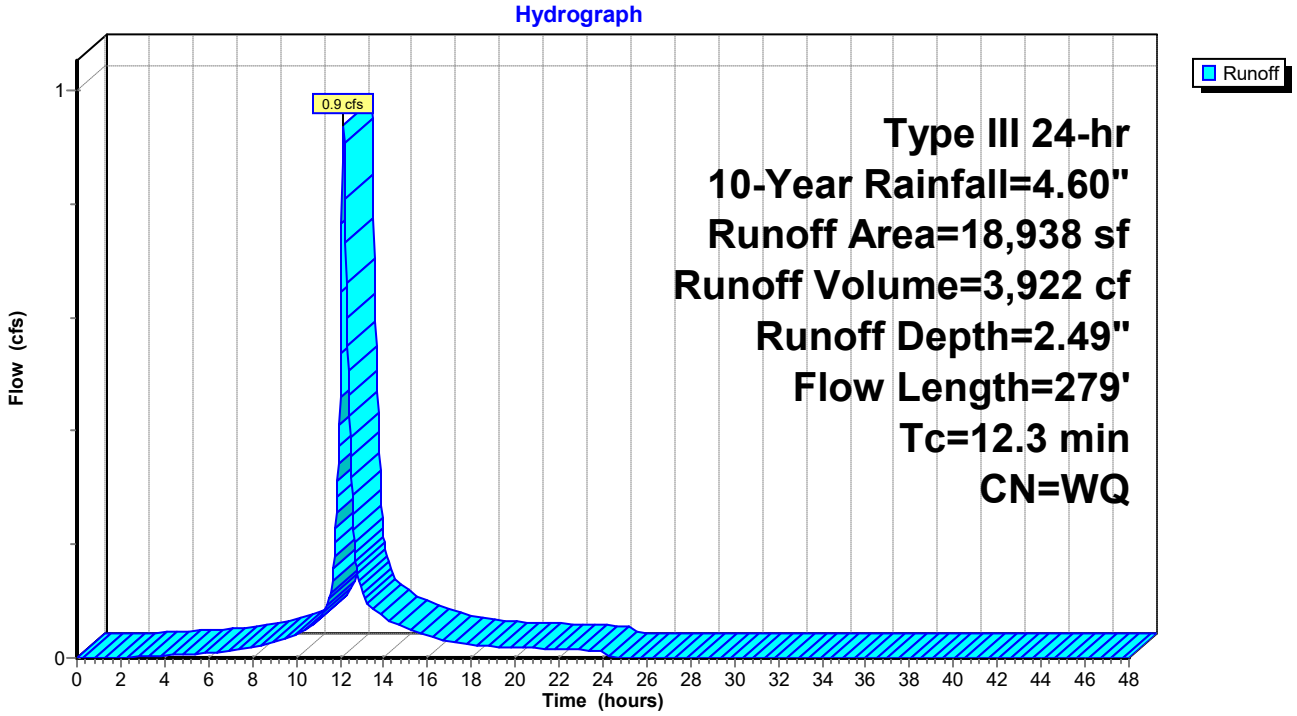
Runoff = 0.9 cfs @ 12.17 hrs, Volume= 3,922 cf, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
5,454	39	>75% Grass cover, Good, HSG A
4,480	74	>75% Grass cover, Good, HSG C
116	80	>75% Grass cover, Good, HSG D
8,250	96	Gravel surface, HSG C
0	98	Roofs, HSG A
638	98	Roofs, HSG D
18,938		Weighted Average
18,301	74	96.63% Pervious Area
638	98	3.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	16	0.1110	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
6.7	48	0.0333	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
3.2	34	0.1030	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.7	181	0.0663	4.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.3	279	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

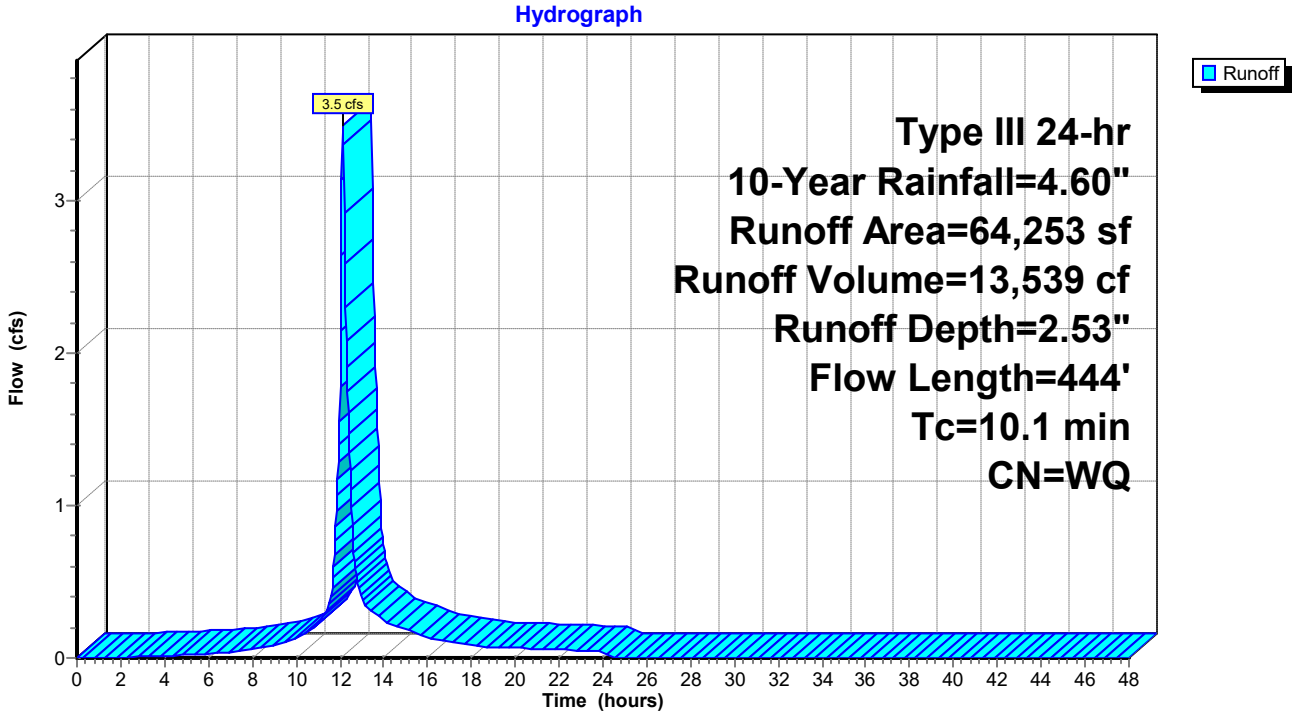
Runoff = 3.5 cfs @ 12.14 hrs, Volume= 13,539 cf, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
14,472	39	>75% Grass cover, Good, HSG A
21,192	74	>75% Grass cover, Good, HSG C
1,033	80	>75% Grass cover, Good, HSG D
24,841	96	Gravel surface, HSG C
473	98	Paved parking, HSG C
982	98	Roofs, HSG C
1,261	98	Roofs, HSG D
64,253		Weighted Average
61,538	75	95.77% Pervious Area
2,715	98	4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.6	331	0.0453	3.43		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.1	444	Total			

Subcatchment ES-2:

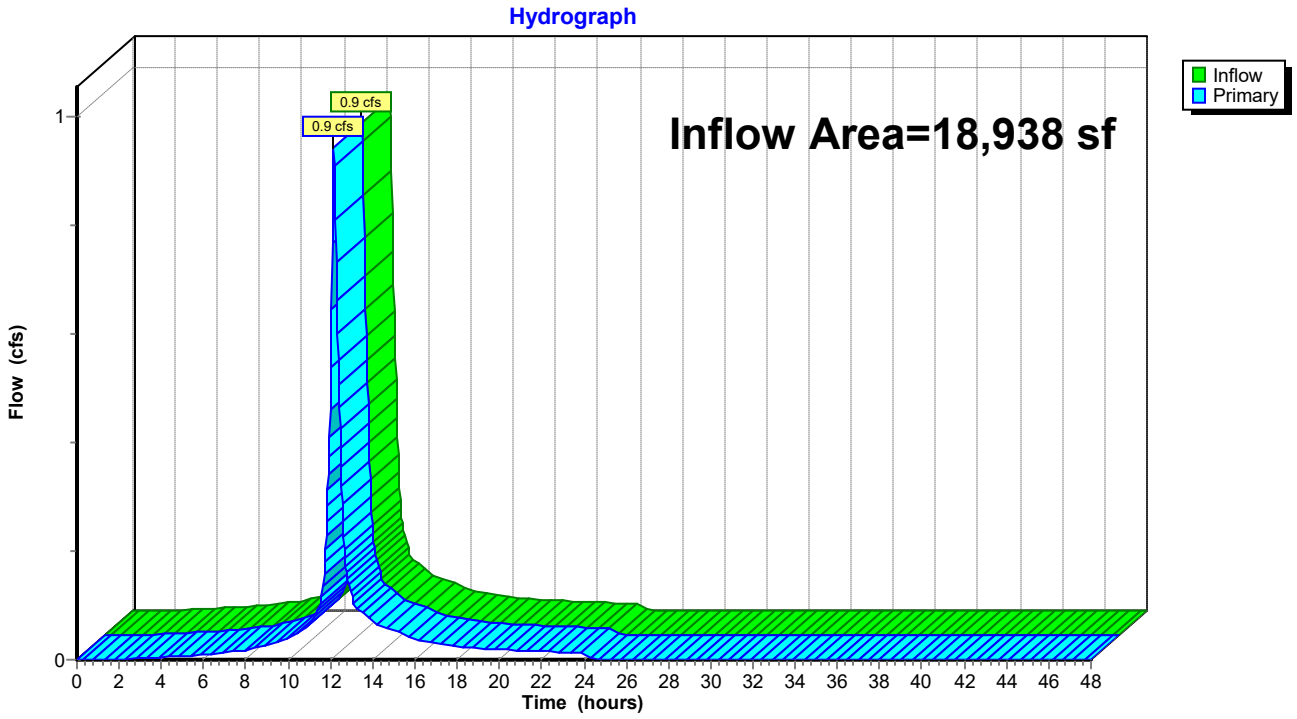


Summary for Link DP-1: Offsite to North

Inflow Area = 18,938 sf, 3.37% Impervious, Inflow Depth = 2.49" for 10-Year event
Inflow = 0.9 cfs @ 12.17 hrs, Volume= 3,922 cf
Primary = 0.9 cfs @ 12.17 hrs, Volume= 3,922 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to North

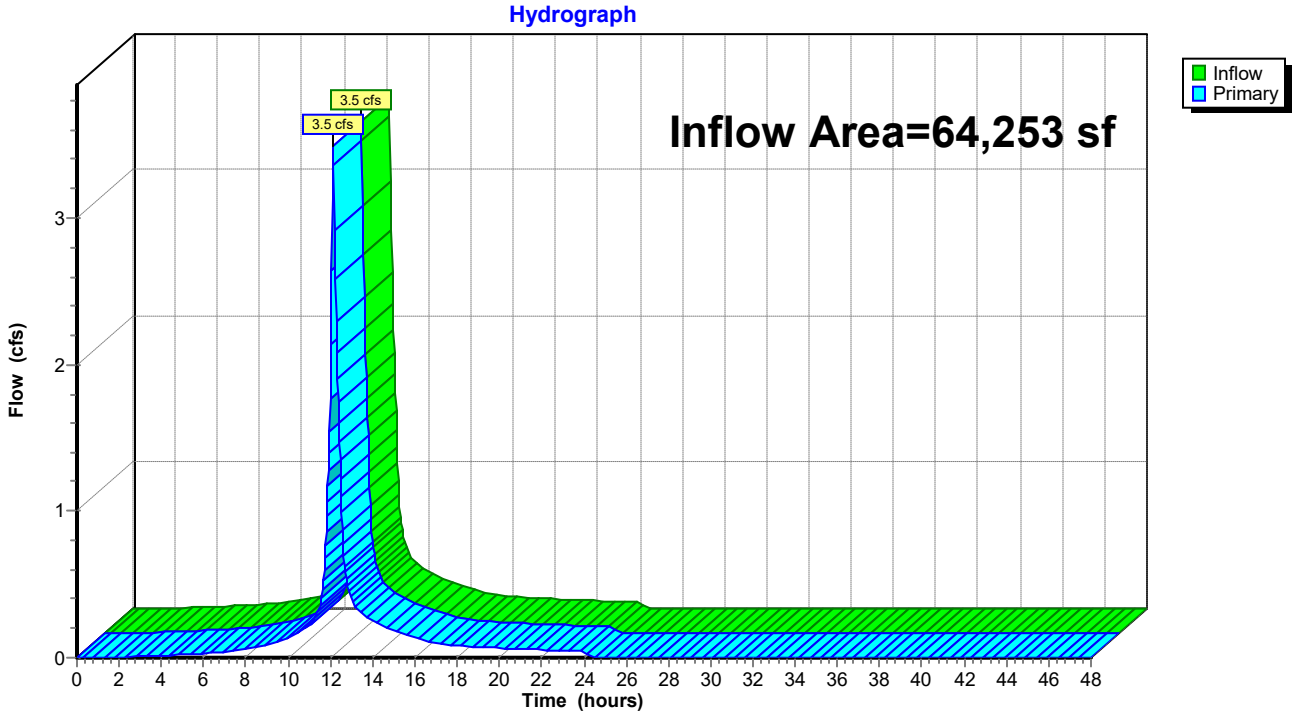


Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 64,253 sf, 4.23% Impervious, Inflow Depth = 2.53" for 10-Year event
Inflow = 3.5 cfs @ 12.14 hrs, Volume= 13,539 cf
Primary = 3.5 cfs @ 12.14 hrs, Volume= 13,539 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage



Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1: Runoff Area=18,938 sf 3.37% Impervious Runoff Depth=3.89"
Flow Length=279' Tc=12.3 min CN=WQ Runoff=1.4 cfs 6,136 cf

Subcatchment ES-2: Runoff Area=64,253 sf 4.23% Impervious Runoff Depth=3.99"
Flow Length=444' Tc=10.1 min CN=WQ Runoff=5.4 cfs 21,350 cf

Link DP-1: Offsite to North Inflow=1.4 cfs 6,136 cf
Primary=1.4 cfs 6,136 cf

Link DP-2: Suffield Street Drainage Inflow=5.4 cfs 21,350 cf
Primary=5.4 cfs 21,350 cf

Total Runoff Area = 83,191 sf Runoff Volume = 27,486 cf Average Runoff Depth = 3.96"
95.97% Pervious = 79,838 sf 4.03% Impervious = 3,353 sf

Summary for Subcatchment ES-1:

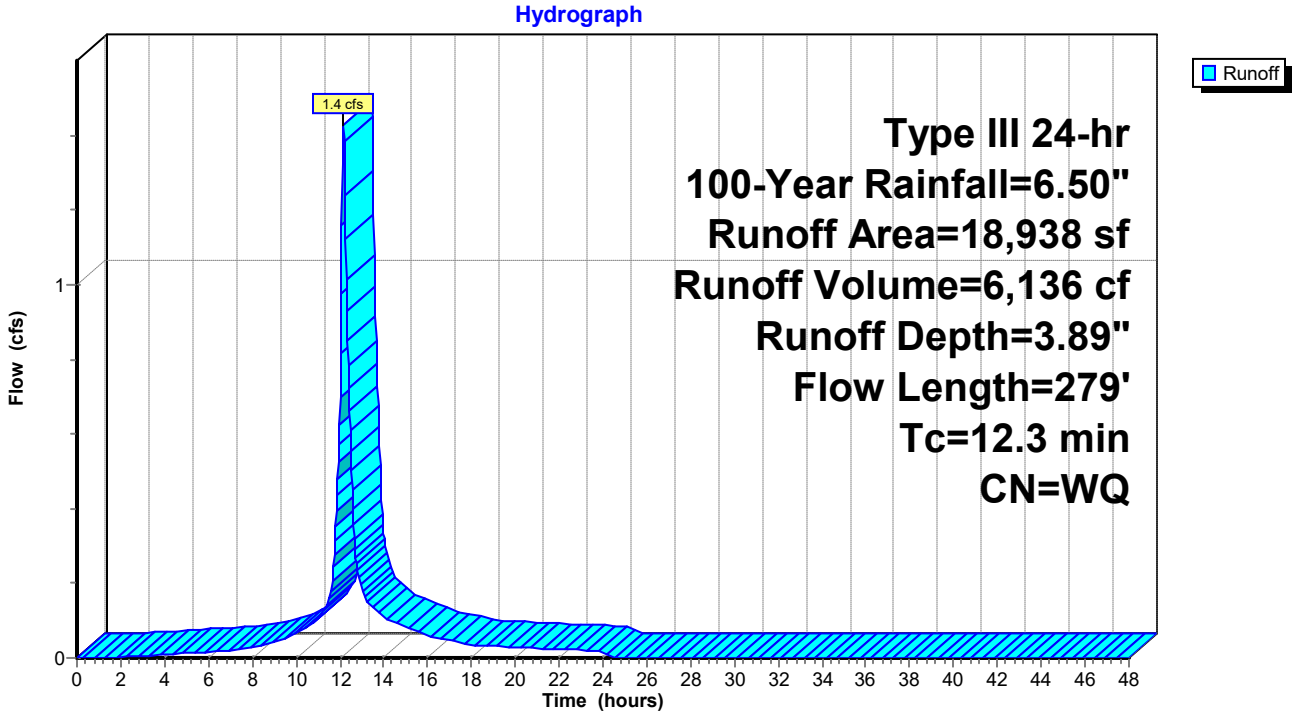
Runoff = 1.4 cfs @ 12.17 hrs, Volume= 6,136 cf, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,454	39	>75% Grass cover, Good, HSG A
4,480	74	>75% Grass cover, Good, HSG C
116	80	>75% Grass cover, Good, HSG D
8,250	96	Gravel surface, HSG C
0	98	Roofs, HSG A
638	98	Roofs, HSG D
18,938		Weighted Average
18,301	74	96.63% Pervious Area
638	98	3.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	16	0.1110	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
6.7	48	0.0333	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
3.2	34	0.1030	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.7	181	0.0663	4.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.3	279	Total			

Subcatchment ES-1:



Summary for Subcatchment ES-2:

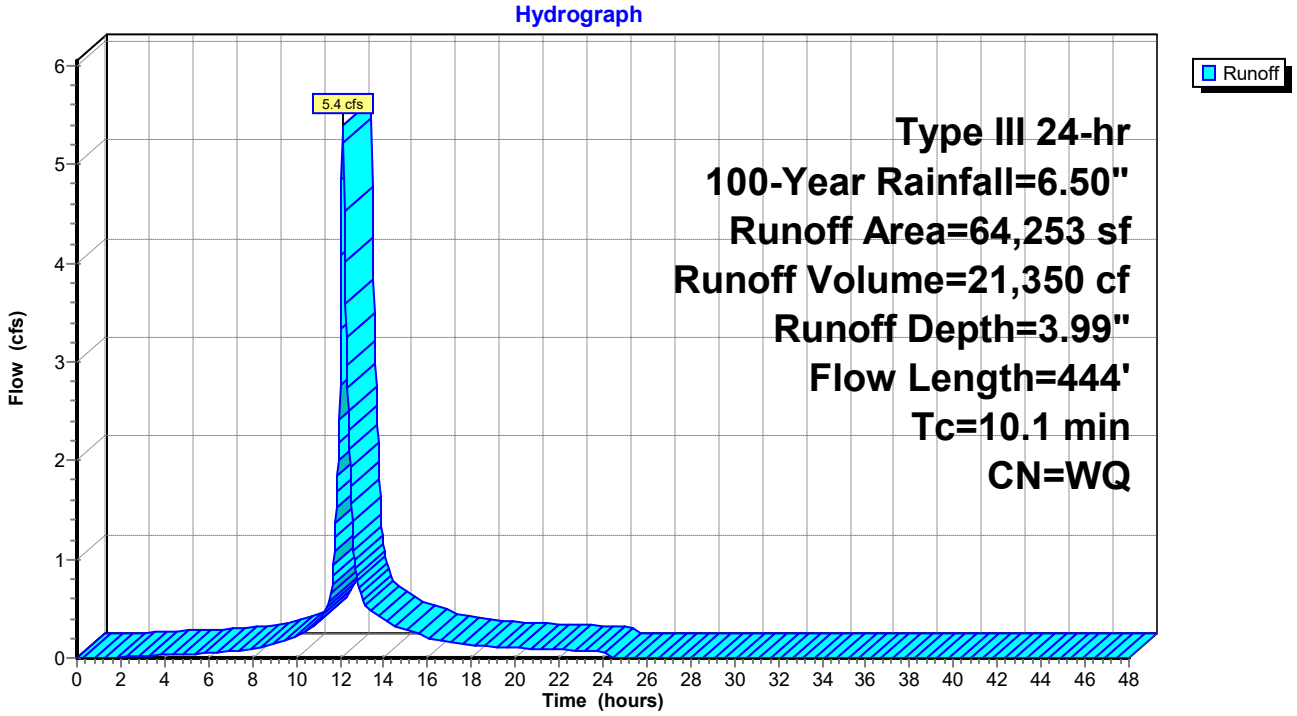
Runoff = 5.4 cfs @ 12.14 hrs, Volume= 21,350 cf, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,472	39	>75% Grass cover, Good, HSG A
21,192	74	>75% Grass cover, Good, HSG C
1,033	80	>75% Grass cover, Good, HSG D
24,841	96	Gravel surface, HSG C
473	98	Paved parking, HSG C
982	98	Roofs, HSG C
1,261	98	Roofs, HSG D
64,253		Weighted Average
61,538	75	95.77% Pervious Area
2,715	98	4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.6	331	0.0453	3.43		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.1	444	Total			

Subcatchment ES-2:

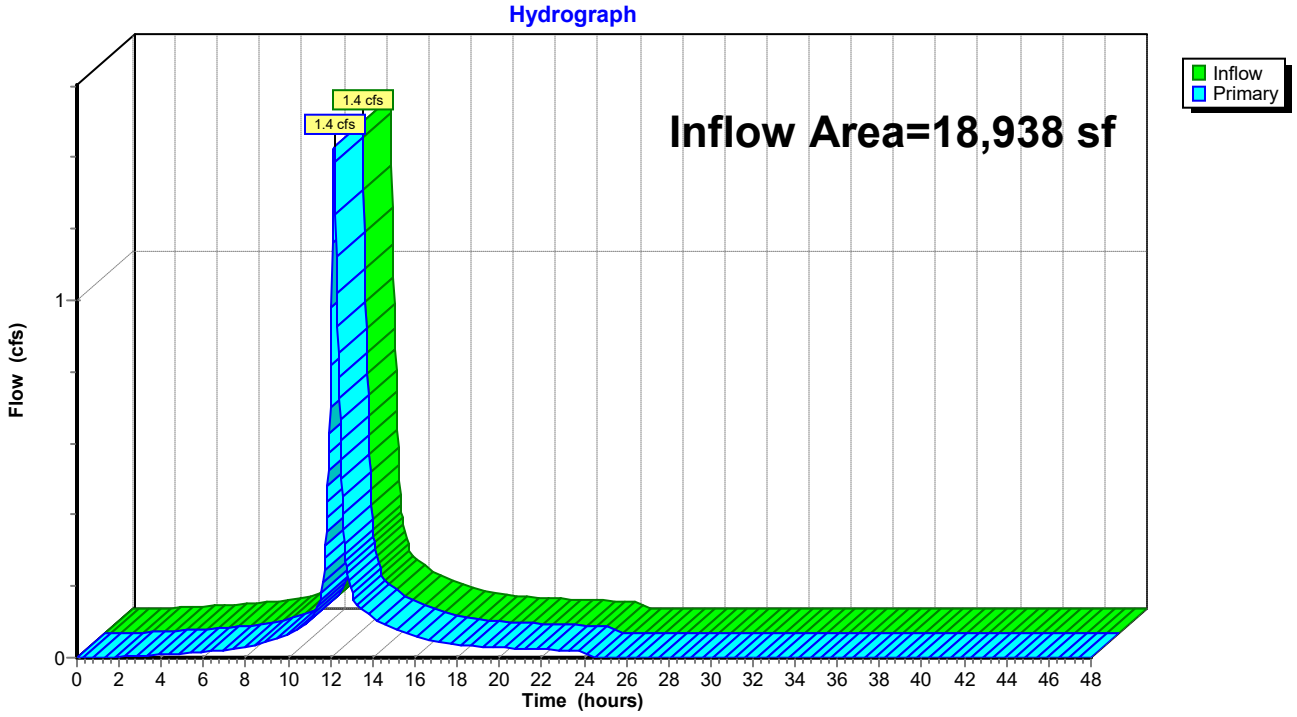


Summary for Link DP-1: Offsite to North

Inflow Area = 18,938 sf, 3.37% Impervious, Inflow Depth = 3.89" for 100-Year event
Inflow = 1.4 cfs @ 12.17 hrs, Volume= 6,136 cf
Primary = 1.4 cfs @ 12.17 hrs, Volume= 6,136 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to North

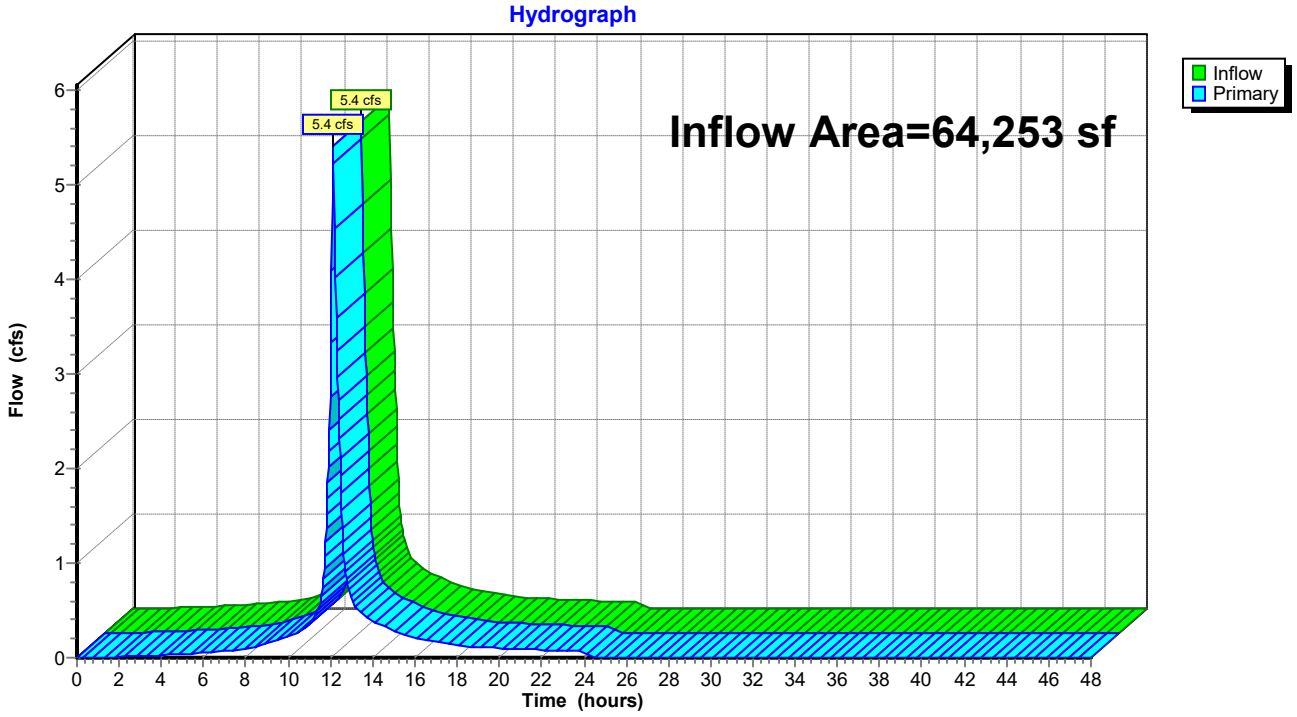


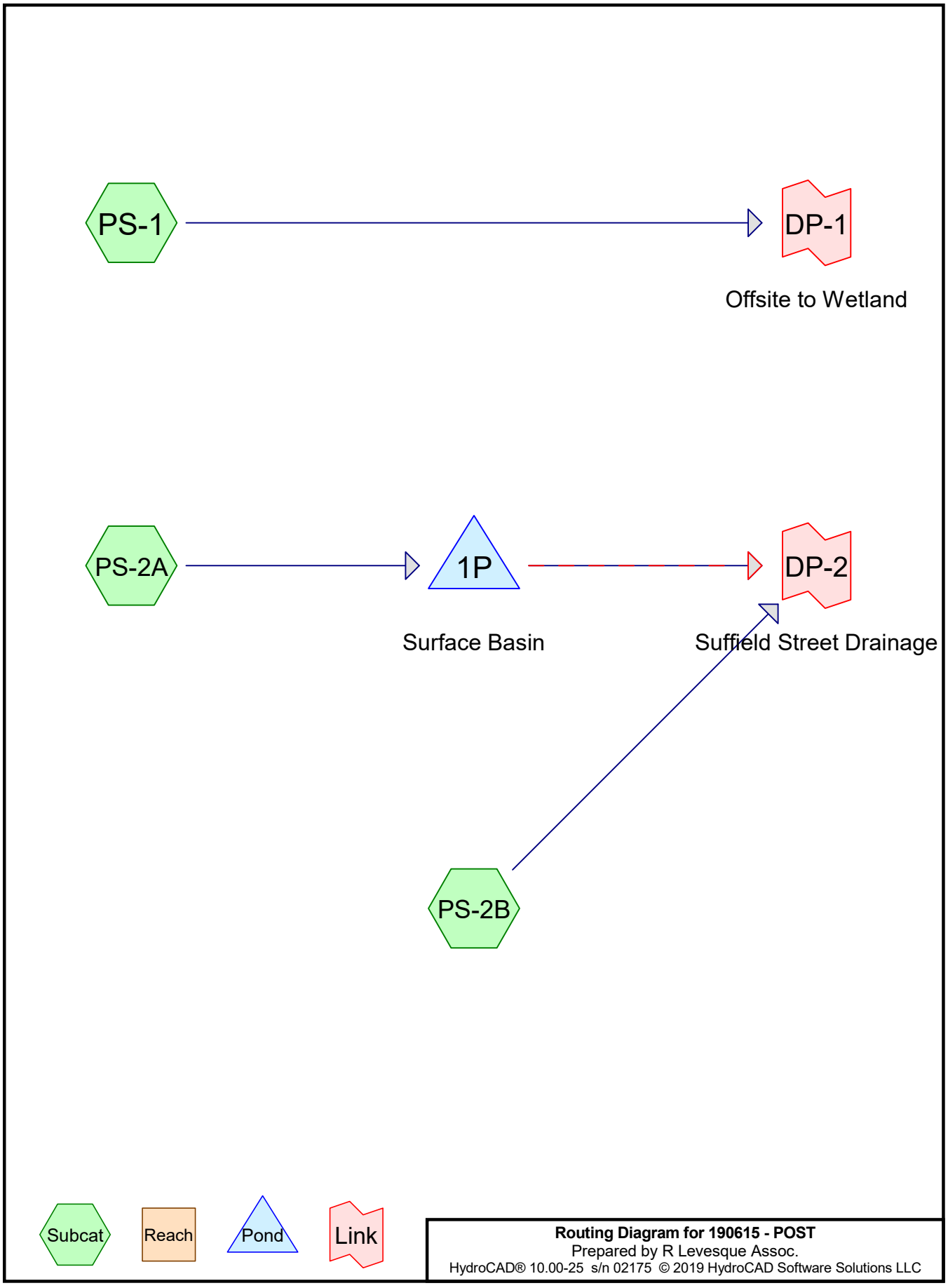
Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 64,253 sf, 4.23% Impervious, Inflow Depth = 3.99" for 100-Year event
Inflow = 5.4 cfs @ 12.14 hrs, Volume= 21,350 cf
Primary = 5.4 cfs @ 12.14 hrs, Volume= 21,350 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage




PS-1
DP-1
Offsite to Wetland
PS-2A
1P
DP-2
Surface Basin
Suffield Street Drainage
PS-2B
Subcat
Reach
Pond
Link
Routing Diagram for 190615 - POST
Prepared by R Levesque Assoc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1: Runoff Area=10,032 sf 3.92% Impervious Runoff Depth=1.46"
Flow Length=268' Tc=10.9 min CN=WQ Runoff=0.3 cfs 1,219 cf

Subcatchment PS-2A: Runoff Area=70,312 sf 26.89% Impervious Runoff Depth=1.49"
Flow Length=335' Tc=14.8 min CN=WQ Runoff=2.0 cfs 8,741 cf

Subcatchment PS-2B: Runoff Area=2,847 sf 0.00% Impervious Runoff Depth=1.90"
Flow Length=98' Slope=0.0408 '/' Tc=10.9 min CN=WQ Runoff=0.1 cfs 451 cf

Pond 1P: Surface Basin Peak Elev=113.61' Storage=1,273 cf Inflow=2.0 cfs 8,741 cf
Discarded=0.1 cfs 3,372 cf Primary=1.7 cfs 5,369 cf Secondary=0.0 cfs 0 cf Outflow=1.7 cfs 8,741 cf

Link DP-1: Offsite to Wetland Inflow=0.3 cfs 1,219 cf
Primary=0.3 cfs 1,219 cf

Link DP-2: Suffield Street Drainage Inflow=1.7 cfs 5,820 cf
Primary=1.7 cfs 5,820 cf

Total Runoff Area = 83,191 sf Runoff Volume = 10,410 cf Average Runoff Depth = 1.50"
76.80% Pervious = 63,890 sf 23.20% Impervious = 19,302 sf

Summary for Subcatchment PS-1:

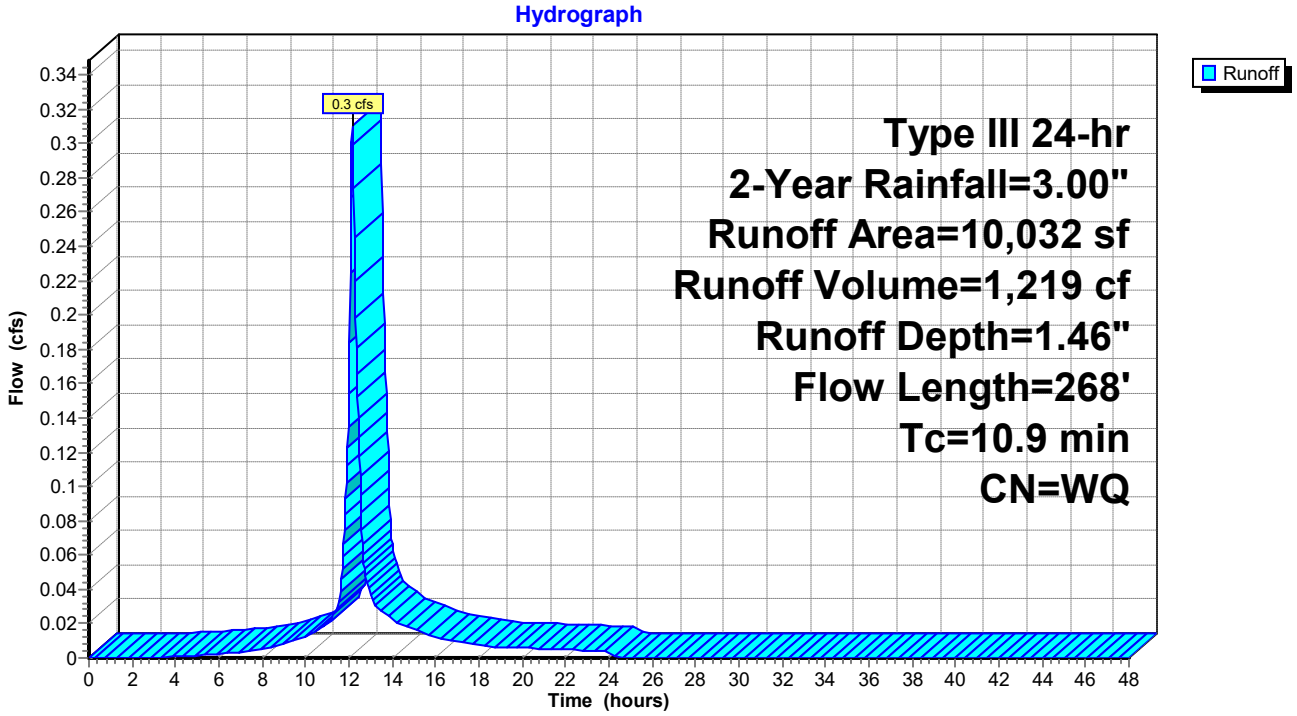
Runoff = 0.3 cfs @ 12.15 hrs, Volume= 1,219 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,690	39	>75% Grass cover, Good, HSG A
2,521	74	>75% Grass cover, Good, HSG C
42	80	>75% Grass cover, Good, HSG D
4,386	96	Gravel surface, HSG C
0	98	Roofs, HSG A
393	98	Roofs, HSG D
10,032		Weighted Average
9,639	74	96.08% Pervious Area
393	98	3.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.1667	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.7	48	0.3330	0.30		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.8	60	0.1167	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	12	0.3333	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	130	0.0231	2.45		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.9	268	Total			

Subcatchment PS-1:



Summary for Subcatchment PS-2A:

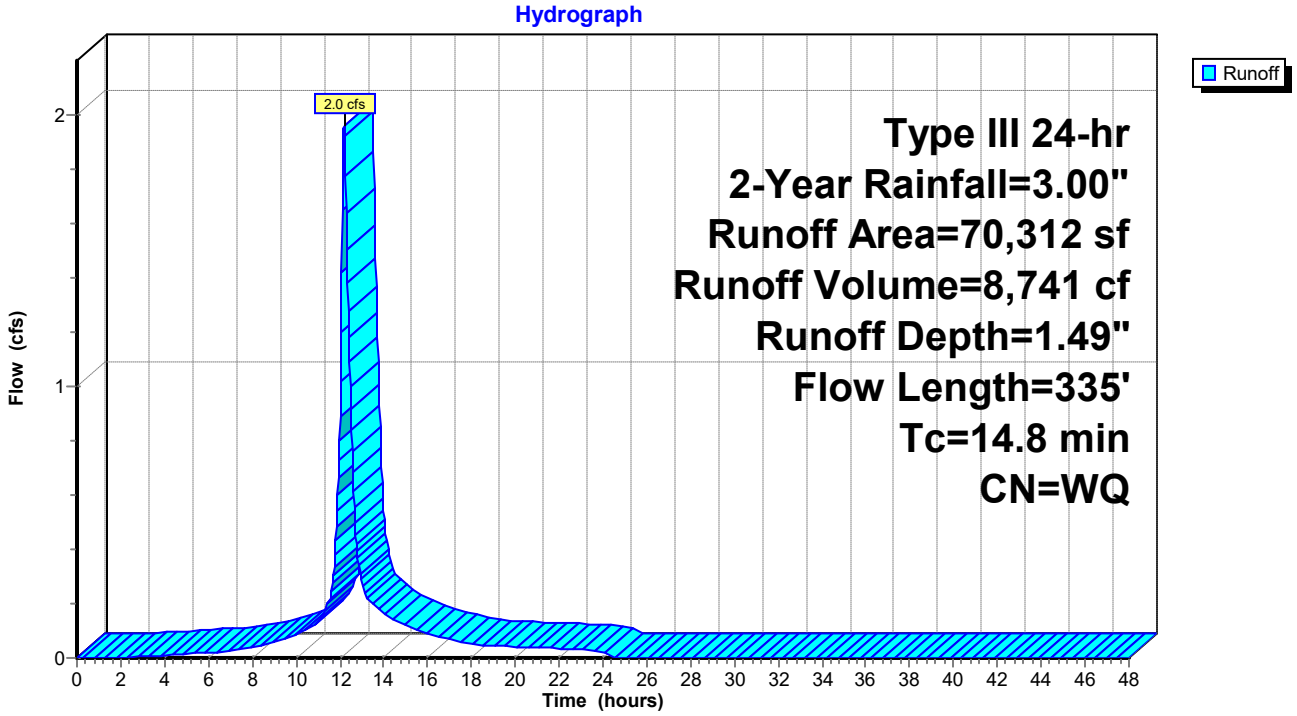
Runoff = 2.0 cfs @ 12.20 hrs, Volume= 8,741 cf, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
16,881	39	>75% Grass cover, Good, HSG A
20,753	74	>75% Grass cover, Good, HSG C
1,107	80	>75% Grass cover, Good, HSG D
355	96	Gravel surface, HSG A
12,307	96	Gravel surface, HSG C
11,171	98	Paved parking, HSG C
6,232	98	Roofs, HSG C
1,506	98	Roofs, HSG D
70,312		Weighted Average
51,403	68	73.11% Pervious Area
18,909	98	26.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.3	36	0.0555	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	17	0.4706	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	169	0.0296	2.77		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.8	335	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

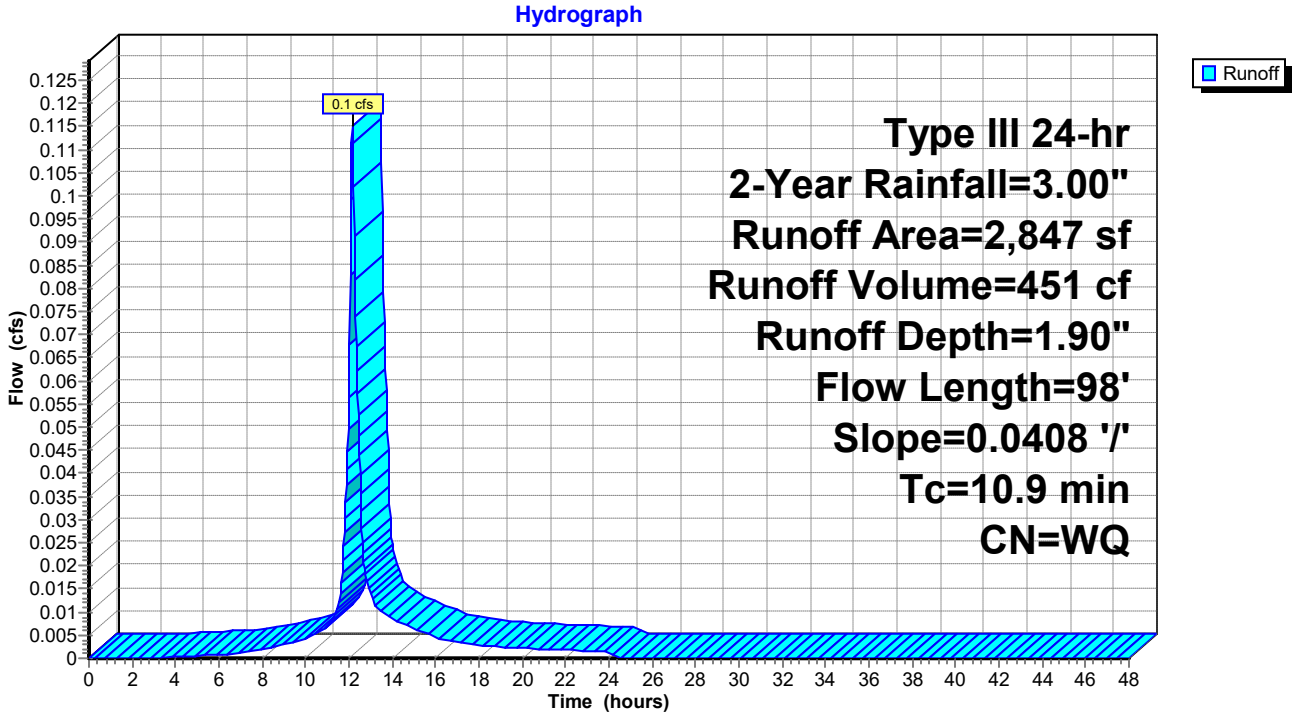
Runoff = 0.1 cfs @ 12.15 hrs, Volume= 451 cf, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,130	74	>75% Grass cover, Good, HSG C
1,718	96	Gravel surface, HSG C
2,847		Weighted Average
2,847	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	98	0.0408	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2B:



Summary for Pond 1P: Surface Basin

Inflow Area = 70,312 sf, 26.89% Impervious, Inflow Depth = 1.49" for 2-Year event
Inflow = 2.0 cfs @ 12.20 hrs, Volume= 8,741 cf
Outflow = 1.7 cfs @ 12.28 hrs, Volume= 8,741 cf, Atten= 13%, Lag= 5.1 min
Discarded = 0.1 cfs @ 12.28 hrs, Volume= 3,372 cf
Primary = 1.7 cfs @ 12.28 hrs, Volume= 5,369 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 113.61' @ 12.28 hrs Surf.Area= 2,467 sf Storage= 1,273 cf

Plug-Flow detention time= 53.1 min calculated for 8,741 cf (100% of inflow)
Center-of-Mass det. time= 53.0 min (845.2 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	113.00'	5,938 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
113.00	1,745	293.0	0	0	1,745
114.00	3,000	394.0	2,344	2,344	7,277
115.00	4,223	416.0	3,594	5,938	8,752

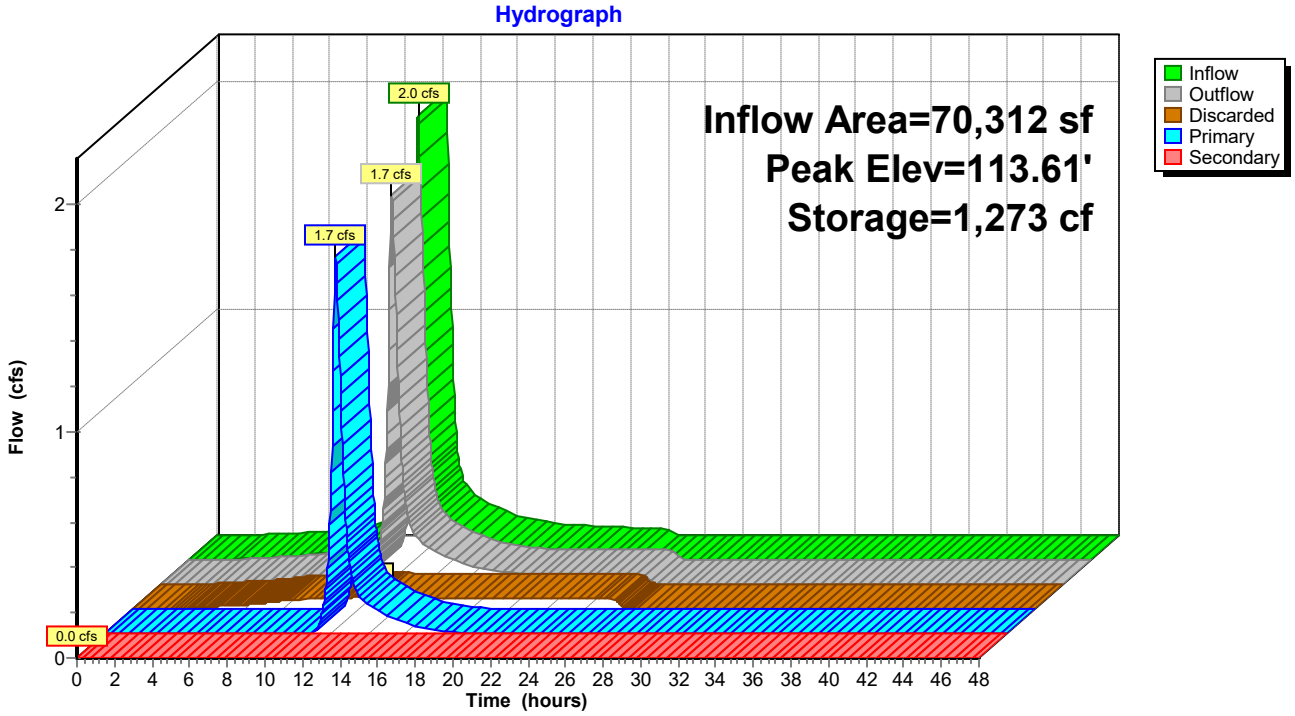
Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**15.0" Round Culvert** L= 22.4' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 112.00' / 111.75' S= 0.0112 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 113.25 113.50 113.50 114.00 Width (feet) 2.25 2.25 3.00 3.00
#3	Device 1	114.00'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	114.50'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#5	Discarded	113.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.28 hrs HW=113.61' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.7 cfs @ 12.28 hrs HW=113.61' (Free Discharge)
└**1=Culvert** (Passes 1.7 cfs of 6.1 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 1.7 cfs @ 1.87 fps)
  └**3=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=113.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Surface Basin

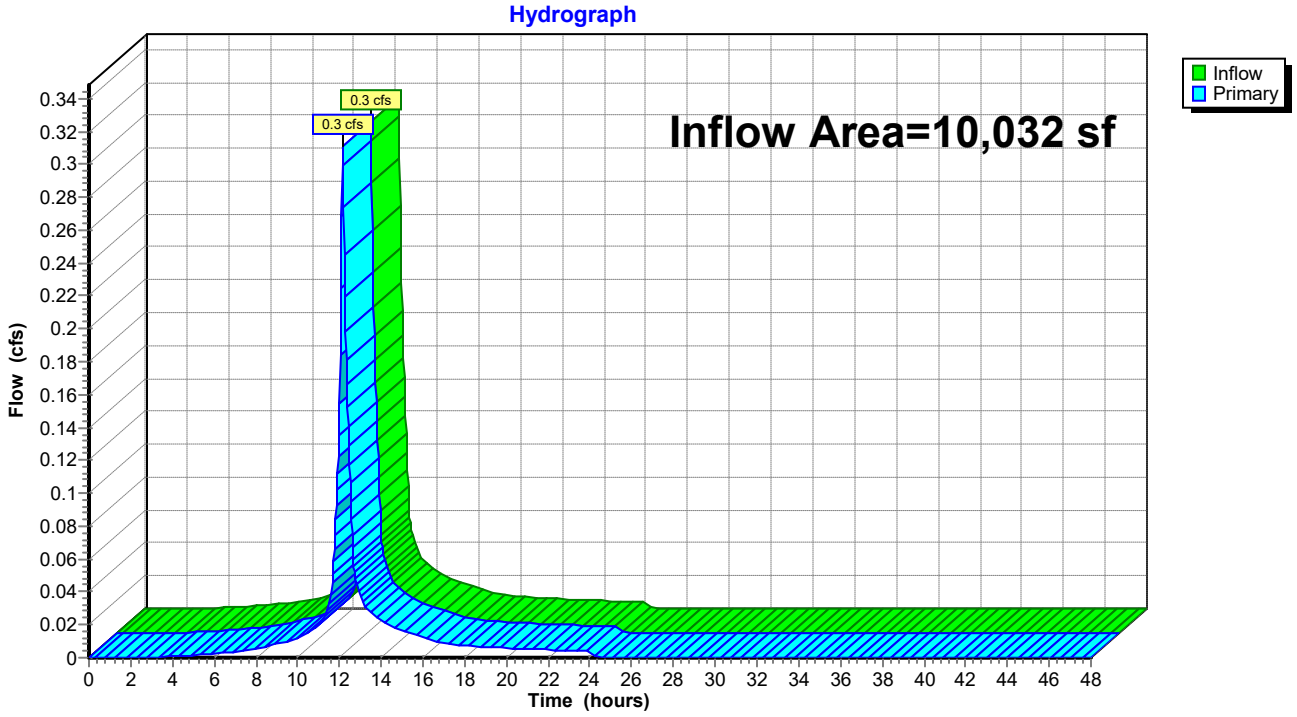


Summary for Link DP-1: Offsite to Wetland

Inflow Area = 10,032 sf, 3.92% Impervious, Inflow Depth = 1.46" for 2-Year event
Inflow = 0.3 cfs @ 12.15 hrs, Volume= 1,219 cf
Primary = 0.3 cfs @ 12.15 hrs, Volume= 1,219 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to Wetland

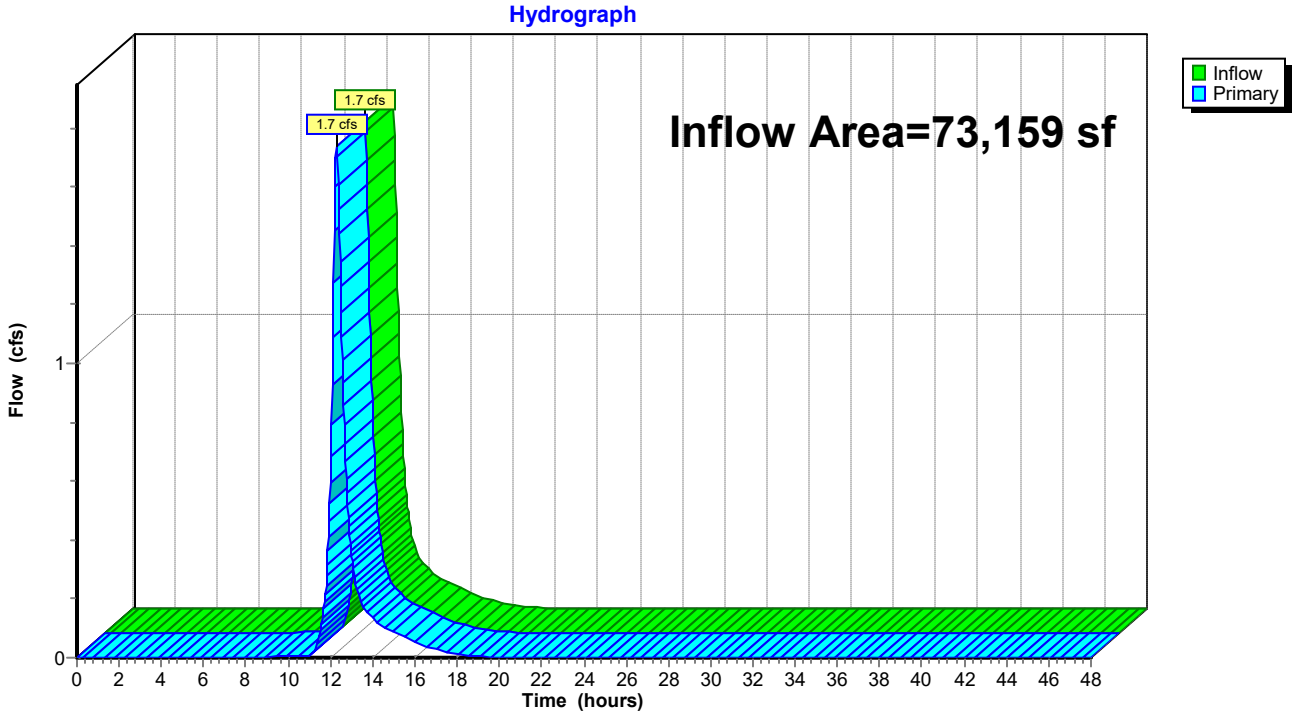


Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 73,159 sf, 25.85% Impervious, Inflow Depth = 0.95" for 2-Year event
Inflow = 1.7 cfs @ 12.28 hrs, Volume= 5,820 cf
Primary = 1.7 cfs @ 12.28 hrs, Volume= 5,820 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage



Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1: Runoff Area=10,032 sf 3.92% Impervious Runoff Depth=2.54"
Flow Length=268' Tc=10.9 min CN=WQ Runoff=0.5 cfs 2,122 cf

Subcatchment PS-2A: Runoff Area=70,312 sf 26.89% Impervious Runoff Depth=2.59"
Flow Length=335' Tc=14.8 min CN=WQ Runoff=3.4 cfs 15,197 cf

Subcatchment PS-2B: Runoff Area=2,847 sf 0.00% Impervious Runoff Depth=3.31"
Flow Length=98' Slope=0.0408 '/' Tc=10.9 min CN=WQ Runoff=0.2 cfs 785 cf

Pond 1P: Surface Basin Peak Elev=113.76' Storage=1,660 cf Inflow=3.4 cfs 15,197 cf
Discarded=0.1 cfs 3,962 cf Primary=3.0 cfs 11,235 cf Secondary=0.0 cfs 0 cf Outflow=3.1 cfs 15,197 cf

Link DP-1: Offsite to Wetland Inflow=0.5 cfs 2,122 cf
Primary=0.5 cfs 2,122 cf

Link DP-2: Suffield Street Drainage Inflow=3.1 cfs 12,020 cf
Primary=3.1 cfs 12,020 cf

Total Runoff Area = 83,191 sf Runoff Volume = 18,104 cf Average Runoff Depth = 2.61"
76.80% Pervious = 63,890 sf 23.20% Impervious = 19,302 sf

Summary for Subcatchment PS-1:

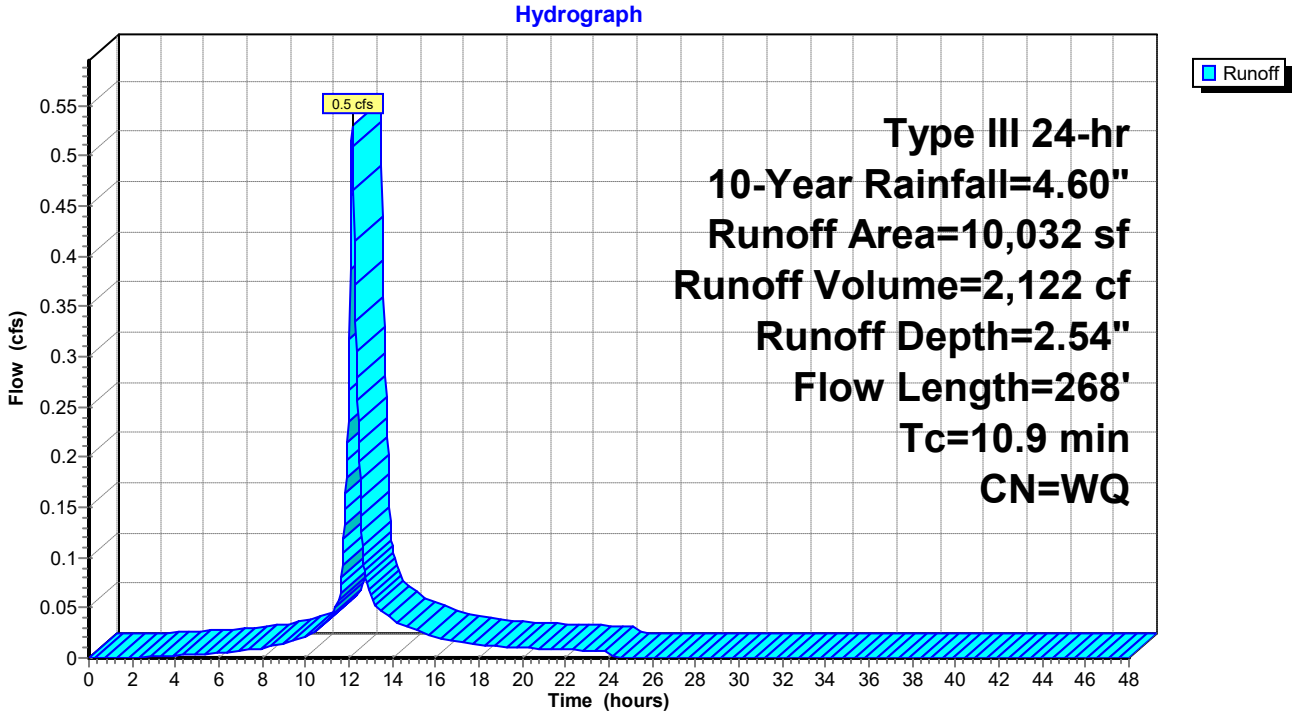
Runoff = 0.5 cfs @ 12.15 hrs, Volume= 2,122 cf, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
2,690	39	>75% Grass cover, Good, HSG A
2,521	74	>75% Grass cover, Good, HSG C
42	80	>75% Grass cover, Good, HSG D
4,386	96	Gravel surface, HSG C
0	98	Roofs, HSG A
393	98	Roofs, HSG D
10,032		Weighted Average
9,639	74	96.08% Pervious Area
393	98	3.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.1667	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.7	48	0.3330	0.30		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.8	60	0.1167	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	12	0.3333	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	130	0.0231	2.45		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.9	268	Total			

Subcatchment PS-1:



Summary for Subcatchment PS-2A:

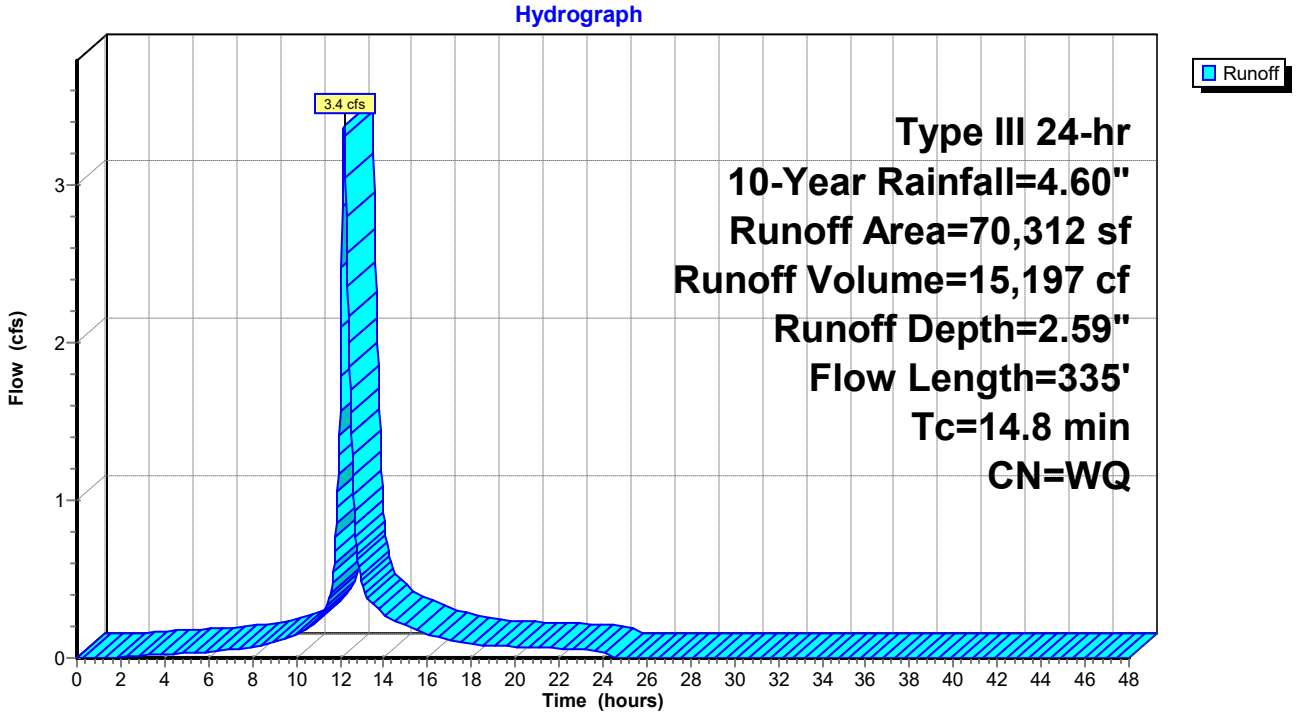
Runoff = 3.4 cfs @ 12.20 hrs, Volume= 15,197 cf, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
16,881	39	>75% Grass cover, Good, HSG A
20,753	74	>75% Grass cover, Good, HSG C
1,107	80	>75% Grass cover, Good, HSG D
355	96	Gravel surface, HSG A
12,307	96	Gravel surface, HSG C
11,171	98	Paved parking, HSG C
6,232	98	Roofs, HSG C
1,506	98	Roofs, HSG D
70,312		Weighted Average
51,403	68	73.11% Pervious Area
18,909	98	26.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.3	36	0.0555	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	17	0.4706	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	169	0.0296	2.77		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.8	335	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

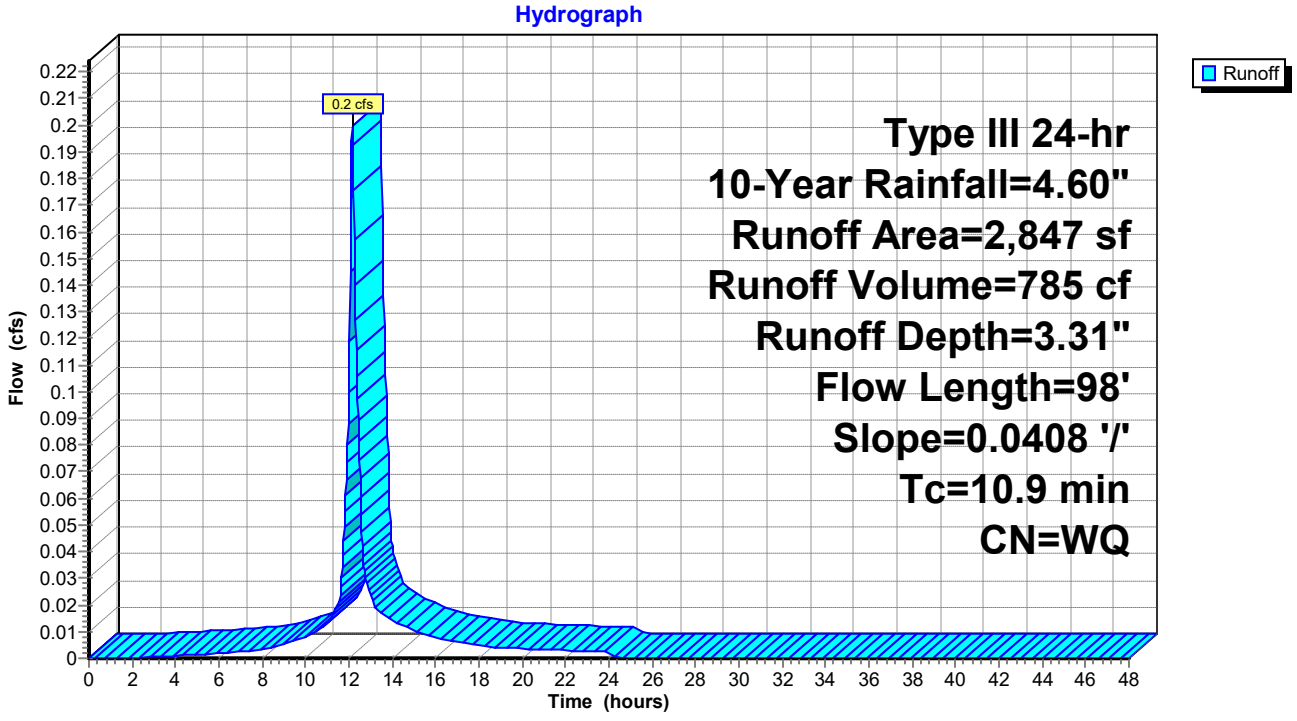
Runoff = 0.2 cfs @ 12.15 hrs, Volume= 785 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,130	74	>75% Grass cover, Good, HSG C
1,718	96	Gravel surface, HSG C
2,847		Weighted Average
2,847	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	98	0.0408	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2B:



Summary for Pond 1P: Surface Basin

Inflow Area = 70,312 sf, 26.89% Impervious, Inflow Depth = 2.59" for 10-Year event
Inflow = 3.4 cfs @ 12.20 hrs, Volume= 15,197 cf
Outflow = 3.1 cfs @ 12.27 hrs, Volume= 15,197 cf, Atten= 10%, Lag= 4.4 min
Discarded = 0.1 cfs @ 12.27 hrs, Volume= 3,962 cf
Primary = 3.0 cfs @ 12.27 hrs, Volume= 11,235 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 113.76' @ 12.27 hrs Surf.Area= 2,666 sf Storage= 1,660 cf

Plug-Flow detention time= 40.9 min calculated for 15,188 cf (100% of inflow)
Center-of-Mass det. time= 40.9 min (829.0 - 788.0)

Volume	Invert	Avail.Storage	Storage Description
#1	113.00'	5,938 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
113.00	1,745	293.0	0	0	1,745
114.00	3,000	394.0	2,344	2,344	7,277
115.00	4,223	416.0	3,594	5,938	8,752

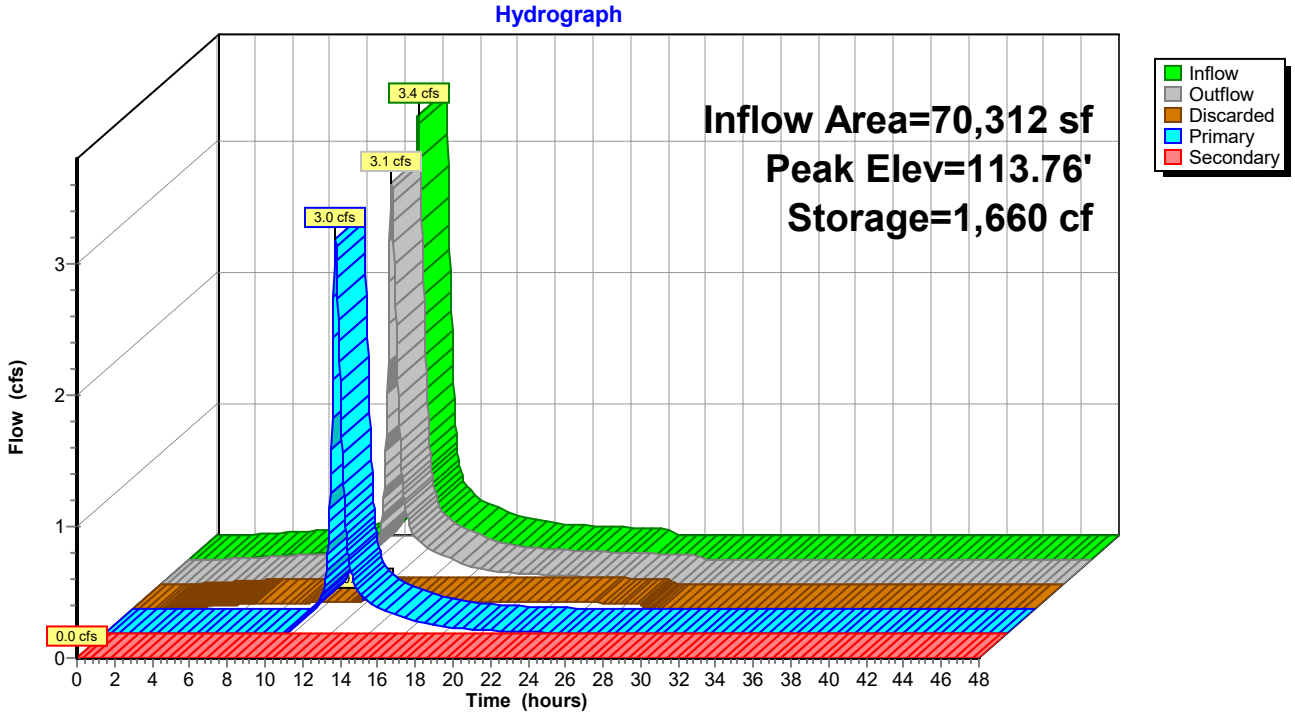
Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**15.0" Round Culvert** L= 22.4' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 112.00' / 111.75' S= 0.0112 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 113.25 113.50 113.50 114.00 Width (feet) 2.25 2.25 3.00 3.00
#3	Device 1	114.00'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	114.50'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#5	Discarded	113.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.27 hrs HW=113.76' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=3.0 cfs @ 12.27 hrs HW=113.76' (Free Discharge)
└**1=Culvert** (Passes 3.0 cfs of 6.5 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 3.0 cfs @ 2.24 fps)
  └**3=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=113.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Surface Basin

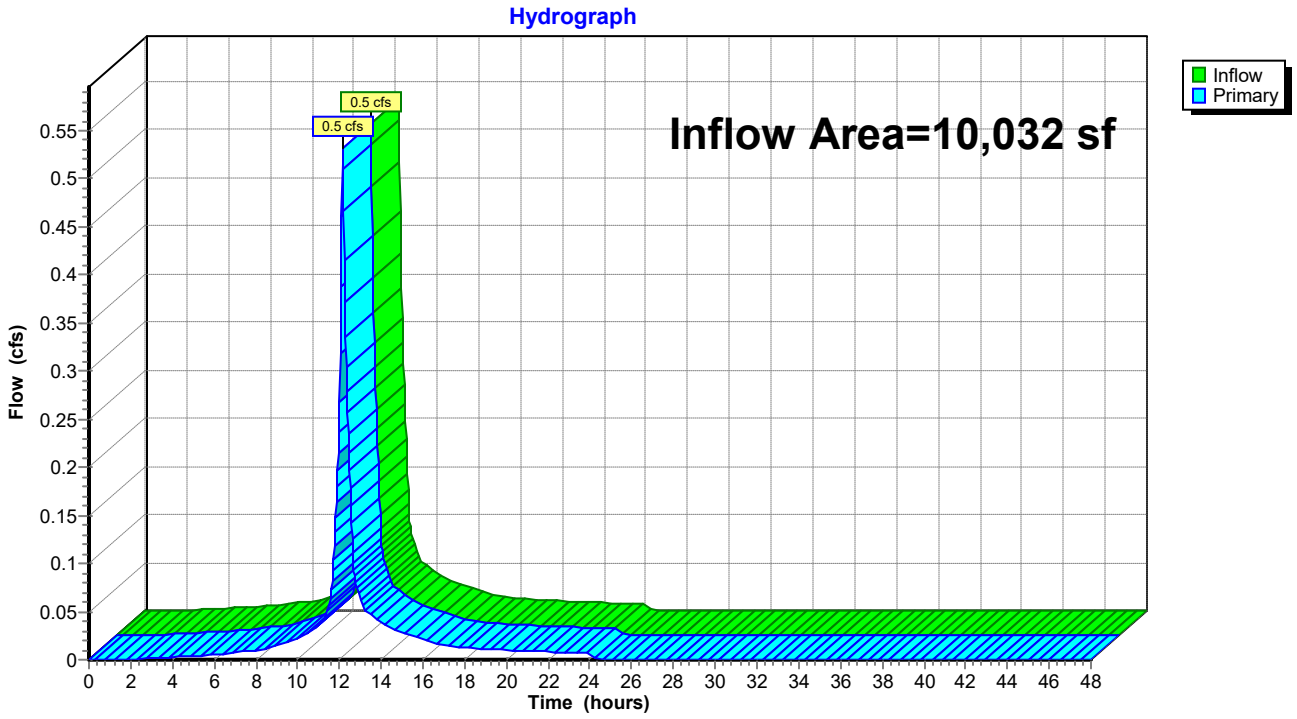


Summary for Link DP-1: Offsite to Wetland

Inflow Area = 10,032 sf, 3.92% Impervious, Inflow Depth = 2.54" for 10-Year event
Inflow = 0.5 cfs @ 12.15 hrs, Volume= 2,122 cf
Primary = 0.5 cfs @ 12.15 hrs, Volume= 2,122 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to Wetland

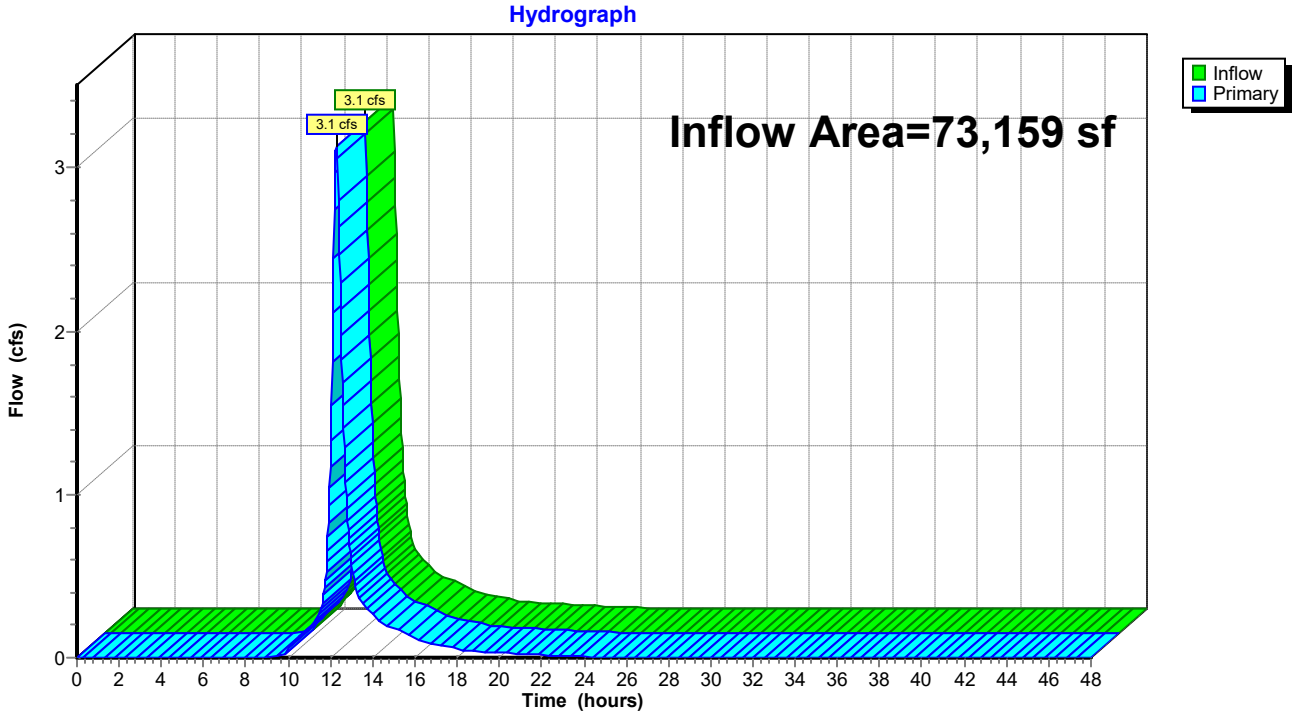


Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 73,159 sf, 25.85% Impervious, Inflow Depth = 1.97" for 10-Year event
Inflow = 3.1 cfs @ 12.27 hrs, Volume= 12,020 cf
Primary = 3.1 cfs @ 12.27 hrs, Volume= 12,020 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage



Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1: Runoff Area=10,032 sf 3.92% Impervious Runoff Depth=3.96"
Flow Length=268' Tc=10.9 min CN=WQ Runoff=0.8 cfs 3,315 cf

Subcatchment PS-2A: Runoff Area=70,312 sf 26.89% Impervious Runoff Depth=4.04"
Flow Length=335' Tc=14.8 min CN=WQ Runoff=5.2 cfs 23,698 cf

Subcatchment PS-2B: Runoff Area=2,847 sf 0.00% Impervious Runoff Depth=5.07"
Flow Length=98' Slope=0.0408 '/' Tc=10.9 min CN=WQ Runoff=0.3 cfs 1,202 cf

Pond 1P: Surface Basin Peak Elev=113.92' Storage=2,102 cf Inflow=5.2 cfs 23,698 cf
Discarded=0.1 cfs 4,293 cf Primary=4.7 cfs 19,405 cf Secondary=0.0 cfs 0 cf Outflow=4.8 cfs 23,698 cf

Link DP-1: Offsite to Wetland Inflow=0.8 cfs 3,315 cf
Primary=0.8 cfs 3,315 cf

Link DP-2: Suffield Street Drainage Inflow=4.9 cfs 20,608 cf
Primary=4.9 cfs 20,608 cf

Total Runoff Area = 83,191 sf Runoff Volume = 28,215 cf Average Runoff Depth = 4.07"
76.80% Pervious = 63,890 sf 23.20% Impervious = 19,302 sf

Summary for Subcatchment PS-1:

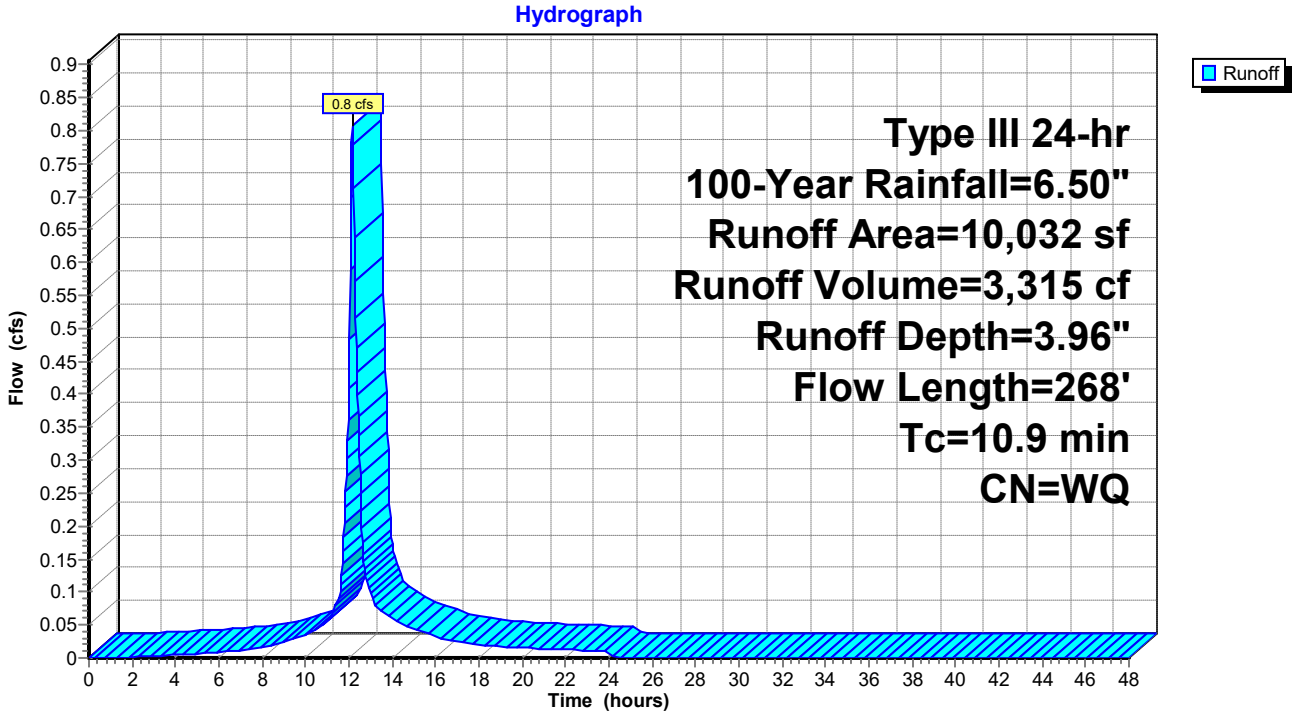
Runoff = 0.8 cfs @ 12.15 hrs, Volume= 3,315 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,690	39	>75% Grass cover, Good, HSG A
2,521	74	>75% Grass cover, Good, HSG C
42	80	>75% Grass cover, Good, HSG D
4,386	96	Gravel surface, HSG C
0	98	Roofs, HSG A
393	98	Roofs, HSG D
10,032		Weighted Average
9,639	74	96.08% Pervious Area
393	98	3.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.1667	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.7	48	0.3330	0.30		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.8	60	0.1167	0.21		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	12	0.3333	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
0.9	130	0.0231	2.45		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.9	268	Total			

Subcatchment PS-1:



Summary for Subcatchment PS-2A:

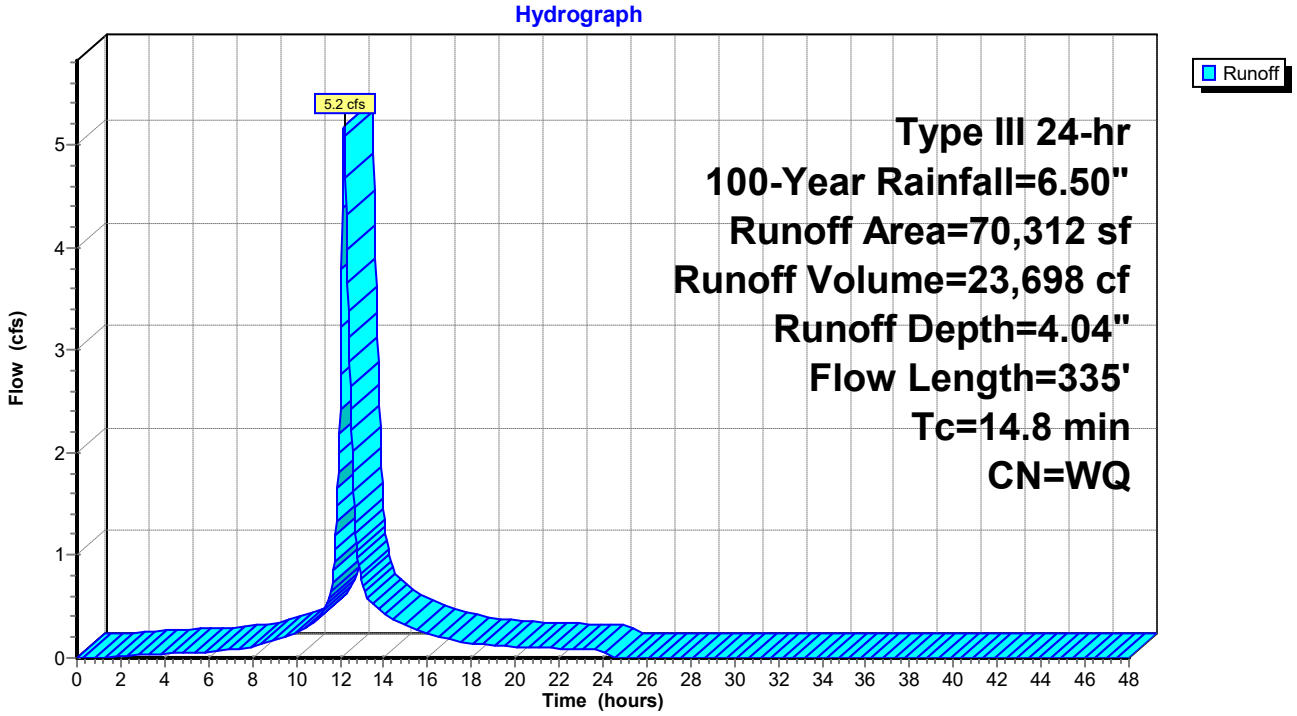
Runoff = 5.2 cfs @ 12.20 hrs, Volume= 23,698 cf, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
16,881	39	>75% Grass cover, Good, HSG A
20,753	74	>75% Grass cover, Good, HSG C
1,107	80	>75% Grass cover, Good, HSG D
355	96	Gravel surface, HSG A
12,307	96	Gravel surface, HSG C
11,171	98	Paved parking, HSG C
6,232	98	Roofs, HSG C
1,506	98	Roofs, HSG D
70,312		Weighted Average
51,403	68	73.11% Pervious Area
18,909	98	26.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	63	0.0873	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
2.9	50	0.3000	0.29		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
4.3	36	0.0555	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	17	0.4706	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"
1.0	169	0.0296	2.77		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.8	335	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

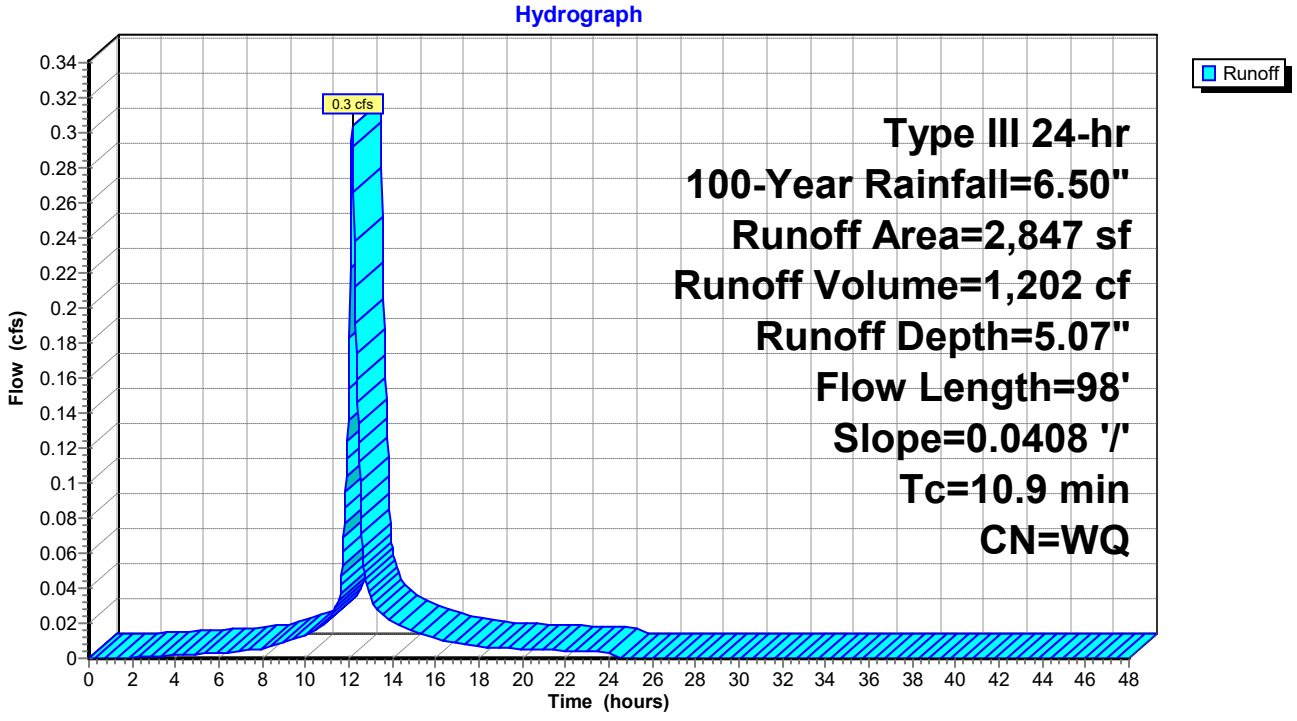
Runoff = 0.3 cfs @ 12.15 hrs, Volume= 1,202 cf, Depth= 5.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,130	74	>75% Grass cover, Good, HSG C
1,718	96	Gravel surface, HSG C
2,847		Weighted Average
2,847	87	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	98	0.0408	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2B:



Summary for Pond 1P: Surface Basin

Inflow Area = 70,312 sf, 26.89% Impervious, Inflow Depth = 4.04" for 100-Year event
Inflow = 5.2 cfs @ 12.20 hrs, Volume= 23,698 cf
Outflow = 4.8 cfs @ 12.27 hrs, Volume= 23,698 cf, Atten= 9%, Lag= 4.0 min
Discarded = 0.1 cfs @ 12.27 hrs, Volume= 4,293 cf
Primary = 4.7 cfs @ 12.27 hrs, Volume= 19,405 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 113.92' @ 12.27 hrs Surf.Area= 2,884 sf Storage= 2,102 cf

Plug-Flow detention time= 31.5 min calculated for 23,684 cf (100% of inflow)
Center-of-Mass det. time= 31.6 min (816.6 - 785.1)

Volume	Invert	Avail.Storage	Storage Description
#1	113.00'	5,938 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
113.00	1,745	293.0	0	0	1,745
114.00	3,000	394.0	2,344	2,344	7,277
115.00	4,223	416.0	3,594	5,938	8,752

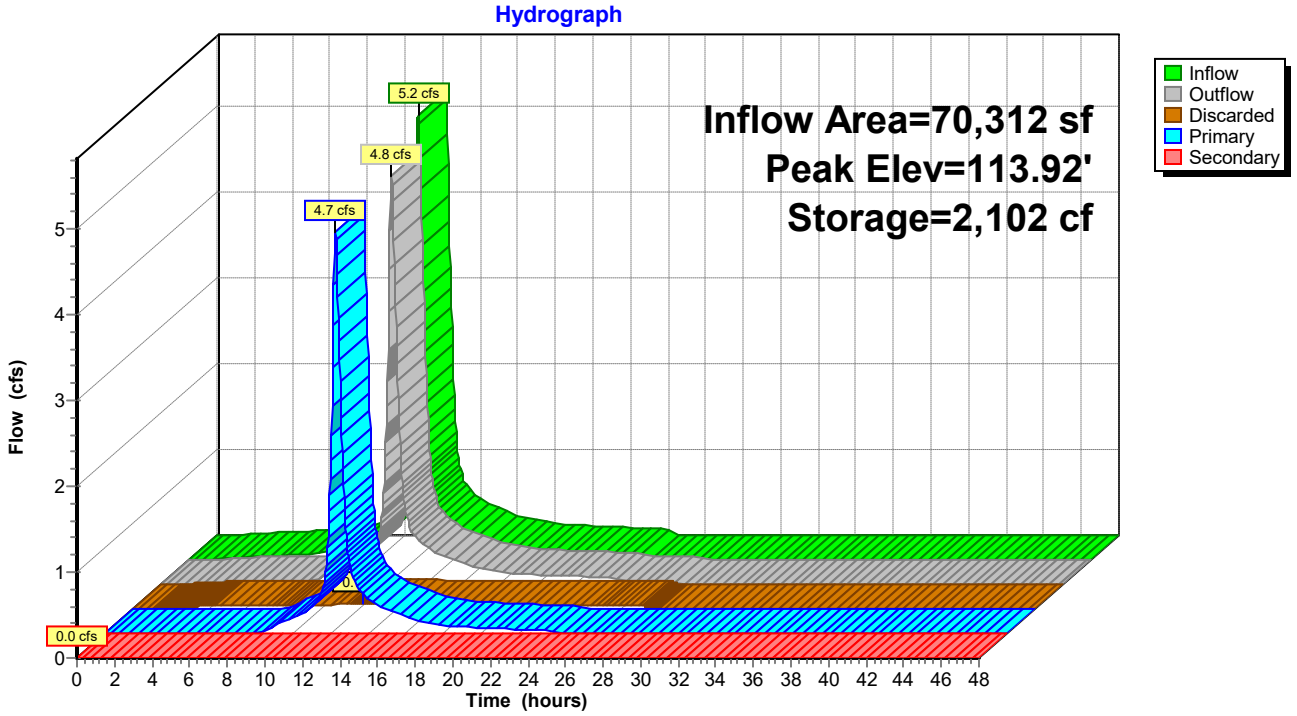
Device	Routing	Invert	Outlet Devices
#1	Primary	112.00'	**15.0" Round Culvert** L= 22.4' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 112.00' / 111.75' S= 0.0112 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 113.25 113.50 113.50 114.00 Width (feet) 2.25 2.25 3.00 3.00
#3	Device 1	114.00'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	114.50'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#5	Discarded	113.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.27 hrs HW=113.92' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.7 cfs @ 12.27 hrs HW=113.92' (Free Discharge)
└**1=Culvert** (Passes 4.7 cfs of 7.2 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 4.7 cfs @ 2.58 fps)
  └**3=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=113.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Surface Basin

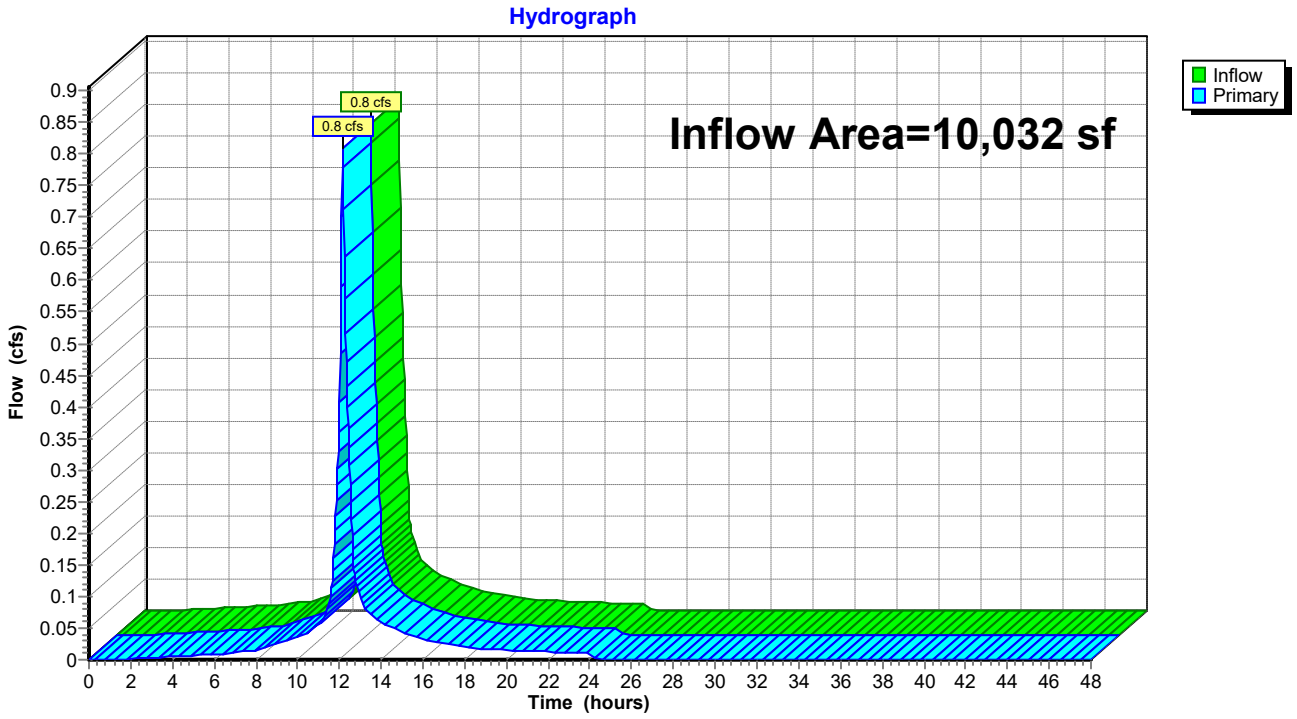


Summary for Link DP-1: Offsite to Wetland

Inflow Area = 10,032 sf, 3.92% Impervious, Inflow Depth = 3.96" for 100-Year event
Inflow = 0.8 cfs @ 12.15 hrs, Volume= 3,315 cf
Primary = 0.8 cfs @ 12.15 hrs, Volume= 3,315 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-1: Offsite to Wetland

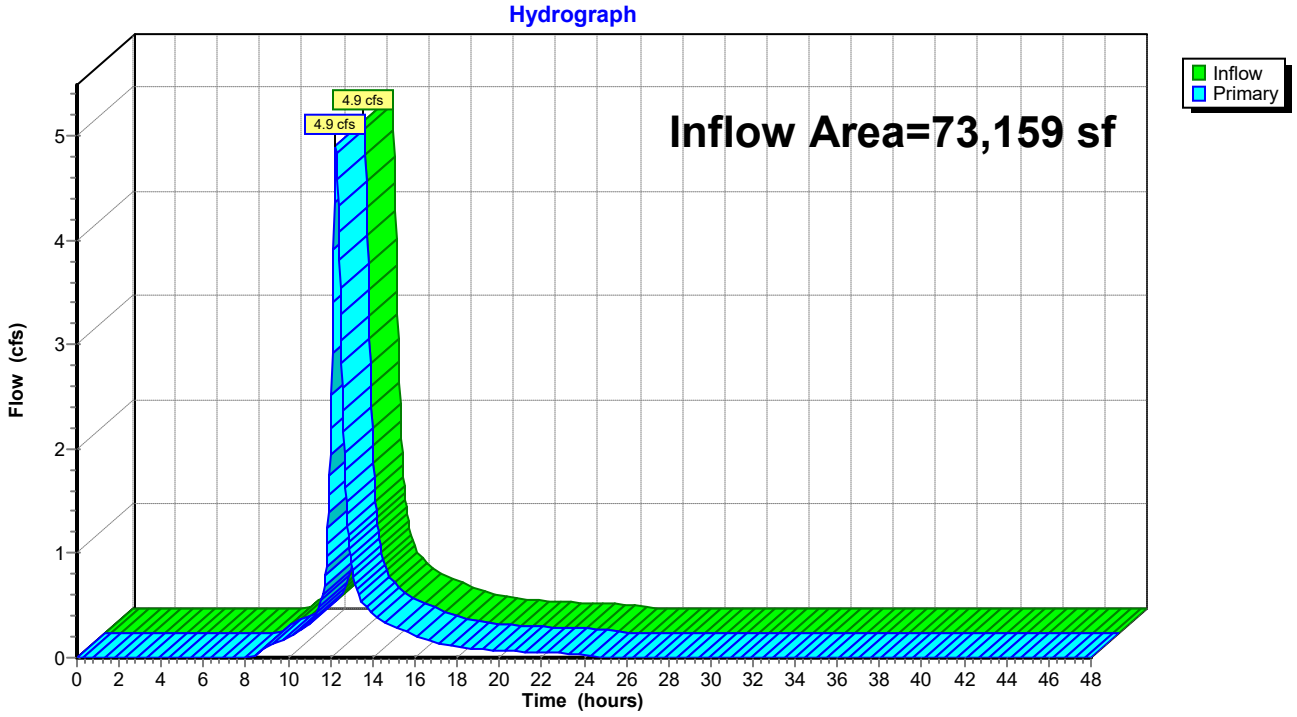


Summary for Link DP-2: Suffield Street Drainage

Inflow Area = 73,159 sf, 25.85% Impervious, Inflow Depth = 3.38" for 100-Year event
Inflow = 4.9 cfs @ 12.26 hrs, Volume= 20,608 cf
Primary = 4.9 cfs @ 12.26 hrs, Volume= 20,608 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link DP-2: Suffield Street Drainage



Appendix D: MassDEP Calculations

- Impervious Area Calculations
- Required Recharge Volume Calculations
- Water Quality Volume Calculation – Bioretention Area
- Stage Storage Chart – Bioretention Area
- TSS Removal Worksheet
- Drawdown Calculation

Standard 3: Recharge Calculations

Impervious Area Calculations

Existing Total Impervious Area

Sub-Catchment	Other Impervious (sf)	Roof (sf)	Sum (sf)
ES-1	0	638	638
ES-2	473	2,243	2,716
	473	2,881	3,354

Proposed Total Impervious Area

Sub-Catchment	Other Impervious (sf)	Roof (sf)	Sum (sf)	
PS-1	393	0	393	
PS-2A	11,171	7,738	18,909	Tributary to Bio-Ret.
PS-2B	0	0	0	
	11,564	7,738	19,302	

Summary Table

Total Existing Impervious Area	3,354	SF
Total Proposed Impervious Area	19,302	SF
Total New Impervious Area	15,948	SF
Total Impervious Area Tributary to Infiltration BMPs	18,909	SF
Percent Tributary to Recharge Facilities	84%	%

Standard 3: Recharge Calculations

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60	inch (A-soils)
0.35	inch (B-soils)
0.25	inch (C-soils)
0.10	inch (D-soils)

Surface Basin: New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.
Impervious Area (B-soils)	0 sq. ft.
Impervious Area (C-soils)	15,948 sq. ft.
Impervious Area (D-soils)	0 sq. ft.
Total Impervious area	15,948 sq. ft.

Required Recharge Volume Sizing (R_V): Bio-Retention Area

Tributary Imp. Area= 15,948 sq. ft.

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 332 cu. ft.

Standard 4: Water Quality

Water Quality Volume: Bio-Retention Area

V_{WQ} = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth (inches) = 0.5 inches*

A_{IMP} = total impervious area (acres) = 0.366 acres**

V_{WQ} (required) = 665 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) = 332 cu. ft.

V_{WQ} (required) = 665 cu. ft.

Use = 665 cu. ft. = Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Bioretention Area	680 cu. ft.***

680 cu. ft. > 665 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Includes impervious area tributary to the bioretention area subject to water quality treatment.

***Volume represents the available storage in the bioretention area below outlet elevation 113.35
Depth of water in basin = 0.35 feet

Stage-Area-Storage for Pond 1P: Surface Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
113.00	1,745	0	114.04	3,045	2,465
113.02	1,767	35	114.06	3,067	2,526
113.04	1,789	71	114.08	3,090	2,588
113.06	1,811	107	114.10	3,113	2,650
113.08	1,833	143	114.12	3,136	2,712
113.10	1,855	180	114.14	3,159	2,775
113.12	1,878	217	114.16	3,182	2,839
113.14	1,900	255	114.18	3,205	2,903
113.16	1,923	293	114.20	3,228	2,967
113.18	1,946	332	114.22	3,251	3,032
113.20	1,969	371	114.24	3,274	3,097
113.22	1,992	411	114.26	3,298	3,163
113.24	2,015	451	114.28	3,321	3,229
113.26	2,039	491	114.30	3,345	3,296
113.28	2,062	532	114.32	3,369	3,363
113.30	2,086	574	114.34	3,392	3,430
113.32	2,110	616	114.36	3,416	3,498
113.34	2,134	658	114.38	3,440	3,567
113.36	2,158	701	114.40	3,464	3,636
113.38	2,182	745	114.42	3,488	3,706
113.40	2,206	788	114.44	3,512	3,776
113.42	2,231	833	114.46	3,537	3,846
113.44	2,256	878	114.48	3,561	3,917
113.46	2,280	923	114.50	3,585	3,989
113.48	2,305	969	114.52	3,610	4,060
113.50	2,330	1,015	114.54	3,635	4,133
113.52	2,355	1,062	114.56	3,659	4,206
113.54	2,381	1,110	114.58	3,684	4,279
113.56	2,406	1,157	114.60	3,709	4,353
113.58	2,432	1,206	114.62	3,734	4,428
113.60	2,457	1,255	114.64	3,759	4,503
113.62	2,483	1,304	114.66	3,784	4,578
113.64	2,509	1,354	114.68	3,809	4,654
113.66	2,535	1,404	114.70	3,834	4,730
113.68	2,562	1,455	114.72	3,860	4,807
113.70	2,588	1,507	114.74	3,885	4,885
113.72	2,615	1,559	114.76	3,910	4,963
113.74	2,641	1,611	114.78	3,936	5,041
113.76	2,668	1,665	114.80	3,962	5,120
113.78	2,695	1,718	114.82	3,987	5,200
113.80	2,722	1,772	114.84	4,013	5,280
113.82	2,749	1,827	114.86	4,039	5,360
113.84	2,776	1,882	114.88	4,065	5,441
113.86	2,804	1,938	114.90	4,091	5,523
113.88	2,832	1,994	114.92	4,117	5,605
113.90	2,859	2,051	114.94	4,144	5,687
113.92	2,887	2,109	114.96	4,170	5,771
113.94	2,915	2,167	114.98	4,196	5,854
113.96	2,943	2,225	115.00	**4,223**	**5,938**
113.98	2,972	2,285			
114.00	3,000	2,344			
114.02	3,022	2,405			

TSS Removal Form - Bio-Retention Areas

Total TSS Removal

BMP	TSS Removal Rate*	Starting TSS	Amount Removed	Remaining Load
Bioretention Area	0.90	1.00	0.90	0.10
			Total TSS Removal =	90%

*TSS Removal Rate based on MassDEP Stormwater Handbook.

Drawdown Analysis

$$T_{DRAWDOWN} = \frac{R_V}{KA}$$

where: $T_{DRAWDOWN}$ = time in hours

R_V = required recharge volume (cu. ft.)

K = Rawls rate
- 8.27 inches/hour (A-soils)*
- 1.02 inches/hour (B-soils)*
- 0.27 inches/hour (C-soils)*

A = bottom area of recharge facility (sq. ft.)

*Most conservative Rawls rate values for given soil type used for analysis purposes

Bio-Retention Area #1

R_V = 332 cu. ft.

A = 1,745 sq. ft.

$T_{DRAWDOWN}$ = 8.5 hours < 72 hours (C-soils)

Appendix E: Construction Period Erosion Control Plan

Construction Period Erosion Control Plan

Proposed Commercial Building

Project Location:
Suffield Street
Agawam, Massachusetts
(Parcel I: Portion of parcel I4-1-4)

Applicant & Owner:
TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

RLA Project File: 190615
January 6, 2023

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

The project shall implement a construction period erosion control plan. The following provides descriptions and guidelines to ensure that the areas surrounding the project site will be protected from excessive sedimentation and runoff during construction.

1.1 Construction Period Pollution Prevention And Erosion Control Measures

1.1.1 Preconstruction Notifications And Meetings

Prior to the start of construction, the contractor shall call together a pre-construction meeting including a representative from the City/Town, the design engineer, contractor, and any pertinent persons that should be in attendance. These requirements shall be the responsibility of the Contractor to arrange, attend, and document.

1.1.2 Sediment Barrier And Work Limit

Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the owner or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine, provided all other ground cover is left intact. No excavation, grading, filling, or removal of vegetative ground cover shall begin until sediment barriers have been installed as shown on the plans and have been inspected by the owner or their representative.

1.1.3 Silt Fence

The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with compacted soil or crushed stone. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

1.1.4 Straw Bales

Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose hay.

1.1.5 Filter Sock (Filtrexx Or Equivalent)

In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, mulch or crushed stone shall be placed along the up-slope face to control and filter underflow. Additional layers of Filter Sock may be required for adequate freeboard. The filter sock shall be staked at 10 feet on-center or in cases where they cannot be staked, utilize heavy concrete blocks to hold in place.

1.1.6 Temporary Sedimentation Basins

Temporary sediment basins may be excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion. If the temporary basin is to be located within an area of future infiltration as part of the stormwater management system, the excavation shall be limited to one foot above final grade of the infiltration structure.

1.1.7 Stocking Additional Materials

A stock of additional erosion control materials shall be available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

Straw Bales – 10 (kept dry) with 20 oak stakes

Or

Silt Fence – 30 Linear feet.

Or

Filter Sock – 4 – 8 foot sections (kept dry)

Washed Stone – One (1) cubic yard, ¾" to 2" diameter

1.1.8 Trench Protection

Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

1.1.9 Site Stabilization – Temporary

Where a portion of the site will not be subject to construction activity for over 14 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

1.1.10 Site Stabilization – Permanent

Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover (season permitting) in accordance with USDA NRCS guidelines or equivalent.

1.1.11 Roadway Sweeping

The entrance to the site and affected portions of the access drive or paved project areas shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

1.2 Short-Term Erosion Control Maintenance

The following provides short-term erosion control maintenance guidelines and requirements.

1. The contractor or subcontractor will be responsible for implementing each control shown on the sedimentation and erosion control plan.
2. All erosion and sediment control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control measures will be installed during construction in order to control erosion and/or off-site sedimentation if deemed necessary by on-site inspection.
3. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
4. All sediment and erosion control devices shall be inspected at least once every seven (7) calendar days and after any storm event greater than 0.5 inches of precipitation during any 24-hour period, and the inspection shall be documented in writing. Damaged or ineffective devices shall be repaired or replaced, as necessary.
5. The contractor shall take all reasonable precautions to avoid excess erosion of the site due to the construction of this project.
6. Silt shall be removed from behind barriers if greater than 6-inches deep or as needed. Sediment that is collected in structures shall be disposed of properly and covered if stored on-site
7. Damaged or deteriorated items will be repaired immediately after identification.
8. All ditches shall be stabilized as soon as is practicable to minimize erosion.
9. The contractor shall maintain all erosion control devices in a good, working state of repair. Upon complete stabilization of any tributary areas, the erosion control devices shall be removed and disposed of so as to cause no off-site siltation.
10. Inspect and maintain construction entrance stone such that sediment does not track onto the street. Any sediment tracked onto the street shall be swept daily.
11. After catch basins have been constructed, the contractor shall protect the inlets by constructing inlet protection as shown on the plans.
12. Once the site has been paved, all catch basin inlets shall receive a silt sack type protection.
13. Erosion control measures shall remain in place until all disturbed earth has been substantially stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Appendix F: Long-Term Operation and Maintenance Plan

- Long-Term Operation & Maintenance Plan Narrative
- O&M Checklist

Long-Term Operation & Maintenance Plan

Proposed Commercial Building

Project Location:
Suffield Street
Agawam, Massachusetts
(Parcel I: Portion of parcel I4-1-4)

Applicant & Owner:
TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

RLA Project File: 190615
January 6, 2023

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner:

TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

Responsible Party*:

TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Pavement to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Bio-Retention Areas	Once per month	Twice per year (Spring and Fall)	• Inspect bio-retention areas for sediment build-up, structural damage, and standing water; • Inspect and repair eroded areas monthly; • Re-mulch void areas as needed; • Remove litter and debris monthly; • Treat diseased or distressed vegetation as needed; • Remove and replace dead vegetation twice per year (Spring and Fall); • Remove invasive species as needed; • Replace mulch every two years. • Prune shrubs as needed; • Mow grasses as necessary to not less than four inches; • Inspect outlet control structure and remove any obstructions or accumulated sediment.

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

C. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Bio-Retention Areas	12/year	$50	1	$600
Total Estimated Annual Cost of Inspections				$600

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Bio-Retention Areas	2/year	$1000	1	$2000
Total Estimated Annual Cost of Maintenance				$2000

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 1 of 1

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Bio-Retention Areas	Sediment has accumulated over mulched surface.	Remove sediment and mulch mixture and replace mulch.			
	Erosion has occurred at inlets.	Repair any eroded areas and replace with appropriate materials.			
	Areas are devoid of mulch.	Replace mulch as necessary.			
	Sshrubs have become overgrown.	Prune shrubs as necessary to promote vegetation growth.			
	Grasses have grown more than 6 inches.	Mow grass to not less than four inches.,			
	Litter and/or debris has accumulated in bio-retention area.	Remove litter and/or debris.			
	Outlet control structure weir opening is obstructed or sediment has accumulated around inlet weir.	Remove obstructions and sediment as necesasary.			
	Vegetation has died or is distressed.	Replace vegetation as necessary.			

_____ _____

Inspector's Signature Date

Bioretention Areas & Rain Gardens



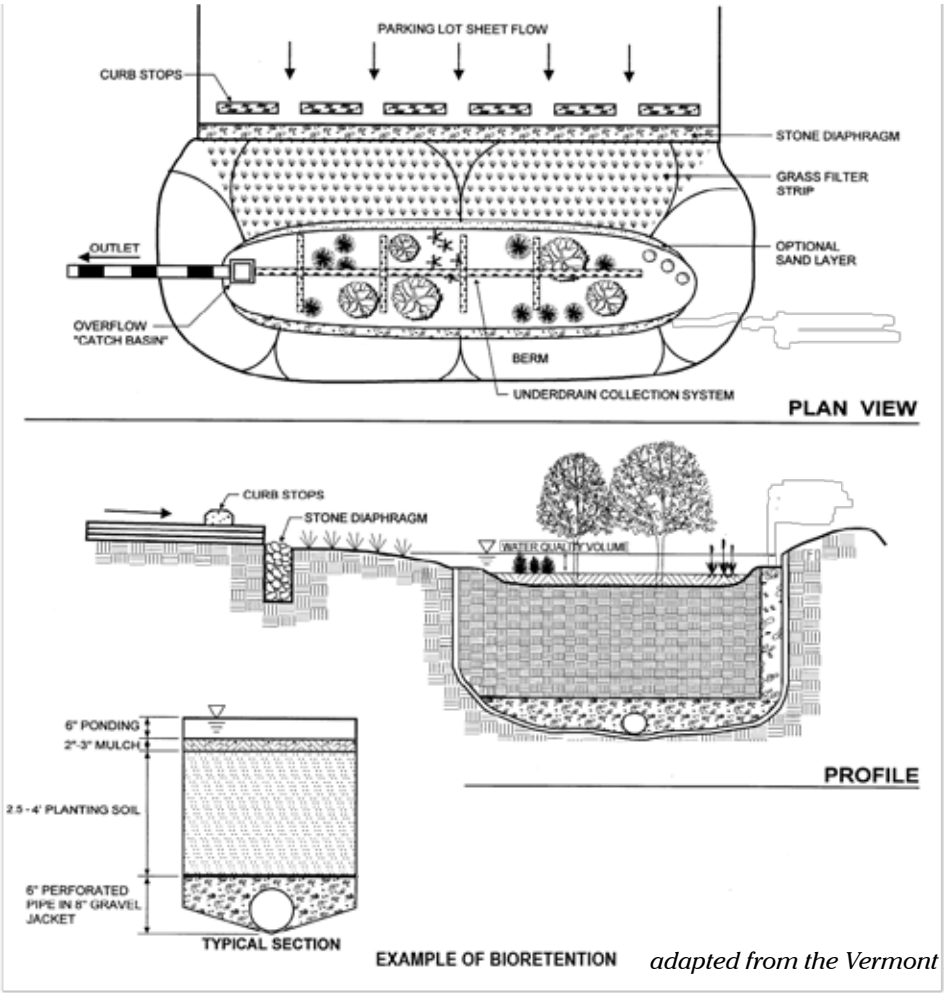
Description: Bioretention is a technique that uses soils, plants, and microbes to treat stormwater before it is infiltrated and/or discharged. Bioretention cells (also called rain gardens in residential applications) are shallow depressions filled with sandy soil topped with a thick layer of mulch and planted with dense native vegetation. Stormwater runoff is directed into the cell via piped or sheet flow. The runoff percolates through the soil media that acts as a filter.
There are two types of bioretention cells: those that are designed solely as an organic filter filtering bioretention areas and those configured to recharge groundwater in addition to acting as a filter exfiltrating bioretention areas. A filtering bioretention area includes an impermeable liner and underdrain that intercepts the runoff before it reaches the water table so that it may be conveyed to a discharge outlet, other best management practices, or the municipal storm drain system. An exfiltrating bioretention area has an underdrain that is designed to enhance exfiltration of runoff into the groundwater.

Ability to meet specific standards

Standard	Description
2 - Peak Flow	N/A
3 - Recharge	An exfiltrating bioretention area provides groundwater recharge.
4 - TSS Removal	90% TSS removal credit with adequate pretreatment
5 - Higher Pollutant Loading	Can be used for certain land uses with higher potential pollutant loads if lined and sealed until adequate pretreatment is provided. Adequate pretreatment must include 44% TSS removal prior to infiltration. For land uses that have the potential to generate runoff with high concentrations of oil and grease such as high intensity use parking lots and gas stations, adequate pretreatment may also include an oil grit separator, sand filter or equivalent. In lieu of an oil grit separator or sand filter, a filtering bioretention area also may be used as a pretreatment device for infiltration practices exfiltrating runoff from land uses with a potential to generate runoff with high concentrations of oil and grease.
6 - Discharges near or to Critical Areas	Good option for discharges near cold-water fisheries. Should not be used near bathing beaches and shellfish growing areas.
7 - Redevelopment	Suitable with appropriate pretreatment

Pollutant Removal Efficiencies

- Total Suspended Solids (TSS) — 90% with vegetated filter strip or equivalent
- Total Nitrogen — 30% to 50% if soil media at least 30 inches
- Total Phosphorus — 30% to 90%
- Metals (copper, lead, zinc, cadmium) — 40% to 90%
- Pathogens (coliform, e coli) — Insufficient data



EXAMPLE OF BIORETENTION *adapted from the Vermont Stormwater Manual*

Special Features:

- Can be lined and sealed to prevent recharge where appropriate
- Adequate pretreatment is essential
- Not recommended in areas with steep slope
- Depth of soil media depends on type of vegetation that is proposed
- Soil media must be 30 inches deep to achieve removal of nitrogen

Advantages/Benefits:

- Can be designed to provide groundwater recharge and preserves the natural water balance of the site
- Can be designed to prevent recharge where appropriate
- Supplies shade, absorbs noise, and provides windbreaks
- Can remove other pollutants besides TSS including phosphorus, nitrogen and metals
- Can be used as a stormwater retrofit by modifying existing landscape or if a parking lot is being resurfaced
- Can be used on small lots with space constraints
- Small rain gardens are mosquito death traps
- Little or no hazard for amphibians or other small animals

Disadvantages/Limitations:

- Requires careful landscaping and maintenance
- Not suitable for large drainage areas

Maintenance

Activity	Frequency
Inspect and remove trash	Monthly
Mow	2 to 12 times per year
Mulch	Annually
Fertilize	Annually
Remove dead vegetation	Annually
Prune	Annually

Bioretention Areas & Rain Gardens

Not all bioretention cells are designed to exfiltrate. Only the infiltration requirements are applicable to bioretention cells intended to exfiltrate.

Applicability

Bioretention areas can provide excellent pollutant removal for the "first flush" of stormwater runoff. Properly designed and maintained cells remove suspended solids, metals, and nutrients, and can infiltrate an inch or more of rainfall. Distributed around a property, vegetated bioretention areas can enhance site aesthetics. In residential developments they are often described as "rain gardens" and marketed as property amenities. Routine maintenance is simple and can be handled by homeowners or conventional landscaping companies, with proper direction.

Bioretention systems can be applied to a wide range of commercial, residential, and industrial developments in many geologic conditions; they work well on small sites and on large sites divided into multiple small drainage areas. Bioretention systems are often well suited for ultra-urban settings where little pervious area exists. Although they require significant space (approximately 5% to 7% of the area that drains to them), they can be integrated into parking lots, parking lot islands, median strips, and traffic islands. Sites can be retrofitted with bioretention areas by replacing existing parking lot islands or by re-configuring a parking lot during resurfacing. On residential sites, they are commonly used for rooftop and driveway runoff.

Effectiveness

Bioretention areas remove pollutants through filtration, microbe activity, and uptake by plants; contact with soil and roots provides water quality treatment better than conventional infiltration structures. Studies indicate that bioretention areas can remove from 80% to 90% of TSS. If properly designed and installed, bioretention areas remove phosphorus, nitrogen, metals, organics, and bacteria to varying degrees.

Bioretention areas help reduce stress in watersheds that experience severe low flows due to excessive impervious cover. Low-tech, decentralized bioretention areas are also less costly to design, install, and maintain than conventional stormwater technologies that treat runoff at the end of the pipe. Decentralized bioretention cells can also reduce the size of storm drain pipes, a major component of stormwater treatment costs. Bioretention areas enhance the landscape in a variety of ways: they improve the appearance of developed sites, provide windbreaks, absorb noise, provide wildlife habitat, and reduce the urban heat island effect.

Planning Considerations

Filtering bioretention areas are designed with an impermeable liner and underdrain so that the stormwater may be transported to additional BMPs for treatment and/or discharge. Exfiltrating bioretention areas are designed so that following treatment by the bioretention area the stormwater may recharge the groundwater.

Both types of bioretention areas may be used to treat runoff from land uses with higher potential pollutant loads. However, exfiltrating bioretention areas may be used to treat runoff from land uses with higher potential pollutant loads, only if pretreatment has been provided to achieve TSS removal of at least 44%. If the land use has the potential to generate runoff with high concentrations of oil and grease, other types of pretreatment, i.e., a deep sump catch basin and oil grit separator or a sand filter, is required prior to discharge of runoff to an exfiltrating bioretention area. A filtering bioretention area may also be used as a pretreatment device for an exfiltrating bioretention area or other infiltration practice that exfiltrates runoff from land uses with a potential to generate runoff with high concentrations of oil and grease.

To receive 90% TSS removal credit, adequate pretreatment must be provided. If the flow is piped to the bioretention area a deep sump catch catch basin and sediment forebay should be used to provide pretreatment. For sheet flow, there are a number or pretreatment options. These options include:

- A vegetated filter strip, grass channel or water quality swale designed in accordance with the specifications set forth in Chapter 2.
- A grass and gravel combination. This should consist of at least 8 inches of gravel followed by 3 to 5 feet of sod. (source: North Carolina Stormwater Manual, 2007, http://h2o.enr.state.nc.us/su/documents/Ch12-Bioretention_001.pdf)
- Pea diaphragm combined with a vegetated filter strip specially designed to provide pretreatment for a bioretention area as set forth in the following table. (source: Georgia Stormwater Manual and Claytor and Schuler 1996)

Dimensions for Filter Strip Designed Specially to Provide Pretreatment for Bioretention Area

Parameter	Impervious Area				Pervious Areas (lawns, etc.)			
Maximum inflow approach length (feet)	35		75		75		100	
Filter strip slope (max=6%)	<2%	>2%	<2%	>2%	<2%	>2%	<2%	>2%
Filter strip minimum length (feet)	10	15	20	25	10	12	15	18

Bioretention areas must not be located on slopes greater than 20%. When the bioretention area is designed to exfiltrate, the design must ensure vertical separation of at least 2 feet from the seasonal high groundwater table to the bottom of the bioretention cell.

For residential rain gardens, pick a low spot on the property, and route water from a downspout or sump pump into it. It is best to choose a location with full sun, but if that is not possible, make sure it gets at least a half-day of sunlight.

Do not excavate an extensive rain garden under large trees. Digging up shallow feeder roots can weaken or kill a tree. If the tree is not a species that prefers moisture, the additional groundwater could damage it. Size the bioretention area using the methodology set forth in Volume 3.

Design

Size the bioretention area to be 5% to 7% of the area draining to it. Determine the infiltrative capacity of the underlying native soil by performing a soil evaluation in accordance with Volume 3. Do not use a standard septic system (i.e., Title 5) percolation test to determine soil permeability.

The depth of the soil media must be between 2 and 4 feet. This range reflects the fact that most of the pollutant removal occurs within the first 2 feet of soil and that excavations deeper than 4 feet become expensive. The depth selected should accommodate the vegetation. If the minimum depth is used, only shallow rooted plants and grasses my be used. If there is a Total Maximum Daily Load that requires nitrogen to be removed from the stormwater dischrges, the bioretention area should have a soil media with a depth of at least 30 inches, because nitrogen removal takes place 30 inches below the ground surface. If trees and shrubs are to be planted, the soil media should be at least 3 feet.

Size the cells (based on void space and ponding area) at a minimum to capture and treat the required water quality volume (the first 0.5 inch or 1 inch of runoff) if intended to be used for water quality treatment (Stormwater Standard No. 4), the required recharge volume if used for recharge (Stormwater Standard No. 3), or the larger of the two volumes if used to achieve compliance with both Stormwater Standards 3 and 4.

Cover the bottom of the excavation with coarse gravel, over pea gravel, over sand. Earlier designs used filter fabric as a bottom blanket, but more recent experiences show that filter fabric is prone to clogging. Consequently, do not use fabric filters or sand curtains. Use the Engineered Soil Mix below.

Engineered Soil Mix for Bioretention Systems Designed to Exfiltrate

- The soil mix for bioretention areas should be a mixture of sand compost and soil.
  - o 40 % sand,
  - o 20-30% topsoil, and
  - o 30-40% compost.

- The soil mix must be uniform, free of stones, stumps, roots or similar objects larger than 2 inches. Clay content should not exceed 5%.
- Soil pH should generally be between 5.5-6.5, a range that is optimal for microbial activity and adsorption of nitrogen, phosphorus, and other pollutants.
- Use soils with 1.5% to 3% organic content and maximum 500-ppm soluble salts.
- The sand component should be gravelly sand that meets ASTM D 422.

Sieve Size	Percent Passing
2-inch	100
¾-inch	70-100
¼-inch	50-80
U.S. No. 40	15-40
U.S. No. 200	0-3

- The topsoil component shall be a sandy loam, loamy sand or loam texture.
- The compost component must be processed from yard waste in accordance with MassDEP Guidelines (see http://www.mass.gov/dep/recycle/reduce/leafguid.doc). The compost shall not contain biosolids.

On-site soil mixing or placement is not allowed if soil is saturated or subject to water within 48 hours. Cover and store soil to prevent wetting or saturation.

Test soil for fertility and micro-nutrients and, only if necessary, amend mixture to create optimum conditions for plant establishment and early growth.

Grade the area to allow a ponding depth of 6 to 8 inches; depending on site conditions, more or less ponding may be appropriate.

Cover the soil with 2 to 3 inches of fine-shredded hardwood mulch.

The planting plan shall include a mix of herbaceous perennials, shrubs, and (if conditions permit) understory trees that can tolerate intermittent ponding, occasional saline conditions due to road salt, and extended dry periods. A list of plants that are suitable for bioretention areas can be found at the end of this section. To avoid a monoculture, it is a good practice to include one tree or shrub per 50 square feet of bioretention area, and at least 3 species each of herbaceous perennials and shrubs. Invasive and exotic species are prohibited. The planting plan should also meet any applicable local landscaping requirements.

All exfiltrating bioretention areas must be designed to drain within 72 hours. However, rain gardens are typically designed to drain water within a day and are thus unlikely to breed mosquitoes.

Bioretention cells, including rain gardens, require pretreatment, such as a vegetated filter strip. A stone or pea gravel diaphragm or, even better, a concrete level spreader upstream of a filter strip will enhance sheet flow and sediment removal.
Bioretention cells can be dosed with sheet flow, a surface inlet, or pipe flow. When using a surface inlet, first direct the flow to a sediment forebay. Alternatively, piped flow may be introduced to the bioretention system via an underdrain.

For bioretention cells dosed via sheet flow or surface inlets, include a ponding area to allow water to pond and be stored temporarily while stormwater is exfiltrating through the cell. Where bioretention areas are adjacent to parking areas, allow three inches of freeboard above the ponding depth to prevent flooding.

Most bioretention cells have an overflow drain that allows ponded water above the selected ponding depth to be dosed to an underdrain. If the bioretention system is designed to exfiltrate, the underdrain is not connected to an outlet, but instead terminates in the bioretention cell. If the bioretention area is not designed to exfiltrate, the underdrain is connected to an outlet for discharge or conveyance to additional best management practices.

Construction

During construction, avoid excessively compacting soils around the bioretention areas and accumulating silt around the drain field. To minimize sediment loading in the treatment area, direct runoff to the bioretention area only from areas that are stabilized; always divert construction runoff elsewhere.

To avoid compaction of the parent material, work from the edge of the area proposed as the location of an exfiltrationg bioretention cell. Never direct runoff to the cell until the cell and the contributing drainage areas are fully stabilized.

Place planting soils in 1-foot to 2-foot lifts and compact them with minimal pressure until the desired elevation is reached. Some engineers suggest flooding the cell between each lift placement in lieu of compaction.

Maintenance

Premature failure of bioretention areas is a significant issue caused by lack of regular maintenance. Ensuring long-term maintenance involves sustained public education and deed restrictions or covenants for privately owned cells. Bioretention areas require careful attention while plants are being established

Bioretention Maintenance Schedule

Activity	*Time of Year*	*Frequency*
Inspect & remove trash	Year round	Monthly
Mulch	Spring	Annually
Remove dead vegetation	Fall or Spring	Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace entire media & all vegetation	Late Spring/early Summer	As needed*

** Paying careful attention to pretreatment and operation & maintenance can extend the life of the soil media*

and seasonal landscaping maintenance thereafter.

In many cases, a landscaping contractor working elsewhere on the site can complete maintenance tasks. Inspect pretreatment devices and bioretention cells regularly for sediment build-up, structural damage, and standing water.

Inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly. Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall).

Proper selection of plant species and support during establishment of vegetation should minimize—if not eliminate—the need for fertilizers and pesticides. Remove invasive species as needed to prevent these species from spreading into the bioretention area. Replace mulch every two years, in the early spring. Upon failure, excavate bioretention area, scarify bottom and sides, replace filter fabric and soil, replant, and mulch. A summary of maintenance activities can be found on the previous page.

Because the soil medium filters contaminants from runoff, the cation exchange capacity of the soil media will eventually be exhausted. When the cation exchange capacity of the soil media decreases, change the soil media to prevent contaminants from migrating to the groundwater, or from being discharged via an underdrain outlet. Using small shrubs and plants instead of larger trees will make it easier to replace the media with clean material when needed.

Plant maintenance is critical. Concentrated salts in roadway runoff may kill plants, necessitating removal of dead vegetation each spring and replanting. The operation and maintenance plan must include measures to make sure the plants are maintained. This is particularly true in residential subdivisions, where the operation and maintenance plan may assign each homeowner the legal responsibility to maintain a bioretention cell or rain garden on his or her property. Including the requirement in the property deed for new subdivisions may alert residential property owners to their legal responsibilities regarding the bioretention cells constructed on their lot.

Cold Climate Considerations

Never store snow in bioretention areas. The Operation and Maintenance plan must specify where on-site snow will be stored. All snow dumps must comply with MassDEP's guidance. When bioretention areas are located along roads, care must be taken during plowing operations to prevent snow from being plowed into the bioretention areas. If snow is plowed into the cells, runoff may bypass the cell and drain into downgradient wetlands without first receiving the required water quality treatment, and without recharging the groundwater.

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Plant Species Suitable for Use in Bioretention - Herbaceous Species

Species	Moisture Regime		Tolerance						Morphology			General Characteristics		Comments
Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Agrostis alba redtop	FAC	Mesic-Xeric	1-2	H	–	H	H	Shade	Grass	2-3'	Fiberous Shallow	Yes	High	–
Andropogon gerardi bluejoint	FAC	Dry Mesic-Mesic	1-2	–	–	–	–	Sun	Grass	2-3'	Fiberous Shallow	Yes	High	–
Andropogon virginicus broomsedge	–	Wet meadow	1-2	L	–			Full sun	Grass	1-3'		Yes	High	Tolerant of fluctuating water levels and drought.
Carex vulpinoidea fox sedge	OBL	Freshwater marsh	2-4	L	–			Sun to partial sun	Grass	2-3.5'	Rhizome	Yes	High	–
Chelone glabra														
Deschampsia caespitosa tufted hairgrass	FACW	Mesic to wet Mesic	2-4	H	–	H	H	Sun	Grass	2-3'	Fiberous Shallow	Yes	High	May become invasive.
Glyceria striata fowl mannagrass, nerved mannagrass	OBL	Freshwater marsh, seeps	1-2	L	–			Partial shade to full shade	Grass	2-4'	Rhizome	Yes	High	–
Hedera helix English Ivy	FACU	Mesic	1-2	–	–	–	H	Sun	Evergreen ground cover	–	Fiberous Shallow	No	Low	–
Hibiscus palustris														
Iris kaempferi														

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FAC Facultative - Equally likely to occur in wetlands and non-wetlands.
FACW Facultative Wetland - Usually occur in wetlands, however, occasionally found in non-wetlands.
OBL Obligate Wetland - Occur almost always in wetlands

Adapted from the Prince George's County Design Manual & the Center for Watershed Protection for the use of bioretention in Stormwater Management

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Species	Moisture Regime		Tolerance						Morphology			General Characteristics		Comments
Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Lobelia siphilitica														
Lotus Corniculatus birdsfoot-trefoil	FAC	Mesic-Xeric	1-2	H	L	H	H	Sun	Grass	2-3'	Fiberous Shallow	Yes	High	Member of the legume family.
Onoclea sensibilis sensitive fern, beadfern	FACW							Shade		1-3.5'			H	
Pachysandra terminalis Japanese pachysandra	FACU	Mesic	1-2	-	-	-	M	Shade	Evergreen ground cover	-	Fiberous Shallow	No	Low	-
Panicum virgatum switch grass	FAC to FACU	Mesic	2-4	H	-	-	H	Sun or Shade	Grass	4-5'	Fiberous Shallow	Yes	High	Can spread fast and reach height of 6'
Vinca major large periwinkle	FACU	Mesic	1-2	-	-	-	H	Shade	Evergreen ground cover	-	Fiberous Shallow	No	Low	Sensitive to soil compaction and pH changes.
Vinca minor common periwinkle	FACU	Mesic	1-2	-	-	-	H	Shade	Evergreen ground cover	-	Fiberous Shallow	No	Low	-
Indian grass														
Little bluestem														
Deer tongue														
Green coneflower														

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Aronia arbutifolia (Pyrus arbutifolia) red chokeberry	FACW	Mesic	1-2	H	_	H	M	Sun to partial sun	Deciduous shrub	6-12'	_	Yes	High	Good bank stabilizer. Tolerates drought.
Clethra alnifolia sweet pepperbush	FAC	Mesic to wet Mesic	2-4	H	_	_	H	Sun to partial sun	Ovoid shrub	6-12'	Shallow	Yes	Med	Coastal plain species.
Cornus Stolonifera (Cornus sericea) red osier dogwood	FACW	Mesic-Hydric	2-4	H	H	H	M	Sun or shade	Arching, spreading shrub	8-10'	Shallow	Yes	High	Needs more consistent moisture levels.
Cornus amomum silky dogwood	FAC	Mesic	1-2	L	_	_	M	Sun to partial sun	Broad-leaved	6-12'	_	Yes	High	Good bank stabilizer
Euonymous europaeus spindle-tree	FAC	Mesic	1-2	M	M	M	M	Sun to partial sun	Upright dense oval shrub	10-12'	Shallow	No	No	_
Hamamelis virginiana witch hazel	FAC	Mesic	2-4	M	M	M	M	Sun or shade	Vase-like compact shrub	4-6'	Shallow	Yes	Low	_
Hypericum densiflorum common St. John's wort	FAC	Mesic	2-4	H	M	M	H	Sun	Ovoid shrub	3-6'	Shallow	Yes	Med	_
Ilex glabra inkberry	FACW	Mesic to wet Mesic	2-4	H	H	_	H	Sun to partial sun	Upright dense shrub	6-12'	Shallow	Yes	High	Coastal plain species.
Ilex verticillata winterberry	FACW	Mesic to wet Mesic	2-4	L	M	_	H	Sun to partial sun	Spreading shrub	6-12'	Shallow	Yes	High	_

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Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Itea virginica tassel-white, Virginia sweetspire	OBL	Mesic	1-2	M	–	–	M	Sun or shade	Broad-leaved, deciduous shrub	6-12'	–	Yes	Low	–
Juniperus communis "compressa" common juniper	FAC	Dry Mesic-Mesic	1-2	M	H	H	M-H	Sun	Mounded shrub	3-6'	Deep taproot	No	High	Evergreen
Juniperus horizontalis "Bar Harbor" creeping juniper	FAC	Dry Mesic-Mesic	1-2	M	H	H	M-H	Sun	Matted shrub	0-3'	Deep taproot	No	High	Evergreen
Lindera benzoin spicebush	FACW	Mesic to wet Mesic	2-4	H	–	–	H	Sun	Upright shrub	6-12'	Deep	Yes	High	–
Myrica pennsylvanica bayberry	FAC	Mesic	2-4	H	M	M	H	Sun to partial sun	Rounded, compact shrub	6-8'	Shallow	Yes	High	Coastal plain species.
Physocarpus opulifolius ninebark	FAC	Dry Mesic to wet Mesic	2-4	M	–	–	H	Sun	Upright shrub	6-12'	Shallow	Yes	Med	May be difficult to locate.
Viburnum cassinoides northern wild raisin	FACW	Mesic	2-4	H	H	H	H	Sun to partial sun	Rounded, compacted shrub	6-8'	Shallow	Yes	High	–
Viburnum dentatum arrow-wood	FAC	Mesic to wet	2-4	H	H	H	H	Sun to partial sun	Upright, multi-stemmed shrub	8-10'	Shallow	Yes	High	–
Viburnum lentago nannyberry	FAC	Mesic	2-4	H	H	H	H	Sun to partial sun	Upright, mlti-stemmed shrub	8-10'	Shallow	Yes	High	–

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Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Acer rubrum red maple	FAC	Mesic-Hydric	4-6	H	H	H	H	Partial sun	Single to multi-stem tree	50-70'	Shallow	Yes	High	-
Amelanchier canadensis shadbush	FAC	Mesic	2-4	H	M	-	H	Partial sun	Single to multi-stem tree	35-50'	Shallow	Yes	High	Not recommended for full sun.
Betula nigra river birch	FACW	Mesic-Hydric	4-6	-	M	M	H	Partial sun	Single to multi-stem tree	50-75'	Shallow	Yes	High	Not susceptible to bronze birch borer.
Betula populifolia gray birch	FAC	Xeric-Hydric	4-6	H	H	M	H	Partial sun	Single to multi-stem tree	35-50'	Shallow to deep	No	High	Native to New England area.
Fraxinus americana white ash	FAC	Mesic	2-4	M	H	H	H	Sun	Large tree	50-80'	Deep	Yes	Low	-
Fraxinus Pennsylvanica green ash	FACW	Mesic	4-6	M	H	H	H	Partial sun	Large tree	40-65'	Shallow to deep	Yes	Low	-
Ginko biloba Maidenhair tree	FAC	Mesic	2-4	H	H	H	H	Sun	Large tree	50-80'	Shallow to deep	No	Low	Avoid female species-offensive odor from fruit.
Gleditsia triacanthos honeylocust	FAC	Mesic	2-4	H	M	-	M	Sun	Small caopled large tree	50-75'	Shallow to deep variable taproot	Yes	Low	Select thornless variety.
Juniperus virginiana eastern red cedar	FACU	Mesic-Xeric	2-4	H	H	-	H	Sun	Dense single stem tree	50-75'	Taproot	Yes	Very high	Evergreen
Liquidambar styraciflua sweet gum	FAC	Mesic	4-6	H	H	H	M	Sun	Large tree	50-70'	Deep taproot	Yes	High	Edge and perimeter; fruit is a maintenance problem.
Nyssa sylvatica black gum	FACW	Mesic-Hydric	4-6	H	H	H	H	Sun	Large tree	40-70'	Shallow to deep taproot	Yes	High	-

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Species	Moisture Regime		Tolerance						Morphology			General Characteristics		Comments
Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Platanus acerifolia London plane-tree	FACW	Mesic	2-4	H	–	–	M	Sun	Large tree	70-80'	Shallow	No	Low	Tree roots can heave sidewalks.
Platanus occidentalis sycamore	FACW	Mesic-Hydric	4-6	M	M	M	M	Sun	Large tree	70-80'	Shallow	Yes	Med	Edge and perimeter; fruit is a maintennance problem; tree is also prone to windthrow.
Populus deltoides eastern cottonnwood	FAC	Xeric-Mesic	4-6	H	H	H	L	Sun	Large tree with spreading branches	75-100'	Shallow	Yes	High	Short lived.
Quercus bicolor Swamp white oak	FACW	Mesic to wet Mesic	4-6	H	–	H	H	Sun to partial sun	Large tree	75-100'	Shallow	Yes	High	One of the faster growing oaks.
Quercus coccinea scarlet oak	FAC	Mesic	1-2	H	M	M	M	Sun	Large tree	50-75'	Shallow to deep	Yes	High	–
Quercus macrocarpa bur oak	FAC	Mesic to wet Mesic	2-4	H	H	H	M	Sun	Large spreading tree	75-100"	Taproot	No	High	Native to Midwest.
Quercus palustris pin oak	FACW	Mesic-Hydric	4-6	H	H	H	M	Sun	Large tree	60-80'	Shallow to deep taproot	Yes	High	–
Quercus phellos willow oak	FACW	Mesic to wet Mesic	4-6	H	–	–	H	Sun	Large tree	55-75'	Shallow	Yes	High	Fast growing oak.
Quercus rubra red oak	FAC	Mesic	2-4	M	H	M	M	Sun to partial sun	Large spreading tree	60-80'	Deep taproot	Yes	High	–
Quercus shumardii Shumard's red oak	FAC	Mesic	2-4	H	H	H	M	Sun to partial sun	Large spreading tree	60-80'	Deep taproot	No	High	Native to Southeast.

H High Tolerance
M Medium Tolerance
L Low Tolerance

FACU Facultative Upland - Usually occur in non-wetlands, however, occasionally found in wetlands.
FAC Facultative - Equally likely to occur in non-wetlands and wetlands.
FACW Facultative Wetland - Usually occur in wetlands, however, occasionally found in non-wetlands.
OBL Obligate Wetland - Almost always occur in wetlands.

Adapted from the Prince George's County Design Manual & the Center for Watershed Protection for the use of bioretention in Stormwater Management

Plant Species Suitable for Use in Bioretention - Herbaceous Species

Species	Moisture Regime		Tolerance						Morphology			General Characteristics		Comments
Scientific Name Common Name	Indicator Status	Habitat	Ponding (days)	Salt	Oil/ Grease	Metals	Insects/ Disease	Exposure	Form	Height	Root System	Native	Wildlife	
Sophora japonica Japanese pagoda tree	FAC	Mesic	1-2	M	M	_	M	Sun	Shade tree	40-70'	Shallow	No	Low	Fruit stains sidewalk.
Taxodium distichum bald cypress	FACW	Mesic-Hydric	4-6	_	_	M	H	Sun to partial sun	Typically single stem tree	75-100'	Shallow	Yes	Low	Not well documented for planting in urban areas.
Thuja occidentalis arborvitae	FACW	Mesic to wet Mesic	2-4	M	M	M	H	Sun to partial sun	Dense single stem tree	50-75'	Shallow	No	Low	Evergreen
Zelkova serrata Japanese zelkova	FACU	Mesic	1-2	M	M	_	H	Sun	Dense shade tree	60-70'	Shallow	No	Low	Branches can split easily in storms.

H High Tolerance
M Medium Tolerance
L Low Tolerance

FACU Facultative Upland - Usually occur in non-wetlands, however, occasionally found in wetlands.
FAC Facultative - Equally likely to occur in non-wetlands and wetlands.
FACW Facultative Wetland - Usually occur in wetlands, however, occasionally found in non-wetlands.
OBL Obligate Wetland - Almost always occur in wetlands.

Adapted from the Prince George's County Design Manual & the Center for Watershed Protection for the use of bioretention in Stormwater Management

Appendix G: Illicit- Discharge Compliance Statement

Illicit Discharge Compliance Statement

The owners of the land/responsible party will be responsible for prohibiting illicit discharges to the stormwater management system during construction and during its life of operation. The stormwater management system is comprised of the components for conveying, treating, and infiltrating stormwater runoff on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. An illicit discharge shall constitute any connection or discharge to the stormwater management system including, but not limited to, wastewater discharges, discharge of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Responsible Party*:

TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

* Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

_____ _____

Signature of Responsible Party Representative Date

_____ _____

Signature of Representative for Association** Date

**Required upon transfer of ownership

Appendix H: Low Impact Development Considerations

Low Impact Development Considerations

Proposed Commercial Building

Project Location:
Suffield Street
Agawam, Massachusetts
(Parcel I: Portion of parcel I4-1-4)

Applicant & Owner:
TCR Properties
c/o Mr. TJ Galis
1298 Suffield Street
Agawam, MA 01001

RLA Project File: 190615
January 6, 2023

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

Introduction

Per the Massachusetts Stormwater Handbook, project proponents must consider environmentally sensitive site design and low impact development techniques to effectively manage stormwater runoff. As part of the proposed project, the proponent has considered a number of environmentally sensitive, low impact development techniques to prevent the generation of stormwater and non-point source pollution. The proposed stormwater management system design was able to incorporate LID techniques such as country drainage via surface flow and a bioretention basin. The proposed stormwater management system has been designed to meet the Agawam Stormwater Management Ordinance requirements which dictate that specific criteria be met in regard to stormwater runoff in conjunction with the criteria set forth and required by the Massachusetts Stormwater Handbook.

The project applicant, TCR Properties, LLC, is proposing to construct a new commercial building and associated site improvements on a parcel which was partitioned from the original parcel with the address of 1298 Suffield Street in Agawam Massachusetts. This property has been historically cleared of mature vegetation and is currently vacant. There are various existing site improvements including a gravel yard area and vegetated lawn area. Adjacent resource areas include offsite bordering vegetated wetlands to the north, riverfront area, and an isolated wetland to the west. There is an existing yard-drain/catch-basin located along the right-of-way property line with Suffield Street which collects runoff from the southern portions of the site and connects to the drainage infrastructure in Suffield Street.

The proposed project involves the following:

1. Removal of on-site vegetation and gravel within the limit of work;
2. Construction of the new commercial building;
3. Construction of associated site improvements including access drives, parking areas, and landscaping;
4. Installation of underground utilities including sanitary sewer, electric, gas, and water services;
5. Construction of a stormwater management system including roof drain leaders and a bioretention basin.

Please refer to the Site Plan Set and Notice of Intent Filing plan for additional resource area information. Under proposed conditions, a stormwater management system has been designed to mimic the existing drainage patterns of the site while increasing water quality and attenuating peak stormwater flow rates through the use of MassDEP recommended stormwater BMPs. The proposed site improvements will maintain the general drainage patterns of the site by discharging runoff to

the same design points in post-development as pre-development conditions. Through the use of efficient site grading, most of the site will convey runoff from impervious areas via surface flow to a bioretention basin toward the frontage of the site. Additionally, all roof runoff is also being directed to the bioretention area for attenuation and groundwater recharge. The bioretention area has been designed to attenuate discharge from the 100-year storm event with an outlet control structure and discharge to via an existing catch basin structure toward the drainage infrastructure in Suffield Street.

This letter serves to describe the relationship between the requirements of the MassDEP Handbook and "environmentally sensitive site design" considerations as well as the analysis of alternatives to any "point source" of "stormwater discharge" which may be regulated. The following sections provide detailed descriptions for the consideration of low impact development measures as listed by the MassDEP.

Environmentally Sensitive Site Design Considerations

The Department's requirement for the inclusion of Environmentally Sensitive Site Design was considered as part of the design of the stormwater management system. These considerations include review of low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting stormwater sheet flow paths and treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat.

A. *Reducing impervious surfaces*

   All of the impervious surfaces are located outside of the 100-foot buffer. All impervious surfaces have been limited to the minimum amount functionally necessary to provide the access to the site improvements.

B. *Disconnecting stormwater sheet flow paths and treating stormwater at its source*

   The proposed stormwater management system has been designed to mitigate the impacts of the proposed site improvements. The relatively small nature of the site lends itself to treating stormwater near its source by utilizing the bioretention basin.

C. *Maximizing open space*

   The project site has historically been disturbed and vegetated with grass. Any areas not allocated for vehicular access or parking can be utilized as open space.

D. *Minimizing disturbance*

   The majority of the proposed project is located within a historically cleared and developed portion of the parcel. The amount of proposed disturbance has been limited to the minimum amount functionally necessary to construct the proposed site improvements.

E. *Protecting natural features and processes*
The majority of the proposed project is located within a historically cleared and disturbed portion of the parcel. The stormwater management system has been designed to mimic the existing drainage patterns of the site.

F. *Enhancing wildlife habitat*
Impacts to wildlife habitat are limited due to the nature of the location of the property in a previously altered setting within an industrial zone.

Point Source Stormwater Discharge Alternatives Analysis
Under the Department's Outreach Document for 310 CMR 10.05(6)(k) through (q) and 314 CMR 9.06(5) & (6)(a) through (f), a list of considerations is provided for use in developing an Alternatives Analysis to point source stormwater discharge within Departmental jurisdiction. In the case of the currently proposed project, the proposed discharge from the basin will be directed to the existing drainage infrastructure in Suffield Street, therefore no new point source discharges proposed as part of the stormwater management system.

For ease of review, the aforementioned list is repeated below in italics with responses after each item:

a. *Removal of all proposed work and/or impervious surfaces from the Department's jurisdiction;*
The location of wetland areas in relation to the existing site improvements are offsite to the north and only a small portion is located within the buffer zone. The site stormwater management system has been carefully designed such that runoff water quality is above MassDEP requirements.

b. *Division of the upper portion of the subject catchments into smaller subcatchments, where resultant stormwater discharges should be completely infiltrated and/or retained;*
The nature of the site being relatively small lends itself to complying with this item. The proposed impervious areas of the project have been directed toward the stormwater bioretention area which has been designed to treat and attenuate up to and including the 100-year storm event.

c. *Maintaining existing drainage patterns and not mixing country drainage with untreated stormwater;*

The intent of this item has been achieved with the proposed grading of the property and layout of the stormwater management system maintaining the existing drainage patterns of the site and utilizing surface conveyance of the runoff.

d. *Treatment of remaining stormwater at or proximate to its source within these subcatchments;*
The intent of this requirement has been achieved by the relatively small nature of the property.

e. *Installation of "qualifying pervious areas" to accept stormwater discharge from roads and driveways within each subcatchment;*
The proposed stormwater management system includes a bioretention area. The commercial nature of the proposed used did not lend itself to pervious pavement.

f. *Installation of dry wells for acceptance of roof drainage;*
As an alternative to conventional dry wells, roof runoff is directed towards the bioretention area with characteristics similar to that of a conventional dry well thereby achieving the intent of this item.

g. *Disconnection of roof drainage;*
Stormwater runoff created from roof areas will be discharged toward the bioretention basin.

h. *Installation of discrete structural Best Management Practices at relatively high elevations in each subcatchment;*
The relatively small nature of the site lends itself to meeting this item by being able to include a grassed channel and bioretention basin which collects runoffs close to its source.

i. *Further describe:*
    1. *Reduction in impervious surfaces;*
    All of the impervious surfaces are located outside of the 100-foot buffer.

    2. *Road width and length reductions;*
    The proposed drive aisles are at the minimum widths to safely provide access around the property.

    3. *Clustering of impervious surfaces;*
    The impervious surfaces are limited to the areas directly adjacent to the building and the access drives and cannot be further condensed for "clustering."

    4. *Addition of planted materials and landscaped areas;*

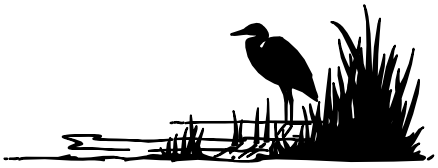
A detailed landscape plan has been prepared as part of the proposed site improvements.

5. *Re-grading of landscaped areas away from jurisdictional Resource Areas and their Buffer Zones; and*

   The general drainage patterns of the site have been maintained by the proposed site improvements and a stormwater management system has been designed to mitigate the impacts imposed by the development. The majority of the site is directed away from jurisdictional area.

6. *Preservation of vegetated areas within the Buffer Zone, and immediately proximate to jurisdictional resource areas.*

   The majority of jurisdictional area is located off-site and is currently previously cleared vegetated lawn area. Only a small portion on the property is located in buffer zone and will not be improved with impervious surfaces.



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS

Suffield Street | TCR Properties | DEP File #087-0688

1. This Order supersedes all previous Orders of Conditions issued for this work.

2. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

3. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

6. The Commission shall be notified at least seventy-two hours prior to the start of site work (including tree cutting or clearing).

7. The Commission shall be notified when the erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

8. The project engineer/designer shall be held responsible and accountable for the true and accurate implementation and construction of his/her design or plan. Should any accidental deviation from the approved plan occur, the engineer/designer shall notify the Commission immediately to determine of a new Notice of Intent is required. If any changes to the approved plan are anticipated, the engineer/designer shall likewise notify the Commission to determine if a new Notice of Intent is required. In any case the Commission may deny any deviation, accidental or intended, from the approved plan.

9. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

10. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

14. The construction site shall be left in a stable condition at the close of each day. Erosion

and sedimentation controls shall be continuously monitored to ensure proper operation.

15. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

19. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

    The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

27. Periodic maintenance/cleaning of the bioretention area shall be conducted by the owner and all successors in interest or control of the property. The applicant, his successors or assigns shall have the continuing responsibility of this maintenance.

29. Parcels abutting or containing wetland or resource areas shall carry the following restrictions, and a covenant so noted on each deed:

    "This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

30. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

32. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

33. The petitioner shall have recorded in the Hampden County Registry of Deeds an “Order of Conditions Form” provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

34. Stormwater features shall be maintained per stormwater standard #9. A log book of the

required maintenance activieis must be kept and made available for commission or MassDEP. This log book shall be submitted to the Commission every four months.

SUMMARY OF PLAN CHANGES FROM 2018 PROJECT

GENERAL

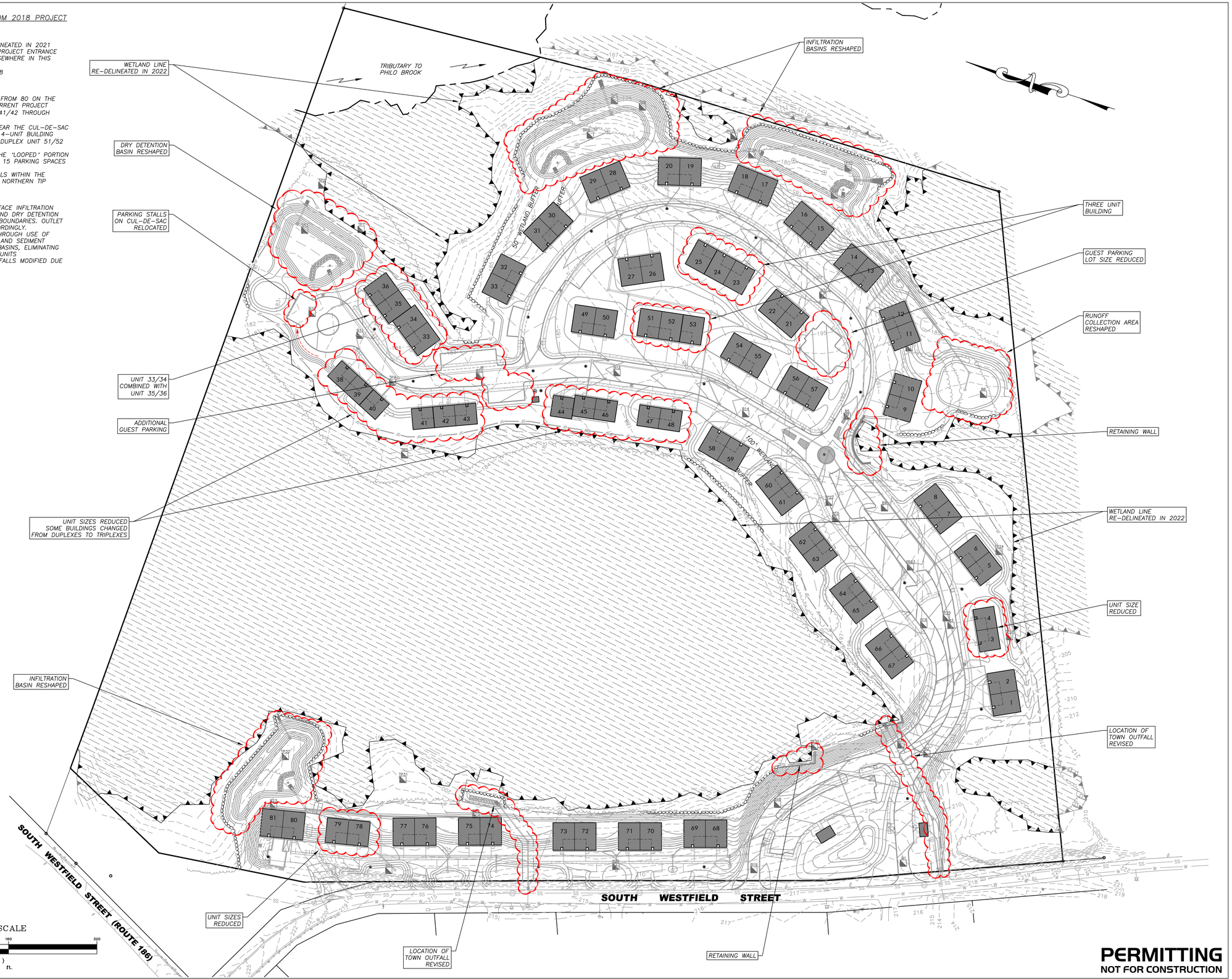
- WETLAND BOUNDARIES WERE RE-DELINEATED IN 2021
- OPEN-BOTTOM BOX CULVERT NEAR PROJECT ENTRANCE HAS BEEN ELIMINATED AS NOTED ELSEWHERE IN THIS LETTER (COMMENT 3)
- PROJECT DATUM CHANGED TO NAVD88

LAYOUT RELATED

- THE TOTAL NUMBER OF UNITS WENT FROM 80 ON THE 2018 PLAN TO 81 UNITS IN THE CURRENT PROJECT
- THE FOOTPRINT OF UNITS 3/4 AND 41/42 THROUGH 47/48 HAVE BEEN REDUCED
- DUPLEX UNITS 37/38 AND 39/40 NEAR THE CUL-DE-SAC HAVE BEEN COMBINED TO CREATE A 4-UNIT BUILDING
- AN ADDITIONAL UNIT WAS ADDED TO DUPLEX UNIT 51/52 TO CREATE A 3-UNIT BUILDING
- THE PARKING LOT LOCATED WITHIN THE "LOOPED" PORTION OF THE PROJECT WAS EXPANDED TO 15 PARKING SPACES FROM 14 SPACES
- THE LOCATION OF THE PARKING STALLS WITHIN THE CUL-DE-SAC WERE SHIFTED TO THE NORTHERN TIP

GRADING & DRAINAGE RELATED

- MODIFIED THE GRADING OF THE SURFACE INFILTRATION BASINS, RUNOFF COLLECTION AREA AND DRY DETENTION BASIN BASED ON REVISED WETLAND BOUNDARIES. OUTLET CONTROL STRUCTURES REVISED ACCORDINGLY.
- REQUIRED TSS REMOVAL ACHIEVED THROUGH USE OF DEEP-SUMP HOODED CATCH BASINS AND SEDIMENT FOREBAYS WITHIN THE INFILTRATION BASINS, ELIMINATING THE NEED FOR THE WATER-QUALITY UNITS
- LOCATION OF RE-ROUTED TOWN OUTFALLS MODIFIED DUE TO REVISED WETLAND BOUNDARY



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

PERMITTING
NOT FOR CONSTRUCTION

RLA

R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

SITE REVISION SKETCH

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
S-1	-

TOWN OF AGAWAM
Department of Public Works
1000 Suffield Street • Agawam, MA 01001
Tel (413) 821 0600 • Fax (413) 821 0631
Christopher J. Golba • Superintendent

MEMORANDUM

To:	Planning Board, R. Levesque Associates, Marc Strange – Planning Director
CC:	File
From:	Engineering Division
Date:	June 21, 2018
Subject:	Proposed Condominium Community Tirone/Depalma – 497 South Westfield Street – SP-555

As per your request, Engineering has reviewed the revised site plans for the proposed condominium community at #497 South Westfield Street, Agawam, MA, dated June 14, 2018, prepared by R. Levesque Associates, Inc. Based on our review, we have the following comments:

Traffic/Pedestrian:

1. A traffic study and trip generation study is required for this project. Due to the proposed future development in the area, a traffic signal may be warranted at South Westfield Street and Pine Street. Conduits will be installed as part of the upcoming project to minimize pavement disturbance when/if a new signal is installed. Per Mayor Sapelli, if a signal is warranted, the cost of the signal will be shared amongst the future developers in the area. Percentage of costs will be based on trip generation.
2. In accordance with the Agawam Complete Streets policy, the DPW is currently working on plans to install sidewalks from the intersection of South Westfield Street and Pine Street, continuing north past Route 57 and connecting to the existing sidewalk at Hendom Drive. This will improve pedestrian traffic and safety and provide better connectivity to Feeding Hills Center. In an effort to further improve connectivity to residents of South Westfield Street (including the residents at Soldier On), the DPW is requesting a sidewalk be installed within the town layout along the frontage of the condominium project (between units 67-80) on South Westfield Street.

Site Layout:

3. The driveway of units 59 & 60 exits directly into the proposed mini-roundabout. Engineering recommends the driveway be redesigned so that vehicles are not exiting directly into roundabout traffic.
4. Top of wall elevations for each unit should be noted on the site plans.
5. Engineering understands that the accessible parking space locations may need to change based on resident need. However, the total number of accessible spaces will need to meet the minimum requirements and shall be evenly spaced throughout the site at all times.
6. "Crosswalk Ahead" signs are recommended but not required for the mid-block crosswalks.
7. Individual DPW Driveway Permits will be required for each of the driveways on South Westfield Street.
8. Engineering will be working with the developer, Fire and Police Department on the address assignments for this project. For emergency purposes, it is likely that the units on South Westfield Street will need to have South Westfield Street addresses even if their mail is delivered to the community mailbox.

Stormwater:

9. There are proposed catch basins located at the end of the driveways of units 13 & 14, 25 & 26, 27 & 28, 45 & 46, and 53 & 54. These catch basins will require a flat basin top as opposed to a curb inlet. The Contractor shall provide a catch basin top detail without a curb inlet on the site plans.
10. Prior to the disturbance of any area in each phase, the Owner, Contractor, Town Engineer, and members of the Conservation Commission shall meet onsite to agree upon a location where fill and other materials will be stored as well as locations for each of the required temporary sedimentation basins and erosion control swales. No sedimentation basin shall be placed in an area where an infiltration basin, bio-retention pond or rain garden is proposed. The conservation commission may wish to require a tentative plan for sedimentation basin locations; however, these will likely need to be adjusted as the project progresses.
11. The level spreader is to be inspected during and after rainfall events to ensure proper construction. Reconstruction and possible re-design may be necessary if it is not functioning properly.
12. The Town of Agawam will need to have a legal right of entry to the property in order to maintain the municipal drainage system.
13. A comprehensive Operations & Maintenance Plan for the stormwater drainage system including all pipes, structures, outfalls, basins and rain gardens shall be made available to the Condominium Associates upon completion of construction. The O & M Plan is to include the names and contact information of all parties responsible for the maintenance of the drainage system.
14. According to the detention basin cross-section, the seasonal high groundwater elevation is above the bottom of the basin. Based on Greg Newman's review in 2013, extra care may be required during maintenance of this section of the pond to prevent stagnant water and mosquito breeding.
15. In 2013, Engineering commented on the condition of the existing municipal outfall near the proposed wildlife crossing. The pipe appeared to be in decent condition at that time, but was impacted by several adjacent trees. Engineering has not had an opportunity to recently inspect the outfall. It is requested that the contractor be allowed to remove all trees (sumac) and other vegetation that may compromise the pipe in the easement. Engineering may have additional comments on this issue after a site inspection has been completed.

Water/Sewer:

16. The Deputy Superintendent of Water and Sewer would like the proposed water main in front of units 79 & 80 to either be looped or a metered auto flushing device be installed at the end of the line.
17. The following details will need to be submitted for review prior to construction: Sewer pump station (with venting, back-up generator, and emergency notice), a detail for the proposed sewer transition manhole location and venting detail.

Other:

18. Engineering will work with the developer during construction to ensure there is adequate overhead street lighting on South Westfield Street in this project location.

Engineering may have additional comments if any new information is provided. If you have any questions, please do not hesitate to contact us.

Sincerely,

Michael F. Albro, P.E.
Assistant Town Engineer

Michelle C. Chase, P.E.
Town Engineer

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Long-Term Operation & Maintenance Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Roadway to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Deep-Sump Catch Basins	Four times per year	Four times per year	• Remove sediment once deposits reach one half the depth from the bottom sump to the lowest invert.
Leaching Drywell	Once per year	As needed	• Remove debris and sediment when the drywell in 50% filled. Rehabilitate drywell if it fails due to clogging
Stormwater Piping	Once per year	Once per year	• Inspect pipe entrances in catch basins and manholes and remove any blockages
Water Quality Unit*	As specified by the manufacturer	As specified by the manufacturer	• Clean the unit using the method specified by the manufacturer. Vactor trucks are typically used to clean these units.
Sediment Forebay	Monthly	Four times per year	• Remove sediment when it reaches six inches; • Mow the grass to no less than 3 inches and no greater than 6 inches; • Replace vegetation damaged during sediment removal.
Surface Infiltration Basin	• After every major storm for the first three months; • Twice per year thereafter.	Twice Per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of the turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris.

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Dry Detention Basin	• After every major storm event for the first three months; • Twice per year thereafter	Twice per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris
Flared End Section	Four times per year	As Needed	• Remove any debris or vegetation around the flared end section such that flow out of the structure is not impeded.
Level Spreader	Once per month and after every major storm event	As needed	• Remove debris and sediment • Rill damage to be repaired and re-vegetated • Replace rotted or broken timbers
Bio-Retention Areas	Once per month	Twice per year (Spring and Fall)	• Inspect bio-retention areas for sediment build-up, structural damage, and standing water; • Inspect and repair eroded areas monthly; • Re-mulch void areas as needed; • Remove litter and debris monthly; • Treat diseased or distressed vegetation as needed; • Remove and replace dead vegetation twice per year (Spring and Fall); • Remove invasive species as needed; • Replace mulch every two years.

*See attached Device Operation and Maintenance Guides

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Heavy-duty stormwater drain manhole covers and catch basin grates have been designed to withstand H20 loading;

C. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

D. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$50	22	$4,400
Yard Drains	4/year	$50	15	$3,000
Sediment Forebay	2/year	$50	4	$400
Surface Infiltration Basin	2/year	$75	3	$450
Dry Detention Basin	2/year	$75	1	$150
Water Quality Unit	2/year	$100	1	$200
Bio-Retention Areas	12/year	$50	1	$600
Total Estimated Annual Cost of Inspections				$9,200

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$100	22	$8,800
Yard Drains	4/year	$100	15	$6,000
Sediment Forebay	2/year	$250	4	$600
Surface Infiltration Basin	2/year	$500	3	$2,000
Dry Detention Basin	2/year	$500	1	$1,000
Bio-Retention Areas	2/year	$500	1	$1,000
Water Quality Unit	2/year	$800	1	$800
Total Estimated Annual Cost of Maintenance				$20,200

*All above costs are estimates to be used for permitting purposes only. Actual maintenance costs are to be ascertained by the responsible party

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 1 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Deep-Sump Catch Basins	Sediment has accumulated to a depth greater than the original design depth for sediment storage, approximately 2-feet of sediment.	Remove the sediment and dispose of in accordance with local and state regulations.			
Stormwater Piping	Blockage of inlet/outlet pipes due to debris or sediment accumulation.	Remove any debris and sediment via proper means. Dispose of debris/sediment in accordance with local & state regulations			
Roof Leaders	Downspout connections have been damaged or disconnected.	Repair and reconnect downspout connections.			
	Roof leaders are surcharging at the downspout connections	Open and insepct at cleanout locations and remove any blockages.			
Surface Infiltration Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Level Spreader	Debris or sediment has collected in level spreader	Remove debris or sediment			
	Rills have developed downstream of level spreader	Repair rill damage and re-vegetate area			
	Timbers are broken or rotted	Replace timbers			

Inspector's Signature

Date

Project: _____ Responsible Party: _____

Address: _____ Date: _____

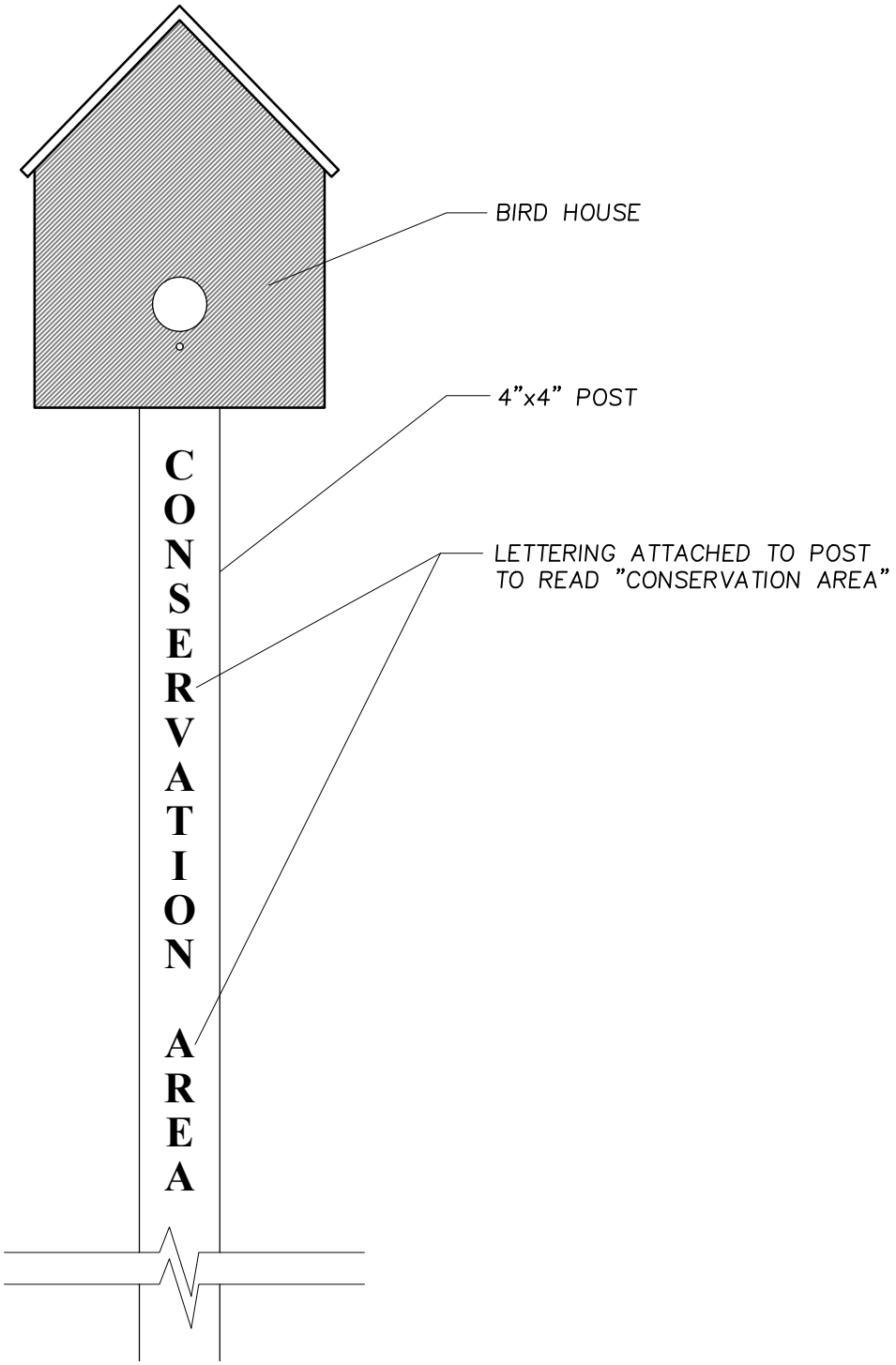
BPM Name: _____ Page: 2 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Dry Detention Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Flared End Sections	Vegetation has started to grow within the riprap area.	Remove vegetation immediately.			
	Accumulation of sediment/debris at the culvert inlet.	Remove sediment or debris such that the culvert has free flow.			
	Erosion is occuring where riprap has been dislodged.	Remedy scoured area and replace riprap immediately.			
Bio-Retention Areas	Sediment has accumulated over mulched surface.	Remove sediment and mulch mixture and replace mulch.			
	Erosion has occurred at inlets.	Repair any eroded areas and replace with appropriate materials.			
	Areas are devoid of mulch.	Replace mulch as necessary.			
	Litter and/or debris has accumulated in bio-retention area.	Remove litter and/or debris.			
	Vegetation has died or is distressed.	Replace vegetation as necessary.			
Water Quality Unit	Sediment has accumulated to a depth greater that the original design depth for sediment storage.	Remove sediment and disposed of in accordance with local and state regulations.			

_____ _____

Inspector's Signature Date



WETLAND MARKER POST DETAIL

NO SCALE

R Levesque Associates

Proposed Condominium Community
497 South Westfield Street – Agawam, MA
November 9, 2022

NOTES

1.) PROPERTY LINES SHOWN HEREON ARE BASED UPON A PLAN PREPARED BY D.L. BEAN, INC. FOR RALPH DEPALMA ET. AL. DATED MARCH 21, 2005.

2.) THE PREMISES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATION AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.

3.) THE WETLANDS SHOWN HEREON WERE FLAGGED BY R LEVESQUE ASSOCIATES, INC. IN FALL 2009.

4.) SUBSURFACE DRAIN LINE LOCATIONS ARE ASSUMED BASED UPON SURFACE LOCATIONS AND SHALL BE VERIFIED BY CONTRACTOR.

5.) WETLAND FLAG LOCATIONS, EXCEPT FOR "B" FLAGS, WERE LOCATED BY R LEVESQUE ASSOCIATES, INC. USING INSTRUMENT SURVEY DURING THE FALL OF 2009.

6.) WETLAND FLAG LOCATIONS "B1" THROUGH "B16" ARE REFERENCED FROM TIGHE AND BOND DRAWINGS TITLED "PHASE I SOUTHWEST AREA SEWER EXTENSION PROJECT" DATED JUNE 2009. WETLAND FLAG LOCATIONS ARE ACCEPTED AS PREVIOUSLY APPROVED BY THE AGAWAM CONSERVATION COMMISSION.

7.) UNDERGROUND UTILITY LOCATIONS SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO FINAL DESIGN AND/OR CONSTRUCTION.

8.) THE CONTOUR ELEVATIONS SHOWN HEREON ARE BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC. IN APRIL 2010 BASED ON NAVD 88.

9.) LOCATION OF WATER LINE IN SOUTH WESTFIELD STREET TAKEN FROM A PLAN TITLED "SOUTHWEST AREA SEWER EXTENSION PROJECT FOR DEPARTMENT OF PUBLIC WORKS" PREPARED BY TIGHE AND BOND, DATED JUNE, 2009.

BENCHMARKS

T.B.M.–1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 590 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION – 216.57

T.B.M.–2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION – 219.61

T.B.M.–3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION – 224.33

N/F
MATTHEW & ELIZABETH I. WANIEWSKI
2607/384

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

PERMITTING

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

CONSERVATION FILING PLAN
OVERALL SITE GRADING

497 South Westfield Street
Map 66, Block 2, Lot 8
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
2/10/22

PREPARED FOR:

Joe Tirone & Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: February 10, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
CC-1	-

SHORT–TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF–SITE SEDIMENTATION IF DEEMED NECESSARY BY ON–SITE INSPECTION.
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4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24–HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.
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CONSTRUCTION SEQUENCE

1. CONTACT THE TOWN OF AGAWAM AT LEAST FORTY–EIGHT HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. CONSTRUCT ANTI–TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
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5. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
6. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
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8. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
9. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
10. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
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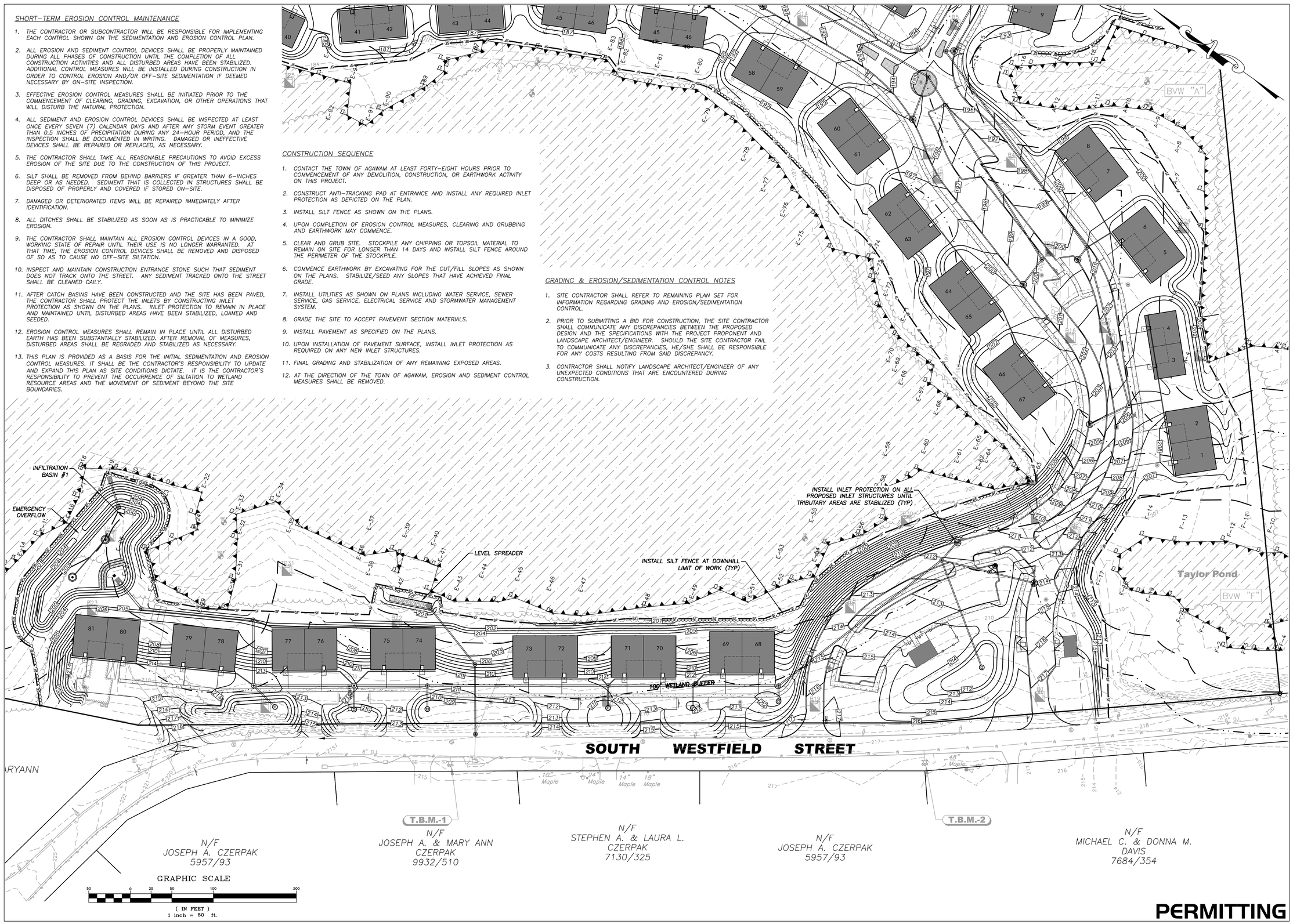
12. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

GRADING & EROSION/SEDIMENTATION CONTROL NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING GRADING AND EROSION/SEDIMENTATION CONTROL.
2. PRIOR TO SUBMITTING A BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
3. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT/ENGINEER OF ANY UNEXPECTED CONDITIONS THAT ARE ENCOUNTERED DURING CONSTRUCTION.



PERMITTING

RLA

R LEVESQUE ASSOCIATES INC

Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

ph: 413.568.0985 fax: 413.568.0986

40 School Street
Westfield, MA 01085

rlaland.com

CONSERVATION FILING PLAN
SITE GRADING, DRAINAGE & EROSION CONTROL
(Southwesterly Section)

497 South Westfield Street
Map 66, Block 2, Lot 8
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
6/10/22

PREPARED FOR:

Joe Tirone & Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: February 10, 2022

REVISIONS:	DATE:

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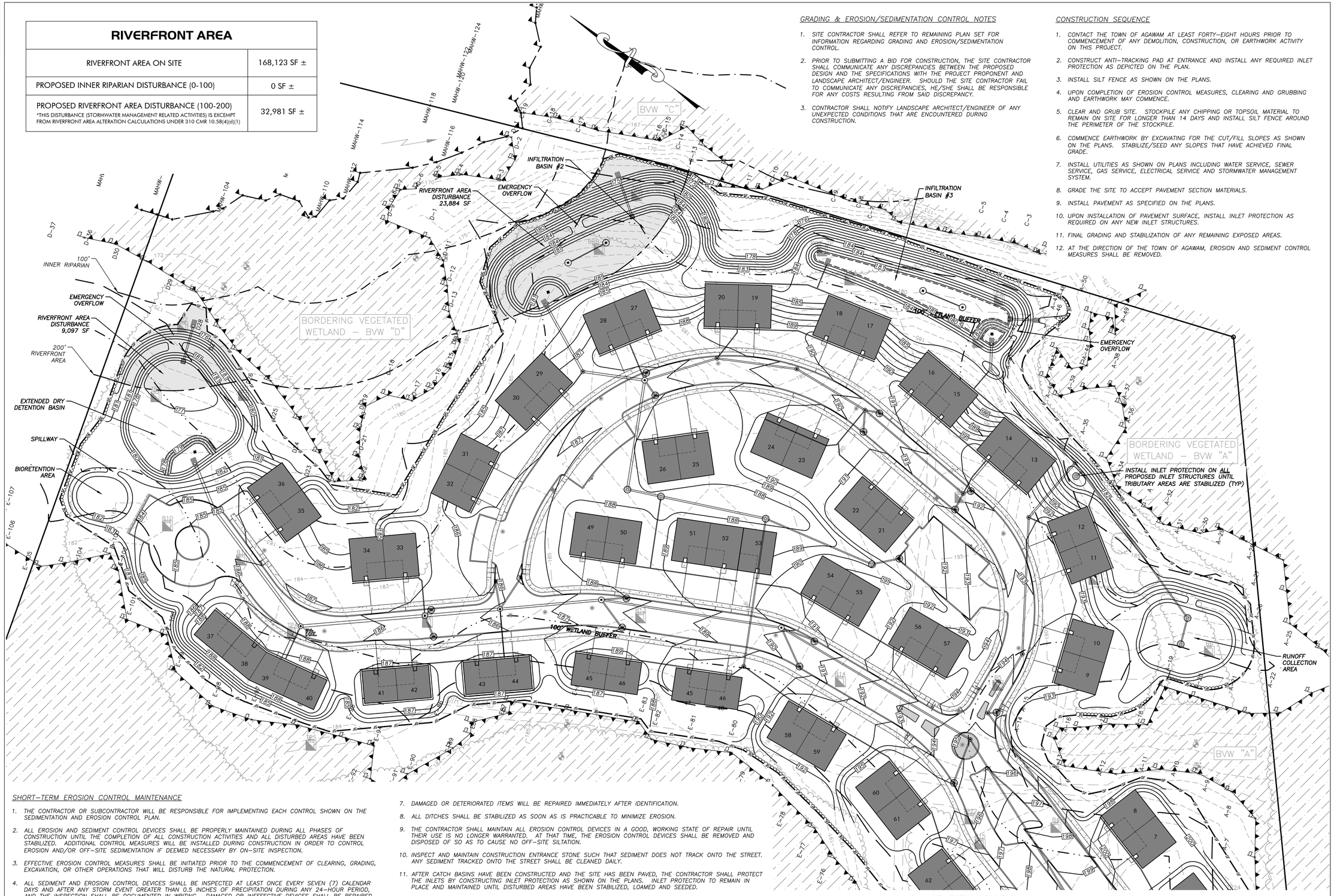
SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
CC-2	-

RIVERFRONT AREA	
RIVERFRONT AREA ON SITE	168,123 SF ±
PROPOSED INNER RIPARIAN DISTURBANCE (0-100)	0 SF ±
PROPOSED RIVERFRONT AREA DISTURBANCE (100-200) *THIS DISTURBANCE (STORMWATER MANAGEMENT RELATED ACTIVITIES) IS EXCEMPT FROM RIVERFRONT AREA ALTERATION CALCULATIONS UNDER 310 CMR 10.58(4)(d)(1)	32,981 SF ±



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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PERMITTING

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40 School Street
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CONSERVATION FILING PLAN
SITE GRADING, DRAINAGE & EROSION CONTROL
(Northwesterly Section)

497 South Westfield Street
Map 66, Block 2, Lot 8
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. GRAVO
CIVIL
NO. 55376
REGISTERED PROFESSIONAL ENGINEER
2/10/22

PREPARED FOR:

Joe Tirone & Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: February 10, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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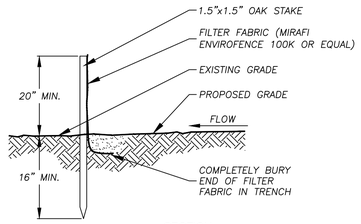

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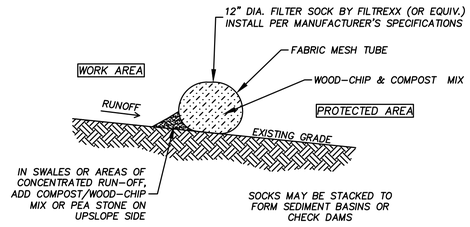

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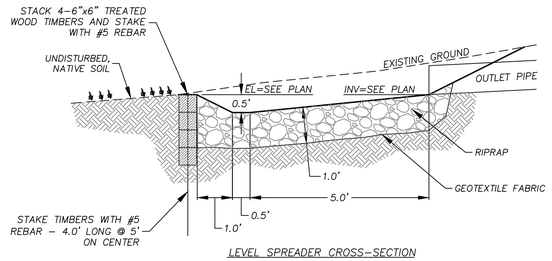

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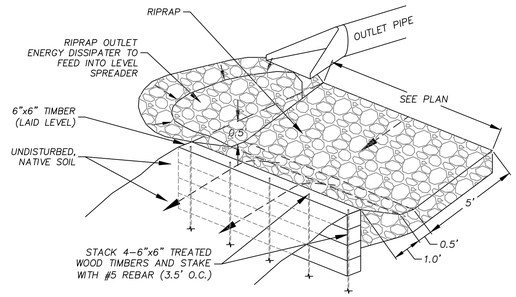
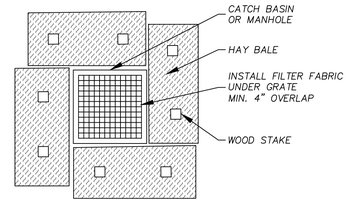


NOTES

1. LEVEL SPREADER SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
2. CONSTRUCTION OF LEVEL SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
3. CONSTRUCT SPREADER WITH LIP AT EXISTING GRADE AS SPECIFIED.
4. DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

LEVEL SPREADER DETAIL

NO SCALE

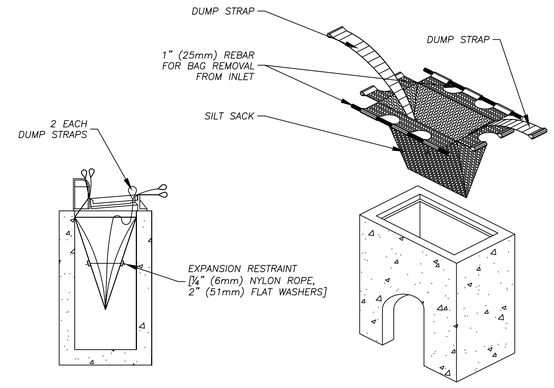


NOTE

INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.

INLET PROTECTION - HAY BALES

NO SCALE



INLET PROTECTION - SEDIMENT FILTER SACK

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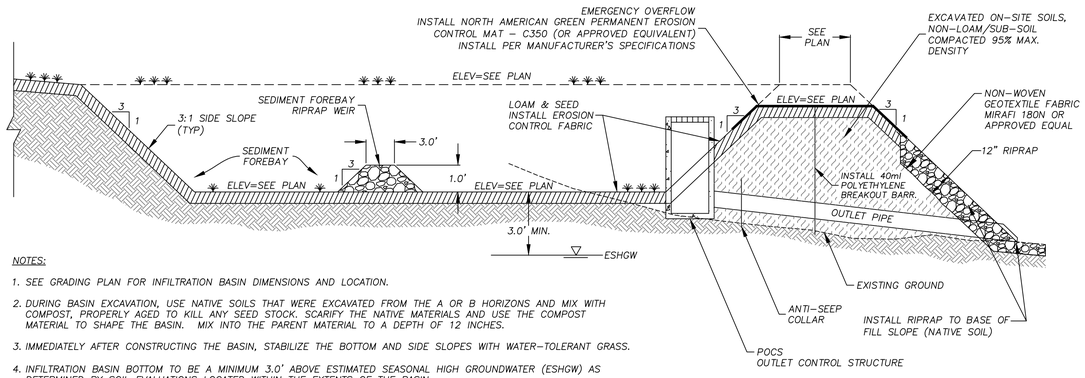
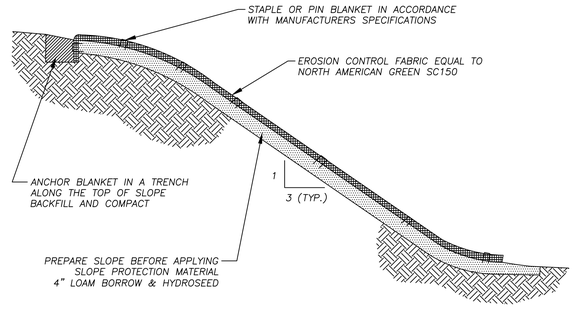


NOTES:

1. SEE GRADING PLAN FOR INFILTRATION BASIN DIMENSIONS AND LOCATION.
2. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
3. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER-TOLERANT GRASS.
4. INFILTRATION BASIN BOTTOM TO BE A MINIMUM 3.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW) AS DETERMINED BY SOIL EVALUATIONS LOCATED WITHIN THE EXTENTS OF THE BASIN.

GENERIC SECTION THROUGH SURFACE BASIN

NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION

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EROSION CONTROL DETAILS

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e/a/az

PREPARED FOR:

Joe Tirone & Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: February 10, 2022

REVISIONS:	DATE:

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NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE RALPH DEPALMA & GIUSEPPE TIRONE. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 14554 PAGE 323.
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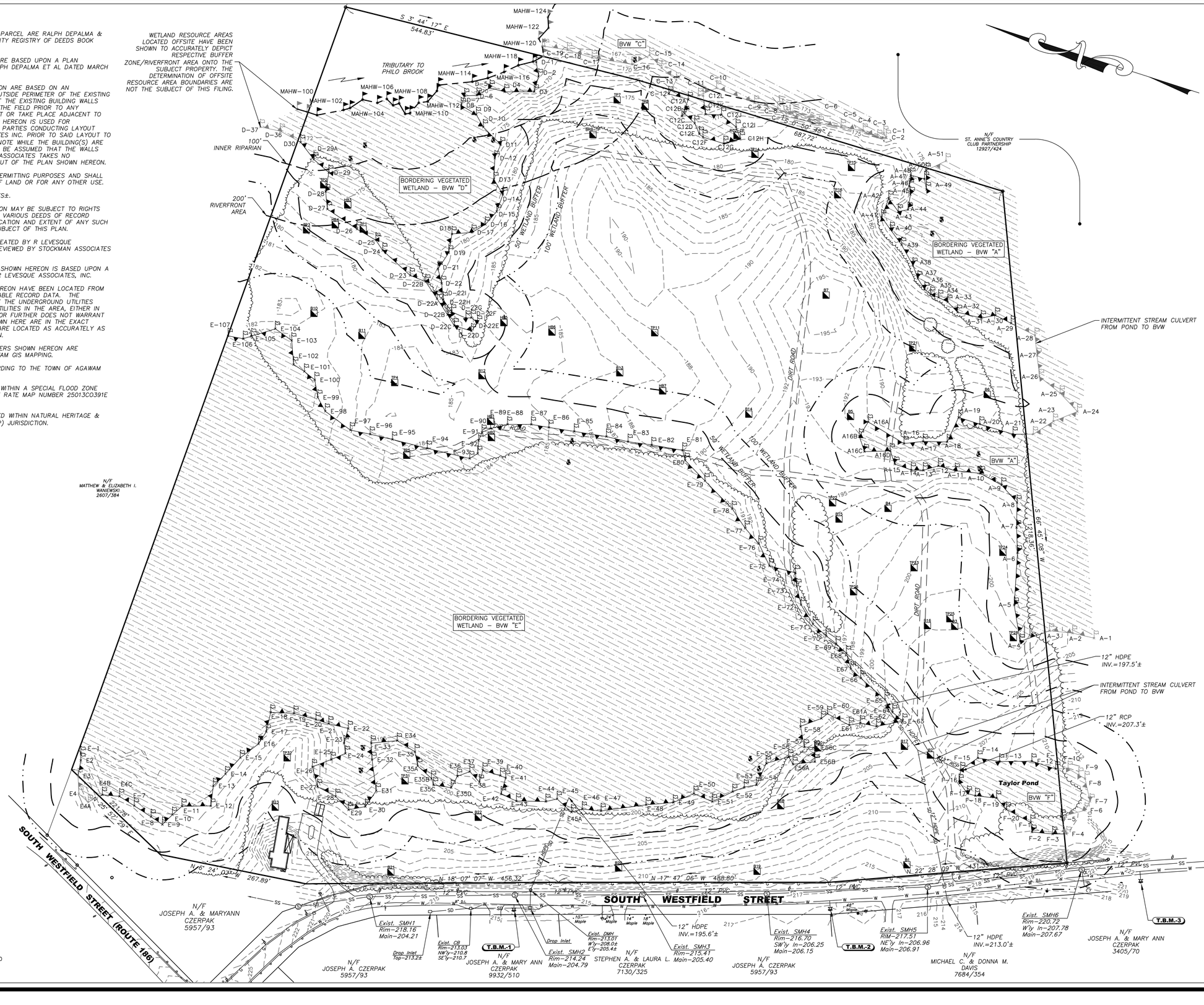

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WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 39610
REGISTERED LAND SURVEYOR

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

REVISIONS:	DATE:
A. Wetland Peer Review	6/17/22
B. Wetland Peer Review	6/22/22
C. Wetland Peer Review	7/26/22

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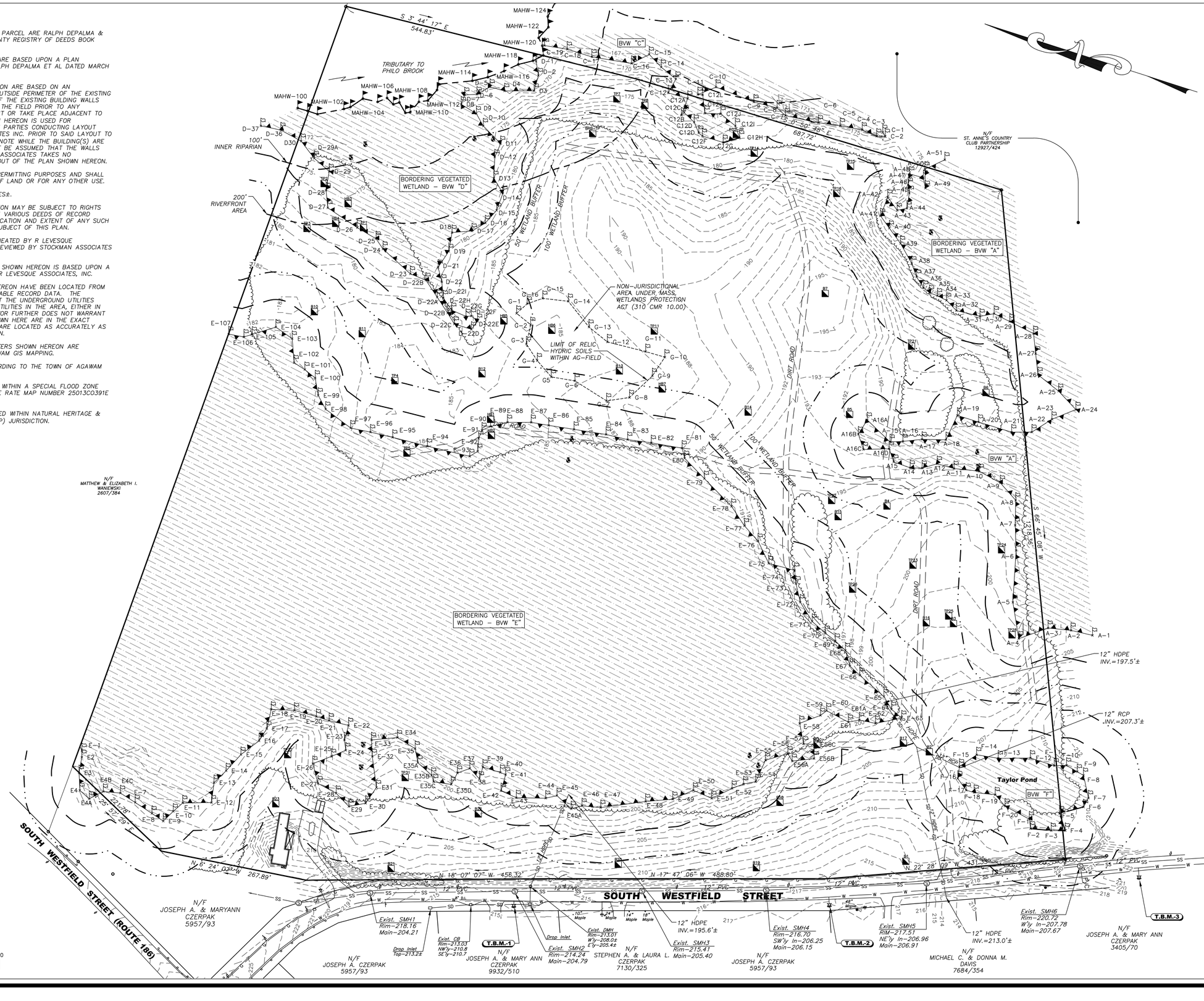

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WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 39610
REGISTERED LAND SURVEYOR

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022	
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B. Wetland Peer Review	6/22/22

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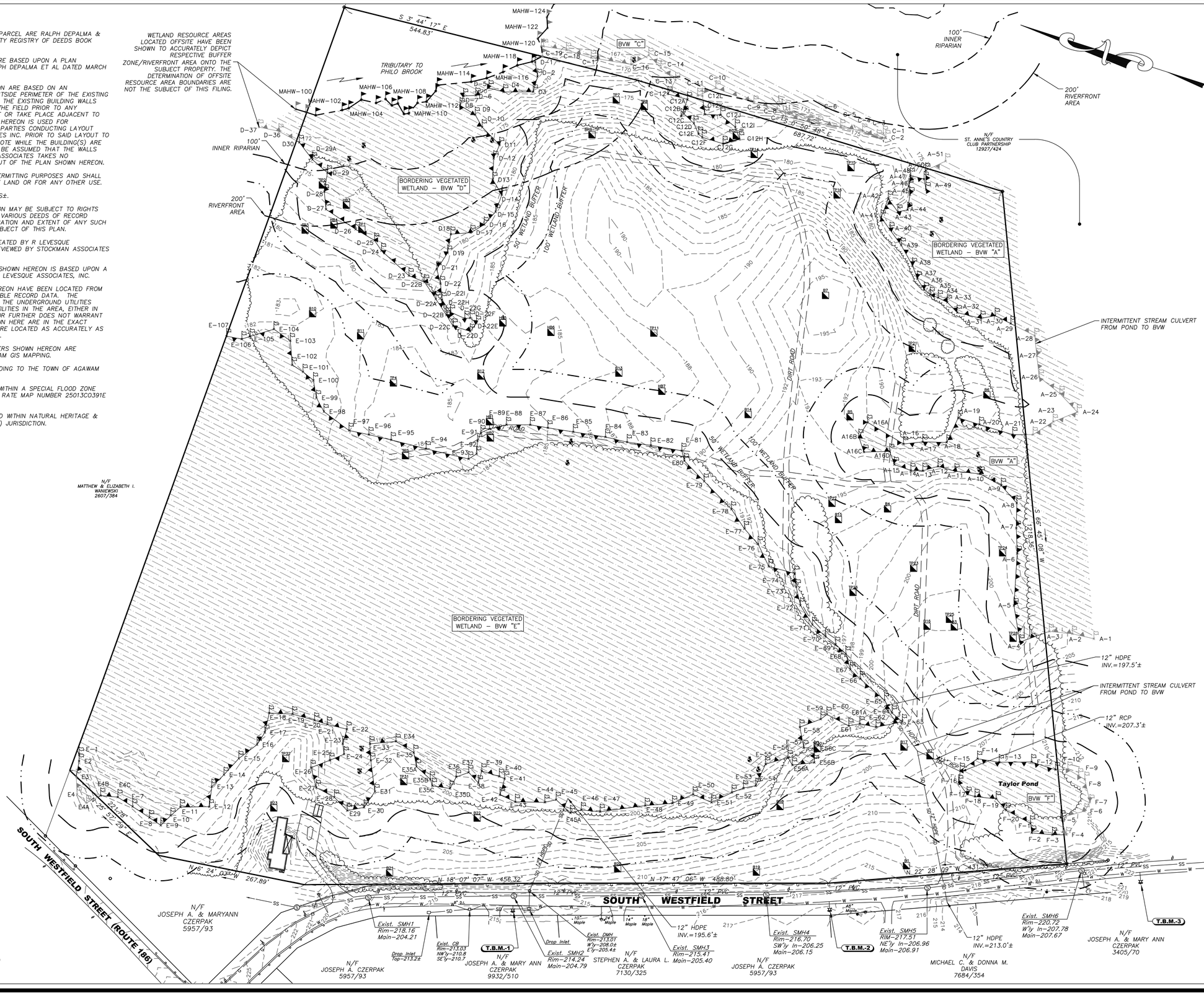

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MARC E. SHUTE No. 39610 REGISTERED LAND SURVEYOR COMMONWEALTH OF MASSACHUSETTS

PREPARED FOR:

Joe Tirone
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36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

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C. Wetland Peer Review	7/26/22
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Stormwater Drainage Report

Proposed Condominium Community

497 South Westfield Street
Agawam, MA 01030
(Map E6, Block 2, Parcel 8)



Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

RLA Project File No. 090506
February 10, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

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APPENDIX I: LOW IMPACT DEVELOPMENT CONSIDERATIONS

I. INTRODUCTION

The project applicants, Ralph Depalma & Giuseppe Tirone, are proposing to construct an 81-unit condominium community on approximately 49.81 acres of land located at 497 South Westfield Street in Agawam, Massachusetts. A majority of the site is currently composed of agricultural land with the exception of wooded wetlands in the central portion of the property and wetlands located along the property boundaries. Currently, there is no stormwater management system at the project site.

The proposed project involves the following:

- Demolition of an existing single-family home and detached garage;
- Rerouting of two drainage outfalls that currently discharge onto the subject property. One collects runoff from South Westfield Street and the other captures runoff from a property on the west side of South Westfield Street and reaches the subject property via a culvert under the roadway;
- Construction of approximately 3,930 feet of roadway from the east side of South Westfield Street to provide access to 66 of the units. The remaining 14 units well have access directly from South Westfield Street;
- Construction of forty (40) new duplex condominium buildings for a total of eighty (81) units;
- Installation of underground water, sanitary sewer, electric, gas and communication utility services;
- Construction of a stormwater management system including deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, extended dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay.

The new drainage infrastructure has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

2. SITE DESCRIPTION

2.1 Predevelopment Conditions

The property to be developed is located at 497 South Westfield Street and is listed as parcel E6-2-8 by the Town of Agawam Assessor's office. The property is zoned Residence A-3 according to the Agawam zoning map. The project site is bounded by St. Anne's Country Club to the south and east, undeveloped agriculturally zoned land to the north and South Westfield Street to the west. The total parcel area is approximately 49.81 acres. There are four bordering vegetated wetlands present along the northern, eastern, and southeastern property lines and one centrally located bordering vegetated wetland that extends to the northerly property line. Philo Brook crosses through the property boundary in the northeastern-most corner of the site. A portion of Taylor Pond is located along the southerly property line adjacent to South Westfield Street. A town drainage outfall currently discharges to the project site and runoff from agricultural fields on the opposite side of South Westfield Street is conveyed to the subject parcel via a culvert pipe under the roadway. Figure 1 – USGS Map illustrates the location of the parcel. The project site is currently in agricultural use and consists almost entirely of tilled fields with a single-family home and accessory building.

In general, the topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the site. The highpoint of the site is along South Westfield Street which ranges in elevation from 215 to 221. From there the topography gradually slopes in an easterly direction toward Philo Brook at approximately elevation 170. Figure 4 – Pre-Development conditions delineates the pre-development sub-catchments areas.

2.2 Resource Areas

The project site contains a number of resource areas, including several bordering vegetated wetlands and bank associated with a tributary to Philo Brook. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various resource areas.

2.2.1 Floodplain

R. Levesque Associates, Inc. performed due diligence research on the property regarding FEMA flood zone mapping. As demonstrated by the most recent FEMA Flood Insurance Rate Maps, the property is not located within any flood hazard area. See Figure 2 – FEMA FIRM Map.

2.2.2 Natural Heritage and Endangered Species Program

R. Levesque Associates, Inc. performed due diligence research on the property regarding Natural Heritage and Endangered Species Program (NHESP) areas. The parcel is not located within an area delineated by NHESP as priority habitat of endangered species; see Figure 3 – NHESP Map.

2.3 Soils

R. Levesque Associates, Inc. researched the soils located on site with information readily available by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Based on a review of the USDA Soil Survey of Hampden County, Massachusetts, Central Part, the site is comprised of the following soil types:

Table 2.4: Hydrologic Soil Group Classification

Soil Description	Map Unit Symbol	Hydrologic Soil Group
Raynham silt loam	30A	C/D
Wareham loamy sand	32A	A/D
Merrimac fine sandy loam	254A/254B	A
Windsor loamy sand	255B	A
Amostown fine sandy loam	258B	C/D
Enfield silt loam	264B	B
Agawam fine sandy loam	275B	B
Ninigret fine sandy loam	276B	C
Meckesville loam	327B/327C	D
Wethersfield fine sandy loam	397B	C
Enosburg loamy sand	731A	C/D
Scantic variant silt loam	736A	C/D

A series of test pits were conducted by Terry Reynolds (S.E. 3090) and Gary Weiner (S.E. 2567) to evaluate the ability of the site to support stormwater drainage system components. A total of twelve test holes were dug in the vicinity of the proposed surface infiltration basins and extended dry detention basin. The following test holes were performed near the BMP indicated:

- Surface Infiltration Basin #1 TP-32
- Surface Infiltration Basin #2 RG2-TP, RG-4, TP-14, TP-15, TP-16
- Surface Infiltration Basin #3 BRB-1, BRB-TP, TP-7
- Extended Dry Detention Basin TP-1, TP-2, TP-3

See Appendix B - Soils Information for supplemental information. Overall, on-site soil investigations corroborated USDA-NRCS mapping.

2.4 Post Development Conditions

The applicant is proposing to construct an 81-unit condominium community on the easterly side of South Westfield Street. Sixty-six of the units will be accessed by roughly 3,930 feet of new roadway while the remaining 14 will be accessed directly from South Westfield Street. The project will also include the installation of underground sanitary sewer, water, gas, and communication lines. In addition, a stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook. The proposed stormwater management system consists of deep-sump hooded catch basins, underground piping, a bioretention area with vegetated filter strip, an extended dry detention basin, and multiple surface infiltration basins with a sediment forebay. A proprietary sedimentation device will be added to improve the water quality of runoff from South Westfield Street that currently discharges to the project site untreated.

The stormwater management system has been designed to reduce the peak discharge rates from the 2, 10, and 100-year storm event. The bioretention area and surface infiltration basins have been designed to provide the required water quality treatment as well as infiltrate the required recharge volume for the impervious area proposed. Overall, the proposed site improvements will maintain the general drainage patterns of the site while improving water quality and reducing flow rates. Figure-5 – Post-Development Watershed Plan delineates the sub-catchment areas. This system has been designed to meet or exceed the standards required by the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

3. STORMWATER MANAGEMENT SYSTEM

R. Levesque Associates, Inc. has prepared the following drainage system calculations for the proposed project site. These calculations were performed to document compliance with the guidelines set forth by the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook (MassDEP Handbook). A detailed hydrologic analysis of the system was completed in order to evaluate the performance of the stormwater management system components. The proposed stormwater management system will collect runoff from on-site impervious areas and utilize stormwater best management practices to provide water quality treatment, groundwater recharge, and peak discharge rate attenuation. See Appendix C - Pre- and Post-Development Hydrologic Analysis for supplemental information.

3.1 Drainage Calculations

R. Levesque Associates, Inc. utilized the HydroCAD software program, Version 10.0, developed by HydroCAD Software Solutions LLC, in order to model and analyze the site hydrology. The HydroCAD software is based upon the Soil Conservation Service (SCS) "Technical Release 20 – Urban Hydrology for Small Watersheds" and "Technical Release 55 – Urban Hydrology for small Watersheds" which are generally accepted industry standard methodologies. The analysis was conducted in order to establish the peak discharge rates and estimated run-off volume from the project site. This was accomplished to properly evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters. Pre-development time of concentration (Tc) values were calculated based on existing site conditions. The minimum recommended time of concentration of six minutes was used in Post-Development calculations.

Drainage calculations were performed for pre and post-development conditions for the 24-hour, 2, 10, and 100-year Type III storm events. The total rainfall for each of the storm events was based upon data provided by the United States Department of Commerce Technical Paper No. 40 – Rainfall Frequency Atlas of the United States. Total rainfall values used in the hydrologic modeling for each event are shown in the following table:

Table 3.1: Design Rainfall Data

2-year, 24-hour storm	10-year, 24-hour storm	100-year, 24-hour storm
3.00 inches	4.60 inches	6.50 inches

3.1.1 Design Points

In order to compare the difference between pre and post-development peak flows, existing and proposed watersheds were delineated. Multiple design points (DP) were established with flow paths representing the longest time of concentration of run-off in each tributary watershed. For this analysis, the design points were determined as follows:

- DP-1: Onsite Wetland – This design point represents the destination for stormwater runoff from the project area which flows to the centrally located wetland;
- DP-2: Offsite to Southeast – This design point represents the destination for stormwater runoff from the project area which flows in a southeasterly direction towards an on-site bordering vegetated wetland;
- DP-3: Offsite to Northeast – This design point represents the destination for stormwater runoff from the project area which flows in a northerly direction towards the perennial stream known as a tributary to Philo Brook.

3.1.2 Pre-Development Hydrology

The project area under existing conditions was analyzed as five sub-catchment areas discharging to the three design points as described above. The sub-catchments were delineated based on existing site topography. For further watershed detail please see Figure 4 titled "Pre-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.3 Post-Development Hydrology

The project area under proposed conditions was broken down into sixteen sub-catchments discharging to the same three design points as in pre-development conditions. For further watershed detail please see Figure 5 titled "Post-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.4 Peak Discharge Rates

The table below summarizes the Pre and Post-Development peak discharge rates for each Design Point:

Table 3.1.4 Pre- and Post-Development Peak Discharge Rates						
	2-year storm (cfs)		10-year storm (cfs)		100-year storm (cfs)	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Design Point 1	2.9	2.8	11.0	9.4	23.7	19.0
Design Point 2	3.3	3.0	8.7	6.6	16.2	11.6
Design Point 3	9.3	9.2	20.2	16.9	34.2	29.5

As depicted in the table, the post-development peak discharge rates do not increase over pre-development peak discharge rates for each of the storm events presented. This is accomplished by provided on site attenuation through the proposed extended dry detention basin, bioretention area and multiple surface infiltration basins.

3.2 Hydraulic Analysis

R. Levesque Associates, Inc. utilized the Hydraflow Storm Sewer Extension for AutoCAD Civil 3D 2020 software program developed by Autodesk, Inc., in order to analyze the hydraulic capacity of the proposed underground infrastructure. The analysis was conducted in order to verify that the proposed conveyance piping has sufficient capacity to convey up to and including the 24-hour, 100-year storm event. The data from the analysis was used to properly size the conveyance piping such that there is no surcharge of stormwater above the rim elevations within the paved areas. As part of the input parameter required for the hydraulic analysis, the tributary inlet areas were delineated based on topography and any additional connected discharges. Additionally, the characteristic land use coverages and flow paths were identified. Please refer to Appendix D for the hydraulic analysis of the proposed stormwater management system.

3.3 MassDEP Stormwater Management Standards

R. Levesque Associates, Inc. has designed the proposed stormwater management system to be in compliance with the MassDEP Stormwater Management Standards. Chapter 1, Volume 3 of the MassDEP Handbook outlines specific calculations, and other information, that must be submitted

with each report to document compliance. The following summary highlights elements of the proposed project and how they apply to each standard.

- *Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

  The proposed project provides water quality treatment to the guidelines of the MassDEP Handbook. Therefore, no new untreated stormwater is discharged.

- *Standard #2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

  The proposed stormwater management system has been designed such that the post-development peak discharge rates are less than the pre-development discharge rates for the 2-year, 10-year, and 100-year 24-hour storms. See Appendix C for the Hydrologic Analysis.

- *Standard #3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook.*

  The proposed stormwater management system has been designed with the capacity to infiltrate the required recharge volume. See Appendix E for the Required Recharge Volume Calculations.

- *Standard #4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. It is presumed that this standard is met when:*

  a. Suitable practices for source control and pollution prevention are identified in a long term pollution prevention plan, and thereafter are implemented and maintained;

  b. Structural stormwater BMPs practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

  c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

  The drainage design utilizes multiple systems to manage the stormwater runoff and provide the necessary water quality treatment. The treatment train for the first system tributary to

Design Point-1 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. The system tributary to Design Point-2 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. There are two separatee systems tributary to Design Point-3. One includes deep-sump hooded catch basins and surface infiltration basin with sediment forebay. The other includes a bioretention area with vegetated filter strip and an extended dry detention basin with sediment forebay. A proprietary sedimentation device will be added to the South Westfield Street drainage infrastructure prior to discharge to the project site in order to meet water quality standards. See Appendix E for the Water Quality Volume Calculations.

- *Standard #5 - For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by MassDEP to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

  This standard is not applicable.

- *Standard #6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater BMPs determined by MassDEP to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

  This standard is not applicable.

- *Standard #7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural BMPs requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

  This standard is not applicable.

- *Standard #8 – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention) shall be developed and implemented.*

  A Construction Period Erosion Control Plan has been provided in Appendix F.

- *Standard #9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

  A Long-term Operation & Maintenance Plan has been provided in Appendix G.

- *Standard #10 - All illicit discharges to the stormwater management system are prohibited.*

  An illicit discharge statement will be provided prior to discharge of stormwater to post-construction BMPs. See Appendix H for a copy of the Illicit Discharge Statement.

3.4 Stormwater Best Management Practices

The proposed stormwater management system was designed utilizing stormwater best management practices (BMP) as set forth by the MassDEP Handbook. The BMPs utilized as part of the stormwater management system include deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, a bioretention area, an extended dry detention basin and surface infiltration basins. All of the BMPs were designed to meet the requirements of the MassDEP Handbook and will provide water quality treatment, groundwater recharge, and peak rate attenuation in order to mitigate the impacts of the proposed site improvements. See Appendix E – MassDEP Calculations for the calculations required to document compliance. The following section provides a description of the best management practices (BMPs) being utilized on site.

3.4.1 Deep Sump Catch Basins

Deep-sump catch basins equipped with an oil/gas hoods are being utilized as structural pretreatment devices within the proposed stormwater management system. The catch basins will be constructed with a 4'-0" deep sumps to act as settling chambers and allow for adequate

storage of collected sediments. Catch basins are typically first in the line of water quality treatment.

3.4.2 Leaching Drywell

Leaching drywells are being utilized to provide groundwater recharge within the surface infiltration basin, particularly during frozen ground conditions. A leaching drywell is a pre-cast concrete barrel with an open bottom surrounded by free-draining crushed stone that permits runoff to infiltrate into the ground. Frequent maintenance of the leaching drywells is crucial to the long-term effectiveness of the stormwater management plan.

3.4.3 Proprietary Sedimentation Devices

Proprietary sedimentation devices are being utilized on site for the pretreatment of stormwater runoff, in addition to the catch basins, prior to discharging off-site. Treatment of the stormwater runoff is essential to improve water quality. Maintenance of the proprietary device is crucial to the long-term effectiveness of the stormwater management system. The stormwater management system is utilizing proprietary treatment devices in order to ensure that the amount of sediment reaching the basin is minimal.

3.4.4 Bioretention Areas

Bio-retention areas are a best management practice which is being utilized on site as part of the stormwater management system treatment train process to enhance water runoff quality, provide groundwater recharge and attenuate peak-discharge rates. Bio-retention areas utilize soils, plants, and microbes to treat stormwater before discharge to downstream drainage infrastructure or infiltration to provide groundwater recharge. The proposed bio-retention areas associated with this project will provide aesthetically pleasing vegetation within the site. Additionally, the bio-retention areas will provide stormwater pre-treatment and groundwater recharge prior to discharge, if necessary.

3.4.5 Extended Dry Detention Basin with Sediment Forebay

Extended Dry Detention basins accompanied by sediment forebays are typically utilized to meet the water quality and water quantity requirements from watershed areas such as those associated with this project. The basin, with associated sediment forebay, mitigate the impact of the proposed site improvements by attenuating the peak discharge rates and treating the water quality volume. The proposed basin has been designed to attenuate up to the 100-year storm event and treat the Water Quality Volume (WQV) for the tributary watershed. The tributary watershed consists of the proposed roadway, walks, driveways, single-family homes and surrounding vegetated areas.

3.4.6 Surface Infiltration Basin with Sediment Forebay

Infiltration basins accompanied by sediment forebays are well suited to meet the water quality and water quantity requirements from watershed areas such as those associated with this project. The infiltration basin with associated sediment forebay mitigates the impact of the proposed site improvements by attenuating the peak discharge rates and retaining the stormwater volume over a period of time. The proposed infiltration basins have been designed to mimic the existing drainage patterns of the site. An outlet control structure will be installed within the basin such that discharge is equal to pre-development conditions upon completion of the proposed site improvements.

3.5 Protection of Stormwater Best Management Practices during Construction

Protection of the stormwater best management practices during construction will ensure the proper functioning of the stormwater management system and provide protection to the undisturbed areas until the site has been stabilized. Certain specific erosion and sedimentation controls and good practices to be performed by the site contractor have been documented in a Construction Period Erosion Control Plan. See Appendix F – Construction Period Erosion Control Plan.

3.6 Inspection and Maintenance of Stormwater Best Management Practices

Frequent maintenance of the stormwater best management practices is essential to ensuring that the stormwater management system will function properly long-term. The MassDEP provides guidelines for the regular inspection and maintenance of the proposed stormwater best management practices. A Long-Term Stormwater Operation and Maintenance Plan has been prepared which dictates the inspection frequency and maintenance operations for each BMP. See Appendix G – Long-Term Operation and Maintenance Plan.

3.7 Illicit Discharge Compliance Statement

RLA has prepared an Illicit Discharge Compliance Statement to document compliance with the Massachusetts Department of Environmental Protection Stormwater Management Handbook, see Appendix H.

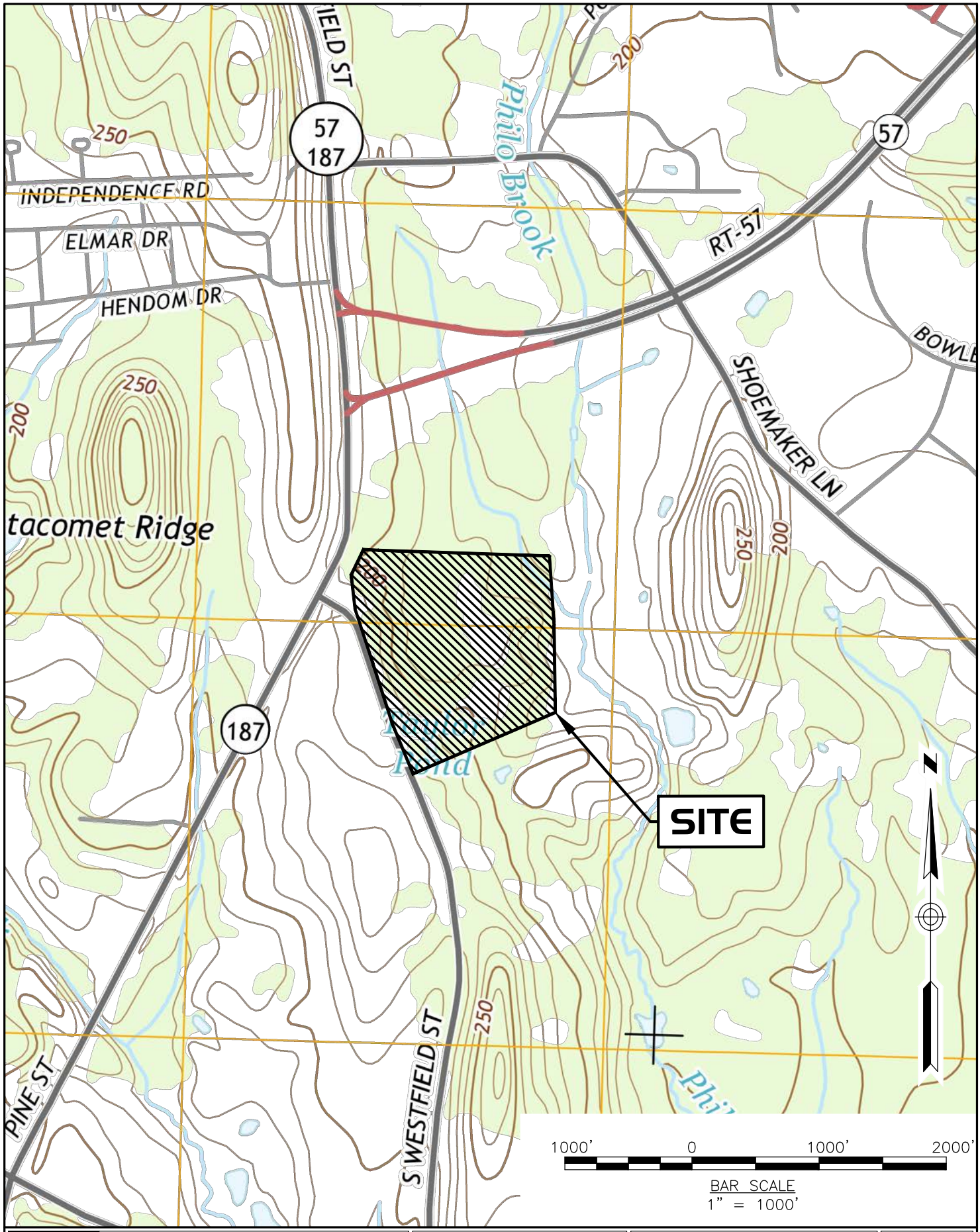
3.8 Low-Impact Development Alternatives Analysis Narrative

RLA has prepared a Low-Impact Development Alternatives Analysis Narrative as part of the Stormwater Drainage Report, see Appendix I.

4. CONCLUSION

The proposed stormwater management system has been designed to mitigate the impacts of the proposed site improvements by providing a control for runoff water quality and water quantity. The proposed site improvements, including the stormwater management system, will utilize best management practices approved by the MassDEP Stormwater Handbook. The best management practices have been incorporated to provide water quality treatment and groundwater recharge. Implementation of stormwater best management practices including such deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, extended dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay to allow for a stormwater drainage design that is in conformance with the criteria set forth in the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

Figure 1: Site Locus – USGS Map



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SITE LOCUS
USGS MAP

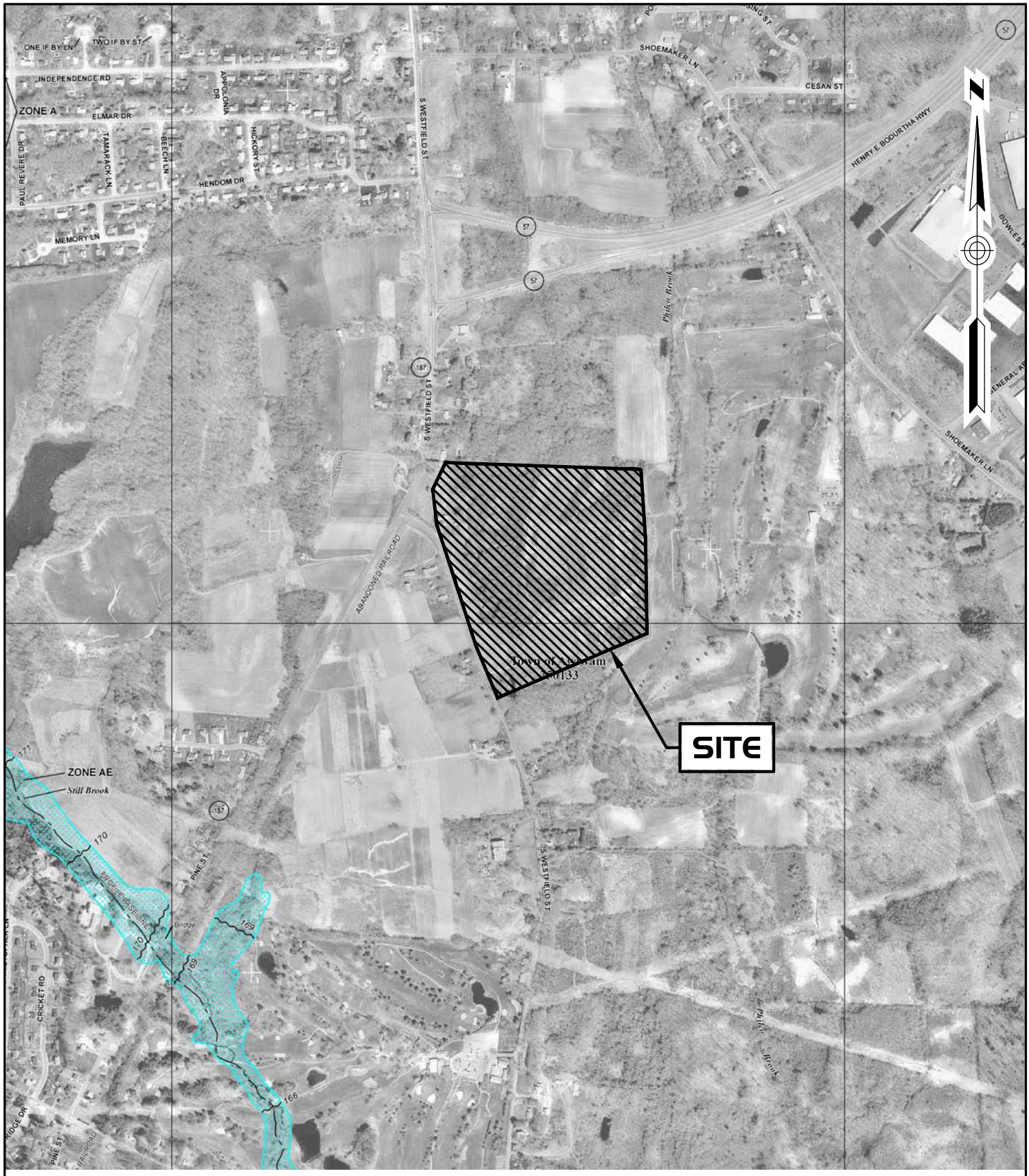
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO: 090506
DATE: 2/10/22
SCALE: As noted

FIG-1

Figure 2: FEMA Flood Map



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FLOOD RATE INSURANCE MAP

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO:	090506
DATE:	2/10/22
SCALE:	As noted

FIG-2

Figure 3: NHESP Map



NOTE: THERE ARE NO NHESP POLYGONS WITHIN MAP AREA

1000' 0 1000' 2000'

BAR SCALE
1" = 1000'

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NHESP Area Map

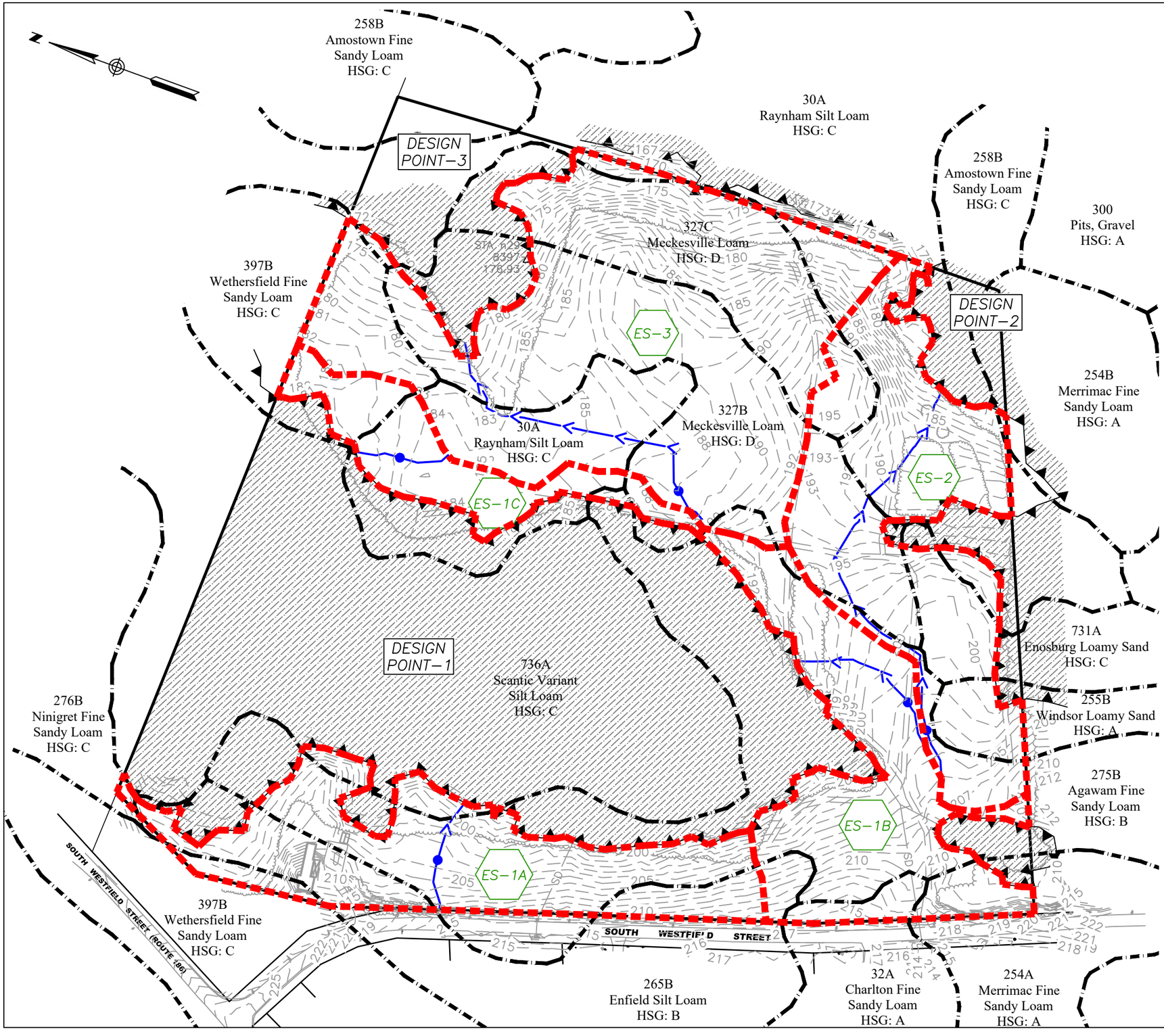
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO: 090506
DATE: 2/10/22
SCALE: As noted

FIG-3

Figure 4: Pre-Development Watershed Plan



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Pre-Development Watershed Plan

Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

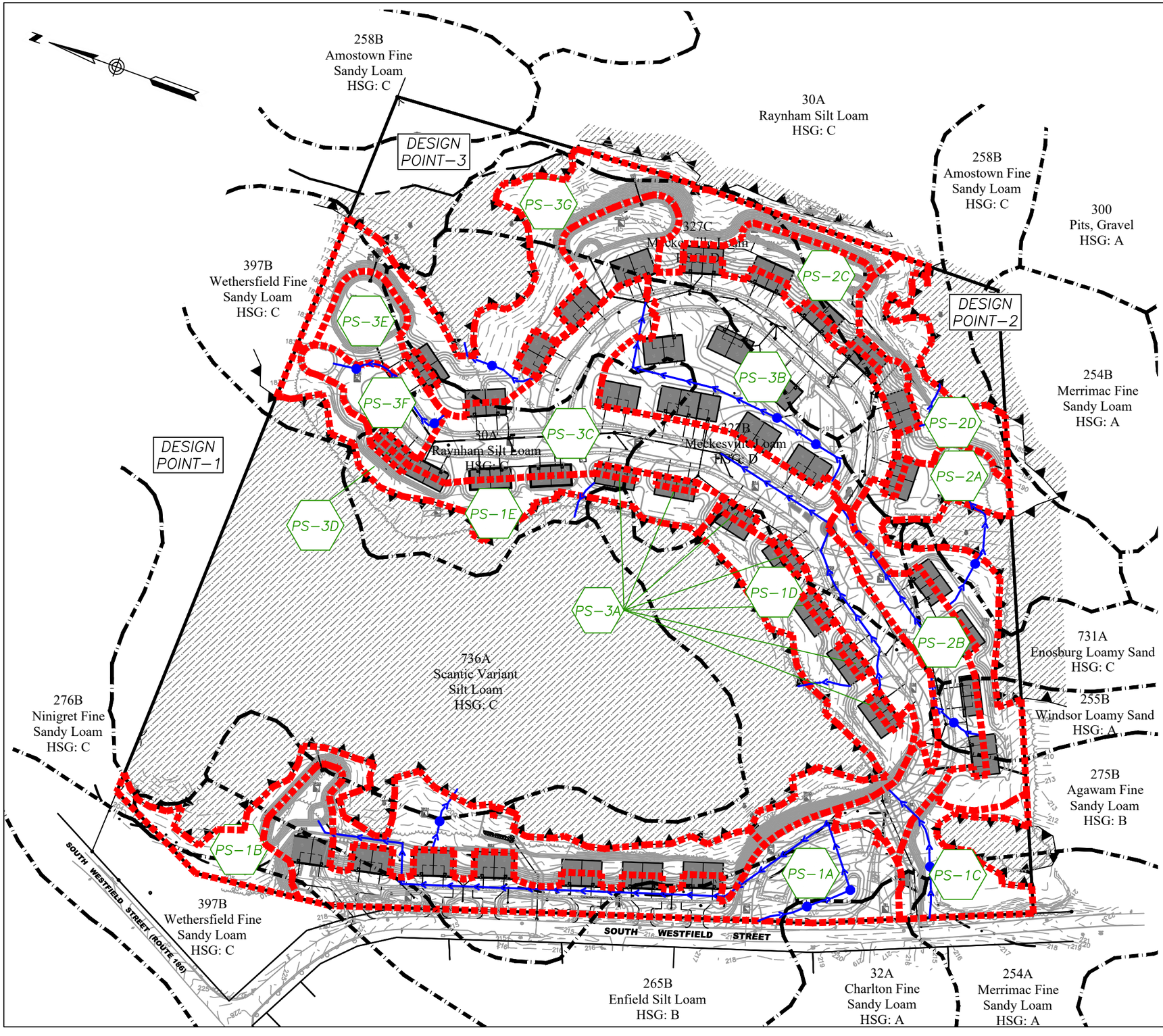
JOB NO.: 090506

DATE: 3/10/22

SCALE: As Noted

FIG-4

Figure 5: Post-Development Watershed Plan



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Post-Development Watershed Plan

Proposed Residential Development
497 South Westfield Street
Agawam, Massachusetts

Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506
DATE: 2/10/22
SCALE: As Noted

FIG-5

Figure 6: Inlet Area Plan



LEGEND

ES-1 — *STRUCTURE NAME*

INLET AREA BOUNDARY

1" = 200"

100 0 200

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Inlet Area Plan

Proposed Residential Development
497 South Westfield Street
Agawam, Massachusetts

Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506

DATE: 3/17/21

SCALE: As Noted

FIG-6

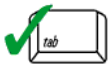
Appendix A: Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



2/10/22

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B: Soils Information

- NRCS Custom Soil Resource Report

- Test pit information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part

South Westfield Street



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

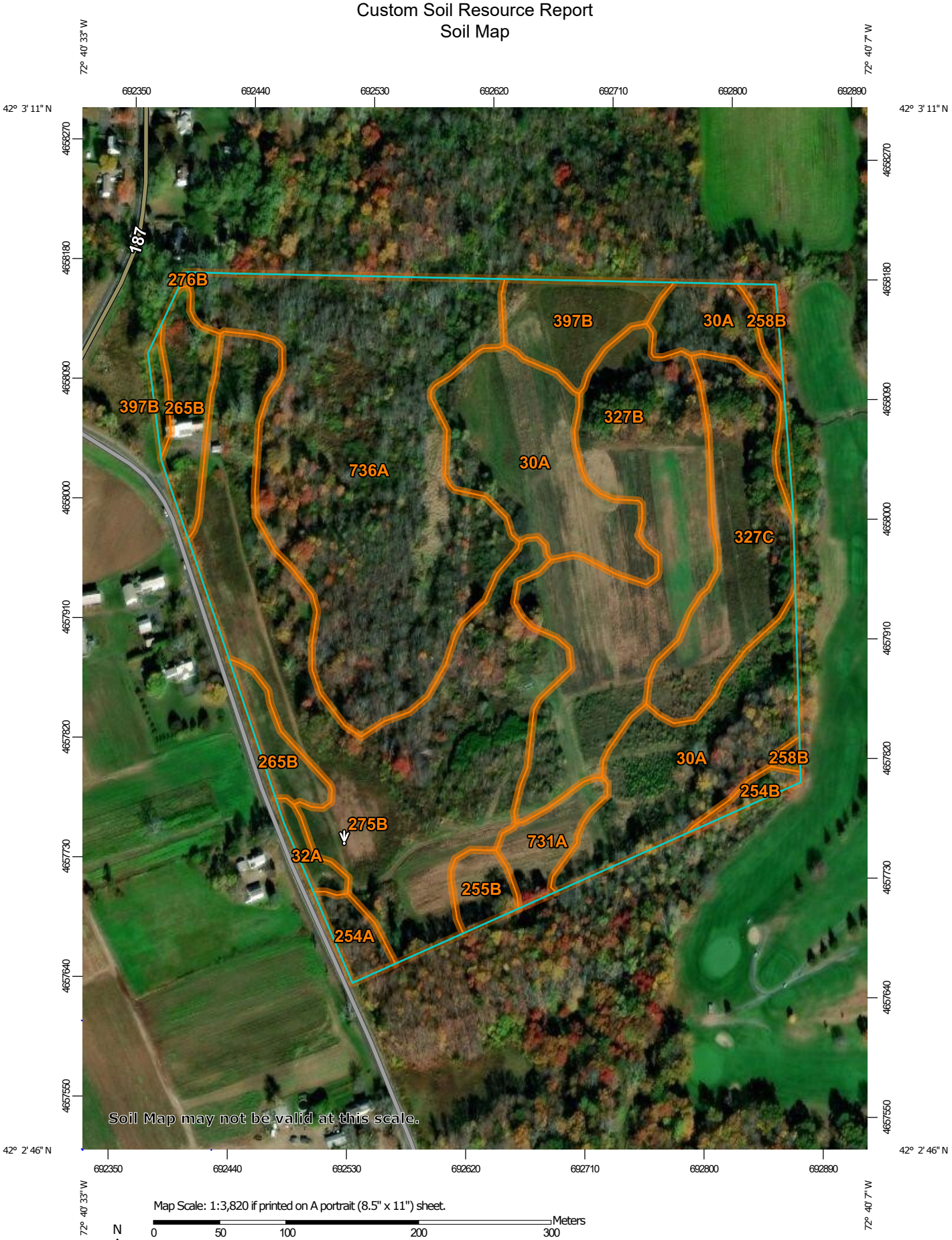
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 14, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Raynham silt loam, 0 to 3 percent slopes	8.9	17.9%
32A	Wareham loamy sand, 0 to 3 percent slopes	0.3	0.6%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.5	1.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.3	0.5%
255B	Windsor loamy sand, 3 to 8 percent slopes	0.6	1.2%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.4	0.7%
265B	Enfield silt loam, 3 to 8 percent slopes	2.0	4.0%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	11.0	22.1%
276B	Ninigret fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
327B	Meckesville loam, 3 to 8 percent slopes	7.0	14.1%
327C	Meckesville loam, 8 to 15 percent slopes	3.8	7.6%
397B	Wethersfield fine sandy loam, 3 to 8 percent slopes	1.9	3.7%
731A	Enosburg loamy sand, 0 to 3 percent slopes	0.9	1.8%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	12.3	24.6%
Totals for Area of Interest		**49.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden County, Massachusetts, Central Part

30A—Raynham silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99r3
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Raynham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raynham

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 24 inches: silt loam
H3 - 24 to 60 inches: stratified very fine sand to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 31 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Belgrade

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scantic variant
Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

32A—Wareham loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 99rs
Elevation: 0 to 3,280 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Wareham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wareham

Setting
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits

Typical profile
H1 - 0 to 13 inches: loamy sand
H2 - 13 to 60 inches: sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Deerfield

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, moraines, outwash plains, outwash terraces, stream terraces, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash terraces, outwash plains, kames, eskers, moraines
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Deltas, dunes, outwash terraces, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Eskers, stream terraces, moraines, outwash terraces, outwash plains, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

258B—Amostown fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 99ms
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Amostown and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amostown

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over hard silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 32 inches: fine sandy loam
H3 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Minor Components

Pollux

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Enosburg

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

265B—Enfield silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99nx
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-silty eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 25 inches: silt loam
H3 - 25 to 60 inches: stratified sand to very gravelly fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Ninigret

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

275B—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqx
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Agawam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Outwash terraces, kame terraces, kames, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam

2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Kames, deltas, outwash plains, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent

Landform: Outwash terraces, deltas, outwash plains, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

276B—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyr6
Elevation: 0 to 1,250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Depressions, drainageways, outwash terraces, kames, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, dip, rise
Down-slope shape: Concave, linear, convex
Across-slope shape: Concave, convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 17 to 39 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY026CT - Moist Silty Outwash
Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent
Landform: Kame terraces, kames, outwash terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

327B—Meckesville loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99pr
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

327C—Meckesville loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99ps
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

397B—Wethersfield fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99rt
Elevation: 130 to 460 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wethersfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy basal till derived from sandstone and shale

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 26 inches: gravelly fine sandy loam
H3 - 26 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 32 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wilbraham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

731A—Enosburg loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99nz
Elevation: 50 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Enosburg and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enosburg

Setting

Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over soft loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 26 inches: sand
H3 - 26 to 60 inches: silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 16 to 34 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Eldridge

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

736A—Scantic Variant silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99rb
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scantic variant and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic Variant

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Buxton variant

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-32**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-7	A	10YR3/2				SL			GR	FR	
7-22	B	7.5YR3/4				LS			SBK	FR	
22-38	C1	7.5YR5/3				S			SG	FR	
38-102	C2	7.5YR5/2				S			SG	FR	

Additional Notes Weeping @ 88"

8|28|13
1:30 P.m.

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD ST.
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RG2 - TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	A_P	10YR 3/6				LS			FRIABLE		
12"-26"	B	10YR 4/6		NONE		SL					
26"-95"	C_1	2.5YR 3/4		OBSERV.		SL		NONE		DRY	
95"-140"	C_2	7.5YR 4/3				SL	<15%	FEW STONES	MASSIVE FIRM	MOIST @ BOTTOM	

Additional Notes:

NO SEEPS

STANDING WATER @ 138" - STATIC

IN CORN FIELD - EL. 179 ±

5|3|13
SUNNY, WARM

Commonwealth of Massachusetts
City/Town of AGAWAM

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RAIN GARDEN #4 - (FORMERLY BASIN #1)

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-7"	A_P	10YR 3/4				SL					
7"-23"	B	10YR 4/6		NONE		LS					
23"-110"	C	7.5YR 4/3		OBSERV.		SL		NONE	COMPACT	DRY	

Additional Notes:

NO SEEPS ; NO STANDING WATER

HOLE LEFT OPEN 1.5 HOURS

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-14**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	20	10YR5/8	C	SL			SBK	FR	
21-65	C1	2.5YR5/2				SL			M	F	
65-93	C2	2.5YR5/3				LS	10		M	FR	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-15**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-27	B	7.5YR3/4	22	10YR5/8	C	SL			SBK	FR	
27-96	C1	2.5YR5/3				SL			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-16**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-21	B	7.5YR3/4				SL			SBK	FR	
21-76	C1	2.5YR5/3				S	10		SG	L	
76-108	C2	2.5YR5/3				LS			M	FR	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of AGAWAM
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	PLOWED	10YR 4/4				SL					
12"-17"	B	10YR 4/6		NONE		SL					
17"-108"	C	5YR 4/4		OBSERV		LS		NONE		DRY	

Additional Notes:

NO SEEP; NO STANDING WATER

8/28/15
2:30 P.M

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD STREET
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB -TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-14"	A_P	10YR 4/4				LS			FRIABLE		
14"-32"	B	10YR 4/6		NONE		SL					
32"-174"	C	5YR 4/4		OBSERV.		SL	<15%	FEW @ 14'	MASSIVE FIRM	DRY	

Additional Notes:

NO SEEPS

NO STANDING WATER

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-7**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-9	Ap	10YR3/2				L			GR	FR	
9-16	B	7.5YR3/4				SL			SBK	FR	
16-38	C1	2.5YR5/3	24	10YR5/8	C	SL			M	FR	
38-83	C2	2.5YR5/3				SILT			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-1**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-10	Ap	10YR3/2				L			GR	FR	
10-34	B	7.5YR3/4	10	10YR5/8	C	SL			SBK	FR	
34-96	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 34"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-2**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	17	10YR5/8	C	SL			SBK	FR	
21-100	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 21"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

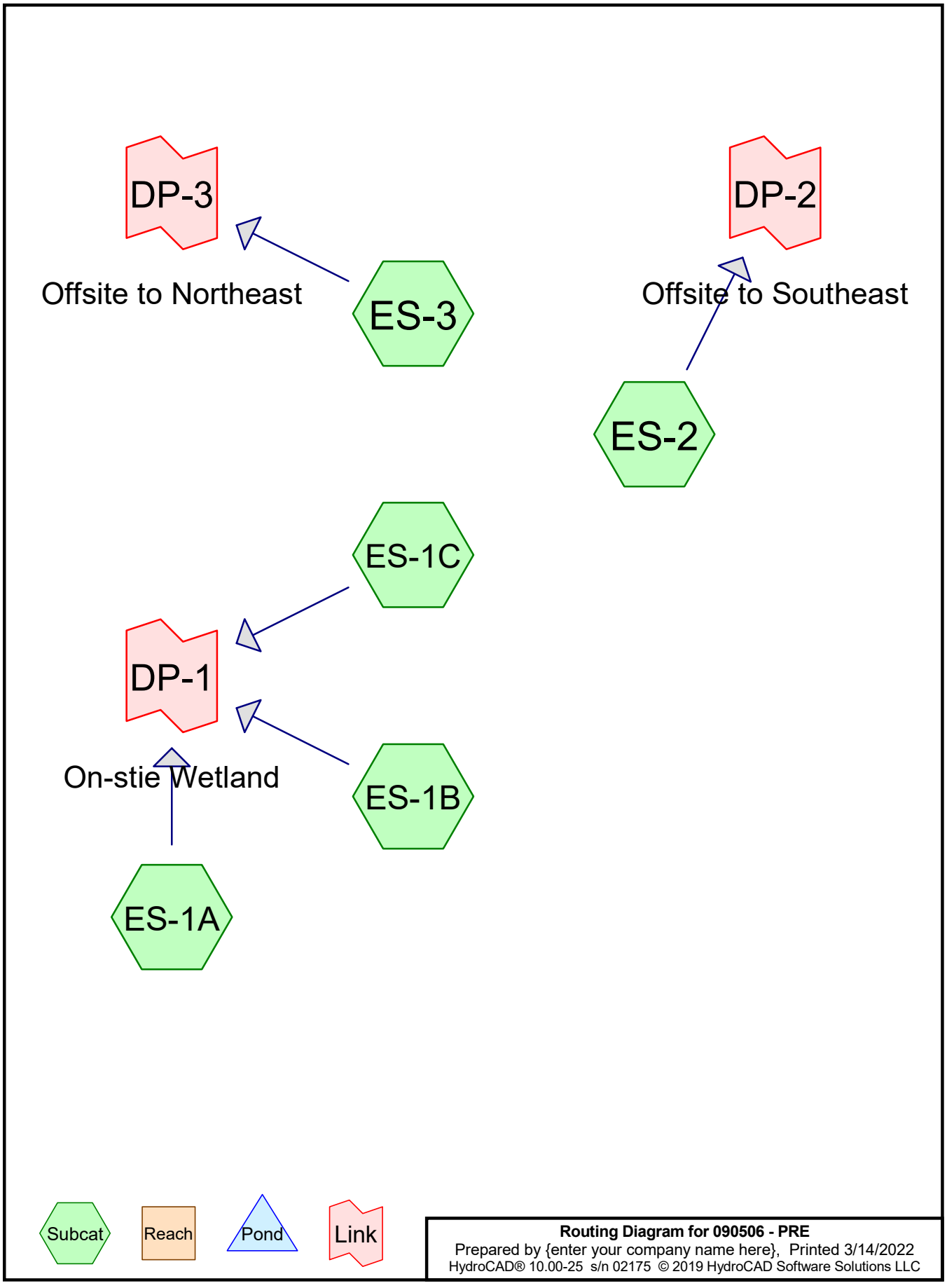
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-3**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4				SL			SBK	FR	
21-36	C	7.5YR3/4	22	10YR5/8	C	SL	5		M	FR	
36-55	C2	7.5YR3/4				FSL			M	FR	
55-102	C3	7.5YR3/4				SL	5		M	F	

Additional Notes Weeping @ 40"

Appendix C: Pre- and Post- Development Hydrologic Analysis (2, 10, & 100 Year Storm Events)


DP-3
Offsite to Northeast
ES-3
DP-2
Offsite to Southeast
ES-2
ES-1C
DP-1
On-stie Wetland
ES-1B
ES-1A
Subcat
Reach
Pond
Link
Routing Diagram for 090506 - PRE
Prepared by {enter your company name here}, Printed 3/14/2022
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=205,090 sf 2.78% Impervious Runoff Depth=0.43"
Flow Length=231' Tc=11.5 min CN=61/98 Runoff=1.2 cfs 7,383 cf

Subcatchment ES-1B: Runoff Area=193,036 sf 0.00% Impervious Runoff Depth=0.27"
Flow Length=386' Tc=12.8 min CN=58/0 Runoff=0.5 cfs 4,405 cf

Subcatchment ES-1C: Runoff Area=80,531 sf 0.00% Impervious Runoff Depth=0.96"
Flow Length=275' Tc=18.4 min CN=75/0 Runoff=1.4 cfs 6,448 cf

Subcatchment ES-2: Runoff Area=259,076 sf 0.00% Impervious Runoff Depth=0.76"
Flow Length=919' Tc=17.8 min CN=71/0 Runoff=3.3 cfs 16,417 cf

Subcatchment ES-3: Runoff Area=475,165 sf 0.00% Impervious Runoff Depth=1.13"
Flow Length=698' Slope=0.0170 '/' Tc=20.4 min CN=78/0 Runoff=9.3 cfs 44,698 cf

Link DP-1: On-stie Wetland Inflow=2.9 cfs 18,236 cf
Primary=2.9 cfs 18,236 cf

Link DP-2: Offsite to Southeast Inflow=3.3 cfs 16,417 cf
Primary=3.3 cfs 16,417 cf

Link DP-3: Offsite to Northeast Inflow=9.3 cfs 44,698 cf
Primary=9.3 cfs 44,698 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 79,351 cf Average Runoff Depth = 0.79"
99.53% Pervious = 1,207,190 sf 0.47% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

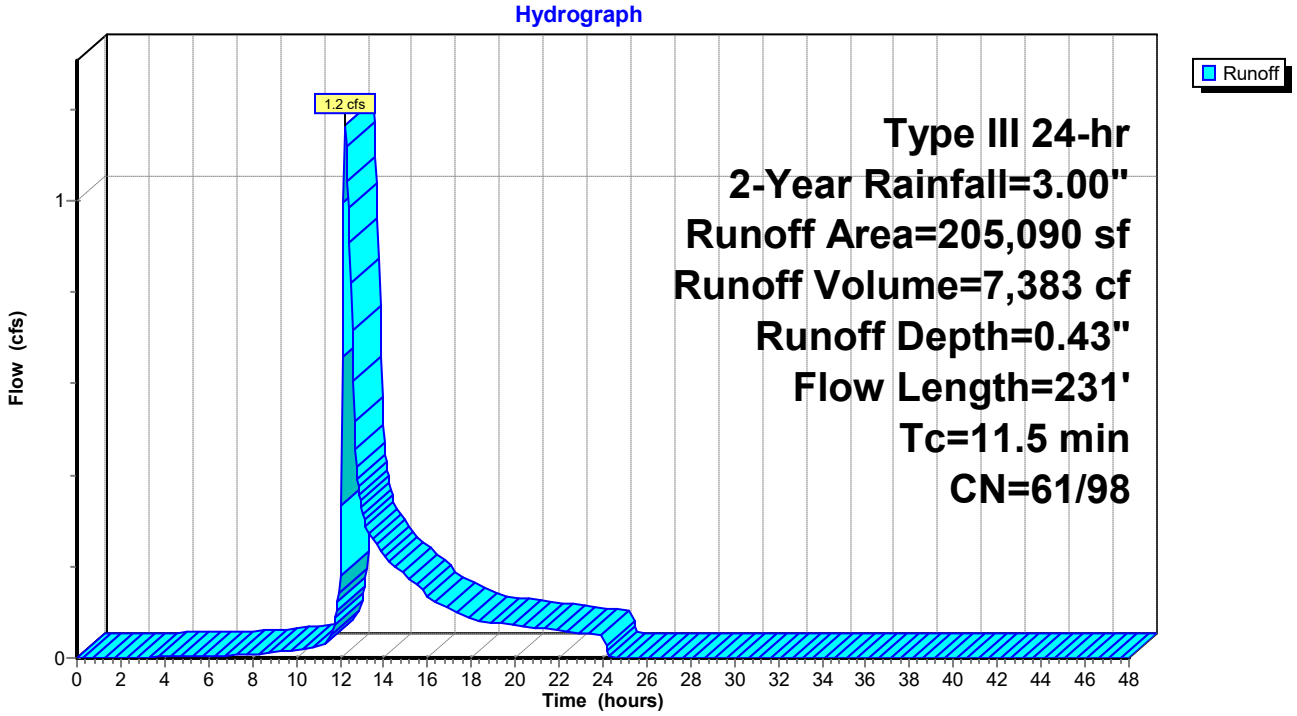
Runoff = 1.2 cfs @ 12.22 hrs, Volume= 7,383 cf, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
121,245	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
0	30	Woods, Good, HSG A
53,409	55	Woods, Good, HSG B
21,966	70	Woods, Good, HSG C
205,090	62	Weighted Average
199,382	61	97.22% Pervious Area
5,708	98	2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	131	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.5	231	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

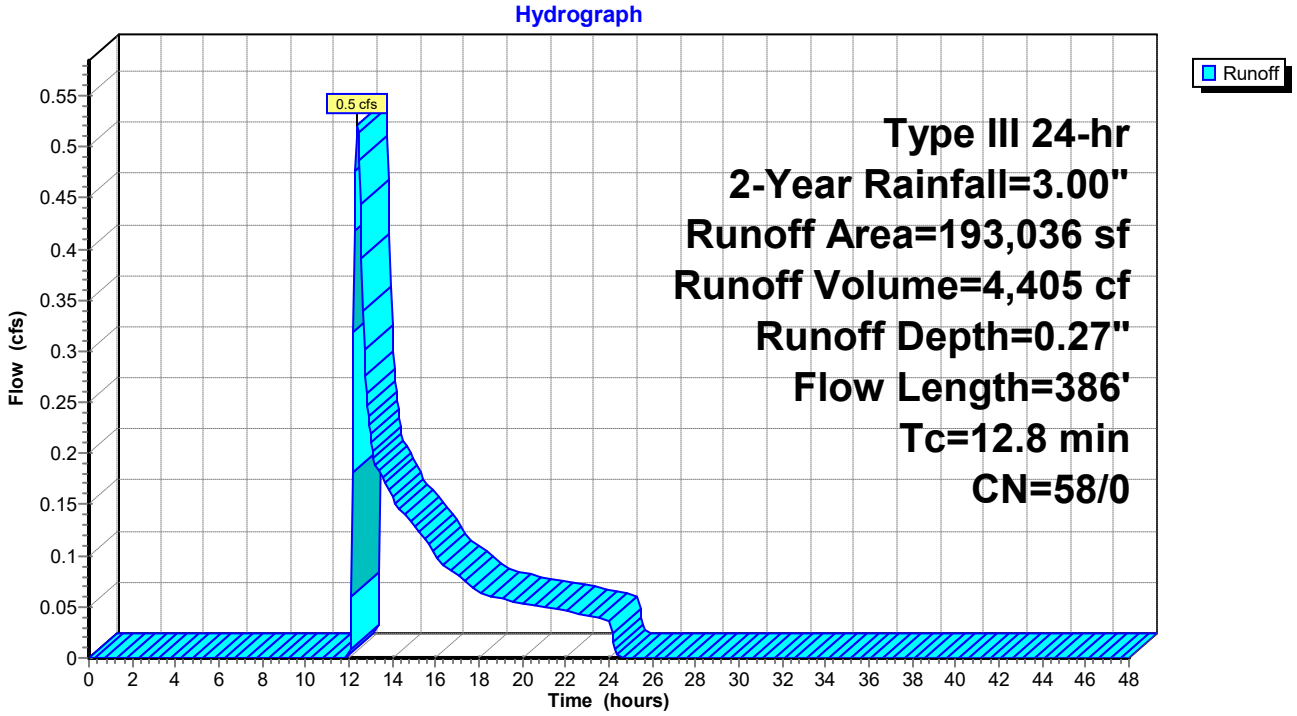
Runoff = 0.5 cfs @ 12.41 hrs, Volume= 4,405 cf, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
19,104	39	>75% Grass cover, Good, HSG A
127,281	61	>75% Grass cover, Good, HSG B
915	80	>75% Grass cover, Good, HSG D
1,684	96	Gravel surface, HSG A
8,532	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
23,563	55	Woods, Good, HSG B
356	77	Woods, Good, HSG D
193,036	58	Weighted Average
193,036	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

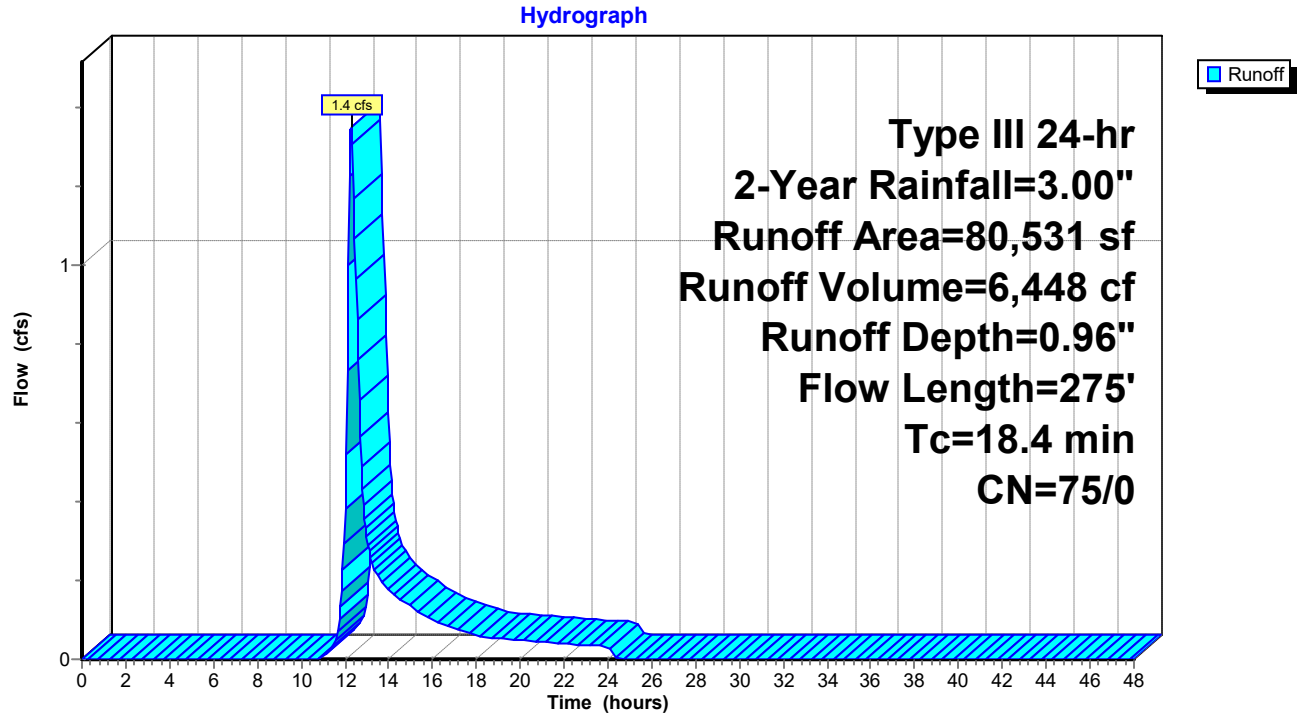
Runoff = 1.4 cfs @ 12.28 hrs, Volume= 6,448 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,727	61	>75% Grass cover, Good, HSG B
67,519	74	>75% Grass cover, Good, HSG C
4,986	80	>75% Grass cover, Good, HSG D
1,861	96	Gravel surface, HSG C
1,201	96	Gravel surface, HSG D
2,833	70	Woods, Good, HSG C
403	77	Woods, Good, HSG D
80,531	75	Weighted Average
80,531	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

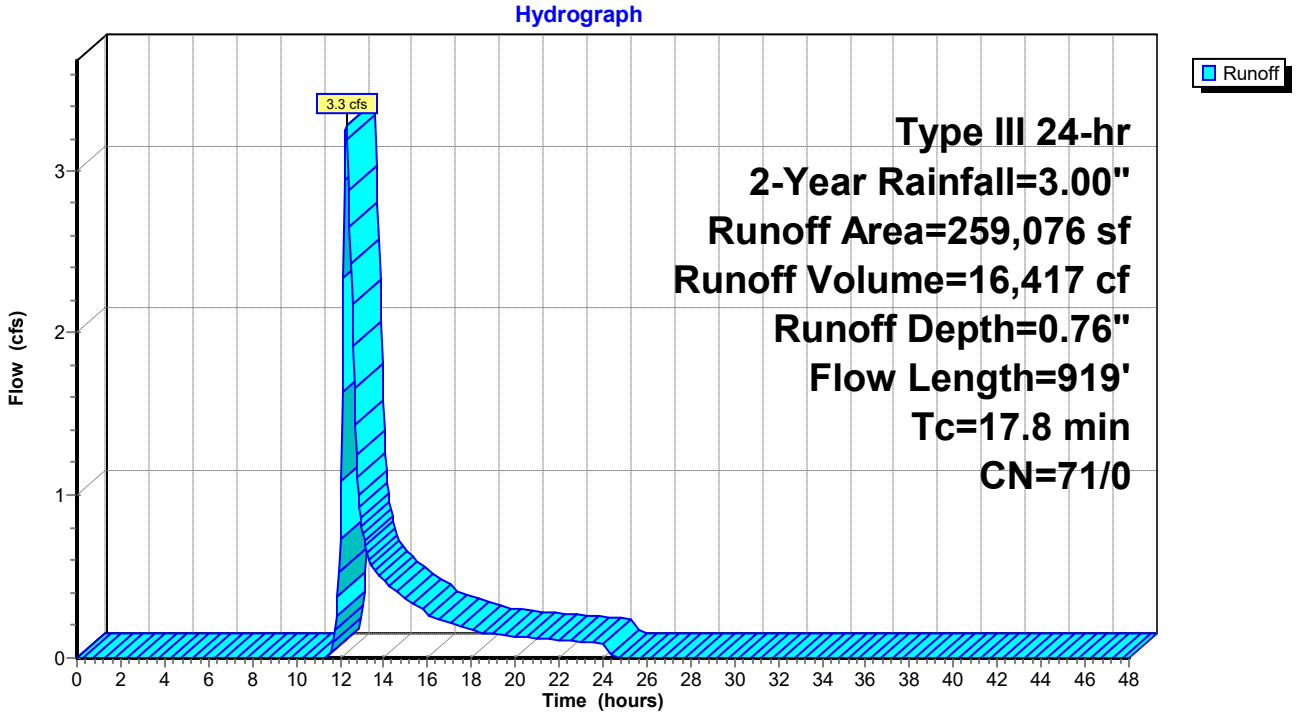
Runoff = 3.3 cfs @ 12.28 hrs, Volume= 16,417 cf, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
22,243	39	>75% Grass cover, Good, HSG A
27,605	61	>75% Grass cover, Good, HSG B
98,083	74	>75% Grass cover, Good, HSG C
69,299	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,702	96	Gravel surface, HSG C
5,423	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
32,490	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
259,076	71	Weighted Average
259,076	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.1	819	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.8	919	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

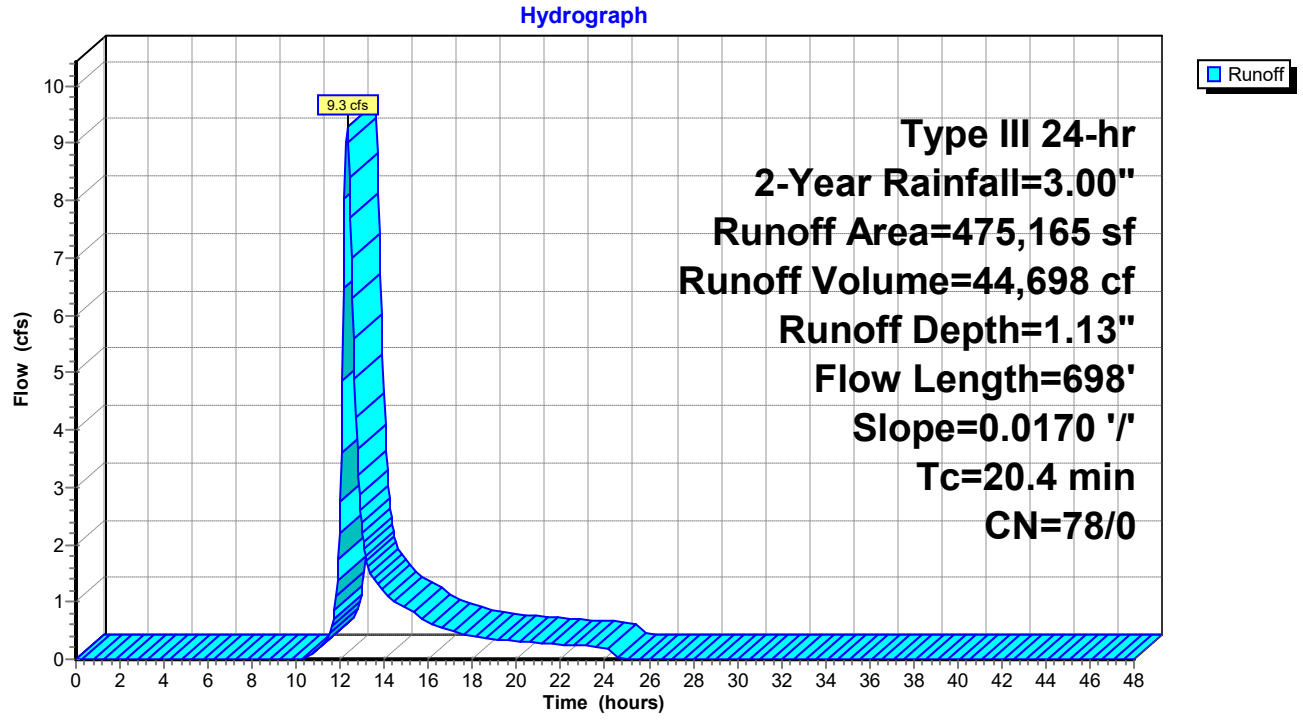
Runoff = 9.3 cfs @ 12.30 hrs, Volume= 44,698 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,682	61	>75% Grass cover, Good, HSG B
131,238	74	>75% Grass cover, Good, HSG C
248,983	80	>75% Grass cover, Good, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
14,162	70	Woods, Good, HSG C
70,274	77	Woods, Good, HSG D
475,165	78	Weighted Average
475,165	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.7	598	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.4	698	Total			

Subcatchment ES-3:

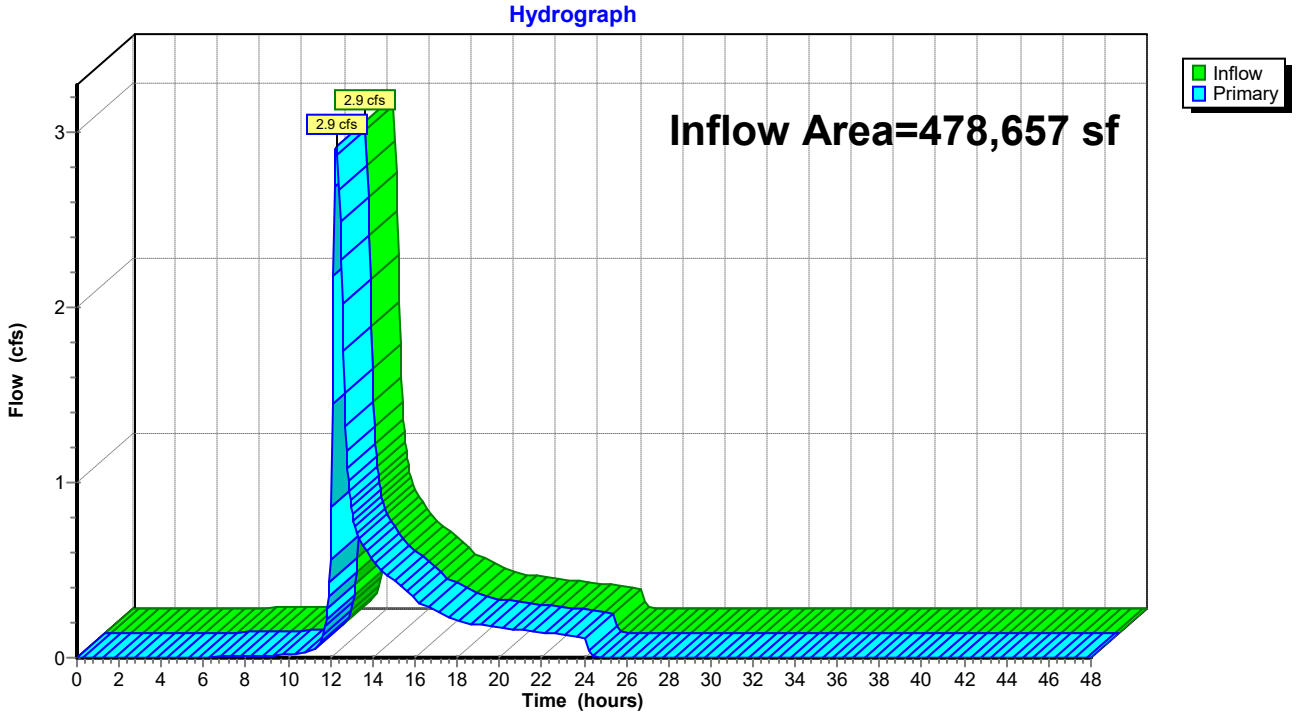


Summary for Link DP-1: On-stie Wetland

Inflow Area = 478,657 sf, 1.19% Impervious, Inflow Depth = 0.46" for 2-Year event
Inflow = 2.9 cfs @ 12.28 hrs, Volume= 18,236 cf
Primary = 2.9 cfs @ 12.28 hrs, Volume= 18,236 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

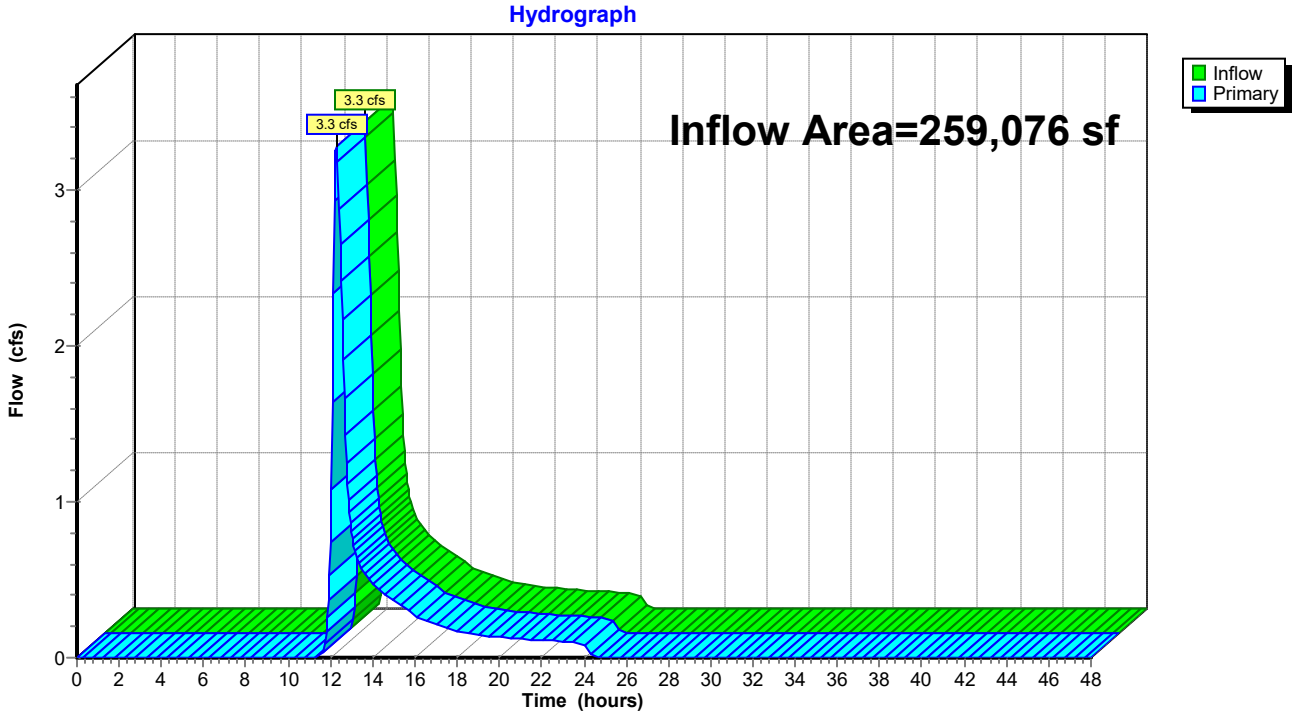


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 259,076 sf, 0.00% Impervious, Inflow Depth = 0.76" for 2-Year event
Inflow = 3.3 cfs @ 12.28 hrs, Volume= 16,417 cf
Primary = 3.3 cfs @ 12.28 hrs, Volume= 16,417 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

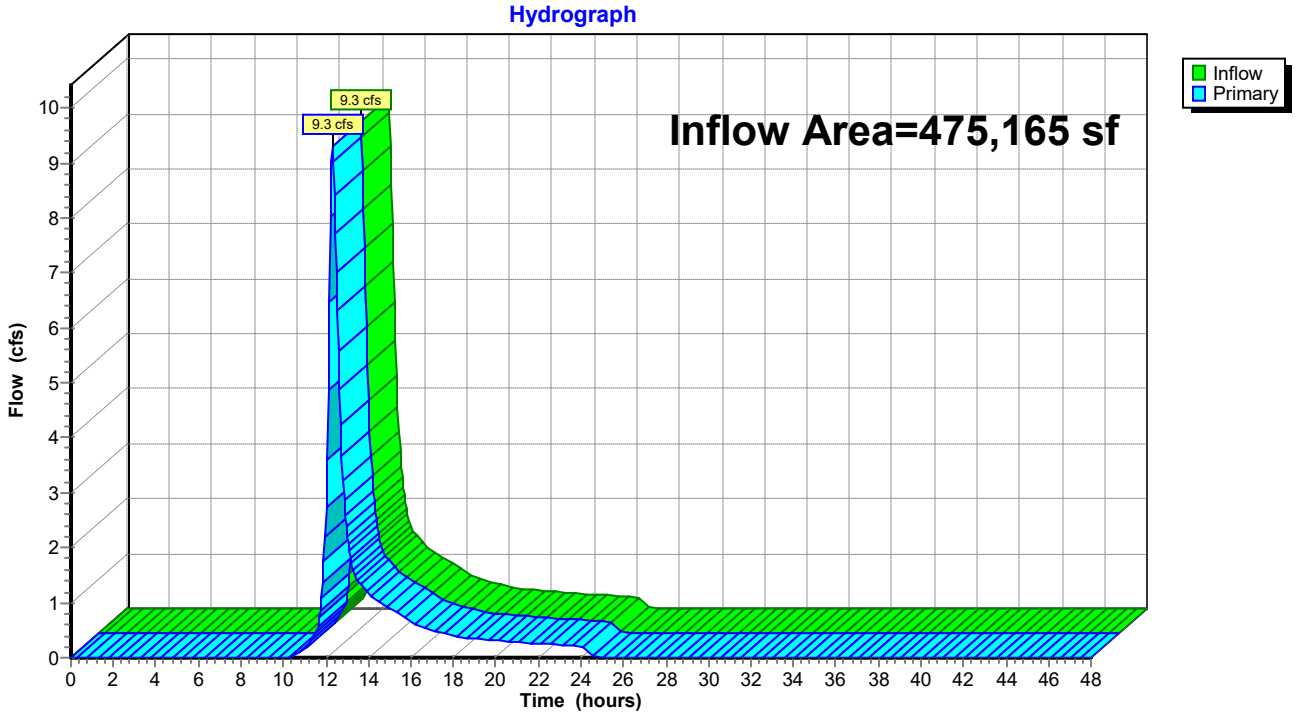


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 475,165 sf, 0.00% Impervious, Inflow Depth = 1.13" for 2-Year event
Inflow = 9.3 cfs @ 12.30 hrs, Volume= 44,698 cf
Primary = 9.3 cfs @ 12.30 hrs, Volume= 44,698 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=205,090 sf 2.78% Impervious Runoff Depth=1.23"
Flow Length=231' Tc=11.5 min CN=61/98 Runoff=4.8 cfs 20,942 cf

Subcatchment ES-1B: Runoff Area=193,036 sf 0.00% Impervious Runoff Depth=0.96"
Flow Length=386' Tc=12.8 min CN=58/0 Runoff=3.2 cfs 15,375 cf

Subcatchment ES-1C: Runoff Area=80,531 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=275' Tc=18.4 min CN=75/0 Runoff=3.2 cfs 14,288 cf

Subcatchment ES-2: Runoff Area=259,076 sf 0.00% Impervious Runoff Depth=1.82"
Flow Length=919' Tc=17.8 min CN=71/0 Runoff=8.7 cfs 39,273 cf

Subcatchment ES-3: Runoff Area=475,165 sf 0.00% Impervious Runoff Depth=2.38"
Flow Length=698' Slope=0.0170 '/' Tc=20.4 min CN=78/0 Runoff=20.2 cfs 94,069 cf

Link DP-1: On-stie Wetland Inflow=11.0 cfs 50,605 cf
Primary=11.0 cfs 50,605 cf

Link DP-2: Offsite to Southeast Inflow=8.7 cfs 39,273 cf
Primary=8.7 cfs 39,273 cf

Link DP-3: Offsite to Northeast Inflow=20.2 cfs 94,069 cf
Primary=20.2 cfs 94,069 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 183,947 cf Average Runoff Depth = 1.82"
99.53% Pervious = 1,207,190 sf 0.47% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

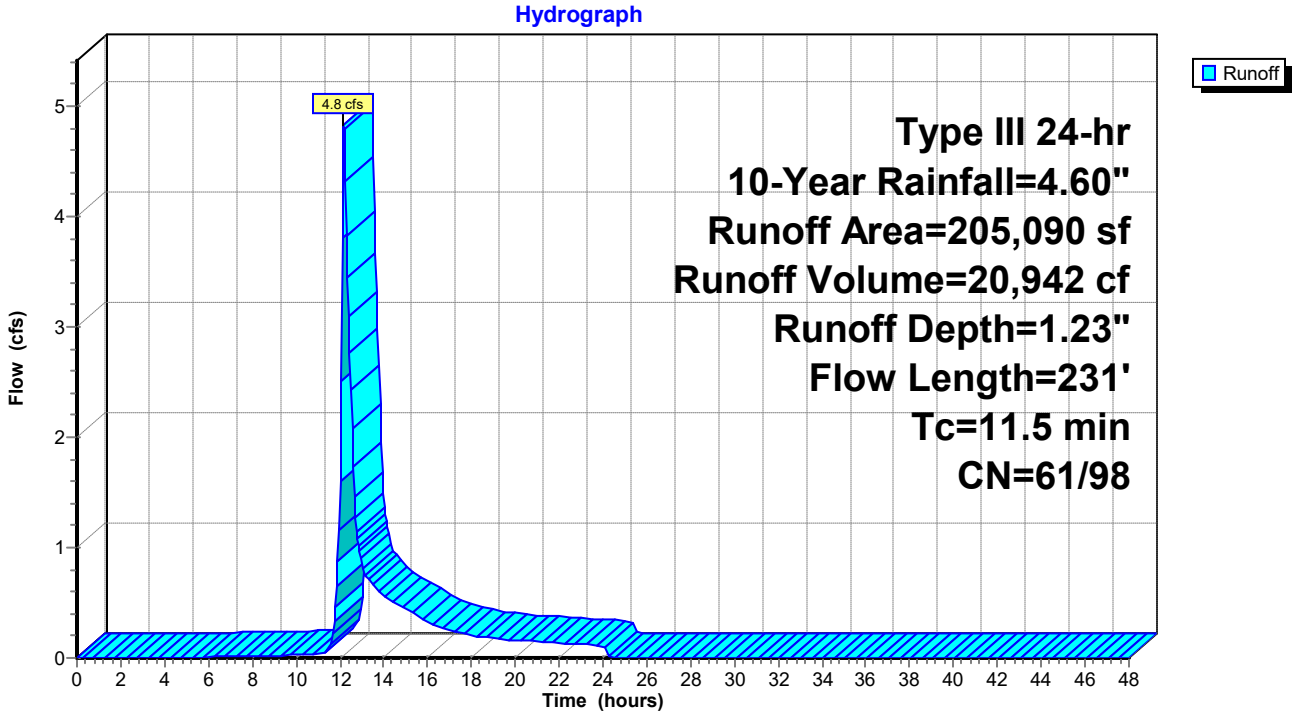
Runoff = 4.8 cfs @ 12.18 hrs, Volume= 20,942 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
121,245	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
0	30	Woods, Good, HSG A
53,409	55	Woods, Good, HSG B
21,966	70	Woods, Good, HSG C
205,090	62	Weighted Average
199,382	61	97.22% Pervious Area
5,708	98	2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	131	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.5	231	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

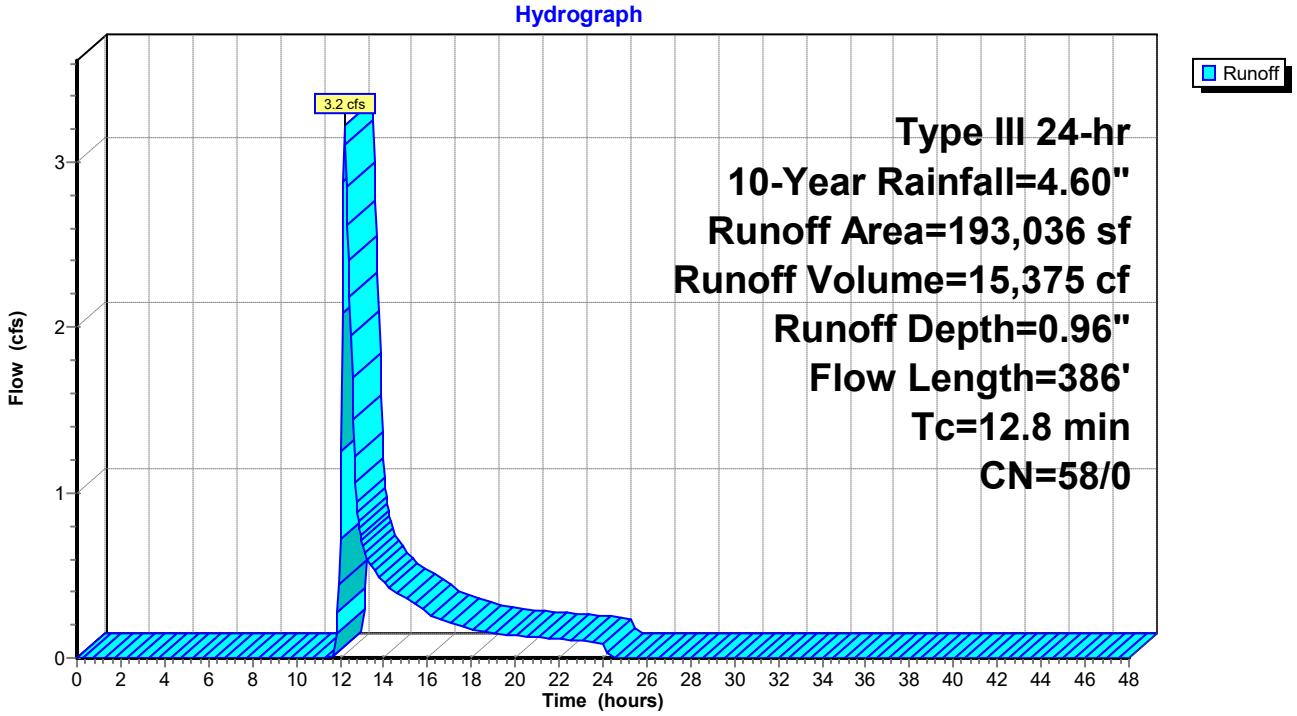
Runoff = 3.2 cfs @ 12.21 hrs, Volume= 15,375 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
19,104	39	>75% Grass cover, Good, HSG A
127,281	61	>75% Grass cover, Good, HSG B
915	80	>75% Grass cover, Good, HSG D
1,684	96	Gravel surface, HSG A
8,532	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
23,563	55	Woods, Good, HSG B
356	77	Woods, Good, HSG D
193,036	58	Weighted Average
193,036	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

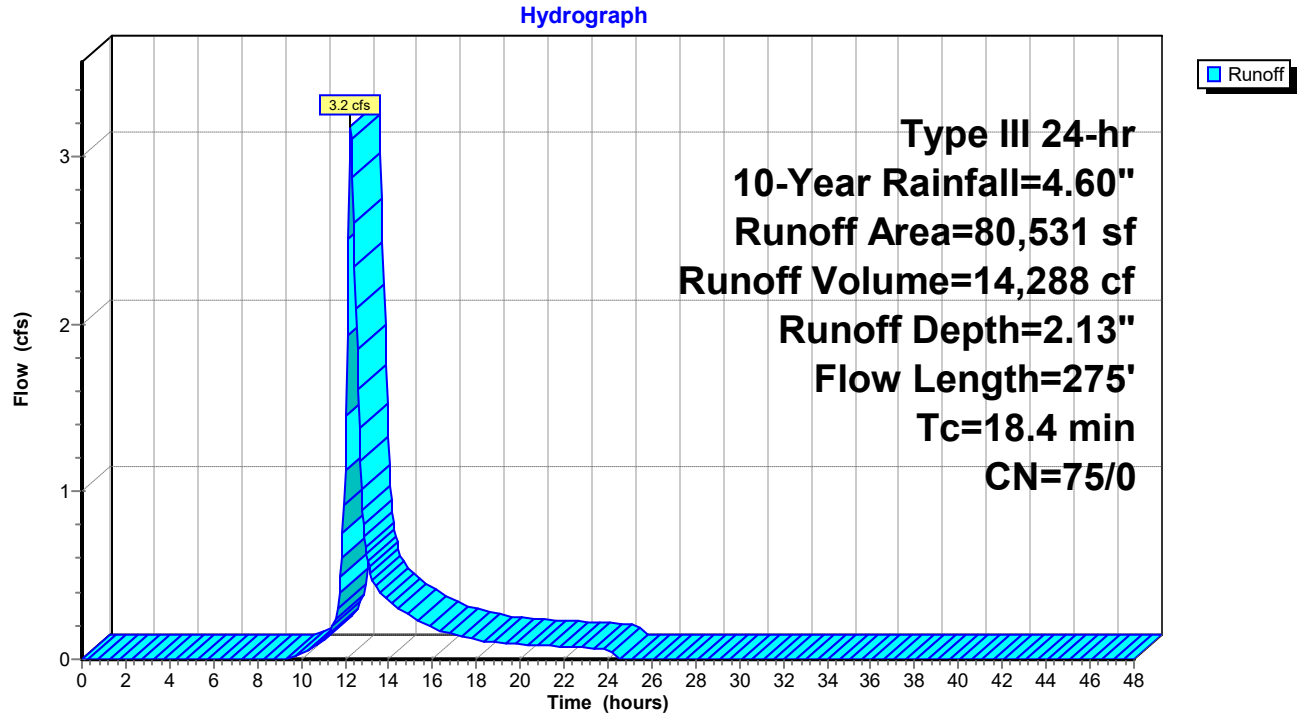
Runoff = 3.2 cfs @ 12.26 hrs, Volume= 14,288 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,727	61	>75% Grass cover, Good, HSG B
67,519	74	>75% Grass cover, Good, HSG C
4,986	80	>75% Grass cover, Good, HSG D
1,861	96	Gravel surface, HSG C
1,201	96	Gravel surface, HSG D
2,833	70	Woods, Good, HSG C
403	77	Woods, Good, HSG D
80,531	75	Weighted Average
80,531	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

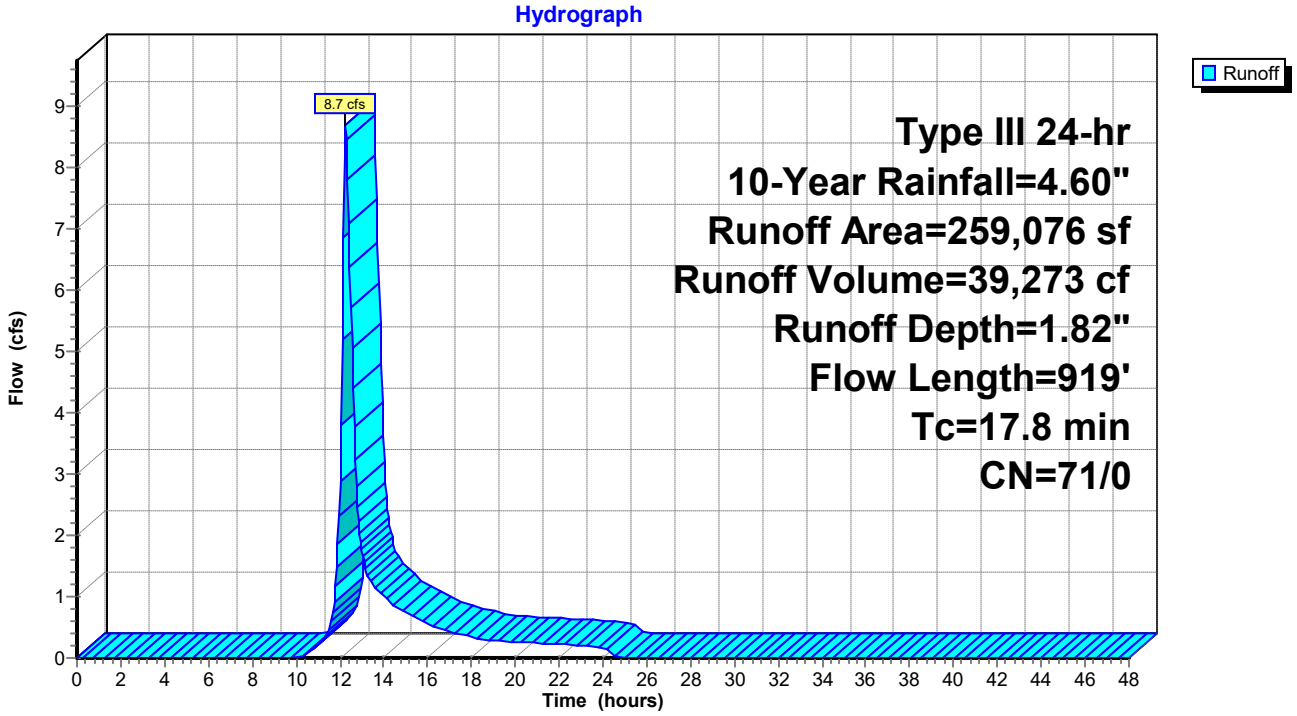
Runoff = 8.7 cfs @ 12.26 hrs, Volume= 39,273 cf, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
22,243	39	>75% Grass cover, Good, HSG A
27,605	61	>75% Grass cover, Good, HSG B
98,083	74	>75% Grass cover, Good, HSG C
69,299	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,702	96	Gravel surface, HSG C
5,423	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
32,490	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
259,076	71	Weighted Average
259,076	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.1	819	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.8	919	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

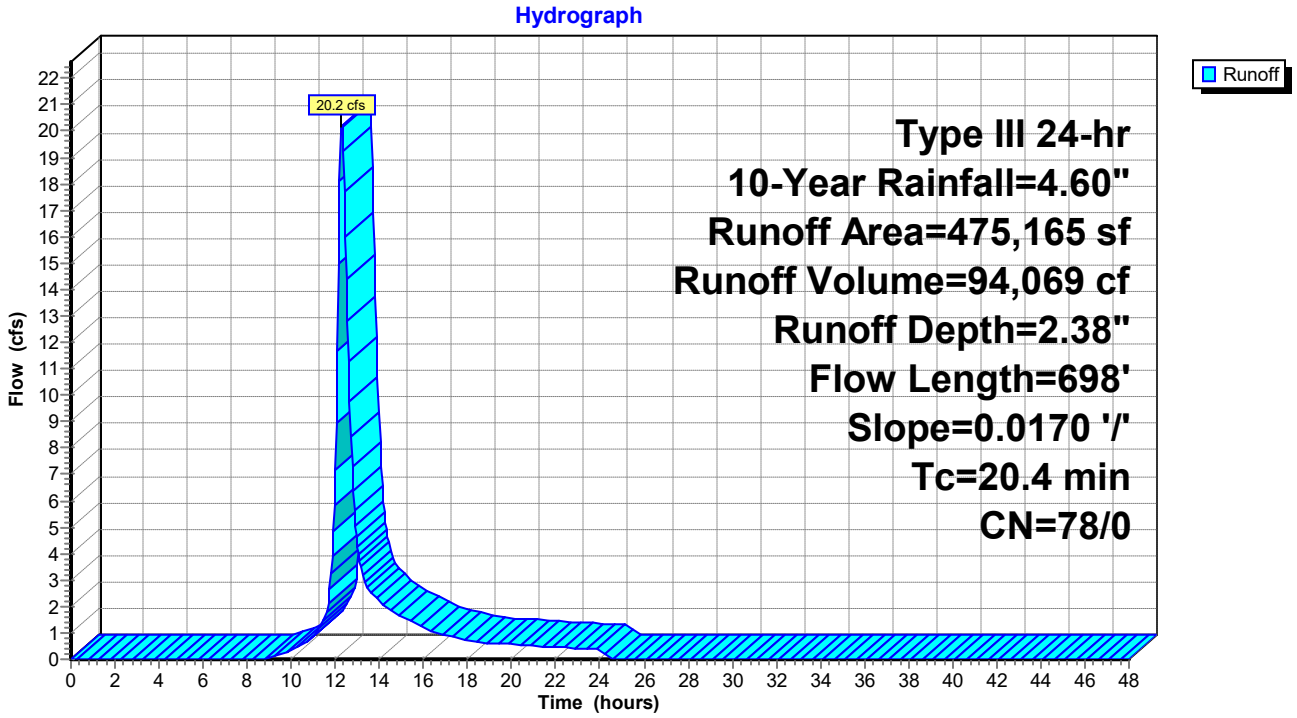
Runoff = 20.2 cfs @ 12.29 hrs, Volume= 94,069 cf, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,682	61	>75% Grass cover, Good, HSG B
131,238	74	>75% Grass cover, Good, HSG C
248,983	80	>75% Grass cover, Good, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
14,162	70	Woods, Good, HSG C
70,274	77	Woods, Good, HSG D
475,165	78	Weighted Average
475,165	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.7	598	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.4	698	Total			

Subcatchment ES-3:

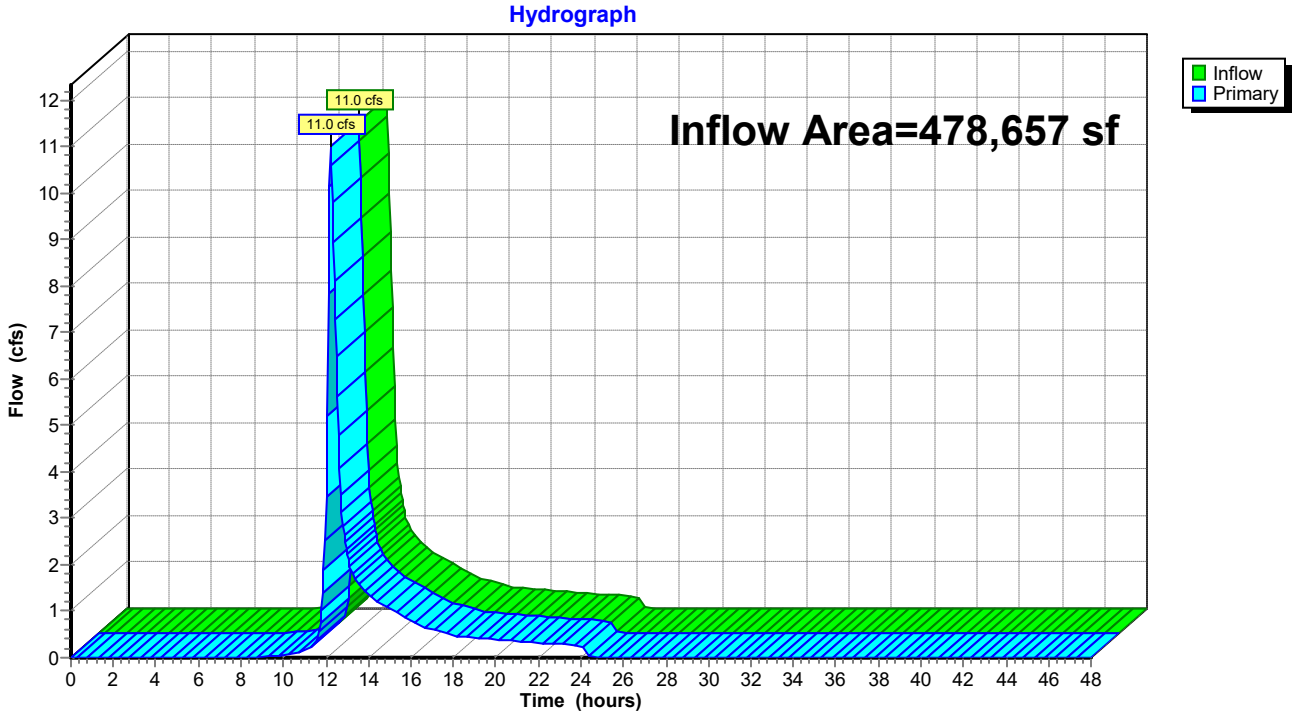


Summary for Link DP-1: On-stie Wetland

Inflow Area = 478,657 sf, 1.19% Impervious, Inflow Depth = 1.27" for 10-Year event
Inflow = 11.0 cfs @ 12.21 hrs, Volume= 50,605 cf
Primary = 11.0 cfs @ 12.21 hrs, Volume= 50,605 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

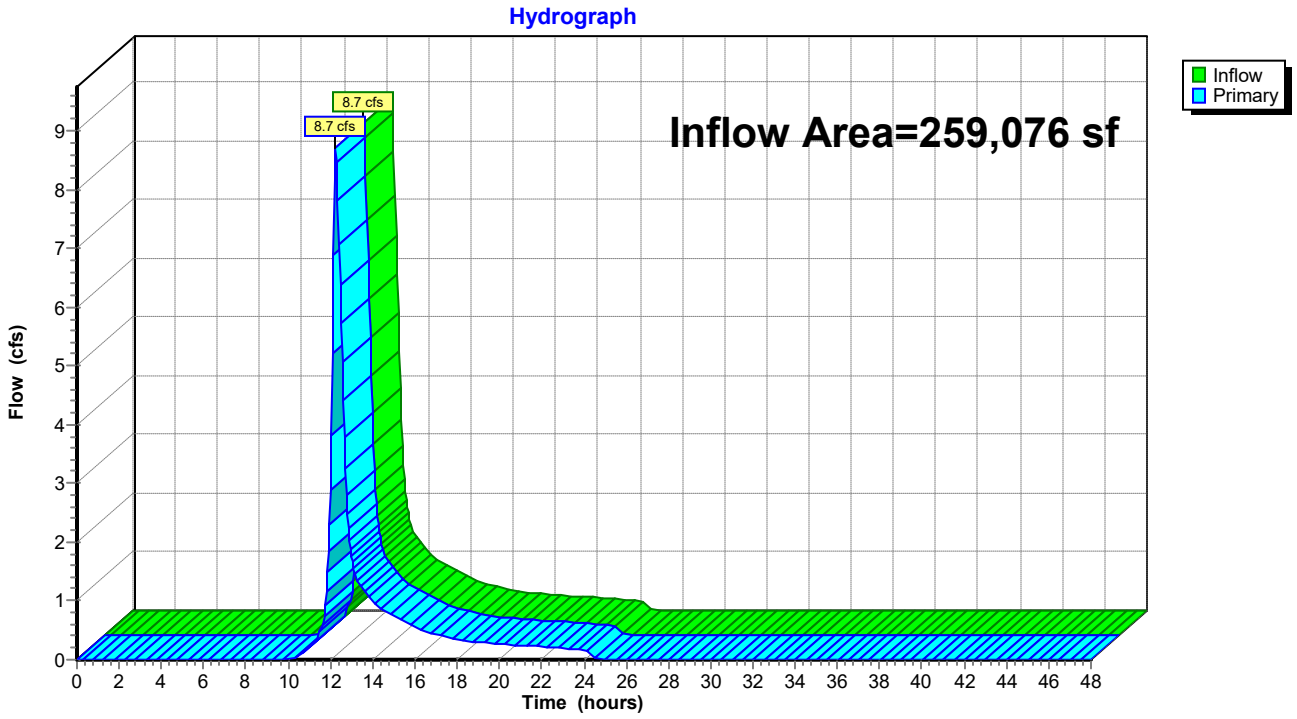


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 259,076 sf, 0.00% Impervious, Inflow Depth = 1.82" for 10-Year event
Inflow = 8.7 cfs @ 12.26 hrs, Volume= 39,273 cf
Primary = 8.7 cfs @ 12.26 hrs, Volume= 39,273 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

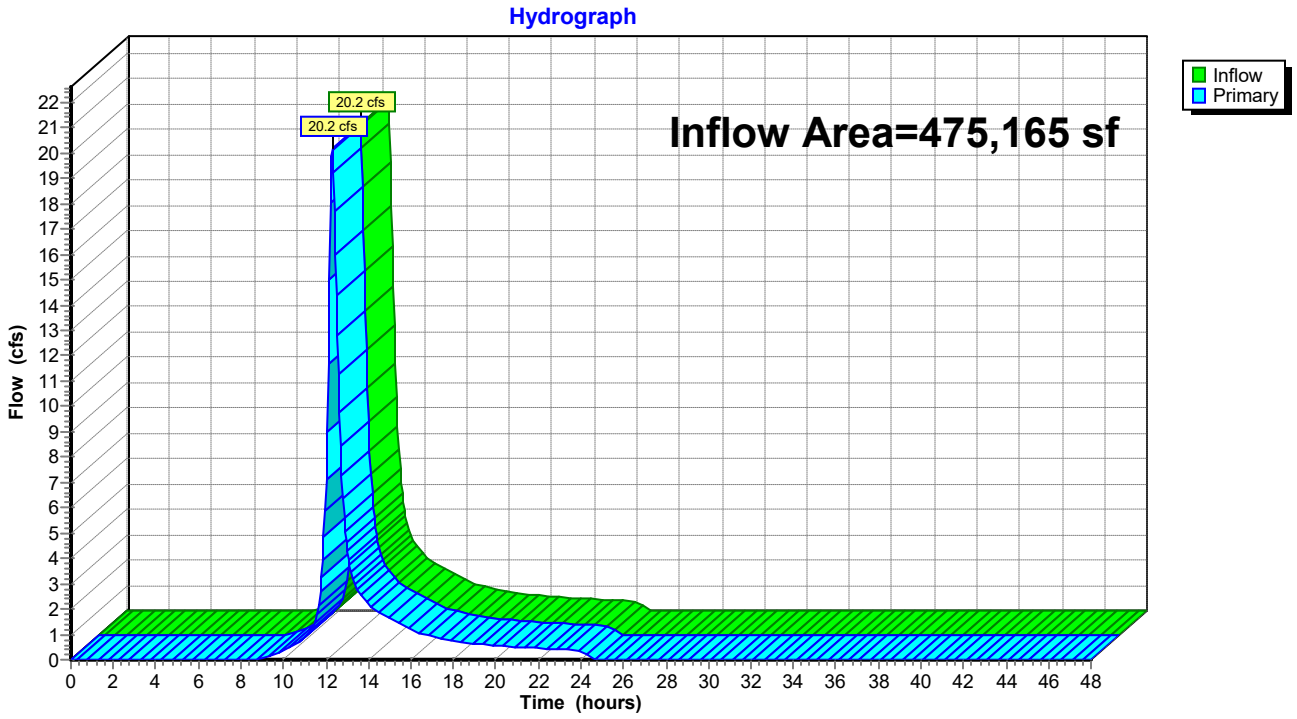


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 475,165 sf, 0.00% Impervious, Inflow Depth = 2.38" for 10-Year event
Inflow = 20.2 cfs @ 12.29 hrs, Volume= 94,069 cf
Primary = 20.2 cfs @ 12.29 hrs, Volume= 94,069 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=205,090 sf 2.78% Impervious Runoff Depth=2.46"
Flow Length=231' Tc=11.5 min CN=61/98 Runoff=10.7 cfs 41,977 cf

Subcatchment ES-1B: Runoff Area=193,036 sf 0.00% Impervious Runoff Depth=2.08"
Flow Length=386' Tc=12.8 min CN=58/0 Runoff=8.1 cfs 33,394 cf

Subcatchment ES-1C: Runoff Area=80,531 sf 0.00% Impervious Runoff Depth=3.71"
Flow Length=275' Tc=18.4 min CN=75/0 Runoff=5.6 cfs 24,912 cf

Subcatchment ES-2: Runoff Area=259,076 sf 0.00% Impervious Runoff Depth=3.31"
Flow Length=919' Tc=17.8 min CN=71/0 Runoff=16.2 cfs 71,388 cf

Subcatchment ES-3: Runoff Area=475,165 sf 0.00% Impervious Runoff Depth=4.02"
Flow Length=698' Slope=0.0170 '/' Tc=20.4 min CN=78/0 Runoff=34.2 cfs 159,334 cf

Link DP-1: On-stie Wetland Inflow=23.7 cfs 100,284 cf
Primary=23.7 cfs 100,284 cf

Link DP-2: Offsite to Southeast Inflow=16.2 cfs 71,388 cf
Primary=16.2 cfs 71,388 cf

Link DP-3: Offsite to Northeast Inflow=34.2 cfs 159,334 cf
Primary=34.2 cfs 159,334 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 331,006 cf Average Runoff Depth = 3.27"
99.53% Pervious = 1,207,190 sf 0.47% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

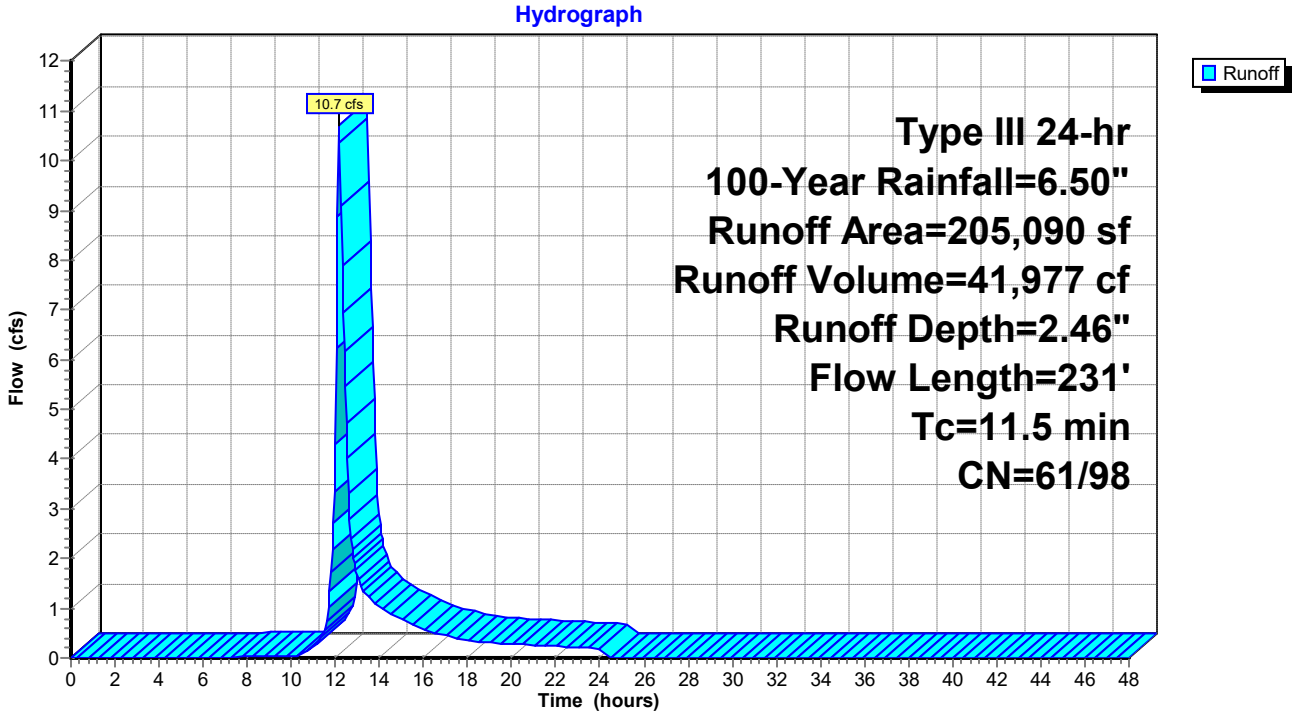
Runoff = 10.7 cfs @ 12.17 hrs, Volume= 41,977 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
121,245	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
0	30	Woods, Good, HSG A
53,409	55	Woods, Good, HSG B
21,966	70	Woods, Good, HSG C
205,090	62	Weighted Average
199,382	61	97.22% Pervious Area
5,708	98	2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	131	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.5	231	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

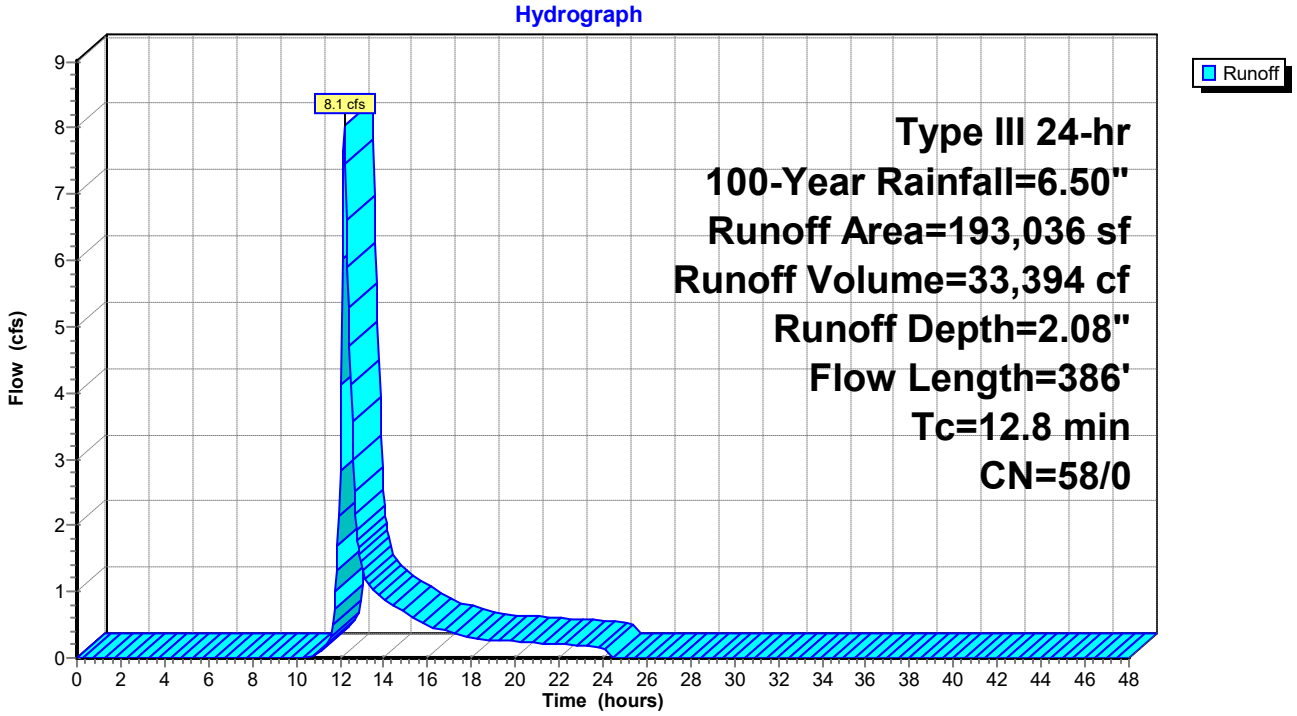
Runoff = 8.1 cfs @ 12.20 hrs, Volume= 33,394 cf, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
19,104	39	>75% Grass cover, Good, HSG A
127,281	61	>75% Grass cover, Good, HSG B
915	80	>75% Grass cover, Good, HSG D
1,684	96	Gravel surface, HSG A
8,532	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
23,563	55	Woods, Good, HSG B
356	77	Woods, Good, HSG D
193,036	58	Weighted Average
193,036	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

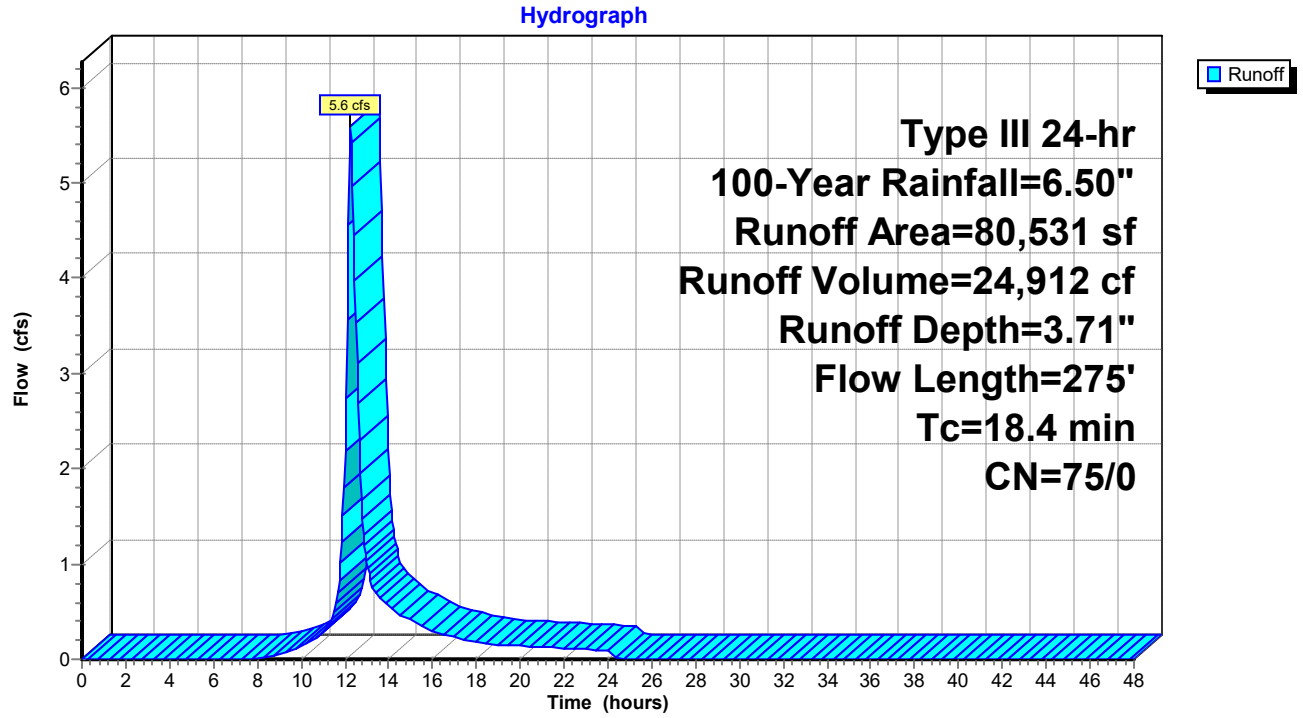
Runoff = 5.6 cfs @ 12.26 hrs, Volume= 24,912 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,727	61	>75% Grass cover, Good, HSG B
67,519	74	>75% Grass cover, Good, HSG C
4,986	80	>75% Grass cover, Good, HSG D
1,861	96	Gravel surface, HSG C
1,201	96	Gravel surface, HSG D
2,833	70	Woods, Good, HSG C
403	77	Woods, Good, HSG D
80,531	75	Weighted Average
80,531	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

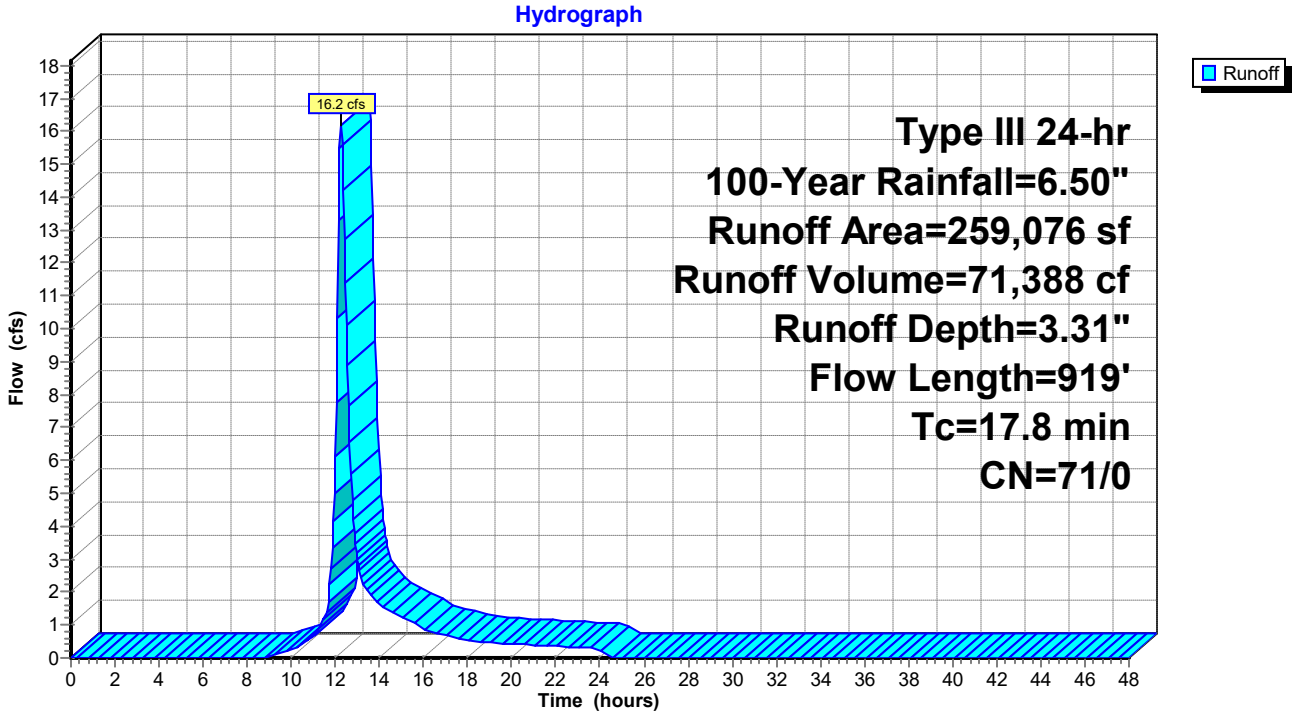
Runoff = 16.2 cfs @ 12.25 hrs, Volume= 71,388 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
22,243	39	>75% Grass cover, Good, HSG A
27,605	61	>75% Grass cover, Good, HSG B
98,083	74	>75% Grass cover, Good, HSG C
69,299	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,702	96	Gravel surface, HSG C
5,423	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
32,490	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
259,076	71	Weighted Average
259,076	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.1	819	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.8	919	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

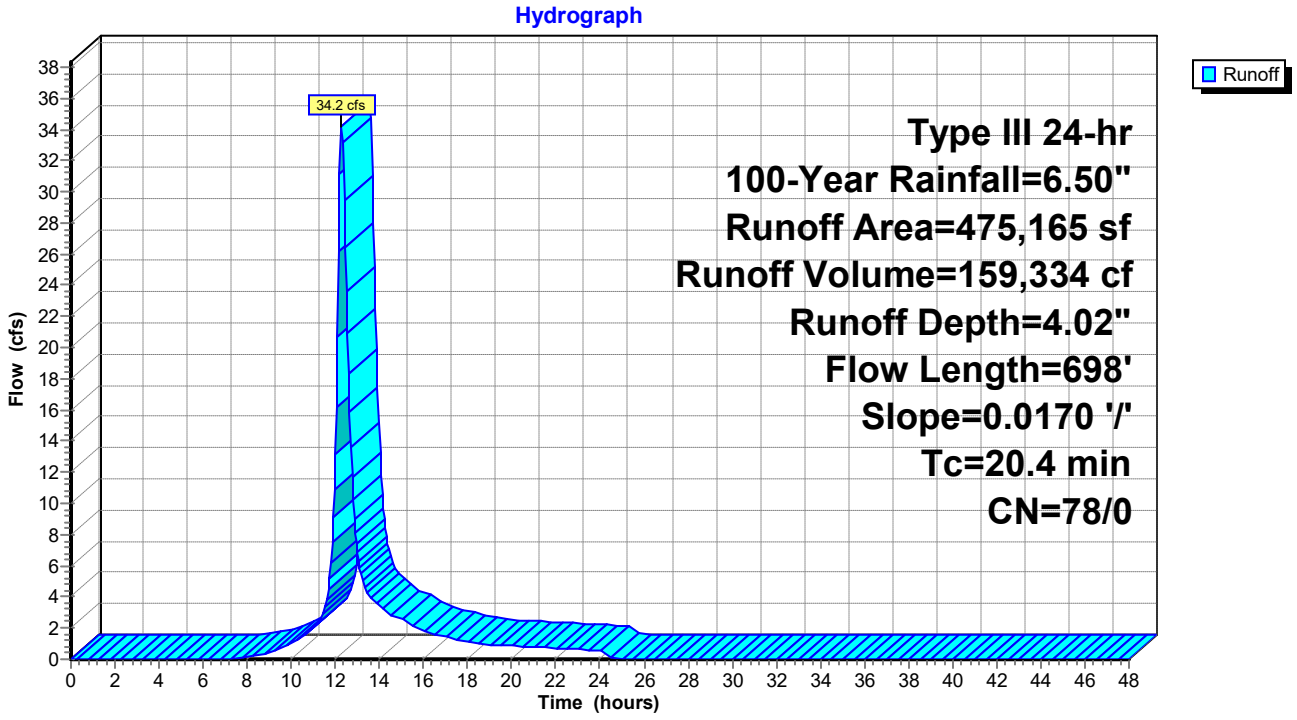
Runoff = 34.2 cfs @ 12.28 hrs, Volume= 159,334 cf, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,682	61	>75% Grass cover, Good, HSG B
131,238	74	>75% Grass cover, Good, HSG C
248,983	80	>75% Grass cover, Good, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
14,162	70	Woods, Good, HSG C
70,274	77	Woods, Good, HSG D
475,165	78	Weighted Average
475,165	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.7	598	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.4	698	Total			

Subcatchment ES-3:

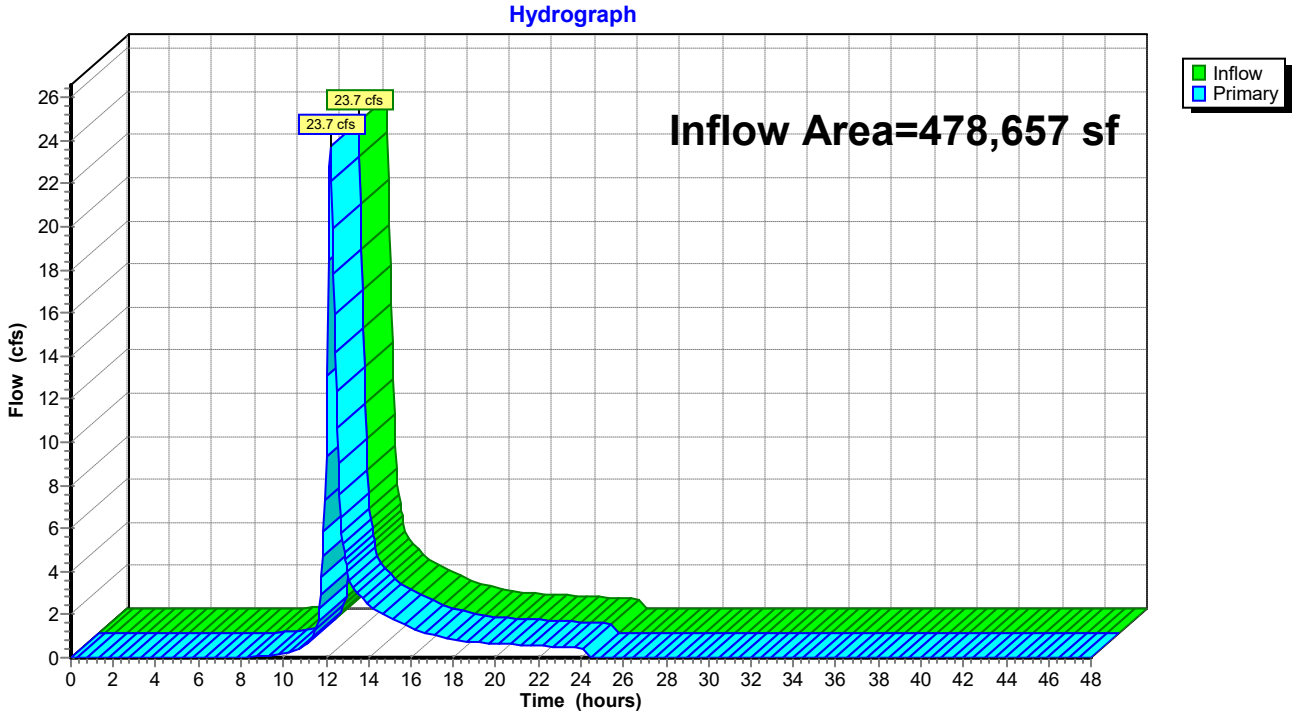


Summary for Link DP-1: On-stie Wetland

Inflow Area = 478,657 sf, 1.19% Impervious, Inflow Depth = 2.51" for 100-Year event
Inflow = 23.7 cfs @ 12.19 hrs, Volume= 100,284 cf
Primary = 23.7 cfs @ 12.19 hrs, Volume= 100,284 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

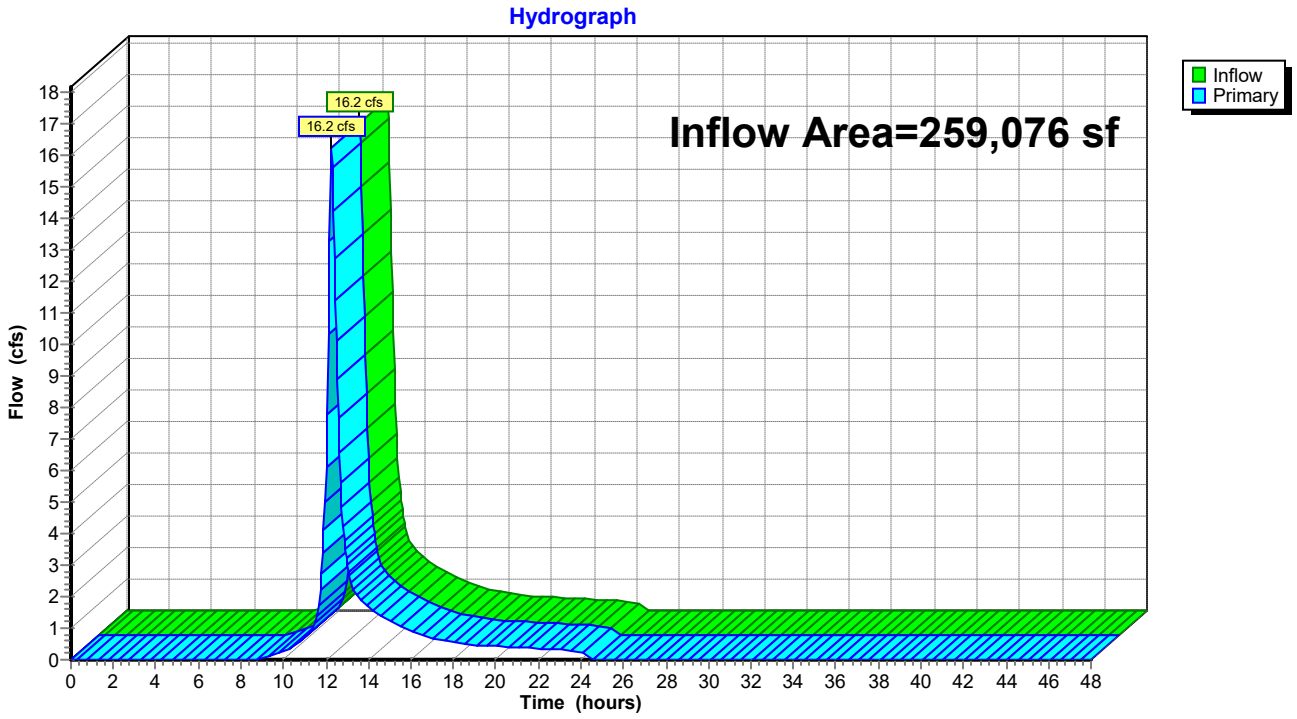


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 259,076 sf, 0.00% Impervious, Inflow Depth = 3.31" for 100-Year event
Inflow = 16.2 cfs @ 12.25 hrs, Volume= 71,388 cf
Primary = 16.2 cfs @ 12.25 hrs, Volume= 71,388 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

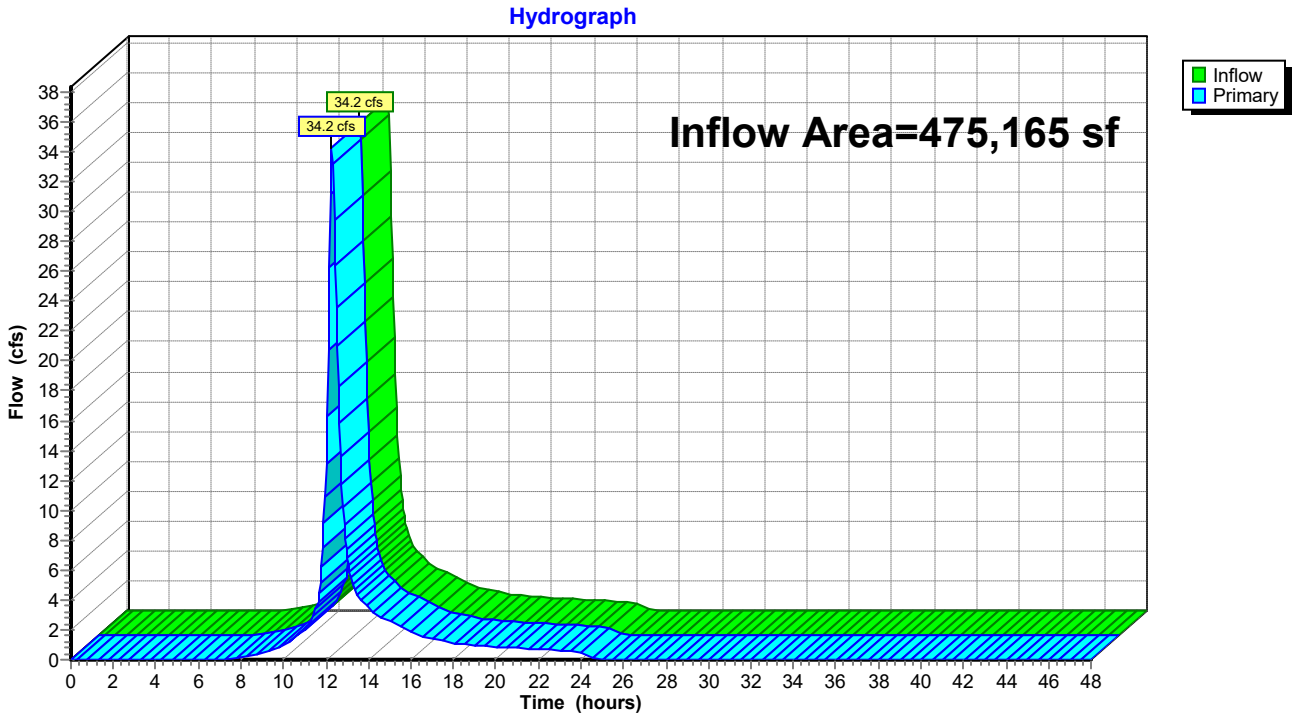


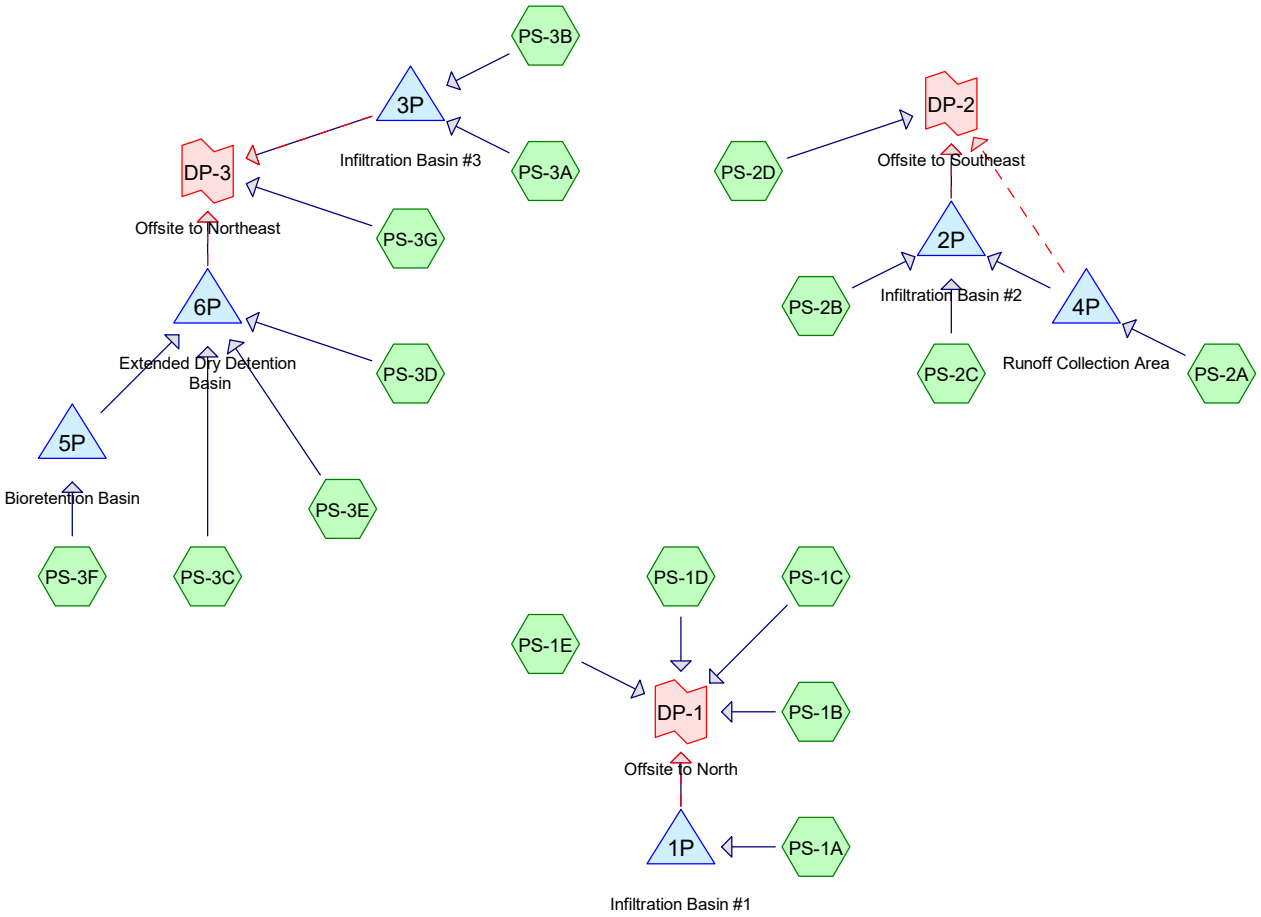
Summary for Link DP-3: Offsite to Northeast

Inflow Area = 475,165 sf, 0.00% Impervious, Inflow Depth = 4.02" for 100-Year event
Inflow = 34.2 cfs @ 12.28 hrs, Volume= 159,334 cf
Primary = 34.2 cfs @ 12.28 hrs, Volume= 159,334 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast





Subcat Reach Pond Link

Routing Diagram for 090506 - POST

Prepared by {enter your company name here}, Printed 3/18/2022

HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=143,245 sf 49.79% Impervious Runoff Depth=1.53"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=3.6 cfs 18,268 cf

Subcatchment PS-1B: Runoff Area=111,253 sf 1.10% Impervious Runoff Depth=0.46"
Flow Length=130' Tc=7.4 min CN=63/98 Runoff=0.8 cfs 4,250 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=0.20"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=0.1 cfs 623 cf

Subcatchment PS-1D: Runoff Area=70,388 sf 0.66% Impervious Runoff Depth=0.52"
Flow Length=100' Slope=0.0400 '/' Tc=11.2 min CN=65/98 Runoff=0.6 cfs 3,057 cf

Subcatchment PS-1E: Runoff Area=54,530 sf 0.00% Impervious Runoff Depth=1.02"
Flow Length=78' Slope=0.0200 '/' Tc=12.1 min CN=76/0 Runoff=1.1 cfs 4,613 cf

Subcatchment PS-2A: Runoff Area=80,244 sf 0.09% Impervious Runoff Depth=0.76"
Flow Length=264' Tc=14.3 min CN=71/98 Runoff=1.1 cfs 5,097 cf

Subcatchment PS-2B: Runoff Area=64,783 sf 68.84% Impervious Runoff Depth=2.09"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=2.7 cfs 11,272 cf

Subcatchment PS-2C: Runoff Area=46,886 sf 39.45% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=77/98 Runoff=2.0 cfs 6,801 cf

Subcatchment PS-2D: Runoff Area=42,405 sf 1.99% Impervious Runoff Depth=0.85"
Flow Length=95' Slope=0.0700 '/' Tc=8.6 min CN=72/98 Runoff=0.8 cfs 2,993 cf

Subcatchment PS-3A: Runoff Area=12,714 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=0/98 Runoff=0.8 cfs 2,933 cf

Subcatchment PS-3B: Runoff Area=191,714 sf 40.54% Impervious Runoff Depth=2.02"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=7.5 cfs 32,333 cf

Subcatchment PS-3C: Runoff Area=176,308 sf 60.49% Impervious Runoff Depth=2.05"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=7.2 cfs 30,180 cf

Subcatchment PS-3D: Runoff Area=3,107 sf 0.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98/0 Runoff=0.2 cfs 717 cf

Subcatchment PS-3E: Runoff Area=25,746 sf 7.60% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=74/98 Runoff=0.7 cfs 2,252 cf

Subcatchment PS-3F: Runoff Area=28,123 sf 55.95% Impervious Runoff Depth=1.95"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=1.2 cfs 4,568 cf

Subcatchment PS-3G: Runoff Area=123,948 sf 5.24% Impervious Runoff Depth=1.16"
Flow Length=178' Tc=12.9 min CN=77/98 Runoff=2.9 cfs 11,981 cf

Pond 1P: Infiltration Basin #1 Peak Elev=201.53' Storage=9,480 cf Inflow=3.6 cfs 18,268 cf
Primary=1.3 cfs 12,491 cf Secondary=0.0 cfs 0 cf Outflow=1.3 cfs 12,491 cf

Pond 2P: Infiltration Basin #2 Peak Elev=181.56' Storage=6,684 cf Inflow=4.4 cfs 19,809 cf
Primary=2.5 cfs 16,913 cf Secondary=0.0 cfs 0 cf Outflow=2.5 cfs 16,913 cf

Pond 3P: Infiltration Basin #3 Peak Elev=182.18' Storage=13,133 cf Inflow=8.0 cfs 35,266 cf
Primary=4.0 cfs 30,022 cf Secondary=0.0 cfs 0 cf Outflow=4.0 cfs 30,022 cf

Pond 4P: Runoff Collection Area Peak Elev=189.01' Storage=3,448 cf Inflow=1.1 cfs 5,097 cf
Primary=0.1 cfs 1,736 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 1,736 cf

Pond 5P: Bioretention Basin Peak Elev=182.56' Storage=2,553 cf Inflow=1.2 cfs 4,568 cf
Outflow=0.4 cfs 2,196 cf

Pond 6P: Extended Dry Detention Basin Peak Elev=178.10' Storage=8,670 cf Inflow=7.9 cfs 35,345 cf
Primary=3.4 cfs 35,345 cf Secondary=0.0 cfs 0 cf Outflow=3.4 cfs 35,345 cf

Link DP-1: Offsite to North Inflow=2.8 cfs 25,033 cf
Primary=2.8 cfs 25,033 cf

Link DP-2: Offsite to Southeast Inflow=3.0 cfs 19,906 cf
Primary=3.0 cfs 19,906 cf

Link DP-3: Offsite to Northeast Inflow=9.2 cfs 77,348 cf
Primary=9.2 cfs 77,348 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 141,937 cf Average Runoff Depth = 1.40"
70.27% Pervious = 852,349 sf 29.73% Impervious = 360,549 sf

Summary for Subcatchment PS-1A:

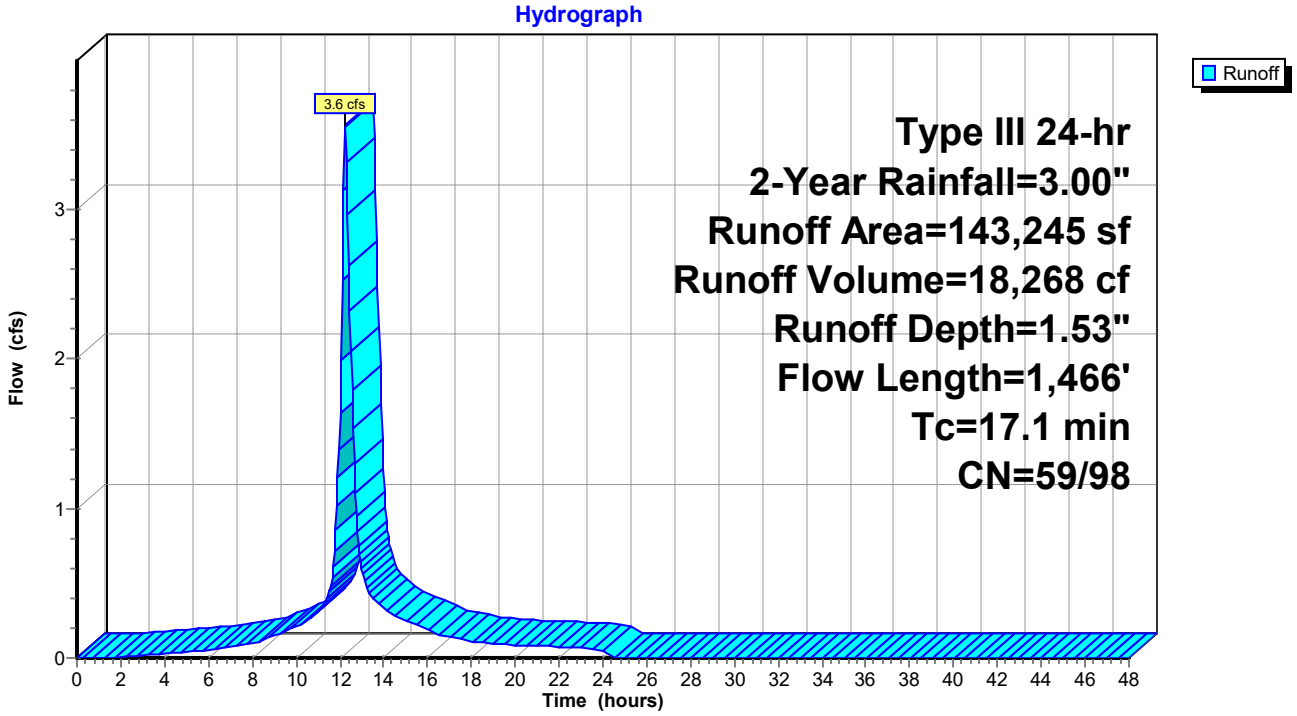
Runoff = 3.6 cfs @ 12.23 hrs, Volume= 18,268 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
22,050	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
143,245	78	Weighted Average
71,926	59	50.21% Pervious Area
71,319	98	49.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

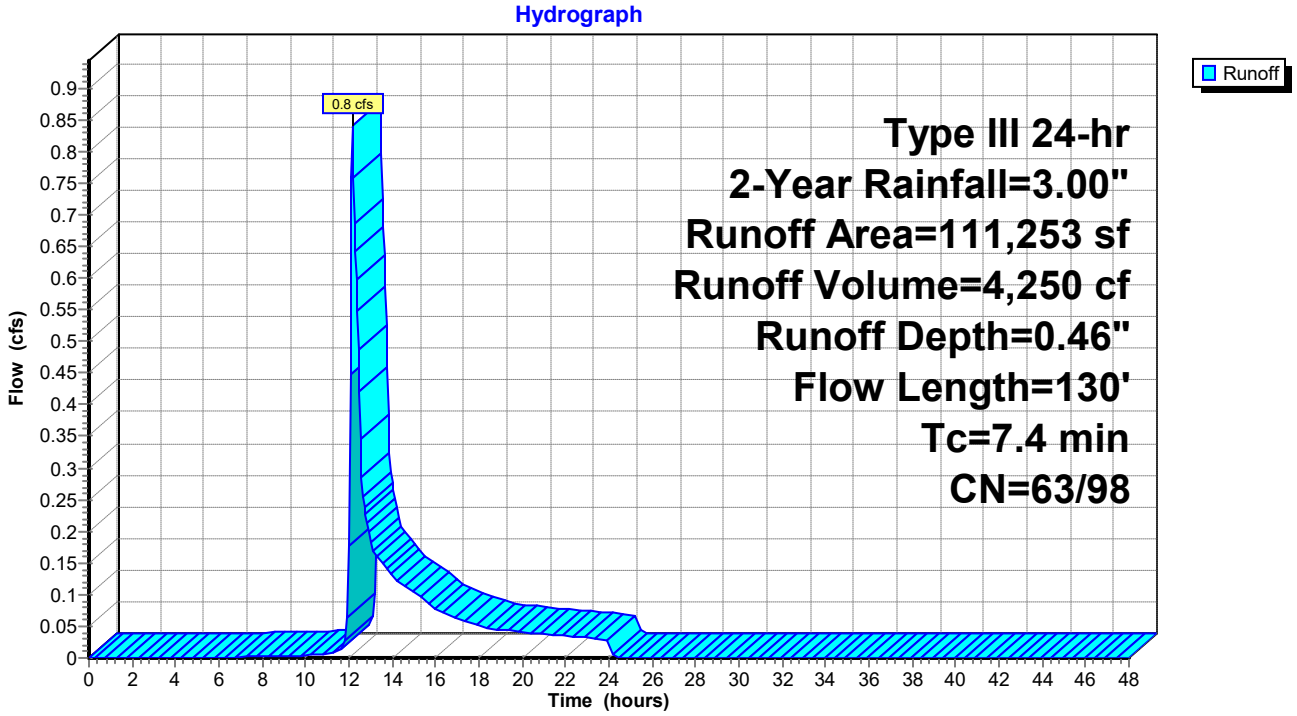
Runoff = 0.8 cfs @ 12.15 hrs, Volume= 4,250 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
45,290	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
727	98	Water Surface, HSG B
492	98	Water Surface, HSG C
0	30	Woods, Good, HSG A
36,205	55	Woods, Good, HSG B
18,556	70	Woods, Good, HSG C
111,253	63	Weighted Average
110,034	63	98.90% Pervious Area
1,219	98	1.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.2	72	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.4	130	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

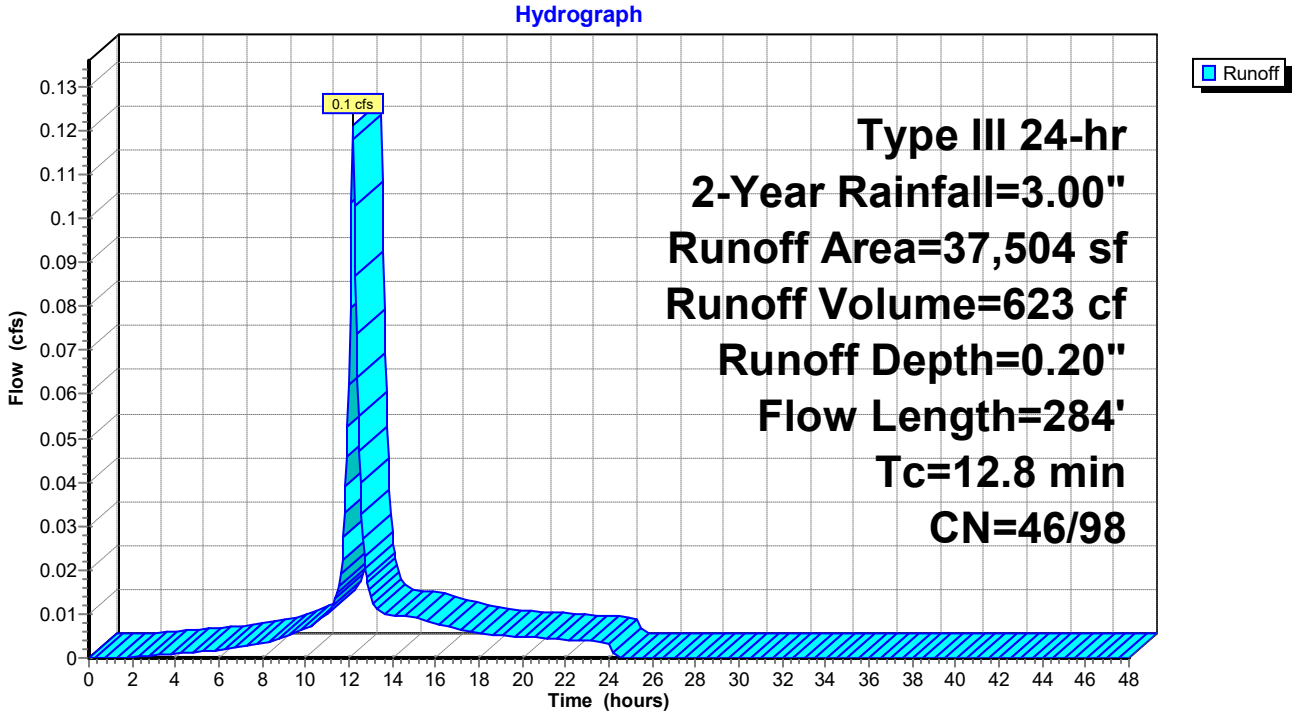
Runoff = 0.1 cfs @ 12.17 hrs, Volume= 623 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
9,878	39	>75% Grass cover, Good, HSG A
15,548	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	49	Weighted Average
35,242	46	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

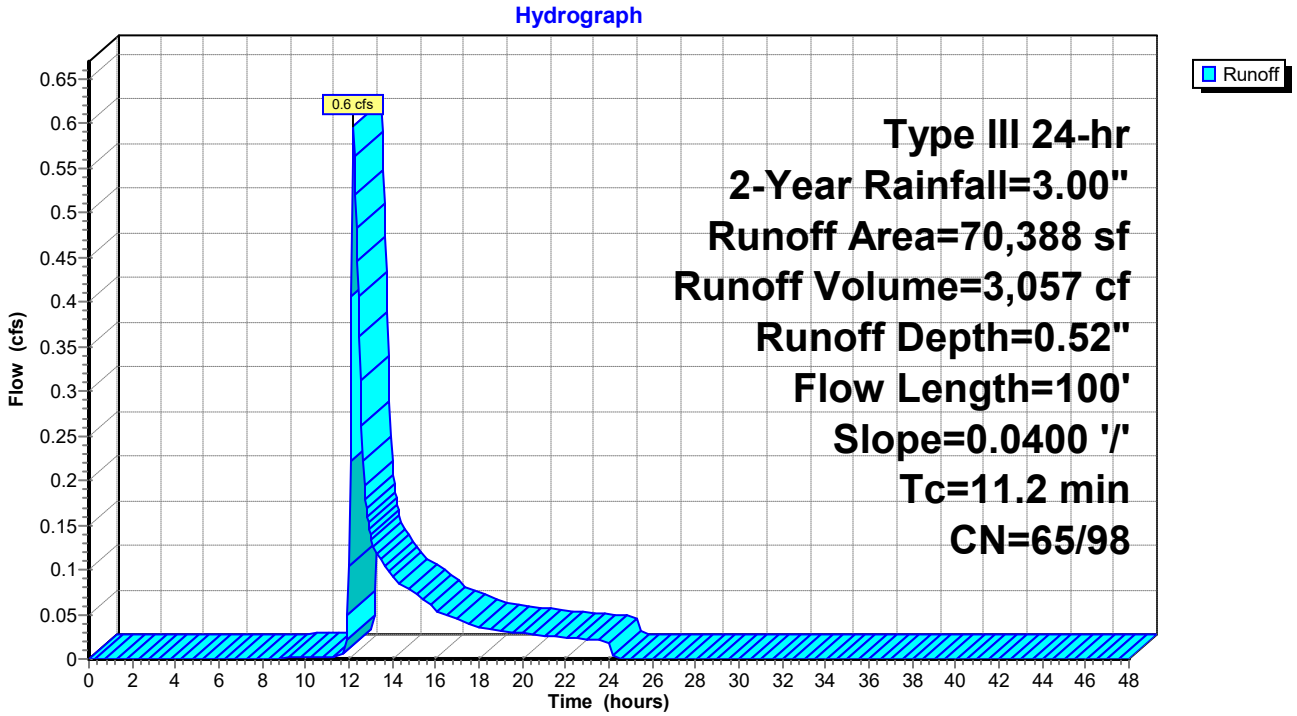
Runoff = 0.6 cfs @ 12.20 hrs, Volume= 3,057 cf, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
41,955	61	>75% Grass cover, Good, HSG B
583	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
468	98	Water Surface, HSG B
17,565	55	Woods, Good, HSG B
67	77	Woods, Good, HSG D
70,388	65	Weighted Average
69,920	65	99.34% Pervious Area
468	98	0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

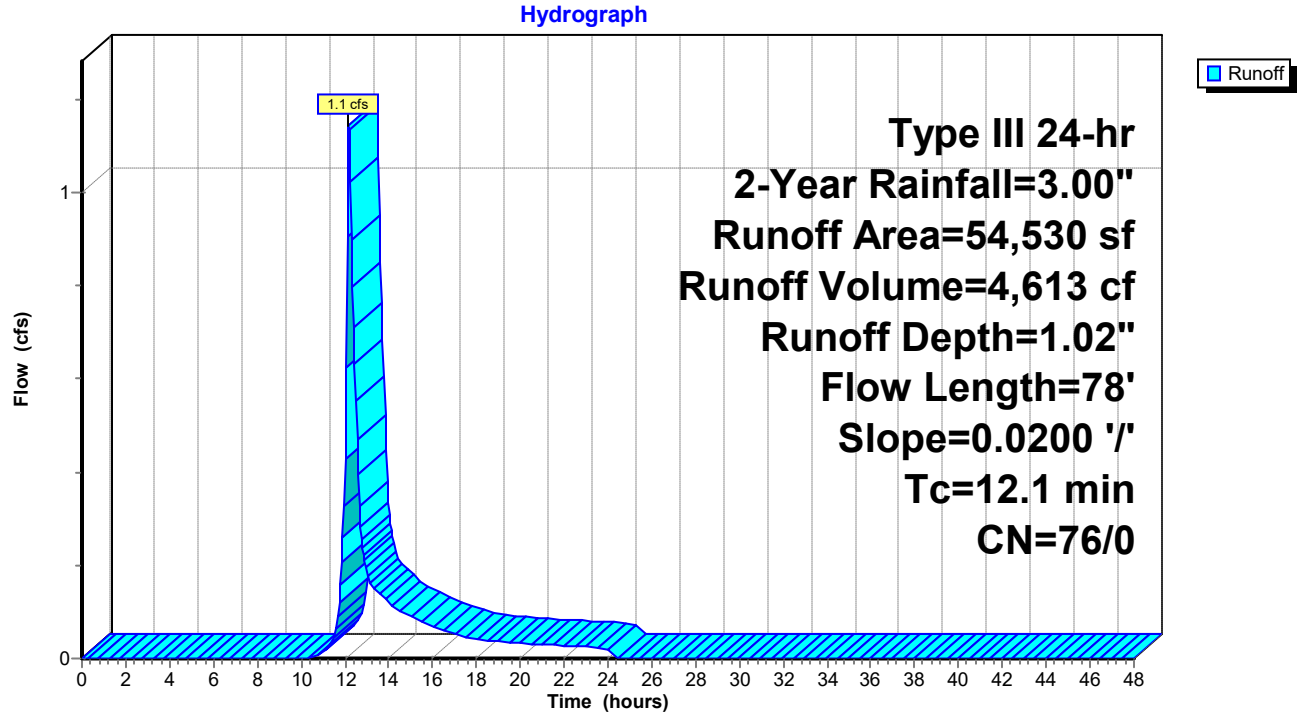
Runoff = 1.1 cfs @ 12.18 hrs, Volume= 4,613 cf, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,435	61	>75% Grass cover, Good, HSG B
23,317	74	>75% Grass cover, Good, HSG C
9,766	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
3,944	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
290	55	Woods, Good, HSG B
12,516	70	Woods, Good, HSG C
1,396	77	Woods, Good, HSG D
54,530	76	Weighted Average
54,530	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	78	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

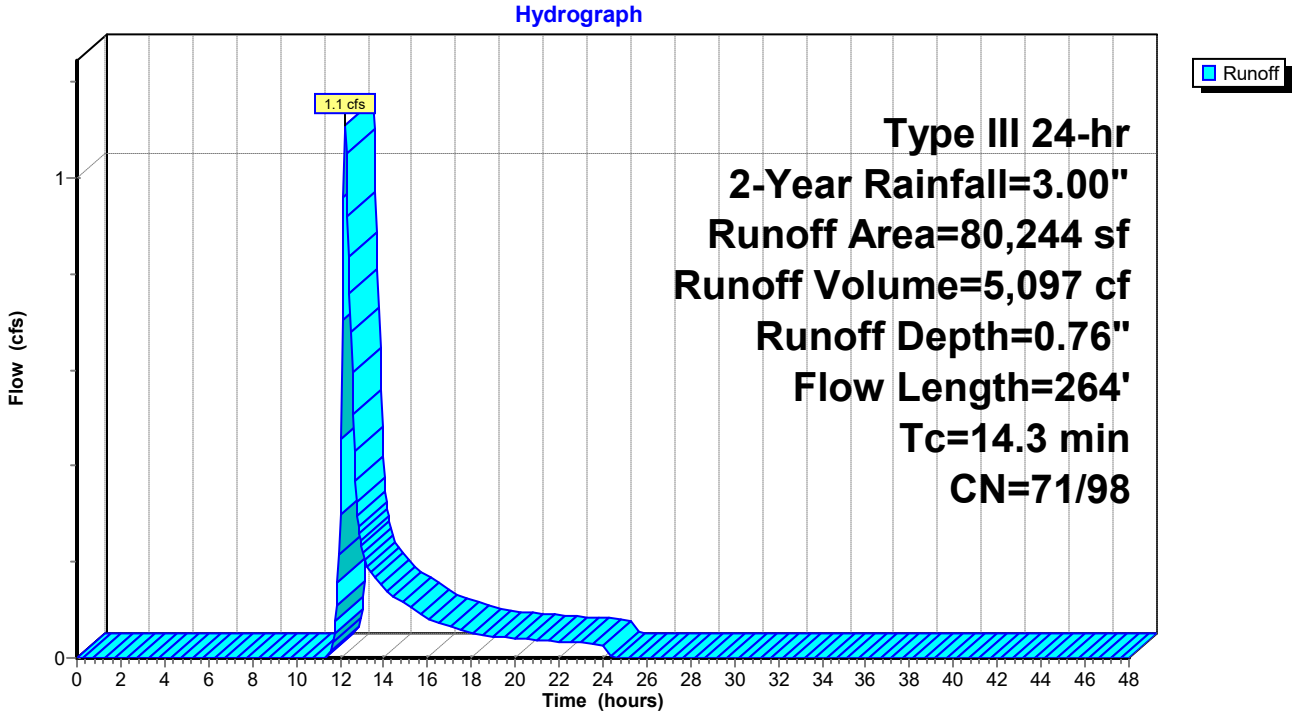
Runoff = 1.1 cfs @ 12.22 hrs, Volume= 5,097 cf, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
8,942	39	>75% Grass cover, Good, HSG A
11,979	61	>75% Grass cover, Good, HSG B
43,810	74	>75% Grass cover, Good, HSG C
7,338	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
167	70	Woods, Good, HSG C
80,244	71	Weighted Average
80,170	71	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

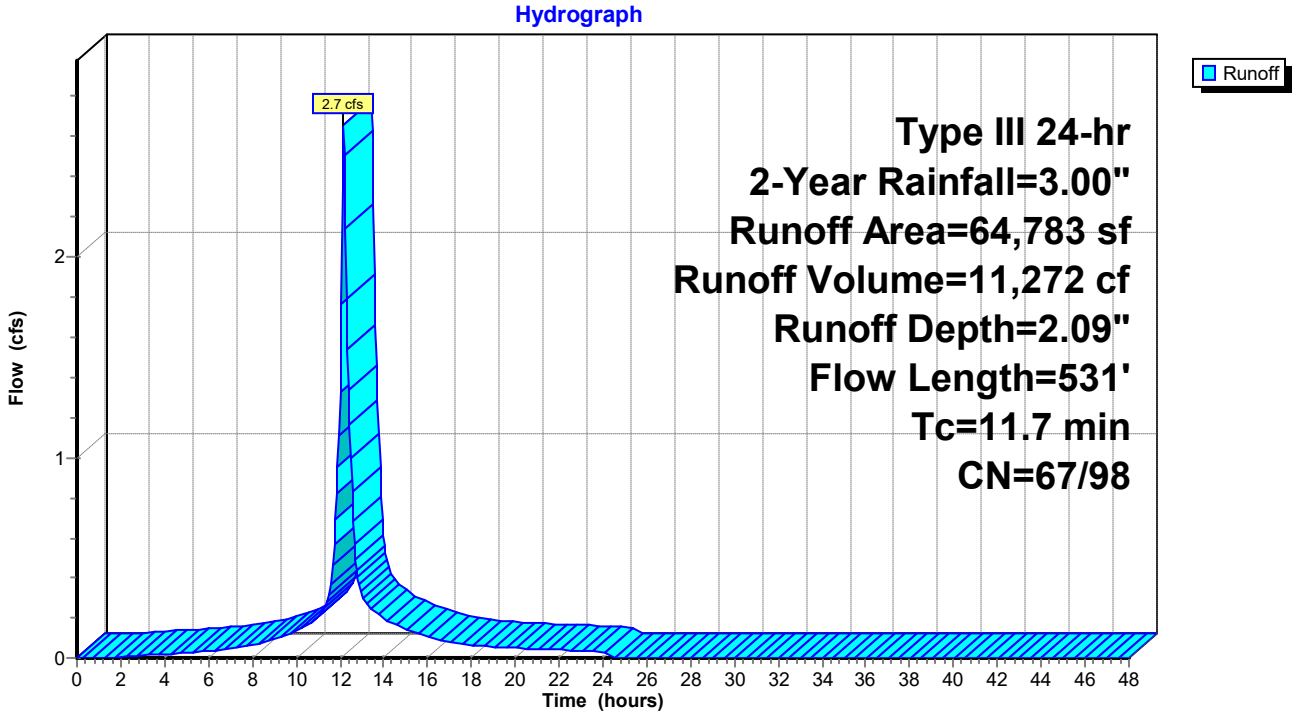
Runoff = 2.7 cfs @ 12.16 hrs, Volume= 11,272 cf, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,799	39	>75% Grass cover, Good, HSG A
5,184	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,783	88	Weighted Average
20,185	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

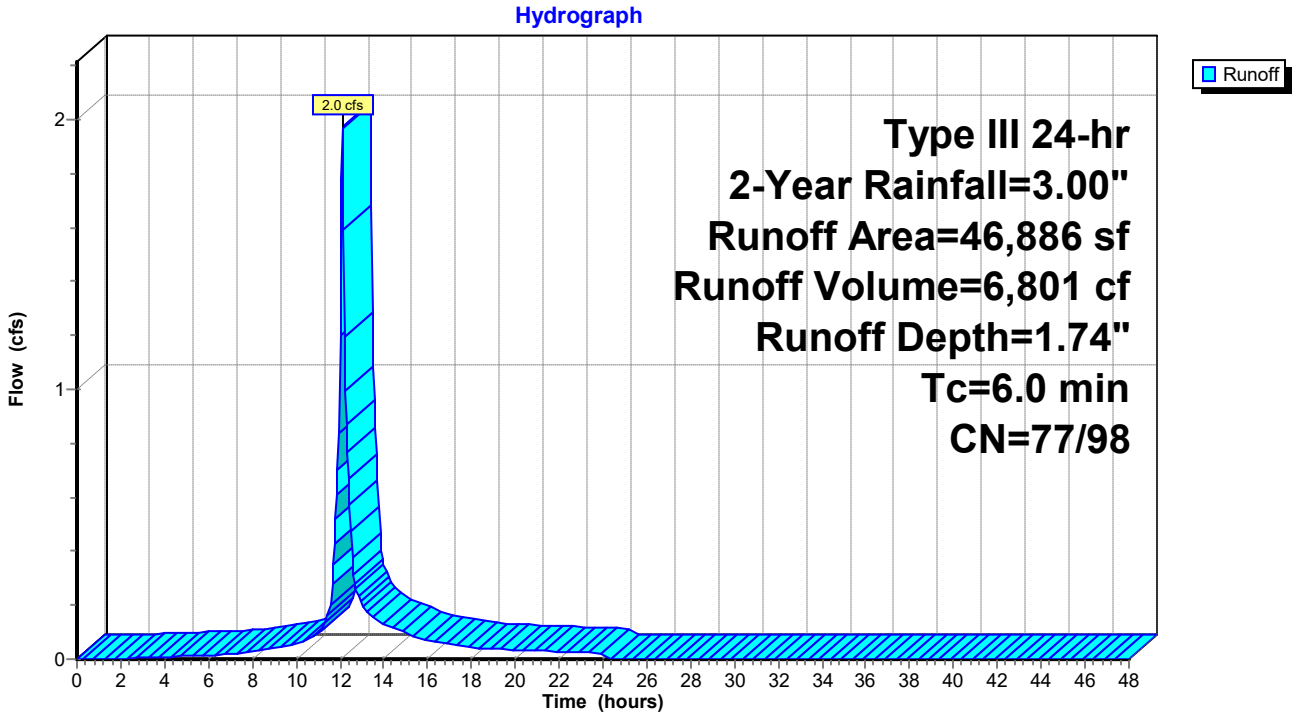
Runoff = 2.0 cfs @ 12.09 hrs, Volume= 6,801 cf, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,571	74	>75% Grass cover, Good, HSG C
13,820	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,757	98	Roofs, HSG D
3,615	98	Water Surface, HSG C
1,473	98	Water Surface, HSG D
46,886	85	Weighted Average
28,391	77	60.55% Pervious Area
18,495	98	39.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

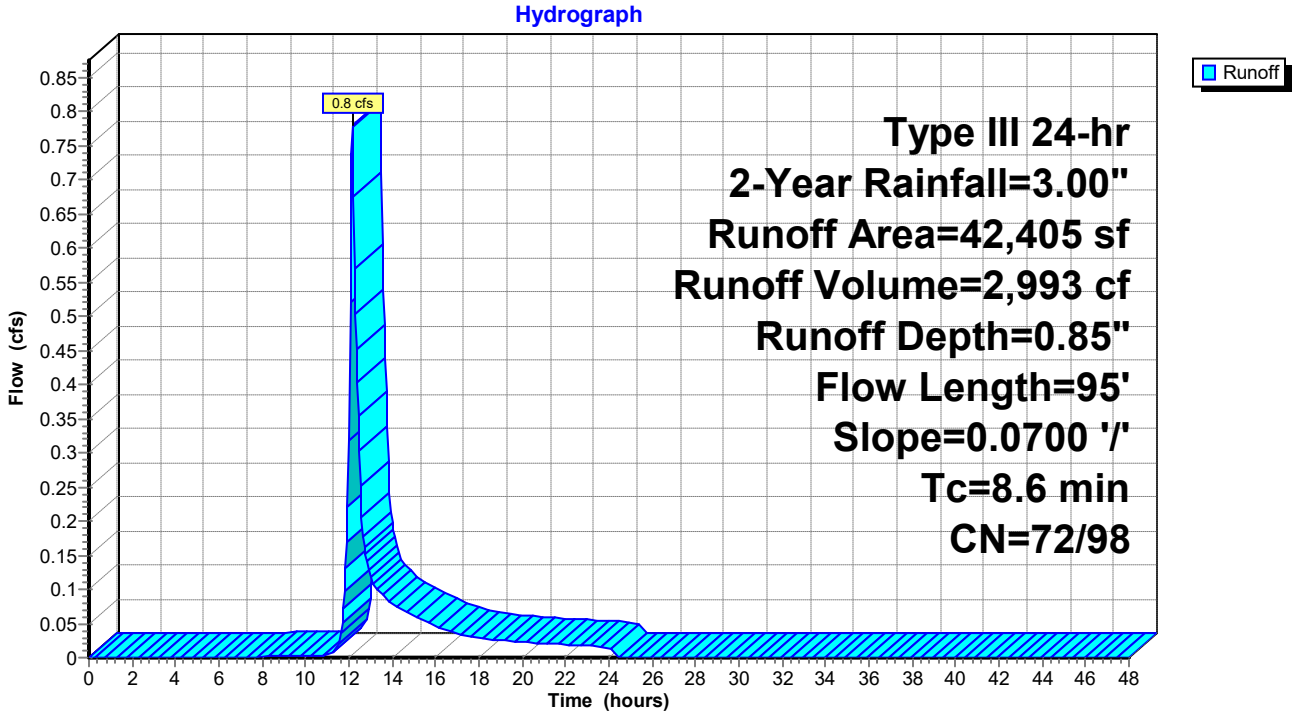
Runoff = 0.8 cfs @ 12.14 hrs, Volume= 2,993 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
28,584	74	>75% Grass cover, Good, HSG C
843	98	Water Surface, HSG C
638	30	Woods, Good, HSG A
12,340	70	Woods, Good, HSG C
42,405	73	Weighted Average
41,562	72	98.01% Pervious Area
843	98	1.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	95	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

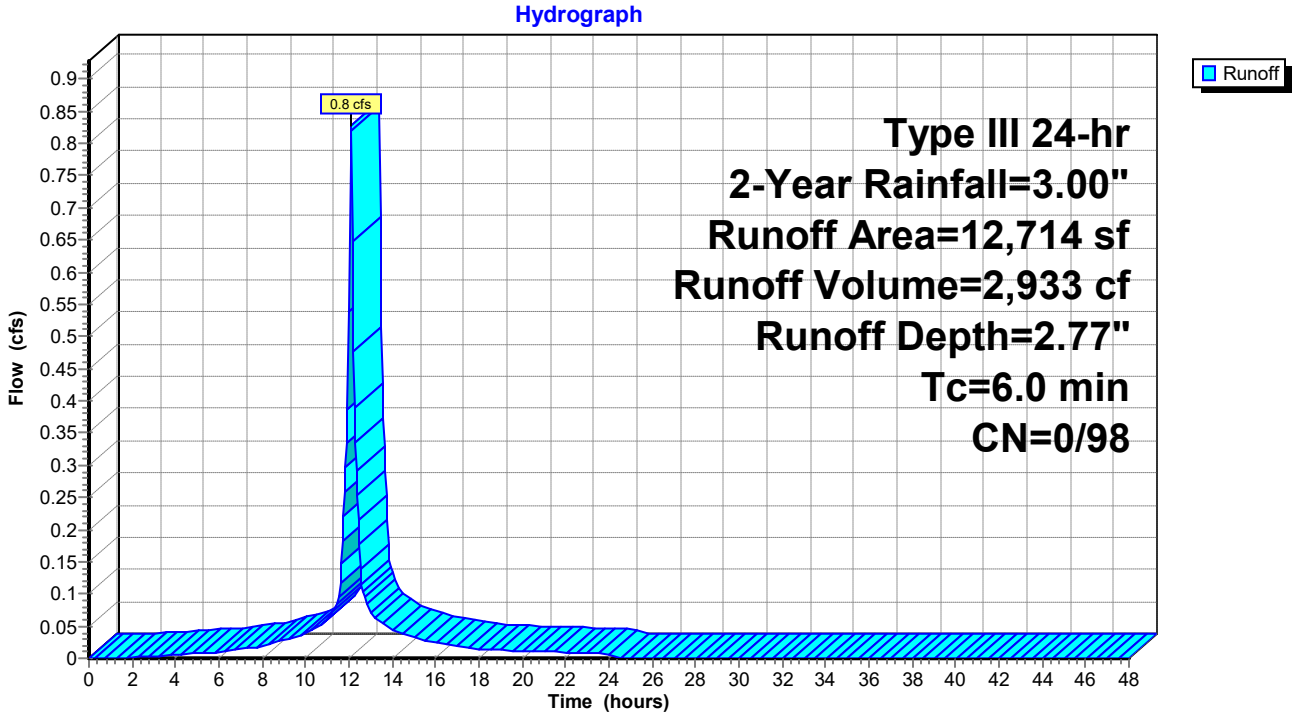
Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,933 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
1,085	98	Roofs, HSG C
4,376	98	Roofs, HSG D
12,714	98	Weighted Average
12,714	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

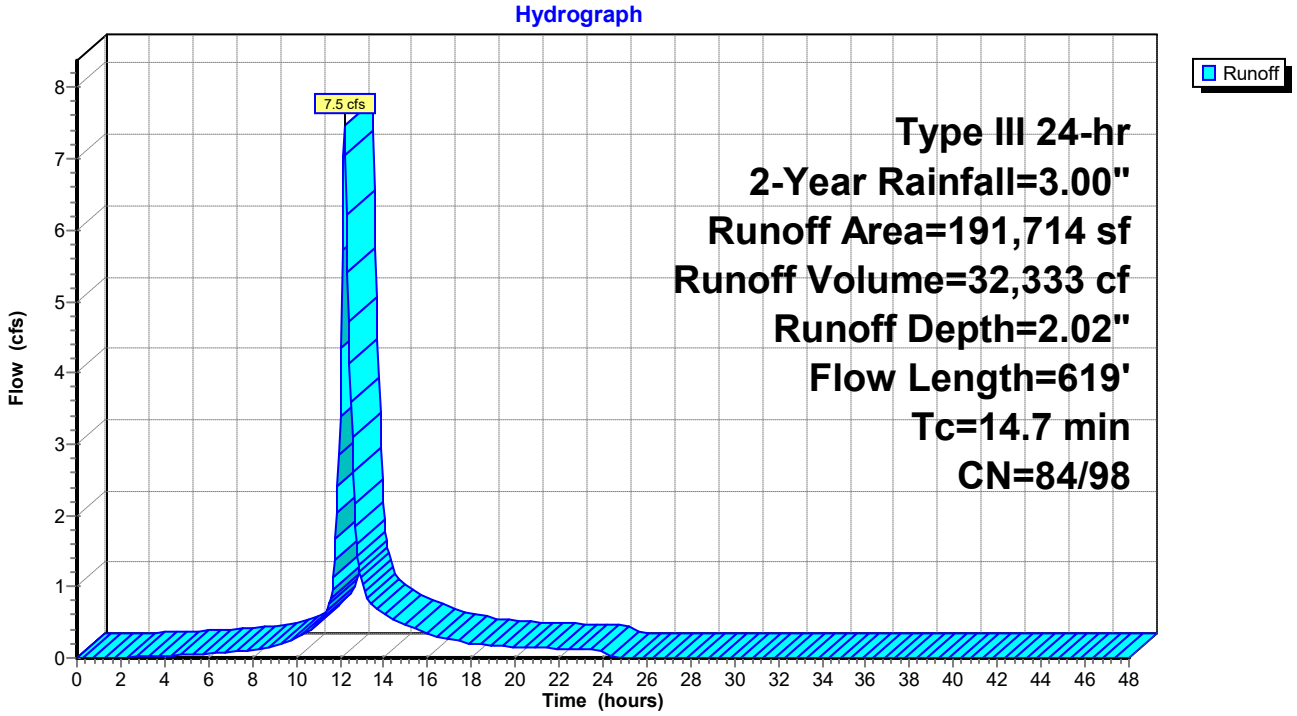
Runoff = 7.5 cfs @ 12.20 hrs, Volume= 32,333 cf, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
13,827	74	>75% Grass cover, Good, HSG C
70,998	80	>75% Grass cover, Good, HSG D
7,694	98	Paved parking, HSG C
40,930	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,790	98	Roofs, HSG D
6,165	98	Unconnected roofs, HSG C
23,006	98	Unconnected roofs, HSG D
9,353	98	Water Surface, HSG D
191,714	90	Weighted Average
113,996	84	59.46% Pervious Area
77,718	98	40.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

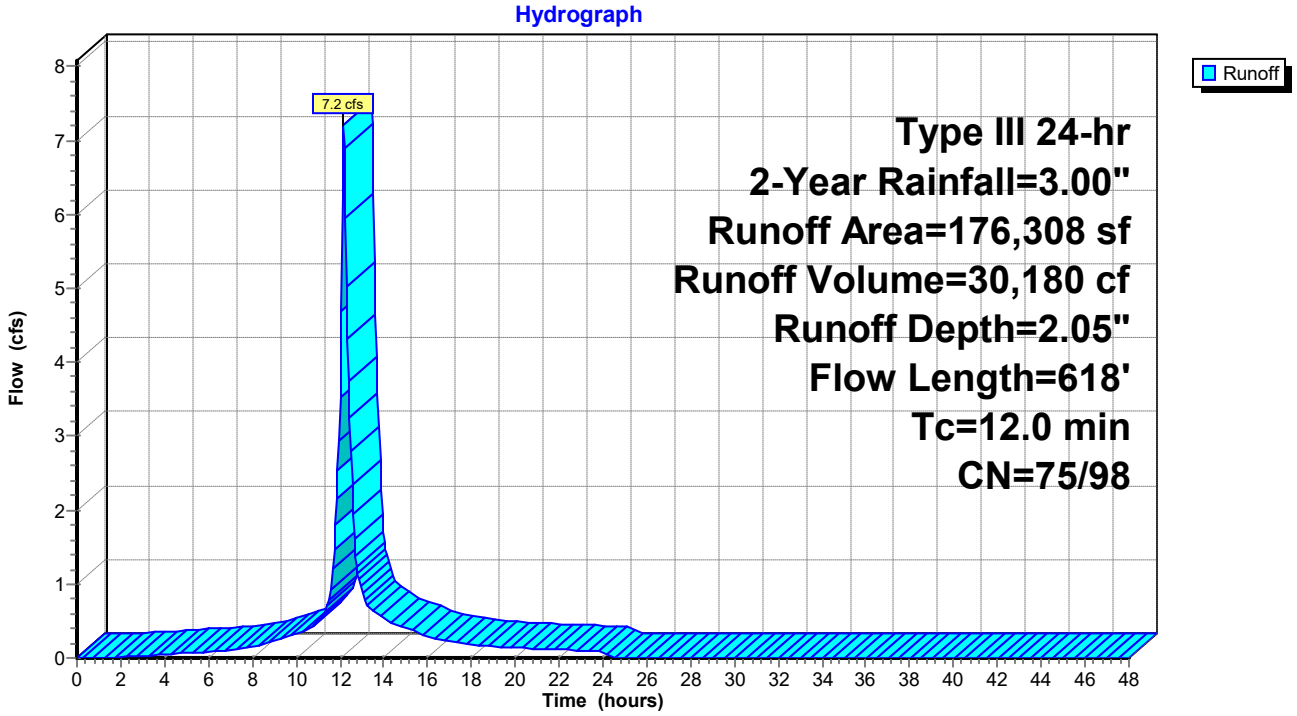
Runoff = 7.2 cfs @ 12.16 hrs, Volume= 30,180 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
23,806	74	>75% Grass cover, Good, HSG C
33,900	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
29,102	98	Paved parking, HSG C
54,828	98	Paved parking, HSG D
7,744	98	Roofs, HSG C
299	98	Roofs, HSG D
79	98	Unconnected roofs, HSG C
176,308	89	Weighted Average
69,656	75	39.51% Pervious Area
106,652	98	60.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

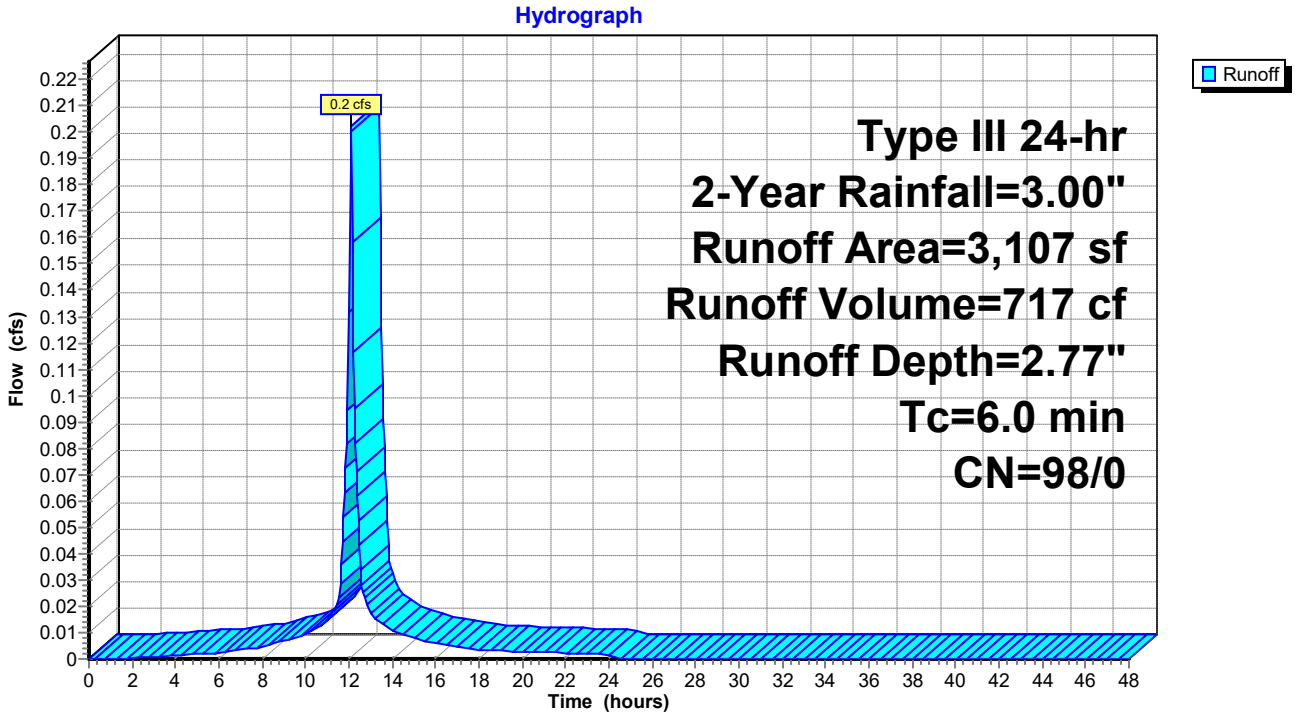
Runoff = 0.2 cfs @ 12.09 hrs, Volume= 717 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,107	98	Unconnected roofs, HSG C
3,107	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

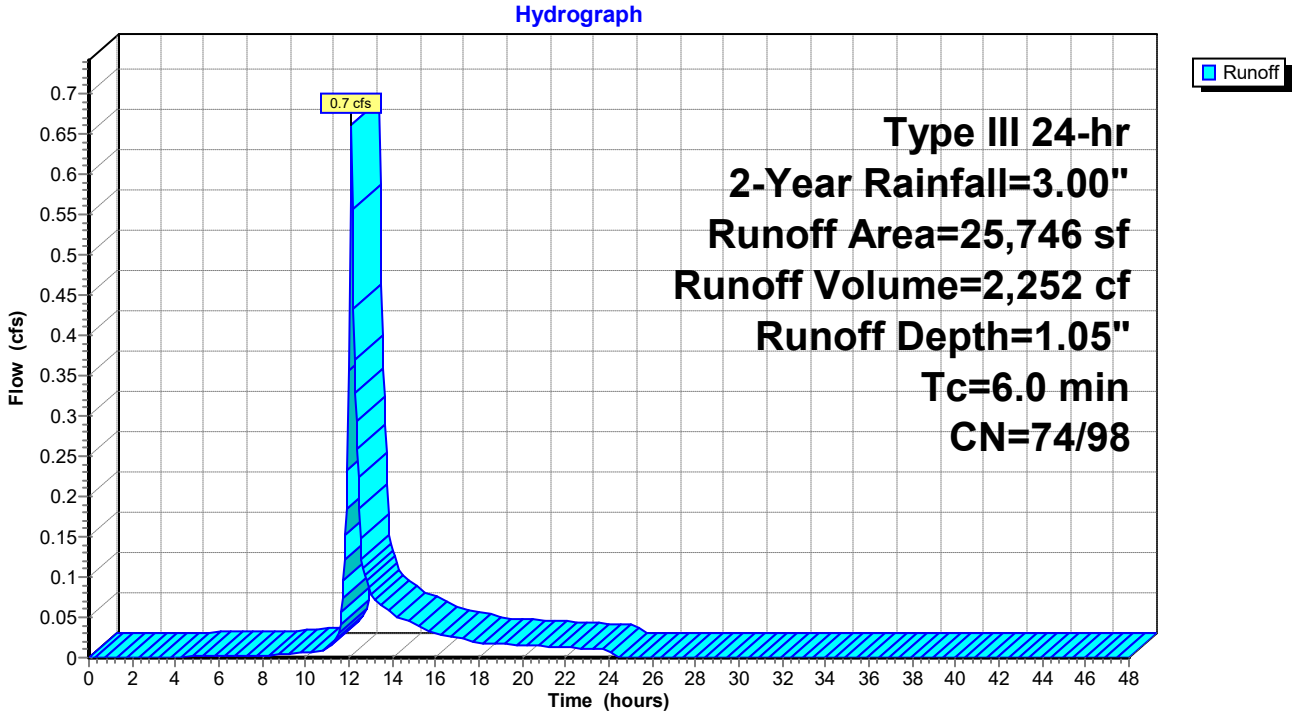
Runoff = 0.7 cfs @ 12.10 hrs, Volume= 2,252 cf, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
21,934	74	>75% Grass cover, Good, HSG C
1,855	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
1,846	98	Roofs, HSG C
104	98	Roofs, HSG D
25,746	76	Weighted Average
23,790	74	92.40% Pervious Area
1,957	98	7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

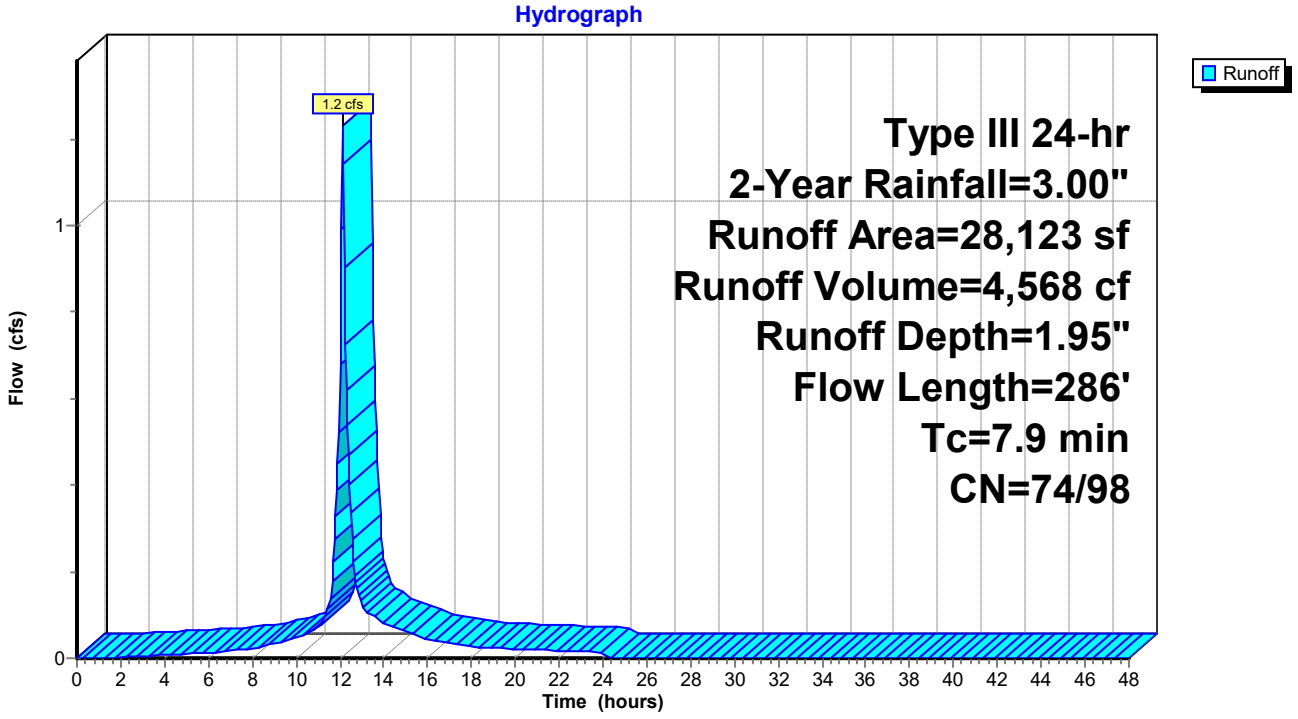
Runoff = 1.2 cfs @ 12.11 hrs, Volume= 4,568 cf, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
12,387	74	>75% Grass cover, Good, HSG C
15,736	98	Paved parking, HSG C
28,123	87	Weighted Average
12,387	74	44.05% Pervious Area
15,736	98	55.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3F:



Summary for Subcatchment PS-3G:

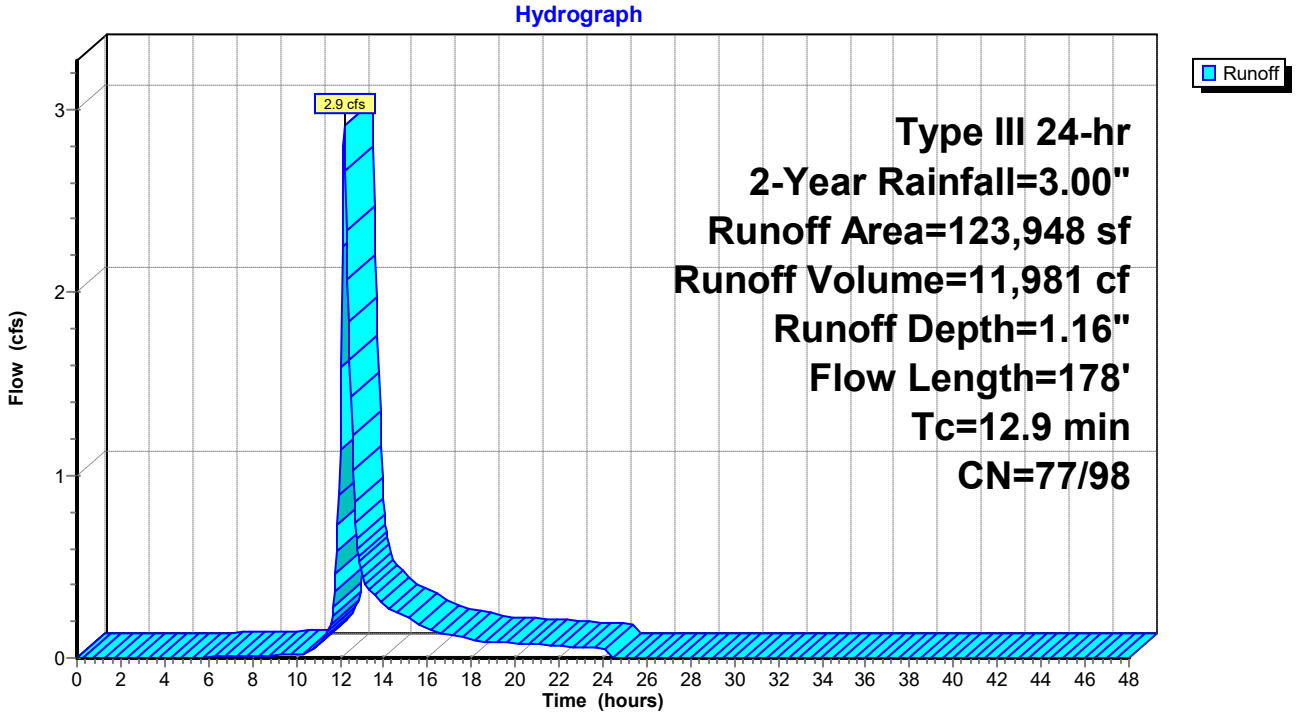
Runoff = 2.9 cfs @ 12.19 hrs, Volume= 11,981 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
19,056	74	>75% Grass cover, Good, HSG C
57,013	80	>75% Grass cover, Good, HSG D
635	98	Roofs, HSG C
3,265	98	Roofs, HSG D
308	98	Water Surface, HSG A
2,286	98	Water Surface, HSG D
11,415	70	Woods, Good, HSG C
29,969	77	Woods, Good, HSG D
123,948	78	Weighted Average
117,454	77	94.76% Pervious Area
6,494	98	5.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	78	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	178	Total			

Subcatchment PS-3G:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 143,245 sf, 49.79% Impervious, Inflow Depth = 1.53" for 2-Year event
Inflow = 3.6 cfs @ 12.23 hrs, Volume= 18,268 cf
Outflow = 1.3 cfs @ 12.66 hrs, Volume= 12,491 cf, Atten= 64%, Lag= 25.6 min
Primary = 1.3 cfs @ 12.66 hrs, Volume= 12,491 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.53' @ 12.66 hrs Surf.Area= 8,069 sf Storage= 9,480 cf

Plug-Flow detention time= 261.2 min calculated for 12,491 cf (68% of inflow)
Center-of-Mass det. time= 157.0 min (942.8 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	4,856 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	37,851 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		43,321 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616
205.00	1,656	155.0	1,540	4,856	1,937

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482
205.00	10,613	498.0	9,983	37,851	12,038

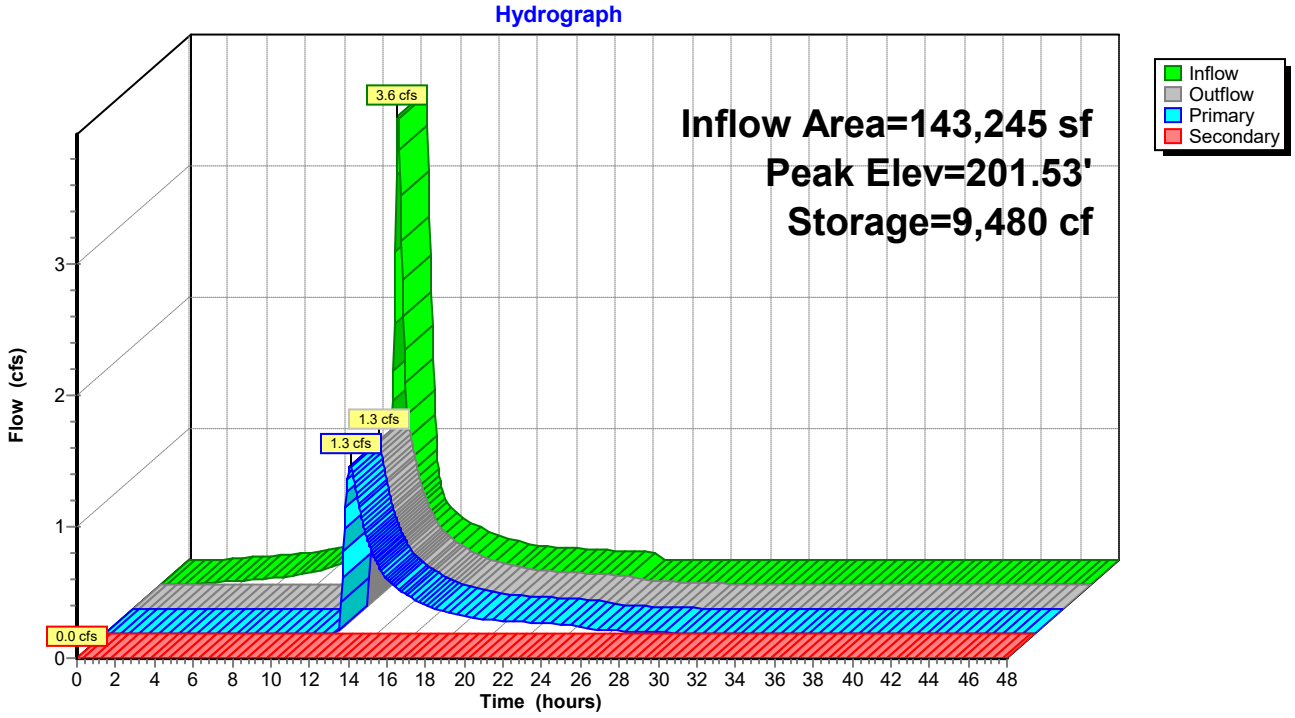
Device	Routing	Invert	Outlet Devices
#1	Primary	198.80'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.80' / 198.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	201.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 201.00 202.00 202.00 202.50 Width (feet) 1.00 1.00 3.50 3.50

#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.3 cfs @ 12.66 hrs HW=201.53' (Free Discharge)
└**1=Culvert** (Passes 1.3 cfs of 6.8 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 1.3 cfs @ 2.39 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #2

Inflow Area = 191,913 sf, 32.91% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 4.4 cfs @ 12.12 hrs, Volume= 19,809 cf
Outflow = 2.5 cfs @ 12.32 hrs, Volume= 16,913 cf, Atten= 43%, Lag= 12.1 min
Primary = 2.5 cfs @ 12.32 hrs, Volume= 16,913 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.56' @ 12.32 hrs Surf.Area= 7,242 sf Storage= 6,684 cf

Plug-Flow detention time= 163.4 min calculated for 16,895 cf (85% of inflow)
Center-of-Mass det. time= 92.7 min (904.8 - 812.1)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	663 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,708 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	180.50'	27,363 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		29,735 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	274	64.0	0	0	274
181.00	378	75.0	162	162	401
182.00	634	96.0	501	663	699

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	634	96.0	0	0	634
183.00	871	113.0	749	749	935
184.00	1,050	124.0	959	1,708	1,174

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,087	508.0	0	0	5,087
181.00	5,857	519.0	2,734	2,734	6,022
182.00	7,446	540.0	6,636	9,369	7,869
183.00	9,017	561.0	8,219	17,588	9,790
184.00	10,553	580.0	9,775	27,363	11,607

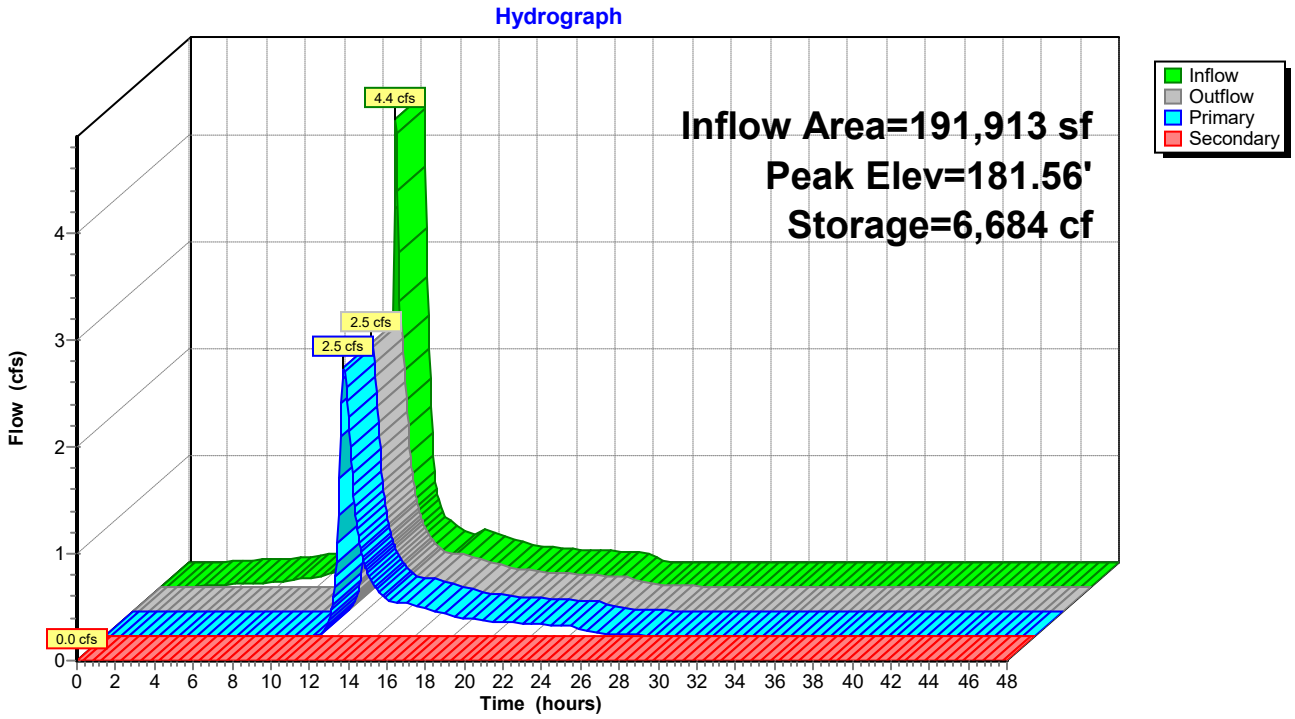
Device	Routing	Invert	Outlet Devices
#1	Primary	179.77'	**18.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 179.77' / 179.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.75 1.75 3.50 3.50
#3	Device 1	182.50'	**48.0" W x 48.0" H Vert. Rim** C= 0.600
#4	Secondary	183.00'	**10.0' long x 6.0' breadth Emergency Overflow**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.5 cfs @ 12.32 hrs HW=181.56' (Free Discharge)
└─**1=Culvert** (Passes 2.5 cfs of 6.9 cfs potential flow)
  └─**2=Custom Weir/Orifice** (Weir Controls 2.5 cfs @ 2.29 fps)
  └─**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #2



Summary for Pond 3P: Infiltration Basin #3

Inflow Area = 204,428 sf, 44.24% Impervious, Inflow Depth = 2.07" for 2-Year event
Inflow = 8.0 cfs @ 12.19 hrs, Volume= 35,266 cf
Outflow = 4.0 cfs @ 12.48 hrs, Volume= 30,022 cf, Atten= 50%, Lag= 17.3 min
Primary = 4.0 cfs @ 12.48 hrs, Volume= 30,022 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.18' @ 12.48 hrs Surf.Area= 12,298 sf Storage= 13,133 cf

Plug-Flow detention time= 149.2 min calculated for 30,022 cf (85% of inflow)
Center-of-Mass det. time= 83.7 min (879.5 - 795.7)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	1,157 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.25'	2,287 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,846 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,290 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	654	105.0	0	0	654
182.00	1,113	133.0	873	873	1,197
182.25	1,155	135.0	283	1,157	1,252

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.25	1,155	135.0	0	0	1,155
183.00	1,284	141.0	914	914	1,323
184.00	1,464	150.0	1,373	2,287	1,577

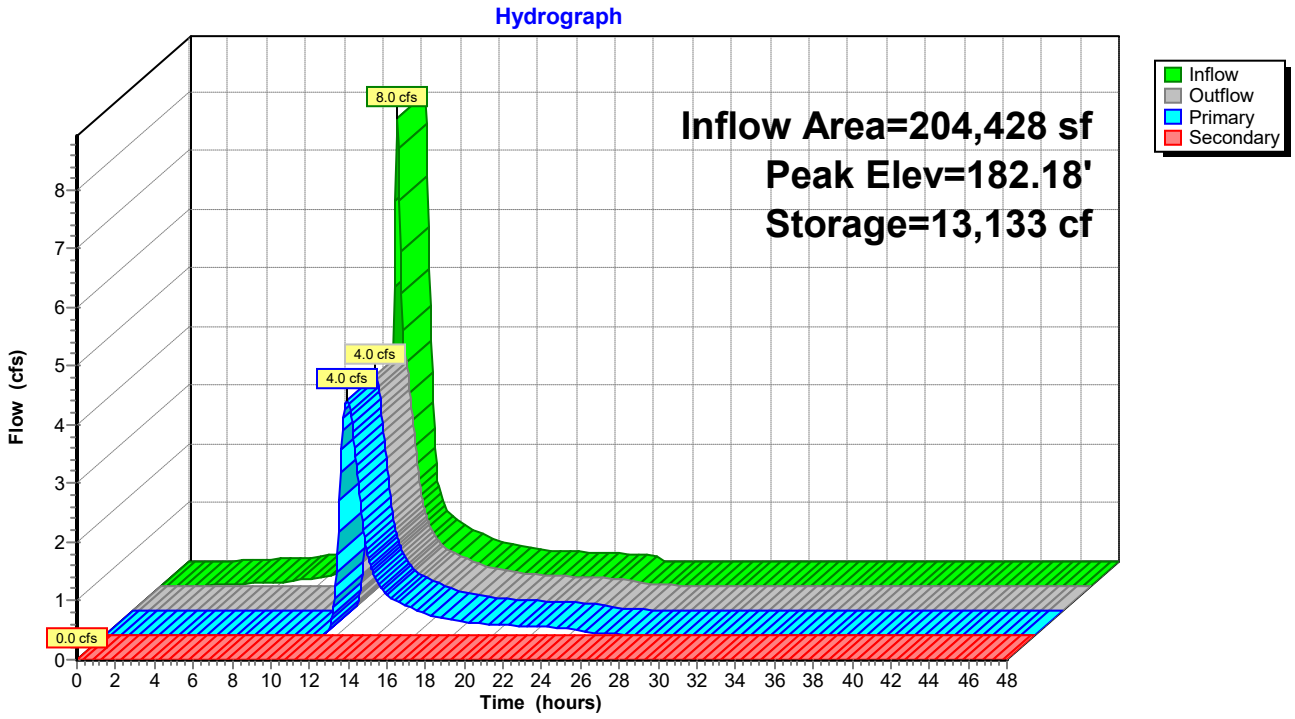
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,353	505.0	0	0	9,353
182.00	10,900	526.0	10,117	10,117	11,151
183.00	12,389	548.0	11,637	21,753	13,107
184.00	13,809	570.0	13,093	34,846	15,142

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 46.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0870 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.0 cfs @ 12.48 hrs HW=182.18' (Free Discharge)
└─**1=Culvert** (Passes 4.0 cfs of 12.4 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 4.0 cfs @ 3.42 fps)
  └─**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 3P: Infiltration Basin #3



Summary for Pond 4P: Runoff Collection Area

Inflow Area = 80,244 sf, 0.09% Impervious, Inflow Depth = 0.76" for 2-Year event
Inflow = 1.1 cfs @ 12.22 hrs, Volume= 5,097 cf
Outflow = 0.1 cfs @ 15.57 hrs, Volume= 1,736 cf, Atten= 91%, Lag= 200.6 min
Primary = 0.1 cfs @ 15.57 hrs, Volume= 1,736 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.01' @ 15.57 hrs Surf.Area= 7,192 sf Storage= 3,448 cf

Plug-Flow detention time= 389.1 min calculated for 1,736 cf (34% of inflow)
Center-of-Mass det. time= 238.6 min (1,122.9 - 884.3)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

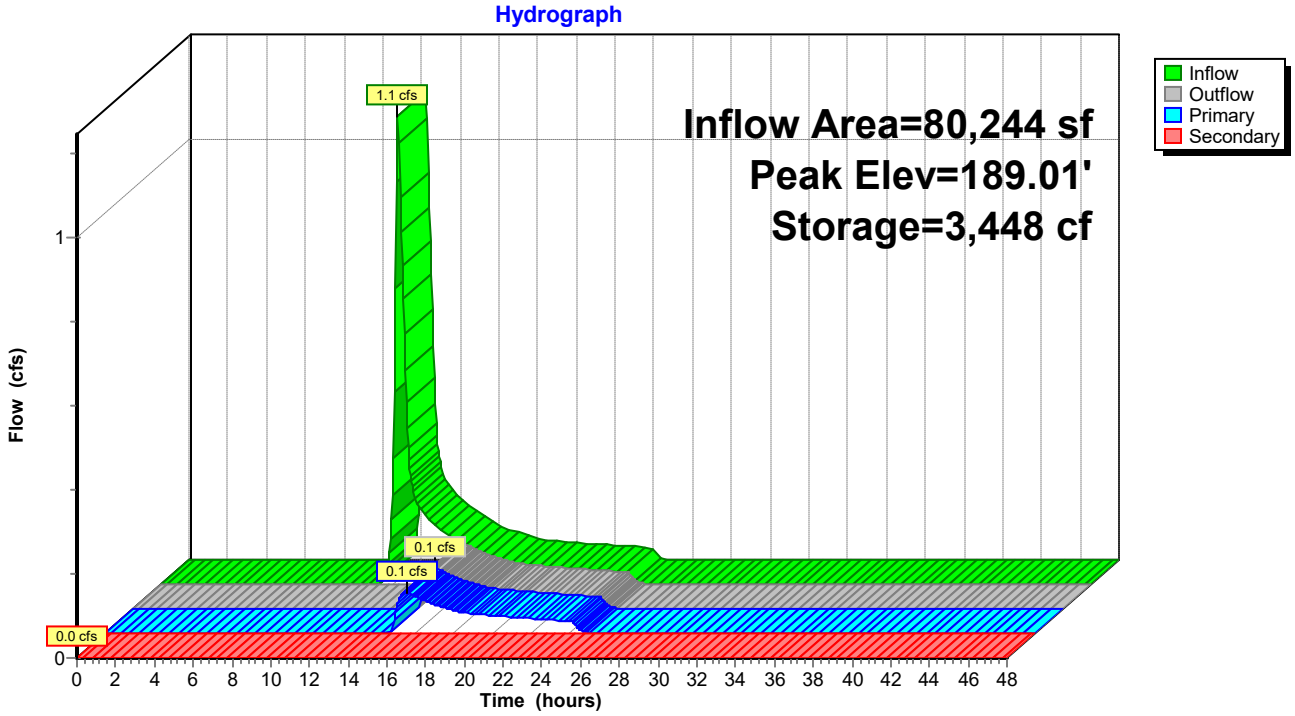
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.0' long x 8.0' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.1 cfs @ 15.57 hrs HW=189.01' (Free Discharge)
└**1=Culvert** (Passes 0.1 cfs of 5.0 cfs potential flow)
└**2=15" Dome** (Custom Controls 0.1 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 4P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 28,123 sf, 55.95% Impervious, Inflow Depth = 1.95" for 2-Year event
Inflow = 1.2 cfs @ 12.11 hrs, Volume= 4,568 cf
Outflow = 0.4 cfs @ 12.47 hrs, Volume= 2,196 cf, Atten= 69%, Lag= 21.8 min
Primary = 0.4 cfs @ 12.47 hrs, Volume= 2,196 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.56' @ 12.47 hrs Surf.Area= 2,880 sf Storage= 2,553 cf

Plug-Flow detention time= 279.6 min calculated for 2,196 cf (48% of inflow)
Center-of-Mass det. time= 148.4 min (930.2 - 781.8)

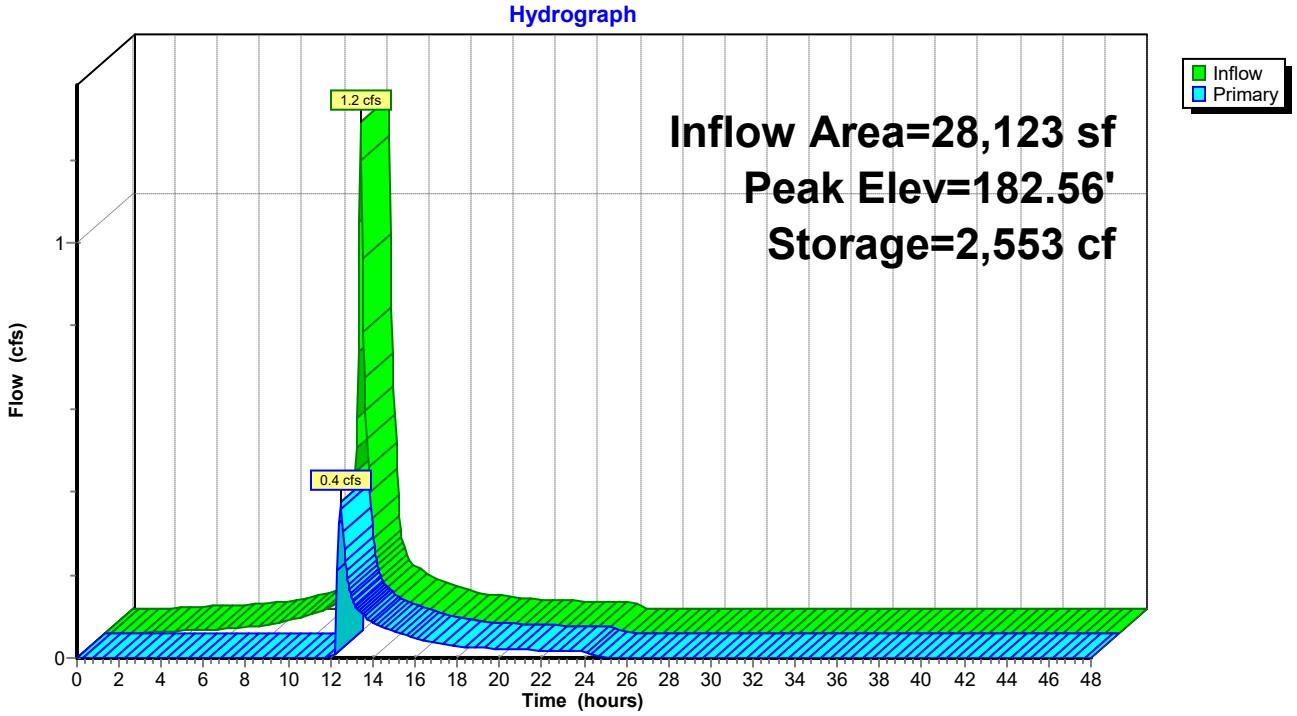
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.4 cfs @ 12.47 hrs HW=182.56' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.4 cfs @ 0.59 fps)

Pond 5P: Bioretention Basin



Summary for Pond 6P: Extended Dry Detention Basin

Inflow Area = 233,284 sf, 53.30% Impervious, Inflow Depth = 1.82" for 2-Year event
Inflow = 7.9 cfs @ 12.16 hrs, Volume= 35,345 cf
Outflow = 3.4 cfs @ 12.50 hrs, Volume= 35,345 cf, Atten= 57%, Lag= 20.7 min
Primary = 3.4 cfs @ 12.50 hrs, Volume= 35,345 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 178.10' @ 12.50 hrs Surf.Area= 11,279 sf Storage= 8,670 cf

Plug-Flow detention time= 40.5 min calculated for 35,345 cf (100% of inflow)
Center-of-Mass det. time= 40.1 min (835.5 - 795.3)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,064 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	3,125 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	176.50'	43,914 cf	**Detention Basin (Irregular)** Listed below (Recalc)
		48,104 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	869	123.0	0	0	869
179.00	1,272	145.0	1,064	1,064	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,272	145.0	0	0	1,272
180.00	1,595	160.0	1,430	1,430	1,667
181.00	1,797	168.0	1,695	3,125	1,932

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
176.50	610	97.0	0	0	610
177.00	3,576	224.0	944	944	3,855
178.00	10,251	418.0	6,627	7,571	13,772
179.00	11,539	439.0	10,889	18,460	15,266
180.00	12,753	461.0	12,141	30,601	16,905
181.00	13,882	484.0	13,314	43,914	18,698

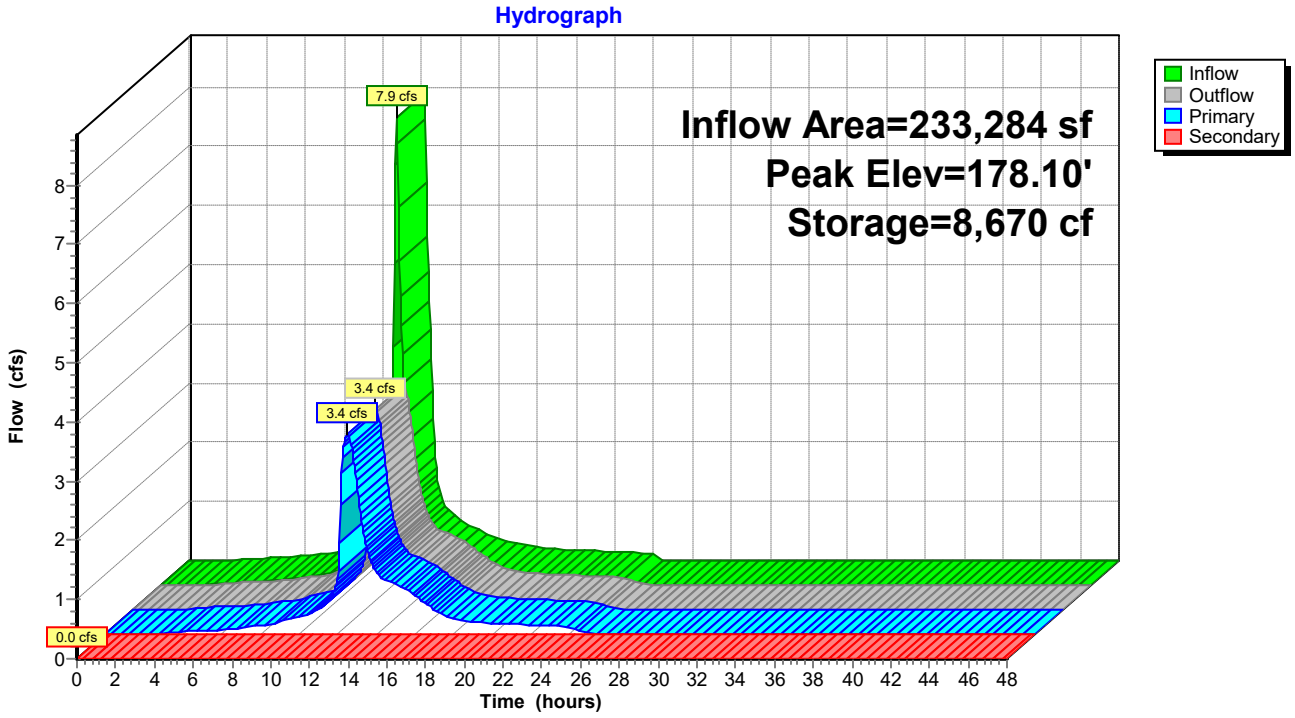
Device	Routing	Invert	Outlet Devices
#1	Primary	175.75'	**18.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 175.75' / 175.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	176.50'	**6.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	177.50'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	179.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#5	Secondary	180.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.4 cfs @ 12.50 hrs HW=178.10' (Free Discharge)
└**1=Culvert** (Passes 3.4 cfs of 8.5 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.3 cfs @ 5.55 fps)
  └**3=Orifice/Grate** (Orifice Controls 2.1 cfs @ 3.14 fps)
  └**4=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=176.50' (Free Discharge)
└**5=Emergency Overflow** (Controls 0.0 cfs)

Pond 6P: Extended Dry Detention Basin

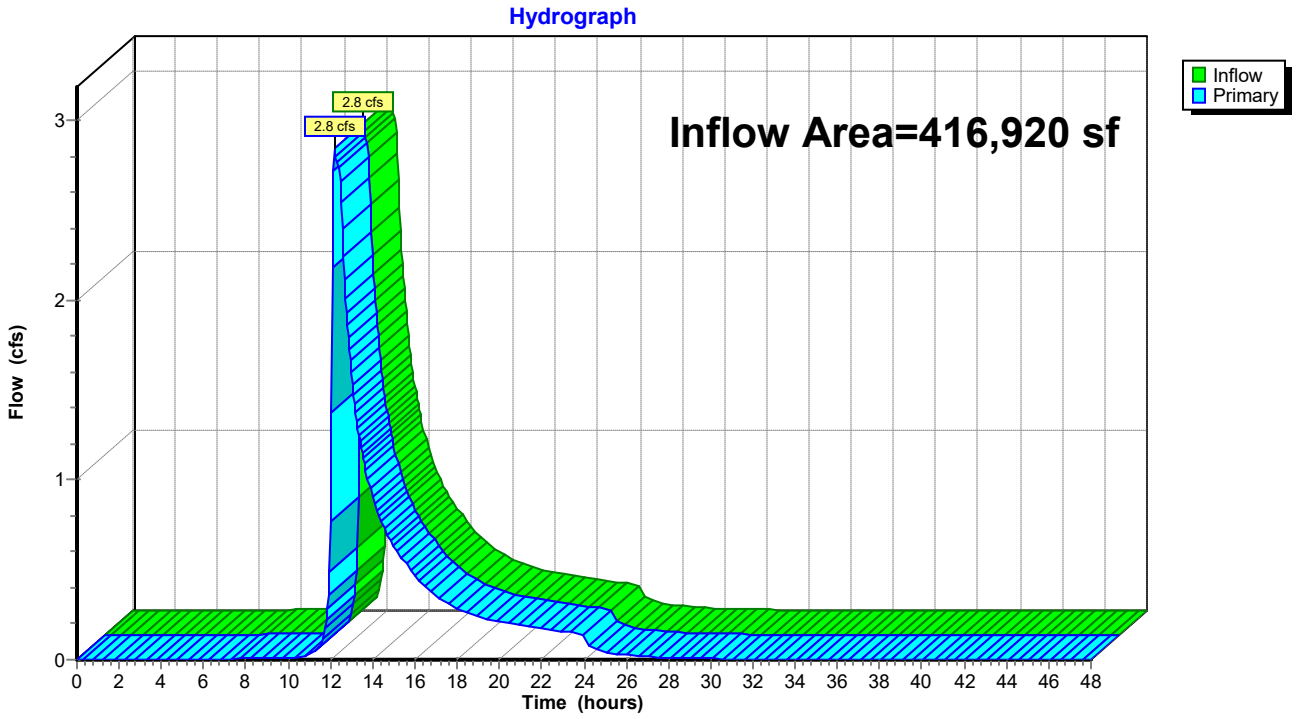


Summary for Link DP-1: Offsite to North

Inflow Area = 416,920 sf, 18.05% Impervious, Inflow Depth = 0.72" for 2-Year event
Inflow = 2.8 cfs @ 12.21 hrs, Volume= 25,033 cf
Primary = 2.8 cfs @ 12.21 hrs, Volume= 25,033 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

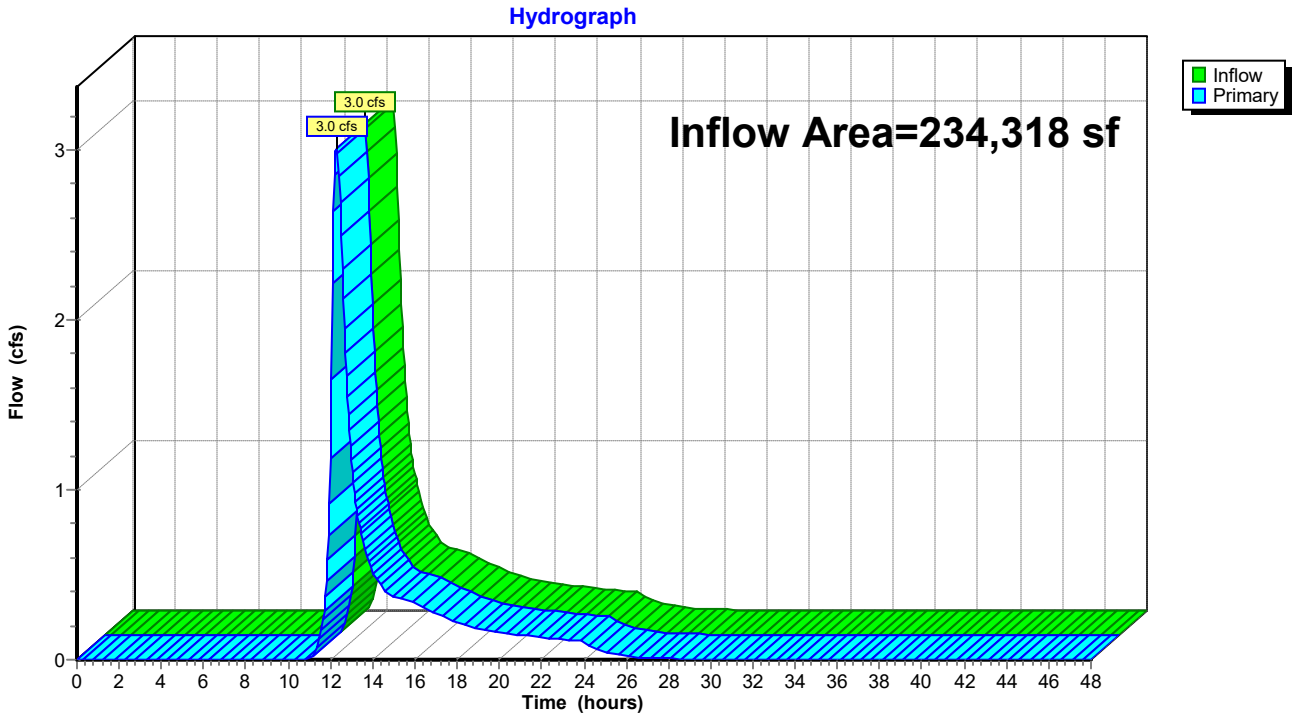


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 234,318 sf, 27.32% Impervious, Inflow Depth = 1.02" for 2-Year event
Inflow = 3.0 cfs @ 12.29 hrs, Volume= 19,906 cf
Primary = 3.0 cfs @ 12.29 hrs, Volume= 19,906 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

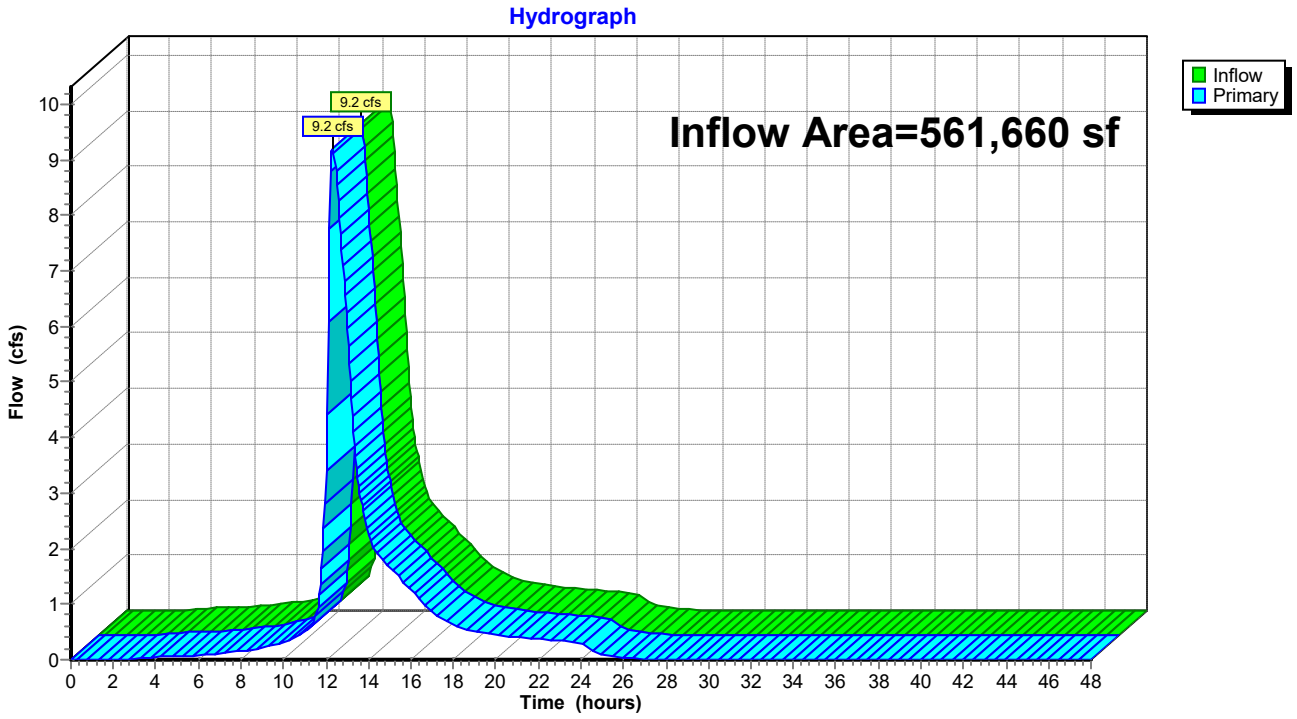


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 561,660 sf, 39.40% Impervious, Inflow Depth = 1.65" for 2-Year event
Inflow = 9.2 cfs @ 12.31 hrs, Volume= 77,348 cf
Primary = 9.2 cfs @ 12.31 hrs, Volume= 77,348 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=143,245 sf 49.79% Impervious Runoff Depth=2.68"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=6.4 cfs 32,015 cf

Subcatchment PS-1B: Runoff Area=111,253 sf 1.10% Impervious Runoff Depth=1.30"
Flow Length=130' Tc=7.4 min CN=63/98 Runoff=3.3 cfs 12,014 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=0.60"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=0.2 cfs 1,887 cf

Subcatchment PS-1D: Runoff Area=70,388 sf 0.66% Impervious Runoff Depth=1.41"
Flow Length=100' Slope=0.0400 '/' Tc=11.2 min CN=65/98 Runoff=2.1 cfs 8,289 cf

Subcatchment PS-1E: Runoff Area=54,530 sf 0.00% Impervious Runoff Depth=2.21"
Flow Length=78' Slope=0.0200 '/' Tc=12.1 min CN=76/0 Runoff=2.6 cfs 10,042 cf

Subcatchment PS-2A: Runoff Area=80,244 sf 0.09% Impervious Runoff Depth=1.82"
Flow Length=264' Tc=14.3 min CN=71/98 Runoff=2.9 cfs 12,180 cf

Subcatchment PS-2B: Runoff Area=64,783 sf 68.84% Impervious Runoff Depth=3.48"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=4.5 cfs 18,792 cf

Subcatchment PS-2C: Runoff Area=46,886 sf 39.45% Impervious Runoff Depth=3.11"
Tc=6.0 min CN=77/98 Runoff=3.6 cfs 12,149 cf

Subcatchment PS-2D: Runoff Area=42,405 sf 1.99% Impervious Runoff Depth=1.94"
Flow Length=95' Slope=0.0700 '/' Tc=8.6 min CN=72/98 Runoff=1.9 cfs 6,868 cf

Subcatchment PS-3A: Runoff Area=12,714 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=0/98 Runoff=1.3 cfs 4,623 cf

Subcatchment PS-3B: Runoff Area=191,714 sf 40.54% Impervious Runoff Depth=3.50"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=12.9 cfs 55,876 cf

Subcatchment PS-3C: Runoff Area=176,308 sf 60.49% Impervious Runoff Depth=3.48"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=12.3 cfs 51,143 cf

Subcatchment PS-3D: Runoff Area=3,107 sf 0.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98/0 Runoff=0.3 cfs 1,130 cf

Subcatchment PS-3E: Runoff Area=25,746 sf 7.60% Impervious Runoff Depth=2.23"
Tc=6.0 min CN=74/98 Runoff=1.5 cfs 4,775 cf

Subcatchment PS-3F: Runoff Area=28,123 sf 55.95% Impervious Runoff Depth=3.34"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=2.1 cfs 7,838 cf

Subcatchment PS-3G: Runoff Area=123,948 sf 5.24% Impervious Runoff Depth=2.40"
Flow Length=178' Tc=12.9 min CN=77/98 Runoff=6.3 cfs 24,796 cf

Pond 1P: Infiltration Basin #1 Peak Elev=202.02' Storage=13,203 cf Inflow=6.4 cfs 32,015 cf
Primary=3.4 cfs 26,239 cf Secondary=0.0 cfs 0 cf Outflow=3.4 cfs 26,239 cf

Pond 2P: Infiltration Basin #2 Peak Elev=181.81' Storage=8,542 cf Inflow=7.6 cfs 39,760 cf
Primary=5.2 cfs 36,864 cf Secondary=0.0 cfs 0 cf Outflow=5.2 cfs 36,864 cf

Pond 3P: Infiltration Basin #3 Peak Elev=182.64' Storage=18,957 cf Inflow=13.6 cfs 60,499 cf
Primary=8.2 cfs 55,255 cf Secondary=0.0 cfs 0 cf Outflow=8.2 cfs 55,255 cf

Pond 4P: Runoff Collection Area Peak Elev=189.14' Storage=4,368 cf Inflow=2.9 cfs 12,180 cf
Primary=1.4 cfs 8,819 cf Secondary=0.0 cfs 0 cf Outflow=1.4 cfs 8,819 cf

Pond 5P: Bioretention Basin Peak Elev=182.68' Storage=2,902 cf Inflow=2.1 cfs 7,838 cf
Outflow=1.8 cfs 5,467 cf

Pond 6P: Extended Dry Detention Basin Peak Elev=178.87' Storage=17,879 cf Inflow=15.5 cfs 62,514 cf
Primary=5.1 cfs 62,514 cf Secondary=0.0 cfs 0 cf Outflow=5.1 cfs 62,514 cf

Link DP-1: Offsite to North Inflow=9.4 cfs 58,471 cf
Primary=9.4 cfs 58,471 cf

Link DP-2: Offsite to Southeast Inflow=6.6 cfs 43,732 cf
Primary=6.6 cfs 43,732 cf

Link DP-3: Offsite to Northeast Inflow=16.9 cfs 142,565 cf
Primary=16.9 cfs 142,565 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 264,418 cf Average Runoff Depth = 2.62"
70.27% Pervious = 852,349 sf 29.73% Impervious = 360,549 sf

Summary for Subcatchment PS-1A:

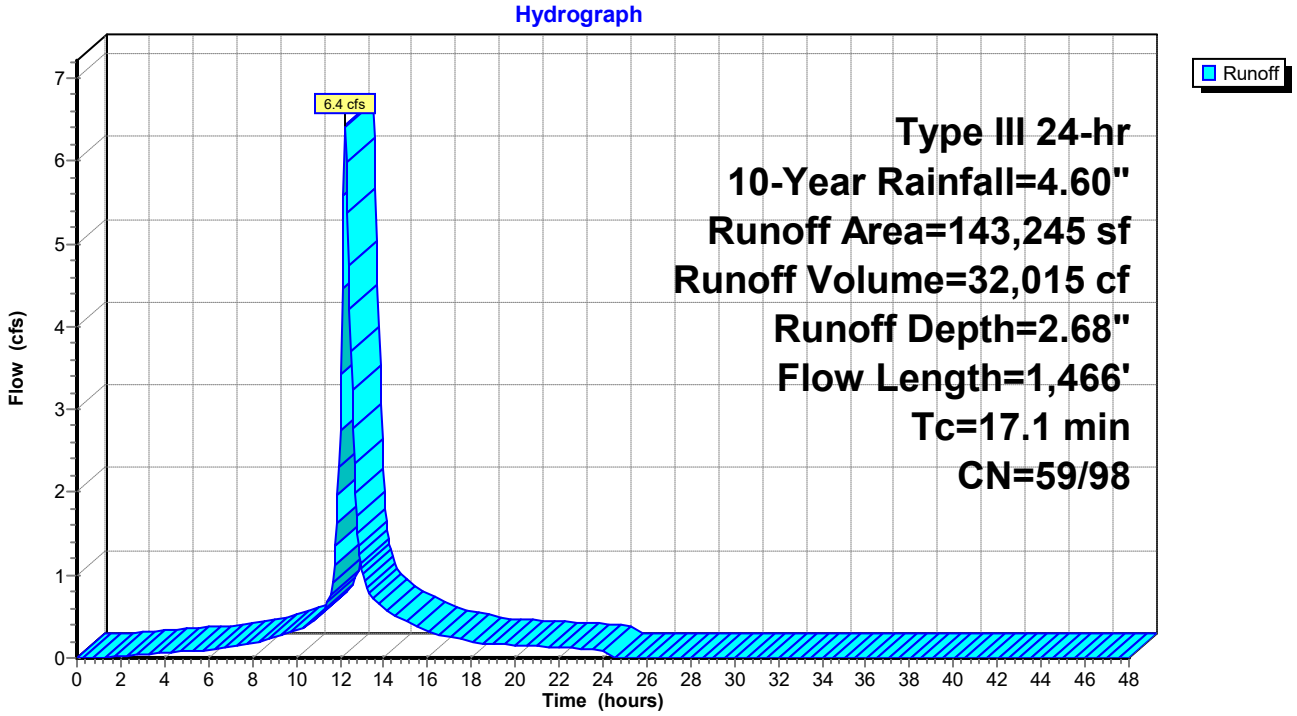
Runoff = 6.4 cfs @ 12.23 hrs, Volume= 32,015 cf, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
22,050	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
143,245	78	Weighted Average
71,926	59	50.21% Pervious Area
71,319	98	49.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

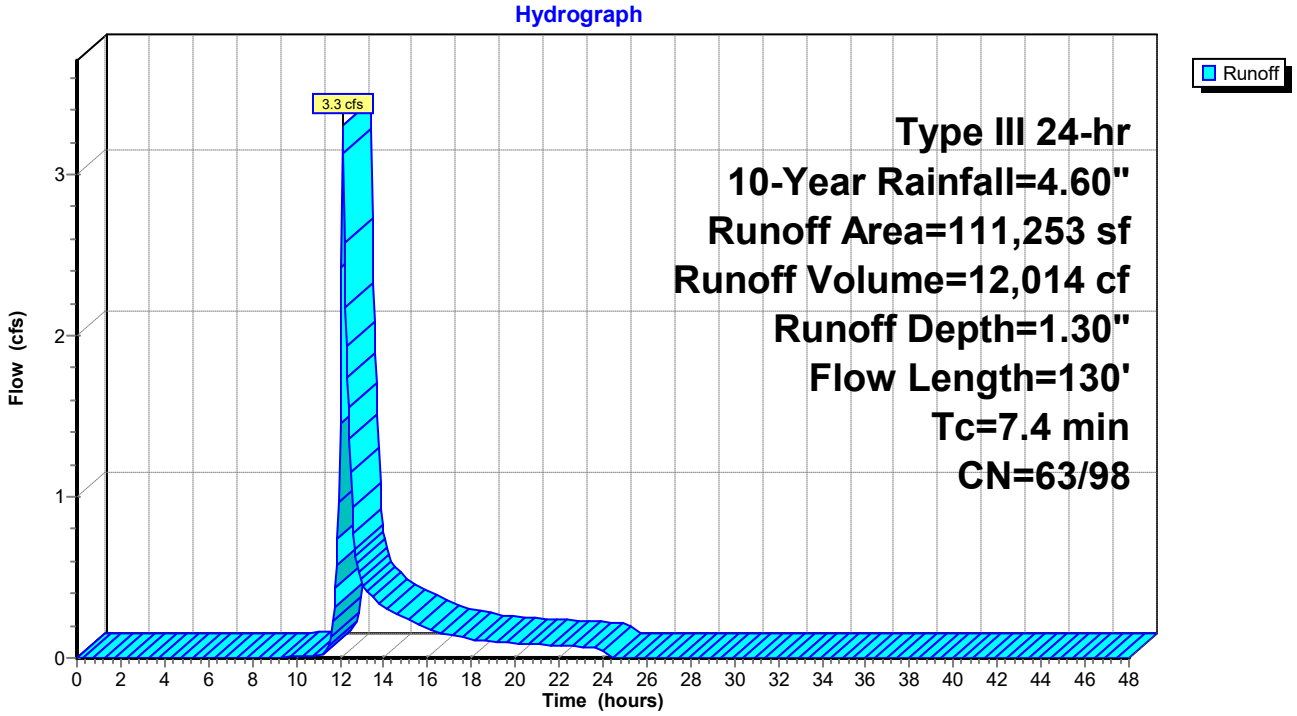
Runoff = 3.3 cfs @ 12.12 hrs, Volume= 12,014 cf, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
45,290	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
727	98	Water Surface, HSG B
492	98	Water Surface, HSG C
0	30	Woods, Good, HSG A
36,205	55	Woods, Good, HSG B
18,556	70	Woods, Good, HSG C
111,253	63	Weighted Average
110,034	63	98.90% Pervious Area
1,219	98	1.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.2	72	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.4	130	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

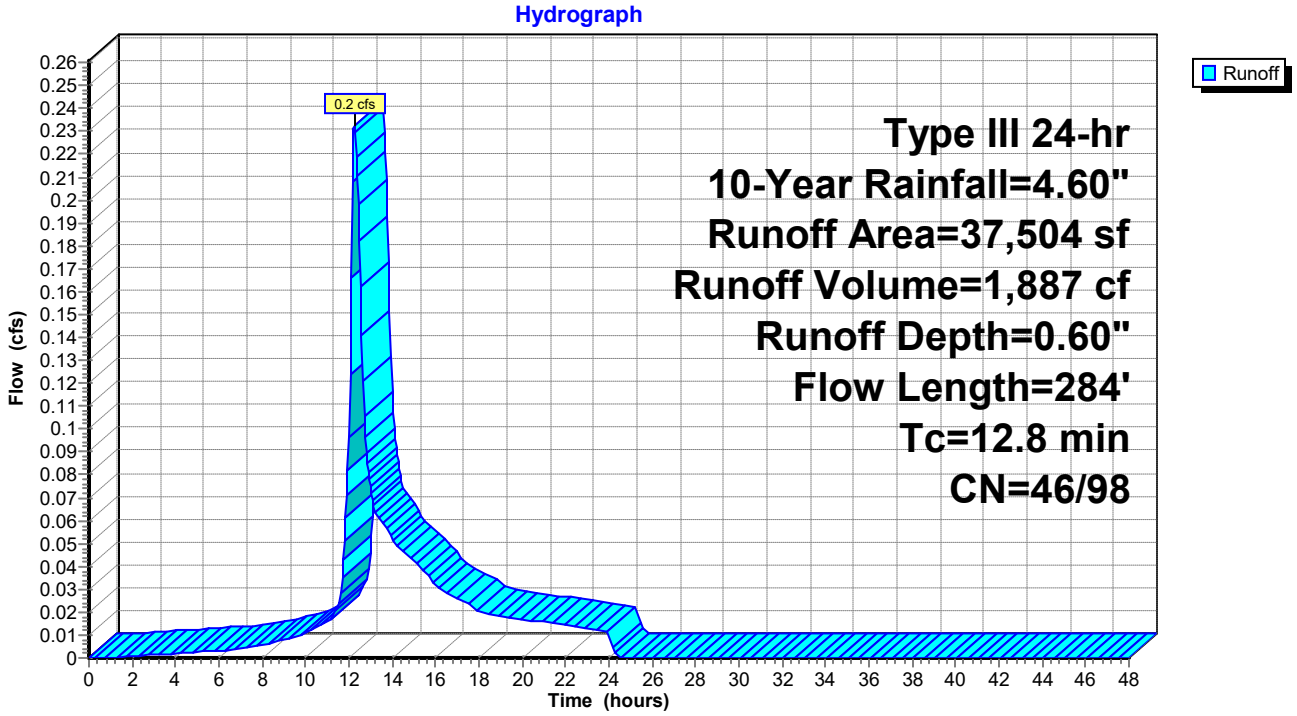
Runoff = 0.2 cfs @ 12.24 hrs, Volume= 1,887 cf, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
9,878	39	>75% Grass cover, Good, HSG A
15,548	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	49	Weighted Average
35,242	46	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

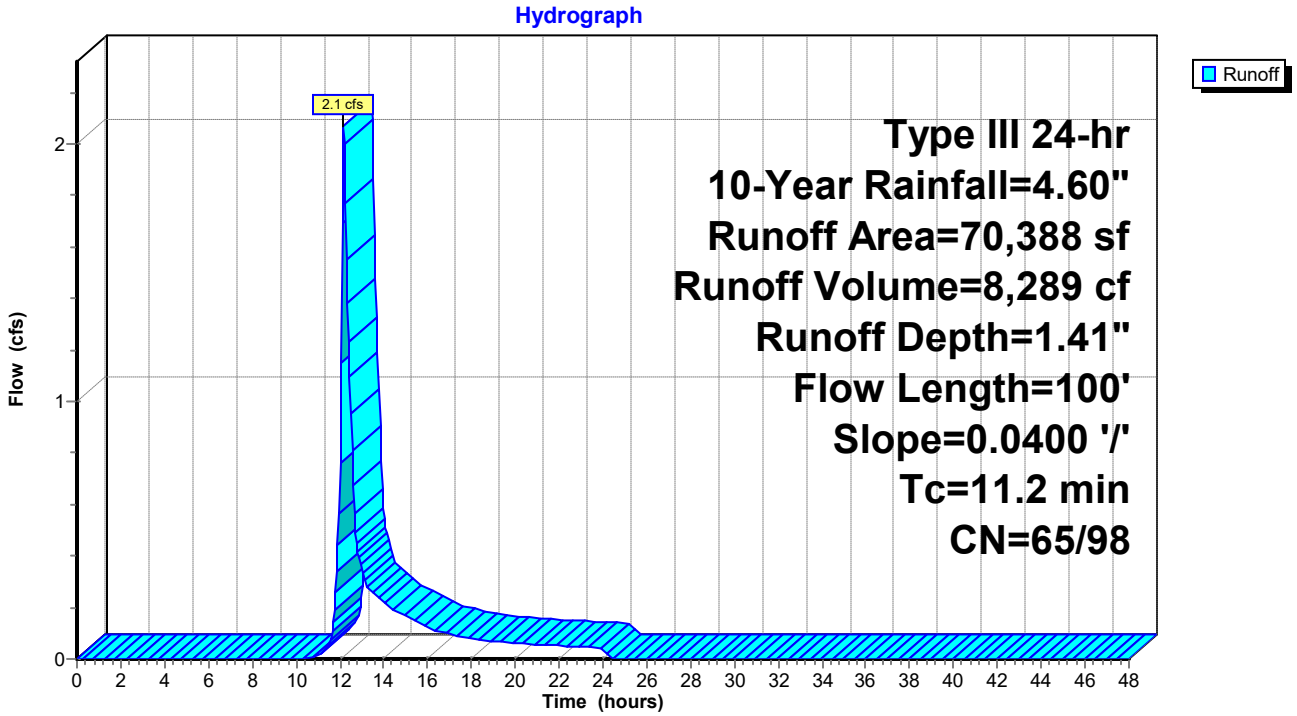
Runoff = 2.1 cfs @ 12.17 hrs, Volume= 8,289 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
41,955	61	>75% Grass cover, Good, HSG B
583	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
468	98	Water Surface, HSG B
17,565	55	Woods, Good, HSG B
67	77	Woods, Good, HSG D
70,388	65	Weighted Average
69,920	65	99.34% Pervious Area
468	98	0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

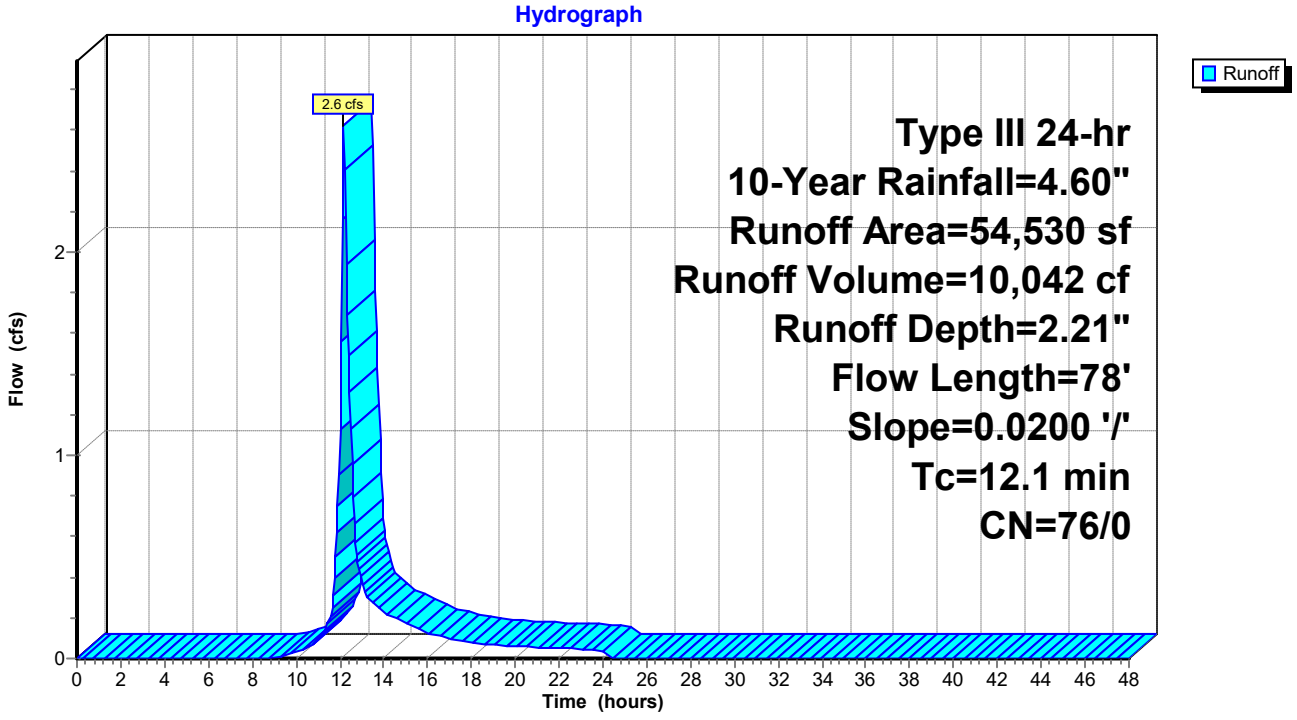
Runoff = 2.6 cfs @ 12.17 hrs, Volume= 10,042 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,435	61	>75% Grass cover, Good, HSG B
23,317	74	>75% Grass cover, Good, HSG C
9,766	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
3,944	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
290	55	Woods, Good, HSG B
12,516	70	Woods, Good, HSG C
1,396	77	Woods, Good, HSG D
54,530	76	Weighted Average
54,530	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	78	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

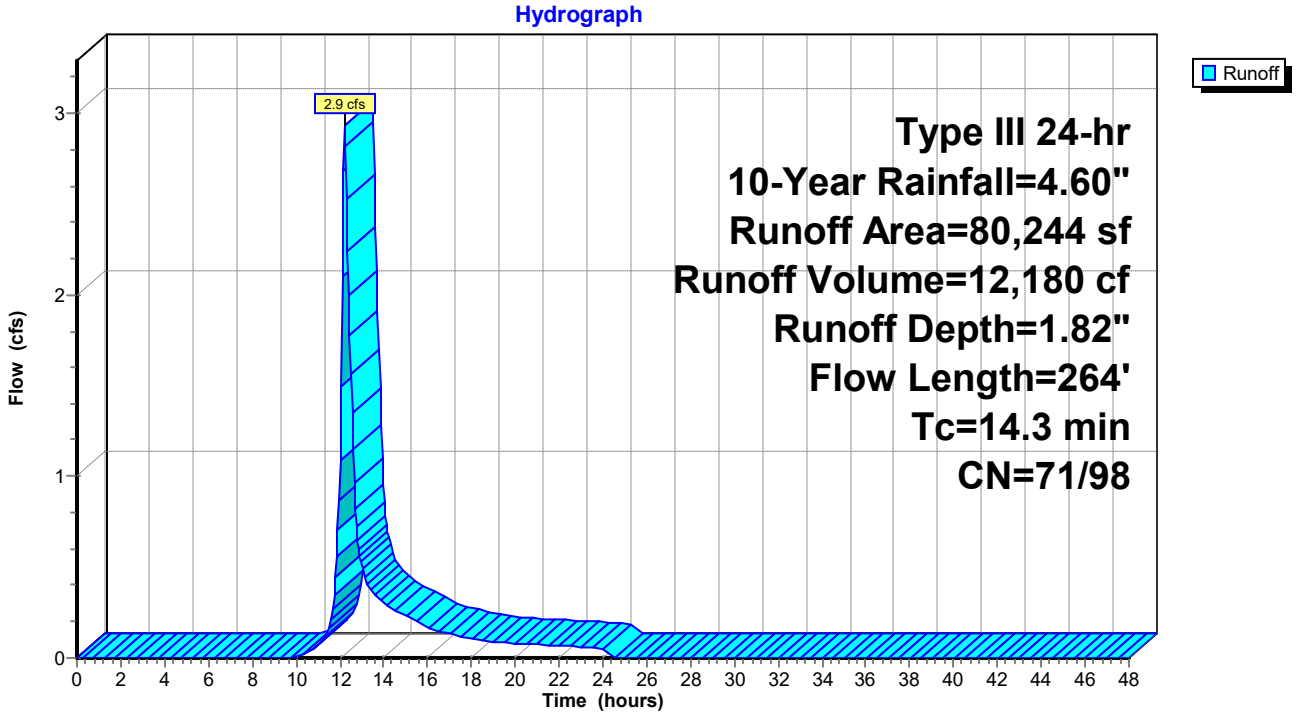
Runoff = 2.9 cfs @ 12.21 hrs, Volume= 12,180 cf, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
8,942	39	>75% Grass cover, Good, HSG A
11,979	61	>75% Grass cover, Good, HSG B
43,810	74	>75% Grass cover, Good, HSG C
7,338	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
167	70	Woods, Good, HSG C
80,244	71	Weighted Average
80,170	71	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

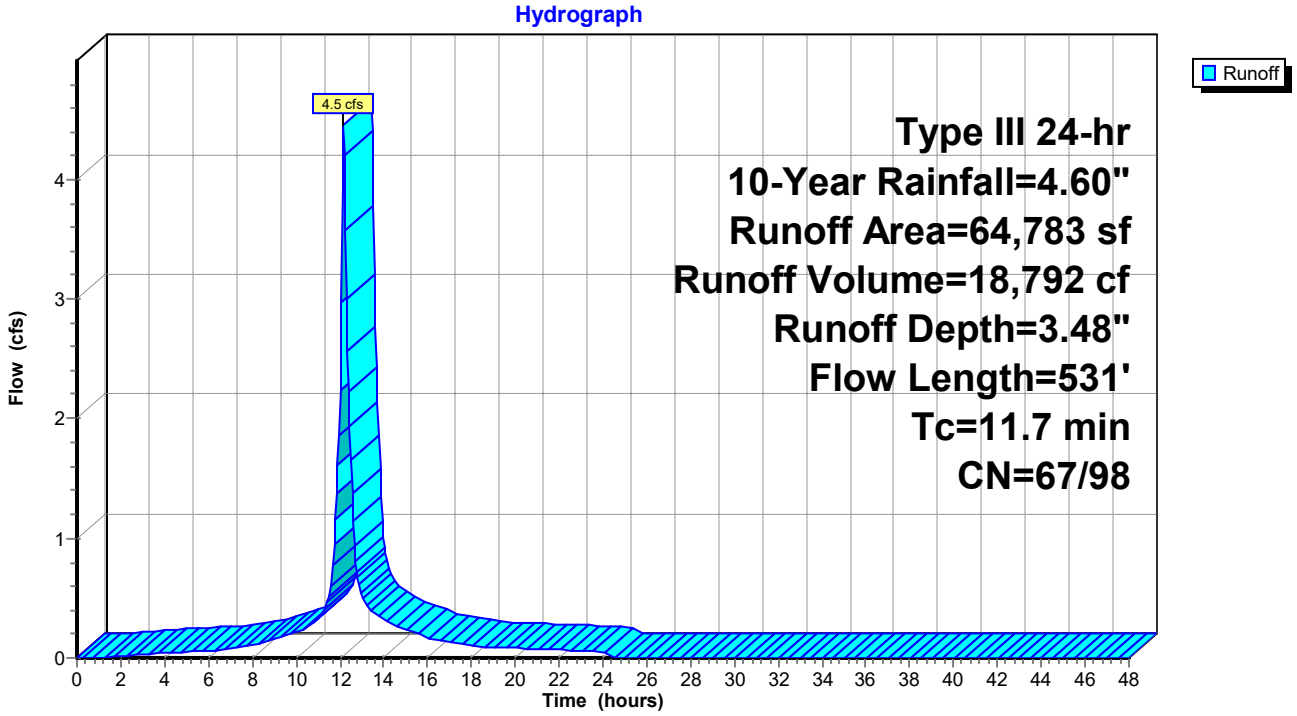
Runoff = 4.5 cfs @ 12.16 hrs, Volume= 18,792 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,799	39	>75% Grass cover, Good, HSG A
5,184	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,783	88	Weighted Average
20,185	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

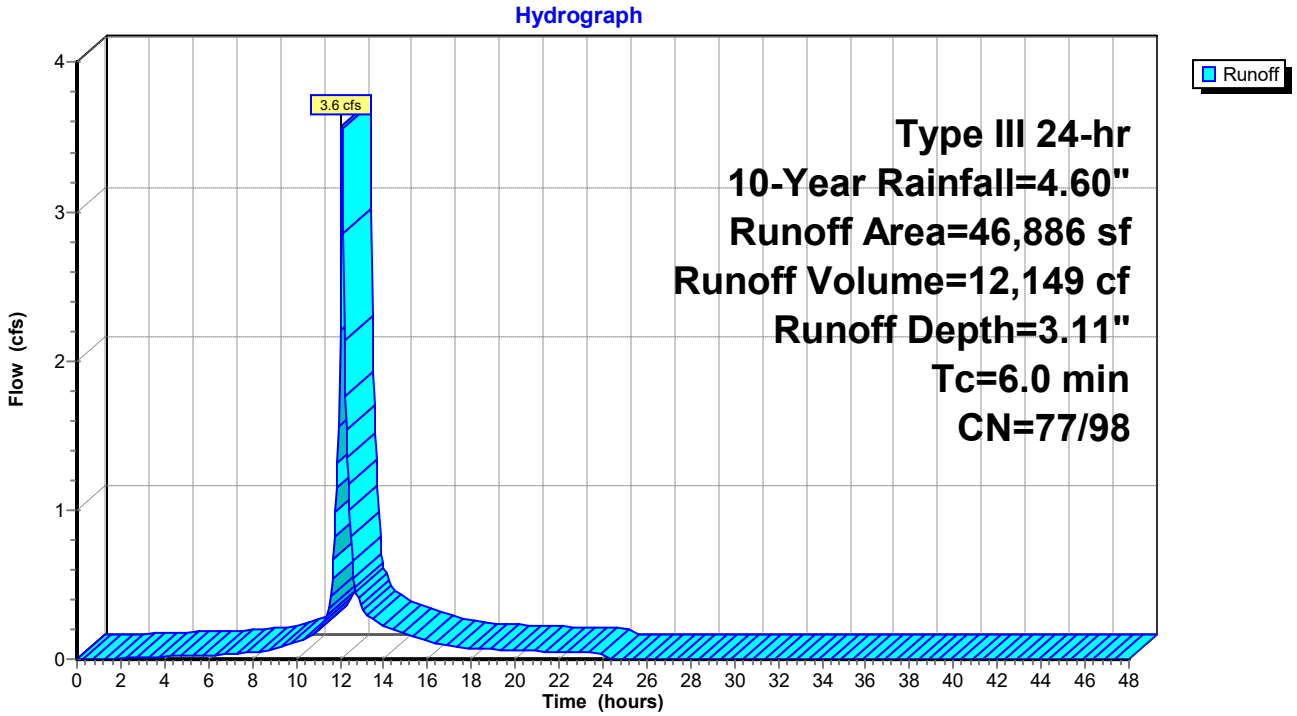
Runoff = 3.6 cfs @ 12.09 hrs, Volume= 12,149 cf, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
14,571	74	>75% Grass cover, Good, HSG C
13,820	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,757	98	Roofs, HSG D
3,615	98	Water Surface, HSG C
1,473	98	Water Surface, HSG D
46,886	85	Weighted Average
28,391	77	60.55% Pervious Area
18,495	98	39.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

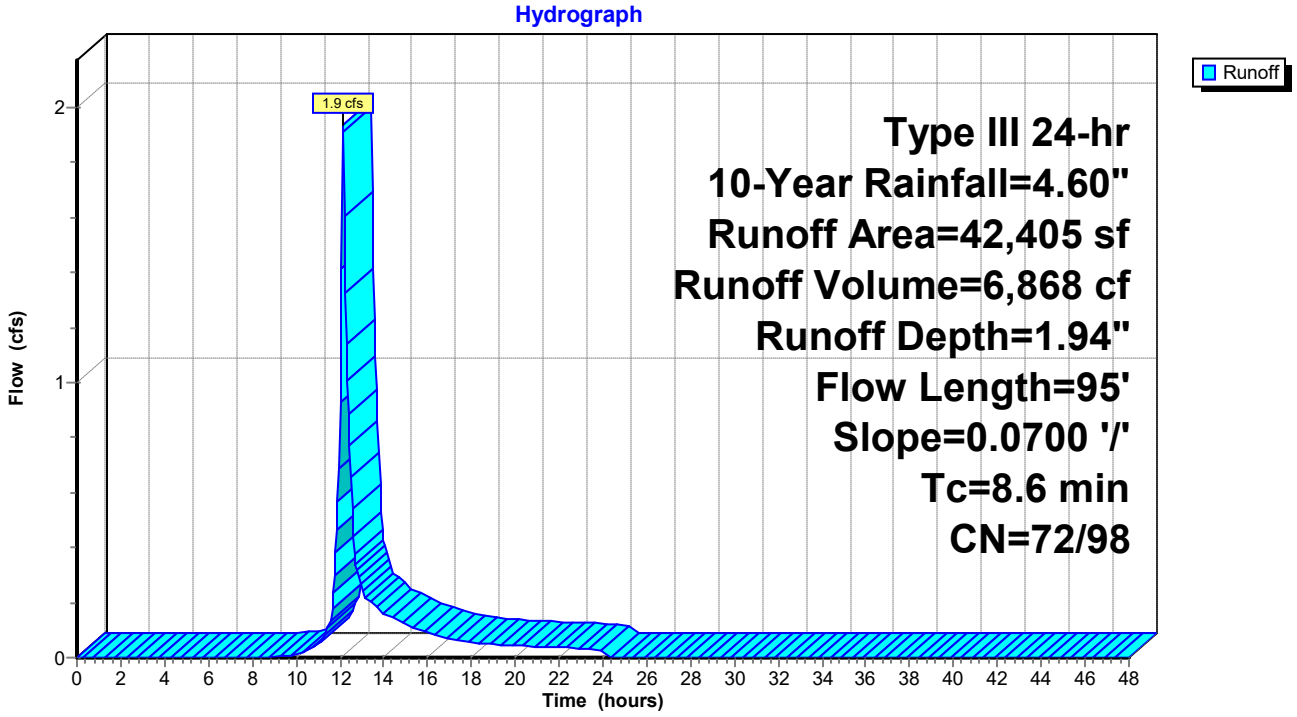
Runoff = 1.9 cfs @ 12.13 hrs, Volume= 6,868 cf, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
28,584	74	>75% Grass cover, Good, HSG C
843	98	Water Surface, HSG C
638	30	Woods, Good, HSG A
12,340	70	Woods, Good, HSG C
42,405	73	Weighted Average
41,562	72	98.01% Pervious Area
843	98	1.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	95	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

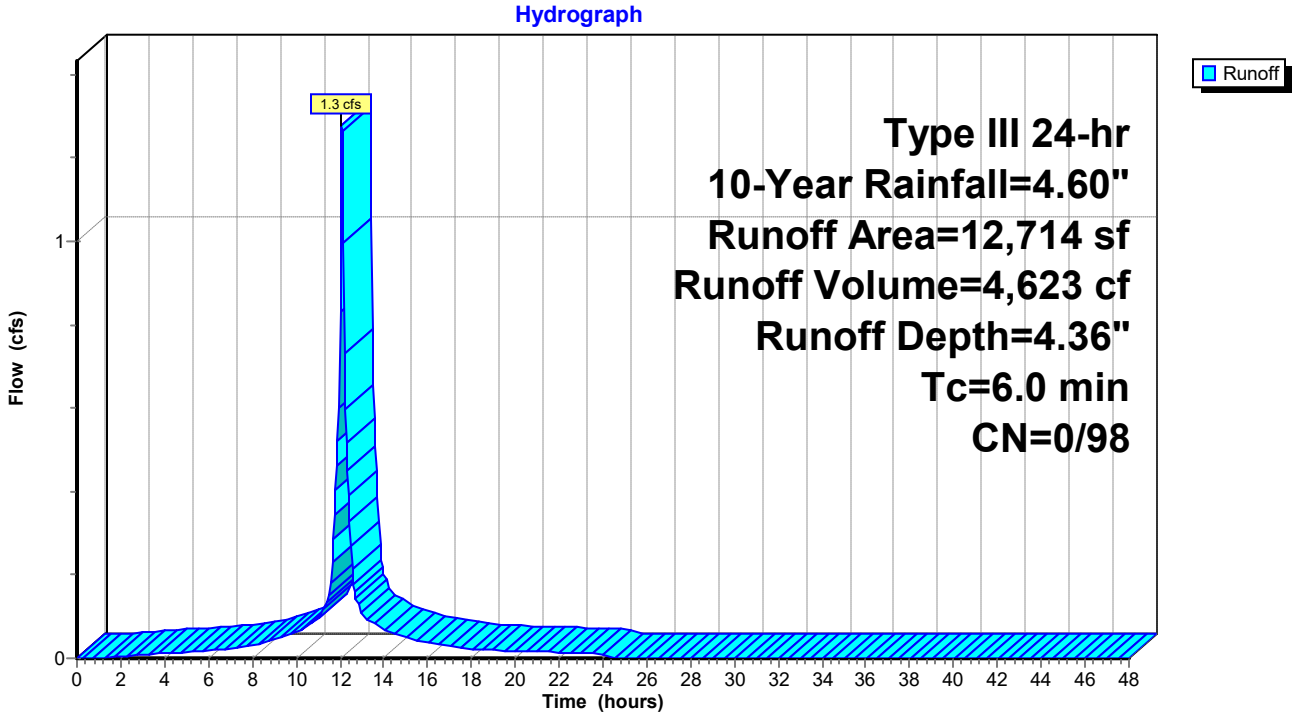
Runoff = 1.3 cfs @ 12.09 hrs, Volume= 4,623 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
1,085	98	Roofs, HSG C
4,376	98	Roofs, HSG D
12,714	98	Weighted Average
12,714	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

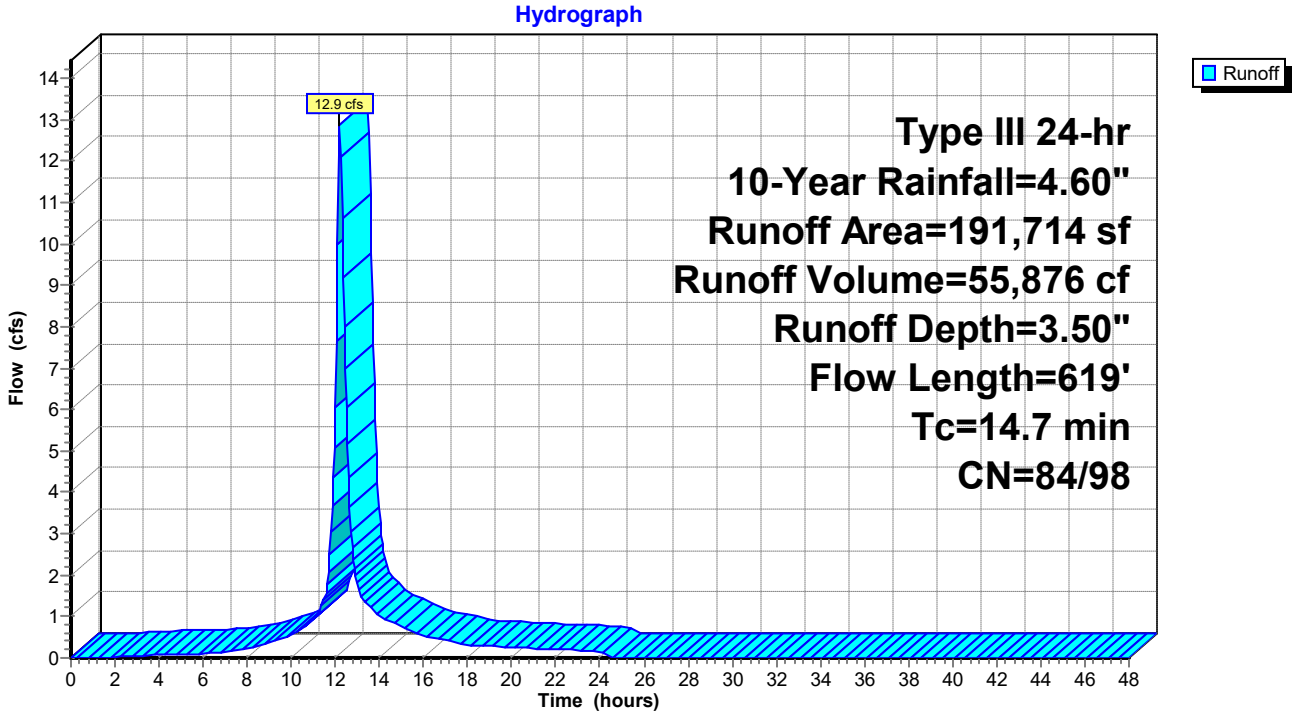
Runoff = 12.9 cfs @ 12.20 hrs, Volume= 55,876 cf, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
13,827	74	>75% Grass cover, Good, HSG C
70,998	80	>75% Grass cover, Good, HSG D
7,694	98	Paved parking, HSG C
40,930	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,790	98	Roofs, HSG D
6,165	98	Unconnected roofs, HSG C
23,006	98	Unconnected roofs, HSG D
9,353	98	Water Surface, HSG D
191,714	90	Weighted Average
113,996	84	59.46% Pervious Area
77,718	98	40.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

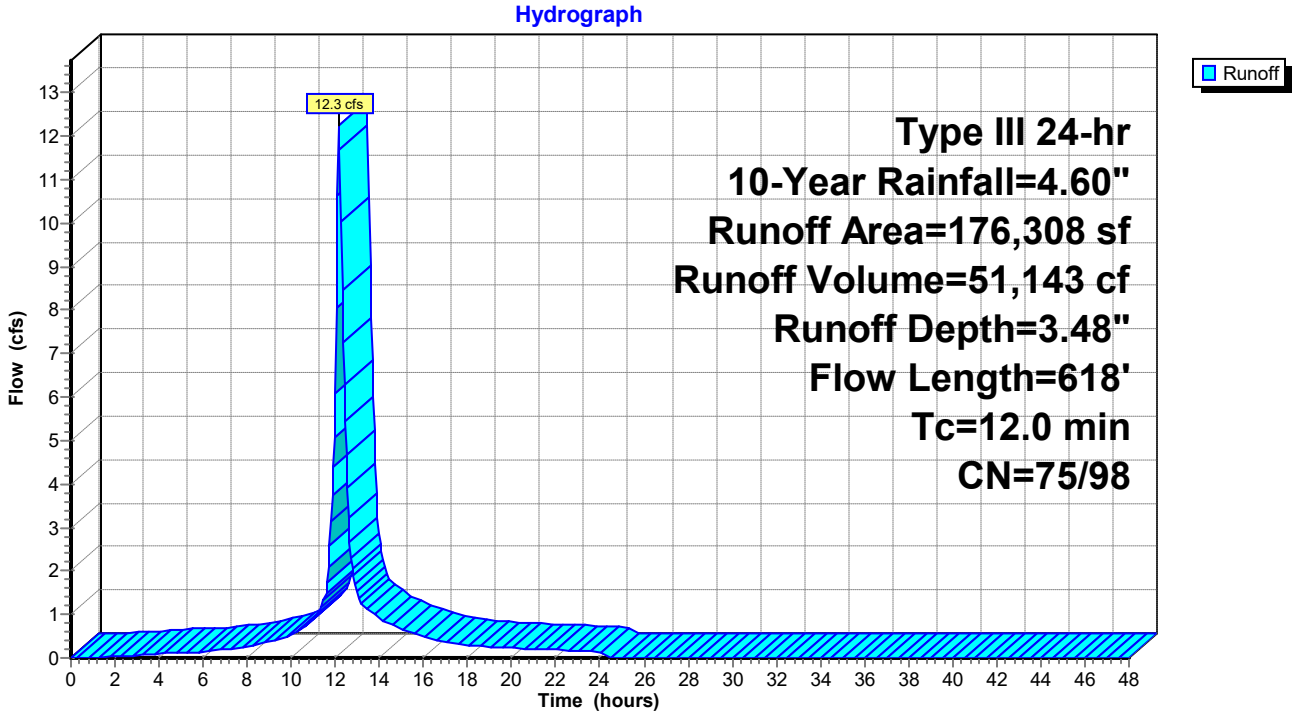
Runoff = 12.3 cfs @ 12.16 hrs, Volume= 51,143 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
23,806	74	>75% Grass cover, Good, HSG C
33,900	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
29,102	98	Paved parking, HSG C
54,828	98	Paved parking, HSG D
7,744	98	Roofs, HSG C
299	98	Roofs, HSG D
79	98	Unconnected roofs, HSG C
176,308	89	Weighted Average
69,656	75	39.51% Pervious Area
106,652	98	60.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

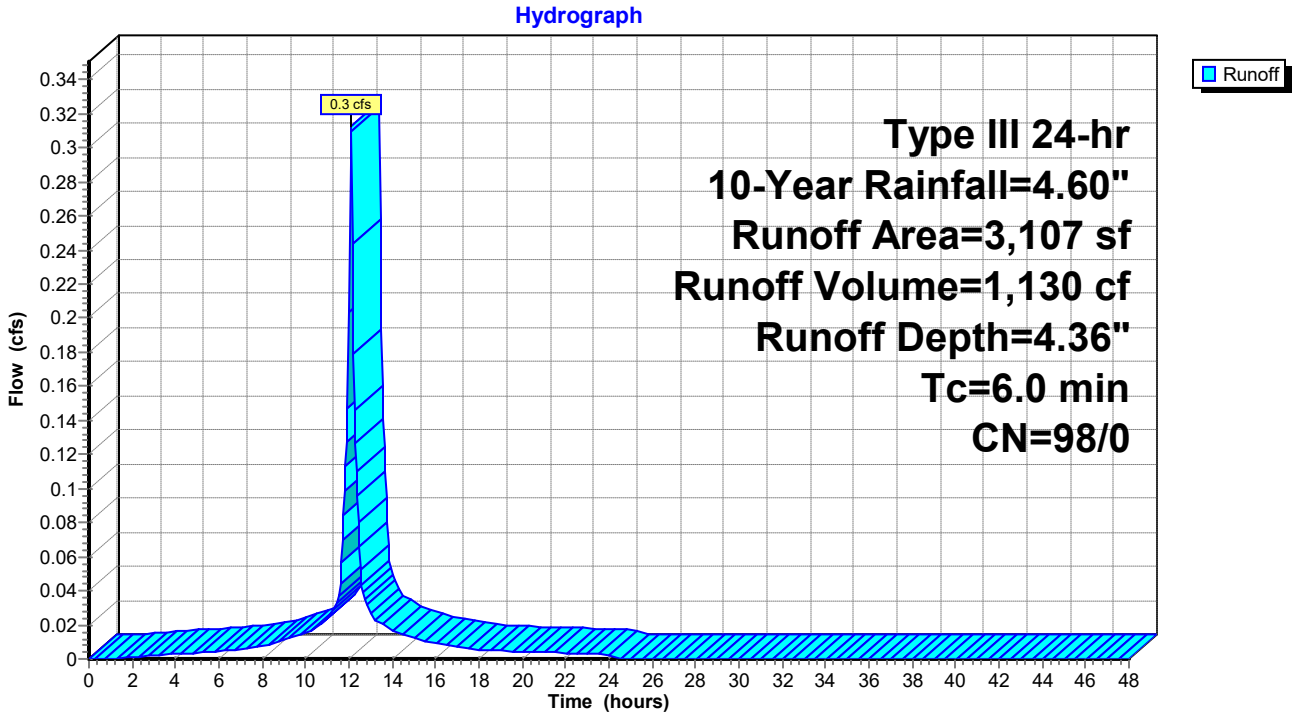
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,130 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,107	98	Unconnected roofs, HSG C
3,107	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

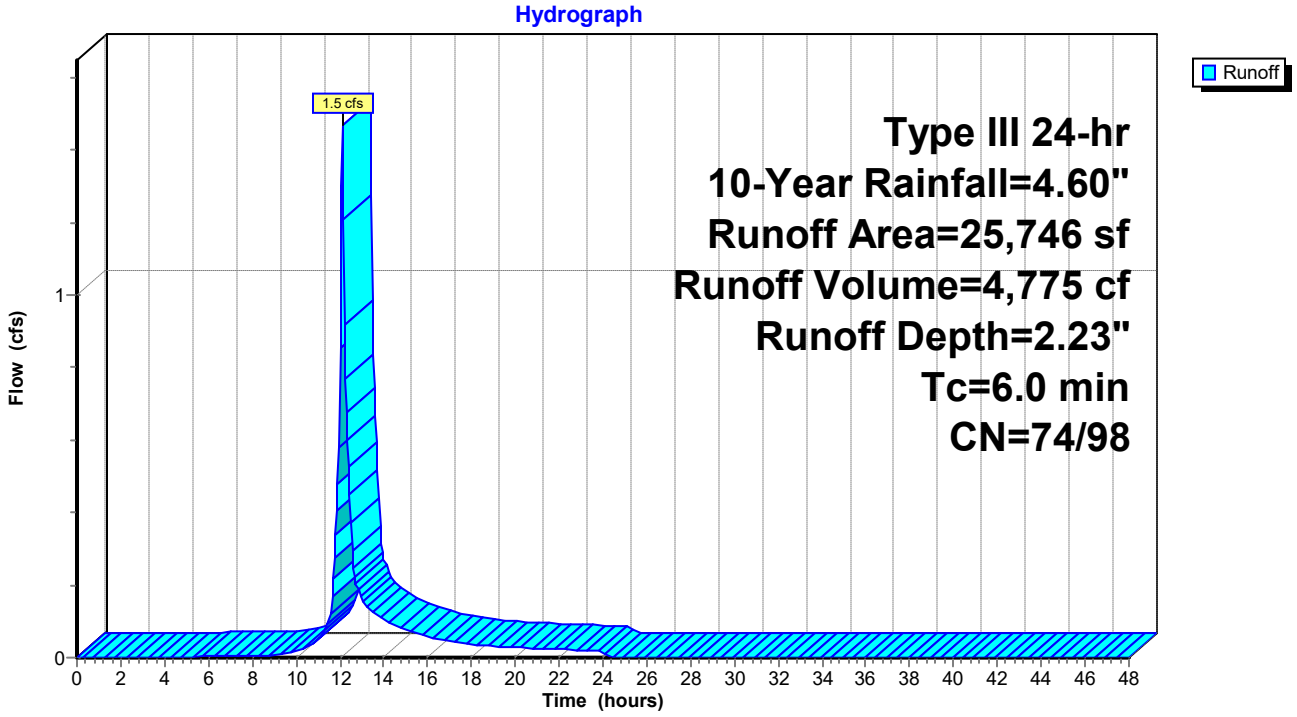
Runoff = 1.5 cfs @ 12.09 hrs, Volume= 4,775 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
21,934	74	>75% Grass cover, Good, HSG C
1,855	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
1,846	98	Roofs, HSG C
104	98	Roofs, HSG D
25,746	76	Weighted Average
23,790	74	92.40% Pervious Area
1,957	98	7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

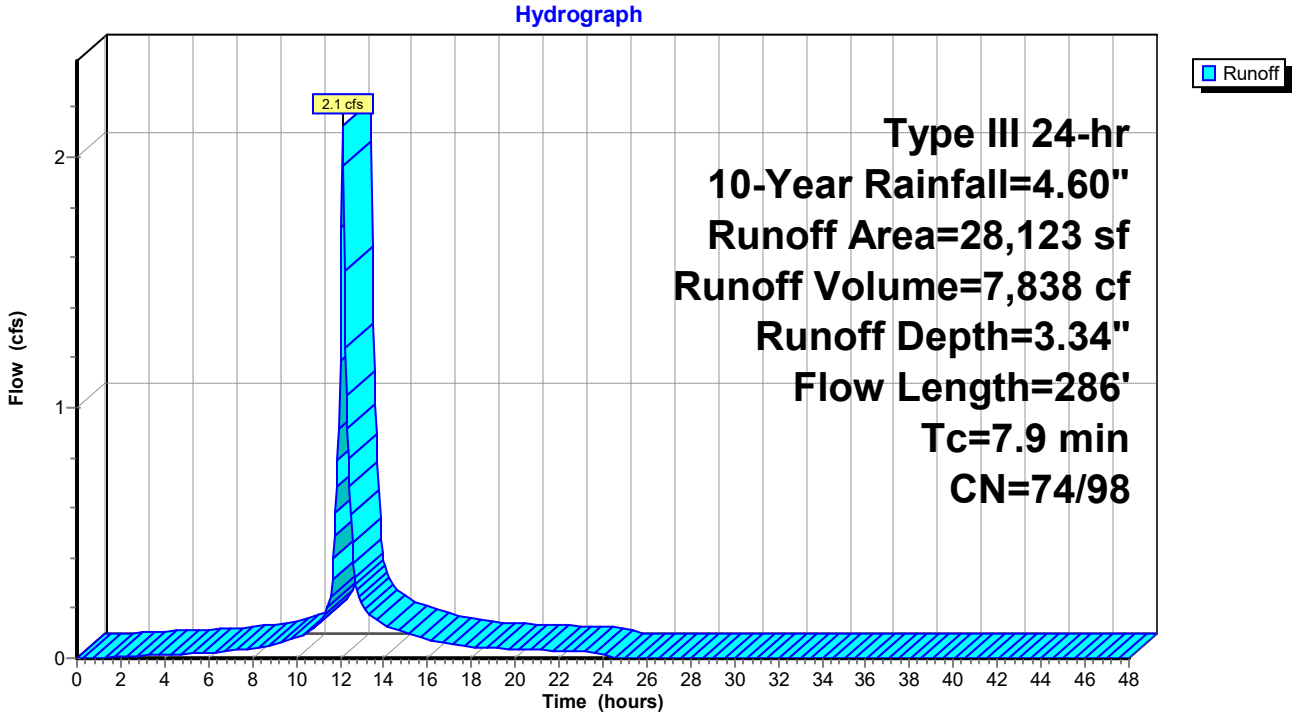
Runoff = 2.1 cfs @ 12.11 hrs, Volume= 7,838 cf, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
12,387	74	>75% Grass cover, Good, HSG C
15,736	98	Paved parking, HSG C
28,123	87	Weighted Average
12,387	74	44.05% Pervious Area
15,736	98	55.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3F:



Summary for Subcatchment PS-3G:

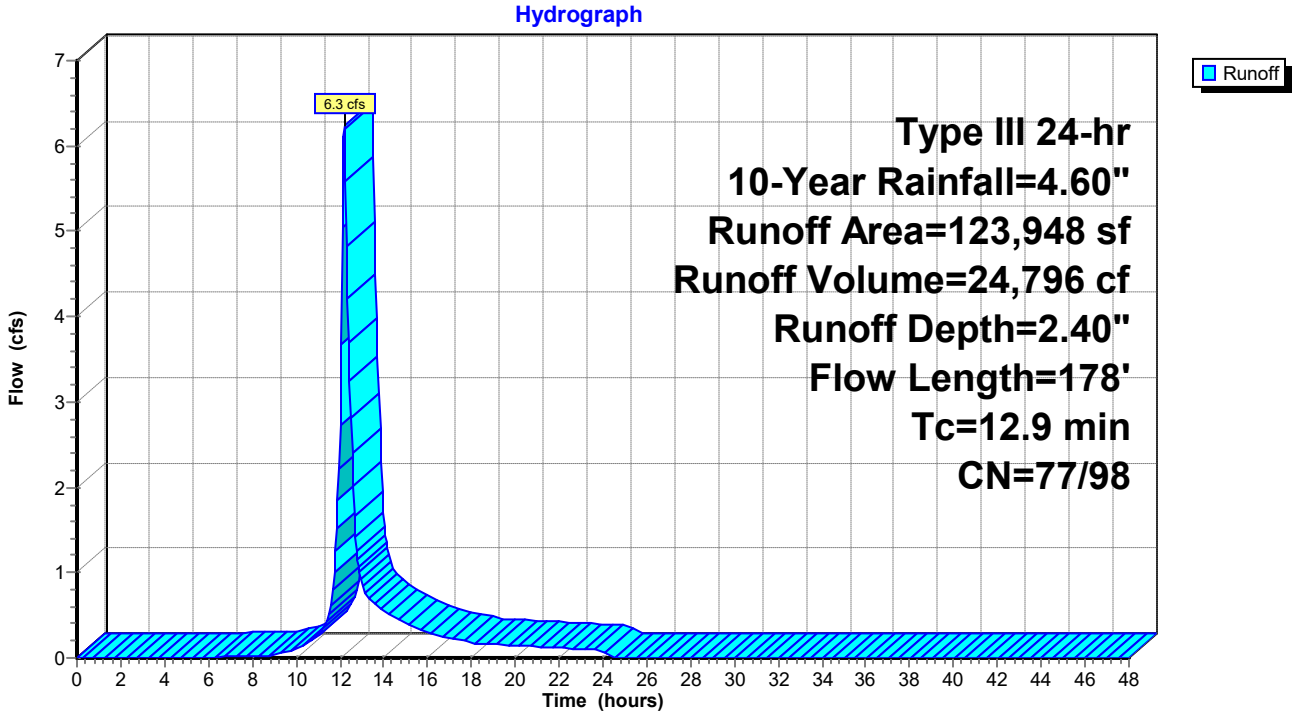
Runoff = 6.3 cfs @ 12.18 hrs, Volume= 24,796 cf, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
19,056	74	>75% Grass cover, Good, HSG C
57,013	80	>75% Grass cover, Good, HSG D
635	98	Roofs, HSG C
3,265	98	Roofs, HSG D
308	98	Water Surface, HSG A
2,286	98	Water Surface, HSG D
11,415	70	Woods, Good, HSG C
29,969	77	Woods, Good, HSG D
123,948	78	Weighted Average
117,454	77	94.76% Pervious Area
6,494	98	5.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	78	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	178	Total			

Subcatchment PS-3G:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 143,245 sf, 49.79% Impervious, Inflow Depth = 2.68" for 10-Year event
Inflow = 6.4 cfs @ 12.23 hrs, Volume= 32,015 cf
Outflow = 3.4 cfs @ 12.53 hrs, Volume= 26,239 cf, Atten= 47%, Lag= 17.9 min
Primary = 3.4 cfs @ 12.53 hrs, Volume= 26,239 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.02' @ 12.53 hrs Surf.Area= 8,794 sf Storage= 13,203 cf

Plug-Flow detention time= 191.8 min calculated for 26,211 cf (82% of inflow)
Center-of-Mass det. time= 116.5 min (902.0 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	4,856 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	37,851 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		43,321 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616
205.00	1,656	155.0	1,540	4,856	1,937

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482
205.00	10,613	498.0	9,983	37,851	12,038

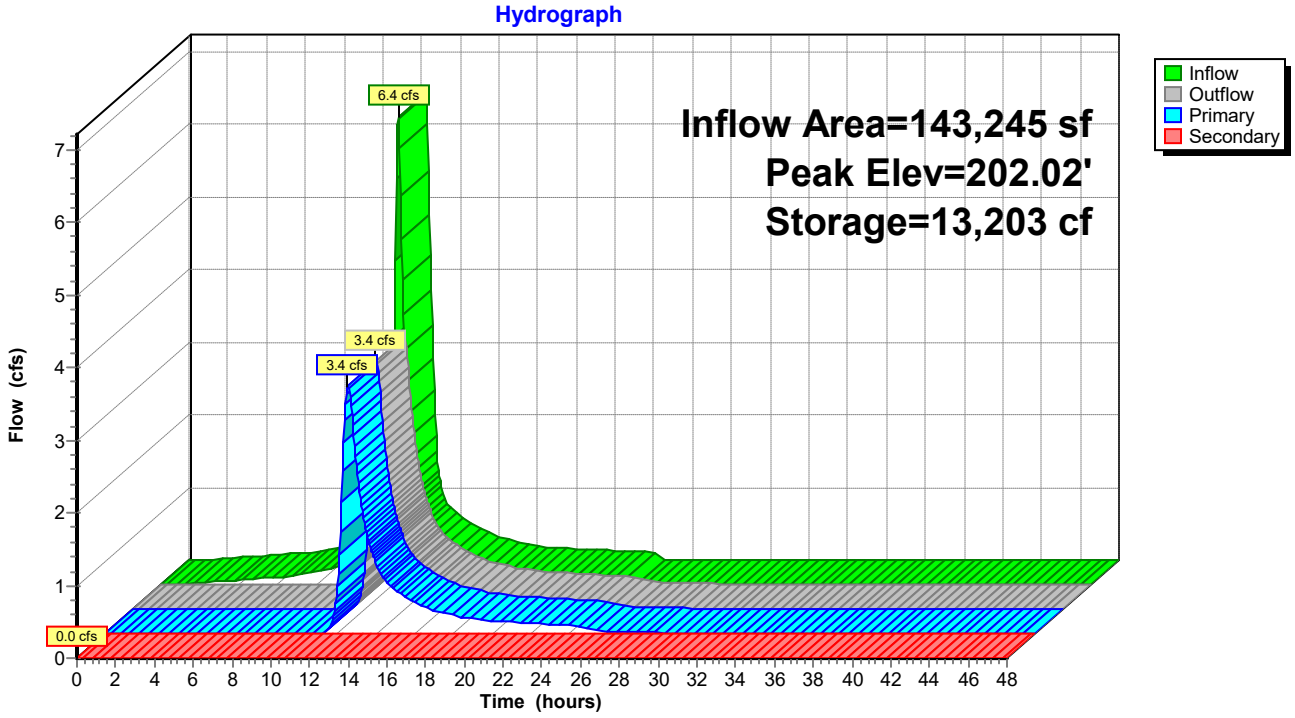
Device	Routing	Invert	Outlet Devices
#1	Primary	198.80'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.80' / 198.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	201.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 201.00 202.00 202.00 202.50 Width (feet) 1.00 1.00 3.50 3.50

#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.4 cfs @ 12.53 hrs HW=202.02' (Free Discharge)
└**1=Culvert** (Passes 3.4 cfs of 7.5 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 3.4 cfs @ 3.18 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #2

Inflow Area = 191,913 sf, 32.91% Impervious, Inflow Depth = 2.49" for 10-Year event
Inflow = 7.6 cfs @ 12.12 hrs, Volume= 39,760 cf
Outflow = 5.2 cfs @ 12.27 hrs, Volume= 36,864 cf, Atten= 32%, Lag= 9.0 min
Primary = 5.2 cfs @ 12.27 hrs, Volume= 36,864 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.81' @ 12.27 hrs Surf.Area= 7,712 sf Storage= 8,542 cf

Plug-Flow detention time= 104.3 min calculated for 36,864 cf (93% of inflow)
Center-of-Mass det. time= 64.2 min (873.6 - 809.4)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	663 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,708 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	180.50'	27,363 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		29,735 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	274	64.0	0	0	274
181.00	378	75.0	162	162	401
182.00	634	96.0	501	663	699

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	634	96.0	0	0	634
183.00	871	113.0	749	749	935
184.00	1,050	124.0	959	1,708	1,174

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,087	508.0	0	0	5,087
181.00	5,857	519.0	2,734	2,734	6,022
182.00	7,446	540.0	6,636	9,369	7,869
183.00	9,017	561.0	8,219	17,588	9,790
184.00	10,553	580.0	9,775	27,363	11,607

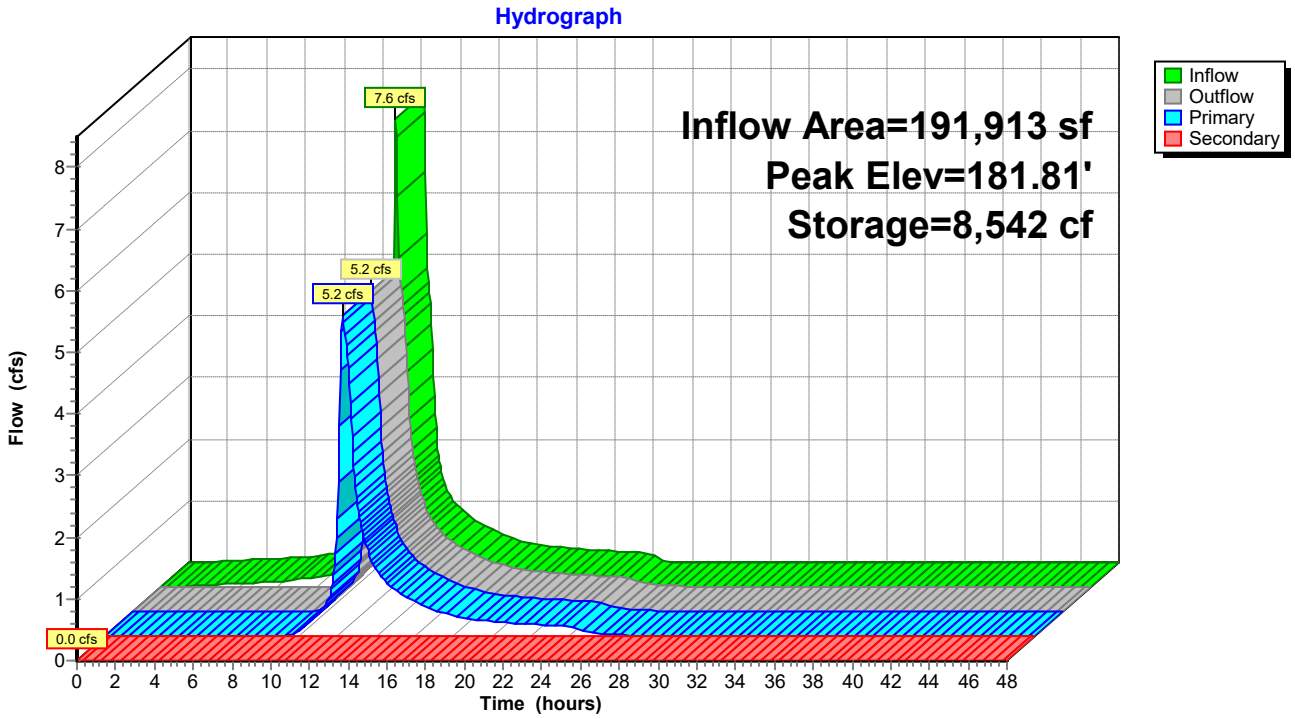
Device	Routing	Invert	Outlet Devices
#1	Primary	179.77'	**18.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 179.77' / 179.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.75 1.75 3.50 3.50
#3	Device 1	182.50'	**48.0" W x 48.0" H Vert. Rim** C= 0.600
#4	Secondary	183.00'	**10.0' long x 6.0' breadth Emergency Overflow**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=5.2 cfs @ 12.27 hrs HW=181.81' (Free Discharge)
└─**1=Culvert** (Passes 5.2 cfs of 7.6 cfs potential flow)
└─**2=Custom Weir/Orifice** (Weir Controls 5.2 cfs @ 2.63 fps)
└─**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #2



Summary for Pond 3P: Infiltration Basin #3

Inflow Area = 204,428 sf, 44.24% Impervious, Inflow Depth = 3.55" for 10-Year event
Inflow = 13.6 cfs @ 12.19 hrs, Volume= 60,499 cf
Outflow = 8.2 cfs @ 12.42 hrs, Volume= 55,255 cf, Atten= 40%, Lag= 13.5 min
Primary = 8.2 cfs @ 12.42 hrs, Volume= 55,255 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.64' @ 12.42 hrs Surf.Area= 14,211 sf Storage= 18,957 cf

Plug-Flow detention time= 114.7 min calculated for 55,255 cf (91% of inflow)
Center-of-Mass det. time= 69.8 min (856.1 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	1,157 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.25'	2,287 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,846 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,290 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	654	105.0	0	0	654
182.00	1,113	133.0	873	873	1,197
182.25	1,155	135.0	283	1,157	1,252

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.25	1,155	135.0	0	0	1,155
183.00	1,284	141.0	914	914	1,323
184.00	1,464	150.0	1,373	2,287	1,577

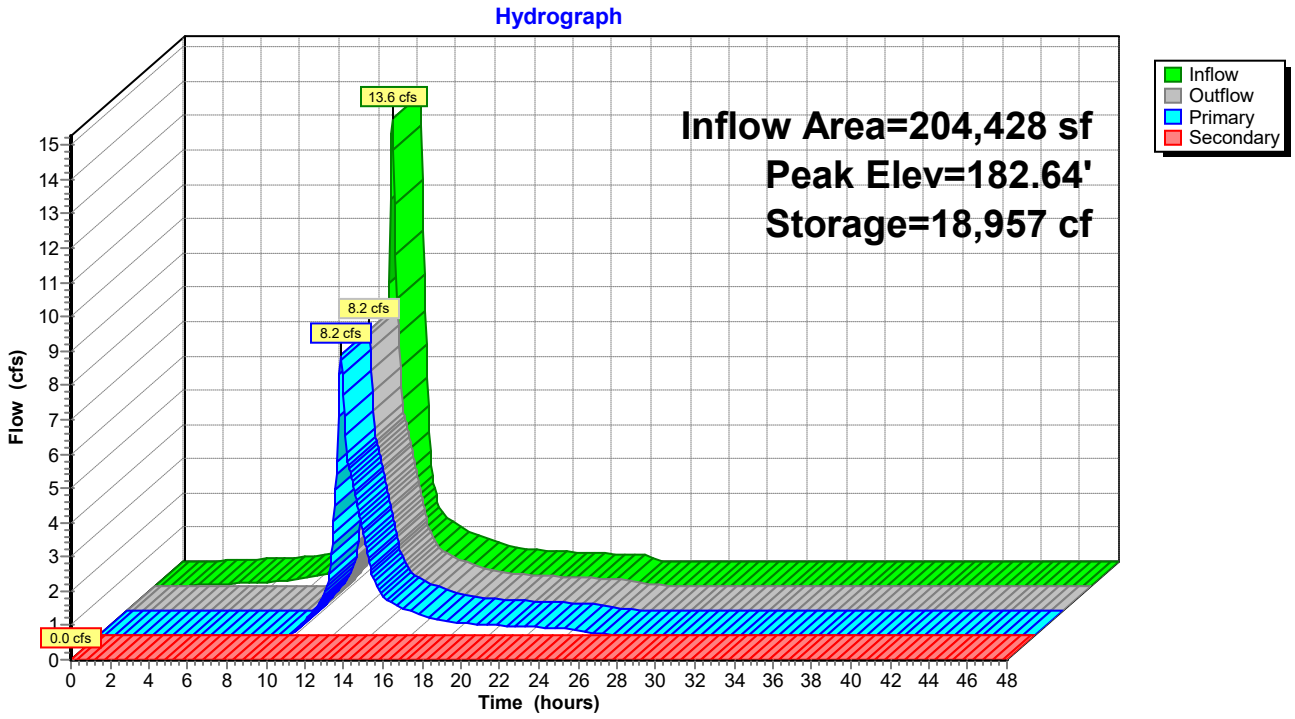
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,353	505.0	0	0	9,353
182.00	10,900	526.0	10,117	10,117	11,151
183.00	12,389	548.0	11,637	21,753	13,107
184.00	13,809	570.0	13,093	34,846	15,142

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 46.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0870 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.1 cfs @ 12.42 hrs HW=182.63' (Free Discharge)
└─**1=Culvert** (Passes 8.1 cfs of 13.2 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 5.5 cfs @ 4.73 fps)
  └─**3=Rim** (Weir Controls 2.6 cfs @ 1.20 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 3P: Infiltration Basin #3



Summary for Pond 4P: Runoff Collection Area

Inflow Area = 80,244 sf, 0.09% Impervious, Inflow Depth = 1.82" for 10-Year event
Inflow = 2.9 cfs @ 12.21 hrs, Volume= 12,180 cf
Outflow = 1.4 cfs @ 12.54 hrs, Volume= 8,819 cf, Atten= 52%, Lag= 19.7 min
Primary = 1.4 cfs @ 12.54 hrs, Volume= 8,819 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.14' @ 12.54 hrs Surf.Area= 7,311 sf Storage= 4,368 cf

Plug-Flow detention time= 163.7 min calculated for 8,810 cf (72% of inflow)
Center-of-Mass det. time= 67.2 min (924.2 - 857.1)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

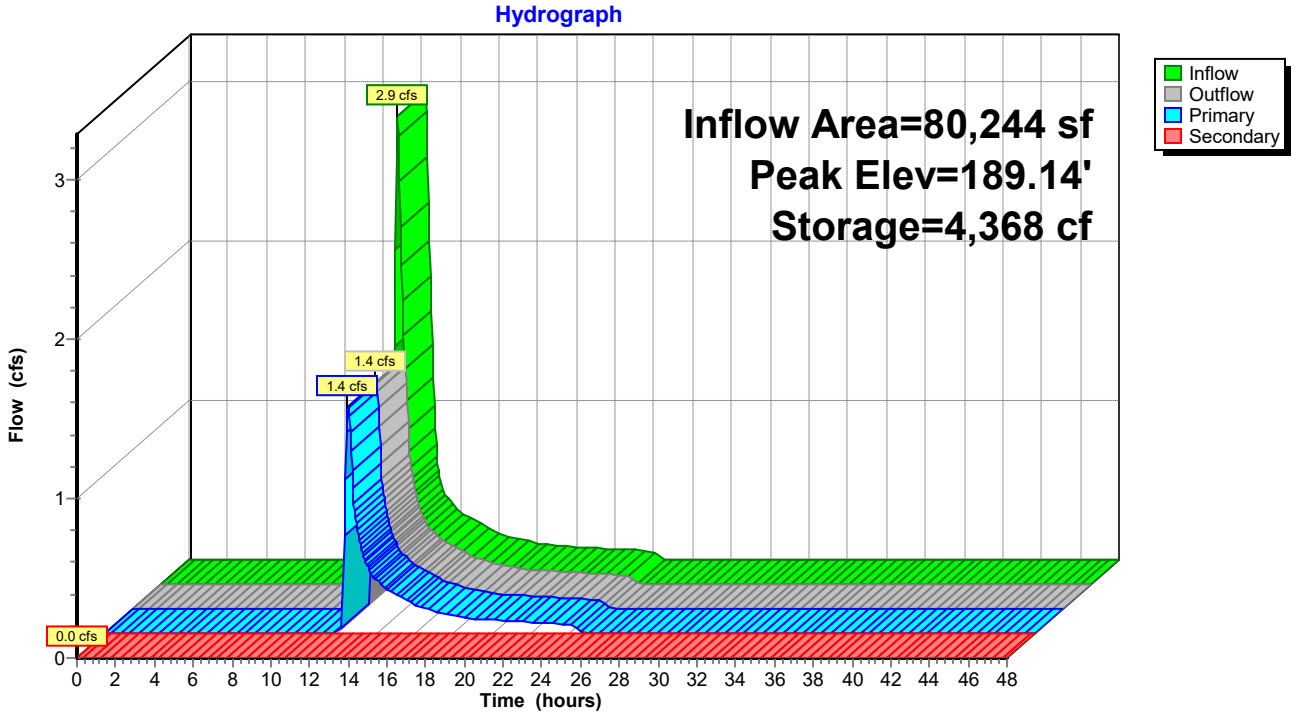
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.0' long x 8.0' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.4 cfs @ 12.54 hrs HW=189.14' (Free Discharge)
└**1=Culvert** (Passes 1.4 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 1.4 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 4P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 28,123 sf, 55.95% Impervious, Inflow Depth = 3.34" for 10-Year event
Inflow = 2.1 cfs @ 12.11 hrs, Volume= 7,838 cf
Outflow = 1.8 cfs @ 12.17 hrs, Volume= 5,467 cf, Atten= 14%, Lag= 3.7 min
Primary = 1.8 cfs @ 12.17 hrs, Volume= 5,467 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.68' @ 12.17 hrs Surf.Area= 2,995 sf Storage= 2,902 cf

Plug-Flow detention time= 184.8 min calculated for 5,461 cf (70% of inflow)
Center-of-Mass det. time= 87.0 min (863.1 - 776.1)

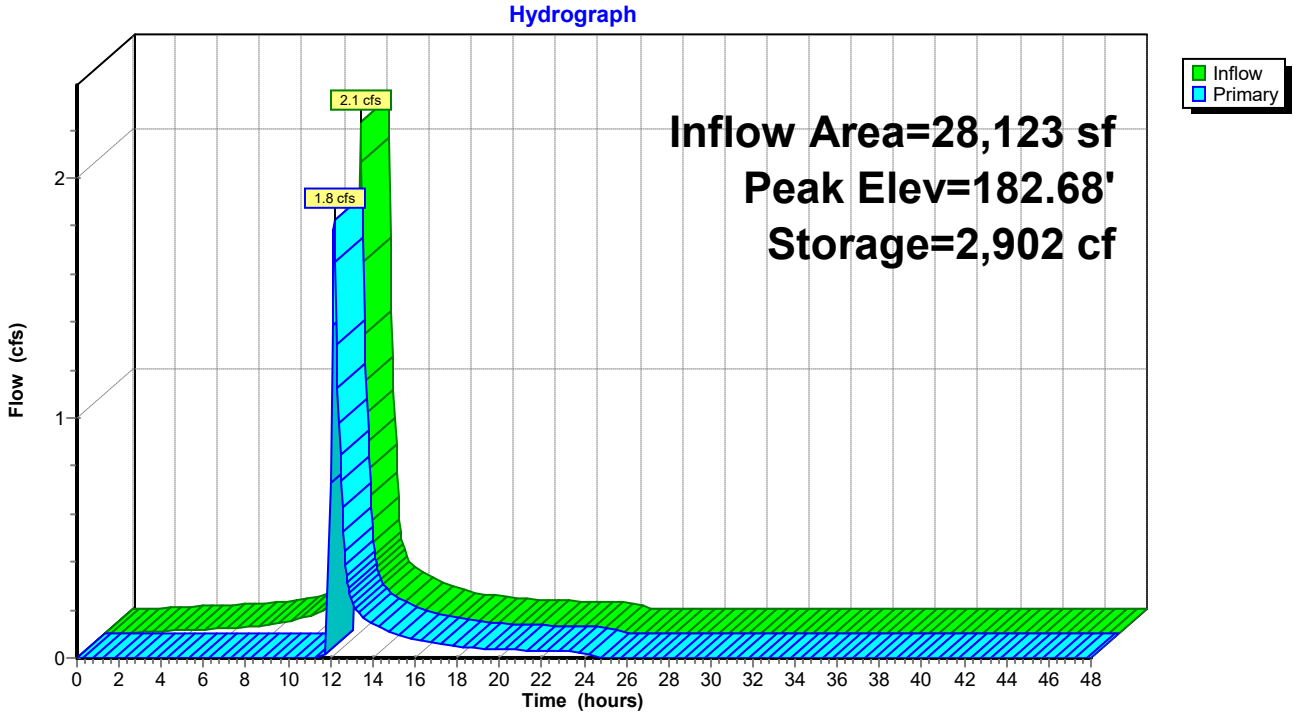
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.8 cfs @ 12.17 hrs HW=182.68' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.8 cfs @ 0.99 fps)

Pond 5P: Bioretention Basin



Summary for Pond 6P: Extended Dry Detention Basin

Inflow Area = 233,284 sf, 53.30% Impervious, Inflow Depth = 3.22" for 10-Year event
Inflow = 15.5 cfs @ 12.16 hrs, Volume= 62,514 cf
Outflow = 5.1 cfs @ 12.54 hrs, Volume= 62,514 cf, Atten= 67%, Lag= 22.9 min
Primary = 5.1 cfs @ 12.54 hrs, Volume= 62,514 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 178.87' @ 12.54 hrs Surf.Area= 12,583 sf Storage= 17,879 cf

Plug-Flow detention time= 44.9 min calculated for 62,449 cf (100% of inflow)
Center-of-Mass det. time= 45.0 min (832.6 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,064 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	3,125 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	176.50'	43,914 cf	**Detention Basin (Irregular)** Listed below (Recalc)
		48,104 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	869	123.0	0	0	869
179.00	1,272	145.0	1,064	1,064	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,272	145.0	0	0	1,272
180.00	1,595	160.0	1,430	1,430	1,667
181.00	1,797	168.0	1,695	3,125	1,932

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
176.50	610	97.0	0	0	610
177.00	3,576	224.0	944	944	3,855
178.00	10,251	418.0	6,627	7,571	13,772
179.00	11,539	439.0	10,889	18,460	15,266
180.00	12,753	461.0	12,141	30,601	16,905
181.00	13,882	484.0	13,314	43,914	18,698

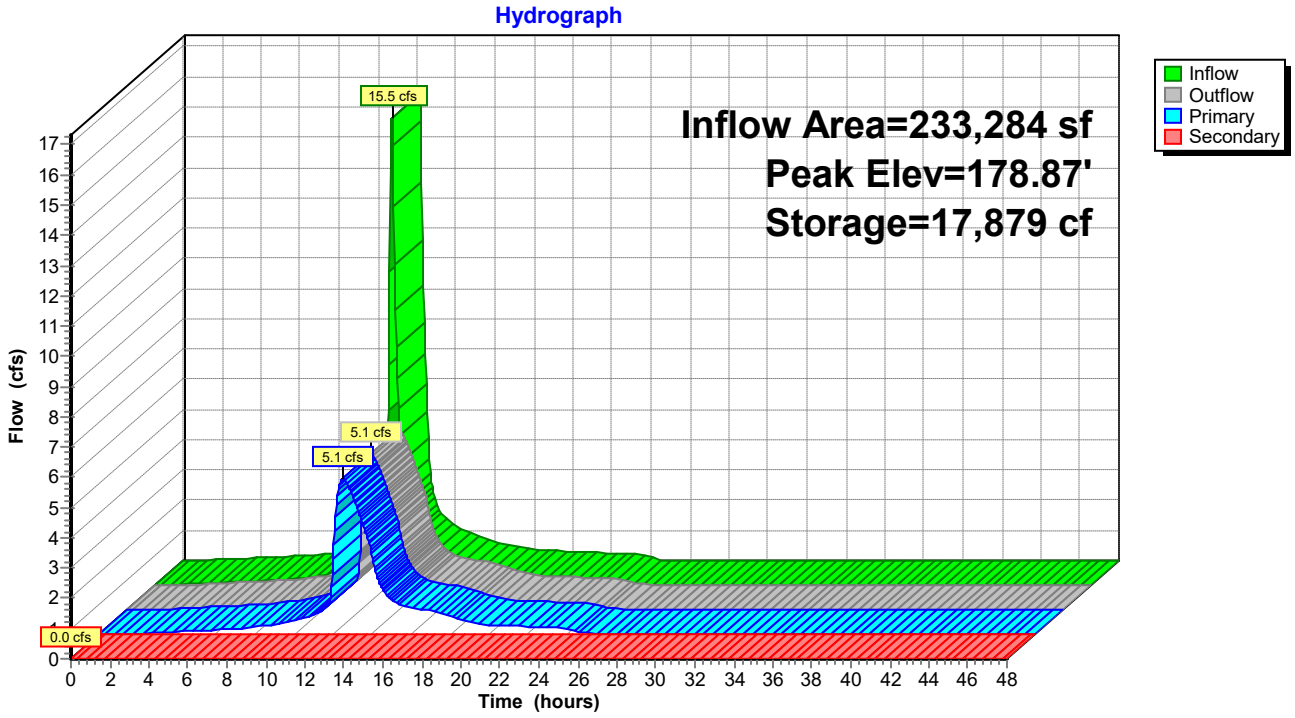
Device	Routing	Invert	Outlet Devices
#1	Primary	175.75'	**18.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 175.75' / 175.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	176.50'	**6.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	177.50'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	179.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#5	Secondary	180.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=5.1 cfs @ 12.54 hrs HW=178.87' (Free Discharge)
└**1=Culvert** (Passes 5.1 cfs of 10.3 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.6 cfs @ 6.98 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.5 cfs @ 5.28 fps)
  └**4=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=176.50' (Free Discharge)
└**5=Emergency Overflow** (Controls 0.0 cfs)

Pond 6P: Extended Dry Detention Basin

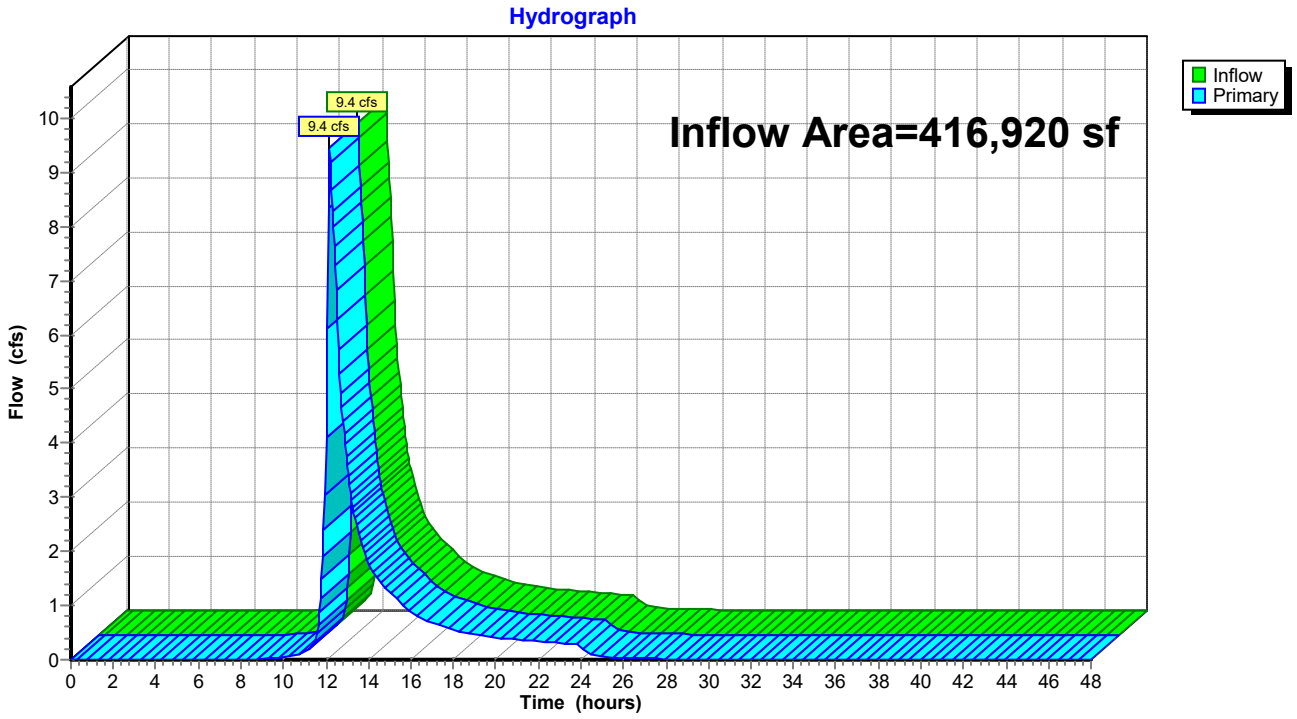


Summary for Link DP-1: Offsite to North

Inflow Area = 416,920 sf, 18.05% Impervious, Inflow Depth = 1.68" for 10-Year event
Inflow = 9.4 cfs @ 12.17 hrs, Volume= 58,471 cf
Primary = 9.4 cfs @ 12.17 hrs, Volume= 58,471 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

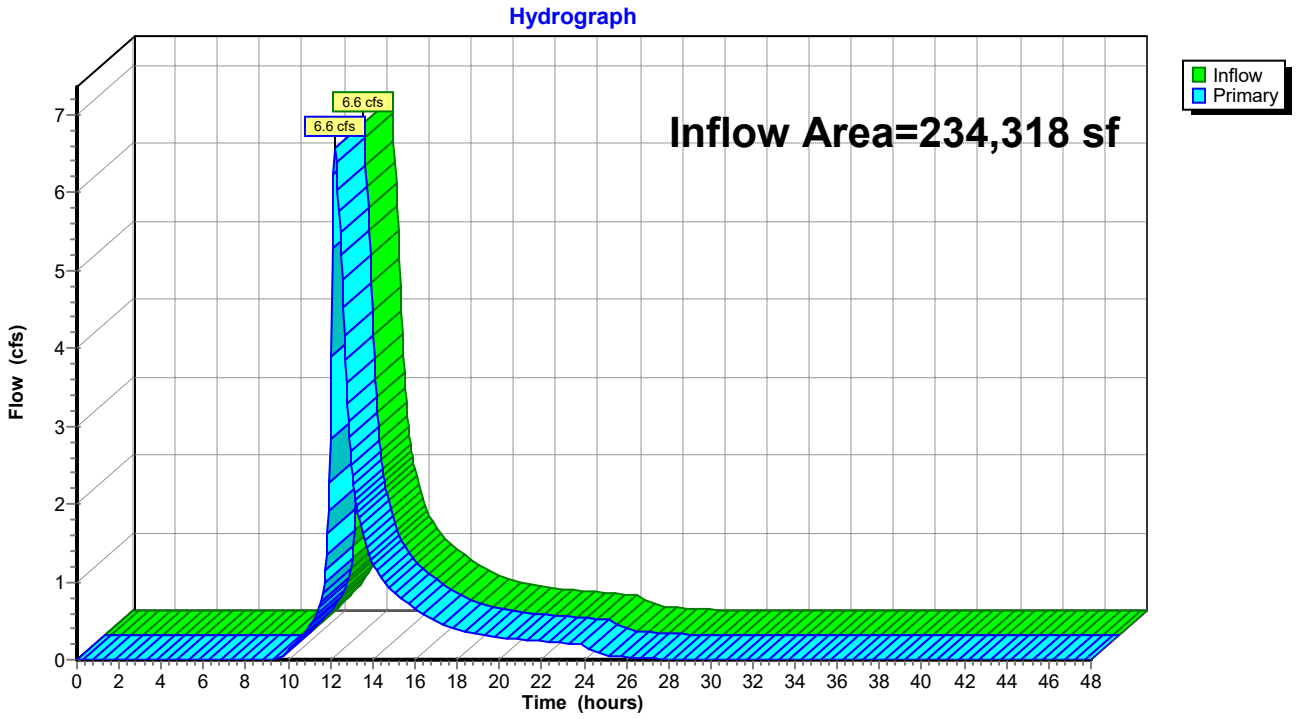


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 234,318 sf, 27.32% Impervious, Inflow Depth = 2.24" for 10-Year event
Inflow = 6.6 cfs @ 12.22 hrs, Volume= 43,732 cf
Primary = 6.6 cfs @ 12.22 hrs, Volume= 43,732 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

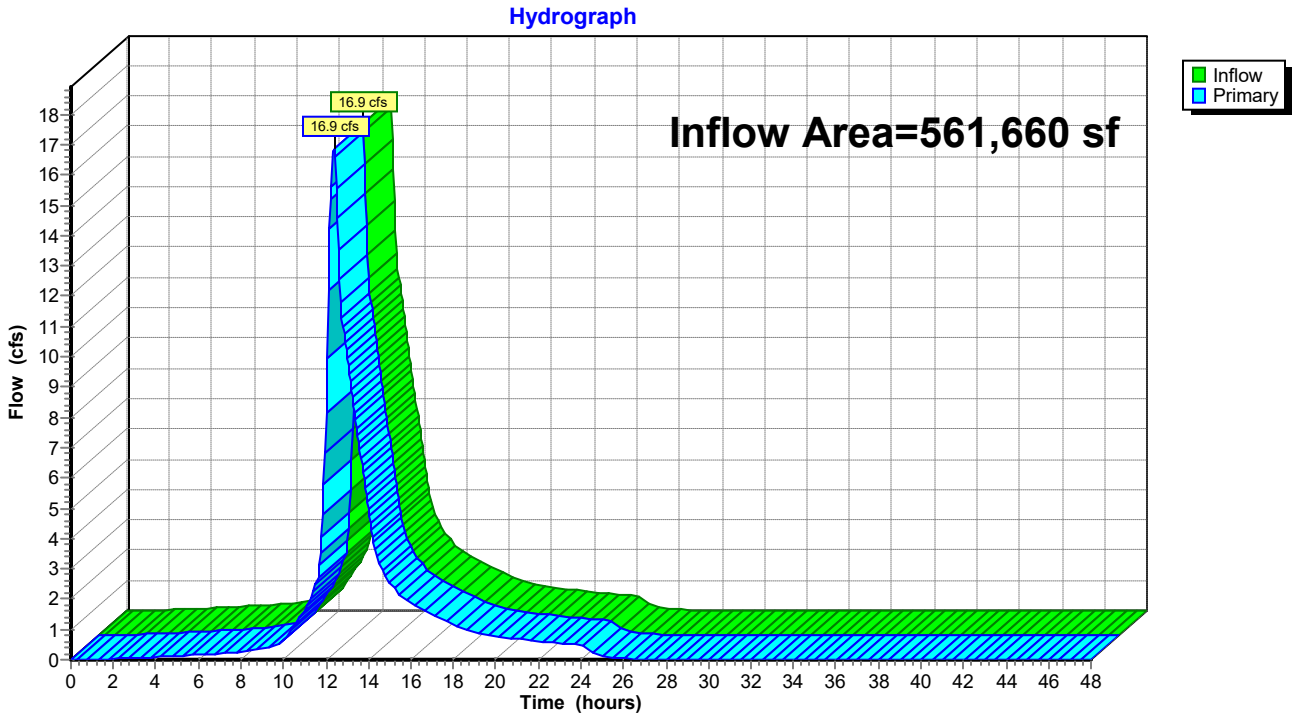


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 561,660 sf, 39.40% Impervious, Inflow Depth = 3.05" for 10-Year event
Inflow = 16.9 cfs @ 12.38 hrs, Volume= 142,565 cf
Primary = 16.9 cfs @ 12.38 hrs, Volume= 142,565 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=143,245 sf 49.79% Impervious Runoff Depth=4.20"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=10.3 cfs 50,192 cf

Subcatchment PS-1B: Runoff Area=111,253 sf 1.10% Impervious Runoff Depth=2.57"
Flow Length=130' Tc=7.4 min CN=63/98 Runoff=7.1 cfs 23,858 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=1.40"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=0.8 cfs 4,367 cf

Subcatchment PS-1D: Runoff Area=70,388 sf 0.66% Impervious Runoff Depth=2.74"
Flow Length=100' Slope=0.0400 '/' Tc=11.2 min CN=65/98 Runoff=4.3 cfs 16,100 cf

Subcatchment PS-1E: Runoff Area=54,530 sf 0.00% Impervious Runoff Depth=3.82"
Flow Length=78' Slope=0.0200 '/' Tc=12.1 min CN=76/0 Runoff=4.6 cfs 17,338 cf

Subcatchment PS-2A: Runoff Area=80,244 sf 0.09% Impervious Runoff Depth=3.31"
Flow Length=264' Tc=14.3 min CN=71/98 Runoff=5.5 cfs 22,130 cf

Subcatchment PS-2B: Runoff Area=64,783 sf 68.84% Impervious Runoff Depth=5.22"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=6.7 cfs 28,171 cf

Subcatchment PS-2C: Runoff Area=46,886 sf 39.45% Impervious Runoff Depth=4.84"
Tc=6.0 min CN=77/98 Runoff=5.6 cfs 18,923 cf

Subcatchment PS-2D: Runoff Area=42,405 sf 1.99% Impervious Runoff Depth=3.46"
Flow Length=95' Slope=0.0700 '/' Tc=8.6 min CN=72/98 Runoff=3.5 cfs 12,239 cf

Subcatchment PS-3A: Runoff Area=12,714 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.8 cfs 6,634 cf

Subcatchment PS-3B: Runoff Area=191,714 sf 40.54% Impervious Runoff Depth=5.31"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=19.4 cfs 84,881 cf

Subcatchment PS-3C: Runoff Area=176,308 sf 60.49% Impervious Runoff Depth=5.25"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=18.5 cfs 77,196 cf

Subcatchment PS-3D: Runoff Area=3,107 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.4 cfs 1,621 cf

Subcatchment PS-3E: Runoff Area=25,746 sf 7.60% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=74/98 Runoff=2.5 cfs 8,177 cf

Subcatchment PS-3F: Runoff Area=28,123 sf 55.95% Impervious Runoff Depth=5.09"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=3.2 cfs 11,937 cf

Subcatchment PS-3G: Runoff Area=123,948 sf 5.24% Impervious Runoff Depth=4.04"
Flow Length=178' Tc=12.9 min CN=77/98 Runoff=10.6 cfs 41,749 cf

Pond 1P: Infiltration Basin #1 Peak Elev=202.38' Storage=16,143 cf Inflow=10.3 cfs 50,192 cf
Primary=7.2 cfs 44,415 cf Secondary=0.0 cfs 0 cf Outflow=7.2 cfs 44,415 cf

Pond 2P: Infiltration Basin #2 Peak Elev=182.29' Storage=12,480 cf Inflow=13.1 cfs 65,862 cf
Primary=8.9 cfs 62,966 cf Secondary=0.0 cfs 0 cf Outflow=8.9 cfs 62,966 cf

Pond 3P: Infiltration Basin #3 Peak Elev=182.92' Storage=22,736 cf Inflow=20.5 cfs 91,515 cf
Primary=13.7 cfs 86,271 cf Secondary=0.0 cfs 0 cf Outflow=13.7 cfs 86,271 cf

Pond 4P: Runoff Collection Area Peak Elev=189.32' Storage=5,731 cf Inflow=5.5 cfs 22,130 cf
Primary=4.0 cfs 18,768 cf Secondary=0.0 cfs 0 cf Outflow=4.0 cfs 18,768 cf

Pond 5P: Bioretention Basin Peak Elev=182.75' Storage=3,104 cf Inflow=3.2 cfs 11,937 cf
Outflow=3.0 cfs 9,565 cf

Pond 6P: Extended Dry Detention Basin Peak Elev=179.67' Storage=28,474 cf Inflow=23.8 cfs 96,560 cf
Primary=10.2 cfs 96,560 cf Secondary=0.0 cfs 0 cf Outflow=10.2 cfs 96,560 cf

Link DP-1: Offsite to North Inflow=19.0 cfs 106,077 cf
Primary=19.0 cfs 106,077 cf

Link DP-2: Offsite to Southeast Inflow=11.6 cfs 75,205 cf
Primary=11.6 cfs 75,205 cf

Link DP-3: Offsite to Northeast Inflow=29.5 cfs 224,580 cf
Primary=29.5 cfs 224,580 cf

Total Runoff Area = 1,212,898 sf Runoff Volume = 425,512 cf Average Runoff Depth = 4.21"
70.27% Pervious = 852,349 sf 29.73% Impervious = 360,549 sf

Summary for Subcatchment PS-1A:

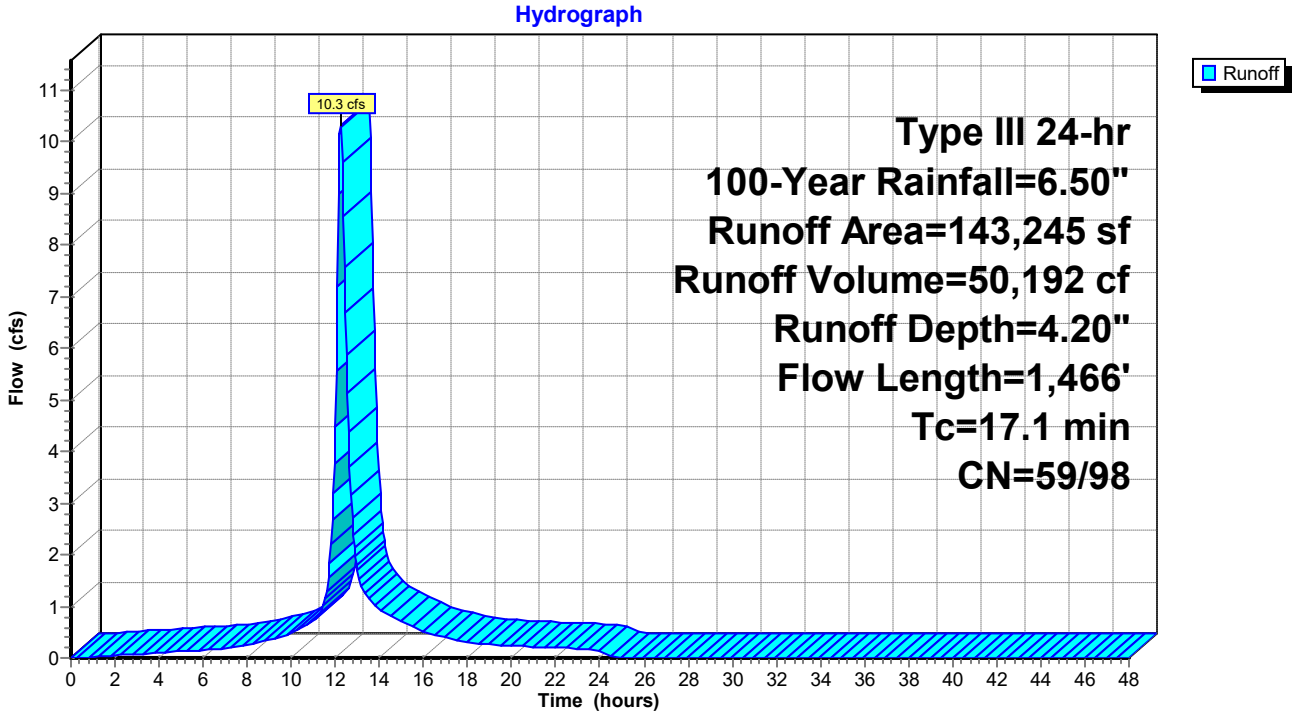
Runoff = 10.3 cfs @ 12.23 hrs, Volume= 50,192 cf, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
22,050	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
143,245	78	Weighted Average
71,926	59	50.21% Pervious Area
71,319	98	49.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

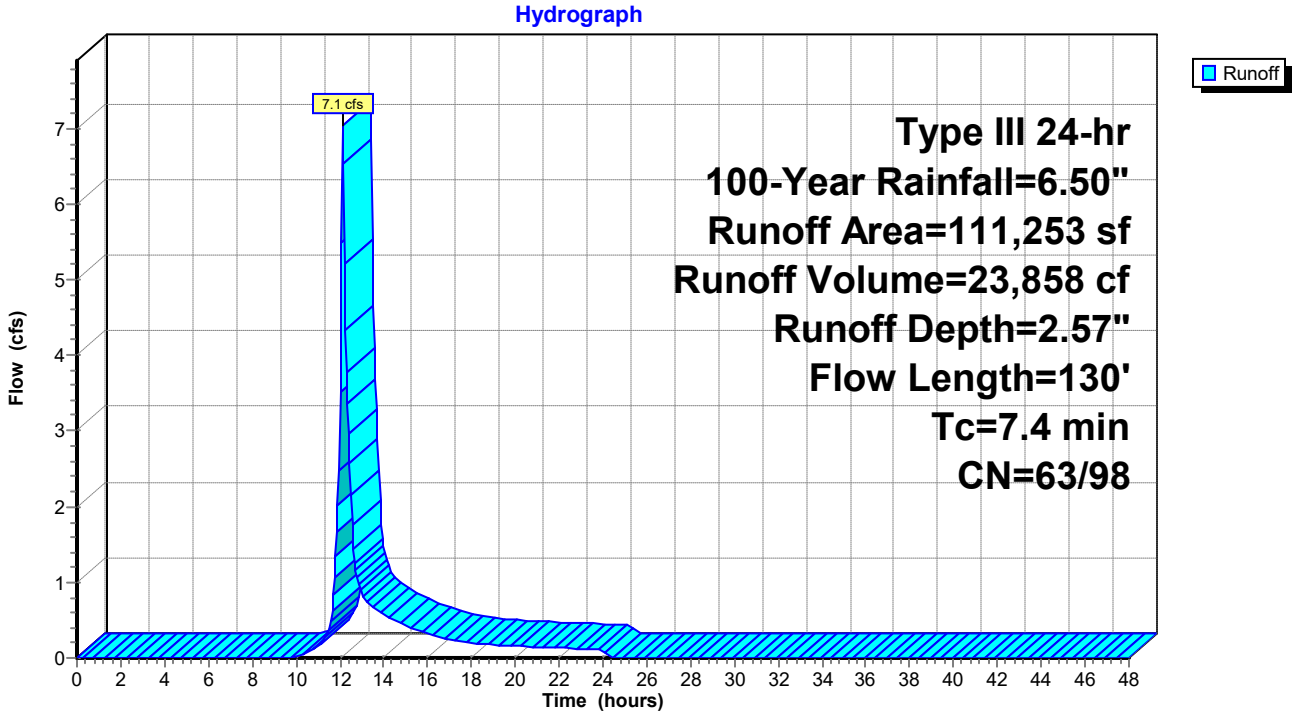
Runoff = 7.1 cfs @ 12.11 hrs, Volume= 23,858 cf, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
45,290	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
727	98	Water Surface, HSG B
492	98	Water Surface, HSG C
0	30	Woods, Good, HSG A
36,205	55	Woods, Good, HSG B
18,556	70	Woods, Good, HSG C
111,253	63	Weighted Average
110,034	63	98.90% Pervious Area
1,219	98	1.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.2	72	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.4	130	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

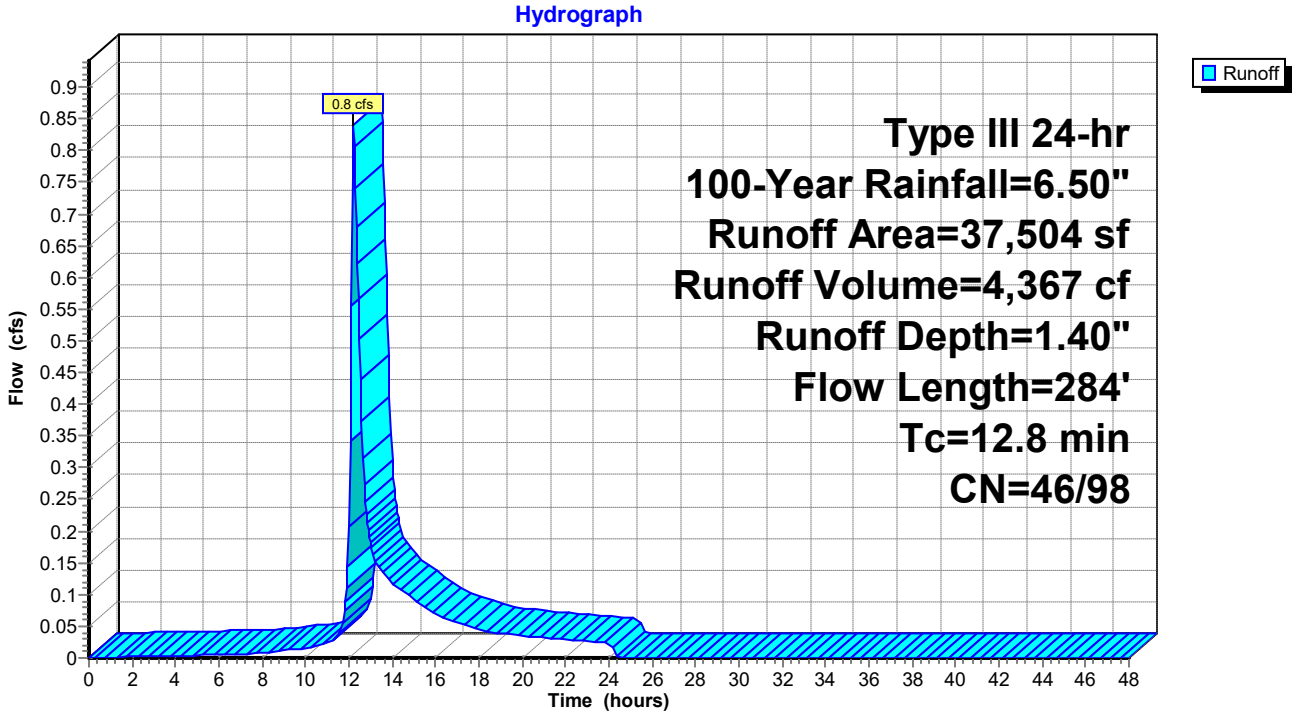
Runoff = 0.8 cfs @ 12.21 hrs, Volume= 4,367 cf, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
9,878	39	>75% Grass cover, Good, HSG A
15,548	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	49	Weighted Average
35,242	46	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

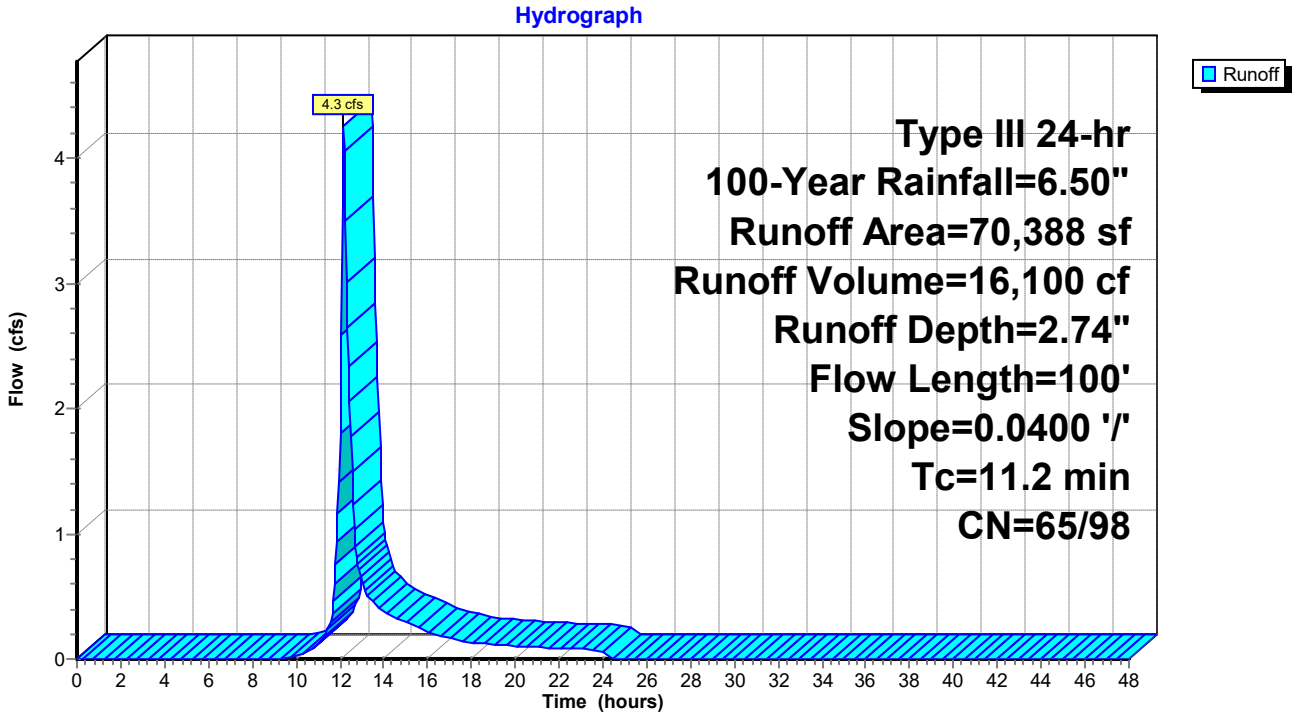
Runoff = 4.3 cfs @ 12.16 hrs, Volume= 16,100 cf, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
41,955	61	>75% Grass cover, Good, HSG B
583	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
468	98	Water Surface, HSG B
17,565	55	Woods, Good, HSG B
67	77	Woods, Good, HSG D
70,388	65	Weighted Average
69,920	65	99.34% Pervious Area
468	98	0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

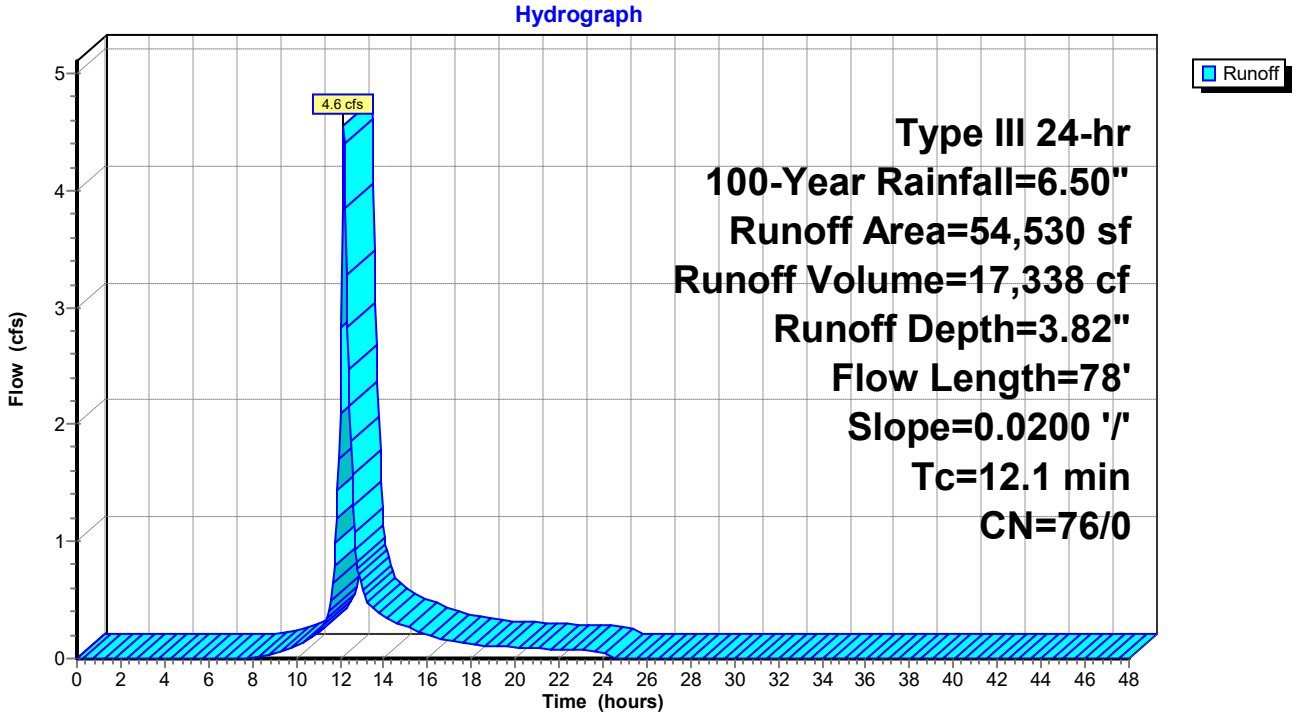
Runoff = 4.6 cfs @ 12.17 hrs, Volume= 17,338 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,435	61	>75% Grass cover, Good, HSG B
23,317	74	>75% Grass cover, Good, HSG C
9,766	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
3,944	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
290	55	Woods, Good, HSG B
12,516	70	Woods, Good, HSG C
1,396	77	Woods, Good, HSG D
54,530	76	Weighted Average
54,530	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	78	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

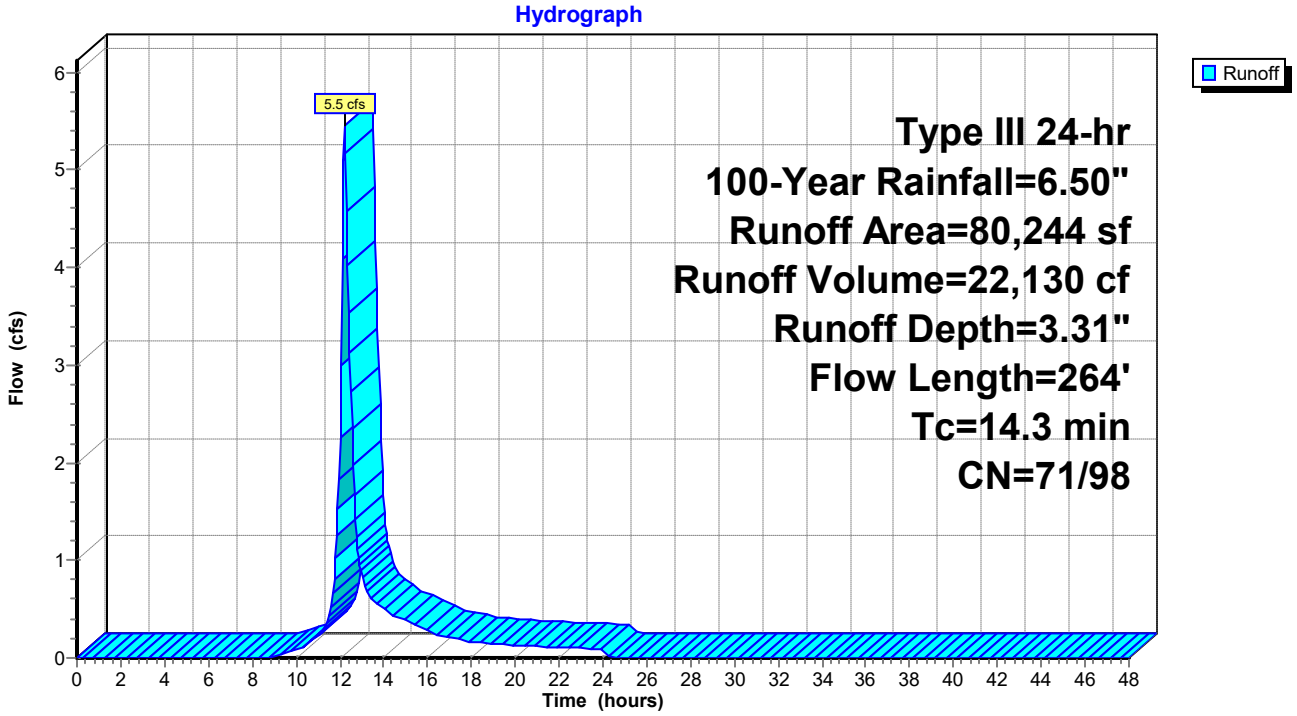
Runoff = 5.5 cfs @ 12.20 hrs, Volume= 22,130 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
8,942	39	>75% Grass cover, Good, HSG A
11,979	61	>75% Grass cover, Good, HSG B
43,810	74	>75% Grass cover, Good, HSG C
7,338	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
167	70	Woods, Good, HSG C
80,244	71	Weighted Average
80,170	71	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

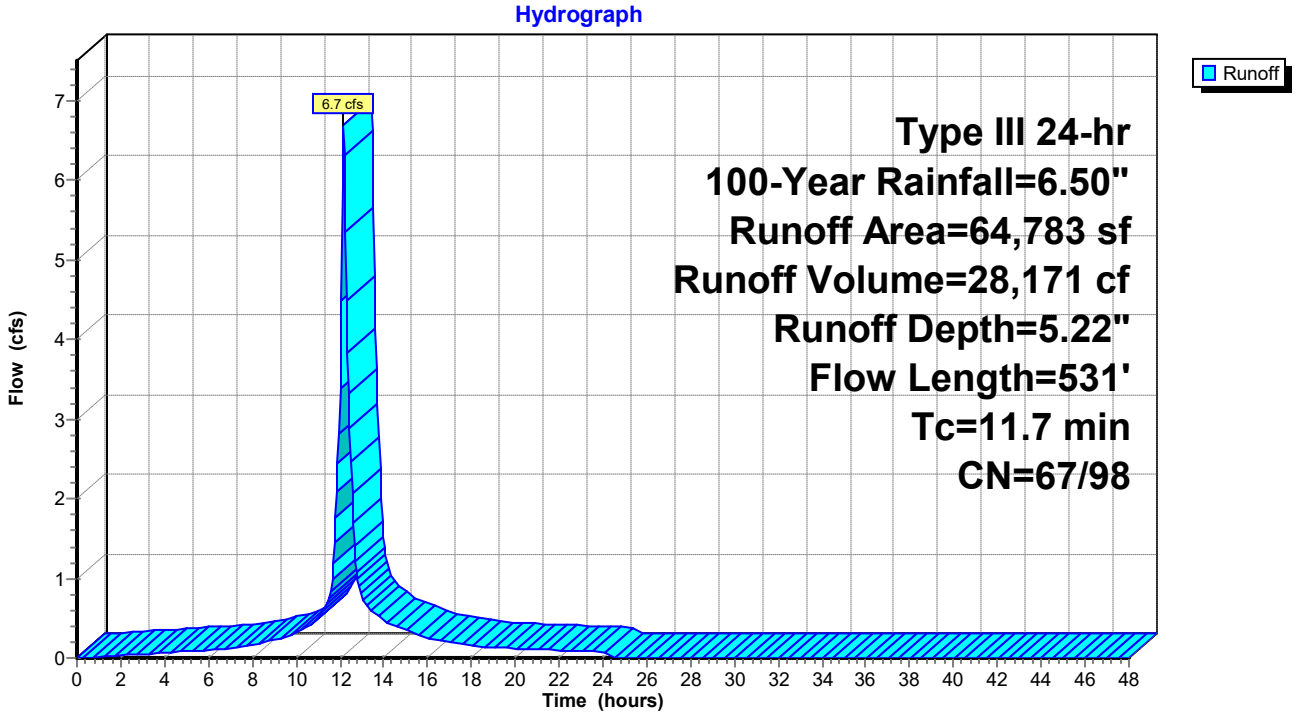
Runoff = 6.7 cfs @ 12.16 hrs, Volume= 28,171 cf, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,799	39	>75% Grass cover, Good, HSG A
5,184	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,783	88	Weighted Average
20,185	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

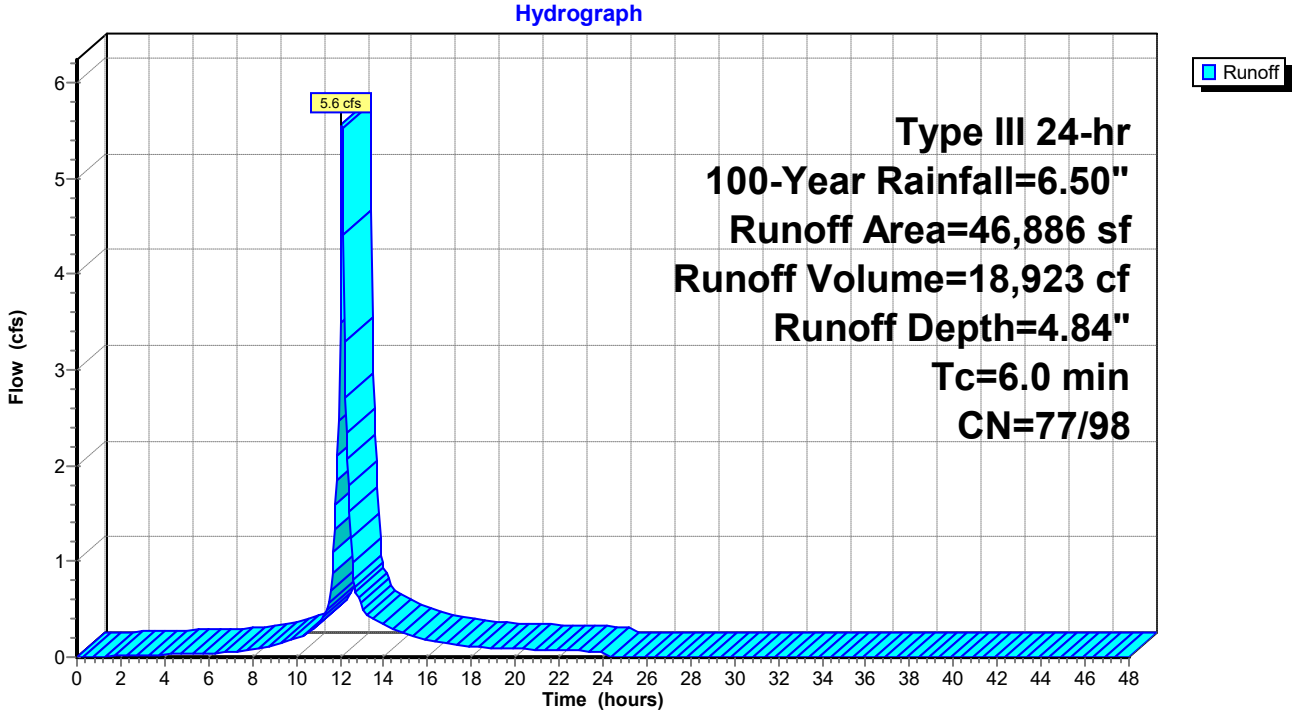
Runoff = 5.6 cfs @ 12.09 hrs, Volume= 18,923 cf, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,571	74	>75% Grass cover, Good, HSG C
13,820	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,757	98	Roofs, HSG D
3,615	98	Water Surface, HSG C
1,473	98	Water Surface, HSG D
46,886	85	Weighted Average
28,391	77	60.55% Pervious Area
18,495	98	39.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

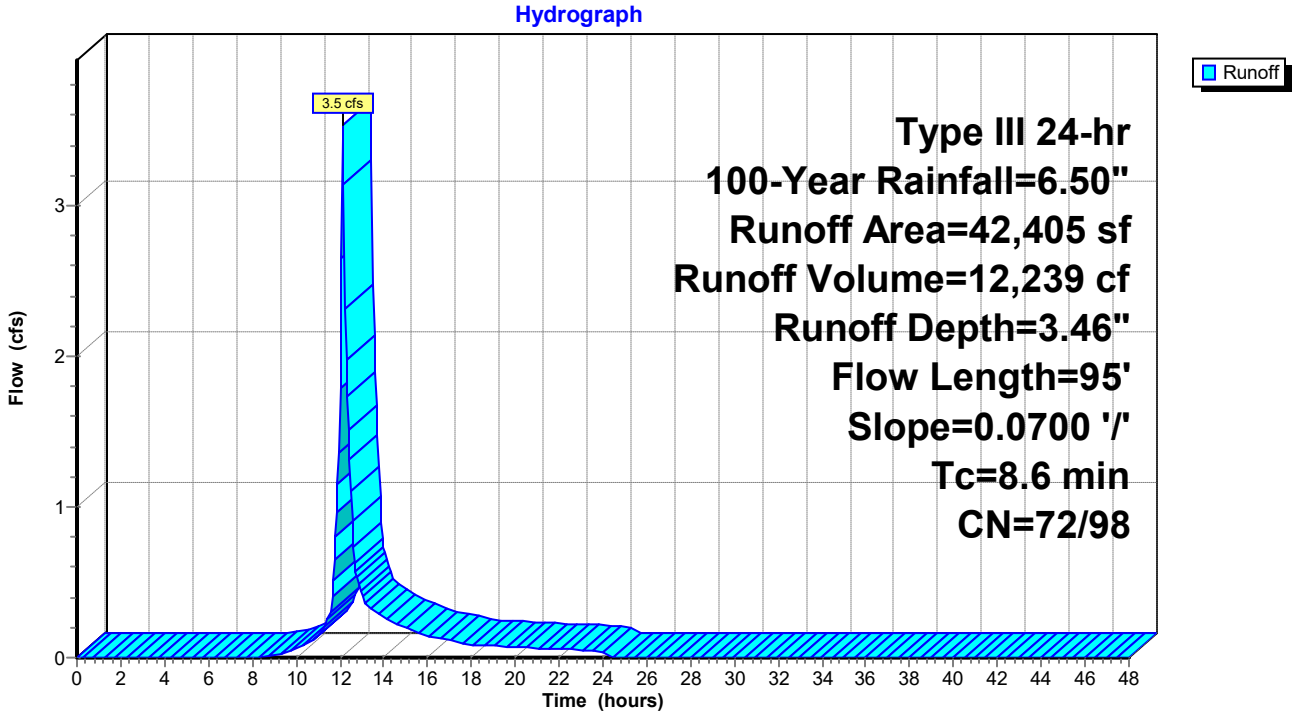
Runoff = 3.5 cfs @ 12.12 hrs, Volume= 12,239 cf, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
28,584	74	>75% Grass cover, Good, HSG C
843	98	Water Surface, HSG C
638	30	Woods, Good, HSG A
12,340	70	Woods, Good, HSG C
42,405	73	Weighted Average
41,562	72	98.01% Pervious Area
843	98	1.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	95	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

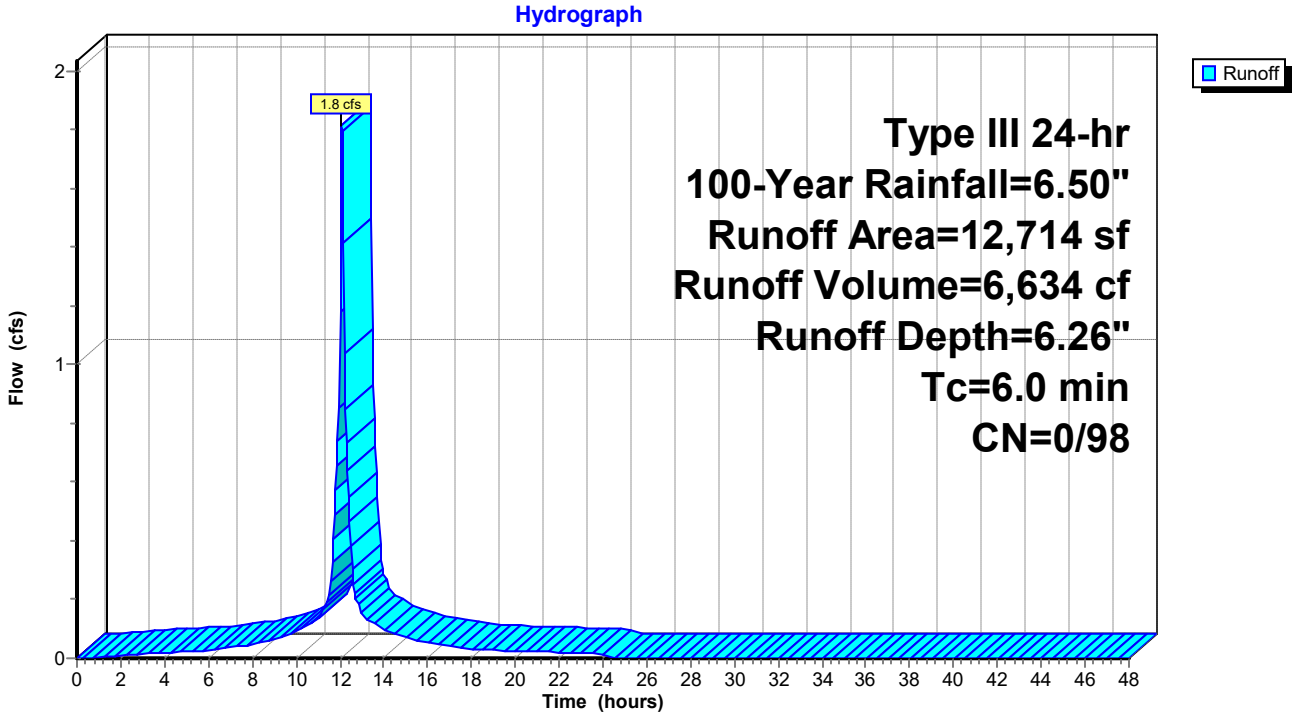
Runoff = 1.8 cfs @ 12.09 hrs, Volume= 6,634 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
1,085	98	Roofs, HSG C
4,376	98	Roofs, HSG D
12,714	98	Weighted Average
12,714	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

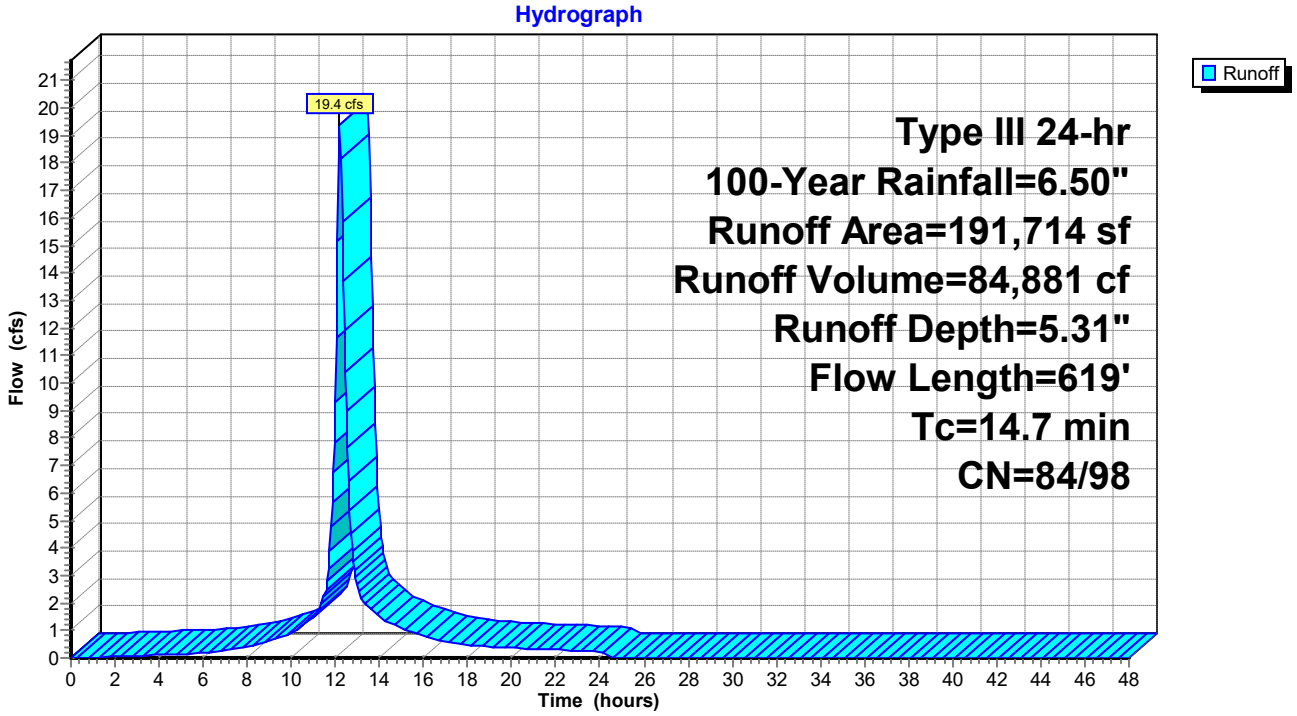
Runoff = 19.4 cfs @ 12.20 hrs, Volume= 84,881 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,827	74	>75% Grass cover, Good, HSG C
70,998	80	>75% Grass cover, Good, HSG D
7,694	98	Paved parking, HSG C
40,930	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,790	98	Roofs, HSG D
6,165	98	Unconnected roofs, HSG C
23,006	98	Unconnected roofs, HSG D
9,353	98	Water Surface, HSG D
191,714	90	Weighted Average
113,996	84	59.46% Pervious Area
77,718	98	40.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

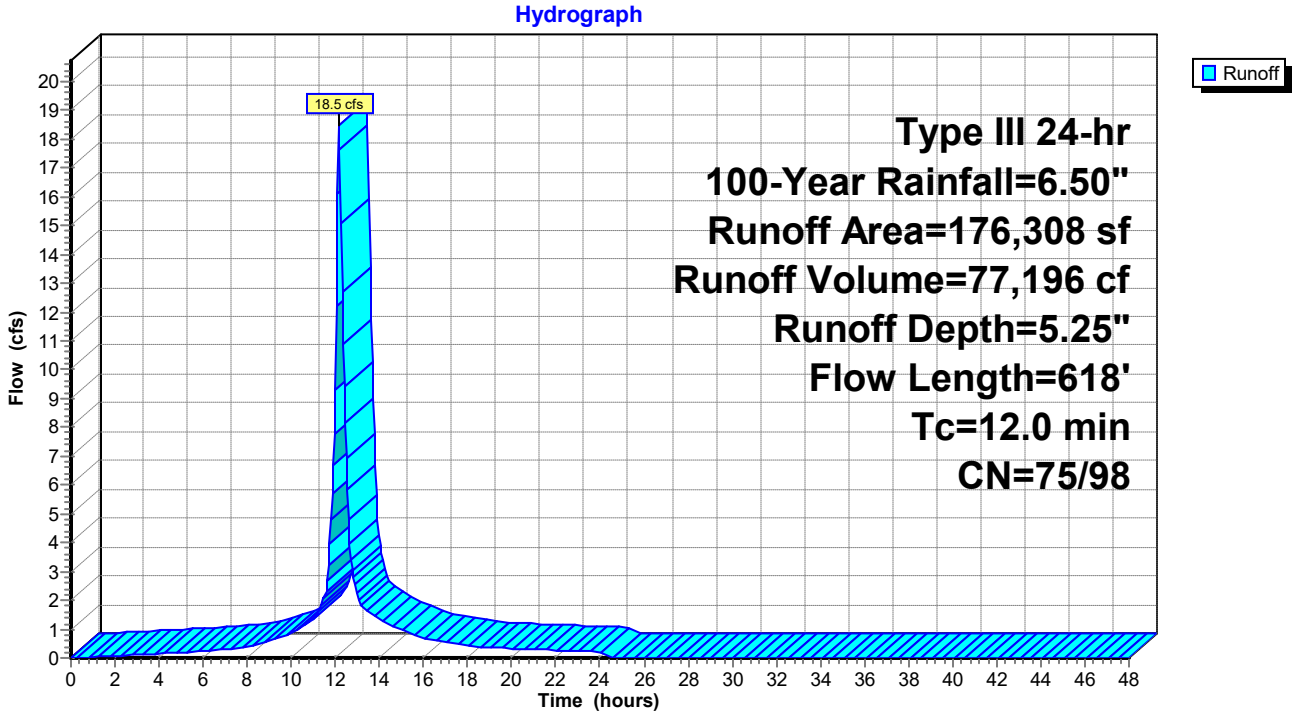
Runoff = 18.5 cfs @ 12.16 hrs, Volume= 77,196 cf, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
23,806	74	>75% Grass cover, Good, HSG C
33,900	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
29,102	98	Paved parking, HSG C
54,828	98	Paved parking, HSG D
7,744	98	Roofs, HSG C
299	98	Roofs, HSG D
79	98	Unconnected roofs, HSG C
176,308	89	Weighted Average
69,656	75	39.51% Pervious Area
106,652	98	60.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

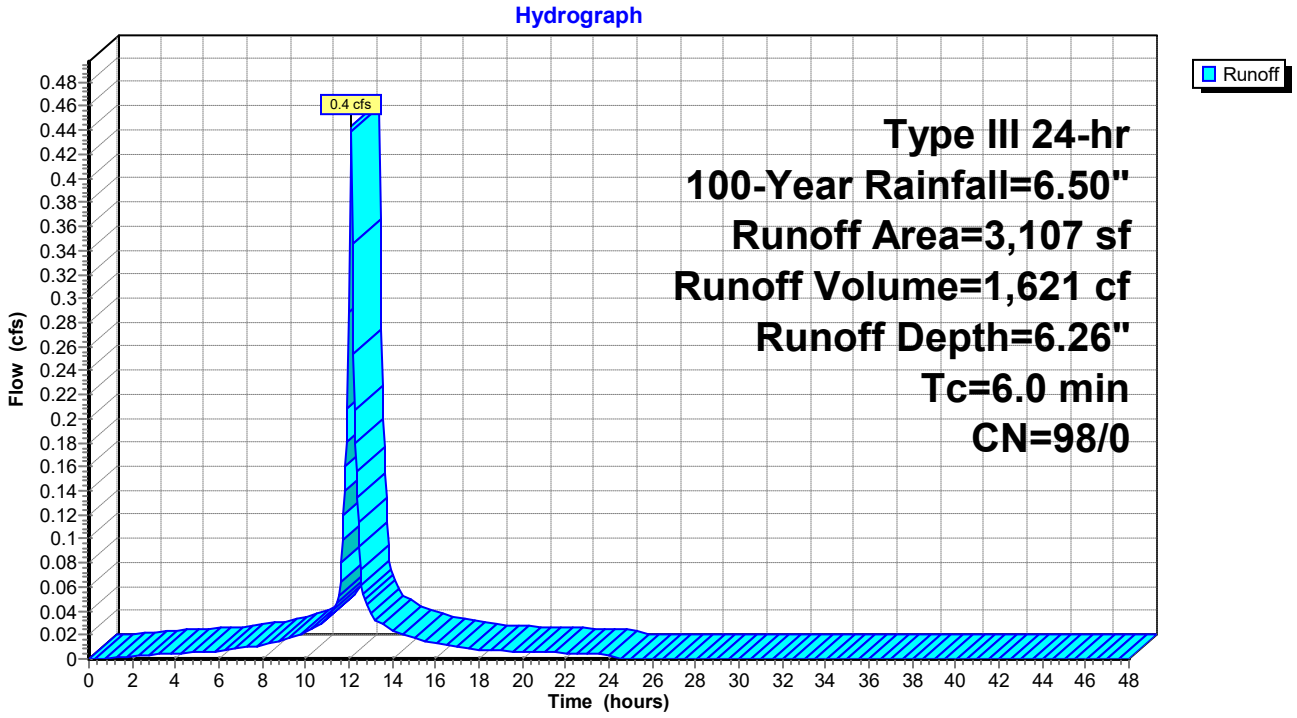
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 1,621 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,107	98	Unconnected roofs, HSG C
3,107	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

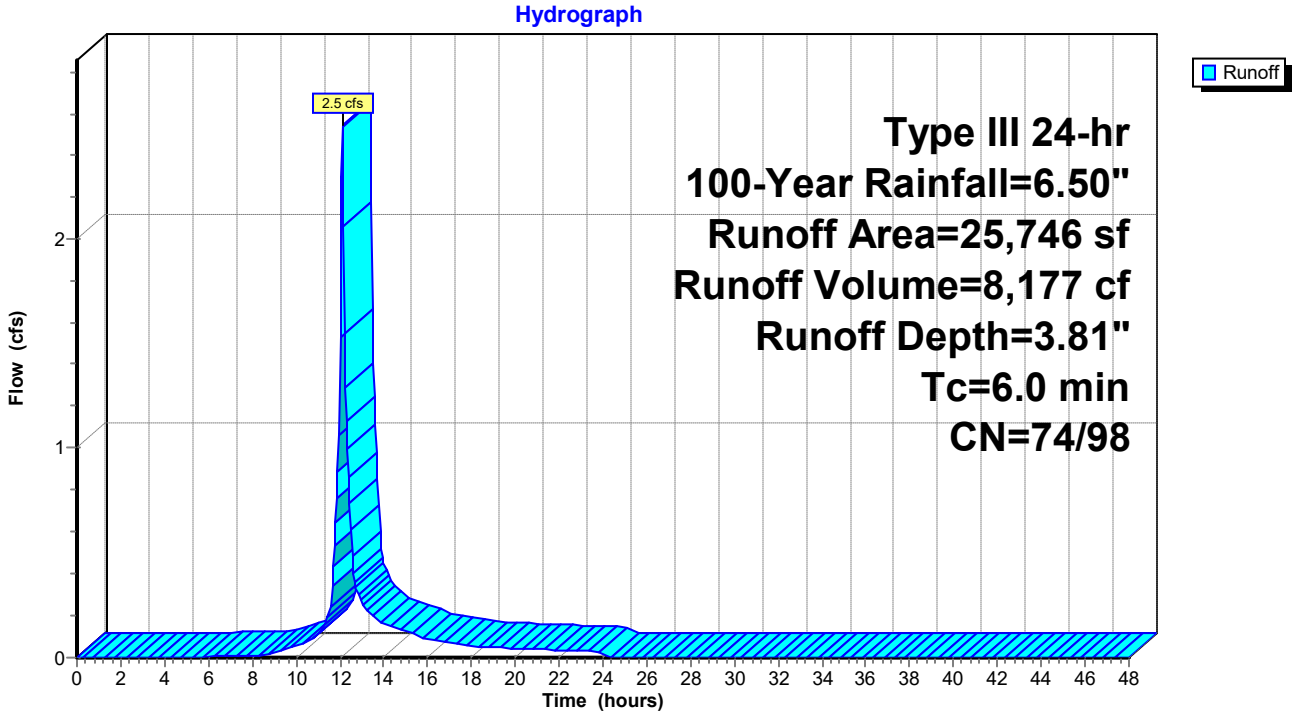
Runoff = 2.5 cfs @ 12.09 hrs, Volume= 8,177 cf, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
21,934	74	>75% Grass cover, Good, HSG C
1,855	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
1,846	98	Roofs, HSG C
104	98	Roofs, HSG D
25,746	76	Weighted Average
23,790	74	92.40% Pervious Area
1,957	98	7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

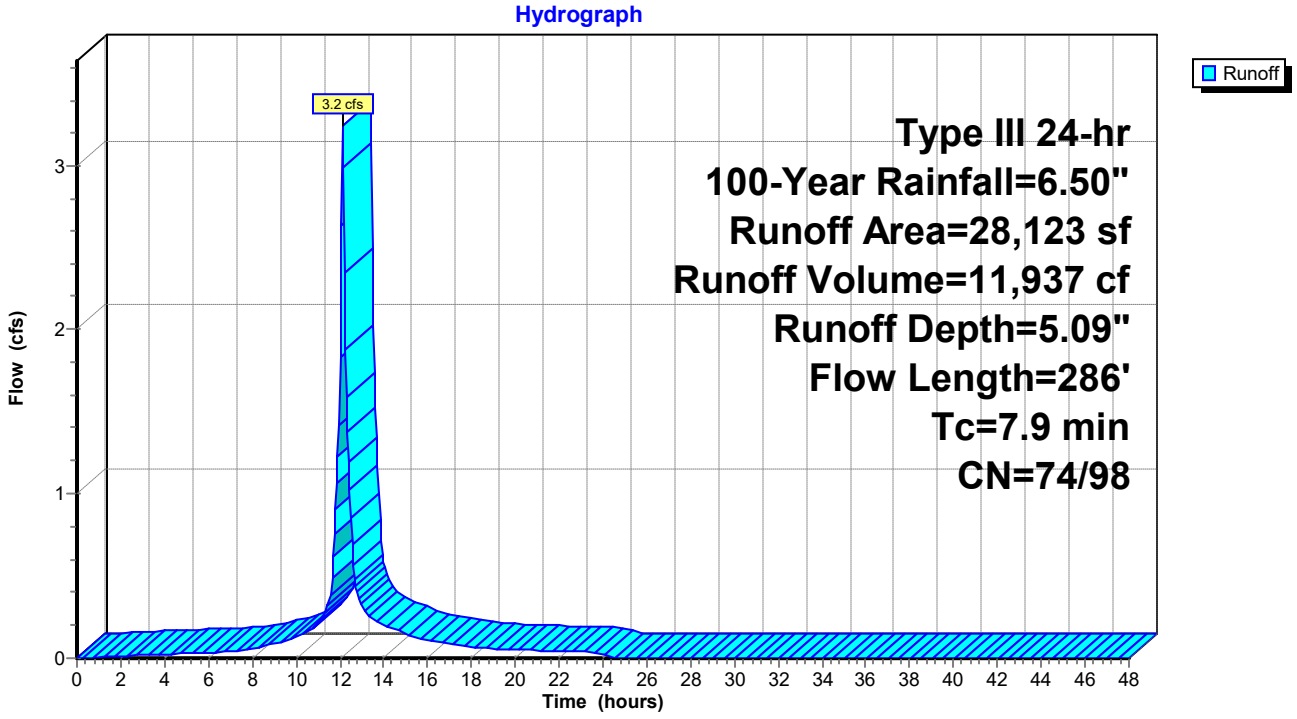
Runoff = 3.2 cfs @ 12.11 hrs, Volume= 11,937 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
12,387	74	>75% Grass cover, Good, HSG C
15,736	98	Paved parking, HSG C
28,123	87	Weighted Average
12,387	74	44.05% Pervious Area
15,736	98	55.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3F:



Summary for Subcatchment PS-3G:

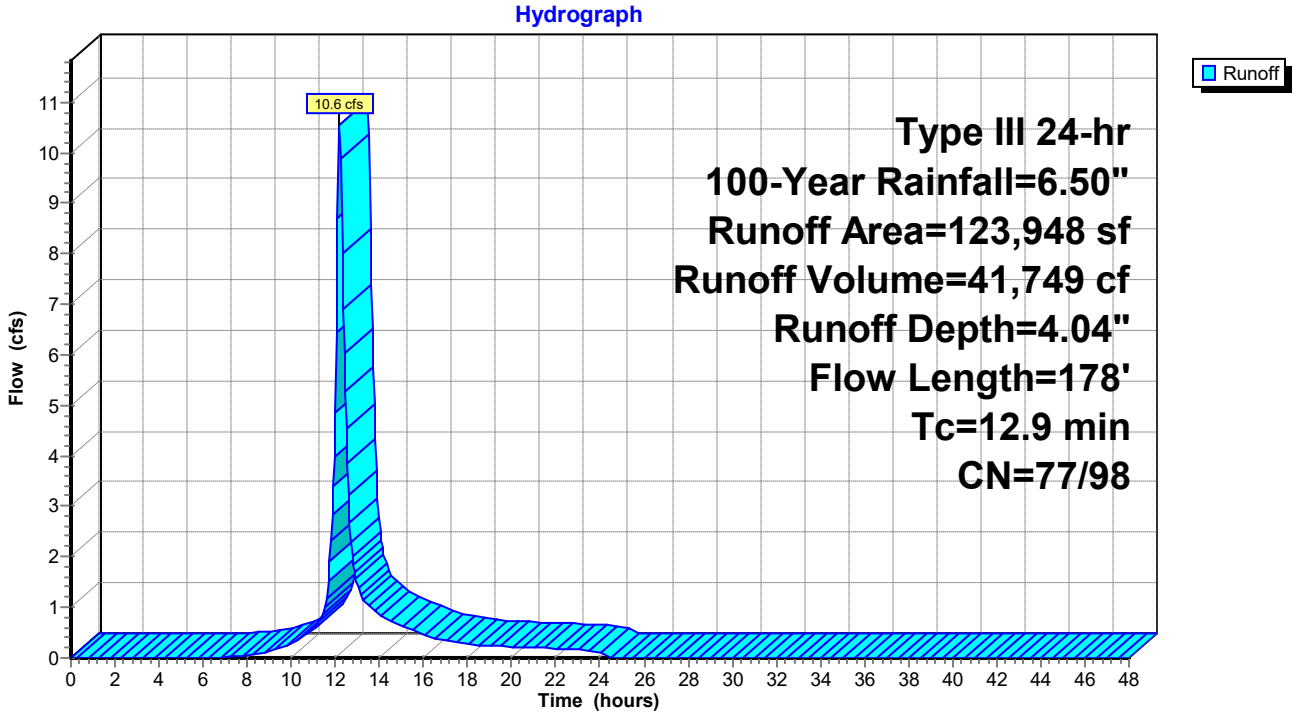
Runoff = 10.6 cfs @ 12.18 hrs, Volume= 41,749 cf, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 h
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
19,056	74	>75% Grass cover, Good, HSG C
57,013	80	>75% Grass cover, Good, HSG D
635	98	Roofs, HSG C
3,265	98	Roofs, HSG D
308	98	Water Surface, HSG A
2,286	98	Water Surface, HSG D
11,415	70	Woods, Good, HSG C
29,969	77	Woods, Good, HSG D
123,948	78	Weighted Average
117,454	77	94.76% Pervious Area
6,494	98	5.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	78	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.9	178	Total			

Subcatchment PS-3G:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 143,245 sf, 49.79% Impervious, Inflow Depth = 4.20" for 100-Year event
Inflow = 10.3 cfs @ 12.23 hrs, Volume= 50,192 cf
Outflow = 7.2 cfs @ 12.42 hrs, Volume= 44,415 cf, Atten= 31%, Lag= 11.5 min
Primary = 7.2 cfs @ 12.42 hrs, Volume= 44,415 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.38' @ 12.42 hrs Surf.Area= 9,267 sf Storage= 16,143 cf

Plug-Flow detention time= 148.6 min calculated for 44,369 cf (88% of inflow)
Center-of-Mass det. time= 93.2 min (877.6 - 784.4)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	4,856 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	37,851 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		43,321 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616
205.00	1,656	155.0	1,540	4,856	1,937

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482
205.00	10,613	498.0	9,983	37,851	12,038

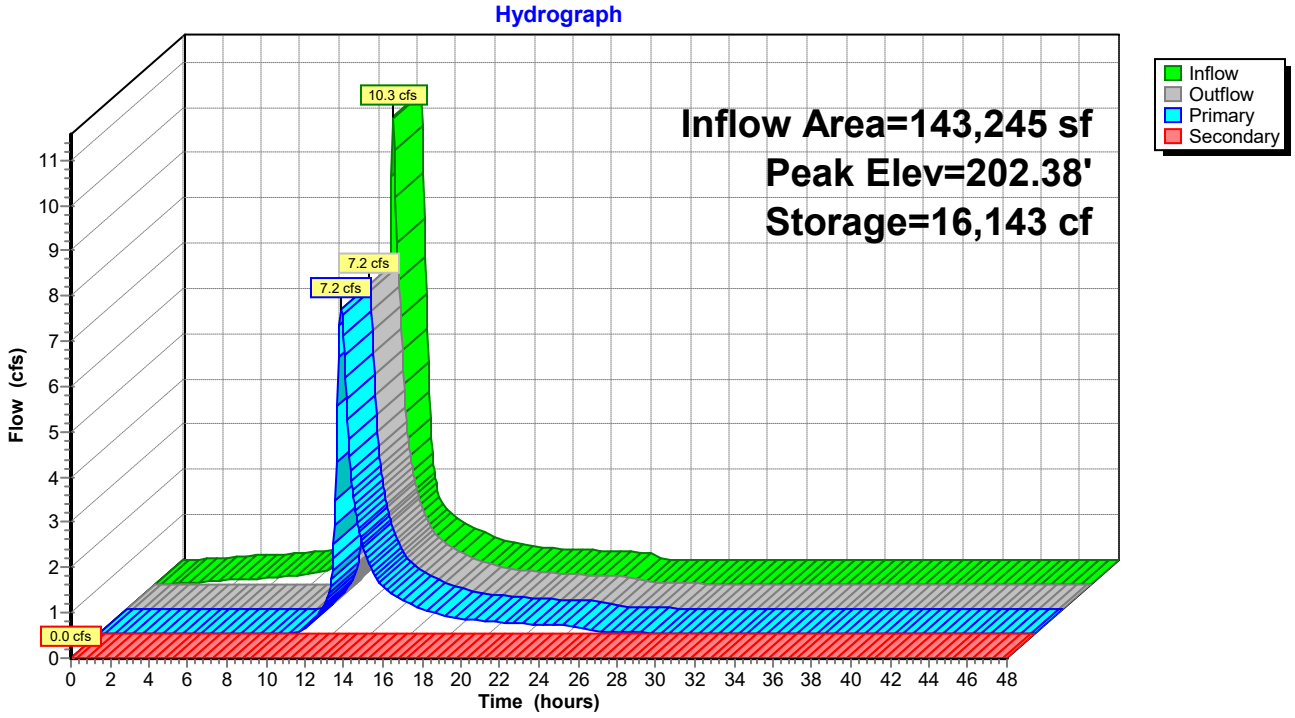
Device	Routing	Invert	Outlet Devices
#1	Primary	198.80'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.80' / 198.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	201.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 201.00 202.00 202.00 202.50 Width (feet) 1.00 1.00 3.50 3.50

#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.1 cfs @ 12.42 hrs HW=202.37' (Free Discharge)
└─**1=Culvert** (Passes 7.1 cfs of 8.0 cfs potential flow)
  └─**2=Custom Weir/Orifice** (Weir Controls 7.1 cfs @ 3.09 fps)
  └─**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #2

Inflow Area = 191,913 sf, 32.91% Impervious, Inflow Depth = 4.12" for 100-Year event
Inflow = 13.1 cfs @ 12.16 hrs, Volume= 65,862 cf
Outflow = 8.9 cfs @ 12.41 hrs, Volume= 62,966 cf, Atten= 32%, Lag= 15.1 min
Primary = 8.9 cfs @ 12.41 hrs, Volume= 62,966 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.29' @ 12.41 hrs Surf.Area= 9,226 sf Storage= 12,480 cf

Plug-Flow detention time= 74.8 min calculated for 62,900 cf (96% of inflow)
Center-of-Mass det. time= 49.9 min (852.5 - 802.6)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	663 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,708 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	180.50'	27,363 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		29,735 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	274	64.0	0	0	274
181.00	378	75.0	162	162	401
182.00	634	96.0	501	663	699

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	634	96.0	0	0	634
183.00	871	113.0	749	749	935
184.00	1,050	124.0	959	1,708	1,174

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,087	508.0	0	0	5,087
181.00	5,857	519.0	2,734	2,734	6,022
182.00	7,446	540.0	6,636	9,369	7,869
183.00	9,017	561.0	8,219	17,588	9,790
184.00	10,553	580.0	9,775	27,363	11,607

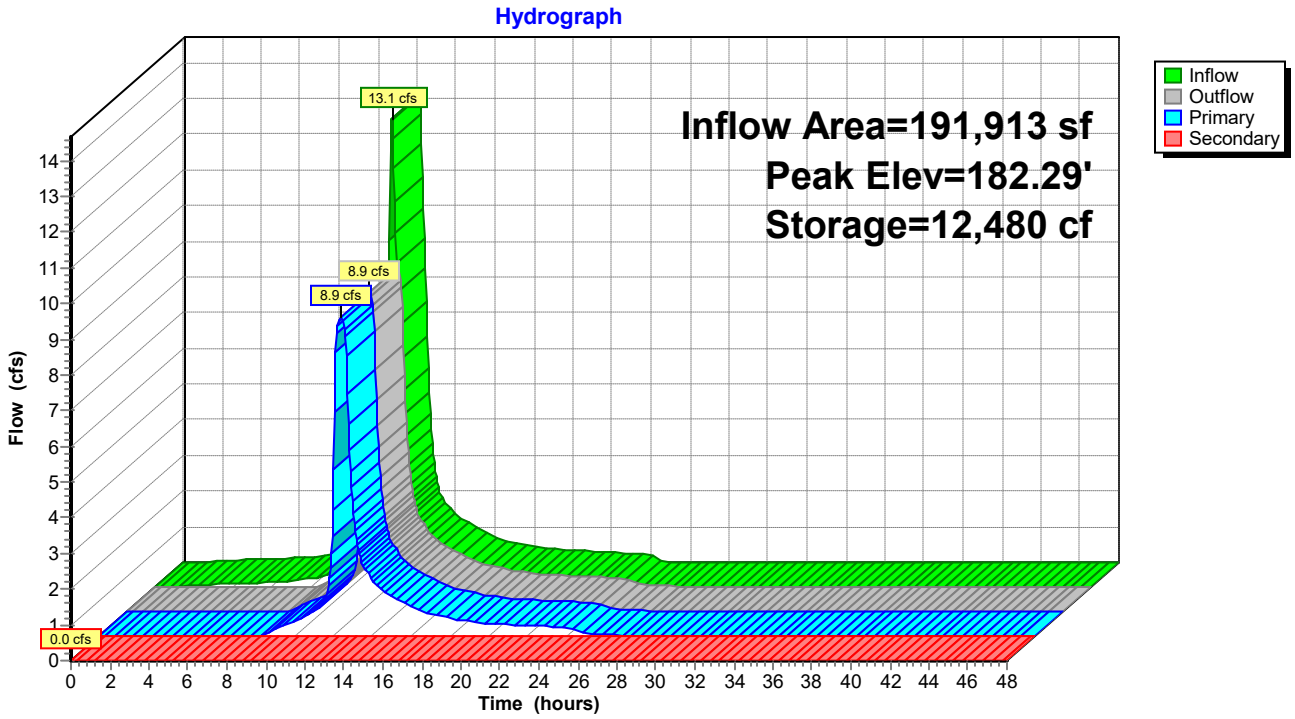
Device	Routing	Invert	Outlet Devices
#1	Primary	179.77'	**18.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 179.77' / 179.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.75 1.75 3.50 3.50
#3	Device 1	182.50'	**48.0" W x 48.0" H Vert. Rim** C= 0.600
#4	Secondary	183.00'	**10.0' long x 6.0' breadth Emergency Overflow**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.9 cfs @ 12.41 hrs HW=182.29' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.9 cfs @ 5.06 fps)
└**2=Custom Weir/Orifice** (Passes 8.9 cfs of 12.5 cfs potential flow)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #2



Summary for Pond 3P: Infiltration Basin #3

Inflow Area = 204,428 sf, 44.24% Impervious, Inflow Depth = 5.37" for 100-Year event
Inflow = 20.5 cfs @ 12.19 hrs, Volume= 91,515 cf
Outflow = 13.7 cfs @ 12.37 hrs, Volume= 86,271 cf, Atten= 33%, Lag= 10.6 min
Primary = 13.7 cfs @ 12.37 hrs, Volume= 86,271 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.92' @ 12.37 hrs Surf.Area= 14,691 sf Storage= 22,736 cf

Plug-Flow detention time= 89.4 min calculated for 86,181 cf (94% of inflow)
Center-of-Mass det. time= 57.9 min (836.7 - 778.8)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	1,157 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.25'	2,287 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,846 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,290 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	654	105.0	0	0	654
182.00	1,113	133.0	873	873	1,197
182.25	1,155	135.0	283	1,157	1,252

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.25	1,155	135.0	0	0	1,155
183.00	1,284	141.0	914	914	1,323
184.00	1,464	150.0	1,373	2,287	1,577

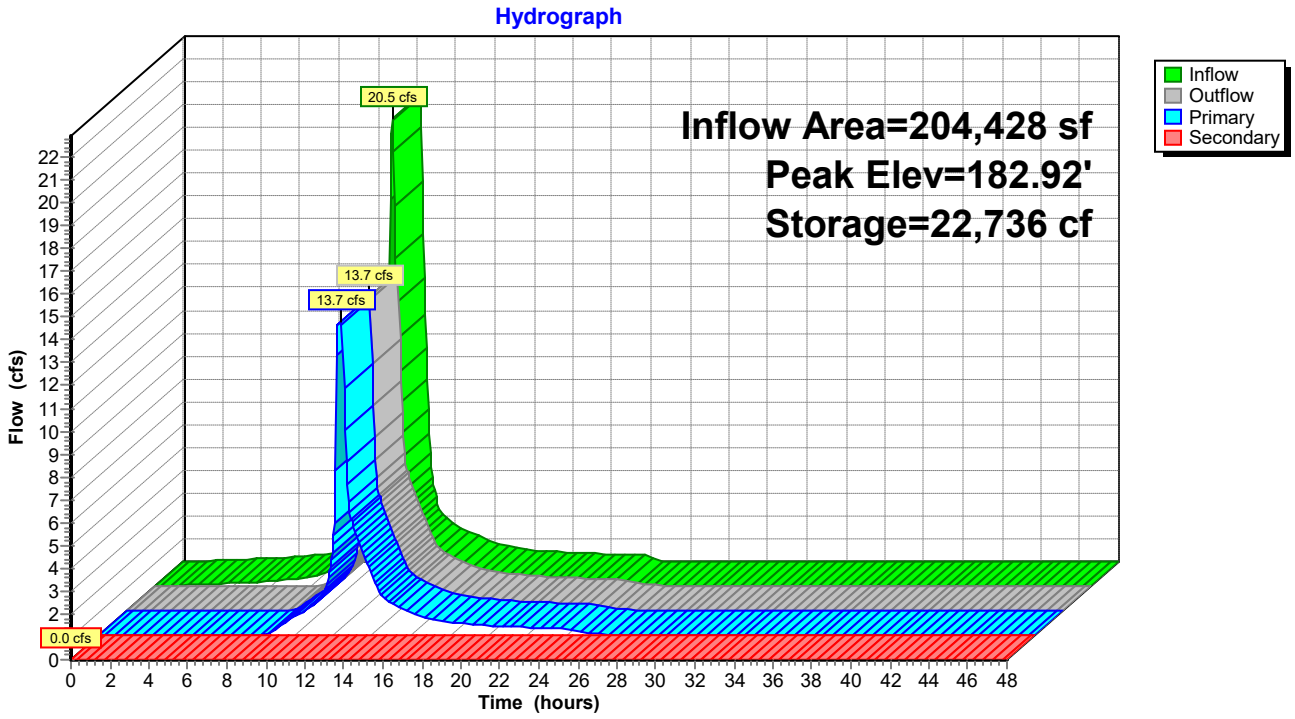
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,353	505.0	0	0	9,353
182.00	10,900	526.0	10,117	10,117	11,151
183.00	12,389	548.0	11,637	21,753	13,107
184.00	13,809	570.0	13,093	34,846	15,142

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 46.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0870 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=13.7 cfs @ 12.37 hrs HW=182.92' (Free Discharge)
└─**1=Culvert** (Inlet Controls 13.7 cfs @ 7.76 fps)
  └─**2=Orifice/Grate** (Passes < 6.3 cfs potential flow)
  └─**3=Rim** (Passes < 14.1 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└─**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 3P: Infiltration Basin #3



Summary for Pond 4P: Runoff Collection Area

Inflow Area = 80,244 sf, 0.09% Impervious, Inflow Depth = 3.31" for 100-Year event
Inflow = 5.5 cfs @ 12.20 hrs, Volume= 22,130 cf
Outflow = 4.0 cfs @ 12.35 hrs, Volume= 18,768 cf, Atten= 26%, Lag= 9.0 min
Primary = 4.0 cfs @ 12.35 hrs, Volume= 18,768 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.32' @ 12.35 hrs Surf.Area= 7,484 sf Storage= 5,731 cf

Plug-Flow detention time= 105.6 min calculated for 18,749 cf (85% of inflow)
Center-of-Mass det. time= 40.3 min (879.9 - 839.6)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

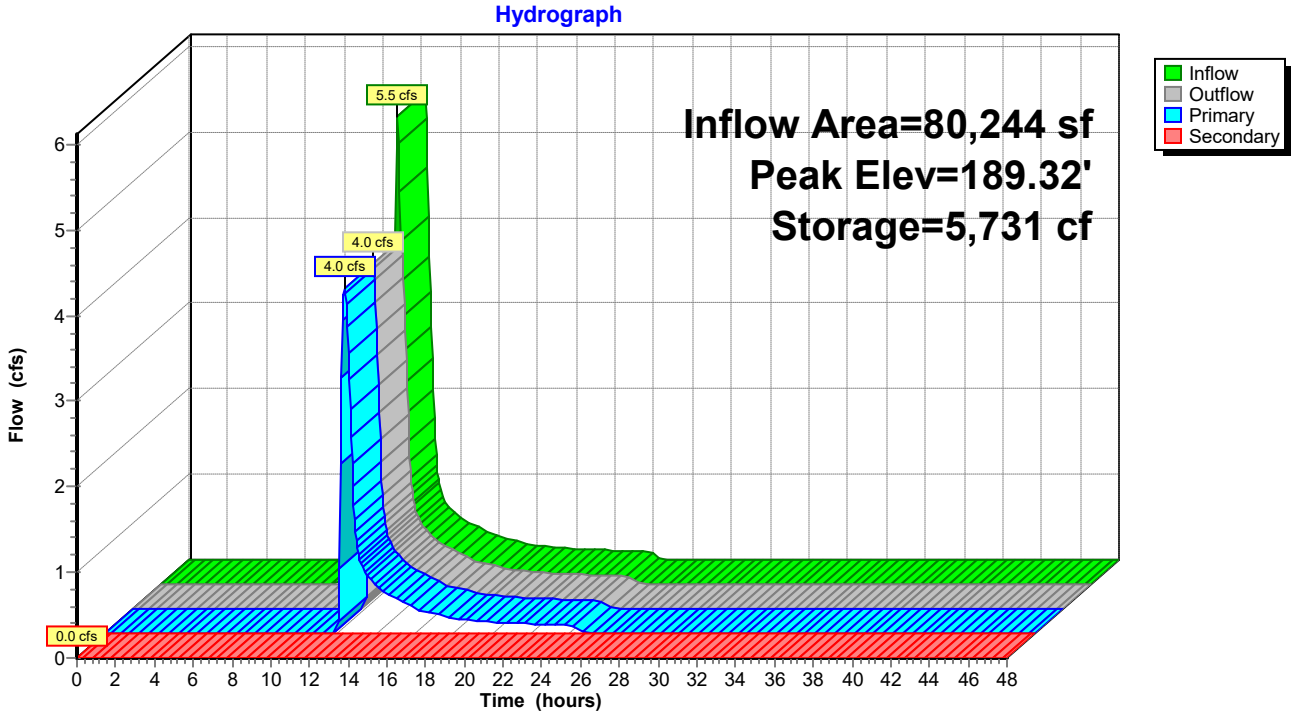
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.0' long x 8.0' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.0 cfs @ 12.35 hrs HW=189.32' (Free Discharge)
└**1=Culvert** (Passes 4.0 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 4.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 4P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 28,123 sf, 55.95% Impervious, Inflow Depth = 5.09" for 100-Year event
Inflow = 3.2 cfs @ 12.11 hrs, Volume= 11,937 cf
Outflow = 3.0 cfs @ 12.16 hrs, Volume= 9,565 cf, Atten= 9%, Lag= 2.8 min
Primary = 3.0 cfs @ 12.16 hrs, Volume= 9,565 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.75' @ 12.16 hrs Surf.Area= 3,061 sf Storage= 3,104 cf

Plug-Flow detention time= 145.5 min calculated for 9,555 cf (80% of inflow)
Center-of-Mass det. time= 68.0 min (839.1 - 771.1)

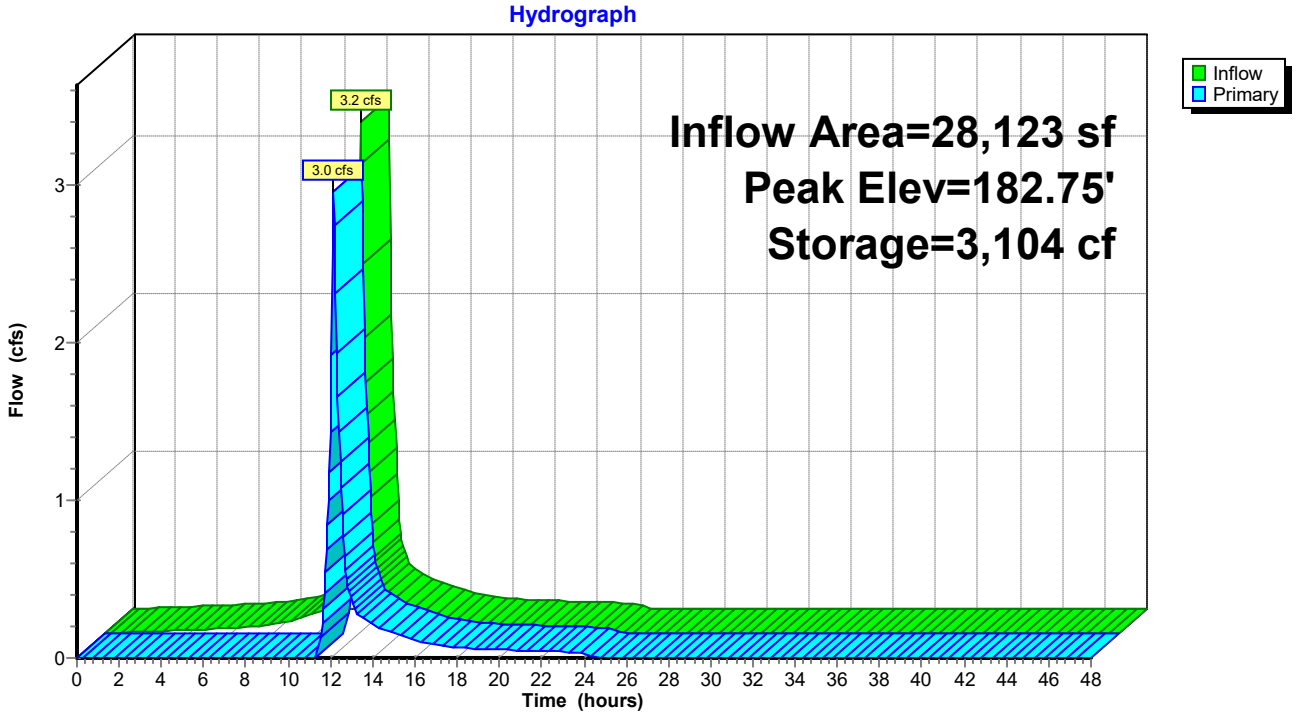
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.9 cfs @ 12.16 hrs HW=182.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.9 cfs @ 1.18 fps)

Pond 5P: Bioretention Basin



Summary for Pond 6P: Extended Dry Detention Basin

Inflow Area = 233,284 sf, 53.30% Impervious, Inflow Depth = 4.97" for 100-Year event
Inflow = 23.8 cfs @ 12.15 hrs, Volume= 96,560 cf
Outflow = 10.2 cfs @ 12.46 hrs, Volume= 96,560 cf, Atten= 57%, Lag= 18.3 min
Primary = 10.2 cfs @ 12.46 hrs, Volume= 96,560 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 179.67' @ 12.46 hrs Surf.Area= 15,105 sf Storage= 28,474 cf

Plug-Flow detention time= 50.1 min calculated for 96,560 cf (100% of inflow)
Center-of-Mass det. time= 49.6 min (831.1 - 781.5)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,064 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	3,125 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	176.50'	43,914 cf	**Detention Basin (Irregular)** Listed below (Recalc)
		48,104 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	869	123.0	0	0	869
179.00	1,272	145.0	1,064	1,064	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,272	145.0	0	0	1,272
180.00	1,595	160.0	1,430	1,430	1,667
181.00	1,797	168.0	1,695	3,125	1,932

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
176.50	610	97.0	0	0	610
177.00	3,576	224.0	944	944	3,855
178.00	10,251	418.0	6,627	7,571	13,772
179.00	11,539	439.0	10,889	18,460	15,266
180.00	12,753	461.0	12,141	30,601	16,905
181.00	13,882	484.0	13,314	43,914	18,698

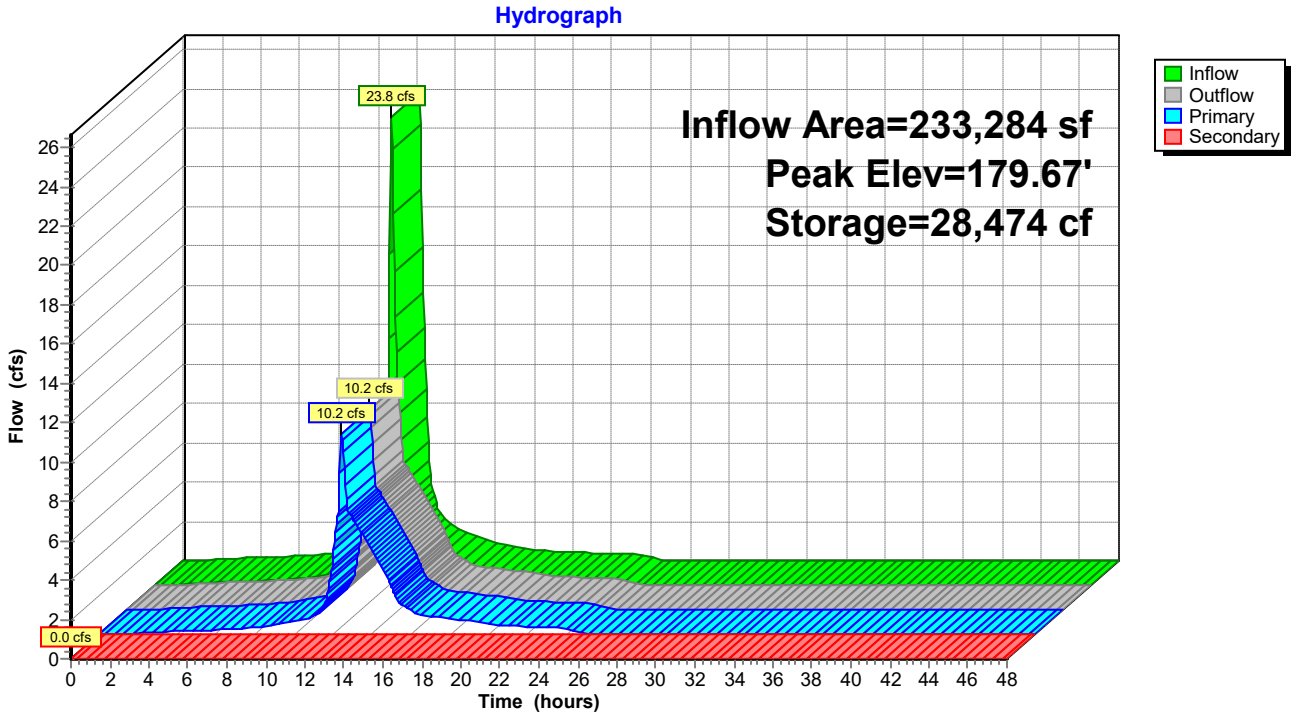
Device	Routing	Invert	Outlet Devices
#1	Primary	175.75'	**18.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 175.75' / 175.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	176.50'	**6.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	177.50'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	179.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#5	Secondary	180.00'	**10.0' long x 10.0' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.1 cfs @ 12.46 hrs HW=179.67' (Free Discharge)
└─**1=Culvert** (Passes 10.1 cfs of 12.0 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 1.9 cfs @ 8.20 fps)
  └─**3=Orifice/Grate** (Orifice Controls 4.5 cfs @ 6.81 fps)
  └─**4=Rim** (Weir Controls 3.7 cfs @ 1.35 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=176.50' (Free Discharge)
└─**5=Emergency Overflow** (Controls 0.0 cfs)

Pond 6P: Extended Dry Detention Basin

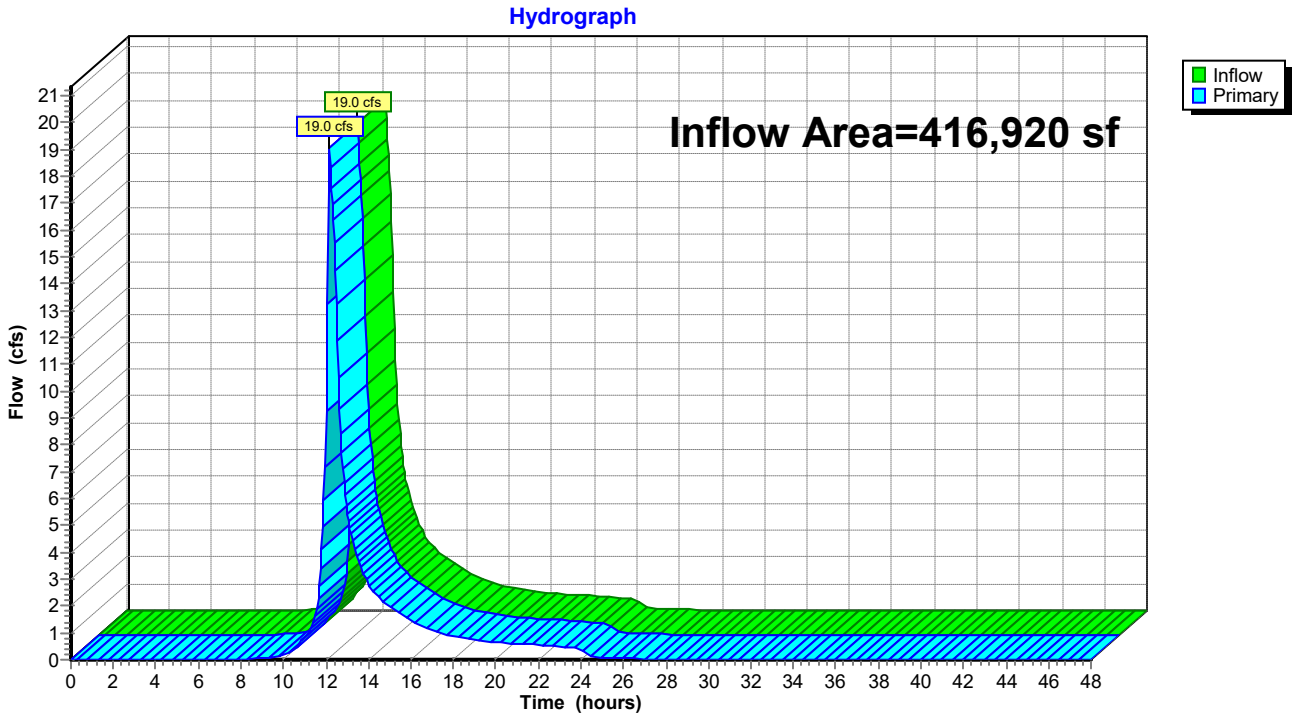


Summary for Link DP-1: Offsite to North

Inflow Area = 416,920 sf, 18.05% Impervious, Inflow Depth = 3.05" for 100-Year event
Inflow = 19.0 cfs @ 12.16 hrs, Volume= 106,077 cf
Primary = 19.0 cfs @ 12.16 hrs, Volume= 106,077 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

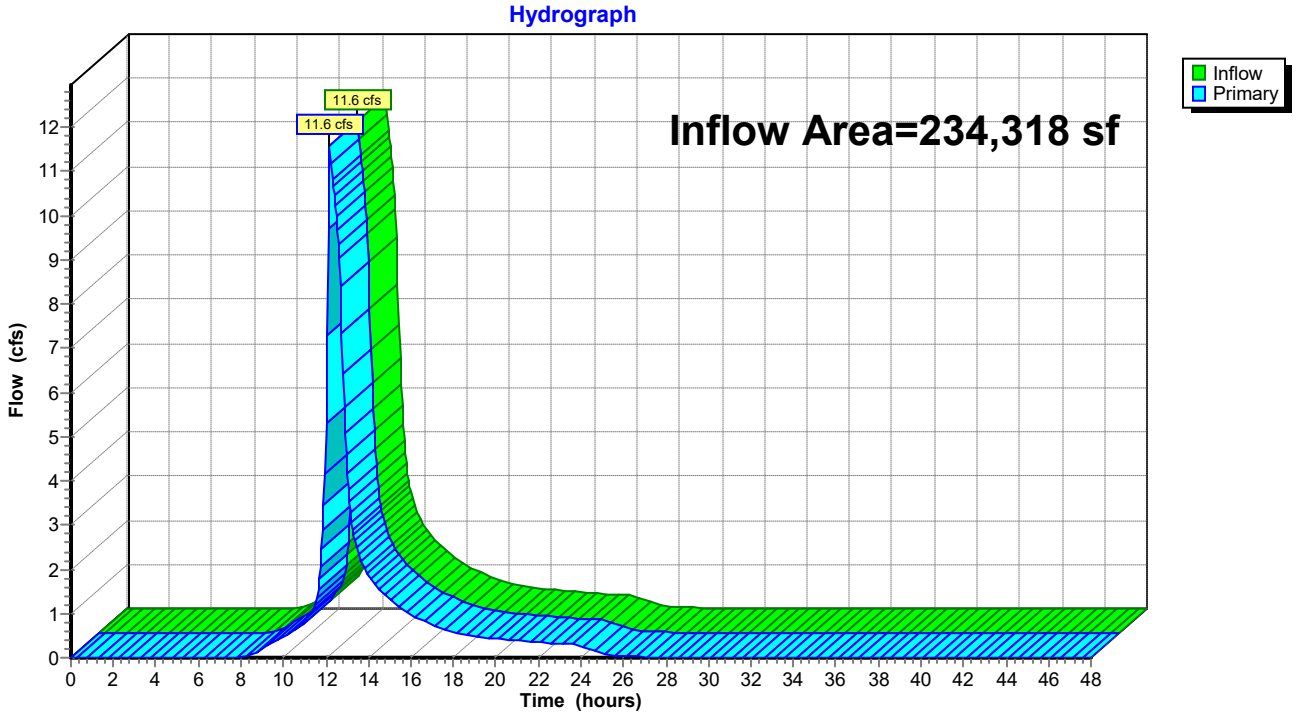


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 234,318 sf, 27.32% Impervious, Inflow Depth = 3.85" for 100-Year event
Inflow = 11.6 cfs @ 12.17 hrs, Volume= 75,205 cf
Primary = 11.6 cfs @ 12.17 hrs, Volume= 75,205 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

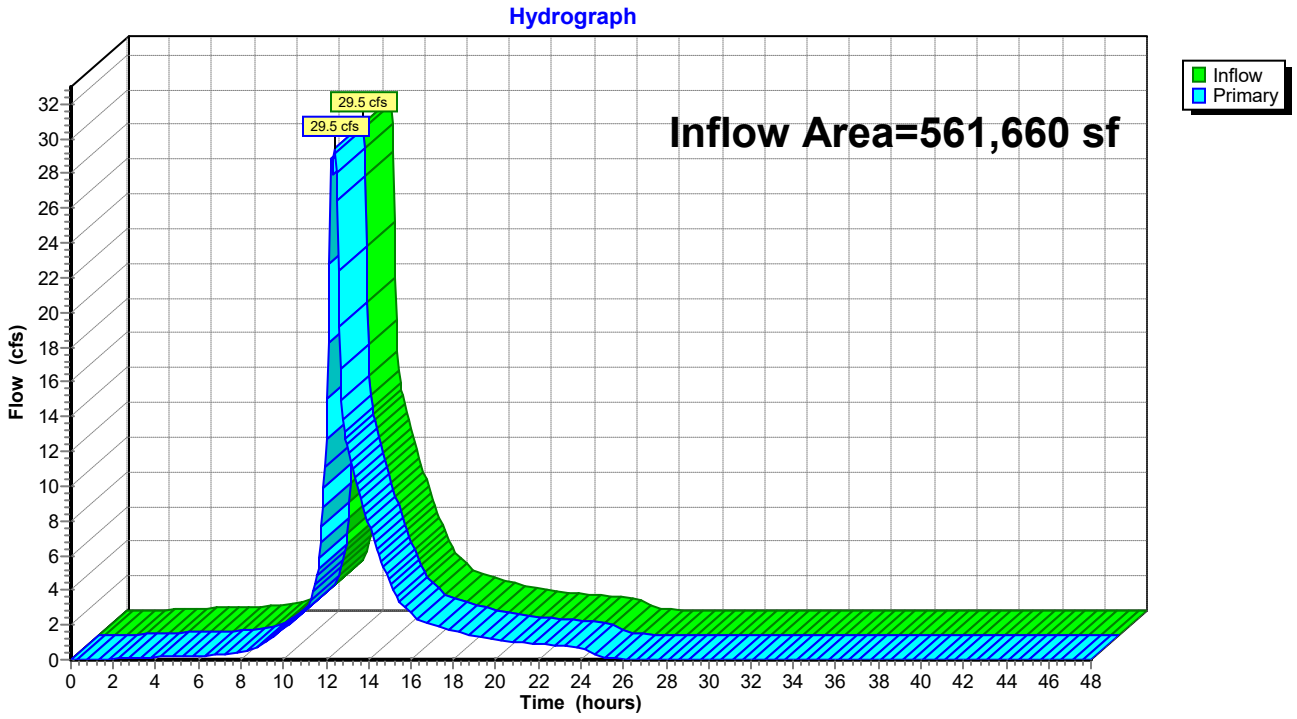


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 561,660 sf, 39.40% Impervious, Inflow Depth = 4.80" for 100-Year event
Inflow = 29.5 cfs @ 12.41 hrs, Volume= 224,580 cf
Primary = 29.5 cfs @ 12.41 hrs, Volume= 224,580 cf, Atten= 0%, Lag= 0.0 min

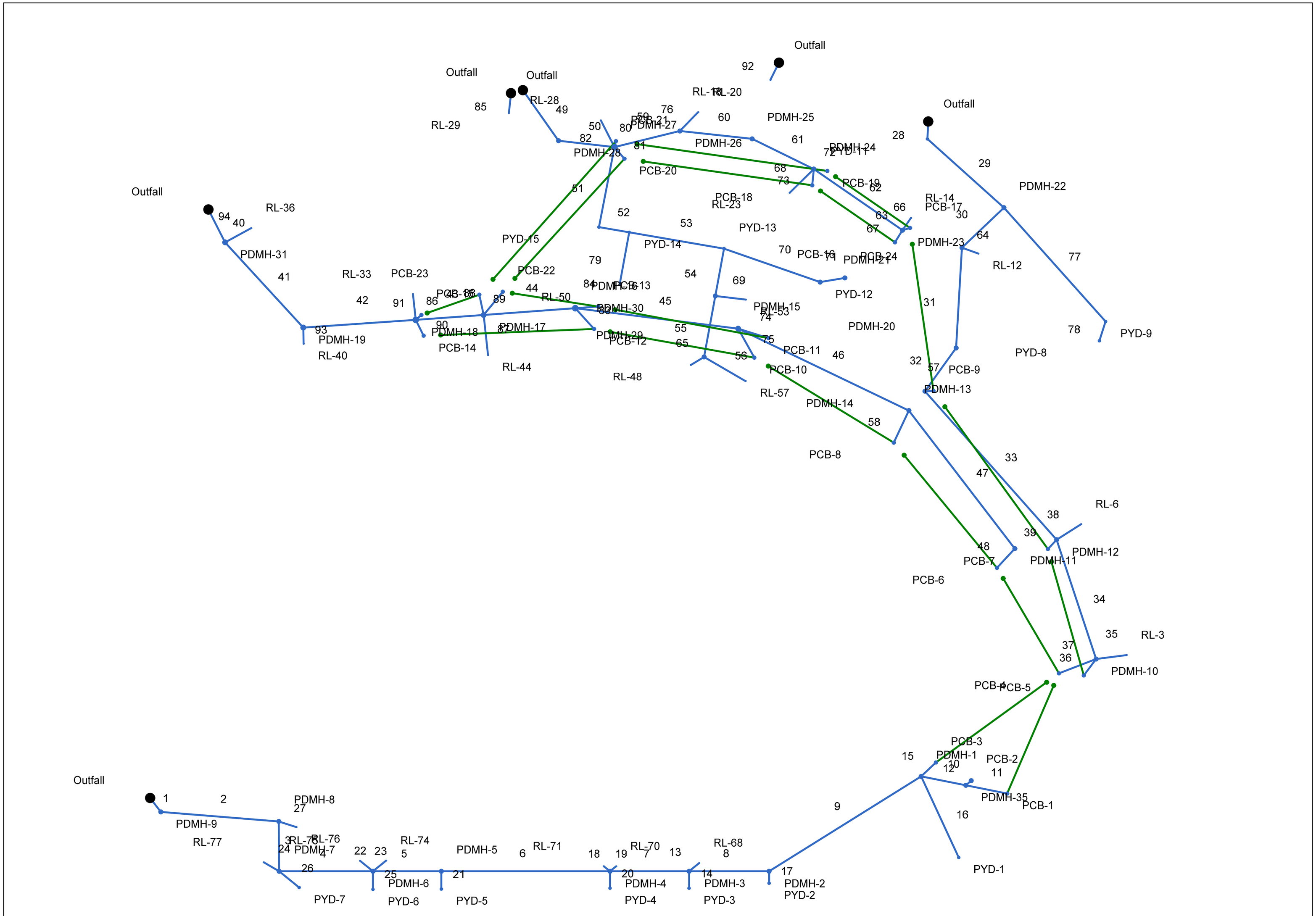
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Appendix D: Hydraulic Analysis

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 090506 - STORM.stm	Number of lines: 94	Date: 3/10/2021

Storm Sewers v2020.00

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	26.131	0.00	0.00	0.00	0.00	0.00	0.0	7.9	0.0	11.13	17.14	4.91	24	0.57	200.60	200.75	202.20	201.95	202.84	206.20	Pipe - (29)
2	1	152.961	0.00	0.00	0.00	0.00	0.00	0.0	7.2	0.0	11.13	16.86	5.68	24	0.56	200.75	201.60	201.95	202.80	206.20	206.20	Pipe - (16)
3	2	79.349	0.00	0.00	0.00	0.00	0.00	0.0	6.8	0.0	10.57	17.03	5.48	24	0.57	201.60	202.05	202.80	203.21	206.20	212.40	Pipe - (14)
4	3	121.010	0.00	0.00	0.00	0.00	0.00	0.0	6.4	0.0	9.32	7.70	5.27	18	0.54	202.55	203.20	204.05	205.00	212.40	212.00	Pipe - (12)
5	4	88.249	0.00	0.00	0.00	0.00	0.00	0.0	6.1	0.0	8.08	7.50	4.57	18	0.51	203.20	203.65	205.44	205.96	212.00	211.19	Pipe - (9)
6	5	217.563	0.00	0.00	0.00	0.00	0.00	0.0	5.2	0.0	7.24	7.63	4.10	18	0.53	203.65	204.80	206.28	207.32	211.19	212.34	Pipe - (7)
7	6	102.000	0.00	0.00	0.00	0.00	0.00	0.0	4.7	0.0	5.82	7.71	3.29	18	0.54	204.80	205.35	207.58	207.89	212.34	212.39	Pipe - (4)
8	7	103.250	0.00	0.00	0.00	0.00	0.00	0.0	4.1	0.0	5.19	7.66	2.94	18	0.53	205.35	205.90	208.06	208.31	212.39	211.70	Pipe - (3)
9	8	247.509	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	4.68	4.59	3.81	15	0.51	206.15	207.40	208.45	209.75	211.70	212.08	Pipe - (31)
10	9	59.382	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	2.76	3.58	3.51	12	1.01	207.75	208.35	209.97	210.33	212.08	212.29	Pipe - (35)
11	10	54.875	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.78	5.69	1.09	12	2.55	208.35	209.75	210.50	210.52	212.29	216.34	Pipe - (173)
12	10	10.173	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.98	5.58	2.52	12	2.46	208.35	208.60	210.50	210.53	212.29	211.85	Pipe - (34)
13	7	18.385	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.55	2.68	8	0.98	207.85	208.03	208.06	208.27	212.39	208.76	Pipe - (53)
14	7	26.976	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.35	5.53	2.63	12	2.41	207.85	208.50	208.06	208.74	212.39	211.50	Pipe - (2)
15	9	29.278	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.33	3.29	1.69	12	0.85	207.75	208.00	209.97	210.02	212.08	211.53	Pipe - (36)
16	9	137.892	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.59	3.52	0.77	12	0.98	207.75	209.10	209.97	210.01	212.08	210.70	Pipe - (30)
17	8	19.019	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.51	5.77	1.69	12	2.63	207.65	208.15	208.45	208.45	211.70	211.50	Pipe - (10)
18	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.55	2.89	8	0.97	207.55	207.66	207.74	207.90	212.34	208.39	Pipe - (55)
19	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.55	2.22	8	0.97	207.30	207.41	207.58	207.65	212.34	208.40	Pipe - (57)
20	6	27.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.86	4.85	3.85	12	1.85	207.30	207.80	207.59	208.19	212.34	210.00	Pipe - (5)
21	5	28.267	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.84	3.67	3.41	12	1.06	206.50	206.80	206.83	207.18	211.19	208.90	Pipe - (6)
22	4	23.983	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.57	2.91	8	1.00	206.20	206.44	206.39	206.68	212.00	207.17	Pipe - (59)

Project File: 090506 - STORM.stm | Number of lines: 94 | Run Date: 3/12/2021

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	4	23.705	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.58	2.91	8	1.01	206.20	206.44	206.39	206.68	212.00	207.16	Pipe - (61)
24	3	24.388	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.56	3.55	8	0.98	206.05	206.29	206.33	206.64	212.40	207.02	Pipe - (33)
25	4	28.781	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.68	5.14	0.87	12	2.08	203.70	204.30	205.44	205.45	212.00	210.34	Pipe - (8)
26	3	36.459	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.69	5.11	3.70	12	2.06	203.05	203.80	203.30	204.15	212.40	209.50	Pipe - (11)
27	2	24.389	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.56	3.55	8	0.98	202.85	203.09	203.13	203.44	206.20	203.82	Pipe - (172)
28	End	27.761	0.00	0.00	0.00	0.00	0.00	0.0	3.6	0.0	17.87	16.63	6.09	24	0.54	180.50	180.65	182.26	182.42	182.22	183.12	Pipe - (24)
29	28	147.352	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	16.93	16.14	5.39	24	0.51	180.65	181.40	183.06	183.88	183.12	184.05	Pipe - (23)
30	29	83.641	0.00	0.00	0.00	0.00	0.00	0.0	2.9	0.0	8.39	25.03	5.34	18	5.68	181.90	186.65	184.33	187.77	184.05	192.10	Pipe - (28)
31	30	159.758	0.00	0.00	0.00	0.00	0.00	0.0	2.4	0.0	7.83	7.91	6.79	15	1.50	186.65	189.05	187.77	190.16	192.10	193.76	Pipe - (20)
32	31	79.759	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	7.83	6.47	6.38	15	1.00	189.30	190.10	190.55	191.72	193.76	194.70	Pipe - (42)
33	32	291.029	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	5.10	5.18	6.49	12	2.11	190.35	196.50	192.36	198.33	194.70	200.61	Pipe - (41)
34	33	196.653	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	2.83	4.65	4.14	12	1.70	196.50	199.85	198.98	200.57	200.61	204.67	Pipe - (21)
35	34	40.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	2.57	8	1.00	200.10	200.50	200.57	200.85	204.67	201.23	Pipe - (44)
36	34	30.577	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	4.78	2.01	12	1.80	199.85	200.40	200.57	200.75	204.67	205.10	Pipe - (38)
37	34	53.041	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.57	4.77	3.15	12	1.79	199.85	200.80	200.57	201.33	204.67	204.01	Pipe - (37)
38	33	39.973	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.60	8	1.00	196.75	197.15	198.98	199.03	200.61	197.88	Pipe - (47)
39	33	18.683	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.71	4.87	2.18	12	1.87	196.50	196.85	198.98	199.03	200.61	200.35	Pipe - (39)
40	End	56.539	0.00	0.00	0.00	0.00	0.00	0.0	6.9	0.0	22.62	34.96	5.98	30	0.62	178.40	178.75	180.46	180.37	181.20	184.90	Pipe - (76)
41	40	169.007	0.00	0.00	0.00	0.00	0.00	0.0	6.3	0.0	22.34	34.18	6.68	30	0.59	178.75	179.75	180.37	181.36	184.90	186.82	Pipe - (75)
42	41	145.575	0.00	0.00	0.00	0.00	0.00	0.0	5.8	0.0	21.78	31.89	6.58	30	0.52	179.75	180.50	181.36	182.09	186.82	186.05	Pipe - (19)
43	42	88.000	0.00	0.00	0.00	0.00	0.00	0.0	5.3	0.0	15.85	29.33	5.36	30	0.51	180.50	180.95	182.09	182.29	186.05	186.50	Pipe - (74)
44	43	118.680	0.00	0.00	0.00	0.00	0.00	0.0	4.7	0.0	11.13	16.08	5.52	24	0.51	181.45	182.05	182.67	183.27	186.50	187.44	Pipe - (73)

Project File: 090506 - STORM.stm | Number of lines: 94 | Run Date: 3/12/2021

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	212.630	0.00	0.00	0.00	0.00	0.00	0.0	3.9	0.0	7.78	9.39	5.55	18	0.80	182.55	184.25	183.69	185.33	187.44	189.99	Pipe - (70)
46	45	255.973	0.00	0.00	0.00	0.00	0.00	0.0	2.7	0.0	4.15	9.34	4.82	15	2.09	184.50	189.85	185.33	190.67	189.99	195.70	Pipe - (67)
47	46	258.794	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	1.45	4.77	3.36	12	1.80	190.10	194.75	190.67	195.26	195.70	200.15	Pipe - (64)
48	47	38.328	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.45	4.07	4.17	12	1.30	195.50	196.00	195.91	196.51	200.15	199.59	Pipe - (62)
49	End	92.741	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	20.84	17.42	6.79	24	0.59	181.60	182.15	183.42	184.22	183.84	187.14	Pipe - (94)
50	49	72.907	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	20.84	17.77	6.63	24	0.62	182.15	182.60	184.78	185.40	187.14	187.63	Pipe - (93)
51	50	129.006	0.00	0.00	0.00	0.00	0.00	0.0	2.1	0.0	10.01	16.05	3.19	24	0.50	182.60	183.25	186.09	186.34	187.63	187.00	Pipe - (119)
52	51	39.947	0.00	0.00	0.00	0.00	0.00	0.0	1.9	0.0	7.45	16.00	2.37	24	0.50	183.25	183.45	186.58	186.62	187.00	187.66	Pipe - (139)
53	52	125.053	0.00	0.00	0.00	0.00	0.00	0.0	1.3	0.0	6.89	7.57	3.90	18	0.52	183.95	184.60	186.71	187.25	187.66	187.07	Pipe - (118)
54	53	76.165	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	2.51	4.18	3.20	12	1.38	185.10	186.15	187.67	188.05	187.07	190.10	Pipe - (121)
55	54	98.169	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	1.95	2.54	2.48	12	0.51	186.15	186.65	188.21	188.50	190.10	190.59	Pipe - (120)
56	55	65.767	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.39	1.57	3.98	8	1.00	186.90	187.56	188.59	189.10	190.59	188.28	Pipe - (146)
57	32	10.990	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.73	4.30	3.48	12	1.46	190.35	190.51	192.36	192.42	194.70	194.49	Pipe - (40)
58	46	54.662	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	3.47	4.73	12	0.95	190.25	190.77	190.91	191.47	195.70	194.77	Pipe - (63)
59	50	88.173	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	6.35	6.52	5.17	15	1.02	183.35	184.25	186.09	186.94	187.63	188.52	Pipe - (90)
60	59	93.996	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	5.79	6.49	4.72	15	1.01	184.25	185.20	187.20	187.96	188.52	189.39	Pipe - (89)
61	60	92.960	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	5.79	6.53	4.72	15	1.02	185.20	186.15	188.11	188.86	189.39	190.34	Pipe - (88)
62	61	150.261	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	3.36	3.56	4.28	12	1.00	186.40	187.90	189.21	190.55	190.34	191.92	Pipe - (85)
63	62	22.420	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.56	1.60	8	0.98	188.40	188.62	190.83	190.86	191.92	189.35	Pipe - (98)
64	30	22.972	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.70	8	1.00	187.00	187.23	187.77	187.79	192.10	187.96	Pipe - (51)
65	55	21.259	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.56	1.60	8	0.99	186.90	187.11	188.59	188.61	190.59	187.84	Pipe - (150)
66	62	10.286	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.94	6.08	2.47	12	2.92	187.90	188.20	190.83	190.86	191.92	191.67	Pipe - (84)

Project File: 090506 - STORM.stm | Number of lines: 94 | Run Date: 3/12/2021

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
67	62	21.598	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.86	4.20	1.10	12	1.39	187.90	188.20	190.83	190.84	191.92	191.67	Pipe - (83)
68	61	49.081	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.60	8	1.00	186.75	187.24	189.21	189.27	190.34	187.97	Pipe - (102)
69	54	39.610	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.58	1.60	8	1.01	186.50	186.90	188.21	188.26	190.10	187.62	Pipe - (135)
70	53	134.880	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	2.30	3.50	2.93	12	0.96	185.10	186.40	187.67	188.23	187.07	189.90	Pipe - (117)
71	70	32.629	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.11	3.69	1.41	12	1.07	186.40	186.75	188.36	188.39	189.90	190.80	Pipe - (116)
72	61	17.681	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.99	4.64	1.26	12	1.70	186.40	186.70	189.21	189.22	190.34	190.27	Pipe - (87)
73	61	26.018	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.88	3.82	1.12	12	1.15	186.40	186.70	189.21	189.22	190.34	190.27	Pipe - (86)
74	45	41.889	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.60	4.53	12	1.67	186.05	186.75	186.46	187.29	189.99	190.35	Pipe - (66)
75	45	50.638	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.03	4.61	4.87	12	1.68	186.00	186.85	186.46	187.46	189.99	190.35	Pipe - (65)
76	59	38.124	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.60	8	1.00	185.00	185.38	187.20	187.25	188.52	186.11	Pipe - (109)
77	29	223.565	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	8.54	3.84	10.87	12	1.16	182.40	185.00	184.33	197.19	184.05	190.44	Pipe - (22)
78	77	31.710	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.27	0.00	5.44	12	0.00	185.60	185.60	199.41	199.87	190.44	189.00	Pipe - (77)
79	52	84.722	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.60	8	1.00	184.70	185.55	186.71	186.81	187.66	186.27	Pipe - (137)
80	50	46.004	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.57	0.80	8	1.00	184.00	184.46	186.09	186.10	187.63	185.19	Pipe - (112)
81	50	22.554	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.01	4.11	2.56	12	1.33	183.60	183.90	186.09	186.16	187.63	187.52	Pipe - (92)
82	50	9.543	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.19	6.31	2.79	12	3.14	183.60	183.90	186.09	186.12	187.63	187.52	Pipe - (91)
83	44	41.008	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.12	4.32	12	1.34	183.30	183.85	183.73	184.39	187.44	187.66	Pipe - (68)
84	44	29.764	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.75	4.84	4.76	12	1.85	183.30	183.85	183.72	184.41	187.44	187.66	Pipe - (69)
85	End	32.131	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.11	1.57	3.70	8	1.00	181.00	181.32	181.58	181.82	181.77	182.05	Pipe - (127)
86	42	41.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.14	1.57	2.38	8	1.00	182.25	182.66	182.38	182.83	186.05	183.39	Pipe - (166)
87	43	64.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	3.40	8	1.00	182.00	182.64	182.29	182.99	186.50	183.37	Pipe - (152)
88	43	44.534	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.77	3.96	4.38	12	1.24	182.45	183.00	182.92	183.57	186.50	185.92	Pipe - (114)

Project File: 090506 - STORM.stm | Number of lines: 94 | Run Date: 3/12/2021

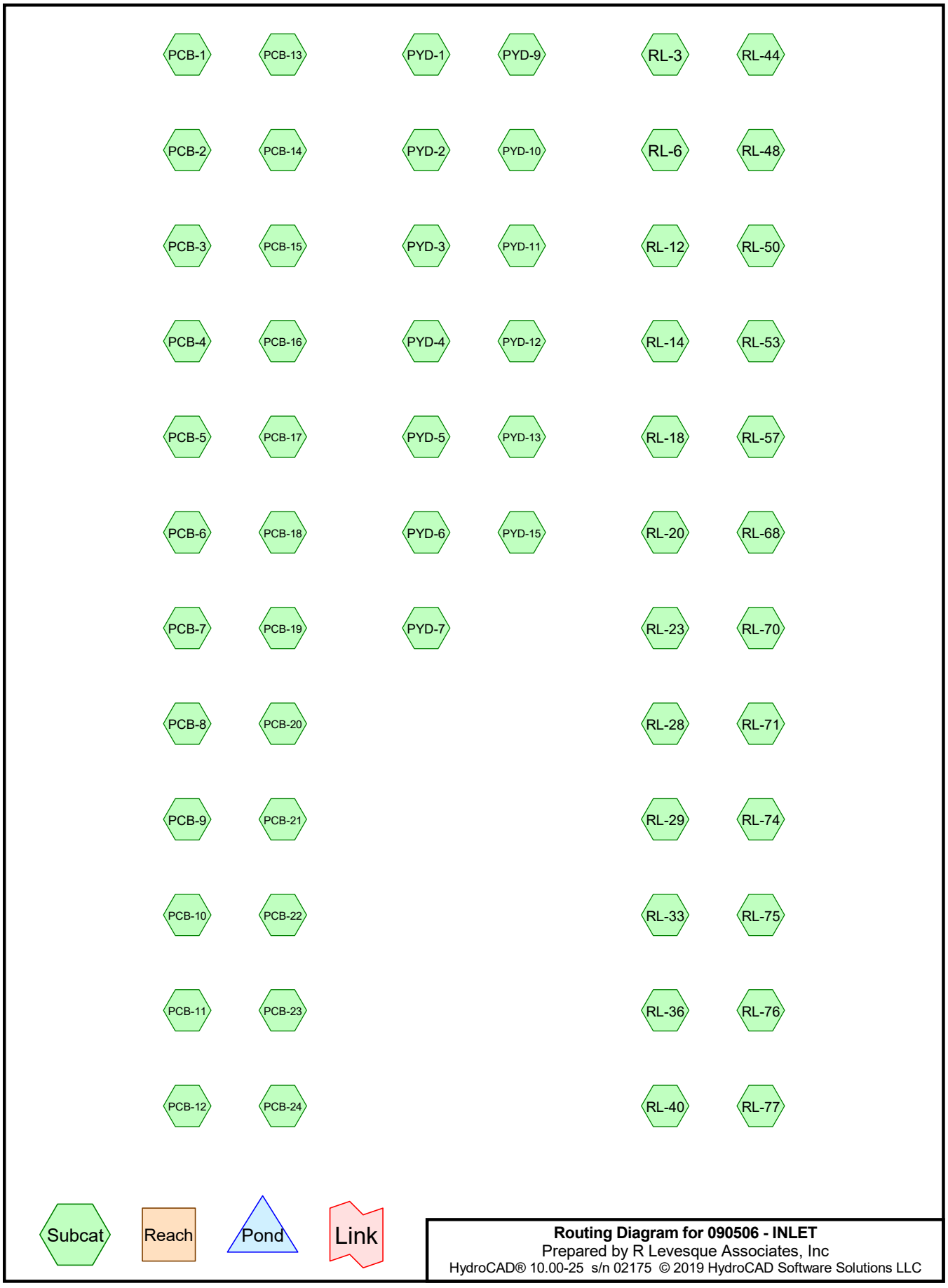
NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
89	43	32.849	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.39	4.61	5.13	12	1.67	182.45	183.00	182.96	183.66	186.50	185.90	Pipe - (115)
90	42	27.203	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.11	4.32	5.44	12	1.47	182.00	182.40	182.63	183.16	186.05	185.34	Pipe - (71)
91	42	10.630	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.68	6.91	6.39	12	3.76	182.00	182.40	182.43	183.10	186.05	185.38	Pipe - (72)
92	End	29.543	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.58	2.48	8	1.02	181.00	181.30	181.51	181.65	181.77	182.02	Pipe - (80) (1)
93	41	25.870	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	1.57	1.63	8	1.01	180.50	180.76	181.36	181.38	186.82	181.48	Pipe - (159)
94	40	40.664	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.28	1.58	2.91	8	1.01	180.50	180.91	180.69	181.15	184.90	181.63	Pipe - (156)

Project File: 090506 - STORM.stm | Number of lines: 94 | Run Date: 3/12/2021

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box



Routing Diagram for 090506 - INLET
Prepared by R Levesque Associates, Inc
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PCB-1: Runoff Area=7,315 sf 69.56% Impervious Runoff Depth=4.71"
Tc=6.0 min CN=47/98 Runoff=0.78 cfs 2,871 cf

Subcatchment PCB-10: Runoff Area=16,291 sf 57.05% Impervious Runoff Depth=5.21"
Tc=6.0 min CN=76/98 Runoff=2.03 cfs 7,074 cf

Subcatchment PCB-11: Runoff Area=12,437 sf 56.84% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=80/98 Runoff=1.60 cfs 5,583 cf

Subcatchment PCB-12: Runoff Area=12,509 sf 54.49% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=80/98 Runoff=1.60 cfs 5,566 cf

Subcatchment PCB-13: Runoff Area=13,726 sf 59.18% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=78/98 Runoff=1.75 cfs 6,117 cf

Subcatchment PCB-14: Runoff Area=29,294 sf 52.26% Impervious Runoff Depth=5.00"
Tc=10.0 min CN=74/98 Runoff=3.11 cfs 12,195 cf

Subcatchment PCB-15: Runoff Area=24,788 sf 54.09% Impervious Runoff Depth=5.09"
Tc=10.0 min CN=75/98 Runoff=2.68 cfs 10,516 cf

Subcatchment PCB-16: Runoff Area=6,223 sf 85.69% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=78/98 Runoff=0.86 cfs 3,081 cf

Subcatchment PCB-17: Runoff Area=14,974 sf 65.77% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=77/98 Runoff=1.94 cfs 6,813 cf

Subcatchment PCB-18: Runoff Area=6,674 sf 64.23% Impervious Runoff Depth=5.54"
Tc=6.0 min CN=80/98 Runoff=0.88 cfs 3,079 cf

Subcatchment PCB-19: Runoff Area=7,584 sf 62.59% Impervious Runoff Depth=5.50"
Tc=6.0 min CN=80/98 Runoff=0.99 cfs 3,478 cf

Subcatchment PCB-2: Runoff Area=16,959 sf 68.54% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=61/98 Runoff=1.98 cfs 7,108 cf

Subcatchment PCB-20: Runoff Area=15,640 sf 55.98% Impervious Runoff Depth=5.37"
Tc=6.0 min CN=80/98 Runoff=2.01 cfs 6,998 cf

Subcatchment PCB-21: Runoff Area=17,106 sf 53.90% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=80/98 Runoff=2.19 cfs 7,594 cf

Subcatchment PCB-22: Runoff Area=13,942 sf 62.41% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=76/98 Runoff=1.77 cfs 6,206 cf

Subcatchment PCB-23: Runoff Area=18,027 sf 67.18% Impervious Runoff Depth=5.60"
Tc=6.0 min CN=80/98 Runoff=2.39 cfs 8,407 cf

Subcatchment PCB-24: Runoff Area=8,200 sf 77.04% Impervious Runoff Depth=5.80"
Tc=6.0 min CN=80/98 Runoff=1.11 cfs 3,961 cf

Subcatchment PCB-3: Runoff Area=11,298 sf 69.41% Impervious Runoff Depth=5.06"
Tc=6.0 min CN=61/98 Runoff=1.33 cfs 4,768 cf

Subcatchment PCB-4: Runoff Area=13,595 sf 67.24% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=61/98 Runoff=1.57 cfs 5,641 cf

Subcatchment PCB-5: Runoff Area=5,186 sf 91.28% Impervious Runoff Depth=5.92"
Tc=6.0 min CN=61/98 Runoff=0.70 cfs 2,558 cf

Subcatchment PCB-6: Runoff Area=13,827 sf 55.48% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=60/98 Runoff=1.45 cfs 5,160 cf

Subcatchment PCB-7: Runoff Area=17,164 sf 56.60% Impervious Runoff Depth=4.33"
Tc=6.0 min CN=55/98 Runoff=1.71 cfs 6,195 cf

Subcatchment PCB-8: Runoff Area=22,584 sf 56.05% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=72/98 Runoff=2.70 cfs 9,423 cf

Subcatchment PCB-9: Runoff Area=21,038 sf 67.36% Impervious Runoff Depth=5.50"
Tc=6.0 min CN=77/98 Runoff=2.73 cfs 9,637 cf

Subcatchment PYD-1: Runoff Area=17,856 sf 1.71% Impervious Runoff Depth=1.64"
Tc=10.0 min CN=52/98 Runoff=0.59 cfs 2,441 cf

Subcatchment PYD-10: Runoff Area=5,369 sf 36.32% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=74/98 Runoff=0.60 cfs 2,046 cf

Subcatchment PYD-11: Runoff Area=7,805 sf 49.97% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=75/98 Runoff=0.94 cfs 3,243 cf

Subcatchment PYD-12: Runoff Area=12,035 sf 0.00% Impervious Runoff Depth=4.56"
Tc=12.0 min CN=83/0 Runoff=1.19 cfs 4,571 cf

Subcatchment PYD-13: Runoff Area=20,592 sf 0.00% Impervious Runoff Depth=4.67"
Tc=12.0 min CN=84/0 Runoff=2.08 cfs 8,008 cf

Subcatchment PYD-15: Runoff Area=27,081 sf 0.00% Impervious Runoff Depth=4.56"
Tc=12.0 min CN=83/0 Runoff=2.68 cfs 10,285 cf

Subcatchment PYD-2: Runoff Area=5,192 sf 46.48% Impervious Runoff Depth=4.17"
Tc=6.0 min CN=61/98 Runoff=0.51 cfs 1,803 cf

Subcatchment PYD-3: Runoff Area=4,445 sf 22.48% Impervious Runoff Depth=3.23"
Tc=6.0 min CN=61/98 Runoff=0.35 cfs 1,195 cf

Subcatchment PYD-4: Runoff Area=8,298 sf 52.57% Impervious Runoff Depth=4.40"
Tc=6.0 min CN=61/98 Runoff=0.86 cfs 3,046 cf

Subcatchment PYD-5: Runoff Area=10,280 sf 26.32% Impervious Runoff Depth=3.38"
Tc=6.0 min CN=61/98 Runoff=0.84 cfs 2,893 cf

Subcatchment PYD-6: Runoff Area=7,084 sf 43.83% Impervious Runoff Depth=4.06"
Tc=6.0 min CN=61/98 Runoff=0.68 cfs 2,399 cf

Subcatchment PYD-7: Runoff Area=8,888 sf 26.58% Impervious Runoff Depth=3.25"
Tc=6.0 min CN=59/98 Runoff=0.69 cfs 2,410 cf

Subcatchment PYD-9: Runoff Area=110,740 sf 11.84% Impervious Runoff Depth=3.83"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=8.54 cfs 35,382 cf

Subcatchment RL-12: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-14: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-18: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-20: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-23: Runoff Area=3,900 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-28: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-29: Runoff Area=7,800 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.11 cfs 4,070 cf

Subcatchment RL-3: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-33: Runoff Area=975 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.14 cfs 509 cf

Subcatchment RL-36: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-40: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-44: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-48: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-50: Runoff Area=3,900 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-53: Runoff Area=3,900 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-57: Runoff Area=9,750 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.39 cfs 5,087 cf

Subcatchment RL-6: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-68: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-70: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-71: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-74: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-75: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.28 cfs 1,017 cf

Subcatchment RL-76: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Subcatchment RL-77: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.56 cfs 2,035 cf

Total Runoff Area = 678,820 sf Runoff Volume = 275,029 cf Average Runoff Depth = 4.86"
52.52% Pervious = 356,541 sf 47.48% Impervious = 322,279 sf

Summary for Subcatchment PCB-1:

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 2,871 cf, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,455	39	>75% Grass cover, Good, HSG A
772	61	>75% Grass cover, Good, HSG B
2,179	98	Paved parking, HSG A
2,909	98	Paved parking, HSG B
7,315	82	Weighted Average
2,227	47	30.44% Pervious Area
5,089	98	69.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-10:

Runoff = 2.03 cfs @ 12.09 hrs, Volume= 7,074 cf, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
5,697	80	>75% Grass cover, Good, HSG D
164	98	Paved parking, HSG B
9,129	98	Paved parking, HSG D
16,291	89	Weighted Average
6,997	76	42.95% Pervious Area
9,293	98	57.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-11:

Runoff = 1.60 cfs @ 12.09 hrs, Volume= 5,583 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,367	80	>75% Grass cover, Good, HSG D
7,070	98	Paved parking, HSG D
12,437	90	Weighted Average
5,367	80	43.16% Pervious Area
7,070	98	56.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-12:

Runoff = 1.60 cfs @ 12.09 hrs, Volume= 5,566 cf, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13	74	>75% Grass cover, Good, HSG C
5,680	80	>75% Grass cover, Good, HSG D
367	98	Paved parking, HSG C
6,450	98	Paved parking, HSG D
12,509	90	Weighted Average
5,693	80	45.51% Pervious Area
6,816	98	54.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-13:

Runoff = 1.75 cfs @ 12.09 hrs, Volume= 6,117 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,691	74	>75% Grass cover, Good, HSG C
3,912	80	>75% Grass cover, Good, HSG D
796	98	Paved parking, HSG C
7,327	98	Paved parking, HSG D
13,726	90	Weighted Average
5,604	78	40.82% Pervious Area
8,122	98	59.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-14:

Runoff = 3.11 cfs @ 12.14 hrs, Volume= 12,195 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,985	74	>75% Grass cover, Good, HSG C
15,276	98	Paved parking, HSG C
32	98	Paved parking, HSG D
29,294	87	Weighted Average
13,985	74	47.74% Pervious Area
15,309	98	52.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-15:

Runoff = 2.68 cfs @ 12.14 hrs, Volume= 10,516 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
8,779	74	>75% Grass cover, Good, HSG C
2,601	80	>75% Grass cover, Good, HSG D
12,433	98	Paved parking, HSG C
973	98	Roofs, HSG C
2	98	Roofs, HSG D
24,788	88	Weighted Average
11,380	75	45.91% Pervious Area
13,408	98	54.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-16:

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 3,081 cf, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
293	74	>75% Grass cover, Good, HSG C
597	80	>75% Grass cover, Good, HSG D
1,952	98	Paved parking, HSG C
3,380	98	Paved parking, HSG D
6,223	95	Weighted Average
891	78	14.31% Pervious Area
5,333	98	85.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-17:

Runoff = 1.94 cfs @ 12.09 hrs, Volume= 6,813 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,975	74	>75% Grass cover, Good, HSG C
2,151	80	>75% Grass cover, Good, HSG D
5,569	98	Paved parking, HSG C
4,280	98	Paved parking, HSG D
14,974	91	Weighted Average
5,126	77	34.23% Pervious Area
9,849	98	65.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-18:

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 3,079 cf, Depth= 5.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,387	80	>75% Grass cover, Good, HSG D
4,287	98	Paved parking, HSG D
6,674	92	Weighted Average
2,387	80	35.77% Pervious Area
4,287	98	64.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-19:

Runoff = 0.99 cfs @ 12.09 hrs, Volume= 3,478 cf, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,837	80	>75% Grass cover, Good, HSG D
4,747	98	Paved parking, HSG D
7,584	91	Weighted Average
2,837	80	37.41% Pervious Area
4,747	98	62.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-2:

Runoff = 1.98 cfs @ 12.09 hrs, Volume= 7,108 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,335	61	>75% Grass cover, Good, HSG B
11,324	98	Paved parking, HSG B
300	98	Roofs, HSG B
16,959	86	Weighted Average
5,335	61	31.46% Pervious Area
11,624	98	68.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-20:

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 6,998 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,885	80	>75% Grass cover, Good, HSG D
8,755	98	Paved parking, HSG D
15,640	90	Weighted Average
6,885	80	44.02% Pervious Area
8,755	98	55.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-21:

Runoff = 2.19 cfs @ 12.09 hrs, Volume= 7,594 cf, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,886	80	>75% Grass cover, Good, HSG D
9,220	98	Paved parking, HSG D
17,106	90	Weighted Average
7,886	80	46.10% Pervious Area
9,220	98	53.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-22:

Runoff = 1.77 cfs @ 12.09 hrs, Volume= 6,206 cf, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,878	74	>75% Grass cover, Good, HSG C
1,364	80	>75% Grass cover, Good, HSG D
1,361	98	Paved parking, HSG C
7,340	98	Paved parking, HSG D
13,942	90	Weighted Average
5,241	76	37.59% Pervious Area
8,701	98	62.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-23:

Runoff = 2.39 cfs @ 12.09 hrs, Volume= 8,407 cf, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
58	74	>75% Grass cover, Good, HSG C
5,858	80	>75% Grass cover, Good, HSG D
498	98	Paved parking, HSG C
11,612	98	Paved parking, HSG D
18,027	92	Weighted Average
5,916	80	32.82% Pervious Area
12,110	98	67.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-24:

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 3,961 cf, Depth= 5.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,883	80	>75% Grass cover, Good, HSG D
46	98	Paved parking, HSG C
6,271	98	Paved parking, HSG D
8,200	94	Weighted Average
1,883	80	22.96% Pervious Area
6,317	98	77.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-3:

Runoff = 1.33 cfs @ 12.09 hrs, Volume= 4,768 cf, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,456	61	>75% Grass cover, Good, HSG B
7,842	98	Paved parking, HSG B
11,298	87	Weighted Average
3,456	61	30.59% Pervious Area
7,842	98	69.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-4:

Runoff = 1.57 cfs @ 12.09 hrs, Volume= 5,641 cf, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,454	61	>75% Grass cover, Good, HSG B
9,141	98	Paved parking, HSG B
13,595	86	Weighted Average
4,454	61	32.76% Pervious Area
9,141	98	67.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-5:

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 2,558 cf, Depth= 5.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
452	61	>75% Grass cover, Good, HSG B
4,733	98	Paved parking, HSG B
5,186	95	Weighted Average
452	61	8.72% Pervious Area
4,733	98	91.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-6:

Runoff = 1.45 cfs @ 12.09 hrs, Volume= 5,160 cf, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
5,785	61	>75% Grass cover, Good, HSG B
13	74	>75% Grass cover, Good, HSG C
90	98	Paved parking, HSG A
7,582	98	Paved parking, HSG B
13,827	81	Weighted Average
6,155	60	44.52% Pervious Area
7,672	98	55.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-7:

Runoff = 1.71 cfs @ 12.09 hrs, Volume= 6,195 cf, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,997	39	>75% Grass cover, Good, HSG A
277	61	>75% Grass cover, Good, HSG B
3,091	74	>75% Grass cover, Good, HSG C
84	80	>75% Grass cover, Good, HSG D
4,507	98	Paved parking, HSG A
2,696	98	Paved parking, HSG B
2,495	98	Paved parking, HSG C
18	98	Paved parking, HSG D
17,164	79	Weighted Average
7,448	55	43.40% Pervious Area
9,716	98	56.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-8:

Runoff = 2.70 cfs @ 12.09 hrs, Volume= 9,423 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,430	61	>75% Grass cover, Good, HSG B
5,496	80	>75% Grass cover, Good, HSG D
6,843	98	Paved parking, HSG B
5,815	98	Paved parking, HSG D
22,584	86	Weighted Average
9,926	72	43.95% Pervious Area
12,658	98	56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-9:

Runoff = 2.73 cfs @ 12.09 hrs, Volume= 9,637 cf, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3	61	>75% Grass cover, Good, HSG B
3,437	74	>75% Grass cover, Good, HSG C
3,427	80	>75% Grass cover, Good, HSG D
13	98	Paved parking, HSG B
2,448	98	Paved parking, HSG C
11,711	98	Paved parking, HSG D
21,038	91	Weighted Average
6,866	77	32.64% Pervious Area
14,172	98	67.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-1:

Runoff = 0.59 cfs @ 12.16 hrs, Volume= 2,441 cf, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,811	39	>75% Grass cover, Good, HSG A
10,739	61	>75% Grass cover, Good, HSG B
6	98	Paved parking, HSG B
300	98	Roofs, HSG B
17,856	53	Weighted Average
17,549	52	98.29% Pervious Area
306	98	1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment PYD-10:

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 2,046 cf, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,393	74	>75% Grass cover, Good, HSG C
26	80	>75% Grass cover, Good, HSG D
1,950	98	Roofs, HSG C
5,369	83	Weighted Average
3,419	74	63.68% Pervious Area
1,950	98	36.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-11:

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 3,243 cf, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,000	74	>75% Grass cover, Good, HSG C
905	80	>75% Grass cover, Good, HSG D
2,801	98	Roofs, HSG C
1,099	98	Roofs, HSG D
7,805	87	Weighted Average
3,905	75	50.03% Pervious Area
3,900	98	49.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-12:

Runoff = 1.19 cfs @ 12.16 hrs, Volume= 4,571 cf, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,128	74	>75% Grass cover, Good, HSG C
8,470	80	>75% Grass cover, Good, HSG D
2,438	98	Unconnected roofs, HSG D
12,035	83	Weighted Average
12,035	83	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-13:

Runoff = 2.08 cfs @ 12.16 hrs, Volume= 8,008 cf, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
15,717	80	>75% Grass cover, Good, HSG D
4,875	98	Unconnected roofs, HSG D
20,592	84	Weighted Average
20,592	84	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-15:

Runoff = 2.68 cfs @ 12.16 hrs, Volume= 10,285 cf, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
9,857	74	>75% Grass cover, Good, HSG C
8,937	80	>75% Grass cover, Good, HSG D
3,171	98	Unconnected roofs, HSG C
5,117	98	Unconnected roofs, HSG D
27,081	83	Weighted Average
27,081	83	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-2:

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 1,803 cf, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,779	61	>75% Grass cover, Good, HSG B
2,413	98	Paved parking, HSG B
5,192	78	Weighted Average
2,779	61	53.52% Pervious Area
2,413	98	46.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-3:

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,195 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,446	61	>75% Grass cover, Good, HSG B
999	98	Paved parking, HSG B
4,445	69	Weighted Average
3,446	61	77.52% Pervious Area
999	98	22.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-4:

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 3,046 cf, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,936	61	>75% Grass cover, Good, HSG B
4,362	98	Paved parking, HSG B
8,298	80	Weighted Average
3,936	61	47.43% Pervious Area
4,362	98	52.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-5:

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 2,893 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,574	61	>75% Grass cover, Good, HSG B
2,706	98	Paved parking, HSG B
10,280	71	Weighted Average
7,574	61	73.68% Pervious Area
2,706	98	26.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-6:

Runoff = 0.68 cfs @ 12.09 hrs, Volume= 2,399 cf, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,919	61	>75% Grass cover, Good, HSG B
3,105	98	Paved parking, HSG B
60	55	Woods, Good, HSG B
7,084	77	Weighted Average
3,979	61	56.17% Pervious Area
3,105	98	43.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-7:

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,410 cf, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,692	61	>75% Grass cover, Good, HSG B
2,363	98	Paved parking, HSG B
1,833	55	Woods, Good, HSG B
8,888	70	Weighted Average
6,525	59	73.42% Pervious Area
2,363	98	26.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-9:

Runoff = 8.54 cfs @ 12.20 hrs, Volume= 35,382 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,397	49	50-75% Grass cover, Fair, HSG A
3,090	69	50-75% Grass cover, Fair, HSG B
20,560	79	50-75% Grass cover, Fair, HSG C
2,943	84	50-75% Grass cover, Fair, HSG D
6,678	39	>75% Grass cover, Good, HSG A
9,568	61	>75% Grass cover, Good, HSG B
34,482	74	>75% Grass cover, Good, HSG C
5,461	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
2,877	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
6,055	98	Unconnected roofs, HSG C
275	98	Water Surface, HSG A
12,273	98	Water Surface, HSG C
494	98	Water Surface, HSG D
635	30	Woods, Good, HSG A
2,060	70	Woods, Good, HSG C
110,740	76	Weighted Average
97,623	73	88.16% Pervious Area
13,117	98	11.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Summary for Subcatchment RL-12:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-14:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
952	98	Roofs, HSG C
2,948	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-18:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG D
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-20:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG D
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-23:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Unconnected roofs, HSG D
3,900	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-28:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG D
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-29:

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 4,070 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,800	98	Roofs, HSG D
7,800	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-3:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,735	98	Roofs, HSG A
1,031	98	Roofs, HSG B
133	98	Roofs, HSG C
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-33:

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 509 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
679	98	Roofs, HSG C
296	98	Roofs, HSG D
975	98	Weighted Average
975	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-36:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,846	98	Roofs, HSG C
104	98	Roofs, HSG D
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-40:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-44:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-48:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,438	98	Roofs, HSG C
2,462	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-50:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,695	98	Unconnected roofs, HSG C
1,205	98	Unconnected roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-53:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Unconnected roofs, HSG D
3,900	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-57:

Runoff = 1.39 cfs @ 12.09 hrs, Volume= 5,087 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
2,497	98	Roofs, HSG D
9,750	98	Weighted Average
9,750	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-6:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-68:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-70:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-71:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-74:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-75:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-76:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG B
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-77:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG B
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Appendix E: MassDEP Calculations

- Impervious Area Calculations
- Required Recharge Volume – Surface Basin #1
- Water Quality Volume – Surface Basin #1
- Stage-Storage Table – Surface Basin #1
- Required Recharge Volume – Surface Basin #2
- Water Quality Volume – Surface Basin #2
- Stage-Storage Table – Surface Basin #2
- Required Recharge Volume – Surface Basin #3
- Water Quality Volume – Surface Basin #3
- Stage-Storage Table – Surface Basin #3
- Required Recharge Volume – Bioretention Basin
- Water Quality Volume – Bioretention Basin
- Stage-Storage Table – Bioretention Basin
- Water Quality Flow Rate Calculation – PWQU-1
- TSS Removal Worksheet
- Sediment Forebay Sizing Calculations
- Drawdown Calculations

Standard 3: Recharge Calculations

Impervious Area Calculations

Existing Total Impervious Area

Sub-Catchmen	Roof (sf)	Other Impervious (sf)	Sum (sf)
ES-1A	2,220	3,488	5,708
ES-1B	0	0	0
ES-1C	0	0	0
ES-2	0	0	0
ES-3	0	0	0
	2,220	3,488	5,708

Proposed Total Impervious Area

Sub-Catchmen	Roof (sf)	Other Impervious (sf)	Sum (sf)	
PS-1A	22,050	44,706	66,756	Tributary to Basin #1
PS-1B	5,850	0	5,850	
PS-1C	375	0	375	
PS-1D	9,750	0	9,750	
PS-1E	7,364	0	7,364	
PS-2A	7,847	74	7,921	
PS-2B	7,332	37,266	44,598	Tributary to Basin #2
PS-2C	13,408	0	13,408	
PS-2D	0	0	0	
PS-3A	12,714	0	12,714	
PS-3B	48,913	48,623	97,536	Tributary to Basin #3
PS-3C	8,043	98,609	106,652	
PS-3D	1,553	0	1,553	Tributary to Dry Detention Basin
PS-3E	1,950	7	1,957	
PS-3F	0	15,736	15,736	Trib. to Bioret. Basin
PS-3G	3,900	0	3,900	
	151,049	245,021	396,070	

Standard 3: Recharge Calculations (cont'd)

Summary Table

Total Existing Impervious Area	5,708 SF
Total Proposed Impervious Area	396,070 SF
Total New Impervious Area	390,362 SF
Total Impervious Area Tributary to Infiltration BMPs	258,669 SF
Percent Impervious Tributary to Infiltration BMPs*	66.3%
Capture Area Adjustment	1.51

*Impervious Area tributary to recharge facilities must be greater than 65%

Standard 3: Recharge Calculations - Infiltration Basin #1

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	2,540 sq. ft.	2.8%
Impervious Area (B-soils)	79,568 sq. ft.	88.3%
Impervious Area (C-soils)	5,631 sq. ft.	6.3%
Impervious Area (D-soils)	2,357 sq. ft.	2.6%
Total Impervious area	90,096 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 2,585 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.51

Adjusted R_V (required) = 3,901 cu. ft.

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #1	5,777 cu. ft.***

5,777 cu. ft. > 3,901 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltration Basin #1

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.533 acres

V_{WQ} (required) = 2,782 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	3,901	cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	2,782	cu. ft.	
Use	3,901	cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #1	5,777 cu. ft.***
	5,777 cu. ft. > 3,901 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in surface infiltration basin below outlet elevation 201.00
Depth of water in basin = 1.00 feet

Stage-Area-Storage for Pond 1P: Infiltration Basin #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
200.00	0	202.60	18,087
200.05	254	202.65	18,529
200.10	511	202.70	18,975
200.15	772	202.75	19,424
200.20	1,037	202.80	19,877
200.25	1,305	202.85	20,334
200.30	1,576	202.90	20,793
200.35	1,852	202.95	21,257
200.40	2,131	203.00	21,723
200.45	2,413	203.05	22,194
200.50	2,700	203.10	22,668
200.55	2,990	203.15	23,145
200.60	3,284	203.20	23,625
200.65	3,582	203.25	24,110
200.70	3,884	203.30	24,597
200.75	4,190	203.35	25,088
200.80	4,499	203.40	25,583
200.85	4,812	203.45	26,081
200.90	5,130	203.50	26,583
200.95	5,451	203.55	27,088
201.00	5,777	203.60	27,597
201.05	6,106	203.65	28,109
201.10	6,438	203.70	28,625
201.15	6,774	203.75	29,145
201.20	7,114	203.80	29,668
201.25	7,457	203.85	30,195
201.30	7,804	203.90	30,726
201.35	8,154	203.95	31,260
201.40	8,508	204.00	31,798
201.45	8,865	204.05	32,339
201.50	9,226	204.10	32,884
201.55	9,591	204.15	33,433
201.60	9,960	204.20	33,985
201.65	10,332	204.25	34,541
201.70	10,708	204.30	35,100
201.75	11,087	204.35	35,663
201.80	11,471	204.40	36,230
201.85	11,858	204.45	36,801
201.90	12,249	204.50	37,375
201.95	12,643	204.55	37,952
202.00	13,042	204.60	38,534
202.05	13,444	204.65	39,119
202.10	13,849	204.70	39,708
202.15	14,258	204.75	40,301
202.20	14,670	204.80	40,897
202.25	15,085	204.85	41,497
202.30	15,504	204.90	42,101
202.35	15,926	204.95	42,709
202.40	16,351	205.00	**43,321**
202.45	16,780		
202.50	17,212		
202.55	17,648		

Standard 3: Recharge Calculations - Infiltration Basins #2

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	9,057 sq. ft.	13.4%
Impervious Area (B-soils)	18,469 sq. ft.	27.4%
Impervious Area (C-soils)	23,351 sq. ft.	34.7%
Impervious Area (D-soils)	16,485 sq. ft.	24.5%
Total Impervious area	67,362 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 1,615 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.51

Adjusted R_V (required) = 2,438 cu. ft.

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #2	2,897 cu. Ft.***

2,897 cu. ft. > 2,438 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #2

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.513 acres

V_{WQ} (required) = 2,747 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	2,438	cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	2,747	cu. ft.	
Use	2,747	cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #2	2,897 cu. Ft.***

2,897 cu. ft. > 2,747 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in infiltration basin #2 below outlet elevation 181.00
Depth of water in basin = 0.50 feet

Stage-Area-Storage for Pond 4P: Infiltration Basin #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
180.50	0	182.58	15,013	184.66	29,735
180.54	216	182.62	15,379	184.70	29,735
180.58	434	182.66	15,747	184.74	29,735
180.62	655	182.70	16,119	184.78	29,735
180.66	879	182.74	16,493	184.82	29,735
180.70	1,106	182.78	16,871	184.86	29,735
180.74	1,336	182.82	17,251	184.90	29,735
180.78	1,568	182.86	17,635	184.94	29,735
180.82	1,803	182.90	18,021	184.98	29,735
180.86	2,041	182.94	18,411	185.02	29,735
180.90	2,282	182.98	18,803	185.06	29,735
180.94	2,525	183.02	19,199	185.10	29,735
180.98	2,772	183.06	19,597	185.14	29,735
181.02	3,021	183.10	19,998	185.18	29,735
181.06	3,273	183.14	20,401	185.22	29,735
181.10	3,528	183.18	20,807	185.26	29,735
181.14	3,786	183.22	21,216	185.30	29,735
181.18	4,046	183.26	21,627	185.34	29,735
181.22	4,310	183.30	22,042	185.38	29,735
181.26	4,576	183.34	22,459	185.42	29,735
181.30	4,845	183.38	22,878	185.46	29,735
181.34	5,117	183.42	23,300	185.50	29,735
181.38	5,392	183.46	23,725	185.54	29,735
181.42	5,669	183.50	24,153	185.58	29,735
181.46	5,950	183.54	24,584	185.62	29,735
181.50	6,233	183.58	25,017	185.66	29,735
181.54	6,520	183.62	25,453	185.70	29,735
181.58	6,809	183.66	25,892	185.74	29,735
181.62	7,102	183.70	26,333	185.78	29,735
181.66	7,397	183.74	26,778	185.82	29,735
181.70	7,696	183.78	27,225	185.86	29,735
181.74	7,997	183.82	27,675	185.90	29,735
181.78	8,302	183.86	28,128	185.94	29,735
181.82	8,610	183.90	28,583	185.98	29,735
181.86	8,920	183.94	29,042	186.02	29,735
181.90	9,234	183.98	**29,503**	186.06	29,735
181.94	9,551	184.02	**29,735**	186.10	29,735
181.98	9,871	184.06	29,735	186.14	29,735
182.02	10,194	184.10	29,735	186.18	29,735
182.06	10,520	184.14	29,735	186.22	29,735
182.10	10,849	184.18	29,735	186.26	29,735
182.14	11,180	184.22	29,735	186.30	29,735
182.18	11,515	184.26	29,735	186.34	29,735
182.22	11,852	184.30	29,735	186.38	29,735
182.26	12,191	184.34	29,735	186.42	29,735
182.30	12,534	184.38	29,735	186.46	29,735
182.34	12,880	184.42	29,735	186.50	29,735
182.38	13,228	184.46	29,735		
182.42	13,579	184.50	29,735		
182.46	13,933	184.54	29,735		
182.50	14,290	184.58	29,735		
182.54	14,650	184.62	29,735		

Standard 3: Recharge Calculations - Infiltration Basins #3

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	90 sq. ft.	0.0%
Impervious Area (B-soils)	21,842 sq. ft.	9.1%
Impervious Area (C-soils)	72,598 sq. ft.	30.2%
Impervious Area (D-soils)	145,597 sq. ft.	60.6%
Total Impervious area	240,127 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 3,367 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.51

Adjusted R_V (required) = 5,082 cu. ft.

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #3	5,232 cu. Ft.***

5,232 cu. ft. > 5,082 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #3

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 2.531 acres

V_{WQ} (required) = 4,594 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	5,082	cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	4,594	cu. ft.	
Use	5,082	cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #3	5,232 cu. Ft.***

5,232 cu. ft. > 5,082 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in infiltration basin #4 below outlet elevation 181.50
Depth of water in basin = 0.50 feet

Stage-Area-Storage for Pond 2P: Infiltration Basin #3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
181.00	0	182.04	11,414	183.08	24,811
181.02	200	182.06	11,654	183.10	25,088
181.04	402	182.08	11,894	183.12	25,365
181.06	604	182.10	12,136	183.14	25,642
181.08	806	182.12	12,377	183.16	25,920
181.10	1,010	182.14	12,620	183.18	26,199
181.12	1,214	182.16	12,863	183.20	26,478
181.14	1,419	182.18	13,107	183.22	26,758
181.16	1,624	182.20	13,351	183.24	27,039
181.18	1,830	182.22	13,597	183.26	27,320
181.20	2,037	182.24	13,842	183.28	27,602
181.22	2,245	182.26	14,089	183.30	27,885
181.24	2,454	182.28	14,336	183.32	28,168
181.26	2,663	182.30	14,584	183.34	28,452
181.28	2,873	182.32	14,833	183.36	28,736
181.30	3,084	182.34	15,083	183.38	29,021
181.32	3,295	182.36	15,333	183.40	29,307
181.34	3,507	182.38	15,583	183.42	29,594
181.36	3,720	182.40	15,835	183.44	29,881
181.38	3,934	182.42	16,087	183.46	30,168
181.40	4,148	182.44	16,340	183.48	30,456
181.42	4,363	182.46	16,594	183.50	30,745
181.44	4,579	182.48	16,848	183.52	31,035
181.46	4,796	182.50	17,103	183.54	31,325
181.48	5,014	182.52	17,359	183.56	31,616
181.50	5,232	182.54	17,615	183.58	31,907
181.52	5,451	182.56	17,873	183.60	32,200
181.54	5,670	182.58	18,130	183.62	32,492
181.56	5,891	182.60	18,389	183.64	32,786
181.58	6,112	182.62	18,648	183.66	33,080
181.60	6,334	182.64	18,908	183.68	33,375
181.62	6,557	182.66	19,169	183.70	33,670
181.64	6,780	182.68	19,431	183.72	33,966
181.66	7,005	182.70	19,693	183.74	34,263
181.68	7,230	182.72	19,956	183.76	34,560
181.70	7,456	182.74	20,219	183.78	34,858
181.72	7,682	182.76	20,484	183.80	35,156
181.74	7,910	182.78	20,749	183.82	35,456
181.76	8,138	182.80	21,015	183.84	35,756
181.78	8,367	182.82	21,281	183.86	36,056
181.80	8,597	182.84	21,548	183.88	36,357
181.82	8,827	182.86	21,816	183.90	36,659
181.84	9,058	182.88	22,085	183.92	36,962
181.86	9,290	182.90	22,354	183.94	37,265
181.88	9,523	182.92	22,625	183.96	37,569
181.90	9,757	182.94	22,896	183.98	37,873
181.92	9,991	182.96	23,167	184.00	**38,178**
181.94	10,227	182.98	23,440		
181.96	10,463	183.00	23,713		
181.98	10,699	183.02	23,986		
182.00	10,937	183.04	24,261		
182.02	11,175	183.06	24,536		

Standard 3: Recharge Calculations - Bioretention Basin

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.	0.0%
Impervious Area (B-soils)	0 sq. ft.	0.0%
Impervious Area (C-soils)	28,123 sq. ft.	100.0%
Impervious Area (D-soils)	0 sq. ft.	0.0%
Total Impervious area	28,123 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 586 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.51

Adjusted R_V (required) = 884 cu. ft.

Storage Volume Provided

Recharge Facility	Volume Provided
Bioretention Basin	2,372 cu. Ft.***

2,372 cu. ft. > 884 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Bioretention Basin

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 0.361 acres

V_{WQ} (required) = 656 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	884 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	656 cu. ft.	
Use	884 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Bioretention Basin	2,372 cu. Ft.***
	2,372 cu. ft. > 884 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in bioretention basin #3 below outlet elevation 182.50
Depth of water in basin = 1.00 feet

Stage-Area-Storage for Pond 5P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
181.50	1,950	0
181.52	1,966	39
181.54	1,982	79
181.56	1,998	118
181.58	2,014	159
181.60	2,030	199
181.62	2,046	240
181.64	2,062	281
181.66	2,078	322
181.68	2,095	364
181.70	2,111	406
181.72	2,128	448
181.74	2,144	491
181.76	2,161	534
181.78	2,177	578
181.80	2,194	621
181.82	2,211	665
181.84	2,228	710
181.86	2,245	754
181.88	2,262	800
181.90	2,279	845
181.92	2,296	891
181.94	2,313	937
181.96	2,330	983
181.98	2,348	1,030
182.00	2,365	1,077
182.02	2,382	1,125
182.04	2,400	1,172
182.06	2,417	1,221
182.08	2,435	1,269
182.10	2,453	1,318
182.12	2,470	1,367
182.14	2,488	1,417
182.16	2,506	1,467
182.18	2,524	1,517
182.20	2,542	1,568
182.22	2,560	1,619
182.24	2,578	1,670
182.26	2,596	1,722
182.28	2,615	1,774
182.30	2,633	1,826
182.32	2,651	1,879
182.34	2,670	1,932
182.36	2,688	1,986
182.38	2,707	2,040
182.40	2,725	2,094
182.42	2,744	2,149
182.44	2,763	2,204
182.46	2,782	2,260
182.48	2,801	2,315
182.50	2,820	2,372
182.52	2,839	2,428
182.54	2,858	2,485
182.56	2,877	2,542
182.58	2,896	2,600
182.60	2,915	2,658
182.62	2,935	2,717
182.64	2,954	2,776
182.66	2,973	2,835
182.68	2,993	2,895
182.70	3,013	2,955
182.72	3,032	3,015
182.74	3,052	3,076
182.76	3,072	3,137
182.78	3,092	3,199
182.80	3,111	3,261
182.82	3,131	3,323
182.84	3,151	3,386
182.86	3,172	3,449
182.88	3,192	3,513
182.90	3,212	3,577
182.92	3,232	3,641
182.94	3,253	3,706
182.96	3,273	3,772
182.98	3,293	3,837
183.00	**3,314**	**3,903**

TSS Removal Form - Infiltration Basins #1, #2 & #3

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep-Sump Hooded Catch Basins	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pre-Treatement TSS Removal = 44%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Surface Infiltration Basin w/ Forebay	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

TSS Removal Form - Bioretention Area

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Vegetated Filter Strip	0.45	1.00	0.45	0.55
			Pre-Treatement TSS Removal =	45%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Bioretention Area	0.90	1.00	0.90	0.10
			Total TSS Removal =	90%

Sediment Forebay Sizing - Infiltration Basin #1

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.53 acres *

V_{SF} (required) = 556 cu.ft.

V_{SF} (provided) = 614 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #2

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.51 acres *

V_{SF} (required) = 549 cu.ft.

V_{SF} (provided) = 663 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #3

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.53 acres *

V_{SF} (required) = 919 cu.ft.

V_{SF} (provided) = 1,157 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Dry Detention Basin

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.53 acres *

V_{SF} (required) = 918 cu.ft.

V_{SF} (provided) = 1,064 cu. ft.

* Only includes impervious area tributary to sediment forebay

Drawdown Analysis

$$T_{DRAWDOWN} = \frac{R_V}{KA}$$

where: $T_{DRAWDOWN}$ = time in hours

R_V = required recharge volume (cu. ft.)

K = Rawls rate
- 2.41 inches/hour (A-soils)*
- 0.52 inches/hour (B-soils)*
- 0.17 inches/hour (C-soils)*

A = bottom area of recharge facility (sq. ft.)

*Most conservative Rawls rate values for given soil type used for analysis purposes

Surface Infiltration Basin #1

R_V = 3,901 cu. ft.
A = 4,562 sq. ft.

$T_{DRAWDOWN}$ = 19.7 hours < 72 hours (B-soils)

Surface Infiltration Basin #2

R_V = 2,438 cu. ft.
A = 5,087 sq. ft.

$T_{DRAWDOWN}$ = 33.8 hours < 72 hours (C-soils)

Surface Infiltration Basin #3

R_V = 5,082 cu. ft.
A = 9,353 sq. ft.

$T_{DRAWDOWN}$ = 38.4 hours < 72 hours (C-soils)

Bioretention Basin

R_V = 884 cu. ft.
A = 1,950 sq. ft.

$T_{DRAWDOWN}$ = 32.0 hours < 72 hours (C-soils)

Appendix F: Construction Period Erosion Control Plan

Construction Period Erosion Control Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
February 10, 2022

R LEVESQUE ASSOCIATES, INC
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The project shall implement a construction period erosion control plan. The following provides descriptions and guidelines to ensure that the areas surrounding the project site will be protected from excessive sedimentation and runoff during construction.

1.1 Construction Period Pollution Prevention And Erosion Control Measures

1.1.1 Preconstruction Notifications And Meetings

Prior to the start of construction, the contractor shall call together a pre-construction meeting including a representative from the Town, the design engineer, contractor, and any pertinent persons that should be in attendance. These requirements shall be the responsibility of the Contractor to arrange, attend, and document.

1.1.2 Sediment Barrier And Work Limit

Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the owner or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine, provided all other ground cover is left intact. No excavation, grading, filling, or removal of vegetative ground cover shall begin until sediment barriers have been installed as shown on the plans and have been inspected by the owner or their representative.

1.1.3 Silt Fence

The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with compacted soil or crushed stone. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

1.1.4 Straw Bales

Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose hay.

1.1.5 Filter Sock (Filtrexx Or Equivalent)

In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, mulch or crushed stone shall be placed along the up-slope face to control and filter underflow. Additional layers of Filter Sock may be required for adequate freeboard. The filter sock shall be staked at 10 feet on-center or in cases where they cannot be staked, utilize heavy concrete blocks to hold in place.

1.1.6 Temporary Sedimentation Basins

Temporary sediment basins may be excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion. If the temporary basin is to be located within an area of future infiltration as part of the stormwater management system, the excavation for the temporary sedimentation basin shall be limited to one foot above final grade of the infiltration structure.

1.1.7 Stocking Additional Materials

A stock of additional erosion control materials shall be available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

Straw Bales – 10 (kept dry) with 20 oak stakes

Or

Silt Fence – 30 Linear feet.

Or

Filter Sock – 4 – 8 foot sections (kept dry)

Washed Stone – One (1) cubic yard, ¾" to 2" diameter

1.1.8 Trench Protection

Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

1.1.9 Site Stabilization – Temporary

Where a portion of the site will not be subject to construction activity for over 14 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

1.1.10 Site Stabilization – Permanent

Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover (season permitting) in accordance with USDA NRCS guidelines or equivalent.

1.1.11 Roadway Sweeping

The entrance to the site and affected portions of the access drive or paved project areas shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

1.2 Short-Term Erosion Control Maintenance

The following provides short-term erosion control maintenance guidelines and requirements.

1. The contractor or subcontractor will be responsible for implementing each control shown on the sedimentation and erosion control plan.
2. All erosion and sediment control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control measures will be installed during construction in order to control erosion and/or off-site sedimentation if deemed necessary by on-site inspection.
3. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
4. All sediment and erosion control devices shall be inspected at least once every seven (7) calendar days and after any storm event greater than 0.5 inches of precipitation during any 24-hour period, and the inspection shall be documented in writing. Damaged or ineffective devices shall be repaired or replaced, as necessary.
5. The contractor shall take all reasonable precautions to avoid excess erosion of the site due to the construction of this project.
6. Silt shall be removed from behind barriers if greater than 6-inches deep or as needed. Sediment that is collected in structures shall be disposed of properly and covered if stored on-site
7. Damaged or deteriorated items will be repaired immediately after identification.
8. All ditches shall be stabilized as soon as is practicable to minimize erosion.
9. The contractor shall maintain all erosion control devices in a good, working state of repair. Upon complete stabilization of any tributary areas, the erosion control devices shall be removed and disposed of so as to cause no off-site siltation.
10. Inspect and maintain construction entrance stone such that sediment does not track onto the street. Any sediment tracked onto the street shall be swept daily.
11. After catch basins have been constructed, the contractor shall protect the inlets by constructing inlet protection as shown on the plans.
12. Once the site has been paved, all catch basin inlets shall receive a silt sack type protection.
13. Erosion control measures shall remain in place until all disturbed earth has been substantially stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Appendix G: Long-Term Operation and Maintenance Plan

- Long-Term Operation & Maintenance Plan Narrative
- CDS Inspection and Maintenance Guide
- O&M Checklist

Long-Term Operation & Maintenance Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
February 10, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
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I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Roadway to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Deep-Sump Catch Basins	Four times per year	Four times per year	• Remove sediment once deposits reach one half the depth from the bottom sump to the lowest invert.
Leaching Drywell	Once per year	As needed	• Remove debris and sediment when the drywell in 50% filled. Rehabilitate drywell if it fails due to clogging
Stormwater Piping	Once per year	Once per year	• Inspect pipe entrances in catch basins and manholes and remove any blockages
Water Quality Unit*	As specified by the manufacturer	As specified by the manufacturer	• Clean the unit using the method specified by the manufacturer. Vactor trucks are typically used to clean these units.
Sediment Forebay	Monthly	Four times per year	• Remove sediment when it reaches six inches; • Mow the grass to no less than 3 inches and no greater than 6 inches; • Replace vegetation damaged during sediment removal.
Surface Infiltration Basin	• After every major storm for the first three months; • Twice per year thereafter.	Twice Per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of the turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris.

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Extended Dry Detention Basin	• After every major storm event for the first three months; • Twice per year thereafter	Twice per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris
Flared End Section	Four times per year	As Needed	• Remove any debris or vegetation around the flared end section such that flow out of the structure is not impeded.
Bio-Retention Areas	Once per month	Twice per year (Spring and Fall)	• Inspect bio-retention areas for sediment build-up, structural damage, and standing water; • Inspect and repair eroded areas monthly; • Re-mulch void areas as needed; • Remove litter and debris monthly; • Treat diseased or distressed vegetation as needed; • Remove and replace dead vegetation twice per year (Spring and Fall); • Remove invasive species as needed; • Replace mulch every two years.

*See attached Device Operation and Maintenance Guides

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Heavy-duty stormwater drain manhole covers and catch basin grates have been designed to withstand H20 loading;

C. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

D. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$50	22	$4,400
Yard Drains	4/year	$50	15	$3,000
Sediment Forebay	2/year	$50	4	$400
Surface Infiltration Basin	2/year	$75	3	$450
Extended Dry Detention Basin	2/year	$75	1	$150
Water Quality Unit	2/year	$100	1	$200
Bio-Retention Areas	12/year	$50	1	$600
Total Estimated Annual Cost of Inspections				$9,200

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$100	22	$8,800
Yard Drains	4/year	$100	15	$6,000
Sediment Forebay	2/year	$250	4	$600
Surface Infiltration Basin	2/year	$500	3	$2,000
Extended Dry Detention Basin	2/year	$500	1	$1,000
Bio-Retention Areas	2/year	$500	1	$1,000
Water Quality Unit	2/year	$800	1	$800
Total Estimated Annual Cost of Maintenance				$20,200

*All above costs are estimates to be used for permitting purposes only. Actual maintenance costs are to be ascertained by the responsible party

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 1 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Deep-Sump Catch Basins	Sediment has accumulated to a depth greater than the original design depth for sediment storage, approximately 2-feet of sediment.	Remove the sediment and dispose of in accordance with local and state regulations.			
Stormwater Piping	Blockage of inlet/outlet pipes due to debris or sediment accumulation.	Remove any debris and sediment via proper means. Dispose of debris/sediment in accordance with local & state regulations			
Roof Leaders	Downspout connections have been damaged or disconnected.	Repair and reconnect downspout connections.			
	Roof leaders are surcharging at the downspout connections	Open and insepct at cleanout locations and remove any blockages.			
Surface Infiltration Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			

_____ _____

Inspector's Signature Date

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 2 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Extended Dry Detention Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Flared End Sections	Vegetation has started to grow within the riprap area.	Remove vegetation immediately.			
	Accumulation of sediment/debris at the culvert inlet.	Remove sediment or debris such that the culvert has free flow.			
	Erosion is occuring where riprap has been dislodged.	Remedy scoured area and replace riprap immediately.			
Bio-Retention Areas	Sediment has accumulated over mulched surface.	Remove sediment and mulch mixture and replace mulch.			
	Erosion has occurred at inlets.	Repair any eroded areas and replace with appropriate materials.			
	Areas are devoid of mulch.	Replace mulch as necessary.			
	Litter and/or debris has accumulated in bio-retention area.	Remove litter and/or debris.			
	Vegetation has died or is distressed.	Replace vegetation as necessary.			
Water Quality Unit	Sediment has accumulated to a depth greater that the original design depth for sediment storage.	Remove sediment and disposed of in accordance with local and state regulations.			

_____ _____

Inspector's Signature Date

Appendix H: Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

The owners of the land/responsible party will be responsible for prohibiting illicit discharges to the stormwater management system during construction and during its life of operation. The stormwater management system is comprised of the components for conveying, treating, and infiltrating stormwater runoff on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. An illicit discharge shall constitute any connection or discharge to the stormwater management system including, but not limited to, wastewater discharges, discharge of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

Signature of Responsible Party Representative _____ Date _____

Signature of Responsible Party Representative** _____ Date _____

**Required upon transfer of ownership

Appendix I: Low Impact Development Considerations

Low Impact Development Considerations

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
February 10, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
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Introduction

Per the Massachusetts Stormwater Handbook, project proponents must consider environmentally sensitive site design and low impact development techniques to effectively manage stormwater runoff. As part of the proposed project, the proponent has considered a number of environmentally sensitive, low impact development techniques to prevent the generation of stormwater and non-point source pollution. The proposed stormwater management system design was able to incorporate some LID techniques such as deep-sump hooded catch basins, a proprietary sedimentation device, surface infiltration basins with sediment forebay, a bioretention area with vegetated filter strip and an extended dry detention basin. The proposed stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance which dictate that specific criteria be met in regard to stormwater runoff in conjunction with the criteria set forth and required by the Massachusetts Stormwater Handbook.

The property to be developed is currently in agricultural use with the exception of wooded wetland in the central portion of the project site. The topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the project area. No stormwater management features currently exist on site, however, a pair of culverts under South Westfield Street discharge runoff from adjacent properties onto the site. As such, untreated stormwater laden with suspended solids flows across the site and into adjacent wetlands and stream.

The developer is proposing to construct forty (40) new duplex condominium buildings and one standalone unit for a total of eighty (81) units. Seven of the duplex units will face directly onto South Westfield Street. The remaining thirty-three duplexes will be accessed by a series of new roadways. The total length of new roadways will be approximately 3,930 feet and will include the installation of gravity and pressure sanitary sewer, water, electric, gas and communication lines. The majority of the parcel where the site improvements are proposed has been historically disturbed. A number of onsite resource areas, including bordering vegetated wetlands, bank, land under water, and riverfront area were delineated as part of the project. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various off-site resource areas.

Currently, there is no existing stormwater management system located on the property. Under proposed conditions, a stormwater management system has been designed to mimic the existing drainage patterns of the site while improving runoff water quality and reducing peak stormwater flow rates through the use of MassDEP recommended stormwater BMPs. The proposed roadway has been carefully graded to mimic existing flow patterns of the site and direct runoff to inlet structures that will collect and convey stormwater to three separate surface infiltration basins and a

dry detention basin situated in logical locations across the site. A bioretention basin with vegetated filter strip is also proposed to treat sheet flow from a portion of the new roadway. The surface infiltration basins and bioretention area were designed such that runoff will infiltrate to provide groundwater recharge as well as provide peak rate attenuation. The dry detention basin was designed only to provide peak rate attenuation. Outlet control structures from the surface basins and dry detention basin will discharge stormwater down gradient. A proprietary sedimentation device will be added to the town's drainage infrastructure that currently discharges onto the subject property to improve runoff water quality. The proposed site improvements will maintain the general drainage patterns of the site by discharging runoff to the same design points in post-development as pre-development conditions.

This letter serves to describe the relationship between the requirements of the MassDEP Handbook and "environmentally sensitive site design" considerations as well as the analysis of alternatives to any "point source" of "stormwater discharge" which may be regulated. The following sections provide detailed descriptions for the consideration of low impact development measures as listed by the MassDEP.

Environmentally Sensitive Site Design Considerations

The Department's requirement for the inclusion of Environmentally Sensitive Site Design was considered as part of the design of the stormwater management system. These considerations include review of low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting stormwater sheet flow paths and treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat. The proposed stormwater management system does not introduce any new point source discharges to resource areas.

A. *Reducing impervious surfaces*

The amount of proposed impervious surface for internal roadways has been reduced to the minimum requirements by the Town of Agawam for pavement and sidewalk width. The pavement width varies and is based on the estimated average daily trips and the sidewalk width was dictated by the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam. The roadway width varies between 30-feet and 36-feet for two-way travel and 20-feet for one-way travel. The sidewalks are 5-feet wide.

B. *Disconnecting stormwater sheet flow paths and treating stormwater at its source*

The proposed roadway has been carefully graded to conform to the requirements of the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam as was requested by the Town. Stormwater runoff from approximately 200-feet of new roadway will sheet flow to vegetated filter strip for treatment prior to discharging to a bioretention area to

provide groundwater recharge. On-site drainage patterns will be maintained and only the new roadway and front yards will be collected via the proposed stormwater infrastructure.

C. *Maximizing open space*

The proposed project has been limited to the on-site upland areas and roadway length was limited to the functional minimums required for a successful project. Existing vegetated areas have been protected to the maximum extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed.

D. *Minimizing disturbance*

The proposed development includes the construction of a new roadway, residential buildings, and stormwater management system. Existing vegetated areas have been protected to the maximum practicable extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed. No work is proposed within any resource areas.

E. *Protecting natural features and processes*

A significant portion of the proposed project is located within areas which have been previously cleared and/or disturbed. The proposed access roadway and stormwater management system has been designed to minimize the impacts to the wetland buffer zones and riverfront area while maintaining the general drainage patterns of the site.

F. *Enhancing wildlife habitat*

Impacts to wildlife habitat have been limited to functional minimums. The majority of the parcel where the site improvements are proposed has been historically disturbed.

Point Source Stormwater Discharge Alternatives Analysis

Under the Department's Outreach Document for 310 CMR 10.05(6)(k) through (q) and 314 CMR 9.06(5) & (6)(a) through (f), a list of considerations is provided for use in developing an Alternatives Analysis to point source stormwater discharge within Departmental jurisdiction.

For ease of review, the aforementioned list is repeated below in italics with responses after each item:

a. *Removal of all proposed work and/or impervious surfaces from the Department's jurisdiction;*

The existing site conditions, with the sloping topography and relatively high groundwater did not allow for a design that was completely outside jurisdiction. Buffer zone and riverfront area impacts have been reduced to functional minimums to provide access and to construct the stormwater management system. The proposed stormwater management system has been carefully designed such that runoff water quality is above MassDEP requirements, thereby limiting negative wetland impact.

b. *Division of the upper portion of the subject catchments into smaller subcatchments, where resultant stormwater discharges should be completely infiltrated and/or retained;*
The subcatchments were delineated based on the proposed roadway layout to maximize building separation while minimizing road length. Careful grading of the site allowed for a stormwater management system design that utilized multiple surface infiltration basins across the site to provide the required groundwater recharge.

c. *Maintaining existing drainage patterns and not mixing country drainage with untreated stormwater;*
The intent of this item has been achieved with the proposed layout of the stormwater management system maintaining existing drainage patterns of the site. Runoff collected from impervious surfaces are directed in the same general direction in post-development conditions as pre-development conditions.

d. *Treatment of remaining stormwater at or proximate to its source within these subcatchments;*
The intent of this requirement has been achieved with the decentralized nature of the proposed stormwater management system. The sloping topography of the site did not allow for intermediate basins, however, a bioretention area with vegetated filter strip was included upgradient of the extended dry detention basin to provide groundwater recharge closer its source.

e. *Installation of "qualifying pervious areas" to accept stormwater discharge from roads and driveways within each subcatchment;*
The proposed project was carefully designed to limit impervious areas to functional minimums. Generally, impervious areas are limited to buildings and shared access drives. Due to the shared nature and anticipated vehicles on the access drives pervious pavement was not a suitable stormwater alternative. Individual driveways and accessory impervious areas have been reduced to functional minimums and combined when possible.

f. *Installation of dry wells for acceptance of roof drainage;*
Do to the relatively high groundwater and proximity of several building units to wetland resource areas dry wells were not utilized for this project. This technique may be a viable option if favorable soil conditions and groundwater depths are discovered during building construction.

g. *Disconnection of roof drainage;*
A portion of stormwater generated from roof areas will flow away from the stormwater management system and drain directly to adjacent downgradient areas, however, for safety reasons during winter months and the potential for freezing on walkways some of the roof runoff will be piped directly to the surface infiltration basins.

h. *Installation of discrete structural Best Management Practices at relatively high elevations in each subcatchment. For instance, canting access road surfaces into grassed channels, water quality*

swales, vegetated filter strips, bioretention areas, sand and organic filters, drainage swales, level spreaders, etc. which terminate outside of the Department's jurisdiction;
This intent of this requirement has been met by directing sheet flow from paved areas to a bioretention area via a vegetated filter strip.

i. *Further describe:*
   1. *Reduction in impervious surfaces;*
      The proposed project has been designed to reduce impervious surfaces to functional minimums. Access roadway widths are designed to the minimums allowed based on town review and walkways and individual driveway widths are reduced to functional minimums.

   2. *Road width and length reductions;*
      The proposed roadway width has been designed to the minimum width required based on average daily traffic for the roadway and the length is the minimum required for a cost effective project buildout.

   3. *Clustering of impervious surfaces;*
      Impervious surfaces have been clustered to the maximum practical extent.

   4. *Addition of planted materials and landscaped areas;*
      A mix of nearly 300 deciduous and evergreen trees are proposed in landscaped areas across the site. In addition, numerous foundation plantings are proposed within landscaped areas adjacent to each building unit. Areas not used for roadways, parking, sidewalks, patios or buildings will be loamed and seeded.

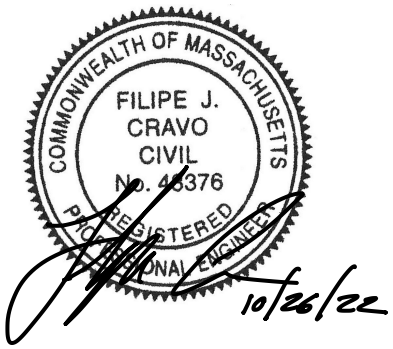
   5. *Re-grading of landscaped areas away from jurisdictional Resource Areas and their Buffer Zones; and*
      The general drainage patterns of the site have been maintained in post-development conditions and a stormwater management system has been designed to offset the impacts imposed by the development.

   6. *Preservation of vegetated areas within the Buffer Zone, and immediately proximate to jurisdictional resource areas.*
      The majority of the project is located outside jurisdictional areas and nothing is proposed within resource areas. An attempt was made to limit disturbance to buffer zones while at the same time design a project that was cost effective. The greatest impact to riverfront area was due to the construction of infiltration basin #3 and the extended dry detention basin which were situated based on site topography.

Stormwater Drainage Report

Proposed Condominium Community

497 South Westfield Street
Agawam, MA 01030
(Map E6, Block 2, Parcel 8)



Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

RLA Project File No. 090506

September 19, 2022

Revised: October 26, 2022

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I. INTRODUCTION

The project applicants, Ralph Depalma & Giuseppe Tirone, are proposing to construct an 81-unit condominium community on approximately 49.81 acres of land located at 497 South Westfield Street in Agawam, Massachusetts. A majority of the site is currently composed of agricultural land with the exception of wooded wetlands in the central portion of the property and wetlands located along the property boundaries. Currently, there is no stormwater management system at the project site.

The proposed project involves the following:

- Demolition of an existing single-family home and detached garage;
- Rerouting of two drainage outfalls that currently discharge onto the subject property. One collects runoff from South Westfield Street and the other captures runoff from a property on the west side of South Westfield Street and reaches the subject property via a culvert under the roadway;
- Construction of approximately 3,930 feet of roadway from the east side of South Westfield Street to provide access to 67 of the units. The remaining 14 units well have access directly from South Westfield Street;
- Construction of thirty-seven (37) multi-unit condominium buildings for a total of eighty (81) units;
- Installation of underground water, sanitary sewer, electric, gas and communication utility services;
- Construction of a stormwater management system including deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay.

The new drainage infrastructure has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

2. SITE DESCRIPTION

2.1 Predevelopment Conditions

The property to be developed is located at 497 South Westfield Street and is listed as parcel E6-2-8 by the Town of Agawam Assessor's office. The property is zoned Residence A-3 according to the Agawam zoning map. The project site is bounded by St. Anne's Country Club to the south and east, undeveloped agriculturally zoned land to the north and South Westfield Street to the west. The total parcel area is approximately 49.81 acres. There are four bordering vegetated wetlands present along the northern, eastern, and southeastern property lines and one centrally located bordering vegetated wetland that extends to the northerly property line. Philo Brook crosses through the property boundary in the northeastern-most corner of the site. A portion of Taylor Pond is located along the southerly property line adjacent to South Westfield Street. A town drainage outfall currently discharges to the project site and runoff from agricultural fields on the opposite side of South Westfield Street is conveyed to the subject parcel via a culvert pipe under the roadway. Figure 1 – USGS Map illustrates the location of the parcel. The project site is currently in agricultural use and consists almost entirely of tilled fields with a single-family home and accessory building.

In general, the topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the site. The highpoint of the site is along South Westfield Street which ranges in elevation from 215 to 221. From there the topography gradually slopes in an easterly direction toward Philo Brook at approximately elevation 170. Figure 4 – Pre-Development conditions delineates the pre-development sub-catchments areas.

2.2 Resource Areas

The project site contains a number of resource areas, including several bordering vegetated wetlands and bank associated with a tributary to Philo Brook. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various resource areas.

2.2.1 Floodplain

R. Levesque Associates, Inc. performed due diligence research on the property regarding FEMA flood zone mapping. As demonstrated by the most recent FEMA Flood Insurance Rate Maps, the property is not located within any flood hazard area. See Figure 2 – FEMA FIRM Map.

2.2.2 Natural Heritage and Endangered Species Program

R. Levesque Associates, Inc. performed due diligence research on the property regarding Natural Heritage and Endangered Species Program (NHESP) areas. The parcel is not located within an area delineated by NHESP as priority habitat of endangered species; see Figure 3 – NHESP Map.

2.3 Soils

R. Levesque Associates, Inc. researched the soils located on site with information readily available by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Based on a review of the USDA Soil Survey of Hampden County, Massachusetts, Central Part, the site is comprised of the following soil types:

Table 2.4: Hydrologic Soil Group Classification

Soil Description	Map Unit Symbol	Hydrologic Soil Group
Raynham silt loam	30A	C/D
Wareham loamy sand	32A	A/D
Merrimac fine sandy loam	254A/254B	A
Windsor loamy sand	255B	A
Amostown fine sandy loam	258B	C/D
Enfield silt loam	264B	B
Agawam fine sandy loam	275B	B
Ninigret fine sandy loam	276B	C
Meckesville loam	327B/327C	D
Wethersfield fine sandy loam	397B	C
Enosburg loamy sand	731A	C/D
Scantic variant silt loam	736A	C/D

A series of test pits were conducted by Terry Reynolds (S.E. 3090) and Gary Weiner (S.E. 2567) to evaluate the ability of the site to support stormwater drainage system components. A total of twelve test holes were dug in the vicinity of the proposed surface infiltration basins and dry detention basin. The following test holes were performed near the BMP indicated:

- Surface Infiltration Basin #1 TP-32
- Surface Infiltration Basin #2 RG2-TP, RG-4, TP-14, TP-15, TP-16
- Surface Infiltration Basin #3 BRB-1, BRB-TP, TP-7
- Dry Detention Basin TP-1, TP-2, TP-3

See Appendix B - Soils Information for supplemental information. Overall, on-site soil investigations corroborated USDA-NRCS mapping.

2.4 Post Development Conditions

The applicant is proposing to construct an 81-unit condominium community on the easterly side of South Westfield Street. Sixty-six of the units will be accessed by roughly 3,930 feet of new roadway while the remaining 14 will be accessed directly from South Westfield Street. The project will also include the installation of underground sanitary sewer, water, gas, and communication lines. In addition, a stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook. The proposed stormwater management system consists of deep-sump hooded catch basins, underground piping, a bioretention area with vegetated filter strip, a dry detention basin, and multiple surface infiltration basins with a sediment forebay. A proprietary sedimentation device will be added to improve the water quality of runoff from South Westfield Street that currently discharges to the project site untreated.

The stormwater management system has been designed to reduce the peak discharge rates from the 2, 10, and 100-year storm event. The bioretention area and surface infiltration basins have been designed to provide the required water quality treatment as well as infiltrate the required recharge volume for the impervious area proposed. Overall, the proposed site improvements will maintain the general drainage patterns of the site while improving water quality and reducing flow rates. Figure-5 – Post-Development Watershed Plan delineates the sub-catchment areas. This system has been designed to meet or exceed the standards required by the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

3. STORMWATER MANAGEMENT SYSTEM

R. Levesque Associates, Inc. has prepared the following drainage system calculations for the proposed project site. These calculations were performed to document compliance with the guidelines set forth by the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook (MassDEP Handbook). A detailed hydrologic analysis of the system was completed in order to evaluate the performance of the stormwater management system components. The proposed stormwater management system will collect runoff from on-site impervious areas and utilize stormwater best management practices to provide water quality treatment, groundwater recharge, and peak discharge rate attenuation. See Appendix C - Pre- and Post-Development Hydrologic Analysis for supplemental information.

3.1 Drainage Calculations

R. Levesque Associates, Inc. utilized the HydroCAD software program, Version 10.0, developed by HydroCAD Software Solutions LLC, in order to model and analyze the site hydrology. The HydroCAD software is based upon the Soil Conservation Service (SCS) "Technical Release 20 – Urban Hydrology for Small Watersheds" and "Technical Release 55 – Urban Hydrology for small Watersheds" which are generally accepted industry standard methodologies. The analysis was conducted in order to establish the peak discharge rates and estimated run-off volume from the project site. This was accomplished to properly evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters. Pre-development time of concentration (Tc) values were calculated based on existing site conditions. The minimum recommended time of concentration of six minutes was used in Post-Development calculations.

Drainage calculations were performed for pre and post-development conditions for the 24-hour, 2, 10, and 100-year Type III storm events. The total rainfall for each of the storm events was based upon data provided by the United States Department of Commerce Technical Paper No. 40 – Rainfall Frequency Atlas of the United States. Total rainfall values used in the hydrologic modeling for each event are shown in the following table:

Table 3.1: Design Rainfall Data		
2-year, 24-hour storm	10-year, 24-hour storm	100-year, 24-hour storm
3.00 inches	4.60 inches	6.50 inches

3.1.1 Design Points

In order to compare the difference between pre and post-development peak flows, existing and proposed watersheds were delineated. Multiple design points (DP) were established with flow paths representing the longest time of concentration of run-off in each tributary watershed. For this analysis, the design points were determined as follows:

- DP-1: Onsite Wetland – This design point represents the destination for stormwater runoff from the project area which flows to the centrally located wetland;
- DP-2: Offsite to Southeast – This design point represents the destination for stormwater runoff from the project area which flows in a southeasterly direction towards an on-site bordering vegetated wetland;
- DP-3: Offsite to Northeast – This design point represents the destination for stormwater runoff from the project area which flows in a northerly direction towards the perennial stream known as a tributary to Philo Brook.

3.1.2 Pre-Development Hydrology

The project area under existing conditions was analyzed as five sub-catchment areas discharging to the three design points as described above. The sub-catchments were delineated based on existing site topography. For further watershed detail please see Figure 4 titled "Pre-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.3 Post-Development Hydrology

The project area under proposed conditions was broken down into sixteen sub-catchments discharging to the same three design points as in pre-development conditions. For further watershed detail please see Figure 5 titled "Post-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.4 Peak Discharge Rates

The table below summarizes the Pre and Post-Development peak discharge rates for each Design Point:

Table 3.1.4 Pre- and Post-Development Peak Discharge Rates						
	2-year storm (cfs)		10-year storm (cfs)		100-year storm (cfs)	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Design Point 1	5.3	3.8	15.2	10.3	29.7	20.0
Design Point 2	4.6	2.8	10.6	6.1	18.3	11.9
Design Point 3	10.7	7.8	21.7	18.4	35.6	34.0

As depicted in the table, the post-development peak discharge rates do not increase over pre-development peak discharge rates for each of the storm events presented. This is accomplished by provided on site attenuation through the proposed dry detention basin, bioretention area and multiple surface infiltration basins.

3.2 Hydraulic Analysis

R. Levesque Associates, Inc. utilized the Hydraflow Storm Sewer Extension for AutoCAD Civil 3D 2020 software program developed by Autodesk, Inc., in order to analyze the hydraulic capacity of the proposed underground infrastructure. The analysis was conducted in order to verify that the proposed conveyance piping has sufficient capacity to convey up to and including the 24-hour, 100-year storm event. The data from the analysis was used to properly size the conveyance piping such that there is no surcharge of stormwater above the rim elevations within the paved areas. As part of the input parameter required for the hydraulic analysis, the tributary inlet areas were delineated based on topography and any additional connected discharges. Additionally, the characteristic land use coverages and flow paths were identified. Please refer to Appendix D for the hydraulic analysis of the proposed stormwater management system.

3.3 MassDEP Stormwater Management Standards

R. Levesque Associates, Inc. has designed the proposed stormwater management system to be in compliance with the MassDEP Stormwater Management Standards. Chapter 1, Volume 3 of the MassDEP Handbook outlines specific calculations, and other information, that must be submitted

with each report to document compliance. The following summary highlights elements of the proposed project and how they apply to each standard.

- *Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

  The proposed project provides water quality treatment to the guidelines of the MassDEP Handbook. Therefore, no new untreated stormwater is discharged.

- *Standard #2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

  The proposed stormwater management system has been designed such that the post-development peak discharge rates are less than the pre-development discharge rates for the 2-year, 10-year, and 100-year 24-hour storms. See Appendix C for the Hydrologic Analysis.

- *Standard #3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook.*

  The proposed stormwater management system has been designed with the capacity to infiltrate the required recharge volume. See Appendix E for the Required Recharge Volume Calculations.

- *Standard #4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. It is presumed that this standard is met when:*

  a. Suitable practices for source control and pollution prevention are identified in a long term pollution prevention plan, and thereafter are implemented and maintained;

  b. Structural stormwater BMPs practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

  c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

  The drainage design utilizes multiple systems to manage the stormwater runoff and provide the necessary water quality treatment. The treatment train for the first system tributary to

Design Point-1 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. The system tributary to Design Point-2 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. There are two separatee systems tributary to Design Point-3. One includes deep-sump hooded catch basins and surface infiltration basin with sediment forebay. The other includes a bioretention area with vegetated filter strip and a dry detention basin with sediment forebay. A proprietary sedimentation device will be added to the South Westfield Street drainage infrastructure prior to discharge to the project site in order to meet water quality standards. See Appendix E for the Water Quality Volume Calculations.

- *Standard #5 - For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by MassDEP to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

  This standard is not applicable.

- *Standard #6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater BMPs determined by MassDEP to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

  This standard is not applicable.

- *Standard #7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural BMPs requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

  This standard is not applicable.

- *Standard #8 – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention) shall be developed and implemented.*

  A Construction Period Erosion Control Plan has been provided in Appendix F.

- *Standard #9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

  A Long-term Operation & Maintenance Plan has been provided in Appendix G.

- *Standard #10 - All illicit discharges to the stormwater management system are prohibited.*

  An illicit discharge statement will be provided prior to discharge of stormwater to post-construction BMPs. See Appendix H for a copy of the Illicit Discharge Statement.

3.4 Stormwater Best Management Practices

The proposed stormwater management system was designed utilizing stormwater best management practices (BMP) as set forth by the MassDEP Handbook. The BMPs utilized as part of the stormwater management system include deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, a bioretention area, a dry detention basin and surface infiltration basins. All of the BMPs were designed to meet the requirements of the MassDEP Handbook and will provide water quality treatment, groundwater recharge, and peak rate attenuation in order to mitigate the impacts of the proposed site improvements. See Appendix E – MassDEP Calculations for the calculations required to document compliance. The following section provides a description of the best management practices (BMPs) being utilized on site.

3.4.1 Deep Sump Catch Basins

Deep-sump catch basins equipped with an oil/gas hoods are being utilized as structural pretreatment devices within the proposed stormwater management system. The catch basins will be constructed with a 4'-0" deep sumps to act as settling chambers and allow for adequate

storage of collected sediments. Catch basins are typically first in the line of water quality treatment.

3.4.2 Leaching Drywell

Leaching drywells are being utilized to provide groundwater recharge within the surface infiltration basin, particularly during frozen ground conditions. A leaching drywell is a pre-cast concrete barrel with an open bottom surrounded by free-draining crushed stone that permits runoff to infiltrate into the ground. Frequent maintenance of the leaching drywells is crucial to the long-term effectiveness of the stormwater management plan.

3.4.3 Proprietary Sedimentation Devices

Proprietary sedimentation devices are being utilized on site for the pretreatment of stormwater runoff, in addition to the catch basins, prior to discharging off-site. Treatment of the stormwater runoff is essential to improve water quality. Maintenance of the proprietary device is crucial to the long-term effectiveness of the stormwater management system. The stormwater management system is utilizing proprietary treatment devices in order to ensure that the amount of sediment reaching the basin is minimal.

3.4.4 Bioretention Areas

Bio-retention areas are a best management practice which is being utilized on site as part of the stormwater management system treatment train process to enhance water runoff quality, provide groundwater recharge and attenuate peak-discharge rates. Bio-retention areas utilize soils, plants, and microbes to treat stormwater before discharge to downstream drainage infrastructure or infiltration to provide groundwater recharge. The proposed bio-retention areas associated with this project will provide aesthetically pleasing vegetation within the site. Additionally, the bio-retention areas will provide stormwater pre-treatment and groundwater recharge prior to discharge, if necessary.

3.4.5 Dry Detention Basin with Sediment Forebay

Dry Detention basins accompanied by sediment forebays are typically utilized for the short-term detention of stormwater runoff from watershed areas such as those associated with this project that allows for a controlled release of runoff to meet pre-development flow rates. The proposed dry detention basin has been designed to store the volume required to meet the peak rate attenuation requirements of standard 2. The tributary watershed consists of the proposed roadway, walks, driveways, single-family homes and surrounding vegetated areas.

3.4.6 Surface Infiltration Basin with Sediment Forebay

Infiltration basins accompanied by sediment forebays are well suited to meet the water quality and water quantity requirements from watershed areas such as those associated with this project. The infiltration basin with associated sediment forebay mitigates the impact of the proposed site improvements by attenuating the peak discharge rates and retaining the stormwater volume over a period of time. The proposed infiltration basins have been designed to mimic the existing drainage patterns of the site. An outlet control structure will be installed within the basin such that discharge is equal to pre-development conditions upon completion of the proposed site improvements.

3.5 Protection of Stormwater Best Management Practices during Construction

Protection of the stormwater best management practices during construction will ensure the proper functioning of the stormwater management system and provide protection to the undisturbed areas until the site has been stabilized. Certain specific erosion and sedimentation controls and good practices to be performed by the site contractor have been documented in a Construction Period Erosion Control Plan. See Appendix F – Construction Period Erosion Control Plan.

3.6 Inspection and Maintenance of Stormwater Best Management Practices

Frequent maintenance of the stormwater best management practices is essential to ensuring that the stormwater management system will function properly long-term. The MassDEP provides guidelines for the regular inspection and maintenance of the proposed stormwater best management practices. A Long-Term Stormwater Operation and Maintenance Plan has been prepared which dictates the inspection frequency and maintenance operations for each BMP. See Appendix G – Long-Term Operation and Maintenance Plan.

3.7 Illicit Discharge Compliance Statement

RLA has prepared an Illicit Discharge Compliance Statement to document compliance with the Massachusetts Department of Environmental Protection Stormwater Management Handbook, see Appendix H.

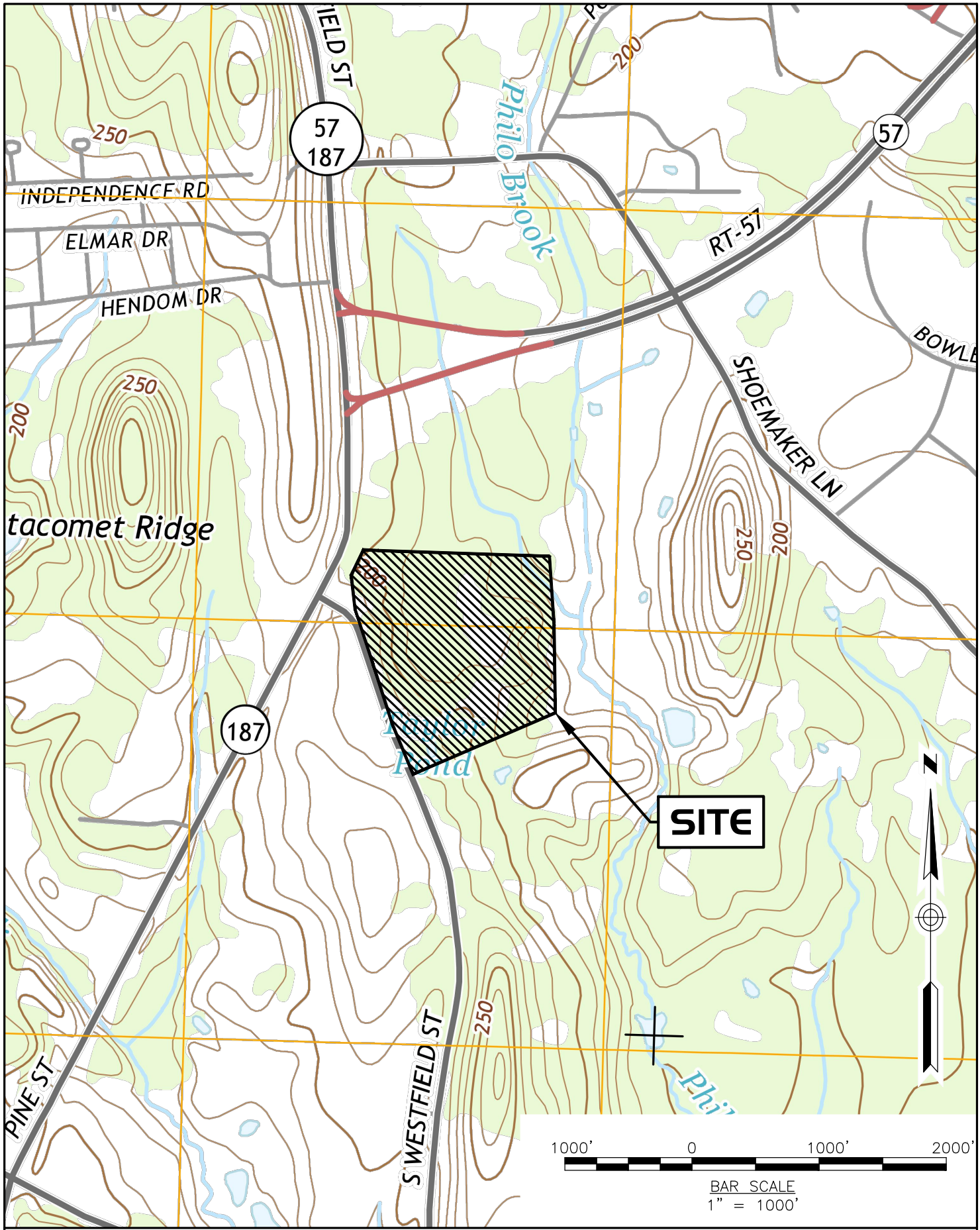
3.8 Low-Impact Development Alternatives Analysis Narrative

RLA has prepared a Low-Impact Development Alternatives Analysis Narrative as part of the Stormwater Drainage Report, see Appendix I.

4. CONCLUSION

The proposed stormwater management system has been designed to mitigate the impacts of the proposed site improvements by providing a control for runoff water quality and water quantity. The proposed site improvements, including the stormwater management system, will utilize best management practices approved by the MassDEP Stormwater Handbook. The best management practices have been incorporated to provide water quality treatment and groundwater recharge. Implementation of stormwater best management practices including such deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay to allow for a stormwater drainage design that is in conformance with the criteria set forth in the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

Figure 1: Site Locus – USGS Map



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SITE LOCUS
USGS MAP

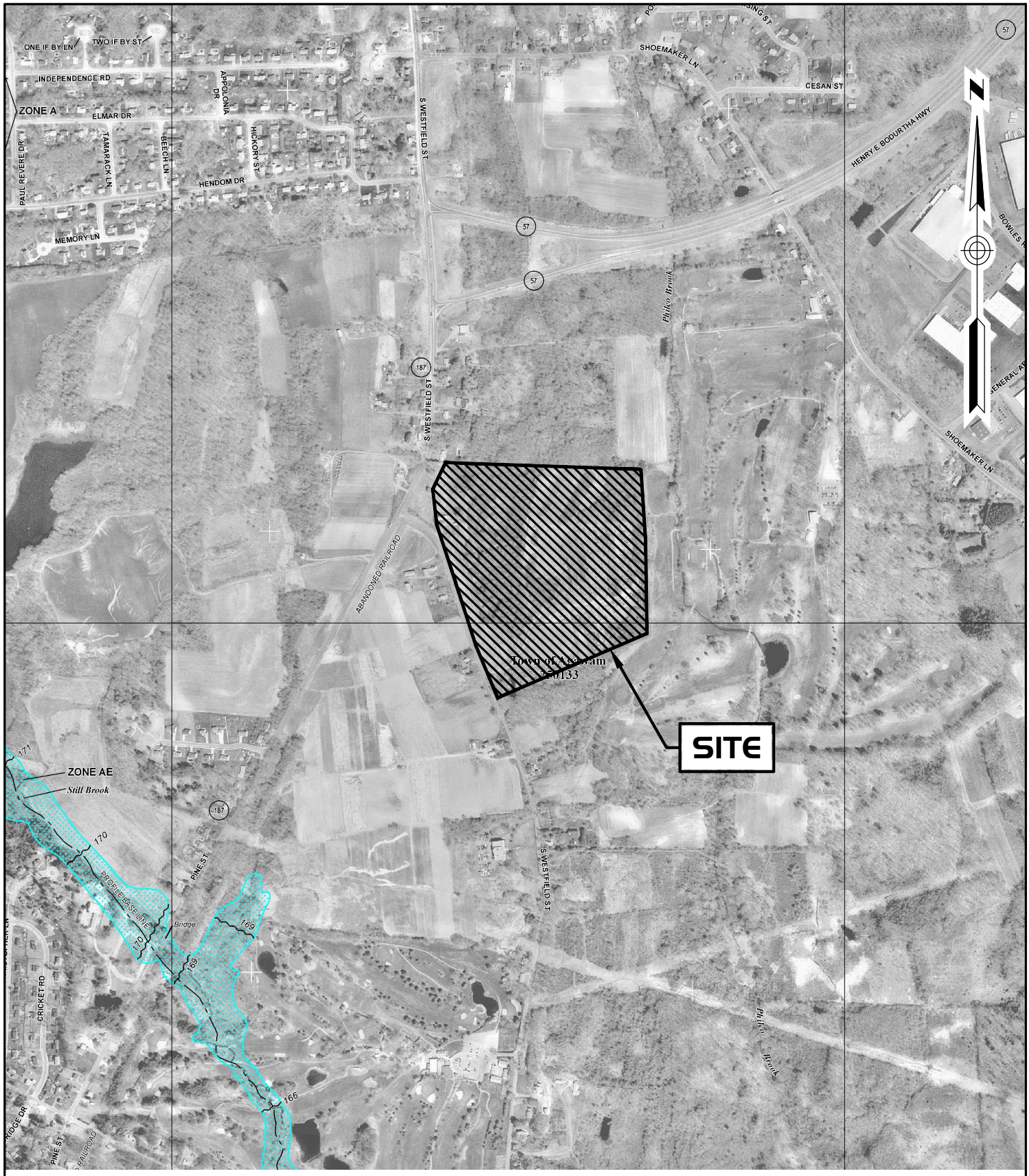
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO: 090506
DATE: 2/10/22
SCALE: As noted

FIG-1

Figure 2: FEMA Flood Map



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FLOOD RATE INSURANCE MAP

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO:	090506
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FIG-2

Figure 3: NHESP Map



NOTE: THERE ARE NO NHESP POLYGONS WITHIN MAP AREA

1000' 0 1000' 2000'

BAR SCALE
1" = 1000'

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NHESP Area Map

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
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497 South Westfield Street
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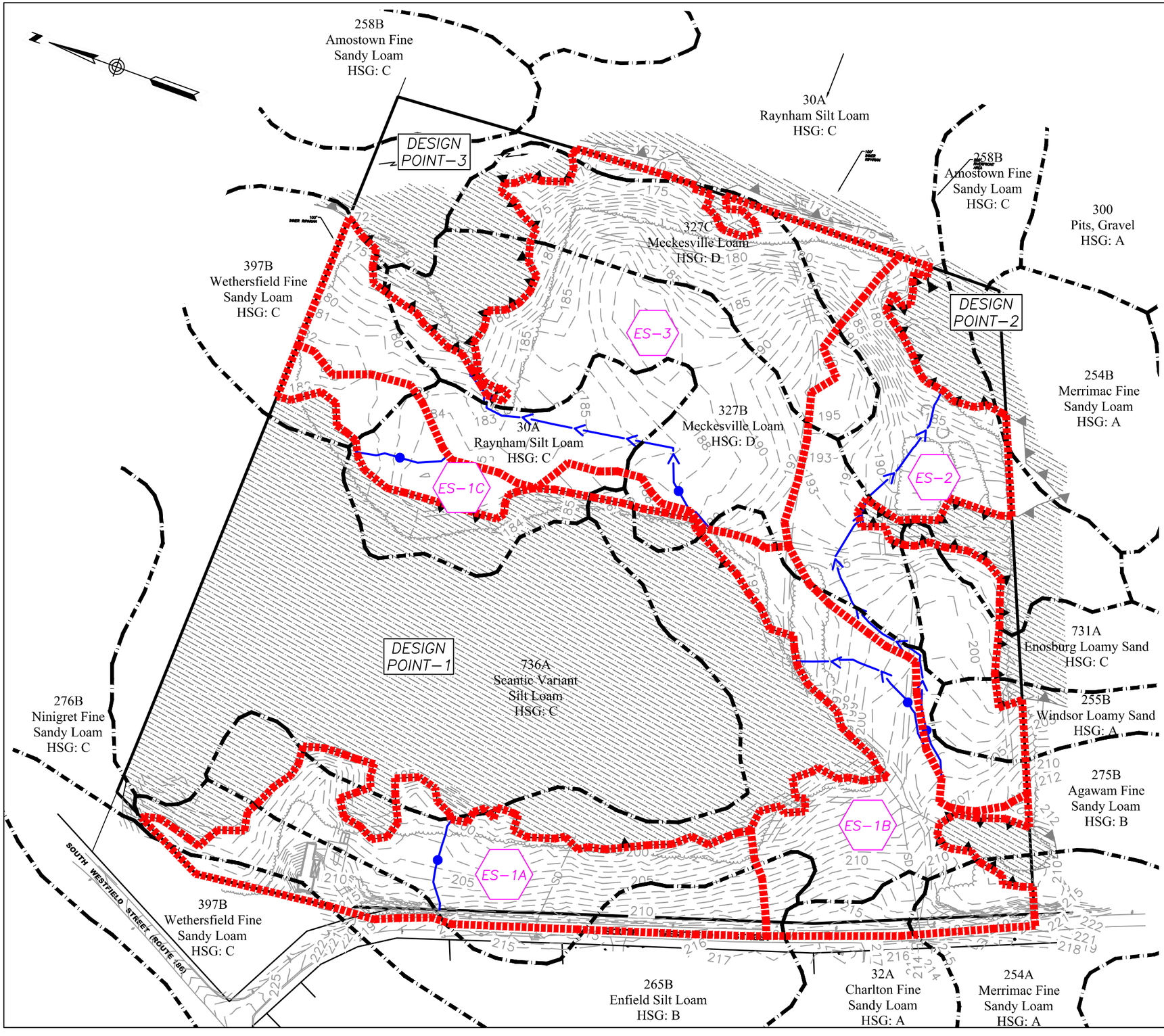
FIG-3

Figure 4: Pre-Development Watershed Plan



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Pre-Development Watershed Plan

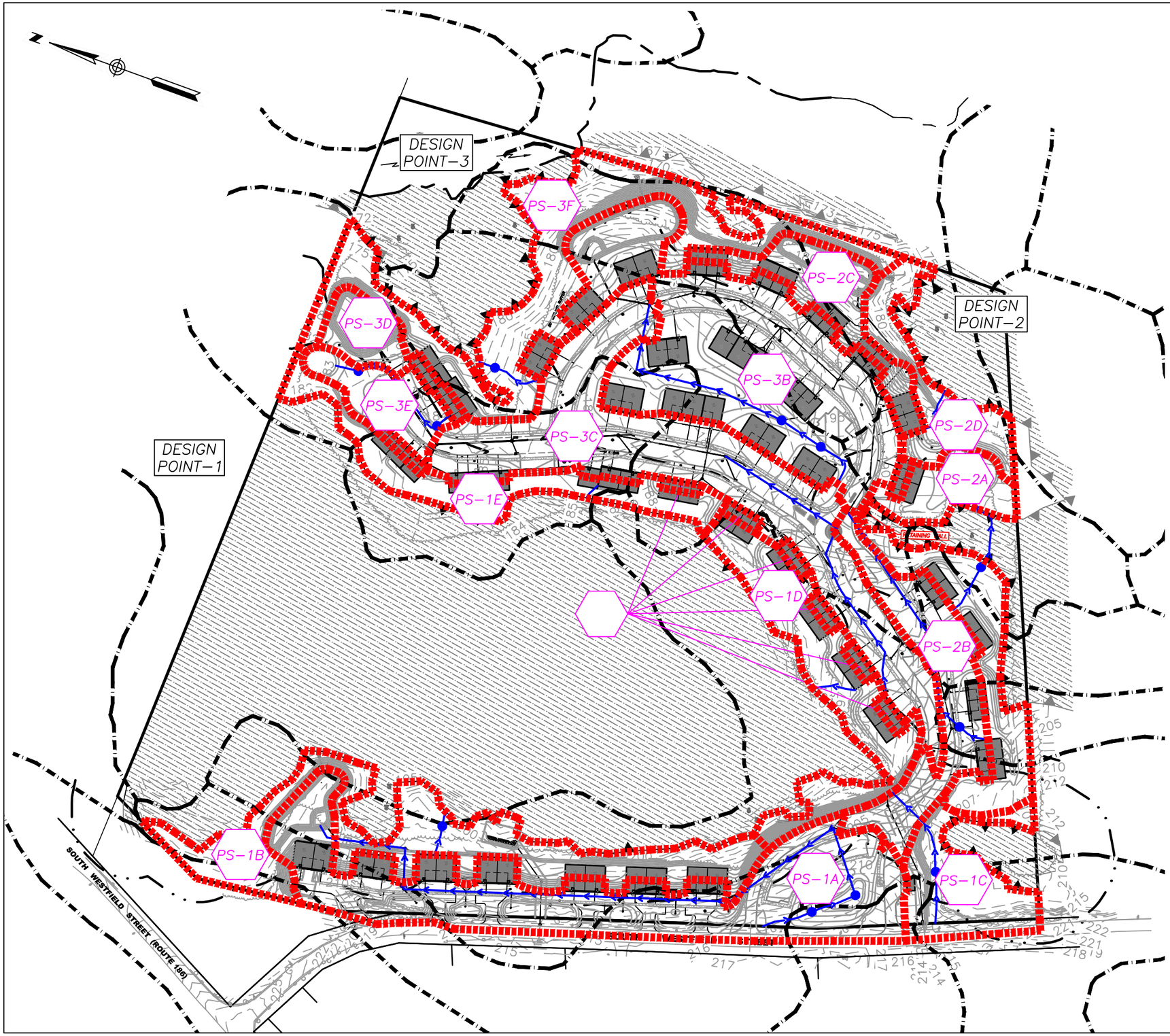
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506
DATE: 9/19/22
SCALE: As Noted

FIG-4

Figure 5: Post-Development Watershed Plan



REVISED: 10/26/22

R LEVESQUE ASSOCIATES, INC
A Land Planning Services Company
40 School Street · P.O. Box 640 · Westfield, MA 01086
ph: 413.568.0985 fax: 413.568.0986 rlaland.com

Post-Development Watershed Plan

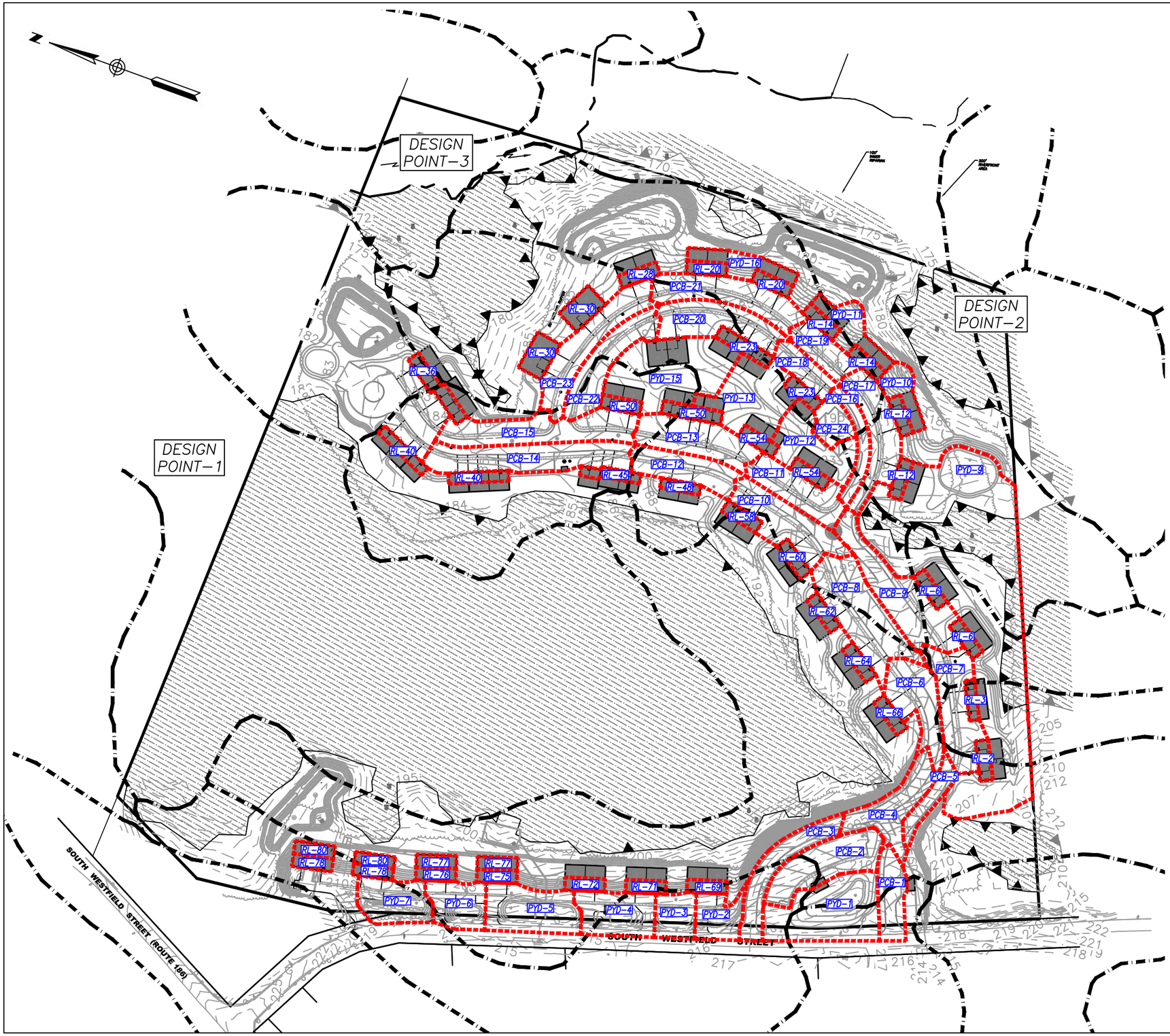
Proposed Residential Development
497 South Westfield Street
Agawam, Massachusetts

Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506
DATE: 9/16/22
SCALE: As Noted

FIG-5

Figure 6: Inlet Area Plan



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Inlet Area Plan

Proposed Residential Development
497 South Westfield Street
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Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506
DATE: 9/19/22
SCALE: As Noted

FIG-6

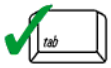
Appendix A: Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

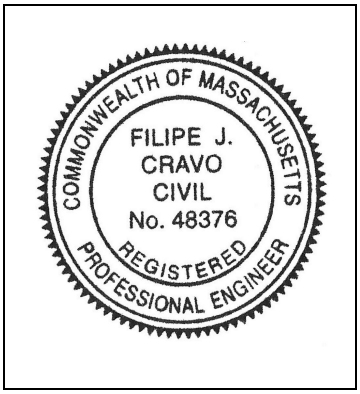
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



10/26/22

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☐ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B: Soils Information

- NRCS Custom Soil Resource Report

- Test pit information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part

South Westfield Street



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

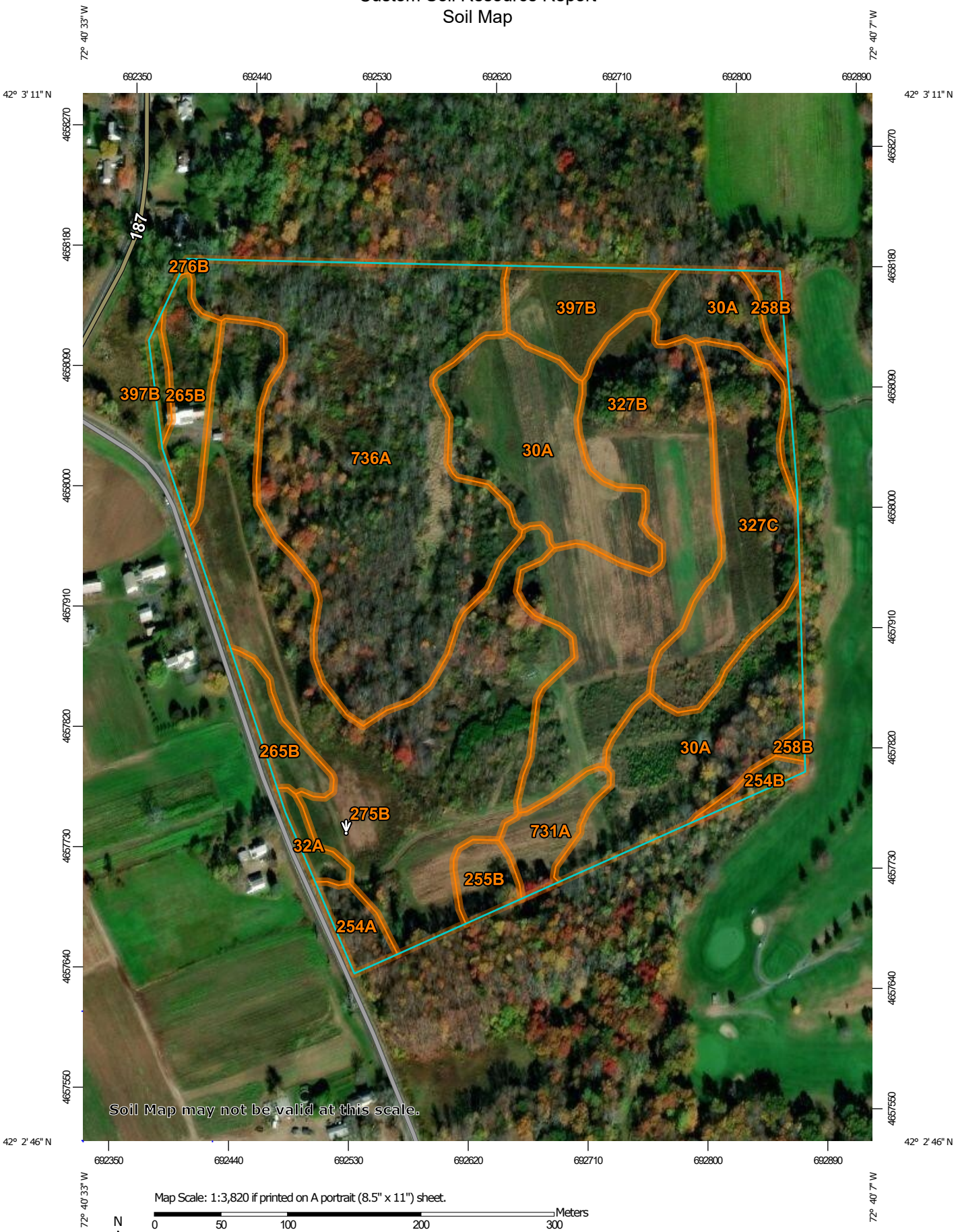
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 14, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Raynham silt loam, 0 to 3 percent slopes	8.9	17.9%
32A	Wareham loamy sand, 0 to 3 percent slopes	0.3	0.6%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.5	1.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.3	0.5%
255B	Windsor loamy sand, 3 to 8 percent slopes	0.6	1.2%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.4	0.7%
265B	Enfield silt loam, 3 to 8 percent slopes	2.0	4.0%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	11.0	22.1%
276B	Ninigret fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
327B	Meckesville loam, 3 to 8 percent slopes	7.0	14.1%
327C	Meckesville loam, 8 to 15 percent slopes	3.8	7.6%
397B	Wethersfield fine sandy loam, 3 to 8 percent slopes	1.9	3.7%
731A	Enosburg loamy sand, 0 to 3 percent slopes	0.9	1.8%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	12.3	24.6%
Totals for Area of Interest		**49.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden County, Massachusetts, Central Part

30A—Raynham silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99r3
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Raynham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raynham

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 24 inches: silt loam
H3 - 24 to 60 inches: stratified very fine sand to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 31 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Belgrade

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scantic variant
Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

32A—Wareham loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 99rs
Elevation: 0 to 3,280 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Wareham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wareham

Setting
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits

Typical profile
H1 - 0 to 13 inches: loamy sand
H2 - 13 to 60 inches: sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Deerfield

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, moraines, outwash plains, outwash terraces, stream terraces, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash terraces, outwash plains, kames, eskers, moraines
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Deltas, dunes, outwash terraces, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Eskers, stream terraces, moraines, outwash terraces, outwash plains, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

258B—Amostown fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 99ms
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Amostown and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amostown

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over hard silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 32 inches: fine sandy loam
H3 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Minor Components

Pollux

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Enosburg

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

265B—Enfield silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99nx
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-silty eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 25 inches: silt loam
H3 - 25 to 60 inches: stratified sand to very gravelly fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Ninigret

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

275B—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqx
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Agawam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Outwash terraces, kame terraces, kames, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam

2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Kames, deltas, outwash plains, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent

Landform: Outwash terraces, deltas, outwash plains, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

276B—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyr6
Elevation: 0 to 1,250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Depressions, drainageways, outwash terraces, kames, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, dip, rise
Down-slope shape: Concave, linear, convex
Across-slope shape: Concave, convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 17 to 39 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY026CT - Moist Silty Outwash
Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent
Landform: Kame terraces, kames, outwash terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

327B—Meckesville loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99pr
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

327C—Meckesville loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99ps
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

397B—Wethersfield fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99rt
Elevation: 130 to 460 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wethersfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy basal till derived from sandstone and shale

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 26 inches: gravelly fine sandy loam
H3 - 26 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 32 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wilbraham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

731A—Enosburg loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99nz
Elevation: 50 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Enosburg and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enosburg

Setting

Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over soft loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 26 inches: sand
H3 - 26 to 60 inches: silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 16 to 34 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Eldridge

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

736A—Scantic Variant silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99rb
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scantic variant and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic Variant

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Buxton variant

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-32**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-7	A	10YR3/2				SL			GR	FR	
7-22	B	7.5YR3/4				LS			SBK	FR	
22-38	C1	7.5YR5/3				S			SG	FR	
38-102	C2	7.5YR5/2				S			SG	FR	

Additional Notes Weeping @ 88"

8|28|13
1:30 P.m.

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD ST.
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RG2 - TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	A_P	10YR 3/6				LS			FRIABLE		
12"-26"	B	10YR 4/6		NONE		SL					
26"-95"	C_1	2.5YR 3/4		OBSERV.		SL		NONE		DRY	
95"-140"	C_2	7.5YR 4/3				SL	<15%	FEW STONES	MASSIVE FIRM	MOIST @ BOTTOM	

Additional Notes:

NO SEEPS

STANDING WATER @ 138" - STATIC

IN CORN FIELD - EL. 179 ±

5|3|13
SUNNY, WARM

Commonwealth of Massachusetts
City/Town of AGAWAM
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RAIN GARDEN #4 - (FORMERLY BASIN #1)

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-7"	A_P	10YR 3/4				SL					
7"-23"	B	10YR 4/6		NONE		LS					
23"-110"	C	7.5YR 4/3		OBSERV.		SL		NONE	COMPACT	DRY	

Additional Notes:

NO SEEPS ; NO STANDING WATER

HOLE LEFT OPEN 1.5 HOURS

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-14**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	20	10YR5/8	C	SL			SBK	FR	
21-65	C1	2.5YR5/2				SL			M	F	
65-93	C2	2.5YR5/3				LS	10		M	FR	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-15**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-27	B	7.5YR3/4	22	10YR5/8	C	SL			SBK	FR	
27-96	C1	2.5YR5/3				SL			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-16**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-21	B	7.5YR3/4				SL			SBK	FR	
21-76	C1	2.5YR5/3				S	10		SG	L	
76-108	C2	2.5YR5/3				LS			M	FR	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of AGAWAM
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	PLOWED	10YR 4/4				SL					
12"-17"	B	10YR 4/6		NONE		SL					
17"-108"	C	5YR 4/4		OBSERV		LS		NONE		DRY	

Additional Notes:

NO SEEP; NO STANDING WATER

8/20/15
2:30 P.M

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD STREET
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB -TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-14"	A_P	10YR 4/4				LS			FRIABLE		
14"-32"	B	10YR 4/6		NONE		SL					
32"-174"	C	5YR 4/4		OBSERV.		SL	<15%	FEW @ 14'	MASSIVE FIRM	DRY	

Additional Notes:

NO SEEPS

NO STANDING WATER

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-7**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-9	Ap	10YR3/2				L			GR	FR	
9-16	B	7.5YR3/4				SL			SBK	FR	
16-38	C1	2.5YR5/3	24	10YR5/8	C	SL			M	FR	
38-83	C2	2.5YR5/3				SILT			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-1**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-10	Ap	10YR3/2				L			GR	FR	
10-34	B	7.5YR3/4	10	10YR5/8	C	SL			SBK	FR	
34-96	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 34"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-2**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	17	10YR5/8	C	SL			SBK	FR	
21-100	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 21"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

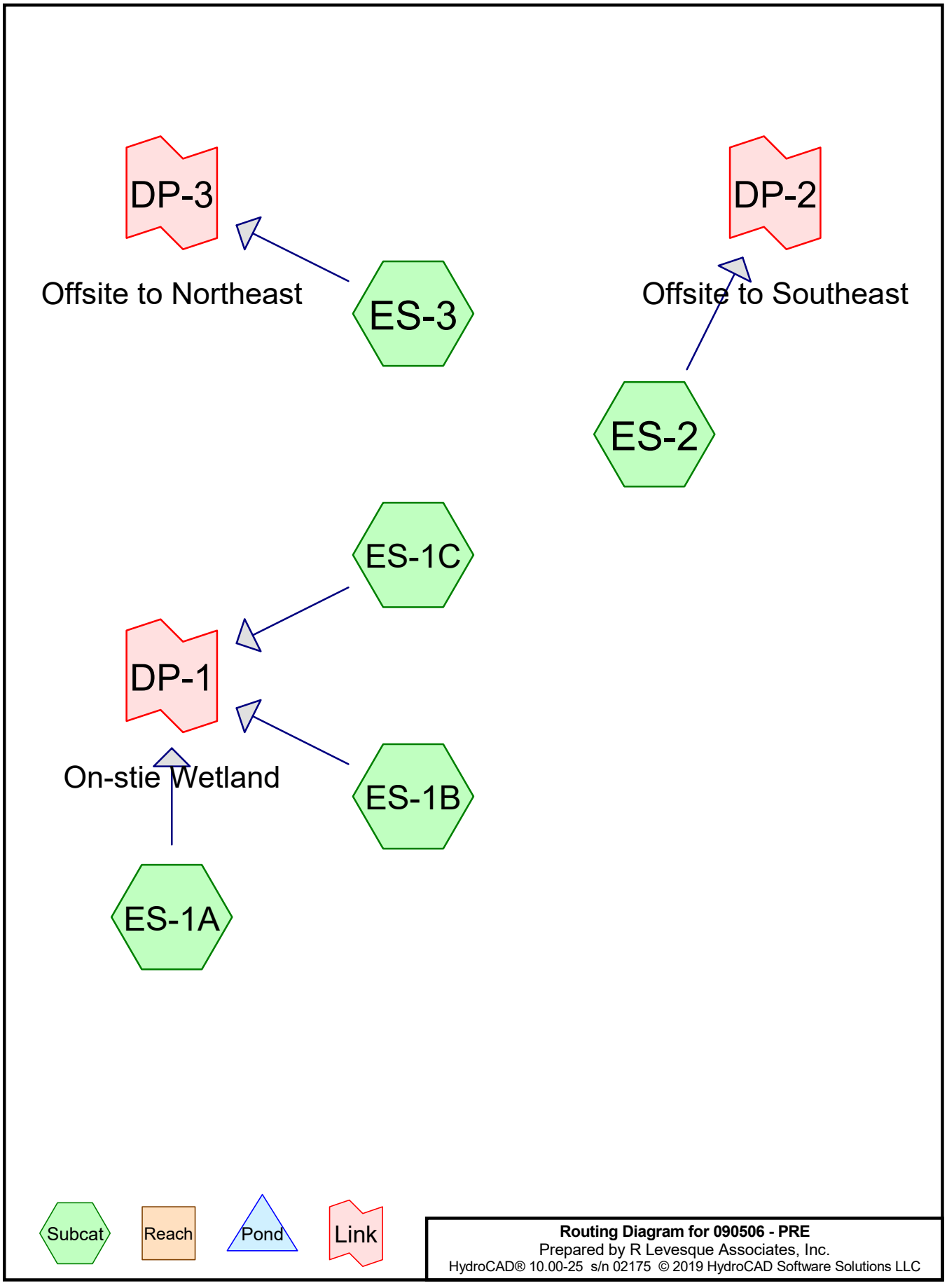
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-3**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4				SL			SBK	FR	
21-36	C	7.5YR3/4	22	10YR5/8	C	SL	5		M	FR	
36-55	C2	7.5YR3/4				FSL			M	FR	
55-102	C3	7.5YR3/4				SL	5		M	F	

Additional Notes Weeping @ 40"

Appendix C: Pre- and Post- Development Hydrologic Analysis (2, 10, & 100 Year Storm Events)


DP-3
Offsite to Northeast
ES-3
DP-2
Offsite to Southeast
ES-2
ES-1C
DP-1
On-stie Wetland
ES-1B
ES-1A
Subcat
Reach
Pond
Link
Routing Diagram for 090506 - PRE
Prepared by R Levesque Associates, Inc.
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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=219,526 sf 6.24% Impervious Runoff Depth=0.61"
Flow Length=185' Tc=11.3 min CN=64/98 Runoff=2.2 cfs 11,200 cf

Subcatchment ES-1B: Runoff Area=205,213 sf 3.07% Impervious Runoff Depth=0.54"
Flow Length=386' Tc=12.8 min CN=64/98 Runoff=1.7 cfs 9,222 cf

Subcatchment ES-1C: Runoff Area=68,405 sf 0.00% Impervious Runoff Depth=1.19"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=1.5 cfs 6,775 cf

Subcatchment ES-2: Runoff Area=253,127 sf 0.00% Impervious Runoff Depth=1.02"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=4.6 cfs 21,411 cf

Subcatchment ES-3: Runoff Area=457,052 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=10.7 cfs 50,028 cf

Link DP-1: On-stie Wetland Inflow=5.3 cfs 27,196 cf
Primary=5.3 cfs 27,196 cf

Link DP-2: Offsite to Southeast Inflow=4.6 cfs 21,411 cf
Primary=4.6 cfs 21,411 cf

Link DP-3: Offsite to Northeast Inflow=10.7 cfs 50,028 cf
Primary=10.7 cfs 50,028 cf

Total Runoff Area = 1,203,323 sf Runoff Volume = 98,635 cf Average Runoff Depth = 0.98"
98.34% Pervious = 1,183,335 sf 1.66% Impervious = 19,988 sf

Summary for Subcatchment ES-1A:

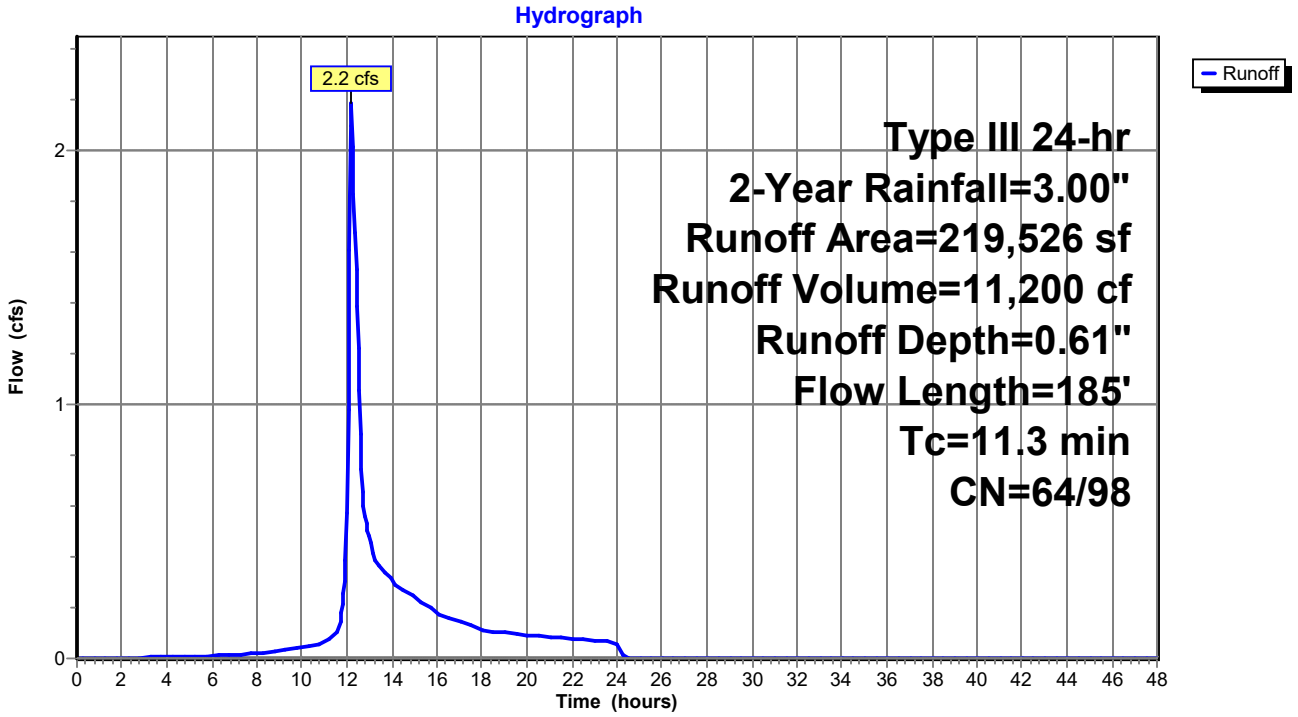
Runoff = 2.2 cfs @ 12.19 hrs, Volume= 11,200 cf, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
30,140	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
11,476	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
51,897	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
219,526	67	Weighted Average
205,830	64	93.76% Pervious Area
13,696	98	6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

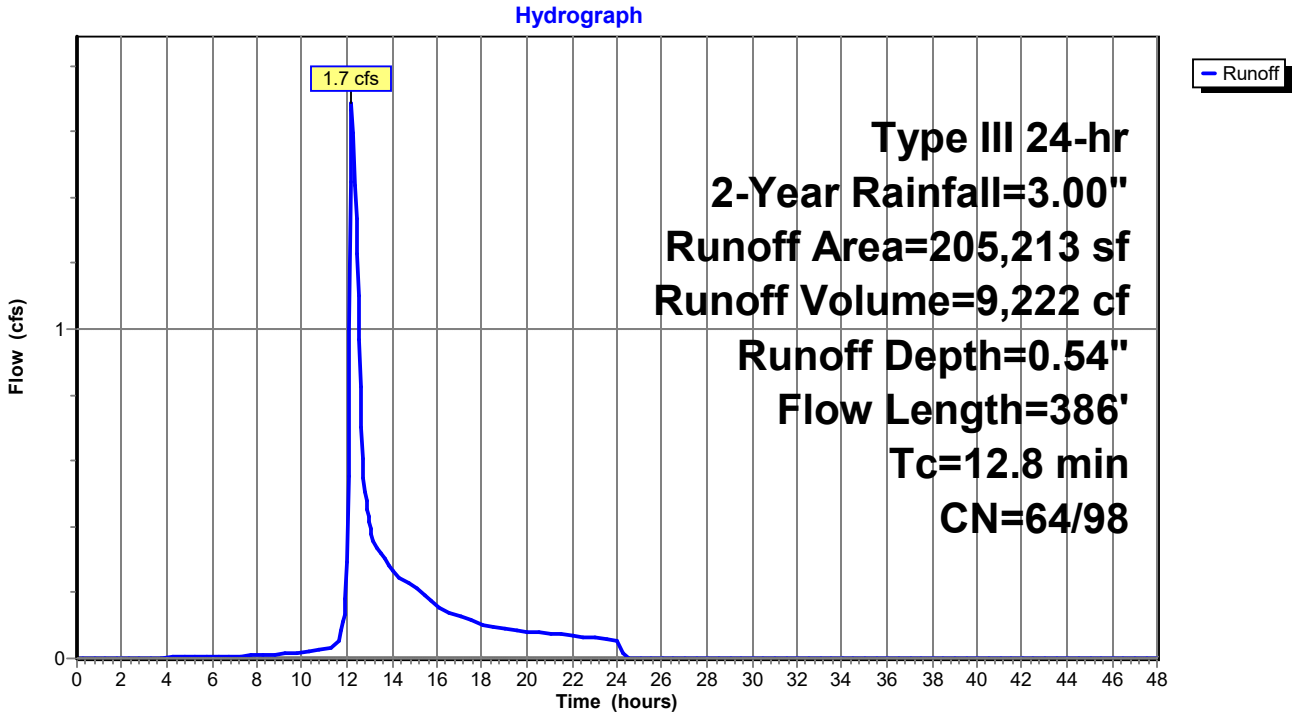
Runoff = 1.7 cfs @ 12.22 hrs, Volume= 9,222 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
6,441	39	>75% Grass cover, Good, HSG A
925	61	>75% Grass cover, Good, HSG B
2,452	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
5,917	98	Paved parking, HSG A
375	98	Paved parking, HSG B
11,535	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
205,213	65	Weighted Average
198,921	64	96.93% Pervious Area
6,292	98	3.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

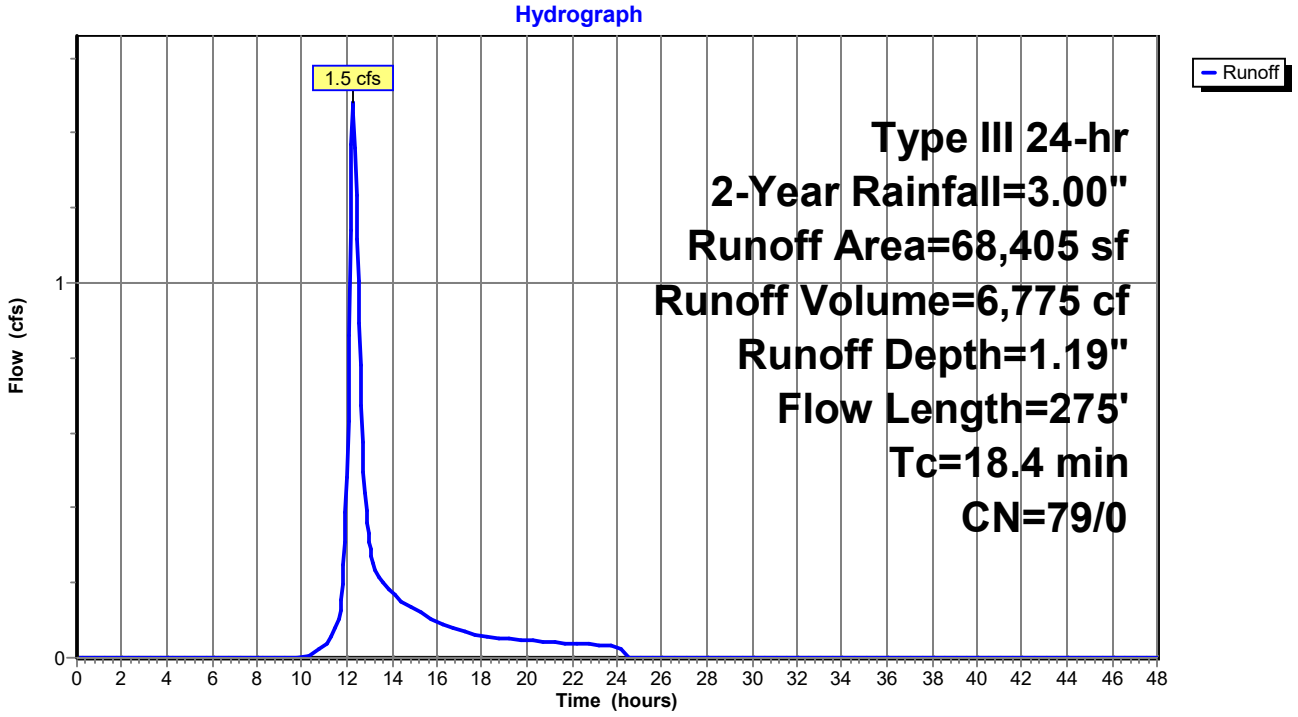
Runoff = 1.5 cfs @ 12.27 hrs, Volume= 6,775 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,405	79	Weighted Average
68,405	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

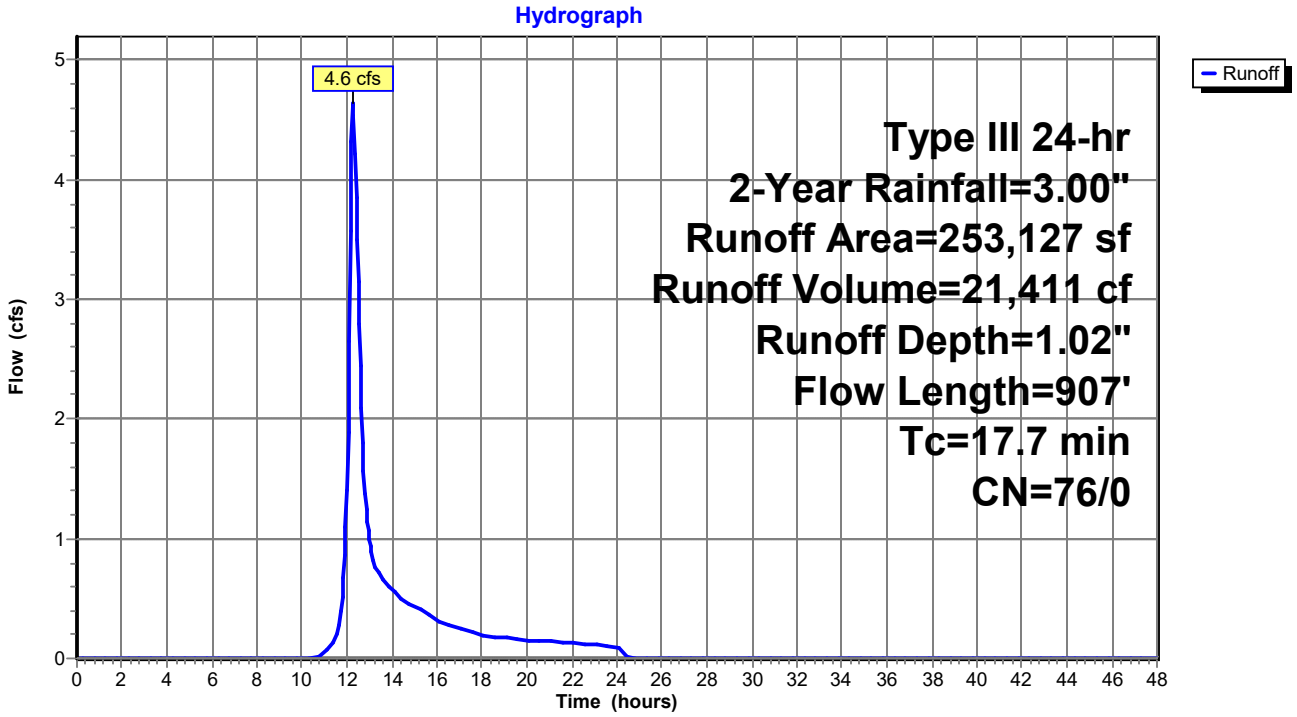
Runoff = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,127	76	Weighted Average
253,127	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

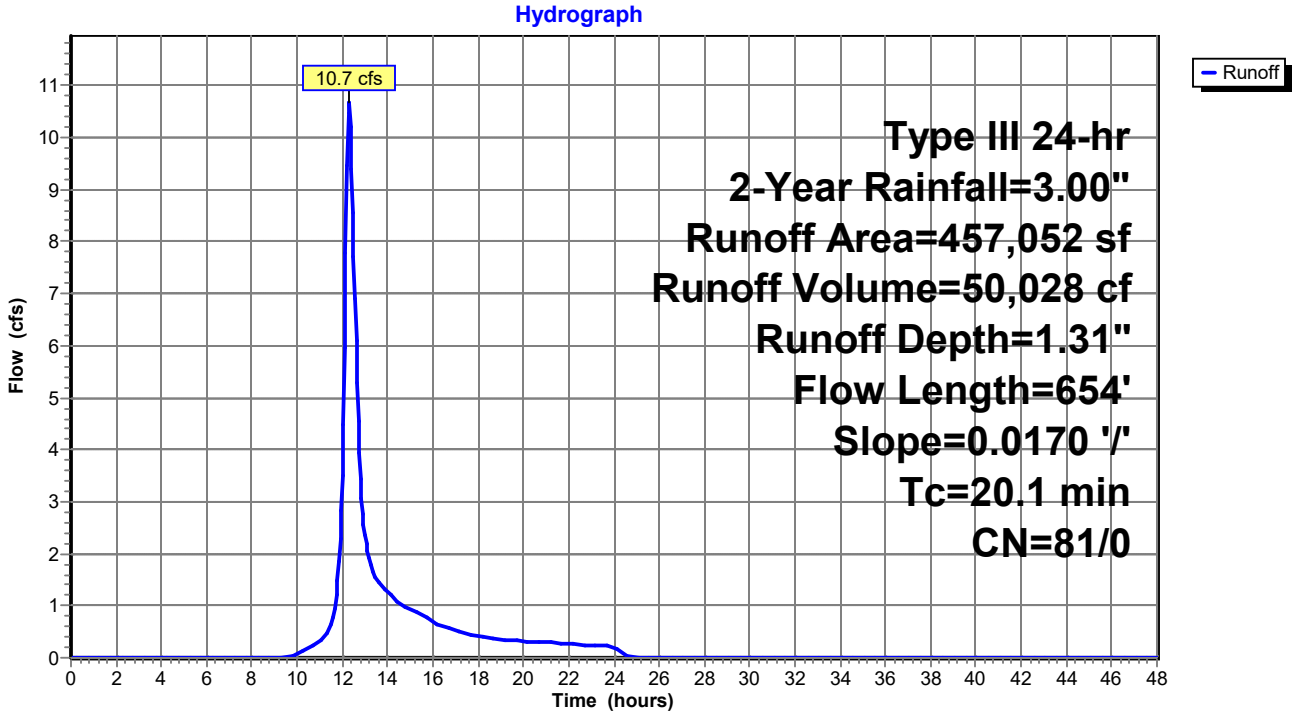
Runoff = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,052	81	Weighted Average
457,052	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

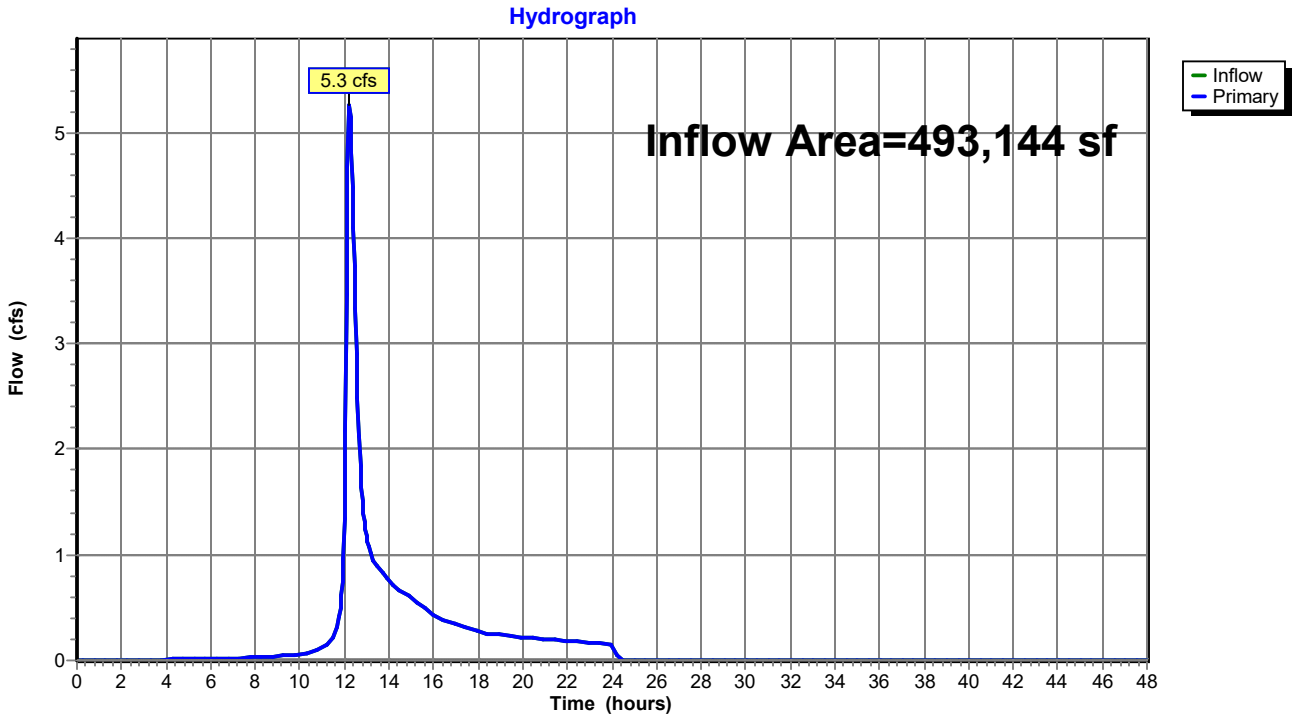


Summary for Link DP-1: On-stie Wetland

Inflow Area = 493,144 sf, 4.05% Impervious, Inflow Depth = 0.66" for 2-Year event
Inflow = 5.3 cfs @ 12.22 hrs, Volume= 27,196 cf
Primary = 5.3 cfs @ 12.22 hrs, Volume= 27,196 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

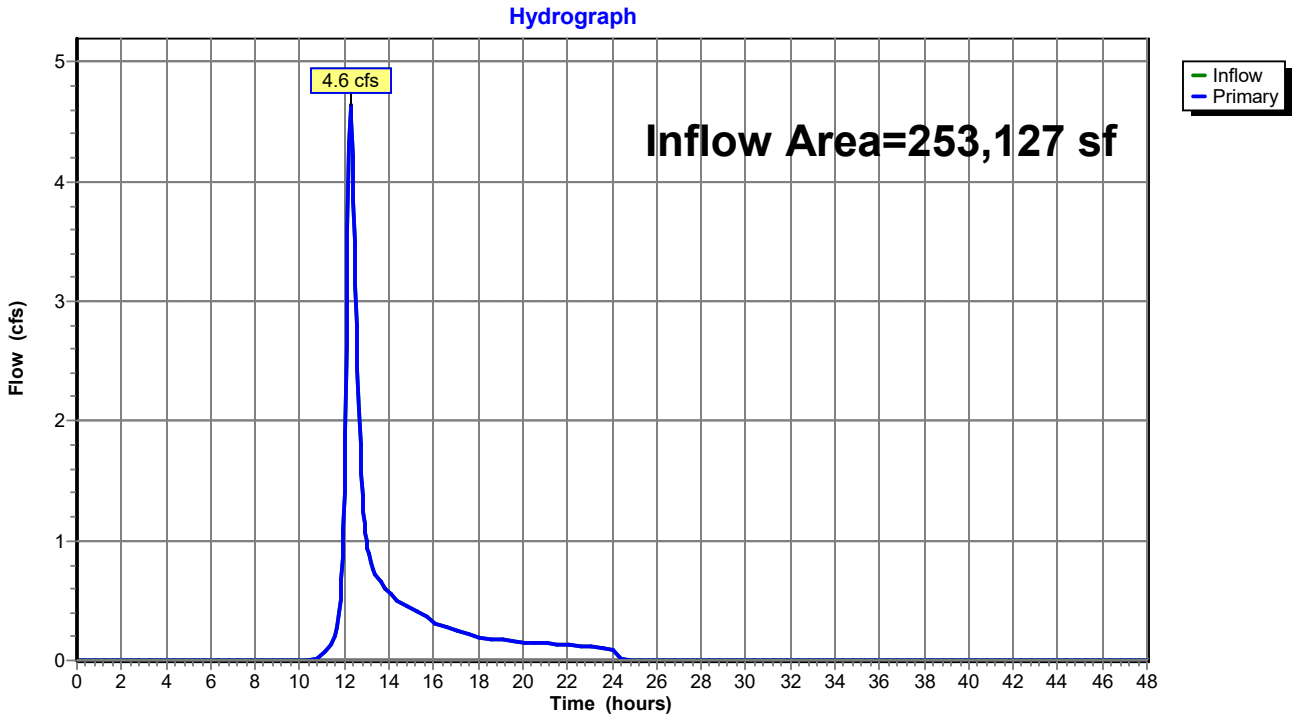


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,127 sf, 0.00% Impervious, Inflow Depth = 1.02" for 2-Year event
Inflow = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf
Primary = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

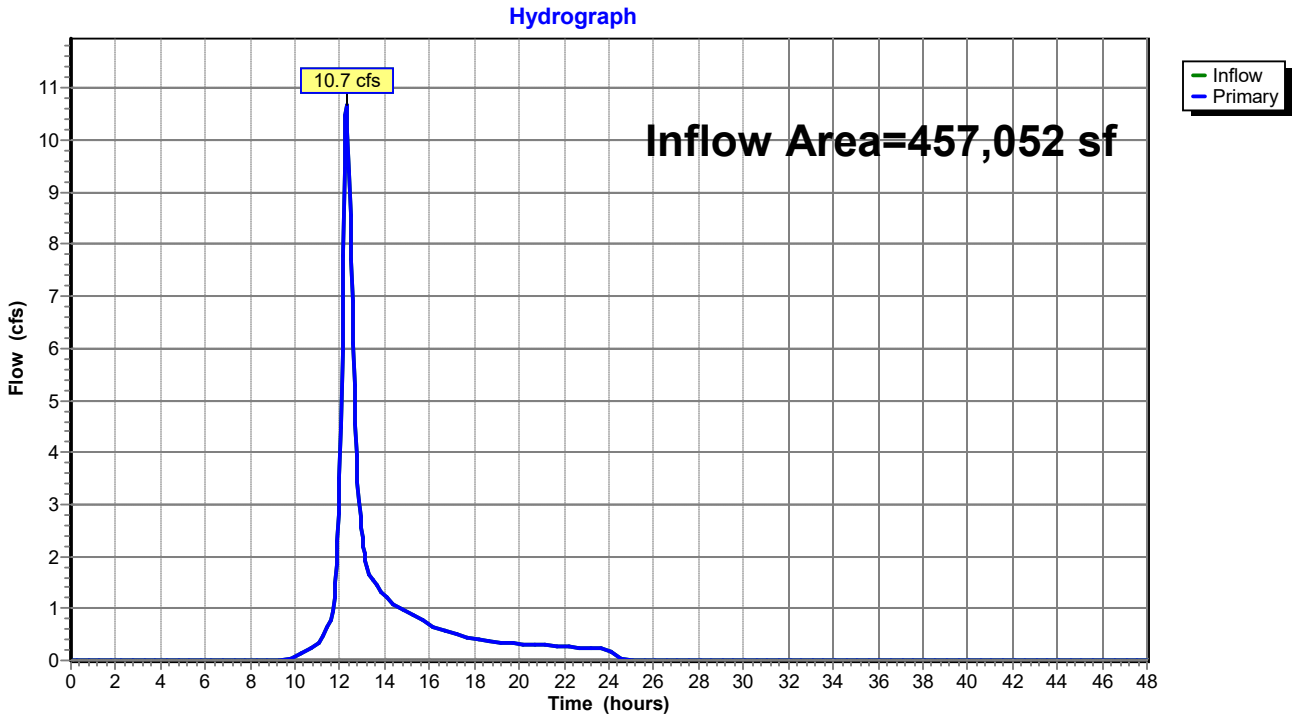


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,052 sf, 0.00% Impervious, Inflow Depth = 1.31" for 2-Year event
Inflow = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf
Primary = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=219,526 sf 6.24% Impervious Runoff Depth=1.52"
Flow Length=185' Tc=11.3 min CN=64/98 Runoff=6.8 cfs 27,742 cf

Subcatchment ES-1B: Runoff Area=205,213 sf 3.07% Impervious Runoff Depth=1.42"
Flow Length=386' Tc=12.8 min CN=64/98 Runoff=5.7 cfs 24,285 cf

Subcatchment ES-1C: Runoff Area=68,405 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=3.1 cfs 14,027 cf

Subcatchment ES-2: Runoff Area=253,127 sf 0.00% Impervious Runoff Depth=2.21"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=10.6 cfs 46,615 cf

Subcatchment ES-3: Runoff Area=457,052 sf 0.00% Impervious Runoff Depth=2.63"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=21.7 cfs 100,351 cf

Link DP-1: On-stie Wetland Inflow=15.2 cfs 66,054 cf
Primary=15.2 cfs 66,054 cf

Link DP-2: Offsite to Southeast Inflow=10.6 cfs 46,615 cf
Primary=10.6 cfs 46,615 cf

Link DP-3: Offsite to Northeast Inflow=21.7 cfs 100,351 cf
Primary=21.7 cfs 100,351 cf

Total Runoff Area = 1,203,323 sf Runoff Volume = 213,020 cf Average Runoff Depth = 2.12"
98.34% Pervious = 1,183,335 sf 1.66% Impervious = 19,988 sf

Summary for Subcatchment ES-1A:

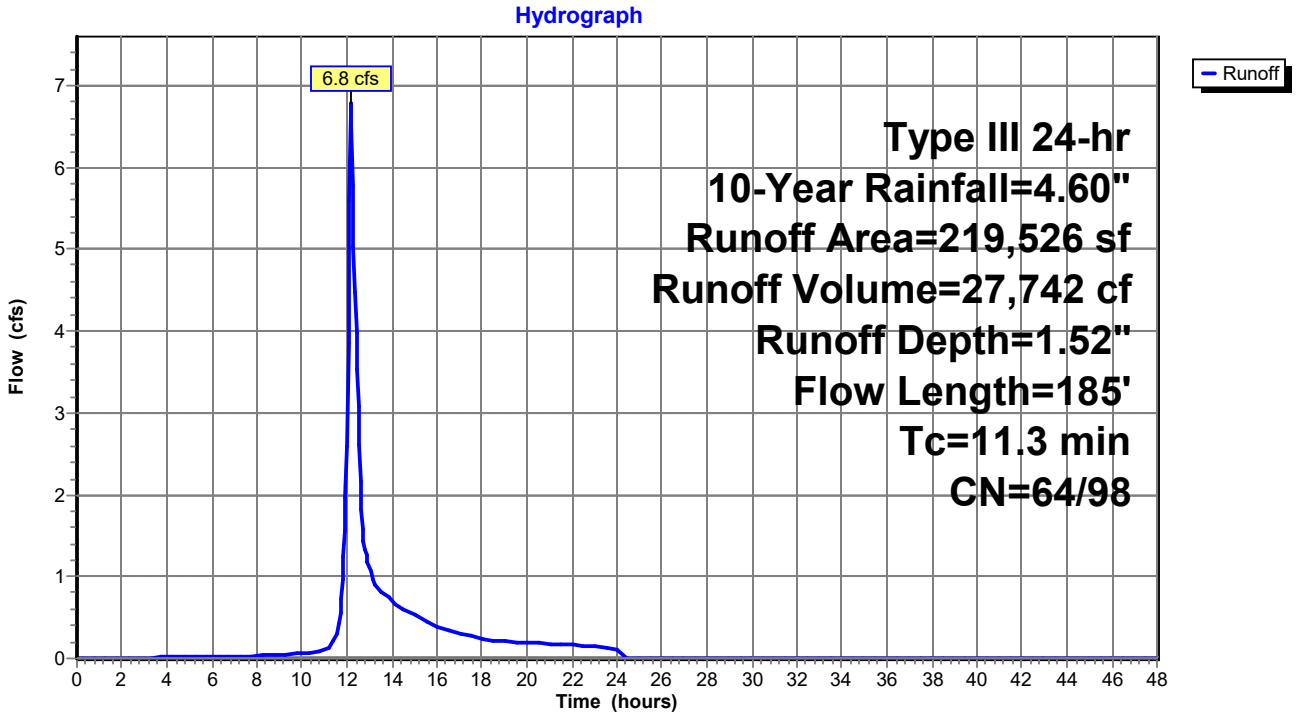
Runoff = 6.8 cfs @ 12.17 hrs, Volume= 27,742 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
30,140	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
11,476	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
51,897	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
219,526	67	Weighted Average
205,830	64	93.76% Pervious Area
13,696	98	6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

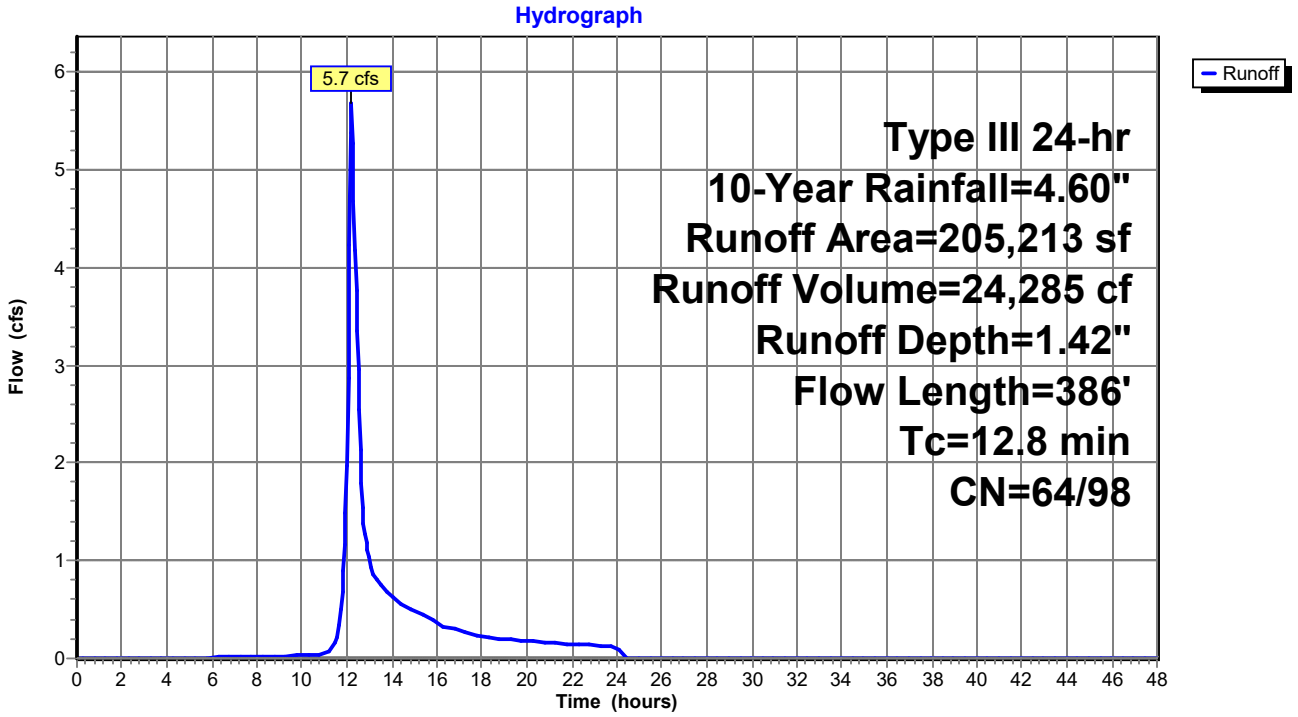
Runoff = 5.7 cfs @ 12.20 hrs, Volume= 24,285 cf, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
6,441	39	>75% Grass cover, Good, HSG A
925	61	>75% Grass cover, Good, HSG B
2,452	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
5,917	98	Paved parking, HSG A
375	98	Paved parking, HSG B
11,535	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
205,213	65	Weighted Average
198,921	64	96.93% Pervious Area
6,292	98	3.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

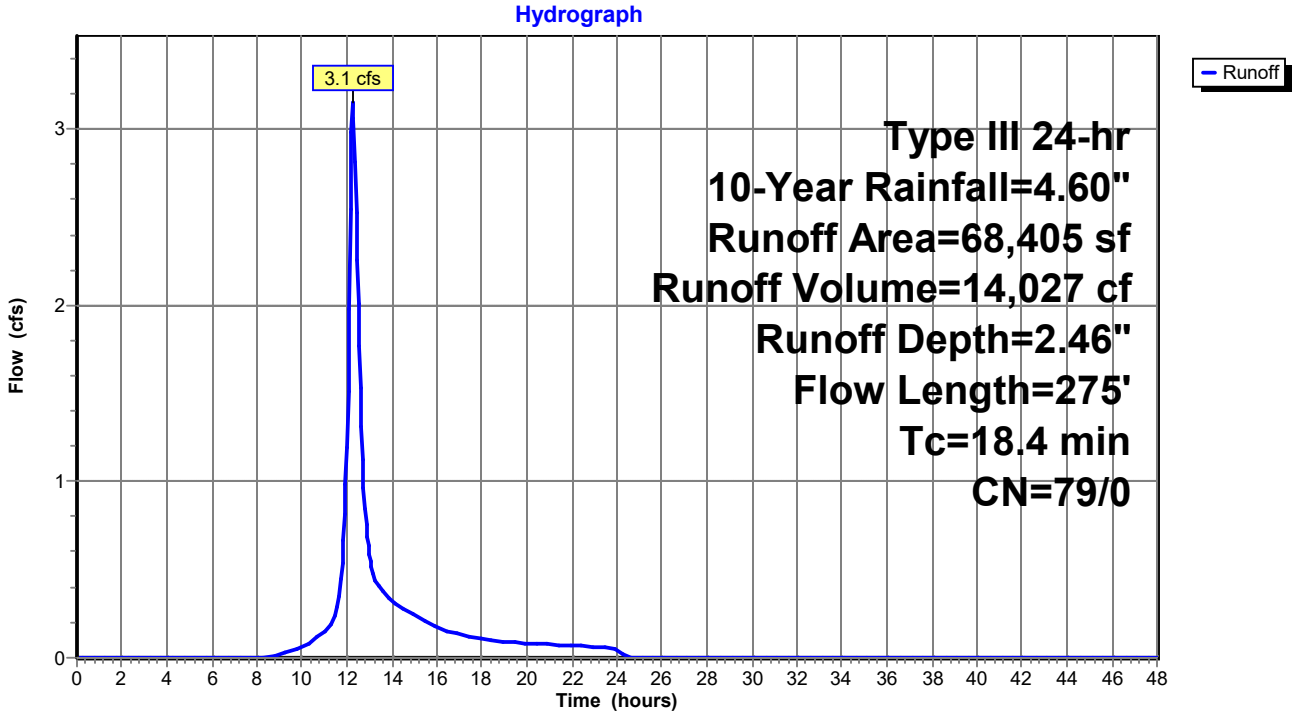
Runoff = 3.1 cfs @ 12.26 hrs, Volume= 14,027 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,405	79	Weighted Average
68,405	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

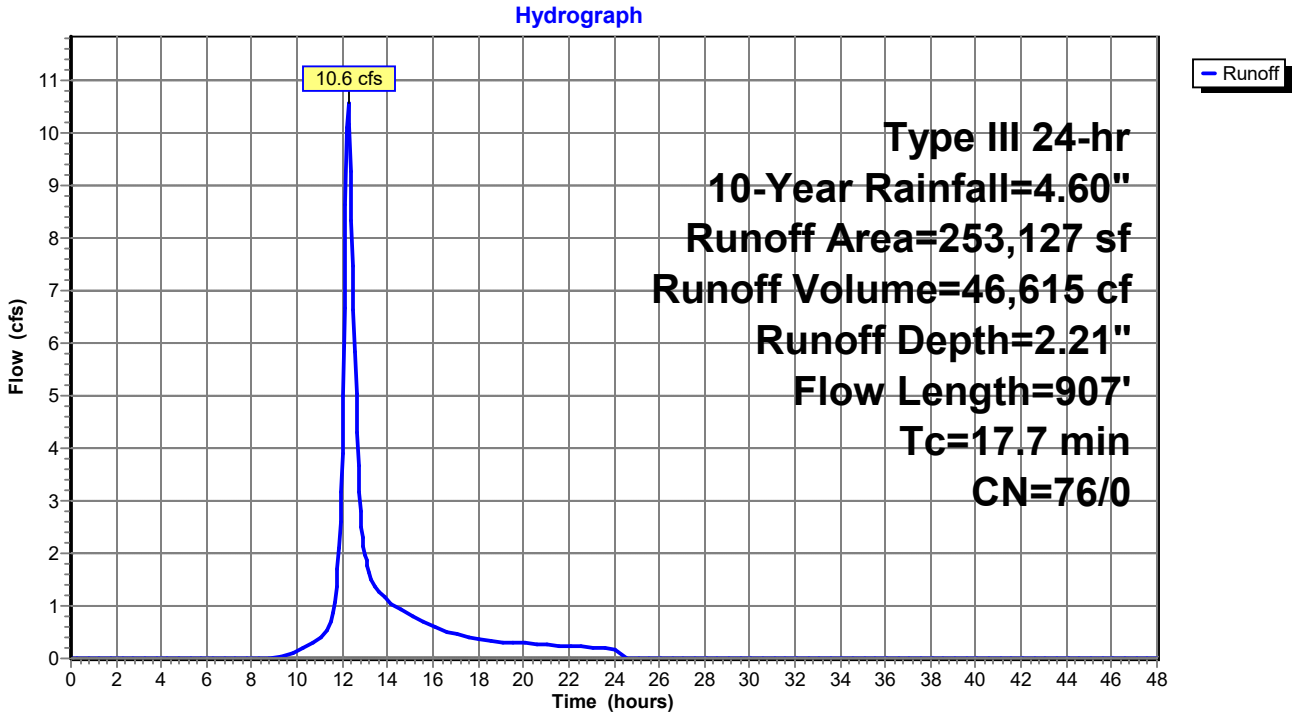
Runoff = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,127	76	Weighted Average
253,127	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

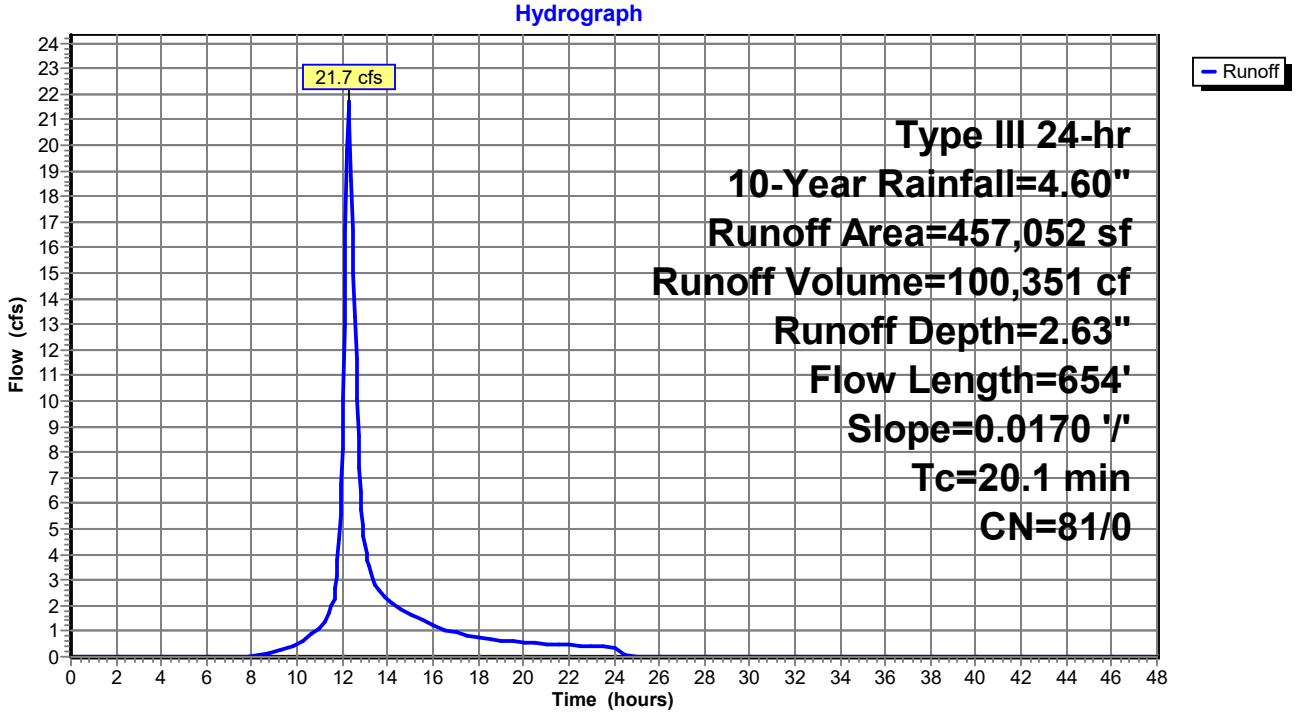
Runoff = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,052	81	Weighted Average
457,052	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

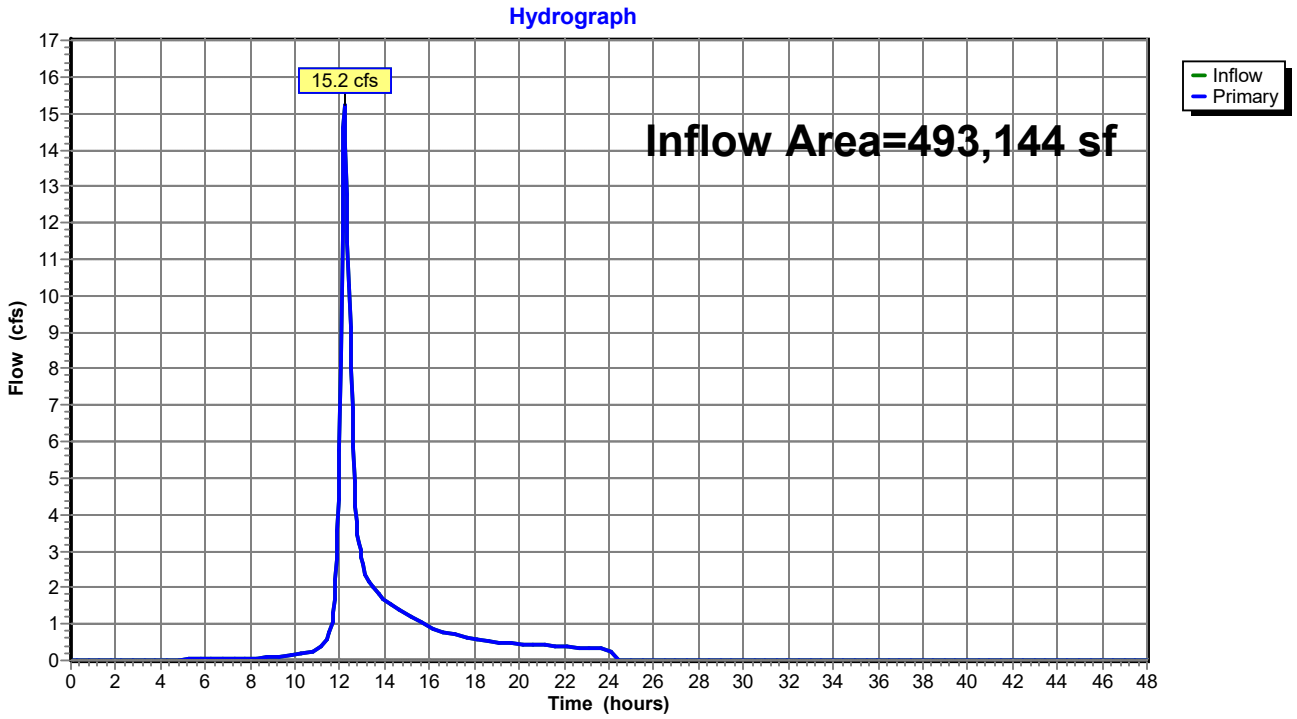


Summary for Link DP-1: On-stie Wetland

Inflow Area = 493,144 sf, 4.05% Impervious, Inflow Depth = 1.61" for 10-Year event
Inflow = 15.2 cfs @ 12.19 hrs, Volume= 66,054 cf
Primary = 15.2 cfs @ 12.19 hrs, Volume= 66,054 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

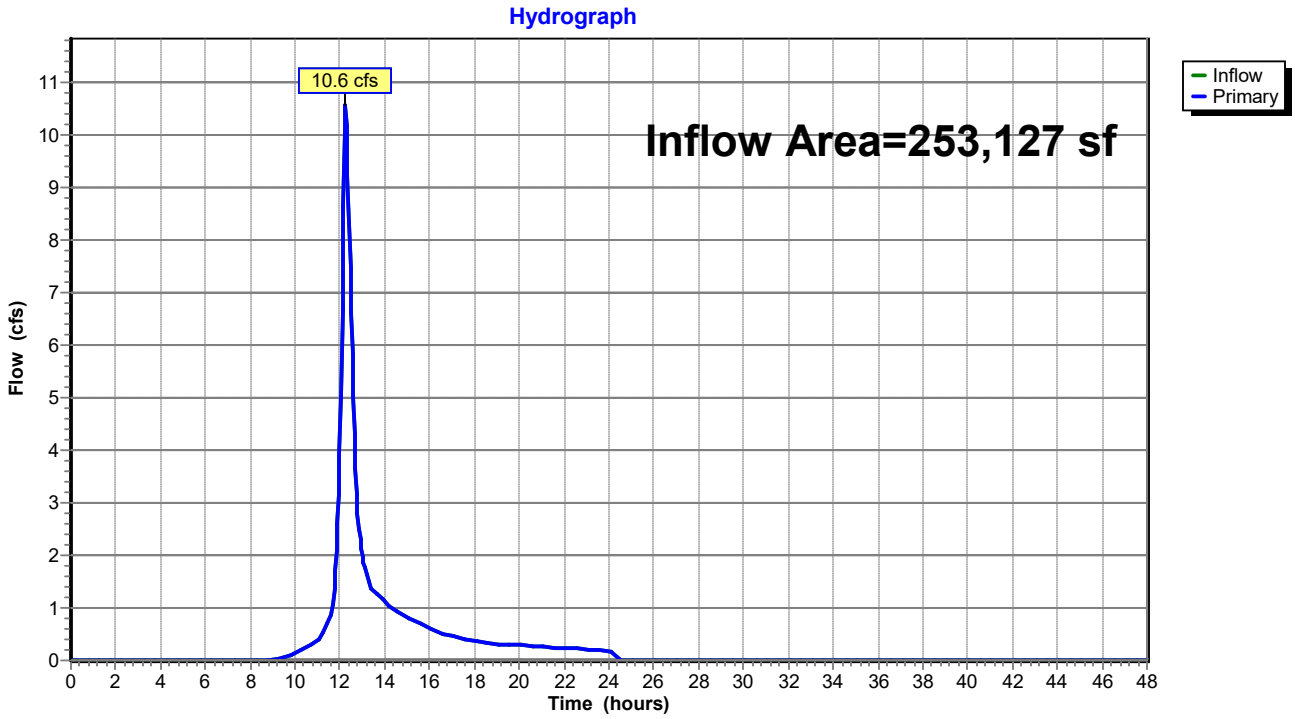


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,127 sf, 0.00% Impervious, Inflow Depth = 2.21" for 10-Year event
Inflow = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf
Primary = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

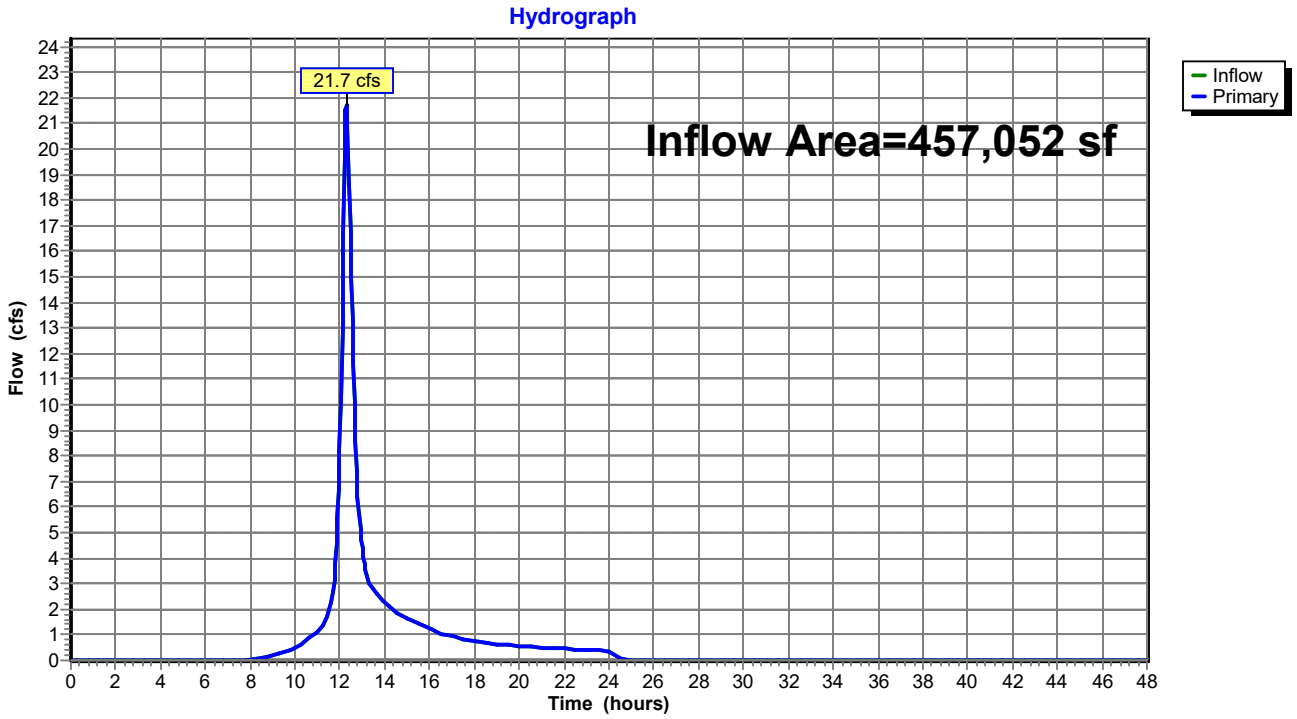


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,052 sf, 0.00% Impervious, Inflow Depth = 2.63" for 10-Year event
Inflow = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf
Primary = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=219,526 sf 6.24% Impervious Runoff Depth=2.85"
Flow Length=185' Tc=11.3 min CN=64/98 Runoff=13.5 cfs 52,196 cf

Subcatchment ES-1B: Runoff Area=205,213 sf 3.07% Impervious Runoff Depth=2.74"
Flow Length=386' Tc=12.8 min CN=64/98 Runoff=11.6 cfs 46,821 cf

Subcatchment ES-1C: Runoff Area=68,405 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=5.3 cfs 23,538 cf

Subcatchment ES-2: Runoff Area=253,127 sf 0.00% Impervious Runoff Depth=3.82"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=18.3 cfs 80,480 cf

Subcatchment ES-3: Runoff Area=457,052 sf 0.00% Impervious Runoff Depth=4.34"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=35.6 cfs 165,378 cf

Link DP-1: On-stie Wetland Inflow=29.7 cfs 122,555 cf
Primary=29.7 cfs 122,555 cf

Link DP-2: Offsite to Southeast Inflow=18.3 cfs 80,480 cf
Primary=18.3 cfs 80,480 cf

Link DP-3: Offsite to Northeast Inflow=35.6 cfs 165,378 cf
Primary=35.6 cfs 165,378 cf

Total Runoff Area = 1,203,323 sf Runoff Volume = 368,414 cf Average Runoff Depth = 3.67"
98.34% Pervious = 1,183,335 sf 1.66% Impervious = 19,988 sf

Summary for Subcatchment ES-1A:

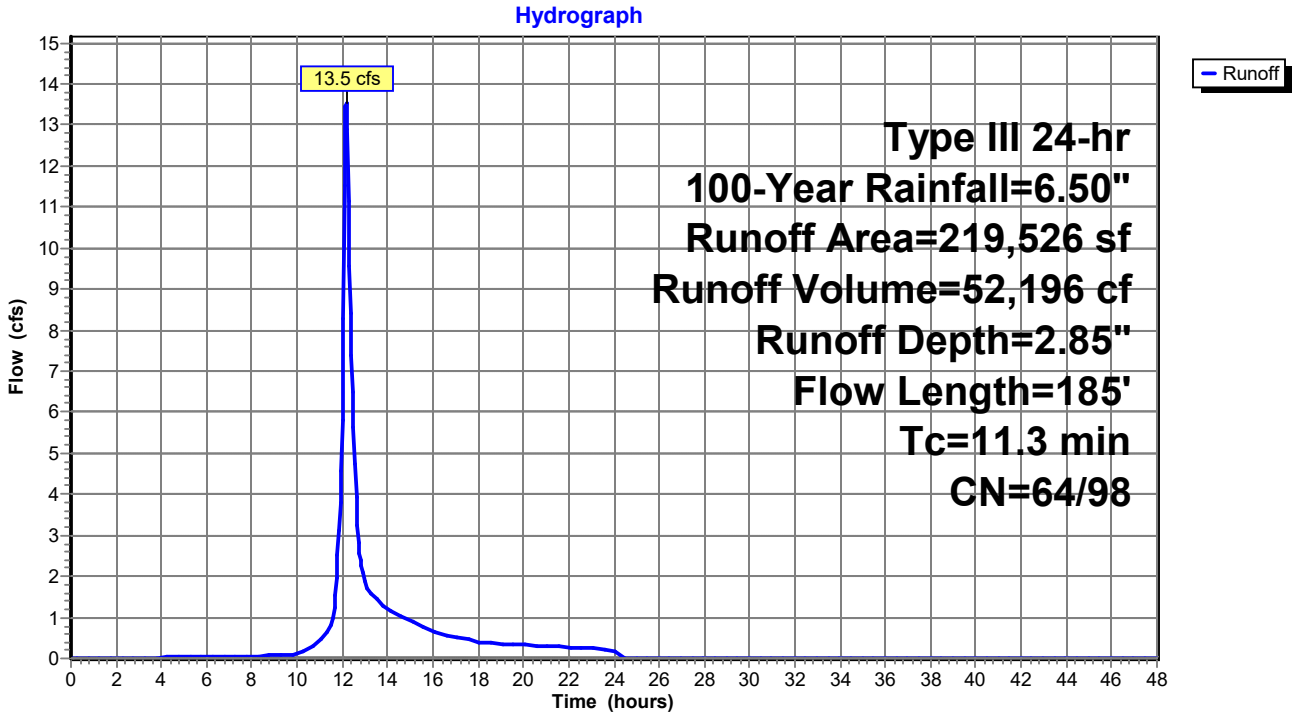
Runoff = 13.5 cfs @ 12.16 hrs, Volume= 52,196 cf, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
30,140	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
11,476	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
51,897	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
219,526	67	Weighted Average
205,830	64	93.76% Pervious Area
13,696	98	6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

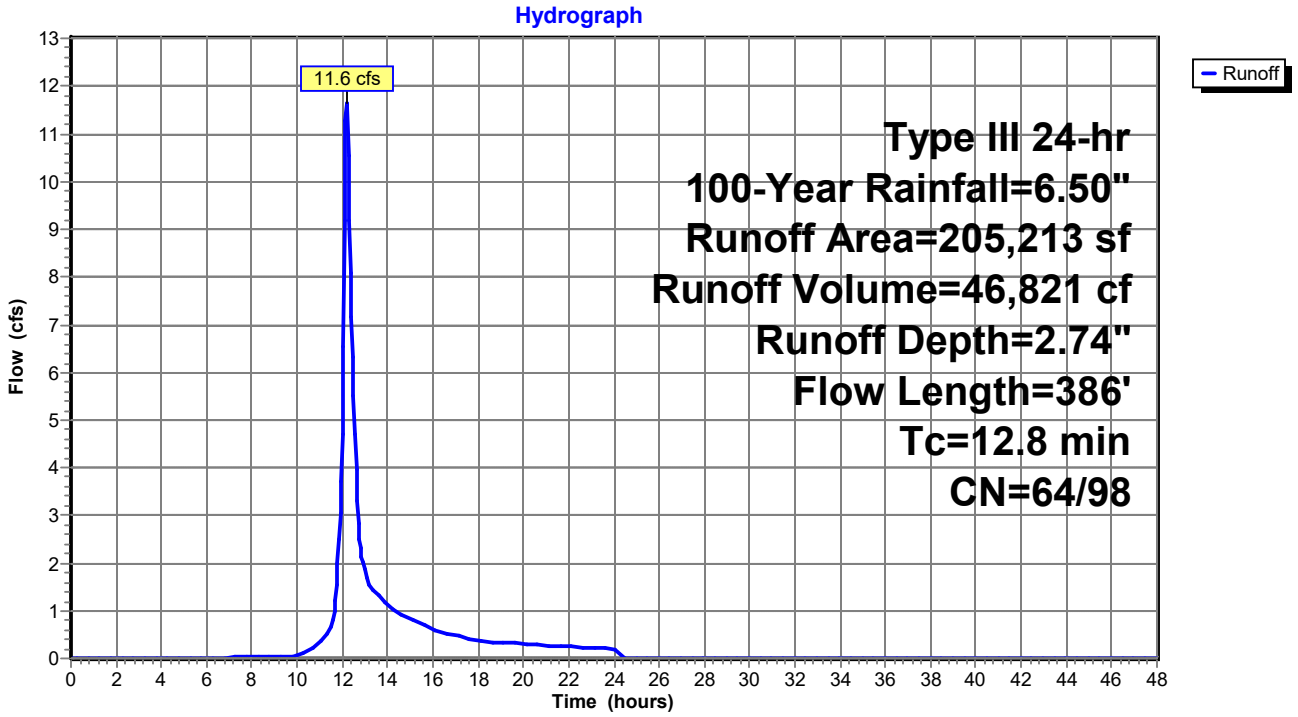
Runoff = 11.6 cfs @ 12.19 hrs, Volume= 46,821 cf, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
6,441	39	>75% Grass cover, Good, HSG A
925	61	>75% Grass cover, Good, HSG B
2,452	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
5,917	98	Paved parking, HSG A
375	98	Paved parking, HSG B
11,535	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
205,213	65	Weighted Average
198,921	64	96.93% Pervious Area
6,292	98	3.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

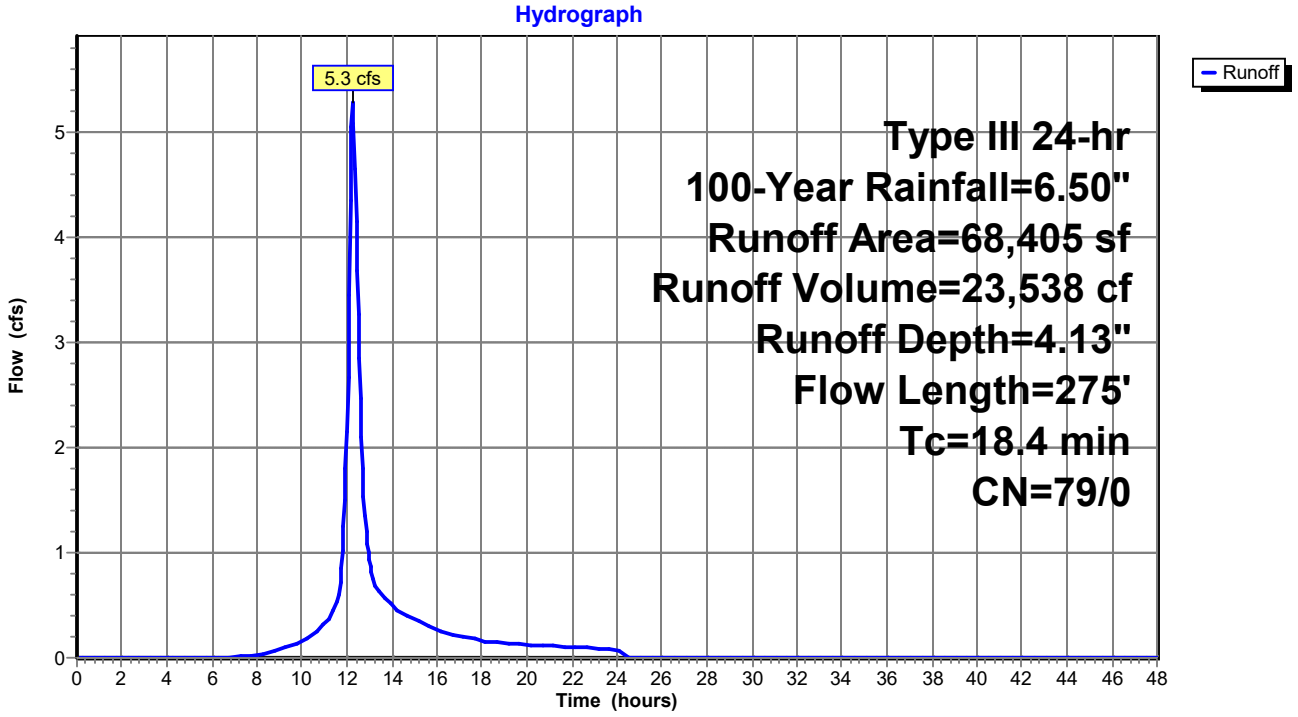
Runoff = 5.3 cfs @ 12.25 hrs, Volume= 23,538 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,405	79	Weighted Average
68,405	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

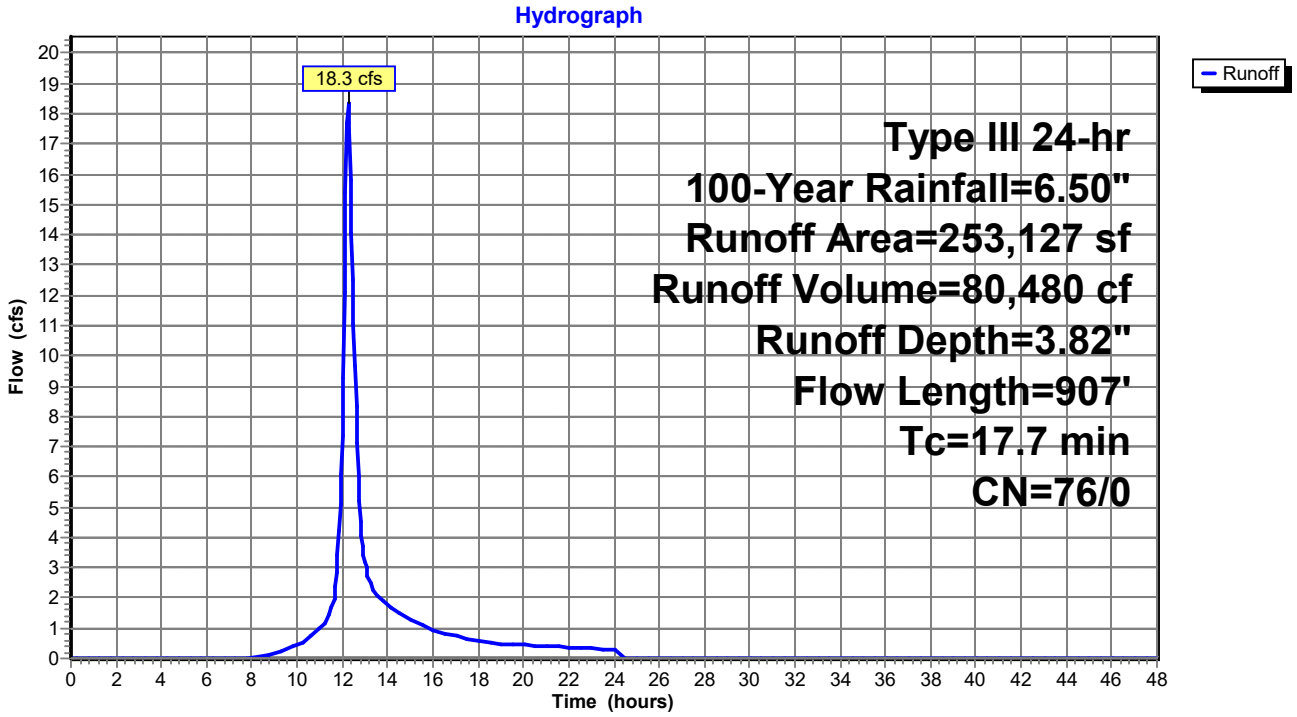
Runoff = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,127	76	Weighted Average
253,127	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

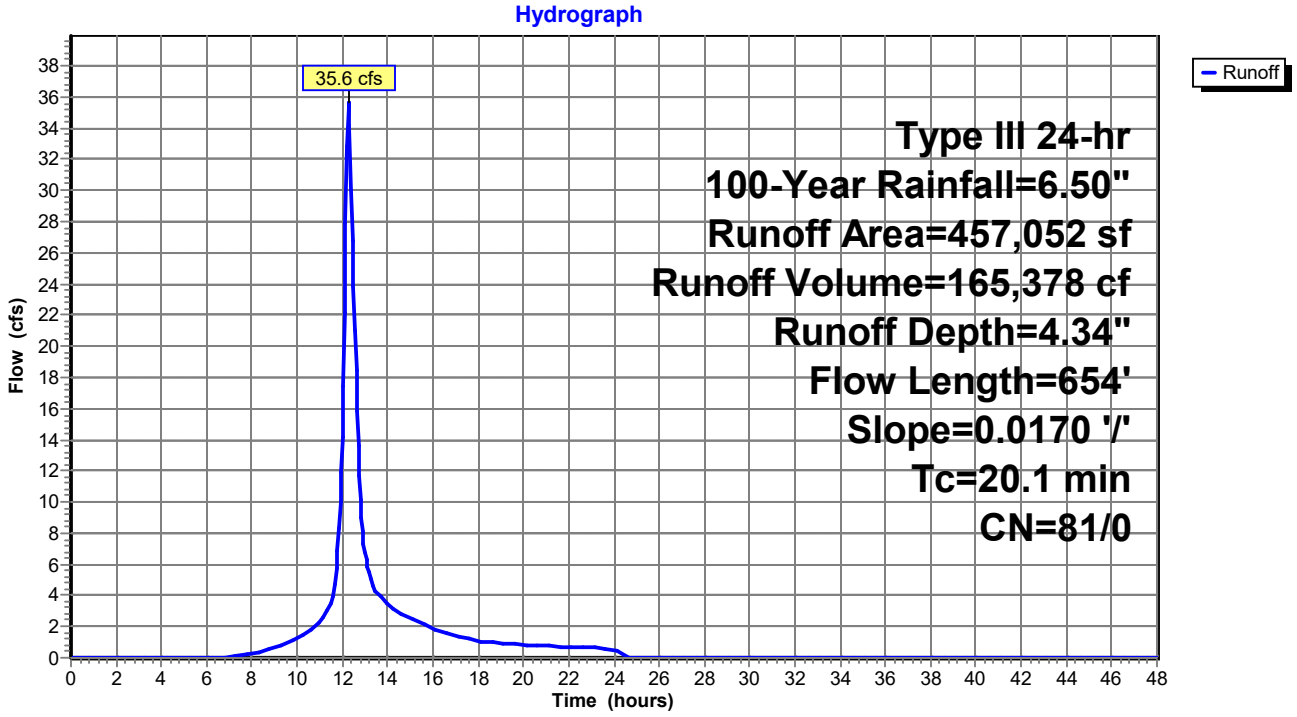
Runoff = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf, Depth= 4.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,052	81	Weighted Average
457,052	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

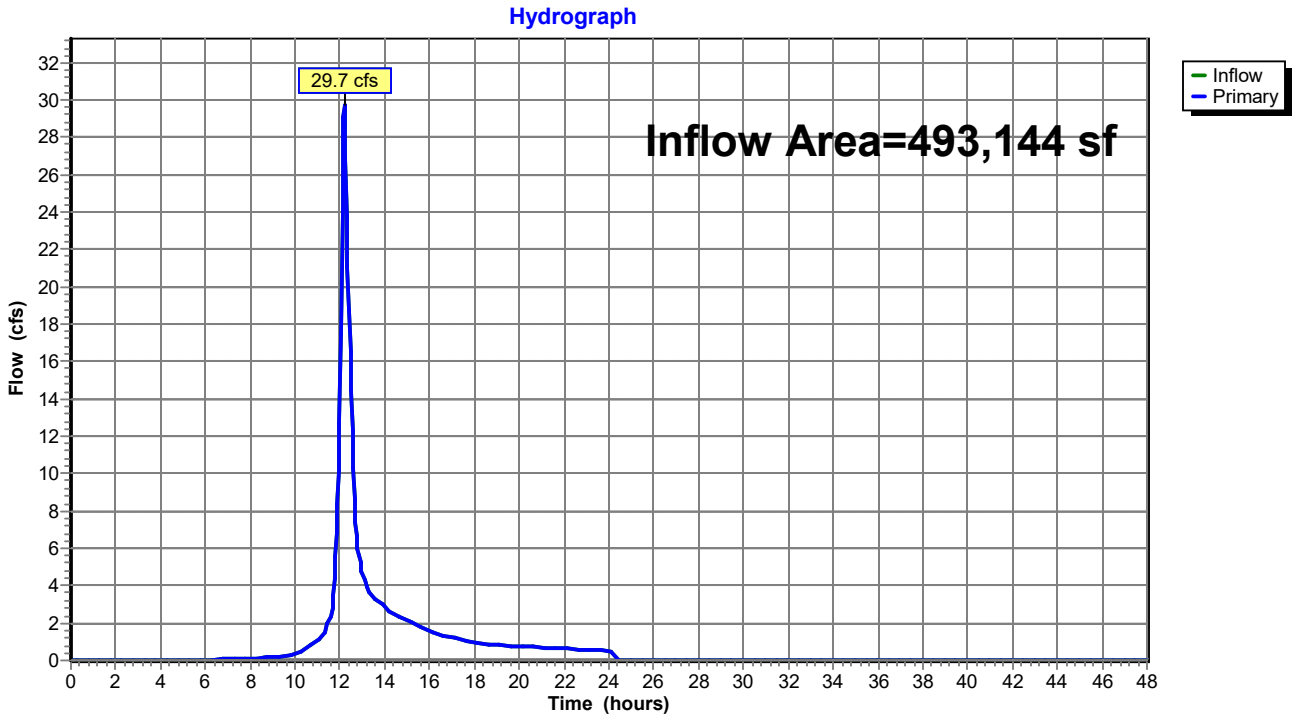


Summary for Link DP-1: On-stie Wetland

Inflow Area = 493,144 sf, 4.05% Impervious, Inflow Depth = 2.98" for 100-Year event
Inflow = 29.7 cfs @ 12.18 hrs, Volume= 122,555 cf
Primary = 29.7 cfs @ 12.18 hrs, Volume= 122,555 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

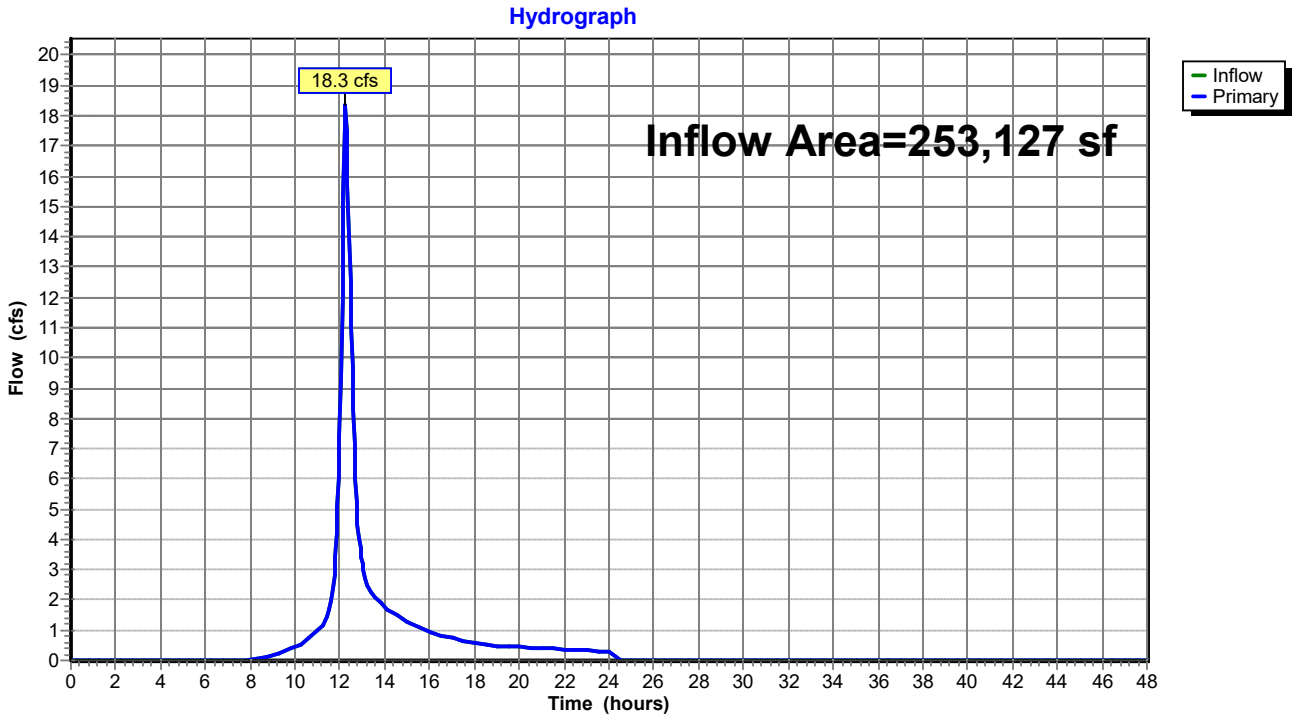


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,127 sf, 0.00% Impervious, Inflow Depth = 3.82" for 100-Year event
Inflow = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf
Primary = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

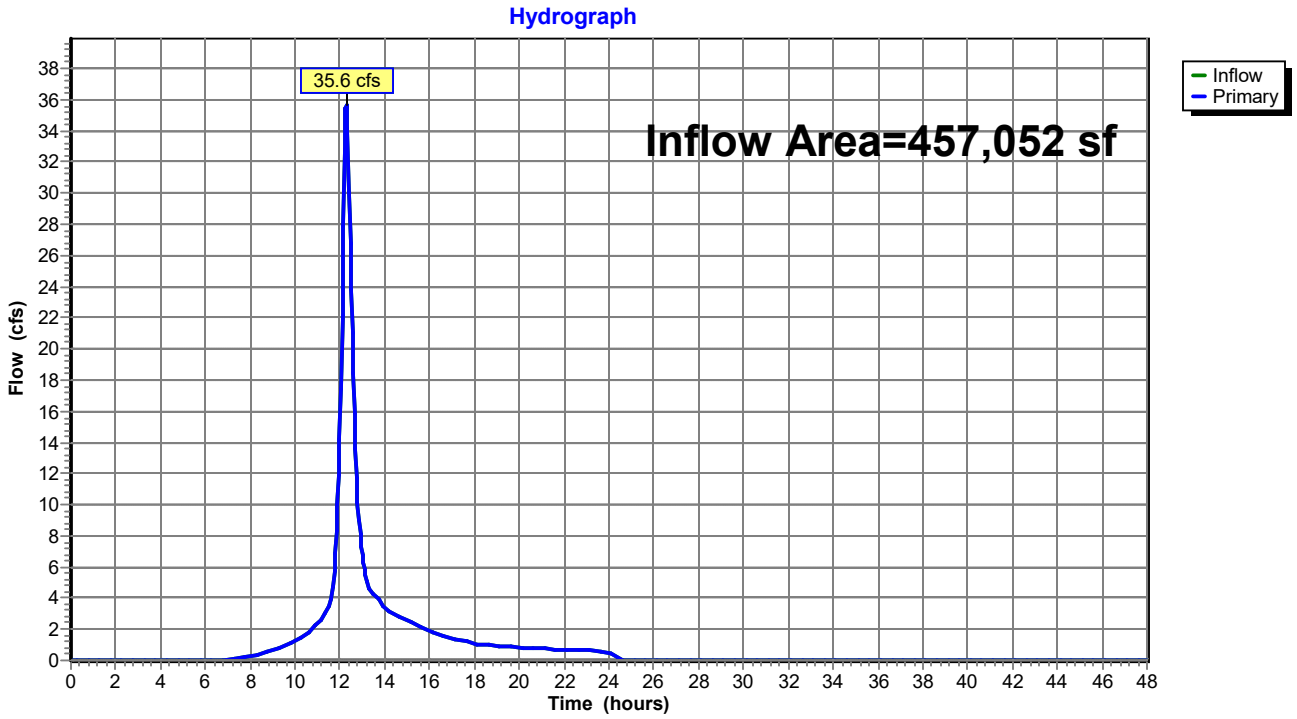


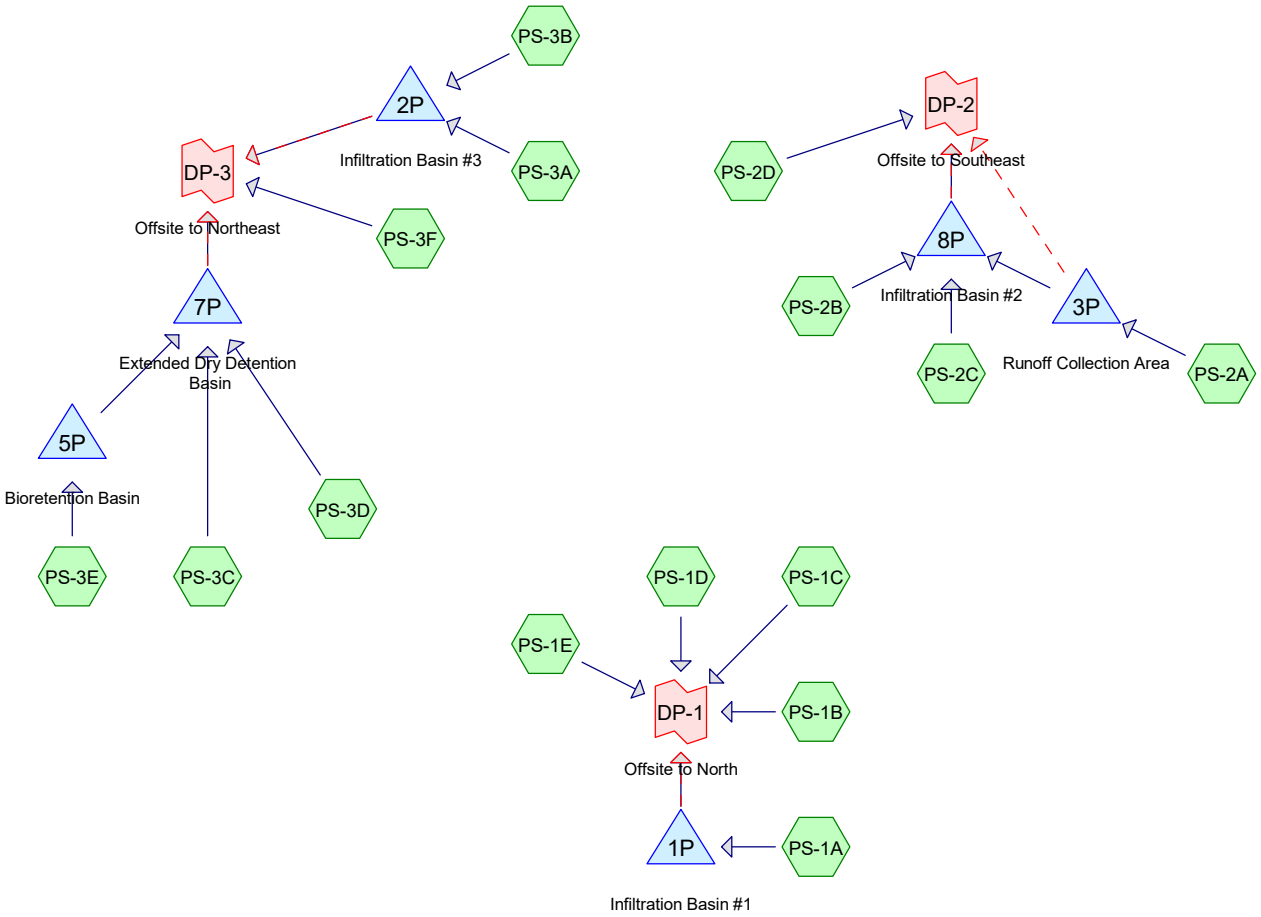
Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,052 sf, 0.00% Impervious, Inflow Depth = 4.34" for 100-Year event
Inflow = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf
Primary = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast





Subcat Reach Pond Link

Routing Diagram for 090506 - POST
Prepared by R Levesque Associates, Inc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=171,804 sf 49.77% Impervious Runoff Depth=1.52"
Flow Length=1,466' Tc=17.1 min CN=58/98 Runoff=4.2 cfs 21,695 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=0.43"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=0.7 cfs 3,762 cf

Subcatchment PS-1C: Runoff Area=44,596 sf 12.79% Impervious Runoff Depth=0.38"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=0.3 cfs 1,427 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=0.51"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=0.6 cfs 2,881 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=1.19"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=1.5 cfs 4,880 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=0.86"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=1.3 cfs 5,636 cf

Subcatchment PS-2B: Runoff Area=64,786 sf 68.84% Impervious Runoff Depth=2.09"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=2.7 cfs 11,272 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=77/98 Runoff=1.9 cfs 6,487 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=0.86"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=0.7 cfs 2,713 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=0/98 Runoff=0.7 cfs 2,591 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=2.01"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=7.4 cfs 31,732 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=2.11"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=7.2 cfs 29,976 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=1.23"
Tc=6.0 min CN=74/98 Runoff=0.7 cfs 2,300 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=2.10"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=1.3 cfs 4,890 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=1.13"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=2.8 cfs 11,139 cf

Pond 1P: Infiltration Basin #1 Peak Elev=201.51' Storage=9,284 cf Inflow=4.2 cfs 21,695 cf
Primary=2.2 cfs 17,526 cf Secondary=0.0 cfs 0 cf Outflow=2.2 cfs 17,526 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.16' Storage=12,797 cf Inflow=7.8 cfs 34,323 cf
Primary=3.9 cfs 29,122 cf Secondary=0.0 cfs 0 cf Outflow=3.9 cfs 29,122 cf

Pond 3P: Runoff Collection Area Peak Elev=189.02' Storage=3,476 cf Inflow=1.3 cfs 5,636 cf
Primary=0.1 cfs 2,275 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 2,275 cf

Pond 5P: Bioretention Basin Peak Elev=182.58' Storage=2,598 cf Inflow=1.3 cfs 4,890 cf
Outflow=0.5 cfs 2,519 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=179.69' Storage=11,641 cf Inflow=7.7 cfs 34,794 cf
Primary=2.6 cfs 34,754 cf Secondary=0.0 cfs 0 cf Outflow=2.6 cfs 34,754 cf

Pond 8P: Infiltration Basin #2 Peak Elev=181.59' Storage=6,812 cf Inflow=4.3 cfs 20,034 cf
Primary=2.4 cfs 17,135 cf Secondary=0.0 cfs 0 cf Outflow=2.4 cfs 17,135 cf

Link DP-1: Offsite to North Inflow=3.8 cfs 30,476 cf
Primary=3.8 cfs 30,476 cf

Link DP-2: Offsite to Southeast Inflow=2.8 cfs 19,848 cf
Primary=2.8 cfs 19,848 cf

Link DP-3: Offsite to Northeast Inflow=7.8 cfs 75,015 cf
Primary=7.8 cfs 75,015 cf

Total Runoff Area = 1,203,322 sf Runoff Volume = 143,380 cf Average Runoff Depth = 1.43"
69.24% Pervious = 833,169 sf 30.76% Impervious = 370,153 sf

Summary for Subcatchment PS-1A:

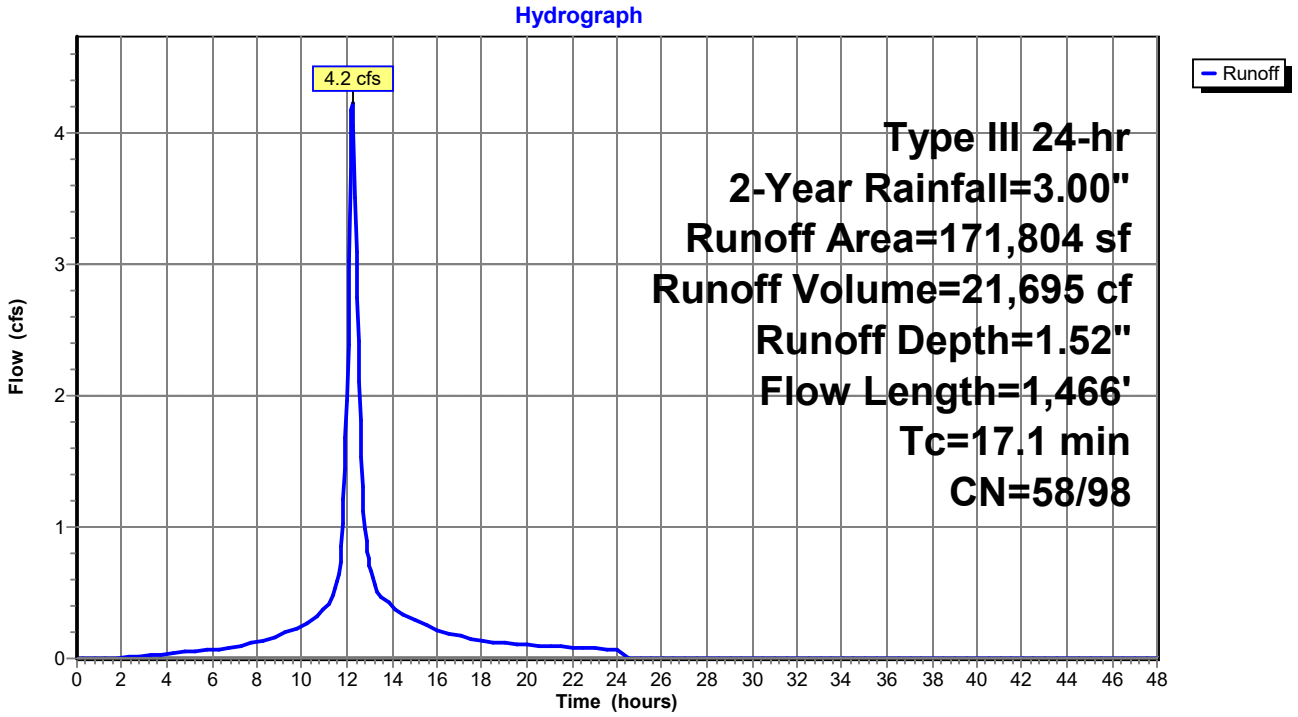
Runoff = 4.2 cfs @ 12.23 hrs, Volume= 21,695 cf, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
11,329	39	>75% Grass cover, Good, HSG A
73,276	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG A
53,764	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
171,804	78	Weighted Average
86,296	58	50.23% Pervious Area
85,509	98	49.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

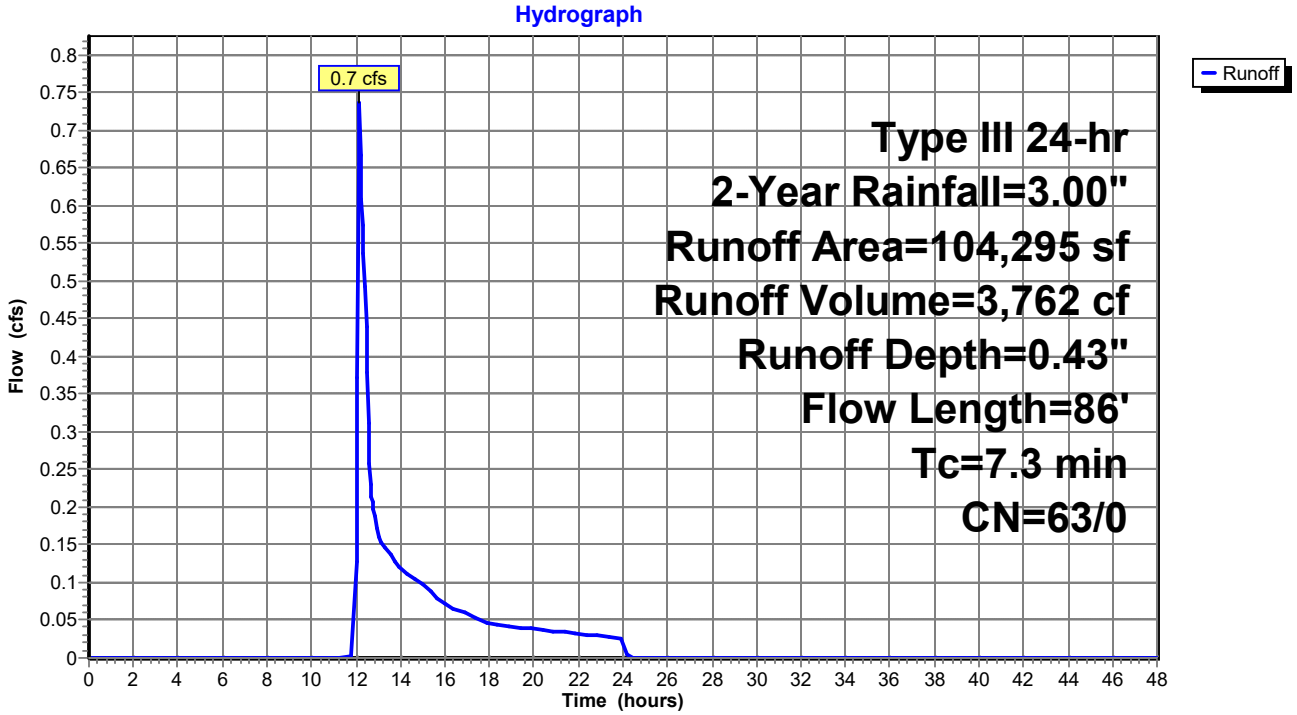
Runoff = 0.7 cfs @ 12.15 hrs, Volume= 3,762 cf, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

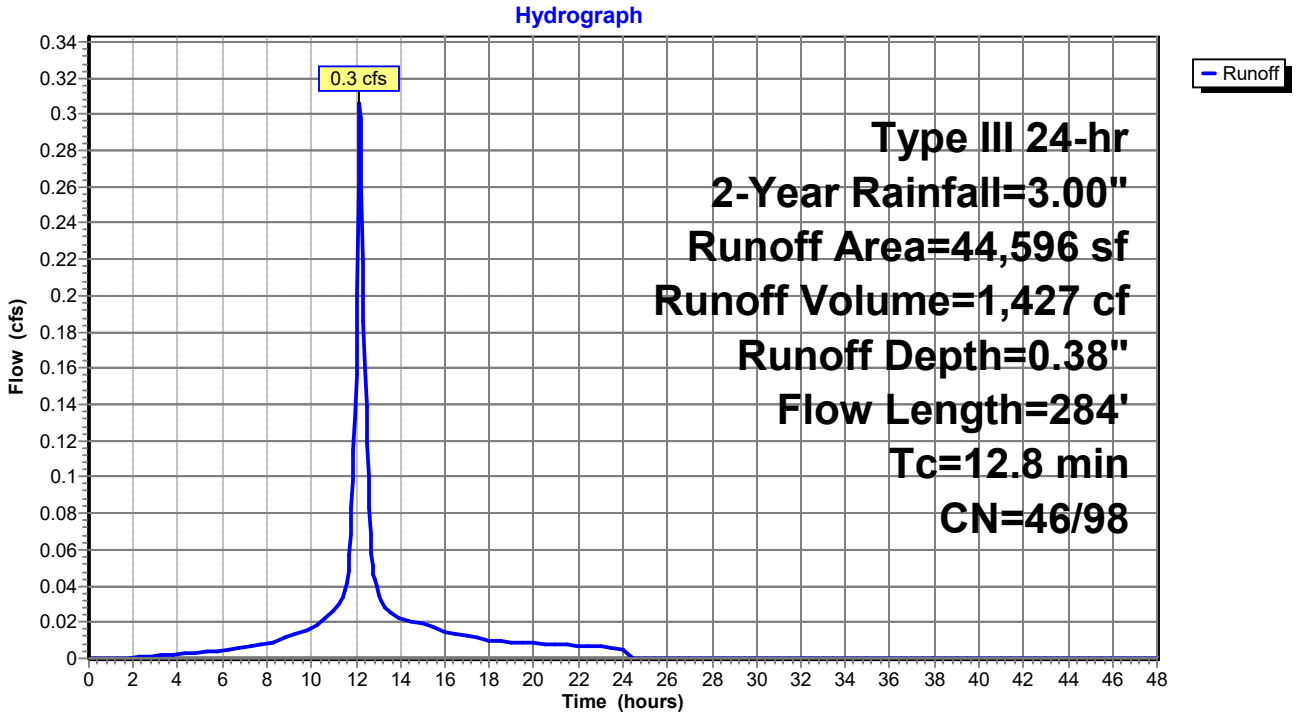
Runoff = 0.3 cfs @ 12.17 hrs, Volume= 1,427 cf, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
13,186	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
3,442	98	Paved parking, HSG A
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
10,158	30	Woods, Good, HSG A
44,596	53	Weighted Average
38,892	46	87.21% Pervious Area
5,704	98	12.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

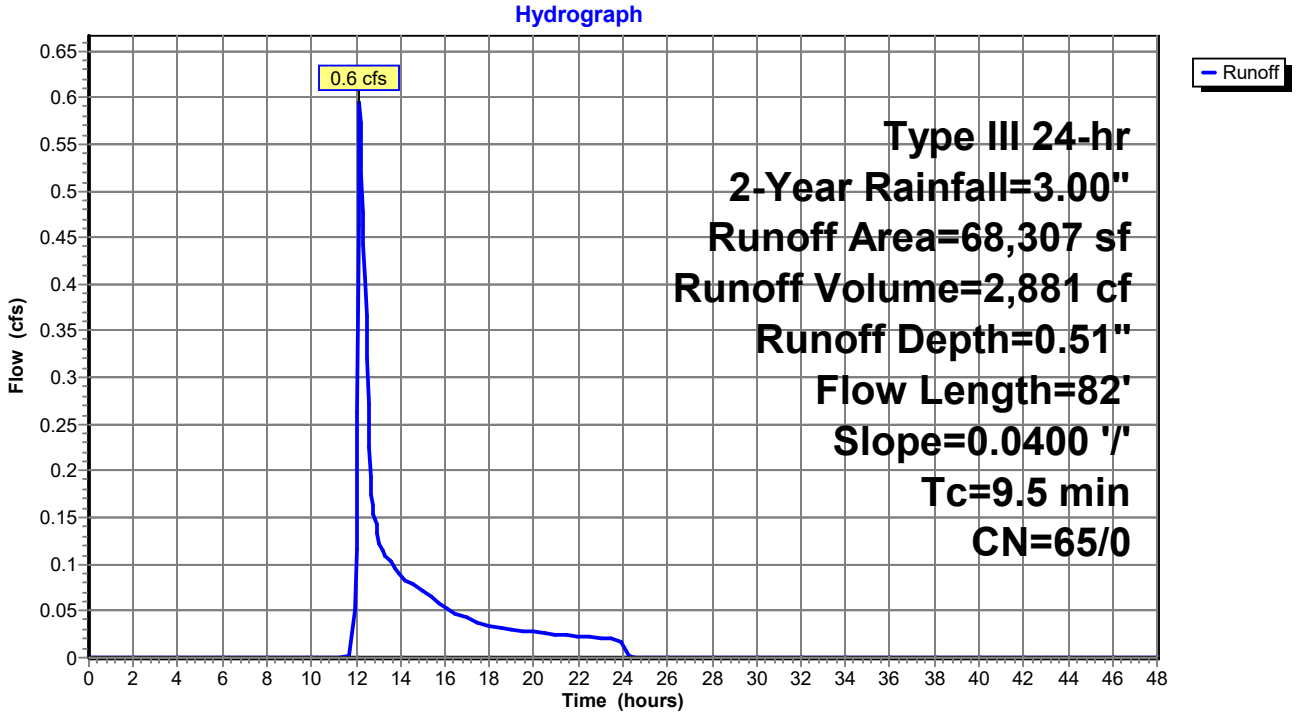
Runoff = 0.6 cfs @ 12.17 hrs, Volume= 2,881 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

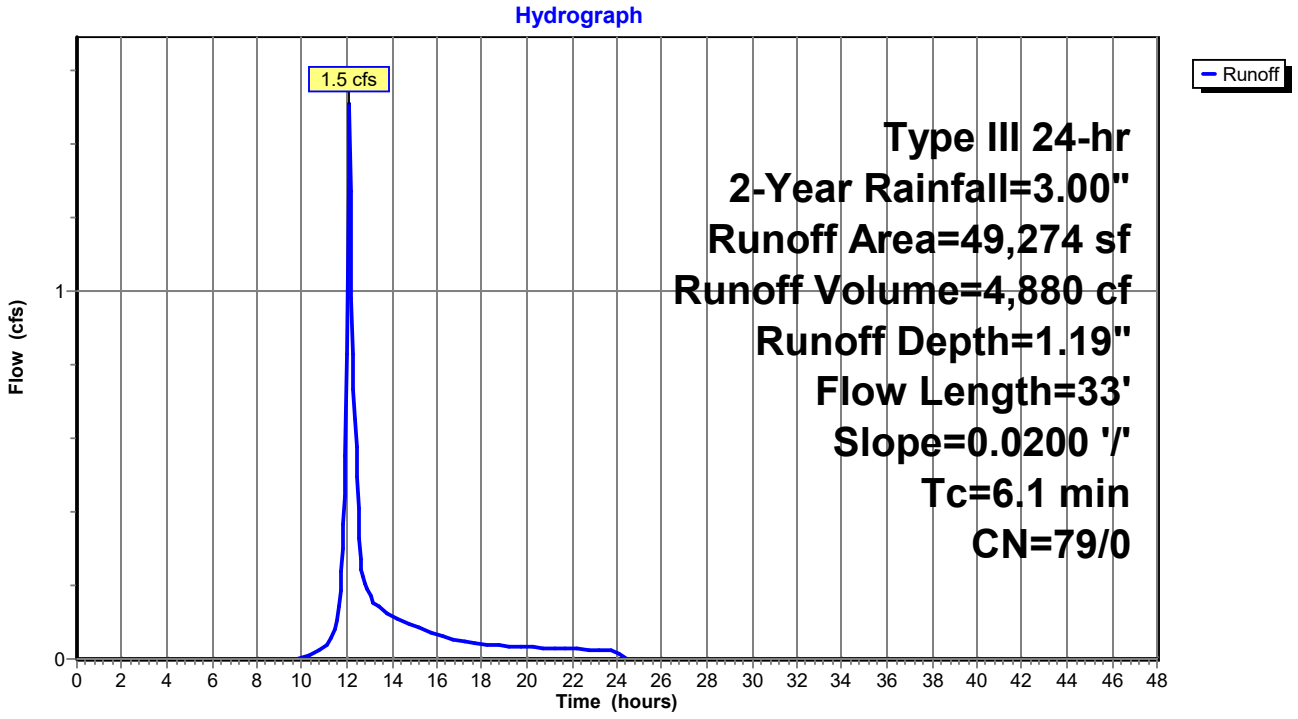
Runoff = 1.5 cfs @ 12.10 hrs, Volume= 4,880 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

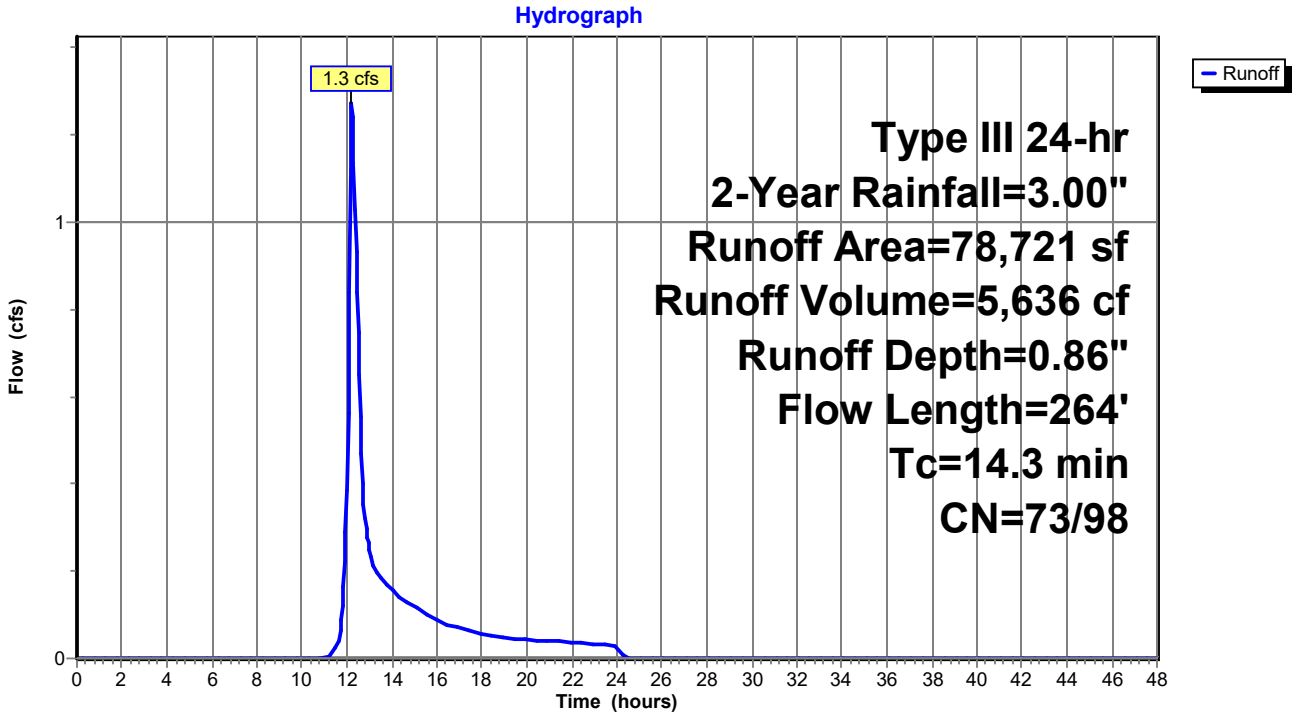
Runoff = 1.3 cfs @ 12.22 hrs, Volume= 5,636 cf, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

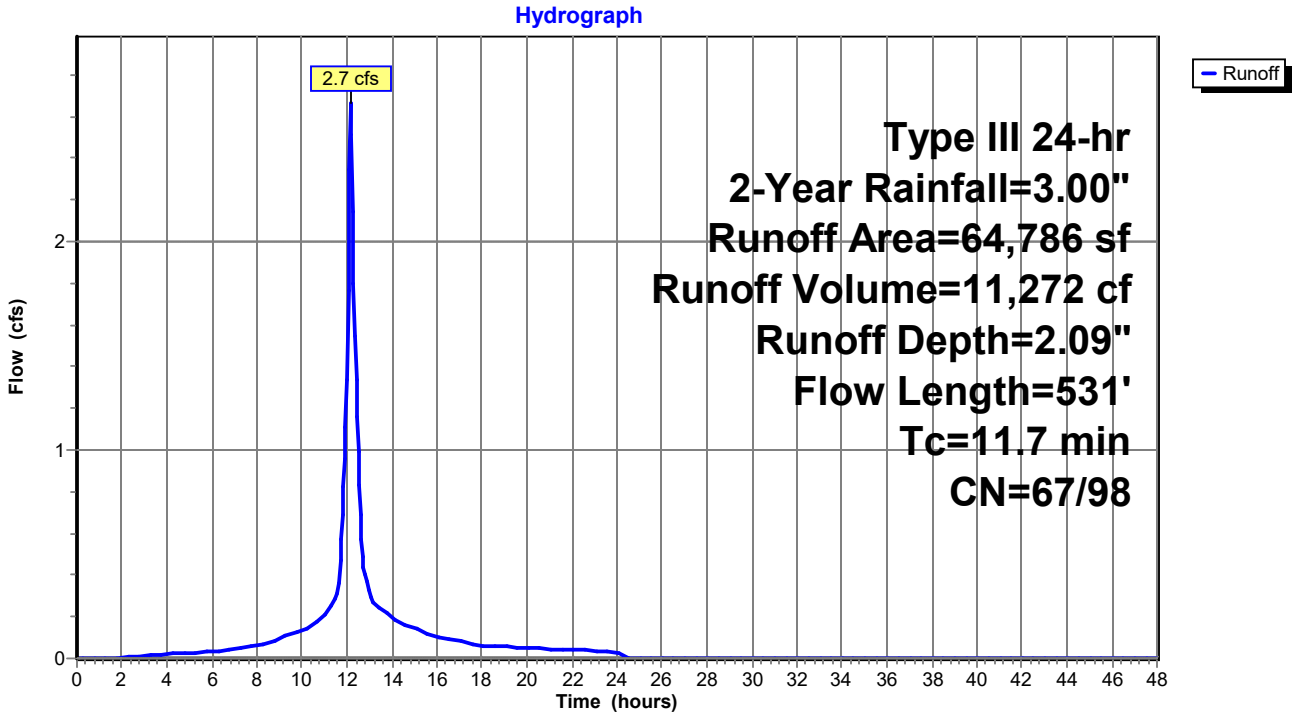
Runoff = 2.7 cfs @ 12.16 hrs, Volume= 11,272 cf, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,786	88	Weighted Average
20,190	67	31.16% Pervious Area
44,596	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

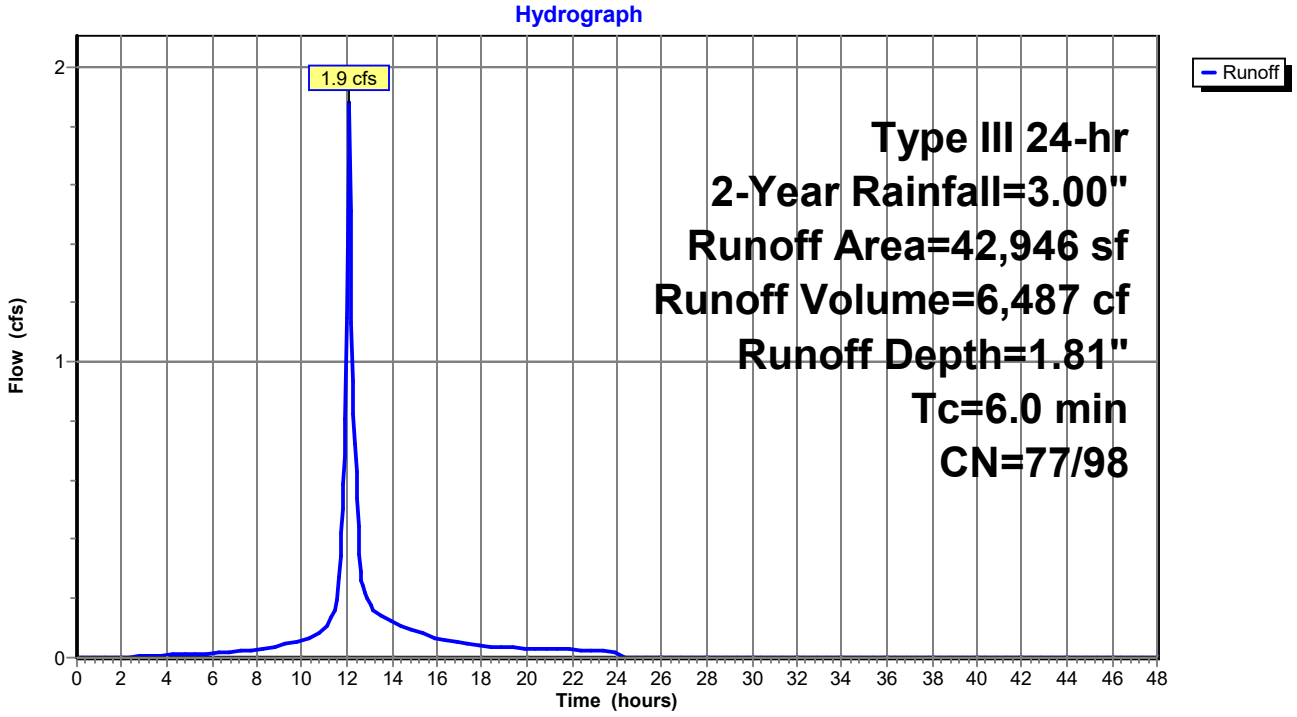
Runoff = 1.9 cfs @ 12.09 hrs, Volume= 6,487 cf, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

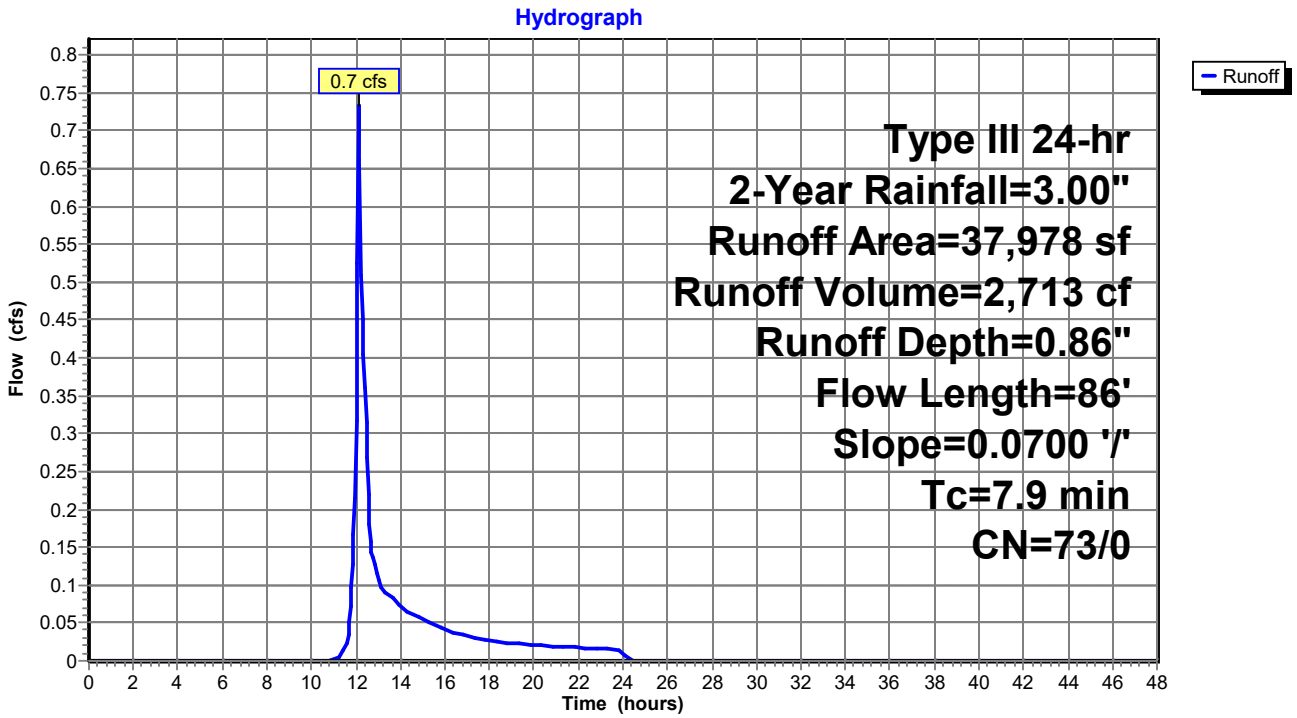
Runoff = 0.7 cfs @ 12.13 hrs, Volume= 2,713 cf, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

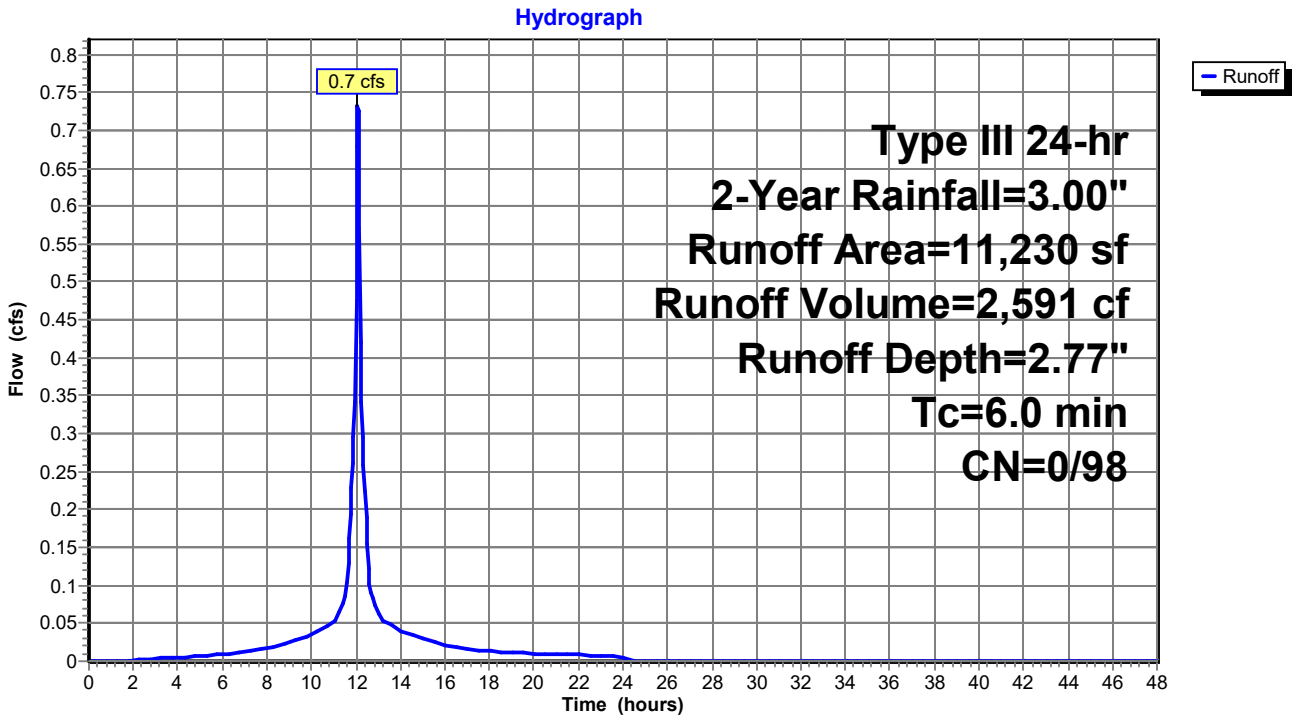
Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,591 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

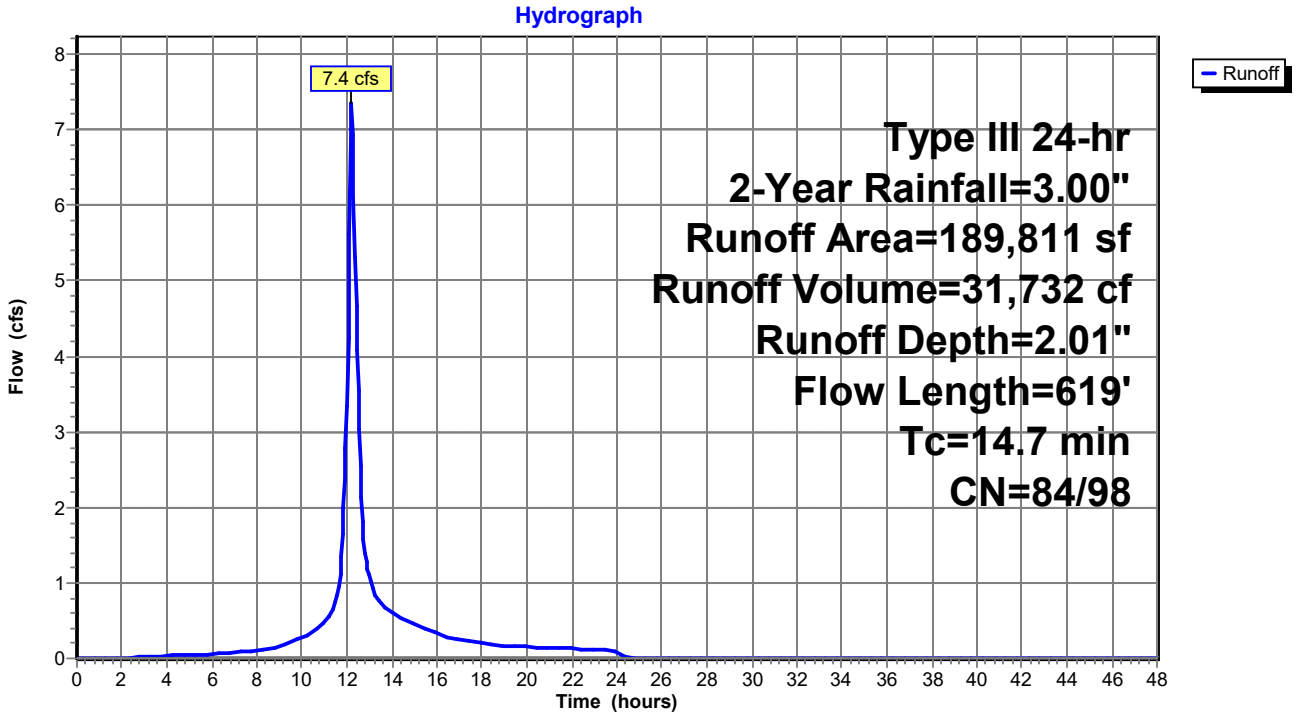
Runoff = 7.4 cfs @ 12.20 hrs, Volume= 31,732 cf, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

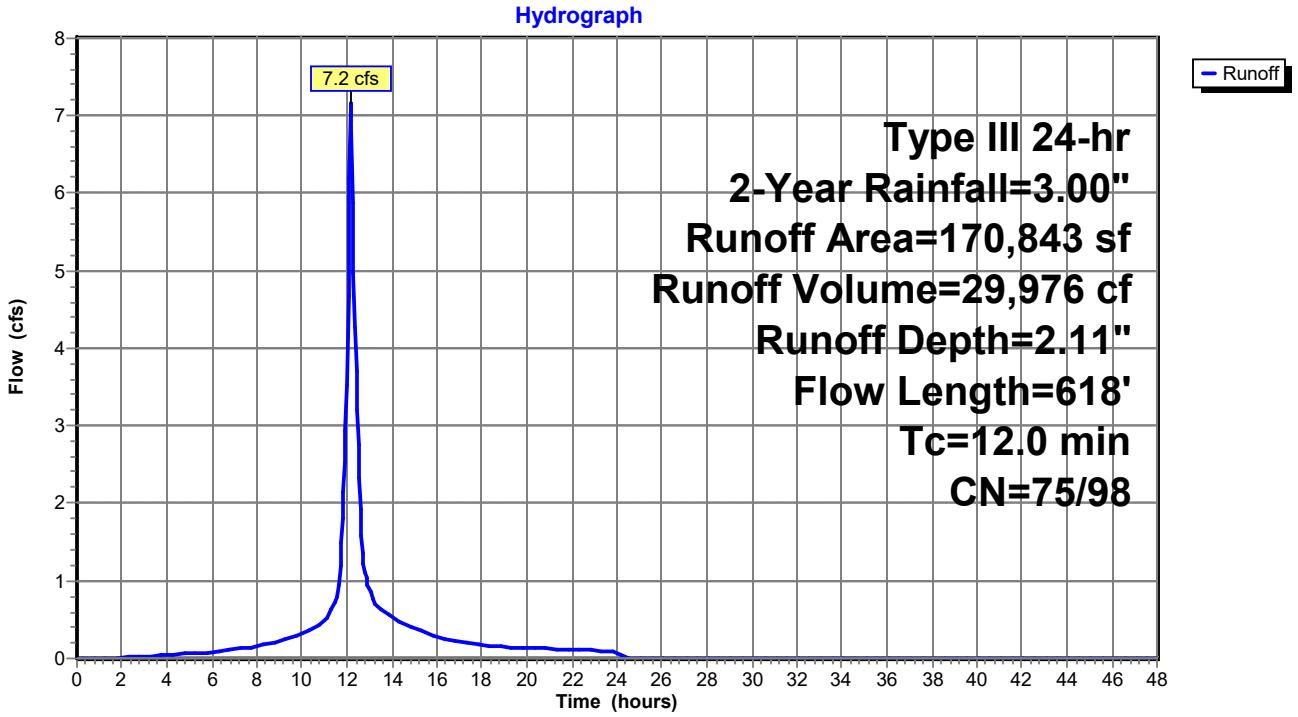
Runoff = 7.2 cfs @ 12.16 hrs, Volume= 29,976 cf, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

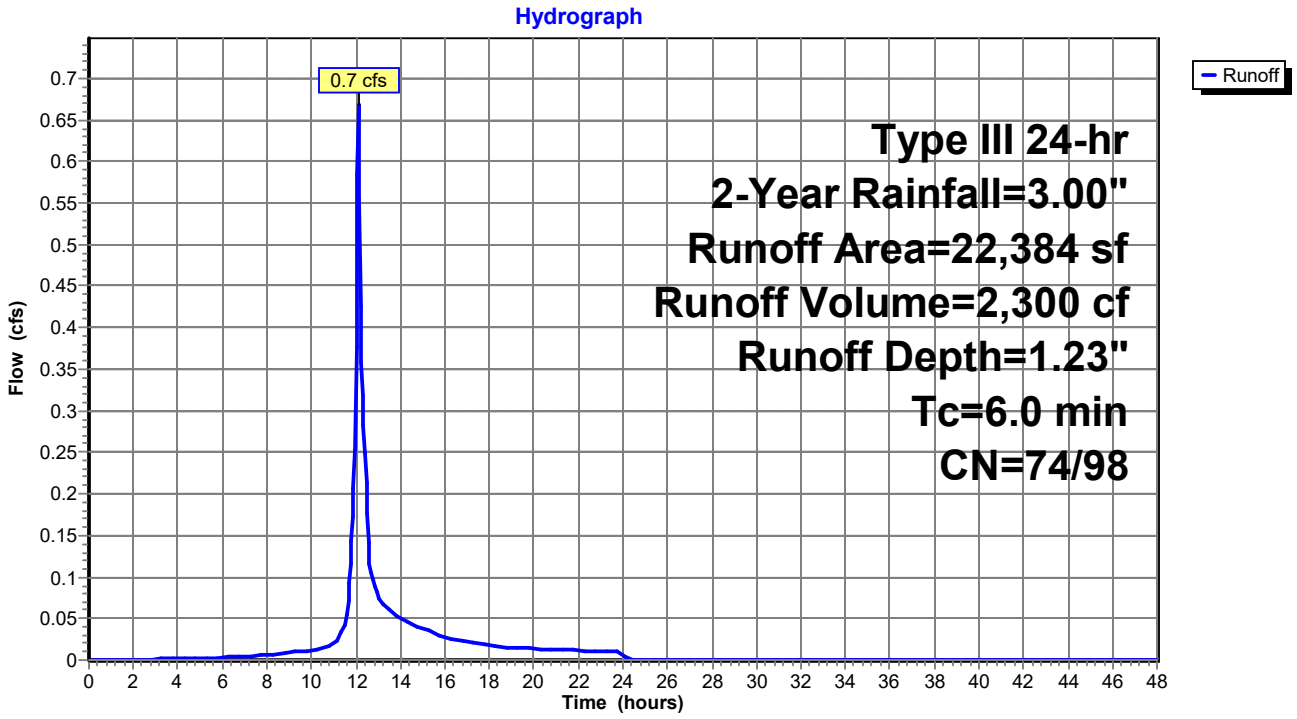
Runoff = 0.7 cfs @ 12.10 hrs, Volume= 2,300 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

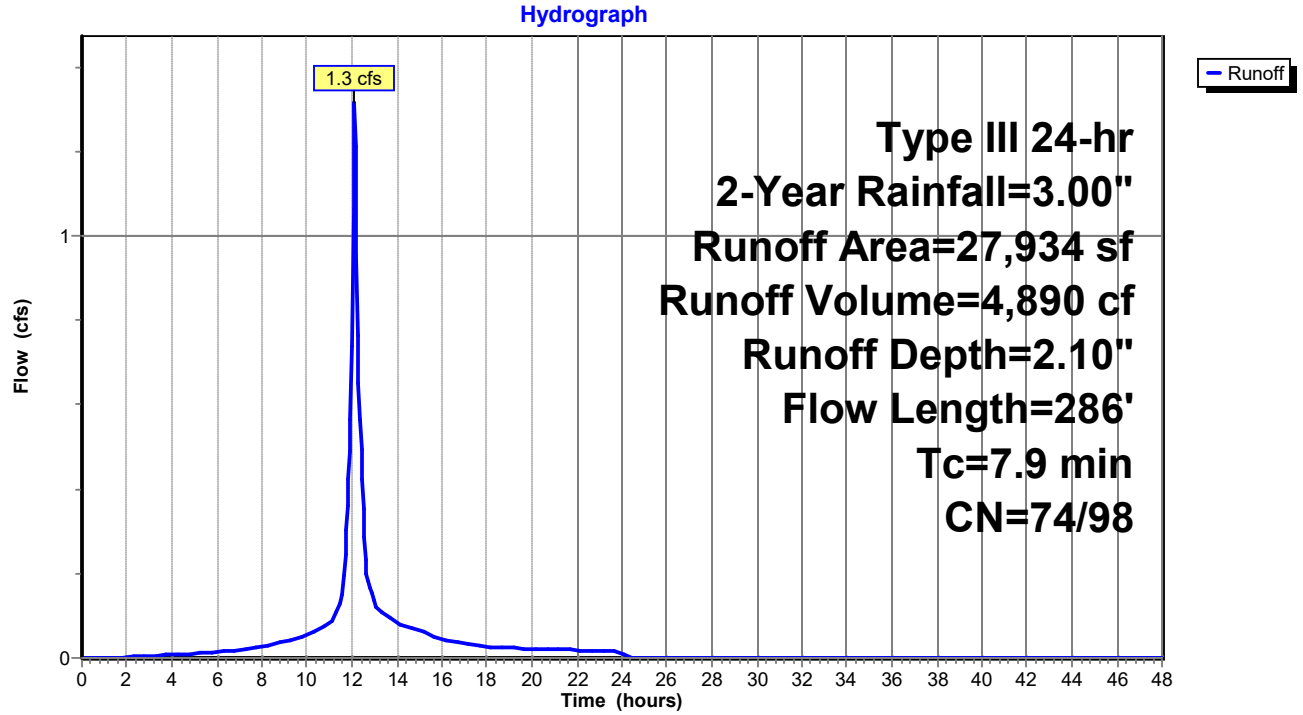
Runoff = 1.3 cfs @ 12.11 hrs, Volume= 4,890 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

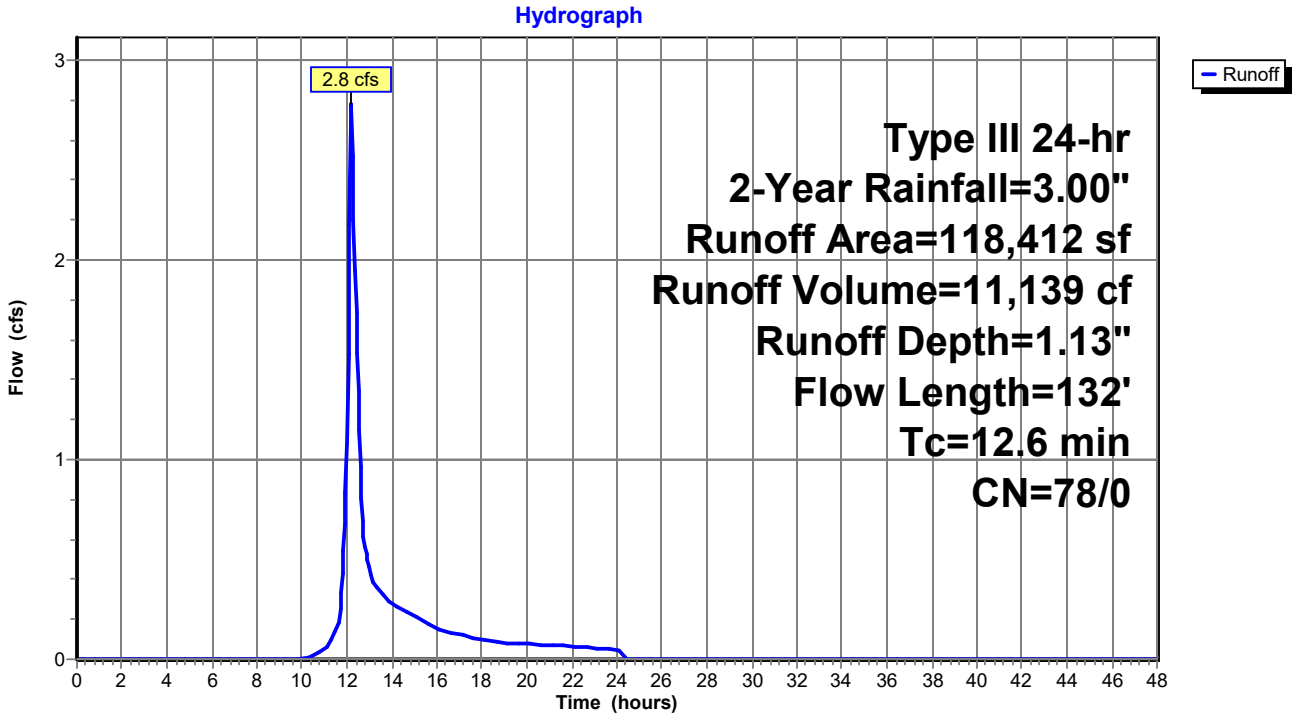
Runoff = 2.8 cfs @ 12.19 hrs, Volume= 11,139 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 171,804 sf, 49.77% Impervious, Inflow Depth = 1.52" for 2-Year event
Inflow = 4.2 cfs @ 12.23 hrs, Volume= 21,695 cf
Outflow = 2.2 cfs @ 12.54 hrs, Volume= 17,526 cf, Atten= 48%, Lag= 18.6 min
Primary = 2.2 cfs @ 12.54 hrs, Volume= 17,526 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.51' @ 12.54 hrs Surf.Area= 8,161 sf Storage= 9,284 cf

Plug-Flow detention time= 199.1 min calculated for 17,508 cf (81% of inflow)
Center-of-Mass det. time= 121.5 min (906.5 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	732 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,796 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,234 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,762 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	583	92.0	0	0	583
201.00	891	113.0	732	732	941

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	891	113.0	0	0	891
202.00	1,170	129.0	1,027	1,027	1,222
203.00	1,382	141.0	1,275	2,302	1,513
204.00	1,610	152.0	1,495	3,796	1,808

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,419	397.0	0	0	4,419
201.00	5,642	418.0	5,018	5,018	5,841
202.00	6,838	438.0	6,230	11,248	7,269
203.00	7,990	458.0	7,407	18,655	8,763
204.00	9,182	477.0	8,579	27,234	10,252

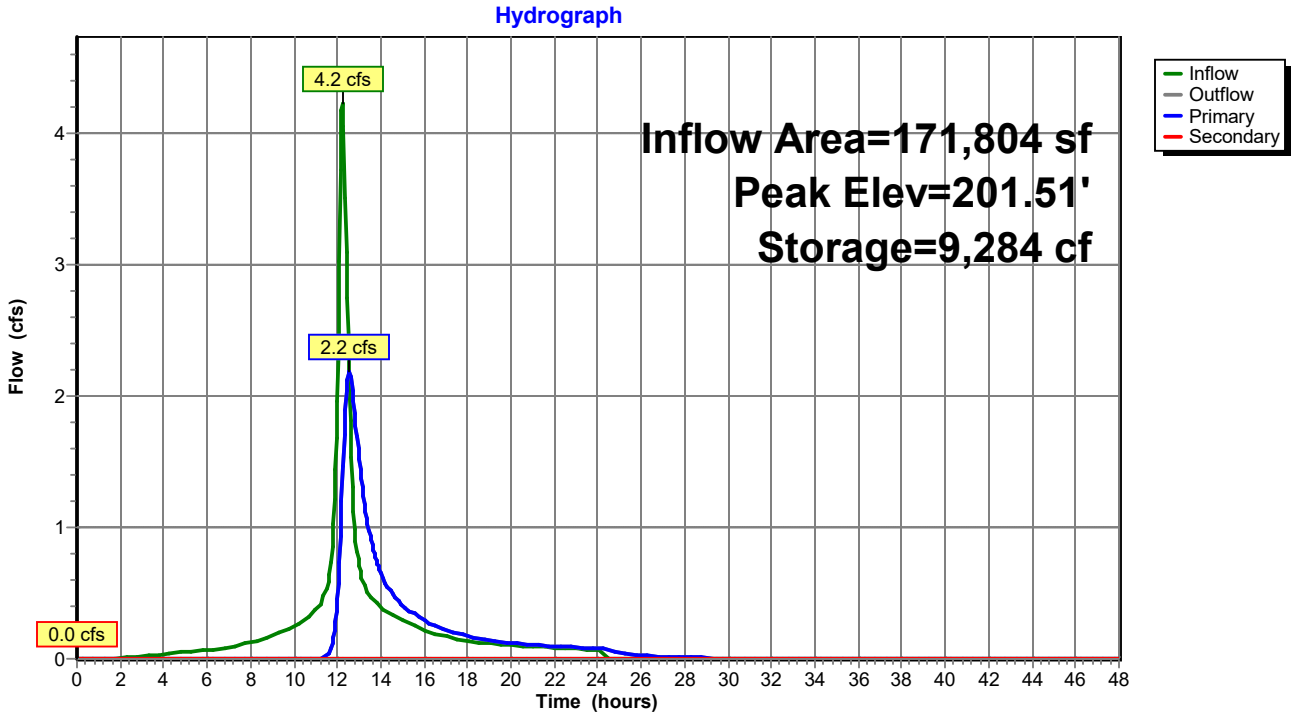
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.2 cfs @ 12.54 hrs HW=201.51' (Free Discharge)
└**1=Culvert** (Passes 2.2 cfs of 7.2 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 2.2 cfs @ 2.86 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 2.05" for 2-Year event
Inflow = 7.8 cfs @ 12.19 hrs, Volume= 34,323 cf
Outflow = 3.9 cfs @ 12.48 hrs, Volume= 29,122 cf, Atten= 50%, Lag= 17.2 min
Primary = 3.9 cfs @ 12.48 hrs, Volume= 29,122 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.16' @ 12.48 hrs Surf.Area= 13,293 sf Storage= 12,797 cf

Plug-Flow detention time= 149.9 min calculated for 29,122 cf (85% of inflow)
Center-of-Mass det. time= 83.6 min (880.7 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

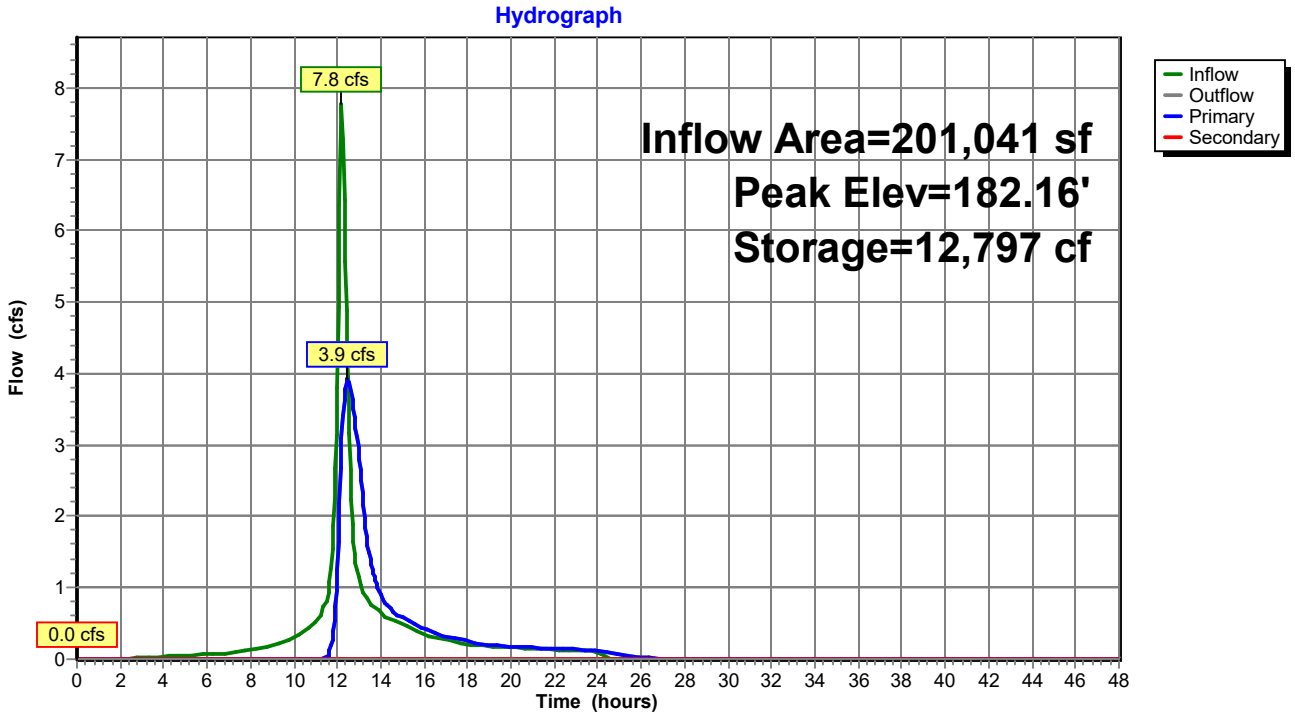
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.9 cfs @ 12.48 hrs HW=182.16' (Free Discharge)
└1=**Culvert** (Passes 3.9 cfs of 21.2 cfs potential flow)
  └2=**Orifice/Grate** (Orifice Controls 3.9 cfs @ 3.36 fps)
  └3=**Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└4=**Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 0.86" for 2-Year event
Inflow = 1.3 cfs @ 12.22 hrs, Volume= 5,636 cf
Outflow = 0.1 cfs @ 14.73 hrs, Volume= 2,275 cf, Atten= 90%, Lag= 150.6 min
Primary = 0.1 cfs @ 14.73 hrs, Volume= 2,275 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.02' @ 14.73 hrs Surf.Area= 7,196 sf Storage= 3,476 cf

Plug-Flow detention time= 340.1 min calculated for 2,275 cf (40% of inflow)
Center-of-Mass det. time= 197.7 min (1,074.8 - 877.1)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

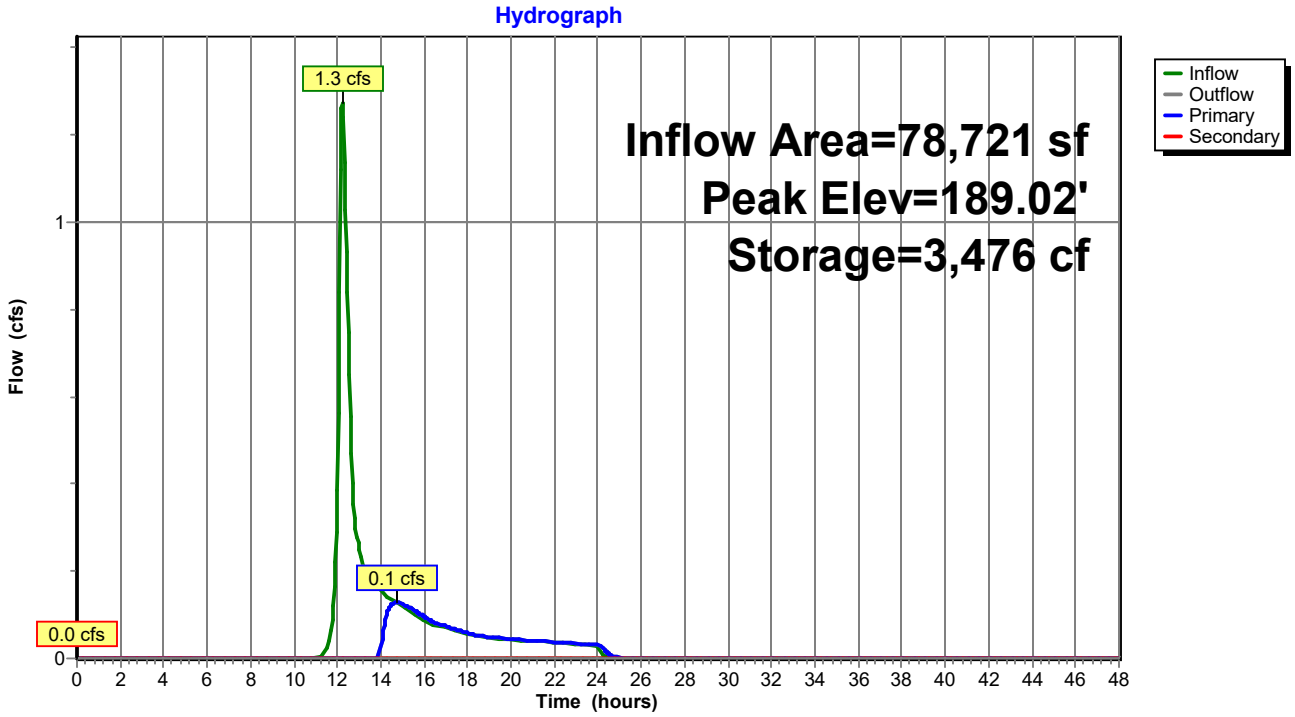
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.1 cfs @ 14.73 hrs HW=189.02' (Free Discharge)
└**1=Culvert** (Passes 0.1 cfs of 5.0 cfs potential flow)
└**2=15" Dome** (Custom Controls 0.1 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 2.10" for 2-Year event
Inflow = 1.3 cfs @ 12.11 hrs, Volume= 4,890 cf
Outflow = 0.5 cfs @ 12.38 hrs, Volume= 2,519 cf, Atten= 60%, Lag= 16.4 min
Primary = 0.5 cfs @ 12.38 hrs, Volume= 2,519 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.58' @ 12.38 hrs Surf.Area= 2,895 sf Storage= 2,598 cf

Plug-Flow detention time= 259.5 min calculated for 2,519 cf (52% of inflow)
Center-of-Mass det. time= 134.8 min (911.2 - 776.4)

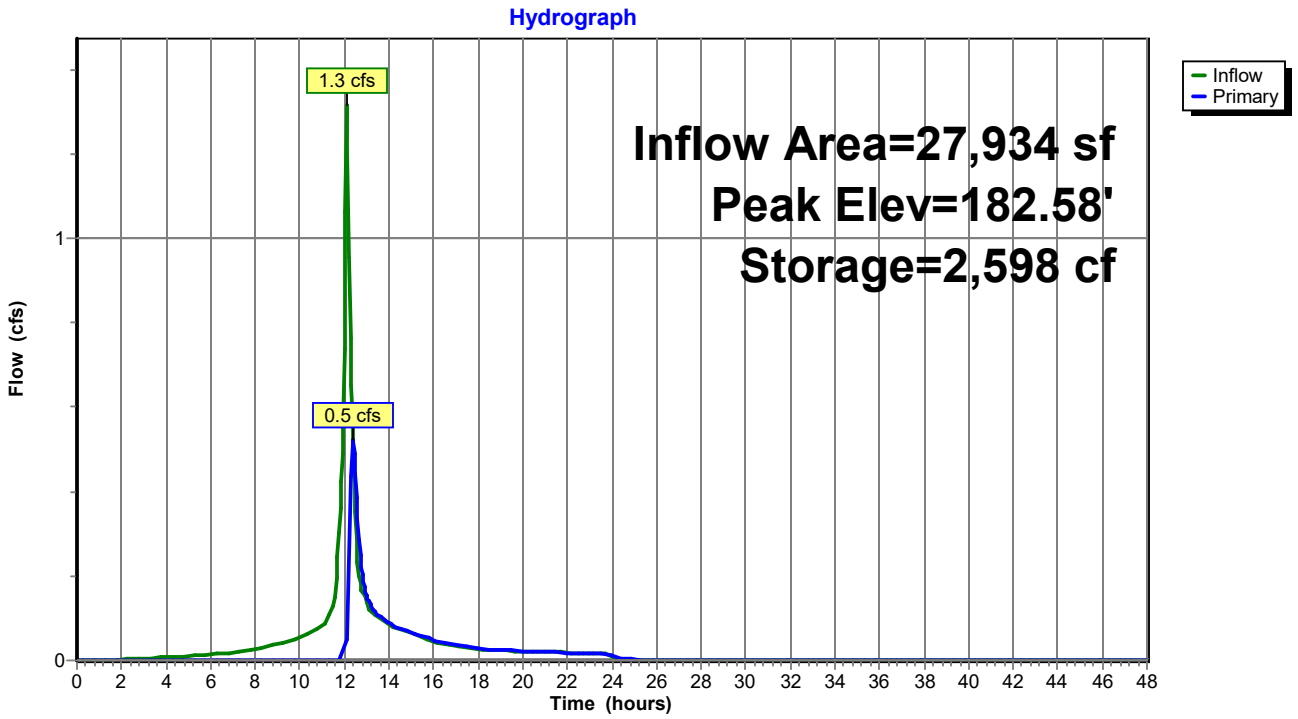
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.5 cfs @ 12.38 hrs HW=182.58' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.5 cfs @ 0.66 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 7.7 cfs @ 12.16 hrs, Volume= 34,794 cf
Outflow = 2.6 cfs @ 12.58 hrs, Volume= 34,754 cf, Atten= 66%, Lag= 25.1 min
Primary = 2.6 cfs @ 12.58 hrs, Volume= 34,754 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 179.69' @ 12.58 hrs Surf.Area= 9,322 sf Storage= 11,641 cf

Plug-Flow detention time= 97.2 min calculated for 34,754 cf (100% of inflow)
Center-of-Mass det. time= 96.5 min (889.6 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

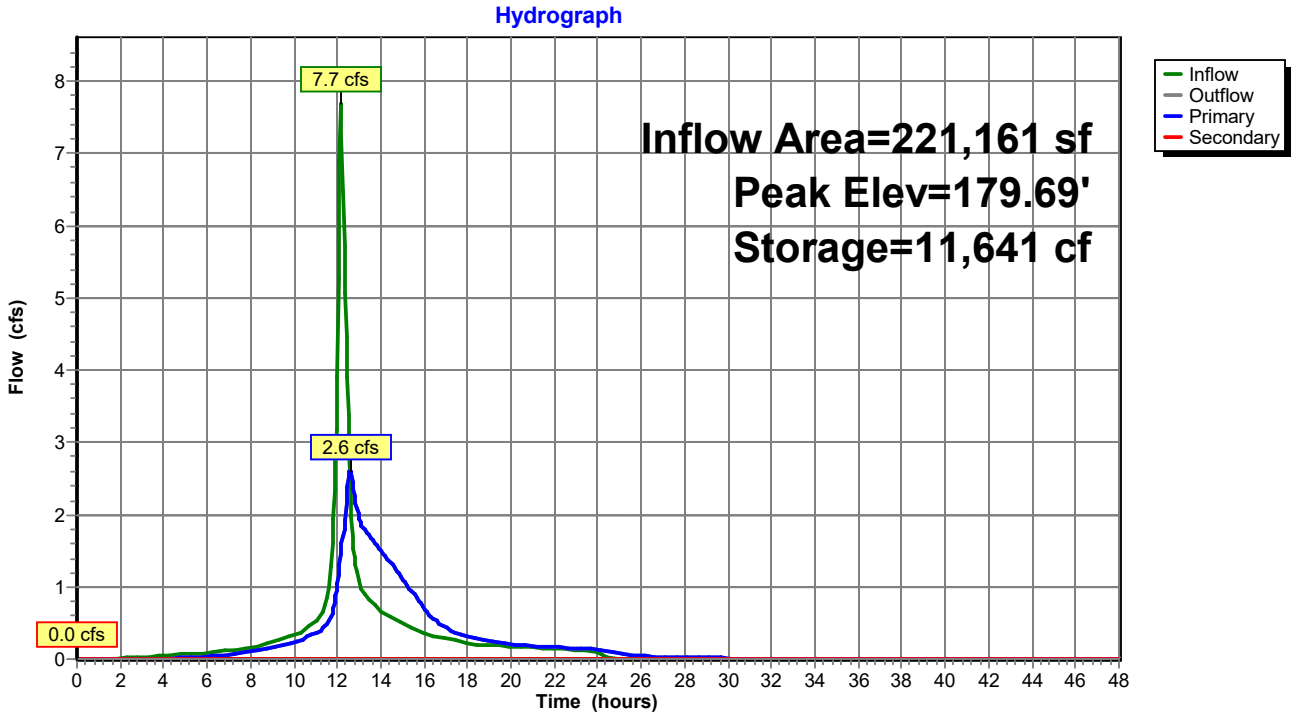
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.6 cfs @ 12.58 hrs HW=179.69' (Free Discharge)
└**1=Culvert** (Passes 2.6 cfs of 6.5 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.0 cfs @ 5.60 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.6 cfs @ 1.38 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,453 sf, 34.02% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 4.3 cfs @ 12.12 hrs, Volume= 20,034 cf
Outflow = 2.4 cfs @ 12.34 hrs, Volume= 17,135 cf, Atten= 45%, Lag= 12.9 min
Primary = 2.4 cfs @ 12.34 hrs, Volume= 17,135 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.59' @ 12.34 hrs Surf.Area= 7,057 sf Storage= 6,812 cf

Plug-Flow detention time= 168.0 min calculated for 17,135 cf (86% of inflow)
Center-of-Mass det. time= 97.5 min (911.5 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

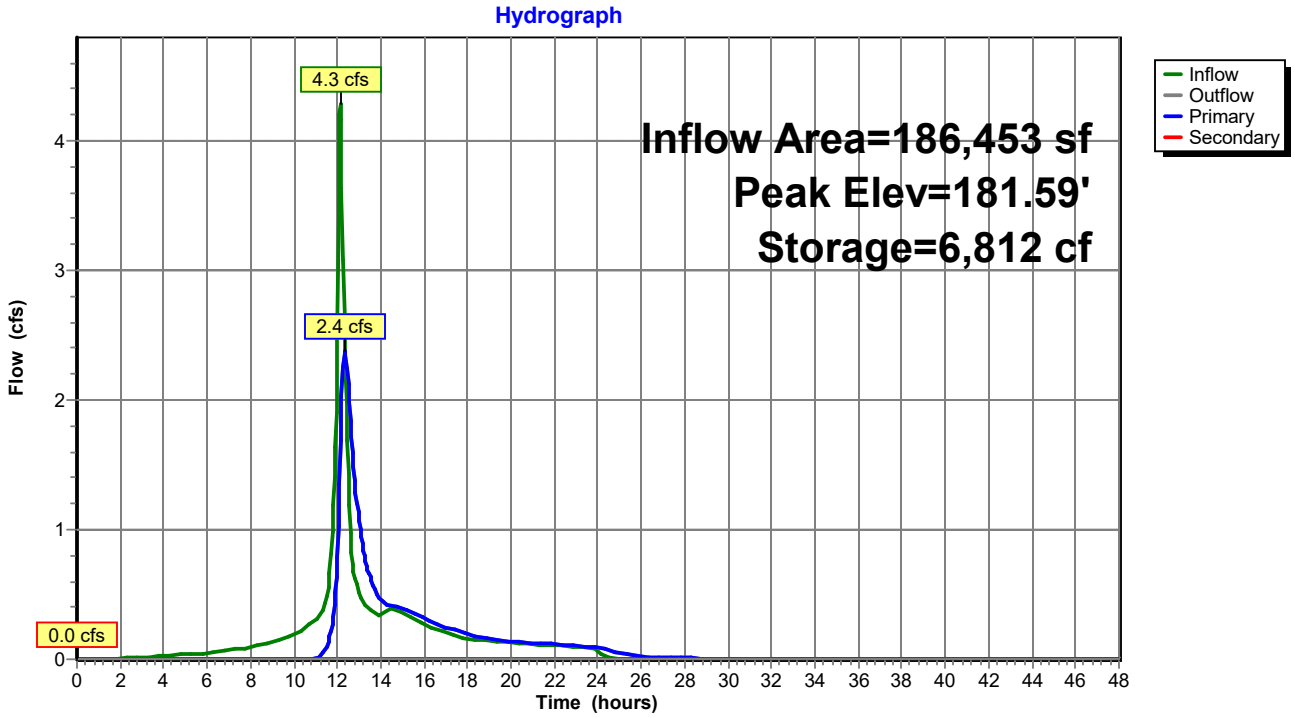
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.4 cfs @ 12.34 hrs HW=181.59' (Free Discharge)
└**1=Culvert** (Passes 2.4 cfs of 6.4 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 2.4 cfs @ 2.31 fps)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

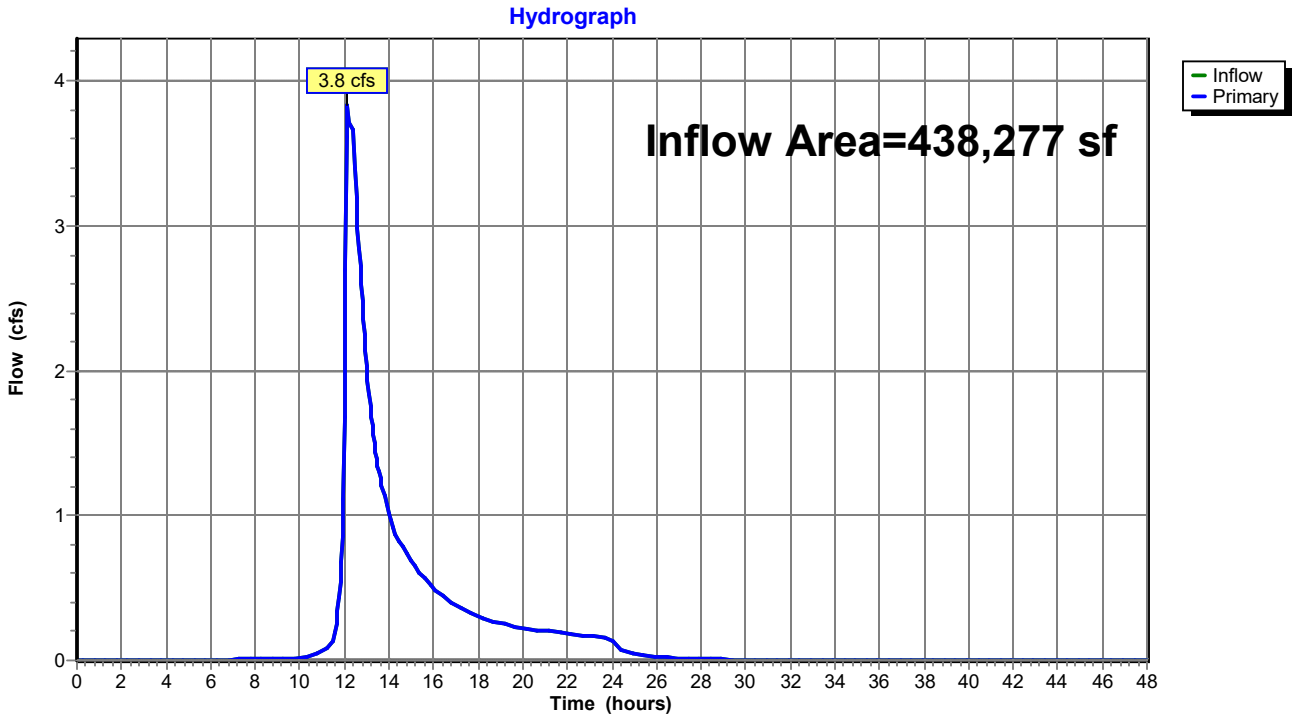


Summary for Link DP-1: Offsite to North

Inflow Area = 438,277 sf, 20.81% Impervious, Inflow Depth = 0.83" for 2-Year event
Inflow = 3.8 cfs @ 12.16 hrs, Volume= 30,476 cf
Primary = 3.8 cfs @ 12.16 hrs, Volume= 30,476 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

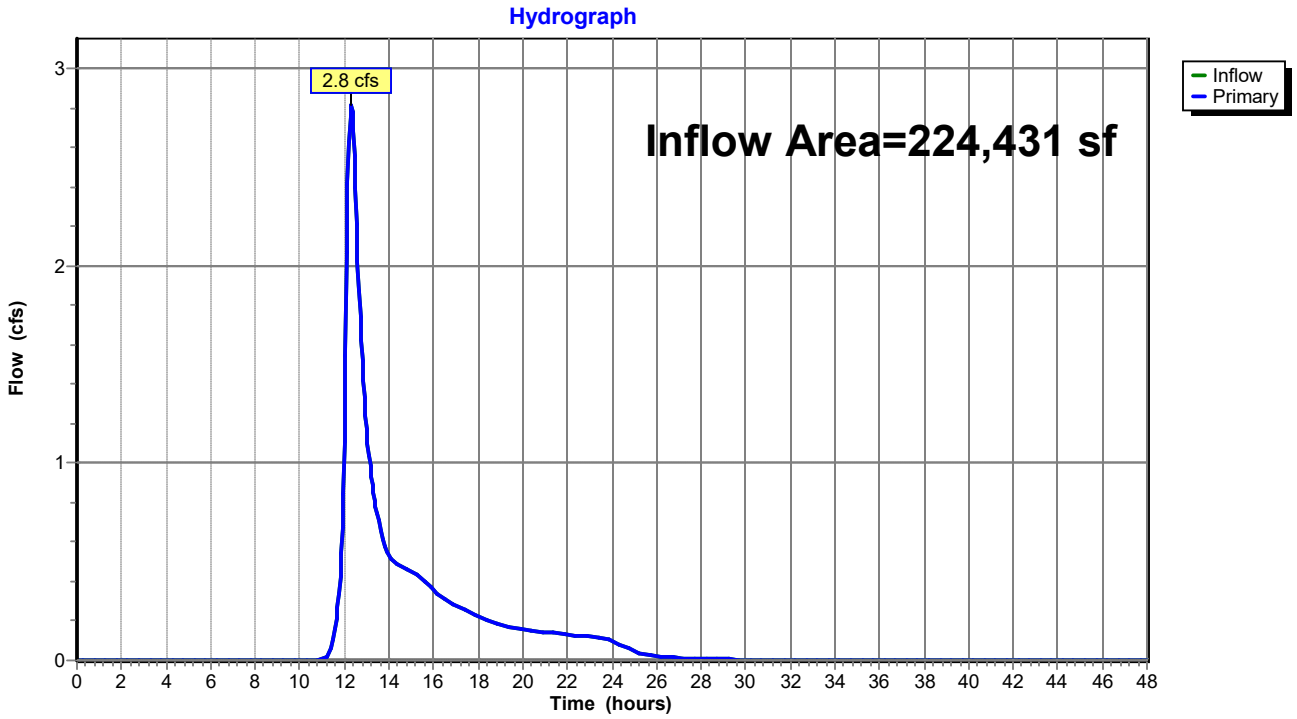


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,431 sf, 28.26% Impervious, Inflow Depth = 1.06" for 2-Year event
Inflow = 2.8 cfs @ 12.31 hrs, Volume= 19,848 cf
Primary = 2.8 cfs @ 12.31 hrs, Volume= 19,848 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

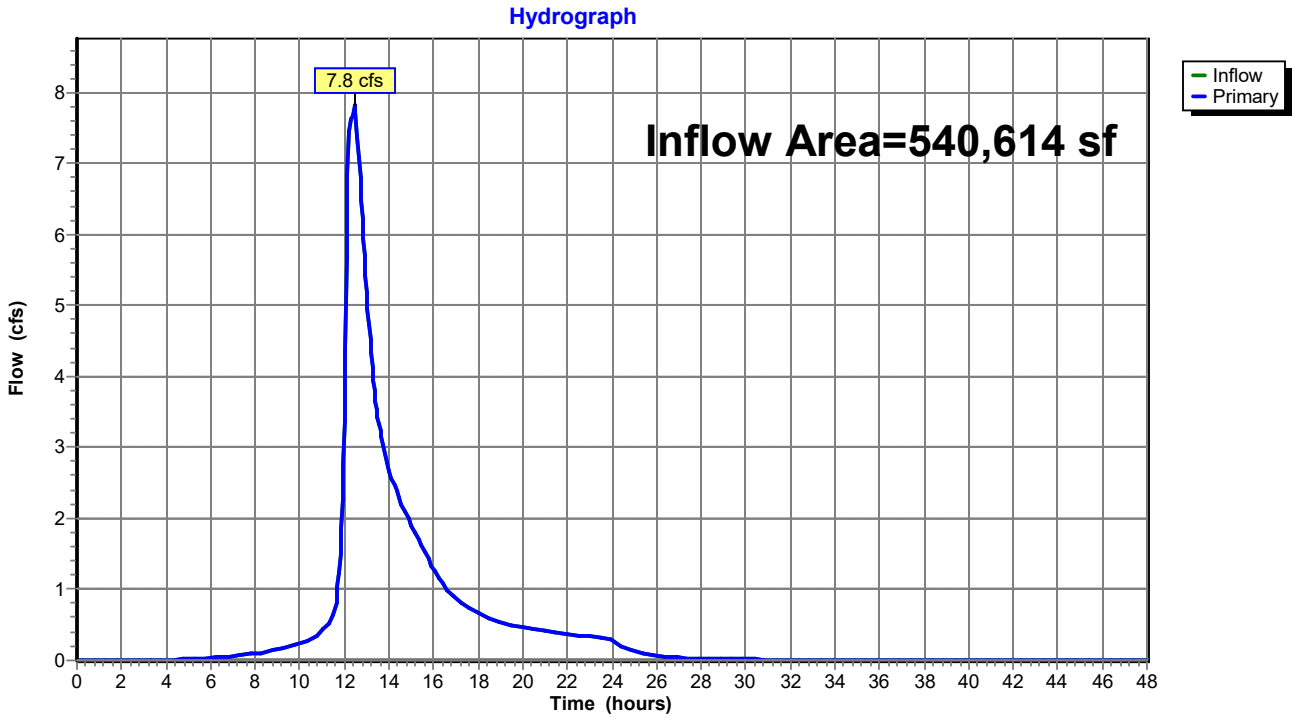


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth > 1.67" for 2-Year event
Inflow = 7.8 cfs @ 12.46 hrs, Volume= 75,015 cf
Primary = 7.8 cfs @ 12.46 hrs, Volume= 75,015 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=171,804 sf 49.77% Impervious Runoff Depth=2.65"
Flow Length=1,466' Tc=17.1 min CN=58/98 Runoff=7.6 cfs 37,969 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=1.26"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=3.0 cfs 10,967 cf

Subcatchment PS-1C: Runoff Area=44,596 sf 12.79% Impervious Runoff Depth=0.87"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=0.5 cfs 3,249 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=1.39"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=2.1 cfs 7,932 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=3.2 cfs 10,104 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=1.97"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=3.2 cfs 12,947 cf

Subcatchment PS-2B: Runoff Area=64,786 sf 68.84% Impervious Runoff Depth=3.48"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=4.5 cfs 18,792 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=3.20"
Tc=6.0 min CN=77/98 Runoff=3.3 cfs 11,443 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=1.97"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=1.8 cfs 6,239 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=0/98 Runoff=1.1 cfs 4,084 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=3.48"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=12.7 cfs 54,995 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=3.54"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=12.1 cfs 50,461 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=74/98 Runoff=1.4 cfs 4,577 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=3.53"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=2.2 cfs 8,225 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=2.38"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=6.0 cfs 23,442 cf

Pond 1P: Infiltration Basin #1 Peak Elev=201.93' Storage=12,439 cf Inflow=7.6 cfs 37,969 cf
Primary=4.8 cfs 33,799 cf Secondary=0.0 cfs 0 cf Outflow=4.8 cfs 33,799 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.63' Storage=18,659 cf Inflow=13.4 cfs 59,079 cf
Primary=7.8 cfs 53,879 cf Secondary=0.0 cfs 0 cf Outflow=7.8 cfs 53,879 cf

Pond 3P: Runoff Collection Area Peak Elev=189.16' Storage=4,494 cf Inflow=3.2 cfs 12,947 cf
Primary=1.7 cfs 9,586 cf Secondary=0.0 cfs 0 cf Outflow=1.7 cfs 9,586 cf

Pond 5P: Bioretention Basin Peak Elev=182.69' Storage=2,927 cf Inflow=2.2 cfs 8,225 cf
Outflow=2.0 cfs 5,854 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=180.38' Storage=17,507 cf Inflow=15.1 cfs 60,891 cf
Primary=7.1 cfs 60,848 cf Secondary=0.0 cfs 0 cf Outflow=7.1 cfs 60,848 cf

Pond 8P: Infiltration Basin #2 Peak Elev=181.86' Storage=8,767 cf Inflow=7.4 cfs 39,821 cf
Primary=5.0 cfs 36,922 cf Secondary=0.0 cfs 0 cf Outflow=5.0 cfs 36,922 cf

Link DP-1: Offsite to North Inflow=10.3 cfs 66,051 cf
Primary=10.3 cfs 66,051 cf

Link DP-2: Offsite to Southeast Inflow=6.1 cfs 43,161 cf
Primary=6.1 cfs 43,161 cf

Link DP-3: Offsite to Northeast Inflow=18.4 cfs 138,169 cf
Primary=18.4 cfs 138,169 cf

Total Runoff Area = 1,203,322 sf Runoff Volume = 265,425 cf Average Runoff Depth = 2.65"
69.24% Pervious = 833,169 sf 30.76% Impervious = 370,153 sf

Summary for Subcatchment PS-1A:

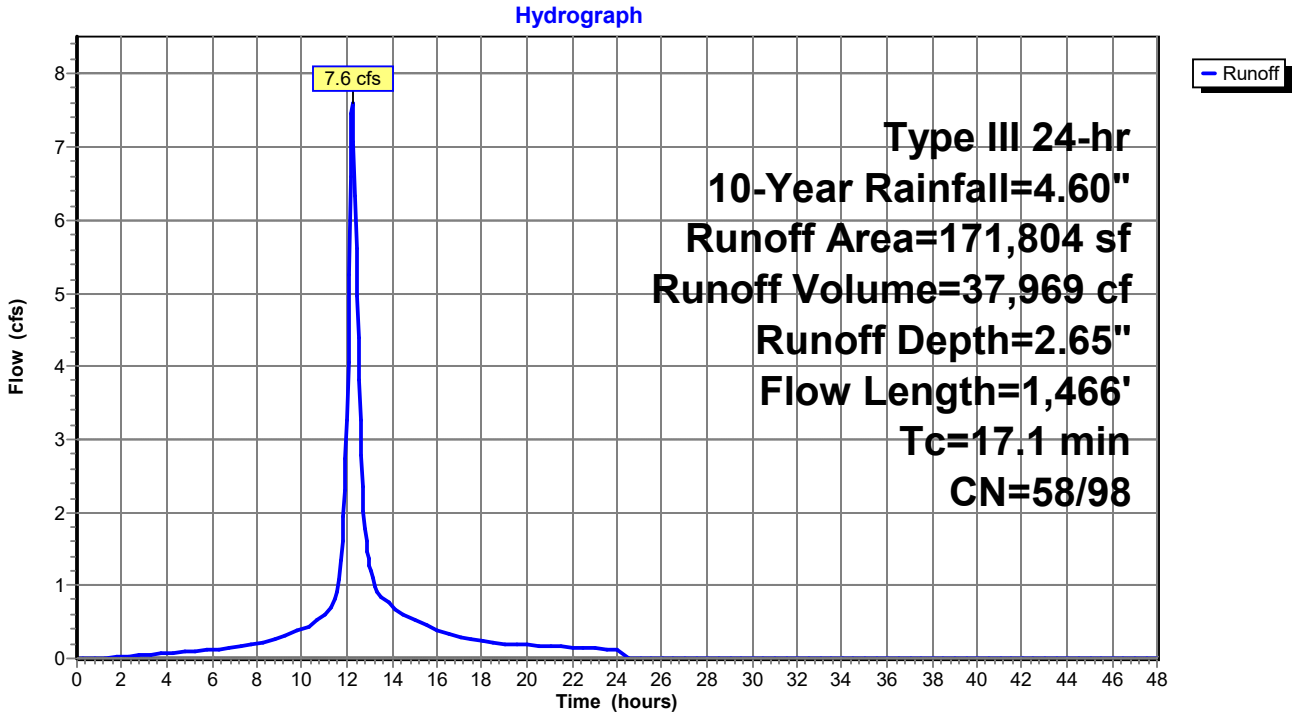
Runoff = 7.6 cfs @ 12.23 hrs, Volume= 37,969 cf, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
11,329	39	>75% Grass cover, Good, HSG A
73,276	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG A
53,764	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
171,804	78	Weighted Average
86,296	58	50.23% Pervious Area
85,509	98	49.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

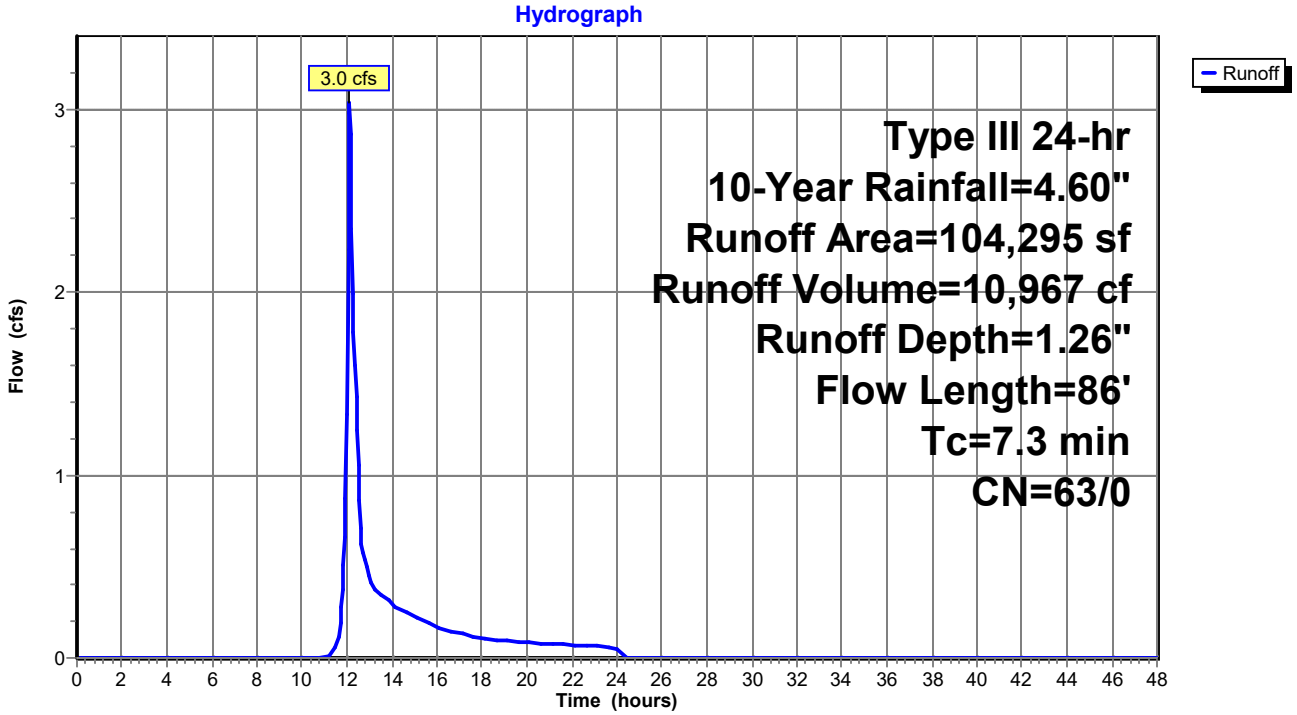
Runoff = 3.0 cfs @ 12.12 hrs, Volume= 10,967 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

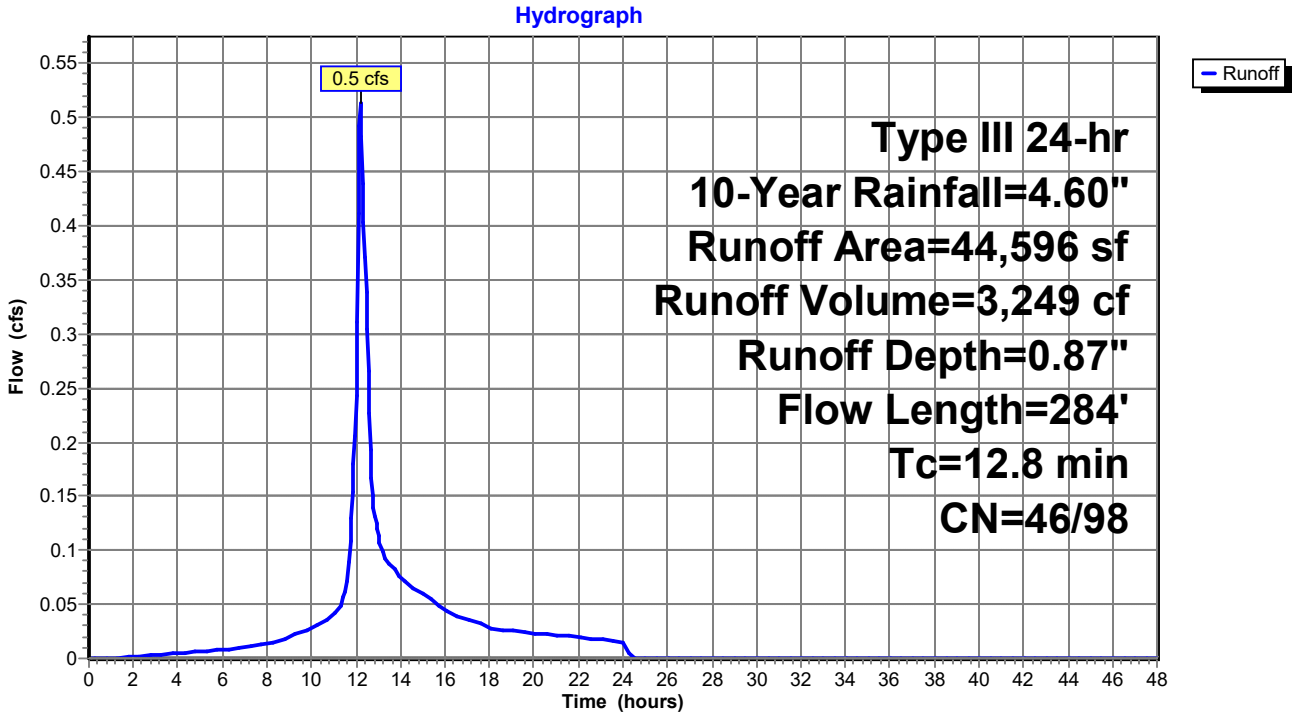
Runoff = 0.5 cfs @ 12.19 hrs, Volume= 3,249 cf, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
13,186	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
3,442	98	Paved parking, HSG A
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
10,158	30	Woods, Good, HSG A
44,596	53	Weighted Average
38,892	46	87.21% Pervious Area
5,704	98	12.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

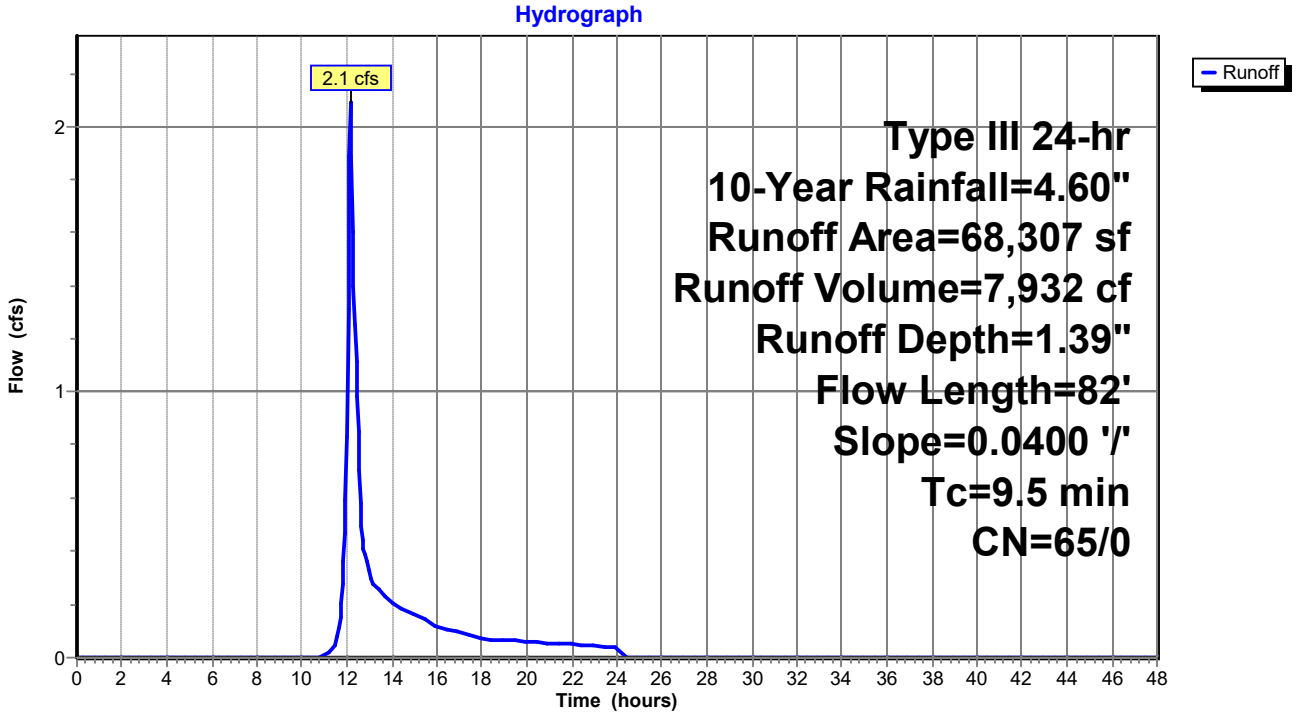
Runoff = 2.1 cfs @ 12.15 hrs, Volume= 7,932 cf, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

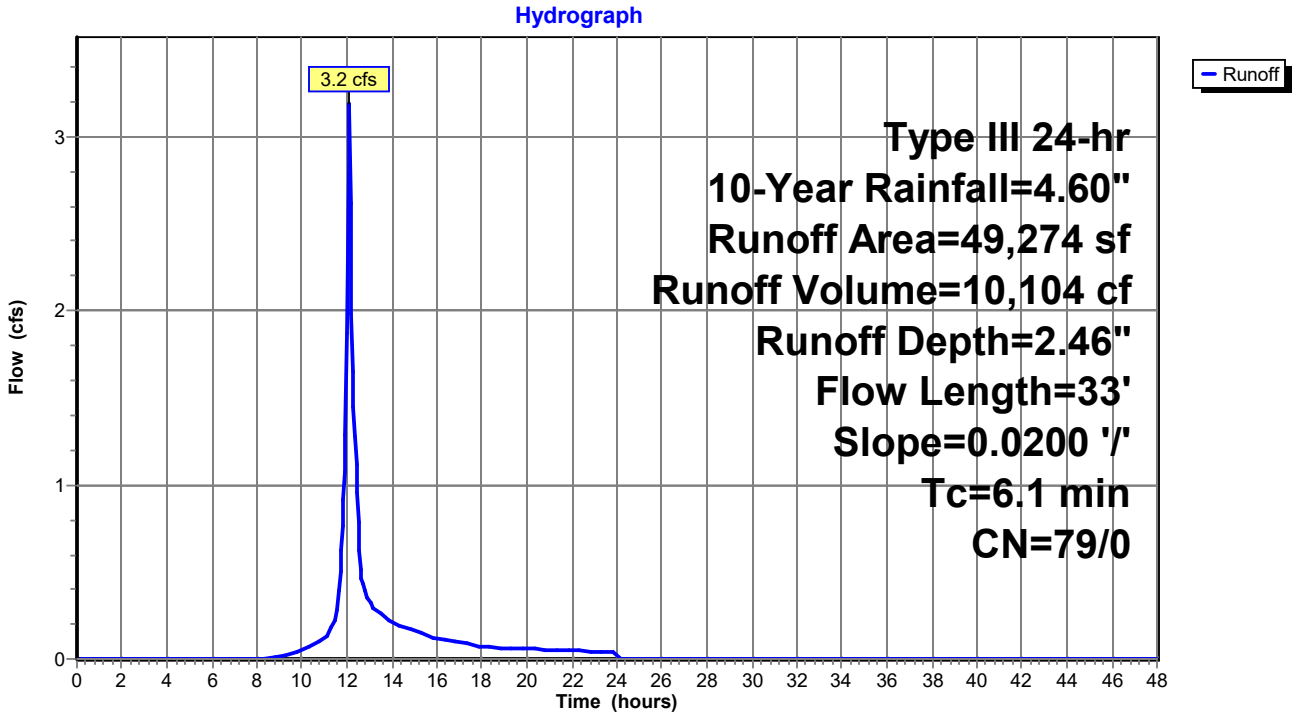
Runoff = 3.2 cfs @ 12.09 hrs, Volume= 10,104 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

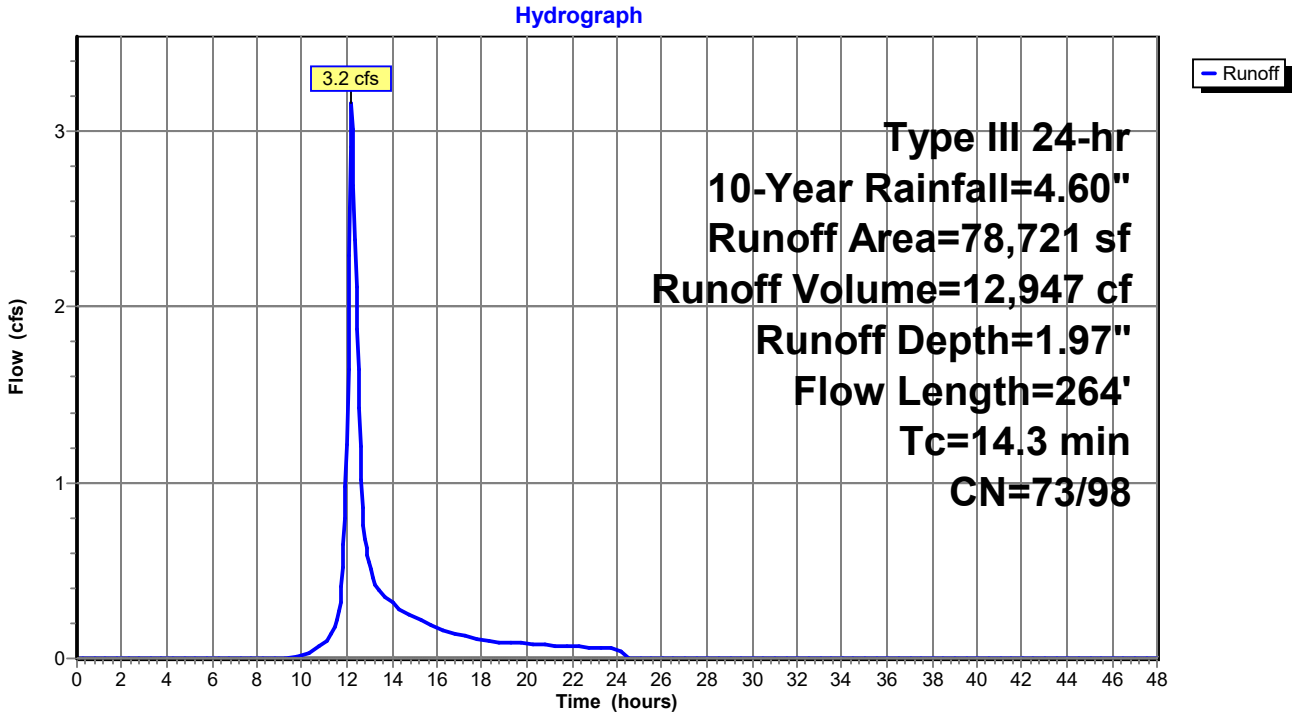
Runoff = 3.2 cfs @ 12.21 hrs, Volume= 12,947 cf, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

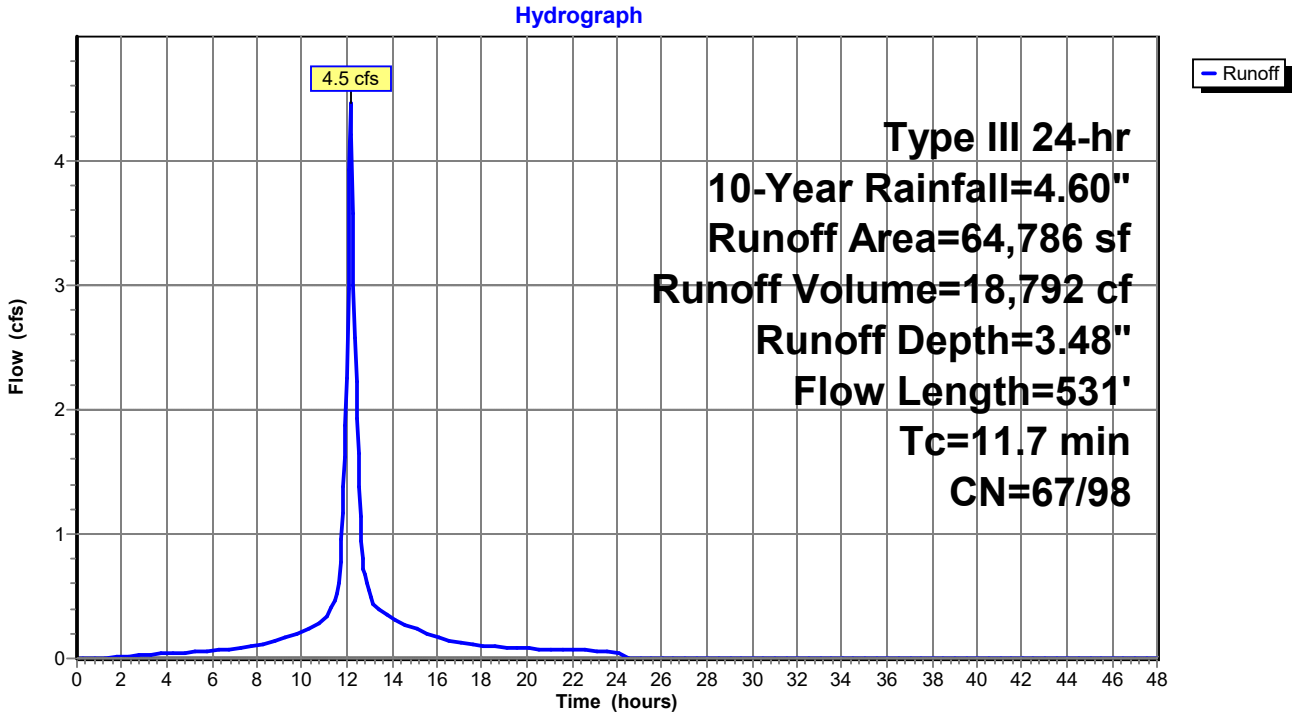
Runoff = 4.5 cfs @ 12.16 hrs, Volume= 18,792 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,786	88	Weighted Average
20,190	67	31.16% Pervious Area
44,596	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

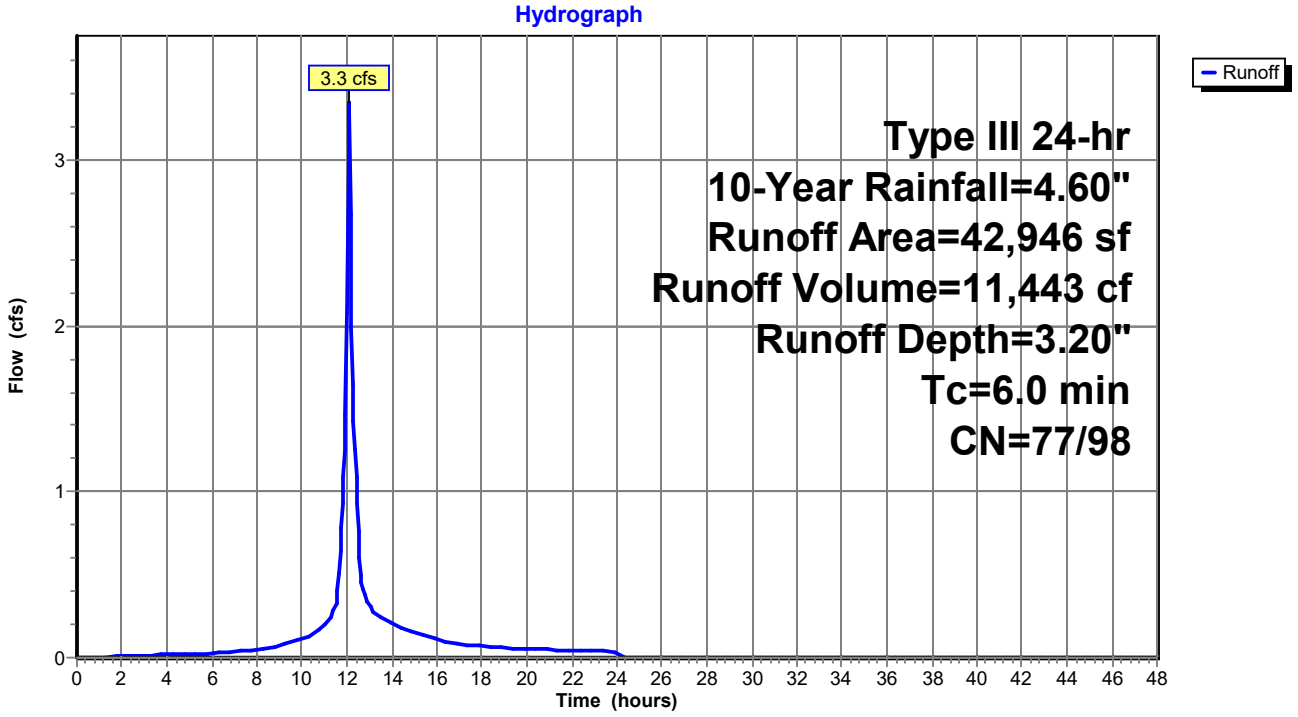
Runoff = 3.3 cfs @ 12.09 hrs, Volume= 11,443 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

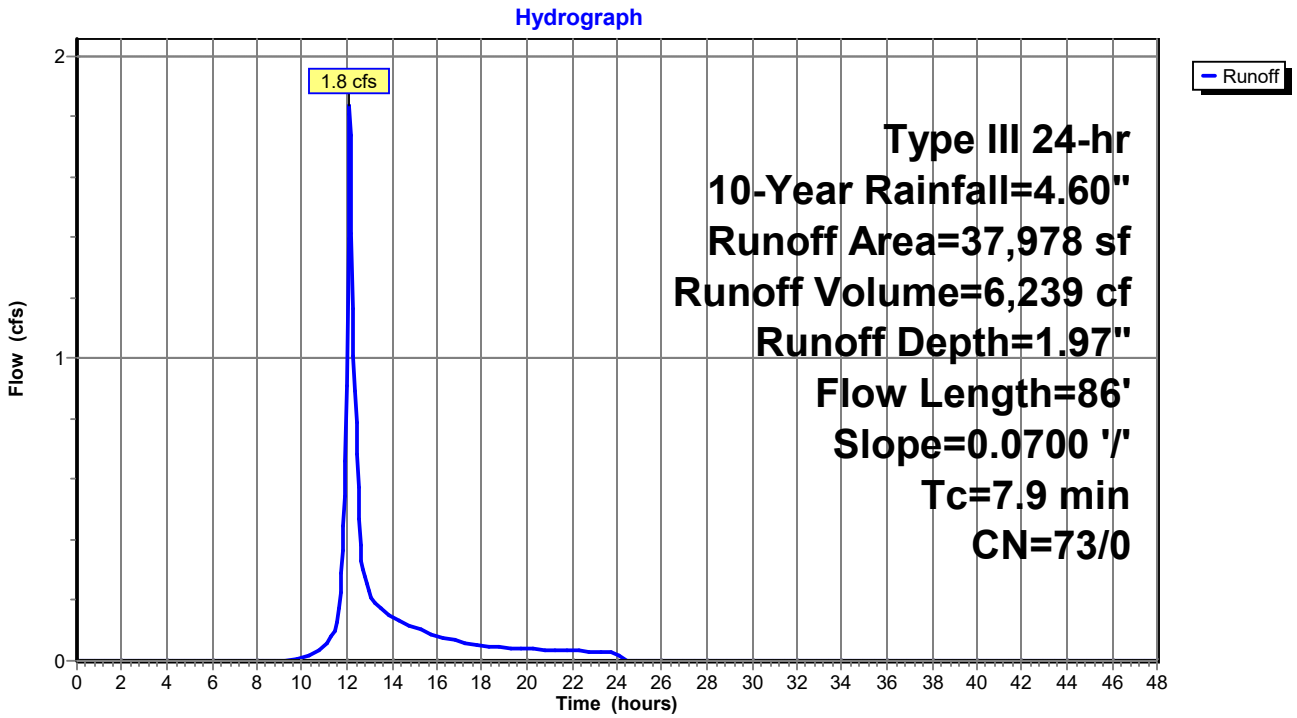
Runoff = 1.8 cfs @ 12.12 hrs, Volume= 6,239 cf, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

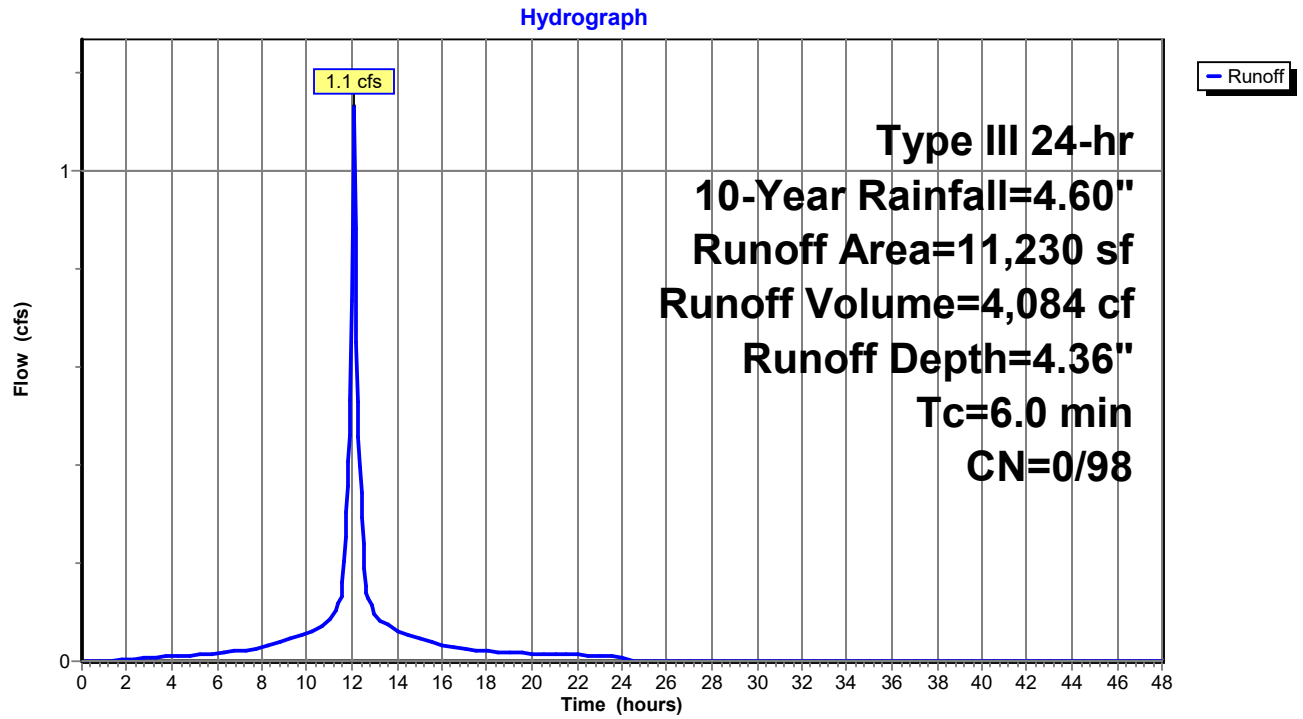
Runoff = 1.1 cfs @ 12.09 hrs, Volume= 4,084 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

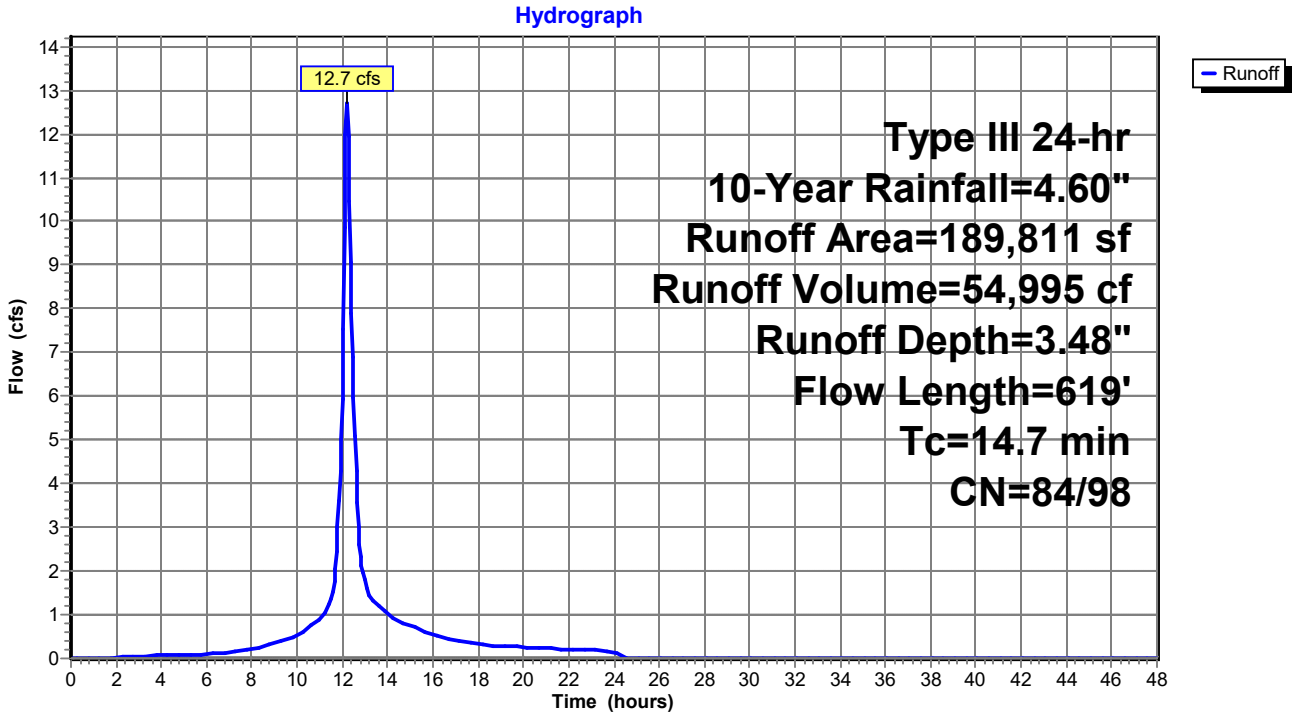
Runoff = 12.7 cfs @ 12.20 hrs, Volume= 54,995 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

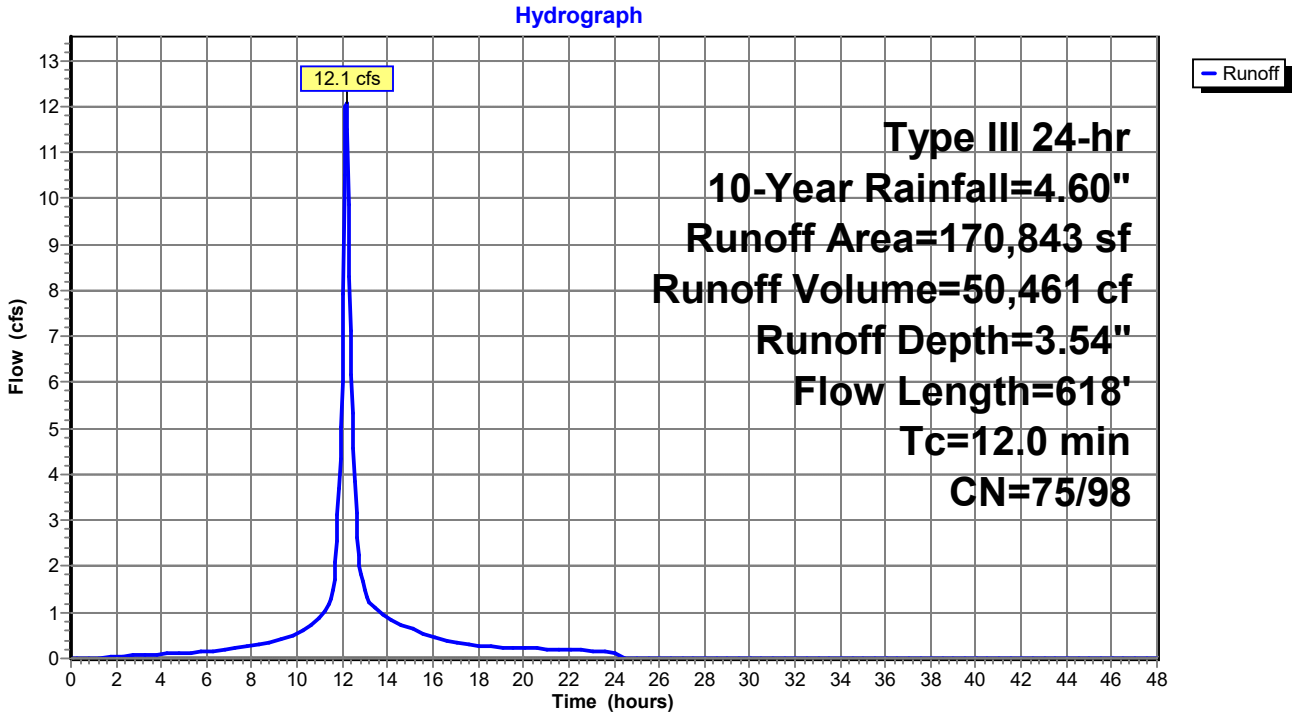
Runoff = 12.1 cfs @ 12.16 hrs, Volume= 50,461 cf, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

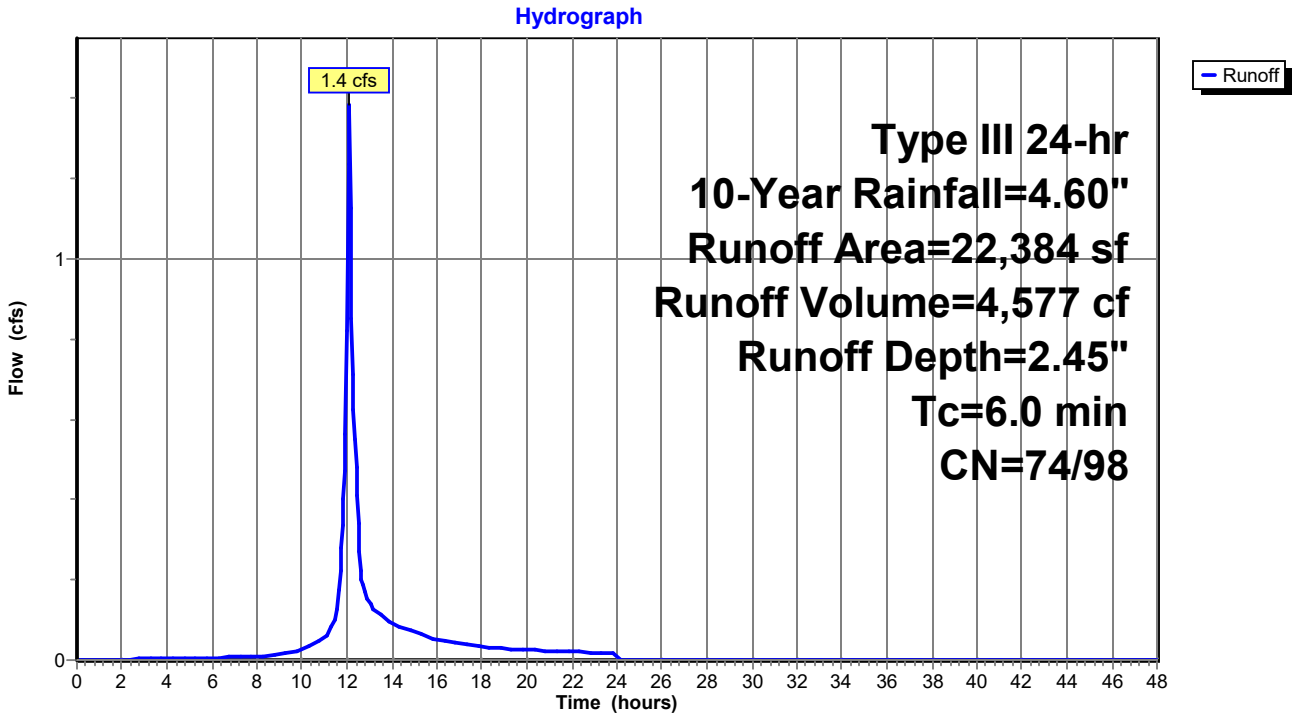
Runoff = 1.4 cfs @ 12.09 hrs, Volume= 4,577 cf, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

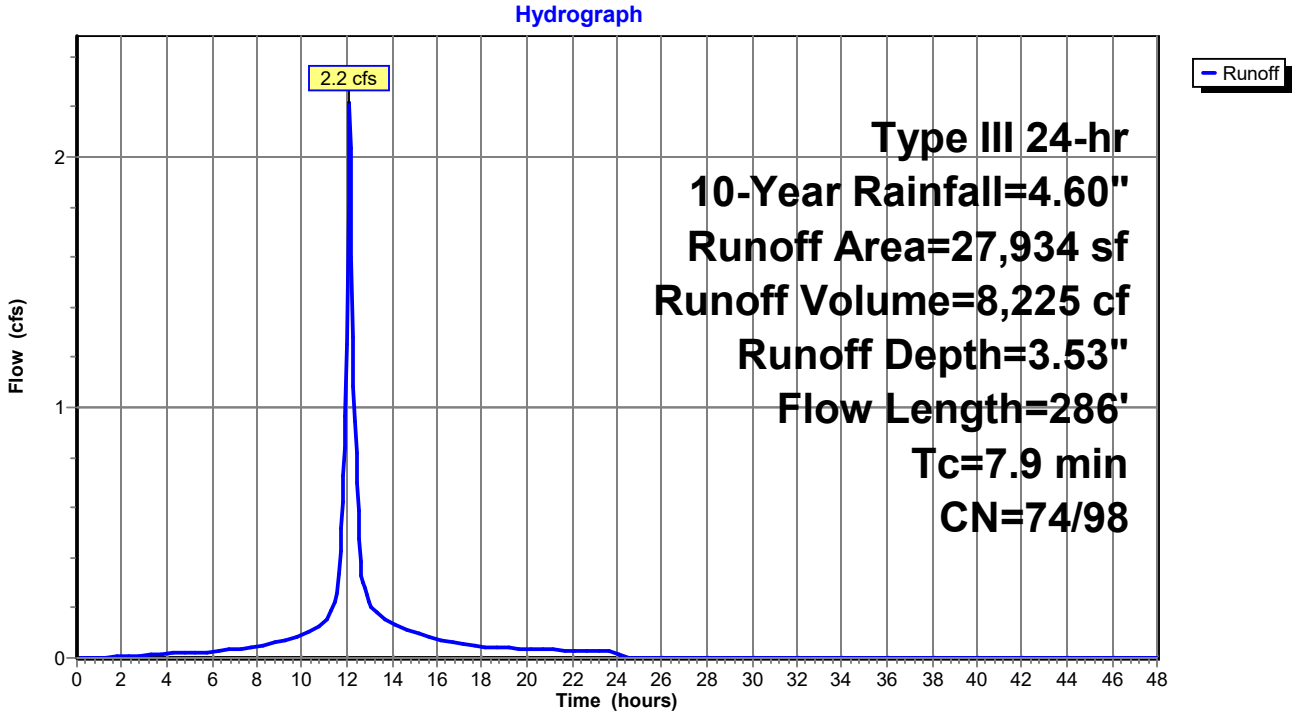
Runoff = 2.2 cfs @ 12.11 hrs, Volume= 8,225 cf, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

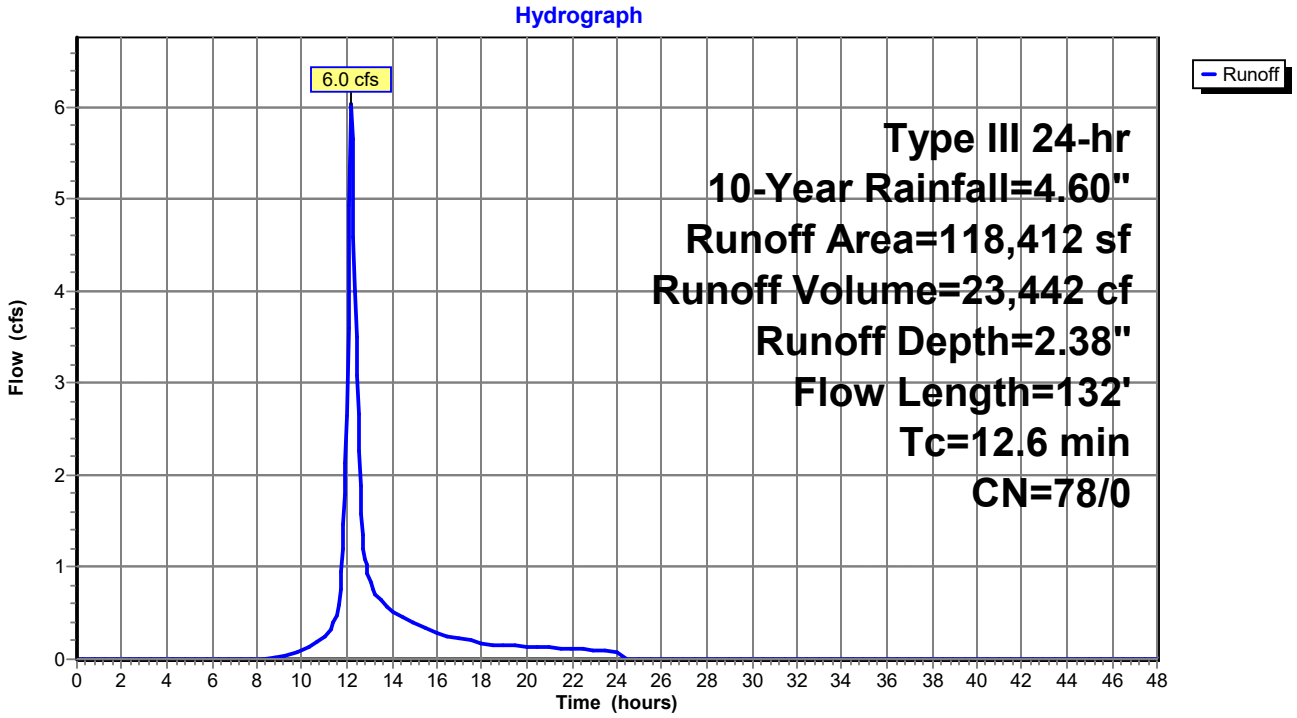
Runoff = 6.0 cfs @ 12.18 hrs, Volume= 23,442 cf, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 171,804 sf, 49.77% Impervious, Inflow Depth = 2.65" for 10-Year event
Inflow = 7.6 cfs @ 12.23 hrs, Volume= 37,969 cf
Outflow = 4.8 cfs @ 12.47 hrs, Volume= 33,799 cf, Atten= 37%, Lag= 13.9 min
Primary = 4.8 cfs @ 12.47 hrs, Volume= 33,799 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.93' @ 12.47 hrs Surf.Area= 8,788 sf Storage= 12,439 cf

Plug-Flow detention time= 149.2 min calculated for 33,799 cf (89% of inflow)
Center-of-Mass det. time= 94.3 min (879.3 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	732 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,796 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,234 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,762 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	583	92.0	0	0	583
201.00	891	113.0	732	732	941

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	891	113.0	0	0	891
202.00	1,170	129.0	1,027	1,027	1,222
203.00	1,382	141.0	1,275	2,302	1,513
204.00	1,610	152.0	1,495	3,796	1,808

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,419	397.0	0	0	4,419
201.00	5,642	418.0	5,018	5,018	5,841
202.00	6,838	438.0	6,230	11,248	7,269
203.00	7,990	458.0	7,407	18,655	8,763
204.00	9,182	477.0	8,579	27,234	10,252

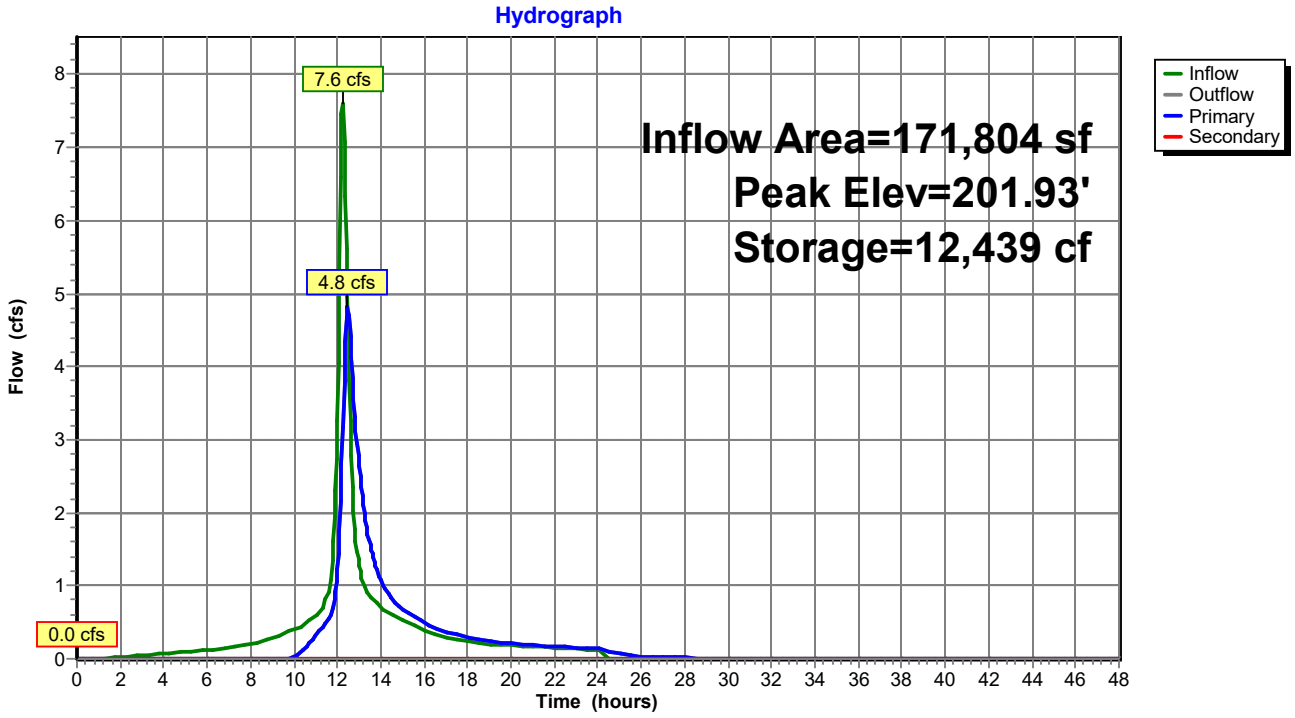
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.8 cfs @ 12.47 hrs HW=201.93' (Free Discharge)
└**1=Culvert** (Passes 4.8 cfs of 7.8 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 4.8 cfs @ 2.96 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 13.4 cfs @ 12.19 hrs, Volume= 59,079 cf
Outflow = 7.8 cfs @ 12.42 hrs, Volume= 53,879 cf, Atten= 41%, Lag= 13.8 min
Primary = 7.8 cfs @ 12.42 hrs, Volume= 53,879 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.63' @ 12.42 hrs Surf.Area= 14,126 sf Storage= 18,659 cf

Plug-Flow detention time= 113.9 min calculated for 53,823 cf (91% of inflow)
Center-of-Mass det. time= 69.7 min (857.2 - 787.5)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

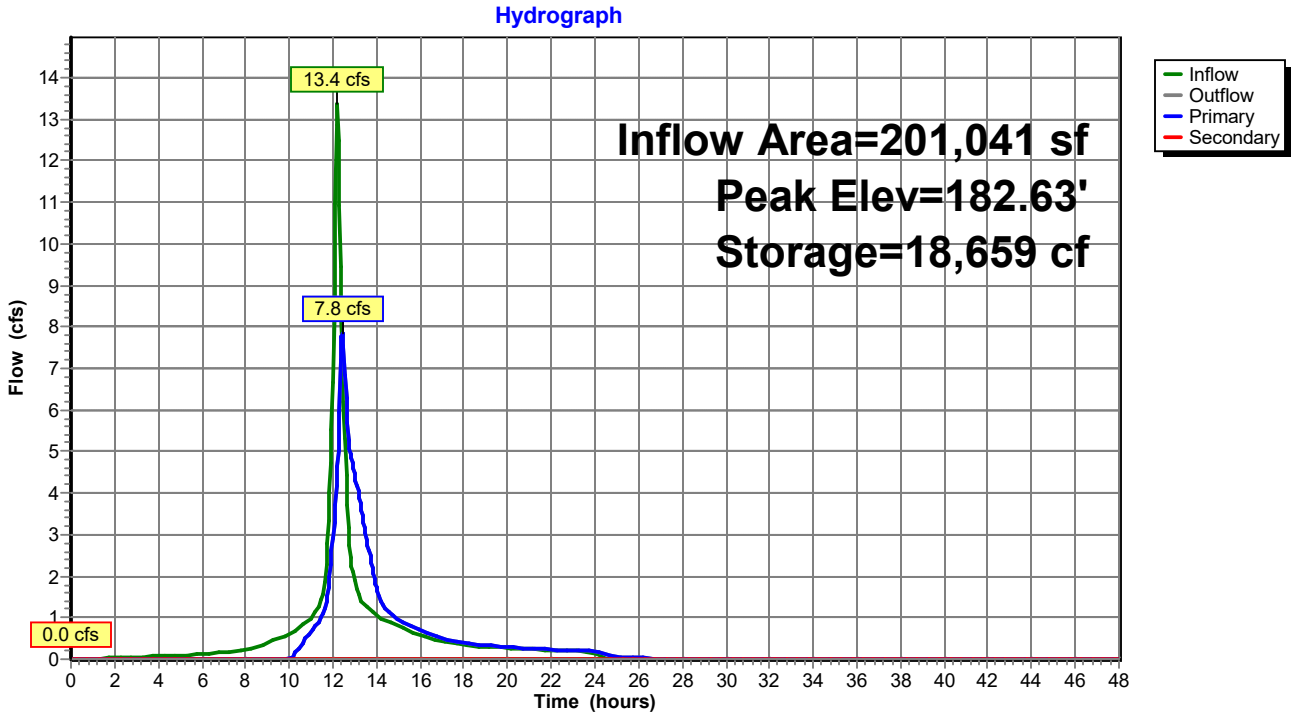
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.7 cfs @ 12.42 hrs HW=182.62' (Free Discharge)
└**1=Culvert** (Passes 7.7 cfs of 22.7 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 5.5 cfs @ 4.70 fps)
  └**3=Rim** (Weir Controls 2.3 cfs @ 1.15 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 1.97" for 10-Year event
Inflow = 3.2 cfs @ 12.21 hrs, Volume= 12,947 cf
Outflow = 1.7 cfs @ 12.49 hrs, Volume= 9,586 cf, Atten= 46%, Lag= 17.2 min
Primary = 1.7 cfs @ 12.49 hrs, Volume= 9,586 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.16' @ 12.49 hrs Surf.Area= 7,327 sf Storage= 4,494 cf

Plug-Flow detention time= 155.5 min calculated for 9,586 cf (74% of inflow)
Center-of-Mass det. time= 62.5 min (914.3 - 851.8)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

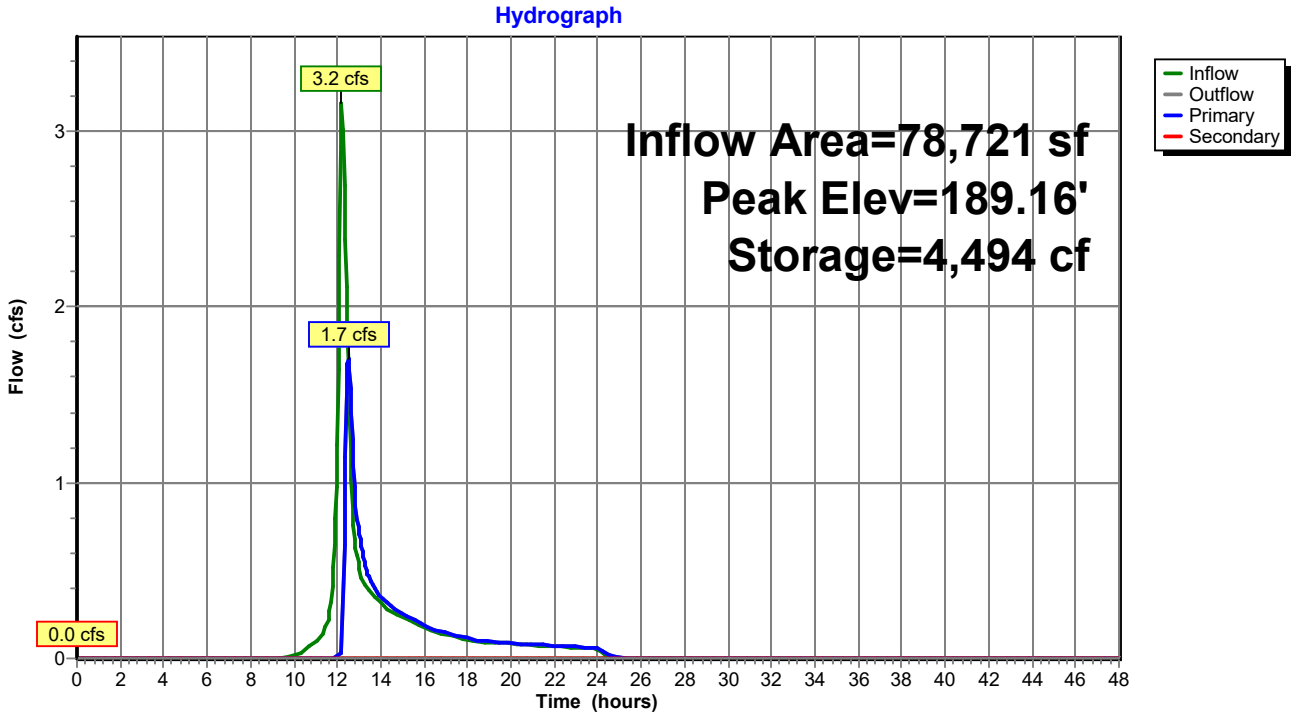
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.7 cfs @ 12.49 hrs HW=189.16' (Free Discharge)
└**1=Culvert** (Passes 1.7 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 1.7 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 2.2 cfs @ 12.11 hrs, Volume= 8,225 cf
Outflow = 2.0 cfs @ 12.17 hrs, Volume= 5,854 cf, Atten= 12%, Lag= 3.3 min
Primary = 2.0 cfs @ 12.17 hrs, Volume= 5,854 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.69' @ 12.17 hrs Surf.Area= 3,004 sf Storage= 2,927 cf

Plug-Flow detention time= 181.4 min calculated for 5,854 cf (71% of inflow)
Center-of-Mass det. time= 85.6 min (856.0 - 770.4)

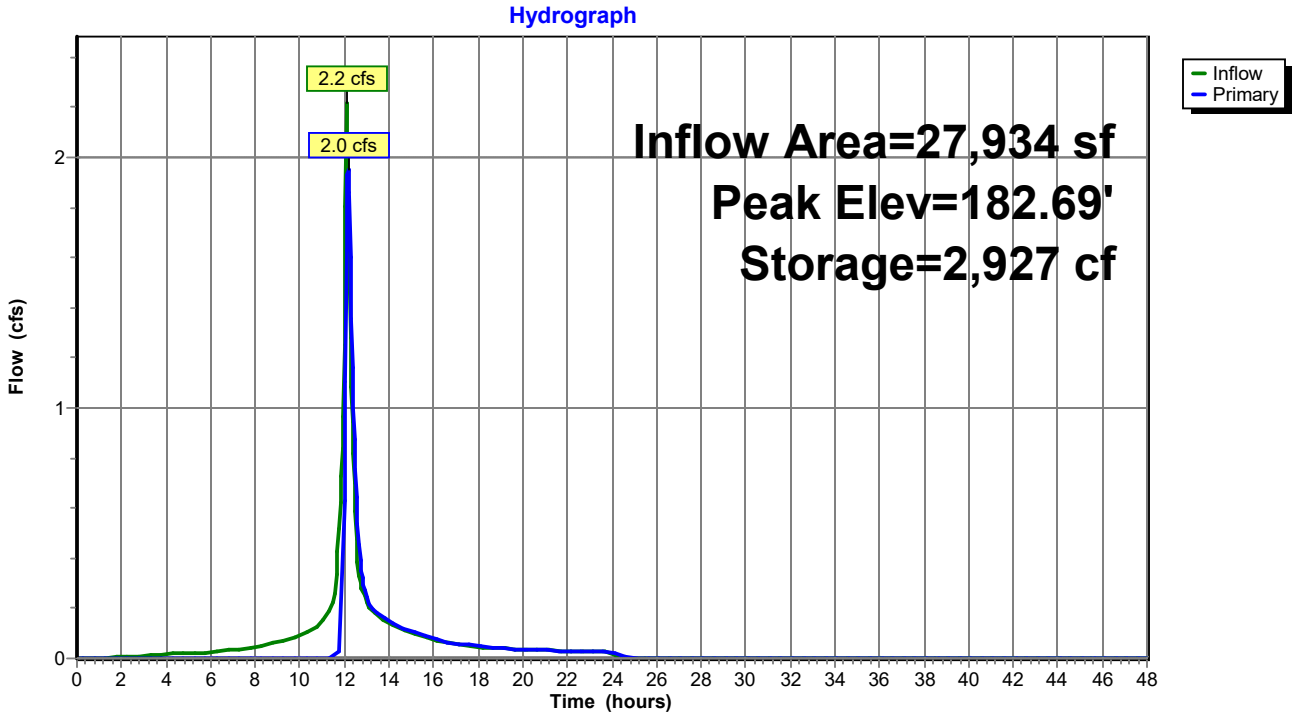
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.9 cfs @ 12.17 hrs HW=182.69' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.9 cfs @ 1.02 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 3.30" for 10-Year event
Inflow = 15.1 cfs @ 12.16 hrs, Volume= 60,891 cf
Outflow = 7.1 cfs @ 12.43 hrs, Volume= 60,848 cf, Atten= 53%, Lag= 16.1 min
Primary = 7.1 cfs @ 12.43 hrs, Volume= 60,848 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 180.38' @ 12.43 hrs Surf.Area= 10,149 sf Storage= 17,507 cf

Plug-Flow detention time= 77.7 min calculated for 60,848 cf (100% of inflow)
Center-of-Mass det. time= 77.2 min (862.6 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

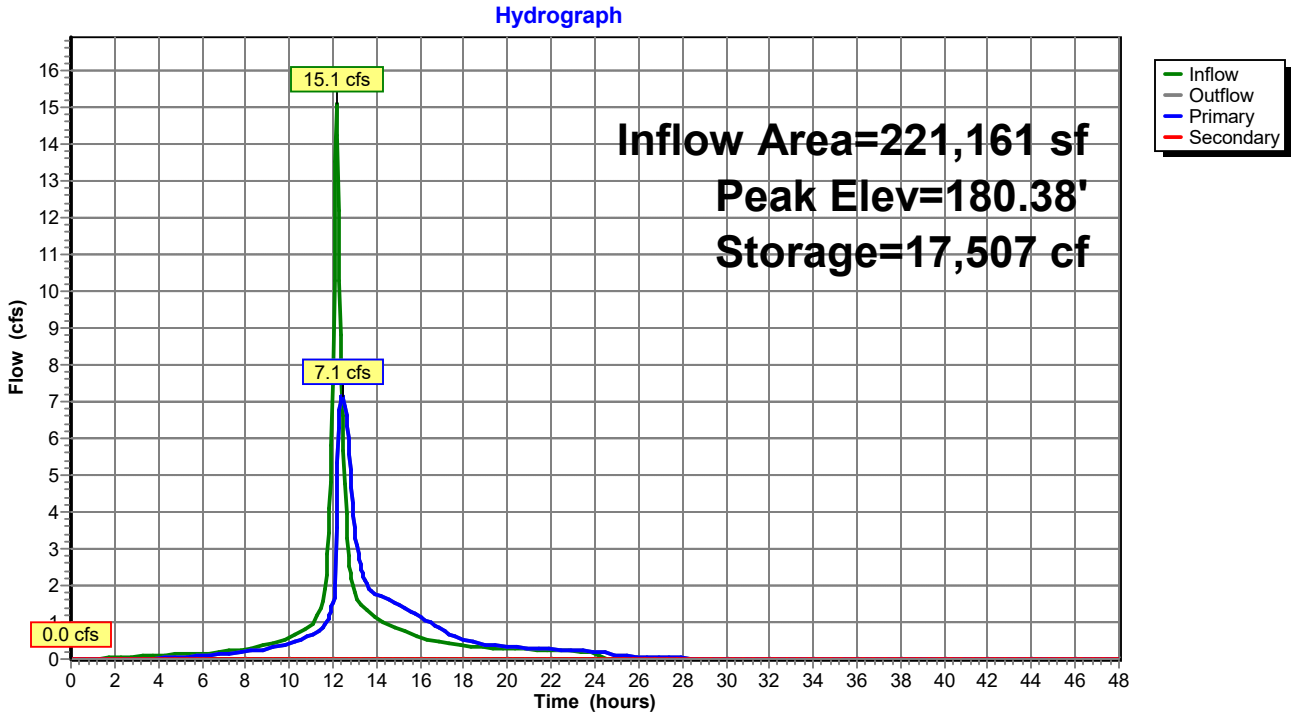
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.1 cfs @ 12.43 hrs HW=180.38' (Free Discharge)
└**1=Culvert** (Passes 7.1 cfs of 8.6 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.4 cfs @ 6.88 fps)
  └**3=Orifice/Grate** (Orifice Controls 4.7 cfs @ 3.78 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,453 sf, 34.02% Impervious, Inflow Depth = 2.56" for 10-Year event
Inflow = 7.4 cfs @ 12.12 hrs, Volume= 39,821 cf
Outflow = 5.0 cfs @ 12.34 hrs, Volume= 36,922 cf, Atten= 32%, Lag= 13.2 min
Primary = 5.0 cfs @ 12.34 hrs, Volume= 36,922 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.86' @ 12.34 hrs Surf.Area= 7,484 sf Storage= 8,767 cf

Plug-Flow detention time= 106.2 min calculated for 36,883 cf (93% of inflow)
Center-of-Mass det. time= 67.4 min (875.9 - 808.6)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

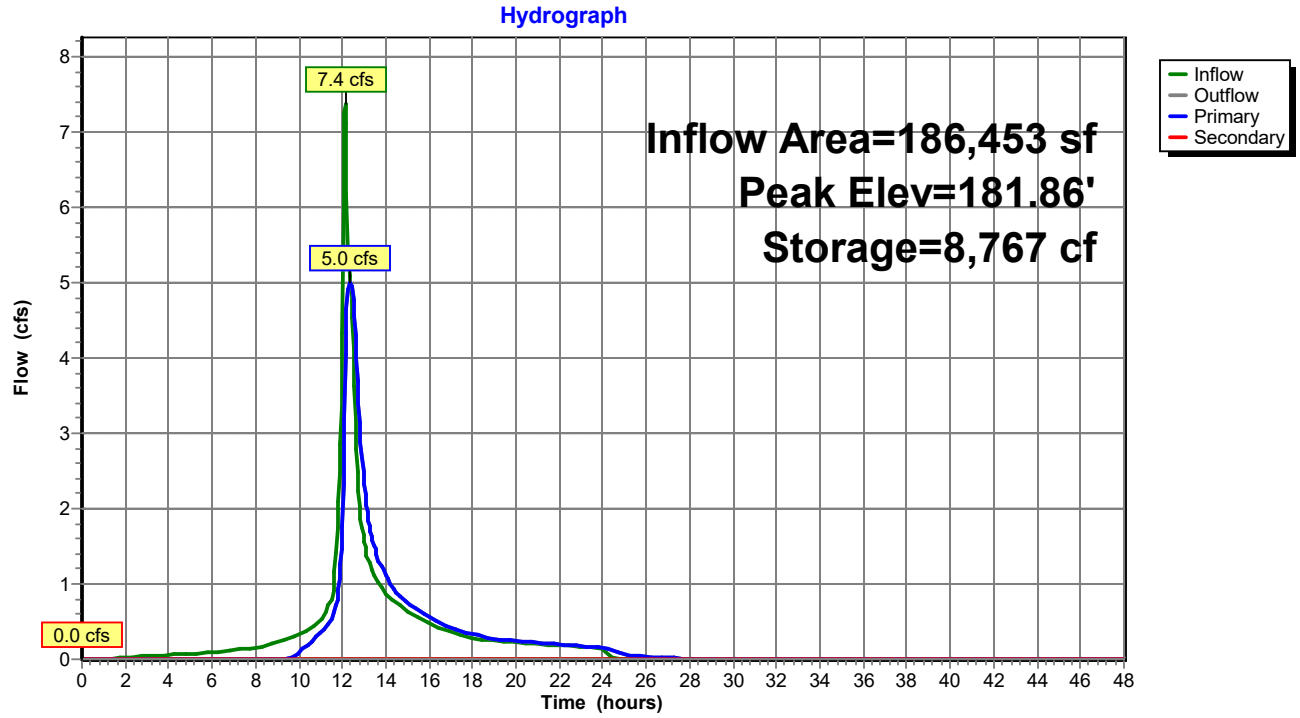
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=5.0 cfs @ 12.34 hrs HW=181.86' (Free Discharge)
└**1=Culvert** (Passes 5.0 cfs of 8.0 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 5.0 cfs @ 2.72 fps)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

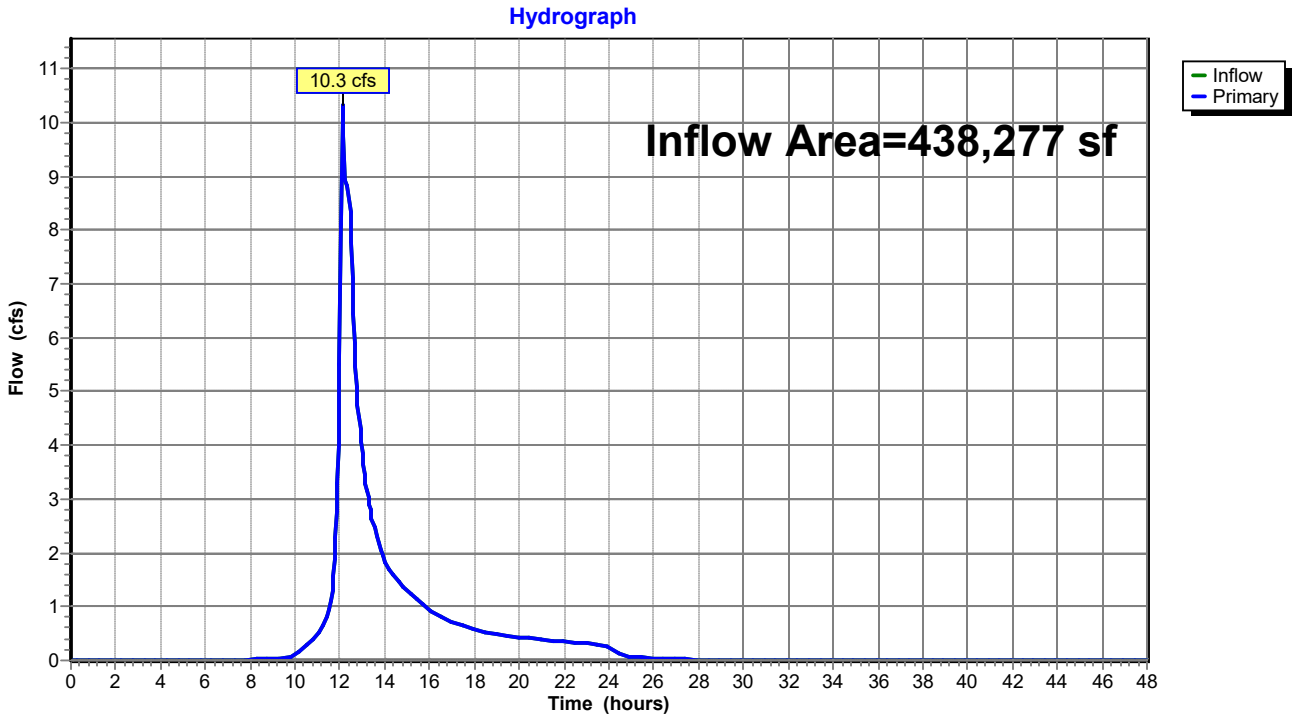


Summary for Link DP-1: Offsite to North

Inflow Area = 438,277 sf, 20.81% Impervious, Inflow Depth = 1.81" for 10-Year event
Inflow = 10.3 cfs @ 12.13 hrs, Volume= 66,051 cf
Primary = 10.3 cfs @ 12.13 hrs, Volume= 66,051 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

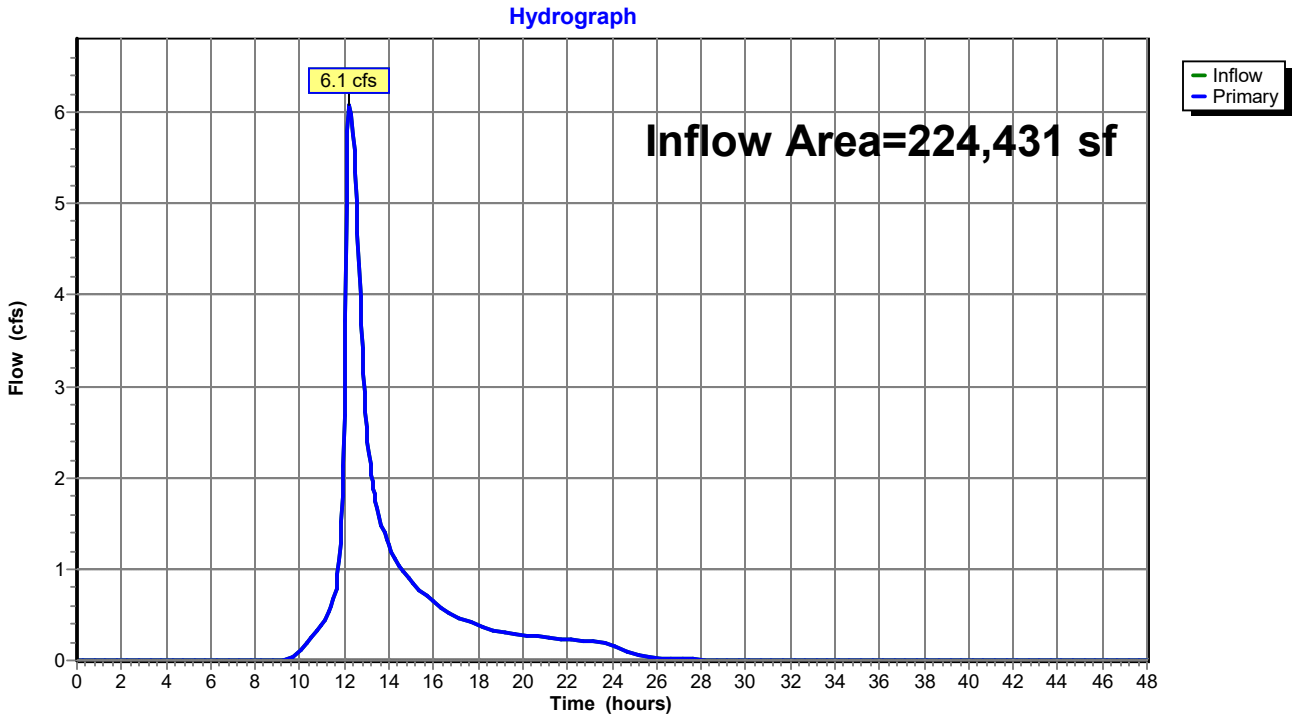


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,431 sf, 28.26% Impervious, Inflow Depth = 2.31" for 10-Year event
Inflow = 6.1 cfs @ 12.24 hrs, Volume= 43,161 cf
Primary = 6.1 cfs @ 12.24 hrs, Volume= 43,161 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

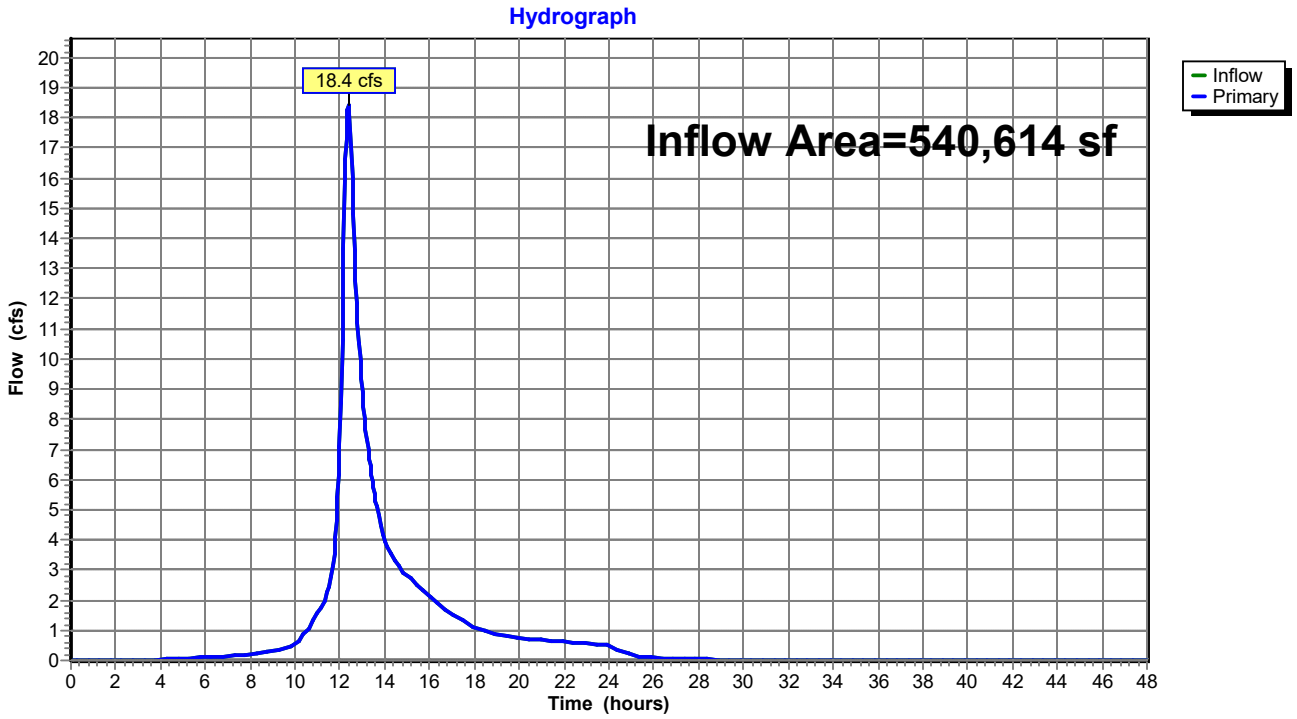


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth = 3.07" for 10-Year event
Inflow = 18.4 cfs @ 12.39 hrs, Volume= 138,169 cf
Primary = 18.4 cfs @ 12.39 hrs, Volume= 138,169 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=171,804 sf 49.77% Impervious Runoff Depth=4.16"
Flow Length=1,466' Tc=17.1 min CN=58/98 Runoff=12.2 cfs 59,545 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=6.6 cfs 22,010 cf

Subcatchment PS-1C: Runoff Area=44,596 sf 12.79% Impervious Runoff Depth=1.75"
Flow Length=284' Tc=12.8 min CN=46/98 Runoff=1.3 cfs 6,493 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=4.3 cfs 15,490 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=5.3 cfs 16,955 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=3.51"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=5.7 cfs 23,029 cf

Subcatchment PS-2B: Runoff Area=64,786 sf 68.84% Impervious Runoff Depth=5.22"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=6.7 cfs 28,171 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=4.94"
Tc=6.0 min CN=77/98 Runoff=5.2 cfs 17,689 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=3.51"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=3.3 cfs 11,102 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.6 cfs 5,860 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=5.29"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=19.2 cfs 83,682 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=5.33"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=18.1 cfs 75,834 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=74/98 Runoff=2.3 cfs 7,597 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=5.31"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=3.3 cfs 12,360 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=4.02"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=10.3 cfs 39,706 cf

Pond 1P: Infiltration Basin #1 Peak Elev=202.30' Storage=15,454 cf Inflow=12.2 cfs 59,545 cf
Primary=8.3 cfs 55,376 cf Secondary=0.0 cfs 0 cf Outflow=8.3 cfs 55,376 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.84' Storage=21,449 cf Inflow=20.1 cfs 89,542 cf
Primary=16.3 cfs 84,341 cf Secondary=0.0 cfs 0 cf Outflow=16.3 cfs 84,341 cf

Pond 3P: Runoff Collection Area Peak Elev=189.35' Storage=5,894 cf Inflow=5.7 cfs 23,029 cf
Primary=4.3 cfs 19,668 cf Secondary=0.0 cfs 0 cf Outflow=4.3 cfs 19,668 cf

Pond 5P: Bioretention Basin Peak Elev=182.75' Storage=3,117 cf Inflow=3.3 cfs 12,360 cf
Outflow=3.0 cfs 9,989 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=181.30' Storage=26,179 cf Inflow=22.9 cfs 93,419 cf
Primary=10.4 cfs 93,375 cf Secondary=0.0 cfs 0 cf Outflow=10.4 cfs 93,375 cf

Pond 8P: Infiltration Basin #2 Peak Elev=182.29' Storage=12,123 cf Inflow=13.3 cfs 65,527 cf
Primary=10.1 cfs 62,628 cf Secondary=0.0 cfs 0 cf Outflow=10.1 cfs 62,628 cf

Link DP-1: Offsite to North Inflow=20.0 cfs 116,324 cf
Primary=20.0 cfs 116,324 cf

Link DP-2: Offsite to Southeast Inflow=11.9 cfs 73,730 cf
Primary=11.9 cfs 73,730 cf

Link DP-3: Offsite to Northeast Inflow=34.0 cfs 217,423 cf
Primary=34.0 cfs 217,423 cf

Total Runoff Area = 1,203,322 sf Runoff Volume = 425,523 cf Average Runoff Depth = 4.24"
69.24% Pervious = 833,169 sf 30.76% Impervious = 370,153 sf

Summary for Subcatchment PS-1A:

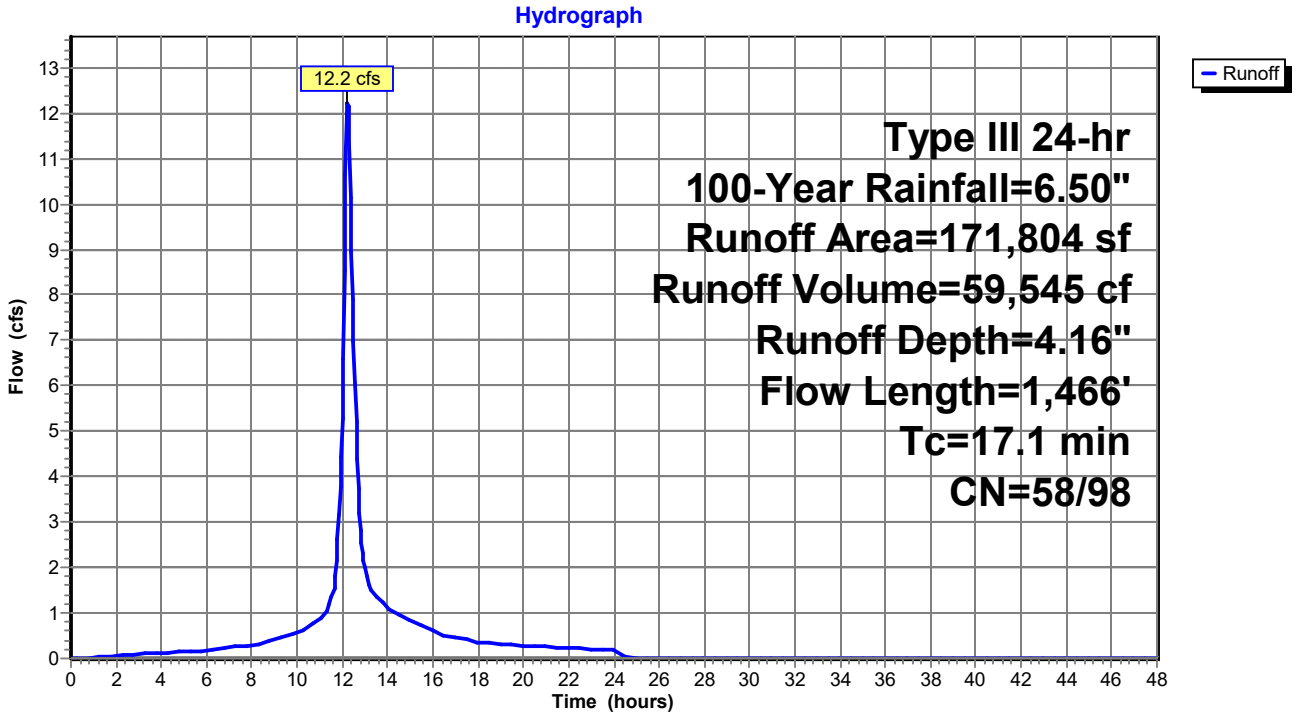
Runoff = 12.2 cfs @ 12.23 hrs, Volume= 59,545 cf, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
11,329	39	>75% Grass cover, Good, HSG A
73,276	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG A
53,764	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
171,804	78	Weighted Average
86,296	58	50.23% Pervious Area
85,509	98	49.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

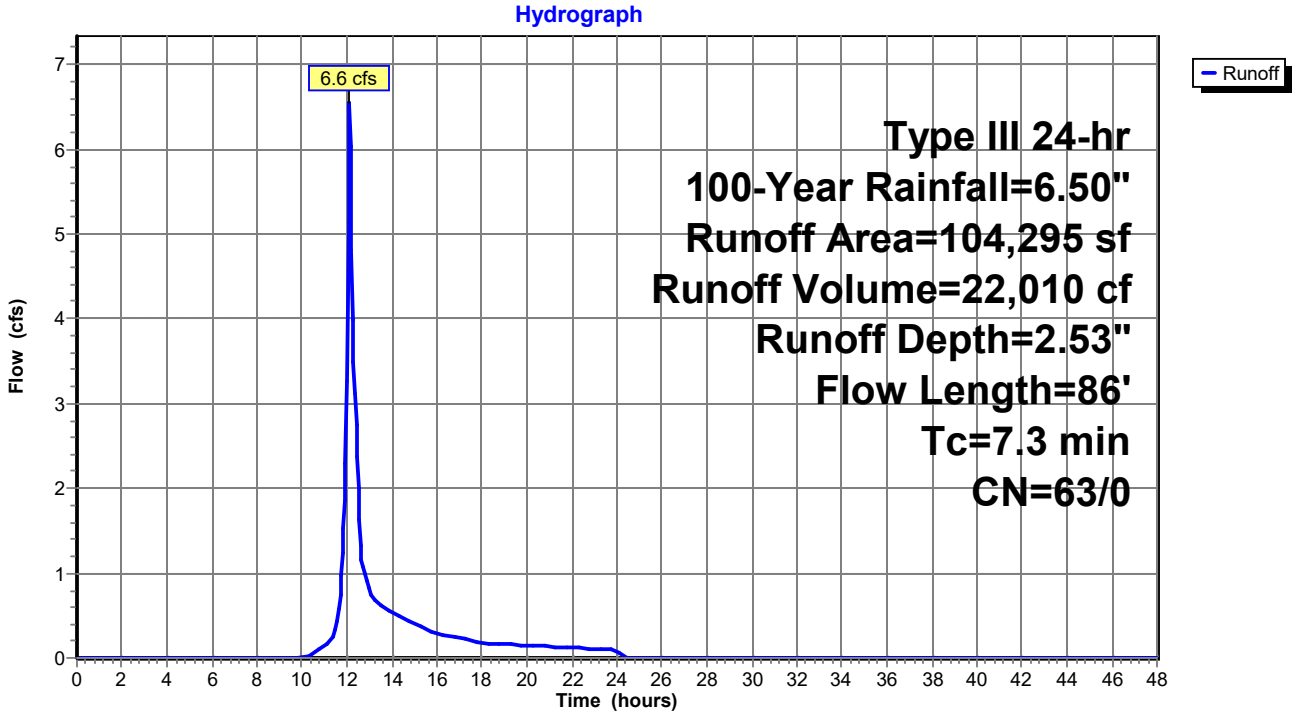
Runoff = 6.6 cfs @ 12.11 hrs, Volume= 22,010 cf, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

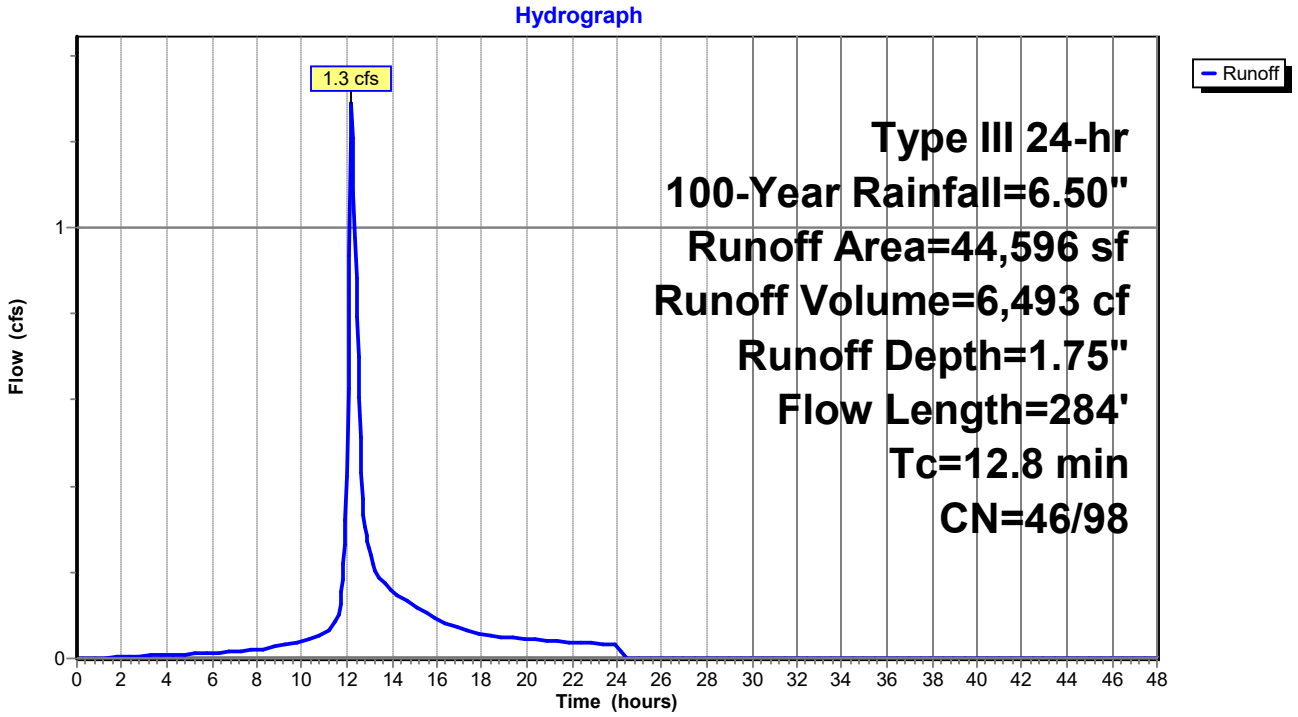
Runoff = 1.3 cfs @ 12.20 hrs, Volume= 6,493 cf, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
13,186	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
3,442	98	Paved parking, HSG A
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
10,158	30	Woods, Good, HSG A
44,596	53	Weighted Average
38,892	46	87.21% Pervious Area
5,704	98	12.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

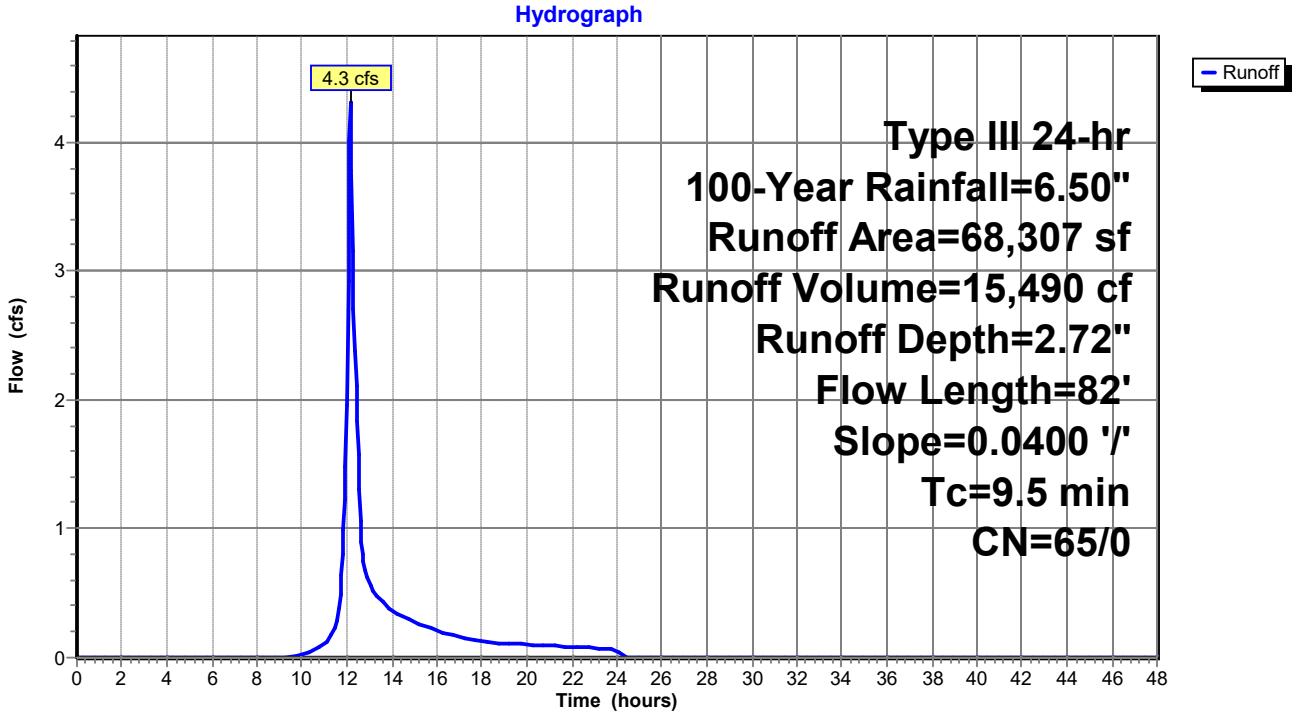
Runoff = 4.3 cfs @ 12.14 hrs, Volume= 15,490 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

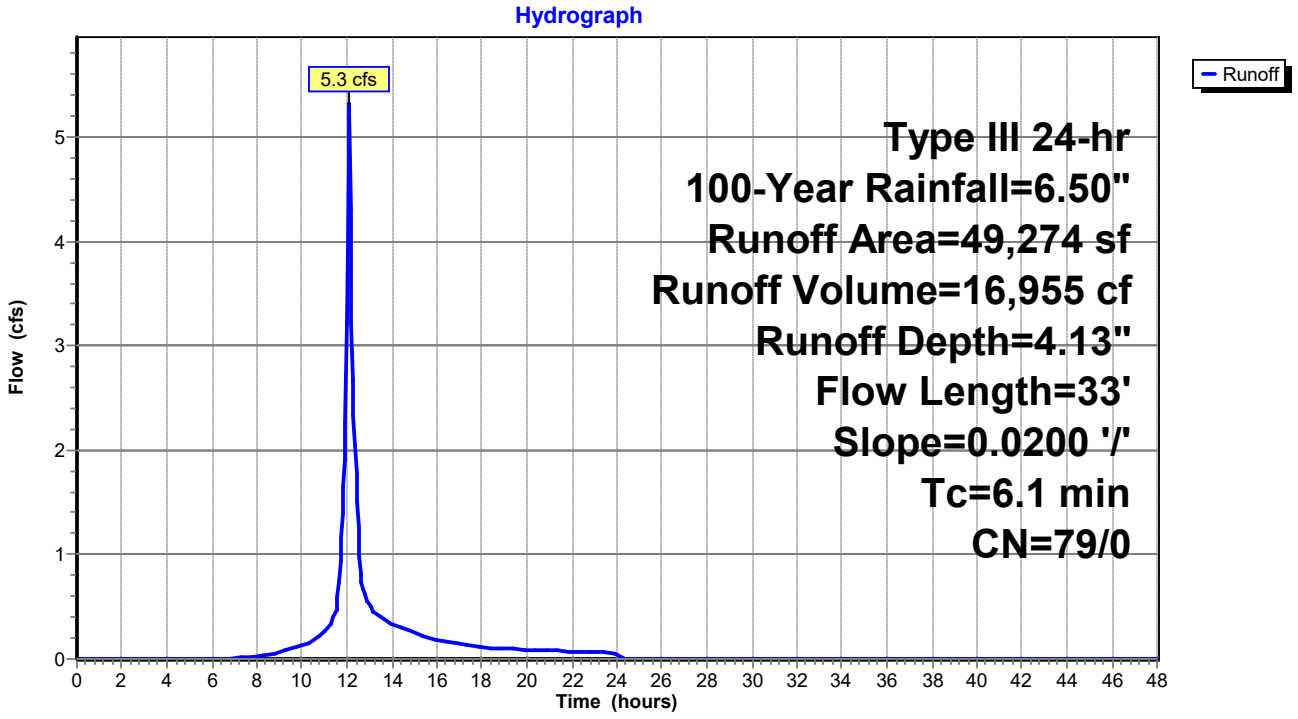
Runoff = 5.3 cfs @ 12.09 hrs, Volume= 16,955 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

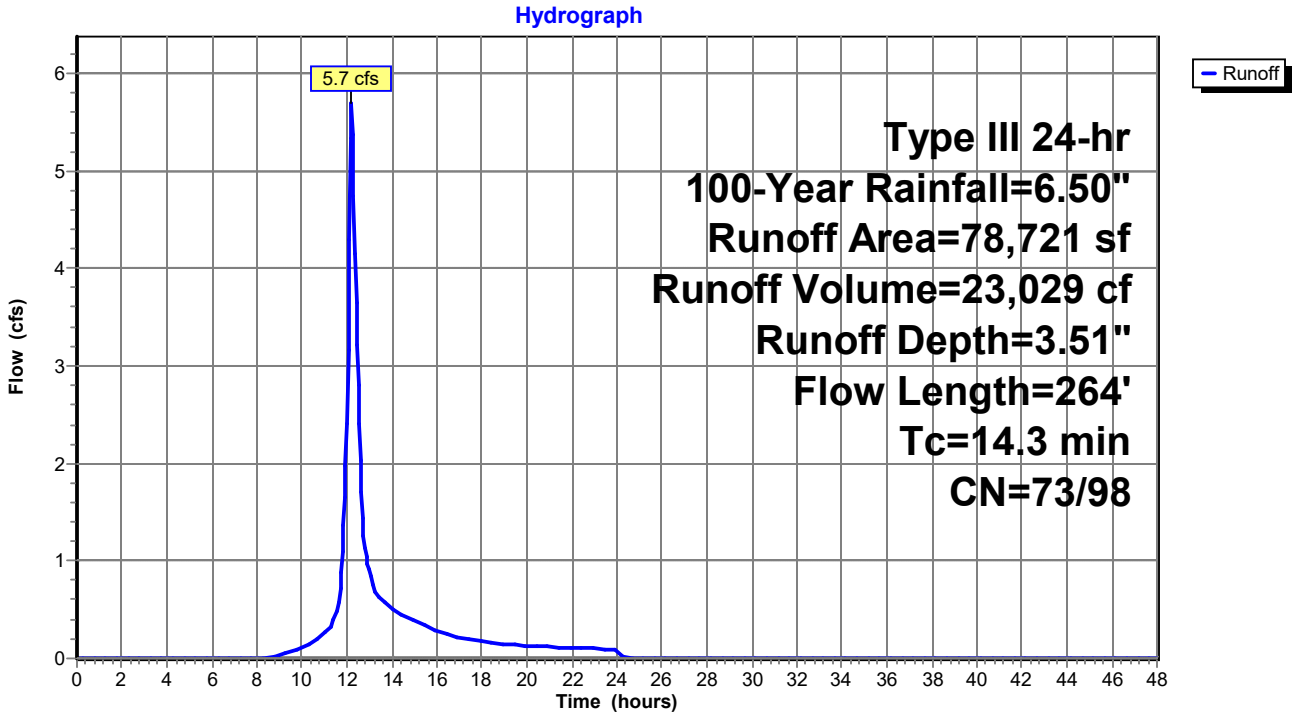
Runoff = 5.7 cfs @ 12.20 hrs, Volume= 23,029 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

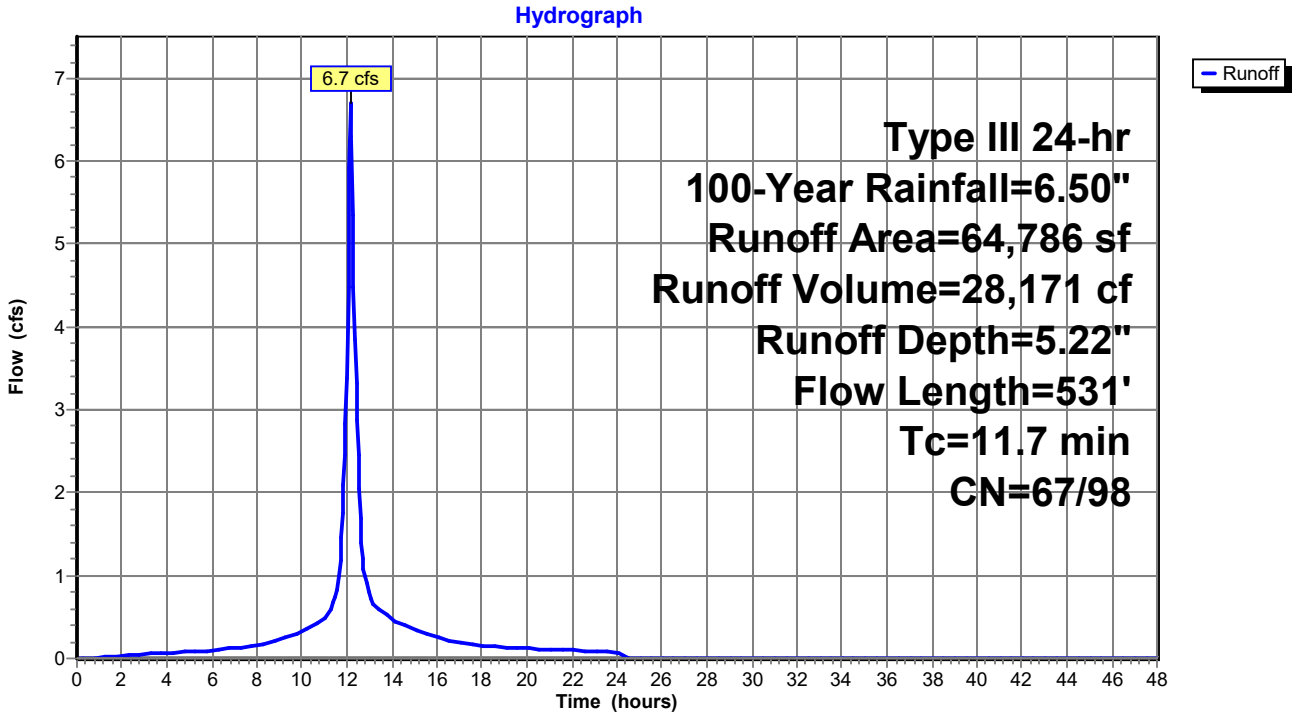
Runoff = 6.7 cfs @ 12.16 hrs, Volume= 28,171 cf, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,786	88	Weighted Average
20,190	67	31.16% Pervious Area
44,596	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

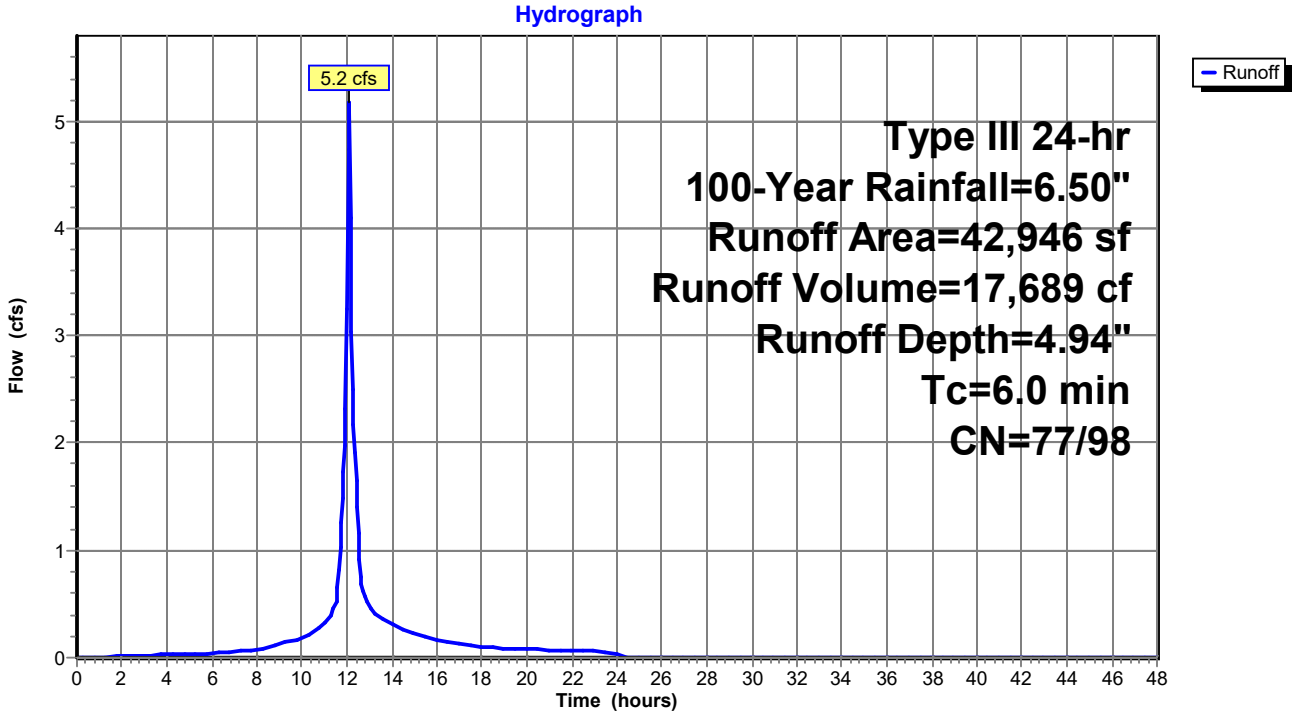
Runoff = 5.2 cfs @ 12.09 hrs, Volume= 17,689 cf, Depth= 4.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

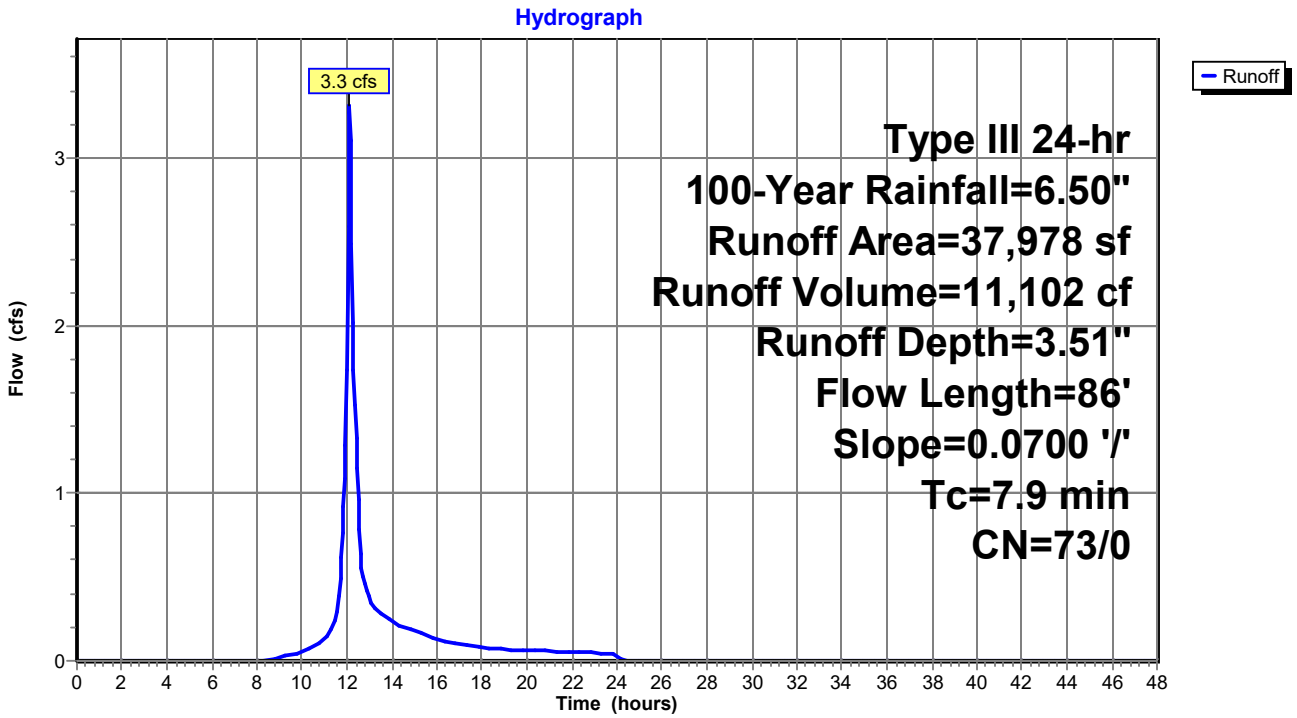
Runoff = 3.3 cfs @ 12.11 hrs, Volume= 11,102 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

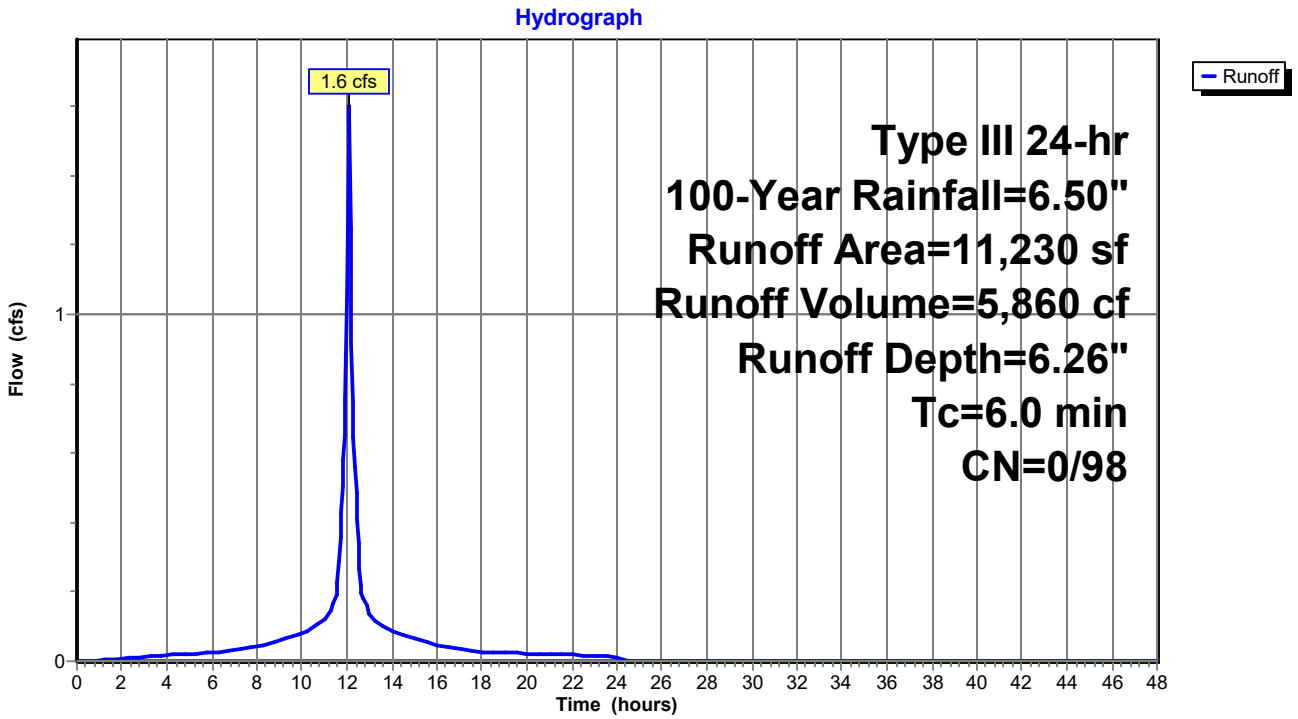
Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,860 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

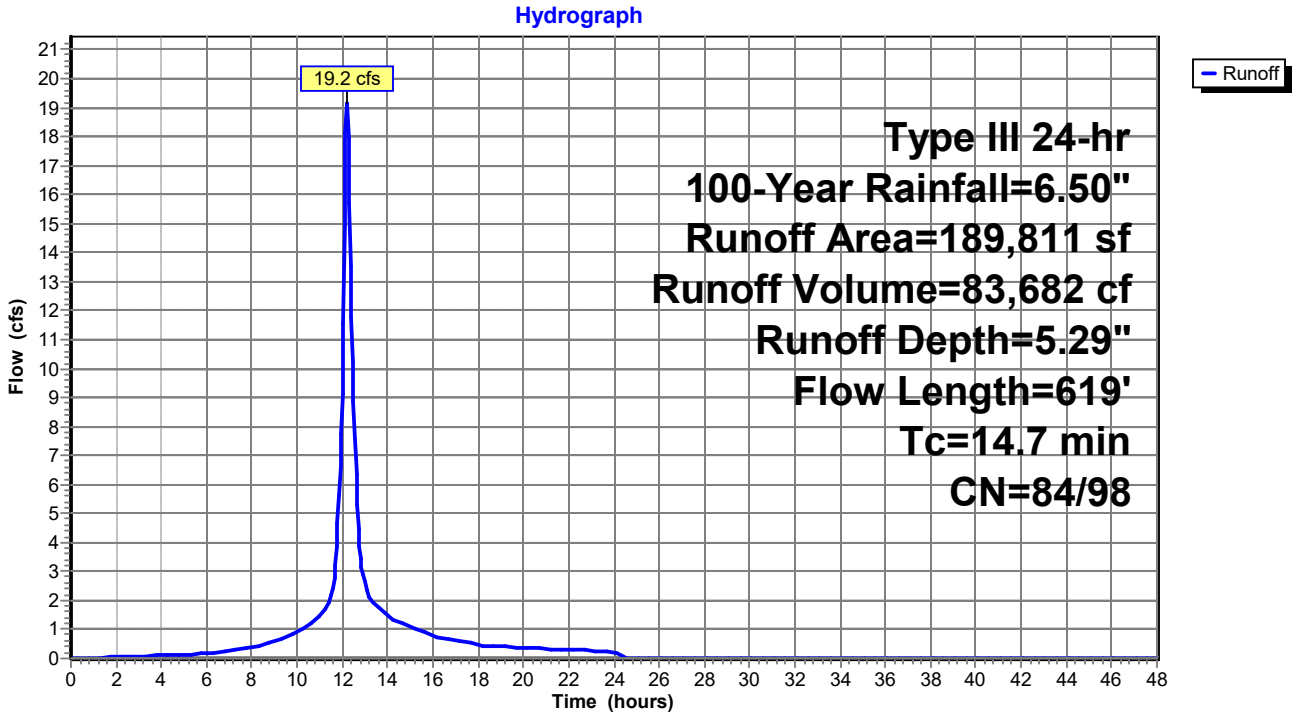
Runoff = 19.2 cfs @ 12.20 hrs, Volume= 83,682 cf, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

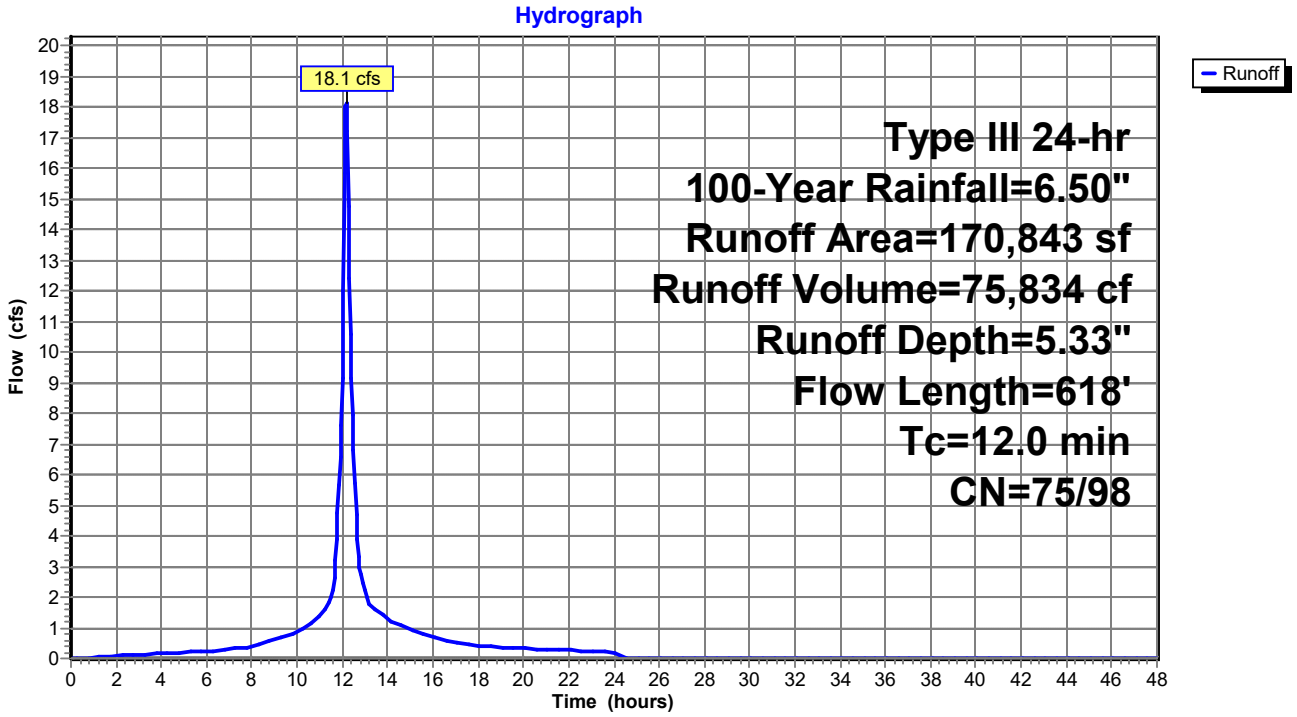
Runoff = 18.1 cfs @ 12.16 hrs, Volume= 75,834 cf, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

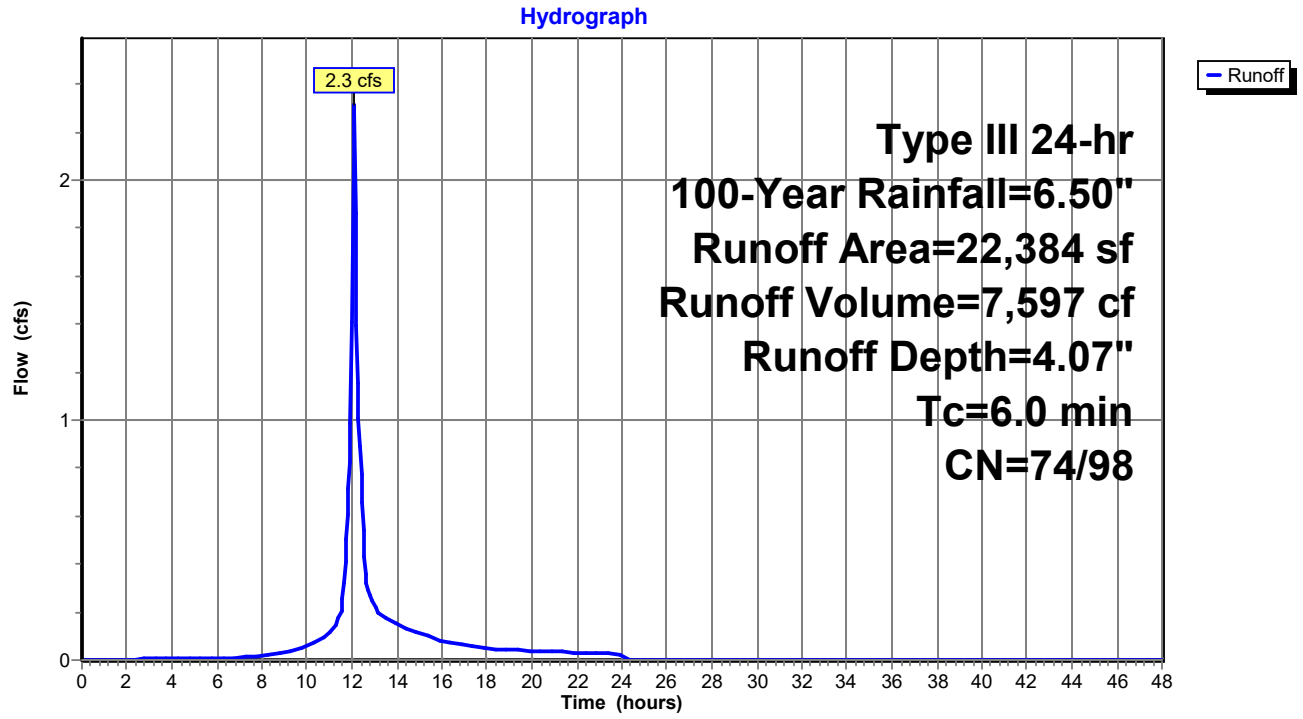
Runoff = 2.3 cfs @ 12.09 hrs, Volume= 7,597 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

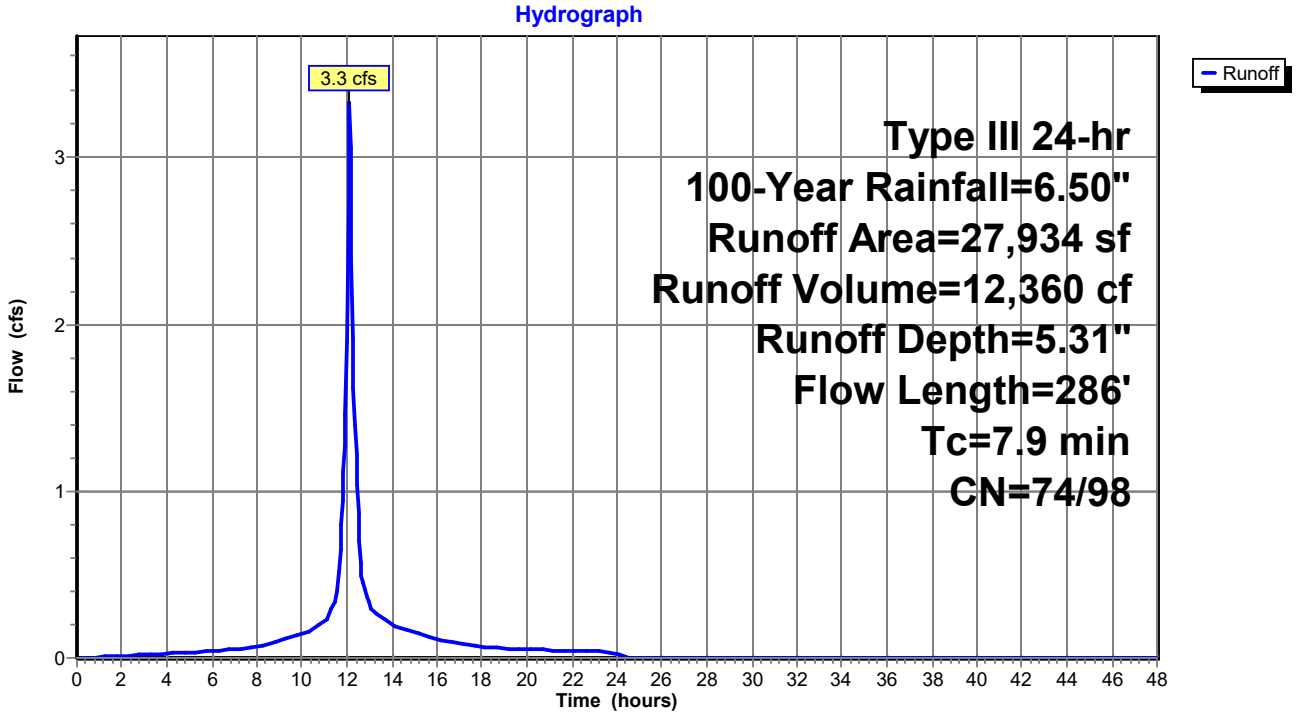
Runoff = 3.3 cfs @ 12.11 hrs, Volume= 12,360 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

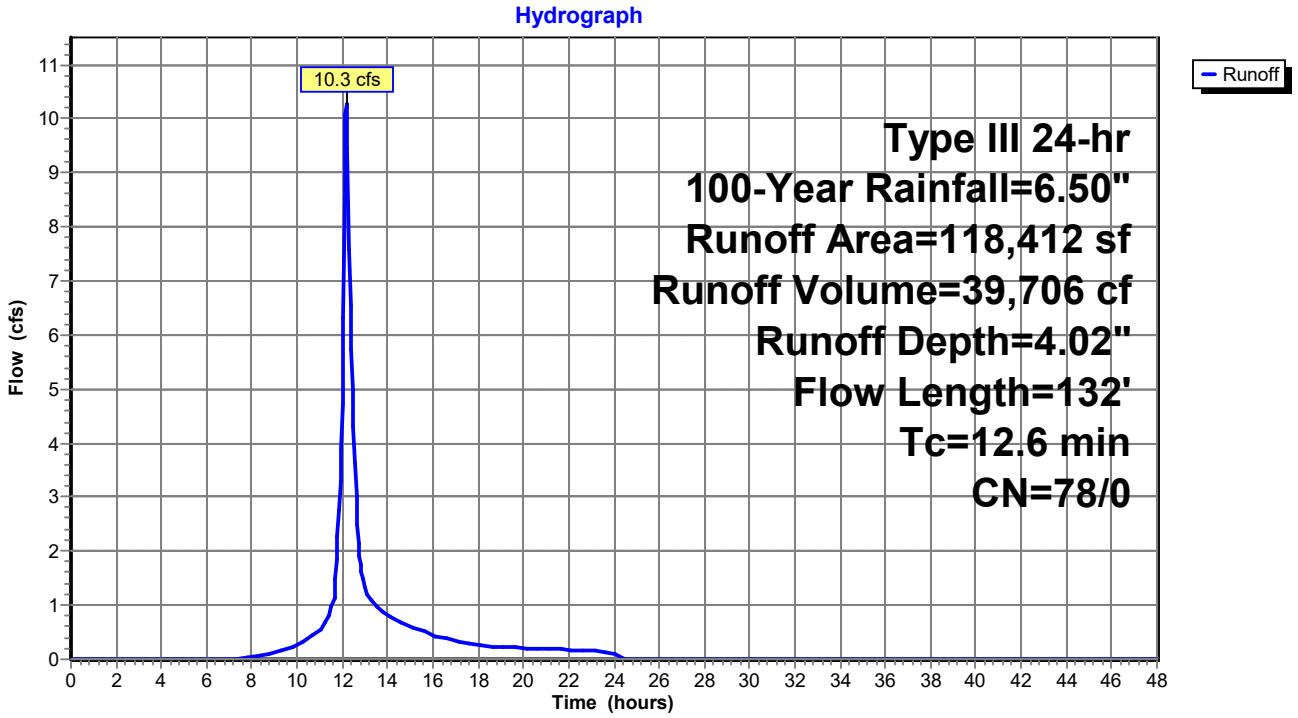
Runoff = 10.3 cfs @ 12.17 hrs, Volume= 39,706 cf, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 171,804 sf, 49.77% Impervious, Inflow Depth = 4.16" for 100-Year event
Inflow = 12.2 cfs @ 12.23 hrs, Volume= 59,545 cf
Outflow = 8.3 cfs @ 12.43 hrs, Volume= 55,376 cf, Atten= 32%, Lag= 11.9 min
Primary = 8.3 cfs @ 12.43 hrs, Volume= 55,376 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.30' @ 12.43 hrs Surf.Area= 9,295 sf Storage= 15,454 cf

Plug-Flow detention time= 114.6 min calculated for 55,376 cf (93% of inflow)
Center-of-Mass det. time= 75.8 min (859.9 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	732 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,796 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,234 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,762 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	583	92.0	0	0	583
201.00	891	113.0	732	732	941

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	891	113.0	0	0	891
202.00	1,170	129.0	1,027	1,027	1,222
203.00	1,382	141.0	1,275	2,302	1,513
204.00	1,610	152.0	1,495	3,796	1,808

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,419	397.0	0	0	4,419
201.00	5,642	418.0	5,018	5,018	5,841
202.00	6,838	438.0	6,230	11,248	7,269
203.00	7,990	458.0	7,407	18,655	8,763
204.00	9,182	477.0	8,579	27,234	10,252

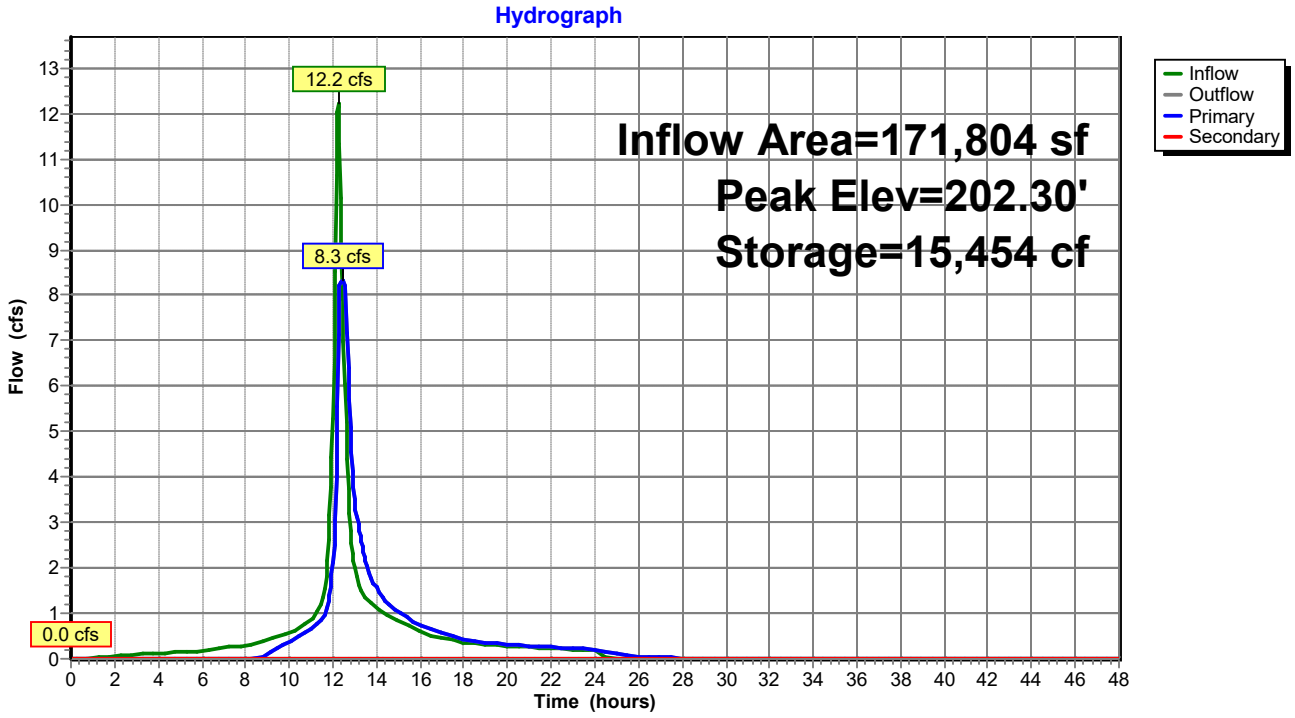
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.3 cfs @ 12.43 hrs HW=202.30' (Free Discharge)
└1=**Culvert** (Inlet Controls 8.3 cfs @ 6.77 fps)
└2=**Custom Weir/Orifice** (Passes 8.3 cfs of 9.6 cfs potential flow)
└3=**Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└4=**Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 5.34" for 100-Year event
Inflow = 20.1 cfs @ 12.19 hrs, Volume= 89,542 cf
Outflow = 16.3 cfs @ 12.31 hrs, Volume= 84,341 cf, Atten= 19%, Lag= 7.1 min
Primary = 16.3 cfs @ 12.31 hrs, Volume= 84,341 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.84' @ 12.31 hrs Surf.Area= 14,513 sf Storage= 21,449 cf

Plug-Flow detention time= 89.3 min calculated for 84,254 cf (94% of inflow)
Center-of-Mass det. time= 57.5 min (837.4 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

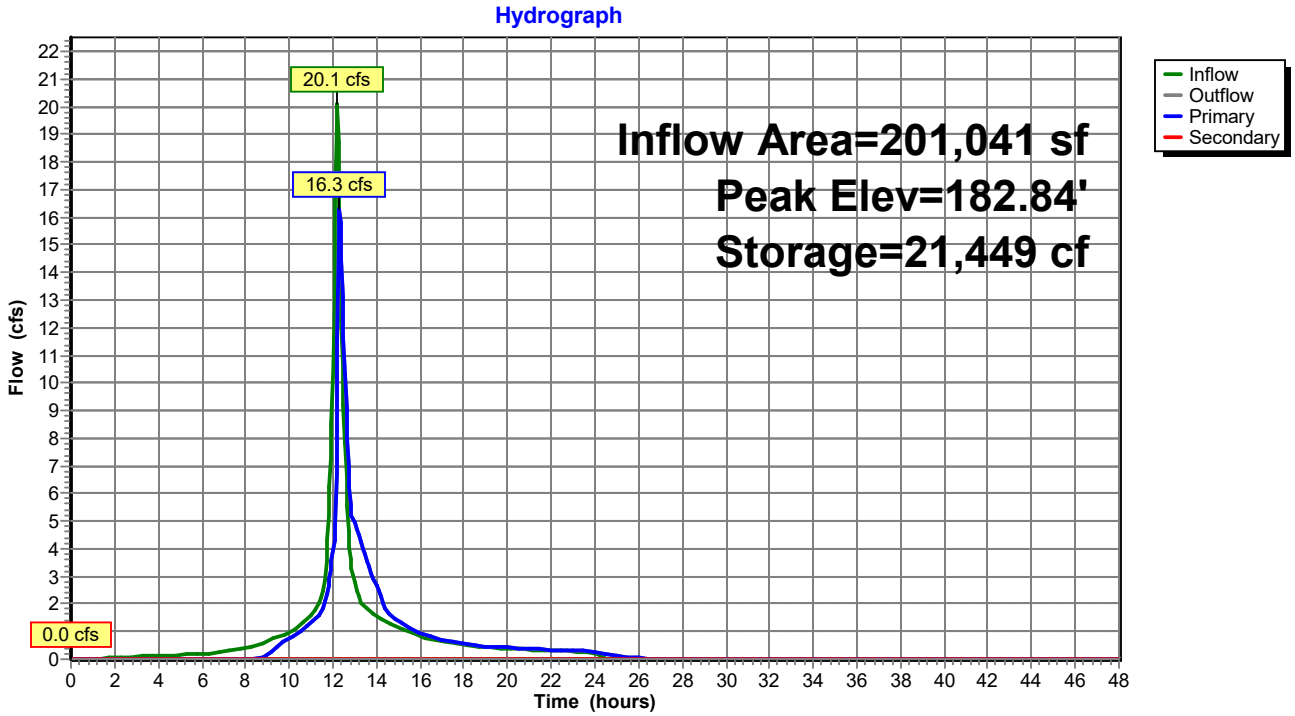
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.2 cfs @ 12.31 hrs HW=182.83' (Free Discharge)
└**1=Culvert** (Passes 16.2 cfs of 23.4 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 6.1 cfs @ 5.20 fps)
  └**3=Rim** (Weir Controls 10.1 cfs @ 1.89 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 3.51" for 100-Year event
Inflow = 5.7 cfs @ 12.20 hrs, Volume= 23,029 cf
Outflow = 4.3 cfs @ 12.35 hrs, Volume= 19,668 cf, Atten= 25%, Lag= 8.7 min
Primary = 4.3 cfs @ 12.35 hrs, Volume= 19,668 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.35' @ 12.35 hrs Surf.Area= 7,505 sf Storage= 5,894 cf

Plug-Flow detention time= 103.6 min calculated for 19,668 cf (85% of inflow)
Center-of-Mass det. time= 39.7 min (874.7 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

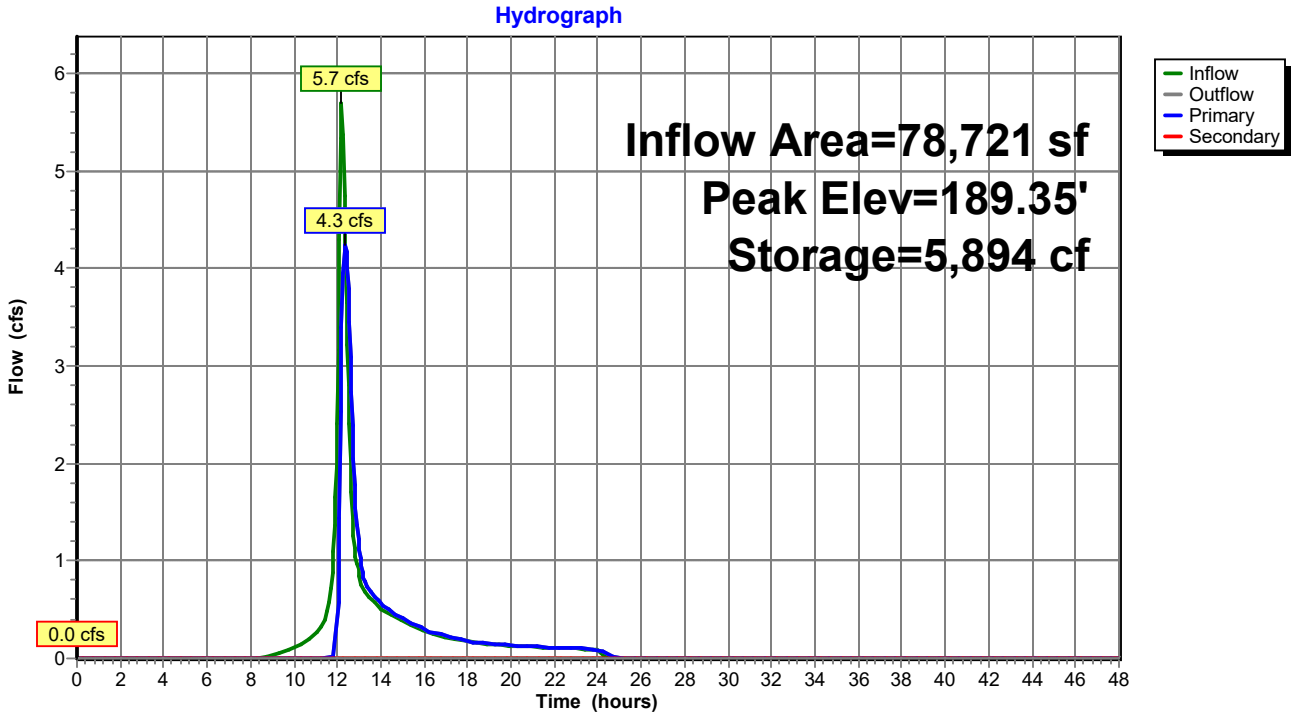
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.2 cfs @ 12.35 hrs HW=189.34' (Free Discharge)
└**1=Culvert** (Passes 4.2 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 4.2 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 5.31" for 100-Year event
Inflow = 3.3 cfs @ 12.11 hrs, Volume= 12,360 cf
Outflow = 3.0 cfs @ 12.16 hrs, Volume= 9,989 cf, Atten= 9%, Lag= 2.8 min
Primary = 3.0 cfs @ 12.16 hrs, Volume= 9,989 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.75' @ 12.16 hrs Surf.Area= 3,065 sf Storage= 3,117 cf

Plug-Flow detention time= 144.4 min calculated for 9,978 cf (81% of inflow)
Center-of-Mass det. time= 68.6 min (834.2 - 765.6)

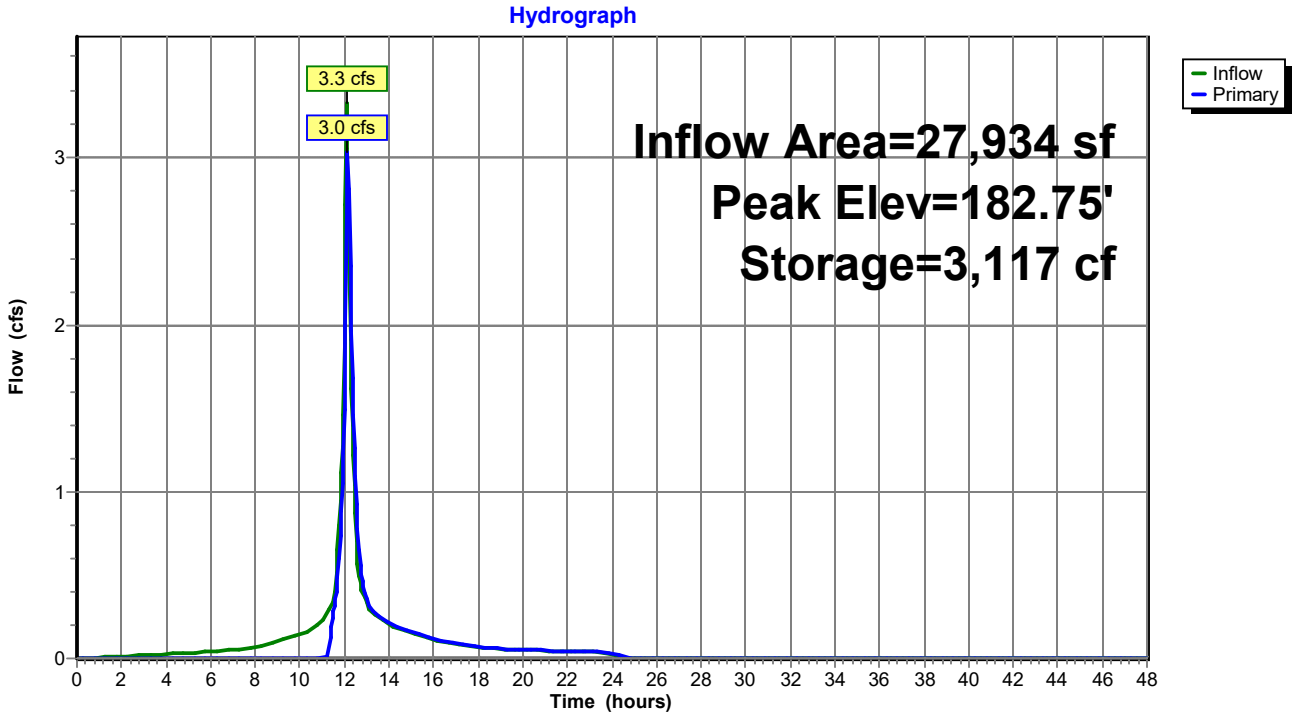
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.0 cfs @ 12.16 hrs HW=182.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.0 cfs @ 1.19 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 5.07" for 100-Year event
Inflow = 22.9 cfs @ 12.15 hrs, Volume= 93,419 cf
Outflow = 10.4 cfs @ 12.43 hrs, Volume= 93,375 cf, Atten= 55%, Lag= 16.8 min
Primary = 10.4 cfs @ 12.43 hrs, Volume= 93,375 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.30' @ 12.43 hrs Surf.Area= 11,179 sf Storage= 26,179 cf

Plug-Flow detention time= 68.3 min calculated for 93,375 cf (100% of inflow)
Center-of-Mass det. time= 68.0 min (847.3 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

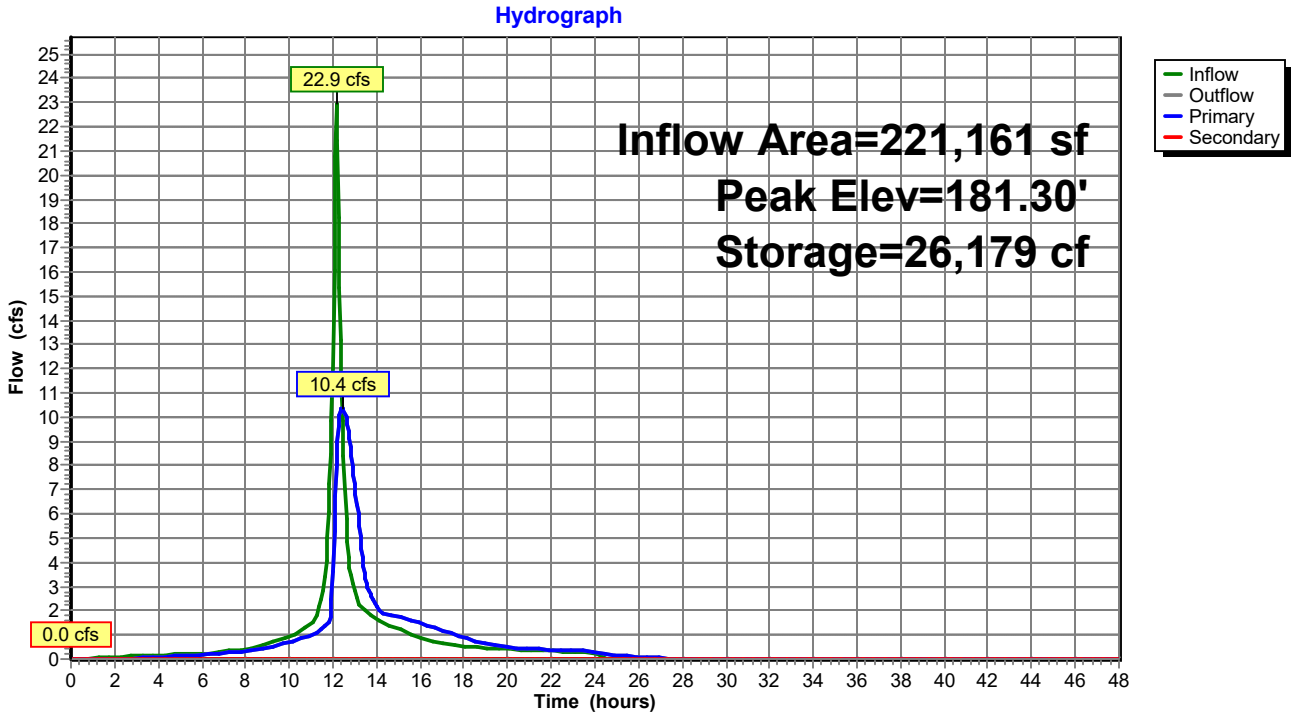
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=10.4 cfs @ 12.43 hrs HW=181.30' (Free Discharge)
└**1=Culvert** (Passes 10.4 cfs of 10.7 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.9 cfs @ 8.29 fps)
  ├**3=Orifice/Grate** (Orifice Controls 7.5 cfs @ 5.99 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,453 sf, 34.02% Impervious, Inflow Depth = 4.22" for 100-Year event
Inflow = 13.3 cfs @ 12.15 hrs, Volume= 65,527 cf
Outflow = 10.1 cfs @ 12.35 hrs, Volume= 62,628 cf, Atten= 24%, Lag= 11.5 min
Primary = 10.1 cfs @ 12.35 hrs, Volume= 62,628 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.29' @ 12.35 hrs Surf.Area= 8,844 sf Storage= 12,123 cf

Plug-Flow detention time= 77.0 min calculated for 62,563 cf (95% of inflow)
Center-of-Mass det. time= 52.0 min (853.7 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

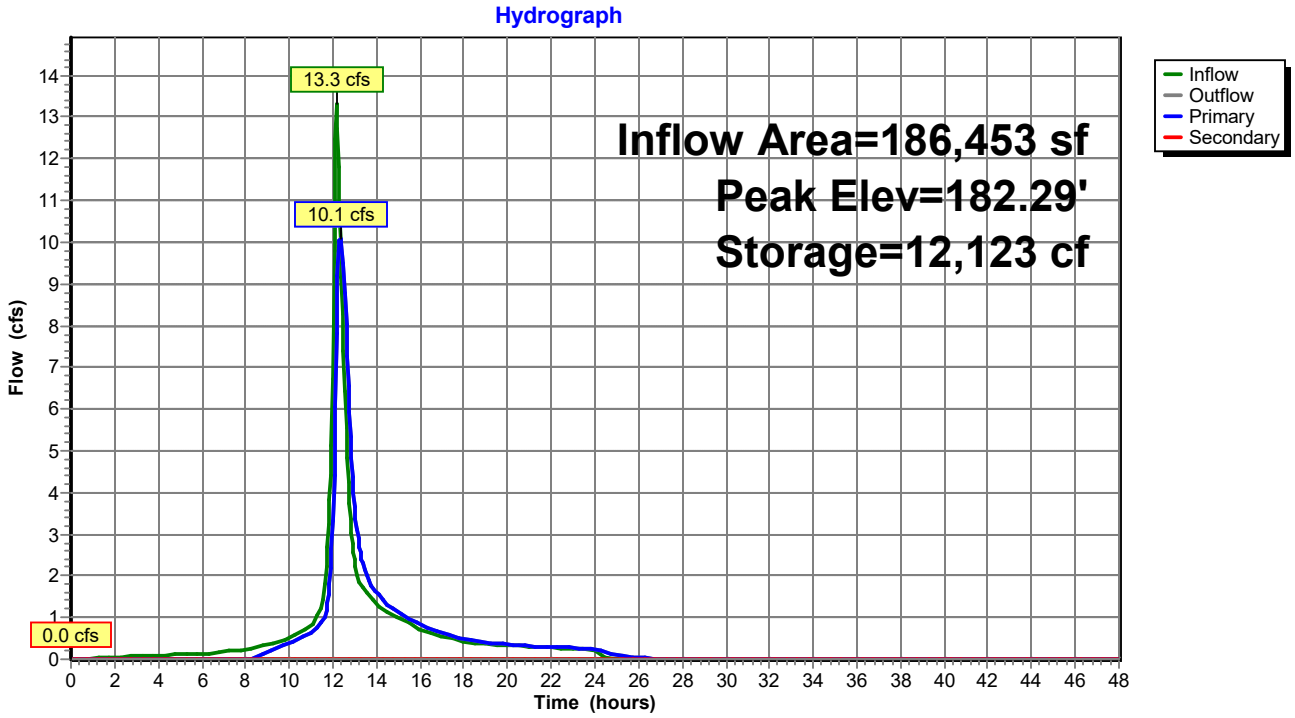
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=10.1 cfs @ 12.35 hrs HW=182.29' (Free Discharge)
└1=**Culvert** (Inlet Controls 10.1 cfs @ 4.10 fps)
└2=**Custom Weir/Orifice** (Passes 10.1 cfs of 10.7 cfs potential flow)
└3=**Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└4=**Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

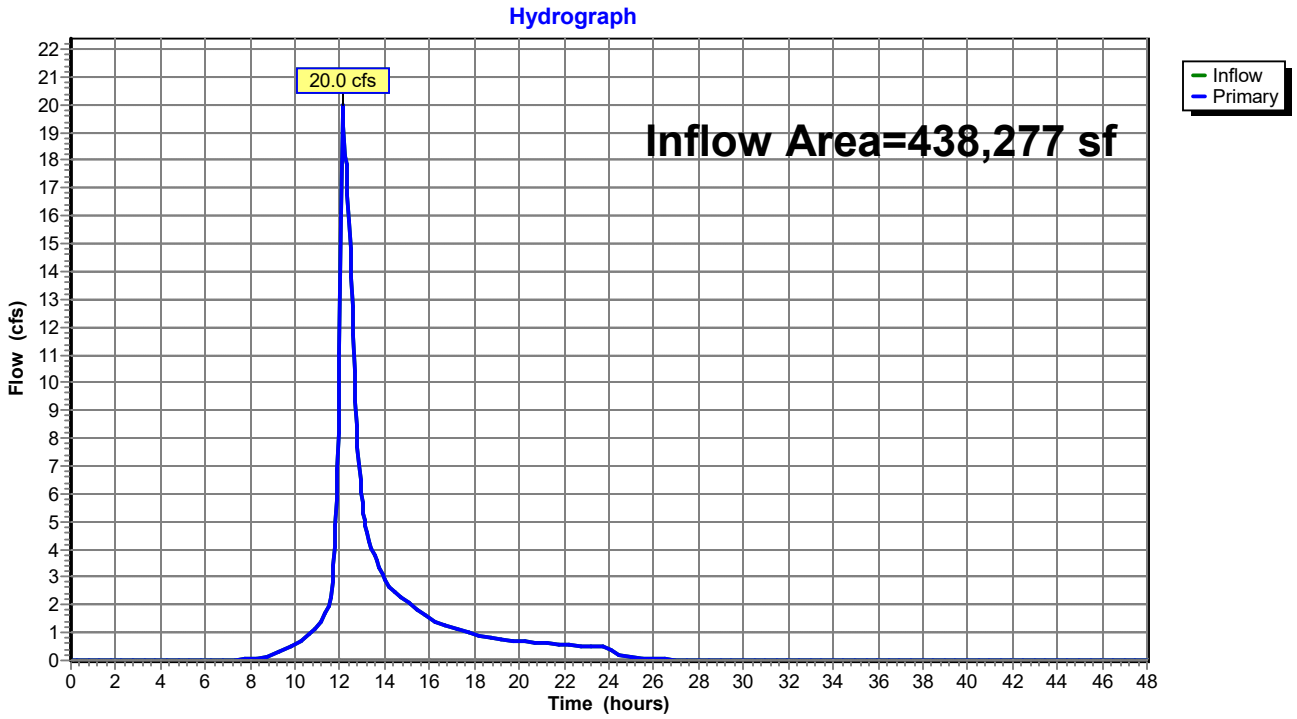


Summary for Link DP-1: Offsite to North

Inflow Area = 438,277 sf, 20.81% Impervious, Inflow Depth = 3.18" for 100-Year event
Inflow = 20.0 cfs @ 12.13 hrs, Volume= 116,324 cf
Primary = 20.0 cfs @ 12.13 hrs, Volume= 116,324 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

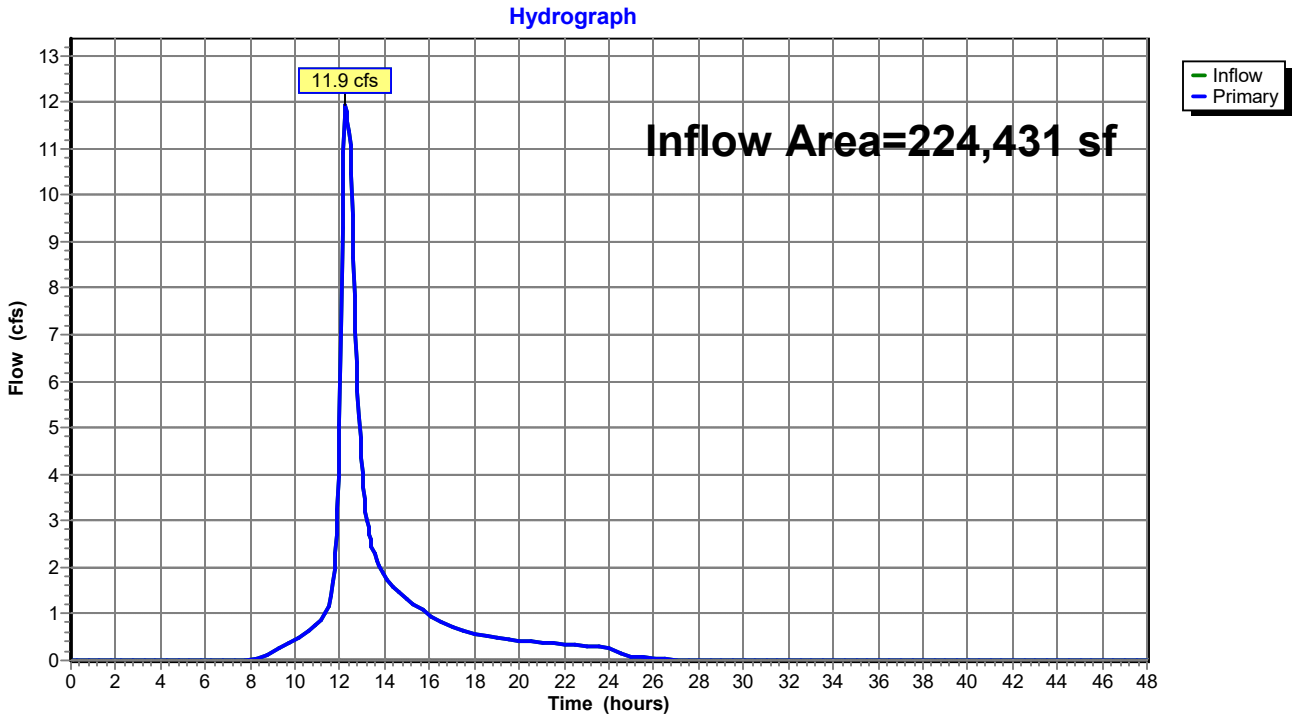


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,431 sf, 28.26% Impervious, Inflow Depth = 3.94" for 100-Year event
Inflow = 11.9 cfs @ 12.25 hrs, Volume= 73,730 cf
Primary = 11.9 cfs @ 12.25 hrs, Volume= 73,730 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

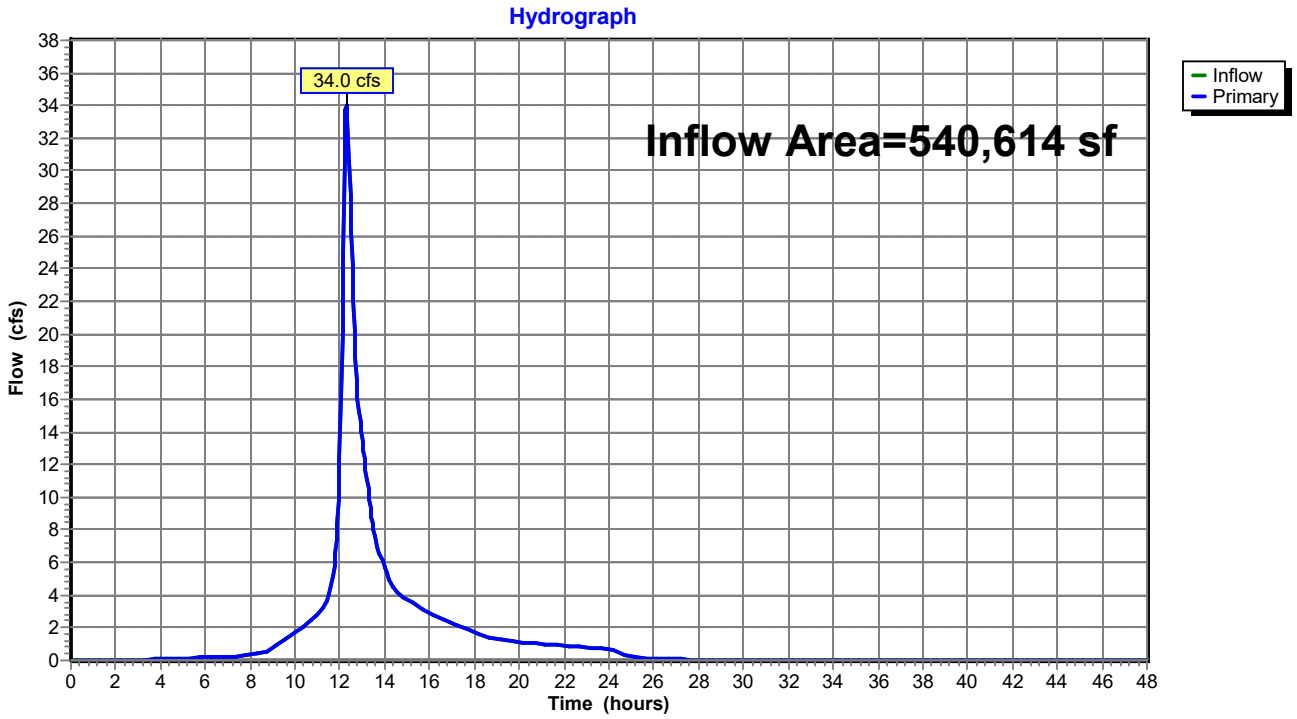


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth = 4.83" for 100-Year event
Inflow = 34.0 cfs @ 12.28 hrs, Volume= 217,423 cf
Primary = 34.0 cfs @ 12.28 hrs, Volume= 217,423 cf, Atten= 0%, Lag= 0.0 min

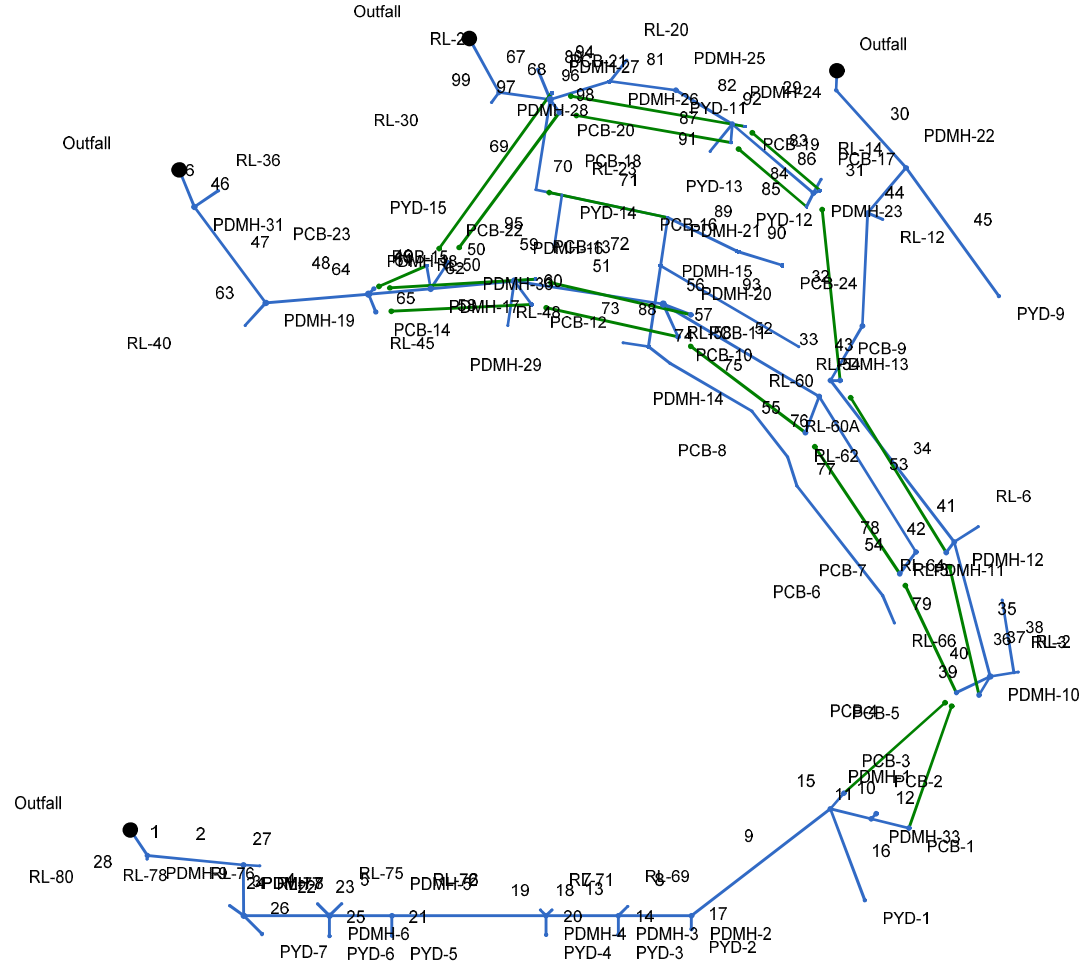
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Appendix D: Hydraulic Analysis

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 090506 - STORM.stm	Number of lines: 99	Date: 9/20/2022

Storm Sewers v2020.00

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	43.388	0.00	0.00	0.00	0.00	0.00	0.0	5.9	0.0	14.50	17.17	5.34	24	0.58	200.50	200.75	202.19	202.30	202.74	206.13	Pipe - (2
2	1	136.289	0.00	0.00	0.00	0.00	0.00	0.0	5.4	0.0	14.00	17.86	5.36	24	0.62	200.75	201.60	202.69	202.95	206.13	205.26	Pipe - (1
3	2	71.586	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	13.40	17.93	6.03	24	0.63	201.60	202.05	202.95	203.37	205.26	212.40	Pipe - (1
4	3	121.010	0.00	0.00	0.00	0.00	0.00	0.0	4.6	0.0	12.00	16.58	5.65	24	0.54	202.05	202.70	203.37	203.95	212.40	212.02	Pipe - (1
5	4	88.249	0.00	0.00	0.00	0.00	0.00	0.0	4.3	0.0	10.50	7.50	5.94	18	0.51	203.20	203.65	204.70	205.58	212.02	211.04	Pipe - (9)
6	5	217.563	0.00	0.00	0.00	0.00	0.00	0.0	3.6	0.0	9.10	7.63	5.15	18	0.53	203.65	204.80	206.13	207.77	211.04	212.06	Pipe - (7)
7	6	102.000	0.00	0.00	0.00	0.00	0.00	0.0	3.2	0.0	7.20	7.71	4.07	18	0.54	204.80	205.35	208.18	208.66	212.06	212.05	Pipe - (4)
8	7	103.250	0.00	0.00	0.00	0.00	0.00	0.0	2.7	0.0	6.30	7.66	3.57	18	0.53	205.35	205.90	208.92	209.29	212.05	211.70	Pipe - (3)
9	8	247.509	0.00	0.00	0.00	0.00	0.00	0.0	1.8	0.0	5.50	4.59	4.48	15	0.51	206.15	207.40	209.49	211.28	211.70	212.08	Pipe - (3
10	9	59.382	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	3.00	3.58	3.82	12	1.01	207.75	208.35	211.59	212.02	212.08	212.29	Pipe - (3
11	10	10.173	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	5.58	2.55	12	2.46	208.35	208.60	212.22	212.25	212.29	211.85	Pipe - (3
12	10	54.875	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.00	5.69	1.27	12	2.55	208.35	209.75	212.22	212.26	212.29	213.90	Pipe - (1
13	7	18.385	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	0.86	8	0.98	207.85	208.03	208.92	208.92	212.05	208.76	Pipe - (5
14	7	26.976	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	5.53	1.42	12	2.41	207.85	208.50	208.92	208.90	212.05	212.00	Pipe - (2)
15	9	29.278	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.50	3.29	1.91	12	0.85	207.75	208.00	211.59	211.65	212.08	211.53	Pipe - (3
16	9	137.892	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.00	3.52	1.27	12	0.98	207.75	209.10	211.59	211.70	212.08	210.70	Pipe - (3
17	8	19.019	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.80	5.77	1.02	12	2.63	207.65	208.15	209.49	209.50	211.70	212.00	Pipe - (1
18	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	0.86	8	0.97	207.30	207.41	208.18	208.18	212.06	208.40	Pipe - (5
19	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	1.67	8	0.97	207.55	207.66	208.18	207.91	212.06	208.39	Pipe - (5
20	6	27.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.30	4.85	2.63	12	1.85	207.30	207.80	208.18	208.28	212.06	211.00	Pipe - (5)
21	5	28.267	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.40	3.67	3.96	12	1.06	206.50	206.80	206.93	207.30	211.04	209.17	Pipe - (6)
22	4	23.983	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.57	2.97	8	1.00	206.20	206.44	206.40	206.69	212.02	207.17	Pipe - (5

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 10/26/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	4	23 705	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.58	2.97	8	1.01	206.20	206.44	206.40	206.69	212.02	207.16	Pipe - (6
24	3	24 388	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.50	1.56	3.43	8	0.98	206.05	206.29	206.31	206.62	212.40	207.02	Pipe - (3
25	4	28 781	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.90	5.14	2.24	12	2.08	203.70	204.30	204.47	204.70	212.02	210.05	Pipe - (8)
26	3	36 459	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.90	5.11	3.66	12	2.06	203.05	203.80	203.37	204.20	212.40	210.00	Pipe - (1
27	2	22 635	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.62	3.68	8	1.06	202.85	203.09	203.13	203.45	205.26	203.82	Pipe - (1
28	1	5 000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.50	1.57	1.44	8	1.00	202.00	202.05	202.69	202.69	206.13	202.78	RL-80
29	End	27 761	0.00	0.00	0.00	0.00	0.00	0.0	6.5	0.0	15.10	16.63	5.39	24	0.54	180.50	180.65	182.20	182.29	182.74	183.74	Pipe - (2
30	29	47 352	0.00	0.00	0.00	0.00	0.00	0.0	6.0	0.0	14.20	16.14	4.74	24	0.51	180.65	181.40	182.64	183.11	183.74	184.55	Pipe - (2
31	30	83 641	0.00	0.00	0.00	0.00	0.00	0.0	5.7	0.0	9.30	25.03	5.76	18	5.68	181.90	186.65	183.49	187.83	184.55	191.12	Pipe - (2
32	31	159 757	0.00	0.00	0.00	0.00	0.00	0.0	5.3	0.0	7.80	7.91	6.66	15	1.50	186.65	189.05	187.83	190.15	191.12	193.76	Pipe - (2
33	32	89 190	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	7.80	6.49	6.36	15	1.01	189.30	190.20	190.55	191.85	193.76	194.39	Pipe - (4
34	33	287 314	0.00	0.00	0.00	0.00	0.00	0.0	4.3	0.0	5.10	5.17	6.49	12	2.11	190.45	196.50	192.48	198.37	194.39	200.61	Pipe - (4
35	34	196 655	0.00	0.00	0.00	0.00	0.00	0.0	3.4	0.0	2.80	4.65	4.11	12	1.70	196.50	199.85	199.03	200.57	200.61	204.67	Pipe - (2
36	35	33 810	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	0.50	1.57	2.40	8	1.00	200.10	200.44	200.57	200.77	204.67	201.16	Pipe - (4
37	36	6 200	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.54	2.11	8	0.97	200.44	200.50	200.77	200.75	201.16	201.23	Pipe - (1
38	36	103 715	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.20	1.57	1.68	8	1.00	200.44	201.48	200.77	201.69	201.16	202.20	Pipe - (4
39	35	30 572	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	4.78	2.02	12	1.80	199.85	200.40	200.57	200.75	204.67	205.10	Pipe - (3
40	35	53 032	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.77	3.19	12	1.79	199.85	200.80	200.57	201.34	204.67	204.02	Pipe - (3
41	34	40 170	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	196.75	197.15	199.03	199.09	200.61	197.88	Pipe - (4
42	34	18 671	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.70	4.88	2.16	12	1.87	196.50	196.85	199.03	199.07	200.61	200.35	Pipe - (3
43	33	13 532	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	4.33	3.44	12	1.48	190.45	190.65	192.48	192.56	194.39	194.65	Pipe - (4
44	31	22 972	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.50	1.57	4.30	8	1.00	187.00	187.23	187.83	188.04	191.12	187.96	Pipe - (5

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 10/26/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	30	223.565	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.30	3.84	5.48	12	1.16	182.40	185.00	183.49	186.75	184.55	189.00	Pipe - (2
46	End	56.538	0.00	0.00	0.00	0.00	0.00	0.0	7.1	0.0	21.503	4.96	5.81	30	0.62	178.40	178.75	180.44	180.32	181.20	184.90	Pipe - (7
47	46	169.007	0.00	0.00	0.00	0.00	0.00	0.0	6.5	0.0	20.903	4.18	6.47	30	0.59	178.75	179.75	180.32	181.30	184.90	186.82	Pipe - (7
48	47	145.574	0.00	0.00	0.00	0.00	0.00	0.0	5.9	0.0	20.203	1.89	6.38	30	0.52	179.75	180.50	181.30	182.02	186.82	185.53	Pipe - (1
49	48	88.002	0.00	0.00	0.00	0.00	0.00	0.0	5.4	0.0	15.502	9.33	5.40	30	0.51	180.50	180.95	182.02	182.28	185.53	186.12	Pipe - (7
50	49	118.691	0.00	0.00	0.00	0.00	0.00	0.0	4.9	0.0	11.501	6.08	5.57	24	0.51	181.45	182.05	182.70	183.30	186.12	187.54	Pipe - (7
51	50	212.615	0.00	0.00	0.00	0.00	0.00	0.0	4.1	0.0	7.70	9.39	5.32	18	0.80	182.55	184.25	183.78	185.32	187.54	189.90	Pipe - (7
52	51	255.968	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	4.10	9.34	4.79	15	2.09	184.50	189.85	185.32	190.67	189.90	195.70	Pipe - (6
53	52	258.802	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	1.40	4.77	3.30	12	1.80	190.10	194.75	190.67	195.25	195.70	200.15	Pipe - (6
54	53	38.328	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.40	4.07	4.13	12	1.30	195.50	196.00	195.90	196.50	200.15	199.59	Pipe - (6
55	52	54.671	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	3.47	4.73	12	0.95	190.25	190.77	190.91	191.47	195.70	194.77	Pipe - (6
56	51	41.889	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.60	4.53	12	1.67	186.05	186.75	186.46	187.29	189.90	190.35	Pipe - (6
57	51	50.638	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.61	4.85	12	1.68	186.00	186.85	186.46	187.45	189.90	190.35	Pipe - (6
58	50	63.425	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.56	1.79	8	0.99	183.30	183.93	183.78	184.18	187.54	185.26	Pipe - (1
59	50	29.752	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.84	4.96	12	1.85	183.60	184.15	184.05	184.75	187.54	187.66	Pipe - (6
60	50	40.990	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.50	4.13	3.83	12	1.34	183.30	183.85	183.78	184.37	187.54	187.66	Pipe - (6
61	49	44.533	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.80	3.96	4.40	12	1.24	182.45	183.00	182.92	183.57	186.12	185.92	Pipe - (1
62	49	32.849	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.20	4.61	5.00	12	1.67	182.45	183.00	182.94	183.63	186.12	185.90	Pipe - (1
63	47	43.293	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.56	3.81	8	0.99	181.50	181.93	181.81	182.32	186.82	182.66	Pipe - (1
64	48	10.630	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.30	6.91	6.09	12	3.76	182.00	182.40	182.40	183.05	185.53	185.38	Pipe - (7
65	48	27.203	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.40	4.32	4.99	12	1.47	182.00	182.40	182.53	183.06	185.53	185.32	Pipe - (7
66	46	40.664	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.58	3.64	8	1.01	180.50	180.91	180.79	181.27	184.90	181.63	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 10/26/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
67	End	66.792	0.00	0.00	0.00	0.00	0.00	0.0	8.0	0.0	22.10	18.00	7.17	24	0.63	181.60	182.15	183.44	184.27	183.84	187.14	Pipe - (9
68	67	72.907	0.00	0.00	0.00	0.00	0.00	0.0	7.8	0.0	21.00	17.77	6.69	24	0.62	182.15	182.60	184.98	185.61	187.14	187.63	Pipe - (9
69	68	129.005	0.00	0.00	0.00	0.00	0.00	0.0	7.2	0.0	9.80	16.05	3.12	24	0.50	182.60	183.25	186.31	186.55	187.63	187.25	Pipe - (1
70	69	37.363	0.00	0.00	0.00	0.00	0.00	0.0	6.9	0.0	7.00	16.55	2.23	24	0.54	183.25	183.45	186.78	186.81	187.25	187.50	Pipe - (1
71	70	152.779	0.00	0.00	0.00	0.00	0.00	0.0	5.6	0.0	6.30	16.37	2.01	24	0.52	183.45	184.25	186.89	187.01	187.50	187.25	Pipe - (1
72	71	68.823	0.00	0.00	0.00	0.00	0.00	0.0	5.2	0.0	2.30	4.07	2.93	12	1.31	185.25	186.15	187.14	187.43	187.25	190.10	Pipe - (1
73	72	115.206	0.00	0.00	0.00	0.00	0.00	0.0	4.3	0.0	1.70	2.57	2.35	12	0.52	186.40	187.00	187.55	187.80	190.10	190.94	Pipe - (1
74	73	38.350	0.00	0.00	0.00	0.00	0.00	0.0	4.2	0.0	1.50	2.06	4.30	8	1.72	186.90	187.56	187.90	188.22	190.94	188.28	Pipe - (1
75	74	33.912	0.00	0.00	0.00	0.00	0.00	0.0	3.5	0.0	1.20	1.57	3.78	8	1.00	187.56	188.90	188.26	189.42	188.28	189.62	Pipe - (1
76	75	82.045	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	0.90	1.57	3.34	8	1.00	188.90	189.72	189.42	190.17	189.62	190.44	Pipe - (1
77	76	43.143	0.00	0.00	0.00	0.00	0.00	0.0	2.7	0.0	0.90	1.57	3.60	8	1.00	189.72	190.15	190.17	190.60	190.44	190.87	Pipe - (1
78	77	196.500	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	0.60	1.57	2.74	8	1.00	190.15	192.11	190.60	192.47	190.87	192.84	Pipe - (1
79	78	41.870	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.57	2.00	8	1.00	192.11	192.53	192.47	192.78	192.84	193.26	Pipe - (1
80	68	88.173	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	6.50	6.52	5.30	15	1.02	183.35	184.25	186.31	187.20	187.63	188.36	Pipe - (9
81	80	93.995	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	5.90	6.49	4.81	15	1.01	184.25	185.20	187.47	188.26	188.36	189.28	Pipe - (8
82	81	92.960	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	5.90	6.53	4.81	15	1.02	185.20	186.15	188.42	189.20	189.28	190.29	Pipe - (8
83	82	150.261	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	3.40	3.56	4.33	12	1.00	186.40	187.90	189.56	190.93	190.29	191.79	Pipe - (8
84	83	22.420	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.56	1.72	8	0.98	188.40	188.62	191.22	191.25	191.79	189.35	Pipe - (9
85	83	21.596	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.90	4.20	1.15	12	1.39	187.90	188.20	191.22	191.23	191.79	191.67	Pipe - (8
86	83	10.287	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.90	6.08	2.42	12	2.92	187.90	188.20	191.22	191.25	191.79	191.67	Pipe - (8
87	82	49.625	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.58	2.01	8	1.01	186.75	187.25	189.56	189.66	190.29	187.97	Pipe - (1
88	73	36.310	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.20	1.56	0.58	8	0.99	186.90	187.26	187.90	187.90	190.94	187.99	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 10/26/2022

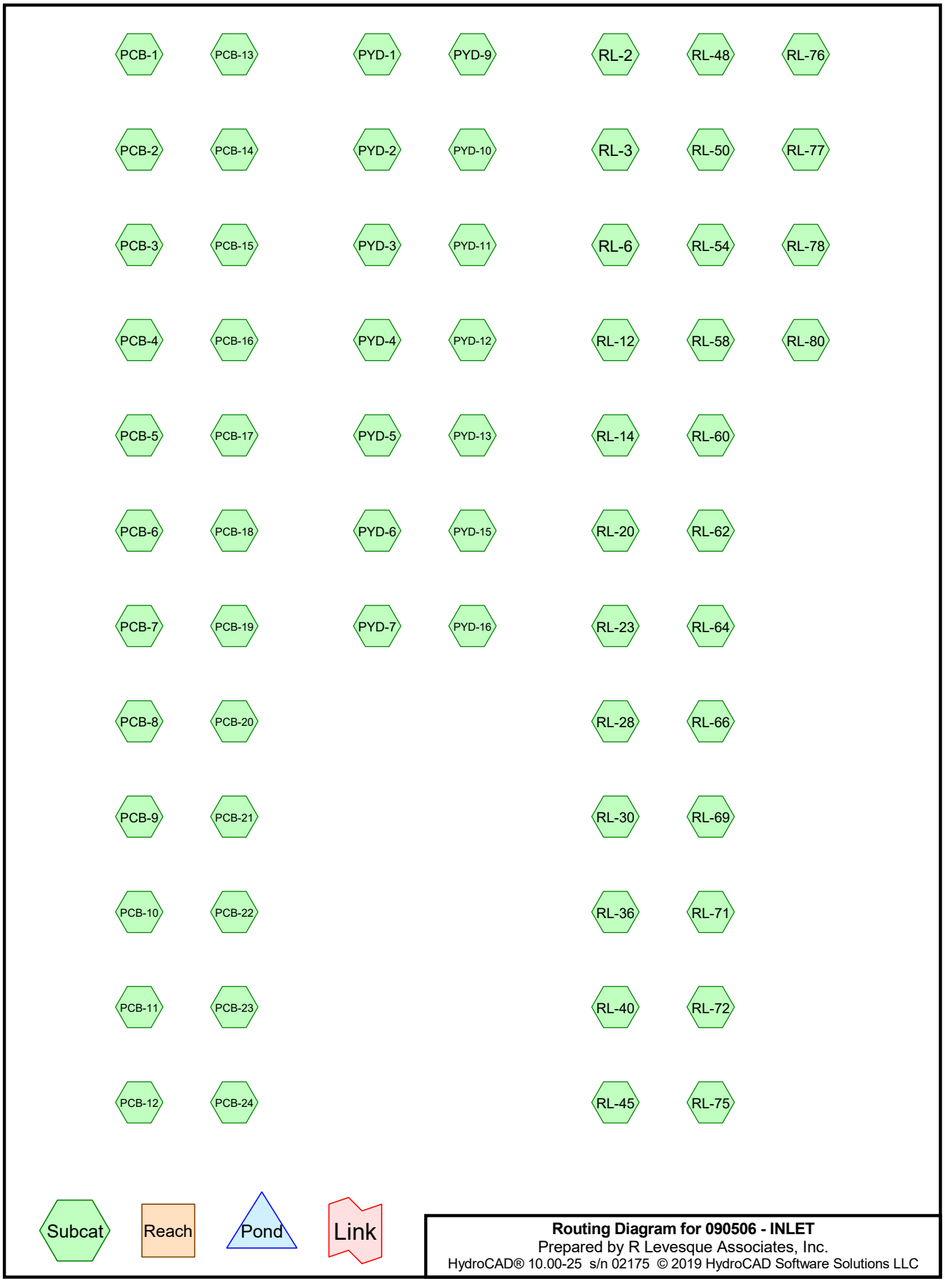
NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
89	71	10 335	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	2.10	3.64	2.67	12	1.04	185.25	186.40	187.14	187.53	187.25	189.90	Pipe - (1
90	89	65 304	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	3.55	1.23	12	1.00	186.40	187.05	187.58	187.60	189.90	191.50	Pipe - (1
91	82	26 018	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.80	3.82	1.02	12	1.15	186.40	186.70	189.56	189.57	190.29	190.27	Pipe - (8
92	82	17 681	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.00	4.64	1.27	12	1.70	186.40	186.70	189.56	189.57	190.29	190.27	Pipe - (8
93	72	226 047	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	2.40	8	1.00	186.40	188.66	187.55	189.02	190.10	189.39	Pipe - (1
94	80	38 124	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	185.00	185.38	187.47	187.53	188.36	186.11	Pipe - (1
95	70	74 121	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.57	2.01	8	1.00	184.70	185.44	186.89	187.04	187.50	186.33	Pipe - (1
96	68	46 005	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	184.00	184.46	186.31	186.37	187.63	185.19	Pipe - (1
97	68	9 543	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.10	6.31	2.67	12	3.14	183.60	183.90	186.31	186.34	187.63	187.52	Pipe - (9
98	68	22 551	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.11	2.55	12	1.33	183.60	183.90	186.31	186.38	187.63	187.52	Pipe - (9
99	67	17 784	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.10	0.74	3.15	8	0.22	181.98	182.02	184.98	185.07	187.14	182.75	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 10/26/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box


PCB-1
PCB-13
PYD-1
PYD-9
RL-2
RL-48
RL-76
PCB-2
PCB-14
PYD-2
PYD-10
RL-3
RL-50
RL-77
PCB-3
PCB-15
PYD-3
PYD-11
RL-6
RL-54
RL-78
PCB-4
PCB-16
PYD-4
PYD-12
RL-12
RL-58
RL-80
PCB-5
PCB-17
PYD-5
PYD-13
RL-14
RL-60
PCB-6
PCB-18
PYD-6
PYD-15
RL-20
RL-62
PCB-7
PCB-19
PYD-7
PYD-16
RL-23
RL-64
PCB-8
PCB-20
RL-28
RL-66
PCB-9
PCB-21
RL-30
RL-69
PCB-10
PCB-22
RL-36
RL-71
PCB-11
PCB-23
RL-40
RL-72
PCB-12
PCB-24
RL-45
RL-75
Subcat
Reach
Pond
Link
Routing Diagram for 090506 - INLET
Prepared by R Levesque Associates, Inc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PCB-1: Runoff Area=8,864 sf 72.31% Impervious Runoff Depth=4.83"
Tc=6.0 min CN=46/98 Runoff=1.0 cfs 3,566 cf

Subcatchment PCB-10: Runoff Area=16,290 sf 57.05% Impervious Runoff Depth=5.21"
Tc=6.0 min CN=76/98 Runoff=2.0 cfs 7,074 cf

Subcatchment PCB-11: Runoff Area=12,437 sf 56.85% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=80/98 Runoff=1.6 cfs 5,583 cf

Subcatchment PCB-12: Runoff Area=11,699 sf 56.86% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=80/98 Runoff=1.5 cfs 5,252 cf

Subcatchment PCB-13: Runoff Area=15,512 sf 61.15% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=78/98 Runoff=2.0 cfs 6,970 cf

Subcatchment PCB-14: Runoff Area=20,928 sf 69.59% Impervious Runoff Depth=5.45"
Tc=10.0 min CN=74/98 Runoff=2.4 cfs 9,513 cf

Subcatchment PCB-15: Runoff Area=20,082 sf 67.75% Impervious Runoff Depth=5.41"
Tc=10.0 min CN=74/98 Runoff=2.3 cfs 9,047 cf

Subcatchment PCB-16: Runoff Area=6,222 sf 85.70% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=78/98 Runoff=0.9 cfs 3,081 cf

Subcatchment PCB-17: Runoff Area=14,975 sf 65.77% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=77/98 Runoff=1.9 cfs 6,813 cf

Subcatchment PCB-18: Runoff Area=6,334 sf 61.95% Impervious Runoff Depth=5.49"
Tc=6.0 min CN=80/98 Runoff=0.8 cfs 2,898 cf

Subcatchment PCB-19: Runoff Area=7,584 sf 62.59% Impervious Runoff Depth=5.50"
Tc=6.0 min CN=80/98 Runoff=1.0 cfs 3,478 cf

Subcatchment PCB-2: Runoff Area=16,959 sf 68.54% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=61/98 Runoff=2.0 cfs 7,109 cf

Subcatchment PCB-20: Runoff Area=15,114 sf 60.20% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=80/98 Runoff=2.0 cfs 6,871 cf

Subcatchment PCB-21: Runoff Area=16,315 sf 54.99% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=80/98 Runoff=2.1 cfs 7,273 cf

Subcatchment PCB-22: Runoff Area=13,813 sf 62.98% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=76/98 Runoff=1.8 cfs 6,165 cf

Subcatchment PCB-23: Runoff Area=16,820 sf 69.62% Impervious Runoff Depth=5.65"
Tc=6.0 min CN=80/98 Runoff=2.2 cfs 7,914 cf

Subcatchment PCB-24: Runoff Area=5,427 sf 67.75% Impervious Runoff Depth=5.61"
Tc=6.0 min CN=80/98 Runoff=0.7 cfs 2,536 cf

Subcatchment PCB-3: Runoff Area=12,595 sf 70.92% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=61/98 Runoff=1.5 cfs 5,377 cf

Subcatchment PCB-4: Runoff Area=13,595 sf 67.24% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=61/98 Runoff=1.6 cfs 5,641 cf

Subcatchment PCB-5: Runoff Area=5,185 sf 91.28% Impervious Runoff Depth=5.92"
Tc=6.0 min CN=61/98 Runoff=0.7 cfs 2,558 cf

Subcatchment PCB-6: Runoff Area=13,827 sf 55.49% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=60/98 Runoff=1.4 cfs 5,160 cf

Subcatchment PCB-7: Runoff Area=16,187 sf 59.22% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=55/98 Runoff=1.7 cfs 5,999 cf

Subcatchment PCB-8: Runoff Area=22,584 sf 56.05% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=72/98 Runoff=2.7 cfs 9,423 cf

Subcatchment PCB-9: Runoff Area=21,039 sf 67.93% Impervious Runoff Depth=5.51"
Tc=6.0 min CN=77/98 Runoff=2.7 cfs 9,661 cf

Subcatchment PYD-1: Runoff Area=23,886 sf 11.49% Impervious Runoff Depth=2.03"
Tc=10.0 min CN=51/98 Runoff=1.0 cfs 4,035 cf

Subcatchment PYD-10: Runoff Area=5,369 sf 36.32% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=74/98 Runoff=0.6 cfs 2,046 cf

Subcatchment PYD-11: Runoff Area=7,805 sf 49.97% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=75/98 Runoff=0.9 cfs 3,243 cf

Subcatchment PYD-12: Runoff Area=13,872 sf 0.00% Impervious Runoff Depth=4.67"
Tc=12.0 min CN=84/0 Runoff=1.4 cfs 5,394 cf

Subcatchment PYD-13: Runoff Area=18,358 sf 0.00% Impervious Runoff Depth=4.78"
Tc=12.0 min CN=85/0 Runoff=1.9 cfs 7,306 cf

Subcatchment PYD-15: Runoff Area=27,507 sf 0.00% Impervious Runoff Depth=4.67"
Tc=12.0 min CN=84/0 Runoff=2.8 cfs 10,697 cf

Subcatchment PYD-16: Runoff Area=6,768 sf 57.62% Impervious Runoff Depth=5.40"
Tc=6.0 min CN=80/98 Runoff=0.9 cfs 3,047 cf

Subcatchment PYD-2: Runoff Area=7,760 sf 50.81% Impervious Runoff Depth=4.34"
Tc=6.0 min CN=61/98 Runoff=0.8 cfs 2,804 cf

Subcatchment PYD-3: Runoff Area=6,794 sf 28.49% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=61/98 Runoff=0.6 cfs 1,960 cf

Subcatchment PYD-4: Runoff Area=12,510 sf 55.50% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=61/98 Runoff=1.3 cfs 4,712 cf

Subcatchment PYD-5: Runoff Area=15,612 sf 34.47% Impervious Runoff Depth=3.70"
Tc=6.0 min CN=61/98 Runoff=1.4 cfs 4,809 cf

Subcatchment PYD-6: Runoff Area=9,600 sf 46.44% Impervious Runoff Depth=4.16"
Tc=6.0 min CN=61/98 Runoff=0.9 cfs 3,332 cf

Subcatchment PYD-7: Runoff Area=11,329 sf 22.22% Impervious Runoff Depth=3.22"
Tc=6.0 min CN=61/98 Runoff=0.9 cfs 3,037 cf

Subcatchment PYD-9: Runoff Area=112,186 sf 0.07% Impervious Runoff Depth=3.51"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=8.1 cfs 32,812 cf

Subcatchment RL-12: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-14: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-2: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-20: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-23: Runoff Area=4,875 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.7 cfs 2,544 cf

Subcatchment RL-28: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-3: Runoff Area=1,482 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.2 cfs 773 cf

Subcatchment RL-30: Runoff Area=7,800 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.1 cfs 4,070 cf

Subcatchment RL-36: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-40: Runoff Area=4,621 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.7 cfs 2,411 cf

Subcatchment RL-45: Runoff Area=2,223 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,160 cf

Subcatchment RL-48: Runoff Area=1,482 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.2 cfs 773 cf

Subcatchment RL-50: Runoff Area=4,875 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.7 cfs 2,544 cf

Subcatchment RL-54: Runoff Area=3,900 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-58: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-6: Runoff Area=3,900 sf 87.59% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-60: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-62: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-64: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-66: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-69: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-71: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-72: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-75: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-76: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-77: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-78: Runoff Area=3,705 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.5 cfs 1,933 cf

Subcatchment RL-80: Runoff Area=3,705 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.5 cfs 1,933 cf

Total Runoff Area = 695,211 sf Runoff Volume = 278,792 cf Average Runoff Depth = 4.81"
53.85% Pervious = 374,405 sf 46.15% Impervious = 320,806 sf

Summary for Subcatchment PCB-1:

Runoff = 1.0 cfs @ 12.09 hrs, Volume= 3,566 cf, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,683	39	>75% Grass cover, Good, HSG A
772	61	>75% Grass cover, Good, HSG B
3,500	98	Paved parking, HSG A
2,909	98	Paved parking, HSG B
8,864	84	Weighted Average
2,455	46	27.69% Pervious Area
6,409	98	72.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-10:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 7,074 cf, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
5,697	80	>75% Grass cover, Good, HSG D
164	98	Paved parking, HSG B
9,129	98	Paved parking, HSG D
16,290	89	Weighted Average
6,997	76	42.95% Pervious Area
9,293	98	57.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-11:

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,583 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,367	80	>75% Grass cover, Good, HSG D
7,070	98	Paved parking, HSG D
12,437	90	Weighted Average
5,367	80	43.15% Pervious Area
7,070	98	56.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-12:

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,252 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13	74	>75% Grass cover, Good, HSG C
5,034	80	>75% Grass cover, Good, HSG D
366	98	Paved parking, HSG C
6,286	98	Paved parking, HSG D
11,699	90	Weighted Average
5,047	80	43.14% Pervious Area
6,652	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-13:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 6,970 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,127	74	>75% Grass cover, Good, HSG C
3,900	80	>75% Grass cover, Good, HSG D
895	98	Paved parking, HSG C
8,590	98	Paved parking, HSG D
15,512	90	Weighted Average
6,027	78	38.85% Pervious Area
9,485	98	61.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-14:

Runoff = 2.4 cfs @ 12.14 hrs, Volume= 9,513 cf, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,365	74	>75% Grass cover, Good, HSG C
14,536	98	Paved parking, HSG C
27	98	Paved parking, HSG D
20,928	91	Weighted Average
6,365	74	30.41% Pervious Area
14,563	98	69.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-15:

Runoff = 2.3 cfs @ 12.14 hrs, Volume= 9,047 cf, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,340	74	>75% Grass cover, Good, HSG C
136	80	>75% Grass cover, Good, HSG D
13,606	98	Paved parking, HSG C
20,082	90	Weighted Average
6,476	74	32.25% Pervious Area
13,606	98	67.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-16:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,081 cf, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
293	74	>75% Grass cover, Good, HSG C
597	80	>75% Grass cover, Good, HSG D
1,952	98	Paved parking, HSG C
3,380	98	Paved parking, HSG D
6,222	95	Weighted Average
890	78	14.30% Pervious Area
5,332	98	85.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-17:

Runoff = 1.9 cfs @ 12.09 hrs, Volume= 6,813 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,975	74	>75% Grass cover, Good, HSG C
2,151	80	>75% Grass cover, Good, HSG D
5,569	98	Paved parking, HSG C
4,280	98	Paved parking, HSG D
14,975	91	Weighted Average
5,126	77	34.23% Pervious Area
9,849	98	65.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-18:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,898 cf, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,410	80	>75% Grass cover, Good, HSG D
3,924	98	Paved parking, HSG D
6,334	91	Weighted Average
2,410	80	38.05% Pervious Area
3,924	98	61.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-19:

Runoff = 1.0 cfs @ 12.09 hrs, Volume= 3,478 cf, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,837	80	>75% Grass cover, Good, HSG D
4,747	98	Paved parking, HSG D
7,584	91	Weighted Average
2,837	80	37.41% Pervious Area
4,747	98	62.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-2:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 7,109 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,335	61	>75% Grass cover, Good, HSG B
11,324	98	Paved parking, HSG B
300	98	Roofs, HSG B
16,959	86	Weighted Average
5,335	61	31.46% Pervious Area
11,624	98	68.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-20:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 6,871 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,015	80	>75% Grass cover, Good, HSG D
9,099	98	Paved parking, HSG D
15,114	91	Weighted Average
6,015	80	39.80% Pervious Area
9,099	98	60.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-21:

Runoff = 2.1 cfs @ 12.09 hrs, Volume= 7,273 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,343	80	>75% Grass cover, Good, HSG D
8,972	98	Paved parking, HSG D
16,315	90	Weighted Average
7,343	80	45.01% Pervious Area
8,972	98	54.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-22:

Runoff = 1.8 cfs @ 12.09 hrs, Volume= 6,165 cf, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,749	74	>75% Grass cover, Good, HSG C
1,364	80	>75% Grass cover, Good, HSG D
1,360	98	Paved parking, HSG C
7,340	98	Paved parking, HSG D
13,813	90	Weighted Average
5,113	76	37.02% Pervious Area
8,700	98	62.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-23:

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,914 cf, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
58	74	>75% Grass cover, Good, HSG C
5,052	80	>75% Grass cover, Good, HSG D
498	98	Paved parking, HSG C
11,212	98	Paved parking, HSG D
16,820	93	Weighted Average
5,110	80	30.38% Pervious Area
11,710	98	69.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-24:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,536 cf, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,750	80	>75% Grass cover, Good, HSG D
46	98	Paved parking, HSG C
3,631	98	Paved parking, HSG D
5,427	92	Weighted Average
1,750	80	32.25% Pervious Area
3,677	98	67.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-3:

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,377 cf, Depth= 5.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,662	61	>75% Grass cover, Good, HSG B
8,933	98	Paved parking, HSG B
12,595	87	Weighted Average
3,662	61	29.08% Pervious Area
8,933	98	70.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-4:

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,641 cf, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,454	61	>75% Grass cover, Good, HSG B
9,141	98	Paved parking, HSG B
13,595	86	Weighted Average
4,454	61	32.76% Pervious Area
9,141	98	67.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-5:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,558 cf, Depth= 5.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
452	61	>75% Grass cover, Good, HSG B
4,733	98	Paved parking, HSG B
5,185	95	Weighted Average
452	61	8.72% Pervious Area
4,733	98	91.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-6:

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 5,160 cf, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
5,785	61	>75% Grass cover, Good, HSG B
13	74	>75% Grass cover, Good, HSG C
90	98	Paved parking, HSG A
7,582	98	Paved parking, HSG B
13,827	81	Weighted Average
6,155	60	44.51% Pervious Area
7,672	98	55.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-7:

Runoff = 1.7 cfs @ 12.09 hrs, Volume= 5,999 cf, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,550	39	>75% Grass cover, Good, HSG A
277	61	>75% Grass cover, Good, HSG B
2,690	74	>75% Grass cover, Good, HSG C
84	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
2,696	98	Paved parking, HSG B
2,431	98	Paved parking, HSG C
18	98	Paved parking, HSG D
182	98	Roofs, HSG C
16,187	80	Weighted Average
6,601	55	40.78% Pervious Area
9,586	98	59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-8:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 9,423 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,430	61	>75% Grass cover, Good, HSG B
5,496	80	>75% Grass cover, Good, HSG D
6,843	98	Paved parking, HSG B
5,815	98	Paved parking, HSG D
22,584	86	Weighted Average
9,926	72	43.95% Pervious Area
12,658	98	56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-9:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 9,661 cf, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3	61	>75% Grass cover, Good, HSG B
3,318	74	>75% Grass cover, Good, HSG C
3,427	80	>75% Grass cover, Good, HSG D
13	98	Paved parking, HSG B
2,265	98	Paved parking, HSG C
11,711	98	Paved parking, HSG D
302	98	Roofs, HSG C
21,039	91	Weighted Average
6,748	77	32.07% Pervious Area
14,291	98	67.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-1:

Runoff = 1.0 cfs @ 12.15 hrs, Volume= 4,035 cf, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
9,645	39	>75% Grass cover, Good, HSG A
11,496	61	>75% Grass cover, Good, HSG B
1,889	98	Paved parking, HSG A
555	98	Paved parking, HSG B
300	98	Roofs, HSG B
23,886	56	Weighted Average
21,141	51	88.51% Pervious Area
2,745	98	11.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PYD-10:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,046 cf, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,393	74	>75% Grass cover, Good, HSG C
26	80	>75% Grass cover, Good, HSG D
1,950	98	Roofs, HSG C
5,369	83	Weighted Average
3,419	74	63.68% Pervious Area
1,950	98	36.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-11:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,243 cf, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,000	74	>75% Grass cover, Good, HSG C
905	80	>75% Grass cover, Good, HSG D
2,801	98	Roofs, HSG C
1,099	98	Roofs, HSG D
7,805	87	Weighted Average
3,905	75	50.03% Pervious Area
3,900	98	49.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-12:

Runoff = 1.4 cfs @ 12.16 hrs, Volume= 5,394 cf, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,128	74	>75% Grass cover, Good, HSG C
9,331	80	>75% Grass cover, Good, HSG D
3,413	98	Unconnected roofs, HSG D
13,872	84	Weighted Average
13,872	84	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-13:

Runoff = 1.9 cfs @ 12.16 hrs, Volume= 7,306 cf, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,030	80	>75% Grass cover, Good, HSG D
5,328	98	Unconnected roofs, HSG D
18,358	85	Weighted Average
18,358	85	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-15:

Runoff = 2.8 cfs @ 12.16 hrs, Volume= 10,697 cf, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
9,069	74	>75% Grass cover, Good, HSG C
9,629	80	>75% Grass cover, Good, HSG D
3,358	98	Unconnected roofs, HSG C
5,451	98	Unconnected roofs, HSG D
27,507	84	Weighted Average
27,507	84	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-16:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,047 cf, Depth= 5.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,868	80	>75% Grass cover, Good, HSG D
3,900	98	Roofs, HSG D
6,768	90	Weighted Average
2,868	80	42.38% Pervious Area
3,900	98	57.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-2:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,804 cf, Depth= 4.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,817	61	>75% Grass cover, Good, HSG B
3,943	98	Paved parking, HSG B
7,760	80	Weighted Average
3,817	61	49.19% Pervious Area
3,943	98	50.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-3:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 1,960 cf, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,859	61	>75% Grass cover, Good, HSG B
1,936	98	Paved parking, HSG B
6,794	72	Weighted Average
4,859	61	71.51% Pervious Area
1,936	98	28.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-4:

Runoff = 1.3 cfs @ 12.09 hrs, Volume= 4,712 cf, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,567	61	>75% Grass cover, Good, HSG B
6,943	98	Paved parking, HSG B
12,510	82	Weighted Average
5,567	61	44.50% Pervious Area
6,943	98	55.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-5:

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 4,809 cf, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
10,231	61	>75% Grass cover, Good, HSG B
5,381	98	Paved parking, HSG B
15,612	74	Weighted Average
10,231	61	65.53% Pervious Area
5,381	98	34.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-6:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,332 cf, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,142	61	>75% Grass cover, Good, HSG B
4,458	98	Paved parking, HSG B
9,600	78	Weighted Average
5,142	61	53.56% Pervious Area
4,458	98	46.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-7:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,037 cf, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
8,812	61	>75% Grass cover, Good, HSG B
2,517	98	Paved parking, HSG B
11,329	69	Weighted Average
8,812	61	77.78% Pervious Area
2,517	98	22.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-9:

Runoff = 8.1 cfs @ 12.20 hrs, Volume= 32,812 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,408	49	50-75% Grass cover, Fair, HSG A
7,195	69	50-75% Grass cover, Fair, HSG B
19,511	79	50-75% Grass cover, Fair, HSG C
4,460	84	50-75% Grass cover, Fair, HSG D
6,176	39	>75% Grass cover, Good, HSG A
5,463	61	>75% Grass cover, Good, HSG B
34,600	74	>75% Grass cover, Good, HSG C
4,438	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
2,497	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,484	98	Unconnected roofs, HSG C
910	30	Woods, Good, HSG A
16,153	70	Woods, Good, HSG C
112,186	73	Weighted Average
112,112	73	99.93% Pervious Area
74	98	0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Summary for Subcatchment RL-12:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-14:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
952	98	Roofs, HSG C
2,948	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-2:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
919	98	Roofs, HSG A
1,031	98	Roofs, HSG B
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-20:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG D
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-23:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,544 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,875	98	Unconnected roofs, HSG D
4,875	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-28:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG D
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-3:

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 773 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,383	98	Roofs, HSG A
99	98	Roofs, HSG C
1,482	98	Weighted Average
1,482	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-30:

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 4,070 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,800	98	Roofs, HSG D
7,800	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-36:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-40:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,411 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,621	98	Roofs, HSG C
4,621	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-45:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,160 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,826	98	Roofs, HSG C
397	98	Roofs, HSG D
2,223	98	Weighted Average
2,223	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-48:

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 773 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,482	98	Roofs, HSG D
1,482	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-50:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,544 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,886	98	Unconnected roofs, HSG C
1,989	98	Unconnected roofs, HSG D
4,875	98	Weighted Average
4,875	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-54:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Unconnected roofs, HSG D
3,900	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-58:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,363	98	Roofs, HSG B
587	98	Roofs, HSG D
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-6:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,416	98	Roofs, HSG C
484	98	Unconnected roofs, HSG C
3,900	98	Weighted Average
484	98	12.41% Pervious Area
3,416	98	87.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-60:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
41	98	Roofs, HSG B
1,909	98	Roofs, HSG D
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-62:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-64:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-66:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-69:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-71:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-72:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-75:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-76:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-77:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG B
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-78:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,933 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,705	98	Roofs, HSG B
3,705	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-80:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,933 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,705	98	Roofs, HSG B
3,705	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Appendix E: MassDEP Calculations

- Impervious Area Calculations
- Required Recharge Volume – Surface Basin #1
- Water Quality Volume – Surface Basin #1
- Stage-Storage Table – Surface Basin #1
- Required Recharge Volume – Surface Basin #2
- Water Quality Volume – Surface Basin #2
- Stage-Storage Table – Surface Basin #2
- Required Recharge Volume – Surface Basin #3
- Water Quality Volume – Surface Basin #3
- Stage-Storage Table – Surface Basin #3
- Required Recharge Volume – Bioretention Basin
- Water Quality Volume – Bioretention Basin
- Stage-Storage Table – Bioretention Basin
- Water Quality Flow Rate Calculation – PWQU-1
- TSS Removal Worksheet
- Sediment Forebay Sizing Calculations
- Drawdown Calculations

Standard 3: Recharge Calculations

Impervious Area Calculations

Existing Total Impervious Area

	Sub-Catchmen	Roof (sf)	Other Impervious (sf)	Sum (sf)
Design Point 1	ES-1A	2,220	11,476	13,696
	ES-1B	0	6,292	6,292
	ES-1C	0	0	0
Design Point 2	ES-2	0	0	0
Design Point 3	ES-3	0	0	0
		2,220	17,768	19,988

Proposed Total Impervious Area

	Sub-Catchmen	Roof (sf)	Other Impervious (sf)	Sum (sf)	
Design Point 1	PS-1A	21,660	59,286	80,946	Tributary to Basin #1
	PS-1B	5,850	0	5,850	
	PS-1C	3,817	0	3,817	
	PS-1D	9,750	0	9,750	
	PS-1E	7,976	0	7,976	
Design Point 2	PS-2A	7,847	74	7,921	
	PS-2B	8,767	37,266	46,033	Tributary to Basin #2
	PS-2C	13,650	0	13,650	
	PS-2D	0	0	0	
Design Point 3	PS-3A	11,230	0	11,230	Tributary to Basin #3
	PS-3B	50,700	45,601	96,301	
	PS-3C	6,842	101,355	108,197	Tributary to Dry Detention Basin
	PS-3D	3,900	7	3,907	
	PS-3E	0	17,910	17,910	Trib. to Bioret. Basin
	PS-3F	3,900	0	3,900	
		155,889	261,498	417,387	

Standard 3: Recharge Calculations (cont'd)

Summary Table

Total Existing Impervious Area	19,988 SF
Total Proposed Impervious Area	417,387 SF
Total New Impervious Area	397,399 SF
Total Impervious Area Tributary to Infiltration BMPs	273,991 SF
Percent Impervious Tributary to Infiltration BMPs*	68.9%
Capture Area Adjustment	1.45

*Impervious Area tributary to recharge facilities must be greater than 65%

Standard 3: Recharge Calculations - Infiltration Basin #I

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor
- 0.60 inch (A-soils)
- 0.35 inch (B-soils)
- 0.25 inch (C-soils)
- 0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	2,179 sq. ft.	3.3%
Impervious Area (B-soils)	64,054 sq. ft.	96.5%
Impervious Area (C-soils)	133 sq. ft.	0.2%
Impervious Area (D-soils)	0 sq. ft.	0.0%
Total Impervious area	66,367 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 1,980 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.45

Adjusted R_V (required) = 2,872 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltration Basin #1

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.858 acres

V_{WQ} (required) = 3,373 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	2,872 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	3,373 cu. ft.	
Use	3,373 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #1	4,167 cu. ft.***

4,167 cu. ft. > 3,373 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in surface infiltration basin below outlet elevation 200.75
Depth of water in basin = 0.75 feet

Stage-Area-Storage for Pond 1P: Infiltration Basin #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
200.00	0	202.60	18,052
200.05	252	202.65	18,494
200.10	507	202.70	18,940
200.15	766	202.75	19,389
200.20	1,029	202.80	19,842
200.25	1,296	202.85	20,299
200.30	1,566	202.90	20,758
200.35	1,839	202.95	21,222
200.40	2,117	203.00	21,688
200.45	2,398	203.05	22,159
200.50	2,683	203.10	22,633
200.55	2,972	203.15	23,110
200.60	3,265	203.20	23,590
200.65	3,562	203.25	24,075
200.70	3,862	203.30	[illegible]
200.75	4,167	203.35	[illegible]
200.80	4,476	203.40	25,548
200.85	4,788	203.45	26,046
200.90	5,104	203.50	26,548
200.95	5,425	203.55	27,053
201.00	5,750	203.60	27,562
201.05	6,078	203.65	28,074
201.10	6,410	203.70	28,590
201.15	6,745	203.75	29,110
201.20	7,084	203.80	29,633
201.25	7,427	203.85	30,160
201.30	7,773	203.90	30,690
201.35	8,123	203.95	31,224
201.40	8,476	204.00	**31,762**
201.45	8,833		
201.50	9,194		
201.55	9,559		
201.60	9,927		
201.65	10,299		
201.70	10,674		
201.75	11,053		
201.80	11,437		
201.85	11,824		
201.90	12,214		
201.95	12,609		
202.00	13,007		
202.05	13,409		
202.10	13,815		
202.15	14,223		
202.20	14,635		
202.25	15,051		
202.30	15,469		
202.35	15,891		
202.40	16,317		
202.45	16,745		
202.50	17,177		
202.55	17,613		

Storage at outlet

Standard 3: Recharge Calculations - Infiltration Basins #2

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor
- 0.60 inch (A-soils)
- 0.35 inch (B-soils)
- 0.25 inch (C-soils)
- 0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	9,058 sq. ft.	13.4%
Impervious Area (B-soils)	18,469 sq. ft.	27.3%
Impervious Area (C-soils)	23,350 sq. ft.	34.5%
Impervious Area (D-soils)	16,727 sq. ft.	24.7%
Total Impervious area	67,605 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 1,617 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.45

Adjusted R_V (required) = 2,346 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #2

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.552 acres

V_{WQ} (required) = 2,817 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	2,346 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	2,817 cu. ft.	
Use	2,817 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #2	2,899 cu. Ft.***

2,899 cu. ft. > 2,817 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

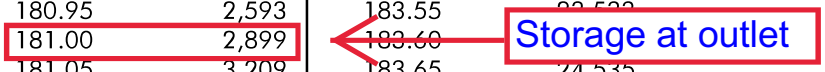
***Volume represents the available storage in infiltration basin #2 below outlet elevation 181.00
Depth of water in basin = 0.50 feet

Type III 24-hr 2-Year Rainfall=3.00"

Stage-Area-Storage for Pond 8P: Infiltration Basin #2

Elevation (feet)	Storage (cubic-feet)
180.50	0
180.55	274
180.60	551
180.65	832
180.70	1,116
180.75	1,404
180.80	1,696
180.85	1,991
180.90	2,290
180.95	2,593
181.00	2,899
181.05	3,209
181.10	3,523
181.15	3,840
181.20	4,161
181.25	4,486
181.30	4,814
181.35	5,146
181.40	5,482
181.45	5,822
181.50	6,166
181.55	6,514
181.60	6,865
181.65	7,220
181.70	7,580
181.75	7,943
181.80	8,310
181.85	8,682
181.90	9,057
181.95	9,436
182.00	9,820
182.05	10,207
182.10	10,598
182.15	10,992
182.20	11,390
182.25	11,792
182.30	12,197
182.35	12,606
182.40	13,019
182.45	13,436
182.50	13,856
182.55	14,280
182.60	14,707
182.65	15,139
182.70	15,574
182.75	16,013
182.80	16,455
182.85	16,902
182.90	17,353
182.95	17,807
183.00	18,265
183.05	18,727

Elevation (feet)	Storage (cubic-feet)
183.10	19,192
183.15	19,661
183.20	20,133
183.25	20,608
183.30	21,087
183.35	21,569
183.40	22,055
183.45	22,544
183.50	23,037
183.55	[illegible]
183.60	[illegible]
183.65	24,535
183.70	25,042
183.75	25,552
183.80	26,065
183.85	26,582
183.90	27,103
183.95	27,627
184.00	**28,155**



Standard 3: Recharge Calculations - Infiltration Basins #3

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor
- 0.60 inch (A-soils)
- 0.35 inch (B-soils)
- 0.25 inch (C-soils)
- 0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.	0.0%
Impervious Area (B-soils)	7,253 sq. ft.	6.7%
Impervious Area (C-soils)	14,762 sq. ft.	13.7%
Impervious Area (D-soils)	85,516 sq. ft.	79.5%
Total Impervious area	107,531 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 1,232 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.45

Adjusted R_V (required) = 1,786 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #3

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 2.469 acres

V_{WQ} (required) = 4,480 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	1,786 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	4,480 cu. ft.	
Use	4,480 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #3	5,200 cu. Ft.***

5,200 cu. ft. > 4,480 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in infiltration basin #4 below outlet elevation 181.50
Depth of water in basin = 0.50 feet

Stage-Area-Storage for Pond 2P: Infiltration Basin #3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
181.00	0	182.04	11,362	183.08	24,747
181.02	199	182.06	11,602	183.10	25,024
181.04	399	182.08	11,842	183.12	25,300
181.06	599	182.10	12,082	183.14	25,578
181.08	800	182.12	12,323	183.16	25,856
181.10	1,002	182.14	12,565	183.18	26,135
181.12	1,205	182.16	12,808	183.20	26,414
181.14	1,409	182.18	13,052	183.22	26,694
181.16	1,613	182.20	13,296	183.24	26,975
181.18	1,818	182.22	13,541	183.26	27,256
181.20	2,023	182.24	13,786	183.28	27,538
181.22	2,230	182.26	14,032	183.30	27,821
181.24	2,437	182.28	14,279	183.32	28,104
181.26	2,645	182.30	14,527	183.34	28,388
181.28	2,854	182.32	14,775	183.36	28,672
181.30	3,063	182.34	15,024	183.38	28,957
181.32	3,273	182.36	15,274	183.40	29,243
181.34	3,484	182.38	15,524	183.42	29,529
181.36	3,696	182.40	15,776	183.44	29,816
181.38	3,909	182.42	16,028	183.46	30,104
181.40	4,122	182.44	16,280	183.48	30,392
181.42	4,336	182.46	16,534	183.50	30,681
181.44	4,551	182.48	16,788	183.52	30,971
181.46	4,767	182.50	17,042	183.54	31,261
181.48	4,983	182.52	[illegible]	[illegible]	31,552
181.50	5,200	182.54	[illegible]	[illegible]	31,843
181.52	5,418	182.56	[illegible]	[illegible]	32,135
181.54	5,637	182.58	18,069	183.62	32,428
181.56	5,856	182.60	18,327	183.64	32,722
181.58	6,077	182.62	18,586	183.66	33,016
181.60	6,298	182.64	18,846	183.68	33,310
181.62	6,520	182.66	19,107	183.70	33,606
181.64	6,742	182.68	19,368	183.72	33,902
181.66	6,966	182.70	19,630	183.74	34,198
181.68	7,190	182.72	19,893	183.76	34,495
181.70	7,415	182.74	20,156	183.78	34,793
181.72	7,641	182.76	20,420	183.80	35,092
181.74	7,867	182.78	20,685	183.82	35,391
181.76	8,095	182.80	20,951	183.84	35,691
181.78	8,323	182.82	21,217	183.86	35,992
181.80	8,552	182.84	21,485	183.88	36,293
181.82	8,782	182.86	21,753	183.90	36,595
181.84	9,012	182.88	22,021	183.92	36,897
181.86	9,244	182.90	22,291	183.94	37,200
181.88	9,476	182.92	22,561	183.96	37,504
181.90	9,709	182.94	22,831	183.98	37,809
181.92	9,943	182.96	23,103	184.00	**38,114**
181.94	10,177	182.98	23,375		
181.96	10,413	183.00	23,649		
181.98	10,649	183.02	23,922		
182.00	10,886	183.04	24,197		
182.02	11,124	183.06	24,472		

Storage at outlet

Standard 3: Recharge Calculations - Bioretention Basin

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor
- 0.60 inch (A-soils)
- 0.35 inch (B-soils)
- 0.25 inch (C-soils)
- 0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.	0.0%
Impervious Area (B-soils)	0 sq. ft.	0.0%
Impervious Area (C-soils)	17,910 sq. ft.	100.0%
Impervious Area (D-soils)	0 sq. ft.	0.0%
Total Impervious area	17,910 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 373 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.45

Adjusted R_V (required) = 541 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Bioretention Basin

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 0.090 acres

V_{WQ} (required) = 163 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	541 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	163 cu. ft.	
Use	541 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Bioretention Basin	2,372 cu. Ft.***

2,372 cu. ft. > 541 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in bioretention basin #3 below outlet elevation 182.50
Depth of water in basin = 1.00 feet

Stage-Area-Storage for Pond 5P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
181.50	1,950	0
181.52	1,966	39
181.54	1,982	79
181.56	1,998	118
181.58	2,014	159
181.60	2,030	199
181.62	2,046	240
181.64	2,062	281
181.66	2,078	322
181.68	2,095	364
181.70	2,111	406
181.72	2,128	448
181.74	2,144	491
181.76	2,161	534
181.78	2,177	578
181.80	2,194	621
181.82	2,211	665
181.84	2,228	710
181.86	2,245	754
181.88	2,262	800
181.90	2,279	845
181.92	2,296	891
181.94	2,313	937
181.96	2,330	983
181.98	2,348	1,030
182.00	2,365	1,077
182.02	2,382	1,125
182.04	2,400	1,172
182.06	2,417	1,221
182.08	2,435	1,269
182.10	2,453	1,318
182.12	2,470	1,367
182.14	2,488	1,417
182.16	2,506	1,467
182.18	2,524	1,517
182.20	2,542	1,568
182.22	2,560	1,619
182.24	2,578	1,670
182.26	2,596	1,722
182.28	2,615	1,774
182.30	2,633	1,826
182.32	2,651	1,879
182.34	2,670	1,932
182.36	2,688	1,986
182.38	2,707	2,040
182.40	2,725	2,094
182.42	2,744	2,149
182.44	2,763	2,204
182.46	2,782	2,260
182.48	2,801	2,315
182.50	2,820	2,372
182.52	2,839	2,428
182.54	2,858	2,485
182.56	2,877	2,542
182.58	2,896	2,600
182.60	2,915	2,658
182.62	2,935	2,717
182.64	2,954	2,776
182.66	2,973	2,835
182.68	2,993	2,895
182.70	3,013	2,955
182.72	3,032	3,015
182.74	3,052	3,076
182.76	3,072	3,137
182.78	3,092	3,199
182.80	3,111	3,261
182.82	3,131	3,323
182.84	3,151	3,386
182.86	3,172	3,449
182.88	3,192	3,513
182.90	3,212	3,577
182.92	3,232	3,641
182.94	3,253	3,706
182.96	3,273	3,772
182.98	3,293	3,837
183.00	**3,314**	**3,903**

Storage at outlet

TSS Removal Form - Infiltration Basins #1, #2 & #3

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep-Sump Hooded Catch Basins	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pre-Treatement TSS Removal = 44%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Surface Infiltration Basin w/ Forebay	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

TSS Removal Form - Bioretention Area

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
12" Gravel Strip & Sod	0.45	1.00	0.45	0.55

Pre-Treatement TSS Removal = 45%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Bioretention Area	0.90	1.00	0.90	0.10

Total TSS Removal = 90%

Sediment Forebay Sizing - Infiltration Basin #1

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.86 acres *

V_{SF} (required) = 675 cu.ft.

V_{SF} (provided) = 732 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #2

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.55 acres *

V_{SF} (required) = 563 cu.ft.

V_{SF} (provided) = 762 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #3

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.47 acres *

V_{SF} (required) = 896 cu.ft.

V_{SF} (provided) = 950 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Dry Detention Basin

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.57 acres *

V_{SF} (required) = 934 cu.ft.

V_{SF} (provided) = 1,064 cu. ft.

* Only includes impervious area tributary to sediment forebay

Drawdown Analysis

$$T_{DRAWDOWN} = \frac{R_V}{KA}$$

where: $T_{DRAWDOWN}$ = time in hours

R_V = required recharge volume **(cu. ft.)**

K = Rawls rate
- **2.41 inches/hour** (A-soils)*
- **0.52 inches/hour** (B-soils)*
- **0.17 inches/hour** (C-soils)*

A = bottom area of recharge facility **(sq. ft.)**

*Most conservative Rawls rate values for given soil type used for analysis purposes

Surface Infiltration Basin #1

R_V = 2,872 cu. ft.
A = 4,419 sq. ft.

$T_{DRAWDOWN}$ = **15.0 hours < 72 hours** (B-soils)

Surface Infiltration Basin #2

R_V = 2,346 cu. ft.
A = 5,113 sq. ft.

$T_{DRAWDOWN}$ = **32.4 hours < 72 hours** (C-soils)

Surface Infiltration Basin #3

R_V = 1,786 cu. ft.
A = 9,161 sq. ft.

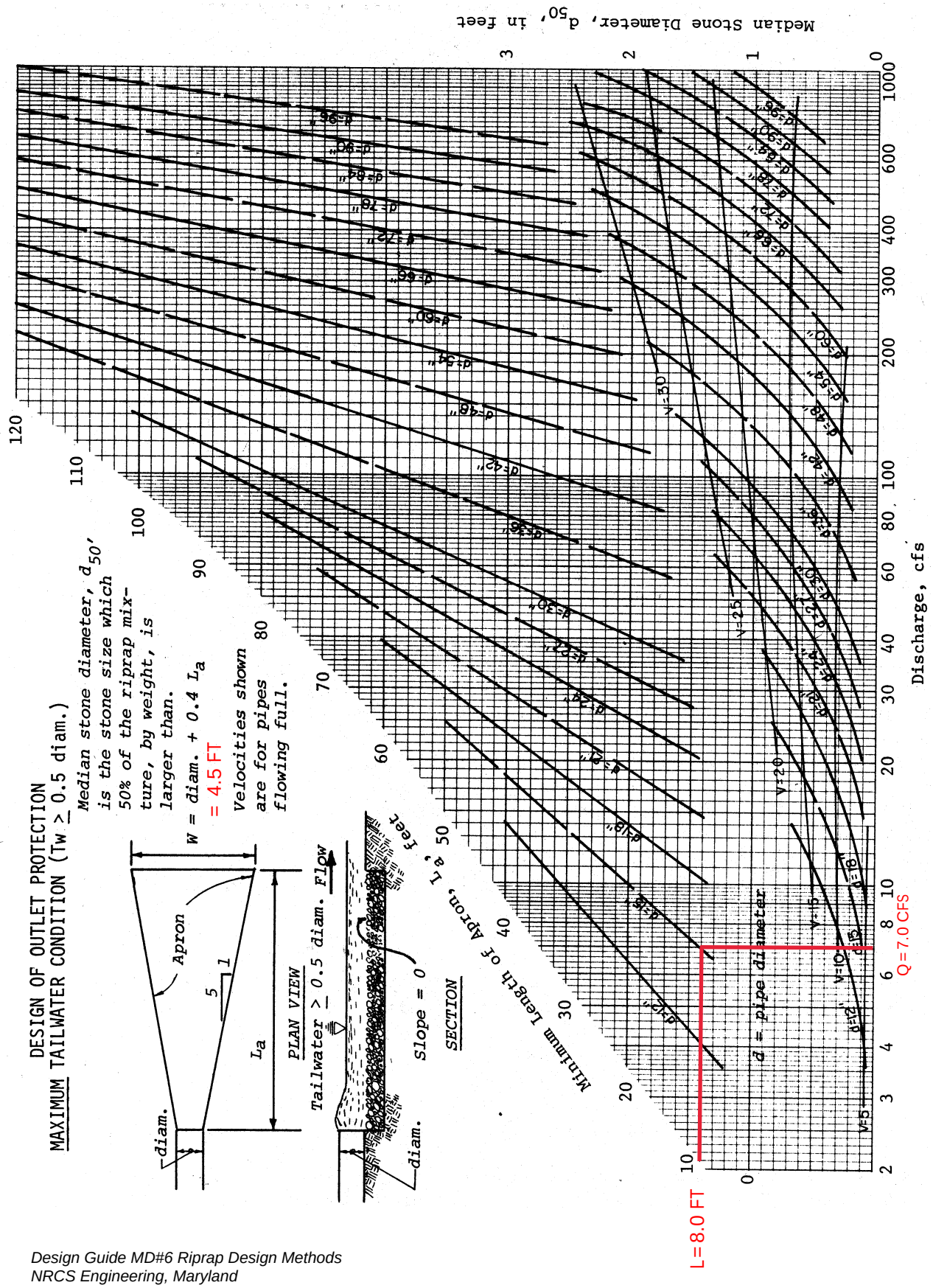
$T_{DRAWDOWN}$ = **13.8 hours < 72 hours** (C-soils)

Bioretention Basin

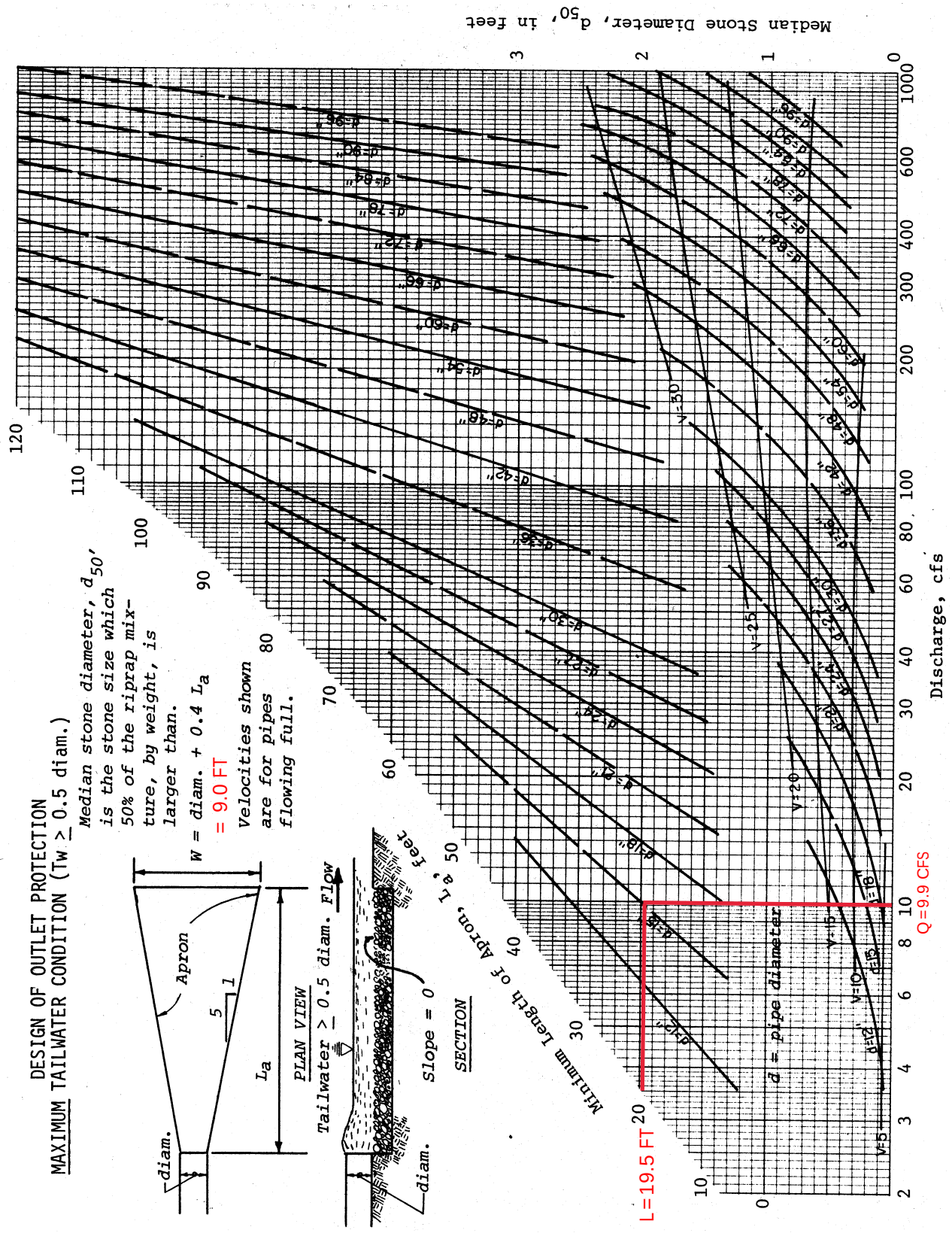
R_V = 541 cu. ft.
A = 1,950 sq. ft.

$T_{DRAWDOWN}$ = **19.6 hours < 72 hours** (C-soils)

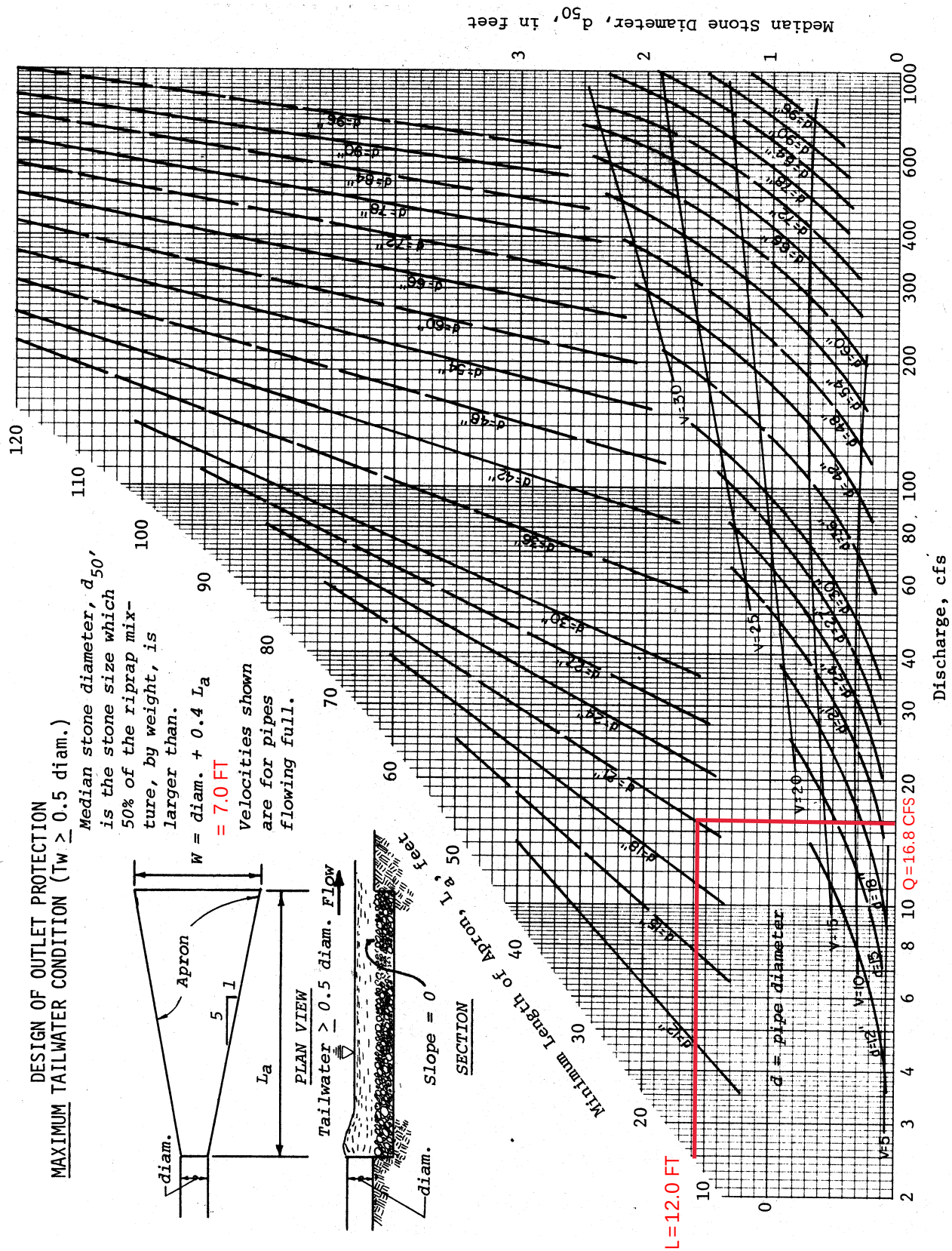
PFES-2 RIPRAP OUTLET



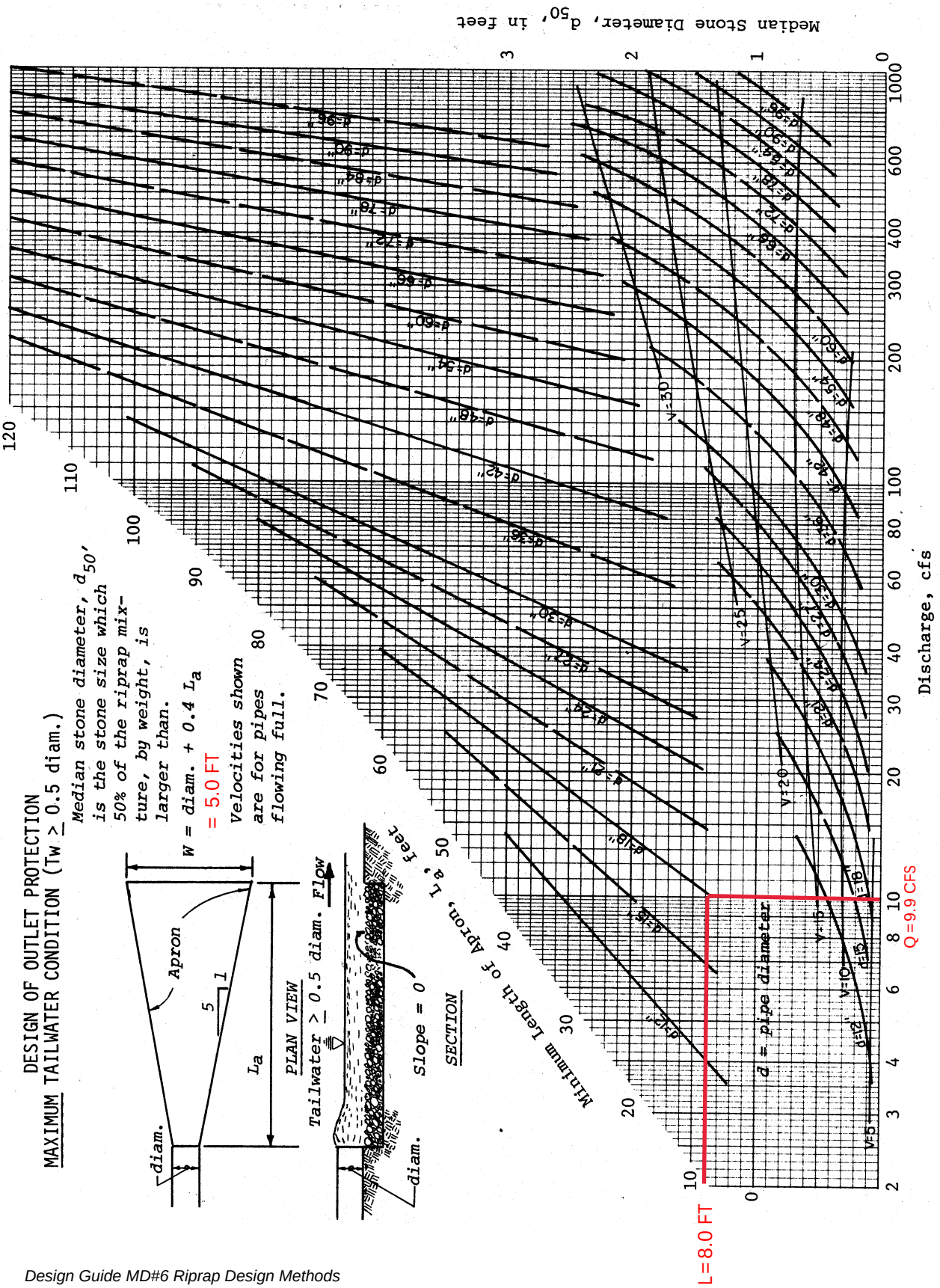
PFES-3A & 4A RIPRAP OUTLET



PFES-8 RIPRAP OUTLET



PFES-8 RIPRAP OUTLET



Appendix F: Construction Period Erosion Control Plan

Construction Period Erosion Control Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506

September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

The project shall implement a construction period erosion control plan. The following provides descriptions and guidelines to ensure that the areas surrounding the project site will be protected from excessive sedimentation and runoff during construction.

1.1 Construction Period Pollution Prevention And Erosion Control Measures

1.1.1 Preconstruction Notifications And Meetings

Prior to the start of construction, the contractor shall call together a pre-construction meeting including a representative from the Town, the design engineer, contractor, and any pertinent persons that should be in attendance. These requirements shall be the responsibility of the Contractor to arrange, attend, and document.

1.1.2 Sediment Barrier And Work Limit

Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the owner or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine, provided all other ground cover is left intact. No excavation, grading, filling, or removal of vegetative ground cover shall begin until sediment barriers have been installed as shown on the plans and have been inspected by the owner or their representative.

1.1.3 Silt Fence

The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with compacted soil or crushed stone. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

1.1.4 Straw Bales

Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose hay.

1.1.5 Filter Sock (Filtrexx Or Equivalent)

In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, mulch or crushed stone shall be placed along the up-slope face to control and filter underflow. Additional layers of Filter Sock may be required for adequate freeboard. The filter sock shall be staked at 10 feet on-center or in cases where they cannot be staked, utilize heavy concrete blocks to hold in place.

1.1.6 Temporary Sedimentation Basins

Temporary sediment basins may be excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion. If the temporary basin is to be located within an area of future infiltration as part of the stormwater management system, the excavation for the temporary sedimentation basin shall be limited to one foot above final grade of the infiltration structure.

1.1.7 Stocking Additional Materials

A stock of additional erosion control materials shall be available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

Straw Bales – 10 (kept dry) with 20 oak stakes

Or

Silt Fence – 30 Linear feet.

Or

Filter Sock – 4 – 8 foot sections (kept dry)

Washed Stone – One (1) cubic yard, ¾" to 2" diameter

1.1.8 Trench Protection

Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

1.1.9 Site Stabilization – Temporary

Where a portion of the site will not be subject to construction activity for over 14 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

1.1.10 Site Stabilization – Permanent

Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover (season permitting) in accordance with USDA NRCS guidelines or equivalent.

1.1.11 Roadway Sweeping

The entrance to the site and affected portions of the access drive or paved project areas shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

1.2 Short-Term Erosion Control Maintenance

The following provides short-term erosion control maintenance guidelines and requirements.

1. The contractor or subcontractor will be responsible for implementing each control shown on the sedimentation and erosion control plan.
2. All erosion and sediment control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control measures will be installed during construction in order to control erosion and/or off-site sedimentation if deemed necessary by on-site inspection.
3. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
4. All sediment and erosion control devices shall be inspected at least once every seven (7) calendar days and after any storm event greater than 0.5 inches of precipitation during any 24-hour period, and the inspection shall be documented in writing. Damaged or ineffective devices shall be repaired or replaced, as necessary.
5. The contractor shall take all reasonable precautions to avoid excess erosion of the site due to the construction of this project.
6. Silt shall be removed from behind barriers if greater than 6-inches deep or as needed. Sediment that is collected in structures shall be disposed of properly and covered if stored on-site
7. Damaged or deteriorated items will be repaired immediately after identification.
8. All ditches shall be stabilized as soon as is practicable to minimize erosion.
9. The contractor shall maintain all erosion control devices in a good, working state of repair. Upon complete stabilization of any tributary areas, the erosion control devices shall be removed and disposed of so as to cause no off-site siltation.
10. Inspect and maintain construction entrance stone such that sediment does not track onto the street. Any sediment tracked onto the street shall be swept daily.
11. After catch basins have been constructed, the contractor shall protect the inlets by constructing inlet protection as shown on the plans.
12. Once the site has been paved, all catch basin inlets shall receive a silt sack type protection.
13. Erosion control measures shall remain in place until all disturbed earth has been substantially stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Appendix G: Long-Term Operation and Maintenance Plan

- Long-Term Operation & Maintenance Plan Narrative
- CDS Inspection and Maintenance Guide
- O&M Checklist

Long-Term Operation & Maintenance Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
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I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Roadway to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Deep-Sump Catch Basins	Four times per year	Four times per year	• Remove sediment once deposits reach one half the depth from the bottom sump to the lowest invert.
Leaching Drywell	Once per year	As needed	• Remove debris and sediment when the drywell in 50% filled. Rehabilitate drywell if it fails due to clogging
Stormwater Piping	Once per year	Once per year	• Inspect pipe entrances in catch basins and manholes and remove any blockages
Water Quality Unit*	As specified by the manufacturer	As specified by the manufacturer	• Clean the unit using the method specified by the manufacturer. Vactor trucks are typically used to clean these units.
Sediment Forebay	Monthly	Four times per year	• Remove sediment when it reaches six inches; • Mow the grass to no less than 3 inches and no greater than 6 inches; • Replace vegetation damaged during sediment removal.
Surface Infiltration Basin	• After every major storm for the first three months; • Twice per year thereafter.	Twice Per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of the turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris.

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Dry Detention Basin	• After every major storm event for the first three months; • Twice per year thereafter	Twice per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris
Flared End Section	Four times per year	As Needed	• Remove any debris or vegetation around the flared end section such that flow out of the structure is not impeded.
Level Spreader	Once per month and after every major storm event	As needed	• Remove debris and sediment • Rill damage to be repaired and re-vegetated • Replace rotted or broken timbers
Bio-Retention Areas	Once per month	Twice per year (Spring and Fall)	• Inspect bio-retention areas for sediment build-up, structural damage, and standing water; • Inspect and repair eroded areas monthly; • Re-mulch void areas as needed; • Remove litter and debris monthly; • Treat diseased or distressed vegetation as needed; • Remove and replace dead vegetation twice per year (Spring and Fall); • Remove invasive species as needed; • Replace mulch every two years.

*See attached Device Operation and Maintenance Guides

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Heavy-duty stormwater drain manhole covers and catch basin grates have been designed to withstand H20 loading;

C. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

D. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$50	22	$4,400
Yard Drains	4/year	$50	15	$3,000
Sediment Forebay	2/year	$50	4	$400
Surface Infiltration Basin	2/year	$75	3	$450
Dry Detention Basin	2/year	$75	1	$150
Water Quality Unit	2/year	$100	1	$200
Bio-Retention Areas	12/year	$50	1	$600
Total Estimated Annual Cost of Inspections				$9,200

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$100	22	$8,800
Yard Drains	4/year	$100	15	$6,000
Sediment Forebay	2/year	$250	4	$600
Surface Infiltration Basin	2/year	$500	3	$2,000
Dry Detention Basin	2/year	$500	1	$1,000
Bio-Retention Areas	2/year	$500	1	$1,000
Water Quality Unit	2/year	$800	1	$800
Total Estimated Annual Cost of Maintenance				$20,200

*All above costs are estimates to be used for permitting purposes only. Actual maintenance costs are to be ascertained by the responsible party

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 1 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Deep-Sump Catch Basins	Sediment has accumulated to a depth greater than the original design depth for sediment storage, approximately 2-feet of sediment.	Remove the sediment and dispose of in accordance with local and state regulations.			
Stormwater Piping	Blockage of inlet/outlet pipes due to debris or sediment accumulation.	Remove any debris and sediment via proper means. Dispose of debris/sediment in accordance with local & state regulations			
Roof Leaders	Downspout connections have been damaged or disconnected.	Repair and reconnect downspout connections.			
	Roof leaders are surcharging at the downspout connections	Open and insepct at cleanout locations and remove any blockages.			
Surface Infiltration Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Level Spreader	Debris or sediment has collected in level spreader	Remove debris or sediment			
	Rills have developed downstream of level spreader	Repair rill damage and re-vegetate area			
	Timbers are broken or rotted	Replace timbers			

_____ _____

Inspector's Signature Date

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 2 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Dry Detention Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Flared End Sections	Vegetation has started to grow within the riprap area.	Remove vegetation immediately.			
	Accumulation of sediment/debris at the culvert inlet.	Remove sediment or debris such that the culvert has free flow.			
	Erosion is occuring where riprap has been dislodged.	Remedy scoured area and replace riprap immediately.			
Bio-Retention Areas	Sediment has accumulated over mulched surface.	Remove sediment and mulch mixture and replace mulch.			
	Erosion has occurred at inlets.	Repair any eroded areas and replace with appropriate materials.			
	Areas are devoid of mulch.	Replace mulch as necessary.			
	Litter and/or debris has accumulated in bio-retention area.	Remove litter and/or debris.			
	Vegetation has died or is distressed.	Replace vegetation as necessary.			
Water Quality Unit	Sediment has accumulated to a depth greater that the original design depth for sediment storage.	Remove sediment and disposed of in accordance with local and state regulations.			

_____ _____

Inspector's Signature Date

Appendix H: Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

The owners of the land/responsible party will be responsible for prohibiting illicit discharges to the stormwater management system during construction and during its life of operation. The stormwater management system is comprised of the components for conveying, treating, and infiltrating stormwater runoff on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. An illicit discharge shall constitute any connection or discharge to the stormwater management system including, but not limited to, wastewater discharges, discharge of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

Signature of Responsible Party Representative _____ Date _____

Signature of Responsible Party Representative** _____ Date _____

**Required upon transfer of ownership

Appendix I: Low Impact Development Considerations

Low Impact Development Considerations

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
September 19, 2022

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Introduction

Per the Massachusetts Stormwater Handbook, project proponents must consider environmentally sensitive site design and low impact development techniques to effectively manage stormwater runoff. As part of the proposed project, the proponent has considered a number of environmentally sensitive, low impact development techniques to prevent the generation of stormwater and non-point source pollution. The proposed stormwater management system design was able to incorporate some LID techniques such as deep-sump hooded catch basins, a proprietary sedimentation device, surface infiltration basins with sediment forebay, a bioretention area with vegetated filter strip and a dry detention basin. The proposed stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance which dictate that specific criteria be met in regard to stormwater runoff in conjunction with the criteria set forth and required by the Massachusetts Stormwater Handbook.

The property to be developed is currently in agricultural use with the exception of wooded wetland in the central portion of the project site. The topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the project area. No stormwater management features currently exist on site, however, a pair of culverts under South Westfield Street discharge runoff from adjacent properties onto the site. As such, untreated stormwater laden with suspended solids flows across the site and into adjacent wetlands and stream.

The developer is proposing to construct forty (40) new duplex condominium buildings and one standalone unit for a total of eighty (81) units. Seven of the duplex units will face directly onto South Westfield Street. The remaining thirty-three duplexes will be accessed by a series of new roadways. The total length of new roadways will be approximately 3,930 feet and will include the installation of gravity and pressure sanitary sewer, water, electric, gas and communication lines. The majority of the parcel where the site improvements are proposed has been historically disturbed. A number of onsite resource areas, including bordering vegetated wetlands, bank, land under water, and riverfront area were delineated as part of the project. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various off-site resource areas.

Currently, there is no existing stormwater management system located on the property. Under proposed conditions, a stormwater management system has been designed to mimic the existing drainage patterns of the site while improving runoff water quality and reducing peak stormwater flow rates through the use of MassDEP recommended stormwater BMPs. The proposed roadway has been carefully graded to mimic existing flow patterns of the site and direct runoff to inlet structures that will collect and convey stormwater to three separate surface infiltration basins and a

dry detention basin situated in logical locations across the site. A bioretention basin with vegetated filter strip is also proposed to treat sheet flow from a portion of the new roadway. The surface infiltration basins and bioretention area were designed such that runoff will infiltrate to provide groundwater recharge as well as provide peak rate attenuation. The dry detention basin was designed only to provide peak rate attenuation. Outlet control structures from the surface basins and dry detention basin will discharge stormwater down gradient. A proprietary sedimentation device will be added to the town's drainage infrastructure that currently discharges onto the subject property to improve runoff water quality. The proposed site improvements will maintain the general drainage patterns of the site by discharging runoff to the same design points in post-development as pre-development conditions.

This letter serves to describe the relationship between the requirements of the MassDEP Handbook and "environmentally sensitive site design" considerations as well as the analysis of alternatives to any "point source" of "stormwater discharge" which may be regulated. The following sections provide detailed descriptions for the consideration of low impact development measures as listed by the MassDEP.

Environmentally Sensitive Site Design Considerations

The Department's requirement for the inclusion of Environmentally Sensitive Site Design was considered as part of the design of the stormwater management system. These considerations include review of low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting stormwater sheet flow paths and treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat. The proposed stormwater management system does not introduce any new point source discharges to resource areas.

A. *Reducing impervious surfaces*

The amount of proposed impervious surface for internal roadways has been reduced to the minimum requirements by the Town of Agawam for pavement and sidewalk width. The pavement width varies and is based on the estimated average daily trips and the sidewalk width was dictated by the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam. The roadway width varies between 30-feet and 36-feet for two-way travel and 20-feet for one-way travel. The sidewalks are 5-feet wide.

B. *Disconnecting stormwater sheet flow paths and treating stormwater at its source*

The proposed roadway has been carefully graded to conform to the requirements of the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam as was requested by the Town. Stormwater runoff from approximately 200-feet of new roadway will sheet flow to vegetated filter strip for treatment prior to discharging to a bioretention area to

provide groundwater recharge. On-site drainage patterns will be maintained and only the new roadway and front yards will be collected via the proposed stormwater infrastructure.

C. *Maximizing open space*

The proposed project has been limited to the on-site upland areas and roadway length was limited to the functional minimums required for a successful project. Existing vegetated areas have been protected to the maximum extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed.

D. *Minimizing disturbance*

The proposed development includes the construction of a new roadway, residential buildings, and stormwater management system. Existing vegetated areas have been protected to the maximum practicable extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed. No work is proposed within any resource areas.

E. *Protecting natural features and processes*

A significant portion of the proposed project is located within areas which have been previously cleared and/or disturbed. The proposed access roadway and stormwater management system has been designed to minimize the impacts to the wetland buffer zones and riverfront area while maintaining the general drainage patterns of the site.

F. *Enhancing wildlife habitat*

Impacts to wildlife habitat have been limited to functional minimums. The majority of the parcel where the site improvements are proposed has been historically disturbed.

Point Source Stormwater Discharge Alternatives Analysis

Under the Department's Outreach Document for 310 CMR 10.05(6)(k) through (q) and 314 CMR 9.06(5) & (6)(a) through (f), a list of considerations is provided for use in developing an Alternatives Analysis to point source stormwater discharge within Departmental jurisdiction.

For ease of review, the aforementioned list is repeated below in italics with responses after each item:

a. *Removal of all proposed work and/or impervious surfaces from the Department's jurisdiction;*

The existing site conditions, with the sloping topography and relatively high groundwater did not allow for a design that was completely outside jurisdiction. Buffer zone and riverfront area impacts have been reduced to functional minimums to provide access and to construct the stormwater management system. The proposed stormwater management system has been carefully designed such that runoff water quality is above MassDEP requirements, thereby limiting negative wetland impact.

b. *Division of the upper portion of the subject catchments into smaller subcatchments, where resultant stormwater discharges should be completely infiltrated and/or retained;*
The subcatchments were delineated based on the proposed roadway layout to maximize building separation while minimizing road length. Careful grading of the site allowed for a stormwater management system design that utilized multiple surface infiltration basins across the site to provide the required groundwater recharge.

c. *Maintaining existing drainage patterns and not mixing country drainage with untreated stormwater;*
The intent of this item has been achieved with the proposed layout of the stormwater management system maintaining existing drainage patterns of the site. Runoff collected from impervious surfaces are directed in the same general direction in post-development conditions as pre-development conditions.

d. *Treatment of remaining stormwater at or proximate to its source within these subcatchments;*
The intent of this requirement has been achieved with the decentralized nature of the proposed stormwater management system. The sloping topography of the site did not allow for intermediate basins, however, a bioretention area with vegetated filter strip was included upgradient of the dry detention basin to provide groundwater recharge closer its source.

e. *Installation of "qualifying pervious areas" to accept stormwater discharge from roads and driveways within each subcatchment;*
The proposed project was carefully designed to limit impervious areas to functional minimums. Generally, impervious areas are limited to buildings and shared access drives. Due to the shared nature and anticipated vehicles on the access drives pervious pavement was not a suitable stormwater alternative. Individual driveways and accessory impervious areas have been reduced to functional minimums and combined when possible.

f. *Installation of dry wells for acceptance of roof drainage;*
Do to the relatively high groundwater and proximity of several building units to wetland resource areas dry wells were not utilized for this project. This technique may be a viable option if favorable soil conditions and groundwater depths are discovered during building construction.

g. *Disconnection of roof drainage;*
A portion of stormwater generated from roof areas will flow away from the stormwater management system and drain directly to adjacent downgradient areas, however, for safety reasons during winter months and the potential for freezing on walkways some of the roof runoff will be piped directly to the surface infiltration basins.

h. *Installation of discrete structural Best Management Practices at relatively high elevations in each subcatchment. For instance, canting access road surfaces into grassed channels, water quality*

swales, vegetated filter strips, bioretention areas, sand and organic filters, drainage swales, level spreaders, etc. which terminate outside of the Department's jurisdiction;
This intent of this requirement has been met by directing sheet flow from paved areas to a bioretention area via a vegetated filter strip.

i. Further describe:

1. *Reduction in impervious surfaces;*
   The proposed project has been designed to reduce impervious surfaces to functional minimums. Access roadway widths are designed to the minimums allowed based on town review and walkways and individual driveway widths are reduced to functional minimums.

2. *Road width and length reductions;*
   The proposed roadway width has been designed to the minimum width required based on average daily traffic for the roadway and the length is the minimum required for a cost effective project buildout.

3. *Clustering of impervious surfaces;*
   Impervious surfaces have been clustered to the maximum practical extent.

4. *Addition of planted materials and landscaped areas;*
   A mix of nearly 300 deciduous and evergreen trees are proposed in landscaped areas across the site. In addition, numerous foundation plantings are proposed within landscaped areas adjacent to each building unit. Areas not used for roadways, parking, sidewalks, patios or buildings will be loamed and seeded.

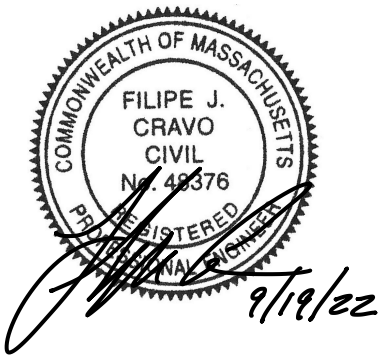
5. *Re-grading of landscaped areas away from jurisdictional Resource Areas and their Buffer Zones; and*
   The general drainage patterns of the site have been maintained in post-development conditions and a stormwater management system has been designed to offset the impacts imposed by the development.

6. *Preservation of vegetated areas within the Buffer Zone, and immediately proximate to jurisdictional resource areas.*
   The majority of the project is located outside jurisdictional areas and nothing is proposed within resource areas. An attempt was made to limit disturbance to buffer zones while at the same time design a project that was cost effective. The greatest impact to riverfront area was due to the construction of infiltration basin #3 and the dry detention basin which were situated based on site topography.

Stormwater Drainage Report

Proposed Condominium Community

497 South Westfield Street
Agawam, MA 01030
(Map E6, Block 2, Parcel 8)



Applicant & Owner:

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I. INTRODUCTION

The project applicants, Ralph Depalma & Giuseppe Tirone, are proposing to construct an 81-unit condominium community on approximately 49.81 acres of land located at 497 South Westfield Street in Agawam, Massachusetts. A majority of the site is currently composed of agricultural land with the exception of wooded wetlands in the central portion of the property and wetlands located along the property boundaries. Currently, there is no stormwater management system at the project site.

The proposed project involves the following:

- Demolition of an existing single-family home and detached garage;
- Rerouting of two drainage outfalls that currently discharge onto the subject property. One collects runoff from South Westfield Street and the other captures runoff from a property on the west side of South Westfield Street and reaches the subject property via a culvert under the roadway;
- Construction of approximately 3,930 feet of roadway from the east side of South Westfield Street to provide access to 67 of the units. The remaining 14 units well have access directly from South Westfield Street;
- Construction of thirty-seven (37) multi-unit condominium buildings for a total of eighty (81) units;
- Installation of underground water, sanitary sewer, electric, gas and communication utility services;
- Construction of a stormwater management system including deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay.

The new drainage infrastructure has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

2. SITE DESCRIPTION

2.1 Predevelopment Conditions

The property to be developed is located at 497 South Westfield Street and is listed as parcel E6-2-8 by the Town of Agawam Assessor's office. The property is zoned Residence A-3 according to the Agawam zoning map. The project site is bounded by St. Anne's Country Club to the south and east, undeveloped agriculturally zoned land to the north and South Westfield Street to the west. The total parcel area is approximately 49.81 acres. There are four bordering vegetated wetlands present along the northern, eastern, and southeastern property lines and one centrally located bordering vegetated wetland that extends to the northerly property line. Philo Brook crosses through the property boundary in the northeastern-most corner of the site. A portion of Taylor Pond is located along the southerly property line adjacent to South Westfield Street. A town drainage outfall currently discharges to the project site and runoff from agricultural fields on the opposite side of South Westfield Street is conveyed to the subject parcel via a culvert pipe under the roadway. Figure 1 – USGS Map illustrates the location of the parcel. The project site is currently in agricultural use and consists almost entirely of tilled fields with a single-family home and accessory building.

In general, the topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the site. The highpoint of the site is along South Westfield Street which ranges in elevation from 215 to 221. From there the topography gradually slopes in an easterly direction toward Philo Brook at approximately elevation 170. Figure 4 – Pre-Development conditions delineates the pre-development sub-catchments areas.

2.2 Resource Areas

The project site contains a number of resource areas, including several bordering vegetated wetlands and bank associated with a tributary to Philo Brook. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various resource areas.

2.2.1 Floodplain

R. Levesque Associates, Inc. performed due diligence research on the property regarding FEMA flood zone mapping. As demonstrated by the most recent FEMA Flood Insurance Rate Maps, the property is not located within any flood hazard area. See Figure 2 – FEMA FIRM Map.

2.2.2 Natural Heritage and Endangered Species Program

R. Levesque Associates, Inc. performed due diligence research on the property regarding Natural Heritage and Endangered Species Program (NHESP) areas. The parcel is not located within an area delineated by NHESP as priority habitat of endangered species; see Figure 3 – NHESP Map.

2.3 Soils

R. Levesque Associates, Inc. researched the soils located on site with information readily available by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Based on a review of the USDA Soil Survey of Hampden County, Massachusetts, Central Part, the site is comprised of the following soil types:

Table 2.4: Hydrologic Soil Group Classification

Soil Description	Map Unit Symbol	Hydrologic Soil Group
Raynham silt loam	30A	C/D
Wareham loamy sand	32A	A/D
Merrimac fine sandy loam	254A/254B	A
Windsor loamy sand	255B	A
Amostown fine sandy loam	258B	C/D
Enfield silt loam	264B	B
Agawam fine sandy loam	275B	B
Ninigret fine sandy loam	276B	C
Meckesville loam	327B/327C	D
Wethersfield fine sandy loam	397B	C
Enosburg loamy sand	731A	C/D
Scantic variant silt loam	736A	C/D

A series of test pits were conducted by Terry Reynolds (S.E. 3090) and Gary Weiner (S.E. 2567) to evaluate the ability of the site to support stormwater drainage system components. A total of twelve test holes were dug in the vicinity of the proposed surface infiltration basins and dry detention basin. The following test holes were performed near the BMP indicated:

- Surface Infiltration Basin #1 TP-32
- Surface Infiltration Basin #2 RG2-TP, RG-4, TP-14, TP-15, TP-16
- Surface Infiltration Basin #3 BRB-1, BRB-TP, TP-7
- Dry Detention Basin TP-1, TP-2, TP-3

See Appendix B - Soils Information for supplemental information. Overall, on-site soil investigations corroborated USDA-NRCS mapping.

2.4 Post Development Conditions

The applicant is proposing to construct an 81-unit condominium community on the easterly side of South Westfield Street. Sixty-six of the units will be accessed by roughly 3,930 feet of new roadway while the remaining 14 will be accessed directly from South Westfield Street. The project will also include the installation of underground sanitary sewer, water, gas, and communication lines. In addition, a stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook. The proposed stormwater management system consists of deep-sump hooded catch basins, underground piping, a bioretention area with vegetated filter strip, a dry detention basin, and multiple surface infiltration basins with a sediment forebay. A proprietary sedimentation device will be added to improve the water quality of runoff from South Westfield Street that currently discharges to the project site untreated.

The stormwater management system has been designed to reduce the peak discharge rates from the 2, 10, and 100-year storm event. The bioretention area and surface infiltration basins have been designed to provide the required water quality treatment as well as infiltrate the required recharge volume for the impervious area proposed. Overall, the proposed site improvements will maintain the general drainage patterns of the site while improving water quality and reducing flow rates. Figure-5 – Post-Development Watershed Plan delineates the sub-catchment areas. This system has been designed to meet or exceed the standards required by the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

3. STORMWATER MANAGEMENT SYSTEM

R. Levesque Associates, Inc. has prepared the following drainage system calculations for the proposed project site. These calculations were performed to document compliance with the guidelines set forth by the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook (MassDEP Handbook). A detailed hydrologic analysis of the system was completed in order to evaluate the performance of the stormwater management system components. The proposed stormwater management system will collect runoff from on-site impervious areas and utilize stormwater best management practices to provide water quality treatment, groundwater recharge, and peak discharge rate attenuation. See Appendix C - Pre- and Post-Development Hydrologic Analysis for supplemental information.

3.1 Drainage Calculations

R. Levesque Associates, Inc. utilized the HydroCAD software program, Version 10.0, developed by HydroCAD Software Solutions LLC, in order to model and analyze the site hydrology. The HydroCAD software is based upon the Soil Conservation Service (SCS) "Technical Release 20 – Urban Hydrology for Small Watersheds" and "Technical Release 55 – Urban Hydrology for small Watersheds" which are generally accepted industry standard methodologies. The analysis was conducted in order to establish the peak discharge rates and estimated run-off volume from the project site. This was accomplished to properly evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters. Pre-development time of concentration (Tc) values were calculated based on existing site conditions. The minimum recommended time of concentration of six minutes was used in Post-Development calculations.

Drainage calculations were performed for pre and post-development conditions for the 24-hour, 2, 10, and 100-year Type III storm events. The total rainfall for each of the storm events was based upon data provided by the United States Department of Commerce Technical Paper No. 40 – Rainfall Frequency Atlas of the United States. Total rainfall values used in the hydrologic modeling for each event are shown in the following table:

Table 3.1: Design Rainfall Data		
2-year, 24-hour storm	10-year, 24-hour storm	100-year, 24-hour storm
3.00 inches	4.60 inches	6.50 inches

3.1.1 Design Points

In order to compare the difference between pre and post-development peak flows, existing and proposed watersheds were delineated. Multiple design points (DP) were established with flow paths representing the longest time of concentration of run-off in each tributary watershed. For this analysis, the design points were determined as follows:

- DP-1: Onsite Wetland – This design point represents the destination for stormwater runoff from the project area which flows to the centrally located wetland;
- DP-2: Offsite to Southeast – This design point represents the destination for stormwater runoff from the project area which flows in a southeasterly direction towards an on-site bordering vegetated wetland;
- DP-3: Offsite to Northeast – This design point represents the destination for stormwater runoff from the project area which flows in a northerly direction towards the perennial stream known as a tributary to Philo Brook.

3.1.2 Pre-Development Hydrology

The project area under existing conditions was analyzed as five sub-catchment areas discharging to the three design points as described above. The sub-catchments were delineated based on existing site topography. For further watershed detail please see Figure 4 titled "Pre-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.3 Post-Development Hydrology

The project area under proposed conditions was broken down into sixteen sub-catchments discharging to the same three design points as in pre-development conditions. For further watershed detail please see Figure 5 titled "Post-Development Watershed Plan". Peak discharge rates for the design point are depicted in Table 3.1.4 below.

3.1.4 Peak Discharge Rates

The table below summarizes the Pre and Post-Development peak discharge rates for each Design Point:

Table 3.1.4 Pre- and Post-Development Peak Discharge Rates						
	2-year storm (cfs)		10-year storm (cfs)		100-year storm (cfs)	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Design Point 1	4.8	3.3	14.1	9.8	27.7	19.3
Design Point 2	4.6	2.8	10.6	6.1	18.3	11.9
Design Point 3	10.7	7.8	21.7	18.4	35.6	34.0

As depicted in the table, the post-development peak discharge rates do not increase over pre-development peak discharge rates for each of the storm events presented. This is accomplished by provided on site attenuation through the proposed dry detention basin, bioretention area and multiple surface infiltration basins.

3.2 Hydraulic Analysis

R. Levesque Associates, Inc. utilized the Hydraflow Storm Sewer Extension for AutoCAD Civil 3D 2020 software program developed by Autodesk, Inc., in order to analyze the hydraulic capacity of the proposed underground infrastructure. The analysis was conducted in order to verify that the proposed conveyance piping has sufficient capacity to convey up to and including the 24-hour, 100-year storm event. The data from the analysis was used to properly size the conveyance piping such that there is no surcharge of stormwater above the rim elevations within the paved areas. As part of the input parameter required for the hydraulic analysis, the tributary inlet areas were delineated based on topography and any additional connected discharges. Additionally, the characteristic land use coverages and flow paths were identified. Please refer to Appendix D for the hydraulic analysis of the proposed stormwater management system.

3.3 MassDEP Stormwater Management Standards

R. Levesque Associates, Inc. has designed the proposed stormwater management system to be in compliance with the MassDEP Stormwater Management Standards. Chapter 1, Volume 3 of the MassDEP Handbook outlines specific calculations, and other information, that must be submitted

with each report to document compliance. The following summary highlights elements of the proposed project and how they apply to each standard.

- *Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

  The proposed project provides water quality treatment to the guidelines of the MassDEP Handbook. Therefore, no new untreated stormwater is discharged.

- *Standard #2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

  The proposed stormwater management system has been designed such that the post-development peak discharge rates are less than the pre-development discharge rates for the 2-year, 10-year, and 100-year 24-hour storms. See Appendix C for the Hydrologic Analysis.

- *Standard #3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook.*

  The proposed stormwater management system has been designed with the capacity to infiltrate the required recharge volume. See Appendix E for the Required Recharge Volume Calculations.

- *Standard #4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. It is presumed that this standard is met when:*

  a. Suitable practices for source control and pollution prevention are identified in a long term pollution prevention plan, and thereafter are implemented and maintained;

  b. Structural stormwater BMPs practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

  c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook

  The drainage design utilizes multiple systems to manage the stormwater runoff and provide the necessary water quality treatment. The treatment train for the first system tributary to

Design Point-1 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. The system tributary to Design Point-2 includes deep-sump hooded catch basins and a surface infiltration basin with sediment forebay. There are two separatee systems tributary to Design Point-3. One includes deep-sump hooded catch basins and surface infiltration basin with sediment forebay. The other includes a bioretention area with vegetated filter strip and a dry detention basin with sediment forebay. A proprietary sedimentation device will be added to the South Westfield Street drainage infrastructure prior to discharge to the project site in order to meet water quality standards. See Appendix E for the Water Quality Volume Calculations.

- *Standard #5 - For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by MassDEP to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

  This standard is not applicable.

- *Standard #6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater BMPs determined by MassDEP to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

  This standard is not applicable.

- *Standard #7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural BMPs requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

  This standard is not applicable.

- *Standard #8 – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention) shall be developed and implemented.*

  A Construction Period Erosion Control Plan has been provided in Appendix F.

- *Standard #9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

  A Long-term Operation & Maintenance Plan has been provided in Appendix G.

- *Standard #10 - All illicit discharges to the stormwater management system are prohibited.*

  An illicit discharge statement will be provided prior to discharge of stormwater to post-construction BMPs. See Appendix H for a copy of the Illicit Discharge Statement.

3.4 Stormwater Best Management Practices

The proposed stormwater management system was designed utilizing stormwater best management practices (BMP) as set forth by the MassDEP Handbook. The BMPs utilized as part of the stormwater management system include deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, a bioretention area, a dry detention basin and surface infiltration basins. All of the BMPs were designed to meet the requirements of the MassDEP Handbook and will provide water quality treatment, groundwater recharge, and peak rate attenuation in order to mitigate the impacts of the proposed site improvements. See Appendix E – MassDEP Calculations for the calculations required to document compliance. The following section provides a description of the best management practices (BMPs) being utilized on site.

3.4.1 Deep Sump Catch Basins

Deep-sump catch basins equipped with an oil/gas hoods are being utilized as structural pretreatment devices within the proposed stormwater management system. The catch basins will be constructed with a 4'-0" deep sumps to act as settling chambers and allow for adequate

storage of collected sediments. Catch basins are typically first in the line of water quality treatment.

3.4.2 Leaching Drywell

Leaching drywells are being utilized to provide groundwater recharge within the surface infiltration basin, particularly during frozen ground conditions. A leaching drywell is a pre-cast concrete barrel with an open bottom surrounded by free-draining crushed stone that permits runoff to infiltrate into the ground. Frequent maintenance of the leaching drywells is crucial to the long-term effectiveness of the stormwater management plan.

3.4.3 Proprietary Sedimentation Devices

Proprietary sedimentation devices are being utilized on site for the pretreatment of stormwater runoff, in addition to the catch basins, prior to discharging off-site. Treatment of the stormwater runoff is essential to improve water quality. Maintenance of the proprietary device is crucial to the long-term effectiveness of the stormwater management system. The stormwater management system is utilizing proprietary treatment devices in order to ensure that the amount of sediment reaching the basin is minimal.

3.4.4 Bioretention Areas

Bio-retention areas are a best management practice which is being utilized on site as part of the stormwater management system treatment train process to enhance water runoff quality, provide groundwater recharge and attenuate peak-discharge rates. Bio-retention areas utilize soils, plants, and microbes to treat stormwater before discharge to downstream drainage infrastructure or infiltration to provide groundwater recharge. The proposed bio-retention areas associated with this project will provide aesthetically pleasing vegetation within the site. Additionally, the bio-retention areas will provide stormwater pre-treatment and groundwater recharge prior to discharge, if necessary.

3.4.5 Dry Detention Basin with Sediment Forebay

Dry Detention basins accompanied by sediment forebays are typically utilized for the short-term detention of stormwater runoff from watershed areas such as those associated with this project that allows for a controlled release of runoff to meet pre-development flow rates. The proposed dry detention basin has been designed to store the volume required to meet the peak rate attenuation requirements of standard 2. The tributary watershed consists of the proposed roadway, walks, driveways, single-family homes and surrounding vegetated areas.

3.4.6 Surface Infiltration Basin with Sediment Forebay

Infiltration basins accompanied by sediment forebays are well suited to meet the water quality and water quantity requirements from watershed areas such as those associated with this project. The infiltration basin with associated sediment forebay mitigates the impact of the proposed site improvements by attenuating the peak discharge rates and retaining the stormwater volume over a period of time. The proposed infiltration basins have been designed to mimic the existing drainage patterns of the site. An outlet control structure will be installed within the basin such that discharge is equal to pre-development conditions upon completion of the proposed site improvements.

3.5 Protection of Stormwater Best Management Practices during Construction

Protection of the stormwater best management practices during construction will ensure the proper functioning of the stormwater management system and provide protection to the undisturbed areas until the site has been stabilized. Certain specific erosion and sedimentation controls and good practices to be performed by the site contractor have been documented in a Construction Period Erosion Control Plan. See Appendix F – Construction Period Erosion Control Plan.

3.6 Inspection and Maintenance of Stormwater Best Management Practices

Frequent maintenance of the stormwater best management practices is essential to ensuring that the stormwater management system will function properly long-term. The MassDEP provides guidelines for the regular inspection and maintenance of the proposed stormwater best management practices. A Long-Term Stormwater Operation and Maintenance Plan has been prepared which dictates the inspection frequency and maintenance operations for each BMP. See Appendix G – Long-Term Operation and Maintenance Plan.

3.7 Illicit Discharge Compliance Statement

RLA has prepared an Illicit Discharge Compliance Statement to document compliance with the Massachusetts Department of Environmental Protection Stormwater Management Handbook, see Appendix H.

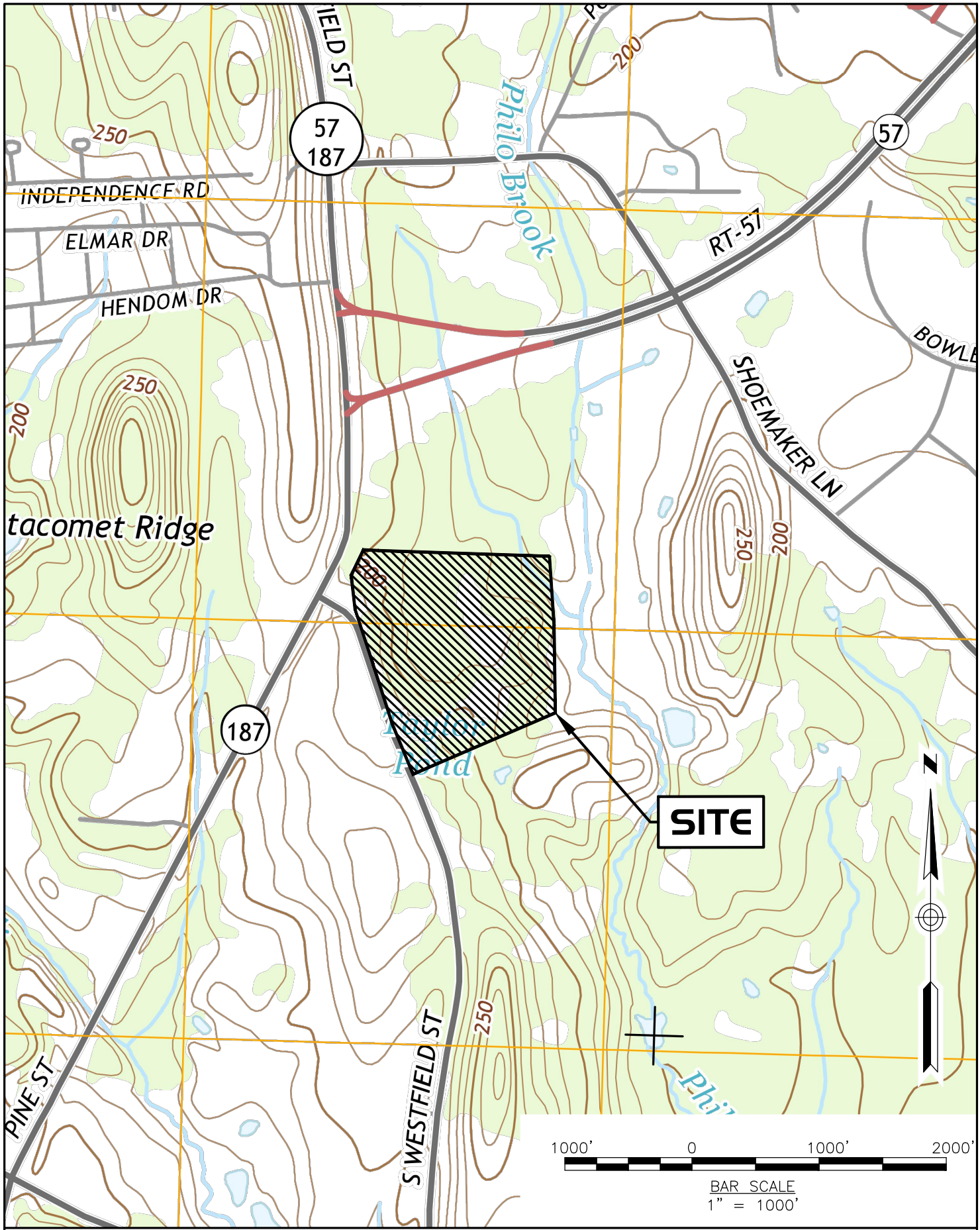
3.8 Low-Impact Development Alternatives Analysis Narrative

RLA has prepared a Low-Impact Development Alternatives Analysis Narrative as part of the Stormwater Drainage Report, see Appendix I.

4. CONCLUSION

The proposed stormwater management system has been designed to mitigate the impacts of the proposed site improvements by providing a control for runoff water quality and water quantity. The proposed site improvements, including the stormwater management system, will utilize best management practices approved by the MassDEP Stormwater Handbook. The best management practices have been incorporated to provide water quality treatment and groundwater recharge. Implementation of stormwater best management practices including such deep-sump hooded catch basins, leaching drywells, proprietary sedimentation devices, bioretention areas, dry detention basins with sediment forebay, and surface infiltration basins with a sediment forebay to allow for a stormwater drainage design that is in conformance with the criteria set forth in the Agawam Stormwater Management Ordinance as well as the Massachusetts Department of Environmental Protection Stormwater Management Handbook.

Figure 1: Site Locus – USGS Map



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SITE LOCUS
USGS MAP

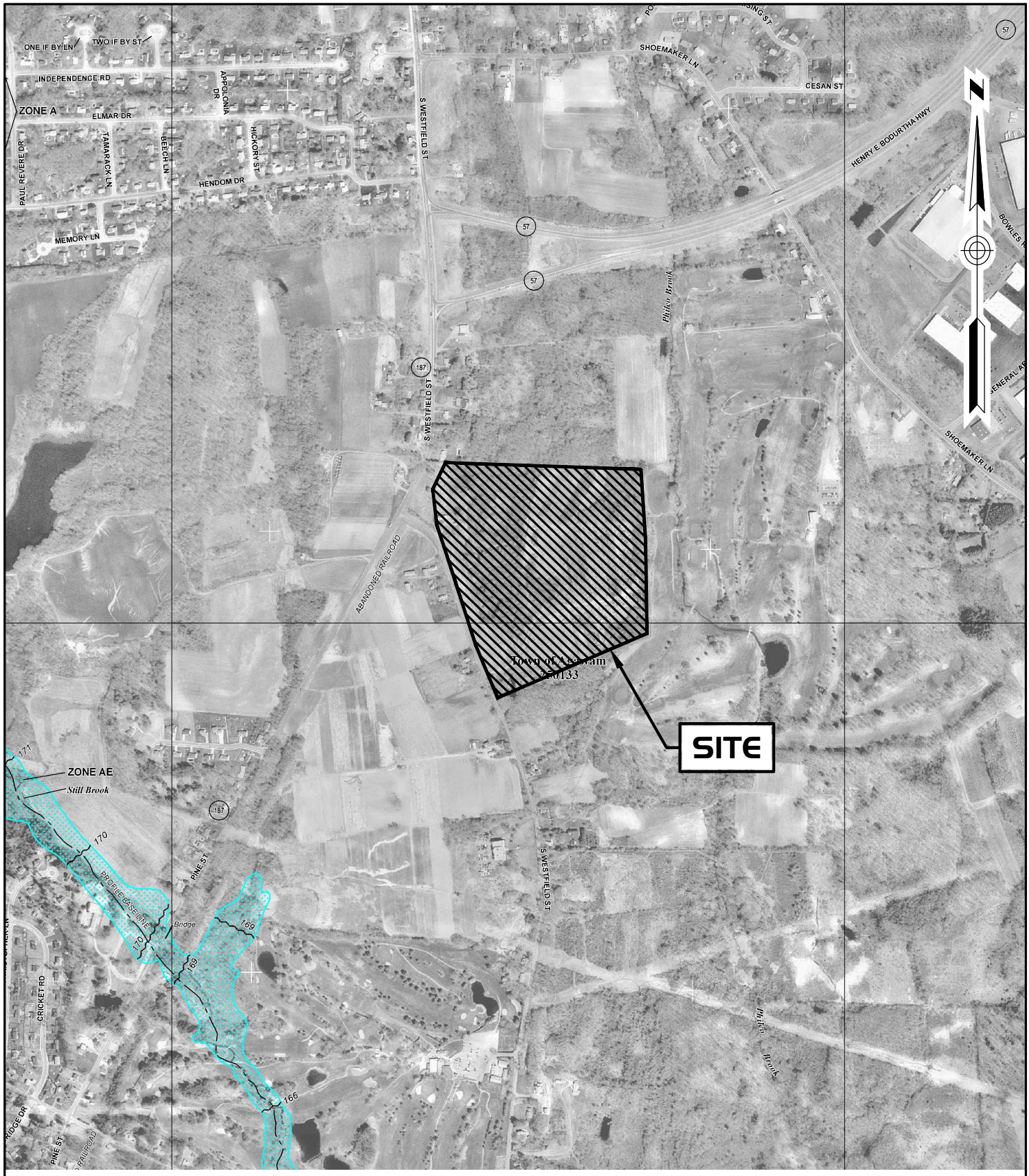
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO: 090506
DATE: 2/10/22
SCALE: As noted

FIG-1

Figure 2: FEMA Flood Map



R LEVESQUE ASSOCIATES, INC A Land Planning Services Company 40 School Street · P.O. Box 640 · Westfield, MA 01086 ph: 413.568.0985 fax: 413.568.0986 rlaland.com	FLOOD RATE INSURANCE MAP	Ralph Depalma & Giuseppe Tirone 36 Canterbury Lane Feeding Hills, MA 01030 Proposed Condominium Community 497 South Westfield Street Agawam, MA 01030	JOB NO: 090506 DATE: 2/10/22 SCALE: As noted FIG-2

Figure 3: NHESP Map



NOTE: THERE ARE NO NHESP POLYGONS WITHIN MAP AREA

1000' 0 1000' 2000'

BAR SCALE
1" = 1000'

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NHESP Area Map

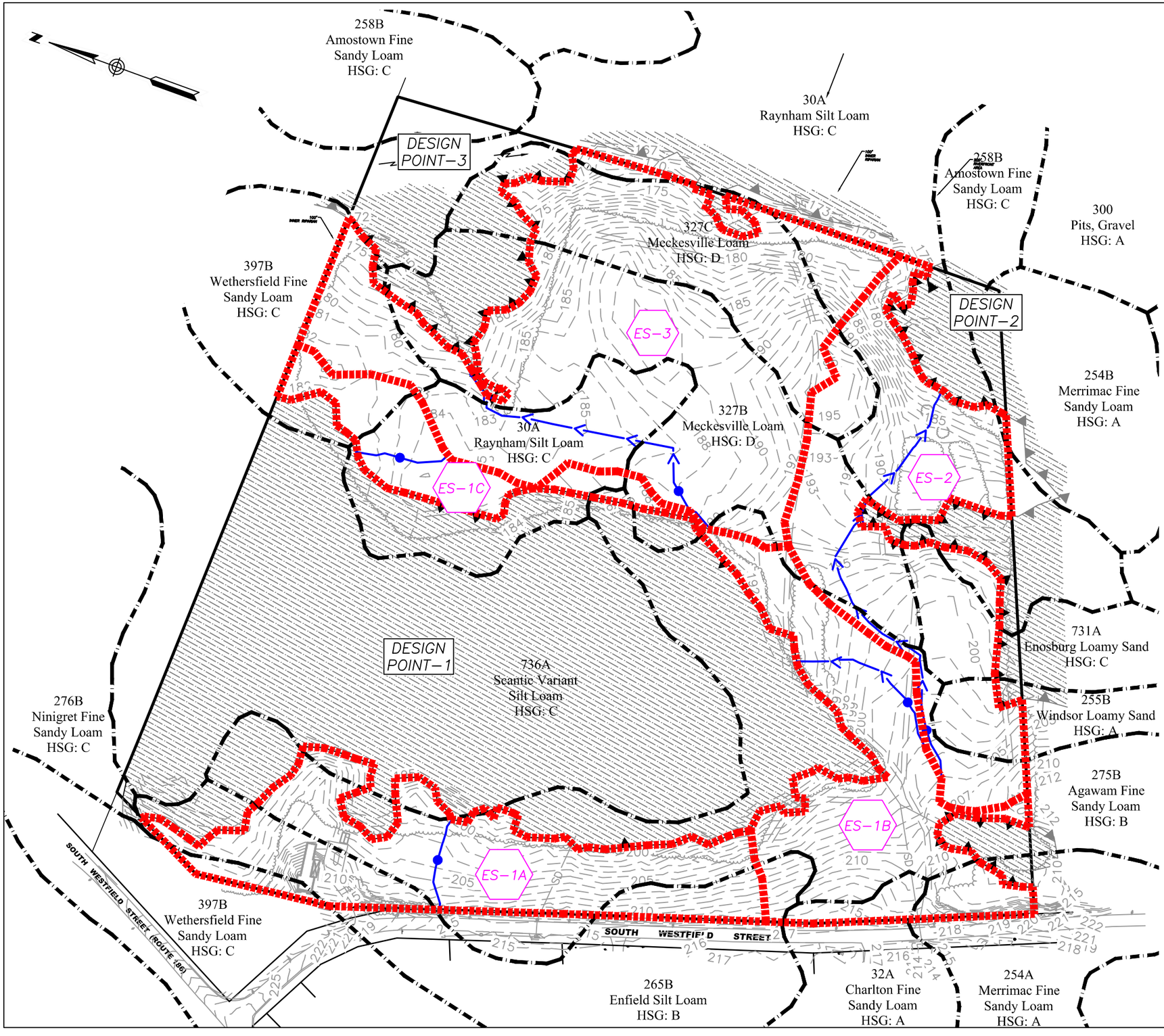
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Proposed Condominium Community
497 South Westfield Street
Agawam, MA 01030

JOB NO: 090506
DATE: 2/10/22
SCALE: As noted

FIG-3

Figure 4: Pre-Development Watershed Plan



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Pre-Development Watershed Plan

Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

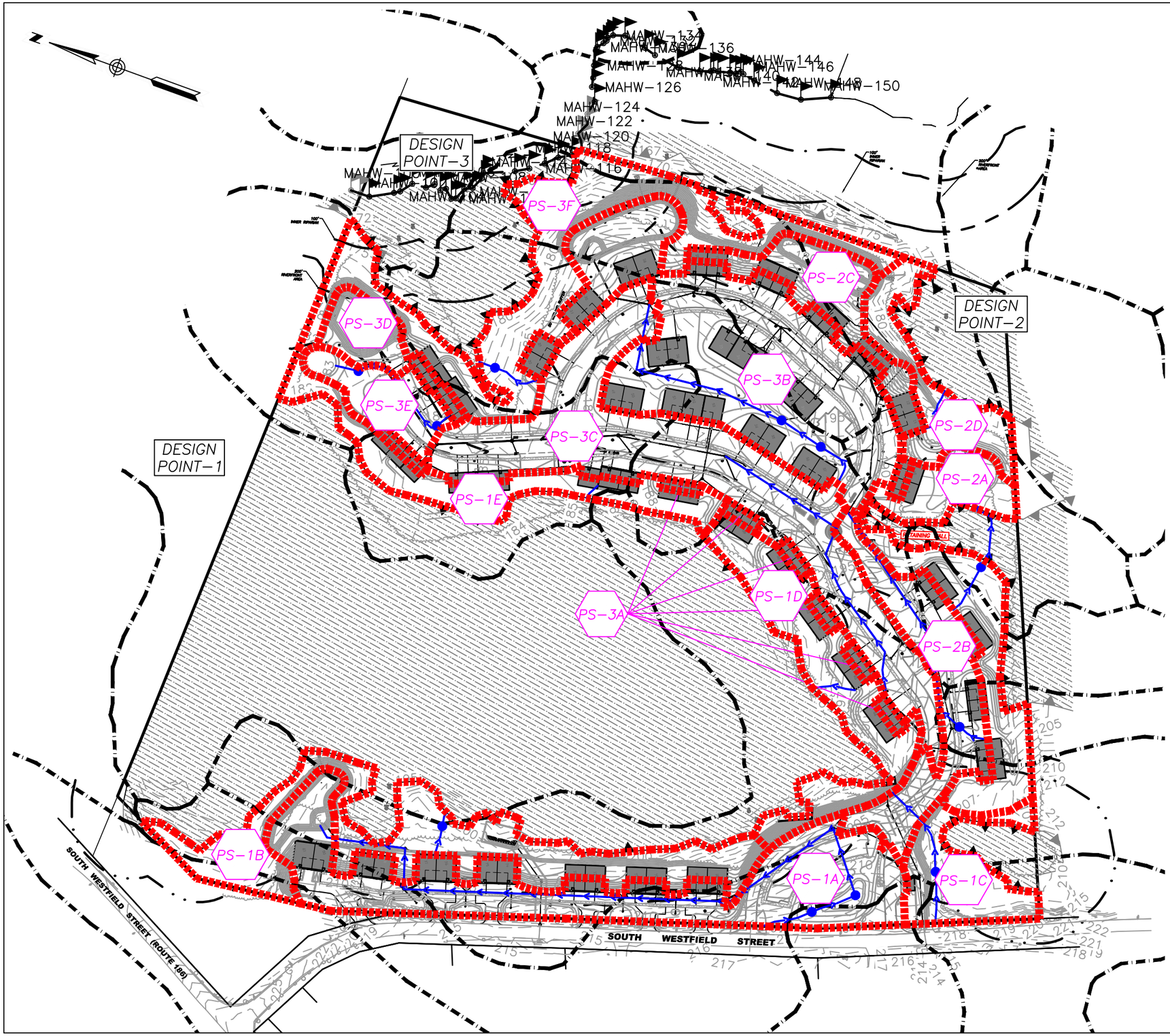
JOB NO.: 090506

DATE: 9/19/22

SCALE: As Noted

FIG-4

Figure 5: Post-Development Watershed Plan



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Post-Development Watershed Plan

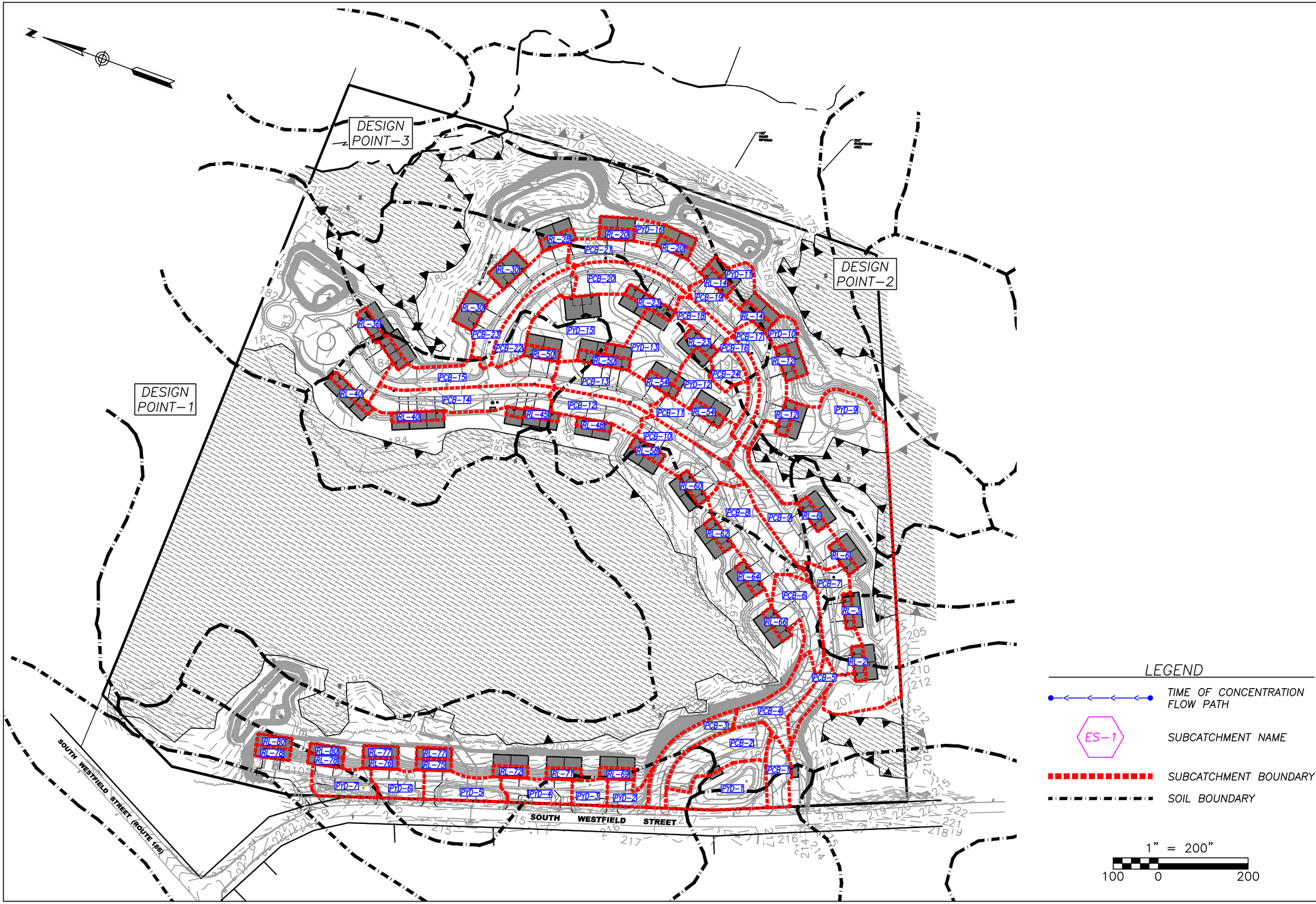
Proposed Residential Development
497 South Westfield Street
Agawam, Massachusetts

Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506
DATE: 9/16/22
SCALE: As Noted

FIG-5

Figure 6: Inlet Area Plan



LEGEND

- TIME OF CONCENTRATION FLOW PATH
- ES–1 SUBCATCHMENT NAME
- SUBCATCHMENT BOUNDARY
- SOIL BOUNDARY

1" = 200"

100 0 200

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Inlet Area Plan

Proposed Residential Development
497 South Westfield Street
Agawam, Massachusetts

Joe T & Ralph D
36 Canterbury Lane
Feeding Hills, MA 01030

JOB NO.: 090506

DATE: 9/19/22

SCALE: As Noted

FIG-6

Appendix A: Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

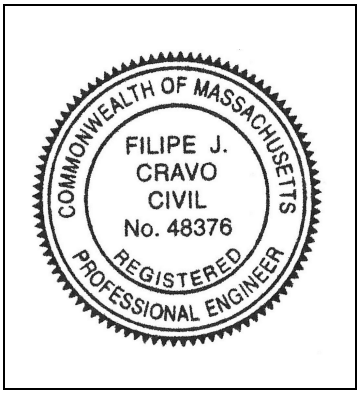
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



9/19/22

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☐ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B: Soils Information

- NRCS Custom Soil Resource Report

- Test pit information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part

South Westfield Street



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

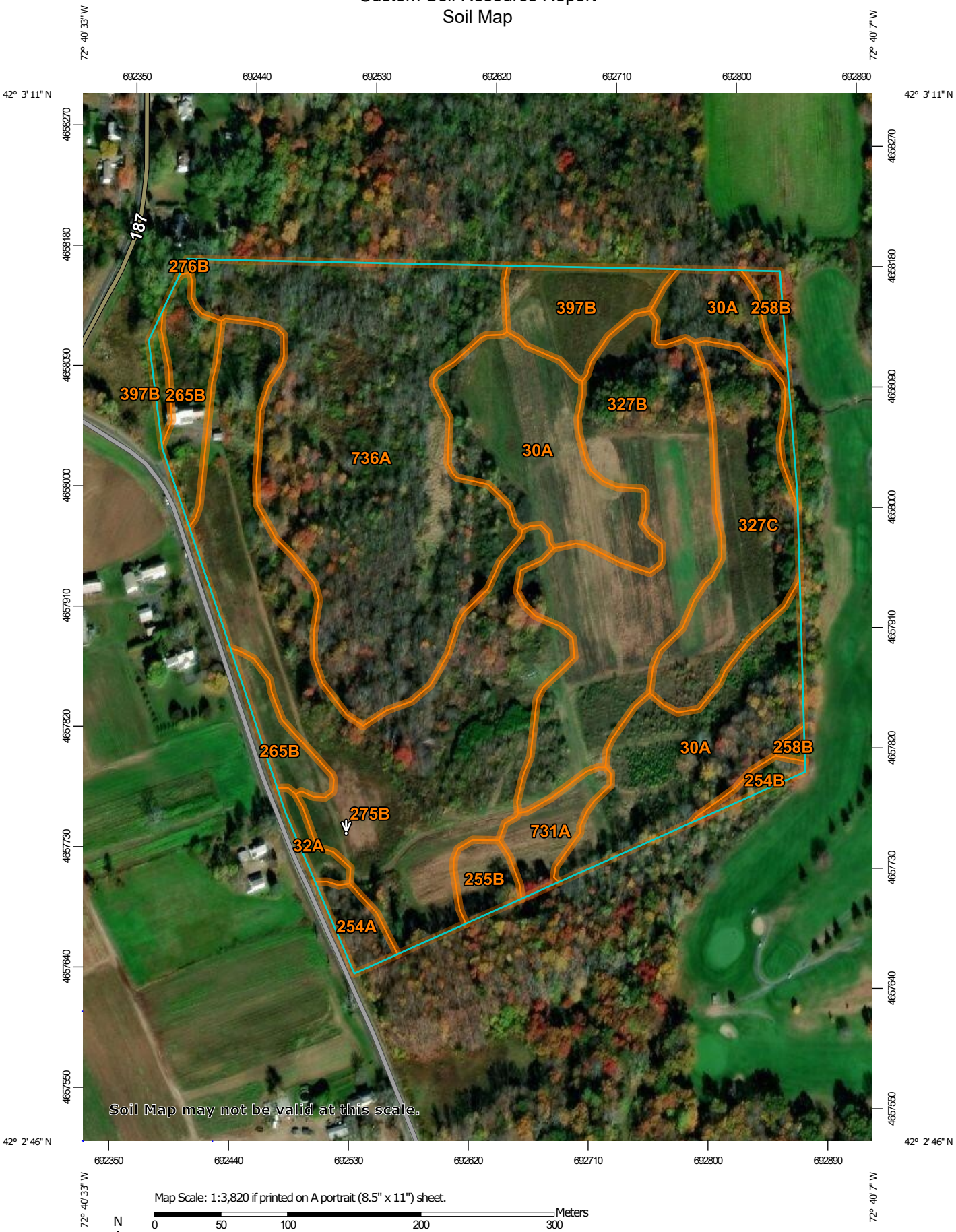
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 14, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Raynham silt loam, 0 to 3 percent slopes	8.9	17.9%
32A	Wareham loamy sand, 0 to 3 percent slopes	0.3	0.6%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.5	1.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.3	0.5%
255B	Windsor loamy sand, 3 to 8 percent slopes	0.6	1.2%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.4	0.7%
265B	Enfield silt loam, 3 to 8 percent slopes	2.0	4.0%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	11.0	22.1%
276B	Ninigret fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
327B	Meckesville loam, 3 to 8 percent slopes	7.0	14.1%
327C	Meckesville loam, 8 to 15 percent slopes	3.8	7.6%
397B	Wethersfield fine sandy loam, 3 to 8 percent slopes	1.9	3.7%
731A	Enosburg loamy sand, 0 to 3 percent slopes	0.9	1.8%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	12.3	24.6%
Totals for Area of Interest		**49.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hampden County, Massachusetts, Central Part

30A—Raynham silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99r3
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Raynham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raynham

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 24 inches: silt loam
H3 - 24 to 60 inches: stratified very fine sand to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 31 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Belgrade

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scantic variant
Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

32A—Wareham loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 99rs
Elevation: 0 to 3,280 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Wareham and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wareham

Setting
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits

Typical profile
H1 - 0 to 13 inches: loamy sand
H2 - 13 to 60 inches: sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Deerfield

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, moraines, outwash plains, outwash terraces, stream terraces, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash terraces, outwash plains, kames, eskers, moraines
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Deltas, dunes, outwash terraces, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Eskers, stream terraces, moraines, outwash terraces, outwash plains, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, eskers, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

258B—Amostown fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 99ms
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Amostown and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amostown

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over hard silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 32 inches: fine sandy loam
H3 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Minor Components

Pollux

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Enosburg

Percent of map unit: 10 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

265B—Enfield silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99nx
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-silty eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 25 inches: silt loam
H3 - 25 to 60 inches: stratified sand to very gravelly fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Ninigret

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

275B—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqx
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Agawam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Outwash terraces, kame terraces, kames, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam

2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Kames, deltas, outwash plains, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent

Landform: Outwash terraces, deltas, outwash plains, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

276B—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyr6
Elevation: 0 to 1,250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Depressions, drainageways, outwash terraces, kames, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, dip, rise
Down-slope shape: Concave, linear, convex
Across-slope shape: Concave, convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 17 to 39 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY026CT - Moist Silty Outwash
Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent
Landform: Kame terraces, kames, outwash terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, outwash terraces, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

327B—Meckesville loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99pr
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

327C—Meckesville loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99ps
Elevation: 600 to 2,800 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Meckesville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable fine-loamy eolian deposits over dense silty lodgment till derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 19 inches: gravelly silt loam
H3 - 19 to 60 inches: gravelly silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 30 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wethersfield

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

397B—Wethersfield fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99rt
Elevation: 130 to 460 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wethersfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy basal till derived from sandstone and shale

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 26 inches: gravelly fine sandy loam
H3 - 26 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 32 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Ludlow

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wilbraham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

731A—Enosburg loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99nz
Elevation: 50 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Enosburg and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enosburg

Setting

Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy glaciofluvial deposits over soft loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 26 inches: sand
H3 - 26 to 60 inches: silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 16 to 34 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Eldridge

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Terraces, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

736A—Scantic Variant silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99rb
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scantic variant and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic Variant

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Soft silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Raynham

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Buxton variant

Percent of map unit: 10 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-32**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-7	A	10YR3/2				SL			GR	FR	
7-22	B	7.5YR3/4				LS			SBK	FR	
22-38	C1	7.5YR5/3				S			SG	FR	
38-102	C2	7.5YR5/2				S			SG	FR	

Additional Notes Weeping @ 88"

8|28|13
1:30 P.m.

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD ST.
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RG2 - TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	A_P	10YR 3/6				LS			FRIABLE		
12"-26"	B	10YR 4/6		NONE		SL					
26"-95"	C_1	2.5YR 3/4		OBSERV.		SL		NONE		DRY	
95"-140"	C_2	7.5YR 4/3				SL	<15%	FEW STONES	MASSIVE FIRM	MOIST @ BOTTOM	

Additional Notes:

NO SEEPS

STANDING WATER @ 138" - STATIC

IN CORN FIELD - EL. 179 ±

5|3|13
SUNNY, WARM

Commonwealth of Massachusetts
City/Town of AGAWAM

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RAIN GARDEN #4 - (FORMERLY BASIN #1)

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-7"	A_P	10YR 3/4				SL					
7"-23"	B	10YR 4/6		NONE		LS					
23"-110"	C	7.5YR 4/3		OBSERV.		SL		NONE	COMPACT	DRY	

Additional Notes:

NO SEEPS ; NO STANDING WATER

HOLE LEFT OPEN 1.5 HOURS

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-14**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	20	10YR5/8	C	SL			SBK	FR	
21-65	C1	2.5YR5/2				SL			M	F	
65-93	C2	2.5YR5/3				LS	10		M	FR	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-15**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-27	B	7.5YR3/4	22	10YR5/8	C	SL			SBK	FR	
27-96	C1	2.5YR5/3				SL			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-16**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-21	B	7.5YR3/4				SL			SBK	FR	
21-76	C1	2.5YR5/3				S	10		SG	L	
76-108	C2	2.5YR5/3				LS			M	FR	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of AGAWAM
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	PLOWED	10YR 4/4				SL					
12"-17"	B	10YR 4/6		NONE		SL					
17"-108"	C	5YR 4/4		OBSERV		LS		NONE		DRY	

Additional Notes:

NO SEEP; NO STANDING WATER

8/20/15
2:30 P.M

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD STREET
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: BRB -TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-14"	A_P	10YR 4/4				LS			FRIABLE		
14"-32"	B	10YR 4/6		NONE		SL					
32"-174"	C	5YR 4/4		OBSERV.		SL	<15%	FEW @ 14'	MASSIVE FIRM	DRY	

Additional Notes:

NO SEEPS

NO STANDING WATER

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-7**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-9	Ap	10YR3/2				L			GR	FR	
9-16	B	7.5YR3/4				SL			SBK	FR	
16-38	C1	2.5YR5/3	24	10YR5/8	C	SL			M	FR	
38-83	C2	2.5YR5/3				SILT			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-1**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-10	Ap	10YR3/2				L			GR	FR	
10-34	B	7.5YR3/4	10	10YR5/8	C	SL			SBK	FR	
34-96	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 34"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-2**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	17	10YR5/8	C	SL			SBK	FR	
21-100	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 21"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

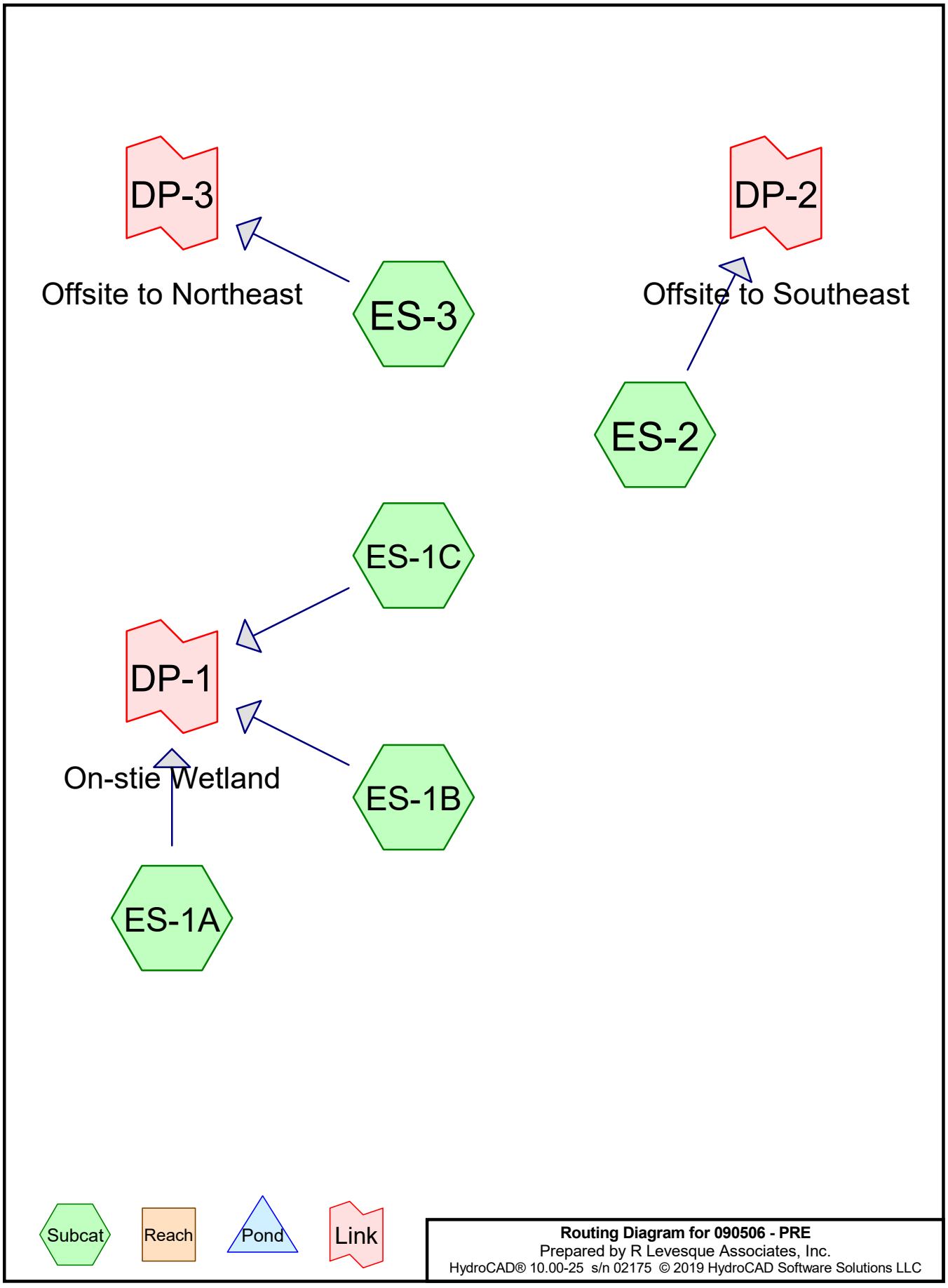
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-3**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4				SL			SBK	FR	
21-36	C	7.5YR3/4	22	10YR5/8	C	SL	5		M	FR	
36-55	C2	7.5YR3/4				FSL			M	FR	
55-102	C3	7.5YR3/4				SL	5		M	F	

Additional Notes Weeping @ 40"

Appendix C: Pre- and Post- Development Hydrologic Analysis (2, 10, & 100 Year Storm Events)


DP-3
Offsite to Northeast
ES-3
DP-2
Offsite to Southeast
ES-2
ES-1C
DP-1
On-stie Wetland
ES-1B
ES-1A
Subcat
Reach
Pond
Link
Routing Diagram for 090506 - PRE
Prepared by R Levesque Associates, Inc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=197,743 sf 2.89% Impervious Runoff Depth=0.57"
Flow Length=185' Tc=11.3 min CN=65/98 Runoff=1.9 cfs 9,415 cf

Subcatchment ES-1B: Runoff Area=190,955 sf 0.00% Impervious Runoff Depth=0.51"
Flow Length=386' Tc=12.8 min CN=65/0 Runoff=1.5 cfs 8,053 cf

Subcatchment ES-1C: Runoff Area=68,407 sf 0.00% Impervious Runoff Depth=1.19"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=1.5 cfs 6,775 cf

Subcatchment ES-2: Runoff Area=253,126 sf 0.00% Impervious Runoff Depth=1.02"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=4.6 cfs 21,411 cf

Subcatchment ES-3: Runoff Area=457,051 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=10.7 cfs 50,028 cf

Link DP-1: On-stie Wetland Inflow=4.8 cfs 24,243 cf
Primary=4.8 cfs 24,243 cf

Link DP-2: Offsite to Southeast Inflow=4.6 cfs 21,411 cf
Primary=4.6 cfs 21,411 cf

Link DP-3: Offsite to Northeast Inflow=10.7 cfs 50,028 cf
Primary=10.7 cfs 50,028 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 95,682 cf Average Runoff Depth = 0.98"
99.51% Pervious = 1,161,574 sf 0.49% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

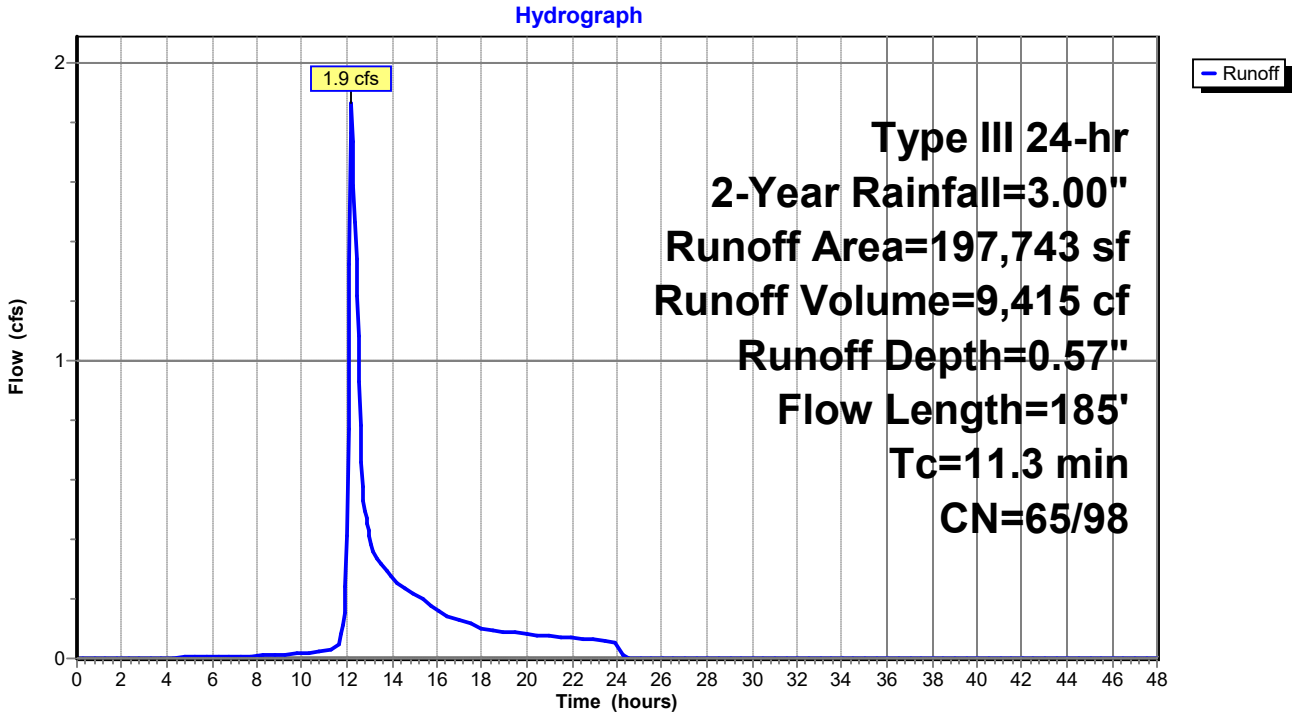
Runoff = 1.9 cfs @ 12.20 hrs, Volume= 9,415 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
17,788	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
50,453	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
197,743	66	Weighted Average
192,034	65	97.11% Pervious Area
5,708	98	2.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

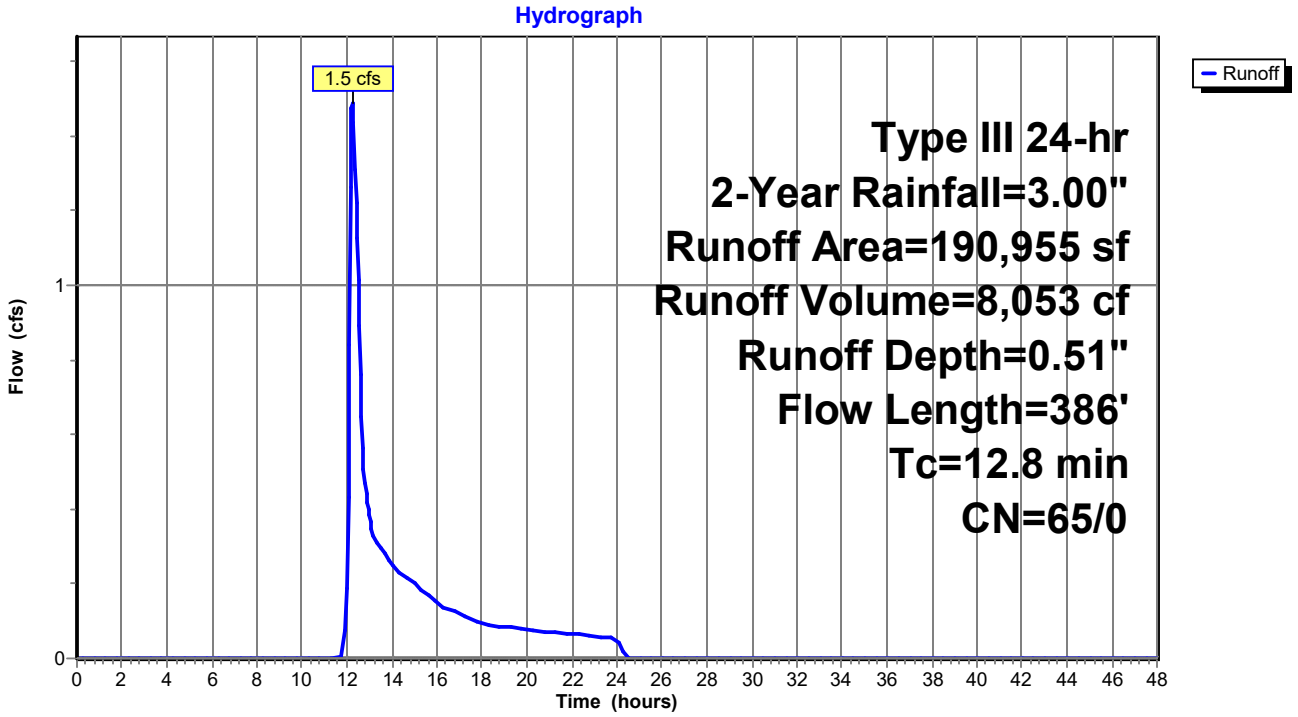
Runoff = 1.5 cfs @ 12.23 hrs, Volume= 8,053 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
104	39	>75% Grass cover, Good, HSG A
406	61	>75% Grass cover, Good, HSG B
1,684	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
190,955	65	Weighted Average
190,955	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

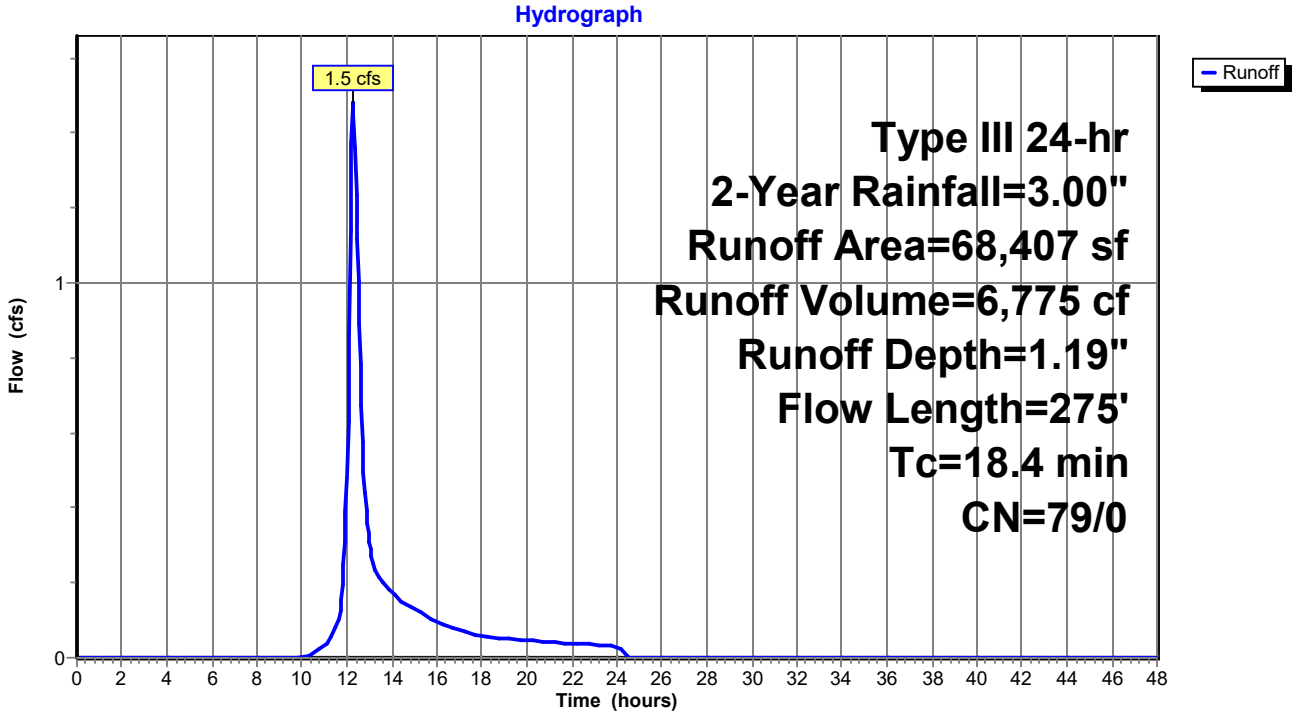
Runoff = 1.5 cfs @ 12.27 hrs, Volume= 6,775 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,407	79	Weighted Average
68,407	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

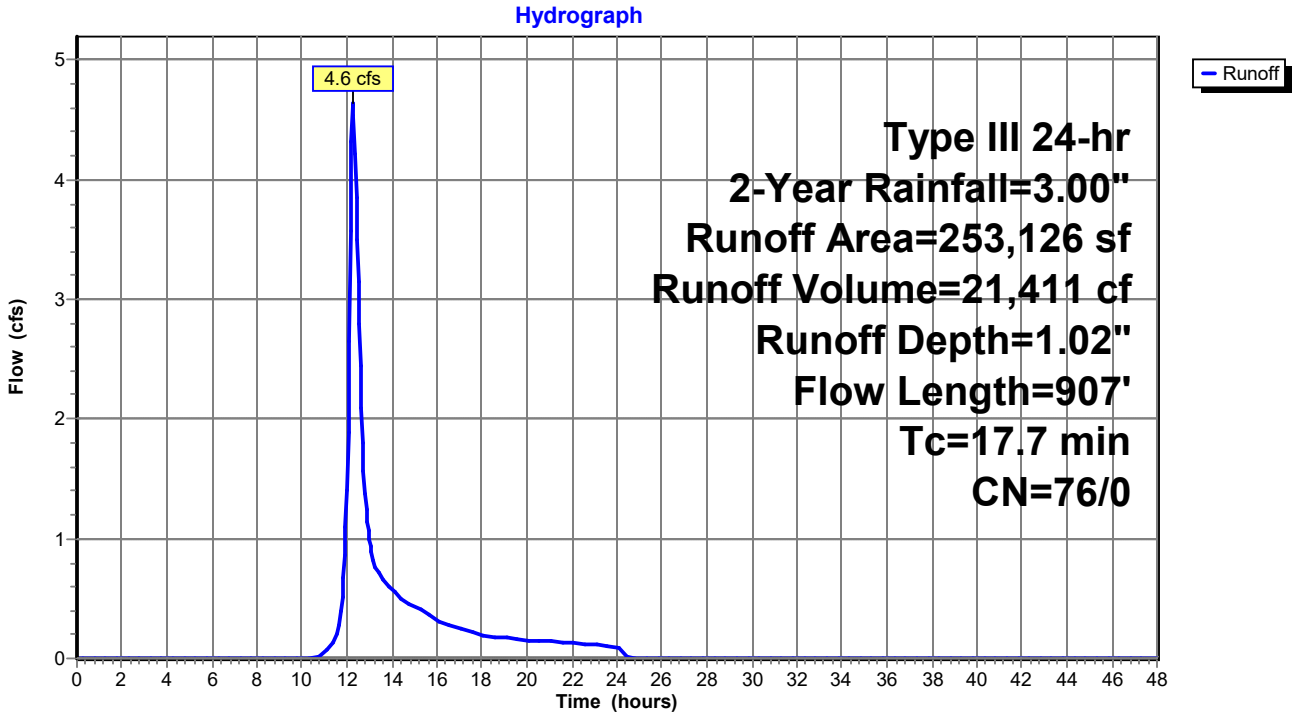
Runoff = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,126	76	Weighted Average
253,126	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

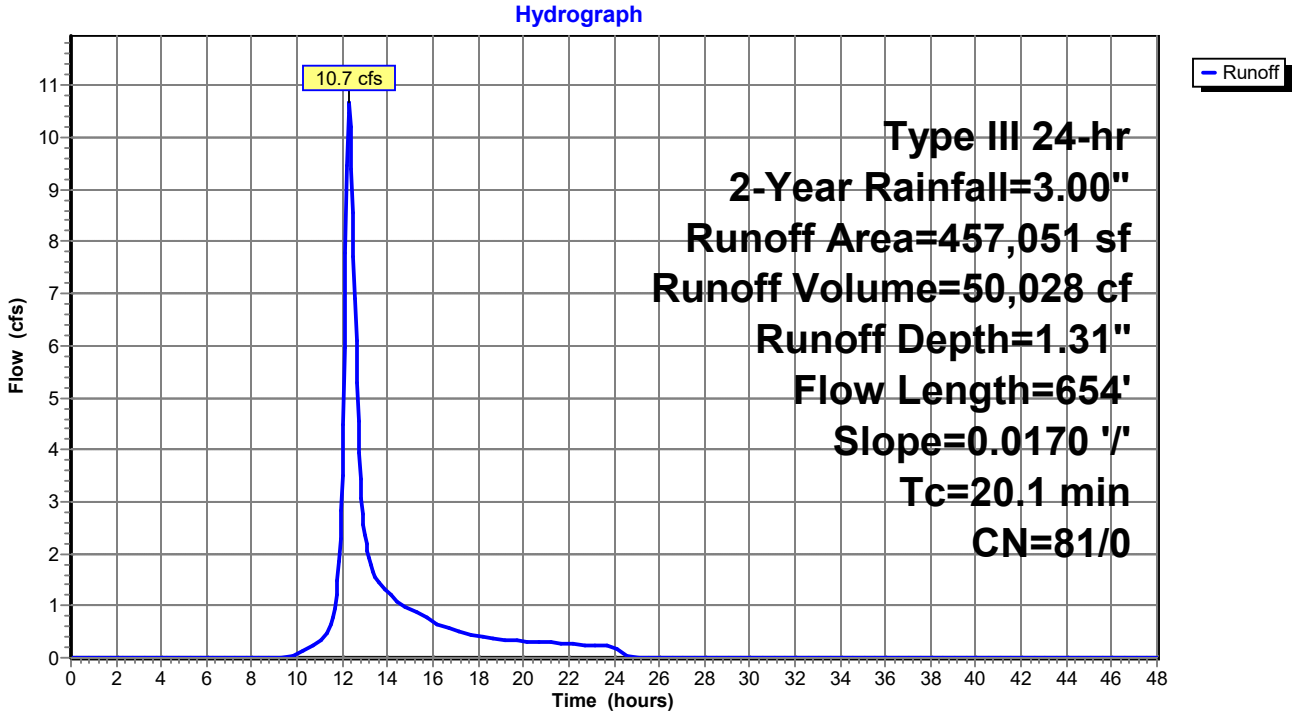
Runoff = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,051	81	Weighted Average
457,051	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

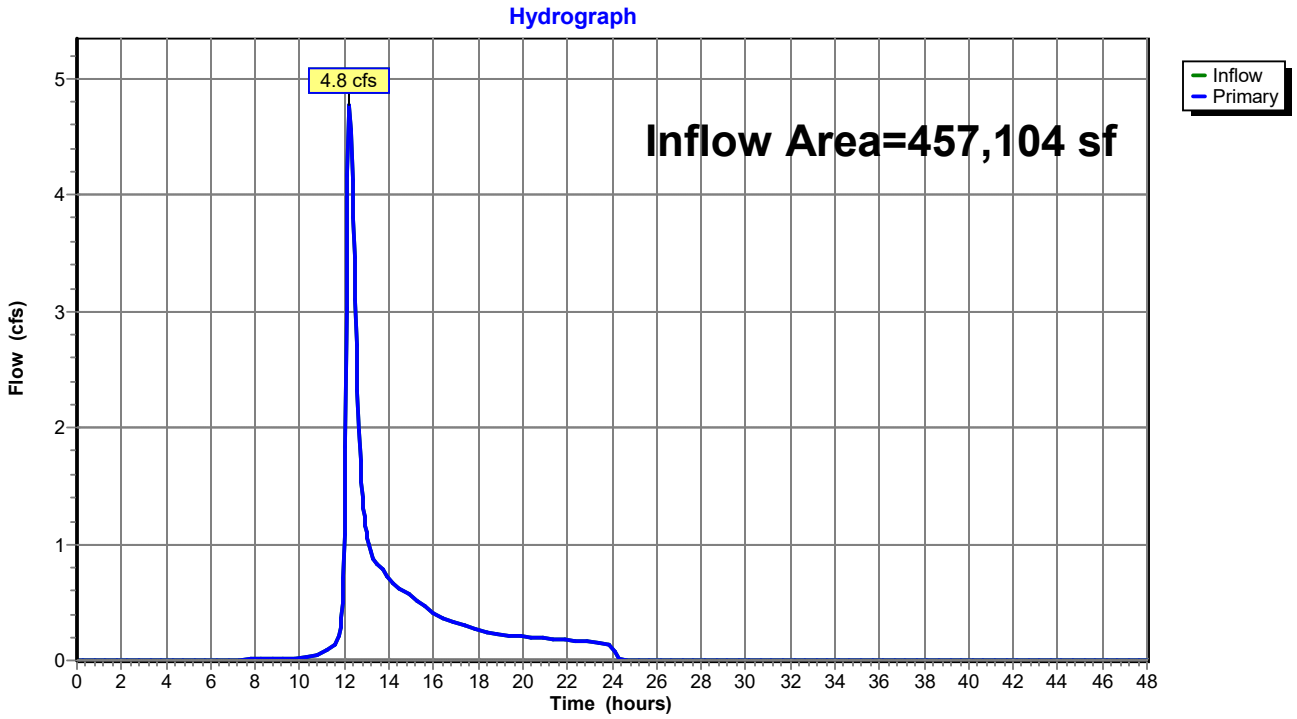


Summary for Link DP-1: On-stie Wetland

Inflow Area = 457,104 sf, 1.25% Impervious, Inflow Depth = 0.64" for 2-Year event
Inflow = 4.8 cfs @ 12.22 hrs, Volume= 24,243 cf
Primary = 4.8 cfs @ 12.22 hrs, Volume= 24,243 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

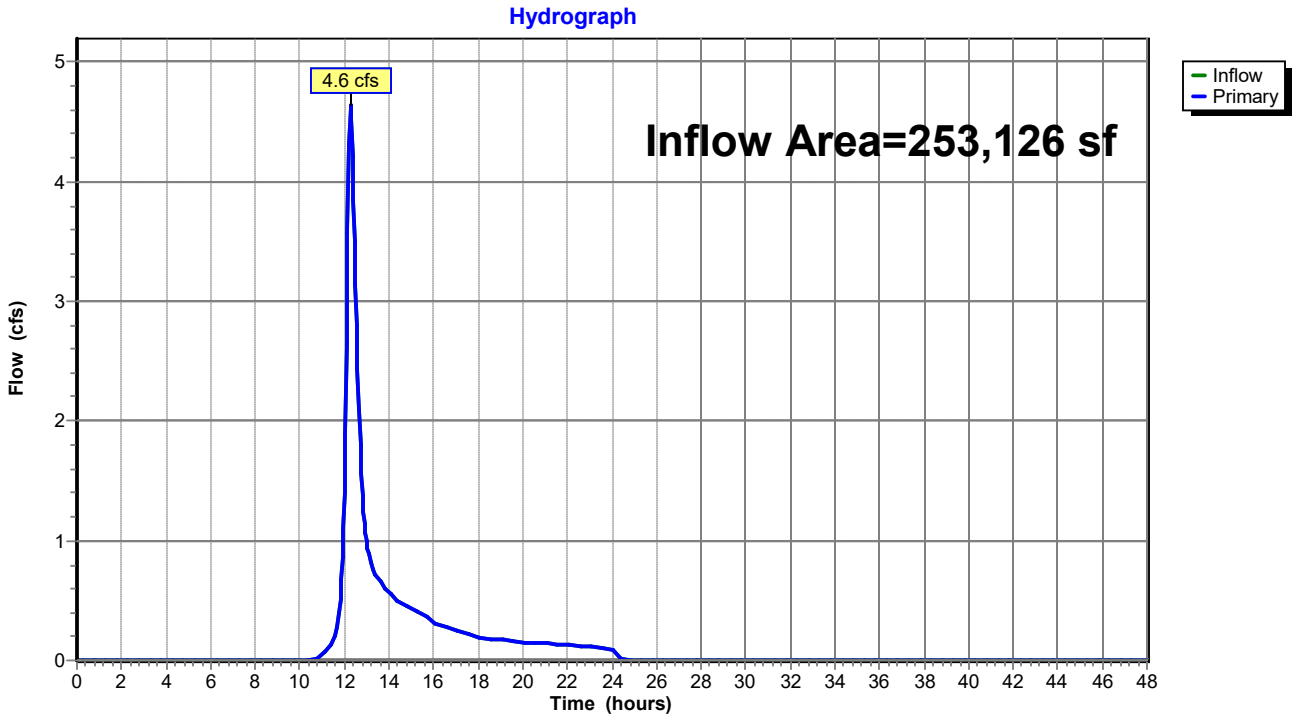


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,126 sf, 0.00% Impervious, Inflow Depth = 1.02" for 2-Year event
Inflow = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf
Primary = 4.6 cfs @ 12.26 hrs, Volume= 21,411 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

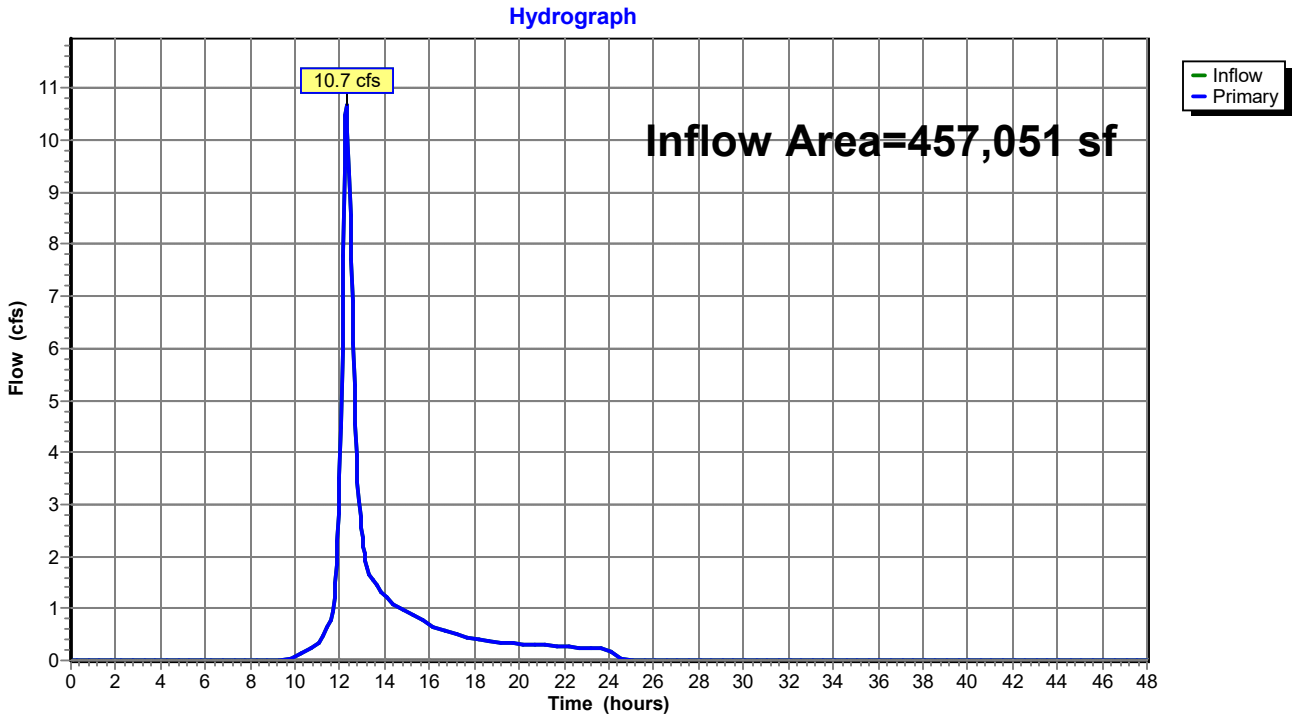


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,051 sf, 0.00% Impervious, Inflow Depth = 1.31" for 2-Year event
Inflow = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf
Primary = 10.7 cfs @ 12.29 hrs, Volume= 50,028 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=197,743 sf 2.89% Impervious Runoff Depth=1.48"
Flow Length=185' Tc=11.3 min CN=65/98 Runoff=6.1 cfs 24,374 cf

Subcatchment ES-1B: Runoff Area=190,955 sf 0.00% Impervious Runoff Depth=1.39"
Flow Length=386' Tc=12.8 min CN=65/0 Runoff=5.3 cfs 22,173 cf

Subcatchment ES-1C: Runoff Area=68,407 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=3.1 cfs 14,027 cf

Subcatchment ES-2: Runoff Area=253,126 sf 0.00% Impervious Runoff Depth=2.21"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=10.6 cfs 46,615 cf

Subcatchment ES-3: Runoff Area=457,051 sf 0.00% Impervious Runoff Depth=2.63"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=21.7 cfs 100,351 cf

Link DP-1: On-stie Wetland Inflow=14.1 cfs 60,574 cf
Primary=14.1 cfs 60,574 cf

Link DP-2: Offsite to Southeast Inflow=10.6 cfs 46,615 cf
Primary=10.6 cfs 46,615 cf

Link DP-3: Offsite to Northeast Inflow=21.7 cfs 100,351 cf
Primary=21.7 cfs 100,351 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 207,541 cf Average Runoff Depth = 2.13"
99.51% Pervious = 1,161,574 sf 0.49% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

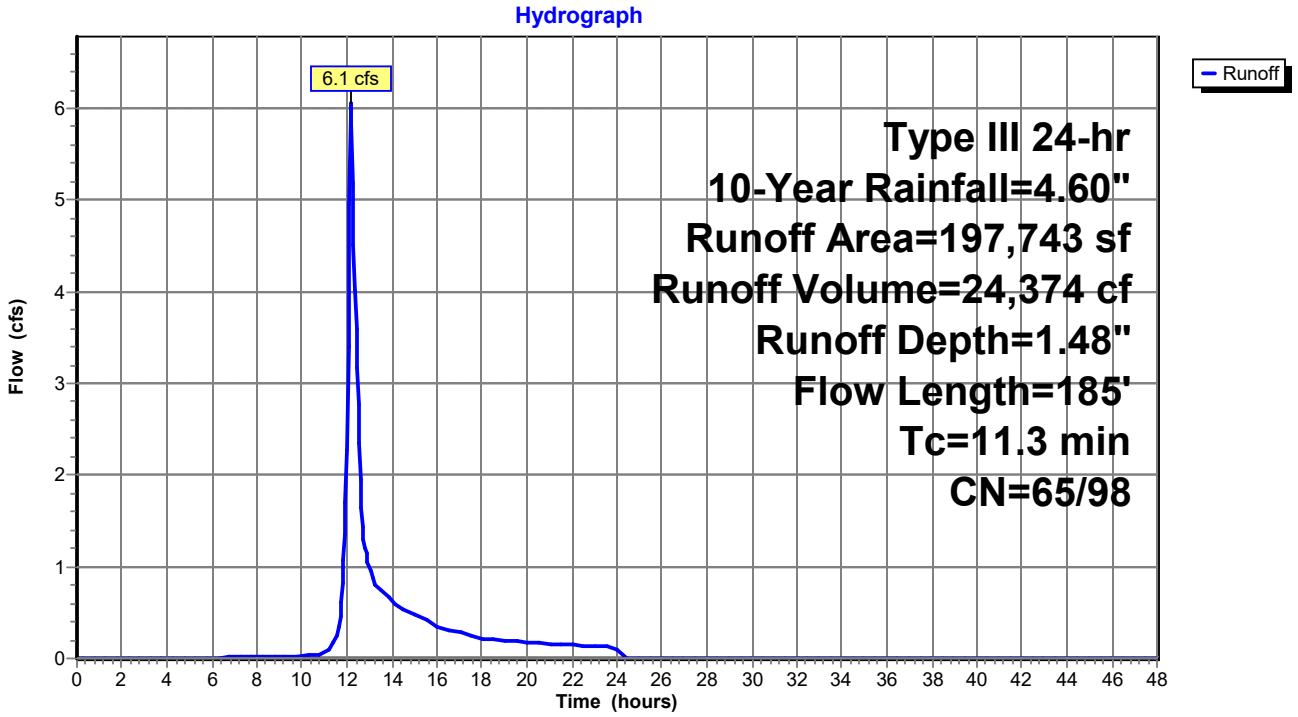
Runoff = 6.1 cfs @ 12.17 hrs, Volume= 24,374 cf, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
17,788	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
50,453	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
197,743	66	Weighted Average
192,034	65	97.11% Pervious Area
5,708	98	2.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

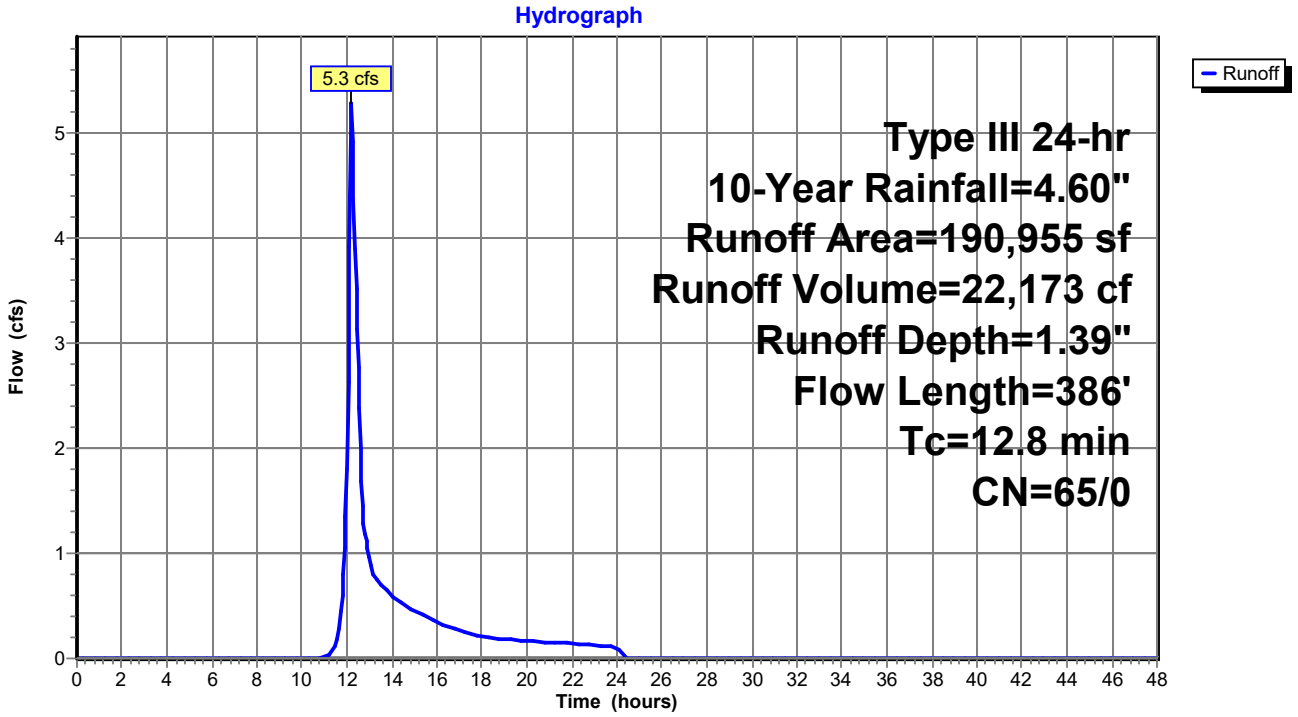
Runoff = 5.3 cfs @ 12.20 hrs, Volume= 22,173 cf, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
104	39	>75% Grass cover, Good, HSG A
406	61	>75% Grass cover, Good, HSG B
1,684	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
190,955	65	Weighted Average
190,955	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

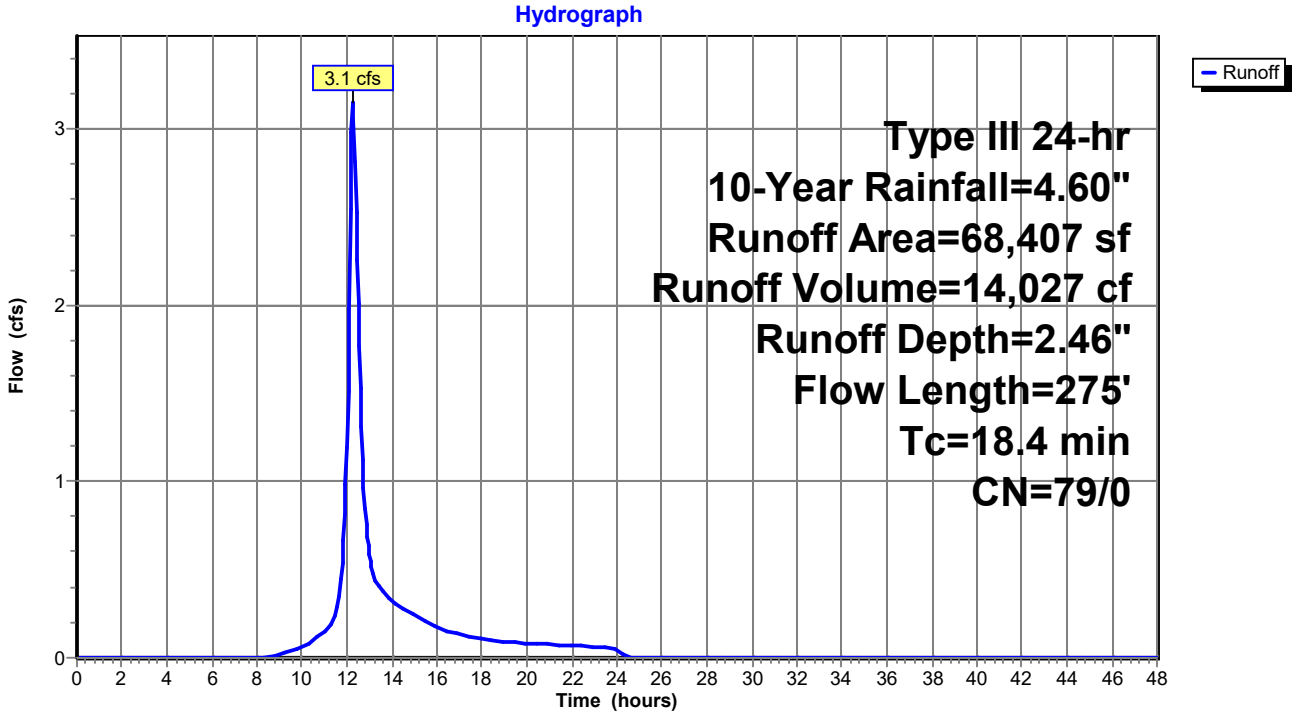
Runoff = 3.1 cfs @ 12.26 hrs, Volume= 14,027 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,407	79	Weighted Average
68,407	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

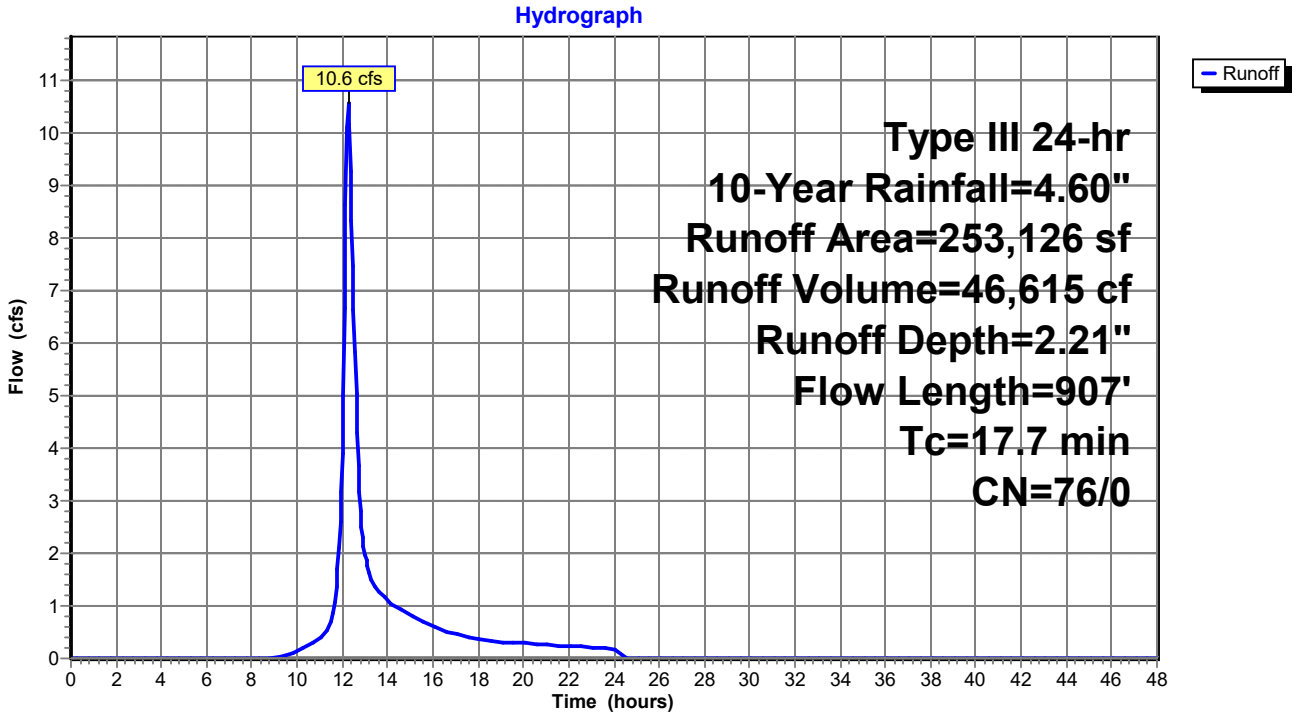
Runoff = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,126	76	Weighted Average
253,126	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

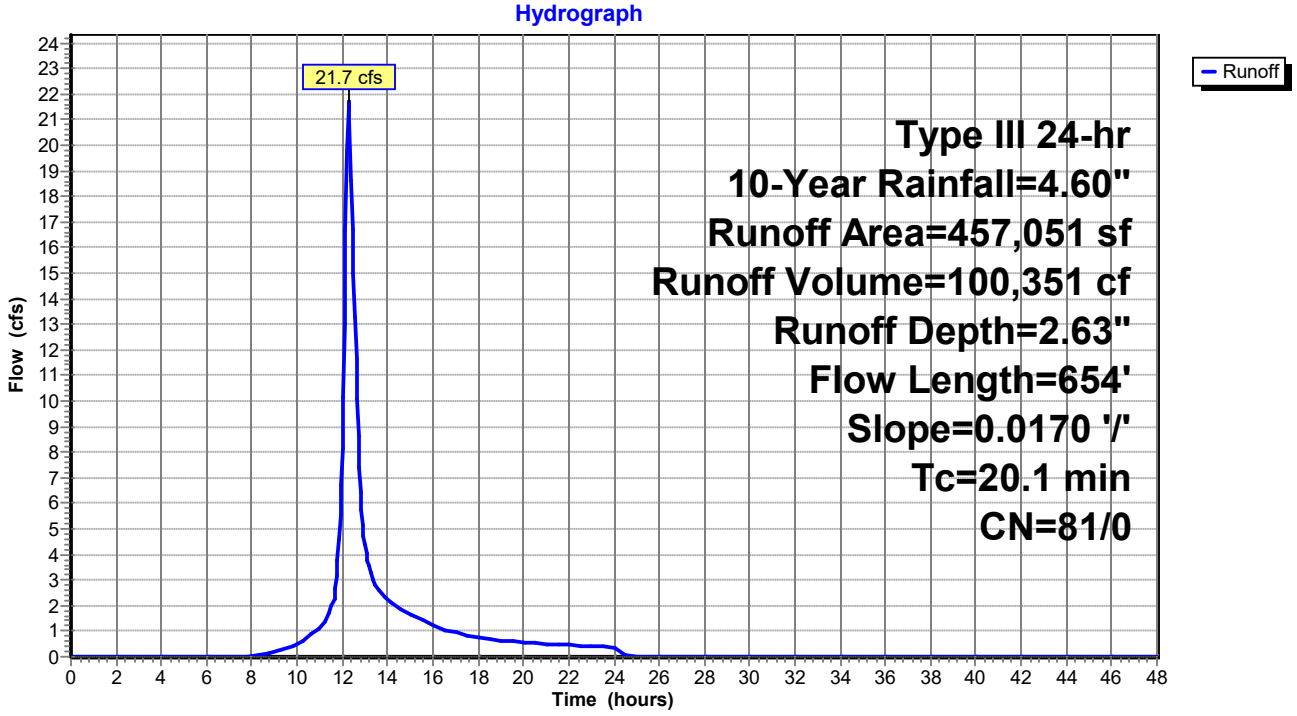
Runoff = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,051	81	Weighted Average
457,051	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

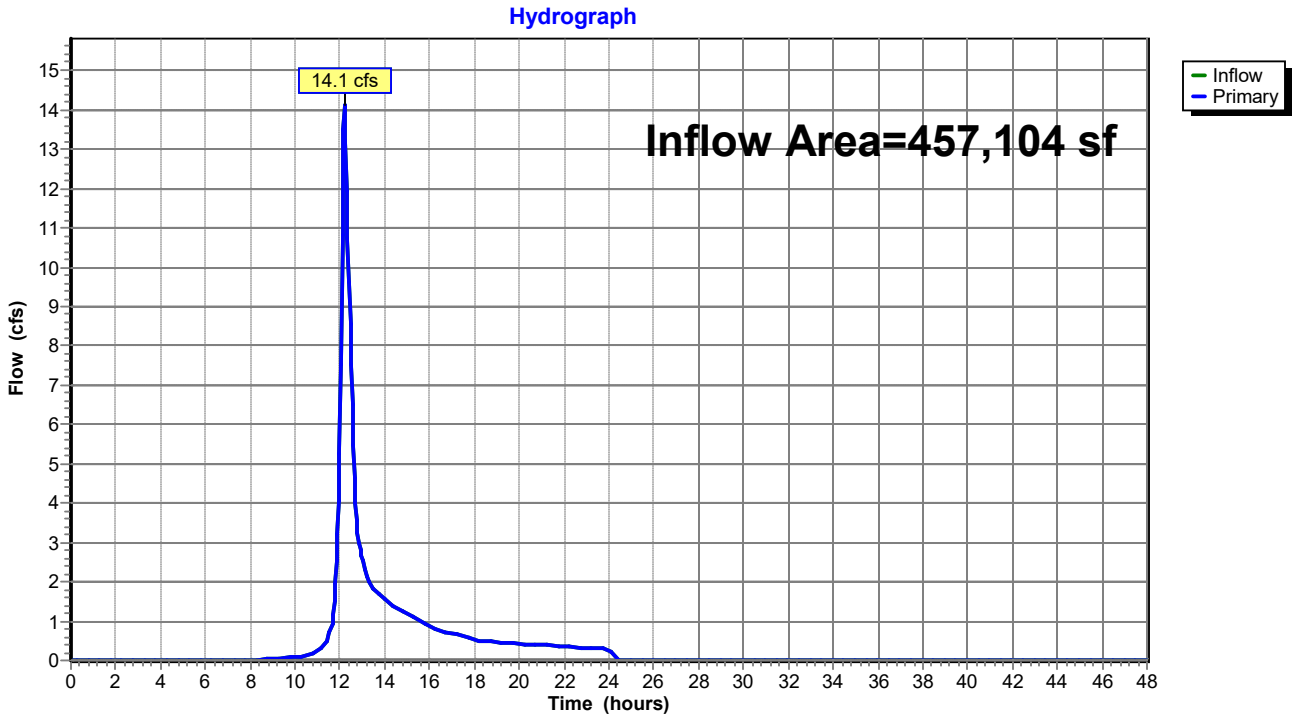


Summary for Link DP-1: On-stie Wetland

Inflow Area = 457,104 sf, 1.25% Impervious, Inflow Depth = 1.59" for 10-Year event
Inflow = 14.1 cfs @ 12.20 hrs, Volume= 60,574 cf
Primary = 14.1 cfs @ 12.20 hrs, Volume= 60,574 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

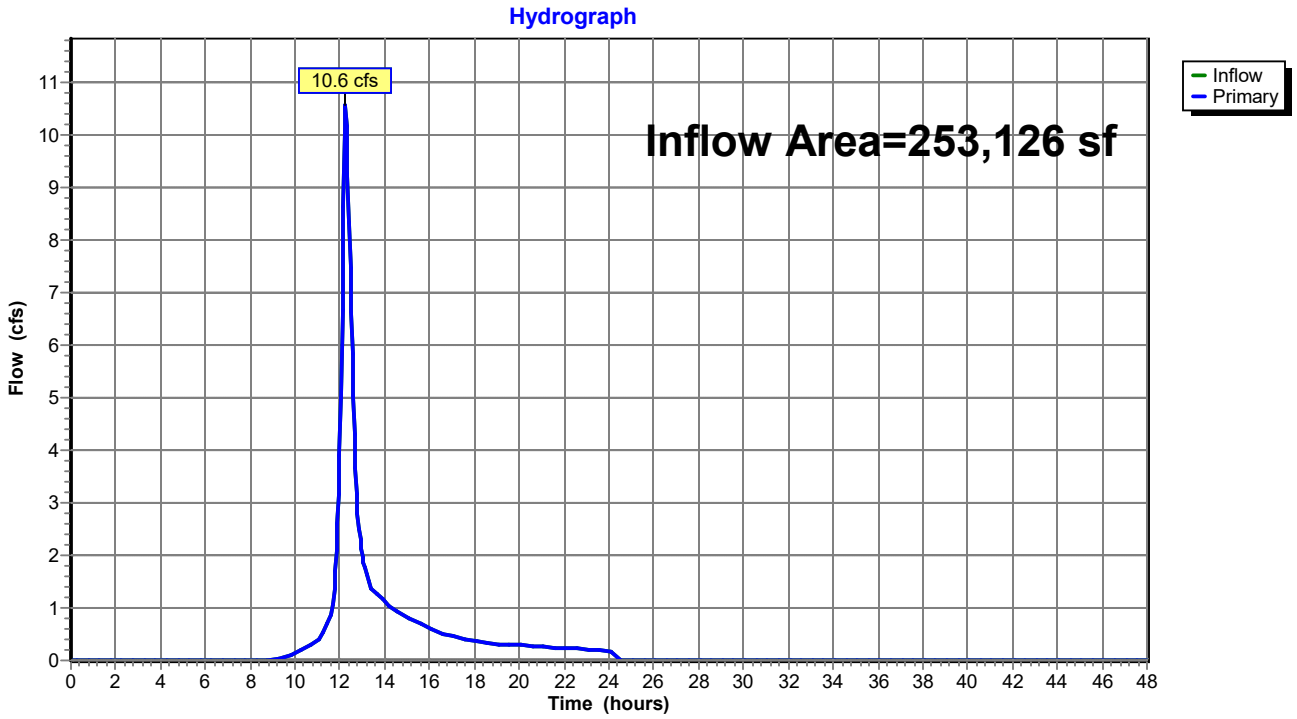


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,126 sf, 0.00% Impervious, Inflow Depth = 2.21" for 10-Year event
Inflow = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf
Primary = 10.6 cfs @ 12.25 hrs, Volume= 46,615 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

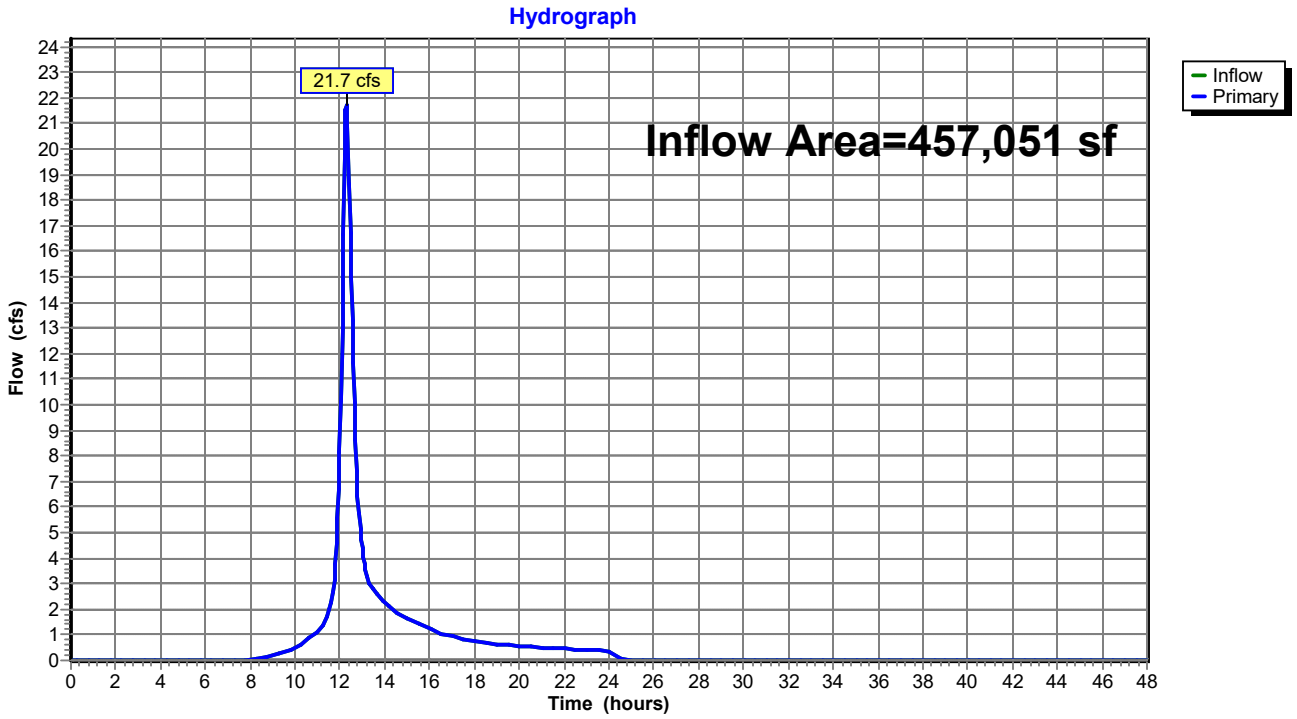


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,051 sf, 0.00% Impervious, Inflow Depth = 2.63" for 10-Year event
Inflow = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf
Primary = 21.7 cfs @ 12.28 hrs, Volume= 100,351 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES-1A: Runoff Area=197,743 sf 2.89% Impervious Runoff Depth=2.82"
Flow Length=185' Tc=11.3 min CN=65/98 Runoff=12.2 cfs 46,525 cf

Subcatchment ES-1B: Runoff Area=190,955 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=386' Tc=12.8 min CN=65/0 Runoff=10.9 cfs 43,302 cf

Subcatchment ES-1C: Runoff Area=68,407 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=275' Tc=18.4 min CN=79/0 Runoff=5.3 cfs 23,539 cf

Subcatchment ES-2: Runoff Area=253,126 sf 0.00% Impervious Runoff Depth=3.82"
Flow Length=907' Tc=17.7 min CN=76/0 Runoff=18.3 cfs 80,480 cf

Subcatchment ES-3: Runoff Area=457,051 sf 0.00% Impervious Runoff Depth=4.34"
Flow Length=654' Slope=0.0170 '/' Tc=20.1 min CN=81/0 Runoff=35.6 cfs 165,378 cf

Link DP-1: On-stie Wetland Inflow=27.7 cfs 113,366 cf
Primary=27.7 cfs 113,366 cf

Link DP-2: Offsite to Southeast Inflow=18.3 cfs 80,480 cf
Primary=18.3 cfs 80,480 cf

Link DP-3: Offsite to Northeast Inflow=35.6 cfs 165,378 cf
Primary=35.6 cfs 165,378 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 359,224 cf Average Runoff Depth = 3.69"
99.51% Pervious = 1,161,574 sf 0.49% Impervious = 5,708 sf

Summary for Subcatchment ES-1A:

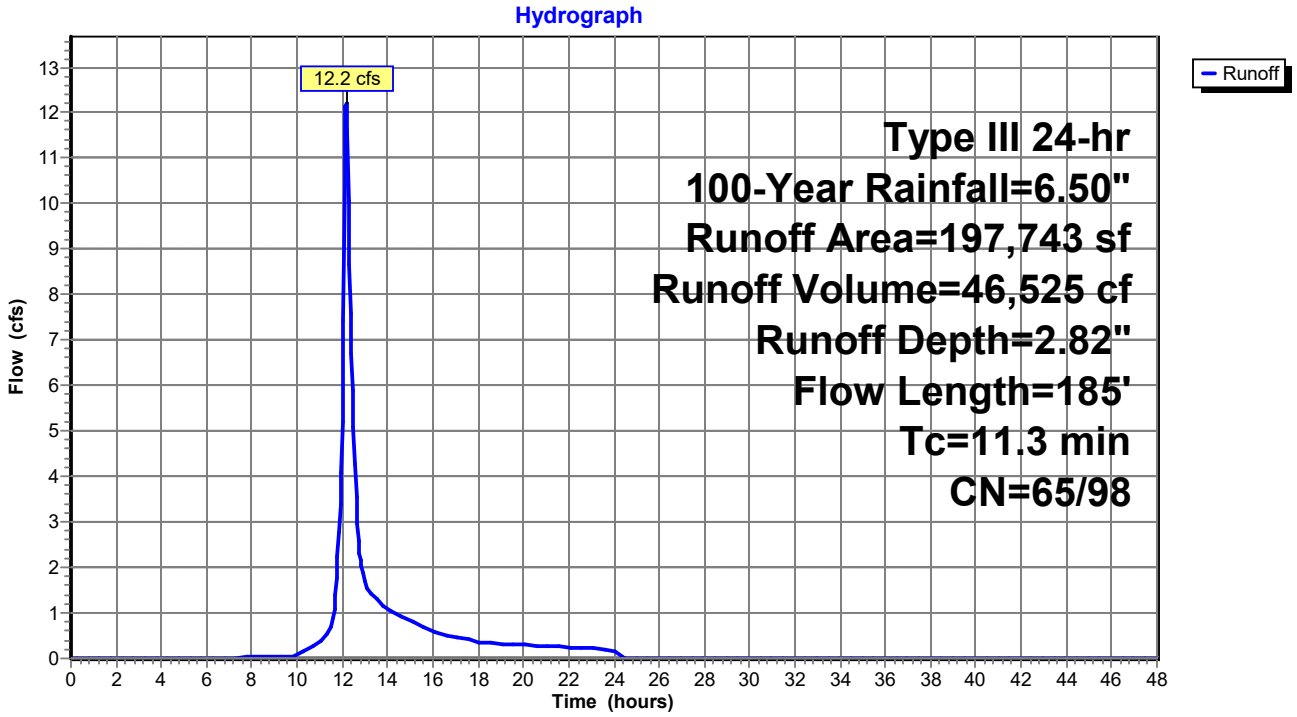
Runoff = 12.2 cfs @ 12.16 hrs, Volume= 46,525 cf, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
103,214	69	50-75% Grass cover, Fair, HSG B
17,788	61	>75% Grass cover, Good, HSG B
2,763	74	>75% Grass cover, Good, HSG C
3,488	98	Paved parking, HSG B
1,945	98	Roofs, HSG B
275	98	Roofs, HSG C
50,453	55	Woods, Good, HSG B
17,816	70	Woods, Good, HSG C
197,743	66	Weighted Average
192,034	65	97.11% Pervious Area
5,708	98	2.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0430	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.4	85	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.3	185	Total			

Subcatchment ES-1A:



Summary for Subcatchment ES-1B:

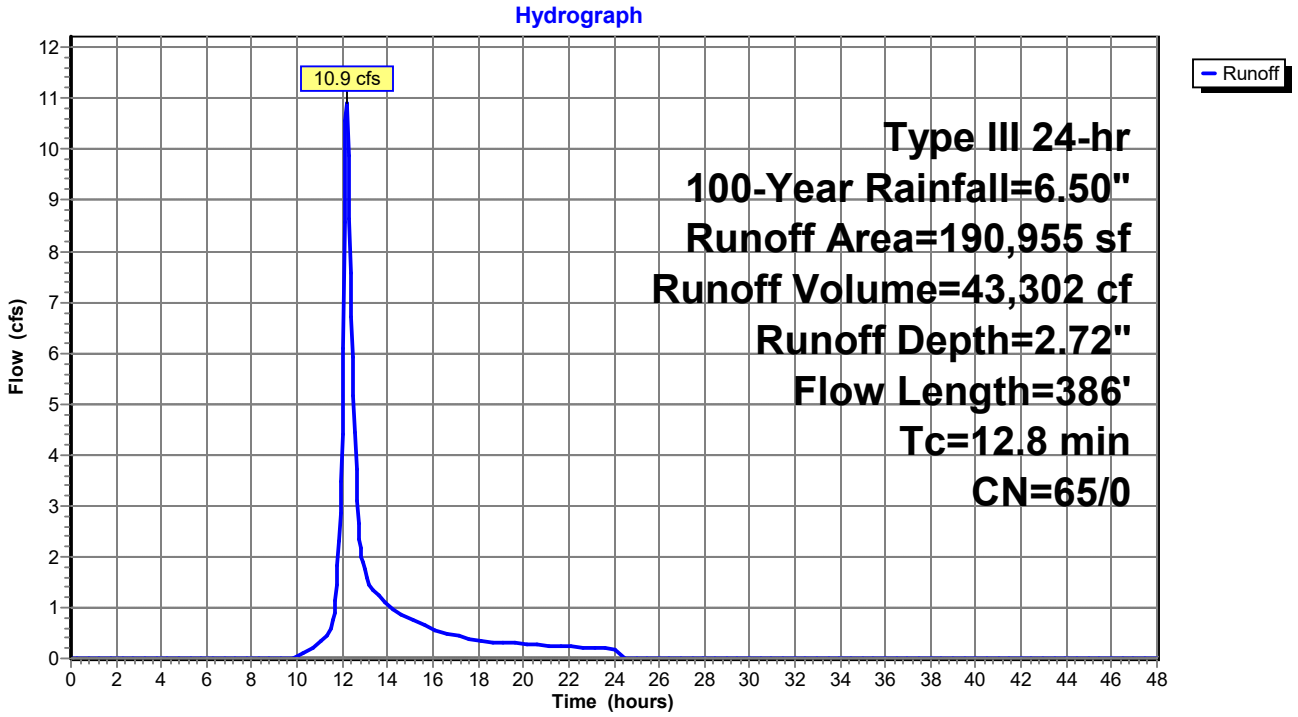
Runoff = 10.9 cfs @ 12.19 hrs, Volume= 43,302 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
19,000	49	50-75% Grass cover, Fair, HSG A
125,685	69	50-75% Grass cover, Fair, HSG B
915	84	50-75% Grass cover, Fair, HSG D
104	39	>75% Grass cover, Good, HSG A
406	61	>75% Grass cover, Good, HSG B
1,684	96	Gravel surface, HSG A
8,524	96	Gravel surface, HSG B
409	96	Gravel surface, HSG D
11,193	30	Woods, Good, HSG A
22,698	55	Woods, Good, HSG B
337	77	Woods, Good, HSG D
190,955	65	Weighted Average
190,955	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.6	286	0.0360	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	386	Total			

Subcatchment ES-1B:



Summary for Subcatchment ES-1C:

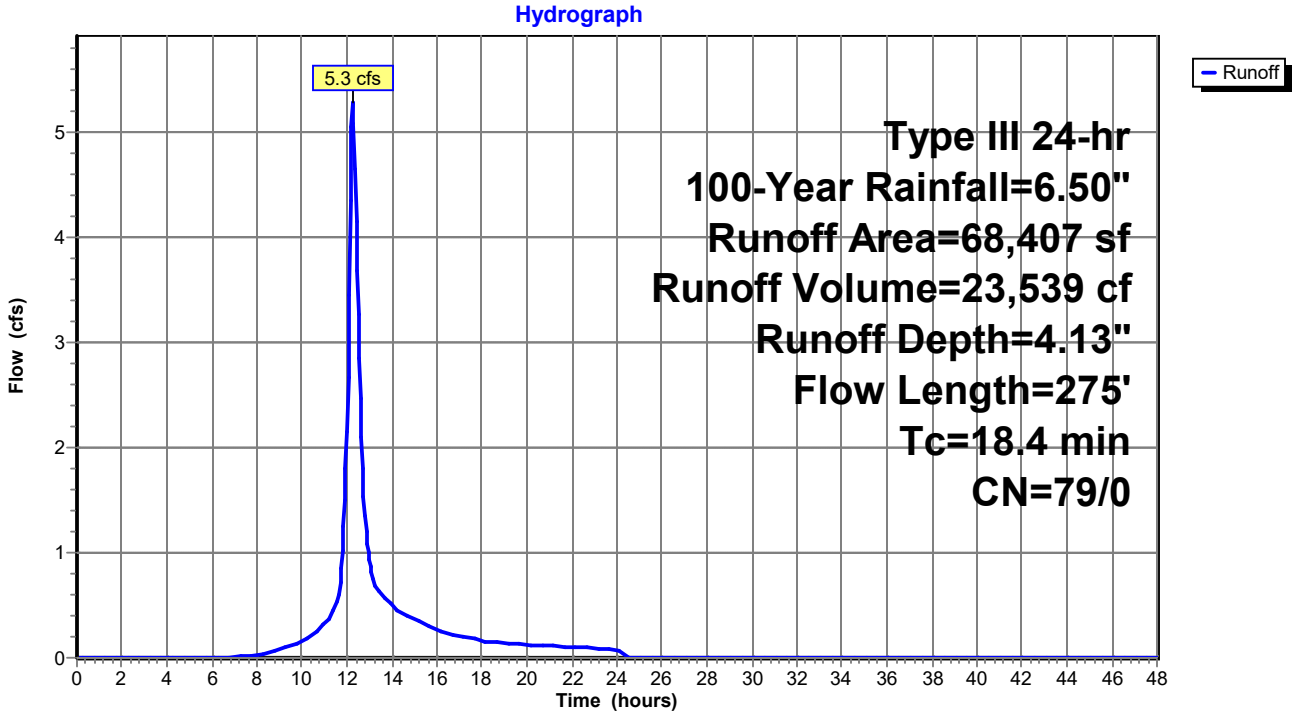
Runoff = 5.3 cfs @ 12.25 hrs, Volume= 23,539 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,545	69	50-75% Grass cover, Fair, HSG B
59,539	79	50-75% Grass cover, Fair, HSG C
4,153	84	50-75% Grass cover, Fair, HSG D
928	96	Gravel surface, HSG C
81	96	Gravel surface, HSG D
2,094	70	Woods, Good, HSG C
65	77	Woods, Good, HSG D
68,407	79	Weighted Average
68,407	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	100	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	175	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
18.4	275	Total			

Subcatchment ES-1C:



Summary for Subcatchment ES-2:

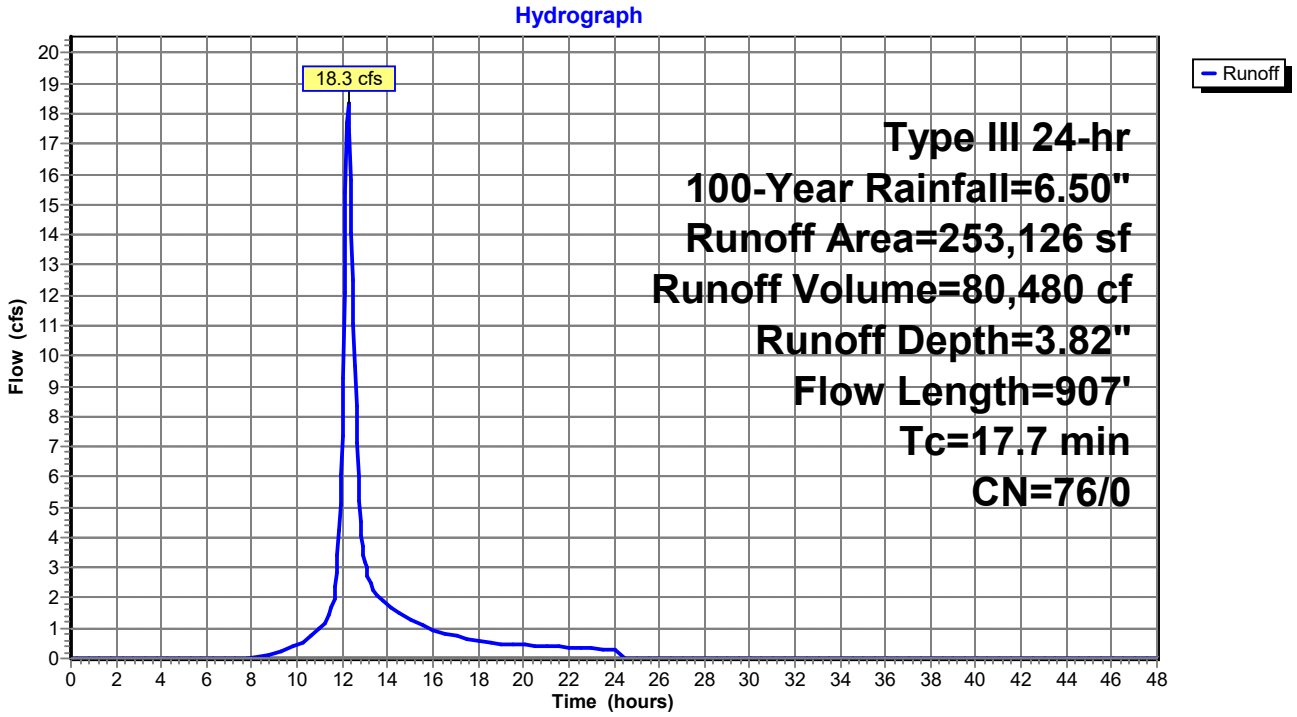
Runoff = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
22,243	49	50-75% Grass cover, Fair, HSG A
27,605	69	50-75% Grass cover, Fair, HSG B
98,372	79	50-75% Grass cover, Fair, HSG C
67,576	84	50-75% Grass cover, Fair, HSG D
71	74	>75% Grass cover, Good, HSG C
25	80	>75% Grass cover, Good, HSG D
236	96	Gravel surface, HSG B
1,637	96	Gravel surface, HSG C
5,315	96	Gravel surface, HSG D
725	30	Woods, Good, HSG A
227	55	Woods, Good, HSG B
28,052	70	Woods, Good, HSG C
1,043	77	Woods, Good, HSG D
253,126	76	Weighted Average
253,126	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0290	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
5.0	807	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.7	907	Total			

Subcatchment ES-2:



Summary for Subcatchment ES-3:

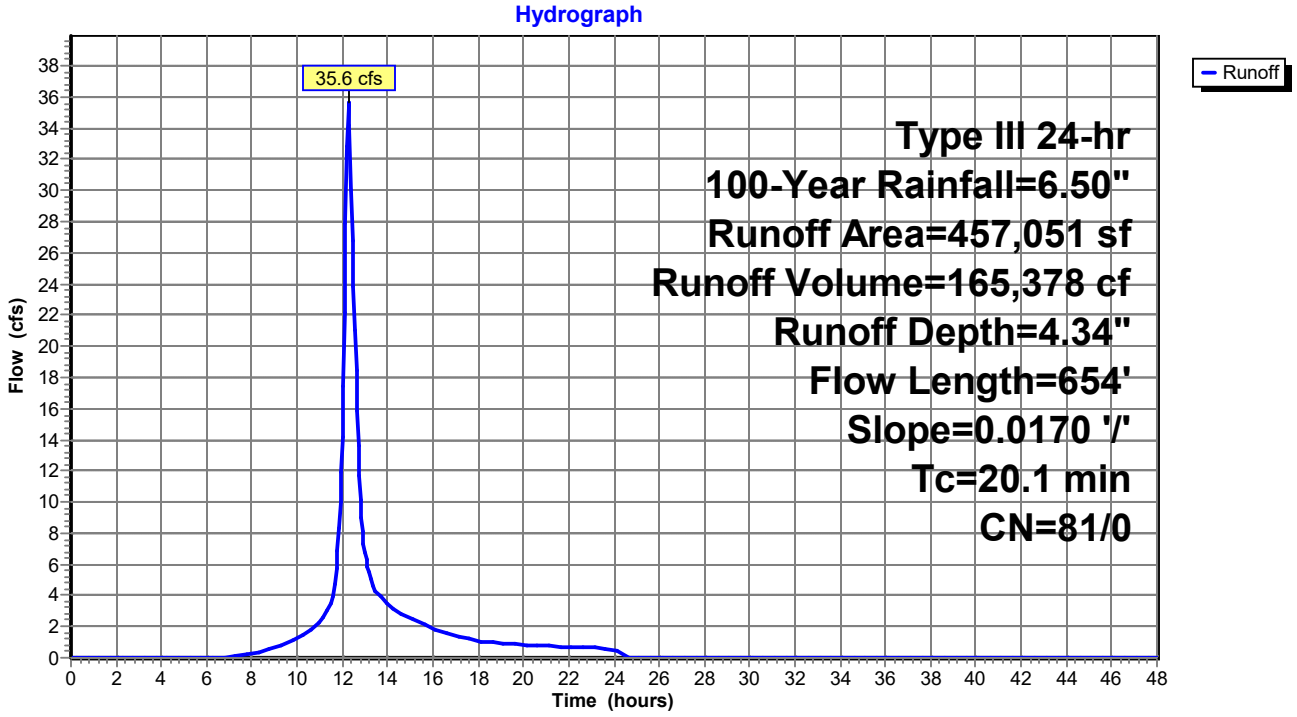
Runoff = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf, Depth= 4.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,682	69	50-75% Grass cover, Fair, HSG B
128,368	79	50-75% Grass cover, Fair, HSG C
242,230	84	50-75% Grass cover, Fair, HSG D
1,044	96	Gravel surface, HSG B
4,782	96	Gravel surface, HSG D
13,902	70	Woods, Good, HSG C
62,044	77	Woods, Good, HSG D
457,051	81	Weighted Average
457,051	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0170	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
4.4	554	0.0170	2.10		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
20.1	654	Total			

Subcatchment ES-3:

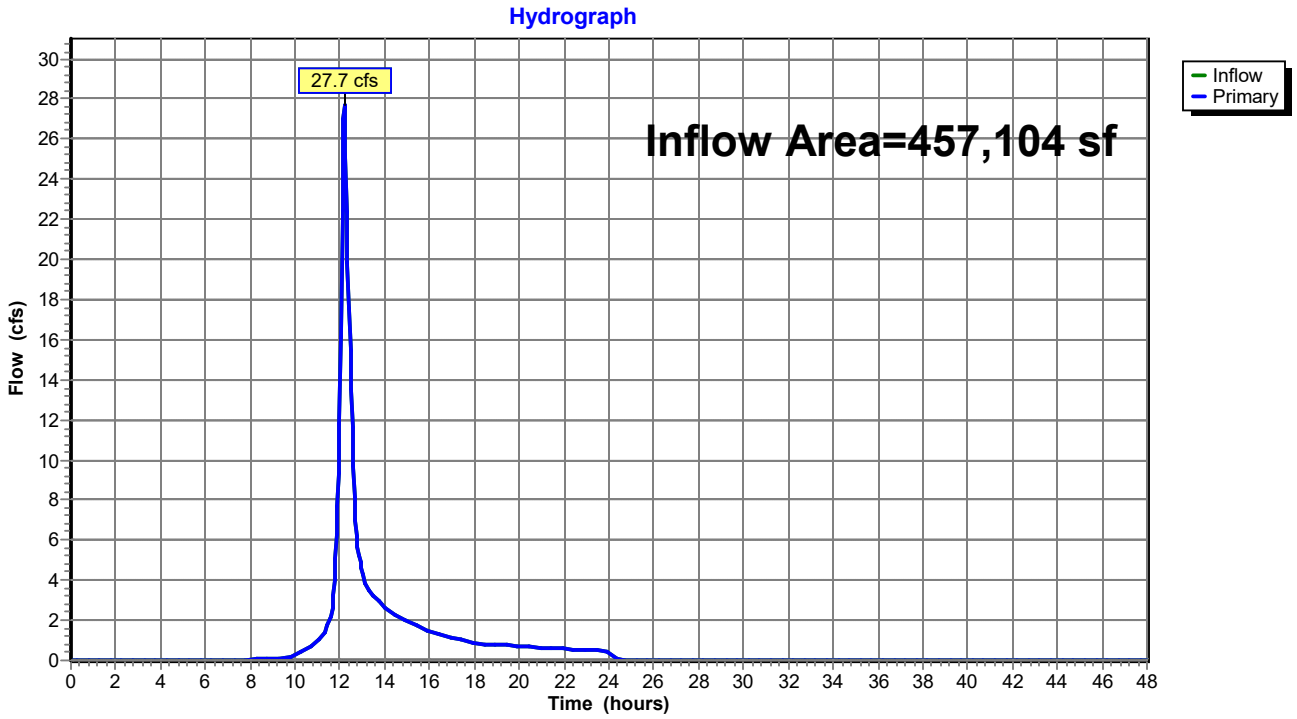


Summary for Link DP-1: On-stie Wetland

Inflow Area = 457,104 sf, 1.25% Impervious, Inflow Depth = 2.98" for 100-Year event
Inflow = 27.7 cfs @ 12.18 hrs, Volume= 113,366 cf
Primary = 27.7 cfs @ 12.18 hrs, Volume= 113,366 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: On-stie Wetland

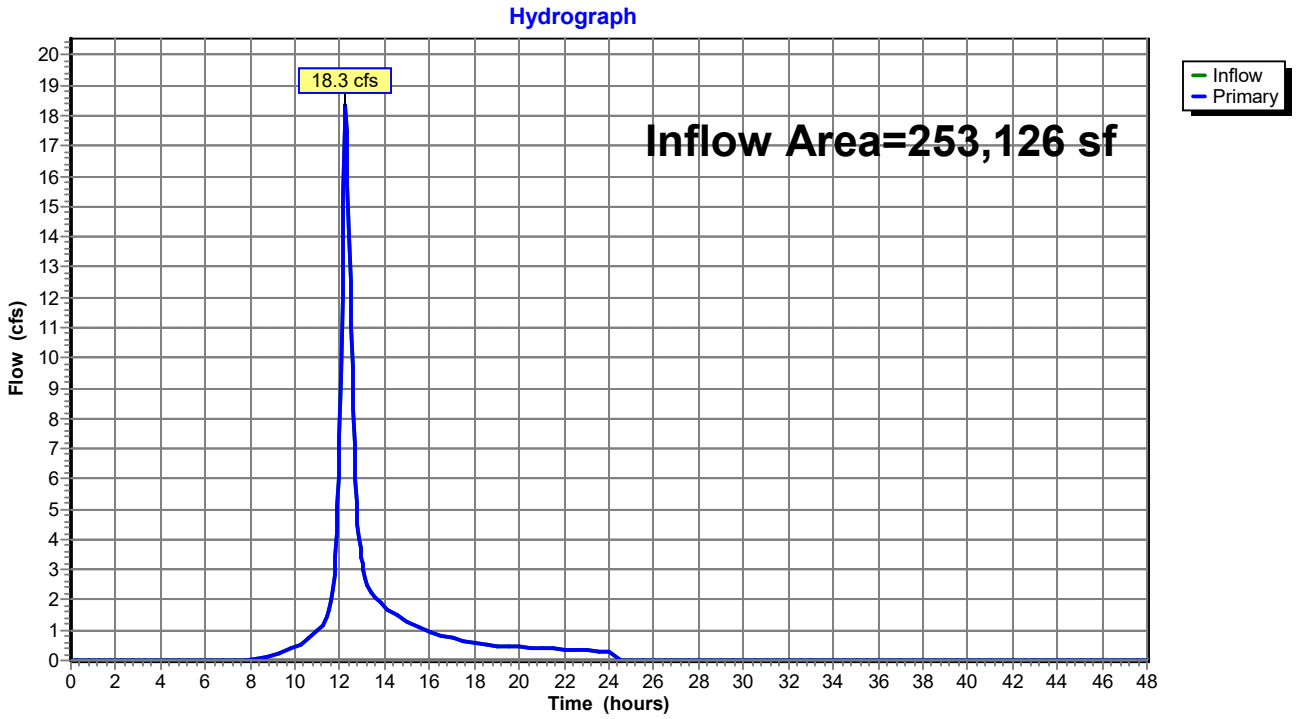


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 253,126 sf, 0.00% Impervious, Inflow Depth = 3.82" for 100-Year event
Inflow = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf
Primary = 18.3 cfs @ 12.25 hrs, Volume= 80,480 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

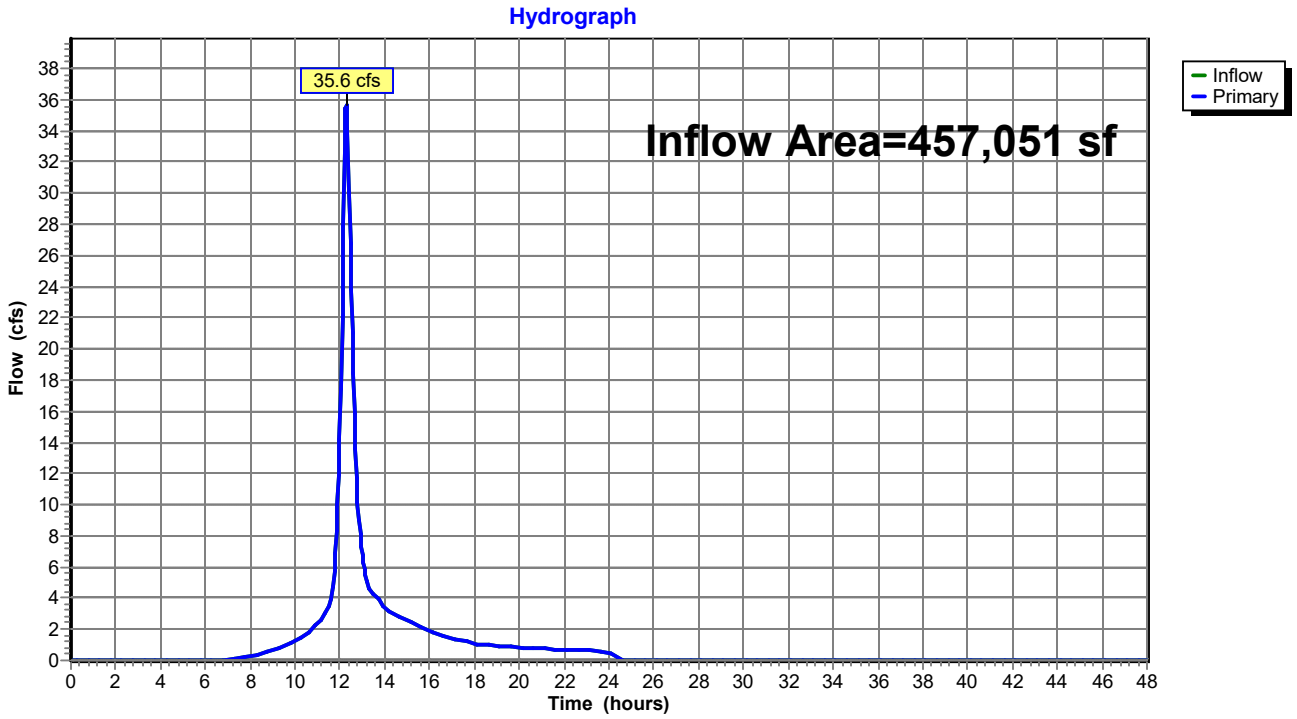


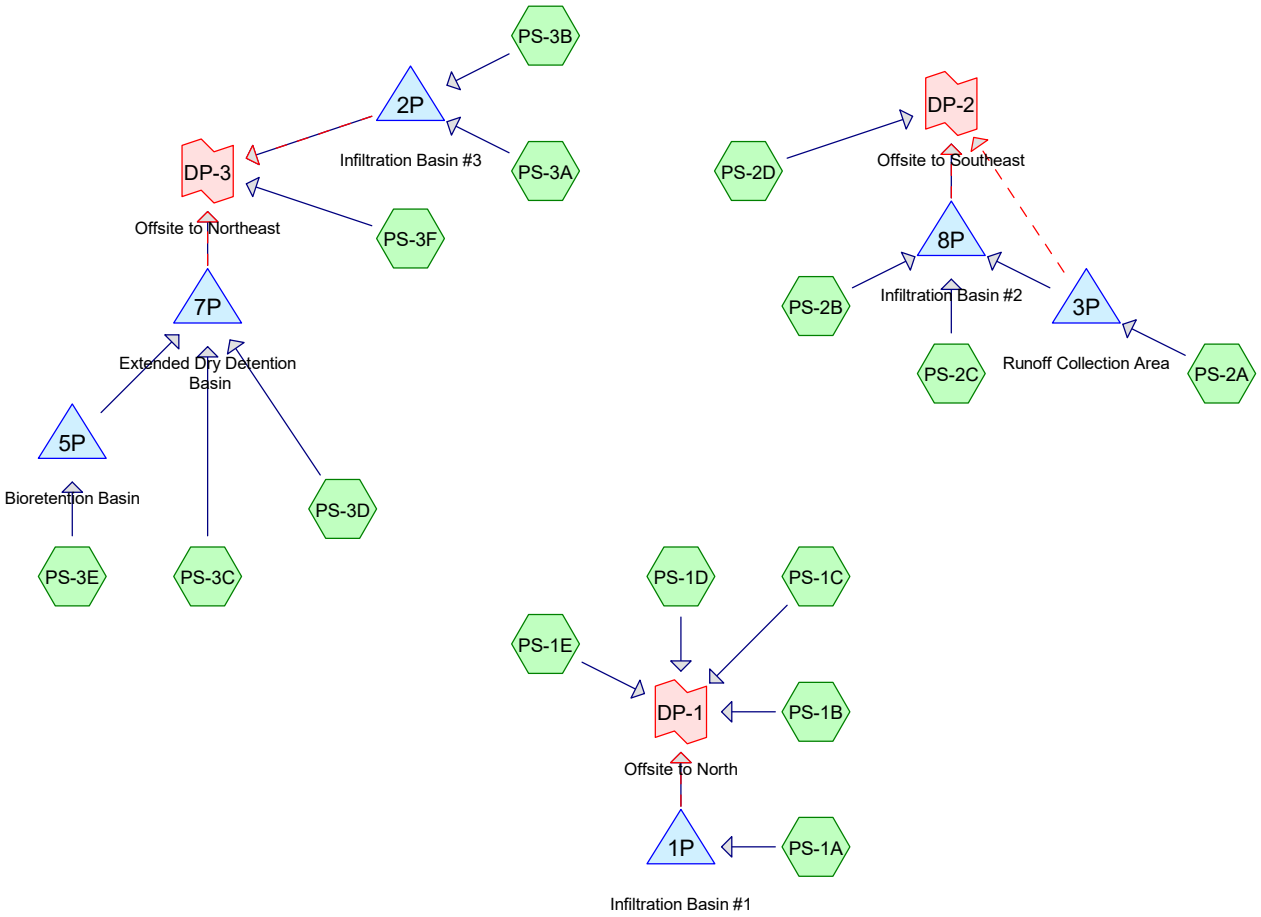
Summary for Link DP-3: Offsite to Northeast

Inflow Area = 457,051 sf, 0.00% Impervious, Inflow Depth = 4.34" for 100-Year event
Inflow = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf
Primary = 35.6 cfs @ 12.27 hrs, Volume= 165,378 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast





Subcat Reach Pond Link

Routing Diagram for 090506 - POST
Prepared by R Levesque Associates, Inc.
HydroCAD® 10.00-25 s/n 02175 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=142,855 sf 49.65% Impervious Runoff Depth=1.53"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=3.5 cfs 18,178 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=0.43"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=0.7 cfs 3,762 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=0.21"
Flow Length=284' Tc=12.8 min CN=47/98 Runoff=0.1 cfs 657 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=0.51"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=0.6 cfs 2,881 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=1.19"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=1.5 cfs 4,880 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=0.86"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=1.3 cfs 5,636 cf

Subcatchment PS-2B: Runoff Area=64,788 sf 68.84% Impervious Runoff Depth=2.09"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=2.7 cfs 11,273 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=77/98 Runoff=1.9 cfs 6,487 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=0.86"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=0.7 cfs 2,713 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=0/98 Runoff=0.7 cfs 2,591 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=2.01"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=7.4 cfs 31,732 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=2.11"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=7.2 cfs 29,976 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=1.23"
Tc=6.0 min CN=74/98 Runoff=0.7 cfs 2,300 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=2.10"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=1.3 cfs 4,890 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=1.13"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=2.8 cfs 11,139 cf

Pond 1P: Infiltration Basin #1 Peak Elev=201.38' Storage=8,392 cf Inflow=3.5 cfs 18,178 cf
Primary=1.7 cfs 13,987 cf Secondary=0.0 cfs 0 cf Outflow=1.7 cfs 13,987 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.16' Storage=12,797 cf Inflow=7.8 cfs 34,323 cf
Primary=3.9 cfs 29,122 cf Secondary=0.0 cfs 0 cf Outflow=3.9 cfs 29,122 cf

Pond 3P: Runoff Collection Area Peak Elev=189.02' Storage=3,476 cf Inflow=1.3 cfs 5,636 cf
Primary=0.1 cfs 2,275 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 2,275 cf

Pond 5P: Bioretention Basin Peak Elev=182.58' Storage=2,598 cf Inflow=1.3 cfs 4,890 cf
Outflow=0.5 cfs 2,519 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=179.69' Storage=11,641 cf Inflow=7.7 cfs 34,794 cf
Primary=2.6 cfs 34,754 cf Secondary=0.0 cfs 0 cf Outflow=2.6 cfs 34,754 cf

Pond 8P: Infiltration Basin #2 Peak Elev=181.59' Storage=6,812 cf Inflow=4.3 cfs 20,034 cf
Primary=2.4 cfs 17,136 cf Secondary=0.0 cfs 0 cf Outflow=2.4 cfs 17,136 cf

Link DP-1: Offsite to North Inflow=3.3 cfs 26,166 cf
Primary=3.3 cfs 26,166 cf

Link DP-2: Offsite to Southeast Inflow=2.8 cfs 19,849 cf
Primary=2.8 cfs 19,849 cf

Link DP-3: Offsite to Northeast Inflow=7.8 cfs 75,015 cf
Primary=7.8 cfs 75,015 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 139,094 cf Average Runoff Depth = 1.43"
69.83% Pervious = 815,148 sf 30.17% Impervious = 352,133 sf

Summary for Subcatchment PS-1A:

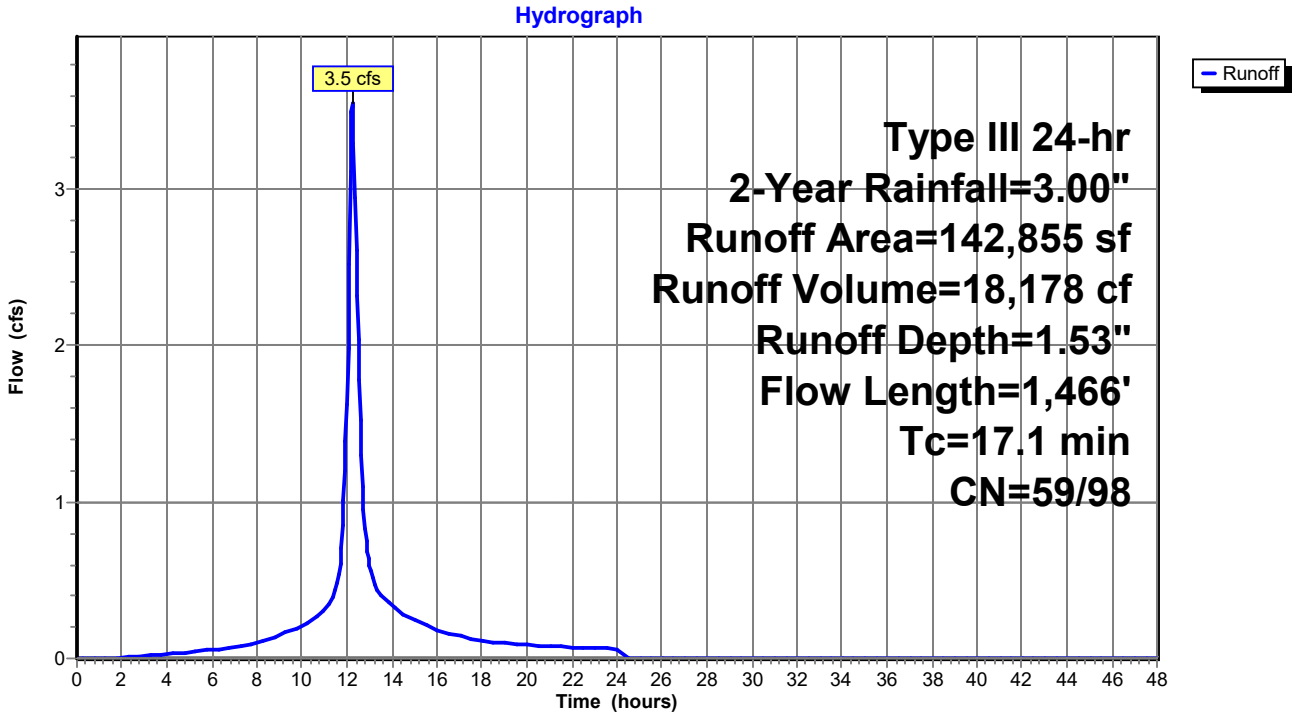
Runoff = 3.5 cfs @ 12.23 hrs, Volume= 18,178 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
142,855	78	Weighted Average
71,926	59	50.35% Pervious Area
70,929	98	49.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

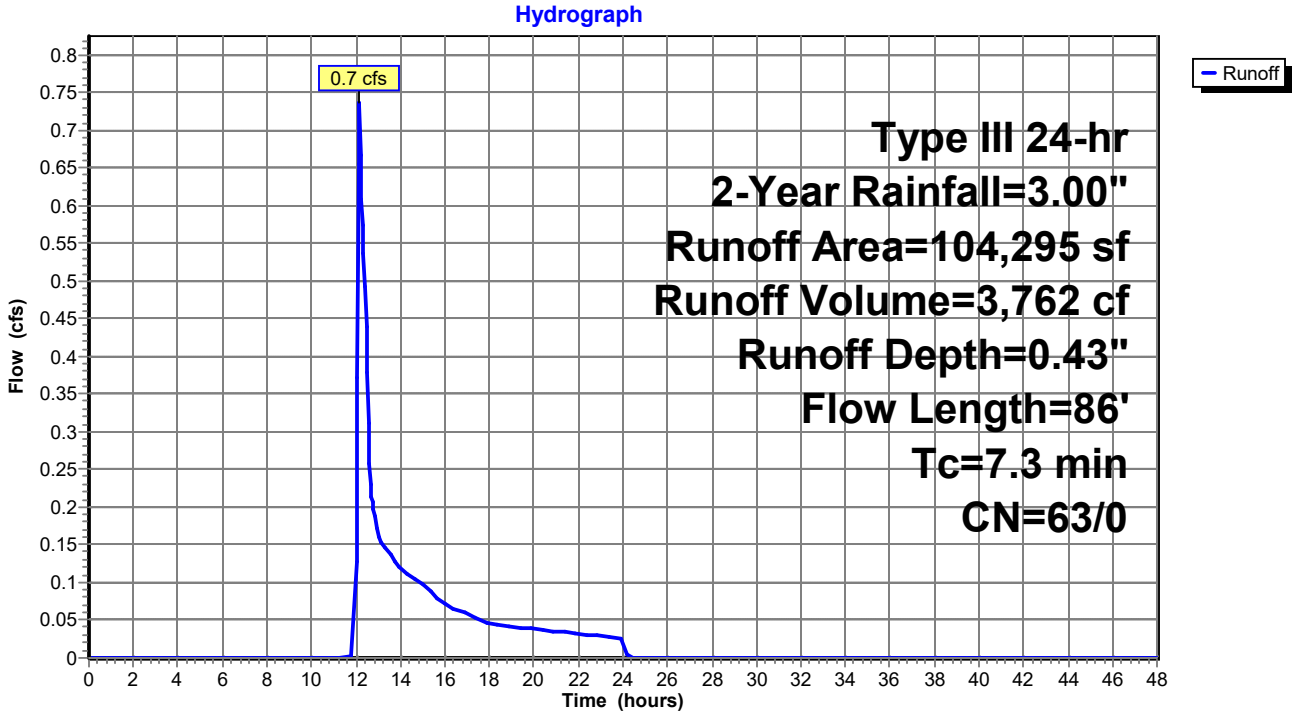
Runoff = 0.7 cfs @ 12.15 hrs, Volume= 3,762 cf, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

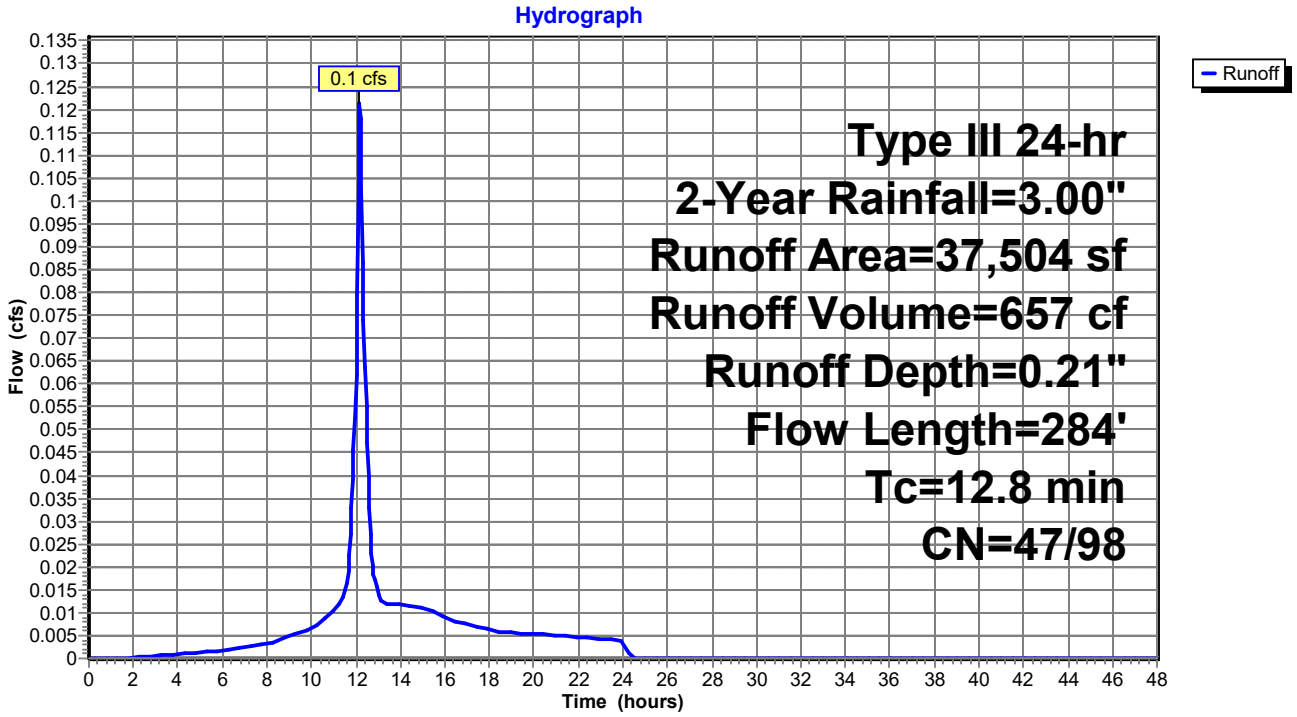
Runoff = 0.1 cfs @ 12.17 hrs, Volume= 657 cf, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
9,878	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	50	Weighted Average
35,242	47	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

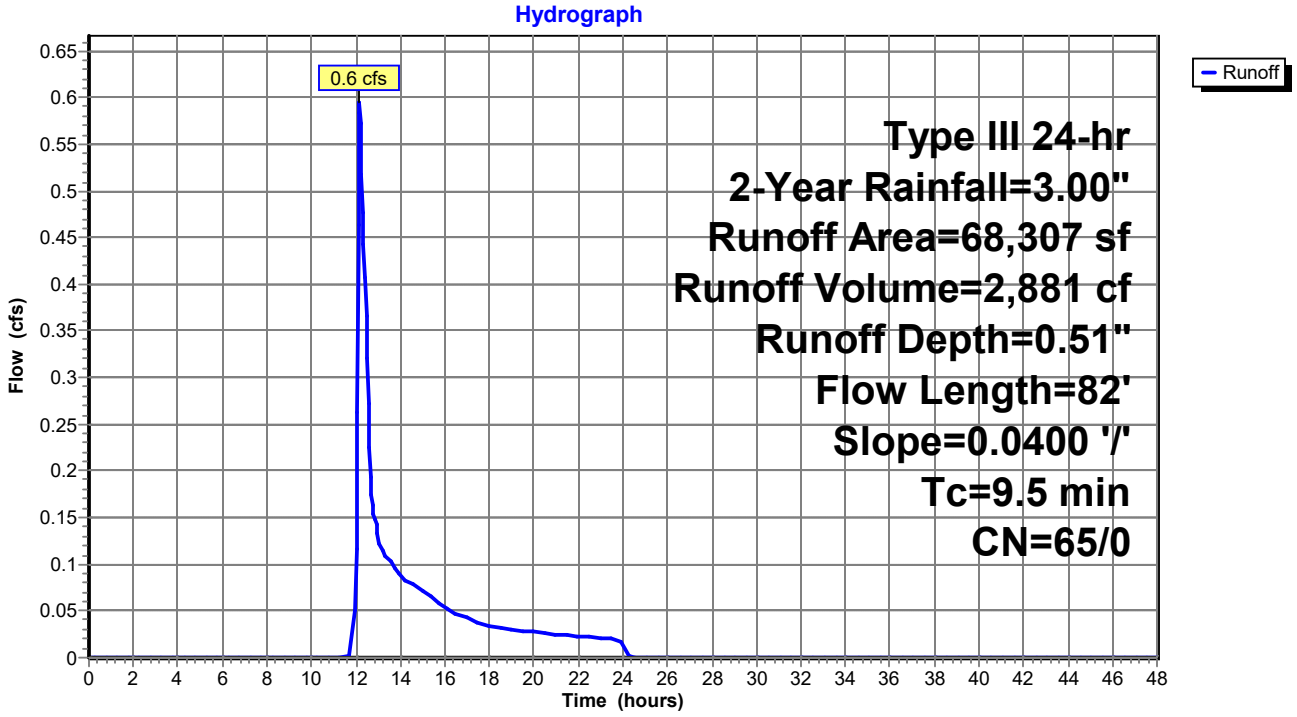
Runoff = 0.6 cfs @ 12.17 hrs, Volume= 2,881 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

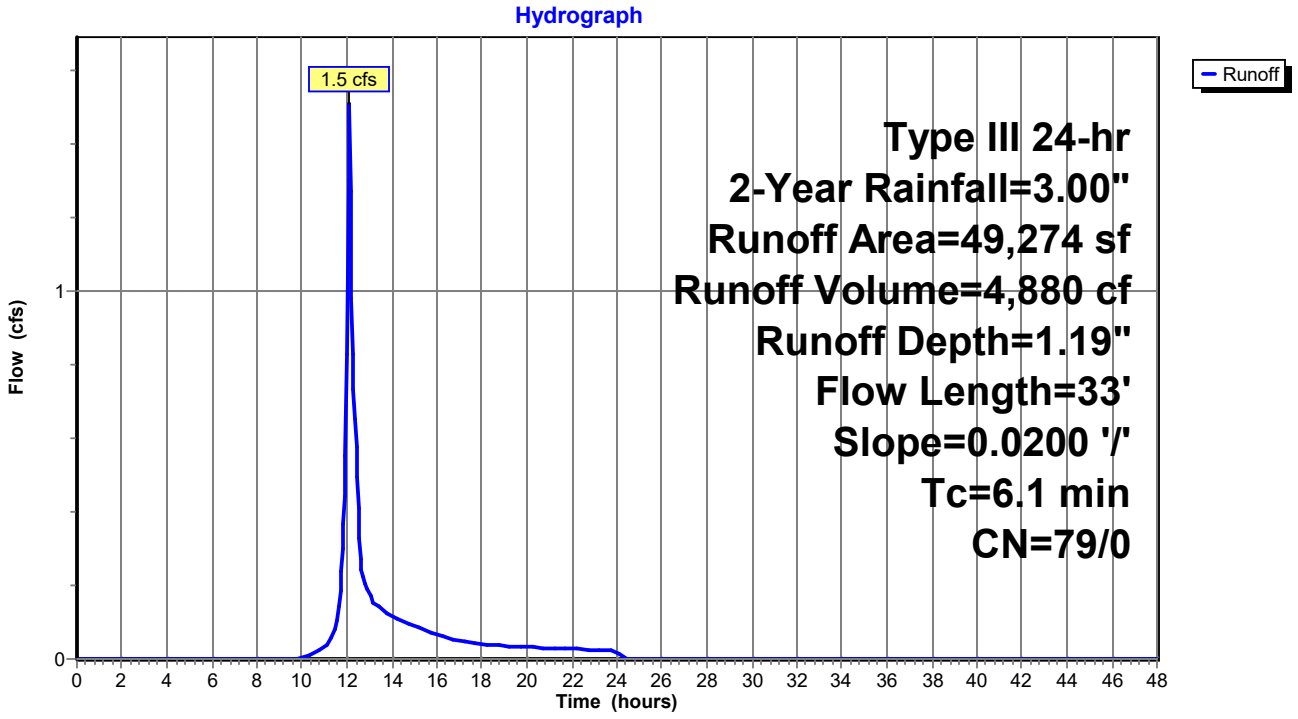
Runoff = 1.5 cfs @ 12.10 hrs, Volume= 4,880 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

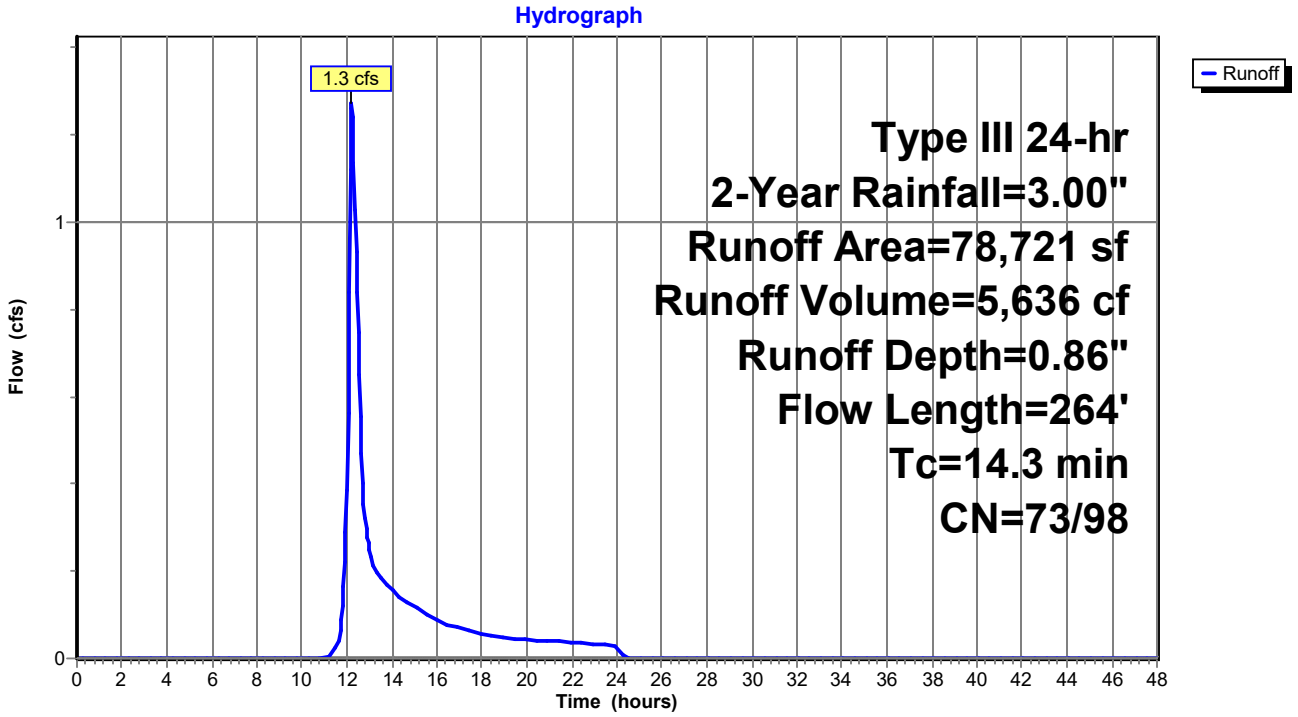
Runoff = 1.3 cfs @ 12.22 hrs, Volume= 5,636 cf, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

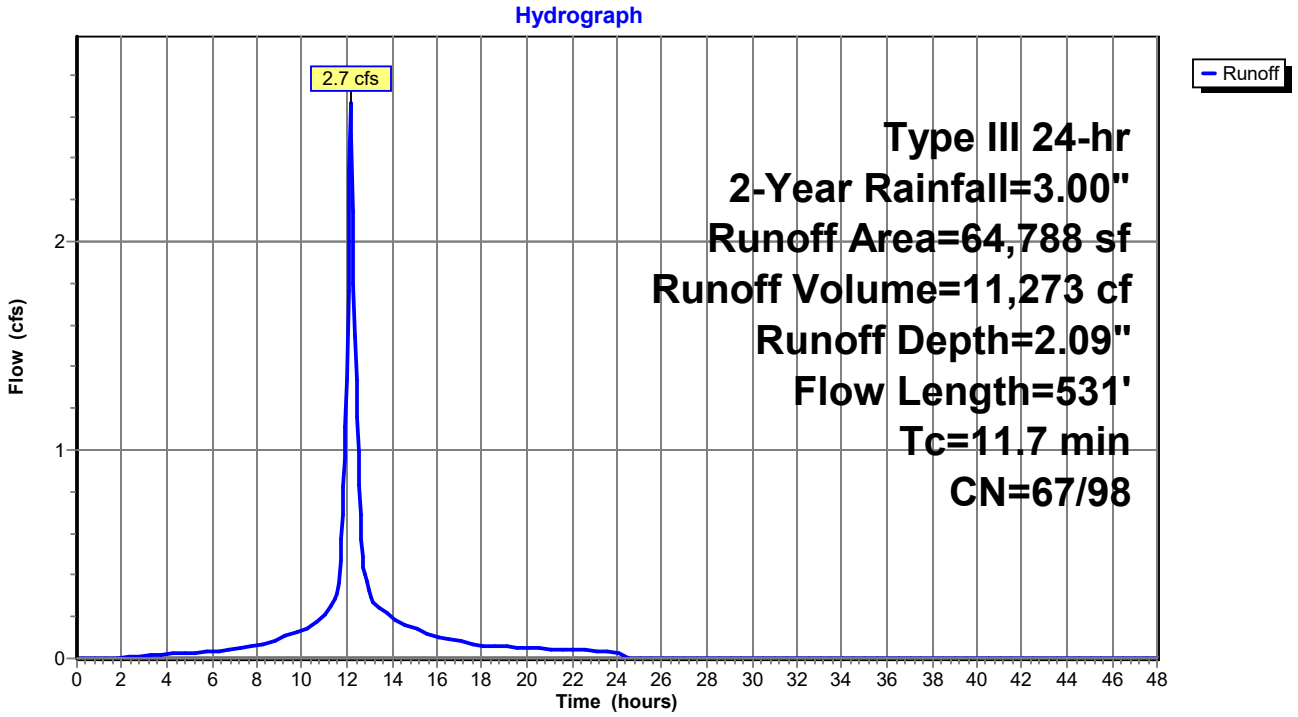
Runoff = 2.7 cfs @ 12.16 hrs, Volume= 11,273 cf, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,788	88	Weighted Average
20,190	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

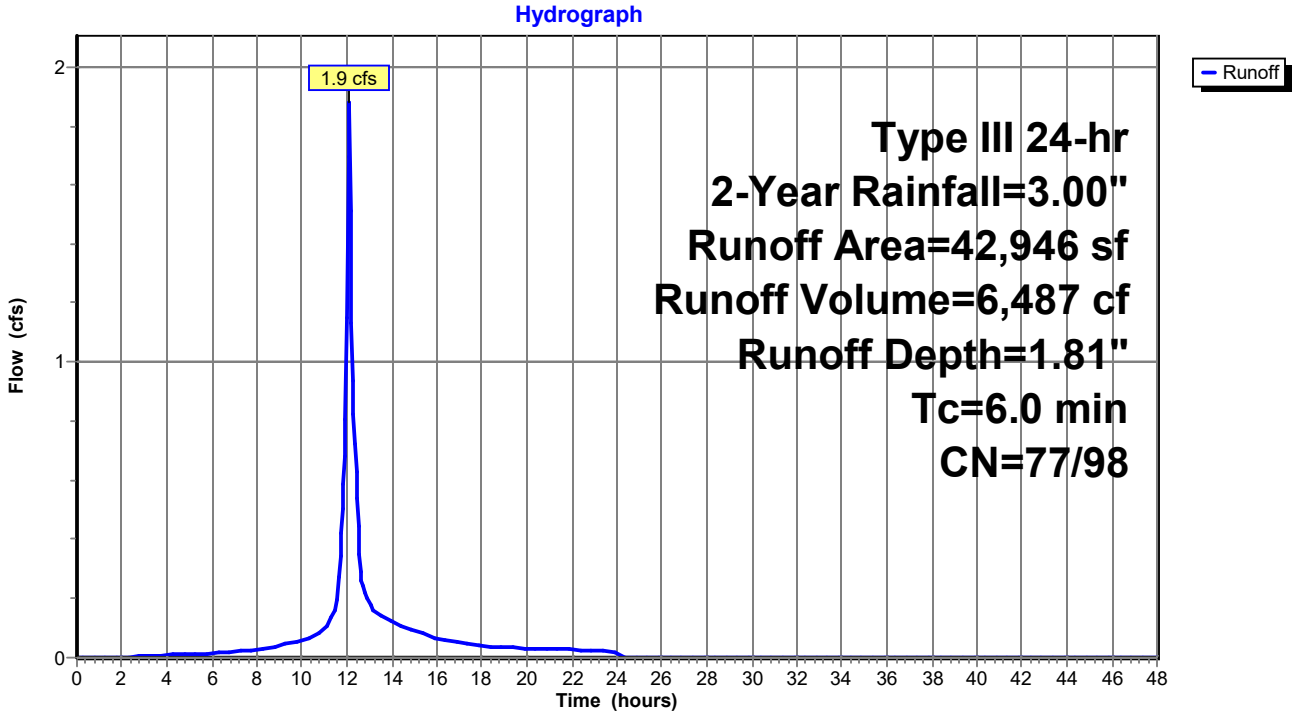
Runoff = 1.9 cfs @ 12.09 hrs, Volume= 6,487 cf, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

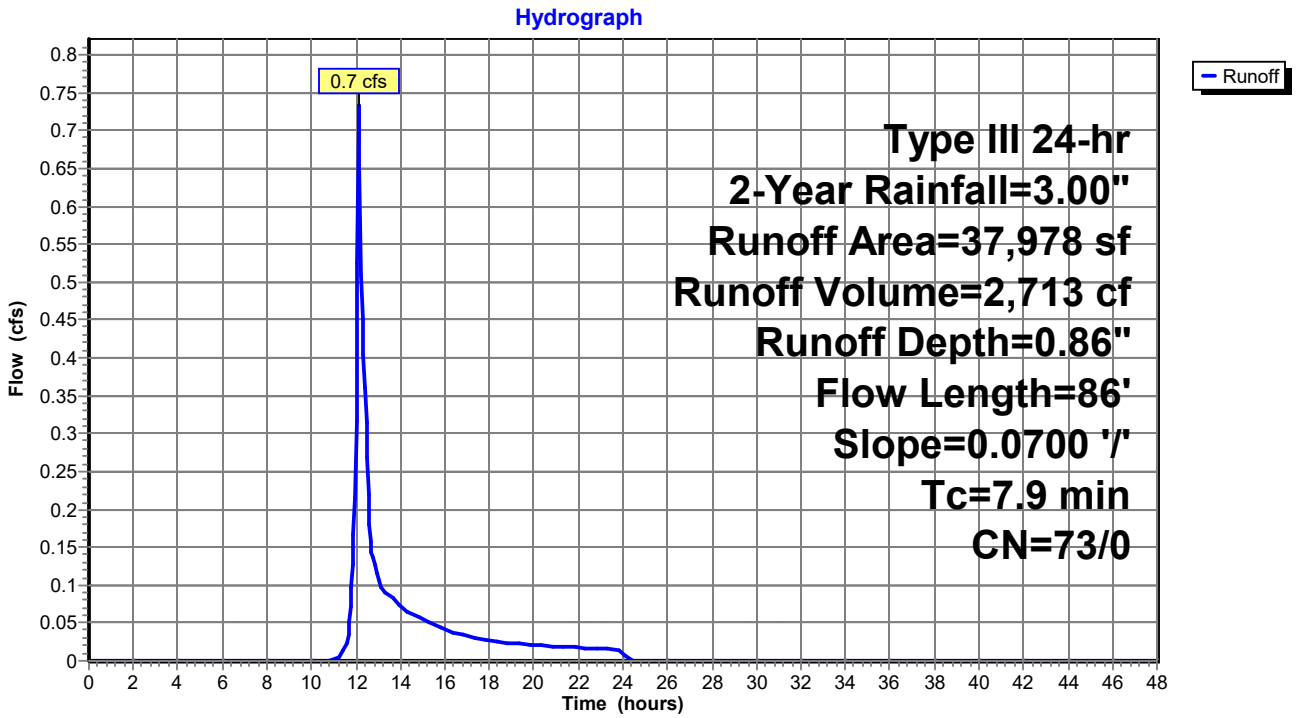
Runoff = 0.7 cfs @ 12.13 hrs, Volume= 2,713 cf, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

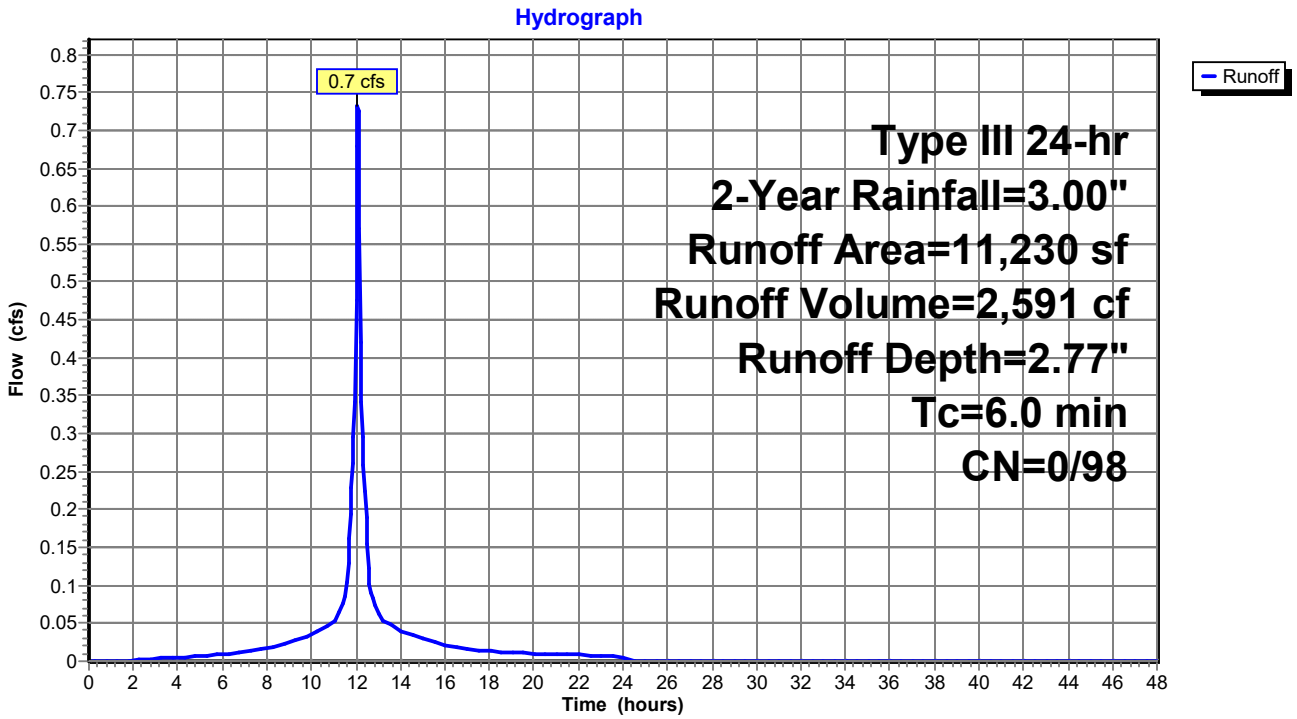
Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,591 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

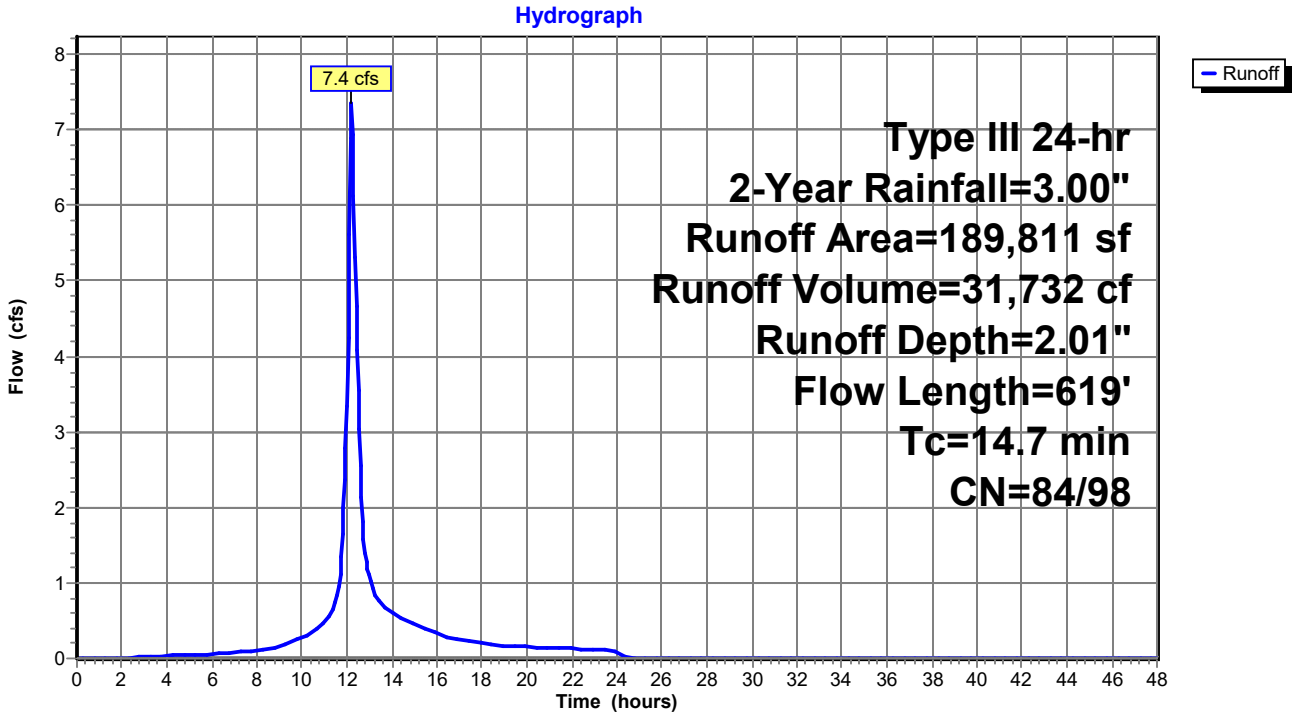
Runoff = 7.4 cfs @ 12.20 hrs, Volume= 31,732 cf, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

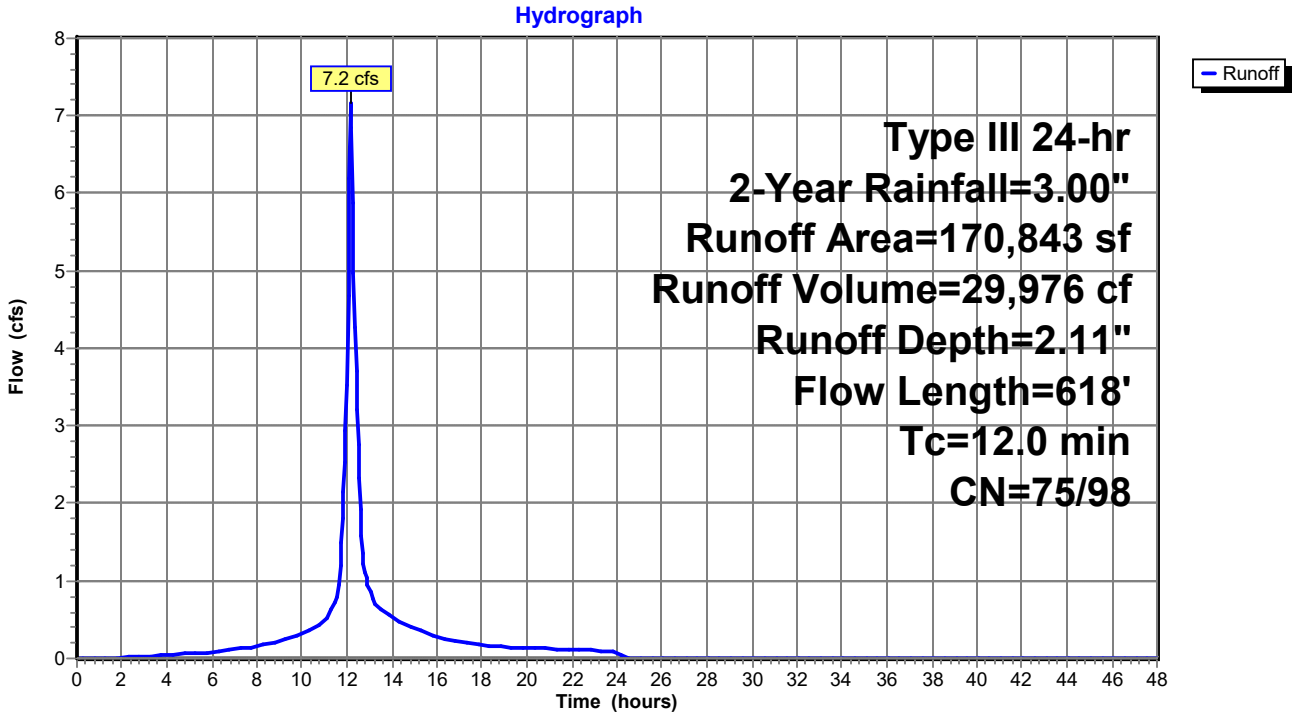
Runoff = 7.2 cfs @ 12.16 hrs, Volume= 29,976 cf, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

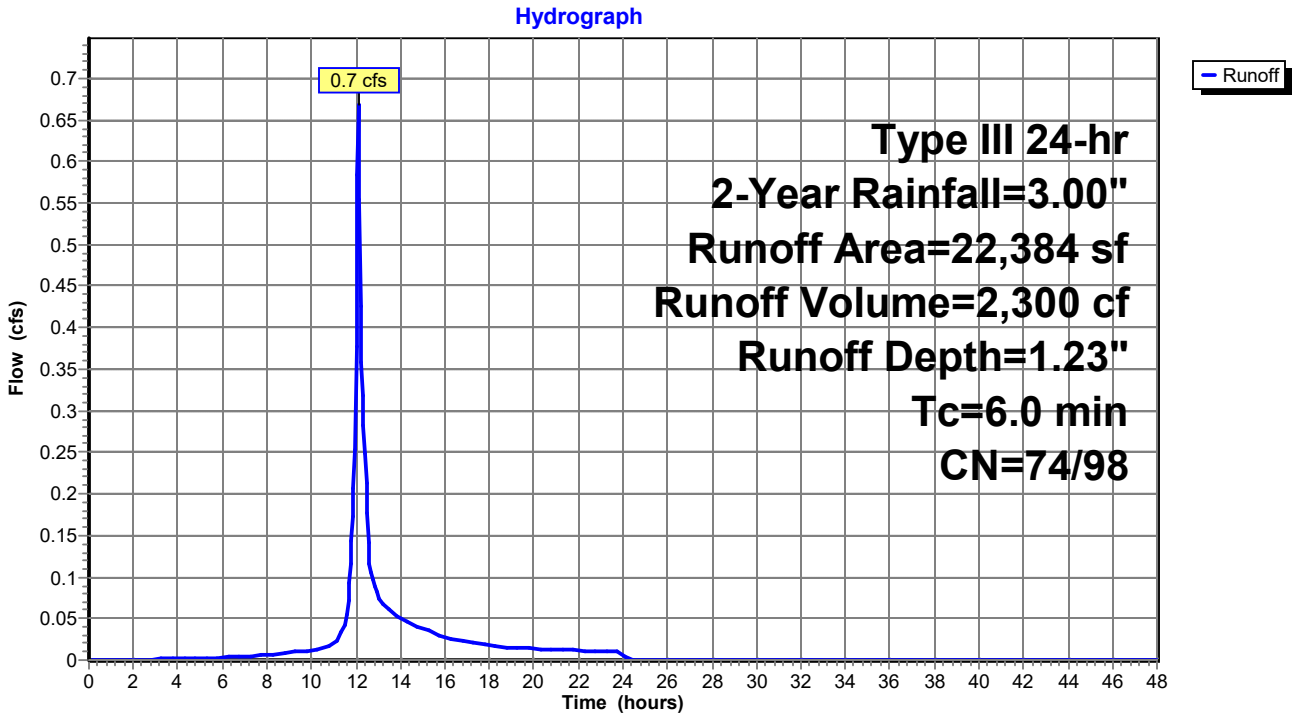
Runoff = 0.7 cfs @ 12.10 hrs, Volume= 2,300 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

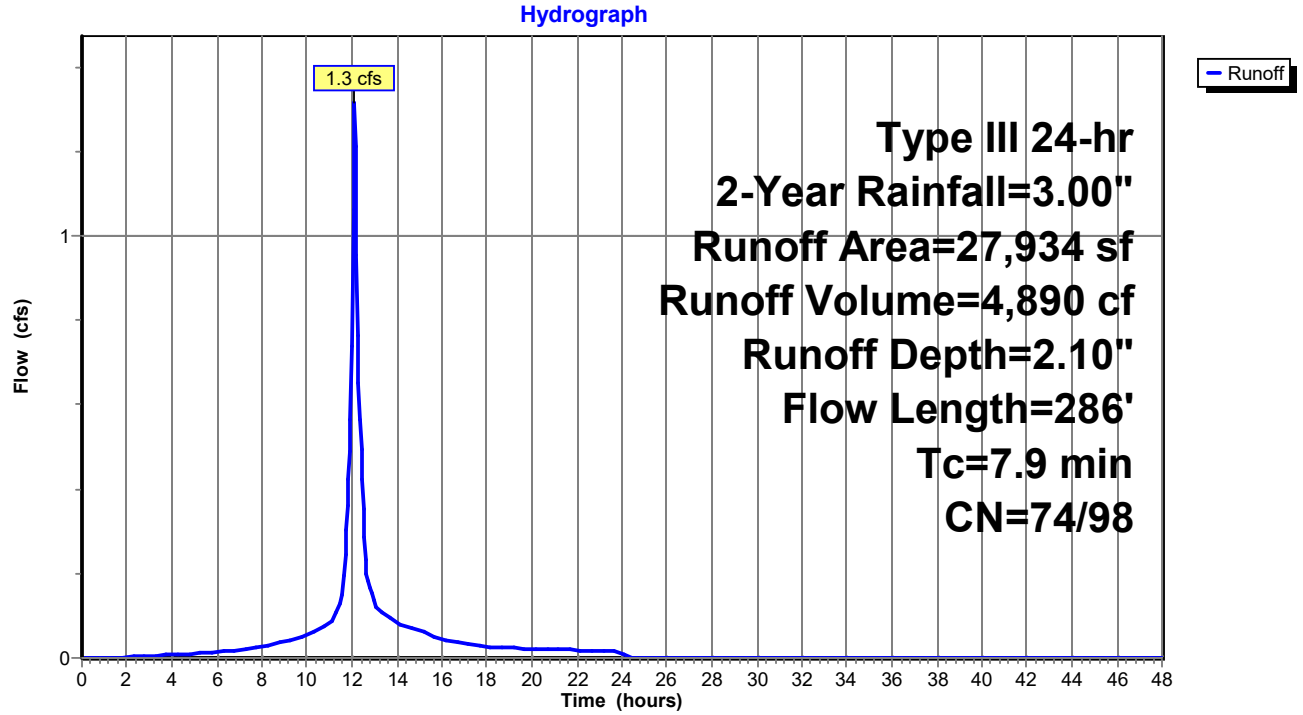
Runoff = 1.3 cfs @ 12.11 hrs, Volume= 4,890 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

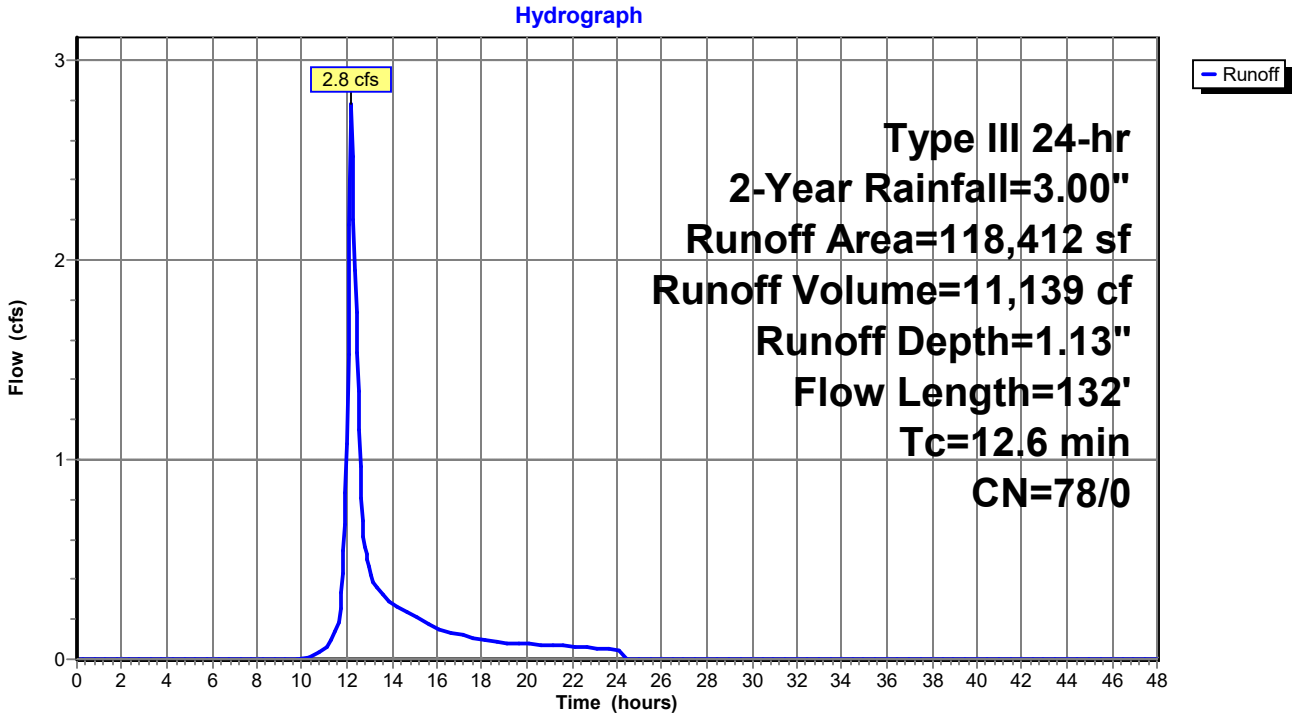
Runoff = 2.8 cfs @ 12.19 hrs, Volume= 11,139 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 142,855 sf, 49.65% Impervious, Inflow Depth = 1.53" for 2-Year event
Inflow = 3.5 cfs @ 12.23 hrs, Volume= 18,178 cf
Outflow = 1.7 cfs @ 12.58 hrs, Volume= 13,987 cf, Atten= 53%, Lag= 20.6 min
Primary = 1.7 cfs @ 12.58 hrs, Volume= 13,987 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.38' @ 12.58 hrs Surf.Area= 7,849 sf Storage= 8,392 cf

Plug-Flow detention time= 220.1 min calculated for 13,972 cf (77% of inflow)
Center-of-Mass det. time= 133.6 min (919.5 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,316 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,868 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,798 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482

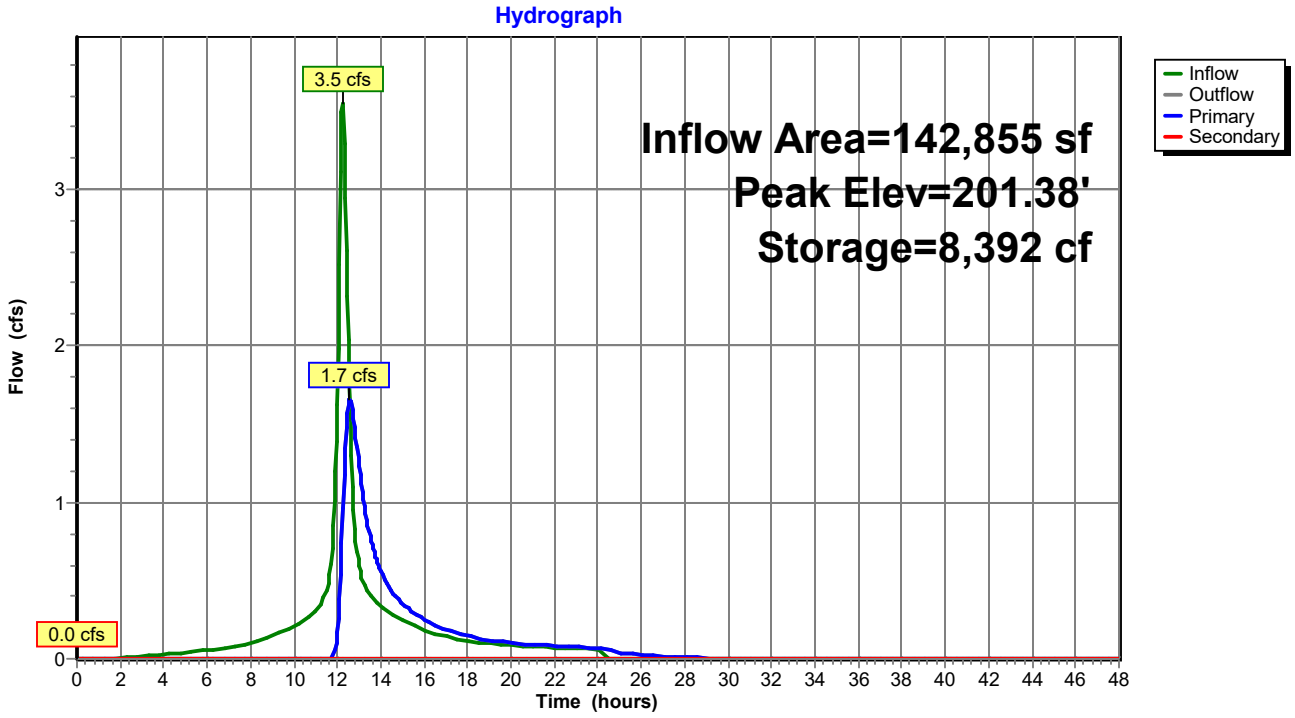
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.6 cfs @ 12.58 hrs HW=201.38' (Free Discharge)
└**1=Culvert** (Passes 1.6 cfs of 7.0 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 1.6 cfs @ 2.61 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 2.05" for 2-Year event
Inflow = 7.8 cfs @ 12.19 hrs, Volume= 34,323 cf
Outflow = 3.9 cfs @ 12.48 hrs, Volume= 29,122 cf, Atten= 50%, Lag= 17.2 min
Primary = 3.9 cfs @ 12.48 hrs, Volume= 29,122 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.16' @ 12.48 hrs Surf.Area= 13,293 sf Storage= 12,797 cf

Plug-Flow detention time= 149.9 min calculated for 29,122 cf (85% of inflow)
Center-of-Mass det. time= 83.6 min (880.7 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

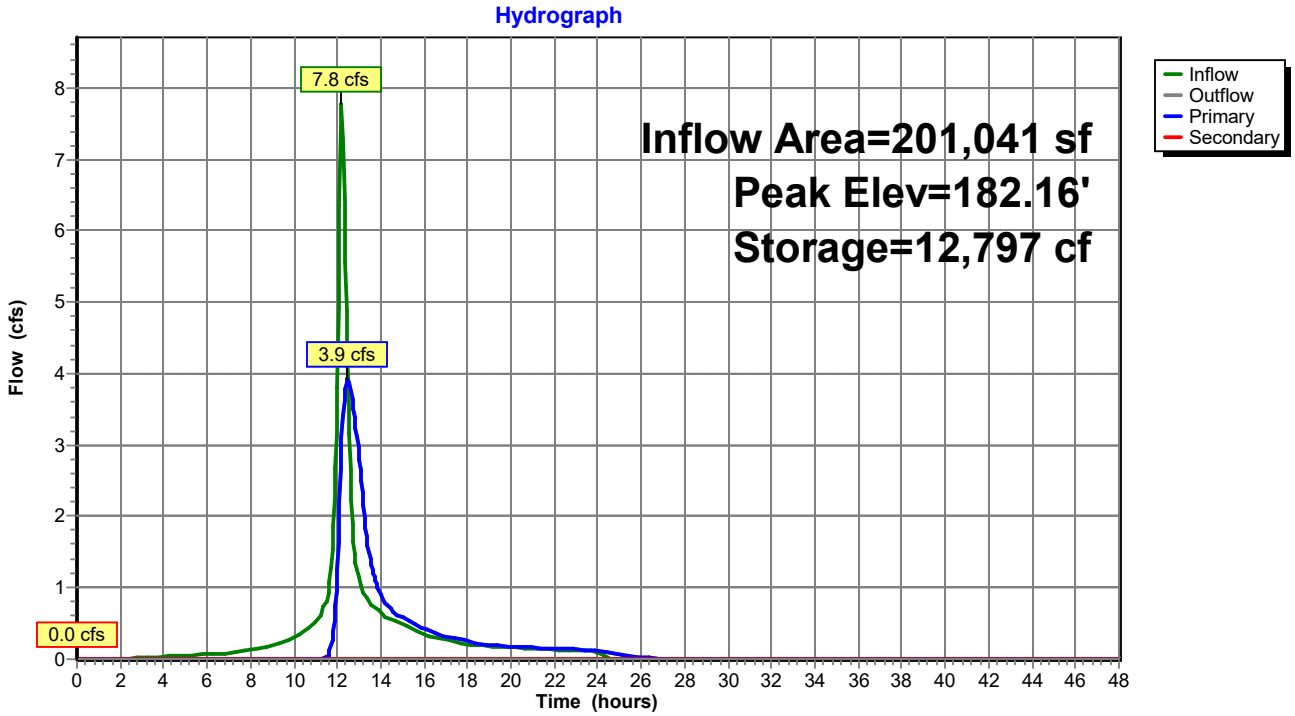
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.9 cfs @ 12.48 hrs HW=182.16' (Free Discharge)
└1=**Culvert** (Passes 3.9 cfs of 21.2 cfs potential flow)
  └2=**Orifice/Grate** (Orifice Controls 3.9 cfs @ 3.36 fps)
  └3=**Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└4=**Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 0.86" for 2-Year event
Inflow = 1.3 cfs @ 12.22 hrs, Volume= 5,636 cf
Outflow = 0.1 cfs @ 14.73 hrs, Volume= 2,275 cf, Atten= 90%, Lag= 150.6 min
Primary = 0.1 cfs @ 14.73 hrs, Volume= 2,275 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.02' @ 14.73 hrs Surf.Area= 7,196 sf Storage= 3,476 cf

Plug-Flow detention time= 339.1 min calculated for 2,273 cf (40% of inflow)
Center-of-Mass det. time= 197.7 min (1,074.8 - 877.1)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

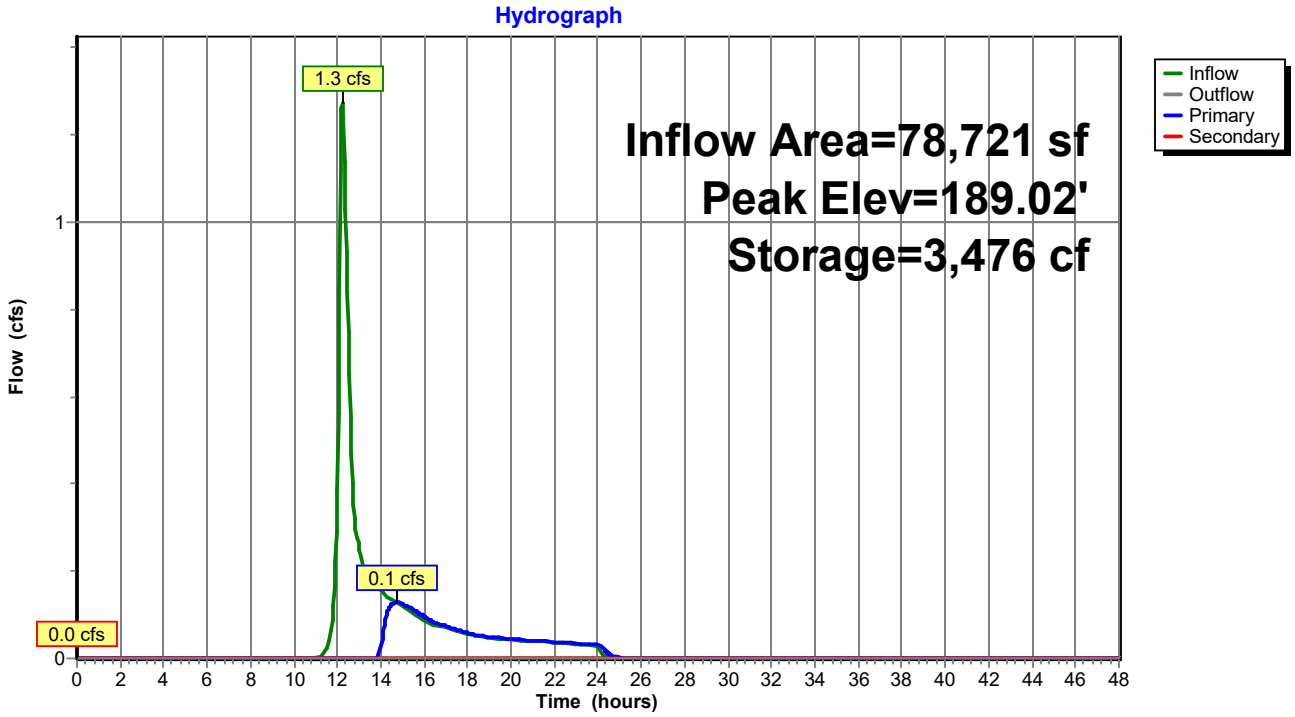
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.1 cfs @ 14.73 hrs HW=189.02' (Free Discharge)
└**1=Culvert** (Passes 0.1 cfs of 5.0 cfs potential flow)
└**2=15" Dome** (Custom Controls 0.1 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 2.10" for 2-Year event
Inflow = 1.3 cfs @ 12.11 hrs, Volume= 4,890 cf
Outflow = 0.5 cfs @ 12.38 hrs, Volume= 2,519 cf, Atten= 60%, Lag= 16.4 min
Primary = 0.5 cfs @ 12.38 hrs, Volume= 2,519 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.58' @ 12.38 hrs Surf.Area= 2,895 sf Storage= 2,598 cf

Plug-Flow detention time= 259.6 min calculated for 2,519 cf (52% of inflow)
Center-of-Mass det. time= 134.8 min (911.2 - 776.4)

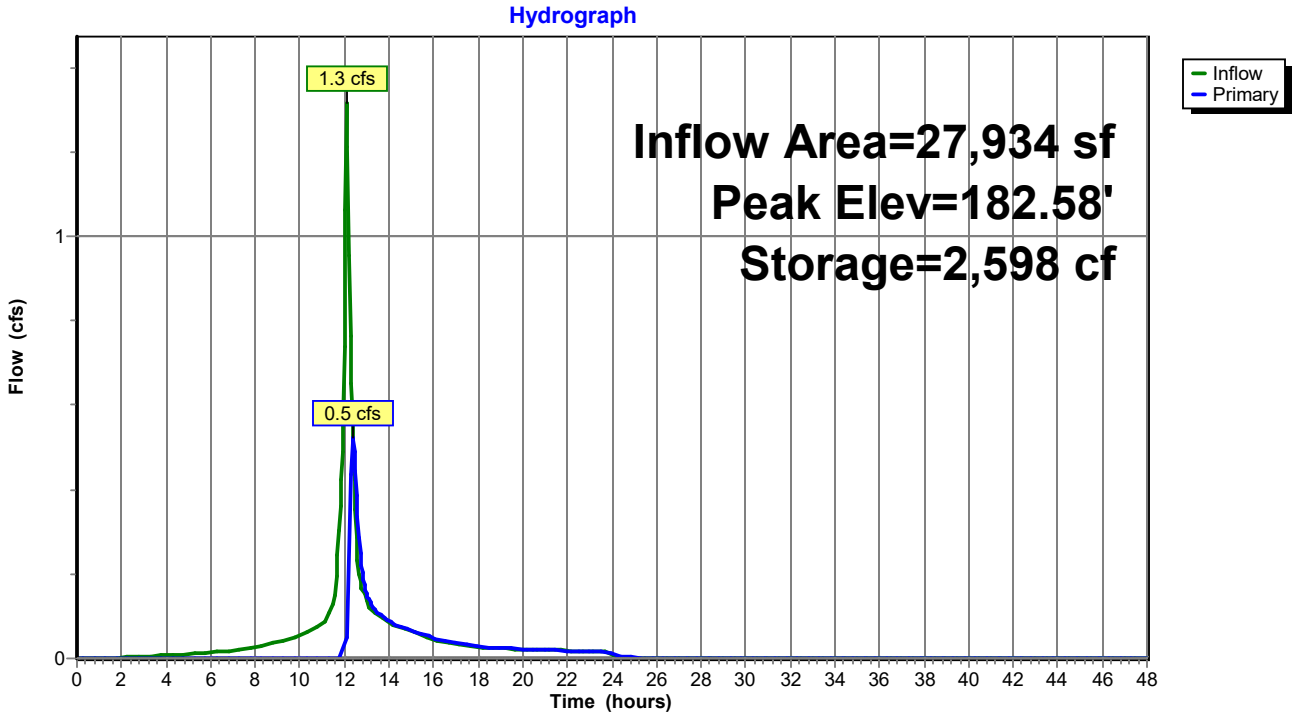
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.5 cfs @ 12.38 hrs HW=182.58' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.5 cfs @ 0.66 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 7.7 cfs @ 12.16 hrs, Volume= 34,794 cf
Outflow = 2.6 cfs @ 12.58 hrs, Volume= 34,754 cf, Atten= 66%, Lag= 25.1 min
Primary = 2.6 cfs @ 12.58 hrs, Volume= 34,754 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 179.69' @ 12.58 hrs Surf.Area= 9,322 sf Storage= 11,641 cf

Plug-Flow detention time= 96.0 min calculated for 34,718 cf (100% of inflow)
Center-of-Mass det. time= 96.5 min (889.6 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

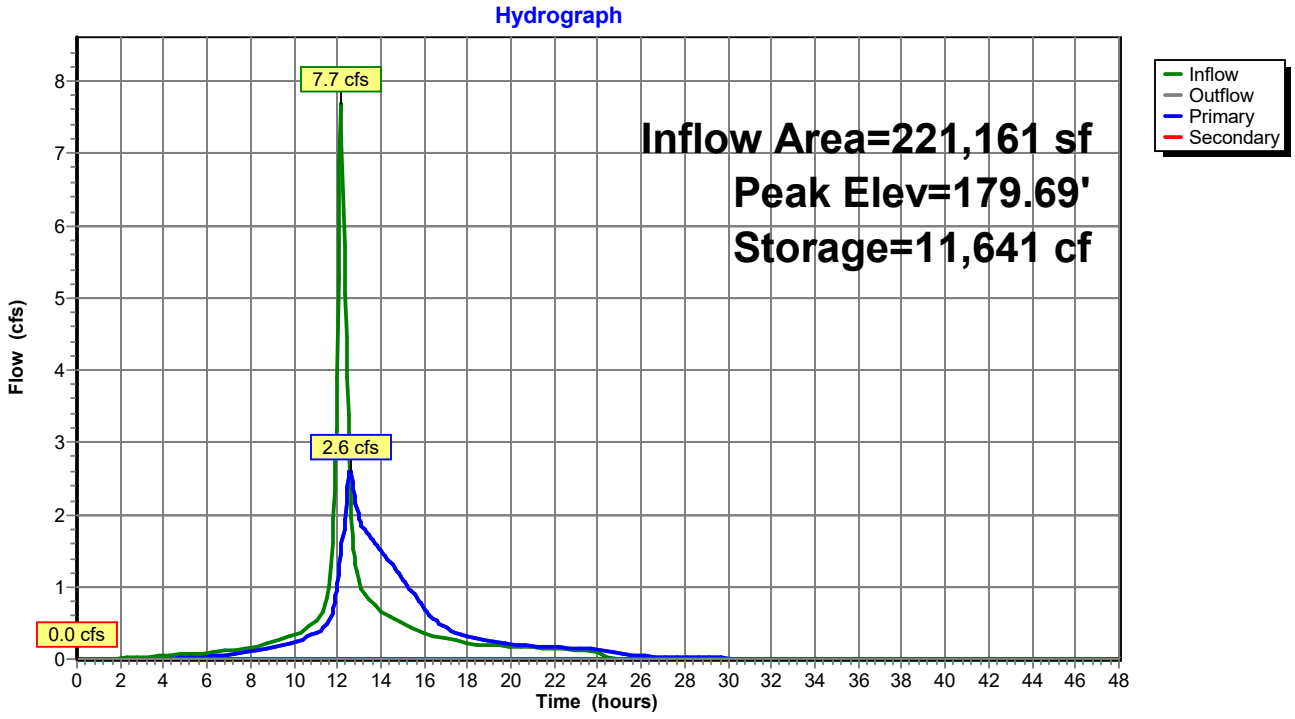
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.6 cfs @ 12.58 hrs HW=179.69' (Free Discharge)
└**1=Culvert** (Passes 2.6 cfs of 6.5 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.0 cfs @ 5.60 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.6 cfs @ 1.38 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,455 sf, 34.02% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 4.3 cfs @ 12.12 hrs, Volume= 20,034 cf
Outflow = 2.4 cfs @ 12.34 hrs, Volume= 17,136 cf, Atten= 45%, Lag= 12.9 min
Primary = 2.4 cfs @ 12.34 hrs, Volume= 17,136 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.59' @ 12.34 hrs Surf.Area= 7,057 sf Storage= 6,812 cf

Plug-Flow detention time= 166.8 min calculated for 17,118 cf (85% of inflow)
Center-of-Mass det. time= 97.5 min (911.5 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

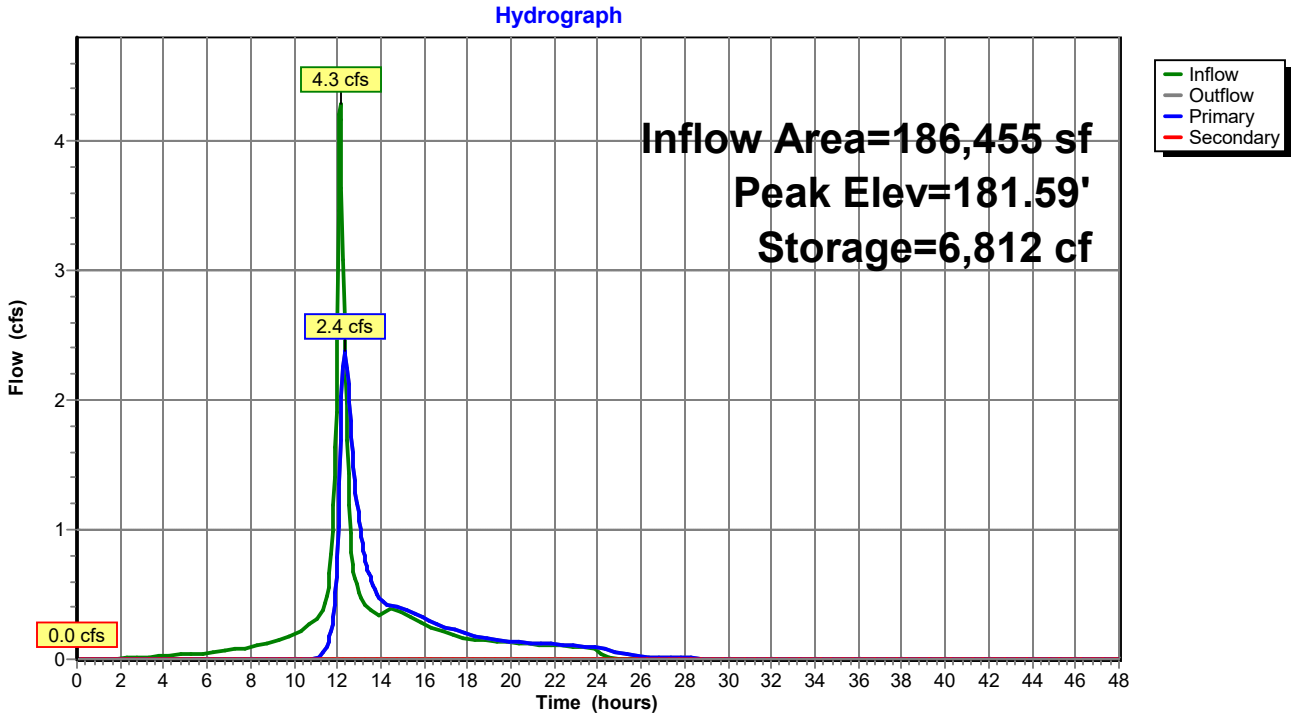
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.4 cfs @ 12.34 hrs HW=181.59' (Free Discharge)
└**1=Culvert** (Passes 2.4 cfs of 6.4 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 2.4 cfs @ 2.31 fps)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

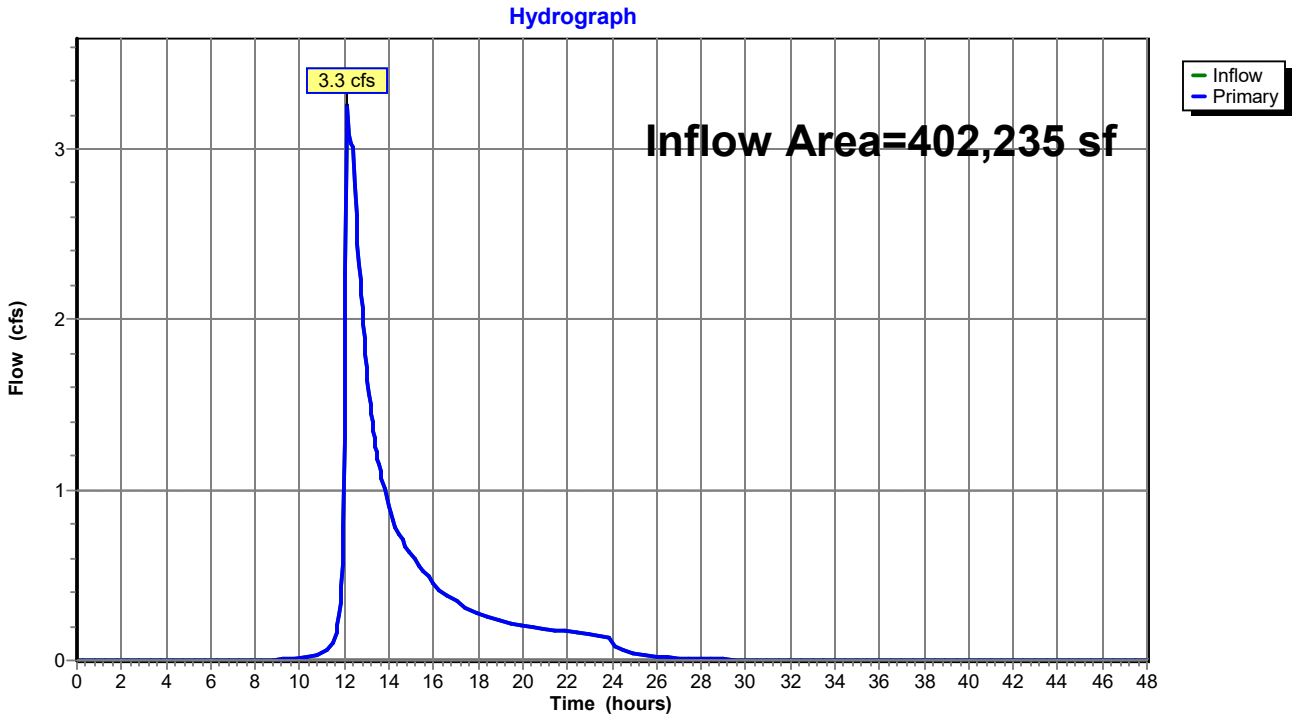


Summary for Link DP-1: Offsite to North

Inflow Area = 402,235 sf, 18.20% Impervious, Inflow Depth = 0.78" for 2-Year event
Inflow = 3.3 cfs @ 12.15 hrs, Volume= 26,166 cf
Primary = 3.3 cfs @ 12.15 hrs, Volume= 26,166 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

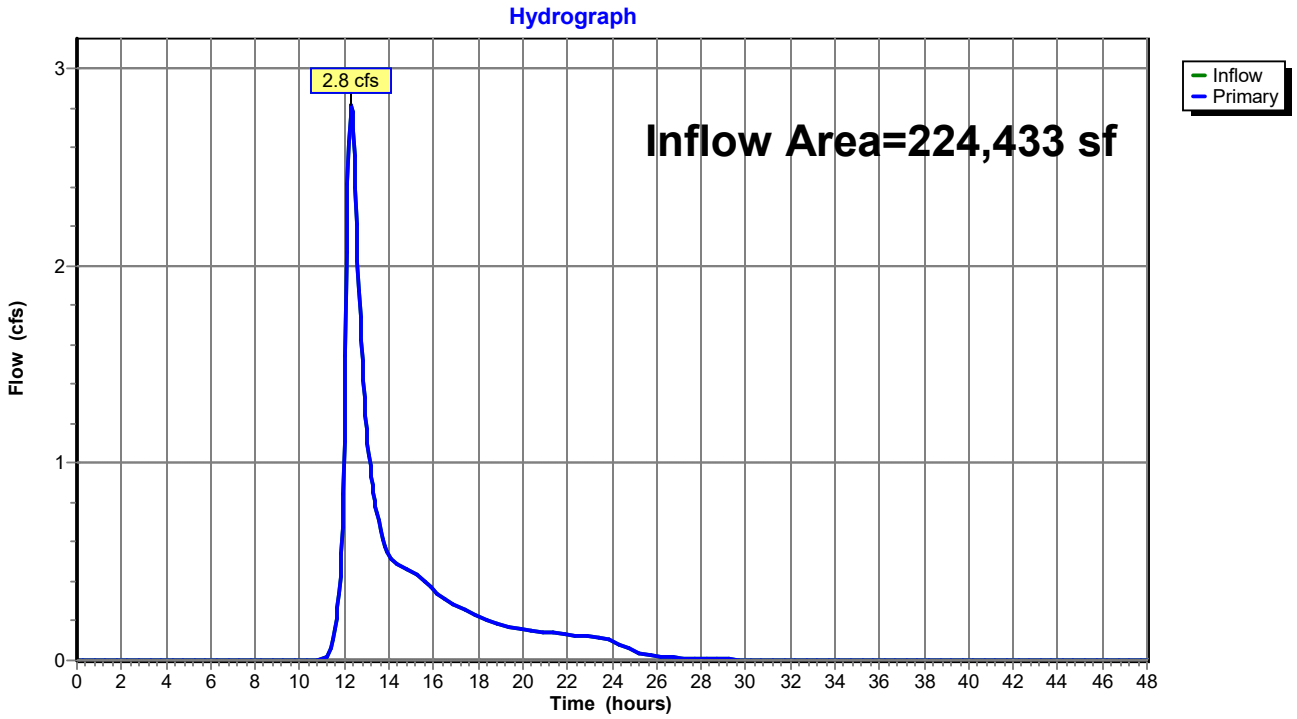


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,433 sf, 28.27% Impervious, Inflow Depth = 1.06" for 2-Year event
Inflow = 2.8 cfs @ 12.31 hrs, Volume= 19,849 cf
Primary = 2.8 cfs @ 12.31 hrs, Volume= 19,849 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

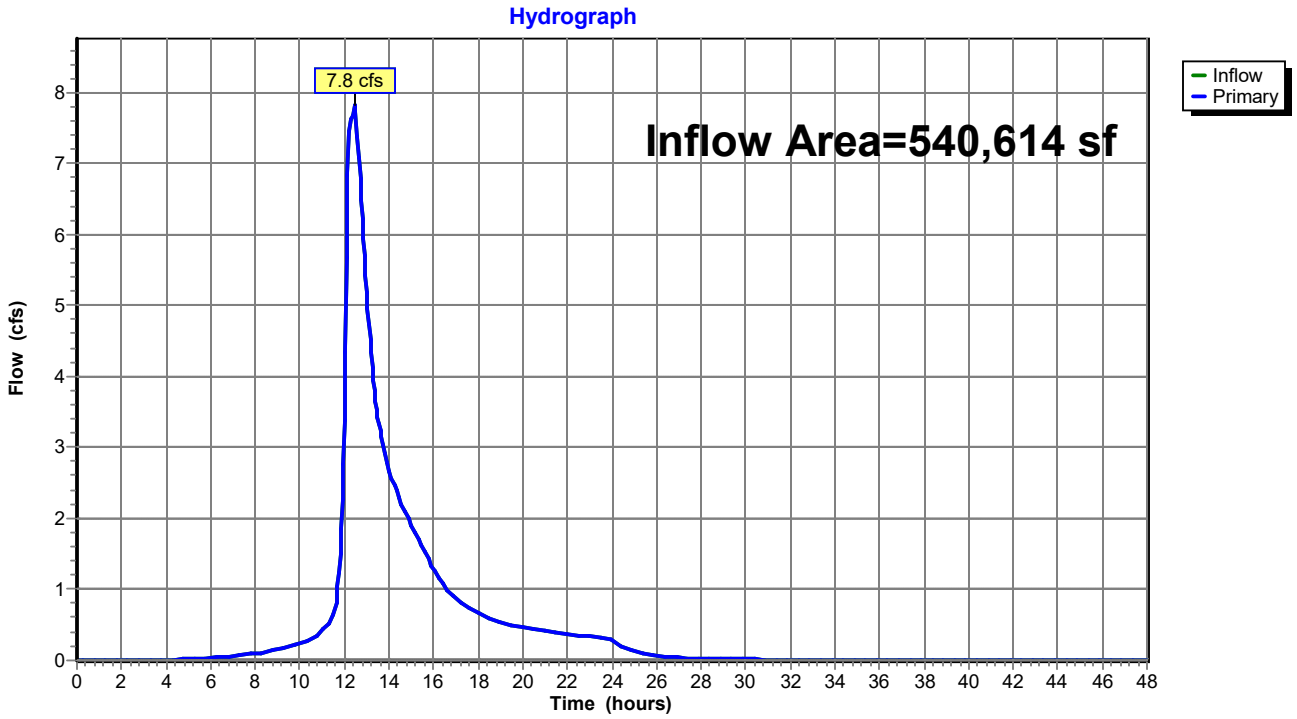


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth > 1.67" for 2-Year event
Inflow = 7.8 cfs @ 12.46 hrs, Volume= 75,015 cf
Primary = 7.8 cfs @ 12.46 hrs, Volume= 75,015 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=142,855 sf 49.65% Impervious Runoff Depth=2.68"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=6.4 cfs 31,873 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=1.26"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=3.0 cfs 10,967 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=0.64"
Flow Length=284' Tc=12.8 min CN=47/98 Runoff=0.3 cfs 2,008 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=1.39"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=2.1 cfs 7,932 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=3.2 cfs 10,104 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=1.97"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=3.2 cfs 12,948 cf

Subcatchment PS-2B: Runoff Area=64,788 sf 68.84% Impervious Runoff Depth=3.48"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=4.5 cfs 18,793 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=3.20"
Tc=6.0 min CN=77/98 Runoff=3.3 cfs 11,443 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=1.97"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=1.8 cfs 6,239 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=0/98 Runoff=1.1 cfs 4,084 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=3.48"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=12.7 cfs 54,995 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=3.54"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=12.1 cfs 50,461 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=74/98 Runoff=1.4 cfs 4,577 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=3.53"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=2.2 cfs 8,225 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=2.38"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=6.0 cfs 23,442 cf

Pond 1P: Infiltration Basin #1 Peak Elev=201.81' Storage=11,530 cf Inflow=6.4 cfs 31,873 cf
Primary=3.7 cfs 27,682 cf Secondary=0.0 cfs 0 cf Outflow=3.7 cfs 27,682 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.63' Storage=18,659 cf Inflow=13.4 cfs 59,079 cf
Primary=7.8 cfs 53,879 cf Secondary=0.0 cfs 0 cf Outflow=7.8 cfs 53,879 cf

Pond 3P: Runoff Collection Area Peak Elev=189.16' Storage=4,494 cf Inflow=3.2 cfs 12,948 cf
Primary=1.7 cfs 9,586 cf Secondary=0.0 cfs 0 cf Outflow=1.7 cfs 9,586 cf

Pond 5P: Bioretention Basin Peak Elev=182.69' Storage=2,927 cf Inflow=2.2 cfs 8,225 cf
Outflow=2.0 cfs 5,853 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=180.38' Storage=17,507 cf Inflow=15.1 cfs 60,891 cf
Primary=7.1 cfs 60,848 cf Secondary=0.0 cfs 0 cf Outflow=7.1 cfs 60,848 cf

Pond 8P: Infiltration Basin #2 Peak Elev=181.86' Storage=8,767 cf Inflow=7.4 cfs 39,822 cf
Primary=5.0 cfs 36,923 cf Secondary=0.0 cfs 0 cf Outflow=5.0 cfs 36,923 cf

Link DP-1: Offsite to North Inflow=9.8 cfs 58,692 cf
Primary=9.8 cfs 58,692 cf

Link DP-2: Offsite to Southeast Inflow=6.1 cfs 43,162 cf
Primary=6.1 cfs 43,162 cf

Link DP-3: Offsite to Northeast Inflow=18.4 cfs 138,169 cf
Primary=18.4 cfs 138,169 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 258,089 cf Average Runoff Depth = 2.65"
69.83% Pervious = 815,148 sf 30.17% Impervious = 352,133 sf

Summary for Subcatchment PS-1A:

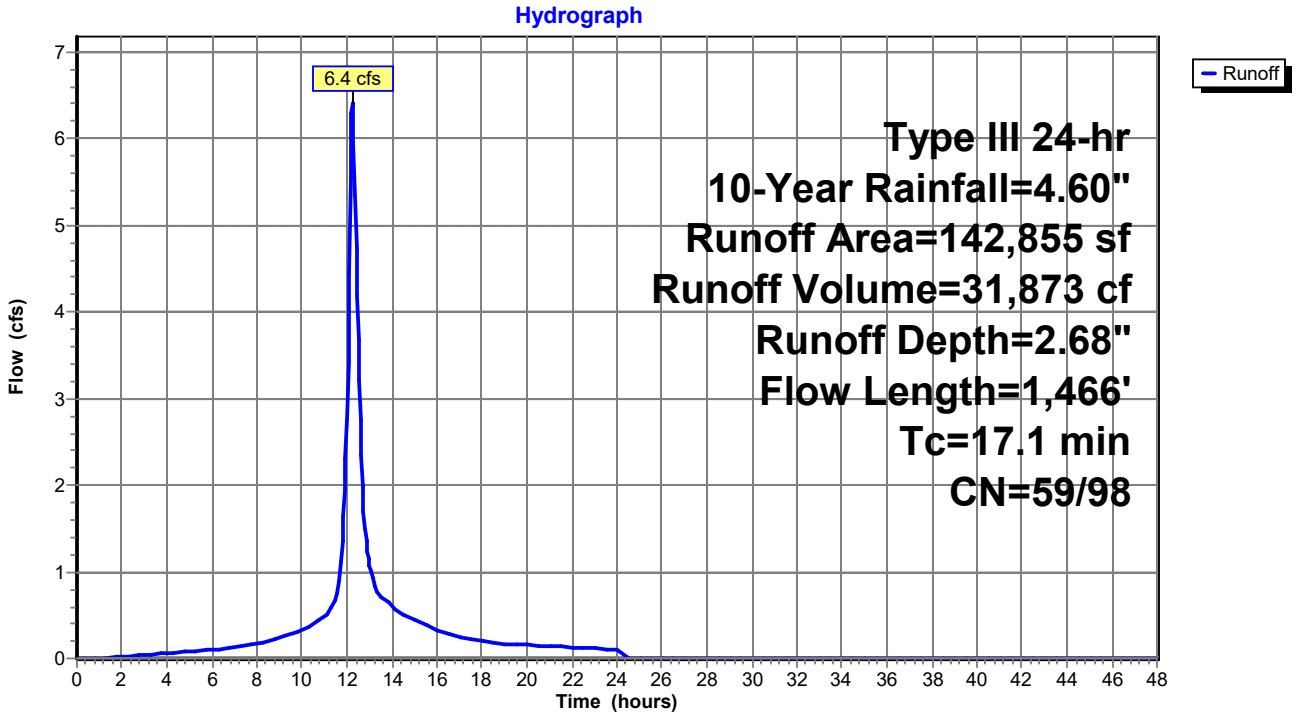
Runoff = 6.4 cfs @ 12.23 hrs, Volume= 31,873 cf, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
142,855	78	Weighted Average
71,926	59	50.35% Pervious Area
70,929	98	49.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

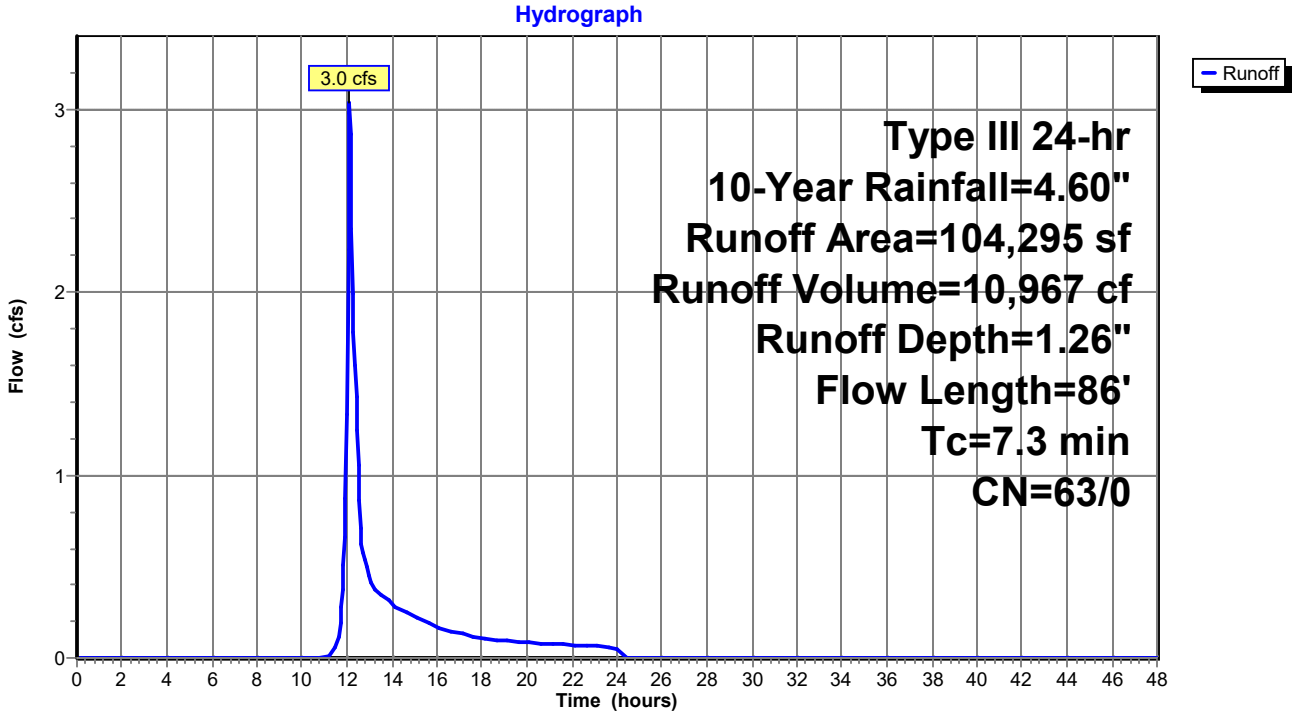
Runoff = 3.0 cfs @ 12.12 hrs, Volume= 10,967 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

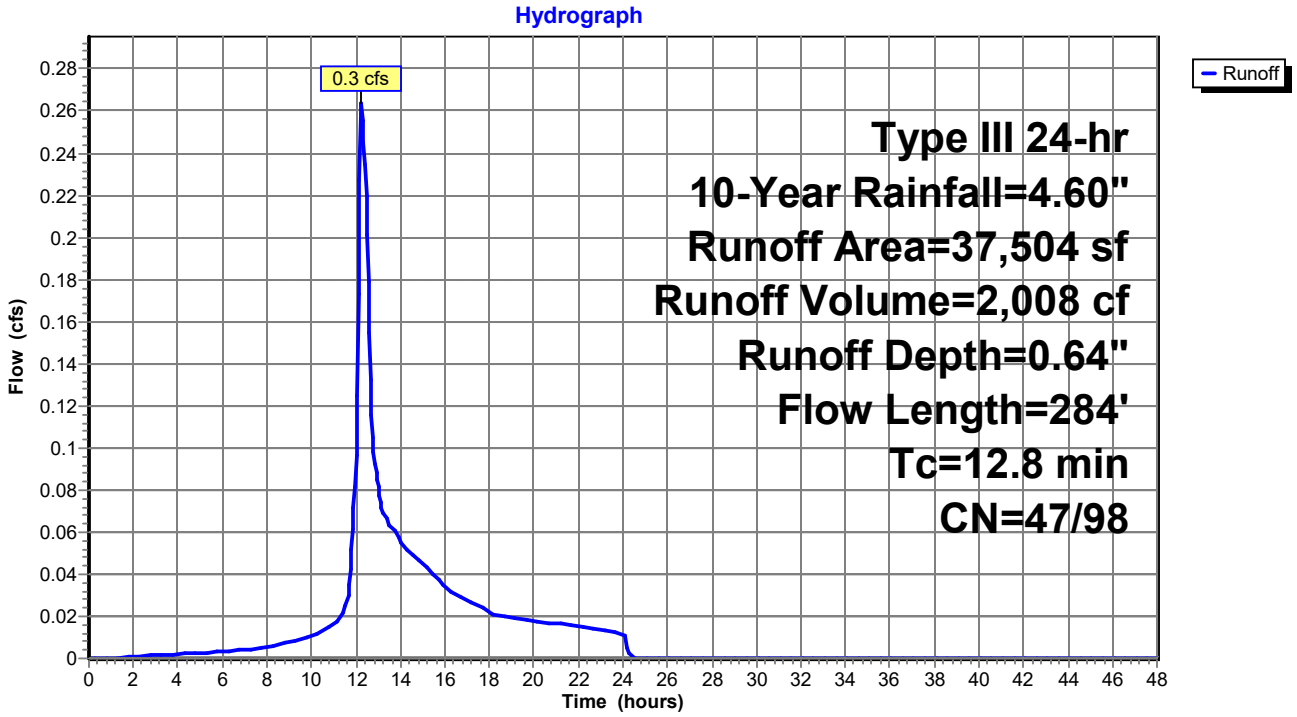
Runoff = 0.3 cfs @ 12.24 hrs, Volume= 2,008 cf, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
9,878	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	50	Weighted Average
35,242	47	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

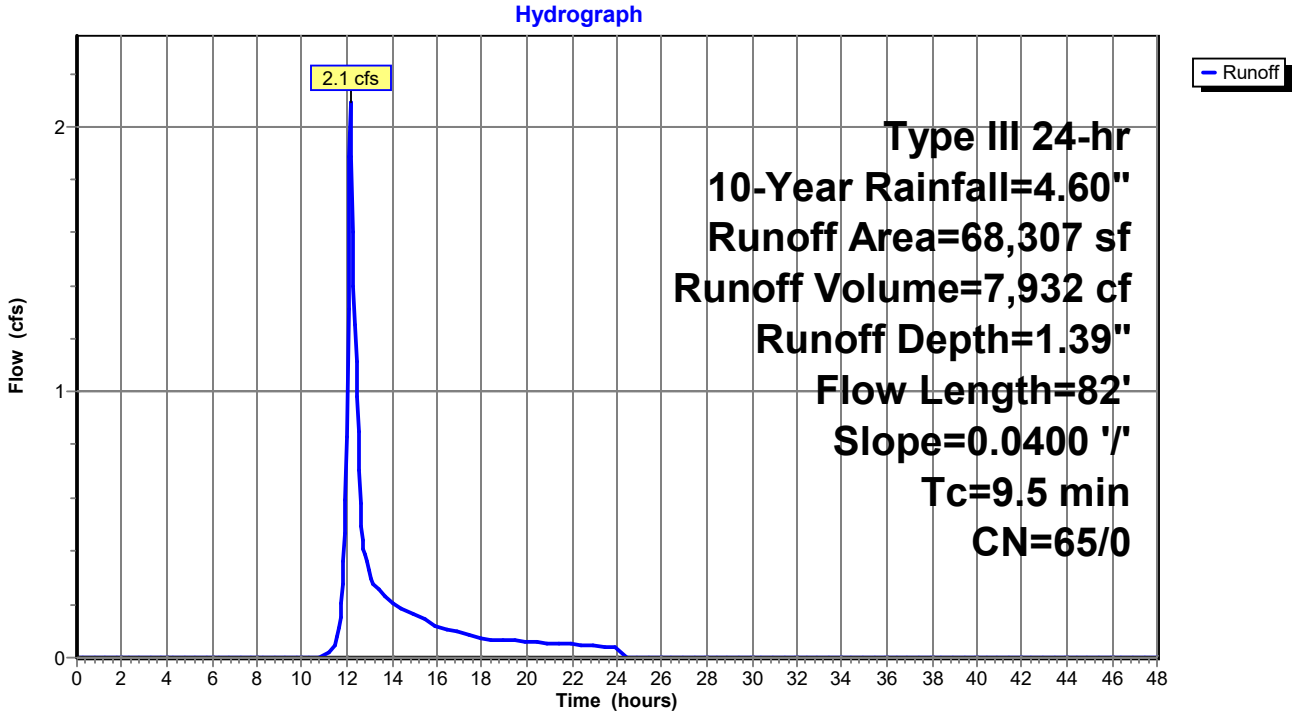
Runoff = 2.1 cfs @ 12.15 hrs, Volume= 7,932 cf, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

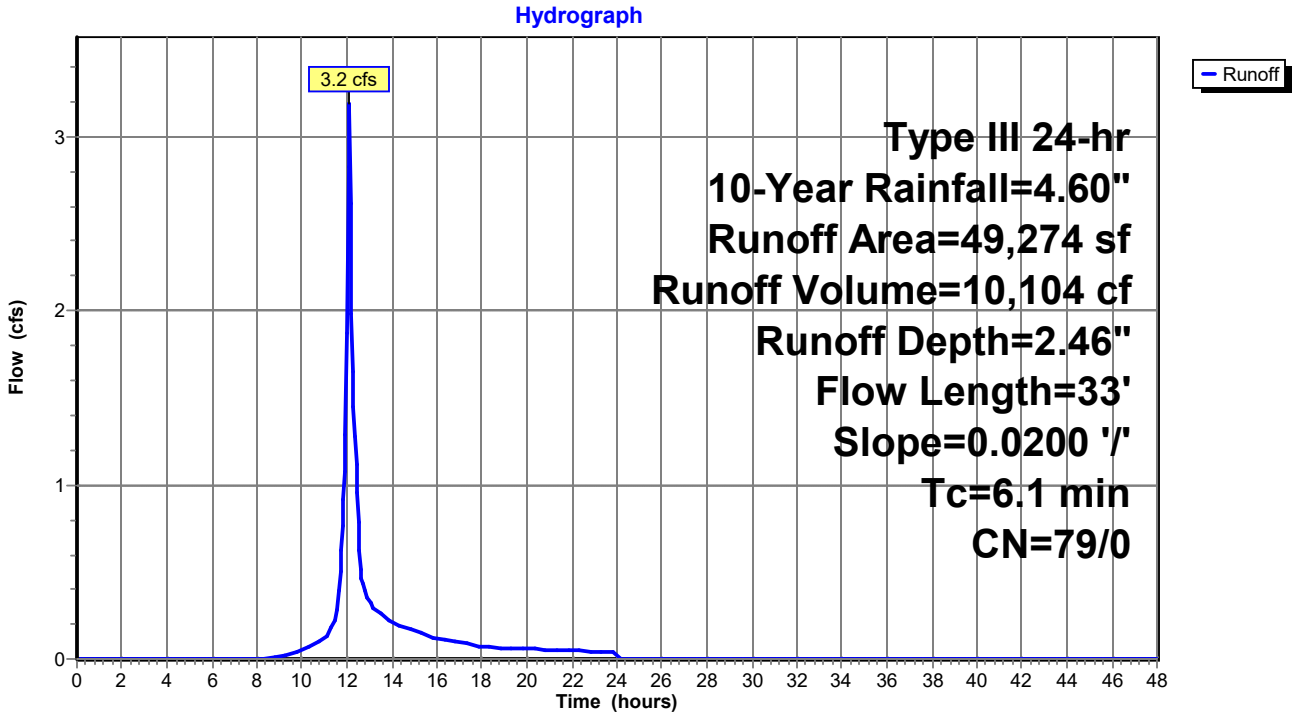
Runoff = 3.2 cfs @ 12.09 hrs, Volume= 10,104 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

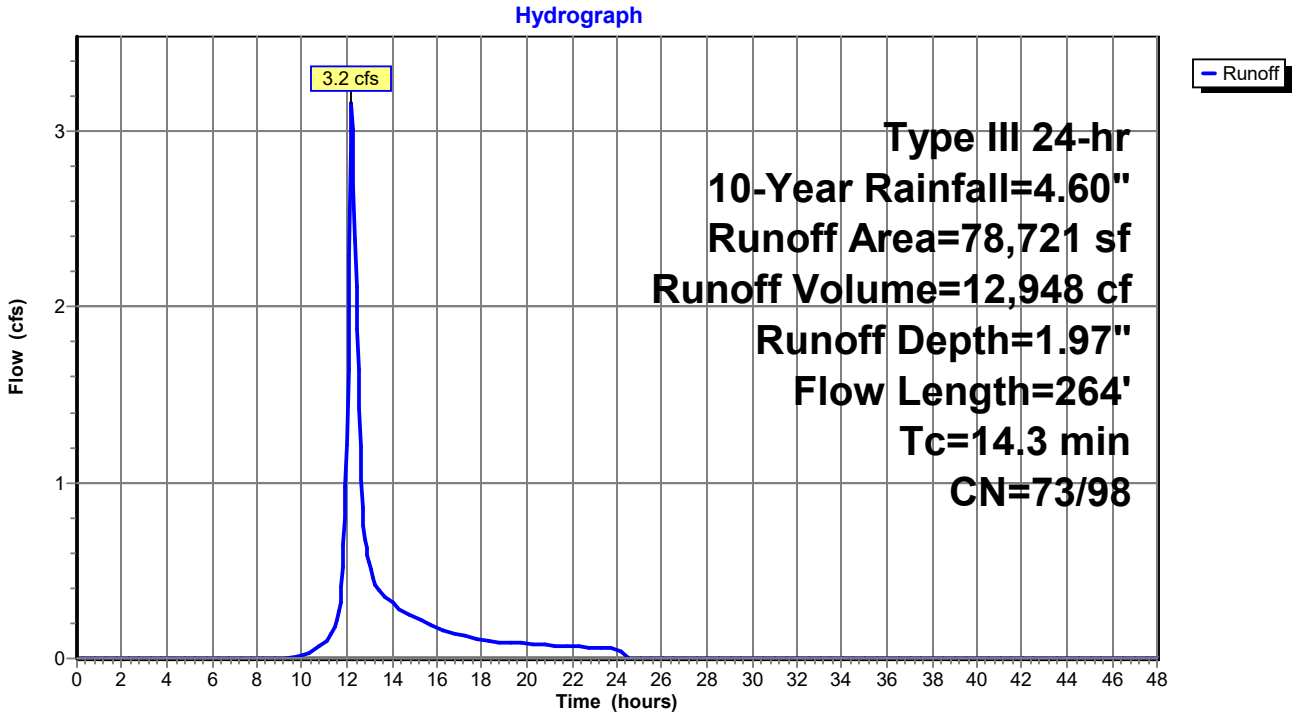
Runoff = 3.2 cfs @ 12.21 hrs, Volume= 12,948 cf, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

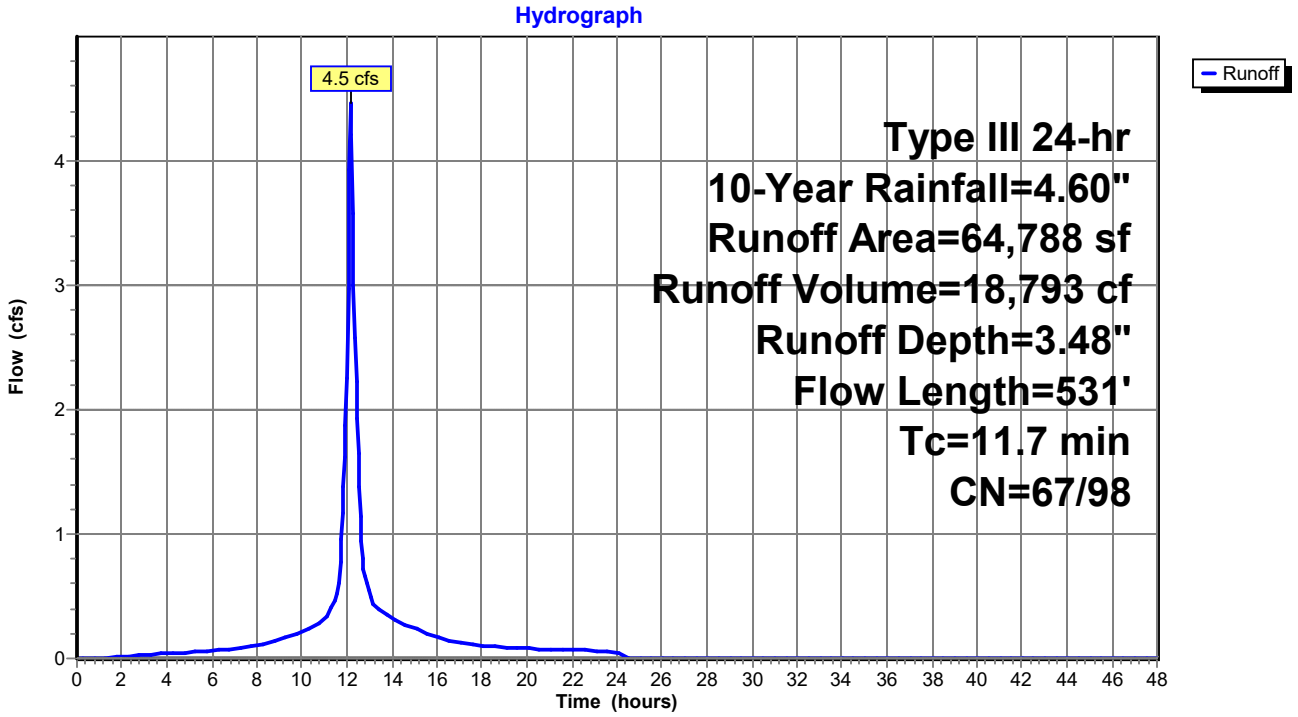
Runoff = 4.5 cfs @ 12.16 hrs, Volume= 18,793 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,788	88	Weighted Average
20,190	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

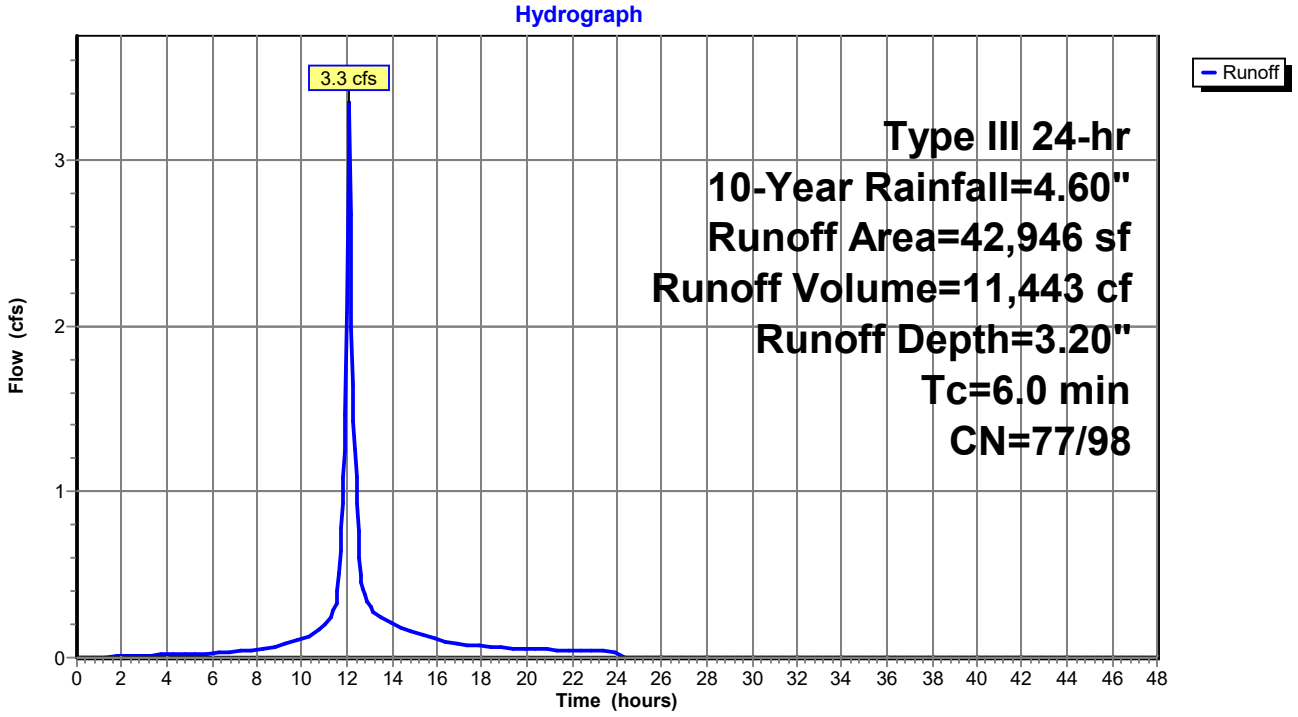
Runoff = 3.3 cfs @ 12.09 hrs, Volume= 11,443 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

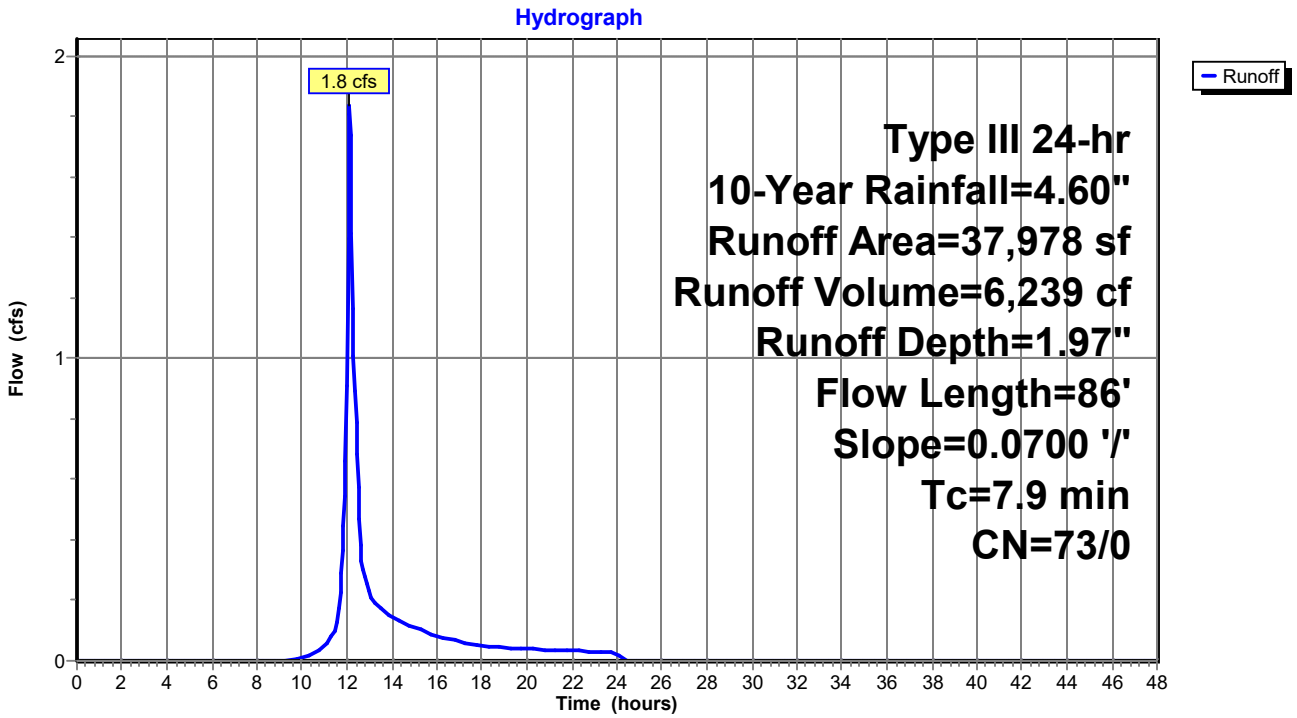
Runoff = 1.8 cfs @ 12.12 hrs, Volume= 6,239 cf, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

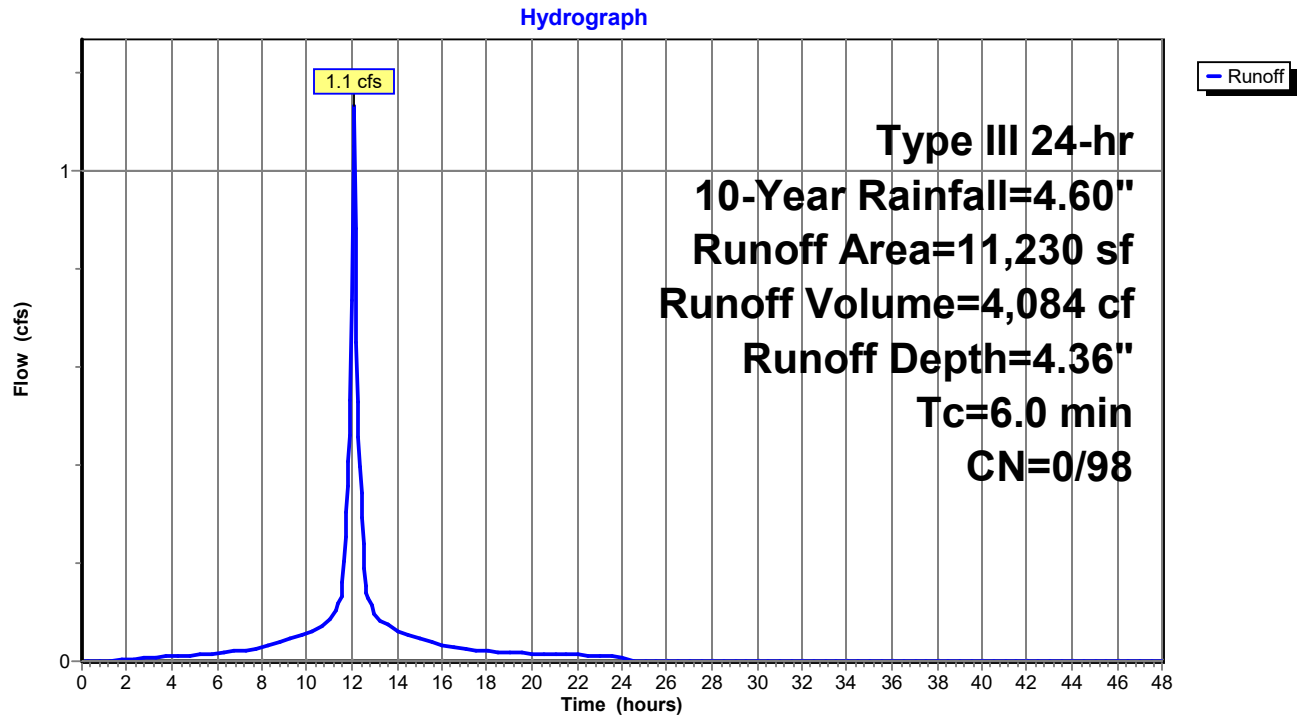
Runoff = 1.1 cfs @ 12.09 hrs, Volume= 4,084 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

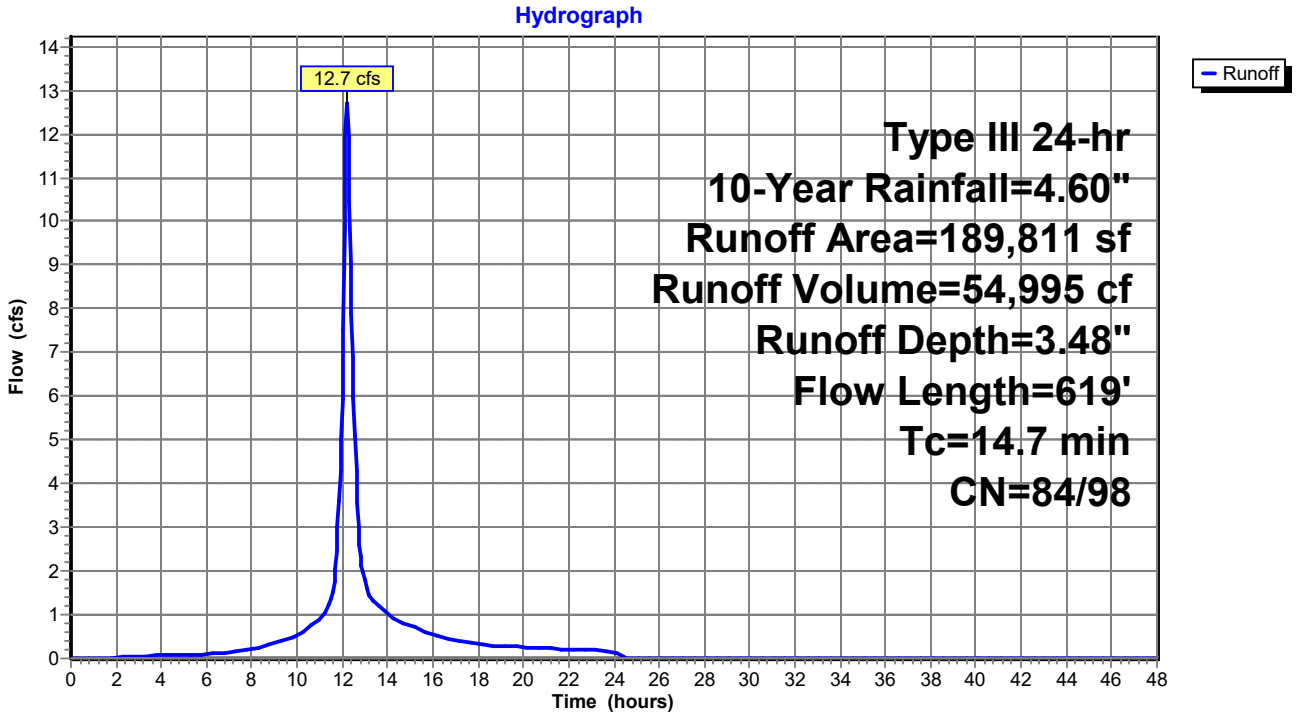
Runoff = 12.7 cfs @ 12.20 hrs, Volume= 54,995 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

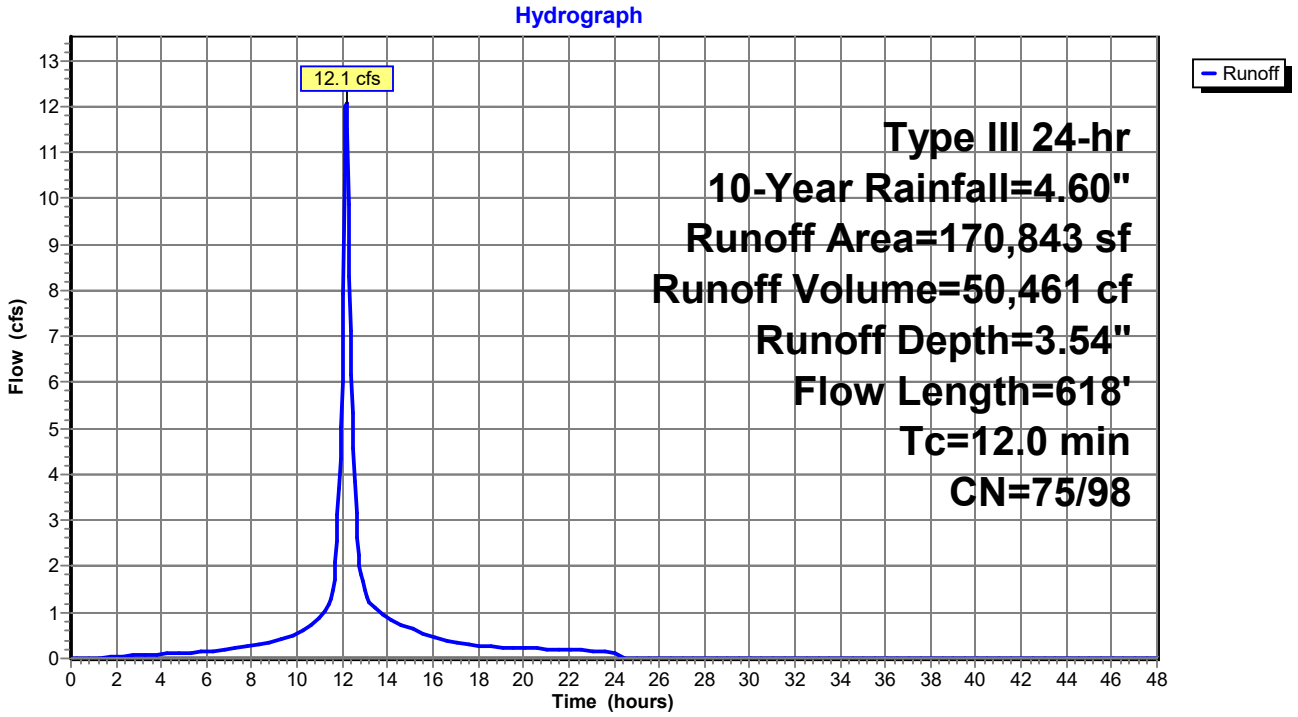
Runoff = 12.1 cfs @ 12.16 hrs, Volume= 50,461 cf, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

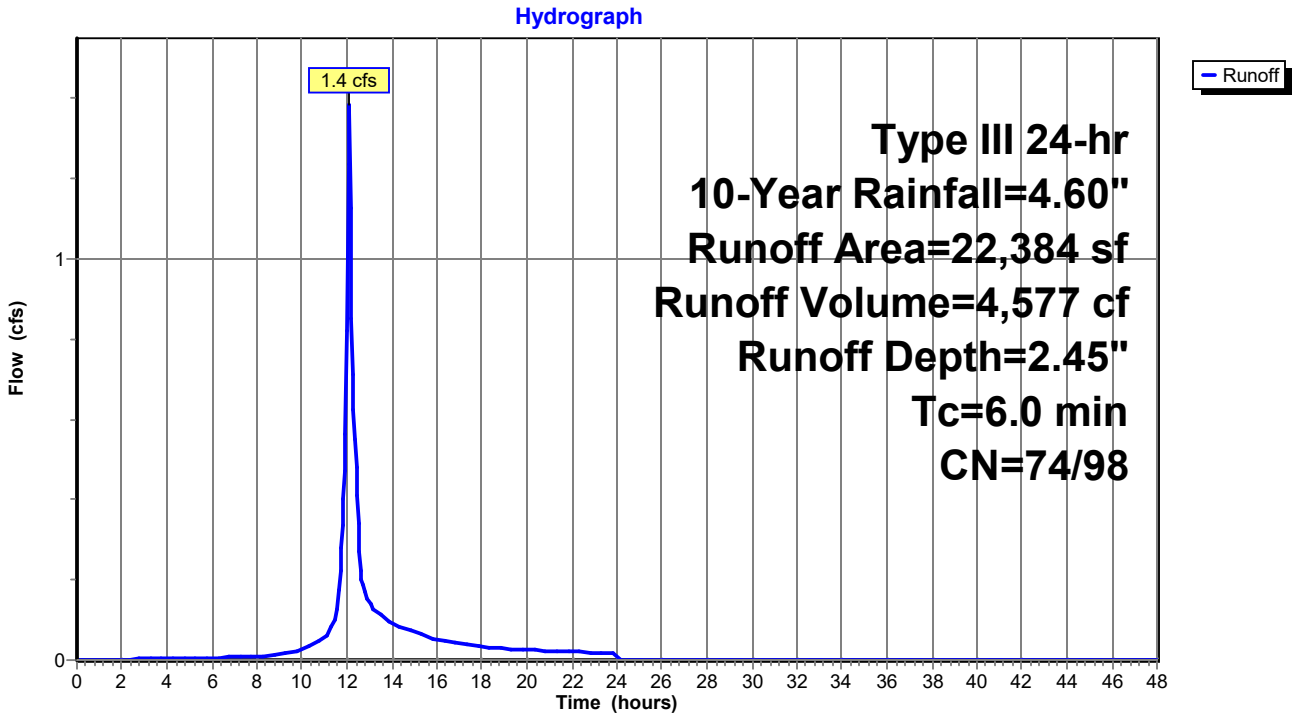
Runoff = 1.4 cfs @ 12.09 hrs, Volume= 4,577 cf, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

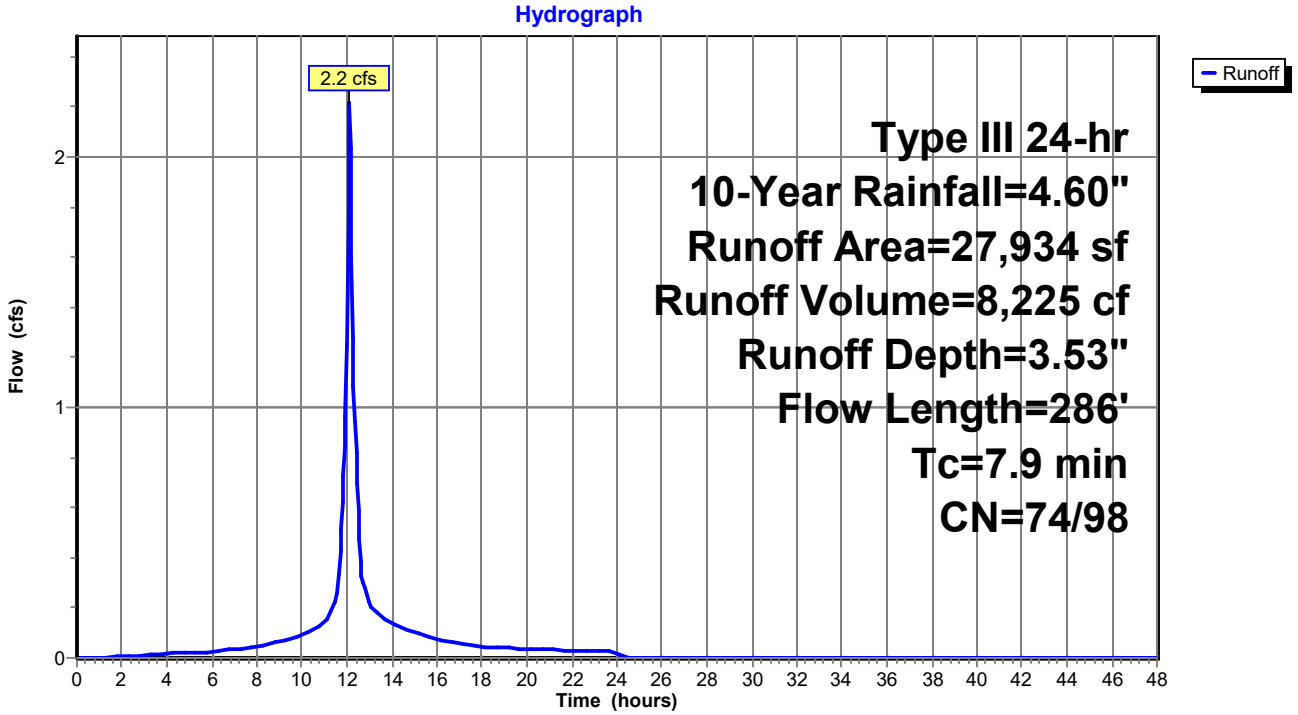
Runoff = 2.2 cfs @ 12.11 hrs, Volume= 8,225 cf, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

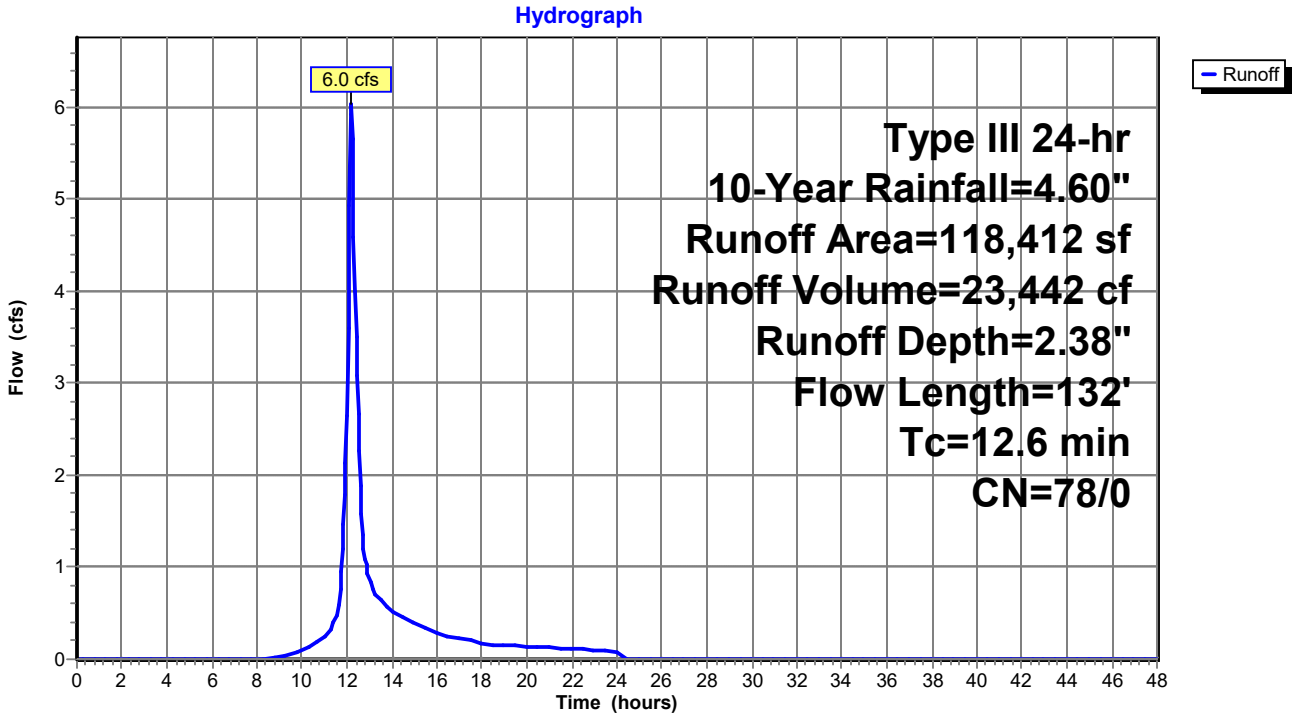
Runoff = 6.0 cfs @ 12.18 hrs, Volume= 23,442 cf, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 142,855 sf, 49.65% Impervious, Inflow Depth = 2.68" for 10-Year event
Inflow = 6.4 cfs @ 12.23 hrs, Volume= 31,873 cf
Outflow = 3.7 cfs @ 12.50 hrs, Volume= 27,682 cf, Atten= 43%, Lag= 16.2 min
Primary = 3.7 cfs @ 12.50 hrs, Volume= 27,682 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.81' @ 12.50 hrs Surf.Area= 8,475 sf Storage= 11,530 cf

Plug-Flow detention time= 163.8 min calculated for 27,653 cf (87% of inflow)
Center-of-Mass det. time= 102.9 min (888.5 - 785.7)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,316 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,868 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,798 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482

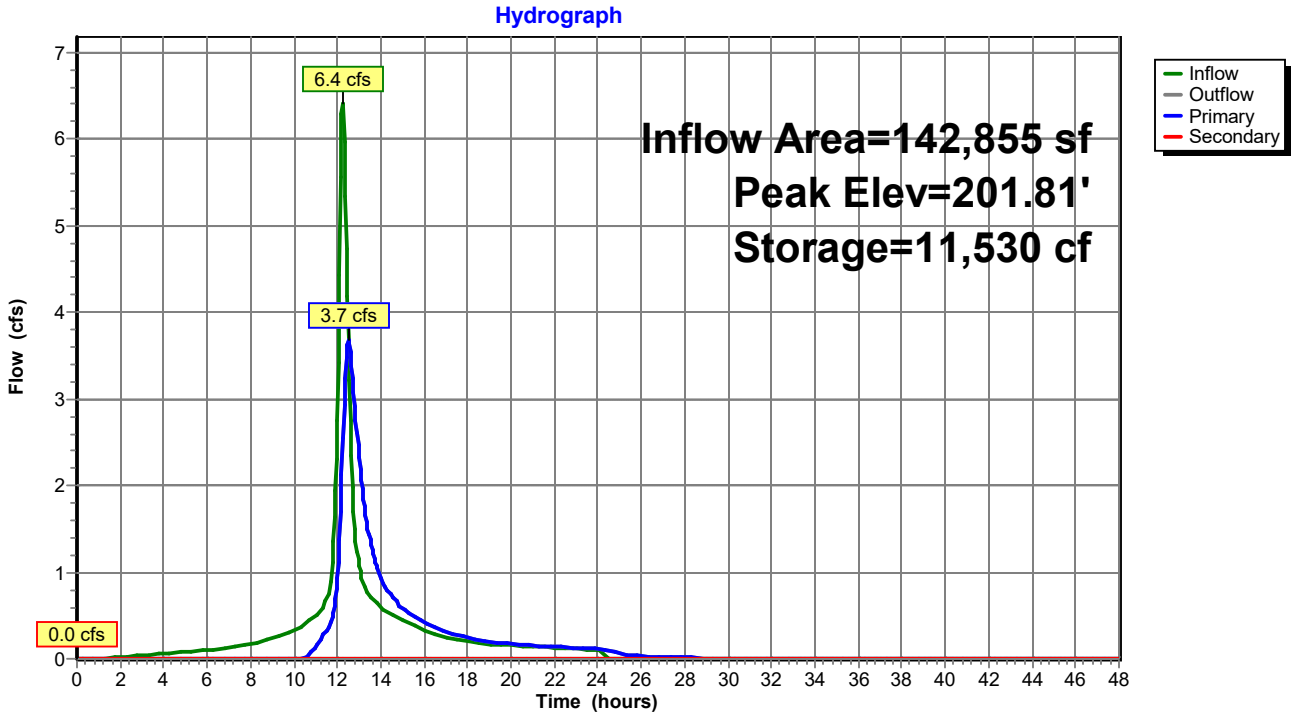
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=3.7 cfs @ 12.50 hrs HW=201.81' (Free Discharge)
└**1=Culvert** (Passes 3.7 cfs of 7.6 cfs potential flow)
  └**2=Custom Weir/Orifice** (Weir Controls 3.7 cfs @ 3.06 fps)
  └**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 13.4 cfs @ 12.19 hrs, Volume= 59,079 cf
Outflow = 7.8 cfs @ 12.42 hrs, Volume= 53,879 cf, Atten= 41%, Lag= 13.8 min
Primary = 7.8 cfs @ 12.42 hrs, Volume= 53,879 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.63' @ 12.42 hrs Surf.Area= 14,126 sf Storage= 18,659 cf

Plug-Flow detention time= 113.9 min calculated for 53,823 cf (91% of inflow)
Center-of-Mass det. time= 69.7 min (857.2 - 787.5)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

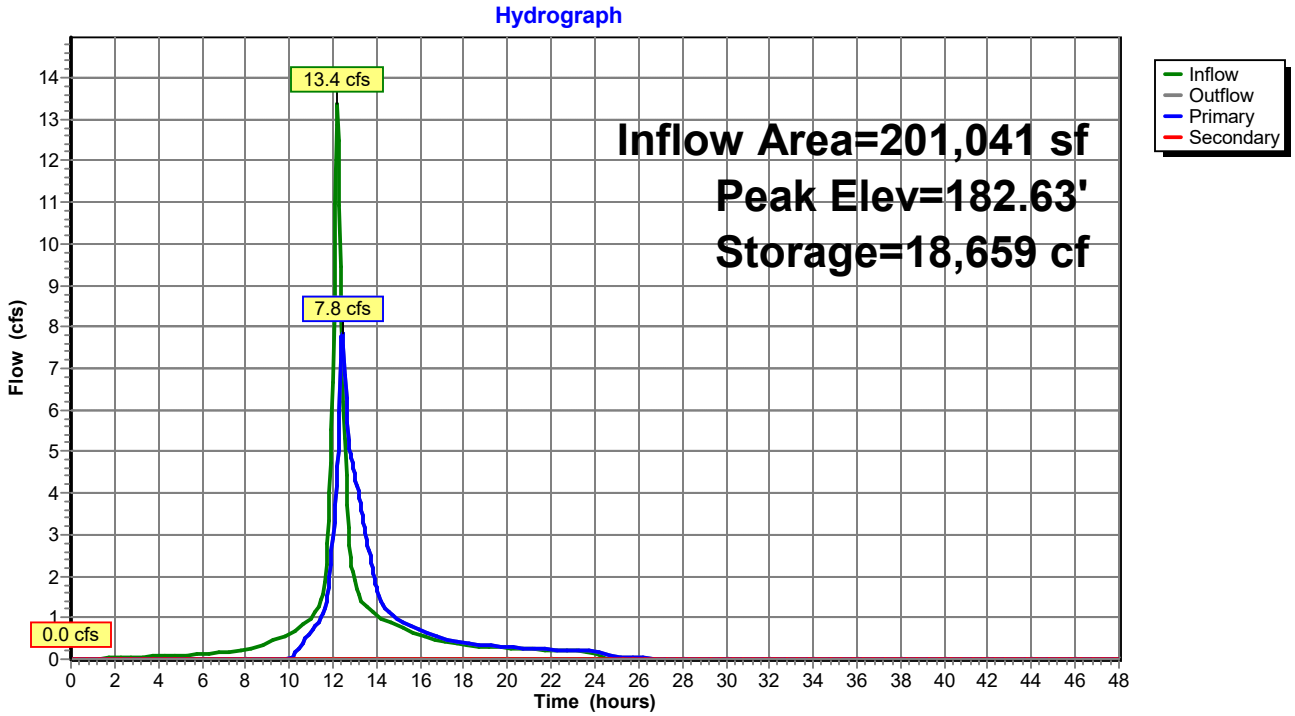
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.7 cfs @ 12.42 hrs HW=182.62' (Free Discharge)
└**1=Culvert** (Passes 7.7 cfs of 22.7 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 5.5 cfs @ 4.70 fps)
  └**3=Rim** (Weir Controls 2.3 cfs @ 1.15 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 1.97" for 10-Year event
Inflow = 3.2 cfs @ 12.21 hrs, Volume= 12,948 cf
Outflow = 1.7 cfs @ 12.49 hrs, Volume= 9,586 cf, Atten= 46%, Lag= 17.2 min
Primary = 1.7 cfs @ 12.49 hrs, Volume= 9,586 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.16' @ 12.49 hrs Surf.Area= 7,327 sf Storage= 4,494 cf

Plug-Flow detention time= 155.5 min calculated for 9,586 cf (74% of inflow)
Center-of-Mass det. time= 62.5 min (914.3 - 851.8)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

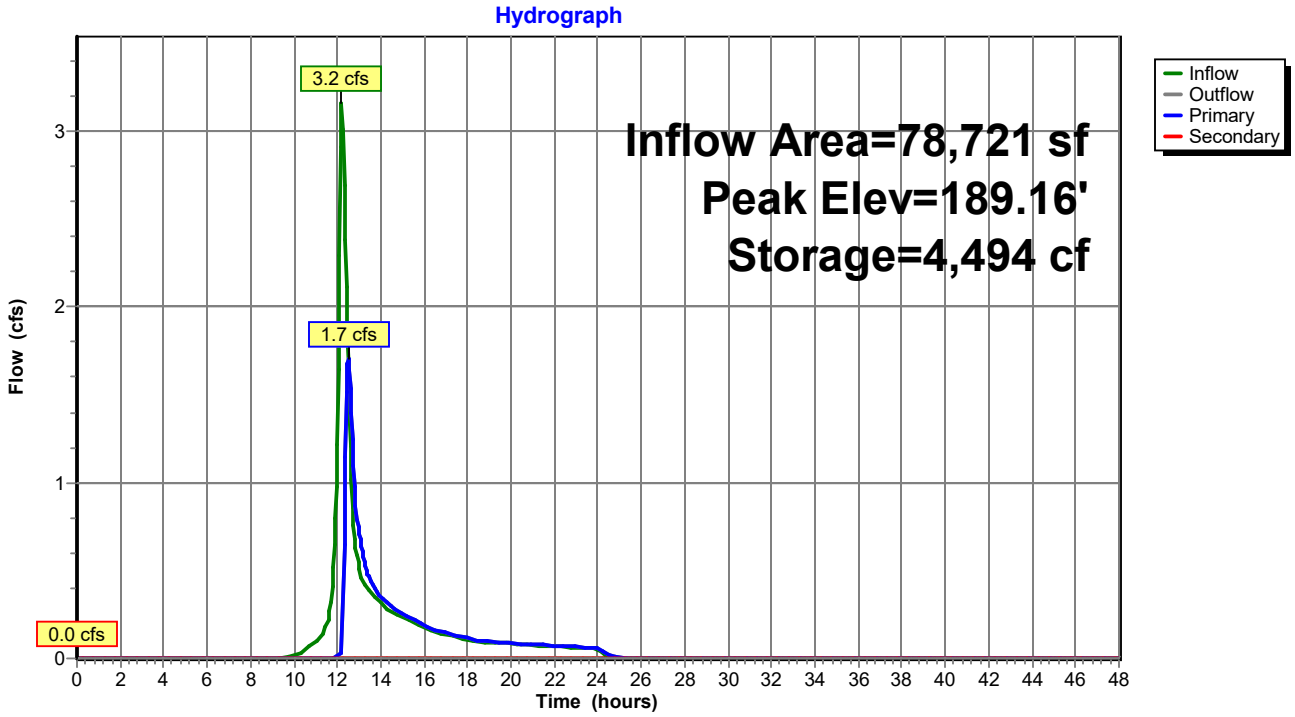
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.7 cfs @ 12.49 hrs HW=189.16' (Free Discharge)
└**1=Culvert** (Passes 1.7 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 1.7 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 2.2 cfs @ 12.11 hrs, Volume= 8,225 cf
Outflow = 2.0 cfs @ 12.17 hrs, Volume= 5,853 cf, Atten= 12%, Lag= 3.3 min
Primary = 2.0 cfs @ 12.17 hrs, Volume= 5,853 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.69' @ 12.17 hrs Surf.Area= 3,004 sf Storage= 2,927 cf

Plug-Flow detention time= 181.3 min calculated for 5,853 cf (71% of inflow)
Center-of-Mass det. time= 85.6 min (856.0 - 770.4)

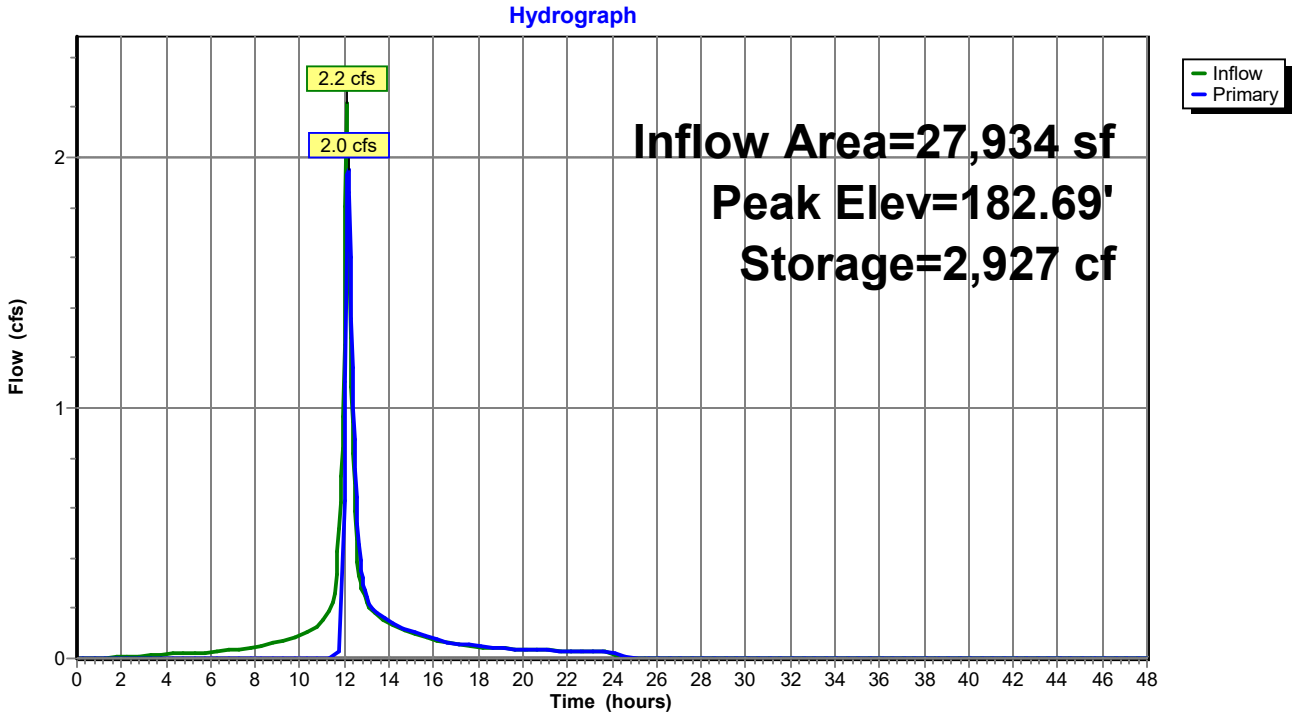
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.9 cfs @ 12.17 hrs HW=182.69' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.9 cfs @ 1.02 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 3.30" for 10-Year event
Inflow = 15.1 cfs @ 12.16 hrs, Volume= 60,891 cf
Outflow = 7.1 cfs @ 12.43 hrs, Volume= 60,848 cf, Atten= 53%, Lag= 16.1 min
Primary = 7.1 cfs @ 12.43 hrs, Volume= 60,848 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 180.38' @ 12.43 hrs Surf.Area= 10,149 sf Storage= 17,507 cf

Plug-Flow detention time= 77.7 min calculated for 60,848 cf (100% of inflow)
Center-of-Mass det. time= 77.2 min (862.6 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

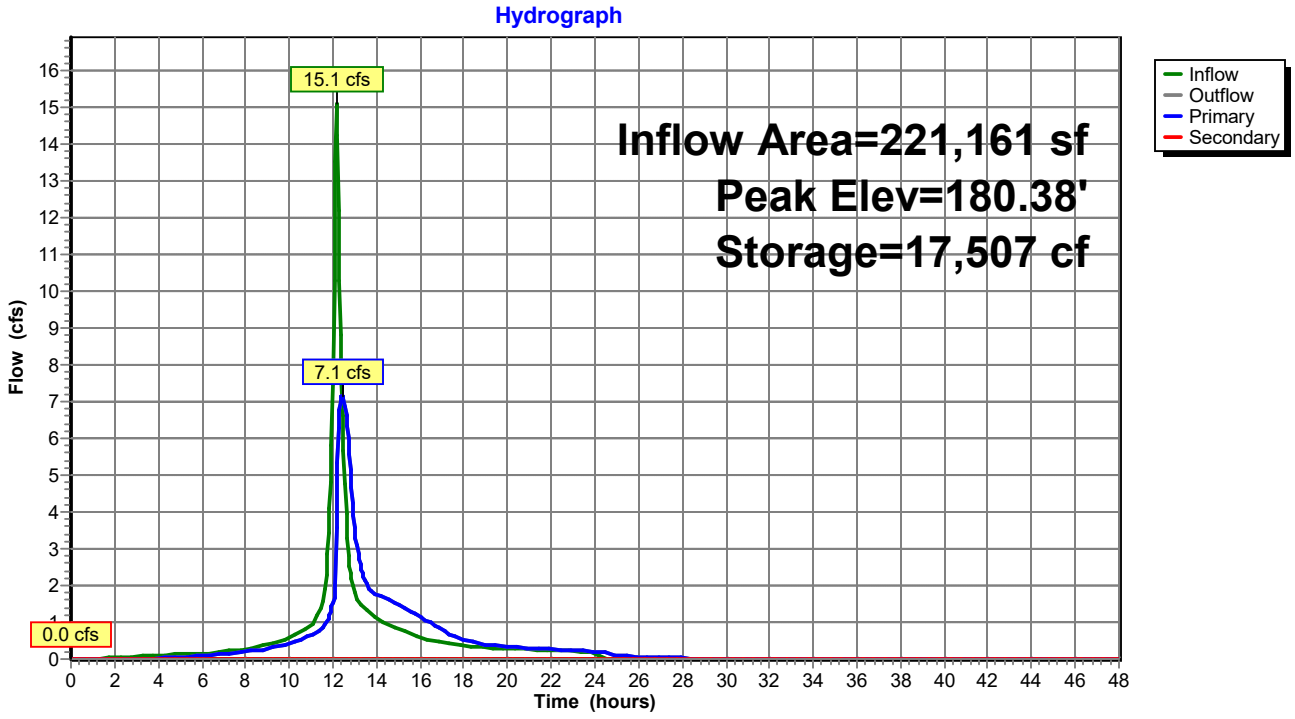
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.1 cfs @ 12.43 hrs HW=180.38' (Free Discharge)
└**1=Culvert** (Passes 7.1 cfs of 8.6 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.4 cfs @ 6.88 fps)
  └**3=Orifice/Grate** (Orifice Controls 4.7 cfs @ 3.78 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,455 sf, 34.02% Impervious, Inflow Depth = 2.56" for 10-Year event
Inflow = 7.4 cfs @ 12.12 hrs, Volume= 39,822 cf
Outflow = 5.0 cfs @ 12.34 hrs, Volume= 36,923 cf, Atten= 32%, Lag= 13.2 min
Primary = 5.0 cfs @ 12.34 hrs, Volume= 36,923 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.86' @ 12.34 hrs Surf.Area= 7,484 sf Storage= 8,767 cf

Plug-Flow detention time= 107.3 min calculated for 36,923 cf (93% of inflow)
Center-of-Mass det. time= 67.4 min (875.9 - 808.6)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

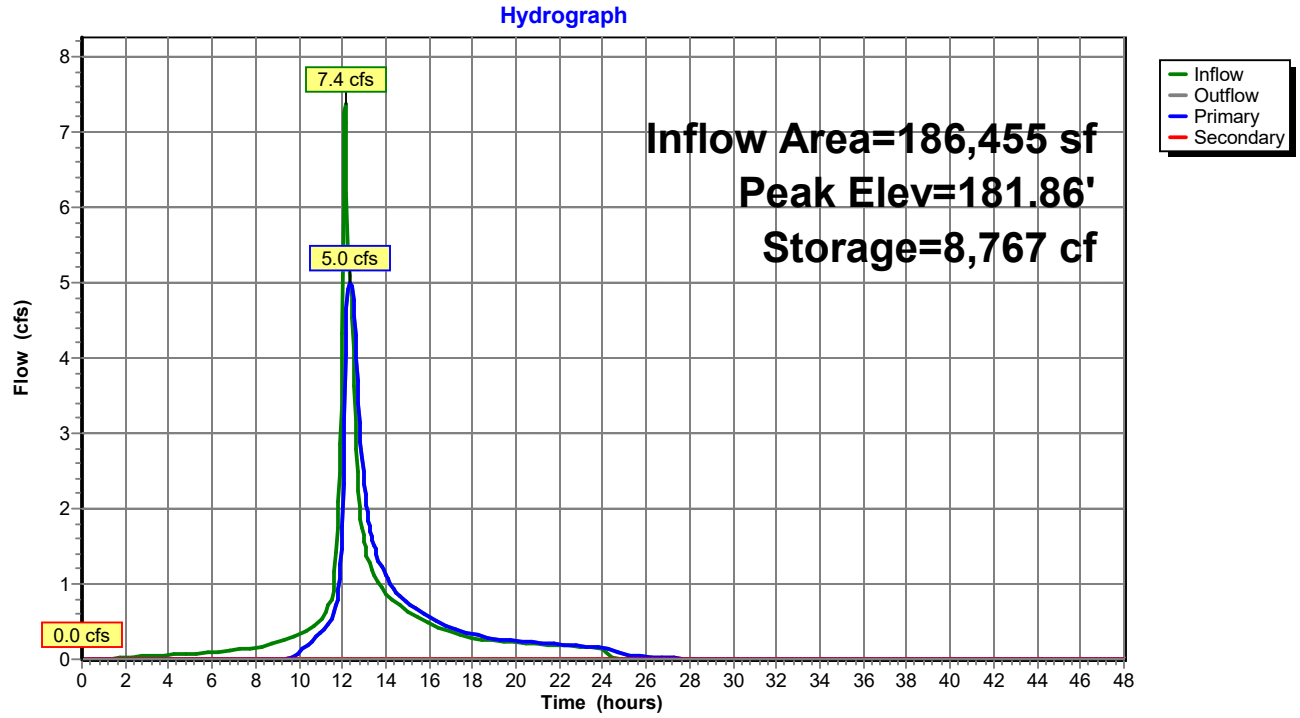
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=5.0 cfs @ 12.34 hrs HW=181.86' (Free Discharge)
└**1=Culvert** (Passes 5.0 cfs of 8.0 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 5.0 cfs @ 2.72 fps)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

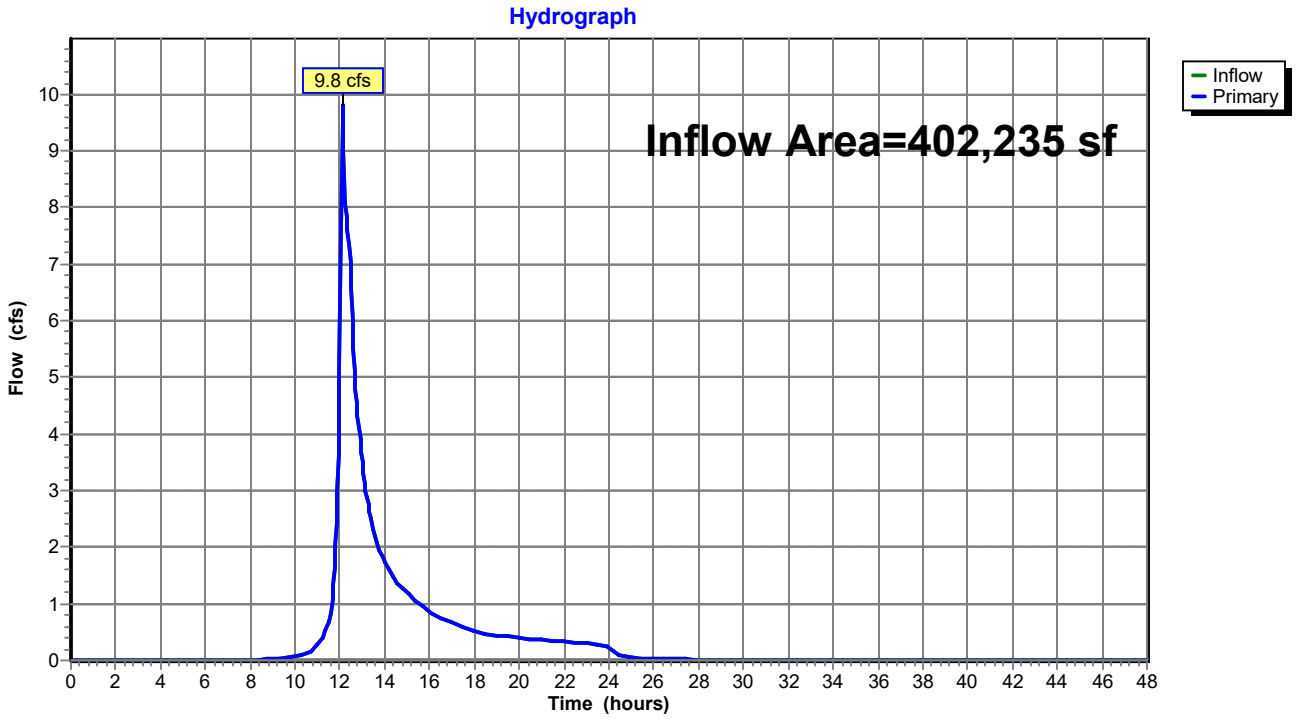


Summary for Link DP-1: Offsite to North

Inflow Area = 402,235 sf, 18.20% Impervious, Inflow Depth = 1.75" for 10-Year event
Inflow = 9.8 cfs @ 12.12 hrs, Volume= 58,692 cf
Primary = 9.8 cfs @ 12.12 hrs, Volume= 58,692 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

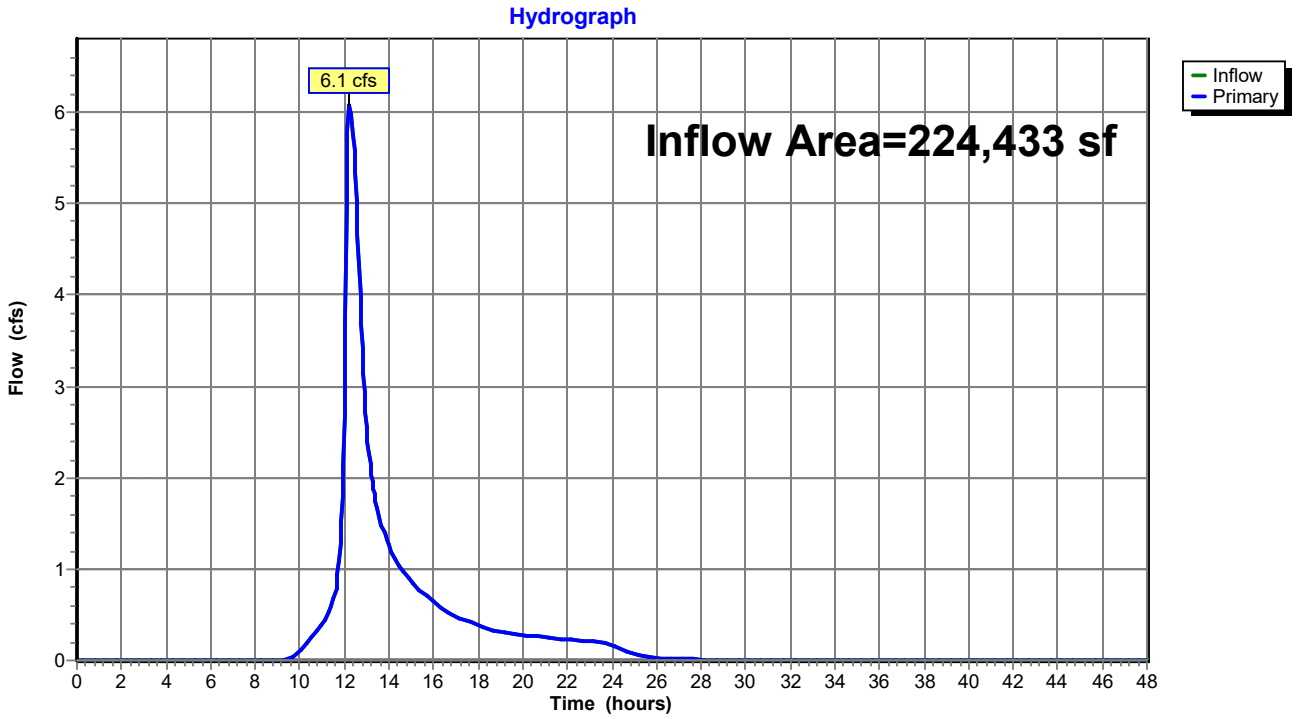


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,433 sf, 28.27% Impervious, Inflow Depth = 2.31" for 10-Year event
Inflow = 6.1 cfs @ 12.24 hrs, Volume= 43,162 cf
Primary = 6.1 cfs @ 12.24 hrs, Volume= 43,162 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

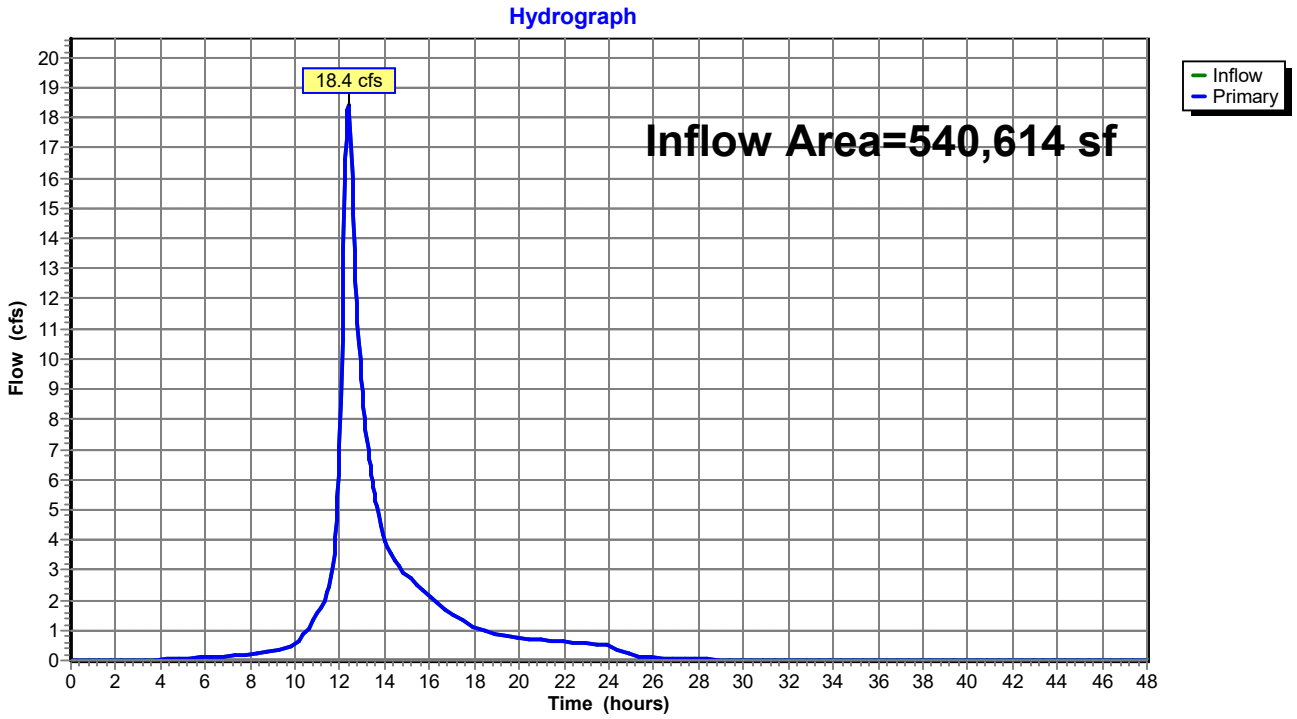


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth = 3.07" for 10-Year event
Inflow = 18.4 cfs @ 12.39 hrs, Volume= 138,169 cf
Primary = 18.4 cfs @ 12.39 hrs, Volume= 138,169 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PS-1A: Runoff Area=142,855 sf 49.65% Impervious Runoff Depth=4.20"
Flow Length=1,466' Tc=17.1 min CN=59/98 Runoff=10.3 cfs 49,989 cf

Subcatchment PS-1B: Runoff Area=104,295 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=86' Tc=7.3 min CN=63/0 Runoff=6.6 cfs 22,010 cf

Subcatchment PS-1C: Runoff Area=37,504 sf 6.03% Impervious Runoff Depth=1.47"
Flow Length=284' Tc=12.8 min CN=47/98 Runoff=0.9 cfs 4,590 cf

Subcatchment PS-1D: Runoff Area=68,307 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=82' Slope=0.0400 '/' Tc=9.5 min CN=65/0 Runoff=4.3 cfs 15,490 cf

Subcatchment PS-1E: Runoff Area=49,274 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=33' Slope=0.0200 '/' Tc=6.1 min CN=79/0 Runoff=5.3 cfs 16,955 cf

Subcatchment PS-2A: Runoff Area=78,721 sf 0.09% Impervious Runoff Depth=3.51"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=5.7 cfs 23,029 cf

Subcatchment PS-2B: Runoff Area=64,788 sf 68.84% Impervious Runoff Depth=5.22"
Flow Length=531' Tc=11.7 min CN=67/98 Runoff=6.7 cfs 28,172 cf

Subcatchment PS-2C: Runoff Area=42,946 sf 43.69% Impervious Runoff Depth=4.94"
Tc=6.0 min CN=77/98 Runoff=5.2 cfs 17,689 cf

Subcatchment PS-2D: Runoff Area=37,978 sf 0.00% Impervious Runoff Depth=3.51"
Flow Length=86' Slope=0.0700 '/' Tc=7.9 min CN=73/0 Runoff=3.3 cfs 11,102 cf

Subcatchment PS-3A: Runoff Area=11,230 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.6 cfs 5,860 cf

Subcatchment PS-3B: Runoff Area=189,811 sf 39.12% Impervious Runoff Depth=5.29"
Flow Length=619' Tc=14.7 min CN=84/98 Runoff=19.2 cfs 83,682 cf

Subcatchment PS-3C: Runoff Area=170,843 sf 63.33% Impervious Runoff Depth=5.33"
Flow Length=618' Tc=12.0 min CN=75/98 Runoff=18.1 cfs 75,834 cf

Subcatchment PS-3D: Runoff Area=22,384 sf 17.45% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=74/98 Runoff=2.3 cfs 7,597 cf

Subcatchment PS-3E: Runoff Area=27,934 sf 64.12% Impervious Runoff Depth=5.31"
Flow Length=286' Tc=7.9 min CN=74/98 Runoff=3.3 cfs 12,360 cf

Subcatchment PS-3F: Runoff Area=118,412 sf 0.00% Impervious Runoff Depth=4.02"
Flow Length=132' Tc=12.6 min CN=78/0 Runoff=10.3 cfs 39,706 cf

Pond 1P: Infiltration Basin #1 Peak Elev=202.14' Storage=14,157 cf Inflow=10.3 cfs 49,989 cf
Primary=7.3 cfs 45,797 cf Secondary=0.0 cfs 0 cf Outflow=7.3 cfs 45,797 cf

Pond 2P: Infiltration Basin #3 Peak Elev=182.84' Storage=21,449 cf Inflow=20.1 cfs 89,542 cf
Primary=16.3 cfs 84,341 cf Secondary=0.0 cfs 0 cf Outflow=16.3 cfs 84,341 cf

Pond 3P: Runoff Collection Area Peak Elev=189.35' Storage=5,894 cf Inflow=5.7 cfs 23,029 cf
Primary=4.3 cfs 19,668 cf Secondary=0.0 cfs 0 cf Outflow=4.3 cfs 19,668 cf

Pond 5P: Bioretention Basin Peak Elev=182.75' Storage=3,117 cf Inflow=3.3 cfs 12,360 cf
Outflow=3.0 cfs 9,989 cf

Pond 7P: Extended Dry Detention Basin Peak Elev=181.30' Storage=26,179 cf Inflow=22.9 cfs 93,419 cf
Primary=10.4 cfs 93,375 cf Secondary=0.0 cfs 0 cf Outflow=10.4 cfs 93,375 cf

Pond 8P: Infiltration Basin #2 Peak Elev=182.29' Storage=12,123 cf Inflow=13.3 cfs 65,528 cf
Primary=10.1 cfs 62,629 cf Secondary=0.0 cfs 0 cf Outflow=10.1 cfs 62,629 cf

Link DP-1: Offsite to North Inflow=19.3 cfs 104,842 cf
Primary=19.3 cfs 104,842 cf

Link DP-2: Offsite to Southeast Inflow=11.9 cfs 73,731 cf
Primary=11.9 cfs 73,731 cf

Link DP-3: Offsite to Northeast Inflow=34.0 cfs 217,423 cf
Primary=34.0 cfs 217,423 cf

Total Runoff Area = 1,167,282 sf Runoff Volume = 414,064 cf Average Runoff Depth = 4.26"
69.83% Pervious = 815,148 sf 30.17% Impervious = 352,133 sf

Summary for Subcatchment PS-1A:

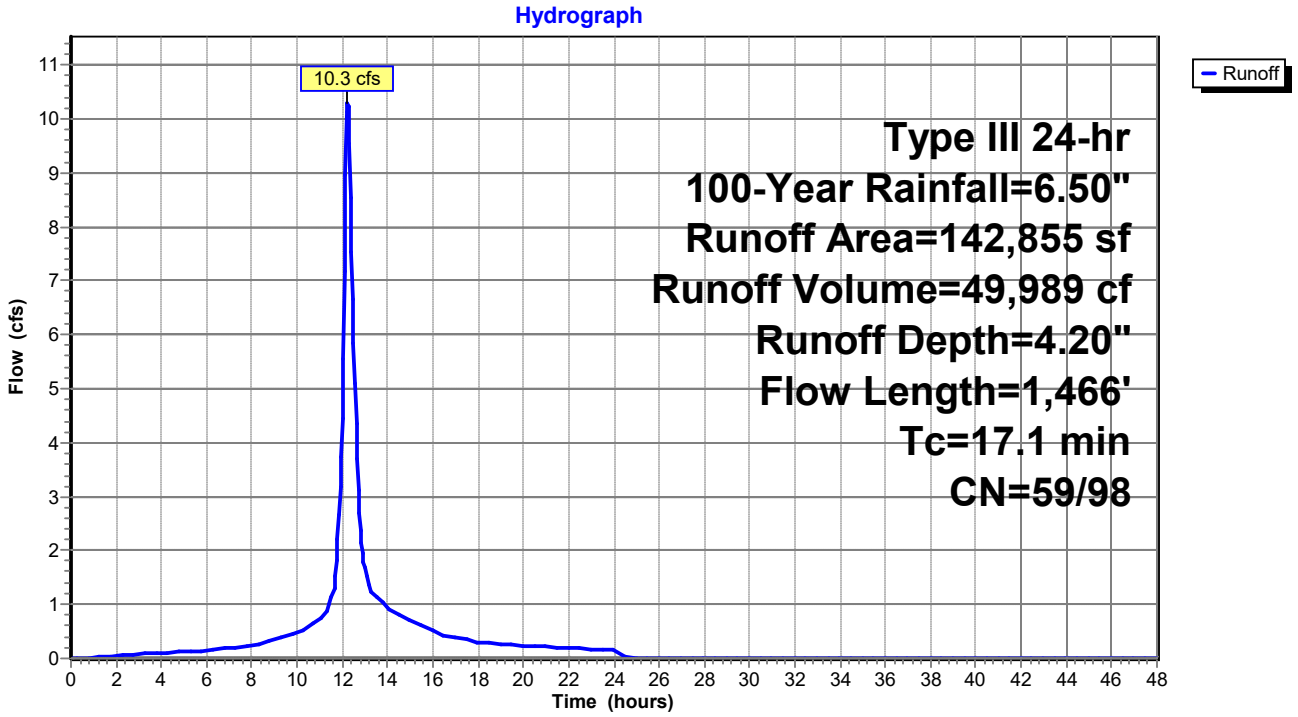
Runoff = 10.3 cfs @ 12.23 hrs, Volume= 49,989 cf, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
8,266	39	>75% Grass cover, Good, HSG A
61,970	61	>75% Grass cover, Good, HSG B
1,691	74	>75% Grass cover, Good, HSG C
2,179	98	Paved parking, HSG A
42,394	98	Paved parking, HSG B
133	98	Paved parking, HSG C
21,660	98	Roofs, HSG B
4,562	98	Water Surface, HSG B
142,855	78	Weighted Average
71,926	59	50.35% Pervious Area
70,929	98	49.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0320	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0250	2.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	1,275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
17.1	1,466	Total			

Subcatchment PS-1A:



Summary for Subcatchment PS-1B:

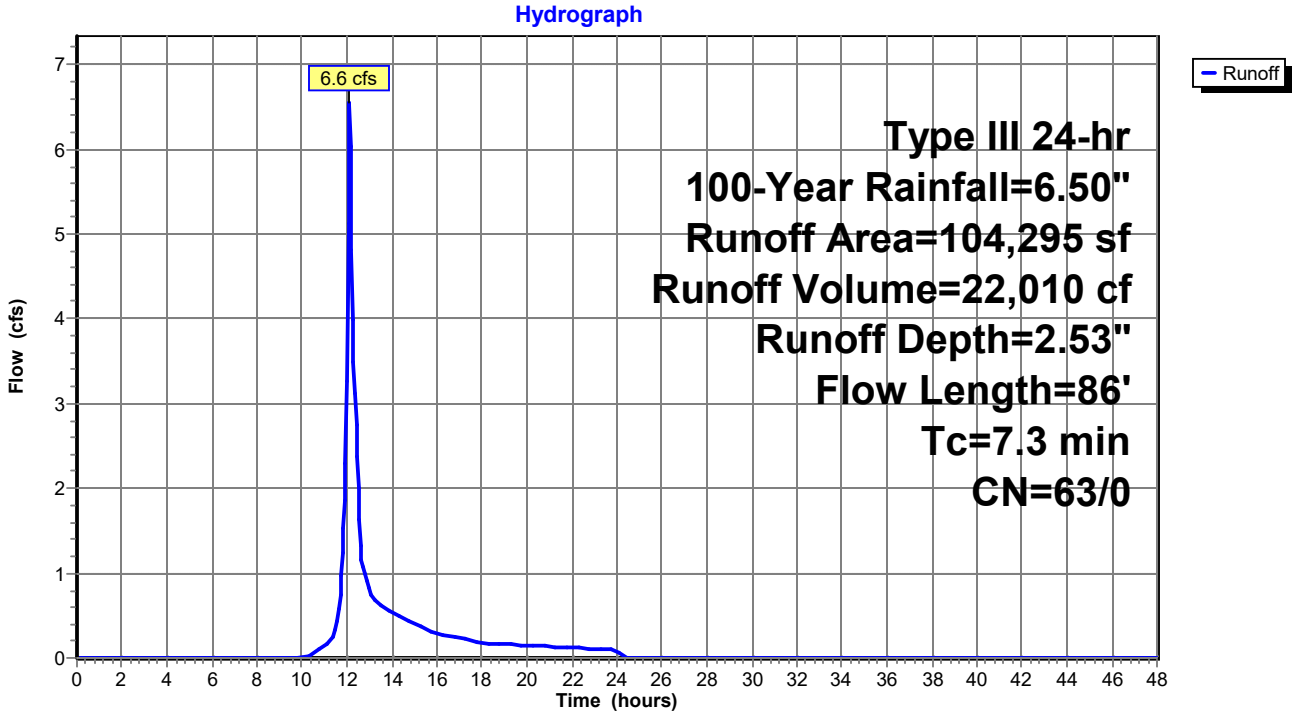
Runoff = 6.6 cfs @ 12.11 hrs, Volume= 22,010 cf, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
48,151	61	>75% Grass cover, Good, HSG B
4,132	74	>75% Grass cover, Good, HSG C
5,850	98	Unconnected roofs, HSG B
31,263	55	Woods, Good, HSG B
14,899	70	Woods, Good, HSG C
104,295	63	Weighted Average
104,295	63	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	58	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	28	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	86	Total			

Subcatchment PS-1B:



Summary for Subcatchment PS-1C:

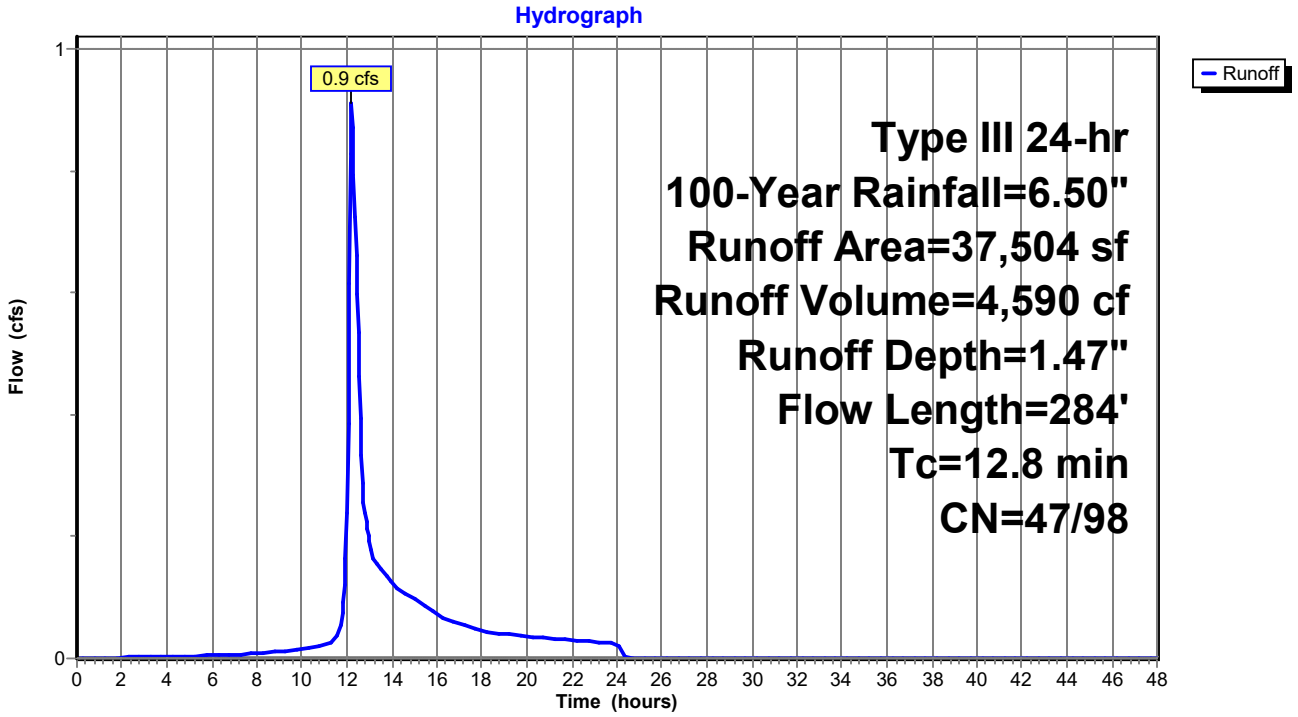
Runoff = 0.9 cfs @ 12.21 hrs, Volume= 4,590 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,355	69	50-75% Grass cover, Fair, HSG B
9,878	39	>75% Grass cover, Good, HSG A
11,193	61	>75% Grass cover, Good, HSG B
361	98	Roofs, HSG A
14	98	Roofs, HSG B
1,481	98	Water Surface, HSG A
406	98	Water Surface, HSG B
9,816	30	Woods, Good, HSG A
37,504	50	Weighted Average
35,242	47	93.97% Pervious Area
2,262	98	6.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0350	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.0	184	0.0400	3.22		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.8	284	Total			

Subcatchment PS-1C:



Summary for Subcatchment PS-1D:

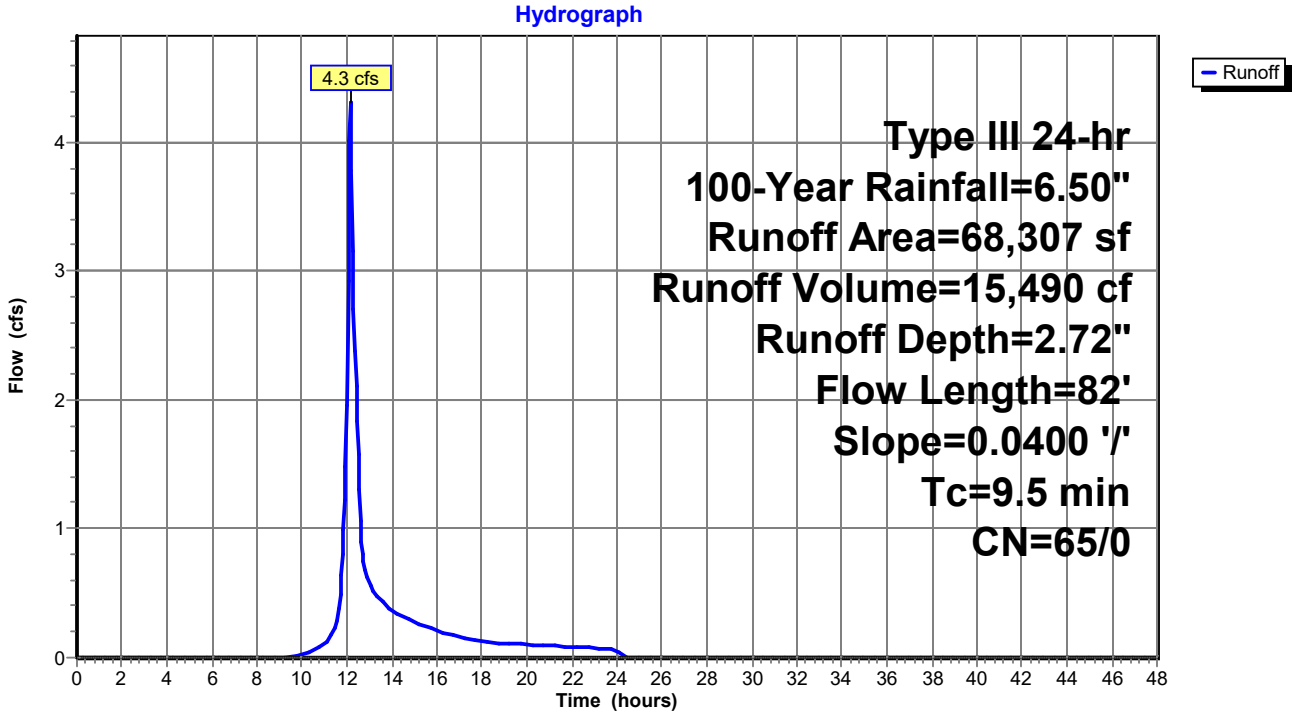
Runoff = 4.3 cfs @ 12.14 hrs, Volume= 15,490 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
46,443	61	>75% Grass cover, Good, HSG B
596	80	>75% Grass cover, Good, HSG D
9,259	98	Unconnected roofs, HSG B
491	98	Unconnected roofs, HSG D
11,483	55	Woods, Good, HSG B
35	77	Woods, Good, HSG D
68,307	65	Weighted Average
68,307	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	82	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1D:



Summary for Subcatchment PS-1E:

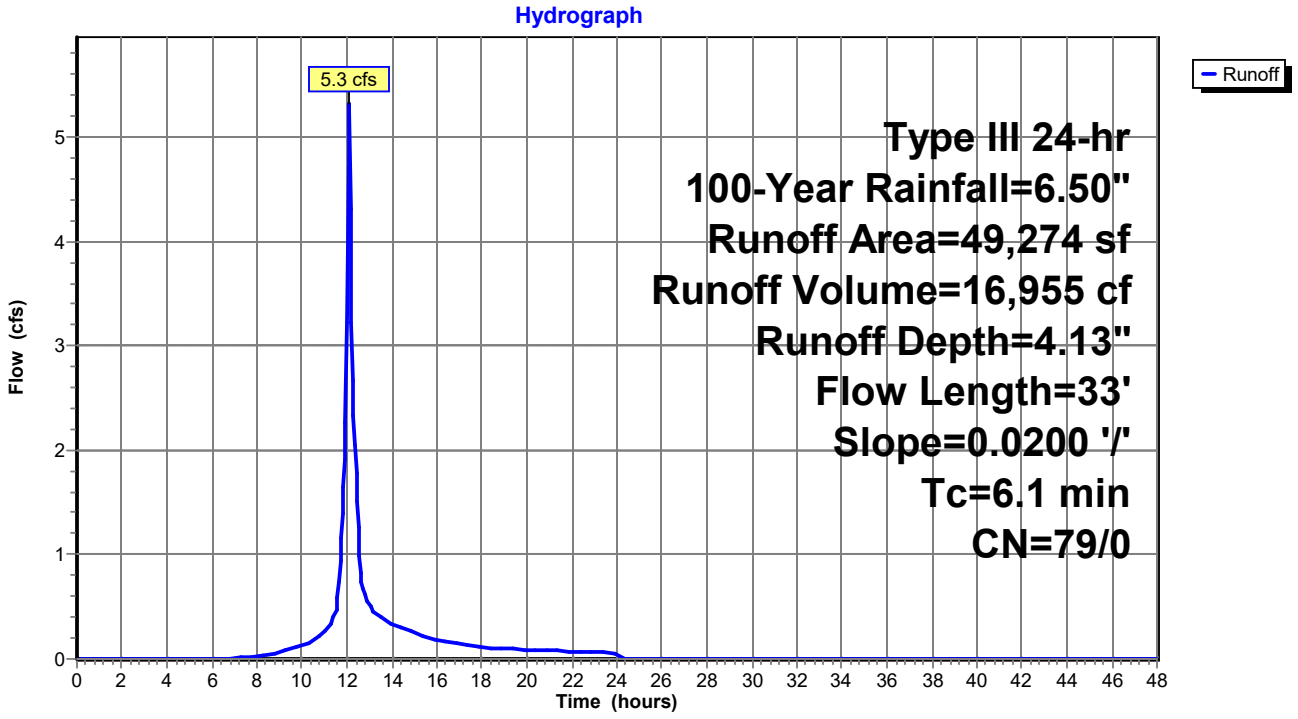
Runoff = 5.3 cfs @ 12.09 hrs, Volume= 16,955 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,903	79	50-75% Grass cover, Fair, HSG C
1,544	61	>75% Grass cover, Good, HSG B
21,033	74	>75% Grass cover, Good, HSG C
8,841	80	>75% Grass cover, Good, HSG D
1	98	Unconnected roofs, HSG B
6,109	98	Unconnected roofs, HSG C
1,865	98	Unconnected roofs, HSG D
1,948	70	Woods, Good, HSG C
30	77	Woods, Good, HSG D
49,274	79	Weighted Average
49,274	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	33	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-1E:



Summary for Subcatchment PS-2A:

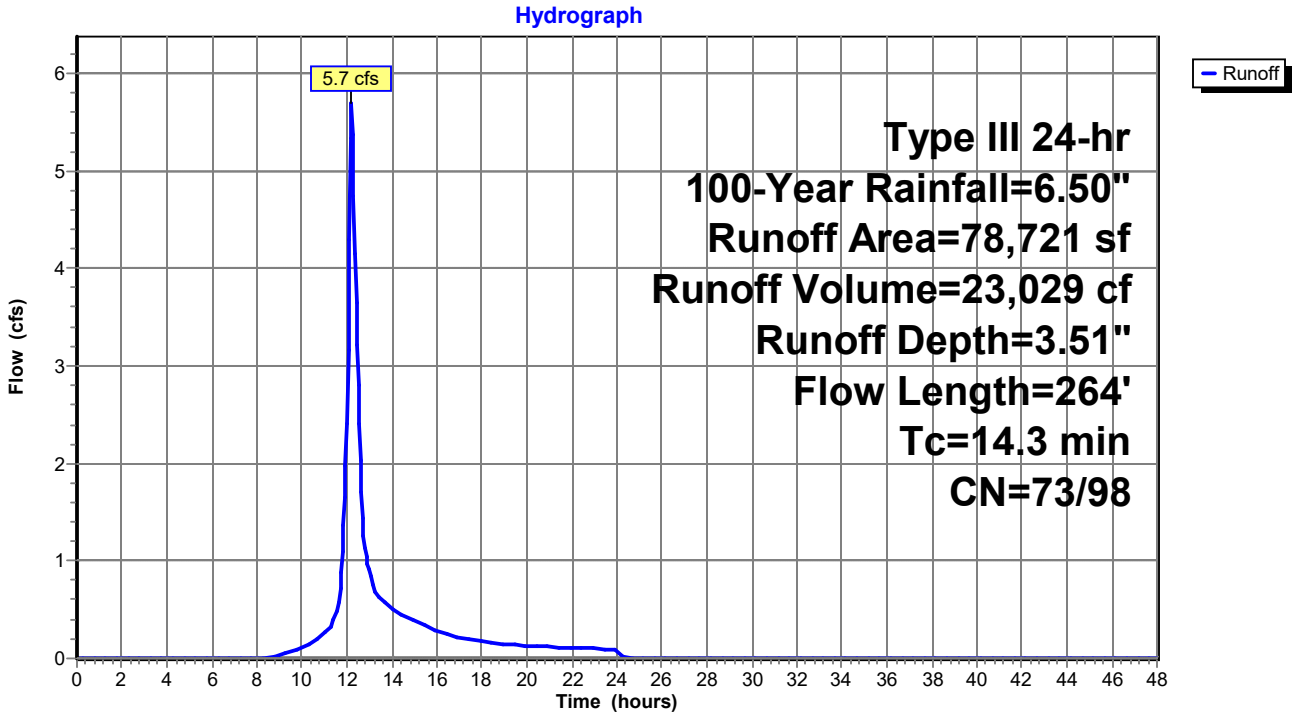
Runoff = 5.7 cfs @ 12.20 hrs, Volume= 23,029 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,013	49	50-75% Grass cover, Fair, HSG A
6,567	69	50-75% Grass cover, Fair, HSG B
11,630	79	50-75% Grass cover, Fair, HSG C
1,880	84	50-75% Grass cover, Fair, HSG D
5,929	39	>75% Grass cover, Good, HSG A
5,412	61	>75% Grass cover, Good, HSG B
32,529	74	>75% Grass cover, Good, HSG C
3,652	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
1,615	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,414	98	Unconnected roofs, HSG C
88	30	Woods, Good, HSG A
101	70	Woods, Good, HSG C
78,721	73	Weighted Average
78,647	73	99.91% Pervious Area
74	98	0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Subcatchment PS-2A:



Summary for Subcatchment PS-2B:

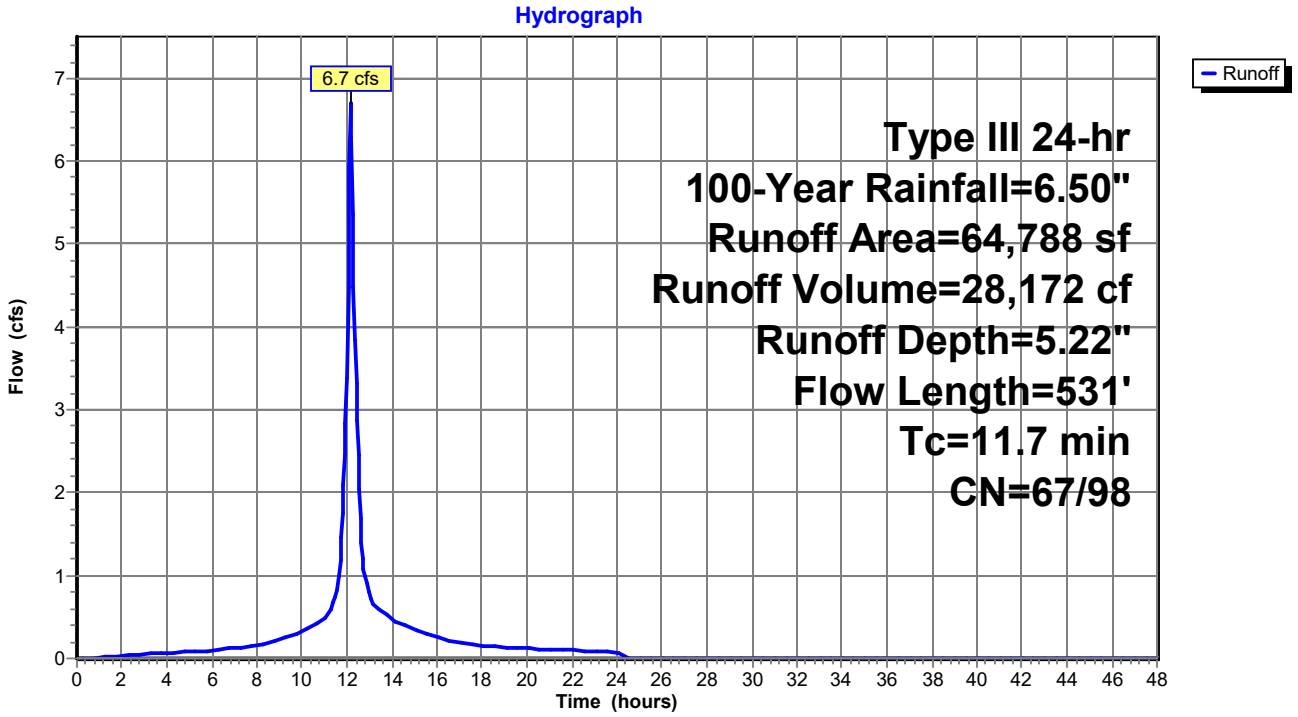
Runoff = 6.7 cfs @ 12.16 hrs, Volume= 28,172 cf, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,802	39	>75% Grass cover, Good, HSG A
5,187	61	>75% Grass cover, Good, HSG B
6,256	74	>75% Grass cover, Good, HSG C
3,510	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
16,583	98	Paved parking, HSG B
4,695	98	Paved parking, HSG C
11,728	98	Paved parking, HSG D
2,301	98	Roofs, HSG A
1,031	98	Roofs, HSG B
3,999	98	Roofs, HSG C
882	98	Unconnected roofs, HSG A
553	98	Unconnected roofs, HSG C
64,788	88	Weighted Average
20,190	67	31.16% Pervious Area
44,598	98	68.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	62	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.9	181	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	288	0.0210	6.57	5.16	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
11.7	531	Total			

Subcatchment PS-2B:



Summary for Subcatchment PS-2C:

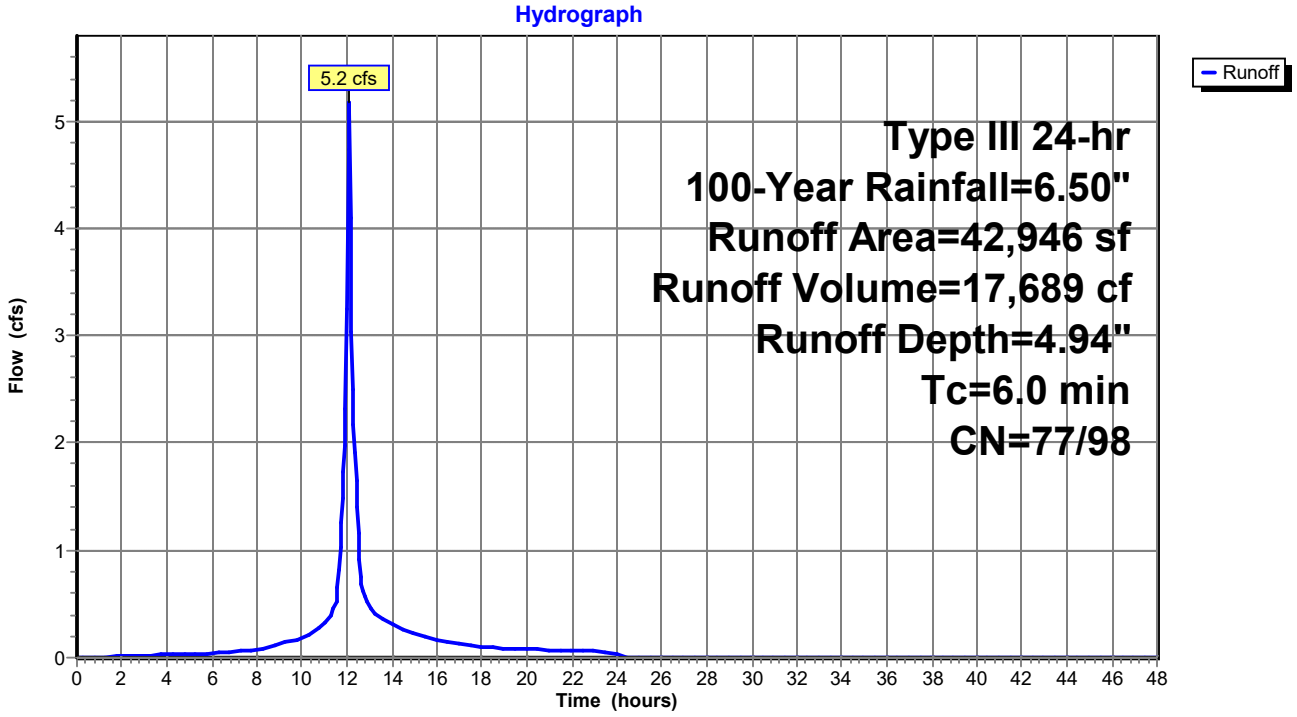
Runoff = 5.2 cfs @ 12.09 hrs, Volume= 17,689 cf, Depth= 4.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
14,084	74	>75% Grass cover, Good, HSG C
10,098	80	>75% Grass cover, Good, HSG D
8,651	98	Roofs, HSG C
4,999	98	Roofs, HSG D
4,101	98	Water Surface, HSG C
1,013	98	Water Surface, HSG D
42,946	86	Weighted Average
24,182	77	56.31% Pervious Area
18,764	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-2C:



Summary for Subcatchment PS-2D:

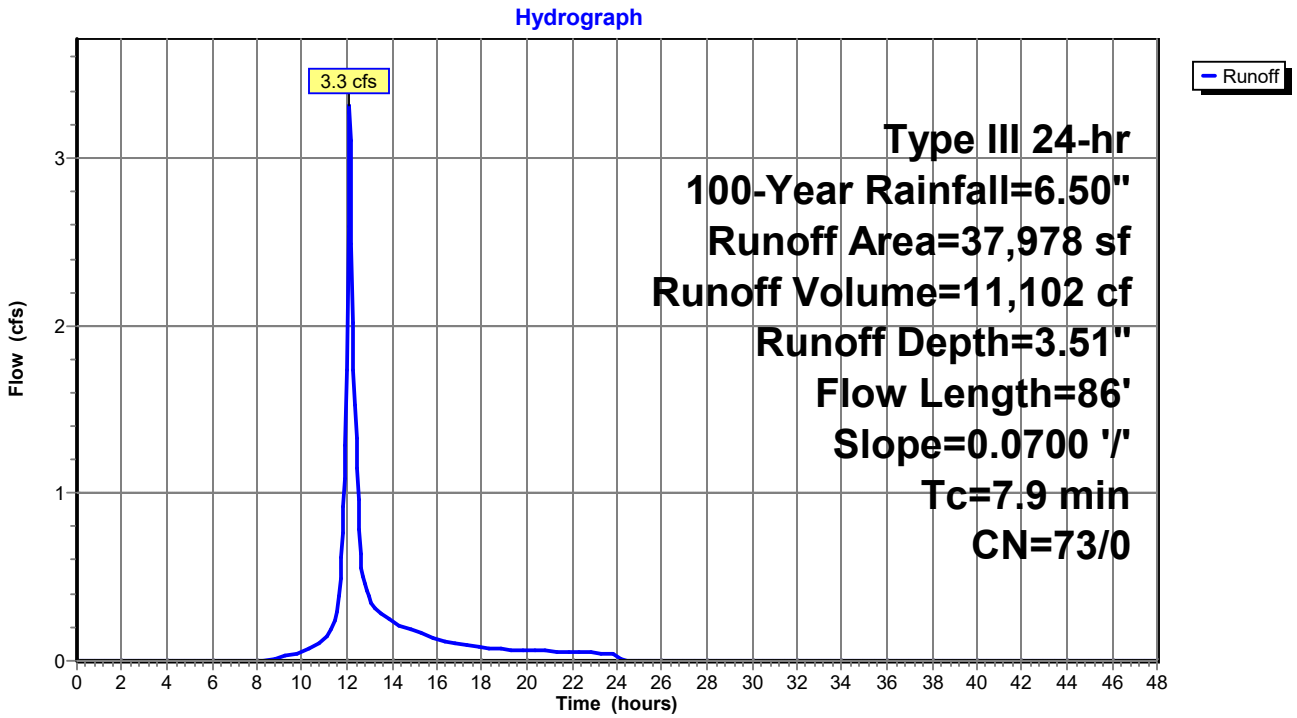
Runoff = 3.3 cfs @ 12.11 hrs, Volume= 11,102 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,484	79	50-75% Grass cover, Fair, HSG C
24,234	74	>75% Grass cover, Good, HSG C
638	30	Woods, Good, HSG A
8,622	70	Woods, Good, HSG C
37,978	73	Weighted Average
37,978	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	86	0.0700	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"

Subcatchment PS-2D:



Summary for Subcatchment PS-3A:

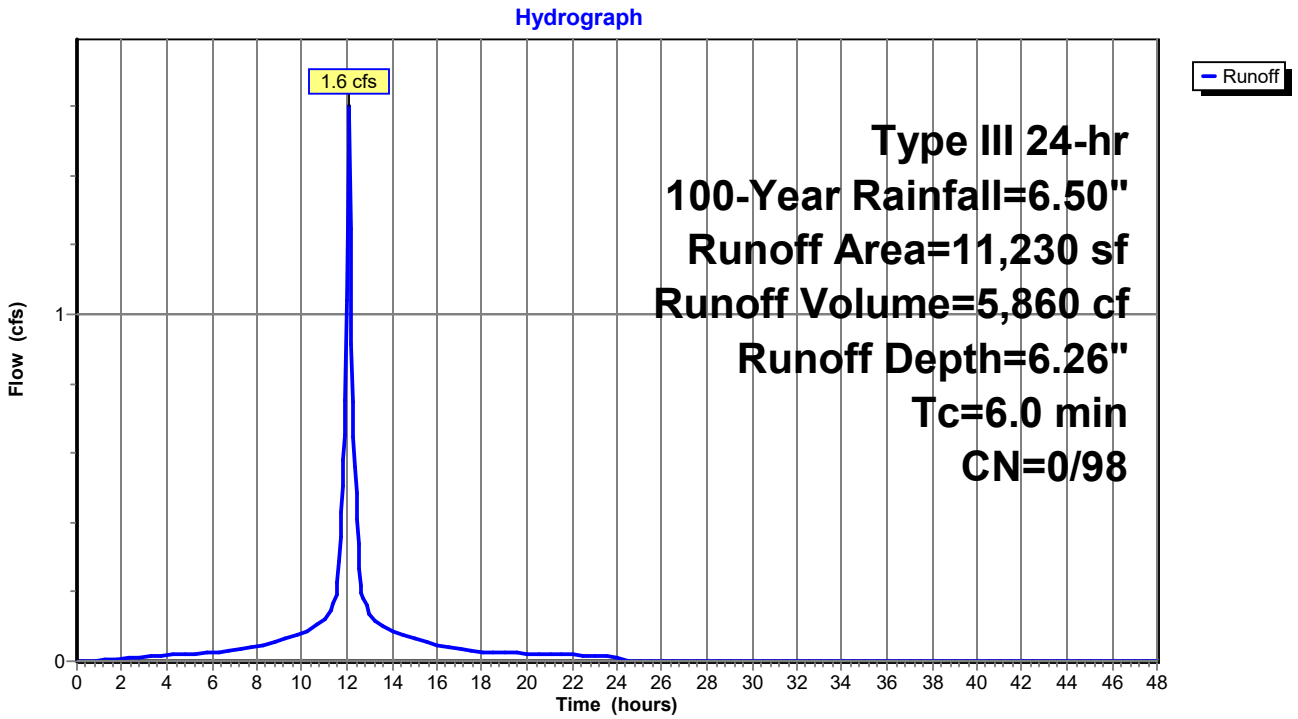
Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,860 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,253	98	Roofs, HSG B
3,977	98	Roofs, HSG D
11,230	98	Weighted Average
11,230	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3A:



Summary for Subcatchment PS-3B:

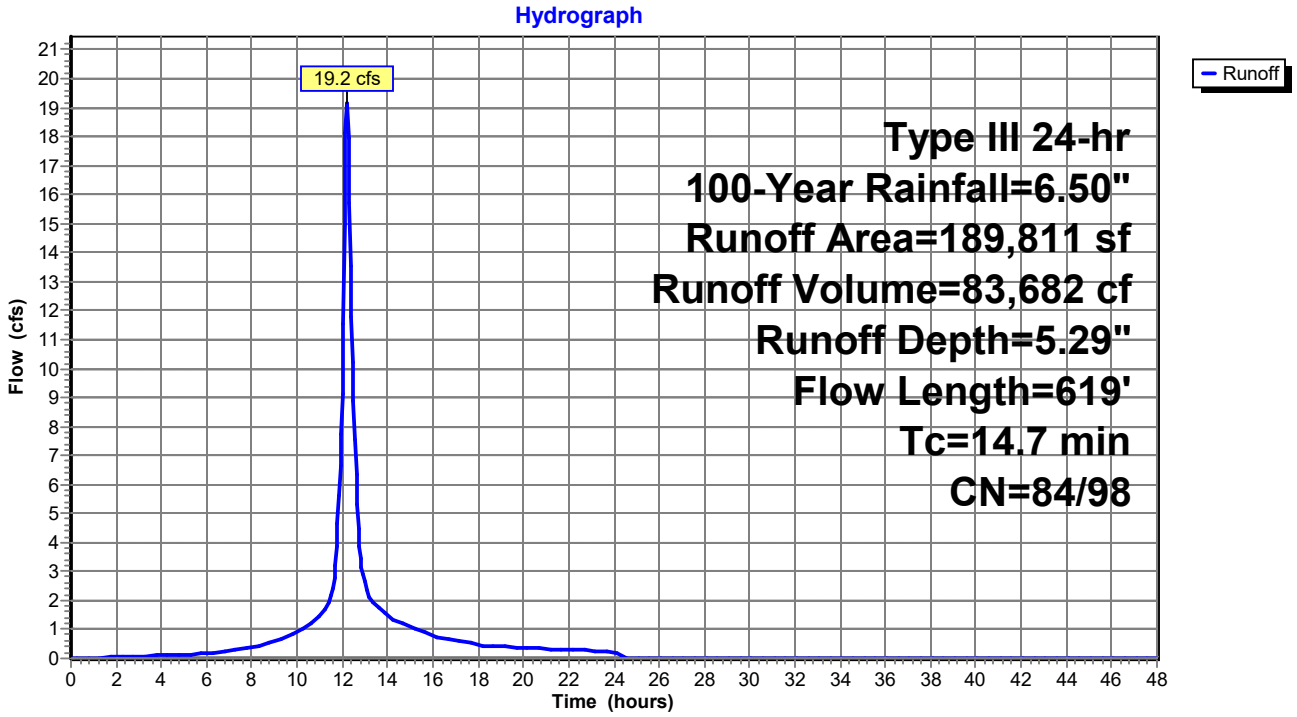
Runoff = 19.2 cfs @ 12.20 hrs, Volume= 83,682 cf, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,464	74	>75% Grass cover, Good, HSG C
70,885	80	>75% Grass cover, Good, HSG D
7,567	98	Paved parking, HSG C
38,034	98	Paved parking, HSG D
952	98	Roofs, HSG C
18,548	98	Roofs, HSG D
6,244	98	Unconnected roofs, HSG C
24,956	98	Unconnected roofs, HSG D
9,161	98	Water Surface, HSG D
189,811	90	Weighted Average
115,549	84	60.88% Pervious Area
74,262	98	39.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.6	91	0.0280	2.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	428	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	619	Total			

Subcatchment PS-3B:



Summary for Subcatchment PS-3C:

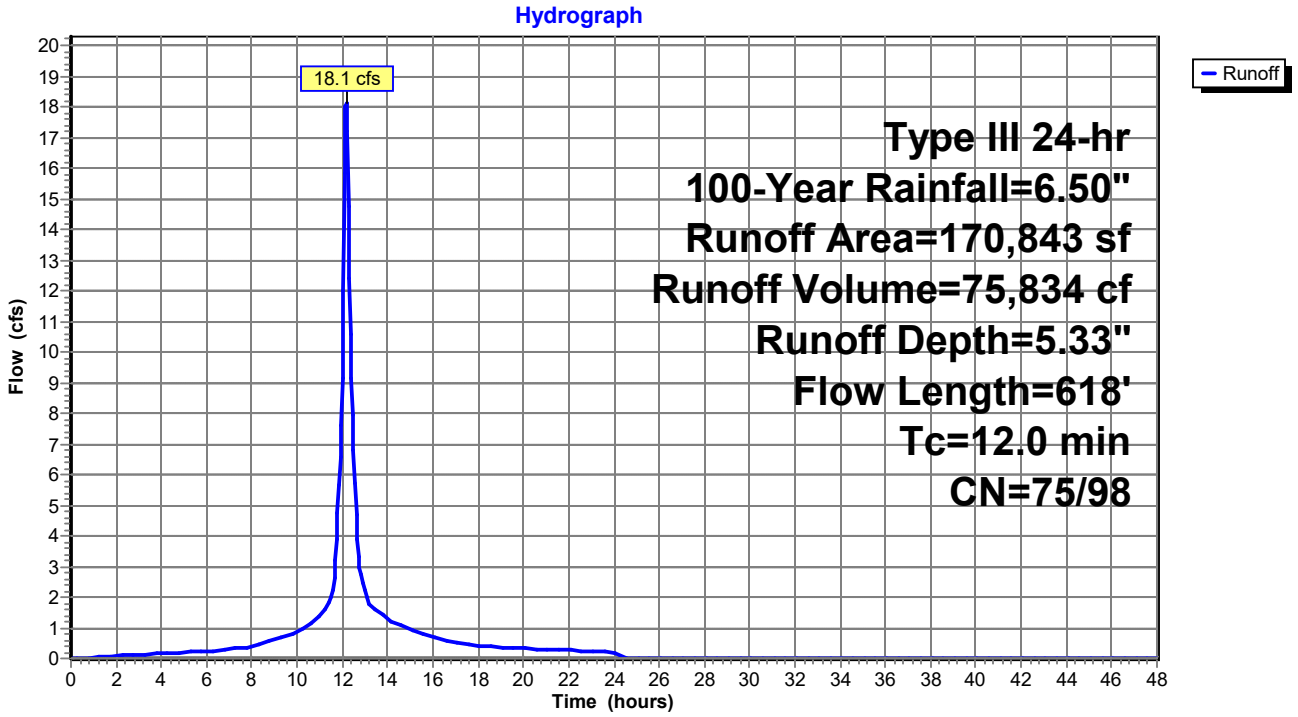
Runoff = 18.1 cfs @ 12.16 hrs, Volume= 75,834 cf, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
11,515	61	>75% Grass cover, Good, HSG B
18,501	74	>75% Grass cover, Good, HSG C
32,273	80	>75% Grass cover, Good, HSG D
90	98	Paved parking, HSG A
14,589	98	Paved parking, HSG B
31,208	98	Paved parking, HSG C
55,468	98	Paved parking, HSG D
6,446	98	Roofs, HSG C
396	98	Roofs, HSG D
170,843	89	Weighted Average
62,646	75	36.67% Pervious Area
108,197	98	63.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	66	0.0250	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.4	243	0.0210	2.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	309	0.0160	5.74	4.51	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
12.0	618	Total			

Subcatchment PS-3C:



Summary for Subcatchment PS-3D:

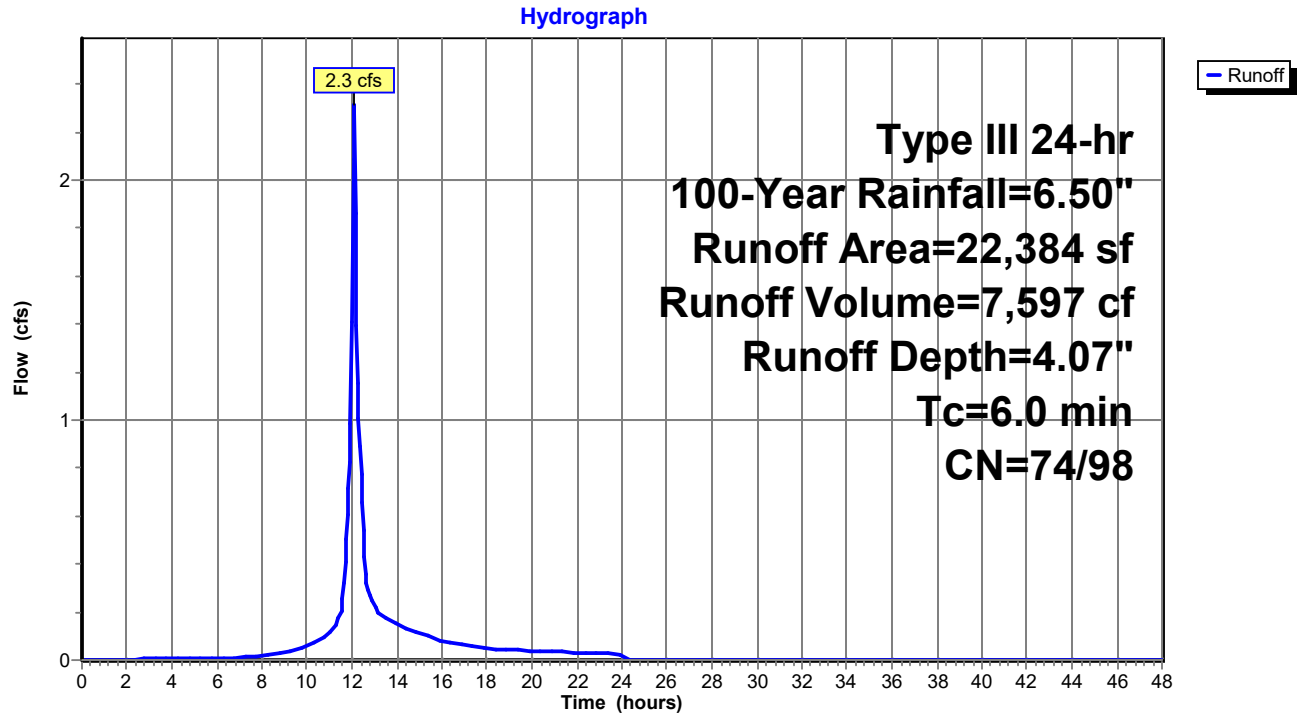
Runoff = 2.3 cfs @ 12.09 hrs, Volume= 7,597 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
18,400	74	>75% Grass cover, Good, HSG C
77	80	>75% Grass cover, Good, HSG D
7	98	Paved parking, HSG C
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
22,384	78	Weighted Average
18,477	74	82.55% Pervious Area
3,907	98	17.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PS-3D:



Summary for Subcatchment PS-3E:

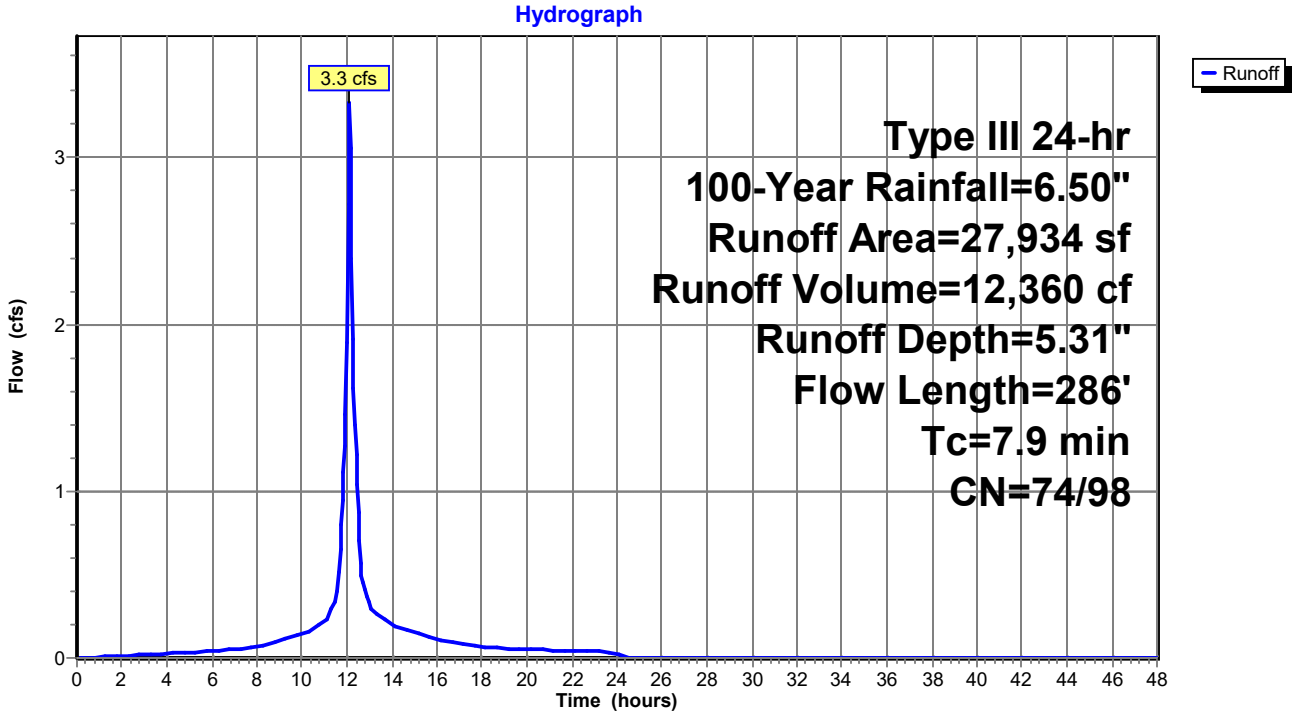
Runoff = 3.3 cfs @ 12.11 hrs, Volume= 12,360 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
10,024	74	>75% Grass cover, Good, HSG C
17,910	98	Paved parking, HSG C
27,934	89	Weighted Average
10,024	74	35.88% Pervious Area
17,910	98	64.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	31	0.0180	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.7	213	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.9	286	Total			

Subcatchment PS-3E:



Summary for Subcatchment PS-3F:

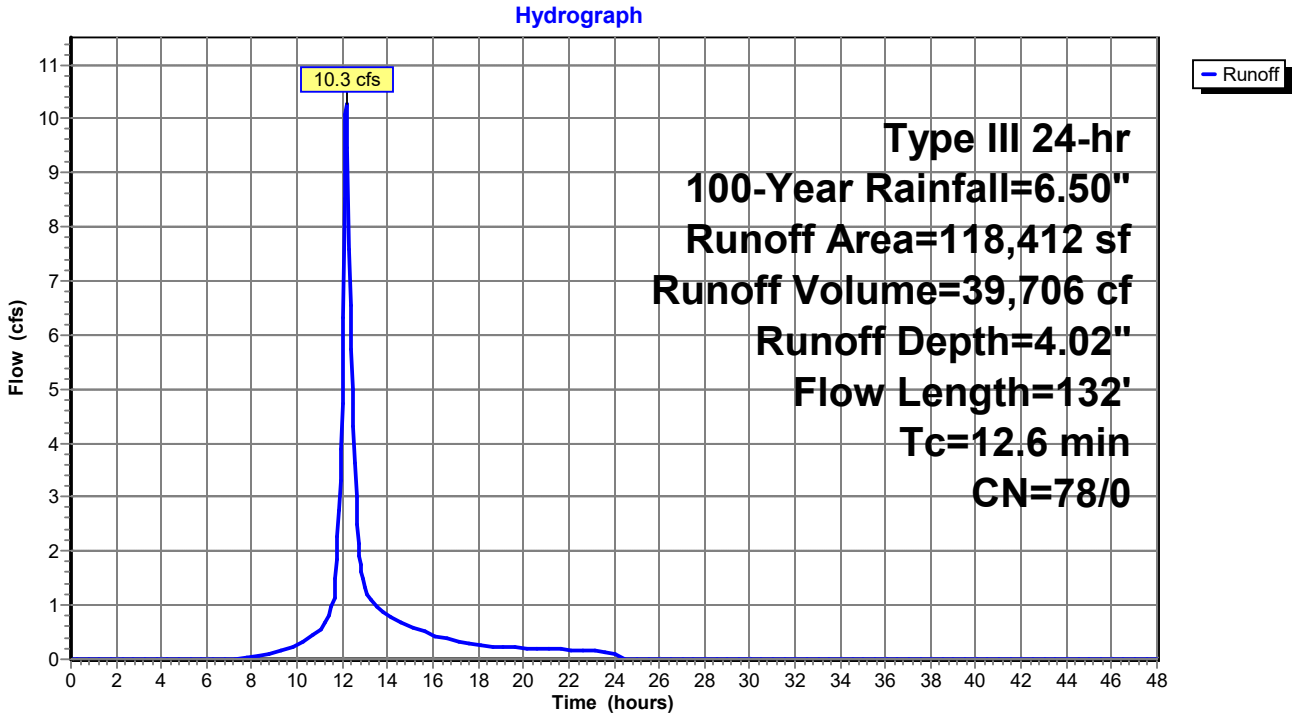
Runoff = 10.3 cfs @ 12.17 hrs, Volume= 39,706 cf, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,713	79	50-75% Grass cover, Fair, HSG C
1,509	84	50-75% Grass cover, Fair, HSG D
18,758	74	>75% Grass cover, Good, HSG C
44,952	80	>75% Grass cover, Good, HSG D
1,812	98	Unconnected roofs, HSG C
2,088	98	Unconnected roofs, HSG D
9,776	70	Woods, Good, HSG C
37,804	77	Woods, Good, HSG D
118,412	78	Weighted Average
118,412	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.1	32	0.0510	3.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.6	132	Total			

Subcatchment PS-3F:



Summary for Pond 1P: Infiltration Basin #1

Inflow Area = 142,855 sf, 49.65% Impervious, Inflow Depth = 4.20" for 100-Year event
Inflow = 10.3 cfs @ 12.23 hrs, Volume= 49,989 cf
Outflow = 7.3 cfs @ 12.42 hrs, Volume= 45,797 cf, Atten= 29%, Lag= 11.0 min
Primary = 7.3 cfs @ 12.42 hrs, Volume= 45,797 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.14' @ 12.42 hrs Surf.Area= 8,949 sf Storage= 14,157 cf

Plug-Flow detention time= 126.1 min calculated for 45,749 cf (92% of inflow)
Center-of-Mass det. time= 82.6 min (867.1 - 784.5)

Volume	Invert	Avail.Storage	Storage Description
#1	200.00'	614 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	201.00'	3,316 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	200.00'	27,868 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		31,798 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	479	83.0	0	0	479
201.00	759	104.0	614	614	805

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
201.00	759	104.0	0	0	759
202.00	1,016	121.0	884	884	1,084
203.00	1,213	132.0	1,113	1,997	1,339
204.00	1,427	143.0	1,319	3,316	1,616

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
200.00	4,562	398.0	0	0	4,562
201.00	5,788	419.0	5,163	5,163	5,987
202.00	6,993	440.0	6,381	11,544	7,485
203.00	8,159	459.0	7,569	19,112	8,917
204.00	9,366	479.0	8,756	27,868	10,482

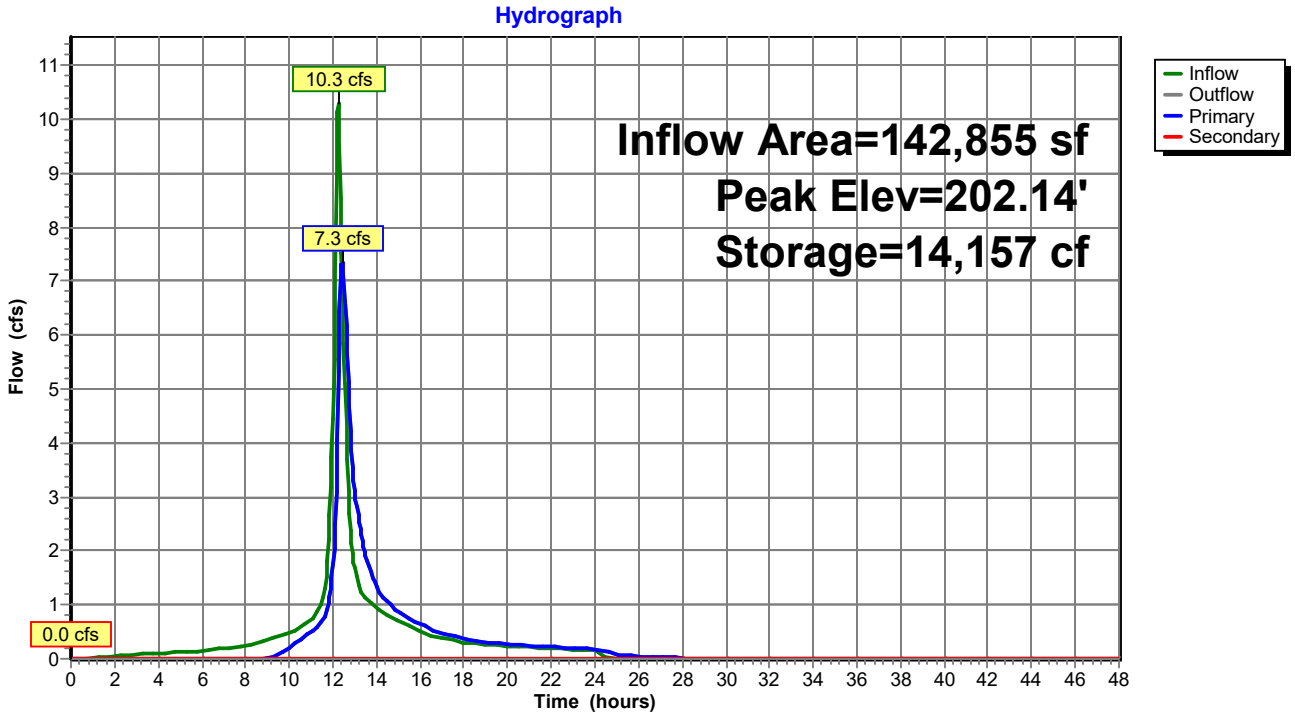
Device	Routing	Invert	Outlet Devices
#1	Primary	198.50'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 198.50' / 197.25' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	200.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 200.75 201.75 201.75 202.50 Width (feet) 1.00 1.00 3.50 3.50
#3	Device 1	202.50'	**48.0" x 48.0" Horiz. Structure Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	203.00'	**10.00' long x 6.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.3 cfs @ 12.42 hrs HW=202.14' (Free Discharge)
└**1=Culvert** (Passes 7.3 cfs of 8.1 cfs potential flow)
└**2=Custom Weir/Orifice** (Weir Controls 7.3 cfs @ 3.11 fps)
└**3=Structure Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=200.00' (Free Discharge)
└**4=Emergency Overflow** (Controls 0.0 cfs)

Pond 1P: Infiltration Basin #1



Summary for Pond 2P: Infiltration Basin #3

Inflow Area = 201,041 sf, 42.52% Impervious, Inflow Depth = 5.34" for 100-Year event
Inflow = 20.1 cfs @ 12.19 hrs, Volume= 89,542 cf
Outflow = 16.3 cfs @ 12.31 hrs, Volume= 84,341 cf, Atten= 19%, Lag= 7.1 min
Primary = 16.3 cfs @ 12.31 hrs, Volume= 84,341 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.84' @ 12.31 hrs Surf.Area= 14,513 sf Storage= 21,449 cf

Plug-Flow detention time= 89.3 min calculated for 84,254 cf (94% of inflow)
Center-of-Mass det. time= 57.5 min (837.4 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	950 cf	**Sediment forebay (Irregular)** Listed below (Recalc)
#2	182.00'	2,815 cf	**Above forebay (Irregular)** Listed below (Recalc)
#3	181.00'	34,348 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		38,114 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	770	112.0	0	0	770
182.00	1,142	134.0	950	950	1,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	1,142	134.0	0	0	1,142
183.00	1,439	149.0	1,288	1,288	1,508
184.00	1,618	158.0	1,528	2,815	1,776

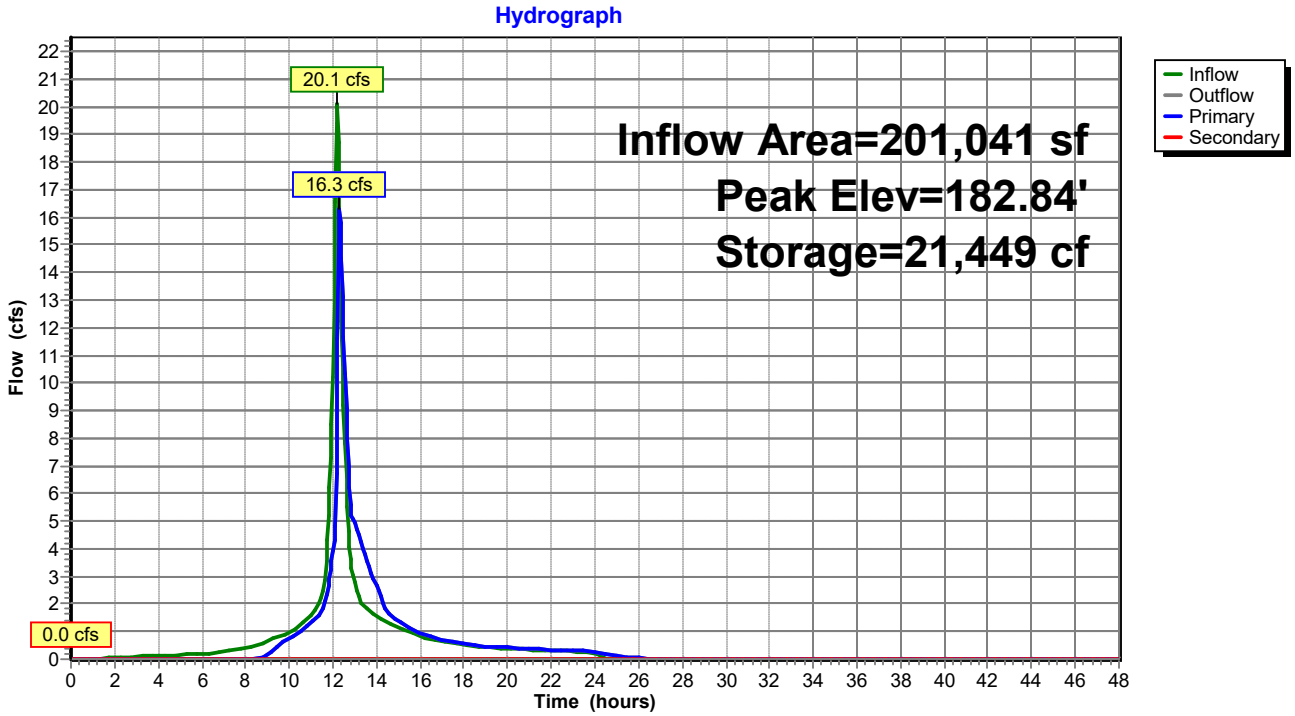
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	9,161	512.0	0	0	9,161
182.00	10,732	534.0	9,936	9,936	11,065
183.00	12,234	556.0	11,475	21,411	13,050
184.00	13,654	578.0	12,938	34,348	15,115

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**24.0" Round Culvert** L= 49.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 173.00' S= 0.1010 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	181.50'	**42.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 10.00' breadth Emergency Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.2 cfs @ 12.31 hrs HW=182.83' (Free Discharge)
└1=**Culvert** (Passes 16.2 cfs of 23.4 cfs potential flow)
  ├2=**Orifice/Grate** (Orifice Controls 6.1 cfs @ 5.20 fps)
  └3=**Rim** (Weir Controls 10.1 cfs @ 1.89 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=181.00' (Free Discharge)
└4=**Emergency Overflow** (Controls 0.0 cfs)

Pond 2P: Infiltration Basin #3



Summary for Pond 3P: Runoff Collection Area

Inflow Area = 78,721 sf, 0.09% Impervious, Inflow Depth = 3.51" for 100-Year event
Inflow = 5.7 cfs @ 12.20 hrs, Volume= 23,029 cf
Outflow = 4.3 cfs @ 12.35 hrs, Volume= 19,668 cf, Atten= 25%, Lag= 8.7 min
Primary = 4.3 cfs @ 12.35 hrs, Volume= 19,668 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.35' @ 12.35 hrs Surf.Area= 7,505 sf Storage= 5,894 cf

Plug-Flow detention time= 103.1 min calculated for 19,648 cf (85% of inflow)
Center-of-Mass det. time= 39.7 min (874.7 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	11,016 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

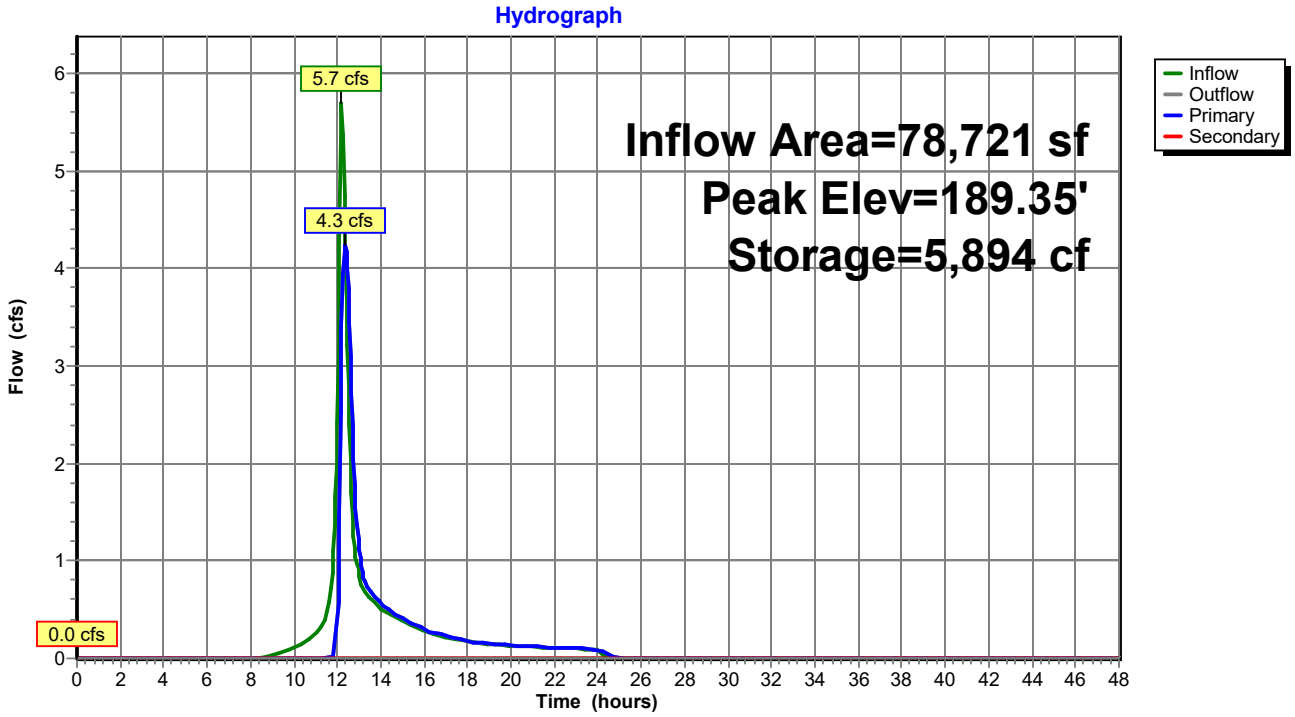
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	6,274	300.0	0	0	6,274
189.00	7,181	310.0	3,361	3,361	6,783
190.00	8,139	329.0	7,655	11,016	7,800

Device	Routing	Invert	Outlet Devices
#1	Primary	185.50'	**12.0" Round Culvert** L= 224.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.50' / 182.40' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	189.00'	**15" Dome X 2.00** Elev. (feet) 189.00 189.10 189.20 189.30 189.40 189.50 189.60 189.70 189.80 189.90 190.00 190.10 Disch. (cfs) 0.000 0.400 1.200 1.900 2.400 2.700 3.000 3.200 3.400 3.600 3.800 4.000
#3	Secondary	189.60'	**10.00' long x 8.00' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.2 cfs @ 12.35 hrs HW=189.34' (Free Discharge)
└**1=Culvert** (Passes 4.2 cfs of 5.1 cfs potential flow)
└**2=15" Dome** (Custom Controls 4.2 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
└**3=Overflow** (Controls 0.0 cfs)

Pond 3P: Runoff Collection Area



Summary for Pond 5P: Bioretention Basin

Inflow Area = 27,934 sf, 64.12% Impervious, Inflow Depth = 5.31" for 100-Year event
Inflow = 3.3 cfs @ 12.11 hrs, Volume= 12,360 cf
Outflow = 3.0 cfs @ 12.16 hrs, Volume= 9,989 cf, Atten= 9%, Lag= 2.8 min
Primary = 3.0 cfs @ 12.16 hrs, Volume= 9,989 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.75' @ 12.16 hrs Surf.Area= 3,065 sf Storage= 3,117 cf

Plug-Flow detention time= 144.4 min calculated for 9,978 cf (81% of inflow)
Center-of-Mass det. time= 68.6 min (834.2 - 765.6)

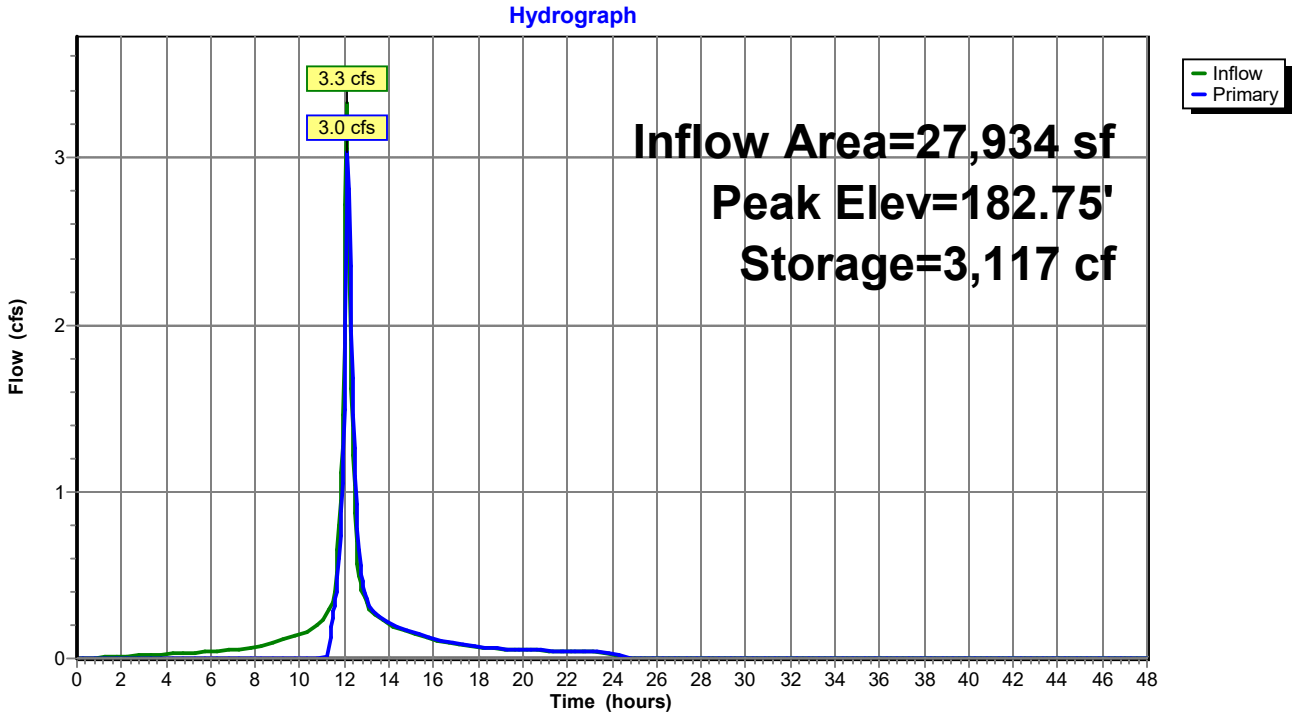
Volume	Invert	Avail.Storage	Storage Description
#1	181.50'	3,903 cf	**Bioretention Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.50	1,950	158.0	0	0	1,950
182.00	2,365	174.0	1,077	1,077	2,381
183.00	3,314	206.0	2,826	3,903	3,367

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**10.00' long x 5.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.0 cfs @ 12.16 hrs HW=182.75' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.0 cfs @ 1.19 fps)

Pond 5P: Bioretention Basin



Summary for Pond 7P: Extended Dry Detention Basin

Inflow Area = 221,161 sf, 58.79% Impervious, Inflow Depth = 5.07" for 100-Year event
Inflow = 22.9 cfs @ 12.15 hrs, Volume= 93,419 cf
Outflow = 10.4 cfs @ 12.43 hrs, Volume= 93,375 cf, Atten= 55%, Lag= 16.8 min
Primary = 10.4 cfs @ 12.43 hrs, Volume= 93,375 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 181.30' @ 12.43 hrs Surf.Area= 11,179 sf Storage= 26,179 cf

Plug-Flow detention time= 68.3 min calculated for 93,375 cf (100% of inflow)
Center-of-Mass det. time= 68.0 min (847.3 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	1,065 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	179.00'	7,139 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	178.00'	36,489 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		44,693 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	870	123.0	0	0	870
179.00	1,273	145.0	1,065	1,065	1,358

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
179.00	1,273	145.0	0	0	1,273
180.00	1,597	160.0	1,432	1,432	1,668
181.00	1,797	168.0	1,696	3,128	1,933
182.00	2,005	176.0	1,900	5,028	2,212
183.00	2,219	185.0	2,111	7,139	2,527

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
178.00	4,837	340.0	0	0	4,837
179.00	5,893	362.0	5,356	5,356	6,115
180.00	6,873	384.0	6,377	11,733	7,473
181.00	7,768	407.0	7,316	19,049	8,974
182.00	8,712	429.0	8,235	27,284	10,496
183.00	9,706	452.0	9,205	36,489	12,168

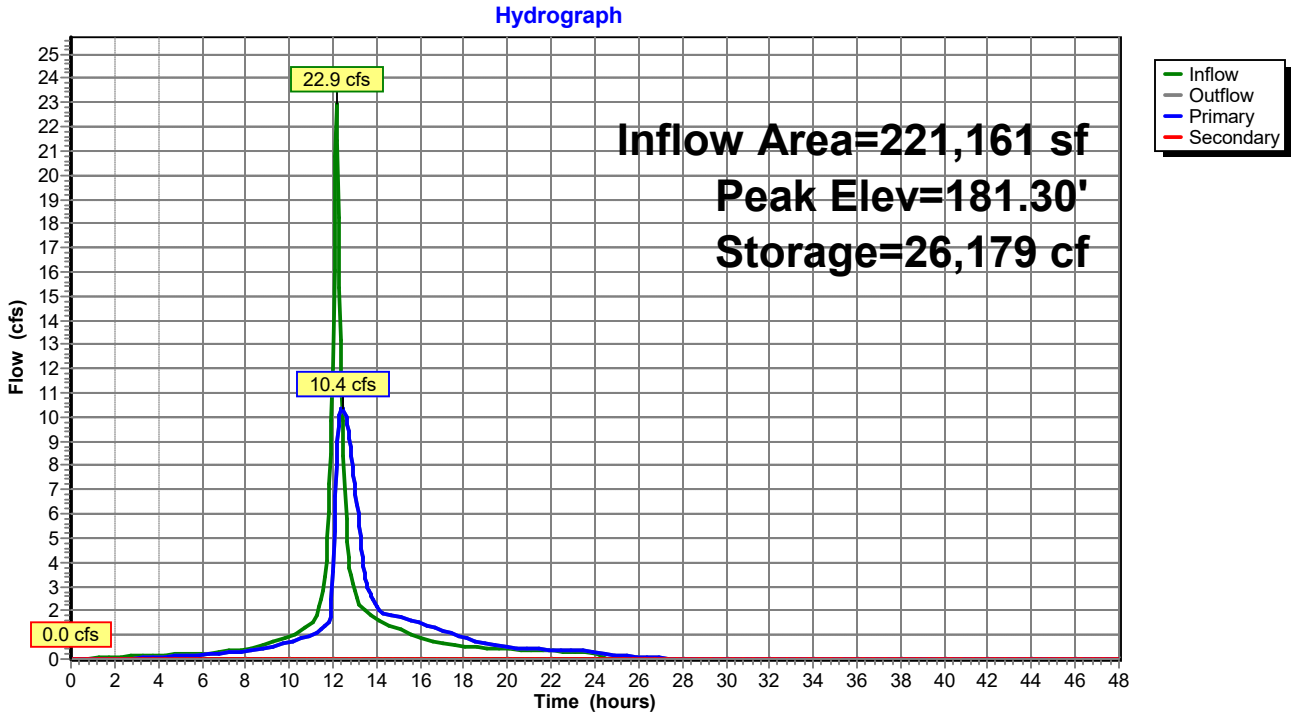
Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**18.0" Round Culvert** L= 38.0' Ke= 0.900 Inlet / Outlet Invert= 178.00' / 177.00' S= 0.0263 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	179.50'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	181.50'	**48.0" x 48.0" Horiz. CB Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	182.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=10.4 cfs @ 12.43 hrs HW=181.30' (Free Discharge)
└**1=Culvert** (Passes 10.4 cfs of 10.7 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.9 cfs @ 8.29 fps)
  ├**3=Orifice/Grate** (Orifice Controls 7.5 cfs @ 5.99 fps)
  └**4=CB Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=178.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 7P: Extended Dry Detention Basin



Summary for Pond 8P: Infiltration Basin #2

Inflow Area = 186,455 sf, 34.02% Impervious, Inflow Depth = 4.22" for 100-Year event
Inflow = 13.3 cfs @ 12.15 hrs, Volume= 65,528 cf
Outflow = 10.1 cfs @ 12.35 hrs, Volume= 62,629 cf, Atten= 24%, Lag= 11.5 min
Primary = 10.1 cfs @ 12.35 hrs, Volume= 62,629 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 182.29' @ 12.35 hrs Surf.Area= 8,844 sf Storage= 12,123 cf

Plug-Flow detention time= 78.0 min calculated for 62,629 cf (96% of inflow)
Center-of-Mass det. time= 52.0 min (853.7 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	180.50'	762 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	182.00'	1,885 cf	**Above Forebay (Irregular)** Listed below (Recalc)
#3	180.50'	25,508 cf	**Infiltration Basin (Irregular)** Listed below (Recalc)
		28,155 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	327	69.0	0	0	327
181.00	439	80.0	191	191	463
182.00	714	102.0	571	762	794

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	714	102.0	0	0	714
183.00	961	118.0	834	834	1,015
184.00	1,143	129.0	1,051	1,885	1,264

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.50	5,113	401.0	0	0	5,113
181.00	5,725	412.0	2,708	2,708	5,853
182.00	6,996	434.0	6,350	9,058	7,393
183.00	8,243	455.0	7,611	16,669	8,944
184.00	9,449	475.0	8,839	25,508	10,496

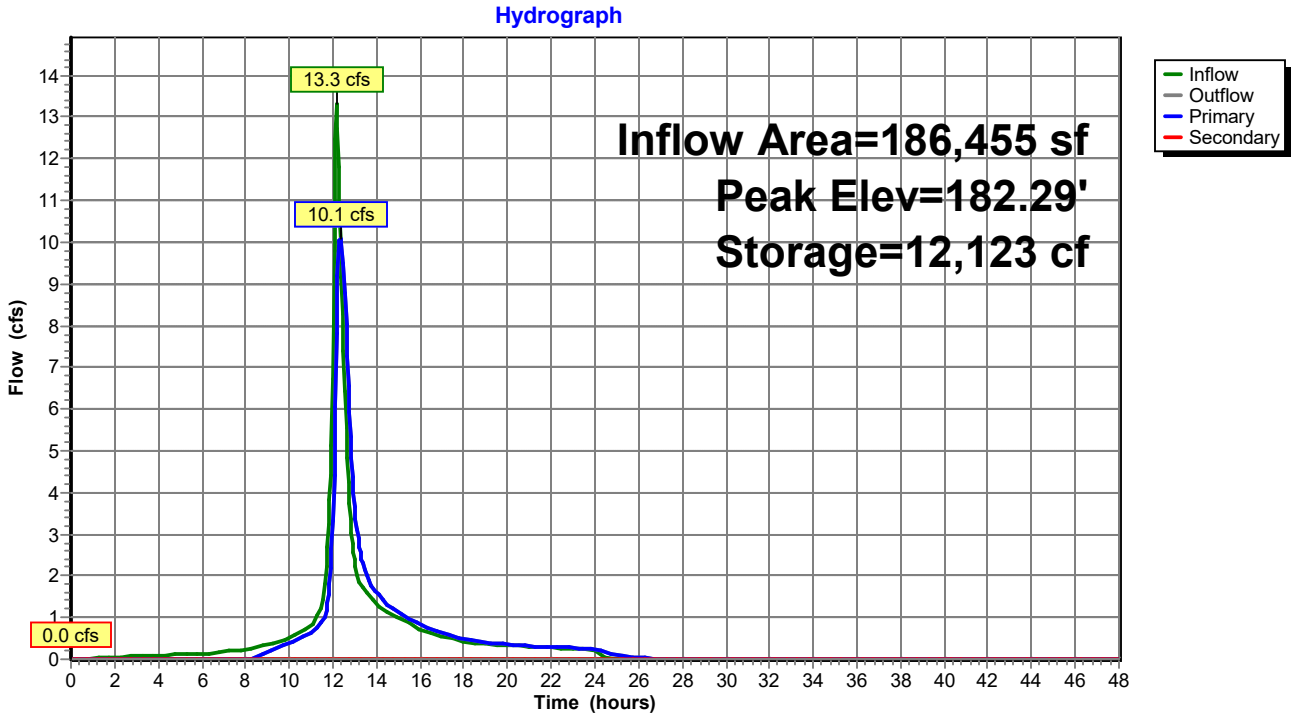
Device	Routing	Invert	Outlet Devices
#1	Primary	180.50'	**15.0" Round Culvert X 2.00** L= 28.6' Ke= 0.900 Inlet / Outlet Invert= 180.50' / 179.00' S= 0.0524 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	181.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 181.00 181.50 181.50 182.50 Width (feet) 1.50 1.50 3.00 3.00
#3	Device 1	182.50'	**48.0" x 48.0" Horiz. Rim** C= 0.600 Limited to weir flow at low heads
#4	Secondary	183.00'	**10.00' long x 6.00' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65
2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=10.1 cfs @ 12.35 hrs HW=182.29' (Free Discharge)
└**1=Culvert** (Inlet Controls 10.1 cfs @ 4.10 fps)
└**2=Custom Weir/Orifice** (Passes 10.1 cfs of 10.7 cfs potential flow)
└**3=Rim** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=180.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 8P: Infiltration Basin #2

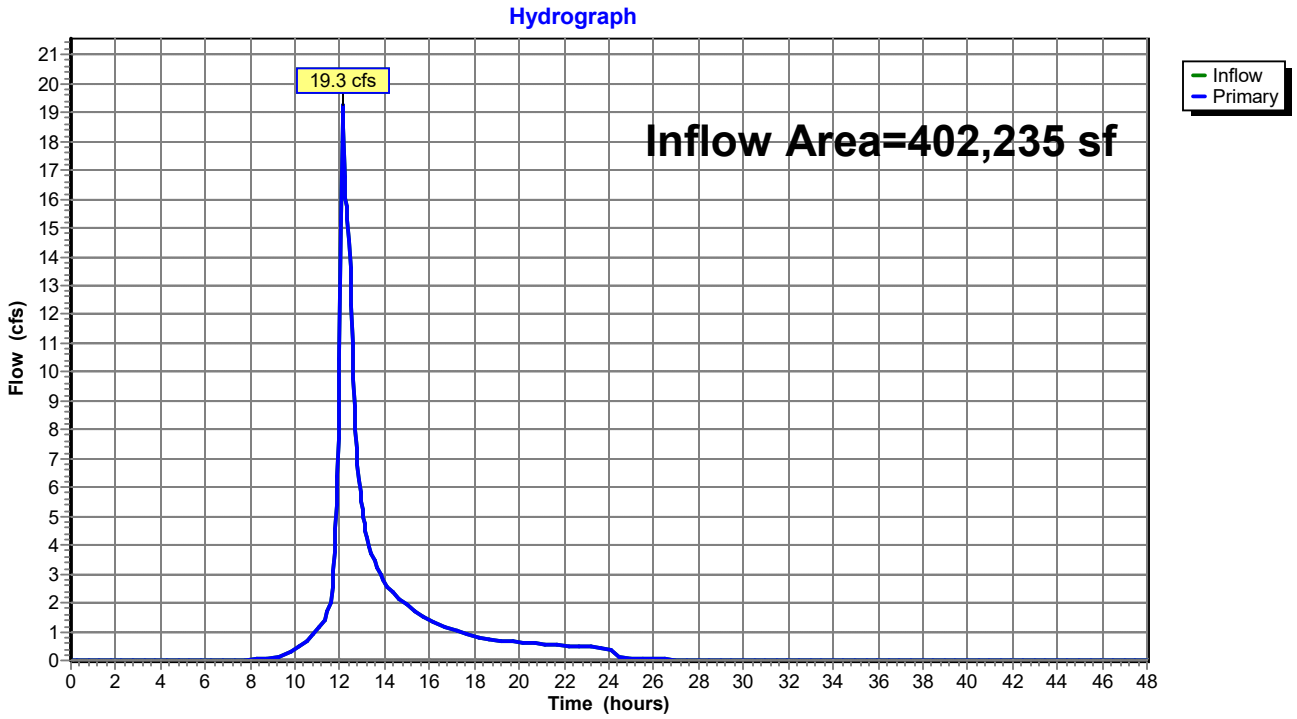


Summary for Link DP-1: Offsite to North

Inflow Area = 402,235 sf, 18.20% Impervious, Inflow Depth = 3.13" for 100-Year event
Inflow = 19.3 cfs @ 12.12 hrs, Volume= 104,842 cf
Primary = 19.3 cfs @ 12.12 hrs, Volume= 104,842 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-1: Offsite to North

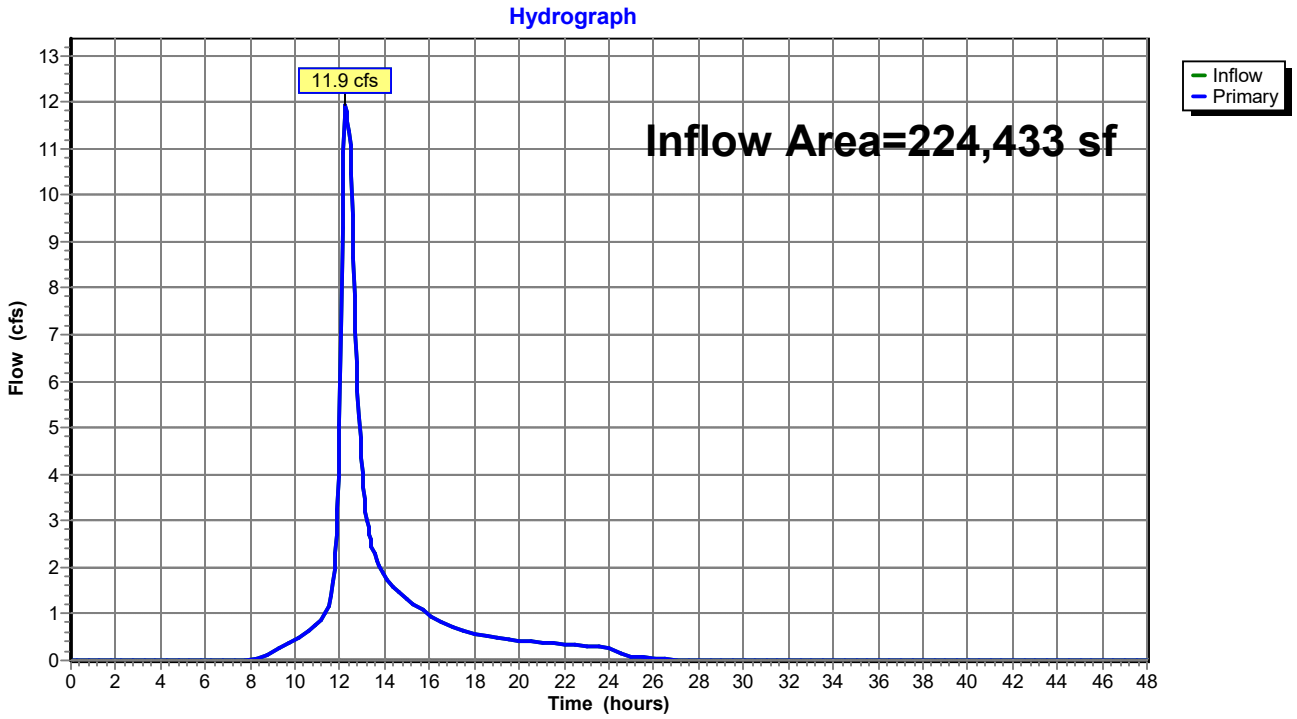


Summary for Link DP-2: Offsite to Southeast

Inflow Area = 224,433 sf, 28.27% Impervious, Inflow Depth = 3.94" for 100-Year event
Inflow = 11.9 cfs @ 12.25 hrs, Volume= 73,731 cf
Primary = 11.9 cfs @ 12.25 hrs, Volume= 73,731 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-2: Offsite to Southeast

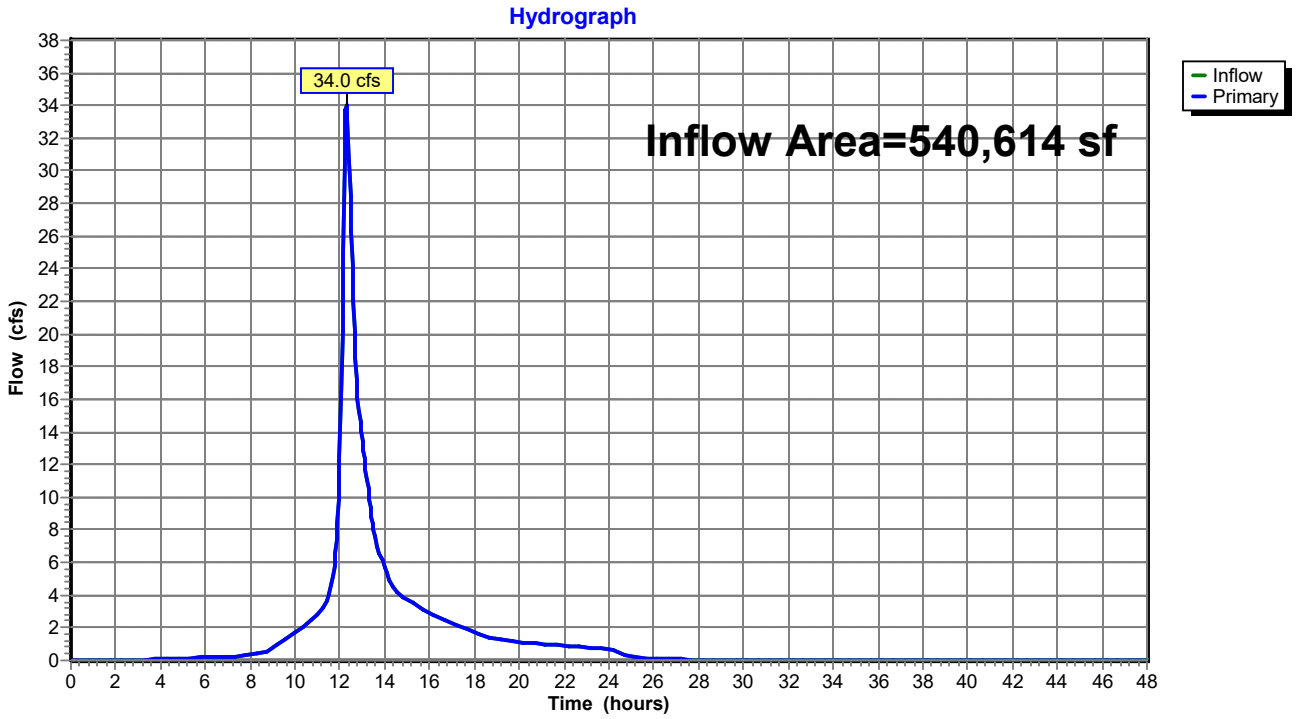


Summary for Link DP-3: Offsite to Northeast

Inflow Area = 540,614 sf, 39.86% Impervious, Inflow Depth = 4.83" for 100-Year event
Inflow = 34.0 cfs @ 12.28 hrs, Volume= 217,423 cf
Primary = 34.0 cfs @ 12.28 hrs, Volume= 217,423 cf, Atten= 0%, Lag= 0.0 min

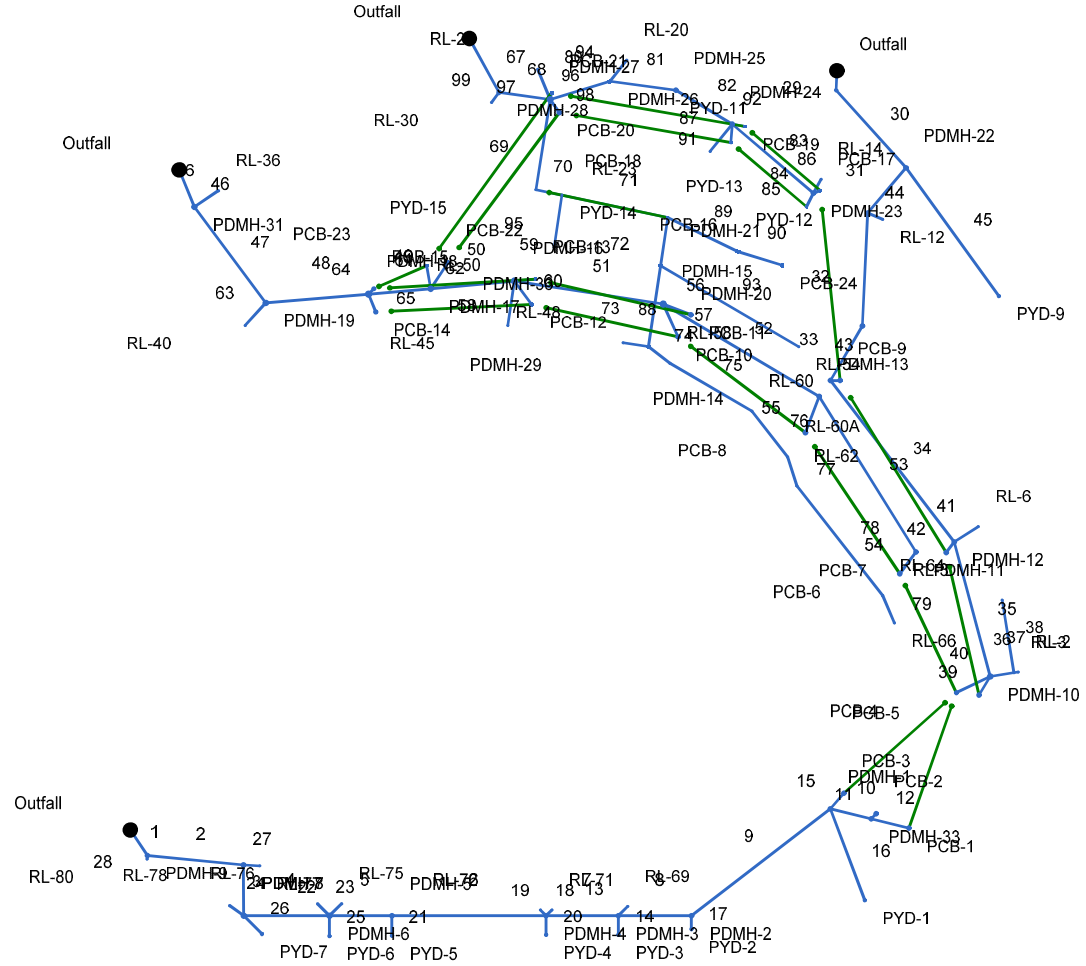
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP-3: Offsite to Northeast



Appendix D: Hydraulic Analysis

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 090506 - STORM.stm	Number of lines: 99	Date: 9/20/2022

Storm Sewers v2020.00

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	43.388	0.00	0.00	0.00	0.00	0.00	0.0	7.8	0.0	11.701	7.17	5.05	24	0.58	200.50	200.75	202.11	201.98	202.74	206.13	Pipe - (2
2	1	136.289	0.00	0.00	0.00	0.00	0.00	0.0	7.1	0.0	11.201	7.86	5.62	24	0.62	200.75	201.60	201.98	202.80	206.13	205.26	Pipe - (1
3	2	71.586	0.00	0.00	0.00	0.00	0.00	0.0	6.8	0.0	10.601	7.93	5.48	24	0.63	201.60	202.05	202.80	203.22	205.26	212.40	Pipe - (1
4	3	121.010	0.00	0.00	0.00	0.00	0.00	0.0	6.4	0.0	9.40	7.70	5.32	18	0.54	202.55	203.20	204.05	205.02	212.40	212.02	Pipe - (1
5	4	88.249	0.00	0.00	0.00	0.00	0.00	0.0	6.1	0.0	8.10	7.50	4.58	18	0.51	203.20	203.65	205.46	205.99	212.02	211.04	Pipe - (9)
6	5	217.563	0.00	0.00	0.00	0.00	0.00	0.0	5.2	0.0	7.30	7.63	4.13	18	0.53	203.65	204.80	206.31	207.36	211.04	212.06	Pipe - (7)
7	6	102.000	0.00	0.00	0.00	0.00	0.00	0.0	4.7	0.0	5.80	7.71	3.28	18	0.54	204.80	205.35	207.63	207.94	212.06	212.05	Pipe - (4)
8	7	103.250	0.00	0.00	0.00	0.00	0.00	0.0	4.1	0.0	5.20	7.66	2.94	18	0.53	205.35	205.90	208.11	208.36	212.05	211.70	Pipe - (3)
9	8	247.509	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	4.70	4.59	3.83	15	0.51	206.15	207.40	208.50	209.81	211.70	212.08	Pipe - (3
10	9	59.382	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	2.80	3.58	3.57	12	1.01	207.75	208.35	210.04	210.40	212.08	212.29	Pipe - (3
11	10	10.173	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	5.58	2.55	12	2.46	208.35	208.60	210.58	210.61	212.29	211.85	Pipe - (3
12	10	54.875	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.80	5.69	1.07	12	2.55	208.35	209.75	210.58	210.60	212.29	213.90	Pipe - (1
13	7	18.385	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	2.44	8	0.98	207.85	208.03	208.11	208.28	212.05	208.76	Pipe - (5
14	7	26.976	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	5.53	2.07	12	2.41	207.85	208.50	208.11	208.73	212.05	212.00	Pipe - (2)
15	9	29.278	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.30	3.29	1.66	12	0.85	207.75	208.00	210.04	210.07	212.08	211.53	Pipe - (3
16	9	137.892	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	3.52	0.77	12	0.98	207.75	209.10	210.04	210.07	212.08	210.70	Pipe - (3
17	8	19.019	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.50	5.77	1.66	12	2.63	207.65	208.15	208.50	208.44	211.70	212.00	Pipe - (1
18	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	2.11	8	0.97	207.30	207.41	207.63	207.66	212.06	208.40	Pipe - (5
19	6	11.314	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.55	2.95	8	0.97	207.55	207.66	207.75	207.91	212.06	208.39	Pipe - (5
20	6	27.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.90	4.85	3.55	12	1.85	207.30	207.80	207.63	208.20	212.06	211.00	Pipe - (5)
21	5	28.267	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.80	3.67	3.36	12	1.06	206.50	206.80	206.82	207.17	211.04	209.17	Pipe - (6)
22	4	23.983	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.57	2.97	8	1.00	206.20	206.44	206.40	206.69	212.02	207.17	Pipe - (5

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 9/20/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	4	23 705	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.58	2.97	8	1.01	206.20	206.44	206.40	206.69	212.02	207.16	Pipe - (6
24	3	24 388	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.50	1.56	3.43	8	0.98	206.05	206.29	206.31	206.62	212.40	207.02	Pipe - (3
25	4	28 781	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	5.14	0.89	12	2.08	203.70	204.30	205.46	205.47	212.02	210.05	Pipe - (8)
26	3	36 459	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	5.11	3.71	12	2.06	203.05	203.80	203.30	204.15	212.40	210.00	Pipe - (1
27	2	22 635	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.62	3.68	8	1.06	202.85	203.09	203.13	203.45	205.26	203.82	Pipe - (1
28	1	5 000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.50	1.57	3.44	8	1.00	202.00	202.05	202.26	202.38	206.13	202.78	RL-80
29	End	27 761	0.00	0.00	0.00	0.00	0.00	0.0	6.5	0.0	15.10	16.63	5.39	24	0.54	180.50	180.65	182.20	182.29	182.74	183.74	Pipe - (2
30	29	47 352	0.00	0.00	0.00	0.00	0.00	0.0	6.0	0.0	14.20	16.14	4.74	24	0.51	180.65	181.40	182.64	183.11	183.74	184.55	Pipe - (2
31	30	83 641	0.00	0.00	0.00	0.00	0.00	0.0	5.7	0.0	9.30	25.03	5.76	18	5.68	181.90	186.65	183.49	187.83	184.55	191.12	Pipe - (2
32	31	159 757	0.00	0.00	0.00	0.00	0.00	0.0	5.3	0.0	7.80	7.91	6.66	15	1.50	186.65	189.05	187.83	190.15	191.12	193.76	Pipe - (2
33	32	89 190	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	7.80	6.49	6.36	15	1.01	189.30	190.20	190.55	191.85	193.76	194.39	Pipe - (4
34	33	287 314	0.00	0.00	0.00	0.00	0.00	0.0	4.3	0.0	5.10	5.17	6.49	12	2.11	190.45	196.50	192.48	198.37	194.39	200.61	Pipe - (4
35	34	196 655	0.00	0.00	0.00	0.00	0.00	0.0	3.4	0.0	2.80	4.65	4.11	12	1.70	196.50	199.85	199.03	200.57	200.61	204.67	Pipe - (2
36	35	33 810	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	0.50	1.57	2.40	8	1.00	200.10	200.44	200.57	200.77	204.67	201.16	Pipe - (4
37	36	6 200	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.54	2.11	8	0.97	200.44	200.50	200.77	200.75	201.16	201.23	Pipe - (1
38	36	103 715	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.20	1.57	1.68	8	1.00	200.44	201.48	200.77	201.69	201.16	202.20	Pipe - (4
39	35	30 572	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	4.78	2.02	12	1.80	199.85	200.40	200.57	200.75	204.67	205.10	Pipe - (3
40	35	53 032	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.77	3.19	12	1.79	199.85	200.80	200.57	201.34	204.67	204.02	Pipe - (3
41	34	40 170	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	196.75	197.15	199.03	199.09	200.61	197.88	Pipe - (4
42	34	18 671	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.70	4.88	2.16	12	1.87	196.50	196.85	199.03	199.07	200.61	200.35	Pipe - (3
43	33	13 532	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	4.33	3.44	12	1.48	190.45	190.65	192.48	192.56	194.39	194.65	Pipe - (4
44	31	22 972	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.50	1.57	4.30	8	1.00	187.00	187.23	187.83	188.04	191.12	187.96	Pipe - (5

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 9/20/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	3022	23.565	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.30	3.84	5.48	12	1.16	182.40	185.00	183.49	186.75	184.55	189.00	Pipe - (2
46	End	56.538	0.00	0.00	0.00	0.00	0.00	0.0	7.1	0.0	21.503	4.96	5.81	30	0.62	178.40	178.75	180.44	180.32	181.20	184.90	Pipe - (7
47	4669	7.007	0.00	0.00	0.00	0.00	0.00	0.0	6.5	0.0	20.903	4.18	6.47	30	0.59	178.75	179.75	180.32	181.30	184.90	186.82	Pipe - (7
48	4745	.574	0.00	0.00	0.00	0.00	0.00	0.0	5.9	0.0	20.203	1.89	6.38	30	0.52	179.75	180.50	181.30	182.02	186.82	185.53	Pipe - (1
49	4888	2.002	0.00	0.00	0.00	0.00	0.00	0.0	5.4	0.0	15.502	9.33	5.40	30	0.51	180.50	180.95	182.02	182.28	185.53	186.12	Pipe - (7
50	4918	.691	0.00	0.00	0.00	0.00	0.00	0.0	4.9	0.0	11.501	6.08	5.57	24	0.51	181.45	182.05	182.70	183.30	186.12	187.54	Pipe - (7
51	5012	.615	0.00	0.00	0.00	0.00	0.00	0.0	4.1	0.0	7.70	9.39	5.32	18	0.80	182.55	184.25	183.78	185.32	187.54	189.90	Pipe - (7
52	5155	.968	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	4.10	9.34	4.79	15	2.09	184.50	189.85	185.32	190.67	189.90	195.70	Pipe - (6
53	5258	.802	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	1.40	4.77	3.30	12	1.80	190.10	194.75	190.67	195.25	195.70	200.15	Pipe - (6
54	5338	.328	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.40	4.07	4.13	12	1.30	195.50	196.00	195.90	196.50	200.15	199.59	Pipe - (6
55	5254	.671	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	3.47	4.73	12	0.95	190.25	190.77	190.91	191.47	195.70	194.77	Pipe - (6
56	5141	.889	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.60	4.60	4.53	12	1.67	186.05	186.75	186.46	187.29	189.90	190.35	Pipe - (6
57	5150	.638	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.61	4.85	12	1.68	186.00	186.85	186.46	187.45	189.90	190.35	Pipe - (6
58	5063	.425	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.56	1.79	8	0.99	183.30	183.93	183.78	184.18	187.54	185.26	Pipe - (1
59	5029	.752	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.84	4.96	12	1.85	183.60	184.15	184.05	184.75	187.54	187.66	Pipe - (6
60	5040	.990	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.50	4.13	3.83	12	1.34	183.30	183.85	183.78	184.37	187.54	187.66	Pipe - (6
61	4944	.533	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.80	3.96	4.40	12	1.24	182.45	183.00	182.92	183.57	186.12	185.92	Pipe - (1
62	4932	.849	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.20	4.61	5.00	12	1.67	182.45	183.00	182.94	183.63	186.12	185.90	Pipe - (1
63	4743	.293	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.56	3.81	8	0.99	181.50	181.93	181.81	182.32	186.82	182.66	Pipe - (1
64	4810	.630	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.30	6.91	6.09	12	3.76	182.00	182.40	182.40	183.05	185.53	185.38	Pipe - (7
65	4827	.203	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.40	4.32	4.99	12	1.47	182.00	182.40	182.53	183.06	185.53	185.32	Pipe - (7
66	4640	.664	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.58	3.64	8	1.01	180.50	180.91	180.79	181.27	184.90	181.63	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 9/20/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
67	End	66.792	0.00	0.00	0.00	0.00	0.00	0.0	8.0	0.0	22.10	18.00	7.17	24	0.63	181.60	182.15	183.44	184.27	183.84	187.14	Pipe - (9
68	67	72.907	0.00	0.00	0.00	0.00	0.00	0.0	7.8	0.0	21.00	17.77	6.69	24	0.62	182.15	182.60	184.98	185.61	187.14	187.63	Pipe - (9
69	68	129.005	0.00	0.00	0.00	0.00	0.00	0.0	7.2	0.0	9.80	16.05	3.12	24	0.50	182.60	183.25	186.31	186.55	187.63	187.25	Pipe - (1
70	69	37.363	0.00	0.00	0.00	0.00	0.00	0.0	6.9	0.0	7.00	16.55	2.23	24	0.54	183.25	183.45	186.78	186.81	187.25	187.50	Pipe - (1
71	70	152.779	0.00	0.00	0.00	0.00	0.00	0.0	5.6	0.0	6.30	16.37	2.01	24	0.52	183.45	184.25	186.89	187.01	187.50	187.25	Pipe - (1
72	71	68.823	0.00	0.00	0.00	0.00	0.00	0.0	5.2	0.0	2.30	4.07	2.93	12	1.31	185.25	186.15	187.14	187.43	187.25	190.10	Pipe - (1
73	72	115.206	0.00	0.00	0.00	0.00	0.00	0.0	4.3	0.0	1.70	2.57	2.35	12	0.52	186.40	187.00	187.55	187.80	190.10	190.94	Pipe - (1
74	73	38.350	0.00	0.00	0.00	0.00	0.00	0.0	4.2	0.0	1.50	2.06	4.30	8	1.72	186.90	187.56	187.90	188.22	190.94	188.28	Pipe - (1
75	74	33.912	0.00	0.00	0.00	0.00	0.00	0.0	3.5	0.0	1.20	1.57	3.78	8	1.00	187.56	188.90	188.26	189.42	188.28	189.62	Pipe - (1
76	75	82.045	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	0.90	1.57	3.34	8	1.00	188.90	189.72	189.42	190.17	189.62	190.44	Pipe - (1
77	76	43.143	0.00	0.00	0.00	0.00	0.00	0.0	2.7	0.0	0.90	1.57	3.60	8	1.00	189.72	190.15	190.17	190.60	190.44	190.87	Pipe - (1
78	77	196.500	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	0.60	1.57	2.74	8	1.00	190.15	192.11	190.60	192.47	190.87	192.84	Pipe - (1
79	78	41.870	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.30	1.57	2.00	8	1.00	192.11	192.53	192.47	192.78	192.84	193.26	Pipe - (1
80	68	88.173	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	6.50	6.52	5.30	15	1.02	183.35	184.25	186.31	187.20	187.63	188.36	Pipe - (9
81	80	93.995	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	5.90	6.49	4.81	15	1.01	184.25	185.20	187.47	188.26	188.36	189.28	Pipe - (8
82	81	92.960	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	5.90	6.53	4.81	15	1.02	185.20	186.15	188.42	189.20	189.28	190.29	Pipe - (8
83	82	150.261	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	3.40	3.56	4.33	12	1.00	186.40	187.90	189.56	190.93	190.29	191.79	Pipe - (8
84	83	22.420	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.56	1.72	8	0.98	188.40	188.62	191.22	191.25	191.79	189.35	Pipe - (9
85	83	21.596	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.90	4.20	1.15	12	1.39	187.90	188.20	191.22	191.23	191.79	191.67	Pipe - (8
86	83	10.287	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.90	6.08	2.42	12	2.92	187.90	188.20	191.22	191.25	191.79	191.67	Pipe - (8
87	82	49.625	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.58	2.01	8	1.01	186.75	187.25	189.56	189.66	190.29	187.97	Pipe - (1
88	73	36.310	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.20	1.56	0.58	8	0.99	186.90	187.26	187.90	187.90	190.94	187.99	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 9/20/2022

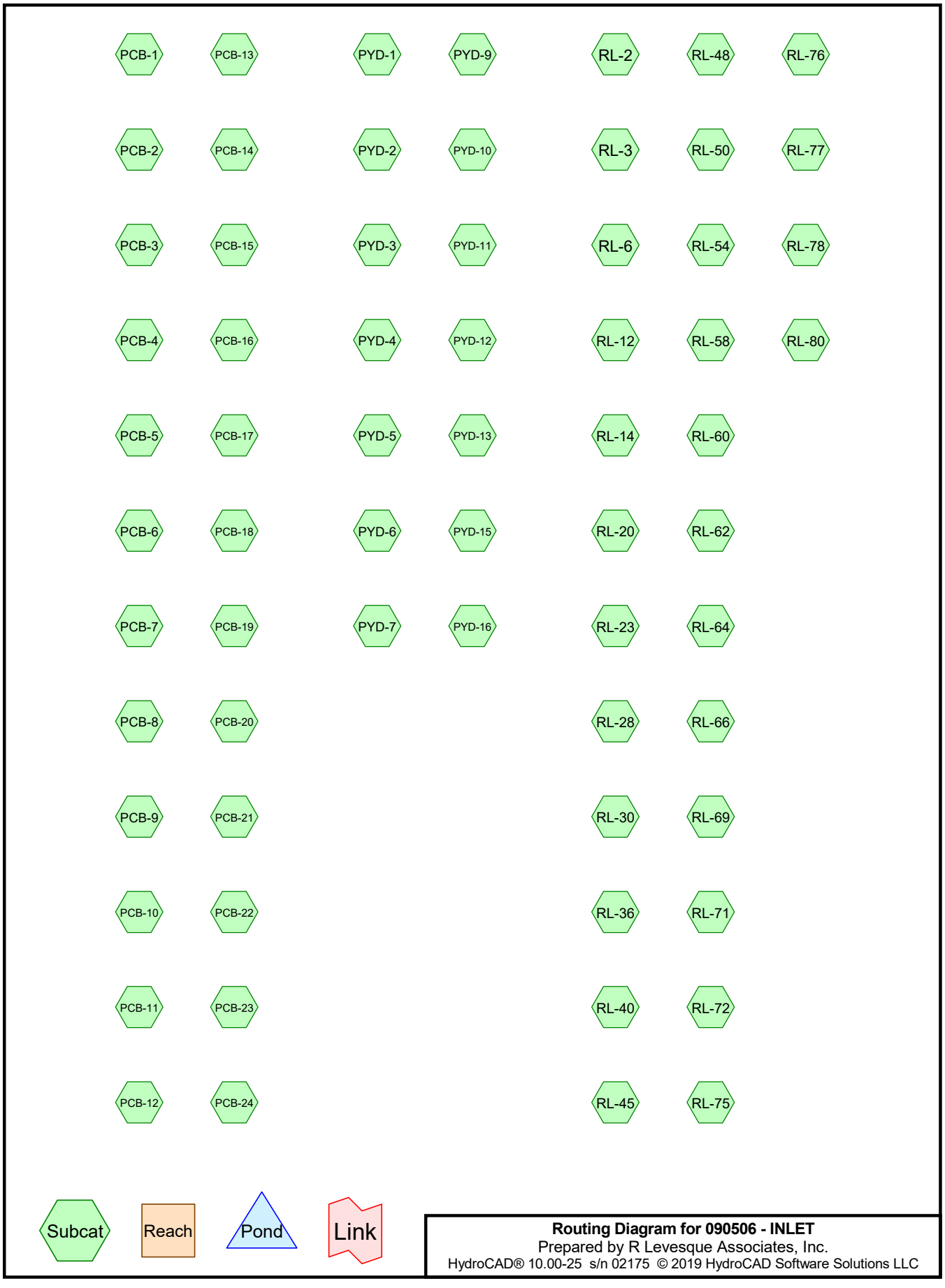
NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
89	71	110 335	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	2.10	3.64	2.67	12	1.04	185.25	186.40	187.14	187.53	187.25	189.90	Pipe - (1
90	89	65 304	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	3.55	1.23	12	1.00	186.40	187.05	187.58	187.60	189.90	191.50	Pipe - (1
91	82	26 018	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.80	3.82	1.02	12	1.15	186.40	186.70	189.56	189.57	190.29	190.27	Pipe - (8
92	82	17 681	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.00	4.64	1.27	12	1.70	186.40	186.70	189.56	189.57	190.29	190.27	Pipe - (8
93	72	226 047	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	2.40	8	1.00	186.40	188.66	187.55	189.02	190.10	189.39	Pipe - (1
94	80	38 124	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	185.00	185.38	187.47	187.53	188.36	186.11	Pipe - (1
95	70	74 121	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.70	1.57	2.01	8	1.00	184.70	185.44	186.89	187.04	187.50	186.33	Pipe - (1
96	68	46 005	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.60	1.57	1.72	8	1.00	184.00	184.46	186.31	186.37	187.63	185.19	Pipe - (1
97	68	9 543	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.10	6.31	2.67	12	3.14	183.60	183.90	186.31	186.34	187.63	187.52	Pipe - (9
98	68	22 551	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	4.11	2.55	12	1.33	183.60	183.90	186.31	186.38	187.63	187.52	Pipe - (9
99	67	17 784	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.10	0.74	3.15	8	0.22	181.98	182.02	184.98	185.07	187.14	182.75	Pipe - (1

Project File: 090506 - STORM.stm | Number of lines: 99 | Run Date: 9/20/2022

NOTES:Intensity = 80.27 / (Inlet time + 12.00) ^ 0.78; Return period =Yrs. 100 ; c = cir e = ellip b = box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RL-2
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RL-3
RL-50
RL-77
PCB-3
PCB-15
PYD-3
PYD-11
RL-6
RL-54
RL-78
PCB-4
PCB-16
PYD-4
PYD-12
RL-12
RL-58
RL-80
PCB-5
PCB-17
PYD-5
PYD-13
RL-14
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PCB-6
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PYD-6
PYD-15
RL-20
RL-62
PCB-7
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RL-45
RL-75
Subcat
Reach
Pond
Link
Routing Diagram for 090506 - INLET
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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PCB-1: Runoff Area=7,315 sf 69.56% Impervious Runoff Depth=4.71"
Tc=6.0 min CN=47/98 Runoff=0.8 cfs 2,871 cf

Subcatchment PCB-10: Runoff Area=16,291 sf 57.05% Impervious Runoff Depth=5.21"
Tc=6.0 min CN=76/98 Runoff=2.0 cfs 7,074 cf

Subcatchment PCB-11: Runoff Area=12,437 sf 56.84% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=80/98 Runoff=1.6 cfs 5,583 cf

Subcatchment PCB-12: Runoff Area=11,699 sf 56.86% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=80/98 Runoff=1.5 cfs 5,252 cf

Subcatchment PCB-13: Runoff Area=15,512 sf 61.15% Impervious Runoff Depth=5.39"
Tc=6.0 min CN=78/98 Runoff=2.0 cfs 6,970 cf

Subcatchment PCB-14: Runoff Area=20,928 sf 69.59% Impervious Runoff Depth=5.45"
Tc=10.0 min CN=74/98 Runoff=2.4 cfs 9,513 cf

Subcatchment PCB-15: Runoff Area=20,082 sf 67.75% Impervious Runoff Depth=5.41"
Tc=10.0 min CN=74/98 Runoff=2.3 cfs 9,047 cf

Subcatchment PCB-16: Runoff Area=6,223 sf 85.69% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=78/98 Runoff=0.9 cfs 3,081 cf

Subcatchment PCB-17: Runoff Area=14,974 sf 65.77% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=77/98 Runoff=1.9 cfs 6,813 cf

Subcatchment PCB-18: Runoff Area=6,334 sf 61.95% Impervious Runoff Depth=5.49"
Tc=6.0 min CN=80/98 Runoff=0.8 cfs 2,898 cf

Subcatchment PCB-19: Runoff Area=7,584 sf 62.59% Impervious Runoff Depth=5.50"
Tc=6.0 min CN=80/98 Runoff=1.0 cfs 3,478 cf

Subcatchment PCB-2: Runoff Area=16,959 sf 68.54% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=61/98 Runoff=2.0 cfs 7,108 cf

Subcatchment PCB-20: Runoff Area=15,114 sf 60.20% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=80/98 Runoff=2.0 cfs 6,871 cf

Subcatchment PCB-21: Runoff Area=16,315 sf 54.99% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=80/98 Runoff=2.1 cfs 7,273 cf

Subcatchment PCB-22: Runoff Area=13,812 sf 62.99% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=76/98 Runoff=1.8 cfs 6,165 cf

Subcatchment PCB-23: Runoff Area=16,820 sf 69.62% Impervious Runoff Depth=5.65"
Tc=6.0 min CN=80/98 Runoff=2.2 cfs 7,914 cf

Subcatchment PCB-24: Runoff Area=5,427 sf 67.75% Impervious Runoff Depth=5.61"
Tc=6.0 min CN=80/98 Runoff=0.7 cfs 2,536 cf

Subcatchment PCB-3: Runoff Area=11,298 sf 69.41% Impervious Runoff Depth=5.06"
Tc=6.0 min CN=61/98 Runoff=1.3 cfs 4,768 cf

Subcatchment PCB-4: Runoff Area=13,595 sf 67.24% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=61/98 Runoff=1.6 cfs 5,641 cf

Subcatchment PCB-5: Runoff Area=5,186 sf 91.28% Impervious Runoff Depth=5.92"
Tc=6.0 min CN=61/98 Runoff=0.7 cfs 2,558 cf

Subcatchment PCB-6: Runoff Area=13,827 sf 55.48% Impervious Runoff Depth=4.48"
Tc=6.0 min CN=60/98 Runoff=1.4 cfs 5,160 cf

Subcatchment PCB-7: Runoff Area=16,186 sf 59.22% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=55/98 Runoff=1.7 cfs 5,999 cf

Subcatchment PCB-8: Runoff Area=22,584 sf 56.05% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=72/98 Runoff=2.7 cfs 9,423 cf

Subcatchment PCB-9: Runoff Area=21,038 sf 67.93% Impervious Runoff Depth=5.51"
Tc=6.0 min CN=77/98 Runoff=2.7 cfs 9,660 cf

Subcatchment PYD-1: Runoff Area=17,856 sf 1.71% Impervious Runoff Depth=1.64"
Tc=10.0 min CN=52/98 Runoff=0.6 cfs 2,441 cf

Subcatchment PYD-10: Runoff Area=5,369 sf 36.32% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=74/98 Runoff=0.6 cfs 2,046 cf

Subcatchment PYD-11: Runoff Area=7,805 sf 49.97% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=75/98 Runoff=0.9 cfs 3,243 cf

Subcatchment PYD-12: Runoff Area=13,871 sf 0.00% Impervious Runoff Depth=4.67"
Tc=12.0 min CN=84/0 Runoff=1.4 cfs 5,394 cf

Subcatchment PYD-13: Runoff Area=18,358 sf 0.00% Impervious Runoff Depth=4.78"
Tc=12.0 min CN=85/0 Runoff=1.9 cfs 7,306 cf

Subcatchment PYD-15: Runoff Area=27,506 sf 0.00% Impervious Runoff Depth=4.67"
Tc=12.0 min CN=84/0 Runoff=2.8 cfs 10,696 cf

Subcatchment PYD-16: Runoff Area=6,768 sf 57.63% Impervious Runoff Depth=5.40"
Tc=6.0 min CN=80/98 Runoff=0.9 cfs 3,047 cf

Subcatchment PYD-2: Runoff Area=5,192 sf 46.48% Impervious Runoff Depth=4.17"
Tc=6.0 min CN=61/98 Runoff=0.5 cfs 1,803 cf

Subcatchment PYD-3: Runoff Area=4,445 sf 22.48% Impervious Runoff Depth=3.23"
Tc=6.0 min CN=61/98 Runoff=0.3 cfs 1,195 cf

Subcatchment PYD-4: Runoff Area=8,298 sf 52.57% Impervious Runoff Depth=4.40"
Tc=6.0 min CN=61/98 Runoff=0.9 cfs 3,046 cf

Subcatchment PYD-5: Runoff Area=10,280 sf 26.32% Impervious Runoff Depth=3.38"
Tc=6.0 min CN=61/98 Runoff=0.8 cfs 2,893 cf

Subcatchment PYD-6: Runoff Area=7,084 sf 43.83% Impervious Runoff Depth=4.06"
Tc=6.0 min CN=61/98 Runoff=0.7 cfs 2,399 cf

Subcatchment PYD-7: Runoff Area=8,888 sf 26.58% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=61/98 Runoff=0.7 cfs 2,509 cf

Subcatchment PYD-9: Runoff Area=112,186 sf 0.07% Impervious Runoff Depth=3.51"
Flow Length=264' Tc=14.3 min CN=73/98 Runoff=8.1 cfs 32,812 cf

Subcatchment RL-12: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-14: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-2: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-20: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-23: Runoff Area=4,875 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.7 cfs 2,544 cf

Subcatchment RL-28: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-3: Runoff Area=1,482 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.2 cfs 773 cf

Subcatchment RL-30: Runoff Area=7,800 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=1.1 cfs 4,070 cf

Subcatchment RL-36: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-40: Runoff Area=4,621 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.7 cfs 2,411 cf

Subcatchment RL-45: Runoff Area=2,223 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,160 cf

Subcatchment RL-48: Runoff Area=1,482 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.2 cfs 773 cf

Subcatchment RL-50: Runoff Area=4,875 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.7 cfs 2,544 cf

Subcatchment RL-54: Runoff Area=3,900 sf 0.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/0 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-58: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-6: Runoff Area=3,900 sf 87.60% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=98/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-60: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-62: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-64: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-66: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-69: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-71: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-72: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-75: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-76: Runoff Area=1,950 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.3 cfs 1,017 cf

Subcatchment RL-77: Runoff Area=3,900 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.6 cfs 2,035 cf

Subcatchment RL-78: Runoff Area=3,705 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.5 cfs 1,933 cf

Subcatchment RL-80: Runoff Area=3,705 sf 100.00% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=0/98 Runoff=0.5 cfs 1,933 cf

Total Runoff Area = 666,915 sf Runoff Volume = 269,083 cf Average Runoff Depth = 4.84"
54.01% Pervious = 360,186 sf 45.99% Impervious = 306,729 sf

Summary for Subcatchment PCB-1:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,871 cf, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,455	39	>75% Grass cover, Good, HSG A
772	61	>75% Grass cover, Good, HSG B
2,179	98	Paved parking, HSG A
2,909	98	Paved parking, HSG B
7,315	82	Weighted Average
2,227	47	30.44% Pervious Area
5,089	98	69.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-10:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 7,074 cf, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
5,697	80	>75% Grass cover, Good, HSG D
164	98	Paved parking, HSG B
9,129	98	Paved parking, HSG D
16,291	89	Weighted Average
6,997	76	42.95% Pervious Area
9,293	98	57.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-11:

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,583 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,367	80	>75% Grass cover, Good, HSG D
7,070	98	Paved parking, HSG D
12,437	90	Weighted Average
5,367	80	43.16% Pervious Area
7,070	98	56.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-12:

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,252 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13	74	>75% Grass cover, Good, HSG C
5,034	80	>75% Grass cover, Good, HSG D
366	98	Paved parking, HSG C
6,286	98	Paved parking, HSG D
11,699	90	Weighted Average
5,047	80	43.14% Pervious Area
6,652	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-13:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 6,970 cf, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,127	74	>75% Grass cover, Good, HSG C
3,900	80	>75% Grass cover, Good, HSG D
895	98	Paved parking, HSG C
8,590	98	Paved parking, HSG D
15,512	90	Weighted Average
6,027	78	38.85% Pervious Area
9,485	98	61.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-14:

Runoff = 2.4 cfs @ 12.14 hrs, Volume= 9,513 cf, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,365	74	>75% Grass cover, Good, HSG C
14,536	98	Paved parking, HSG C
27	98	Paved parking, HSG D
20,928	91	Weighted Average
6,365	74	30.41% Pervious Area
14,563	98	69.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-15:

Runoff = 2.3 cfs @ 12.14 hrs, Volume= 9,047 cf, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,340	74	>75% Grass cover, Good, HSG C
136	80	>75% Grass cover, Good, HSG D
13,606	98	Paved parking, HSG C
20,082	90	Weighted Average
6,476	74	32.25% Pervious Area
13,606	98	67.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment PCB-16:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,081 cf, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
293	74	>75% Grass cover, Good, HSG C
597	80	>75% Grass cover, Good, HSG D
1,952	98	Paved parking, HSG C
3,380	98	Paved parking, HSG D
6,223	95	Weighted Average
891	78	14.31% Pervious Area
5,333	98	85.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-17:

Runoff = 1.9 cfs @ 12.09 hrs, Volume= 6,813 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,975	74	>75% Grass cover, Good, HSG C
2,151	80	>75% Grass cover, Good, HSG D
5,569	98	Paved parking, HSG C
4,280	98	Paved parking, HSG D
14,974	91	Weighted Average
5,126	77	34.23% Pervious Area
9,849	98	65.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-18:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,898 cf, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,410	80	>75% Grass cover, Good, HSG D
3,924	98	Paved parking, HSG D
6,334	91	Weighted Average
2,410	80	38.05% Pervious Area
3,924	98	61.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-19:

Runoff = 1.0 cfs @ 12.09 hrs, Volume= 3,478 cf, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,837	80	>75% Grass cover, Good, HSG D
4,747	98	Paved parking, HSG D
7,584	91	Weighted Average
2,837	80	37.41% Pervious Area
4,747	98	62.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-2:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 7,108 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
5,335	61	>75% Grass cover, Good, HSG B
11,324	98	Paved parking, HSG B
300	98	Roofs, HSG B
16,959	86	Weighted Average
5,335	61	31.46% Pervious Area
11,624	98	68.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-20:

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 6,871 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,015	80	>75% Grass cover, Good, HSG D
9,099	98	Paved parking, HSG D
15,114	91	Weighted Average
6,015	80	39.80% Pervious Area
9,099	98	60.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-21:

Runoff = 2.1 cfs @ 12.09 hrs, Volume= 7,273 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,343	80	>75% Grass cover, Good, HSG D
8,972	98	Paved parking, HSG D
16,315	90	Weighted Average
7,343	80	45.01% Pervious Area
8,972	98	54.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-22:

Runoff = 1.8 cfs @ 12.09 hrs, Volume= 6,165 cf, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,749	74	>75% Grass cover, Good, HSG C
1,364	80	>75% Grass cover, Good, HSG D
1,360	98	Paved parking, HSG C
7,340	98	Paved parking, HSG D
13,812	90	Weighted Average
5,112	76	37.01% Pervious Area
8,700	98	62.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-23:

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,914 cf, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
58	74	>75% Grass cover, Good, HSG C
5,052	80	>75% Grass cover, Good, HSG D
498	98	Paved parking, HSG C
11,212	98	Paved parking, HSG D
16,820	93	Weighted Average
5,110	80	30.38% Pervious Area
11,710	98	69.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-24:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,536 cf, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,750	80	>75% Grass cover, Good, HSG D
46	98	Paved parking, HSG C
3,631	98	Paved parking, HSG D
5,427	92	Weighted Average
1,750	80	32.25% Pervious Area
3,677	98	67.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-3:

Runoff = 1.3 cfs @ 12.09 hrs, Volume= 4,768 cf, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,456	61	>75% Grass cover, Good, HSG B
7,842	98	Paved parking, HSG B
11,298	87	Weighted Average
3,456	61	30.59% Pervious Area
7,842	98	69.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-4:

Runoff = 1.6 cfs @ 12.09 hrs, Volume= 5,641 cf, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,454	61	>75% Grass cover, Good, HSG B
9,141	98	Paved parking, HSG B
13,595	86	Weighted Average
4,454	61	32.76% Pervious Area
9,141	98	67.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-5:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,558 cf, Depth= 5.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
452	61	>75% Grass cover, Good, HSG B
4,733	98	Paved parking, HSG B
5,186	95	Weighted Average
452	61	8.72% Pervious Area
4,733	98	91.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PCB-6:

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 5,160 cf, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
357	39	>75% Grass cover, Good, HSG A
5,785	61	>75% Grass cover, Good, HSG B
13	74	>75% Grass cover, Good, HSG C
90	98	Paved parking, HSG A
7,582	98	Paved parking, HSG B
13,827	81	Weighted Average
6,155	60	44.52% Pervious Area
7,672	98	55.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-7:

Runoff = 1.7 cfs @ 12.09 hrs, Volume= 5,999 cf, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,550	39	>75% Grass cover, Good, HSG A
277	61	>75% Grass cover, Good, HSG B
2,690	74	>75% Grass cover, Good, HSG C
84	80	>75% Grass cover, Good, HSG D
4,259	98	Paved parking, HSG A
2,696	98	Paved parking, HSG B
2,431	98	Paved parking, HSG C
18	98	Paved parking, HSG D
182	98	Roofs, HSG C
16,186	80	Weighted Average
6,601	55	40.78% Pervious Area
9,585	98	59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-8:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 9,423 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,430	61	>75% Grass cover, Good, HSG B
5,496	80	>75% Grass cover, Good, HSG D
6,843	98	Paved parking, HSG B
5,815	98	Paved parking, HSG D
22,584	86	Weighted Average
9,926	72	43.95% Pervious Area
12,658	98	56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PCB-9:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 9,660 cf, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3	61	>75% Grass cover, Good, HSG B
3,318	74	>75% Grass cover, Good, HSG C
3,427	80	>75% Grass cover, Good, HSG D
13	98	Paved parking, HSG B
2,265	98	Paved parking, HSG C
11,711	98	Paved parking, HSG D
302	98	Roofs, HSG C
21,038	91	Weighted Average
6,748	77	32.07% Pervious Area
14,290	98	67.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-1:

Runoff = 0.6 cfs @ 12.16 hrs, Volume= 2,441 cf, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,811	39	>75% Grass cover, Good, HSG A
10,739	61	>75% Grass cover, Good, HSG B
6	98	Paved parking, HSG B
300	98	Roofs, HSG B
17,856	53	Weighted Average
17,549	52	98.29% Pervious Area
306	98	1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment PYD-10:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,046 cf, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,393	74	>75% Grass cover, Good, HSG C
26	80	>75% Grass cover, Good, HSG D
1,950	98	Roofs, HSG C
5,369	83	Weighted Average
3,419	74	63.68% Pervious Area
1,950	98	36.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-11:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,243 cf, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,000	74	>75% Grass cover, Good, HSG C
905	80	>75% Grass cover, Good, HSG D
2,801	98	Roofs, HSG C
1,099	98	Roofs, HSG D
7,805	87	Weighted Average
3,905	75	50.03% Pervious Area
3,900	98	49.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-12:

Runoff = 1.4 cfs @ 12.16 hrs, Volume= 5,394 cf, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,128	74	>75% Grass cover, Good, HSG C
9,331	80	>75% Grass cover, Good, HSG D
3,413	98	Unconnected roofs, HSG D
13,871	84	Weighted Average
13,871	84	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-13:

Runoff = 1.9 cfs @ 12.16 hrs, Volume= 7,306 cf, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
13,030	80	>75% Grass cover, Good, HSG D
5,328	98	Unconnected roofs, HSG D
18,358	85	Weighted Average
18,358	85	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-15:

Runoff = 2.8 cfs @ 12.16 hrs, Volume= 10,696 cf, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
9,069	74	>75% Grass cover, Good, HSG C
9,629	80	>75% Grass cover, Good, HSG D
3,358	98	Unconnected roofs, HSG C
5,451	98	Unconnected roofs, HSG D
27,506	84	Weighted Average
27,506	84	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					Direct Entry,

Summary for Subcatchment PYD-16:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,047 cf, Depth= 5.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,868	80	>75% Grass cover, Good, HSG D
3,900	98	Roofs, HSG D
6,768	90	Weighted Average
2,868	80	42.37% Pervious Area
3,900	98	57.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-2:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,803 cf, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,779	61	>75% Grass cover, Good, HSG B
2,413	98	Paved parking, HSG B
5,192	78	Weighted Average
2,779	61	53.52% Pervious Area
2,413	98	46.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-3:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,195 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,446	61	>75% Grass cover, Good, HSG B
999	98	Paved parking, HSG B
4,445	69	Weighted Average
3,446	61	77.52% Pervious Area
999	98	22.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-4:

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 3,046 cf, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,936	61	>75% Grass cover, Good, HSG B
4,362	98	Paved parking, HSG B
8,298	80	Weighted Average
3,936	61	47.43% Pervious Area
4,362	98	52.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PYD-5:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 2,893 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,574	61	>75% Grass cover, Good, HSG B
2,706	98	Paved parking, HSG B
10,280	71	Weighted Average
7,574	61	73.68% Pervious Area
2,706	98	26.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-6:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,399 cf, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,979	61	>75% Grass cover, Good, HSG B
3,105	98	Paved parking, HSG B
7,084	77	Weighted Average
3,979	61	56.17% Pervious Area
3,105	98	43.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-7:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,509 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
6,525	61	>75% Grass cover, Good, HSG B
2,363	98	Paved parking, HSG B
8,888	71	Weighted Average
6,525	61	73.42% Pervious Area
2,363	98	26.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment PYD-9:

Runoff = 8.1 cfs @ 12.20 hrs, Volume= 32,812 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,408	49	50-75% Grass cover, Fair, HSG A
7,195	69	50-75% Grass cover, Fair, HSG B
19,511	79	50-75% Grass cover, Fair, HSG C
4,460	84	50-75% Grass cover, Fair, HSG D
6,176	39	>75% Grass cover, Good, HSG A
5,463	61	>75% Grass cover, Good, HSG B
34,600	74	>75% Grass cover, Good, HSG C
4,438	80	>75% Grass cover, Good, HSG D
37	98	Paved parking, HSG B
37	98	Paved parking, HSG C
2,497	98	Unconnected roofs, HSG A
817	98	Unconnected roofs, HSG B
5,484	98	Unconnected roofs, HSG C
910	30	Woods, Good, HSG A
16,153	70	Woods, Good, HSG C
112,186	73	Weighted Average
112,112	73	99.93% Pervious Area
74	98	0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.8	164	0.0480	3.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.3	264	Total			

Summary for Subcatchment RL-12:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG C
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-14:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
952	98	Roofs, HSG C
2,948	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-2:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
919	98	Roofs, HSG A
1,031	98	Roofs, HSG B
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-20:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG D
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-23:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,544 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,875	98	Unconnected roofs, HSG D
4,875	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-28:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG D
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-3:

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 773 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,383	98	Roofs, HSG A
99	98	Roofs, HSG C
1,482	98	Weighted Average
1,482	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-30:

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 4,070 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
7,800	98	Roofs, HSG D
7,800	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-36:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,796	98	Roofs, HSG C
104	98	Roofs, HSG D
3,900	98	Weighted Average
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-40:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,411 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
4,621	98	Roofs, HSG C
4,621	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-45:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,160 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,826	98	Roofs, HSG C
397	98	Roofs, HSG D
2,223	98	Weighted Average
2,223	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-48:

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 773 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,482	98	Roofs, HSG D
1,482	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-50:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,544 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,886	98	Unconnected roofs, HSG C
1,989	98	Unconnected roofs, HSG D
4,875	98	Weighted Average
4,875	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-54:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Unconnected roofs, HSG D
3,900	98	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-58:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,363	98	Roofs, HSG B
587	98	Roofs, HSG D
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-6:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,416	98	Roofs, HSG C
484	98	Unconnected roofs, HSG C
3,900	98	Weighted Average
484	98	12.40% Pervious Area
3,416	98	87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-60:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
41	98	Roofs, HSG B
1,909	98	Roofs, HSG D
1,950	98	Weighted Average
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-62:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-64:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-66:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-69:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-71:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-72:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-75:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-76:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,017 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,950	98	Roofs, HSG B
1,950	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment RL-77:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 2,035 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,900	98	Roofs, HSG B
3,900	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-78:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,933 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,705	98	Roofs, HSG B
3,705	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment RL-80:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,933 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
3,705	98	Roofs, HSG B
3,705	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Appendix E: MassDEP Calculations

- Impervious Area Calculations
- Required Recharge Volume – Surface Basin #1
- Water Quality Volume – Surface Basin #1
- Stage-Storage Table – Surface Basin #1
- Required Recharge Volume – Surface Basin #2
- Water Quality Volume – Surface Basin #2
- Stage-Storage Table – Surface Basin #2
- Required Recharge Volume – Surface Basin #3
- Water Quality Volume – Surface Basin #3
- Stage-Storage Table – Surface Basin #3
- Required Recharge Volume – Bioretention Basin
- Water Quality Volume – Bioretention Basin
- Stage-Storage Table – Bioretention Basin
- Water Quality Flow Rate Calculation – PWQU-1
- TSS Removal Worksheet
- Sediment Forebay Sizing Calculations
- Drawdown Calculations

Standard 3: Recharge Calculations

Impervious Area Calculations

Existing Total Impervious Area

	Sub-Catchment	Roof (sf)	Other Impervious (sf)	Sum (sf)
Design Point 1	ES-1A	2,220	3,488	5,708
	ES-1B	0	0	0
	ES-1C	0	0	0
Design Point 2	ES-2	0	0	0
Design Point 3	ES-3	0	0	0
		2,220	3,488	5,708

Proposed Total Impervious Area

	Sub-Catchment	Roof (sf)	Other Impervious (sf)	Sum (sf)	
Design Point 1	PS-1A	21,660	44,707	66,367	Tributary to Basin #1
	PS-1B	5,850	0	5,850	
	PS-1C	375	0	375	
	PS-1D	9,750	0	9,750	
	PS-1E	7,976	0	7,976	
Design Point 2	PS-2A	7,847	74	7,921	Tributary to Basin #2
	PS-2B	8,767	37,266	46,033	
	PS-2C	13,650	0	13,650	
	PS-2D	0	0	0	
Design Point 3	PS-3A	11,230	0	11,230	Tributary to Basin #3
	PS-3B	50,700	45,601	96,301	
	PS-3C	6,842	101,355	108,197	Tributary to Dry Detention Basin
	PS-3D	3,900	7	3,907	
	PS-3E	0	17,910	17,910	Trib. to Bioret. Basin
	PS-3F	3,900	0	3,900	
		152,446	246,919	399,366	

Standard 3: Recharge Calculations (cont'd)

Summary Table

Total Existing Impervious Area	5,708 SF
Total Proposed Impervious Area	399,366 SF
Total New Impervious Area	393,658 SF
Total Impervious Area Tributary to Infiltration BMPs	259,412 SF
Percent Impervious Tributary to Infiltration BMPs*	65.9%
Capture Area Adjustment	1.52

*Impervious Area tributary to recharge facilities must be greater than 65%

Standard 3: Recharge Calculations - Infiltration Basin #I

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	2,179 sq. ft.	3.3%
Impervious Area (B-soils)	64,054 sq. ft.	96.5%
Impervious Area (C-soils)	133 sq. ft.	0.2%
Impervious Area (D-soils)	0 sq. ft.	0.0%
Total Impervious area	66,367 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum [F_{Soil\ Type} \times \text{Impervious Area}_{Soil\ Type}] \times 1\ \text{ft.}/12\ \text{in.}$

R_v (required) = 1,980 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.52

Adjusted R_V (required) = 3,005 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltration Basin #1

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.524 acres

V_{WQ} (required) = 2,765 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	3,005 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	2,765 cu. ft.	
Use	3,005 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #1	4,190 cu. ft.***

4,190 cu. ft. > 3,005 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in surface infiltration basin below outlet elevation 200.75
Depth of water in basin = 0.75 feet

Stage-Area-Storage for Pond 1P: Infiltration Basin #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
200.00	0	202.60	18,087
200.05	254	202.65	18,529
200.10	511	202.70	18,975
200.15	772	202.75	19,424
200.20	1,037	202.80	19,877
200.25	1,305	202.85	20,334
200.30	1,576	202.90	20,793
200.35	1,852	202.95	21,257
200.40	2,131	203.00	21,723
200.45	2,413	203.05	22,194
200.50	2,700	203.10	22,668
200.55	2,990	203.15	23,145
200.60	3,284	203.20	23,625
200.65	3,582	203.25	24,110
200.70	3,884	203.30	24,597
200.75	4,190	203.35	[illegible]
200.80	4,499	203.40	[illegible]
200.85	4,812	203.45	26,081
200.90	5,130	203.50	26,583
200.95	5,451	203.55	27,088
201.00	5,777	203.60	27,597
201.05	6,106	203.65	28,109
201.10	6,438	203.70	28,625
201.15	6,774	203.75	29,145
201.20	7,114	203.80	29,668
201.25	7,457	203.85	30,195
201.30	7,804	203.90	30,726
201.35	8,154	203.95	31,260
201.40	8,508	204.00	31,798
201.45	8,865	204.05	32,339
201.50	9,226	204.10	32,884
201.55	9,591	204.15	33,433
201.60	9,960	204.20	33,985
201.65	10,332	204.25	34,541
201.70	10,708	204.30	35,100
201.75	11,087	204.35	35,663
201.80	11,471	204.40	36,230
201.85	11,858	204.45	36,801
201.90	12,249	204.50	37,375
201.95	12,643	204.55	37,952
202.00	13,042	204.60	38,534
202.05	13,444	204.65	39,119
202.10	13,849	204.70	39,708
202.15	14,258	204.75	40,301
202.20	14,670	204.80	40,897
202.25	15,085	204.85	41,497
202.30	15,504	204.90	42,101
202.35	15,926	204.95	42,709
202.40	16,351	205.00	**43,321**
202.45	16,780		
202.50	17,212		
202.55	17,648		

Storage at outlet

Standard 3: Recharge Calculations - Infiltration Basins #2

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	9,058 sq. ft.	13.4%
Impervious Area (B-soils)	18,469 sq. ft.	27.3%
Impervious Area (C-soils)	23,350 sq. ft.	34.5%
Impervious Area (D-soils)	16,727 sq. ft.	24.7%
Total Impervious area	67,605 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum [F_{Soil\ Type} \times \text{Impervious Area}_{Soil\ Type}] \times 1\ \text{ft.}/12\ \text{in.}$

R_v (required) = 1,617 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.52

Adjusted R_V (required) = 2,454 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #2

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 1.552 acres

V_{WQ} (required) = 2,817 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	2,454 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	2,817 cu. ft.	
Use	2,817 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #2	2,899 cu. Ft.***

2,899 cu. ft. > 2,817 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

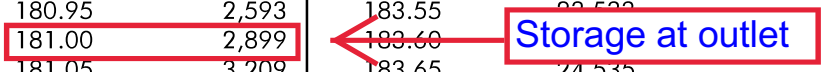
***Volume represents the available storage in infiltration basin #2 below outlet elevation 181.00
Depth of water in basin = 0.50 feet

Type III 24-hr 2-Year Rainfall=3.00"

Stage-Area-Storage for Pond 8P: Infiltration Basin #2

Elevation (feet)	Storage (cubic-feet)
180.50	0
180.55	274
180.60	551
180.65	832
180.70	1,116
180.75	1,404
180.80	1,696
180.85	1,991
180.90	2,290
180.95	2,593
181.00	2,899
181.05	3,209
181.10	3,523
181.15	3,840
181.20	4,161
181.25	4,486
181.30	4,814
181.35	5,146
181.40	5,482
181.45	5,822
181.50	6,166
181.55	6,514
181.60	6,865
181.65	7,220
181.70	7,580
181.75	7,943
181.80	8,310
181.85	8,682
181.90	9,057
181.95	9,436
182.00	9,820
182.05	10,207
182.10	10,598
182.15	10,992
182.20	11,390
182.25	11,792
182.30	12,197
182.35	12,606
182.40	13,019
182.45	13,436
182.50	13,856
182.55	14,280
182.60	14,707
182.65	15,139
182.70	15,574
182.75	16,013
182.80	16,455
182.85	16,902
182.90	17,353
182.95	17,807
183.00	18,265
183.05	18,727

Elevation (feet)	Storage (cubic-feet)
183.10	19,192
183.15	19,661
183.20	20,133
183.25	20,608
183.30	21,087
183.35	21,569
183.40	22,055
183.45	22,544
183.50	23,037
183.55	[illegible]
183.60	[illegible]
183.65	24,535
183.70	25,042
183.75	25,552
183.80	26,065
183.85	26,582
183.90	27,103
183.95	27,627
184.00	**28,155**



Standard 3: Recharge Calculations - Infiltration Basins #3

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch	(A-soils)
0.35 inch	(B-soils)
0.25 inch	(C-soils)
0.10 inch	(D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.	0.0%
Impervious Area (B-soils)	7,253 sq. ft.	6.7%
Impervious Area (C-soils)	14,762 sq. ft.	13.7%
Impervious Area (D-soils)	85,516 sq. ft.	79.5%
Total Impervious area	107,531 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 1,232 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.52

Adjusted R_V (required) = 1,869 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Infiltrations Basins #3

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 2.469 acres

V_{WQ} (required) = 4,480 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	1,869 cu. ft.	Rv for tributary impervious area
V_{WQ} (required) =	4,480 cu. ft.	
Use	4,480 cu. ft.	= Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Surface Infiltration Basin #3	5,200 cu. Ft.***

5,200 cu. ft. > 4,480 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in infiltration basin #4 below outlet elevation 181.50
Depth of water in basin = 0.50 feet

Stage-Area-Storage for Pond 2P: Infiltration Basin #3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
181.00	0	182.04	11,362	183.08	24,747
181.02	199	182.06	11,602	183.10	25,024
181.04	399	182.08	11,842	183.12	25,300
181.06	599	182.10	12,082	183.14	25,578
181.08	800	182.12	12,323	183.16	25,856
181.10	1,002	182.14	12,565	183.18	26,135
181.12	1,205	182.16	12,808	183.20	26,414
181.14	1,409	182.18	13,052	183.22	26,694
181.16	1,613	182.20	13,296	183.24	26,975
181.18	1,818	182.22	13,541	183.26	27,256
181.20	2,023	182.24	13,786	183.28	27,538
181.22	2,230	182.26	14,032	183.30	27,821
181.24	2,437	182.28	14,279	183.32	28,104
181.26	2,645	182.30	14,527	183.34	28,388
181.28	2,854	182.32	14,775	183.36	28,672
181.30	3,063	182.34	15,024	183.38	28,957
181.32	3,273	182.36	15,274	183.40	29,243
181.34	3,484	182.38	15,524	183.42	29,529
181.36	3,696	182.40	15,776	183.44	29,816
181.38	3,909	182.42	16,028	183.46	30,104
181.40	4,122	182.44	16,280	183.48	30,392
181.42	4,336	182.46	16,534	183.50	30,681
181.44	4,551	182.48	16,788	183.52	30,971
181.46	4,767	182.50	17,042	183.54	31,261
181.48	4,983	182.52	[illegible]	[illegible]	31,552
181.50	5,200	182.54	[illegible]	[illegible]	31,843
181.52	5,418	182.56	[illegible]	[illegible]	32,135
181.54	5,637	182.58	18,069	183.62	32,428
181.56	5,856	182.60	18,327	183.64	32,722
181.58	6,077	182.62	18,586	183.66	33,016
181.60	6,298	182.64	18,846	183.68	33,310
181.62	6,520	182.66	19,107	183.70	33,606
181.64	6,742	182.68	19,368	183.72	33,902
181.66	6,966	182.70	19,630	183.74	34,198
181.68	7,190	182.72	19,893	183.76	34,495
181.70	7,415	182.74	20,156	183.78	34,793
181.72	7,641	182.76	20,420	183.80	35,092
181.74	7,867	182.78	20,685	183.82	35,391
181.76	8,095	182.80	20,951	183.84	35,691
181.78	8,323	182.82	21,217	183.86	35,992
181.80	8,552	182.84	21,485	183.88	36,293
181.82	8,782	182.86	21,753	183.90	36,595
181.84	9,012	182.88	22,021	183.92	36,897
181.86	9,244	182.90	22,291	183.94	37,200
181.88	9,476	182.92	22,561	183.96	37,504
181.90	9,709	182.94	22,831	183.98	37,809
181.92	9,943	182.96	23,103	184.00	**38,114**
181.94	10,177	182.98	23,375		
181.96	10,413	183.00	23,649		
181.98	10,649	183.02	23,922		
182.00	10,886	183.04	24,197		
182.02	11,124	183.06	24,472		

Storage at outlet

Standard 3: Recharge Calculations - Bioretention Basin

R_V (required) = F x Impervious Area

where: R_V = Required Recharge Volume (cu. ft.)

F = Target Depth Factor

0.60 inch (A-soils)
0.35 inch (B-soils)
0.25 inch (C-soils)
0.10 inch (D-soils)

New Impervious Area by Hydrologic Soil Type

Impervious Area (A-soils)	0 sq. ft.	0.0%
Impervious Area (B-soils)	0 sq. ft.	0.0%
Impervious Area (C-soils)	17,910 sq. ft.	100.0%
Impervious Area (D-soils)	0 sq. ft.	0.0%
Total Impervious area	17,910 sq. ft.	100.0%

Required Recharge Volume Sizing (R_V)

R_v (required) = $\sum$ [$F_{Soil\ Type}$ x Impervious $Area_{Soil\ Type}$] x 1 ft./12 in.

R_v (required) = 373 cu. ft.

Capture Area Adjustment

Adjustment Factor = 1.52

Adjusted R_V (required) = 566 cu. ft.

Standard 4: Water Quality

Water Quality Volume - Bioretention Basin

V_{WQ} (required) = (D_{WQ} / 12 inches/foot) (A_{IMP} x 43,560 square feet/acre)

where: V_{WQ} = req'd water quality volume (cu. ft.)

D_{WQ} = water quality depth* (inches) = 0.5 inches

A_{IMP} = total impervious area (acres)** = 0.090 acres

V_{WQ} (required) = 163 cu. ft.

Compare required water quality volume (V_{WQ}) to required recharge volume (R_V)
Infilatraion BMP must be sized to treat or hold the larger of the two volumes

R_V (required) =	566 cu. ft.	Rv for tributary impervious area	
V_{WQ} (required) =	163 cu. ft.		
Use	566 cu. ft.	=	Target Volume

Storage Volume Provided

Recharge Facility	Volume Provided
Bioretention Basin	2,372 cu. Ft.***

2,372 cu. ft. > 566 cu. ft.

*Water quality depth shall equal 1-inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a LUHPPL, or exfiltration to soils with infiltration rate greater than 2.4 inches/hour or greater; ½-inch for discharges near or to other areas

**Only includes impervious area tributary to the surface infiltration basin subject to water quality treatment.

***Volume represents the available storage in bioretention basin #3 below outlet elevation 182.50
Depth of water in basin = 1.00 feet

Stage-Area-Storage for Pond 5P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
181.50	1,950	0
181.52	1,966	39
181.54	1,982	79
181.56	1,998	118
181.58	2,014	159
181.60	2,030	199
181.62	2,046	240
181.64	2,062	281
181.66	2,078	322
181.68	2,095	364
181.70	2,111	406
181.72	2,128	448
181.74	2,144	491
181.76	2,161	534
181.78	2,177	578
181.80	2,194	621
181.82	2,211	665
181.84	2,228	710
181.86	2,245	754
181.88	2,262	800
181.90	2,279	845
181.92	2,296	891
181.94	2,313	937
181.96	2,330	983
181.98	2,348	1,030
182.00	2,365	1,077
182.02	2,382	1,125
182.04	2,400	1,172
182.06	2,417	1,221
182.08	2,435	1,269
182.10	2,453	1,318
182.12	2,470	1,367
182.14	2,488	1,417
182.16	2,506	1,467
182.18	2,524	1,517
182.20	2,542	1,568
182.22	2,560	1,619
182.24	2,578	1,670
182.26	2,596	1,722
182.28	2,615	1,774
182.30	2,633	1,826
182.32	2,651	1,879
182.34	2,670	1,932
182.36	2,688	1,986
182.38	2,707	2,040
182.40	2,725	2,094
182.42	2,744	2,149
182.44	2,763	2,204
182.46	2,782	2,260
182.48	2,801	2,315
182.50	2,820	2,372
182.52	2,839	2,428
182.54	2,858	2,485
182.56	2,877	2,542
182.58	2,896	2,600
182.60	2,915	2,658
182.62	2,935	2,717
182.64	2,954	2,776
182.66	2,973	2,835
182.68	2,993	2,895
182.70	3,013	2,955
182.72	3,032	3,015
182.74	3,052	3,076
182.76	3,072	3,137
182.78	3,092	3,199
182.80	3,111	3,261
182.82	3,131	3,323
182.84	3,151	3,386
182.86	3,172	3,449
182.88	3,192	3,513
182.90	3,212	3,577
182.92	3,232	3,641
182.94	3,253	3,706
182.96	3,273	3,772
182.98	3,293	3,837
183.00	**3,314**	**3,903**

Storage at outlet

TSS Removal Form - Infiltration Basins #1, #2 & #3

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep-Sump Hooded Catch Basins	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pre-Treatement TSS Removal = 44%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Surface Infiltration Basin w/ Forebay	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

TSS Removal Form - Bioretention Area

Pre-Treatment

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
12" Gravel Strip & Sod	0.45	1.00	0.45	0.55

Pre-Treatement TSS Removal = 45%

Total TSS Removal

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Bioretention Area	0.90	1.00	0.90	0.10

Total TSS Removal = 90%

Sediment Forebay Sizing - Infiltration Basin #1

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.52 acres *

V_{SF} (required) = 553 cu.ft.

V_{SF} (provided) = 614 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #2

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 1.55 acres *

V_{SF} (required) = 563 cu.ft.

V_{SF} (provided) = 762 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Infiltration Basin #3

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.47 acres *

V_{SF} (required) = 896 cu.ft.

V_{SF} (provided) = 950 cu. ft.

* Only includes impervious area tributary to sediment forebay

Sediment Forebay Sizing - Dry Detention Basin

$$V_{SF}\ (\text{required}) = \frac{0.1\text{-inch}}{\text{Impervious Acre}}$$

where:

V_{SF} (required) = required volume of the sediment forebay (cu. ft.)

Impervious Acre = amount of impervious area tributary to forebay (acres)

= 2.57 acres *

V_{SF} (required) = 934 cu.ft.

V_{SF} (provided) = 1,064 cu. ft.

* Only includes impervious area tributary to sediment forebay

Drawdown Analysis

$$T_{DRAWDOWN} = \frac{R_V}{KA}$$

where: $T_{DRAWDOWN}$ = time in hours

R_V = required recharge volume **(cu. ft.)**

K = Rawls rate **2.41 inches/hour** (A-soils)*
0.52 inches/hour (B-soils)*
0.17 inches/hour (C-soils)*

A = bottom area of recharge facility **(sq. ft.)**

*Most conservative Rawls rate values for given soil type used for analysis purposes

Surface Infiltration Basin #1

R_V = 3,005 cu. ft.
A = 4,562 sq. ft.

$T_{DRAWDOWN}$ = **15.2 hours** < **72 hours** **(B-soils)**

Surface Infiltration Basin #2

R_V = 2,454 cu. ft.
A = 5,113 sq. ft.

$T_{DRAWDOWN}$ = **33.9 hours** < **72 hours** **(C-soils)**

Surface Infiltration Basin #3

R_V = 1,869 cu. ft.
A = 9,161 sq. ft.

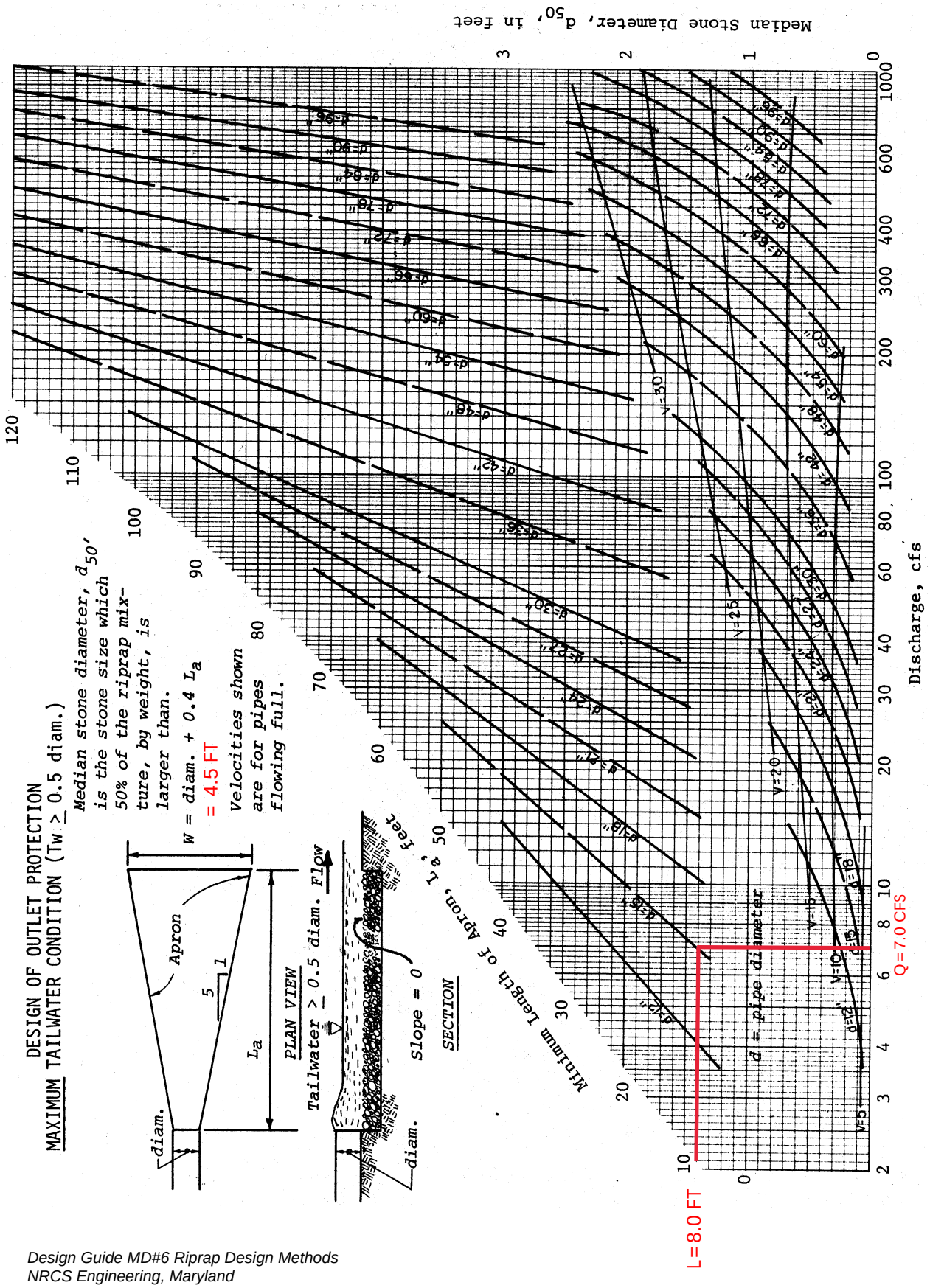
$T_{DRAWDOWN}$ = **14.4 hours** < **72 hours** **(C-soils)**

Bioretention Basin

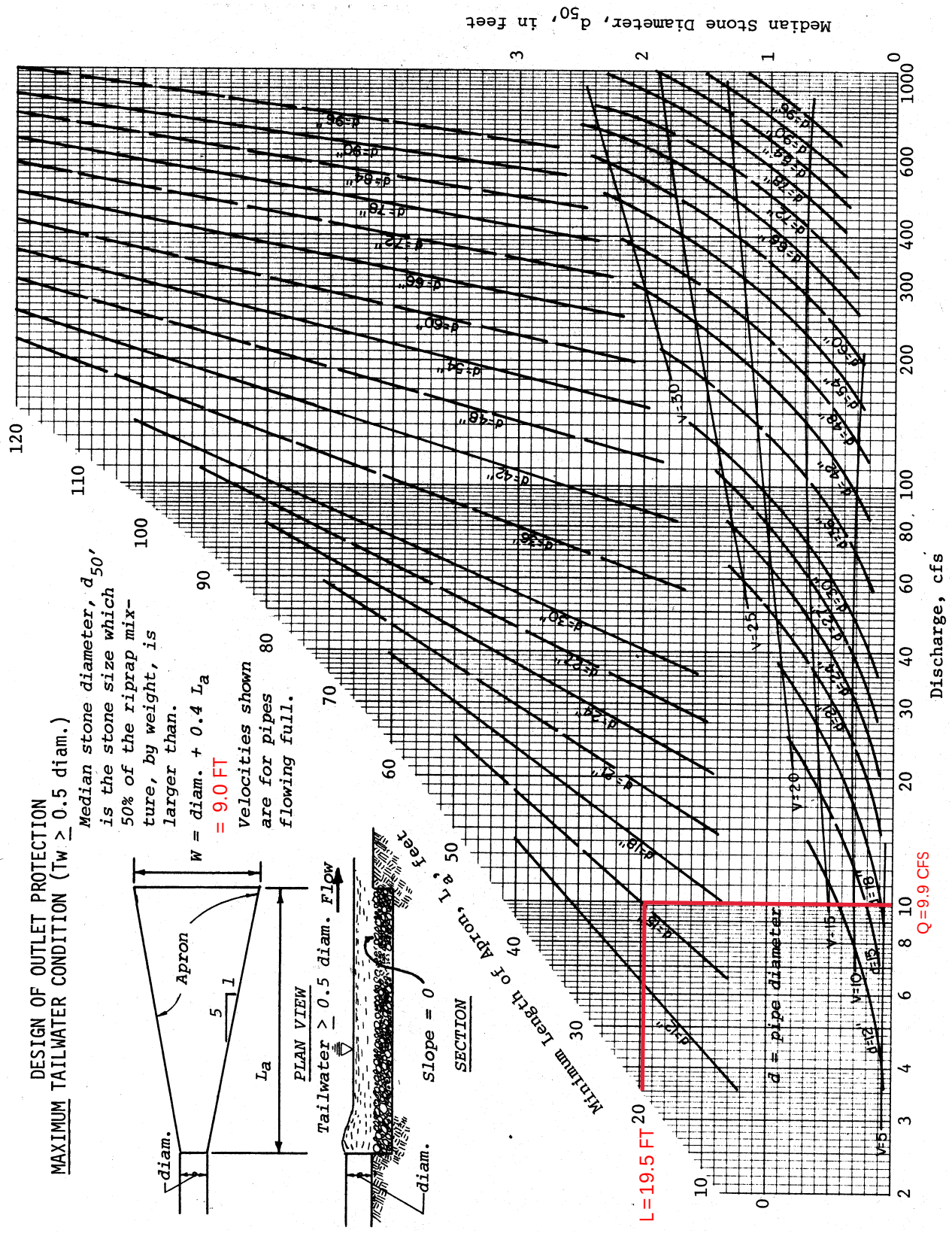
R_V = 566 cu. ft.
A = 1,950 sq. ft.

$T_{DRAWDOWN}$ = **20.5 hours** < **72 hours** **(C-soils)**

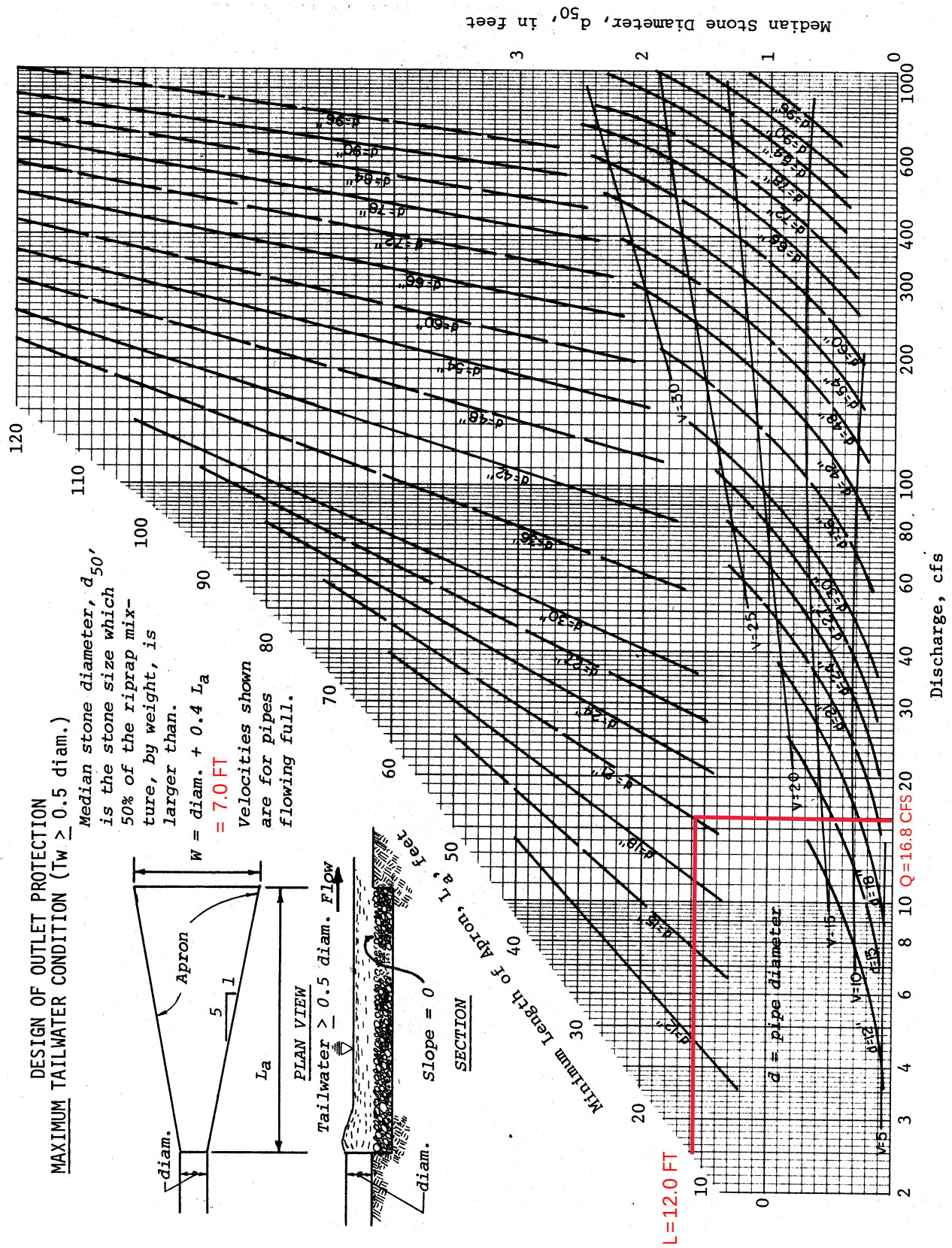
PFES-2 RIPRAP OUTLET



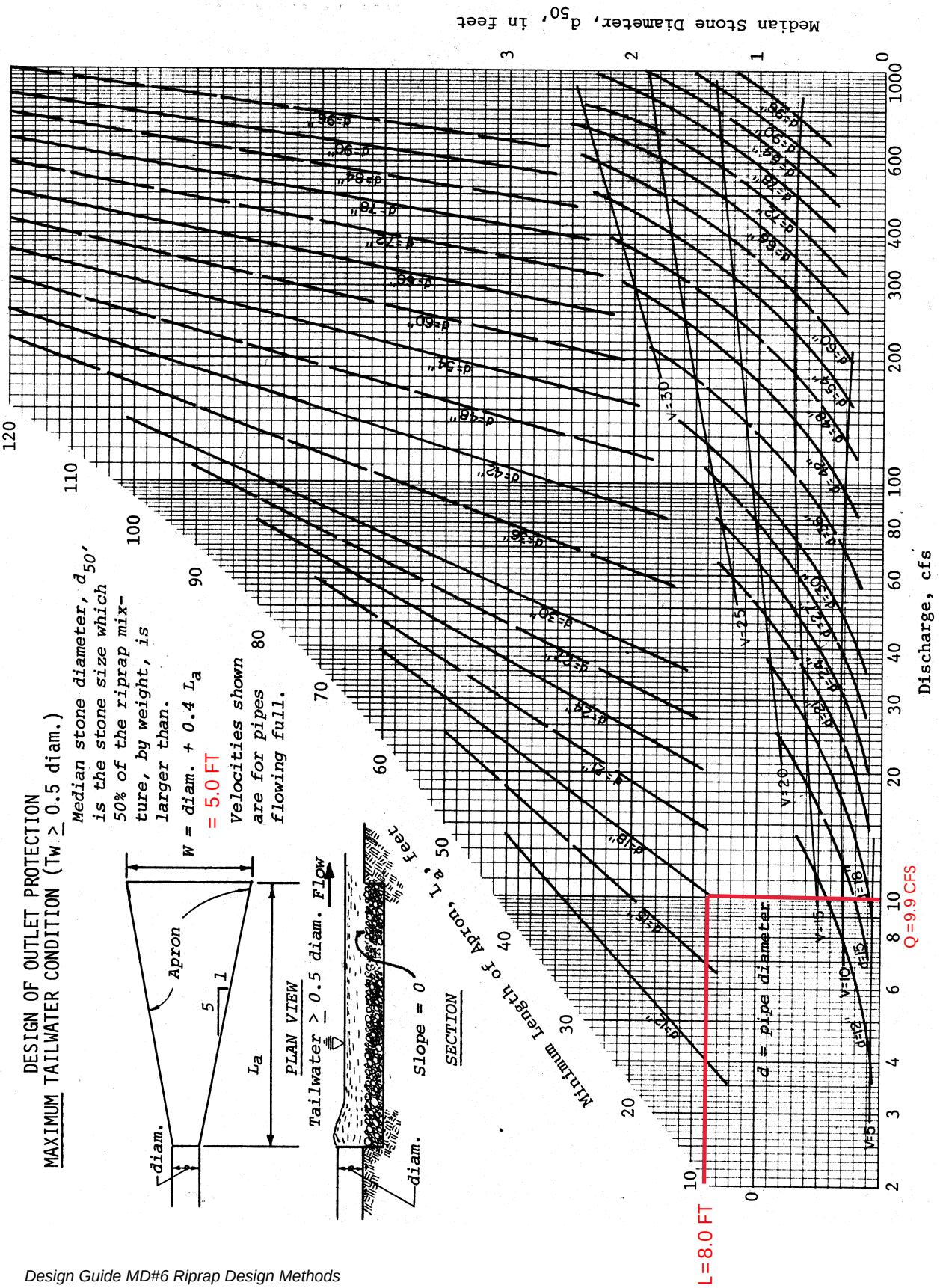
PFES-3A & 4A RIPRAP OUTLET



PFES-8 RIPRAP OUTLET



PFES-8 RIPRAP OUTLET



Appendix F: Construction Period Erosion Control Plan

Construction Period Erosion Control Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506

September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

The project shall implement a construction period erosion control plan. The following provides descriptions and guidelines to ensure that the areas surrounding the project site will be protected from excessive sedimentation and runoff during construction.

1.1 Construction Period Pollution Prevention And Erosion Control Measures

1.1.1 Preconstruction Notifications And Meetings

Prior to the start of construction, the contractor shall call together a pre-construction meeting including a representative from the Town, the design engineer, contractor, and any pertinent persons that should be in attendance. These requirements shall be the responsibility of the Contractor to arrange, attend, and document.

1.1.2 Sediment Barrier And Work Limit

Before installation of the sediment barriers, the location shall be staked in the field for review and approval by the owner or their representative. To facilitate sediment barrier installation, woody vegetation may then be removed and any required trench may be cut by machine, provided all other ground cover is left intact. No excavation, grading, filling, or removal of vegetative ground cover shall begin until sediment barriers have been installed as shown on the plans and have been inspected by the owner or their representative.

1.1.3 Silt Fence

The bottom of the fence shall be trenched into the ground a minimum of 6" and back-filled with compacted soil. Where trenching is not feasible, silt fence skirt shall be covered with compacted soil or crushed stone. The top of the fabric shall be stretched as tightly as is practical, with intermediate stakes added to correct excessive sags. Stakes shall be driven at least 12" into the ground. Splices between sections shall be made by rolling end stakes together one complete turn and driving into the ground together.

1.1.4 Straw Bales

Straw bales may be used as temporary and moveable control measures, temporary check dams, or as reinforcement for silt fence in areas of concentrated runoff or high fills. Bales shall be tightly butted and staked 12" into the ground. Where used without silt fence in front, the bales shall be trenched 4" into the ground, back-filled with compacted soil, and the spaces between bales shall be chinked with loose hay.

1.1.5 Filter Sock (Filtrexx Or Equivalent)

In areas of expected sheet flow, filter sock may be placed directly on the ground without trenching or stakes. In areas of expected concentrated flow, mulch or crushed stone shall be placed along the up-slope face to control and filter underflow. Additional layers of Filter Sock may be required for adequate freeboard. The filter sock shall be staked at 10 feet on-center or in cases where they cannot be staked, utilize heavy concrete blocks to hold in place.

1.1.6 Temporary Sedimentation Basins

Temporary sediment basins may be excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion. If the temporary basin is to be located within an area of future infiltration as part of the stormwater management system, the excavation for the temporary sedimentation basin shall be limited to one foot above final grade of the infiltration structure.

1.1.7 Stocking Additional Materials

A stock of additional erosion control materials shall be available on the site for emergency repairs and temporary measures. Stock shall be replenished when decreased to 50% of the numbers below. Stock shall include:

Straw Bales – 10 (kept dry) with 20 oak stakes

Or

Silt Fence – 30 Linear feet.

Or

Filter Sock – 4 – 8 foot sections (kept dry)

Washed Stone – One (1) cubic yard, ¾" to 2" diameter

1.1.8 Trench Protection

Open trenches shall be protected from accumulation of surface water or groundwater that could result in erosion of the trench and discharge of sediment. Where feasible, spoil shall be stockpiled on the up-slope side of the trench to prevent entrance of surface runoff. Backfill shall be crowned to allow for settlement and to avoid concentration of runoff on top of the trench.

1.1.9 Site Stabilization – Temporary

Where a portion of the site will not be subject to construction activity for over 14 days, measures shall be taken to provide temporary stabilization of that inactive portion of the site, within 14 days of the cessation of construction activity. Stabilization measures may include seeding for temporary cover, mulching, or other measures to protect exposed soil from erosion and prevent sediment movement.

1.1.10 Site Stabilization – Permanent

Within 14 days of completion of loaming and finish grading on any portion of the site, that area shall be seeded or planted for permanent cover (season permitting) in accordance with USDA NRCS guidelines or equivalent.

1.1.11 Roadway Sweeping

The entrance to the site and affected portions of the access drive or paved project areas shall be swept as needed to control sediment runoff into storm drains or waterways and to control blowing dust.

1.2 Short-Term Erosion Control Maintenance

The following provides short-term erosion control maintenance guidelines and requirements.

1. The contractor or subcontractor will be responsible for implementing each control shown on the sedimentation and erosion control plan.
2. All erosion and sediment control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control measures will be installed during construction in order to control erosion and/or off-site sedimentation if deemed necessary by on-site inspection.
3. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
4. All sediment and erosion control devices shall be inspected at least once every seven (7) calendar days and after any storm event greater than 0.5 inches of precipitation during any 24-hour period, and the inspection shall be documented in writing. Damaged or ineffective devices shall be repaired or replaced, as necessary.
5. The contractor shall take all reasonable precautions to avoid excess erosion of the site due to the construction of this project.
6. Silt shall be removed from behind barriers if greater than 6-inches deep or as needed. Sediment that is collected in structures shall be disposed of properly and covered if stored on-site
7. Damaged or deteriorated items will be repaired immediately after identification.
8. All ditches shall be stabilized as soon as is practicable to minimize erosion.
9. The contractor shall maintain all erosion control devices in a good, working state of repair. Upon complete stabilization of any tributary areas, the erosion control devices shall be removed and disposed of so as to cause no off-site siltation.
10. Inspect and maintain construction entrance stone such that sediment does not track onto the street. Any sediment tracked onto the street shall be swept daily.
11. After catch basins have been constructed, the contractor shall protect the inlets by constructing inlet protection as shown on the plans.
12. Once the site has been paved, all catch basin inlets shall receive a silt sack type protection.
13. Erosion control measures shall remain in place until all disturbed earth has been substantially stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Appendix G: Long-Term Operation and Maintenance Plan

- Long-Term Operation & Maintenance Plan Narrative
- CDS Inspection and Maintenance Guide
- O&M Checklist

Long-Term Operation & Maintenance Plan

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

I. Long-Term Stormwater Maintenance Program:

This Long-Term Operation and Maintenance Plan (O&M) identifies inspection and maintenance requirements for the proposed stormwater management system. The O&M references guidelines set forth by the Stormwater Management Handbook developed by the Massachusetts Department of Environmental Protection.

Owner:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

2. Inspection and Maintenance Program:

Regular inspection and routine maintenance are necessary to ensure that the stormwater management system continues to control and treat runoff. The following lists the inspection schedule and maintenance procedures for the proposed stormwater Best Management Practices:

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Bituminous Concrete Pavement	Four times per year	Twice per year	• Roadway to be swept in March or April following snow melt and again in late November or early December to remove fallen leaves and debris
Deep-Sump Catch Basins	Four times per year	Four times per year	• Remove sediment once deposits reach one half the depth from the bottom sump to the lowest invert.
Leaching Drywell	Once per year	As needed	• Remove debris and sediment when the drywell in 50% filled. Rehabilitate drywell if it fails due to clogging
Stormwater Piping	Once per year	Once per year	• Inspect pipe entrances in catch basins and manholes and remove any blockages
Water Quality Unit*	As specified by the manufacturer	As specified by the manufacturer	• Clean the unit using the method specified by the manufacturer. Vactor trucks are typically used to clean these units.
Sediment Forebay	Monthly	Four times per year	• Remove sediment when it reaches six inches; • Mow the grass to no less than 3 inches and no greater than 6 inches; • Replace vegetation damaged during sediment removal.
Surface Infiltration Basin	• After every major storm for the first three months; • Twice per year thereafter.	Twice Per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of the turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris.

BMP	Inspection Schedule	Maintenance Schedule	Maintenance Procedures
Dry Detention Basin	• After every major storm event for the first three months; • Twice per year thereafter	Twice per year	• Check for signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth, riprap condition, sediment accumulation, and health of turf; • Mow side slopes and basin bottom and remove clippings; • Remove accumulated trash and debris
Flared End Section	Four times per year	As Needed	• Remove any debris or vegetation around the flared end section such that flow out of the structure is not impeded.
Level Spreader	Once per month and after every major storm event	As needed	• Remove debris and sediment • Rill damage to be repaired and re-vegetated • Replace rotted or broken timbers
Bio-Retention Areas	Once per month	Twice per year (Spring and Fall)	• Inspect bio-retention areas for sediment build-up, structural damage, and standing water; • Inspect and repair eroded areas monthly; • Re-mulch void areas as needed; • Remove litter and debris monthly; • Treat diseased or distressed vegetation as needed; • Remove and replace dead vegetation twice per year (Spring and Fall); • Remove invasive species as needed; • Replace mulch every two years.

*See attached Device Operation and Maintenance Guides

See the attached Long-Term O&M Inspection Checklist for record keeping purposes.

3. Additional Long-Term Operation and Maintenance Items

The following is a list of additional operation and maintenance items to be implemented by the owner/governing group to maintain the features proposed in this project.

A. Proper storage, use, and disposal of hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc. shall be required. Information should be provided on chemicals of concern, proper use, and disposal options. Recycling programs for used motor oil, antifreeze, and other products should be developed.

B. Vehicle Washing. This management measure involves educating the owner on the water quality impacts of the outdoor washing of vehicles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons which is conveyed by the detergent-rich water into storm drains.

C. Recycling, spill prevention and response plans, and proper material storage and disposal of potentially hazardous materials shall be implemented. It will be the responsibility of the owner to contain and legally remove any materials that are spilled onsite. The use of dry floor cleaners and absorbent materials and limiting the use of water to clean pavement is encouraged. Care should be taken to avoid accidental disposal of hazardous materials.

D. Provisions for storing trash and waste products shall be implemented. The waste materials shall be collected by the owner and all materials shall be properly disposed of.

E. Requirements for routine inspections and maintenance of stormwater best management practices. Routine inspections shall be performed to ensure the correct functioning of stormwater best management practices. See the specific maintenance criteria for detail regarding inspections and maintenance frequency.

F. Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides. Fertilizers, pesticides, herbicides, lawn care chemicals, or other leachable materials shall be used in accordance with the Lawn Care Regulations of the Massachusetts Pesticide Board, 33 CMR 10.03 (30,31), as amended, with manufacturer's label instructions and all other necessary precautions to minimize adverse impacts on surface and groundwater. The storage of any such materials shall be within structure designed to prevent the escape of contaminated runoff or leachate.

G. Provisions for prevention of illicit discharges to the stormwater management system shall be implemented. Any illicit discharges to the stormwater management system shall be prohibited. It will be the owner's responsibility to ensure compliance with the legal disposal of all materials and containment/cleanup of any illicit discharges.

H. Training for staff or personnel involved with implementation of the Long-Term Pollution Prevention Plan shall be required. The owner/governing group will be responsible for the implementation of the measures set forth in the Long-Term Pollution Prevention Plan. Documentation that personnel and owners involved with the implementation of the Long-Term Pollution Prevention Plan have been trained to conduct such tasks shall be documented.

4. Winter and Snow Conditions

The following is a list of additional operation and maintenance items to be implemented by the owner during winter and snow conditions.

A. Snowfall shall be stored on the grassed areas surrounding the pavement areas, excluding any areas utilized for stormwater management practices. As needed, any snow that cannot be stored on site shall be trucked off site and disposed of properly.

B. Winter road salt and/or sand use and storage restrictions shall be implemented based on any restrictions issued for the project. Sodium chloride for ice control shall be used at the minimum salt to sand ratio which is consistent with the Massachusetts Department of Environmental Protections guidelines. Sodium chloride, calcium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads/drives shall not be stored on site.

5. Public Safety Features

The proposed site design utilizes the following features which have been incorporated to ensure the safety of the public:

A. Control and collection of stormwater runoff through positive drainage and curbing directing it towards the drainage inlets;

B. Heavy-duty stormwater drain manhole covers and catch basin grates have been designed to withstand H20 loading;

C. Reduction of peak discharge rates from the site in the post-development condition as compared to the pre-developed conditions;

D. Development and implementation of an Operations & Maintenance Plan to ensure the stormwater management system continues to function as designed.

6. Estimated Cost of Maintenance

The following budget was prepared as an estimate of inspection and maintenance costs for the stormwater management system. The budget is an estimate only as the costs may vary depending on the level of sediment accumulation and frequency of maintenance tasks required.

BMP Inspections	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$50	22	$4,400
Yard Drains	4/year	$50	15	$3,000
Sediment Forebay	2/year	$50	4	$400
Surface Infiltration Basin	2/year	$75	3	$450
Dry Detention Basin	2/year	$75	1	$150
Water Quality Unit	2/year	$100	1	$200
Bio-Retention Areas	12/year	$50	1	$600
Total Estimated Annual Cost of Inspections				$9,200

BMP Maintenance	Number of Occurrences	Maintenance Cost	Number of Structures	Sum
Catch Basin	4/year	$100	22	$8,800
Yard Drains	4/year	$100	15	$6,000
Sediment Forebay	2/year	$250	4	$600
Surface Infiltration Basin	2/year	$500	3	$2,000
Dry Detention Basin	2/year	$500	1	$1,000
Bio-Retention Areas	2/year	$500	1	$1,000
Water Quality Unit	2/year	$800	1	$800
Total Estimated Annual Cost of Maintenance				$20,200

*All above costs are estimates to be used for permitting purposes only. Actual maintenance costs are to be ascertained by the responsible party

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 1 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Bituminous Concrete Roadway	Build-up of sediment over the winter months and collection of leaves during the fall months.	Sweep roadway using a high-efficiency street sweeper.			
Deep-Sump Catch Basins	Sediment has accumulated to a depth greater than the original design depth for sediment storage, approximately 2-feet of sediment.	Remove the sediment and dispose of in accordance with local and state regulations.			
Stormwater Piping	Blockage of inlet/outlet pipes due to debris or sediment accumulation.	Remove any debris and sediment via proper means. Dispose of debris/sediment in accordance with local & state regulations			
Roof Leaders	Downspout connections have been damaged or disconnected.	Repair and reconnect downspout connections.			
	Roof leaders are surcharging at the downspout connections	Open and insepct at cleanout locations and remove any blockages.			
Surface Infiltration Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Level Spreader	Debris or sediment has collected in level spreader	Remove debris or sediment			
	Rills have developed downstream of level spreader	Repair rill damage and re-vegetate area			
	Timbers are broken or rotted	Replace timbers			

_____ _____

Inspector's Signature Date

Project: _____ Responsible Party: _____

Address: _____ Date: _____

BPM Name: _____ Page: 2 of 2

Operation & Maintenance Inspection Checklist

BMP Element:	Potential Problem:	Resolution:	Pass	Fail	Recommended Remediation
Dry Detention Basin	Standing water inside basin.	Verify that sediment is not entering the basin. Remove collected sediment and scour basin bottom. Replace damaged vegetation			
	Erosion is occuring on the side slope or around the flared end section.	Remedy scoured area and replace vegetation.			
	Trees/Shrubs are starting to grow within the basin.	Remove trees/shrubs and vegetate with grass.			
	Debris has collected inside the basin.	Remove debris and remedy any damage caused.			
Flared End Sections	Vegetation has started to grow within the riprap area.	Remove vegetation immediately.			
	Accumulation of sediment/debris at the culvert inlet.	Remove sediment or debris such that the culvert has free flow.			
	Erosion is occuring where riprap has been dislodged.	Remedy scoured area and replace riprap immediately.			
Bio-Retention Areas	Sediment has accumulated over mulched surface.	Remove sediment and mulch mixture and replace mulch.			
	Erosion has occurred at inlets.	Repair any eroded areas and replace with appropriate materials.			
	Areas are devoid of mulch.	Replace mulch as necessary.			
	Litter and/or debris has accumulated in bio-retention area.	Remove litter and/or debris.			
	Vegetation has died or is distressed.	Replace vegetation as necessary.			
Water Quality Unit	Sediment has accumulated to a depth greater that the original design depth for sediment storage.	Remove sediment and disposed of in accordance with local and state regulations.			

_____ _____

Inspector's Signature Date

Appendix H: Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

The owners of the land/responsible party will be responsible for prohibiting illicit discharges to the stormwater management system during construction and during its life of operation. The stormwater management system is comprised of the components for conveying, treating, and infiltrating stormwater runoff on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. An illicit discharge shall constitute any connection or discharge to the stormwater management system including, but not limited to, wastewater discharges, discharge of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Responsible Party*:

Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

*The party listed shall be responsible for implementation and record keeping of the requirements listed in this operation and maintenance plan. Upon sale of property or any other transition of ownership, the responsible party shall be reinstated as the new owner or any other group created as determined by the owner.

Signature of Responsible Party Representative _____ Date _____

Signature of Responsible Party Representative** _____ Date _____

**Required upon transfer of ownership

Appendix I: Low Impact Development Considerations

Low Impact Development Considerations

Proposed Condominium Community

497 South Westfield Street
Agawam, MA
(Parcel ID: E6-2-8)

Applicant & Owner:
Ralph Depalma & Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

Project File #:090506
September 19, 2022

R LEVESQUE ASSOCIATES, INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

Introduction

Per the Massachusetts Stormwater Handbook, project proponents must consider environmentally sensitive site design and low impact development techniques to effectively manage stormwater runoff. As part of the proposed project, the proponent has considered a number of environmentally sensitive, low impact development techniques to prevent the generation of stormwater and non-point source pollution. The proposed stormwater management system design was able to incorporate some LID techniques such as deep-sump hooded catch basins, a proprietary sedimentation device, surface infiltration basins with sediment forebay, a bioretention area with vegetated filter strip and a dry detention basin. The proposed stormwater management system has been designed utilizing the Agawam Stormwater Management Ordinance which dictate that specific criteria be met in regard to stormwater runoff in conjunction with the criteria set forth and required by the Massachusetts Stormwater Handbook.

The property to be developed is currently in agricultural use with the exception of wooded wetland in the central portion of the project site. The topography of the site slopes from South Westfield Street in an easterly direction toward the centrally located wetland, a different wetland located at the southeast corner of the parcel, as well as Philo Brook located at the northern tip of the project area. No stormwater management features currently exist on site, however, a pair of culverts under South Westfield Street discharge runoff from adjacent properties onto the site. As such, untreated stormwater laden with suspended solids flows across the site and into adjacent wetlands and stream.

The developer is proposing to construct forty (40) new duplex condominium buildings and one standalone unit for a total of eighty (81) units. Seven of the duplex units will face directly onto South Westfield Street. The remaining thirty-three duplexes will be accessed by a series of new roadways. The total length of new roadways will be approximately 3,930 feet and will include the installation of gravity and pressure sanitary sewer, water, electric, gas and communication lines. The majority of the parcel where the site improvements are proposed has been historically disturbed. A number of onsite resource areas, including bordering vegetated wetlands, bank, land under water, and riverfront area were delineated as part of the project. Please refer to the Notice of Intent filing with the conservation commission for additional information pertaining to the various off-site resource areas.

Currently, there is no existing stormwater management system located on the property. Under proposed conditions, a stormwater management system has been designed to mimic the existing drainage patterns of the site while improving runoff water quality and reducing peak stormwater flow rates through the use of MassDEP recommended stormwater BMPs. The proposed roadway has been carefully graded to mimic existing flow patterns of the site and direct runoff to inlet structures that will collect and convey stormwater to three separate surface infiltration basins and a

dry detention basin situated in logical locations across the site. A bioretention basin with vegetated filter strip is also proposed to treat sheet flow from a portion of the new roadway. The surface infiltration basins and bioretention area were designed such that runoff will infiltrate to provide groundwater recharge as well as provide peak rate attenuation. The dry detention basin was designed only to provide peak rate attenuation. Outlet control structures from the surface basins and dry detention basin will discharge stormwater down gradient. A proprietary sedimentation device will be added to the town's drainage infrastructure that currently discharges onto the subject property to improve runoff water quality. The proposed site improvements will maintain the general drainage patterns of the site by discharging runoff to the same design points in post-development as pre-development conditions.

This letter serves to describe the relationship between the requirements of the MassDEP Handbook and "environmentally sensitive site design" considerations as well as the analysis of alternatives to any "point source" of "stormwater discharge" which may be regulated. The following sections provide detailed descriptions for the consideration of low impact development measures as listed by the MassDEP.

Environmentally Sensitive Site Design Considerations

The Department's requirement for the inclusion of Environmentally Sensitive Site Design was considered as part of the design of the stormwater management system. These considerations include review of low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting stormwater sheet flow paths and treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat. The proposed stormwater management system does not introduce any new point source discharges to resource areas.

A. *Reducing impervious surfaces*

The amount of proposed impervious surface for internal roadways has been reduced to the minimum requirements by the Town of Agawam for pavement and sidewalk width. The pavement width varies and is based on the estimated average daily trips and the sidewalk width was dictated by the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam. The roadway width varies between 30-feet and 36-feet for two-way travel and 20-feet for one-way travel. The sidewalks are 5-feet wide.

B. *Disconnecting stormwater sheet flow paths and treating stormwater at its source*

The proposed roadway has been carefully graded to conform to the requirements of the Rules and Regulations Governing the Subdivision of Land in the Town of Agawam as was requested by the Town. Stormwater runoff from approximately 200-feet of new roadway will sheet flow to vegetated filter strip for treatment prior to discharging to a bioretention area to

provide groundwater recharge. On-site drainage patterns will be maintained and only the new roadway and front yards will be collected via the proposed stormwater infrastructure.

C. *Maximizing open space*

The proposed project has been limited to the on-site upland areas and roadway length was limited to the functional minimums required for a successful project. Existing vegetated areas have been protected to the maximum extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed.

D. *Minimizing disturbance*

The proposed development includes the construction of a new roadway, residential buildings, and stormwater management system. Existing vegetated areas have been protected to the maximum practicable extent. Any areas on the site not needed to accommodate the roadway and stormwater management system have been left undisturbed. No work is proposed within any resource areas.

E. *Protecting natural features and processes*

A significant portion of the proposed project is located within areas which have been previously cleared and/or disturbed. The proposed access roadway and stormwater management system has been designed to minimize the impacts to the wetland buffer zones and riverfront area while maintaining the general drainage patterns of the site.

F. *Enhancing wildlife habitat*

Impacts to wildlife habitat have been limited to functional minimums. The majority of the parcel where the site improvements are proposed has been historically disturbed.

Point Source Stormwater Discharge Alternatives Analysis

Under the Department's Outreach Document for 310 CMR 10.05(6)(k) through (q) and 314 CMR 9.06(5) & (6)(a) through (f), a list of considerations is provided for use in developing an Alternatives Analysis to point source stormwater discharge within Departmental jurisdiction.

For ease of review, the aforementioned list is repeated below in italics with responses after each item:

a. *Removal of all proposed work and/or impervious surfaces from the Department's jurisdiction;*

The existing site conditions, with the sloping topography and relatively high groundwater did not allow for a design that was completely outside jurisdiction. Buffer zone and riverfront area impacts have been reduced to functional minimums to provide access and to construct the stormwater management system. The proposed stormwater management system has been carefully designed such that runoff water quality is above MassDEP requirements, thereby limiting negative wetland impact.

b. *Division of the upper portion of the subject catchments into smaller subcatchments, where resultant stormwater discharges should be completely infiltrated and/or retained;*
The subcatchments were delineated based on the proposed roadway layout to maximize building separation while minimizing road length. Careful grading of the site allowed for a stormwater management system design that utilized multiple surface infiltration basins across the site to provide the required groundwater recharge.

c. *Maintaining existing drainage patterns and not mixing country drainage with untreated stormwater;*
The intent of this item has been achieved with the proposed layout of the stormwater management system maintaining existing drainage patterns of the site. Runoff collected from impervious surfaces are directed in the same general direction in post-development conditions as pre-development conditions.

d. *Treatment of remaining stormwater at or proximate to its source within these subcatchments;*
The intent of this requirement has been achieved with the decentralized nature of the proposed stormwater management system. The sloping topography of the site did not allow for intermediate basins, however, a bioretention area with vegetated filter strip was included upgradient of the dry detention basin to provide groundwater recharge closer its source.

e. *Installation of "qualifying pervious areas" to accept stormwater discharge from roads and driveways within each subcatchment;*
The proposed project was carefully designed to limit impervious areas to functional minimums. Generally, impervious areas are limited to buildings and shared access drives. Due to the shared nature and anticipated vehicles on the access drives pervious pavement was not a suitable stormwater alternative. Individual driveways and accessory impervious areas have been reduced to functional minimums and combined when possible.

f. *Installation of dry wells for acceptance of roof drainage;*
Do to the relatively high groundwater and proximity of several building units to wetland resource areas dry wells were not utilized for this project. This technique may be a viable option if favorable soil conditions and groundwater depths are discovered during building construction.

g. *Disconnection of roof drainage;*
A portion of stormwater generated from roof areas will flow away from the stormwater management system and drain directly to adjacent downgradient areas, however, for safety reasons during winter months and the potential for freezing on walkways some of the roof runoff will be piped directly to the surface infiltration basins.

h. *Installation of discrete structural Best Management Practices at relatively high elevations in each subcatchment. For instance, canting access road surfaces into grassed channels, water quality*

swales, vegetated filter strips, bioretention areas, sand and organic filters, drainage swales, level spreaders, etc. which terminate outside of the Department's jurisdiction;
This intent of this requirement has been met by directing sheet flow from paved areas to a bioretention area via a vegetated filter strip.

i. *Further describe:*

1. *Reduction in impervious surfaces;*
   The proposed project has been designed to reduce impervious surfaces to functional minimums. Access roadway widths are designed to the minimums allowed based on town review and walkways and individual driveway widths are reduced to functional minimums.

2. *Road width and length reductions;*
   The proposed roadway width has been designed to the minimum width required based on average daily traffic for the roadway and the length is the minimum required for a cost effective project buildout.

3. *Clustering of impervious surfaces;*
   Impervious surfaces have been clustered to the maximum practical extent.

4. *Addition of planted materials and landscaped areas;*
   A mix of nearly 300 deciduous and evergreen trees are proposed in landscaped areas across the site. In addition, numerous foundation plantings are proposed within landscaped areas adjacent to each building unit. Areas not used for roadways, parking, sidewalks, patios or buildings will be loamed and seeded.

5. *Re-grading of landscaped areas away from jurisdictional Resource Areas and their Buffer Zones; and*
   The general drainage patterns of the site have been maintained in post-development conditions and a stormwater management system has been designed to offset the impacts imposed by the development.

6. *Preservation of vegetated areas within the Buffer Zone, and immediately proximate to jurisdictional resource areas.*
   The majority of the project is located outside jurisdictional areas and nothing is proposed within resource areas. An attempt was made to limit disturbance to buffer zones while at the same time design a project that was cost effective. The greatest impact to riverfront area was due to the construction of infiltration basin #3 and the dry detention basin which were situated based on site topography.

Site Plans

Proposed Condominium Community

Assessor's Map 66, Block 2, Lot 8
497 South Westfield Street · Agawam, MA

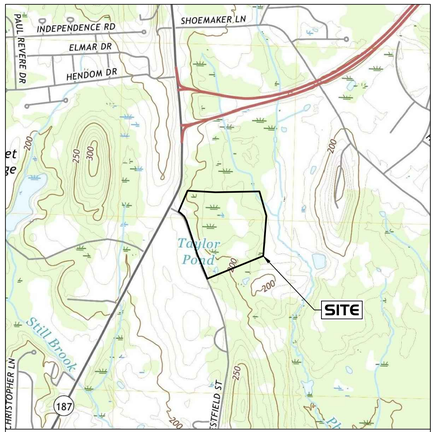
AS PREPARED FOR

Joe Tirone & Ralph Depalma

36 Canterbury Lane
Feeding Hills, MA 01030

SITE INFORMATION		
LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



SOURCE: USGS

NORTH

September 19, 2022
Revised: 10/26/22

BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

DRAWING INDEX

SHEET NO.	SHEET NAME	ISSUE DATE	REVISION DATE
T-1	TITLE SHEET	9/19/22	10/26/22
EX-1	EXISTING SITE CONDITIONS	7/28/22	
C-1	NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS	9/19/22	
C-2	CONSTRUCTION NOTES	9/19/22	
C-3	SITE PREPARATION PLAN	9/19/22	
C-4	SITE LAYOUT – Southwesterly Section	9/19/22	10/26/22
C-5	SITE LAYOUT – Northeasterly Section	9/19/22	10/26/22
C-6	OVERALL SITE GRADING	9/19/22	10/26/22
C-7	SITE GRADING & DRAINAGE – Southwesterly Section	9/19/22	10/26/22
C-8	SITE GRADING & DRAINAGE – Northeasterly Section	9/19/22	
C-9	PLAN & PROFILE – Entrance Drive	9/19/22	
C-10	PLAN & PROFILE – Exit Drive	9/19/22	
C-11	PLAN & PROFILE – Cul-de-sac	9/19/22	
C-12	PLAN & PROFILE – Loop Drive	9/19/22	
C-13	PLAN & PROFILE – Along South Westfield Street	9/19/22	10/26/22
C-14	SITE LANDSCAPING PLAN – Southwesterly Section	9/19/22	
C-15	SITE LANDSCAPING PLAN – Northeasterly Section	9/19/22	
C-16	OVERALL SITE UTILITY PLAN	9/19/22	
C-17	CUL-DE-SAC & INTERSECTION DETAILS	9/19/22	
C-18	EROSION & SEDIMENTATION CONTROL & PROJECT PHASING PLAN	9/19/22	
C-19	WETLAND RESTORATION PLAN	10/26/22	
SL-1	SITE LIGHTING PLAN	5/2/22	
D-1	DETAILS	9/19/22	
D-2	DETAILS	9/19/22	
D-3	DETAILS	9/19/22	
D-4	DETAILS	9/19/22	
D-5	DETAILS	9/19/22	
D-6	DETAILS	9/19/22	
D-7	DETAILS	9/19/22	

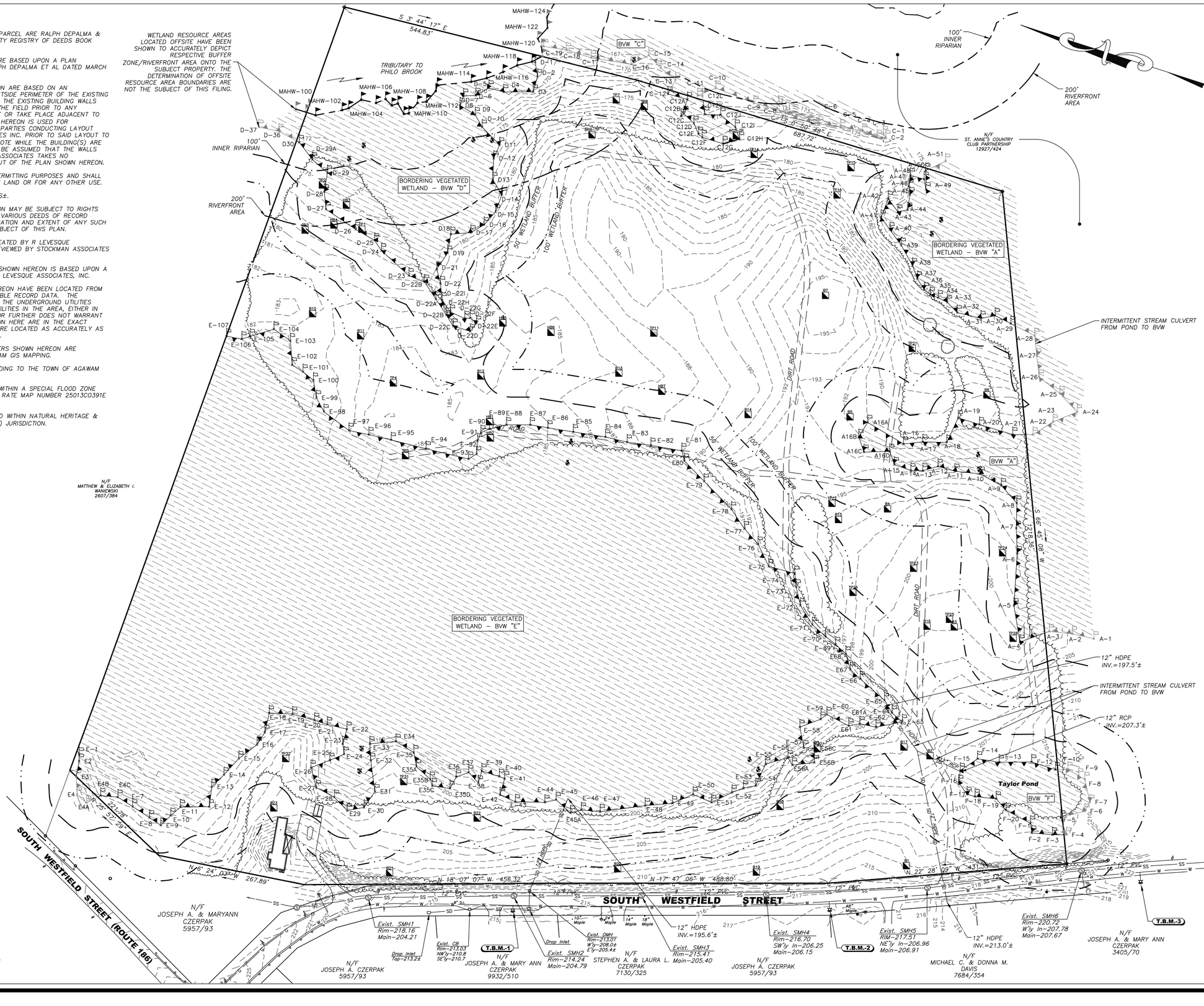
RLA Project Number: 090506

PERMITTING
NOT FOR CONSTRUCTION

NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE RALPH DEPALMA & GIUSEPPE TIRONE. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 14554 PAGE 323.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON A PLAN PREPARED BY D.L. BEAN, INC. FOR RALPH DEPALMA ET AL DATED MARCH 21, 2005.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCEL CONTAINS 49.81 ACRES±.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLAND RESOURCE AREAS WERE DELINEATED BY R LEVESQUE ASSOCIATES, INC. IN 2021 AND PEER REVIEWED BY STOCKMAN ASSOCIATES IN JUNE 2022.
8. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND AVAILABLE RECORD DATA. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
11. SUBJECT PARCEL IS ZONED A–3 ACCORDING TO THE TOWN OF AGAWAM ZONING MAP.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0391E – EFFECTIVE DATE: 7/16/13.
13. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.



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WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MARC E. SHUTE No. 39610 REGISTERED LAND SURVEYOR COMMONWEALTH OF MASSACHUSETTS

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

REVISIONS:	DATE:
A. Wetland Peer Review	6/17/22
B. Wetland Peer Review	6/22/22
C. Wetland Peer Review	7/26/22
D. Updated Riverfront Area	7/28/22

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SCALE: AS NOTED

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SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VAVLE
- PROPOSED HYDRANT
- GV EXISTING GAS VALVE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- OBS-1 OBSERVATION HOLE LOCATION
- P.T.-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- WETLAND
- EXISTING STONE WALL
- TREE LINE
- × 102.3 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- • 99.4 PROPOSED SPOT GRADE
- PROPOSED CONTOUR
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF DOUBLE EROSION CONTROL BARRIER

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER/LANDSCAPE ARCHITECT AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.
   A. SITE PREPARATION
      - -COMPLETE ALL ROUGH GRADING ACTIVITIES
      - -REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
      - -EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
      - -SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
      - -THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.
   B. ESTABLISHMENT
      - -EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
      - -UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
      - -APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
      - -VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
      - -PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.
   C. MAINTENANCE
      - -ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION.
   APPLICATION STANDARDS:
      - -REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
      - -SCARIFY SURFACE PRIOR TO SEED APPLICATION.
      - -APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS TO THE WETLAND. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:
   A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
   B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
   C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL NE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENVIRONMENTAL PROFESSIONALS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

DEMO NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
5. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
6. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. CONTRACTOR SHALL PROMPTLY TRANSPORT DEMOLISHED MATERIALS OFF OWNERS PROPERTY AND LEGALLY DISPOSE OF. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL PAY ANY DUMPING FEES.
8. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
9. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
10. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, LIGHT POLE BASES, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
13. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2) REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. FINAL FOUNDATION PLANTINGS PLANS AND LISTS TO BE PROVIDED BY LANDSCAPE CONTRACTOR AND SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
11. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
12. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
13. DURING THE INSTALLATION OF PLANT MATERIAL AND OTHER LANDSCAPE FEATURES LANDSCAPE/SITE/IRRIGATION CONTRACTORS SHALL PAY SPECIAL ATTENTION TO THE LOCATION OF PRE-EXISTING, AS WELL AS, NEWLY INSTALLED UTILITIES. CONTRACTOR SHALL REFER TO THE APPLICABLE SHEETS HEREIN AND KEEP A RECORD OF ON-SITE CHANGES AND PLAN/SKETCH REVISIONS THAT MAY AFFECT UTILITY AND DRAINAGE LOCATIONS.
14. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
15. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
   A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RAT OF 50 LBS/1,000 S.F.
   B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
   C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
   D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F.
   SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

   E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F. UNLESS HYDROSEEDING WAS USED.
   F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHE IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.
16. ALL SLOPES STEEPER THAN 1:5 SHALL BE BLANKETED W/ EROSION CONTROL FABRIC AND /OR HYDROSEEDED AND INSPECTED BY THE LANDSCAPE ARCHITECT.

MATERIALS CONSTRUCTION NOTES

1. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 40, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE A MINIMUM CLEARANCE OF 2" BETWEEN OUTSIDE OF STEEL AND FACE OF CONCRETE. UNLESS CAST AGAINST EXPOSED SOIL, IN WHICH CASE A MINIMUM OF 3" OF CLEARANCE IS REQUIRED.

PERMITTING
NOT FOR CONSTRUCTION

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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATION

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COMMONWEALTH OF MASSACHUSETTS
ROBERT LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
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ISSUANCE DATE: September 19, 2022

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DRAFTED BY: JT, JM & CK

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.
2. THE OWNER AND R LEVESQUE ASSOCIATES, INC. AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.
4. CONTRACTOR SHALL PROVIDE TWO SETS OF AS-BUILT DRAWINGS, PRIOR TO FINAL PAYMENT. AS-BUILT DRAWINGS BY A REGISTERED LAND SURVEYOR SHALL INCLUDE ALL INSTALLED UTILITIES WITH VERTICAL AND HORIZONTAL LOCATIONS AND BE SATISFACTORY TO THE BUILDING OFFICIAL FOR ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
5. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150 AND SECTION 159-19C, OF TOWN CODE.
6. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
7. ALL WORK IN THE CITY RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
8. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.
9. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
10. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.
11. THE GENERAL CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.
12. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.
13. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.
14. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
15. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.
16. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.
17. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.
19. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
20. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
21. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.
22. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS HIGHWAY (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
23. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.
24. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.
25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.
26. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.
27. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. ALL CONSTRUCTION IN CITY RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.
3. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
4. SITE CONTRACTOR SHALL REFER TO ARCHITECTURAL DETAILS AND SPECIFICATIONS FOR REQUIREMENTS OF CONSTRUCTION AND JOINT SPACING OF SIDEWALKS, RAMPS, AND CURBING ADJACENT TO BUILDING.
5. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.
6. SITE CONTRACTOR SHALL PAINT ALL LIGHT POLE BASES, CURBS, FIRE HYDRANTS, PIPE BOLLARDS SIGN BASES, AND OTHER SITE AND UTILITY APPURTENANCES. CONTRACTOR SHALL PAINT OR REPAINT FIRE LANES WHERE REQUIRED BY LOCAL CODE.
7. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.
8. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASS HIGHWAY, AND THE TOWN OF AGAWAM. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.
9. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
10. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND LANDSCAPE ARCHITECT/ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.
11. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE LANDSCAPE ARCHITECT/ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.
13. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASS HIGHWAY AND/OR THE CITY/TOWN REGULATIONS.
14. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.
15. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
3. STORM PIPE SHALL BE AS NOTED ON PLANS.
4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20) LIDS SHALL BE LABELED "STORM SEWER".
10. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN.
12. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
13. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
14. TOPOGRAPHIC INFORMATION TAKEN FROM A EXISTING CONDITIONS PLAN BY R LEVESQUE ASSOCIATES, INC. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
15. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
16. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
17. EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.
18. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT. ALL FOOTINGS AND FOUNDATIONS FOR PROPOSED STRUCTURES SHALL BE EXCAVATED TO NATIVE SUBGRADE AND COMPACTED PER ARCHITECTURAL SPECIFICATIONS.
19. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.
20. CONTRACTOR TO SPREAD ON-SITE STOCKPILE TO A 4" DEPTH ON ALL AREAS TO BE SODED/SEEDED AS SHOWN ON LANDSCAPE DRAWINGS. SITE CONTRACTOR FINE GRADE OF INSTALLED TOPSOIL PRIOR TO HYDROMULCHING BY LANDSCAPE SUB-CONTRACTOR.

SITE UTILITY NOTES

GENERAL:
1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.
3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. PRIOR TO CONSTRUCTION OF UTILITIES REFER TO ARCHITECTURAL INTERIOR PLUMBING DRAWINGS FOR ALL TIE-INS.
7. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.
8. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
9. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICE.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
11. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.
12. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.
13. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
14. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
16. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.
17. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:
1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.
2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.
3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.
4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.
5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.
6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.
7. ALL SANITARY SEWER MANHOLE INVERTS ARE TO BE BRICK AS SHOWN IN THE TOWN OF AGAWAM SEWER MANHOLE DETAIL.

WATER:
1. CONTRACTOR SHALL CONTACT THE CITY WATER RESOURCE DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.
2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.
3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).
4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.
5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).
6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.
7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER TOWN OF AGAWAM WATER DEPARTMENT STANDARDS.
9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.
10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE RESTRAINT SCHEDULE. (SEE DETAIL SHEETS)
11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.
12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.
13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.
14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.
15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.
16. ALL WATER MAINS SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.
17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.
18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.
19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER RESOURCE DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
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CONSTRUCTION NOTES

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE-CONSTRUCTION MEETING ON-SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI-TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.

MA+WW-100
MA+WW-102
MA+WW-106
MA+WW-108
TRIBUTARY TO PHILLIPS BROOK
MA+WW-112
MA+WW-114
MA+WW-116
MA+WW-118
MA+WW-120

100' INNER RIPARIAN
200' RIVERFRONT AREA
APPROXIMATE LIMIT OF TREE CLEARING
SILT FENCE/ LIMIT OF WORK
50' WETLAND BUFFER
100' WETLAND BUFFER
INTERMITTENT STREAM CULVERT FROM POND TO BVW

LAST SECTION OF PIPE TO ABANDONED IN PLACE
EXISTING 12" HDPE DRAIN PIPE TO BE REMOVED
EXISTING DRAIN MANHOLE TO BE REPLACED WITH OIL/SEDIMENT SEPARATOR
EXISTING DRIVEWAY TO BE REMOVED
EXISTING HOUSE & FOUNDATION TO BE REMOVED
APPROX. SAW CUT LINES/ LIMITS OF FULL OVERLAY (SEE DETAIL, SHEET D-4)
LAST FEW SECTIONS OF PIPE TO REMAIN IN PLACE (40'±)
12" HDPE INV.=197.5'±
12" RCP INV.=207.3'±
EXISTING 12" DRAIN PIPES TO BE RELAYED
INSTALL ANTI-TRACKING PAD
12" HDPE INV.=195.6'±
12" HDPE INV.=213.0'±

SOUTH WESTFIELD STREET (ROUTE 186)
SOUTH WESTFIELD STREET

Exist. SMH1 Rim-218.16 Main-204.21
Drop Inlet Top-213.2±
Exist. CB Rim-213.03 NW'ly-210.8 SE'ly-210.7
Drop Inlet
Exist. SMH2 Rim-214.24 Main-204.79
Exist. DMH Rim-213.01 W'ly-208.0± E'ly-205.4±
Exist. SMH3 Rim-215.41 Main-205.40
Exist. SMH4 Rim-216.70 SW'ly In-206.25 Main-206.15
Exist. SMH5 RIM-217.51 NE'ly In-206.96 Main-206.91
Exist. SMH6 Rim-220.72 W'ly In-207.78 Main-207.67

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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40 School Street
Westfield, MA 01085
rlaland.com

DEMOLITION & REMOVALS PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT LEVESQUE REGISTERED LANDSCAPE ARCHITECT NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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C-3	-

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS-SECTION ON SHEET C-7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D-5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

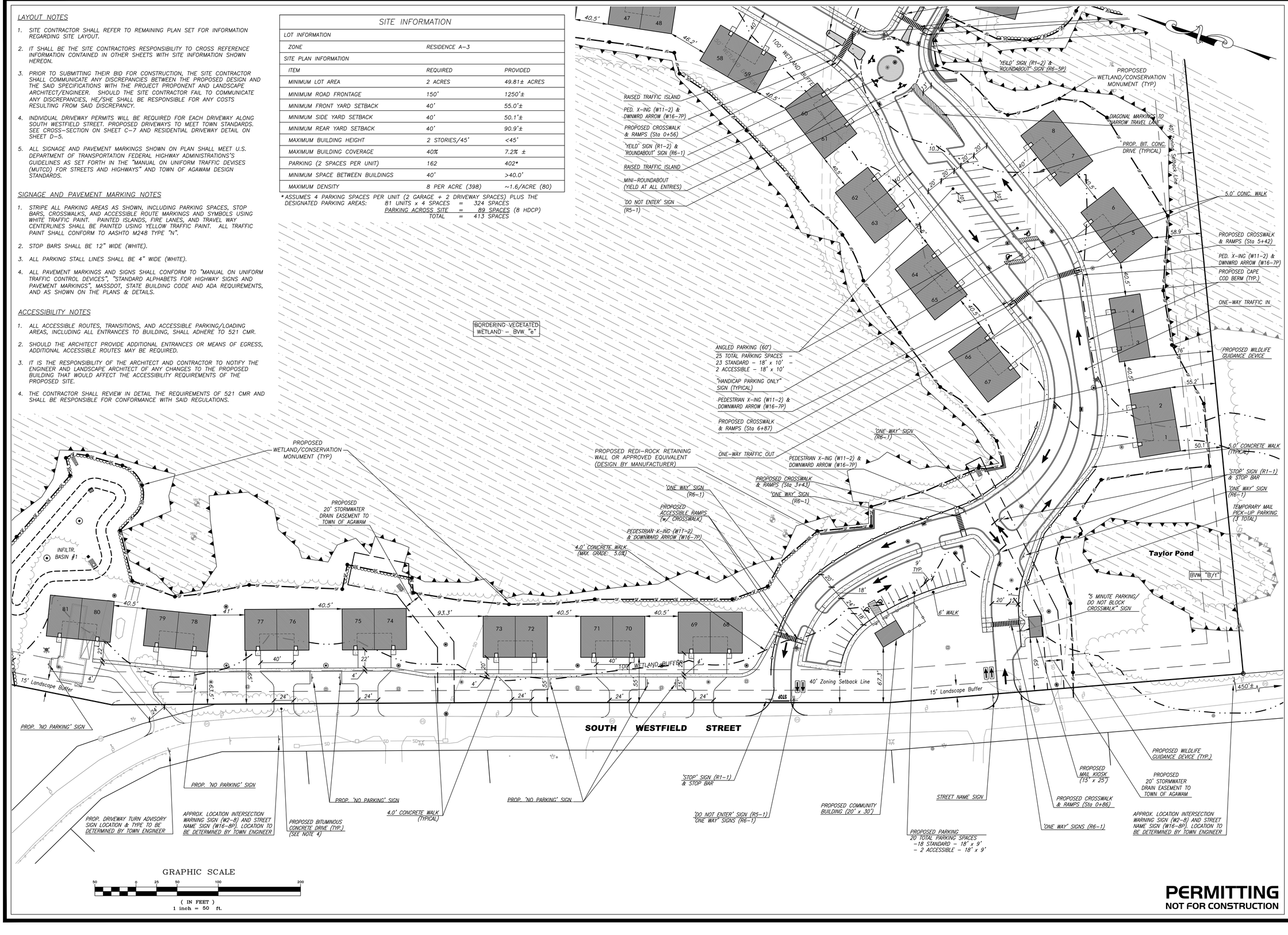
ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



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40 School Street
Westfield, MA 01085
rlaland.com

LAYOUT & MATERIALS PLAN
(Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT A. LEVESQUE NO. 1395 REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Wetland monuments added	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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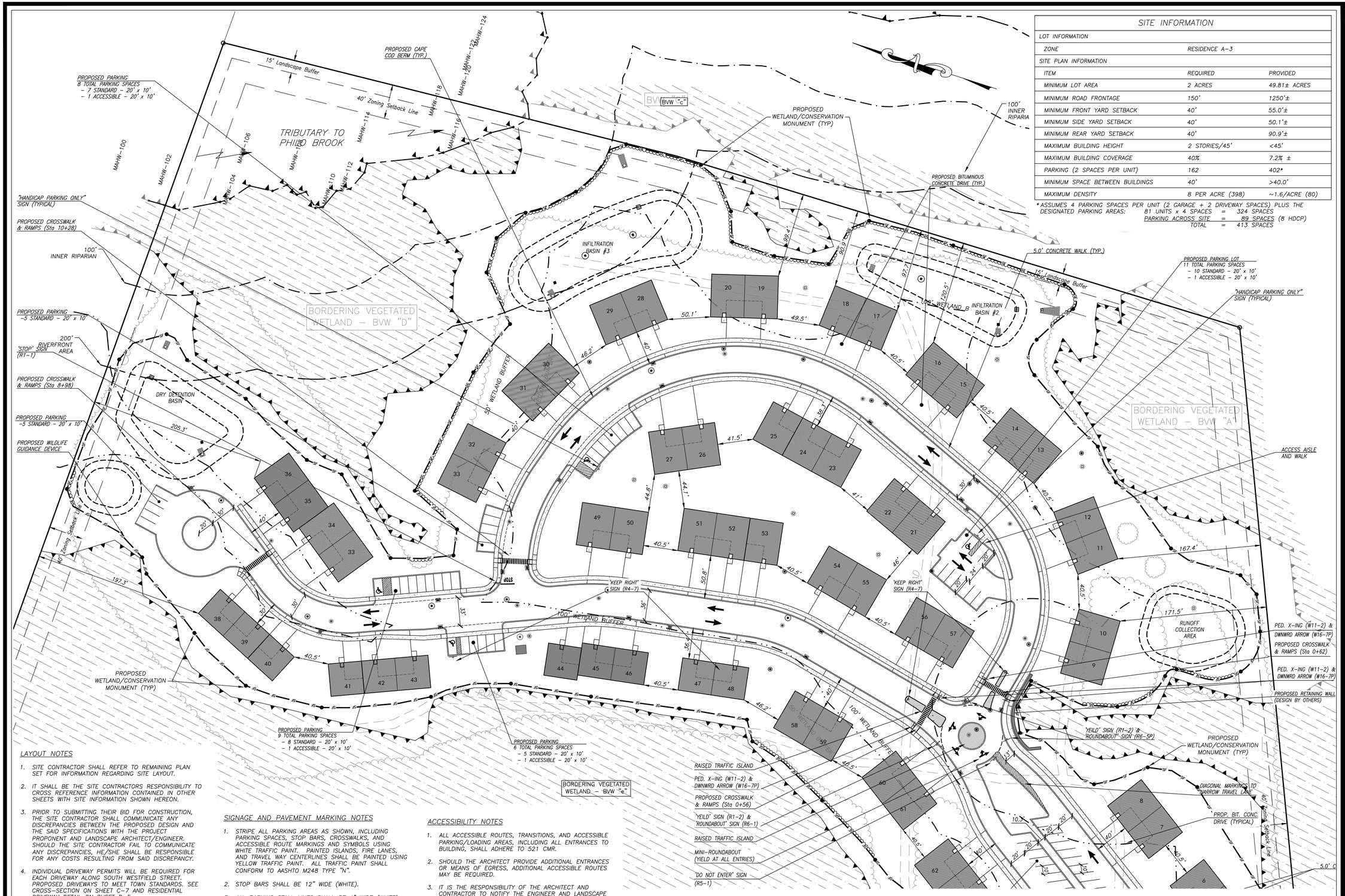

SITE INFORMATION		
LOT INFORMATION		
ZONE	RESIDENCE A–3	
SITE PLAN INFORMATION		
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4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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Civil Engineers · Land Surveyors
Environmental Consultants
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rlaland.com

LAYOUT & MATERIALS PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT R. LEVESQUE NO. 1395 REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Wetland monuments added	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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CONSTRUCTION NOTES

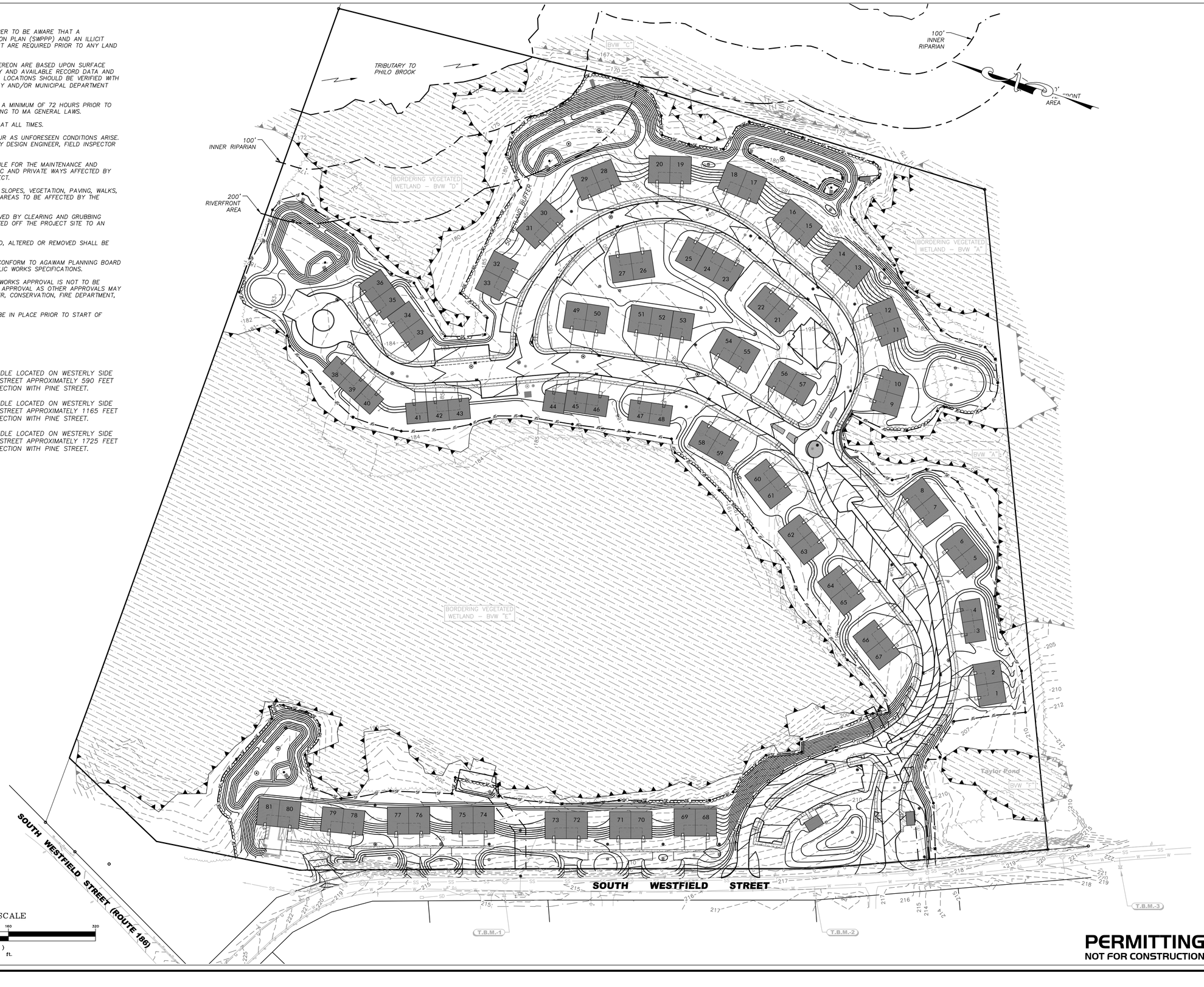
1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

BENCHMARKS

T.B.M.-1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 590 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 216.65

T.B.M.-2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 219.68

T.B.M.-3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 224.29



GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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OVERALL SITE GRADING

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT N. LEVESQUE
NO. 1595
REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Drainage revisions	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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SHORT–TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF–SITE SEDIMENTATION IF DEEMED NECESSARY BY ON–SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24–HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF–SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE–CONSTRUCTION MEETING ON–SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI–TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
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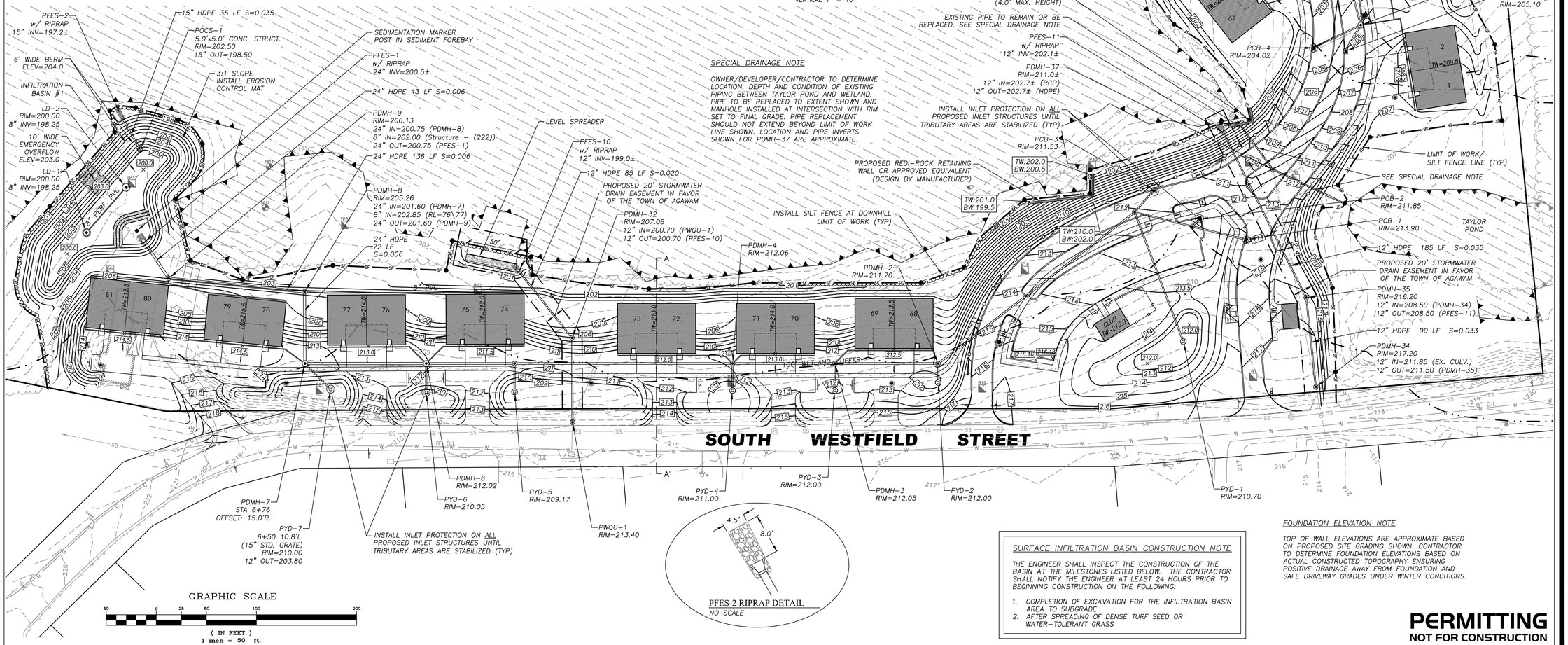

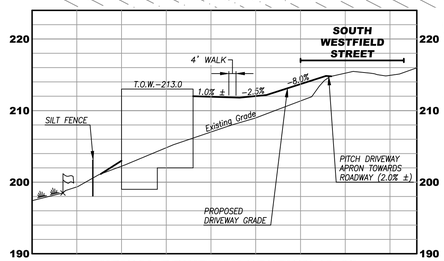

TYPICAL DRIVEWAY SECTION (A-A')
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'

SPECIAL DRAINAGE NOTE

OWNER/DEVELOPER/CONTRACTOR TO DETERMINE LOCATION, DEPTH AND CONDITION OF EXISTING PIPING BETWEEN TAYLOR POND AND WETLAND. PIPE TO BE REPLACED TO EXTENT SHOWN AND MANHOLE INSTALLED AT INTERSECTION WITH RIM SET TO FINAL GRADE. PIPE REPLACEMENT SHOULD NOT EXTEND BEYOND LIMIT OF WORK LINE SHOWN. LOCATION AND PIPE INVERTS SHOWN FOR PDMH–37 ARE APPROXIMATE.

PFES–2 RIPRAP DETAIL
NO SCALE

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER–TOLERANT GRASS

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

GRADING & DRAINAGE PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No.48376
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Drainage revisions	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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RIVERFRONT AREA	
RIVERFRONT AREA ON SITE	168,123 SF ±
PROPOSED INNER RIPARIAN DISTURBANCE (0-100)	0 SF ±
PROPOSED RIVERFRONT AREA DISTURBANCE (100-200) *THIS DISTURBANCE (STORMWATER MANAGEMENT RELATED ACTIVITIES) IS EXCEMPT FROM RIVERFRONT AREA ALTERATION CALCULATIONS UNDER 310 CMR 10.58(4)(d)(1)	27,554 SF ±

PFES-12 DETAIL
NO SCALE

PFES-8 DETAIL
NO SCALE

PFES-3A & 4A DETAIL
NO SCALE

TRIBUTARY TO PHILO BROOK

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER-TOLERANT GRASS

SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PERMITTING
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GRADING & DRAINAGE PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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C-8	-

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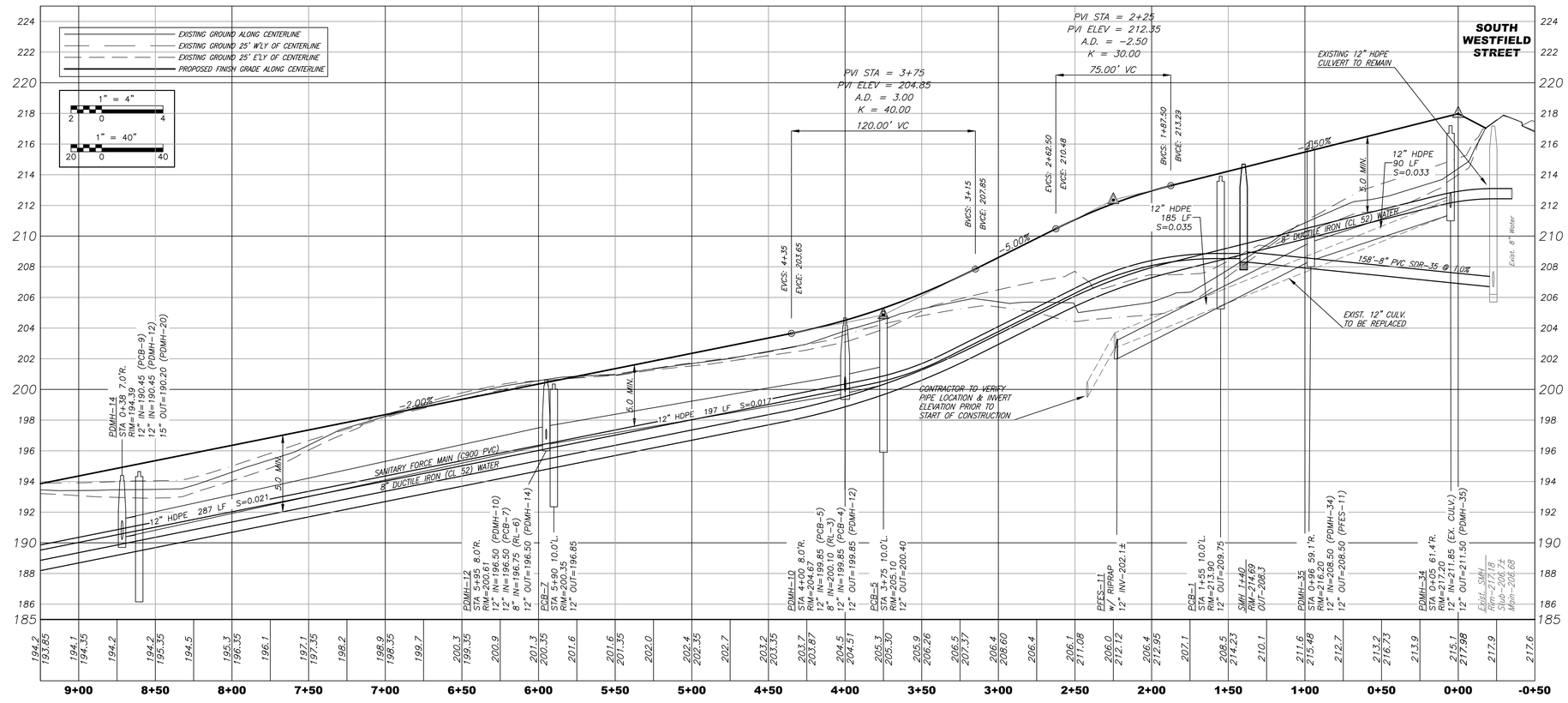
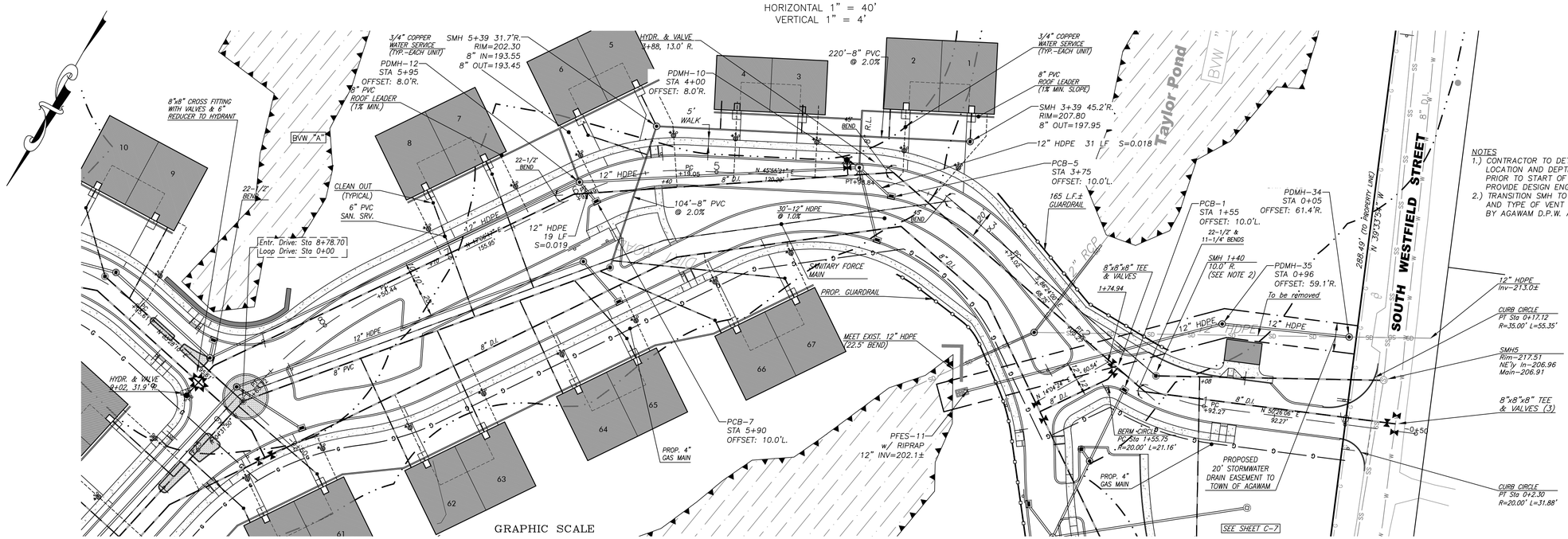


PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



NOTES
1.) CONTRACTOR TO DETERMINE SIZE & TYPE, LOCATION AND DEPTH OF EXSITING PIPE PRIOR TO START OF CONSTRUCTION AND PROVIDE DESIGN ENGINEER WITH FINDINGS.
2.) TRANSITION SMH TO BE VENTED. LOCATION AND TYPE OF VENT TO BE APPROVED BY AGAWAM D.P.W. AND TOWN ENGINEER.

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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
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REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
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Feeding Hills, MA 01030

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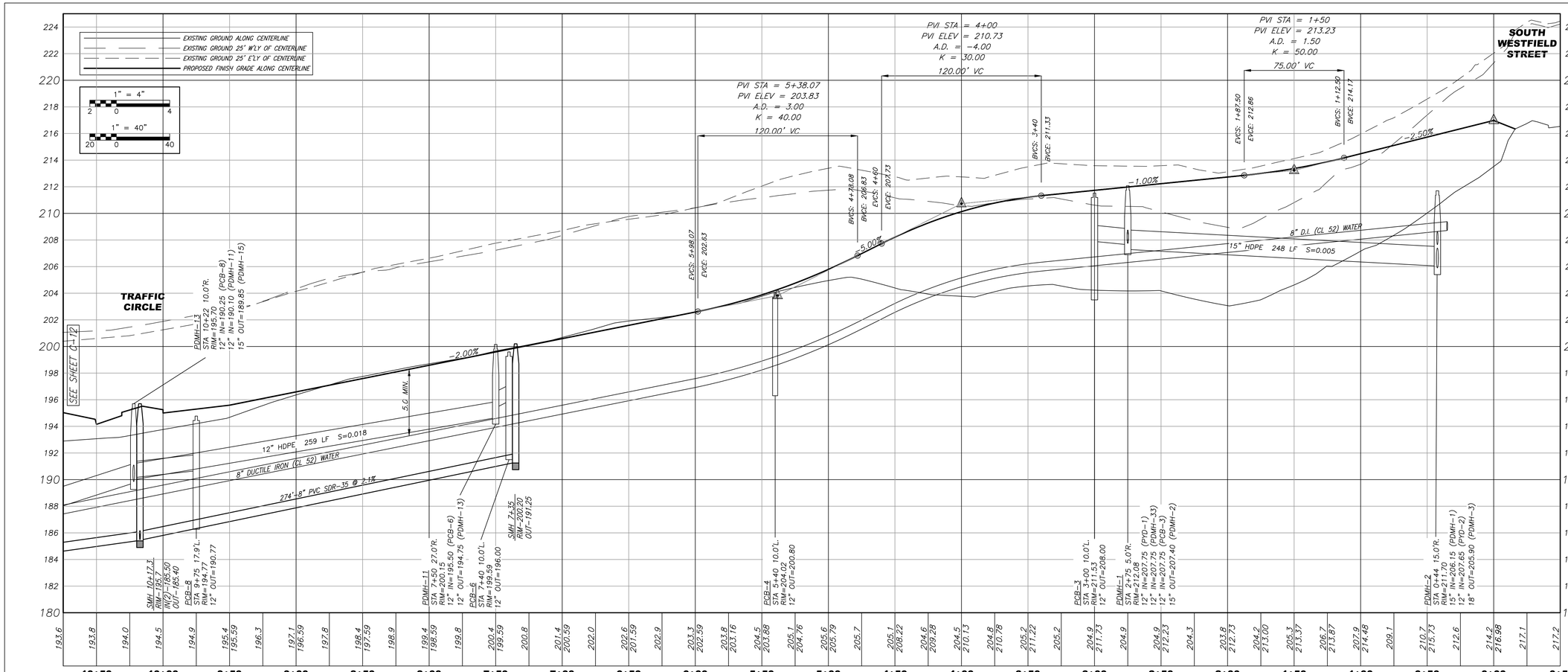
C-9	-



PROFILE SCALES

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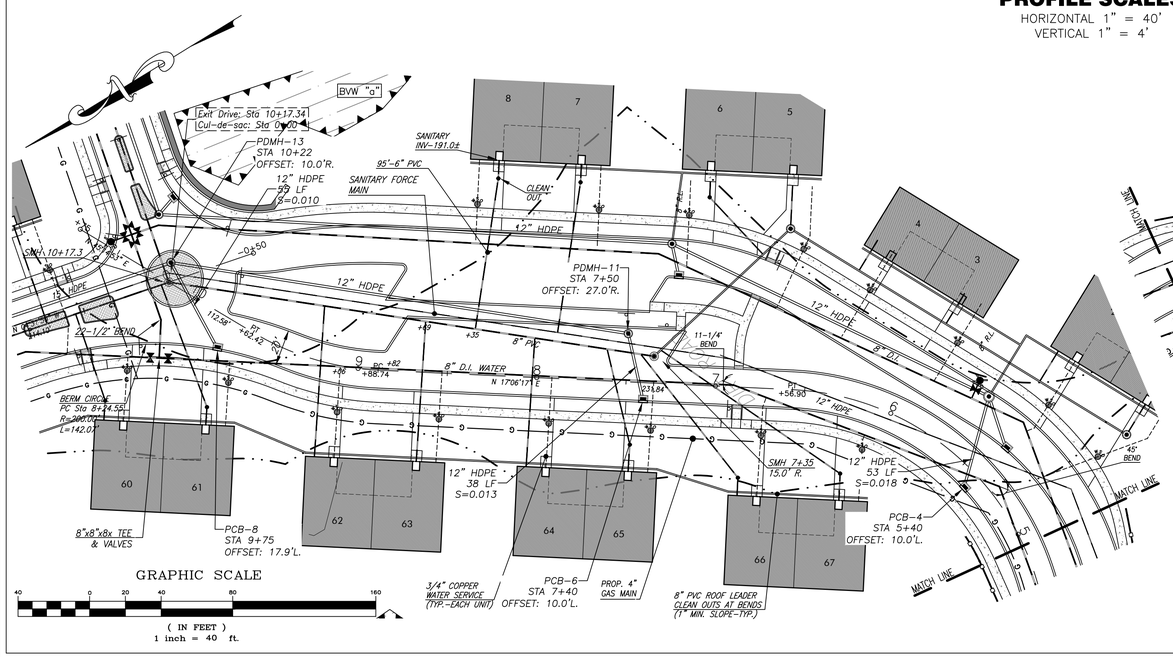

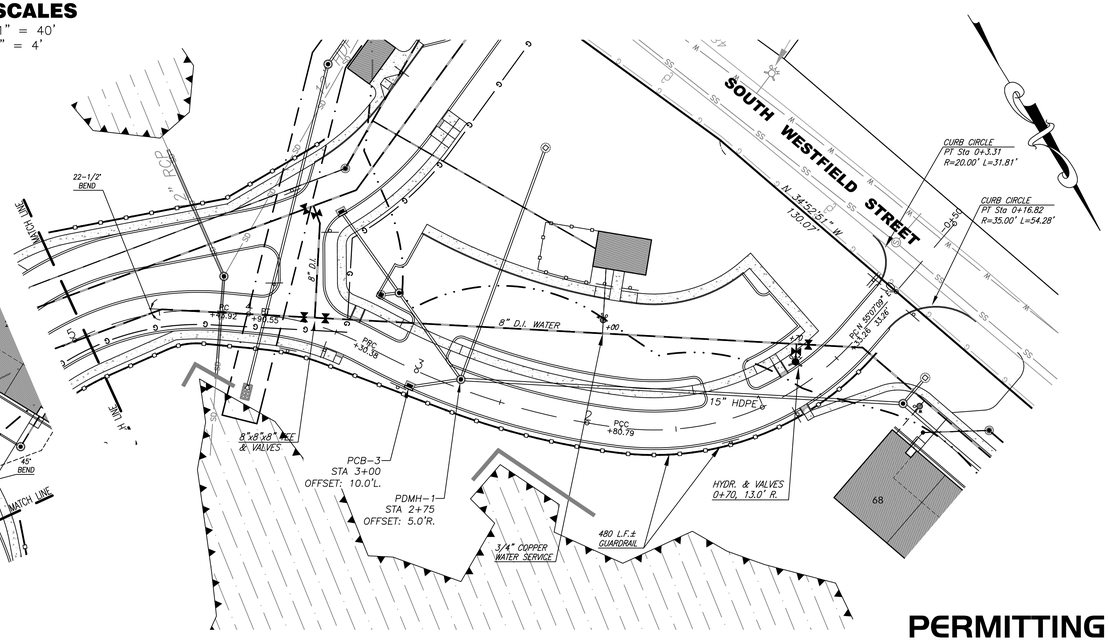

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COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
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8/31/22

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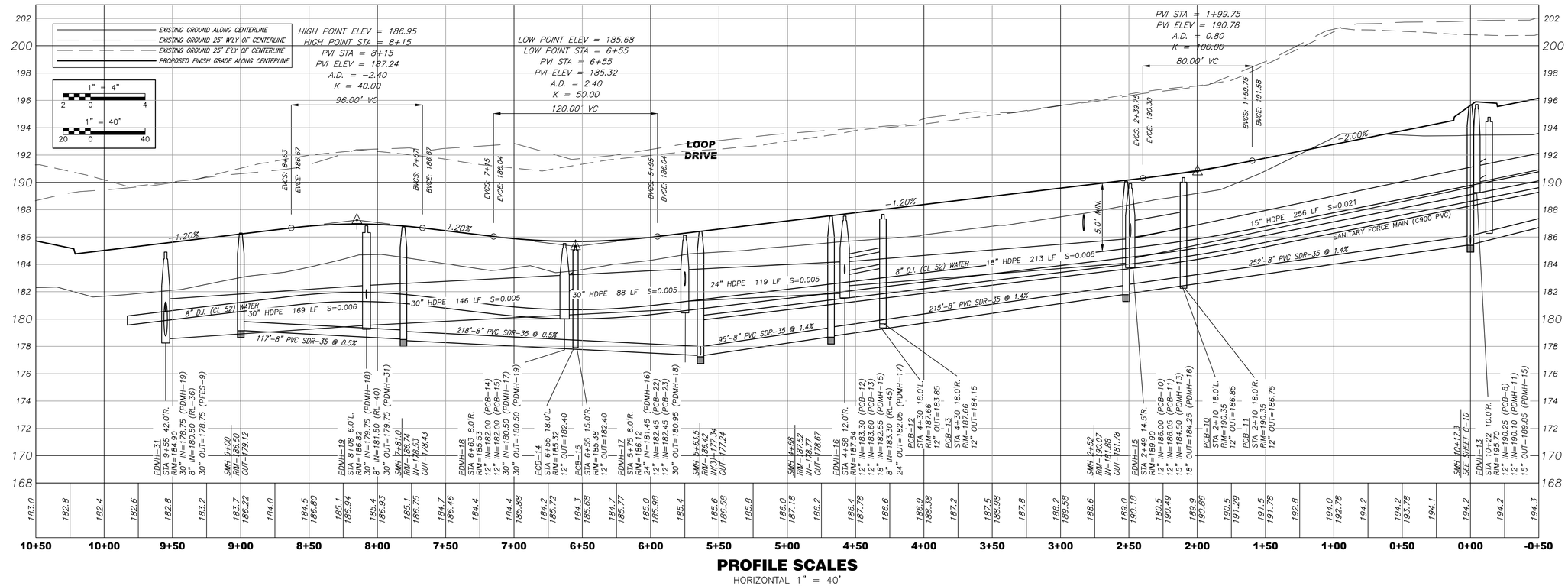
C-10	-



PROFILE SCALES

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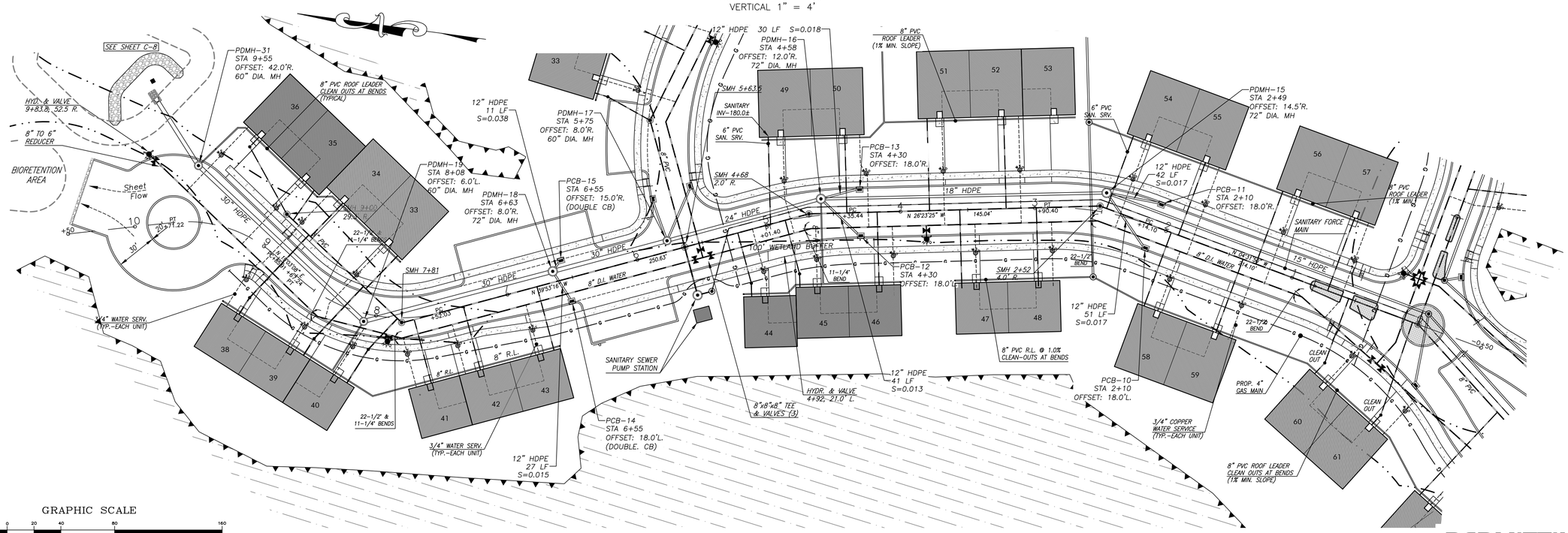

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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PLAN & PROFILE
CUL-DE-SAC DRIVE
Sta 0+00 to Sta 10+50

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

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FILIPE J. GRAVO
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C-11	-

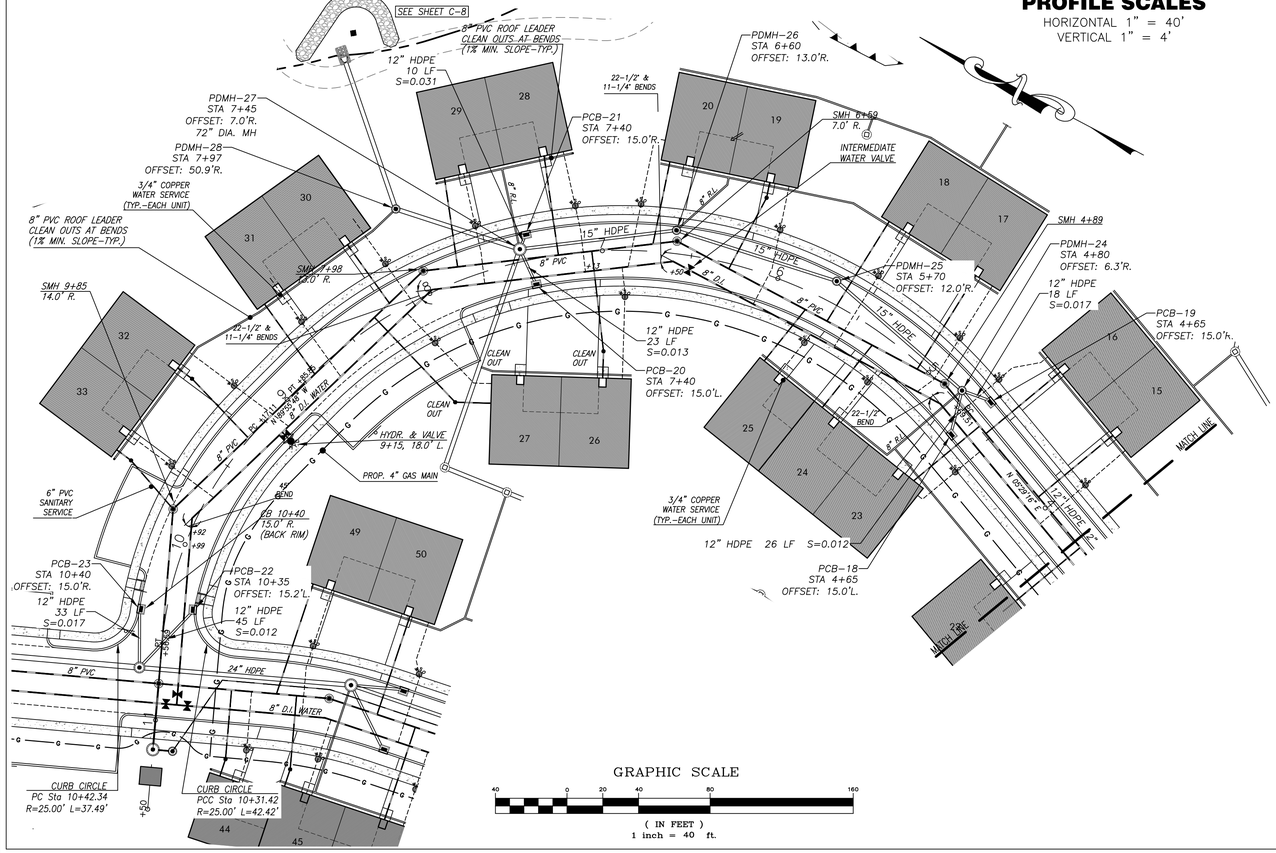
EXISTING GROUND ALONG CENTERLINE
EXISTING GROUND 25' W'LY OF CENTERLINE
EXISTING GROUND 25' E'LY OF CENTERLINE
PROPOSED FINISH GRADE ALONG CENTERLINE

1" = 4"
1" = 40"

CUL-DE-SAC DRIVE

PCB-23 STA 10+40 15.0'R. RIM=188.36 12" OUT=183.00
PCB-22 STA 10+35 15.2'L. RIM=185.92 12" OUT=183.00
12" HDPE
5.0' MIN.
-0.50%
8" DUCTILE IRON (CL 52) WATER
192'-8" PVC SDR-35 @ 0.5%
96'-8" PVC SDR-35 @ 0.5%
SMH 5+63.5 SEE SHEET C-12
SMH 1+65 RIM=186.18 IN=178.43 OUT=177.82
SMH 7+08 RIM=187.14 IN=178.38 OUT=178.88
PVI STA = 7+63.05
PVI ELEV = 187.58
A.D. = 0.50
K = 100.00
50.00' VC
EVCS: 7+88.05
EVCE: 187.46
BVCS: 7+38.05
BVCE: 187.83
PCB-20 STA 7+40 15.0'L. RIM=187.63 12" OUT=183.90 (PDMH-27)
PCB-21 STA 7+40 15.0'R. RIM=187.52 12" OUT=183.90 (PDMH-27)
15" HDPE 88 LF S=0.010
15" HDPE 94 LF S=0.010
15" HDPE 93 LF S=0.010
12" HDPE 150 LF S=0.010
142'-8" PVC SDR-35 @ 0.5%
170'-8" PVC SDR-35 @ 0.5%
226'-8" PVC SDR-35 @ 1.0%
PDMH-27 STA 7+45 7.0'R. RIM=187.63 15" IN=183.35 (PDMH-26) 15" IN=183.60 (PCB-21) 12" IN=183.60 (PCB-20) 8" IN=184.00 (RL-28) 24" IN=182.60 (PYD-15) 24" OUT=182.60 (PDMH-28)
PDMH-26 STA 6+60 13.0'R. RIM=188.36 15" IN=185.25 (PDMH-25) 8" IN=185.00 (RL-20) 15" OUT=184.25 (PDMH-27)
SMH 6+59 RIM=188.48 IN=179.79 OUT=179.69
PDMH-25 STA 5+70 12.0'R. RIM=189.28 15" IN=185.20 (PDMH-24) 15" OUT=185.20 (PDMH-26)
PDMH-24 STA 4+80 6.3'R. RIM=190.39 IN=180.70 OUT=180.60
PCB-18 STA 4+65 15.0'L. RIM=190.27 12" OUT=186.70
PCB-19 STA 4+65 15.0'R. RIM=190.27 12" OUT=186.70
SMH 4+89 RIM=190.39 IN=180.70 OUT=180.60
PDMH-23 STA 3+30 6.0'R. RIM=191.29 12" IN=187.90 (PCB-16) 12" IN=187.90 (PCB-17) 8" IN=188.40 (RL-14) 12" OUT=187.90 (PDMH-24)
PCB-16 STA 3+25 15.0'L. RIM=191.67 12" OUT=188.20
PCB-17 STA 3+25 15.0'R. RIM=191.67 12" OUT=188.20
SMH 2+65 RIM=192.43 OUT=183.00
PDMH-21 STA 2+64 41.5'R. RIM=191.12 15" IN=186.65 (PDMH-20) 8" IN=187.00 (RL-12) 18" OUT=186.65 (PDMH-22)
SMH 1+92 RIM=193.84 OUT=186.15
PDMH-20 STA 1+25 10.0'R. RIM=193.76 12" IN=189.30 (PDMH-14) 15" OUT=189.05 (PDMH-21)
PCB-9 STA 0+44 18.7'R. RIM=194.65 12" OUT=190.65
PDMH-14 STA 0+38 7.0'R. RIM=194.39 12" IN=190.45 (PCB-9) 12" IN=190.45 (PDMH-12) 12" OUT=190.20 (PDMH-20)
SMH 1+24.7 SEE SHEET C-10
15" HDPE 89 LF S=0.010
115'-8" PVC SDR-35 @ 0.5%
TRAFFIC CIRCLE

PROFILE SCALES
HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
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PLAN & PROFILE
LOOP DRIVE
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9/19/22

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REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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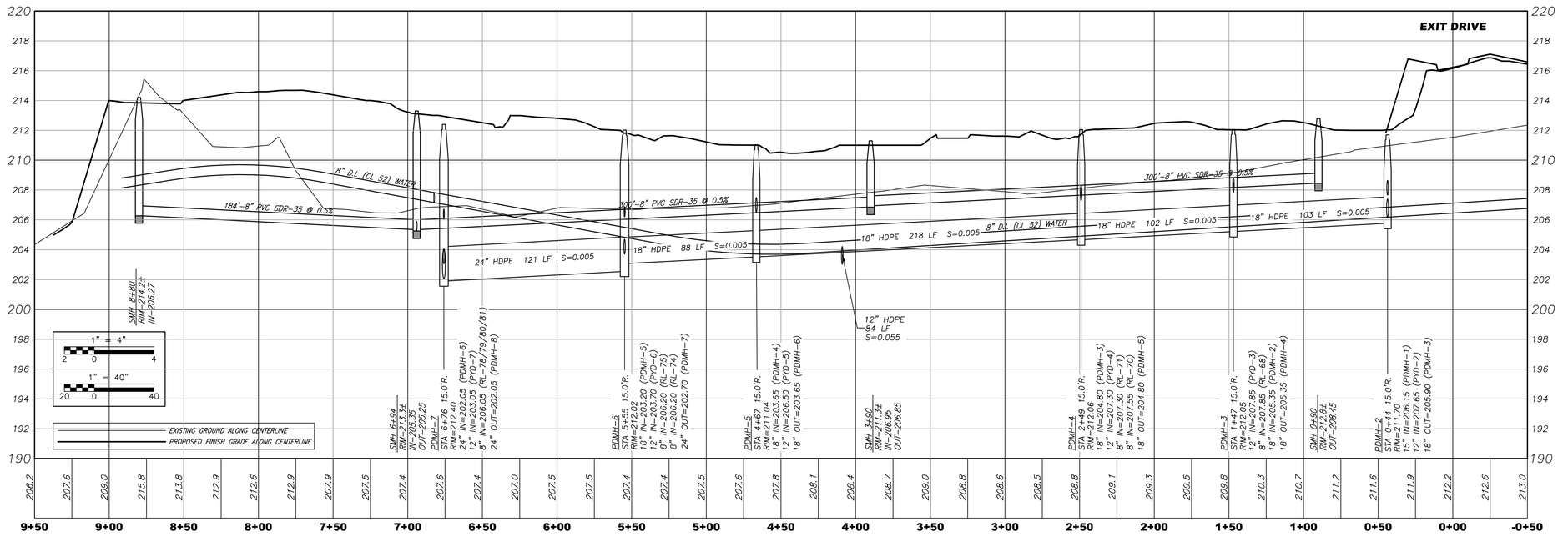

PROFILE SCALES

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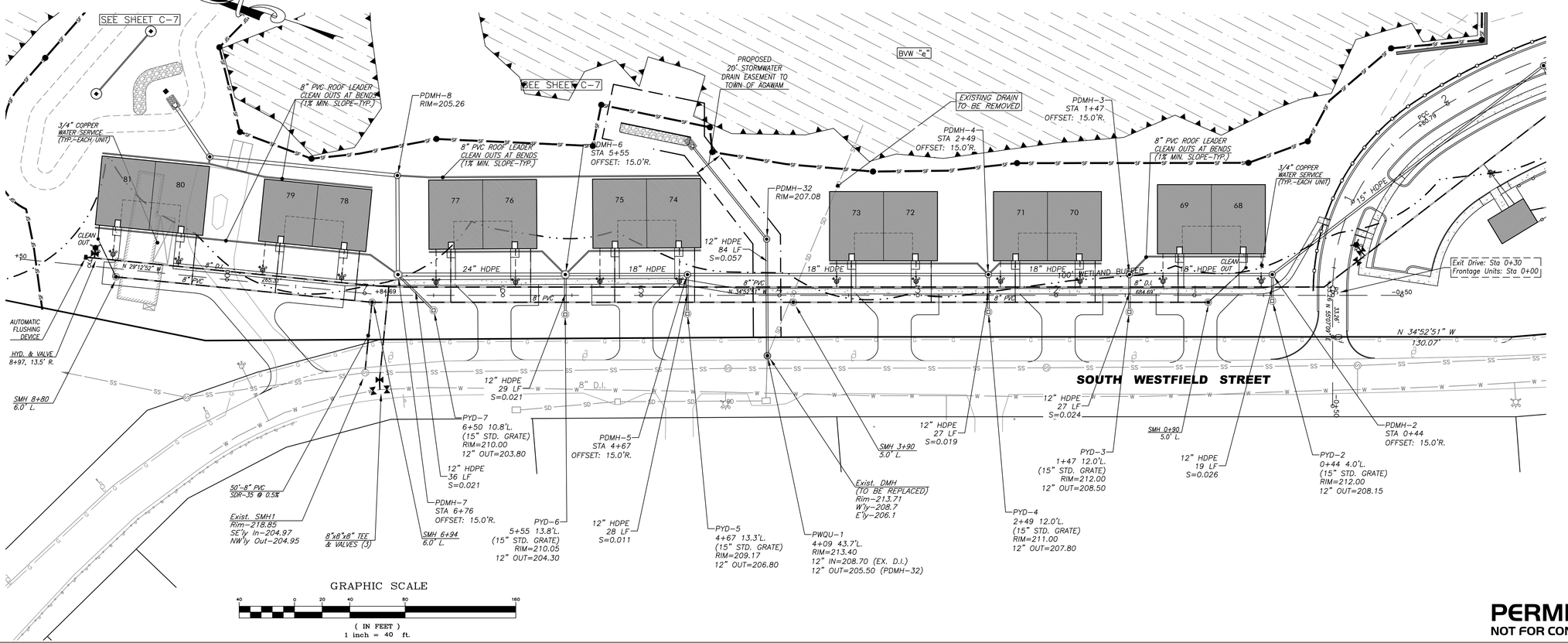
VERTICAL 1" = 4'



GRAPHIC SCALE

(IN FEET)
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C-13	A

LANDSCAPING NOTES

1.) SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.

2.) IT SHALL BE THE SITE CONTRACORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN TOERH SHEETS WITH LANDSCAPE INFORMATION SHOWN HEREIN.

3.) ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTORS RESPONSIBILITY TO ACQUIRE THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING.

4.) THE LANDSCAPE PLANTING SCHEME SHOWN REPRESENTS THE MINIMUM NECESSARY TO FULFILL THE INTENTION OF THESE PLANS. ADDITIONAL PLANTING WILL BE REQUIRED TO SELECTIVELY FILL VOIDS. LANDSCAPE ARCHITECT RESERVES THE RIGHT, SHOULD IT BE REQUIRED BY FIELD CONDITIONS TO UPWARDLY MODIFY THE PLANT QUANTITIES.

5.) PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

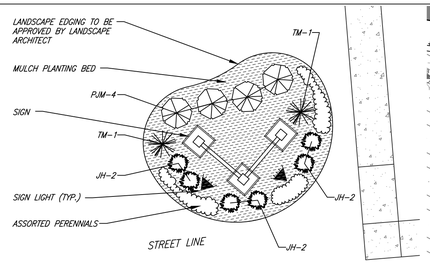
6.) LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATION CONTRACTOR MARK ALL UNDERGROUND UTILITIES AS WELL AS DIG-SAFE SITE PRIOR TO ANY PLANTINGS. LANDSCAPE CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE ANS STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

7.) IRRIGATION SYSTEM LIMITS FOR LAWN AREA TO BE DETERMINED BY OWNER.

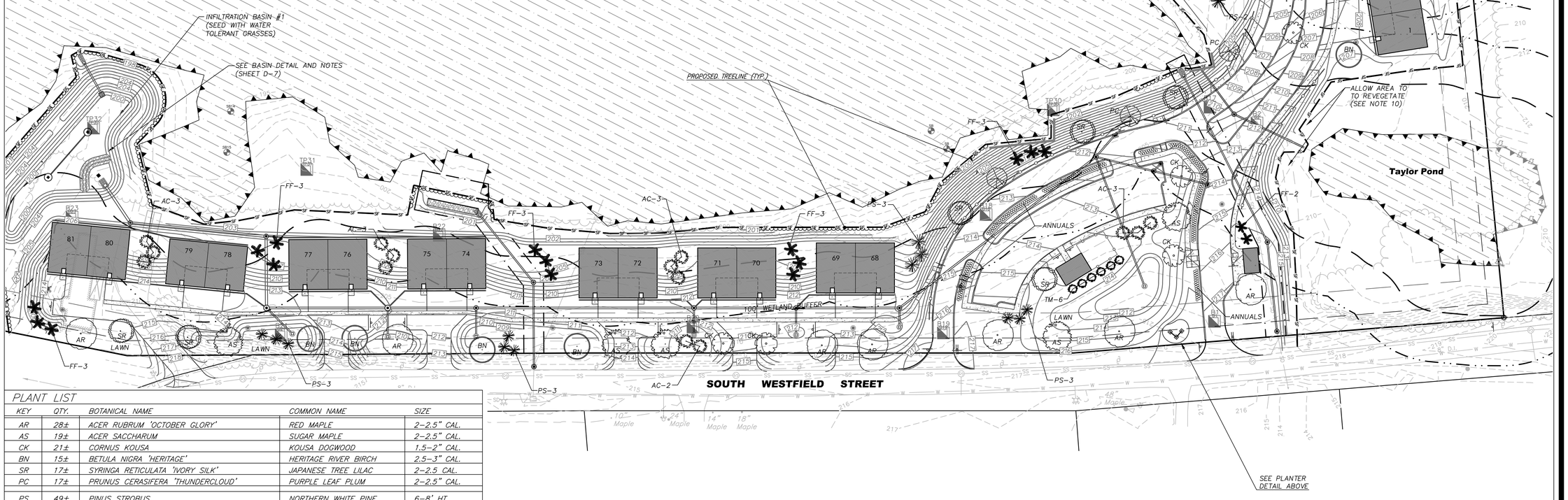
8.) ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, R LEVESQUE ASSOCIATES, INC. (RLA) WILL CONDUCT POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENT TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.

9.) ALL PLANTINGS MUST BE MAINTAINED AND THAT PORTION OF THE PUBLIC WAY ABUTTING THE PARCEL AND INCLUDING THE TREEBELT SHALL BE MAINTAINED IN A SAFE AND ATTRACTIVE CONDITION BY THE OWNER OF THE PARCEL.

10.) SEE SHEETS C-15, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



SIGN PLANTING DETAIL
1" = 10'



PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
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SITE LANDSCAPING PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
NO. 1396
REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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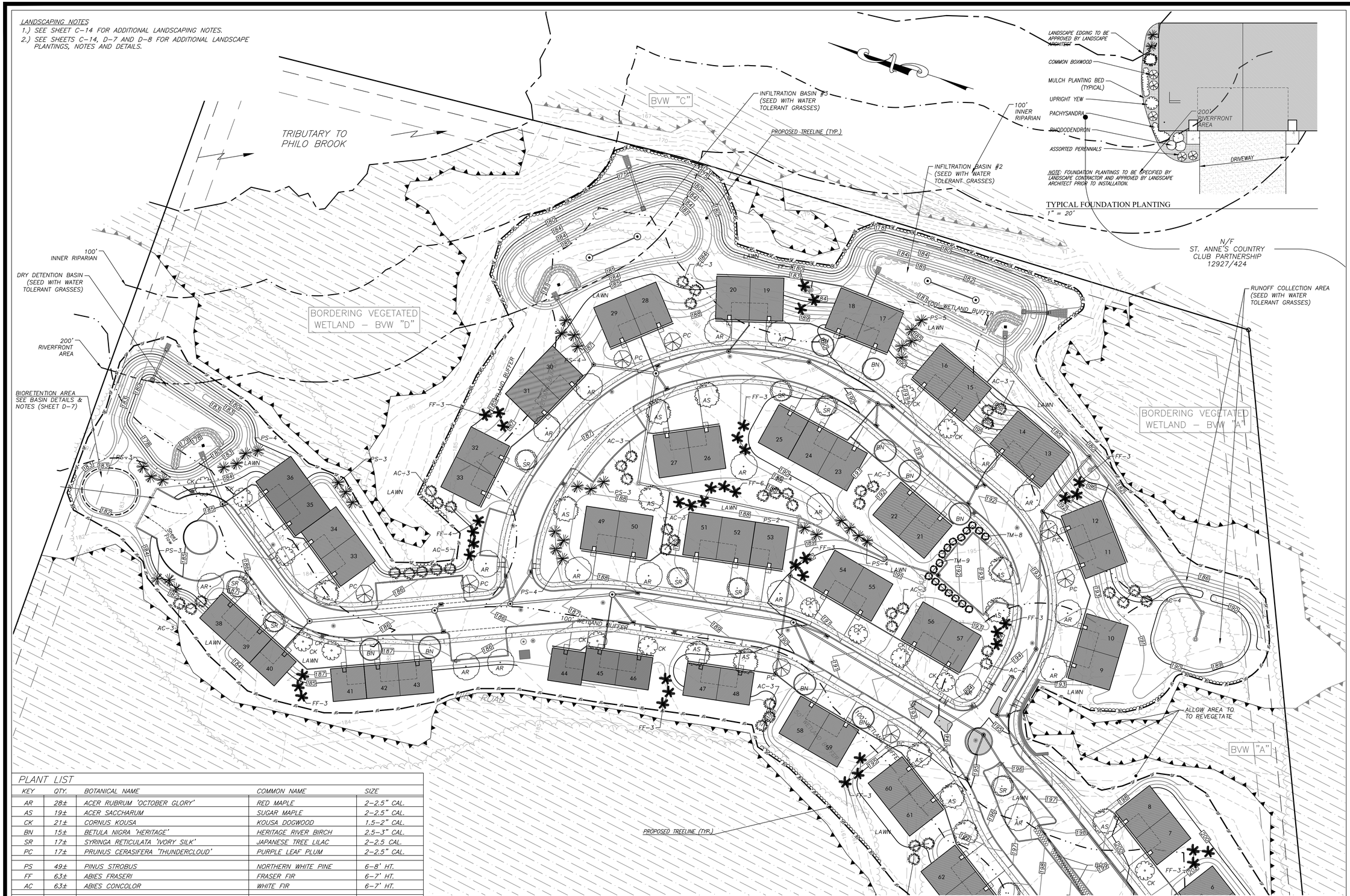
LANDSCAPING NOTES
1.) SEE SHEET C-14 FOR ADDITIONAL LANDSCAPING NOTES.
2.) SEE SHEETS C-14, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



TYPICAL FOUNDATION PLANTING
1" = 20'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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SITE LANDSCAPING PLAN (Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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RLA PROJ. NUMBER: 090506

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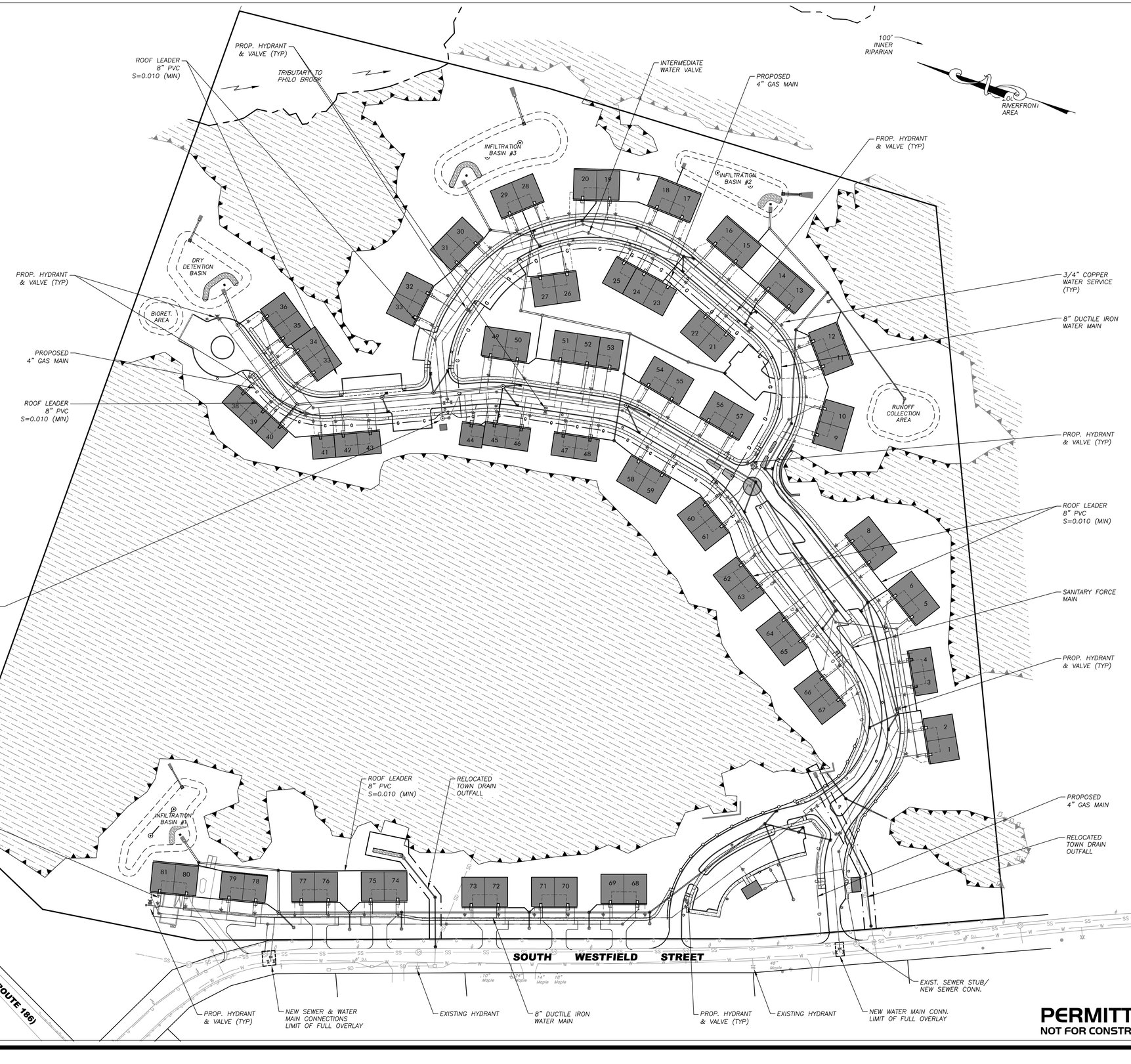
C-15	-

CONSTRUCTION NOTES

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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OVERALL SITE UTILITY PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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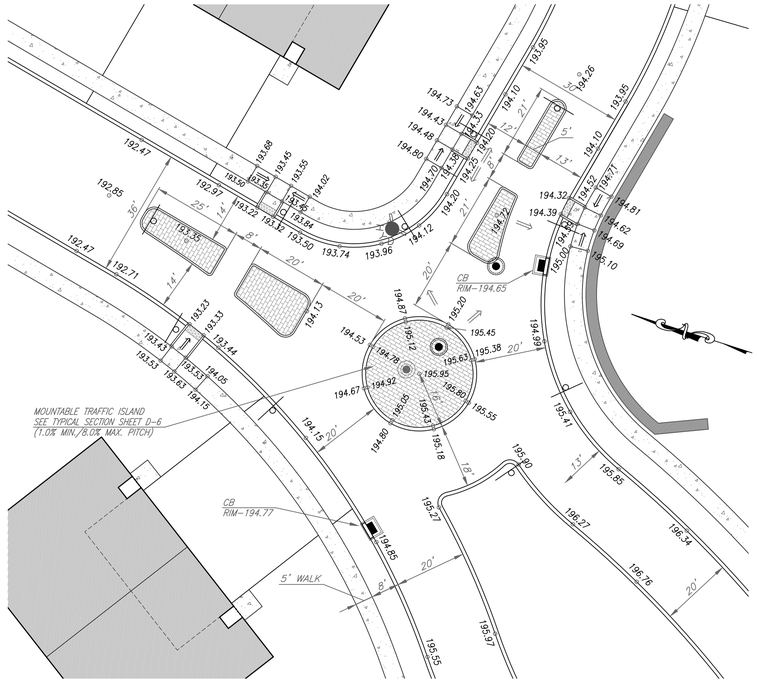
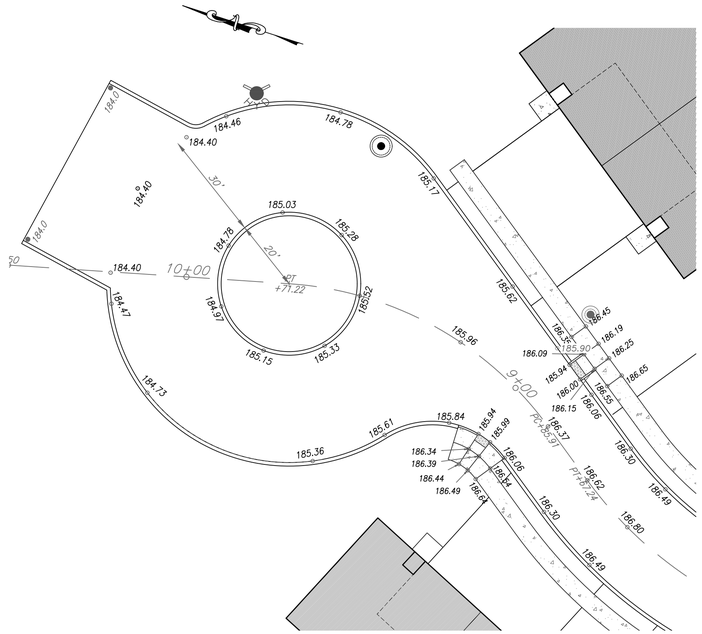
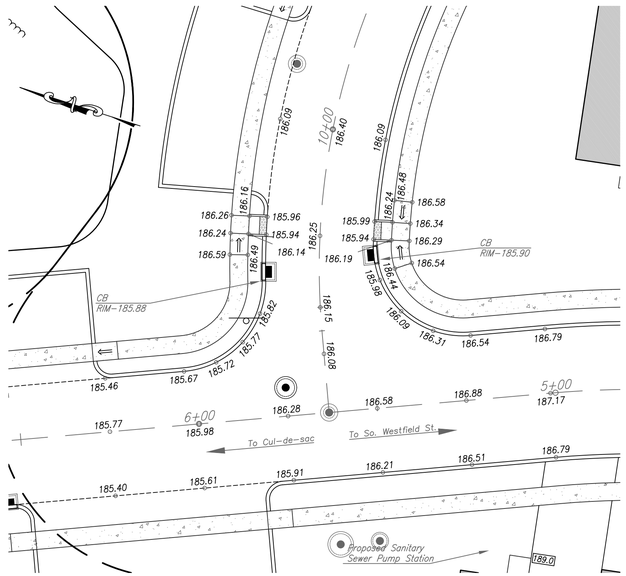


TRAFFIC CIRCLE DETAIL
1"=20'

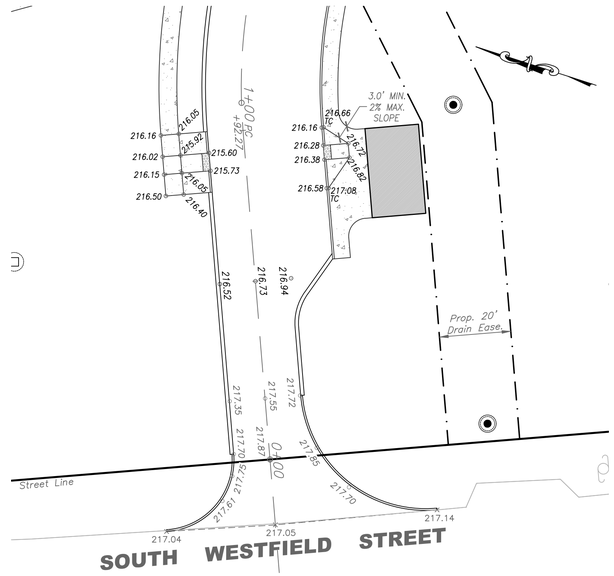


CUL-DE-SAC DETAIL
1"=20'

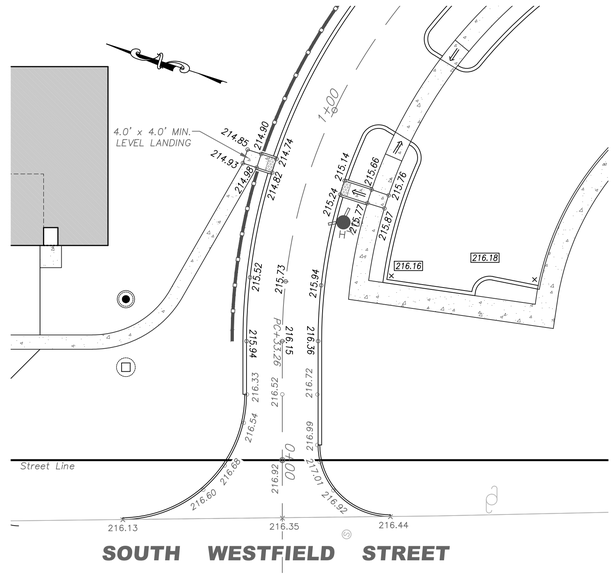
ACCESSIBLE RAMP NOTE
ACCESSIBLE ROUTE RAMPED SECTIONS NOT TO EXCEED 8.0% SLOPE.
CROSS-SLOPE NOT TO EXCEED 2.0% IN ANY DIRECTION. SEE
SHEET D-5 FOR ADDITIONAL ACCESSIBLE RAMP SPECIFICATIONS.



INTERSECTION DETAIL
1"=20'



CROSSWALK DETAIL - ENTRANCE DRIVE AT MAILBOX
1"=20'



CROSSWALK DETAIL - EXIT DRIVE NEAR S. WESTFIELD STREET
1"=20'

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INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map E6, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MASSACHUSETTS ROBERT A. LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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EROSION & SEDIMENTATION CONTROL NOTE

THE EROSION/SEDIMENTATION MEASURES SHOWN HEREON ARE TO BE CONSIDERED THE MINIMUM EFFORT REQUIRED, AND SHOULD ACT AS A GUIDELINE FOR THE ANTICIPATED EROSION/SEDIMENTATION CONTROL EFFORT NECESSARY TO MAINTAIN CONTROL OVER THE PROJECT SITE. ACTUAL SITE CONDITIONS MAY VARY FROM THOSE SHOWN HEREON, AND THE EROSION/SEDIMENTATION CONTROL EFFORT SHALL BE ADJUSTED IN RESPONSE. SHOULD THE EROSION CONTROL PLAN NOT BE FOLLOWED AS THE MINIMUM REQUIREMENT, THE CONTRACTOR SHALL BEAR COMPLETE AND ULTIMATE RESPONSIBILITY FOR THE SITE-SPECIFIC LAYOUT, INSTALLATION, MAINTENANCE, AND — SHOULD FAILURE OCCUR — REPARATIONS TO ANY DAMAGED PROPERTY. R LEVESQUE ASSOCIATES, INC. (RLA) RESERVES THE RIGHT TO MAKE REQUIRED ADJUSTMENTS TO THE EROSION CONTROL PLAN AS SITE CONSTRUCTION EVOLVES AND AS RLA DEEMS NECESSARY.

GENERAL CONSTRUCTION SEQUENCE

1.) LOCATE AND STAKE BY SURVEY THE LIMITS OF WORK LINES, CENTERLINES OF PROPOSED ROADWAYS, PROPOSED DRAINAGE STRUCTURES, SEDIMENTATION BASINS (AS REQUIRED) AND DETENTION BASIN, RAIN GARDENS, ETC. LOCATIONS

2.) INSTALL EROSION CONTROLS AS SPECIFIED ON THESE PLANS AND REVIEW THEM WITH THE PROJECT ENGINEER, LANDSCAPE ARCHITECT AND SITE SUPERINTENDENT. SHOULD ADDITIONAL CONTROLS BE DEEMED REQUIRED THEY SHALL BE INSTALLED.

3.) CONSTRUCT ANTI-TRACKING APRONS AS SHOWN ON THESE PLANS.

4.) REMOVE TREES WITHIN THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING LOGS AND BRUSH FROM THE SITE.

5.) GRUB AND STUMP THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING STUMPS FROM THE SITE AND DISPOSING OF THEM IN ACCORDANCE WITH STATE AND LOCAL RULES AND REGULATIONS.

6.) CONSTRUCT THE SEDIMENTATION BASINS (AS REQUIRED) WITH THE OUTLET TEMPORARILY BLOCKED. ONCE THE BASIN HAS BEEN STABILIZED AND THE VERTICAL OVERFLOW STANDPIPE AND FOREBAY SEDIMENT STUMP AREA AT THE BASIN INLET ARE IN PLACE, THE OUTLET CAN BE ACTIVATED.

7.) EXCAVATE FOR THE ROADS AND SIDE SLOPES IN 1000 FOOT INTERVALS. UPON COMPLETING EACH 500 FOOT INTERVAL, ROAD SIDE CHANNELS (WITH STONE CHECK DAMS PLACED EVERY 200 FEET) LEADING TO THE SEDIMENTATION BASINS SHALL BE CONSTRUCTED. SHOULD SIGNIFICANT SEDIMENTION BE OBSERVED WITHIN THE CHANNEL, SILTATION FENCING SHOULD BE INSTALLED WITHIN THE CHANNEL AT AN INTERVAL OF EVERY 100 FOOT. WATER BARS SHALL BE UTILIZED TO DIRECT STORM FLOWS INTO THE CHANNELS AND SHALL BE SPACED AT 200 FOOT INTERVALS.

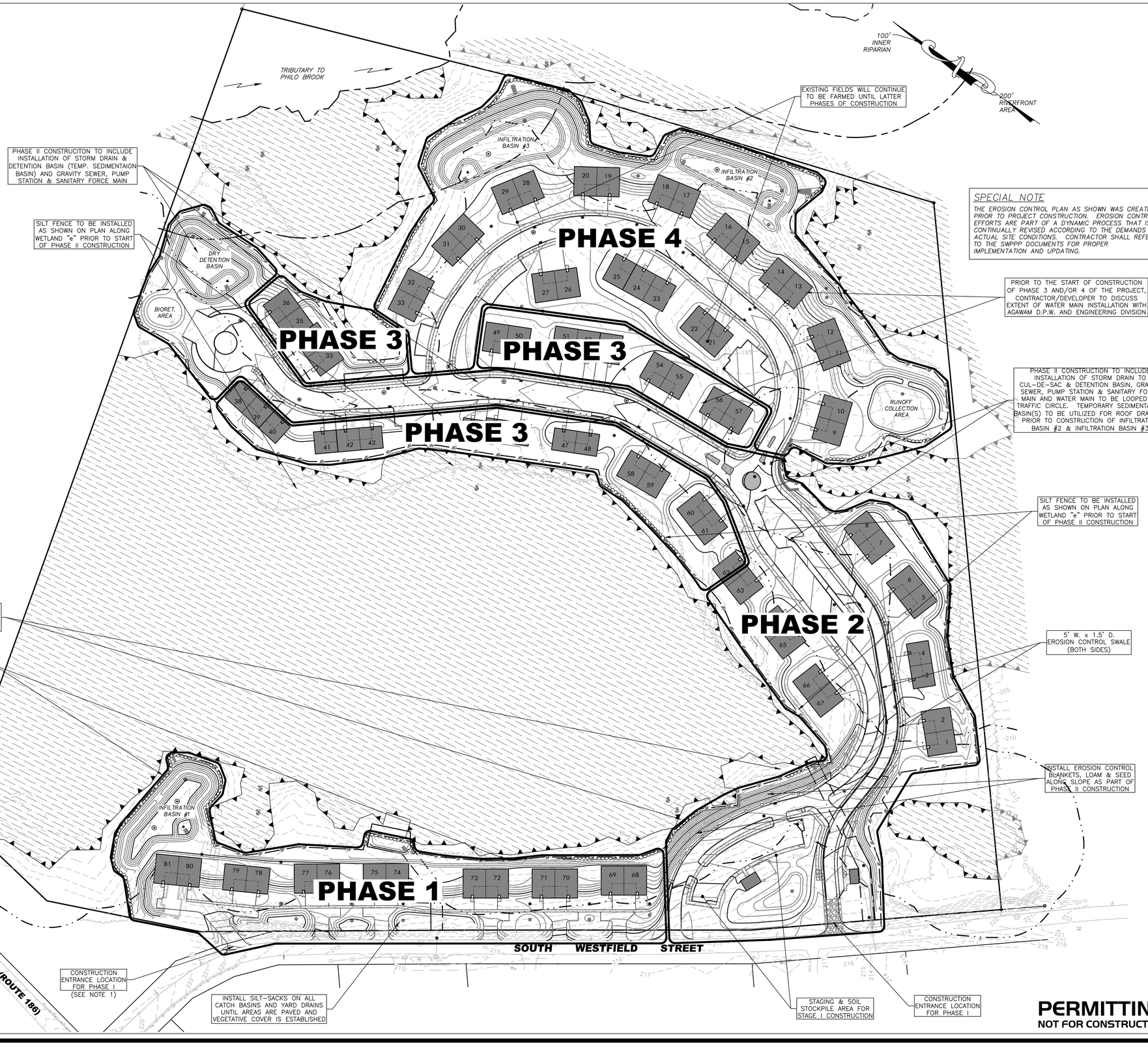
8.) EXCAVATE TO PLAN GRADES THE AREA SHOWN ON PLAN. STOCKPILE LOAM AT LOCATION DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. AREAS NOT DESIGNATED FOR PAVEMENT TO BE STABILIZED USING HYDROSEEDING AND EROSION CONTROL BLANKETS IF NECESSARY. GRASS SEED MIXTURES WILL BE DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. SUBSTITUTION OF SEED MIXTURE BY THE CONTRACTOR WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF THE ENGINEER OR LANDSCAPE ARCHITECT. EXCESS SOILS REMOVED AND STOCKPILE DURING SITE CONSTRUCTION WILL BE STABILIZED WITH A VEGETATIVE COVER IF SOILS ARE STOCKPILED FOR MORE THAN 14 DAYS.

9.) AT A MINIMUM, ROADWAY DRAINAGE CHANNELS AND THE SEDIMENTATION BASINS SHOULD BE CLEANED EVERY TWO WEEKS OR AFTER EVERY MAJOR RAIN EVENT.

10.) ONCE THE ROADS ARE CONSTRUCTED AND UTILITIES INSTALLED, THE ROADS WILL BE PAVED IN BINDER COURSE. ROAD SIDE CHANNELS WILL BE FILLED AND THE TREEBELT AREA CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS.

NOTE

EXISTING PAVED DRIVEWAY TO BE USED FOR SITE ACCESS. PAVEMENT CONDITION TO BE MONITORED AND SHALL BE REPLACED BY A PROPER ANTI-TRACKING APRON SHOULD DRIVEWAY FAIL TO PROVIDE ADEQUATE ANTI-TRACKING CAPABILITIES.



SPECIAL NOTE

THE EROSION CONTROL PLAN AS SHOWN WAS CREATED PRIOR TO PROJECT CONSTRUCTION. EROSION CONTROL EFFORTS ARE PART OF A DYNAMIC PROCESS THAT IS CONTINUALLY REVISED ACCORDING TO THE DEMANDS OF ACTUAL SITE CONDITIONS. CONTRACTOR SHALL REFER TO THE SWPPP DOCUMENTS FOR PROPER IMPLEMENTATION AND UPDATING.

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

PERMITTING
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PROJECT PHASING PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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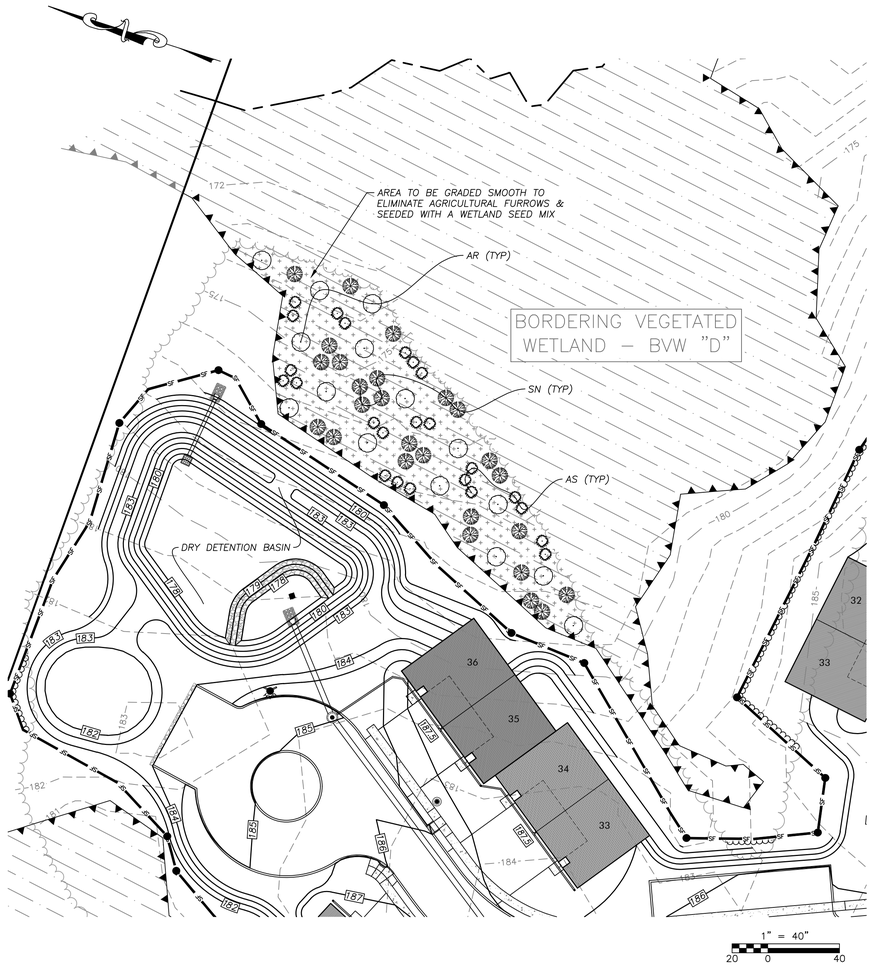

PLANT LIST				
KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	15	ACER RUBRUM	RED MAPLE	2–2.5" CAL.
AS	24	ALNUS INCANA (RUGOSA)	SPECKLED ALDER	3'–4' HT.
SN	26	SALIX NIGRA	BLACK WILLOW	3'–4' HT.
		NEW ENGLAND WETLAND SEED MIX	RATE PER SUPPLIER REC.	

SCHEDULE:

1. WETLAND REPLICATION WORK SHALL TAKE PLACE DURING THE GROWING SEASON. ONCE BEGUN, WORK WILL BE COMPLETED WITHIN APPROXIMATELY ONE MONTH.
2. THE AGAWAM CONSERVATION COMMISSION (ACC) SHALL BE CONTACTED 48 HOURS IN ADVANCE OF THE START OF WORK AND A PRECONSTRUCTION SITE MEETING SHALL BE HELD WITH THE ACC, WETLAND CONSULTANT (RLA), AND THE APPLICANT/CONTRACTOR.
3. THE RLA/WETLAND CONSULTANT, OR HIS REPRESENTATIVE, SHALL BE ON SITE AT THE START OF WORK AND CHECK ON THE PROGRESS OF THE PROJECT REGULARLY DURING WORK IN WETLANDS AND AT OTHER CRITICAL POINTS DURING CONSTRUCTION. AT A MINIMUM, THE RLA/WETLAND SCIENTIST SHALL BE PRESENT: AT THE START OF WORK; TO VERIFY SUBGRADES; AT THE BEGINNING OF PLANTING; AND TO VERIFY THAT WORK IS COMPLETE.
4. AN INSPECTION REPORT SHALL BE SUBMITTED TO THE ACC BY THE RLA DURING THE WETLAND CONSTRUCTION PERIOD.

CONSTRUCTION SEQUENCE:

5. INSTALL EROSION CONTROL AND SILTATION BARRIERS AT LOCATIONS SHOWN ON PLAN, PRIOR TO CONSTRUCTION. NO EQUIPMENT TRAFFIC OR OTHER ALTERATION IS PERMITTED BEYOND SEDIMENT BARRIERS OR IN WETLAND AREAS, EXCEPT FOR EXCAVATION WORK AS SHOWN ON THE PLAN. BARRIERS WITHIN THE WETLAND SHALL BE INSTALLED SO AS TO MINIMIZE DISTURBANCE OF THE WETLAND. STRAW LOGS/FILTER SOCK SHALL BE STAKED IN BY HAND IN WETLAND AREAS. STRAW BALES MAY BE SET DIRECTLY ON THE WETLAND SURFACE WITHOUT TRENCHING, BUT MUST BE WELL STAKED, TIGHTLY BUTTED, AND JOINTS CHINKED WITH LOOSE HAY.
6. A STONE ANTI–TRACKING APRON SHALL BE INSTALLED AT THE CONSTRUCTION SITE ENTRANCE AS SHOWN ON THE PLAN.
7. CONTRACTOR TO DEMOLISH AND REMOVE HOUSE, GARAGE, AND SITE IMPROVEMENTS PRIOR TO WETLAND RESTORATION.
8. CLEAR THE SURFACE OF THE HISTORIC FILL AREA FROM ANY DEBRIS PRIOR TO EXCAVATION. EXCAVATE SOIL FROM THE WETLAND FILL AREA AS SHOWN TO EXPOSE THE NATIVE SOIL "A" OR "O" HORIZON, TO BE DETERMINED BY THE WETLAND CONSULTANT. DO NOT STOCKPILE TOPSOIL, SUBSOIL, STUMPS OR DEBRIS WITHIN RESOURCE AREAS.
9. EXCAVATION WORK SHALL BE DONE FROM FILL AREA, OUTSIDE THE EXISTING WETLAND AND SHALL PROGRESS FROM THE EASTERN EXTENT OF THE FILL AREA AND PROGRESS TO THE WEST.
10. CARE SHALL BE TAKEN TO PRESERVE, WHEN POSSIBLE, EXISTING TREES ON SLOPES ALONG THE EDGE OF THE WETLAND FILL AREA.
11. EXCAVATED SOILS ARE TO EITHER TRANSPORTED OFF–SITE OR IF STORED ON SITE, ARE TO BE STOCKPILED WITHIN THE DESIGNATED STOCKPILE AREAS AS NOTED ON THE PLAN. STOCKPILED MATERIALS SHALL NOT BE PLACED WITHIN WETLAND RESOURCE AREAS OR THE BUFFER ZONE TO WETLAND RESOURCE AREAS. SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF STOCKPILED SOILS.
12. THE GROUNDWATER ELEVATION SHALL BE VERIFIED IN THE WETLAND REPLICATION AREA BY THE RLA ONCE THE REPLICATION AREA HAS BEEN EXCAVATED TO SUB–GRADE. IF SEASONAL HIGH GROUNDWATER IS NOT PRESENT AT OR WITHIN SUFFICIENT DEPTH TO SUPPORT WETLAND VEGETATION, MODIFICATIONS TO THE PROPOSED REPLICATION AREA TOPOGRAPHY SHALL BE MADE IN THE FIELD UNDER THE SUPERVISION OF THE RLA/WETLAND SCIENTIST.
13. ORGANIC SOIL INLAYS TO THE RESTORATION AREA MAY BE REQUIRED, DEPENDING ON WHAT IS DISCOVERED, TO ACHIEVE A SUITABLE MEDIUM FOR WETLAND VEGETATION. ORGANIC SOIL SHALL BE AN ORGANIC FINE SANDY LOAM APPROVED BY THE RLA/WETLAND SCIENTIST.
14. AVOID COMPACTION OF SUBSOILS AND PLACED WETLAND SOILS. EQUIPMENT TRAFFIC IN THE RESTORATION AREA IS TO BE MINIMIZED BY USING TRACK INSTEAD OF WHEEL MACHINES. THERE SHALL BE NO TRAFFIC ON FINISH GRADE WETLAND SOILS.
15. ONCE FINAL GRADES HAVE BEEN ESTABLISHED, TREES AND SHRUBS SHALL BE INSTALLED AS SHOWN ON THE PLANS.
16. FOR THE WETLAND RESTORATION SEED MIX, RLA SUGGESTS "NEW ENGLAND WETLAND SEED MIX" BY NEW ENGLAND WETLAND PLANTS INC., OR AN APPROVED EQUIVALENT.
17. ONCE FINAL GRADES WITHIN THE FILL AREA HAVE BEEN ESTABLISHED, ALL EXPOSED SOILS SHALL BE SEEDED WITH A WETLAND MIXTURE (SEE SPECIFICATION) AND MULCHED WITH WET MEADOW HAY, SALT HAY OR STRAW TO PREVENT EROSION UNTIL VEGETATION IS ESTABLISHED AND APPROVAL IS RECEIVED FROM THE LOCAL CONSERVATION COMMISSION.
18. FINAL WETLAND RESTORATION AREA ELEVATIONS SHALL BE CERTIFIED BY THE RLA/WETLAND SCIENTIST.
19. IMPACT TO ADJACENT WETLAND AREAS SHALL BE AT A MINIMUM. STORAGE OF ANY CONSTRUCTION MATERIALS OR MACHINERY IN ADJACENT WETLAND AREAS IS PROHIBITED. USE OF HEAVY MACHINERY IN ADJACENT WETLAND AREAS IS PERMITTED FOR CONSTRUCTION OF THE RESTORATION AREA ONLY WITHIN THE LIMITS OF THE EROSION CONTROL BARRIERS. ANY ADJACENT WETLAND DISTURBED DURING CONSTRUCTION WILL BE REESTABLISHED TO ITS PRE–CONSTRUCTION CONDITION AT THE CONTRACTOR'S EXPENSE.
20. ALL SLOPES AND FILL AREAS IN BUFFER ZONE SHALL BE SEEDED AND MULCHED UPON COMPLETION OF CONSTRUCTION TO PREVENT ANY POSSIBLE IMPACT TO ADJACENT WETLAND.
21. UPON COMPLETION OF THE CONSTRUCTION PHASE OF THE WETLAND RESTORATION, THE CONTRACTOR SHALL CONTACT THE RLA/WETLAND SCIENTIST FOR AN INSPECTION. THE RLA/WETLAND SCIENTIST SHALL NOTIFY THE LOCAL CONSERVATION COMMISSION AS TO THE COMPLETION DATE.

ESTABLISHMENT & MONITORING:

1. AT THE END OF EACH GROWING SEASON, AND UNTIL COMPLIANCE WITH THE PERFORMANCE STANDARDS SET FORTH IN 310 CMR 10.55(4)(B)1–7 IS ACHIEVED, A PROGRESS REPORT SHALL BE SUBMITTED BY A REGISTERED LANDSCAPE ARCHITECT OR WETLAND SCIENTIST, TO THE LOCAL ISSUING AUTHORITY.
2. ALL WORK SHALL COMPLY WITH 310 CMR 10.55 (4)(B)1–7: WITHIN TWO GROWING SEASONS AFTER COMPLETION, AT LEAST 75% OF THE RESTORATION AREA SHALL BE ESTABLISHED WITH INDIGENOUS WETLAND PLANT SPECIES. IF AT THE END OF THE FIRST OR THE SECOND GROWING SEASON (OR BOTH), THE SUCCESS RATE IS NOT EXPECTED TO BE 75%, PLANTING AND/OR RE–SEEDING OF THE RESTORATION AREA SHALL BE UNDERTAKEN. VEGETATION MAY BE CUT OR REMOVED SELECTIVELY TO ELIMINATE NUISANCE OR INVASIVE PLANTS AND ENCOURAGE WETLAND SPECIES.

MAINTENANCE:

1. AFTER SUCCESSFUL ESTABLISHMENT OF WETLAND VEGETATION AND RECEIPT OF APPROVAL FROM THE LOCAL CONSERVATION COMMISSION, THE AREA SHALL BE PERMITTED TO GROW WITHOUT DISTURBANCE. NO CONTINUING MAINTENANCE IS REQUIRED, EXCEPT FOR THE POSSIBLE SELECTIVE PRUNING OR REMOVAL OF NUISANCE AND/OR INVASIVE SPECIES THAT MAY HAVE INVADED THE REPLICATION AREA.

PLANTING NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE WETLAND CONSULTANT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2)REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
5. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
6. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
7. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.

INVASIVE PLANT NOTE:

PRIOR TO CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT ANY ACCUMULATED SOIL ON EARTHMOVING EQUIPMENT HAS BEEN REMOVED TO LIMIT THE RISK OF INVASIVE PLANT INTRODUCTION TO THE CONSTRUCTION SITE. CONTRACTOR SHALL CONTROL EXISTING INVASIVE PLANT SPECIES WITHIN THE LIMIT OF WORK AND WITHIN CONSERVATION JURISDICTION AFTER COORDINATION WITH THE WETLAND SCIENTIST TO IDENTIFY SAID SPECIES. CONTROL EFFORTS SHALL BE IN ACCORDANCE WITH WETLAND SCIENTIST'S RECOMMENDATIONS AND ANY APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

WETLAND RESTORATION PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: October 26, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
C-19	-

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Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ROAD and PARKING_Planar	Illuminance	Fc	1.42	9.2	0.0	N.A.	N.A.

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	LLF	Description	Lum. Lumens	Lum. Watts
	14	SL5	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-5W	14875	159.1
	13	SL4	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-4W-H5	7602	159.1
	10	SL1	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-3-H5	7502	159.1

SOUTH WESTFIELD STREET

Project:
Agawam Condos

Contact:
Liza Tuttle
Specification Sales
(860) 751-4388
ltuttle@illuminatene.com

illuminate
44 Sixth Road
Woburn, MA 01801
(781) 935-8500

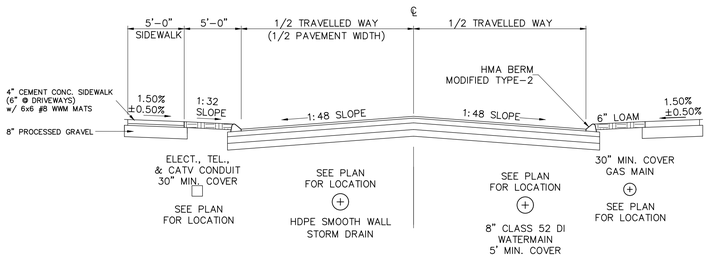
333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

Detail: Photometric Calculation
Date: 5/2/2022
Revision:A
Scale: 1" = 60'-0"
Drawn By: AJS

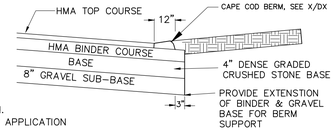
Drawing Number:

SL-1

Sheet 1 of 1



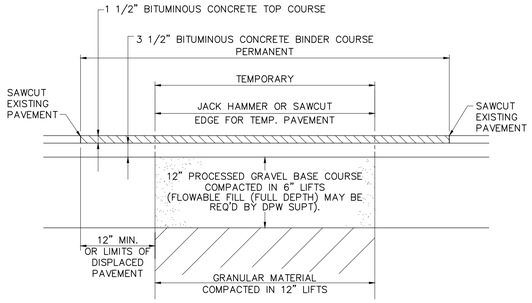
NOTE:
TACK COAT IS REQUIRED BETWEEN ALL COURSES OF HMA AND ON THE HMA BEFORE PLACING HMA BERM



TYPICAL ROADWAY SECTION
N.T.S.

PER MA HIGHWAY – 95% MINIMUM DRY DENSITY COMPACTION
BASED ON STANDARD PROCTOR – ALL ROADWAY CONSTRUCTION.
MODIFIED PROCTOR IS USED ONLY NEAR BRIDGE ABUTMENTS & HEAVY DUTY APPLICATION

TYPICAL ROADWAY SECTION (H-2) [MODIFIED]
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I–1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'–0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE

MINIMUM THICKNESS FOR PAVEMENT

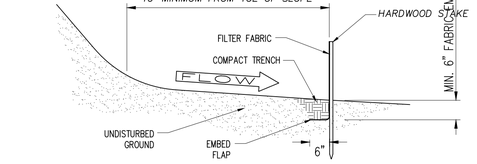
TYPE OF STREET	HOT MIX ASPHALT			GRAVEL BASE & GRAVEL SUB-BASE	
	SURFACE COURSE (INCHES)	BINDER COURSE (INCHES)	BASE (INCHES)	BASE (INCHES) DENSE GRADED CRUSHED STONE (M 201.7)	SUB-BASE (INCHES) (M 1.03.0 TYPE B, 3" MAX.)
PLACE	1.5"	3.0"	NA	4.0"	8.0"
LANE	1.5"	3.0"	NA	4.0"	8.0"
SUBCOLLECTOR	1.5"	2.0"	3.0"	4.0"	8.0"
COLLECTOR	1.5"	2.0"	4.0"	4.0"	10.0"
NOTE: THE ABOVE THICKNESS DO NOT APPLY TO INDUSTRIAL PARK ROADS					

1. THE MATERIAL TO BE USED FOR THE GRAVEL BASE (THE 4" OF MATERIAL DIRECTLY UNDER THE BINDER COURSE OF PAVING) IS TO BE DENSE GRADED CRUSHED STONE (NOT PROCESSED GRAVEL OR OTHER NATURAL STONE PRODUCT. MHD SPECIFICATION M2.01.7, WHICH MUST BE MET, STATES THAT COARSE AGGREGATE (#4 SIEVE AND LARGER) MUST BE CRUSHER RUN.
2. THE LINE, GRADE AND COMPACTION OF THE GRAVEL SUB–BASE (THE 8" LAYER OF GRAVEL BORROW DIRECTLY UNDER THE DENSE GRADED CRUSHED STONE) MUST BE APPROVED BY ENGINEERING BEFORE THE 4" LAYER OF DENSE GRADED CRUSHED STONE IS PLACED. IT IS IMPORTANT THAT ENOUGH TIME IS ALLOWED IN THE CONSTRUCTION SCHEDULE SO THAT FIELD DENSITY TESTS CAN BE MADE.
3. GRAVEL SAMPLES FOR THE SUB–BASE AND BASE WILL BE TAKEN BY THE ENGINEERING DIVISION FOR TESTING. THE SAMPLE MUST MEET ITS RESPECTIVE MHD SPECIFICATION AND BE APPROVED BY THE TOWN ENGINEER BEFORE ANY OF THE GRAVEL CAN BE SPREAD ON–SITE. THE TOWN ENGINEER OR THEIR AGENT ARE SOLELY RESPONSIBLE FOR CHAIN OF CUSTODY OF ALL SAMPLES; ANY TESTING PERFORMED OUTSIDE OF THE TOWN CHAIN OF CUSTODY WILL NOT BE ACCEPTED.
4. FIELD DENSITY TESTING IS TO BE MADE ON BOTH THE GRAVEL SUB–BASE AND GRAVEL BASE SEPARATELY. THE GRAVEL SUB–BASE IS TO BE TESTED BEFORE THE GRAVEL BASE WILL BE ALLOWED TO BE PLACED.
5. WHEN THE GRAVEL FOR THE SUB–BASE AND BASE IS SPREAD OUT, IT IS TO BE SPREAD INTO THE SITE STARTING AT THE SITE'S ENTRANCE AND WORKING INWARDS.
6. THE BINDER COURSE OF PAVING CANNOT BE LAID UNTIL THE ENGINEERING DIVISION HAS APPROVED THE GRADE FOR THE ROADWAY AND THE COMPACTION OF THE GRAVEL BASE.
7. PRIOR TO INSTALLING THE CURB, THE DEVELOPER SHALL HAVE THE LINES OF THE PROPOSED CURBING LAID OUT WITH RED PAINT OR OTHER MARKING AND THEN NOTIFY ENGINEERING THAT MARKING IS READY FOR INSPECTION. AFTER INSPECTION, ENGINEERING WILL NOTIFY THE DEVELOPER THAT CURBING IS EITHER READY FOR LAYING OR CORRECTIONS MUST BE MADE TO THE MARKINGS. IN THE LATTER CASE, THE DEVELOPER MUST MAKE THE CORRECTIONS PRIOR TO APPROVAL AND INSTALLATION. TACK COAT IS REQUIRED BEFORE PLACEMENT OF HMA BERMS.
8. PRIOR TO LAYING THE TOP COURSE OF PAVEMENT, AND AFTER THE CURB IS INSTALLED, THE PAVEMENT MUST BE FLOODED SO THAT ENGINEERING CAN OBSERVE AND SURVEY THE GRADES OF BINDER COURSE TO DETECT ANY DISCREPANCIES IN GRADE. THIS INFORMATION MUST BE FURNISHED TO THE PAVING SUBCONTRACTOR BY THE DEVELOPER SO THAT ANY NECESSARY SHIMMING OF THE PAVEMENT CAN BE MADE. ENGINEERING WILL CHECK SHIMS.
9. AS NOTED IN THE SUBDIVISION REGULATIONS AND STANDARD PERFORMANCE AGREEMENT, THE PRESENCE OF AN INSPECTOR WILL NOT RELIEVE THE DEVELOPER OF HIS OBLIGATIONS TO PROVIDE A SATISFACTORY INSTALLATION OF ALL FACILITIES WHICH ARE A PART OF THE SUBDIVISION.
10. TACK COAT WILL BE REQUIRED TO BE APPLIED AT A RATE OF 1/20 GAL/SY WHENEVER PLACING HMA OVER EXISTING PAVEMENT, OTHERWISE THE TACK COAT SHALL BE AS SPECIFIED IN SECTION 460.62 OF THE MHD STANDARD SPECIFICATIONS.

STREET DESIGN STANDARDS

TYPE OF STREET	RIGHT OF WAY WIDTH (FEET)	PAVEMENT WIDTH (FEET)
PLACE	46	26
LANE	50	30
SUBCOLLECTOR	60	36
COLLECTOR	66	40

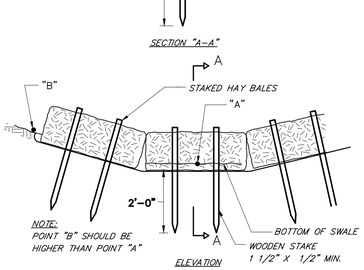
STREET STANDARDS
NO SCALE



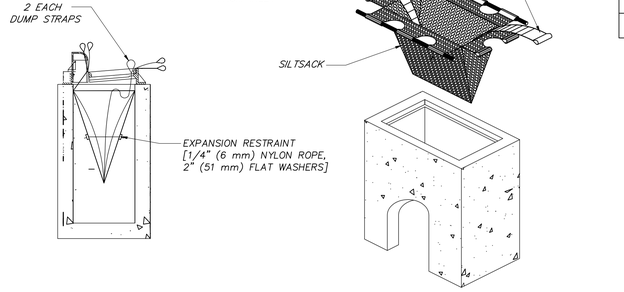
SECTION A–A

NOTES:
1. SILT FENCE IS TO BE INSTALLED BEFORE ANY LAND DISTURBING ACTIVATES START AT THE CONSTRUCTION SITE –OR– AS DIRECTED IN THE SITE'S EROSION AND SEDIMENTATION PLAN.
2. INSPECT SILT FENCE ON WEEKLY BASIS AND AFTER EACH RAIN ANY DETERIORATED/DAMAGED SILT FENCE MUST BE REPLACED IMMEDIATELY.
3. REMOVE SILT FROM FENCE AS NEEDED –OR– WHEN THE SILT HAS ACCUMULATED TO HALF THE ORIGINAL HEIGHT OF THE FENCE.
4. WHEN JOINING TWO SECTIONS OF FENCE, ROLL THE END STAKES TOGETHER SUCH THAT THERE IS NO GAP IN THE FENCE, OVERLAPPING FENCE SECTIONS IS NOT AN ACCEPTABLE ALTERNATIVE

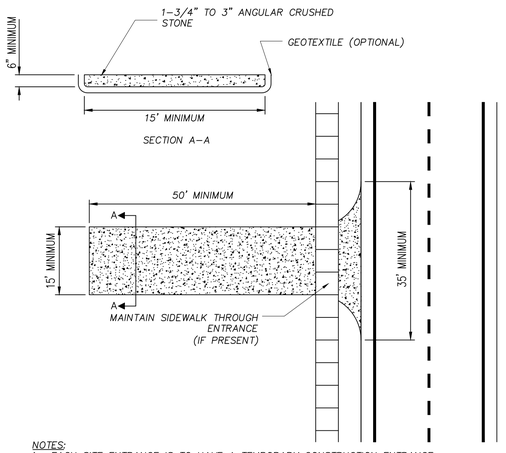
SILT FENCE
NO SCALE



HAY BALE CHECK DAM X-SECTION
NO SCALE

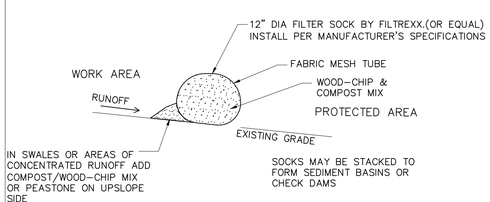


INLET PROTECTION, SEDIMENT FILTER SACK
NO SCALE



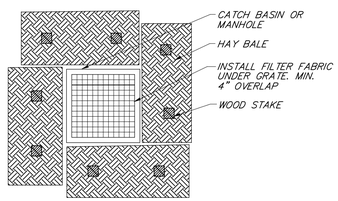
NOTES:
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMEADEITLY.
4. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
5. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
6. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE – AGAWAM DETAIL ES–1



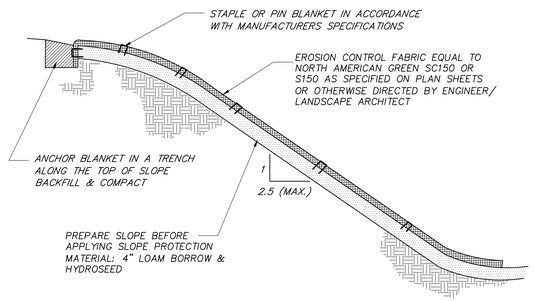
TYPICAL FILTER SOCK INSTALLATION

SEDIMENT BARRIER ALTERNATIVE - FILTER SOCK
NO SCALE



NOTES:
1. INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.
2. TWO (2) WOOD STAKES MINIMUM PER HAYBALE. STEEL DOWELS SHALL BE UTILIZED WHERE WOOD STAKES CAN NOR BE DRIVEN INTO GROUND

STORM INLET PROTECTION DETAIL
NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION
NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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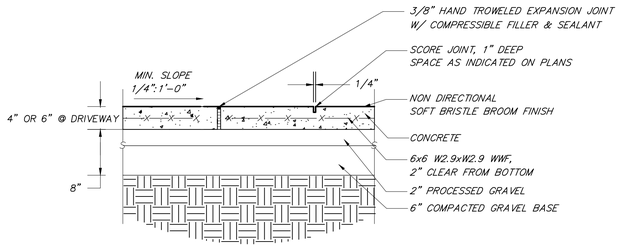
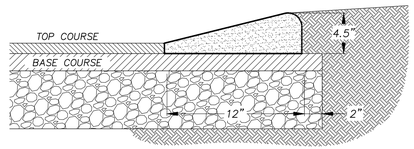


CONCRETE SIDEWALK

NO SCALE

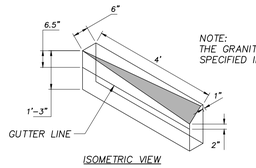


BITUMINOUS CONCRETE BERM (CAPE COD)

NO SCALE

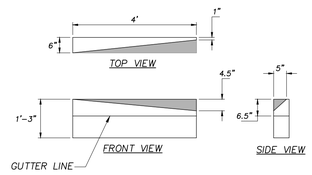
TYPICAL DRIVEWAY PAVEMENT DETAIL

NO SCALE



ISOMETRIC VIEW

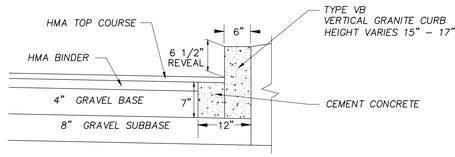
NOTE:
THE GRANITE CURBING SHALL BE INSTALLED AS SPECIFIED IN AGAWAM DETAIL H-4.



SLOPED GRANITE CURB/HMA BERM TO VERTICAL GRANITE CURB

GRANITE TRANSITION CURB DETAIL (H-5)

NO SCALE



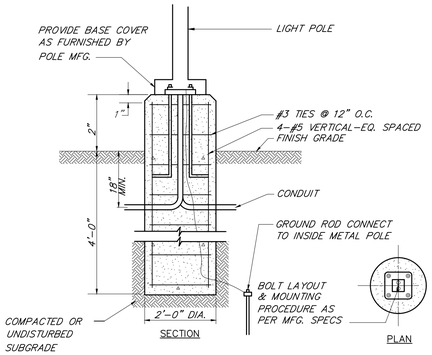
PROCEDURE DESCRIBED HEREIN IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE AND/OR BINDER COURSE ARE IN PLACE. OTHERWISE CEMENT CONCRETE WILL BE ELIMINATED AND GRAVEL WILL BE BROUGHT UP TO THE BOTTOM OF THE BASE COURSE. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE SPECIFICATIONS.

NOTES:
1. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BINDER, BASE AND STONE, AND REPLACE WITH CEMENT CONCRETE.
2. ACCEPTABLE CEMENT CONCRETE IS ANY CLASS UNDER SECTION M4 OF THE 1988 MHD STANDARD SPECIFICATIONS; ALL TEST REQUIREMENTS ARE WAIVED. HMA IS NOT AN ACCEPTABLE SUBSTITUTE
3. WHEN SET ON RADII, THE CURBING SHALL BE CUT WITH THE REQUIRED RADIUS OF CURVATURE.

VERTICAL GRANITE CURB DETAIL (H-4)

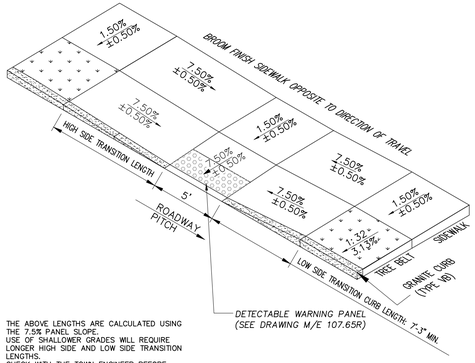
NO SCALE

NOTES:
1. ALL SIDEWALK SLOPES ARE MAXIMUMS, TREE BELT SLOPE IS TO BE MAINTAINED TO THE BEST EXTENT PRACTICABLE.
2. ALL SIDEWALKS ARE TO BE CONSTRUCTED TO THE SAME SPECIFICATION FOUND IN MHD SUPPLEMENTAL SPECIFICATIONS TO THE 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, ENGLISH UNITS, JUNE 6, 2006 SECTIONS 701.00 TO 701.61 INCLUSIVE, AS AMENDED - UNLESS OTHERWISE SPECIFIED.
3. ALL SIDEWALKS ARE TO BE 4000 PSI (28 DAY) PORTLAND CEMENT CONCRETE, 6%±1% AIR ENTRAINED.
4. CURBING TO BE VERTICAL GRANITE CURB -OR- CAST IN PLACE PORTLAND CEMENT CONCRETE IF SUBMITTED TO AND APPROVED BY DPW. SCORE LINES @ 5'-0" INTERVALS
6. WHEN THE SIDEWALK IS INSTALLED ON A CURVE, THE 5'-0" SCORE LINE INTERVAL IS MEASURE ON ALONG THE INSIDE THE CURVE.
10. TOOL ALL JOINTS AND EDGES
11. WHEN TRANSITIONING FROM VERTICAL GRANITE CURB TO MODIFIED TYPE 2 BERM A 4 FT GRANITE TRANSITION IS REQUIRED. ATTEMPTING TO BLEND THE MODIFIED TYPE 2 BERM TO THE GRANITE CURBING, OR FIELD CUTTING A GRANITE TRANSITION ARE NOT AN ACCEPTABLE ALTERNATIVE.
12. SIDEWALK IS TO BE POURED IN ALTERNATING 20' LENGTHS TO ACCOUNT FOR PANEL CONTRACTION DURING DRYING.
13. INSTALL 1/2" THICK PREFORMED EXPANSION JOINT FILLER (M.9.14.0) AT 20' INTERVALS
14. BROOM FINISH SIDEWALK OPPOSITE TO THE DIRECTION OF TRAVEL
15. SIDEWALK IS REQUIRED TO BE COVERED WITH PLASTIC AND KEPT MOIST FOR MINIMUM OF 72 HOURS AFTER IT HAS SET-UP.
16. DETECTABLE WARNING PANEL ARE TO COMPLY WITH ADA 4.29.2
17. DETECTABLE WARNING PANEL TO BE CAST IN PLACE DETECTABLE WARNING PANEL, 24"X60", FEDERAL YELLOW, ITEM#: 24601DPAD2Y, MFD. BY: ADA SOLUTIONS INC.. 1 SURVEY CIRCLE, 2ND FLR, N. BILLERICA, MA 01862, WWW.ADATILE.COM -OR- APPROVED EQUAL.
18. SIDEWALKS ARE TO BE INSTALLED THROUGH DRIVEWAYS. SIDEWALK FINISH IS TO BE BROOM FINISHED, NO ALTERNATE FINISH IS ALLOWED I.E. STAMPED, EPOXY FINISHED, ETC.... THE 1.50% (±0.50%) CROSS SLOPE MUST BE MAINTAINED THROUGH DRIVEWAYS.
19. ANY CHANGES IN BOUNDS, PINS, EASEMENTS, AND FORM-A'S SHOULD BE SHOWN ON AMENDED DEFINITIVE PLANS PRIOR TO THE SIGN OFF OF THE PUNCH LIST.
20. ALL MONUMENTATION IS TO COMPLY WITH AGAWAM TOWN CODE SECTION 159-33



LIGHT POLE INSTALLATION DETAIL

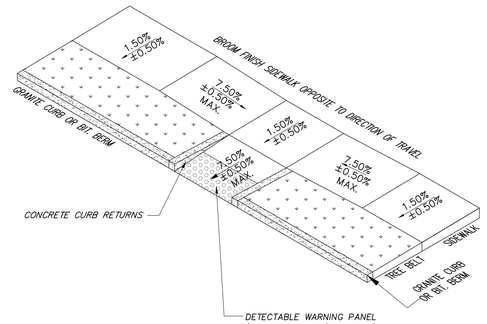
NO SCALE



- THE ABOVE LENGTHS ARE CALCULATED USING THE 7.5% PANEL SLOPE.
- USE OF SHALLOWER GRADES WILL REQUIRE LONGER HIGH SIDE AND LOW SIDE TRANSITION LENGTHS.
- CHECK WITH THE TOWN ENGINEER BEFORE USING ANY GRADES BESIDES THOSE LISTED IN THE TABLE ABOVE.

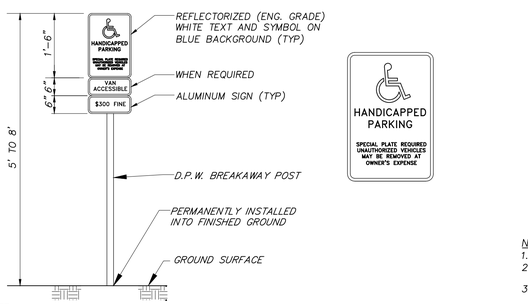
SIDEWALK CURB CUT

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

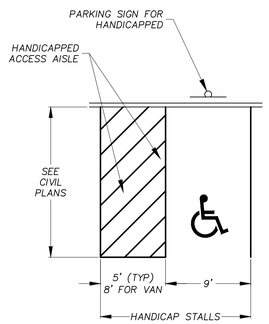
NO SCALE



NOTE:
MAXIMUM MOUNTING DISTANCE FROM HEAD OF STALL IS 10'.
PLEASE SEE: MGL C.40&21-22A, AAB 521 CMR 23.00, AGAWAM CODE &169-28

ACCESSIBLE PARKING SIGN (A-1)

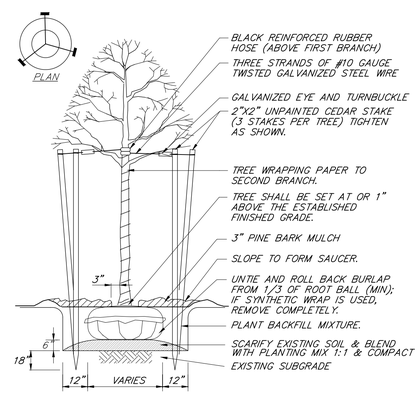
NO SCALE



NOTES:
1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" SOLID WHITE PAVEMENT MARKING PAINT UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO ENSURE HANDICAP ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
4. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER AND PROPORTION OF VAN ACCESSIBLE SPACES.

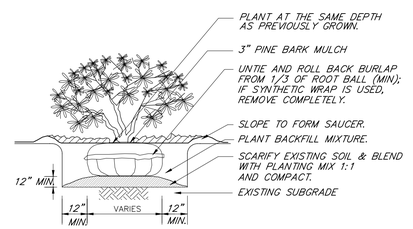
HANDICAP PARKING STALL

NO SCALE



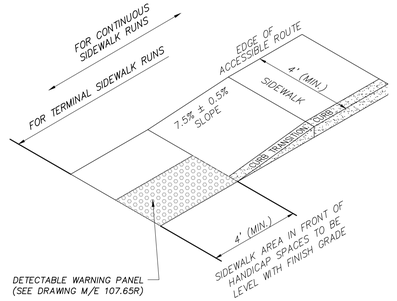
TREE PLANTING

NO SCALE



SHRUB PLANTING

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers - Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
No. 1388
REGISTERED LANDSCAPE ARCHITECT
7/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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D-2	-

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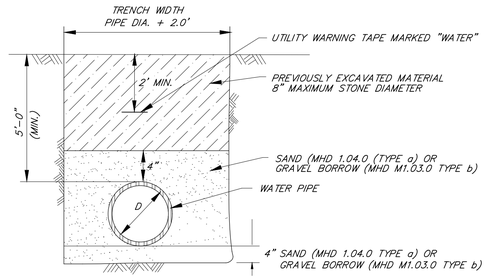
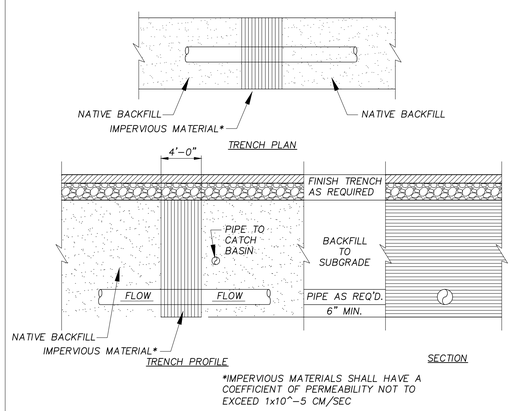


NOTES:
1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIALS IN MAXIMUM ONE FOOT LIFTS.
3. ALL WATER LINES SHALL BE SET A MINIMUM OF 5 FEET BELOW FINISH GRADE UNLESS OTHERWISE NOTED.

TYPICAL WATERMAIN TRENCH SECTION

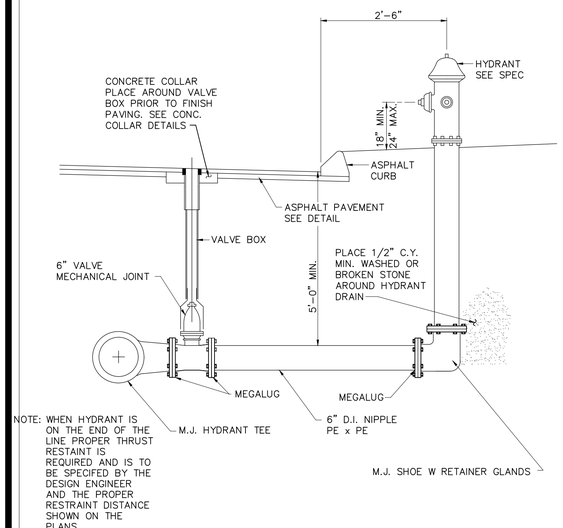
NO SCALE



*IMPERVIOUS MATERIALS SHALL HAVE A COEFFICIENT OF PERMEABILITY NOT TO EXCEED 1x10^-5 CM/SEC

IMPERVIOUS TRENCH DAM DETAIL (D-6)

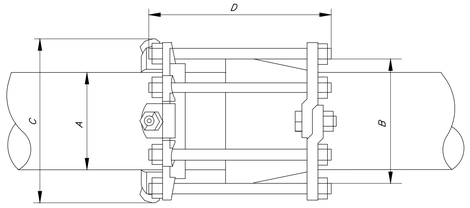
NO SCALE



NOTE: WHEN HYDRANT IS ON THE END OF THE LINE PROPER THRUST RESTAINT IS REQUIRED AND IS TO BE SPECIFED BY THE DESIGN ENGINEER AND THE PROPER RESTRAINT DISTANCE SHOWN ON THE PLANS

FIRE HYDRANT DETAIL (W-1)

NO SCALE



MEGALUG SERIES 1700 TABLE (*)					
NOMINAL PIPE SIZE	SERIES NUMBER	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C CASING CLEARANCE (W/NUTS OFF)	D THRUST ROD (QUANTY-SIZE)
4"	1704	4.80	6.60	9.90	4-3/4x13
6"	1706	6.90	8.60	12.00	6-3/4x13
8"	1708	9.05	10.90	14.15	6-3/4x13
10"	1710	11.10	13.10	16.20	8-3/4x18

* SEE MANUFACTURER FOR ADDITIONAL SPECIFICATIONS.

NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

SERIES 1700 MEGALUG RESTRAINT HARNESS

NO SCALE

SEDIMENTATION MARKER POST

NO SCALE

NOTE:
1. ALL VALVE BOXES LOCATED IN NON PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONC. 6" ALL AROUND.
2. SET VALVE BOX FLUSH IN PAVED AREAS.

TYPICAL BURIED VALVE

NO SCALE

PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES										
LENGTH OF RESTRAINT REQD (FEET)									DESIGN FORCE ON RESTRAINT REQD (KIPS) ⑤	
DEFLECTION ANGLE / PIPE	11 1/4	22 1/2	45°	90° BEND	TEE	DEAD END	8"-4" REDUCER	8"-6" REDUCER	45°	TEE
	3	6	11	27	48	80	57	34	11	48

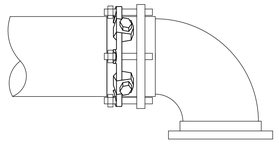
① ALL GATE VALVES MUST BE RESTAINED.

② THIS TABLE IS BASED ON A TEST PRESSURE OF 200 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY

③ IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.

④ IF TIE RODS ARE USED, USE 4 RODS MINIMUM AND ADD 1/8" TO BAR DIA AS CORROSION ALLOWANCE.

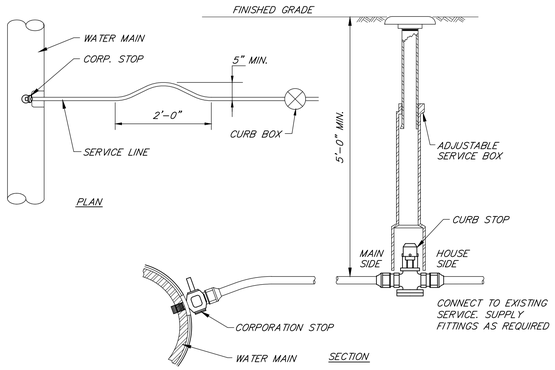
⑤ THE TABLE IS BASED ON THE PIPE LAYING CONDITIONS OF TYPE 4 TRENCH, BURIED DEPTH OF 5' OR MORE AND SOIL TYPE "ML".



NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

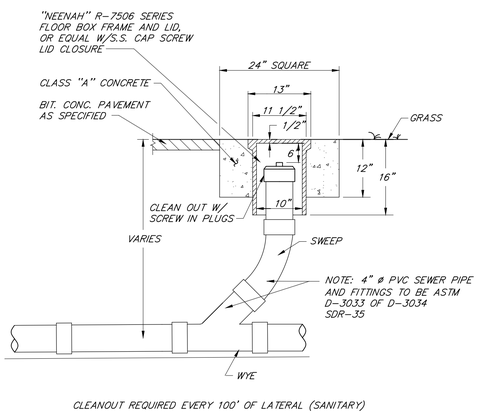
SERIES 1100 MEGALUG RESTRAINT HARNESS

NO SCALE



TYPICAL WATER SERVICE CONNECTION

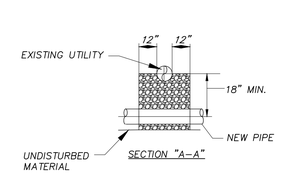
NO SCALE

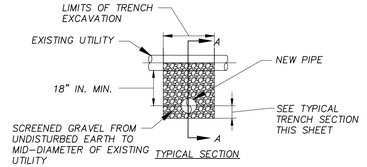


CLEANOUT REQUIRED EVERY 100' OF LATERAL (SANITARY)

TYPICAL CLEANOUT DETAIL

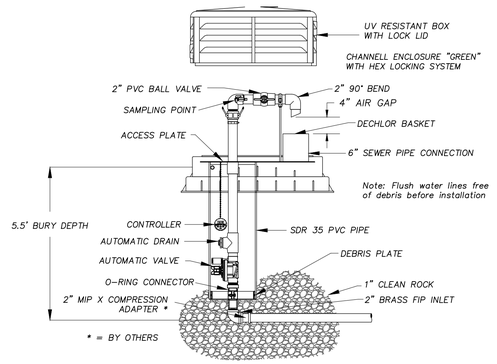
NO SCALE





UTILITY CROSSING DETAIL

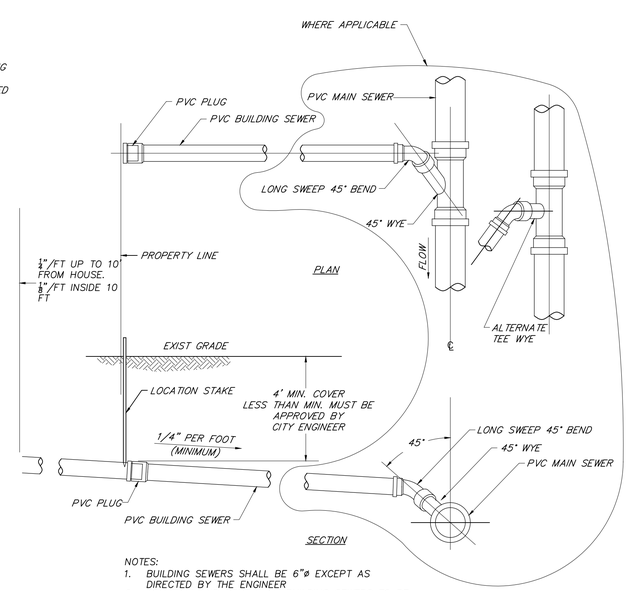
NO SCALE



AUTOMATIC FLUSHING DEVICE SHALL HAVE A 2" BRASS FIP INLET, LEADING VERTICALLY INTO A 2" AUTOMATIC SOLENOID VALVE. AUTOMATIC SOLENOID VALVE SHALL HAVE A 150 PSI RATING. EACH UNIT SHALL BE FURNISHED WITH A STAND-ALONE VALVE CONTROLLER. VALVE CONTROLLER WILL NOT REQUIRE A SECOND HAND-HELD DEVICE FOR PROGRAMMING. CONTROLLER MUST HAVE MINIMUM OF 12 POSSIBLE FLUSHING CYCLES PER DAY, UP TO 6 HOURS PER FLUSH CYCLE AND SHALL BE SUBMERSIBLE TO 12 FEET, OPERATE WITH 9 VOLT BATTERY(COMPARTMENT HOLDS TWO BATTERS) AND HAVE RESIN-SEALED ELECTRICAL COMPONENTS. SOLENOID HALL HAVE NO LOOSE PARTS WHEN REMOVED FROM VALVE. EACH UNIT SHALL HAVE A DOUBLE-VALVE, ALL BRASS, SAMPLING POINT. REMOVAL OF 2" SOLENOID VALVE SHALL BE POSSIBLE VIA AN O-RING CONNECTOR LOCATED UNDER THE VALVE. AFTER REMOVAL OF STAINLESS STEEL ACCESS PLATE. VALVE ASSEMBLY SHALL BE HOUSED IN A PVC ENCLOSURE AND EACH UNIT SHALL BE SELF-DRAINING, NON-FREEZING, ALL ABOVE-GROUND COMPONENTS SHALL BE CONTAINED WITHIN A UV-RESISTANT LOCKING COVER, AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY. MODEL#9800 ST. LOUIS, MO. 1-800-231-3990, OR APPROVED EQUAL.

AUTOMATIC FLUSHING DEVICE - MODEL #9800

NO SCALE



NOTES:
1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL (S-4)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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RLA PROJ. NUMBER: 090506

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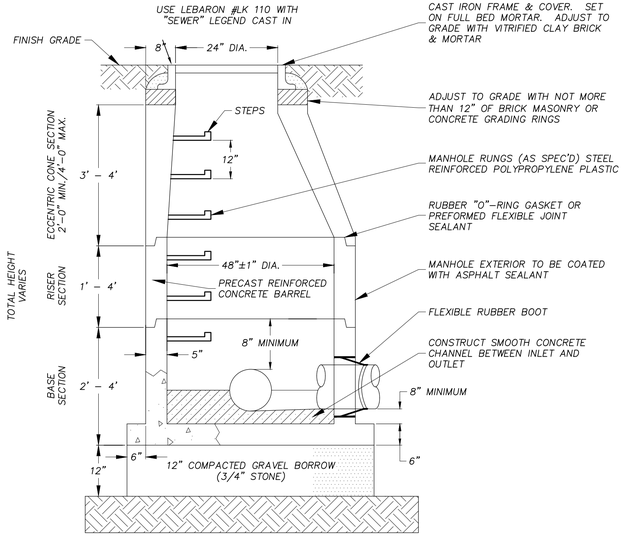
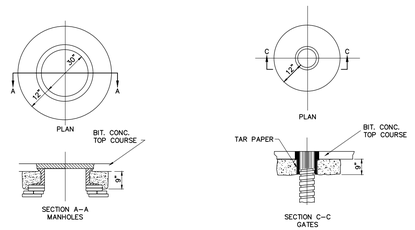


STANDARD SANITARY SEWER MANHOLE DETAIL

NO SCALE



PORTLAND CEMENT CONCRETE COLLARS

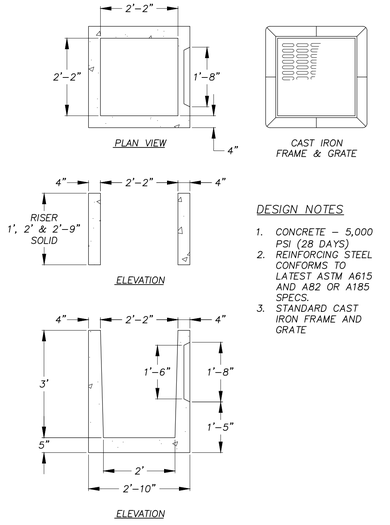
N.T.S

NOTES:

1. CONCRETE COLLARS ARE NOT REQUIRED FOR TYPE "C" OR "CL" PRECAST CATCH BASINS
2. ALL STRUCTURES ARE TO BE PLATED BEFORE PLACEMENT OF THE FIRST COURSE OF PAVEMENT AND RAISED PROMPTLY AFTERWARDS.
3. ALL RAISED STRUCTURES SHALL HAVE BITUMINOUS CONCRETE "DOUGHNUTS" PLACED AROUND THEM UNTIL THE FINISH COURSE OF PAVEMENT HAS BEEN COMPLETED.

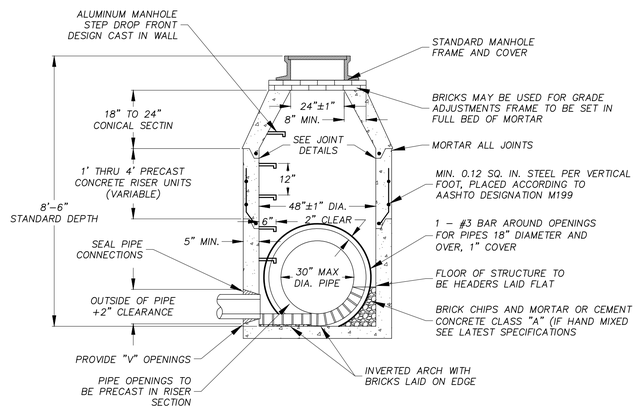
CONCRETE COLLARS

NO SCALE



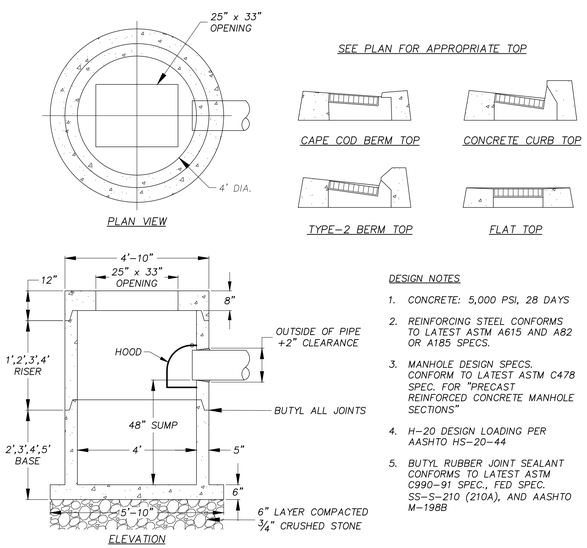
YARD DRAIN DETAIL

NO SCALE



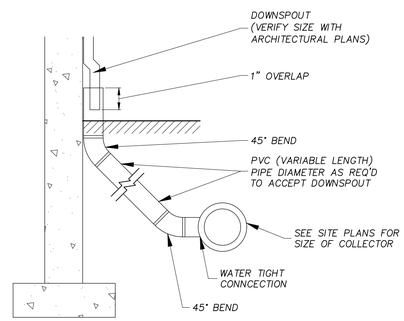
PRECAST CONCRETE MANHOLE

NO SCALE



PRECAST CONCRETE CATCH BASIN-CT STYLE/ROUND BASE

NO SCALE



DOWNSPOUT COLLECTOR DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
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DRAFTED BY: JT, JM & CK

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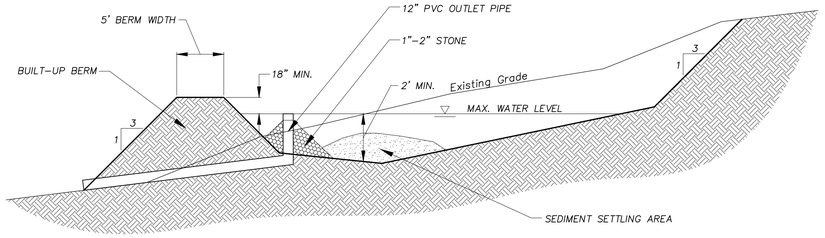


TEMPORARY SEDIMENT BASIN

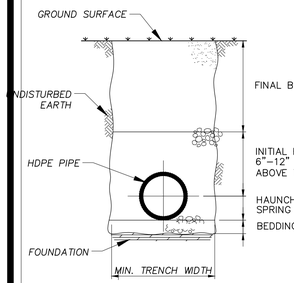
NO SCALE

HDPE TRENCH INSTALLATION DETAIL

NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY–FLOW APPLICATIONS," LATEST EDITION; AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

   UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 6" (150mm).
3. HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
4. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:



TYPICAL HDPE TRENCH CROSS–SECTION

NOMINAL ø in (mm)	MIN. RECOMMENDED TRENCH WIDTH, in (mm)
4 (100)	21 (530)
6 (150)	23 (580)
8 (200)	25 (630)
10 (250)	28 (710)
12 (300)	31 (790)
15 (375)	34 (860)
18 (450)	39 (990)
24 (600)	48 (1220)
30 (750)	66 (1680)
36 (900)	78 (1980)
42 (1050)	83 (2110)
48 (1200)	89 (2260)
60 (1500)	102 (2590)

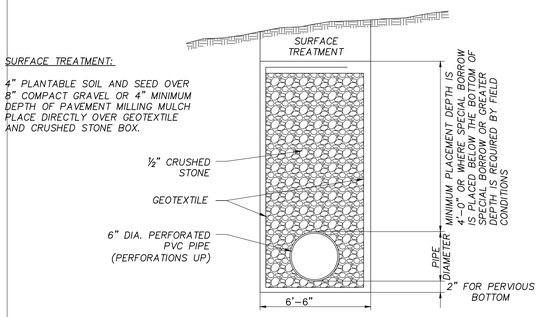
5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADING CONDITIONS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.

SURFACE LIVE LOADING CONDITION	MINIMUM RECOMMENDED COVER, in (mm)
H25 (FLEXIBLE PAVEMENT)	12 (300)
H25 (RIGID PAVEMENT)	12 (300)
E80 RAILWAY	24 (610)
HEAVY CONSTRUCTION	48 (1220)

*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

HDPE TRENCH INSTALLATION DETAIL

NO SCALE

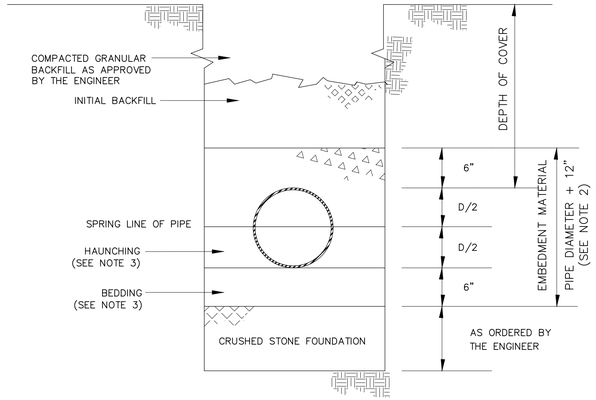


NOTES:

1. GEOTEXTILE FABRIC AS DESCRIBED IN SECTION M9.50.
2. PIPE SHALL BE SET AT BOTTOM OF TRENCH FOR IMPERVIOUS BOTTOM.
3. SUBDRAIN LOCATED APPROXIMATELY AT INTERSECTION OF TANGENTS (SEE DWG. E102.1.0).
4. GRAVEL (AND SPECIAL BORROW WHERE REQUIRED) SHALL INTERSECT CRUSHED STONE FOR SUBDRAIN.

SUBDRAIN DETAIL (MHD #E 209.1.0)

NO SCALE

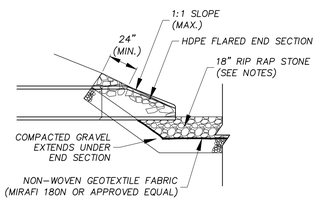


NOTES:

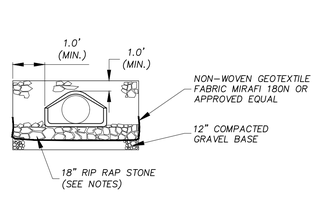
1. THE INSTALLATION OF PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD D–2321.
2. THE EMBEDMENT MATERIAL SHALL BE 3/4" CRUSHED STONE.
3. USE HAND OR MECHANICAL TAMPING TO COMPACT THE BEDDING AND HAUNCHING.
4. GEOTEXTILE TO BE USED WHERE AND AS DIRECTED BY ENGINEER.

SANITARY & STORM SEWER TRENCH SECTION (M-2)

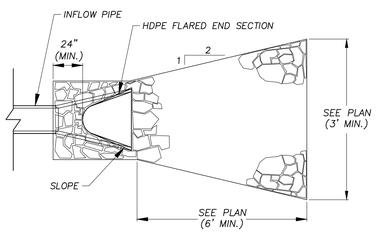
NO SCALE – AGAWAM DETAIL M–2



SIDE SECTION



FRONT SECTION



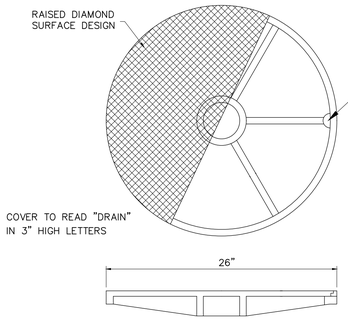
PLAN VIEW

NOTES

1. FLARED END SECTION PIPE JOINT SHALL BE SIMILAR TO THE MAIN RUN OF PIPE JOINTS
2. STONE RIPRAP SHALL NOT BE LESS THAN 50 POUNDS NOR MORE THAN 125 POUNDS AND AT LEAST 75% OF THE VOLUME SHALL BE AT LEAST 75 POUNDS

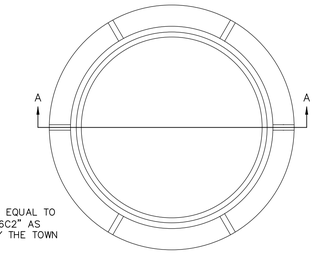
STANDARD RIP RAP PIPE OUTLET

NO SCALE

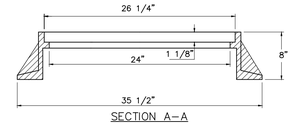


24" MANHOLE COVER

N.T.S.
202.8.1



COVER TO BE EQUAL TO "LEBARON L26C2" AS APPROVED BY THE TOWN ENGINEER



SECTION A–A

FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LK 110A"

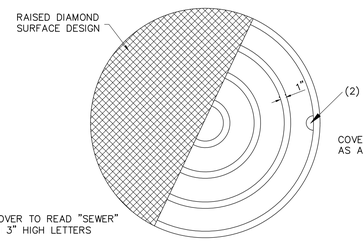
TOTAL WEIGHT OF FRAME & COVER = 485 LBS

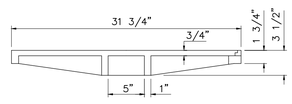
24" MANHOLE FRAME

N.T.S.

DRAIN MANHOLE FRAME & COVER (D-2)

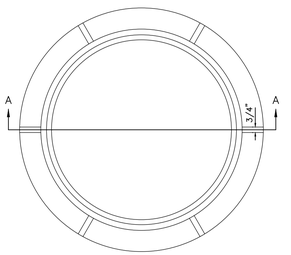
NO SCALE – AGAWAM DETAIL D–2





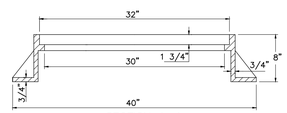
30" MANHOLE COVER

N.T.S.
202.8.1



FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LC328"

TOTAL WEIGHT OF FRAME & COVER = 551 LBS



SECTION A–A

30" MANHOLE FRAME TYPE 'C'

N.T.S.
202.7.1

SANITARY SEWER FRAME & COVER (S-3)

NO SCALE – AGAWAM DETAIL S–3

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Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

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FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/1/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
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Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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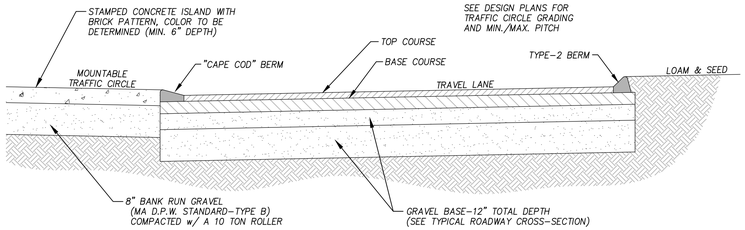
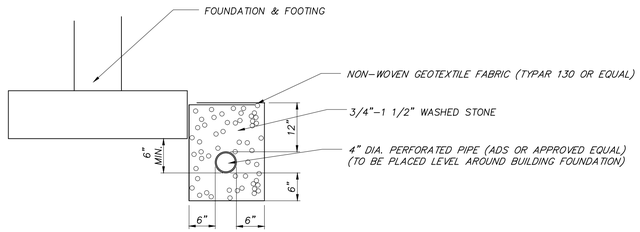


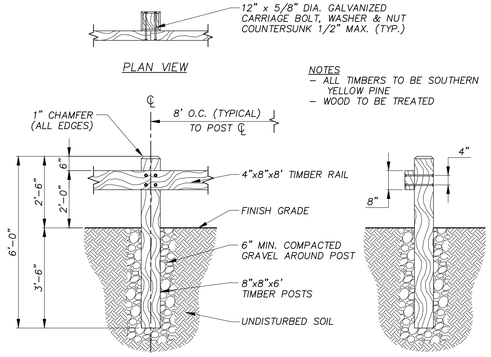
MOUNTABLE TRAFFIC CIRCLE ISLAND DETAIL

NO SCALE



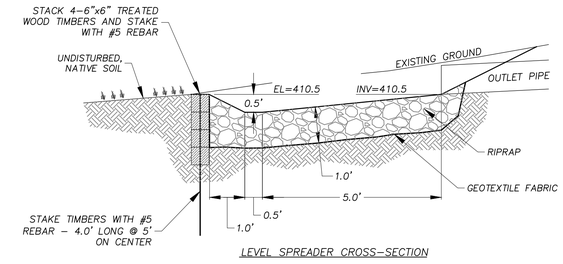
TYPICAL BUILDING FOUNDATION DRAIN DETAIL

NO SCALE



WOOD GUARDRAIL

NO SCALE



NOTES

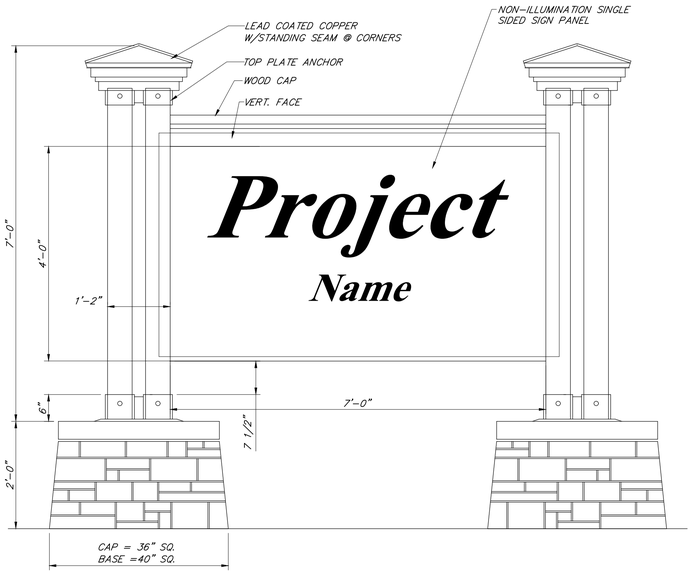
1.) LEVEL SPREADER SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
2.) CONSTRUCTION OF LEVEL SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
3.) CONSTRUCT SPREADER WITH LIP AT EXISTING GRADE AS SPECIFIED.
4.) DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

LEVEL SPREADER DETAIL

NO SCALE

NOTE:

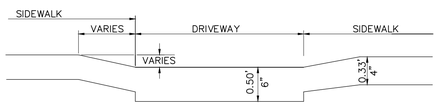
SIGN SIZE, COLORS, MATERIALS & HEIGHT AS SPECIFIED BY SIGN MANUFACTURER

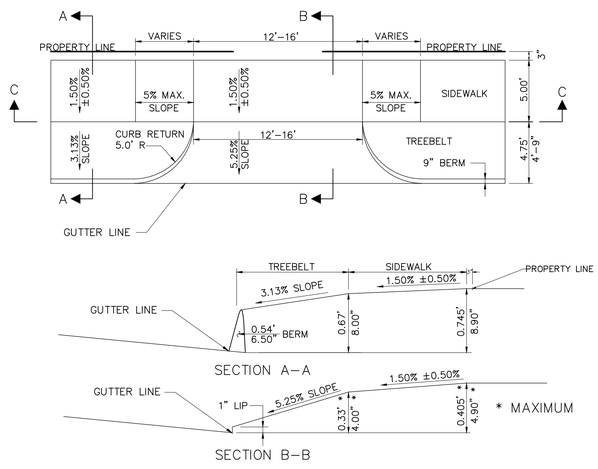


FOUNDATION SHALL BE DESIGNED ACCORDING TO PREVAILING SOIL CONDITIONS, WIND LOADS, AND SUBSURFACE EXPLORATION RESULTS.

FREESTANDING SIGN DETAIL

NO SCALE





NOTES

1.) CONCRETE SIDEWALK IS TO RUN CONTINUOUSLY THOUGH DRIVEWAYS.
2.) CONCRETE USED SHALL BE 4000 PSI WITH A MAX. AGGREGATE SIZE OF ¾"AND SHALL CONTAIN 5-7% ENTRANED AIR.
3.) CONCRETE DEPTH SHALL BE A MINIMUM OF 4" WITH A MIN. DEPTH OF 6" AT DRIVEWAYS.
4.) SIDEWALKS SHOULD BE INSTALLED PRIOR TO THE APPLICATION FOR A BUILDING PERMIT UNLESS THE BUILDER REQUESTS IN WRITING THAT THE SIDEWALKS BE DELAYED AND GUARANTEES THAT THE SIDEWALK WILL CONFORM TO THE STANDARD DRIVEWAY DETAIL.
5.) ALL DRIVEWAYS REQUIRE A DPW DRIVEWAY PERMIT.
6.) ALL SLOPES ARE MAXIMUM. DRIVEWAYS ARE TO BE DESIGNED SUCH THAT WATER WILL NOT FLOW INTO DRIVEWAY FROM THE ROADWAY.

STANDARD RESIDENTIAL DRIVEWAY (H-6)

NO SCALE

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9/19/22

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ISSUANCE DATE: September 19, 2022

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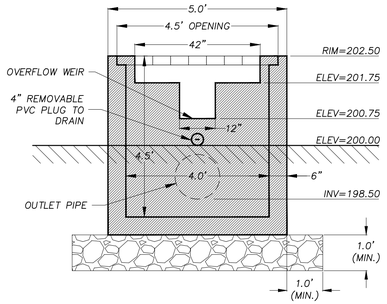
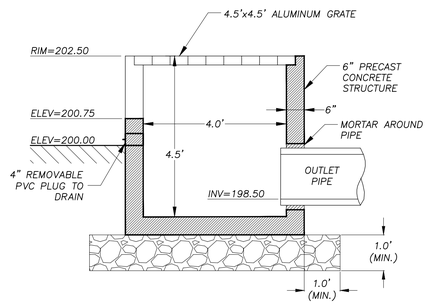
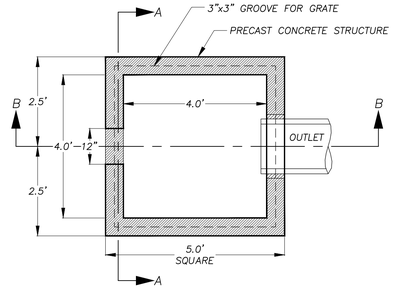


SECTION A–A



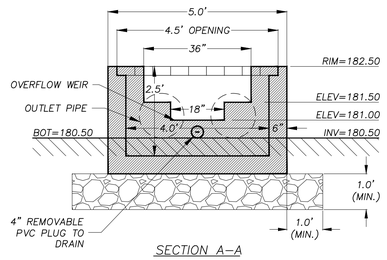
SECTION B–B



PLAN VIEW

INFILTRATION BASIN #1 OUTLET DETAIL (POCS-1)

NO SCALE



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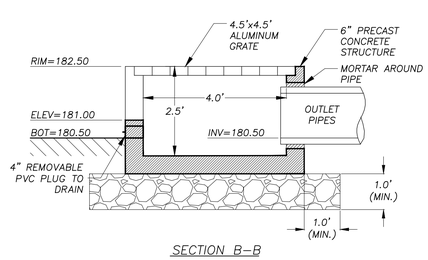
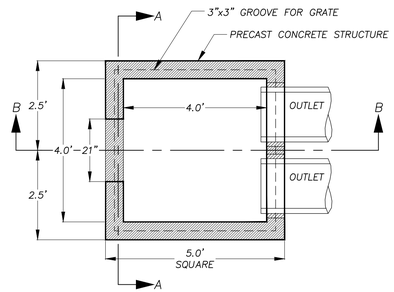


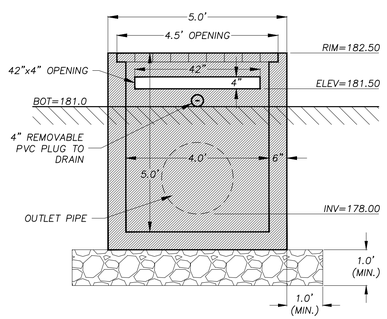
SECTION B–B



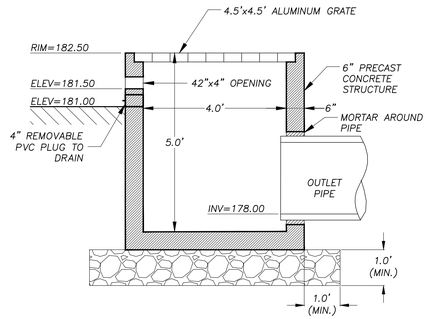
PLAN VIEW

INFILTRATION BASIN #2 OUTLET DETAIL (POCS-2)

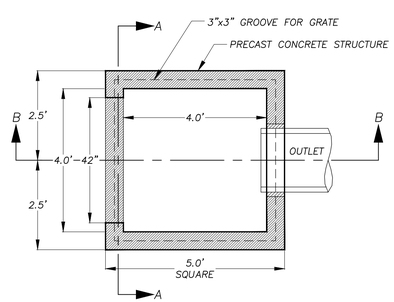
NO SCALE



SECTION A–A



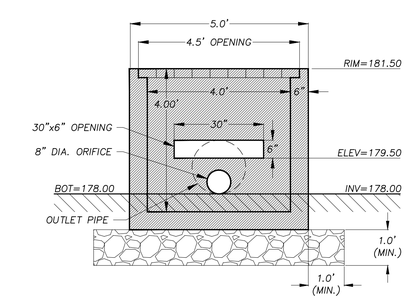
SECTION B–B



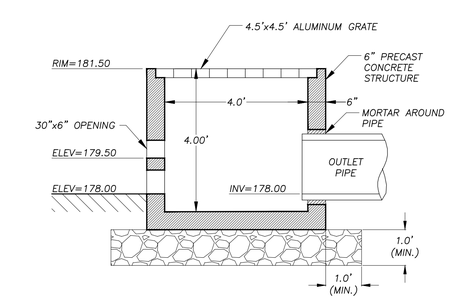
PLAN VIEW

INFILTRATION BASIN #3 OUTLET DETAIL (POCS-3)

NO SCALE



SECTION A–A



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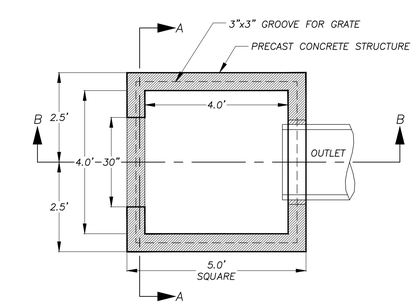
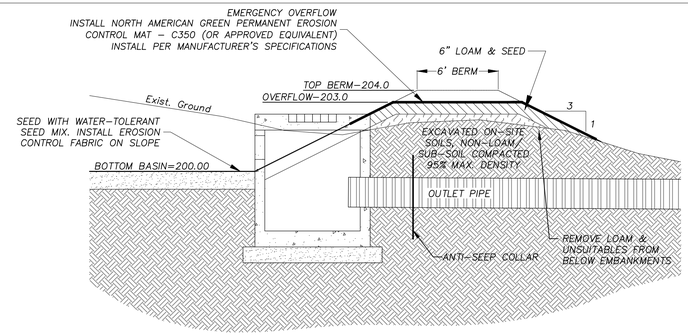
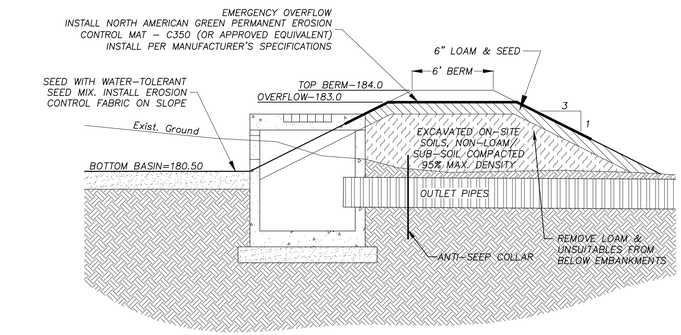


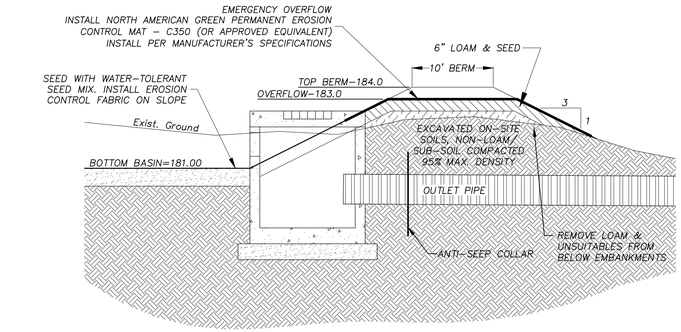
PLAN VIEW

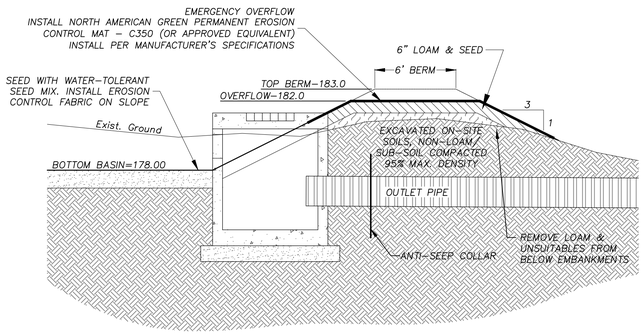
INFILTRATION BASIN #4 OUTLET DETAIL (POCS-4)

NO SCALE









INFILTRATION BASIN NOTES

1. INFILTRATION BASIN BOTTOM TO BE LOCATED A MINIMUM OF 2.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW).
2. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER–TOLERANT GRASS.
3. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE INFILTRATION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
6. IF INFILTRATION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
7. ALL DRAINAGE AREAS TO AN INFILTRATION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF TOPSOIL/COMPOST MIX AND SEED MIX.
8. INFILTRATION BASIN BOTTOMS AND EMBANKMENTS TO BE SEEDED AS NOTED ON PLANS. NO TREES OR SHRUBS TO BE PLANTED WITHIN INFILTRATION BASINS OR EMBANKMENTS. DO NOT USE SOD.

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INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

FILIPE J. CRAVO CIVIL No. 48376 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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Site Plans

Proposed Condominium Community

Assessor's Map 66, Block 2, Lot 8
497 South Westfield Street · Agawam, MA

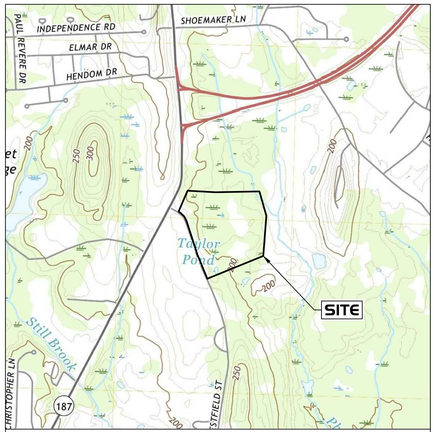
AS PREPARED FOR

Joe Tirone & Ralph Depalma

36 Canterbury Lane
Feeding Hills, MA 01030

SITE INFORMATION		
LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



SOURCE: USGS

NORTH

September 19, 2022
Revised: 10/26/22

BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA · 01085
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RLA Project Number: 090506

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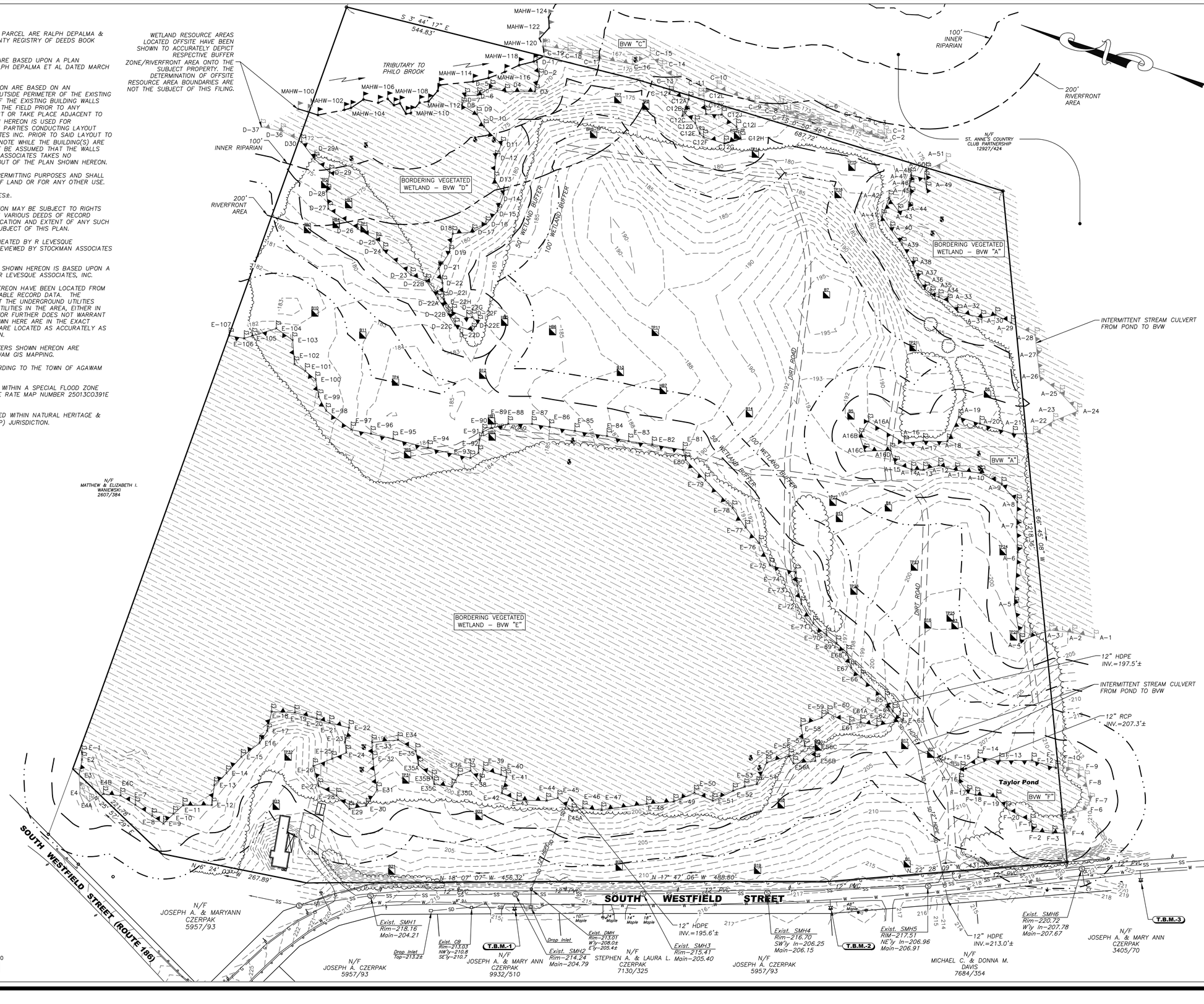
NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE RALPH DEPALMA & GIUSEPPE TIRONE. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 14554 PAGE 323.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON A PLAN PREPARED BY D.L. BEAN, INC. FOR RALPH DEPALMA ET AL DATED MARCH 21, 2005.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCEL CONTAINS 49.81 ACRES±.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLAND RESOURCE AREAS WERE DELINEATED BY R LEVESQUE ASSOCIATES, INC. IN 2021 AND PEER REVIEWED BY STOCKMAN ASSOCIATES IN JUNE 2022.
8. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND AVAILABLE RECORD DATA. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
11. SUBJECT PARCEL IS ZONED A–3 ACCORDING TO THE TOWN OF AGAWAM ZONING MAP.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0391E – EFFECTIVE DATE: 7/16/13.
13. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.



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WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MARC E. SHUTE No. 39610 REGISTERED LAND SURVEYOR COMMONWEALTH OF MASSACHUSETTS

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

REVISIONS:	DATE:
A. Wetland Peer Review	6/17/22
B. Wetland Peer Review	6/22/22
C. Wetland Peer Review	7/26/22
D. Updated Riverfront Area	7/28/22

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SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- E EXISTING ELECTRIC MANHOLE
- T EXISTING TELEPHONE MANHOLE
- W EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VAVLE
- PROPOSED HYDRANT
- GV EXISTING GAS VALVE
- S EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- D EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- OBS-1 OBSERVATION HOLE LOCATION
- PT-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- WETLAND
- EXISTING STONE WALL
- TREE LINE
- × 102.3 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- • 99.4 PROPOSED SPOT GRADE
- PROPOSED CONTOUR
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF DOUBLE EROSION CONTROL BARRIER

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER/LANDSCAPE ARCHITECT AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.
   A. SITE PREPARATION
      - -COMPLETE ALL ROUGH GRADING ACTIVITIES
      - -REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
      - -EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
      - -SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
      - -THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.
   B. ESTABLISHMENT
      - -EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
      - -UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
      - -APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
      - -VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
      - -PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.
   C. MAINTENANCE
      - -ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION. APPLICATION STANDARDS:
   - -REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
   - -SCARIFY SURFACE PRIOR TO SEED APPLICATION.
   - -APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS TO THE WETLAND. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:
   A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
   B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
   C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL NE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENVIRONMENTAL PROFESSIONALS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

DEMO NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
5. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
6. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. CONTRACTOR SHALL PROMPTLY TRANSPORT DEMOLISHED MATERIALS OFF OWNERS PROPERTY AND LEGALLY DISPOSE OF. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL PAY ANY DUMPING FEES.
8. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
9. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
10. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, LIGHT POLE BASES, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
13. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2) REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. FINAL FOUNDATION PLANTINGS PLANS AND LISTS TO BE PROVIDED BY LANDSCAPE CONTRACTOR AND SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
11. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
12. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
13. DURING THE INSTALLATION OF PLANT MATERIAL AND OTHER LANDSCAPE FEATURES LANDSCAPE/SITE/IRRIGATION CONTRACTORS SHALL PAY SPECIAL ATTENTION TO THE LOCATION OF PRE-EXISTING, AS WELL AS, NEWLY INSTALLED UTILITIES. CONTRACTOR SHALL REFER TO THE APPLICABLE SHEETS HEREIN AND KEEP A RECORD OF ON-SITE CHANGES AND PLAN/SKETCH REVISIONS THAT MAY AFFECT UTILITY AND DRAINAGE LOCATIONS.
14. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
15. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
   A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RAT OF 50 LBS/1,000 S.F.
   B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
   C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
   D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F.

SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

   E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F. UNLESS HYDROSEEDING WAS USED.
   F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHE IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.
16. ALL SLOPES STEEPER THAN 1:5 SHALL BE BLANKETED W/ EROSION CONTROL FABRIC AND /OR HYDROSEEDED AND INSPECTED BY THE LANDSCAPE ARCHITECT.

MATERIALS CONSTRUCTION NOTES

1. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 40, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE A MINIMUM CLEARANCE OF 2" BETWEEN OUTSIDE OF STEEL AND FACE OF CONCRETE. UNLESS CAST AGAINST EXPOSED SOIL, IN WHICH CASE A MINIMUM OF 3" OF CLEARANCE IS REQUIRED.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

NOTES, SYMBOL & LINE LEGEND AND ABBREVIATION

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
7/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.

2. THE OWNER AND R LEVESQUE ASSOCIATES, INC. AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.

3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.

4. CONTRACTOR SHALL PROVIDE TWO SETS OF AS-BUILT DRAWINGS, PRIOR TO FINAL PAYMENT. AS-BUILT DRAWINGS BY A REGISTERED LAND SURVEYOR SHALL INCLUDE ALL INSTALLED UTILITIES WITH VERTICAL AND HORIZONTAL LOCATIONS AND BE SATISFACTORY TO THE BUILDING OFFICIAL FOR ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

5. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150 AND SECTION 159-19C, OF TOWN CODE.

6. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

7. ALL WORK IN THE CITY RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.

8. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.

9. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.

10. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.

11. THE GENERAL CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.

12. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.

13. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.

14. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.

15. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.

16. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.

17. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.

19. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.

20. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

21. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.

22. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS HIGHWAY (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

23. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.

24. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.

25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.

26. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.

27. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.

2. ALL CONSTRUCTION IN CITY RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.

3. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.

4. SITE CONTRACTOR SHALL REFER TO ARCHITECTURAL DETAILS AND SPECIFICATIONS FOR REQUIREMENTS OF CONSTRUCTION AND JOINT SPACING OF SIDEWALKS, RAMPS, AND CURBING ADJACENT TO BUILDING.

5. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.

6. SITE CONTRACTOR SHALL PAINT ALL LIGHT POLE BASES, CURBS, FIRE HYDRANTS, PIPE BOLLARDS SIGN BASES, AND OTHER SITE AND UTILITY APPURTENANCES. CONTRACTOR SHALL PAINT OR REPAINT FIRE LANES WHERE REQUIRED BY LOCAL CODE.

7. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.

8. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASS HIGHWAY, AND THE TOWN OF AGAWAM. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.

9. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

10. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND LANDSCAPE ARCHITECT/ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.

11. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE LANDSCAPE ARCHITECT/ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.

13. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASS HIGHWAY AND/OR THE CITY/TOWN REGULATIONS.

14. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.

15. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.

3. STORM PIPE SHALL BE AS NOTED ON PLANS.

4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.

5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.

6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.

7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.

9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20) LIDS SHALL BE LABELED "STORM SEWER".

10. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN.

12. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

13. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.

14. TOPOGRAPHIC INFORMATION TAKEN FROM A EXISTING CONDITIONS PLAN BY R LEVESQUE ASSOCIATES, INC. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.

15. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.

16. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

17. EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.

18. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT. ALL FOOTINGS AND FOUNDATIONS FOR PROPOSED STRUCTURES SHALL BE EXCAVATED TO NATIVE SUBGRADE AND COMPACTED PER ARCHITECTURAL SPECIFICATIONS.

19. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.

20. CONTRACTOR TO SPREAD ON-SITE STOCKPILE TO A 4" DEPTH ON ALL AREAS TO BE SODDED/SEEDED AS SHOWN ON LANDSCAPE DRAWINGS. SITE CONTRACTOR FINE GRADE OF INSTALLED TOPSOIL PRIOR TO HYDROMULCHING BY LANDSCAPE SUB-CONTRACTOR.

SITE UTILITY NOTES

GENERAL:

1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.

2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.

3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.

4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.

5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.

6. PRIOR TO CONSTRUCTION OF UTILITIES REFER TO ARCHITECTURAL INTERIOR PLUMBING DRAWINGS FOR ALL TIE-INS.

7. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.

8. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

9. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICE.

10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.

11. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.

12. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.

13. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.

14. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

16. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.

17. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:

1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.

2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.

3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.

4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.

5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.

6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.

7. ALL SANITARY SEWER MANHOLE INVERTS ARE TO BE BRICK AS SHOWN IN THE TOWN OF AGAWAM SEWER MANHOLE DETAIL.

WATER:

1. CONTRACTOR SHALL CONTACT THE CITY WATER RESOURCE DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.

2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.

3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).

4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.

5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).

6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.

7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER TOWN OF AGAWAM WATER DEPARTMENT STANDARDS.

9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.

10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE RESTRAINT SCHEDULE. (SEE DETAIL SHEETS)

11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.

12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.

13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.

14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.

15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.

16. ALL WATER MAINS SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.

17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.

18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.

19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER RESOURCE DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

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40 School Street
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CONSTRUCTION NOTES

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE-CONSTRUCTION MEETING ON-SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI-TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.

MA+WW-100
MA+WW-102
MA+WW-106
MA+WW-108
TRIBUTARY TO PHILLIPS BROOK
MA+WW-112
MA+WW-114
MA+WW-116
MA+WW-118
MA+WW-120

100' INNER RIPARIAN
200' RIVERFRONT AREA
APPROXIMATE LIMIT OF TREE CLEARING
SILT FENCE/ LIMIT OF WORK
50' WETLAND BUFFER
100' WETLAND BUFFER
INTERMITTENT STREAM CULVERT FROM POND TO BVW

LAST SECTION OF PIPE TO ABANDONED IN PLACE
EXISTING 12" HDPE DRAIN PIPE TO BE REMOVED
EXISTING DRAIN MANHOLE TO BE REPLACED WITH OIL/SEDIMENT SEPARATOR
EXISTING DRIVEWAY TO BE REMOVED
EXISTING HOUSE & FOUNDATION TO BE REMOVED
APPROX. SAW CUT LINES/ LIMITS OF FULL OVERLAY (SEE DETAIL, SHEET D-4)
LAST FEW SECTIONS OF PIPE TO REMAIN IN PLACE (40'±)
12" HDPE INV.=197.5'±
12" RCP INV.=207.3'±
EXISTING 12" DRAIN PIPES TO BE RELAYED
INSTALL ANTI-TRACKING PAD

SOUTH WESTFIELD STREET (ROUTE 186)
SOUTH WESTFIELD STREET

Exist. SMH1 Rim-218.16 Main-204.21
Drop Inlet Top-213.2±
Exist. CB Rim-213.03 NW'ly-210.8 SE'ly-210.7
Drop Inlet
Exist. SMH2 Rim-214.24 Main-204.79
Exist. DMH Rim-213.01 W'ly-208.0± E'ly-205.4±
12" HDPE INV.=195.6'±
Exist. SMH3 Rim-215.41 Main-205.40
Exist. SMH4 Rim-216.70 SW'ly In-206.25 Main-206.15
Exist. SMH5 RIM-217.51 NE'ly In-206.96 Main-206.91
12" HDPE INV.=213.0'±
Exist. SMH6 Rim-220.72 W'ly In-207.78 Main-207.67

GRAPHIC SCALE
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DEMOLITION & REMOVALS PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT LEVESQUE REGISTERED LANDSCAPE ARCHITECT NO. 1358
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS-SECTION ON SHEET C-7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D-5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

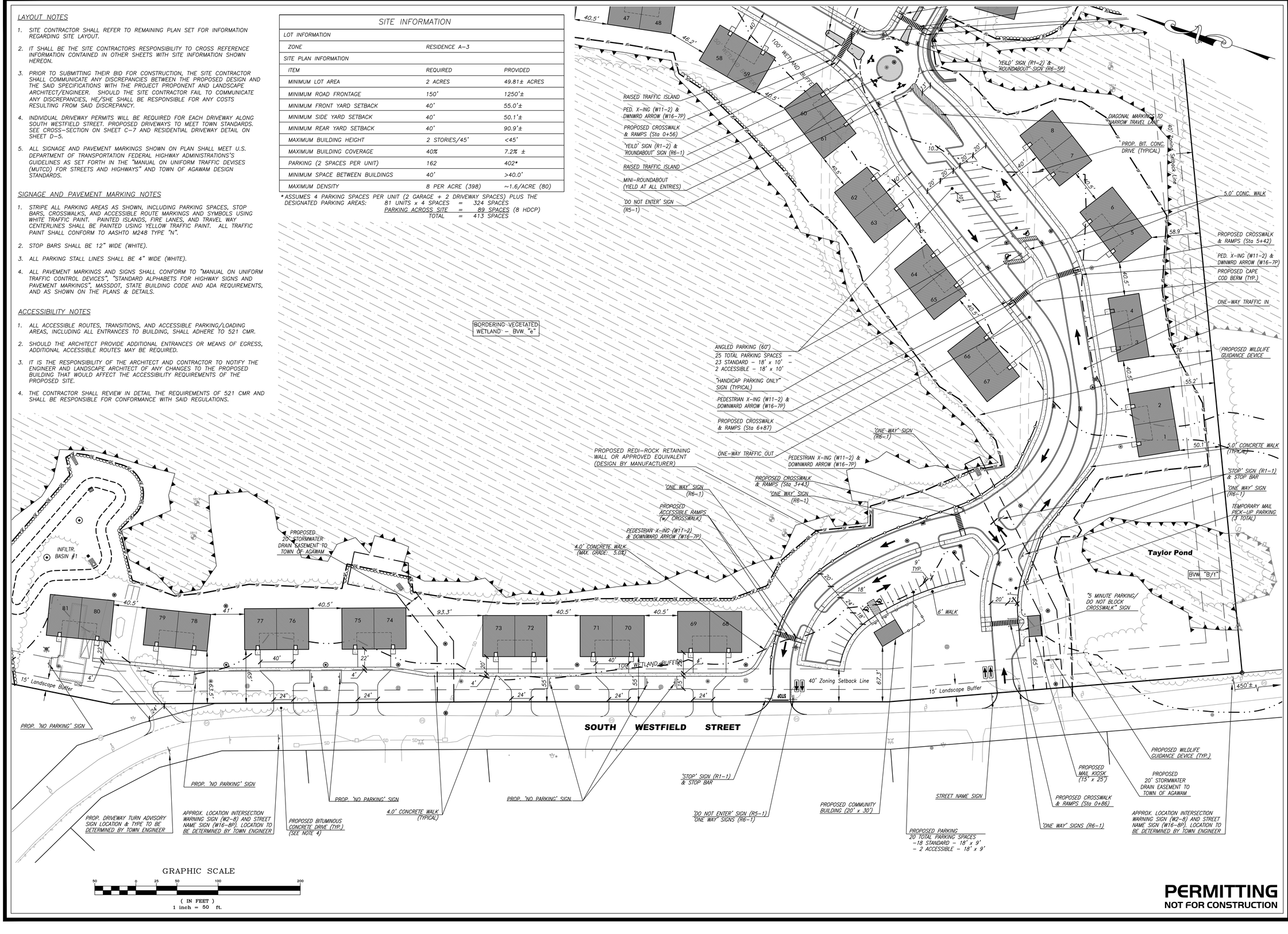
ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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40 School Street
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rlaland.com

LAYOUT & MATERIALS PLAN
(Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT S. LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

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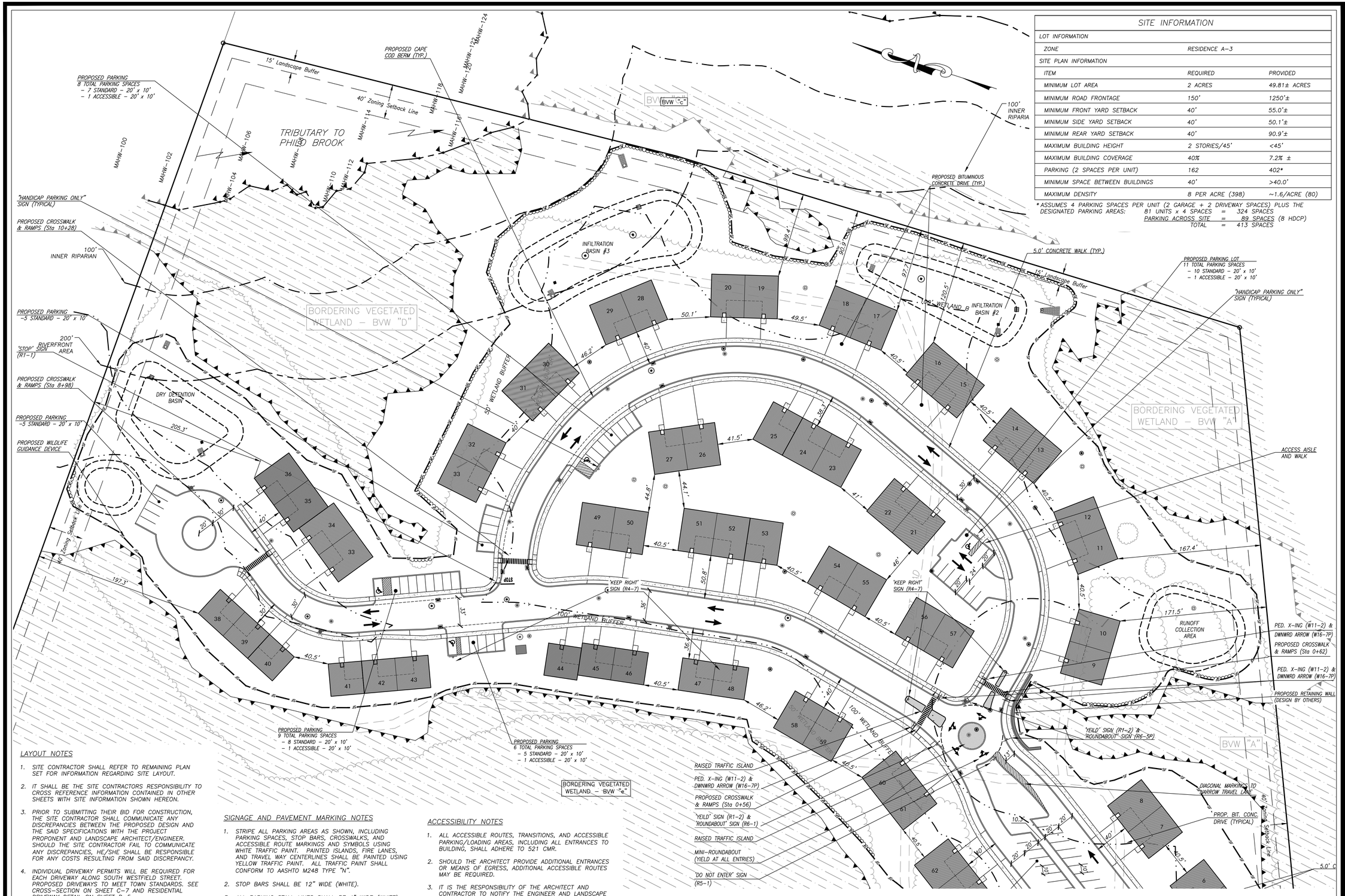

SITE INFORMATION		
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ZONE	RESIDENCE A–3	
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81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES

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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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LAYOUT & MATERIALS PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
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COMMONWEALTH OF MASSACHUSETTS
ROBERT LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1398
9/19/22

PREPARED FOR:

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CONSTRUCTION NOTES

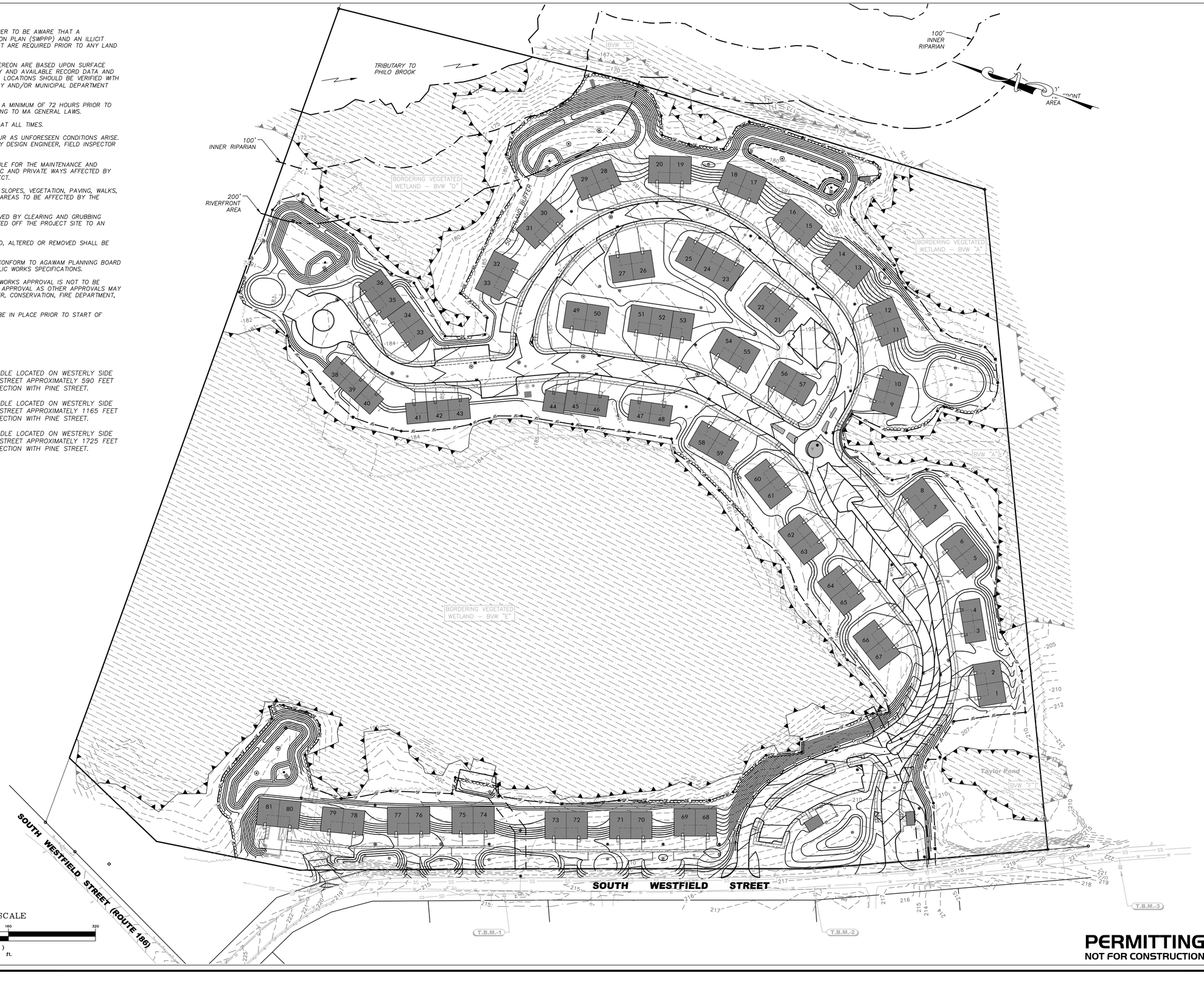
1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

BENCHMARKS

T.B.M.-1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 590 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 216.65

T.B.M.-2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 219.68

T.B.M.-3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 224.29



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OVERALL SITE GRADING

Map 66, Block 2, Lot 8
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ROBERT N. LEVESQUE
NO. 1595
REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Drainage revisions	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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C-6	A

SHORT–TERM EROSION CONTROL MAINTENANCE

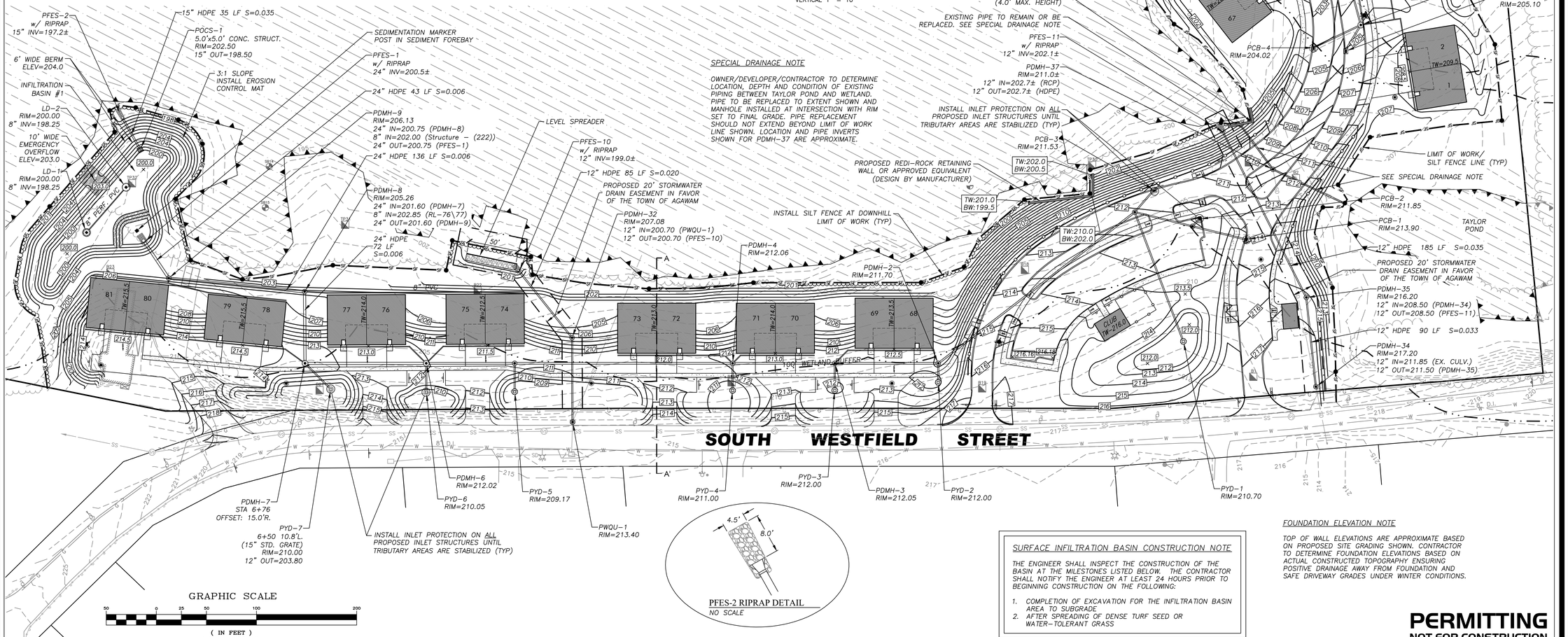
1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF–SITE SEDIMENTATION IF DEEMED NECESSARY BY ON–SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24–HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF–SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE–CONSTRUCTION MEETING ON–SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI–TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

TYPICAL DRIVEWAY SECTION (A-A')
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'

PFES–2 RIPRAP DETAIL
NO SCALE

SPECIAL DRAINAGE NOTE

OWNER/DEVELOPER/CONTRACTOR TO DETERMINE LOCATION, DEPTH AND CONDITION OF EXISTING PIPING BETWEEN TAYLOR POND AND WETLAND. PIPE TO BE REPLACED TO EXTENT SHOWN AND MANHOLE INSTALLED AT INTERSECTION WITH RIM SET TO FINAL GRADE. PIPE REPLACEMENT SHOULD NOT EXTEND BEYOND LIMIT OF WORK LINE SHOWN. LOCATION AND PIPE INVERTS SHOWN FOR PDMH–37 ARE APPROXIMATE.

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER–TOLERANT GRASS

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

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40 School Street
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GRADING & DRAINAGE PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
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RIVERFRONT AREA	
RIVERFRONT AREA ON SITE	168,123 SF ±
PROPOSED INNER RIPARIAN DISTURBANCE (0-100)	0 SF ±
PROPOSED RIVERFRONT AREA DISTURBANCE (100-200) *THIS DISTURBANCE (STORMWATER MANAGEMENT RELATED ACTIVITIES) IS EXCEMPT FROM RIVERFRONT AREA ALTERATION CALCULATIONS UNDER 310 CMR 10.58(4)(d)(1)	27,554 SF ±

PFES-12 DETAIL
NO SCALE

PFES-8 DETAIL
NO SCALE

PFES-3A & 4A DETAIL
NO SCALE

TRIBUTARY TO PHILO BROOK

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

BORDERING VEGETATED WETLAND – BVW "D"

BORDERING VEGETATED WETLAND – BVW "A"

BVW "C"

BVW "B"

100' INNER RIPARIAN

200' RIVERFRONT AREA

100' WETLAND BUFFER

RIVERFRONT AREA DISTURBANCE 3,660 SF

RIVERFRONT AREA DISTURBANCE 23,884 SF

DRY DETENTION BASIN

INFILTRATION BASIN #2

INFILTRATION BASIN #3

BIORETENTION AREA

SPILLWAY ELEV=182.5

12" WIDE GRAVEL STRIP

PFES-12 w/ RIPRAP 18" INV=177.0±

18" HDPE 38 LF S=0.026

EMERGENCY OVERFLOW ELEV=182.0

PFES-9 w/ RIPRAP 30" INV=178.4±

PFES-6 w/ RIPRAP 24" INV=181.6±

24" HDPE 87 LF S=0.006

6' WIDE BERM ELEV=183.0

3:1 SLOPE INSTALL EROSION CONTROL MAT

SEDIMENTATION MARKER POST IN SEDIMENT FOREBAY

10' WIDE EMERGENCY OVERFLOW ELEV=183.0

LD-5 RIM=181.00 8" INV=179.25

8" PERF. PVC

PFES-8 w/ RIPRAP 24" INV=173.0±

24" HDPE 50 LF S=0.101

POCS-3 5.0'x5.0' CONC. STRUCT. RIM=181.30 24" OUT=178.00

LD-6 RIM=181.00 8" INV=179.25

10' WIDE BERM ELEV=184.0

24" HDPE 129 LF S=0.005

PYD-15 RIM=187.25 24" IN=183.25 (PYD-14) 24" OUT=183.25 (PDMH-27)

24" HDPE 37 LF S=0.005

PYD-14 RIM=187.50 24" IN=183.45 (PYD-13) 8" IN=184.70 (RL-51) 24" OUT=183.45 (PYD-15)

PYD-16 RIM=182.80 (12" STD. GRATE) 8" OUT=181.56

PFES-5 w/ RIPRAP 8" INV=180.5±

PYD-13 RIM=187.25 12" IN=185.25 (PYD-12) 12" IN=185.25 (PDMH-36) 24" OUT=184.25 (PYD-14)

12" HDPE 110 LF S=0.010

LD-3 RIM=180.50 8" INV=178.75

100' INNER RIPARIAN

PYD-12 RIM=189.90 12" IN=186.40 (PCB-24) 12" OUT=186.40 (PYD-13)

12" HDPE 65 LF S=0.010

LD-4 RIM=180.50 8" INV=178.75

6' WIDE BERM ELEV=184.0

SEDIMENTATION MARKER POST IN SEDIMENT FOREBAY

3:1 SLOPE INSTALL EROSION CONTROL MAT

200' RIVERFRONT AREA

POCS-2 5.0'x5.0' CONC. STRUCT. RIM=183.52 15" OUT=180.50 15" OUT=180.50

15" HDPE (2) 28 LF S=0.053

PFES-4A & PFES-4B w/ RIPRAP 15" INV=179.0±

10' WIDE EMERG. OVERFLOW ELEV=183.0

PFES-3 w/ RIPRAP 24" INV=180.5±

24" HDPE 28 LF S=0.005

PYD-11 RIM=183.74 24" IN=180.65 (PDMH-22) 8" IN=181.50 (RL-15) 24" OUT=180.65 (PFES-3)

24" HDPE 147 LF S=0.005

PDMH-22 RIM=184.55 12" IN=182.40 (PYD-9) 18" IN=181.90 (PDMH-21) 24" OUT=181.40 (PYD-11)

PYD-10 RIM=183.60 (12" STD. GRATE) 12" OUT=181.55

18" HDPE 84 LF S=0.057

12" HDPE 224 LF S=0.012

10' WIDE OVERFLOW ELEV=189.6

PYD-9 RIM=189.00 (12" DOME) 12" IN=185.60 12" OUT=185.00

PYD-8 RIM=189.00 (12" DOME) 12" OUT=185.60

8' WIDE BERM ELEV=190.0

RUNOFF COLLECTION AREA

PROPOSED RETAINING WALL (DESIGN BY OTHERS)

PCB-9 RIM=194.65

PDMH-14 RIM=194.39

PCB-8 RIM=194.77

24" HDPE 73 LF S=0.006

24" HDPE 153 LF S=0.005

12" HDPE 69 LF S=0.013

12" HDPE 115 LF S=0.005

PDMH-28 RIM=187.14 24" IN=182.15 (PDMH-27) 8" IN=181.98 (RL-29) 24" OUT=182.15 (PFES-6)

PDMH-31 RIM=184.90

PCB-23 RIM=185.90

PCB-15 RIM=185.38

PCB-22 RIM=185.92

PCB-13 RIM=187.66

PCB-12 RIM=187.66

PCB-14 RIM=185.32

PCB-24 RIM=191.50 12" OUT=187.05

PDMH-36 RIM=190.10 8" IN=186.40 (RL-54) 12" IN=186.40 (PDMH-29) 12" OUT=186.15 (PYD-13)

PDMH-29 RIM=190.94 8" IN=186.90 (RL-57) 8" IN=186.90 (RL-48) 12" OUT=187.00 (PDMH-36)

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

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SHORT-TERM EROSION CONTROL MAINTENANCE

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NOTES

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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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40 School Street
Westfield, MA 01085
rlaland.com

GRADING & DRAINAGE PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER

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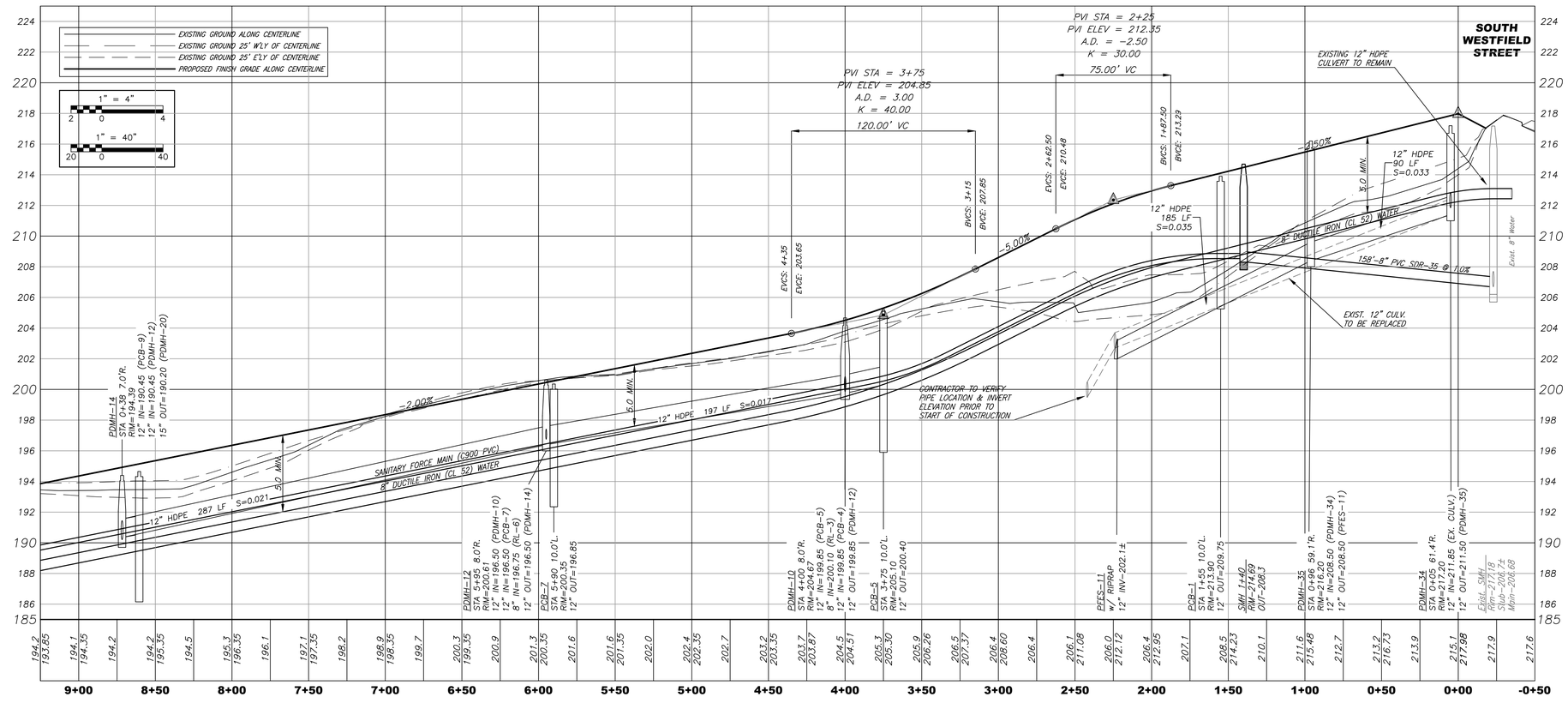
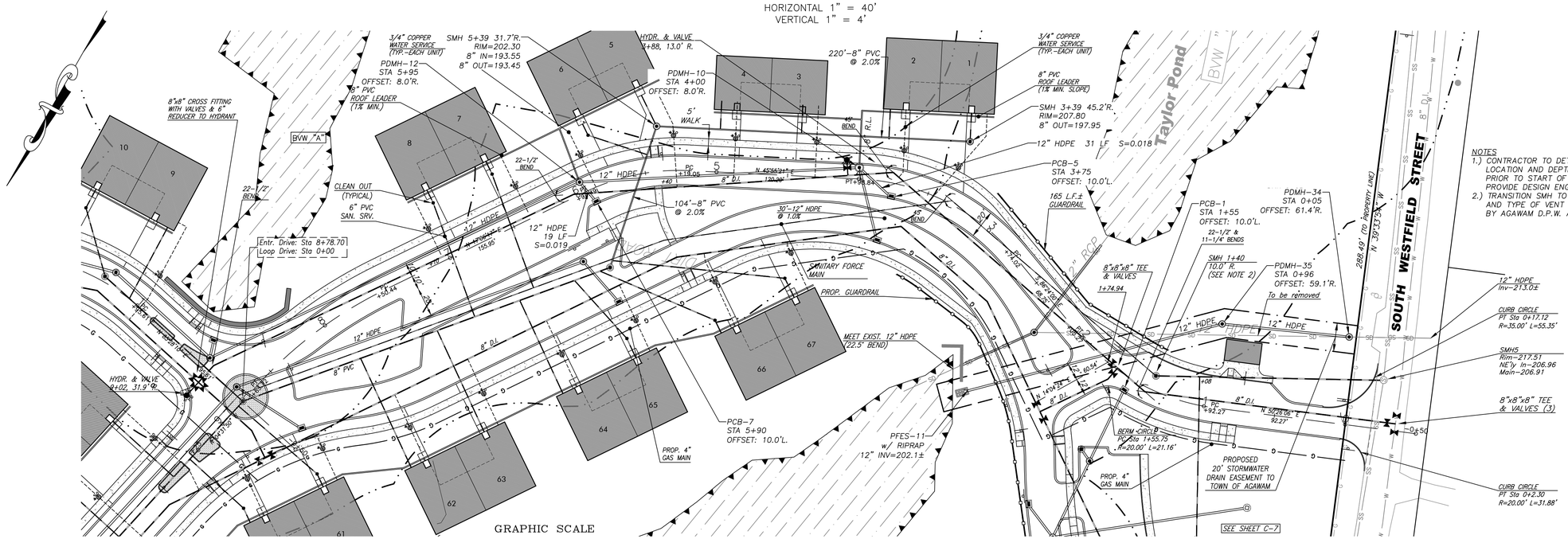


PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
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NOTES

1.) CONTRACTOR TO DETERMINE SIZE & TYPE, LOCATION AND DEPTH OF EXSITING PIPE PRIOR TO START OF CONSTRUCTION AND PROVIDE DESIGN ENGINEER WITH FINDINGS.
2.) TRANSITION SMH TO BE VENTED. LOCATION AND TYPE OF VENT TO BE APPROVED BY AGAWAM D.P.W. AND TOWN ENGINEER.

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PLAN & PROFILE
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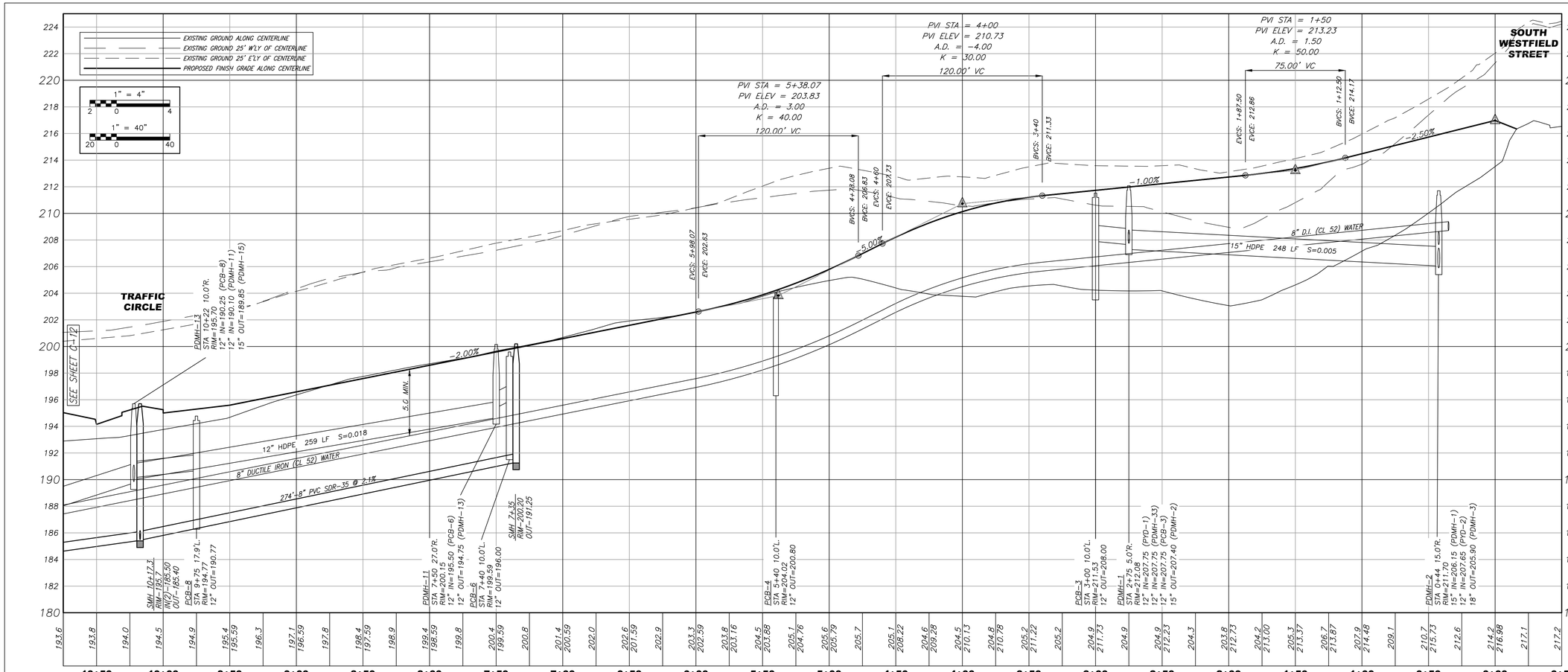

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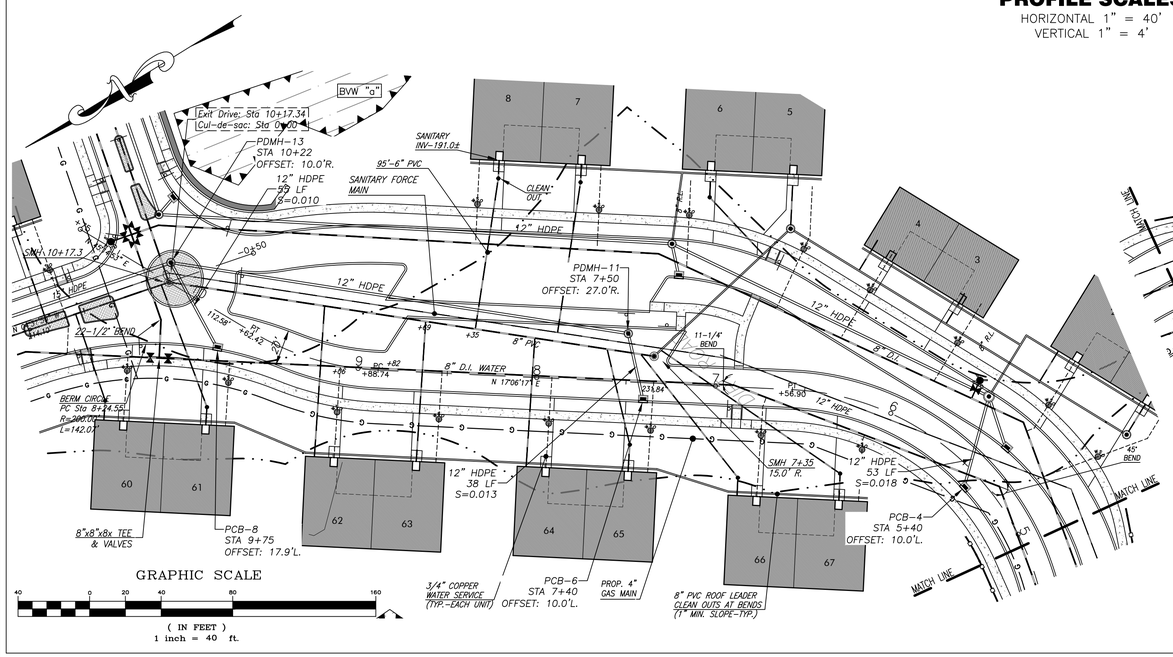

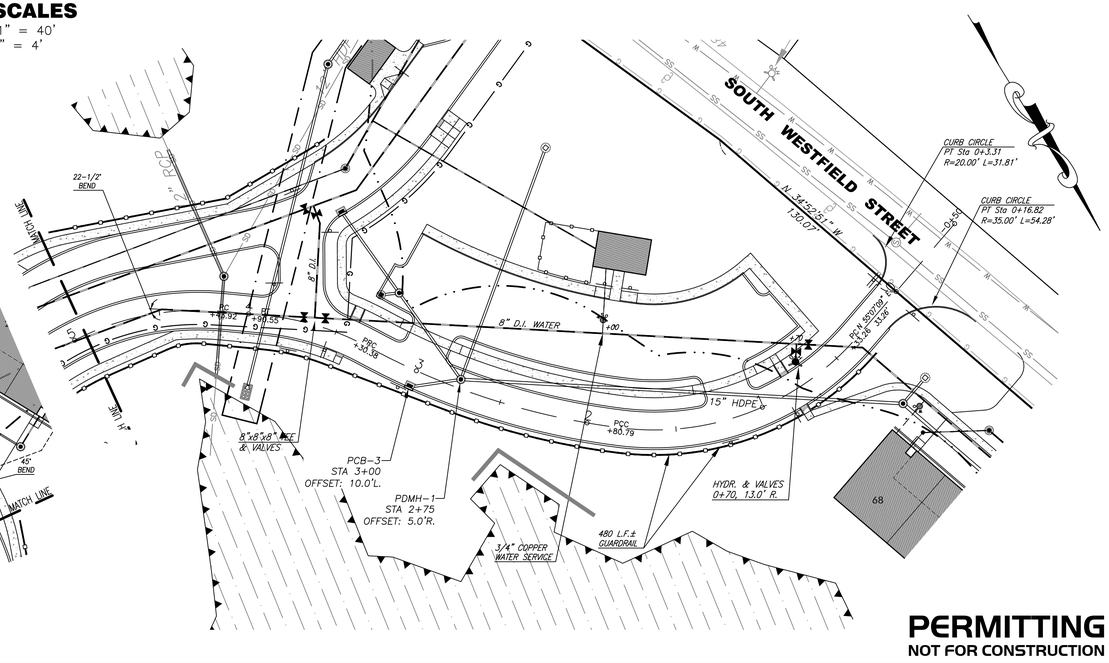

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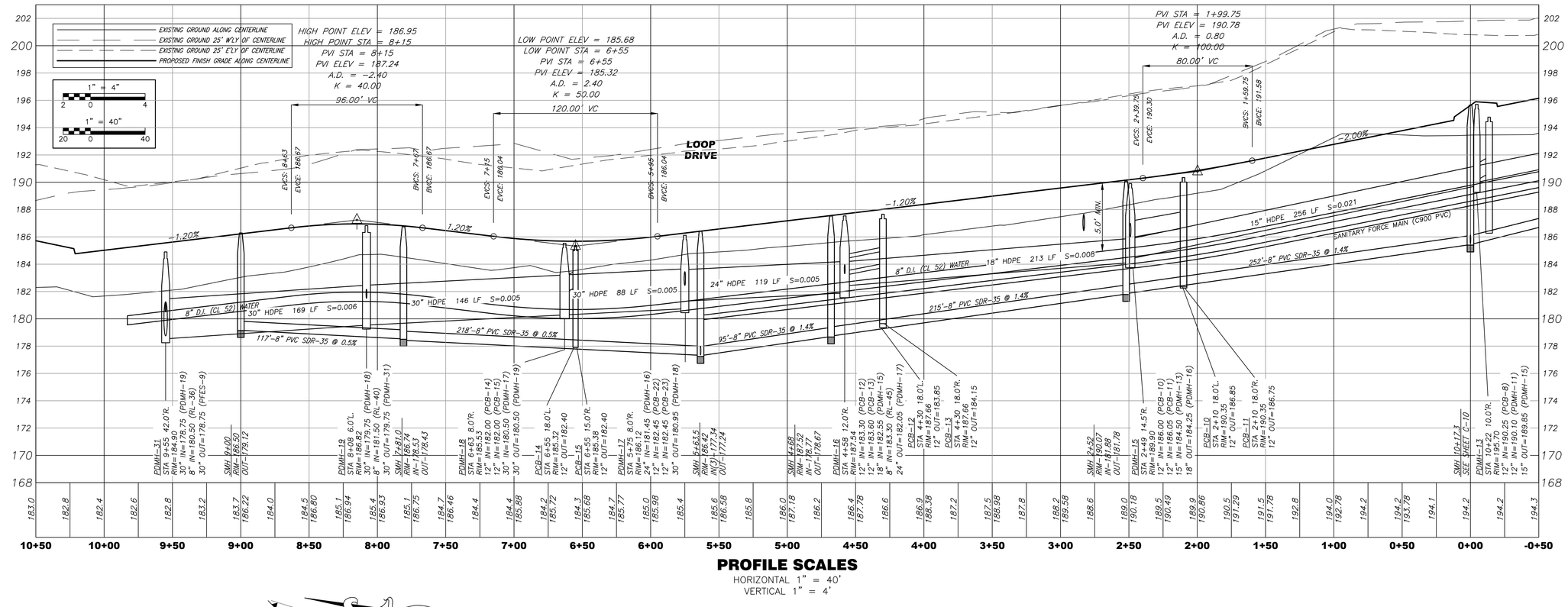

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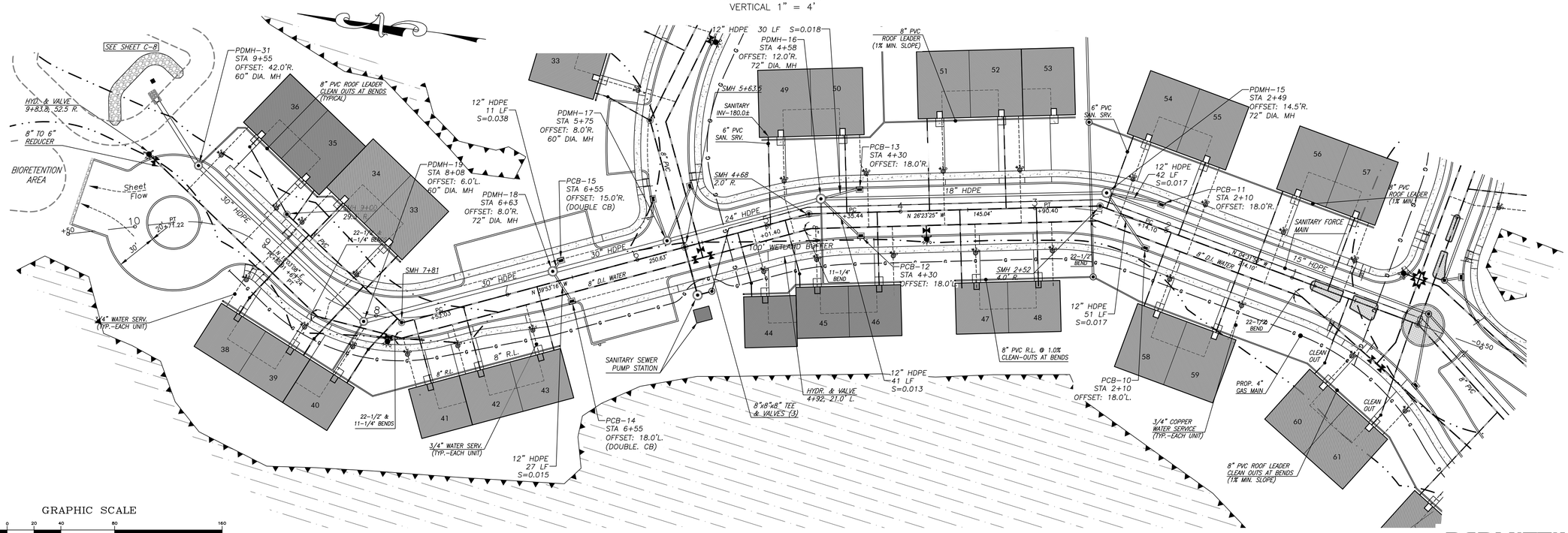
VERTICAL 1" = 4'



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

PERMITTING
NOT FOR CONSTRUCTION

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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
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ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

PLAN & PROFILE
CUL-DE-SAC DRIVE
Sta 0+00 to Sta 10+50

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. GRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
C-11	-

EXISTING GROUND ALONG CENTERLINE
EXISTING GROUND 25' W'LY OF CENTERLINE
EXISTING GROUND 25' E'LY OF CENTERLINE
PROPOSED FINISH GRADE ALONG CENTERLINE

1" = 4"
1" = 40"

CUL-DE-SAC DRIVE

PCB-23 STA 10+40 15.0'R. RIM=188.36 12" OUT=183.00
PCB-22 STA 10+35 15.2'L. RIM=185.92 12" OUT=183.00

12" HDPE
5.0' MIN.
-0.50%
8" DUCTILE IRON (CL 52) WATER
192'-8" PVC SDR-35 @ 0.5%
96'-8" PVC SDR-35 @ 0.5%

SMH 7+63.5 SEE SHEET C-12
SMH 1+65 RIM=186.18 IN=178.48 OUT=177.82
SMH 7+08 RIM=187.14 IN=178.38 OUT=178.88

PVI STA = 7+63.05
PVI ELEV = 187.58
A.D. = 0.50
K = 100.00
50.00' VC
EVCS: 7+88.05
EVCE: 187.46
BVCS: 7+38.05
BVCE: 187.83

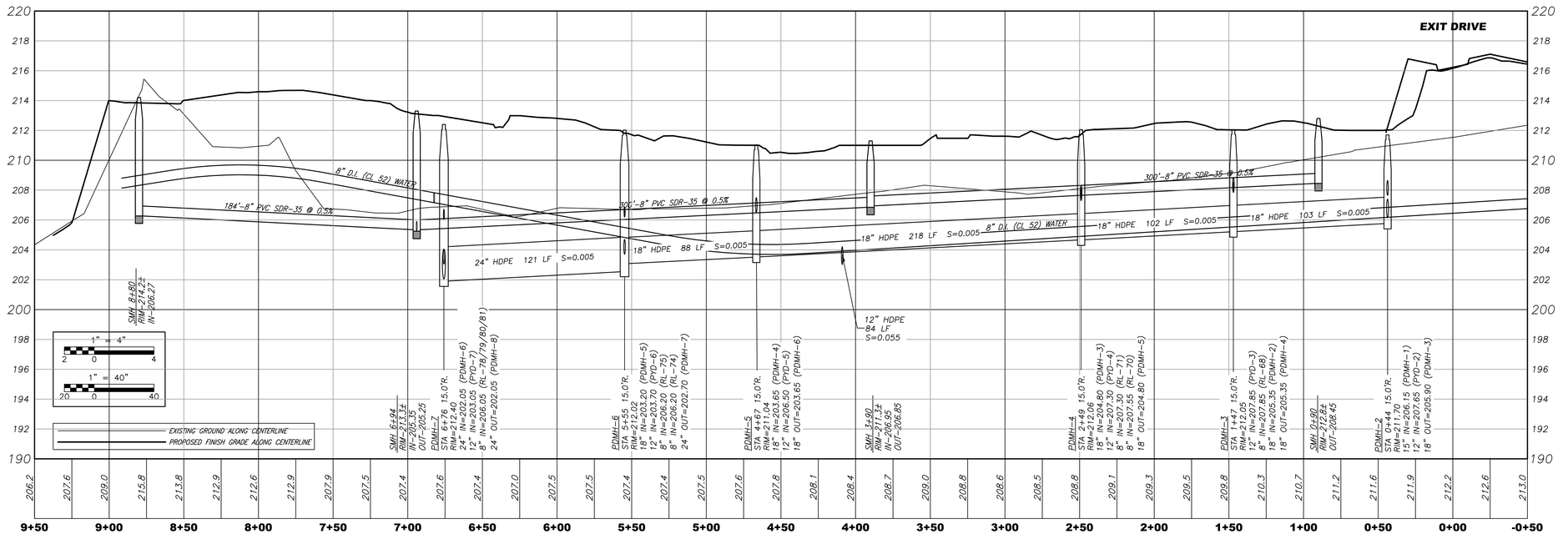
PDMH-27 STA 7+45 7.0'R. RIM=187.63 15" IN=183.35 (PDMH-26) 12" IN=183.60 (PCB-21) 12" IN=183.60 (PCB-22) 8" IN=184.00 (RL-28) 24" IN=182.60 (PYD-15) 24" OUT=182.60 (PDMH-28)
PDMH-26 STA 6+60 13.0'R. RIM=188.36 15" IN=185.25 (PDMH-25) 8" IN=185.00 (RL-20) 15" OUT=184.25 (PDMH-27)
SMH 6+69 RIM=188.48 IN=179.79 OUT=179.69
PDMH-25 STA 5+70 12.0'R. RIM=189.28 15" IN=185.20 (PDMH-24) 15" OUT=185.20 (PDMH-26)
SMH 4+89 RIM=190.39 IN=180.70 OUT=180.60
PCB-18 STA 4+65 15.0'L. RIM=190.27 12" OUT=186.70
PCB-19 STA 4+65 15.0'R. RIM=190.27 12" OUT=186.70
PDMH-23 STA 3+30 6.0'R. RIM=191.29 12" IN=187.90 (PCB-16) 12" IN=187.90 (PCB-17) 8" IN=188.40 (RL-14) 12" OUT=187.90 (PDMH-24)
PCB-16 STA 3+25 15.0'L. RIM=191.67 12" OUT=188.20
PCB-17 STA 3+25 15.0'R. RIM=191.67 12" OUT=188.20
SMH 2+65 RIM=192.43 OUT=183.00
PDMH-21 STA 2+64 41.5'R. RIM=191.12 15" IN=186.65 (PDMH-20) 8" IN=187.00 (RL-12) 18" OUT=186.65 (PDMH-22)
SMH 1+30 RIM=193.84 OUT=186.15
PDMH-20 STA 1+25 10.0'R. RIM=193.76 12" IN=189.30 (PDMH-14) 15" OUT=189.05 (PDMH-21)
PCB-9 STA 0+44 18.7'R. RIM=194.65 12" OUT=190.65
PDMH-14 STA 0+38 7.0'R. RIM=194.39 12" IN=190.45 (PCB-9) 12" IN=190.45 (PDMH-12) 12" OUT=190.20 (PDMH-20)
SMH 1+27.3 SEE SHEET C-10

PDMH-24 STA 4+80 6.3'R. RIM=191.29 12" IN=186.40 (PDMH-23) 12" IN=186.40 (PCB-18) 12" IN=186.40 (PCB-19) 8" IN=186.75 (RL-23) 15" OUT=186.15 (PDMH-25)

15" HDPE 88 LF S=0.010
15" HDPE 94 LF S=0.010
15" HDPE 93 LF S=0.010
12" HDPE 150 LF S=0.010
8" DUCTILE IRON (CL 52) WATER
226'-8" PVC SDR-35 @ 1.0%
170'-8" PVC SDR-35 @ 0.5%
142'-8" PVC SDR-35 @ 0.5%
-1.00%
5.0' MIN.
15" HDPE 89 LF S=0.010
15" HDPE 160 LF S=0.015
115'-8" PVC SDR-35 @ 0.5%

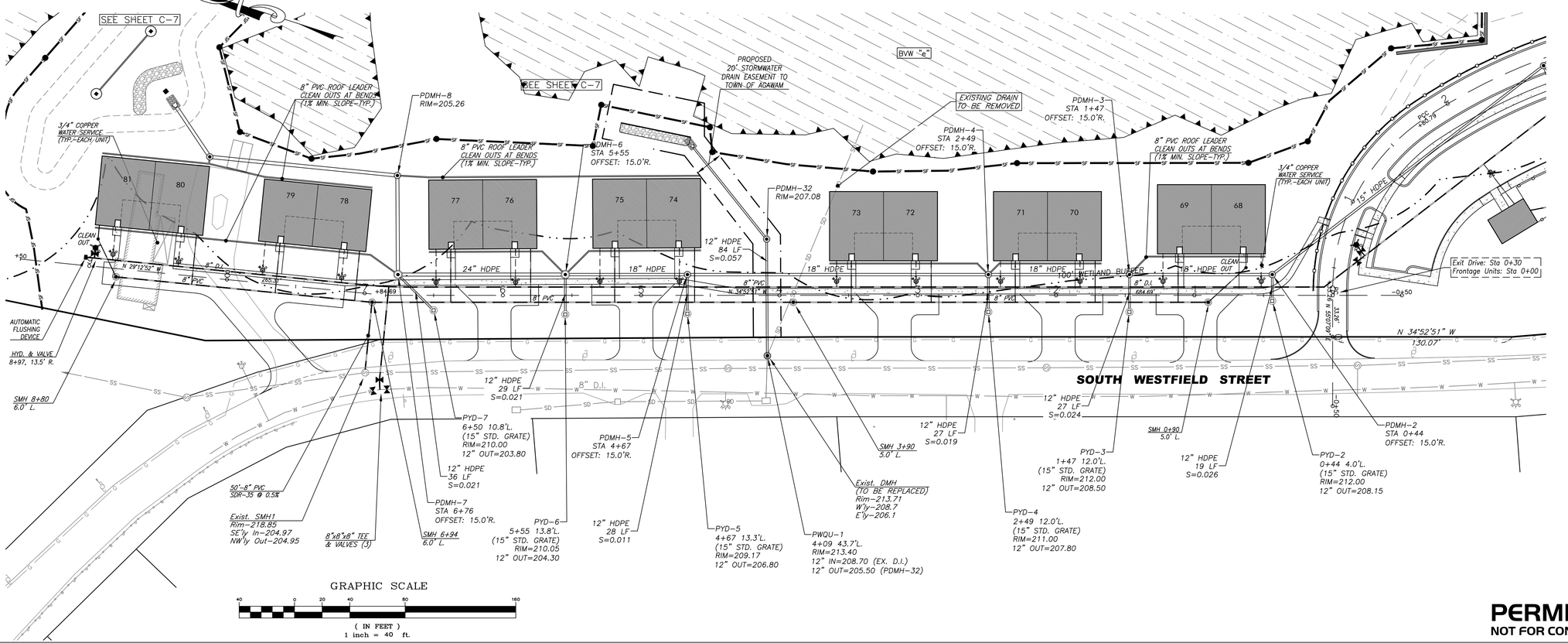
TRAFFIC CIRCLE

| | | |



PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PERMITTING
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RLA

R LEVESQUE ASSOCIATES INC

Landscape Architects
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Environmental Consultants

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40 School Street
Westfield, MA 01085

rlaland.com

PLAN & PROFILE ALONG SOUTH WESTFIELD STREET

Sta -0+50 to Sta 10+00

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Drainage revisions	10/26/22

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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C-13	A

LANDSCAPING NOTES

1.) SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.

2.) IT SHALL BE THE SITE CONTRACORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN TOERH SHEETS WITH LANDSCAPE INFORMATION SHOWN HEREIN.

3.) ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTORS RESPONSIBILITY TO ACQUIRE THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING.

4.) THE LANDSCAPE PLANTING SCHEME SHOWN REPRESENTS THE MINIMUM NECESSARY TO FULFILL THE INTENTION OF THESE PLANS. ADDITIONAL PLANTING WILL BE REQUIRED TO SELECTIVELY FILL VOIDS. LANDSCAPE ARCHITECT RESERVES THE RIGHT, SHOULD IT BE REQUIRED BY FIELD CONDITIONS TO UPWARDLY MODIFY THE PLANT QUANTITIES.

5.) PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

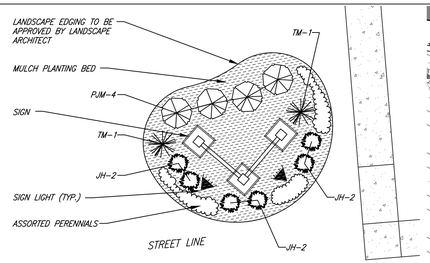
6.) LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATION CONTRACTOR MARK ALL UNDERGROUND UTILITIES AS WELL AS DIG-SAFE SITE PRIOR TO ANY PLANTINGS. LANDSCAPE CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE ANS STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

7.) IRRIGATION SYSTEM LIMITS FOR LAWN AREA TO BE DETERMINED BY OWNER.

8.) ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, R LEVESQUE ASSOCIATES, INC. (RLA) WILL CONDUCT POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENT TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.

9.) ALL PLANTINGS MUST BE MAINTAINED AND THAT PORTION OF THE PUBLIC WAY ABUTTING THE PARCEL AND INCLUDING THE TREEBELT SHALL BE MAINTAINED IN A SAFE AND ATTRACTIVE CONDITION BY THE OWNER OF THE PARCEL.

10.) SEE SHEETS C-15, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



SIGN PLANTING DETAIL
1" = 10'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
Landscape Architects
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Westfield, MA 01085
rlaland.com

SITE LANDSCAPING PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT J. LEVESQUE — MASSACHUSETTS — REGISTERED LANDSCAPE ARCHITECT — NO. 1356
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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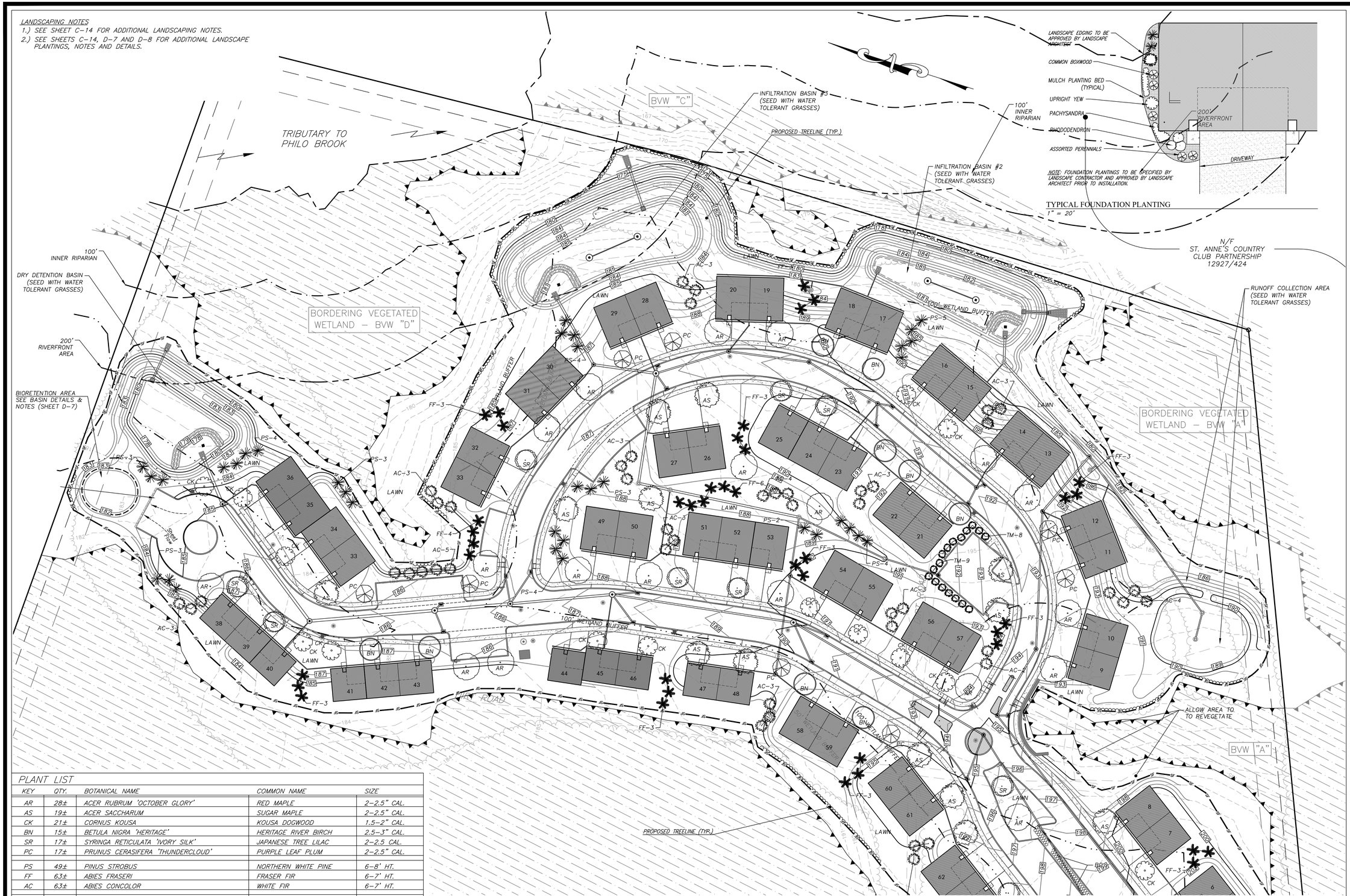
C-14	-

LANDSCAPING NOTES
1.) SEE SHEET C-14 FOR ADDITIONAL LANDSCAPING NOTES.
2.) SEE SHEETS C-14, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



TYPICAL FOUNDATION PLANTING
1" = 20'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PERMITTING
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40 School Street
Westfield, MA 01085
rlaland.com

SITE LANDSCAPING PLAN (Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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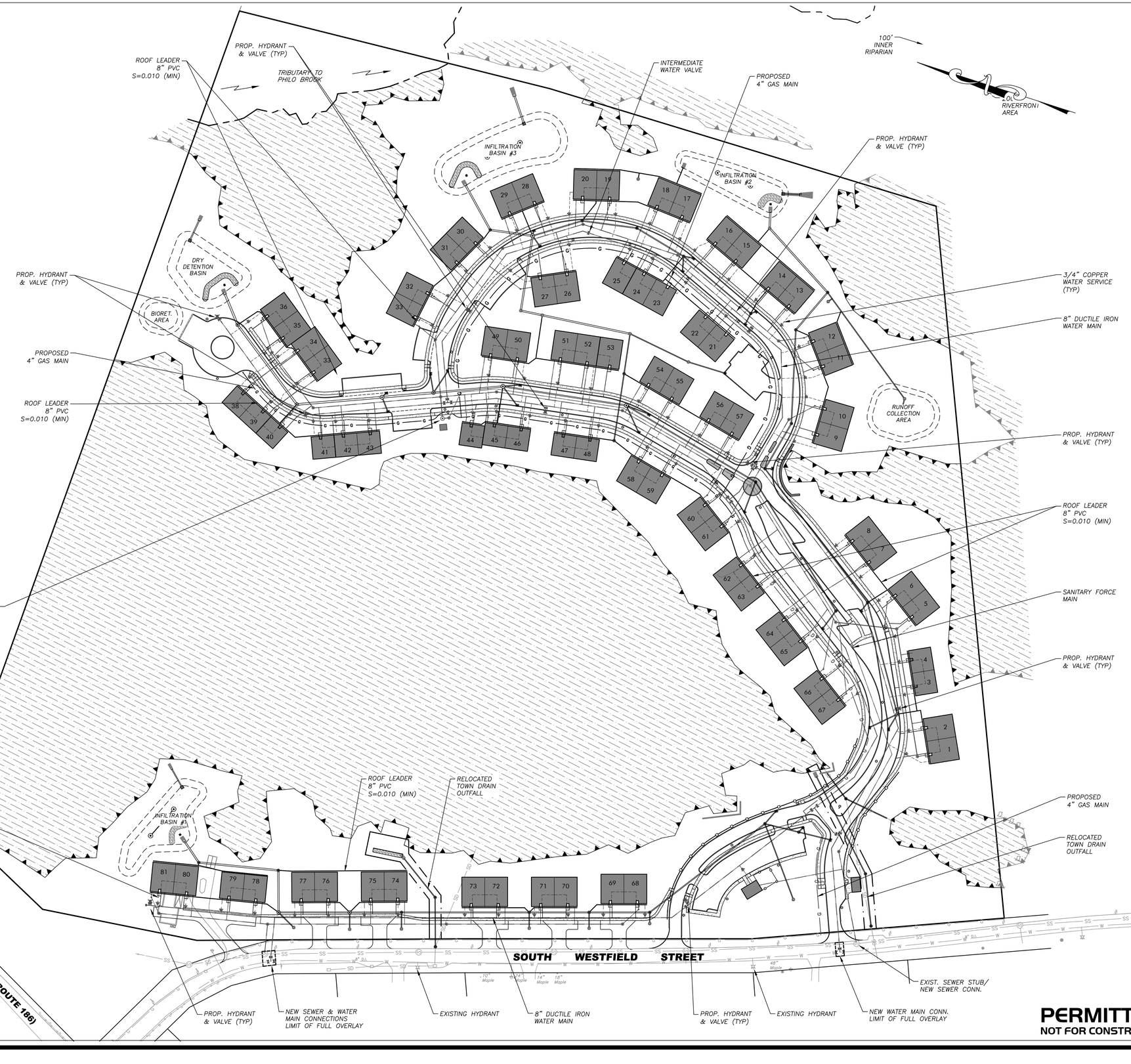
C-15	-

CONSTRUCTION NOTES

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

OVERALL SITE UTILITY PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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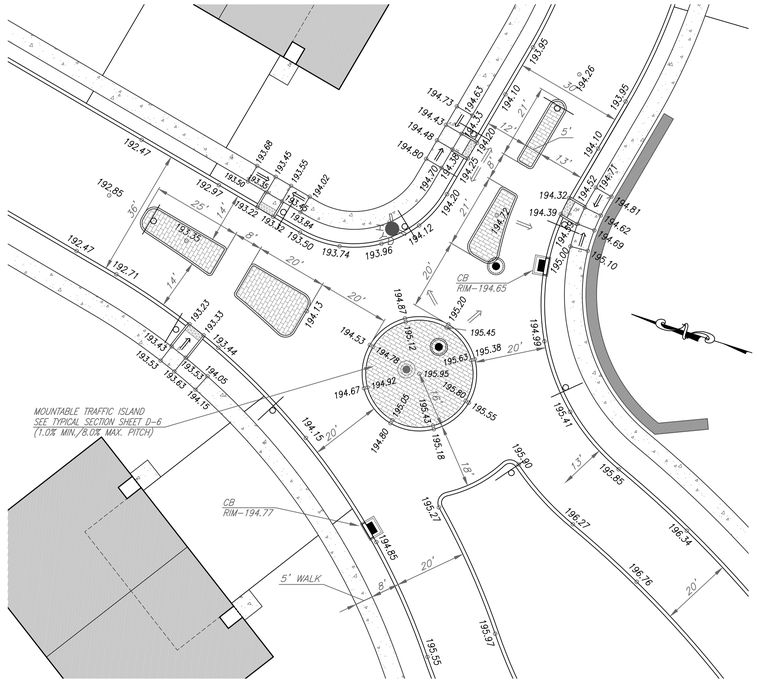
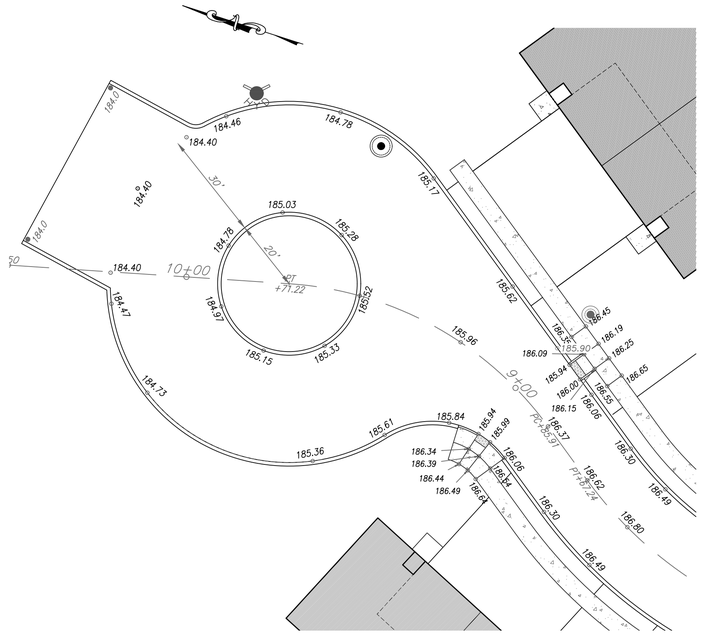
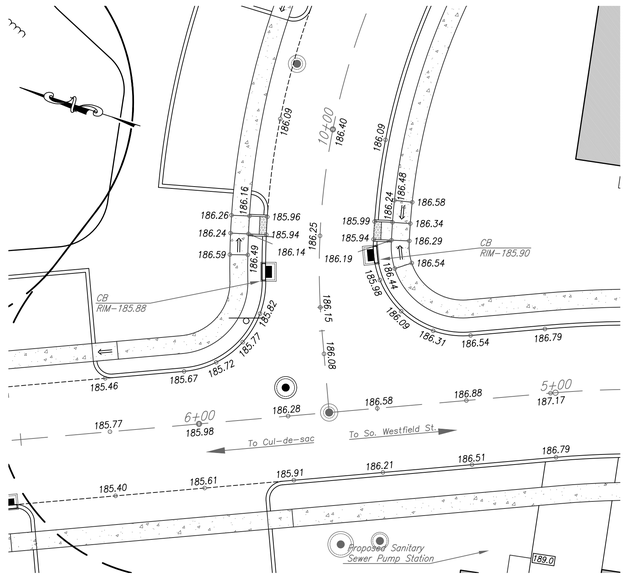


TRAFFIC CIRCLE DETAIL
1"=20'

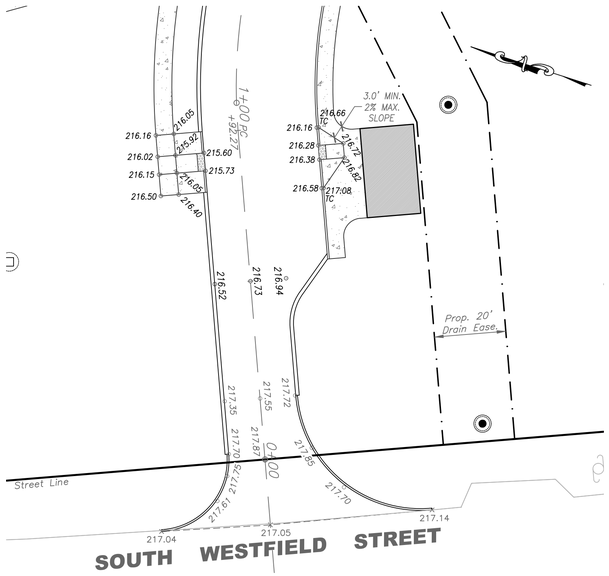


CUL-DE-SAC DETAIL
1"=20'

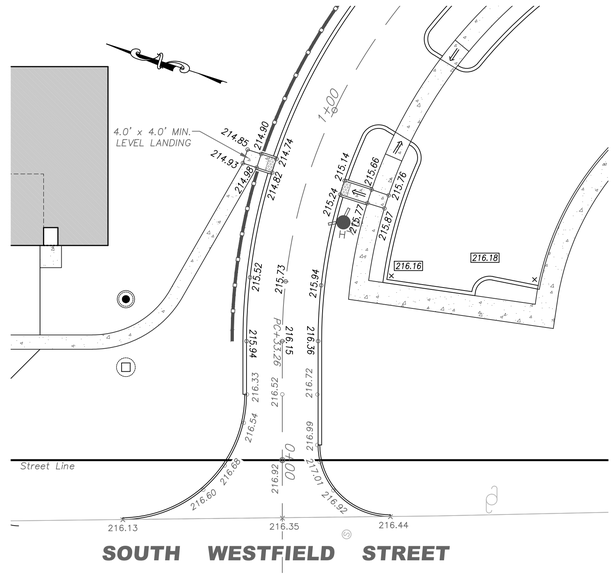
ACCESSIBLE RAMP NOTE
ACCESSIBLE ROUTE RAMPED SECTIONS NOT TO EXCEED 8.0% SLOPE.
CROSS-SLOPE NOT TO EXCEED 2.0% IN ANY DIRECTION. SEE
SHEET D-5 FOR ADDITIONAL ACCESSIBLE RAMP SPECIFICATIONS.



INTERSECTION DETAIL
1"=20'



CROSSWALK DETAIL - ENTRANCE DRIVE AT MAILBOX
1"=20'



CROSSWALK DETAIL - EXIT DRIVE NEAR S. WESTFIELD STREET
1"=20'

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rlaland.com

INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map E6, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MASSACHUSETTS ROBERT LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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EROSION & SEDIMENTATION CONTROL NOTE

THE EROSION/SEDIMENTATION MEASURES SHOWN HEREON ARE TO BE CONSIDERED THE MINIMUM EFFORT REQUIRED, AND SHOULD ACT AS A GUIDELINE FOR THE ANTICIPATED EROSION/SEDIMENTATION CONTROL EFFORT NECESSARY TO MAINTAIN CONTROL OVER THE PROJECT SITE. ACTUAL SITE CONDITIONS MAY VARY FROM THOSE SHOWN HEREON, AND THE EROSION/SEDIMENTATION CONTROL EFFORT SHALL BE ADJUSTED IN RESPONSE. SHOULD THE EROSION CONTROL PLAN NOT BE FOLLOWED AS THE MINIMUM REQUIREMENT, THE CONTRACTOR SHALL BEAR COMPLETE AND ULTIMATE RESPONSIBILITY FOR THE SITE-SPECIFIC LAYOUT, INSTALLATION, MAINTENANCE, AND — SHOULD FAILURE OCCUR — REPARATIONS TO ANY DAMAGED PROPERTY. R LEVESQUE ASSOCIATES, INC. (RLA) RESERVES THE RIGHT TO MAKE REQUIRED ADJUSTMENTS TO THE EROSION CONTROL PLAN AS SITE CONSTRUCTION EVOLVES AND AS RLA DEEMS NECESSARY.

GENERAL CONSTRUCTION SEQUENCE

1.) LOCATE AND STAKE BY SURVEY THE LIMITS OF WORK LINES, CENTERLINES OF PROPOSED ROADWAYS, PROPOSED DRAINAGE STRUCTURES, SEDIMENTATION BASINS (AS REQUIRED) AND DETENTION BASIN, RAIN GARDENS, ETC. LOCATIONS

2.) INSTALL EROSION CONTROLS AS SPECIFIED ON THESE PLANS AND REVIEW THEM WITH THE PROJECT ENGINEER, LANDSCAPE ARCHITECT AND SITE SUPERINTENDENT. SHOULD ADDITIONAL CONTROLS BE DEEMED REQUIRED THEY SHALL BE INSTALLED.

3.) CONSTRUCT ANTI-TRACKING APRONS AS SHOWN ON THESE PLANS.

4.) REMOVE TREES WITHIN THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING LOGS AND BRUSH FROM THE SITE.

5.) GRUB AND STUMP THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING STUMPS FROM THE SITE AND DISPOSING OF THEM IN ACCORDANCE WITH STATE AND LOCAL RULES AND REGULATIONS.

6.) CONSTRUCT THE SEDIMENTATION BASINS (AS REQUIRED) WITH THE OUTLET TEMPORARILY BLOCKED. ONCE THE BASIN HAS BEEN STABILIZED AND THE VERTICAL OVERFLOW STANDPIPE AND FOREBAY SEDIMENT STUMP AREA AT THE BASIN INLET ARE IN PLACE, THE OUTLET CAN BE ACTIVATED.

7.) EXCAVATE FOR THE ROADS AND SIDE SLOPES IN 1000 FOOT INTERVALS. UPON COMPLETING EACH 500 FOOT INTERVAL, ROAD SIDE CHANNELS (WITH STONE CHECK DAMS PLACED EVERY 200 FEET) LEADING TO THE SEDIMENTATION BASINS SHALL BE CONSTRUCTED. SHOULD SIGNIFICANT SEDIMENTION BE OBSERVED WITHIN THE CHANNEL, SILTATION FENCING SHOULD BE INSTALLED WITHIN THE CHANNEL AT AN INTERVAL OF EVERY 100 FOOT. WATER BARS SHALL BE UTILIZED TO DIRECT STORM FLOWS INTO THE CHANNELS AND SHALL BE SPACED AT 200 FOOT INTERVALS.

8.) EXCAVATE TO PLAN GRADES THE AREA SHOWN ON PLAN. STOCKPILE LOAM AT LOCATION DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. AREAS NOT DESIGNATED FOR PAVEMENT TO BE STABILIZED USING HYDROSEEDING AND EROSION CONTROL BLANKETS IF NECESSARY. GRASS SEED MIXTURES WILL BE DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. SUBSTITUTION OF SEED MIXTURE BY THE CONTRACTOR WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF THE ENGINEER OR LANDSCAPE ARCHITECT. EXCESS SOILS REMOVED AND STOCKPILE DURING SITE CONSTRUCTION WILL BE STABILIZED WITH A VEGETATIVE COVER IF SOILS ARE STOCKPILED FOR MORE THAN 14 DAYS.

9.) AT A MINIMUM, ROADWAY DRAINAGE CHANNELS AND THE SEDIMENTATION BASINS SHOULD BE CLEANED EVERY TWO WEEKS OR AFTER EVERY MAJOR RAIN EVENT.

10.) ONCE THE ROADS ARE CONSTRUCTED AND UTILITIES INSTALLED, THE ROADS WILL BE PAVED IN BINDER COURSE. ROAD SIDE CHANNELS WILL BE FILLED AND THE TREEBELT AREA CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS.

NOTE

EXISTING PAVED DRIVEWAY TO BE USED FOR SITE ACCESS. PAVEMENT CONDITION TO BE MONITORED AND SHALL BE REPLACED BY A PROPER ANTI-TRACKING APRON SHOULD DRIVEWAY FAIL TO PROVIDE ADEQUATE ANTI-TRACKING CAPABILITIES.

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

PHASE II CONSTRUCITON TO INCLUDE INSTALLATION OF STORM DRAIN & DETENTION BASIN (TEMP. SEDIMENTAION BASIN) AND GRAVITY SEWER, PUMP STATION & SANITARY FORCE MAIN

SILT FENCE TO BE INSTALLED AS SHOWN ON PLAN ALONG WETLAND "e" PRIOR TO START OF PHASE II CONSTRUCTION

SILT FENCE TO BE INSTALLED DOWN GRADIENT OF STAGING AREA DURING PHASE I CONSTRUCTION

SILT FENCE TO BE INSTALLED AS SHOWN ON PLAN PRIOR TO START OF PHASE I CONSTRUCTION

CONSTRUCTION ENTRANCE LOCATION FOR PHASE I (SEE NOTE 1)

INSTALL SILT-SACKS ON ALL CATCH BASINS AND YARD DRAINS UNTIL AREAS ARE PAVED AND VEGETATIVE COVER IS ESTABLISHED

TRIBUTARY TO PHILO BROOK

100' INNER RIPARIAN

200' RIVERFRONT AREA

EXISTING FIELDS WILL CONTINUE TO BE FARMED UNTIL LATTER PHASES OF CONSTRUCTION

INFILTRATION BASIN #3

INFILTRATION BASIN #2

INFILTRATION BASIN #1

DRY DETENTION BASIN

BIORET. AREA

RUNOFF COLLECTION AREA

PHASE 1

PHASE 2

PHASE 3

PHASE 3

PHASE 3

PHASE 4

PRIOR TO THE START OF CONSTRUCTION OF PHASE 3 AND/OR 4 OF THE PROJECT, CONTRACTOR/DEVELOPER TO DISCUSS EXTENT OF WATER MAIN INSTALLATION WITH AGAWAM D.P.W. AND ENGINEERING DIVISION

PHASE II CONSTRUCTION TO INCLUDE INSTALLATION OF STORM DRAIN TO CUL-DE-SAC & DETENTION BASIN, GRAVITY SEWER, PUMP STATION & SANITARY FORCE MAIN AND WATER MAIN TO BE LOOPED TO TRAFFIC CIRCLE. TEMPORARY SEDIMENTATION BASIN(S) TO BE UTILIZED FOR ROOF DRAINAGE PRIOR TO CONSTRUCTION OF INFILTRATION BASIN #2 & INFILTRATION BASIN #3

SILT FENCE TO BE INSTALLED AS SHOWN ON PLAN ALONG WETLAND "e" PRIOR TO START OF PHASE II CONSTRUCTION

5' W. x 1.5' D. EROSION CONTROL SWALE (BOTH SIDES)

INSTALL EROSION CONTROL BLANKETS, LOAM & SEED ALONG SLOPE AS PART OF PHASE II CONSTRUCTION

STAGING & SOIL STOCKPILE AREA FOR STAGE I CONSTRUCTION

CONSTRUCTION ENTRANCE LOCATION FOR PHASE I

SOUTH WESTFIELD STREET (ROUTE 186)

SOUTH WESTFIELD STREET

SPECIAL NOTE

THE EROSION CONTROL PLAN AS SHOWN WAS CREATED PRIOR TO PROJECT CONSTRUCTION. EROSION CONTROL EFFORTS ARE PART OF A DYNAMIC PROCESS THAT IS CONTINUALLY REVISED ACCORDING TO THE DEMANDS OF ACTUAL SITE CONDITIONS. CONTRACTOR SHALL REFER TO THE SWPPP DOCUMENTS FOR PROPER IMPLEMENTATION AND UPDATING.

PERMITTING
NOT FOR CONSTRUCTION

RLA

R LEVESQUE ASSOCIATES INC

Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

ph: 413.568.0985 fax: 413.568.0986

40 School Street
Westfield, MA 01085

rlaland.com

PROJECT PHASING PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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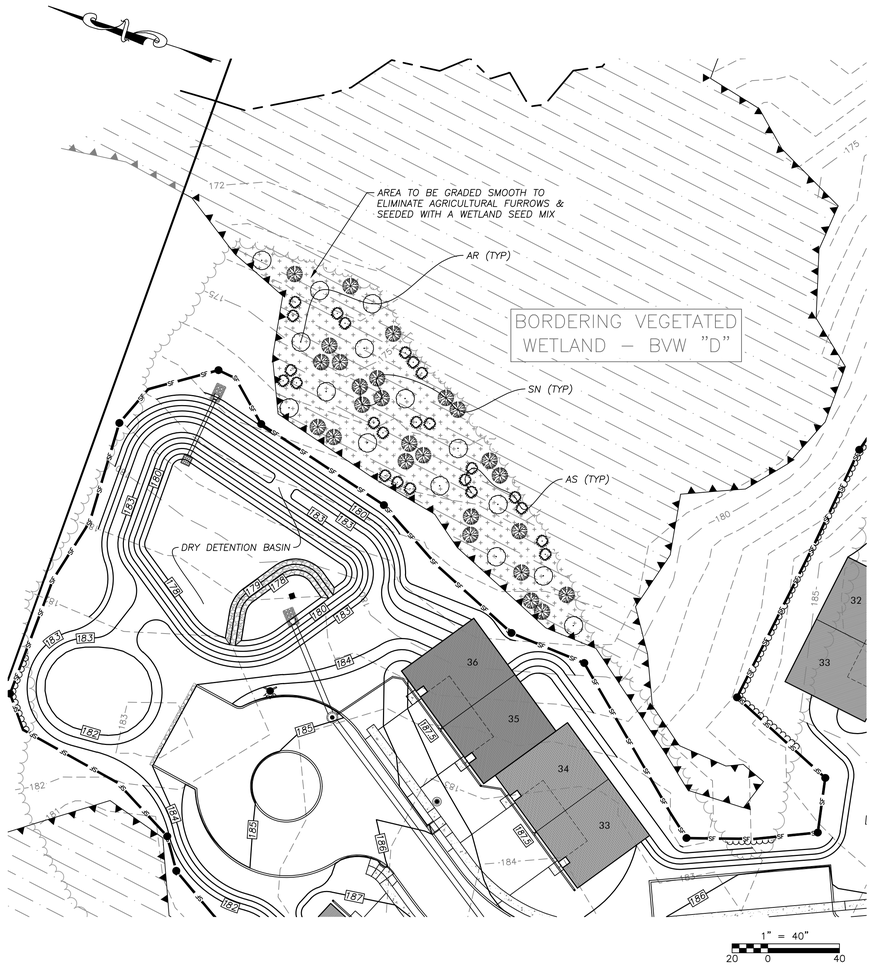

PLANT LIST				
KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	15	ACER RUBRUM	RED MAPLE	2–2.5" CAL.
AS	24	ALNUS INCANA (RUGOSA)	SPECKLED ALDER	3'–4' HT.
SN	26	SALIX NIGRA	BLACK WILLOW	3'–4' HT.
		NEW ENGLAND WETLAND SEED MIX	RATE PER SUPPLIER REC.	

SCHEDULE:

1. WETLAND REPLICATION WORK SHALL TAKE PLACE DURING THE GROWING SEASON. ONCE BEGUN, WORK WILL BE COMPLETED WITHIN APPROXIMATELY ONE MONTH.
2. THE AGAWAM CONSERVATION COMMISSION (ACC) SHALL BE CONTACTED 48 HOURS IN ADVANCE OF THE START OF WORK AND A PRECONSTRUCTION SITE MEETING SHALL BE HELD WITH THE ACC, WETLAND CONSULTANT (RLA), AND THE APPLICANT/CONTRACTOR.
3. THE RLA/WETLAND CONSULTANT, OR HIS REPRESENTATIVE, SHALL BE ON SITE AT THE START OF WORK AND CHECK ON THE PROGRESS OF THE PROJECT REGULARLY DURING WORK IN WETLANDS AND AT OTHER CRITICAL POINTS DURING CONSTRUCTION. AT A MINIMUM, THE RLA/WETLAND SCIENTIST SHALL BE PRESENT: AT THE START OF WORK; TO VERIFY SUBGRADES; AT THE BEGINNING OF PLANTING; AND TO VERIFY THAT WORK IS COMPLETE.
4. AN INSPECTION REPORT SHALL BE SUBMITTED TO THE ACC BY THE RLA DURING THE WETLAND CONSTRUCTION PERIOD.

CONSTRUCTION SEQUENCE:

5. INSTALL EROSION CONTROL AND SILTATION BARRIERS AT LOCATIONS SHOWN ON PLAN, PRIOR TO CONSTRUCTION. NO EQUIPMENT TRAFFIC OR OTHER ALTERATION IS PERMITTED BEYOND SEDIMENT BARRIERS OR IN WETLAND AREAS, EXCEPT FOR EXCAVATION WORK AS SHOWN ON THE PLAN. BARRIERS WITHIN THE WETLAND SHALL BE INSTALLED SO AS TO MINIMIZE DISTURBANCE OF THE WETLAND. STRAW LOGS/FILTER SOCK SHALL BE STAKED IN BY HAND IN WETLAND AREAS. STRAW BALES MAY BE SET DIRECTLY ON THE WETLAND SURFACE WITHOUT TRENCHING, BUT MUST BE WELL STAKED, TIGHTLY BUTTED, AND JOINTS CHINKED WITH LOOSE HAY.
6. A STONE ANTI–TRACKING APRON SHALL BE INSTALLED AT THE CONSTRUCTION SITE ENTRANCE AS SHOWN ON THE PLAN.
7. CONTRACTOR TO DEMOLISH AND REMOVE HOUSE, GARAGE, AND SITE IMPROVEMENTS PRIOR TO WETLAND RESTORATION.
8. CLEAR THE SURFACE OF THE HISTORIC FILL AREA FROM ANY DEBRIS PRIOR TO EXCAVATION. EXCAVATE SOIL FROM THE WETLAND FILL AREA AS SHOWN TO EXPOSE THE NATIVE SOIL "A" OR "O" HORIZON, TO BE DETERMINED BY THE WETLAND CONSULTANT. DO NOT STOCKPILE TOPSOIL, SUBSOIL, STUMPS OR DEBRIS WITHIN RESOURCE AREAS.
9. EXCAVATION WORK SHALL BE DONE FROM FILL AREA, OUTSIDE THE EXISTING WETLAND AND SHALL PROGRESS FROM THE EASTERN EXTENT OF THE FILL AREA AND PROGRESS TO THE WEST.
10. CARE SHALL BE TAKEN TO PRESERVE, WHEN POSSIBLE, EXISTING TREES ON SLOPES ALONG THE EDGE OF THE WETLAND FILL AREA.
11. EXCAVATED SOILS ARE TO EITHER TRANSPORTED OFF–SITE OR IF STORED ON SITE, ARE TO BE STOCKPILED WITHIN THE DESIGNATED STOCKPILE AREAS AS NOTED ON THE PLAN. STOCKPILED MATERIALS SHALL NOT BE PLACED WITHIN WETLAND RESOURCE AREAS OR THE BUFFER ZONE TO WETLAND RESOURCE AREAS. SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF STOCKPILED SOILS.
12. THE GROUNDWATER ELEVATION SHALL BE VERIFIED IN THE WETLAND REPLICATION AREA BY THE RLA ONCE THE REPLICATION AREA HAS BEEN EXCAVATED TO SUB–GRADE. IF SEASONAL HIGH GROUNDWATER IS NOT PRESENT AT OR WITHIN SUFFICIENT DEPTH TO SUPPORT WETLAND VEGETATION, MODIFICATIONS TO THE PROPOSED REPLICATION AREA TOPOGRAPHY SHALL BE MADE IN THE FIELD UNDER THE SUPERVISION OF THE RLA/WETLAND SCIENTIST.
13. ORGANIC SOIL INLAYS TO THE RESTORATION AREA MAY BE REQUIRED, DEPENDING ON WHAT IS DISCOVERED, TO ACHIEVE A SUITABLE MEDIUM FOR WETLAND VEGETATION. ORGANIC SOIL SHALL BE AN ORGANIC FINE SANDY LOAM APPROVED BY THE RLA/WETLAND SCIENTIST.
14. AVOID COMPACTION OF SUBSOILS AND PLACED WETLAND SOILS. EQUIPMENT TRAFFIC IN THE RESTORATION AREA IS TO BE MINIMIZED BY USING TRACK INSTEAD OF WHEEL MACHINES. THERE SHALL BE NO TRAFFIC ON FINISH GRADE WETLAND SOILS.
15. ONCE FINAL GRADES HAVE BEEN ESTABLISHED, TREES AND SHRUBS SHALL BE INSTALLED AS SHOWN ON THE PLANS.
16. FOR THE WETLAND RESTORATION SEED MIX, RLA SUGGESTS "NEW ENGLAND WETLAND SEED MIX" BY NEW ENGLAND WETLAND PLANTS INC., OR AN APPROVED EQUIVALENT.
17. ONCE FINAL GRADES WITHIN THE FILL AREA HAVE BEEN ESTABLISHED, ALL EXPOSED SOILS SHALL BE SEEDED WITH A WETLAND MIXTURE (SEE SPECIFICATION) AND MULCHED WITH WET MEADOW HAY, SALT HAY OR STRAW TO PREVENT EROSION UNTIL VEGETATION IS ESTABLISHED AND APPROVAL IS RECEIVED FROM THE LOCAL CONSERVATION COMMISSION.
18. FINAL WETLAND RESTORATION AREA ELEVATIONS SHALL BE CERTIFIED BY THE RLA/WETLAND SCIENTIST.
19. IMPACT TO ADJACENT WETLAND AREAS SHALL BE AT A MINIMUM. STORAGE OF ANY CONSTRUCTION MATERIALS OR MACHINERY IN ADJACENT WETLAND AREAS IS PROHIBITED. USE OF HEAVY MACHINERY IN ADJACENT WETLAND AREAS IS PERMITTED FOR CONSTRUCTION OF THE RESTORATION AREA ONLY WITHIN THE LIMITS OF THE EROSION CONTROL BARRIERS. ANY ADJACENT WETLAND DISTURBED DURING CONSTRUCTION WILL BE REESTABLISHED TO ITS PRE–CONSTRUCTION CONDITION AT THE CONTRACTOR'S EXPENSE.
20. ALL SLOPES AND FILL AREAS IN BUFFER ZONE SHALL BE SEEDED AND MULCHED UPON COMPLETION OF CONSTRUCTION TO PREVENT ANY POSSIBLE IMPACT TO ADJACENT WETLAND.
21. UPON COMPLETION OF THE CONSTRUCTION PHASE OF THE WETLAND RESTORATION, THE CONTRACTOR SHALL CONTACT THE RLA/WETLAND SCIENTIST FOR AN INSPECTION. THE RLA/WETLAND SCIENTIST SHALL NOTIFY THE LOCAL CONSERVATION COMMISSION AS TO THE COMPLETION DATE.

ESTABLISHMENT & MONITORING:

1. AT THE END OF EACH GROWING SEASON, AND UNTIL COMPLIANCE WITH THE PERFORMANCE STANDARDS SET FORTH IN 310 CMR 10.55(4)(B)1–7 IS ACHIEVED, A PROGRESS REPORT SHALL BE SUBMITTED BY A REGISTERED LANDSCAPE ARCHITECT OR WETLAND SCIENTIST, TO THE LOCAL ISSUING AUTHORITY.
2. ALL WORK SHALL COMPLY WITH 310 CMR 10.55 (4)(B)1–7: WITHIN TWO GROWING SEASONS AFTER COMPLETION, AT LEAST 75% OF THE RESTORATION AREA SHALL BE ESTABLISHED WITH INDIGENOUS WETLAND PLANT SPECIES. IF AT THE END OF THE FIRST OR THE SECOND GROWING SEASON (OR BOTH), THE SUCCESS RATE IS NOT EXPECTED TO BE 75%, PLANTING AND/OR RE–SEEDING OF THE RESTORATION AREA SHALL BE UNDERTAKEN. VEGETATION MAY BE CUT OR REMOVED SELECTIVELY TO ELIMINATE NUISANCE OR INVASIVE PLANTS AND ENCOURAGE WETLAND SPECIES.

MAINTENANCE:

1. AFTER SUCCESSFUL ESTABLISHMENT OF WETLAND VEGETATION AND RECEIPT OF APPROVAL FROM THE LOCAL CONSERVATION COMMISSION, THE AREA SHALL BE PERMITTED TO GROW WITHOUT DISTURBANCE. NO CONTINUING MAINTENANCE IS REQUIRED, EXCEPT FOR THE POSSIBLE SELECTIVE PRUNING OR REMOVAL OF NUISANCE AND/OR INVASIVE SPECIES THAT MAY HAVE INVADED THE REPLICATION AREA.

PLANTING NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE WETLAND CONSULTANT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2)REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
5. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
6. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
7. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.

INVASIVE PLANT NOTE:

PRIOR TO CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT ANY ACCUMULATED SOIL ON EARTHMOVING EQUIPMENT HAS BEEN REMOVED TO LIMIT THE RISK OF INVASIVE PLANT INTRODUCTION TO THE CONSTRUCTION SITE. CONTRACTOR SHALL CONTROL EXISTING INVASIVE PLANT SPECIES WITHIN THE LIMIT OF WORK AND WITHIN CONSERVATION JURISDICTION AFTER COORDINATION WITH THE WETLAND SCIENTIST TO IDENTIFY SAID SPECIES. CONTROL EFFORTS SHALL BE IN ACCORDANCE WITH WETLAND SCIENTIST'S RECOMMENDATIONS AND ANY APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

PERMITTING
NOT FOR CONSTRUCTION

RLA
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Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
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WETLAND RESTORATION PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: October 26, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ROAD and PARKING_Planar	Illuminance	Fc	1.42	9.2	0.0	N.A.	N.A.

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	LLF	Description	Lum. Lumens	Lum. Watts
	14	SL5	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-5W	14875	159.1
	13	SL4	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-4W-H5	7602	159.1
	10	SL1	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-3-H5	7502	159.1

Project:
Agawam Condos

Contact:
Liza Tuttle
Specification Sales
(860) 751-4388
ltuttle@illuminatene.com

illuminate
44 Sixth Road
Woburn, MA 01801
(781) 935-8500

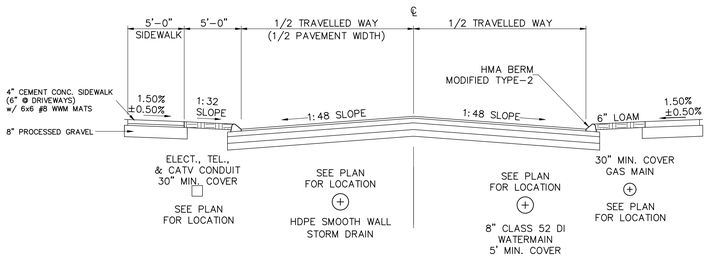
333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

Detail: Photometric Calculation
Date: 5/2/2022
Revision:A
Scale: 1" = 60'-0"
Drawn By: AJS

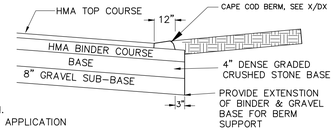
Drawing Number:

SL-1

Sheet 1 of 1



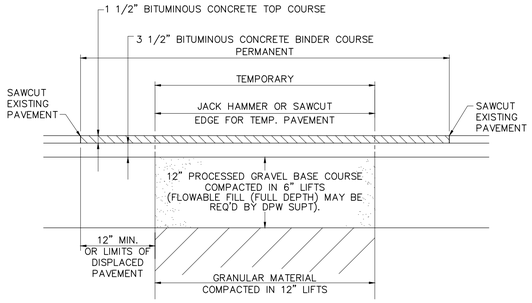
NOTE:
TACK COAT IS REQUIRED BETWEEN ALL COURSES OF HMA AND ON THE HMA BEFORE PLACING HMA BERM



TYPICAL ROADWAY SECTION
N.T.S.

PER MA HIGHWAY – 95% MINIMUM DRY DENSITY COMPACTION
BASED ON STANDARD PROCTOR – ALL ROADWAY CONSTRUCTION.
MODIFIED PROCTOR IS USED ONLY NEAR BRIDGE ABUTMENTS & HEAVY DUTY APPLICATION

TYPICAL ROADWAY SECTION (H-2) [MODIFIED]
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I–1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'–0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE

MINIMUM THICKNESS FOR PAVEMENT

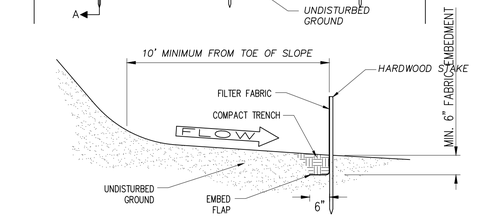
TYPE OF STREET	HOT MIX ASPHALT			GRAVEL BASE & GRAVEL SUB-BASE	
	SURFACE COURSE (INCHES)	BINDER COURSE (INCHES)	BASE (INCHES)	BASE (INCHES) DENSE GRADED CRUSHED STONE (M 201.7)	SUB-BASE (INCHES) (M 1.03.0 TYPE B, 3" MAX.)
PLACE	1.5"	3.0"	NA	4.0"	8.0"
LANE	1.5"	3.0"	NA	4.0"	8.0"
SUBCOLLECTOR	1.5"	2.0"	3.0"	4.0"	8.0"
COLLECTOR	1.5"	2.0"	4.0"	4.0"	10.0"
NOTE: THE ABOVE THICKNESS DO NOT APPLY TO INDUSTRIAL PARK ROADS					

1. THE MATERIAL TO BE USED FOR THE GRAVEL BASE (THE 4" OF MATERIAL DIRECTLY UNDER THE BINDER COURSE OF PAVING) IS TO BE DENSE GRADED CRUSHED STONE (NOT PROCESSED GRAVEL OR OTHER NATURAL STONE PRODUCT. MHD SPECIFICATION M2.01.7, WHICH MUST BE MET, STATES THAT COARSE AGGREGATE (#4 SIEVE AND LARGER) MUST BE CRUSHER RUN.
2. THE LINE, GRADE AND COMPACTION OF THE GRAVEL SUB–BASE (THE 8" LAYER OF GRAVEL BORROW DIRECTLY UNDER THE DENSE GRADED CRUSHED STONE) MUST BE APPROVED BY ENGINEERING BEFORE THE 4" LAYER OF DENSE GRADED CRUSHED STONE IS PLACED. IT IS IMPORTANT THAT ENOUGH TIME IS ALLOWED IN THE CONSTRUCTION SCHEDULE SO THAT FIELD DENSITY TESTS CAN BE MADE.
3. GRAVEL SAMPLES FOR THE SUB–BASE AND BASE WILL BE TAKEN BY THE ENGINEERING DIVISION FOR TESTING. THE SAMPLE MUST MEET ITS RESPECTIVE MHD SPECIFICATION AND BE APPROVED BY THE TOWN ENGINEER BEFORE ANY OF THE GRAVEL CAN BE SPREAD ON–SITE. THE TOWN ENGINEER OR THEIR AGENT ARE SOLELY RESPONSIBLE FOR CHAIN OF CUSTODY OF ALL SAMPLES; ANY TESTING PERFORMED OUTSIDE OF THE TOWN CHAIN OF CUSTODY WILL NOT BE ACCEPTED.
4. FIELD DENSITY TESTING IS TO BE MADE ON BOTH THE GRAVEL SUB–BASE AND GRAVEL BASE SEPARATELY. THE GRAVEL SUB–BASE IS TO BE TESTED BEFORE THE GRAVEL BASE WILL BE ALLOWED TO BE PLACED.
5. WHEN THE GRAVEL FOR THE SUB–BASE AND BASE IS SPREAD OUT, IT IS TO BE SPREAD INTO THE SITE STARTING AT THE SITE'S ENTRANCE AND WORKING INWARDS.
6. THE BINDER COURSE OF PAVING CANNOT BE LAID UNTIL THE ENGINEERING DIVISION HAS APPROVED THE GRADE FOR THE ROADWAY AND THE COMPACTION OF THE GRAVEL BASE.
7. PRIOR TO INSTALLING THE CURB, THE DEVELOPER SHALL HAVE THE LINES OF THE PROPOSED CURBING LAID OUT WITH RED PAINT OR OTHER MARKING AND THEN NOTIFY ENGINEERING THAT MARKING IS READY FOR INSPECTION. AFTER INSPECTION, ENGINEERING WILL NOTIFY THE DEVELOPER THAT CURBING IS EITHER READY FOR LAYING OR CORRECTIONS MUST BE MADE TO THE MARKINGS. IN THE LATTER CASE, THE DEVELOPER MUST MAKE THE CORRECTIONS PRIOR TO APPROVAL AND INSTALLATION. TACK COAT IS REQUIRED BEFORE PLACEMENT OF HMA BERMS.
8. PRIOR TO LAYING THE TOP COURSE OF PAVEMENT, AND AFTER THE CURB IS INSTALLED, THE PAVEMENT MUST BE FLOODED SO THAT ENGINEERING CAN OBSERVE AND SURVEY THE GRADES OF BINDER COURSE TO DETECT ANY DISCREPANCIES IN GRADE. THIS INFORMATION MUST BE FURNISHED TO THE PAVING SUBCONTRACTOR BY THE DEVELOPER SO THAT ANY NECESSARY SHIMMING OF THE PAVEMENT CAN BE MADE. ENGINEERING WILL CHECK SHIMS.
9. AS NOTED IN THE SUBDIVISION REGULATIONS AND STANDARD PERFORMANCE AGREEMENT, THE PRESENCE OF AN INSPECTOR WILL NOT RELIEVE THE DEVELOPER OF HIS OBLIGATIONS TO PROVIDE A SATISFACTORY INSTALLATION OF ALL FACILITIES WHICH ARE A PART OF THE SUBDIVISION.
10. TACK COAT WILL BE REQUIRED TO BE APPLIED AT A RATE OF 1/20 GAL/SY WHENEVER PLACING HMA OVER EXISTING PAVEMENT, OTHERWISE THE TACK COAT SHALL BE AS SPECIFIED IN SECTION 460.62 OF THE MHD STANDARD SPECIFICATIONS.

STREET DESIGN STANDARDS

TYPE OF STREET	RIGHT OF WAY WIDTH (FEET)	PAVEMENT WIDTH (FEET)
PLACE	46	26
LANE	50	30
SUBCOLLECTOR	60	36
COLLECTOR	66	40

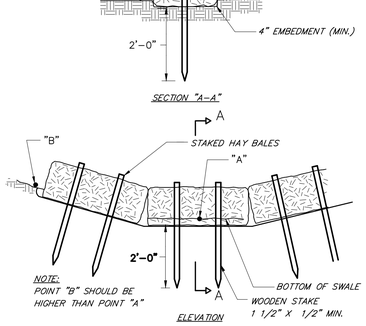
STREET STANDARDS
NO SCALE



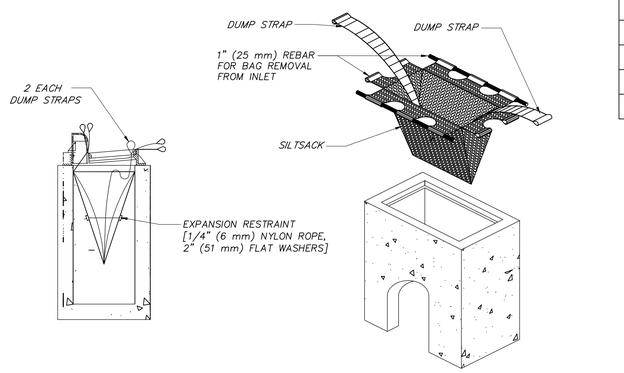
SECTION A–A

NOTES:
1. SILT FENCE IS TO BE INSTALLED BEFORE ANY LAND DISTURBING ACTIVATES START AT THE CONSTRUCTION SITE –OR– AS DIRECTED IN THE SITE'S EROSION AND SEDIMENTATION PLAN.
2. INSPECT SILT FENCE ON WEEKLY BASIS AND AFTER EACH RAIN ANY DETERIORATED/DAMAGED SILT FENCE MUST BE REPLACED IMMEDIATELY.
3. REMOVE SILT FROM FENCE AS NEEDED –OR– WHEN THE SILT HAS ACCUMULATED TO HALF THE ORIGINAL HEIGHT OF THE FENCE.
4. WHEN JOINING TWO SECTIONS OF FENCE, ROLL THE END STAKES TOGETHER SUCH THAT THERE IS NO GAP IN THE FENCE, OVERLAPPING FENCE SECTIONS IS NOT AN ACCEPTABLE ALTERNATIVE

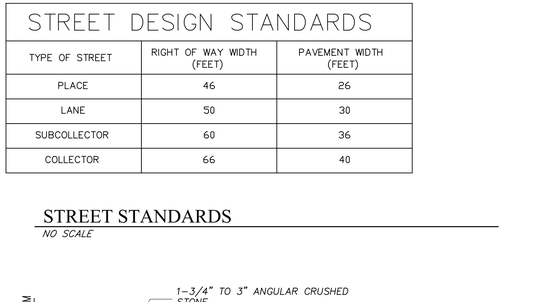
SILT FENCE
NO SCALE



HAY BALE CHECK DAM X-SECTION
NO SCALE

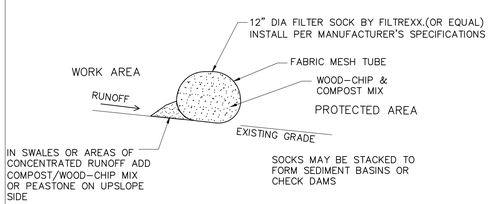


INLET PROTECTION, SEDIMENT FILTER SACK
NO SCALE



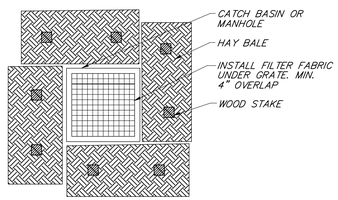
NOTES:
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMEADEITLY.
4. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
5. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
6. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE – AGAWAM DETAIL ES–1



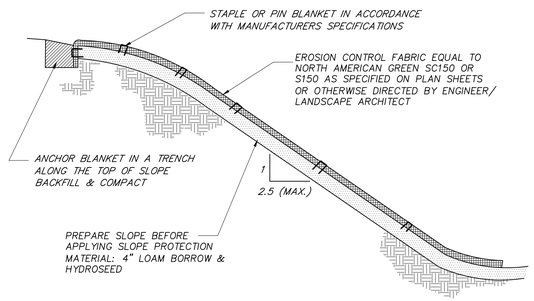
TYPICAL FILTER SOCK INSTALLATION

SEDIMENT BARRIER ALTERNATIVE - FILTER SOCK
NO SCALE



NOTES:
1. INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.
2. TWO (2) WOOD STAKES MINIMUM PER HAYBALE. STEEL DOWELS SHALL BE UTILIZED WHERE WOOD STAKES CAN NOR BE DRIVEN INTO GROUND

STORM INLET PROTECTION DETAIL
NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION
NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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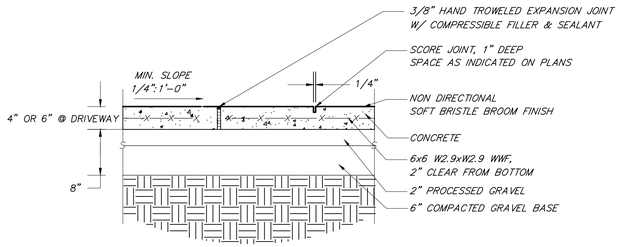
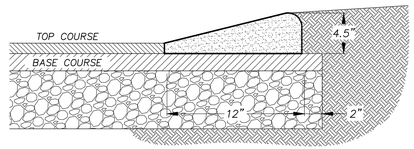


CONCRETE SIDEWALK

NO SCALE

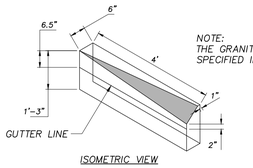


BITUMINOUS CONCRETE BERM (CAPE COD)

NO SCALE

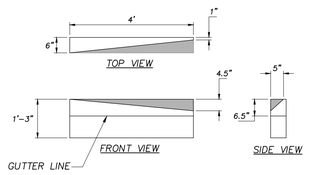
TYPICAL DRIVEWAY PAVEMENT DETAIL

NO SCALE



ISOMETRIC VIEW

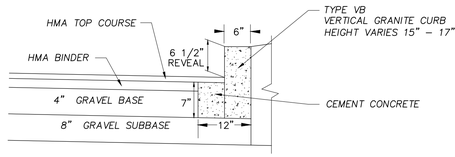
NOTE:
THE GRANITE CURBING SHALL BE INSTALLED AS SPECIFIED IN AGAWAM DETAIL H-4.



SLOPED GRANITE CURB/HMA BERM TO VERTICAL GRANITE CURB

GRANITE TRANSITION CURB DETAIL (H-5)

NO SCALE



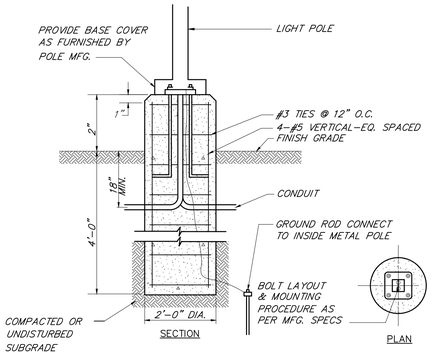
PROCEDURE DESCRIBED HEREIN IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE AND/OR BINDER COURSE ARE IN PLACE. OTHERWISE CEMENT CONCRETE WILL BE ELIMINATED AND GRAVEL WILL BE BROUGHT UP TO THE BOTTOM OF THE BASE COURSE. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE SPECIFICATIONS.

NOTES:
1. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BINDER, BASE AND STONE, AND REPLACE WITH CEMENT CONCRETE.
2. ACCEPTABLE CEMENT CONCRETE IS ANY CLASS UNDER SECTION M4 OF THE 1988 MHD STANDARD SPECIFICATIONS; ALL TEST REQUIREMENTS ARE WAIVED. HMA IS NOT AN ACCEPTABLE SUBSTITUTE
3. WHEN SET ON RADII, THE CURBING SHALL BE CUT WITH THE REQUIRED RADIUS OF CURVATURE.

VERTICAL GRANITE CURB DETAIL (H-4)

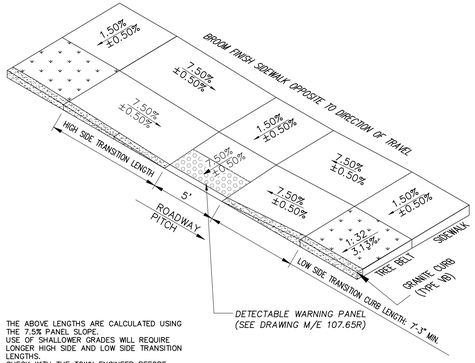
NO SCALE

NOTES:
1. ALL SIDEWALK SLOPES ARE MAXIMUMS, TREE BELT SLOPE IS TO BE MAINTAINED TO THE BEST EXTENT PRACTICABLE.
2. ALL SIDEWALKS ARE TO BE CONSTRUCTED TO THE SAME SPECIFICATION FOUND IN MHD SUPPLEMENTAL SPECIFICATIONS TO THE 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, ENGLISH UNITS, JUNE 6, 2006 SECTIONS 701.00 TO 701.61 INCLUSIVE, AS AMENDED - UNLESS OTHERWISE SPECIFIED.
3. ALL SIDEWALKS ARE TO BE 4000 PSI (28 DAY) PORTLAND CEMENT CONCRETE, 6%±1% AIR ENTRAINED.
4. CURBING TO BE VERTICAL GRANITE CURB -OR- CAST IN PLACE PORTLAND CEMENT CONCRETE IF SUBMITTED TO AND APPROVED BY DPW. SCORE LINES @ 5'-0" INTERVALS
6. WHEN THE SIDEWALK IS INSTALLED ON A CURVE, THE 5'-0" SCORE LINE INTERVAL IS MEASURE ON ALONG THE INSIDE THE CURVE.
10. TOOL ALL JOINTS AND EDGES
11. WHEN TRANSITIONING FROM VERTICAL GRANITE CURB TO MODIFIED TYPE 2 BERM A 4 FT GRANITE TRANSITION IS REQUIRED. ATTEMPTING TO BLEND THE MODIFIED TYPE 2 BERM TO THE GRANITE CURBING, OR FIELD CUTTING A GRANITE TRANSITION ARE NOT AN ACCEPTABLE ALTERNATIVE.
12. SIDEWALK IS TO BE POURED IN ALTERNATING 20' LENGTHS TO ACCOUNT FOR PANEL CONTRACTION DURING DRYING.
13. INSTALL 1/2" THICK PREFORMED EXPANSION JOINT FILLER (M.9.14.0) AT 20' INTERVALS
14. BROOM FINISH SIDEWALK OPPOSITE TO THE DIRECTION OF TRAVEL
15. SIDEWALK IS REQUIRED TO BE COVERED WITH PLASTIC AND KEPT MOIST FOR MINIMUM OF 72 HOURS AFTER IT HAS SET-UP.
16. DETECTABLE WARNING PANEL ARE TO COMPLY WITH ADA 4.29.2
17. DETECTABLE WARNING PANEL TO BE CAST IN PLACE DETECTABLE WARNING PANEL, 24"X60", FEDERAL YELLOW, ITEM#: 24601DPAD2Y, MFD. BY: ADA SOLUTIONS INC.. 1 SURVEY CIRCLE, 2ND FLR, N. BILLERICA, MA 01862, WWW.ADATILE.COM -OR- APPROVED EQUAL.
18. SIDEWALKS ARE TO BE INSTALLED THROUGH DRIVEWAYS. SIDEWALK FINISH IS TO BE BROOM FINISHED, NO ALTERNATE FINISH IS ALLOWED I.E. STAMPED, EPOXY FINISHED, ETC.... THE 1.50% (±0.50%) CROSS SLOPE MUST BE MAINTAINED THROUGH DRIVEWAYS.
19. ANY CHANGES IN BOUNDS, PINS, EASEMENTS, AND FORM-A'S SHOULD BE SHOWN ON AMENDED DEFINITIVE PLANS PRIOR TO THE SIGN OFF OF THE PUNCH LIST.
20. ALL MONUMENTATION IS TO COMPLY WITH AGAWAM TOWN CODE SECTION 159-33



LIGHT POLE INSTALLATION DETAIL

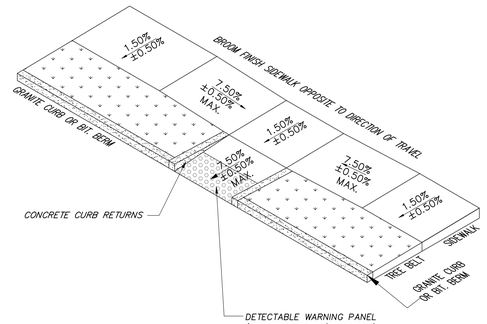
NO SCALE



- THE ABOVE LENGTHS ARE CALCULATED USING THE 7.5% PANEL SLOPE.
- USE OF SHALLOWER GRADES WILL REQUIRE LONGER HIGH SIDE AND LOW SIDE TRANSITION LENGTHS.
- CHECK WITH THE TOWN ENGINEER BEFORE USING ANY GRADES BESIDES THOSE LISTED IN THE TABLE ABOVE.

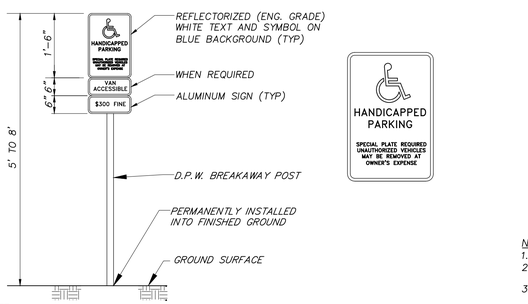
SIDEWALK CURB CUT

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

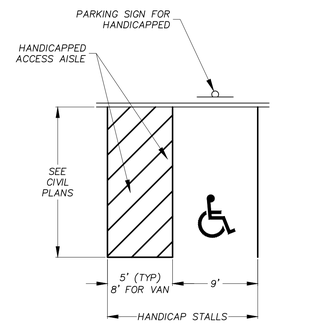
NO SCALE



NOTE:
MAXIMUM MOUNTING DISTANCE FROM HEAD OF STALL IS 10'.
PLEASE SEE: MGL C.40&21-22A, AAB 521 CMR 23.00, AGAWAM CODE &169-28

ACCESSIBLE PARKING SIGN (A-1)

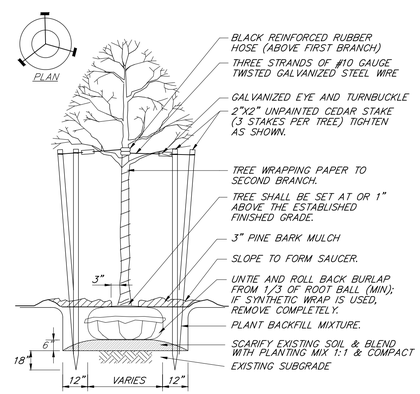
NO SCALE



NOTES:
1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" SOLID WHITE PAVEMENT MARKING PAINT UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO ENSURE HANDICAP ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
4. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER AND PROPORTION OF VAN ACCESSIBLE SPACES.

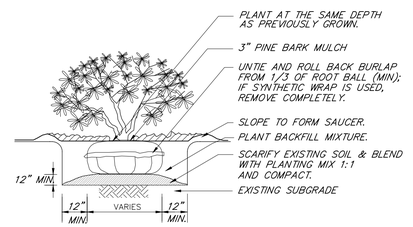
HANDICAP PARKING STALL

NO SCALE



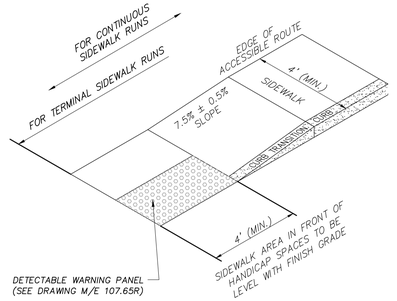
TREE PLANTING

NO SCALE



SHRUB PLANTING

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers - Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
No. 1388
REGISTERED LANDSCAPE ARCHITECT
7/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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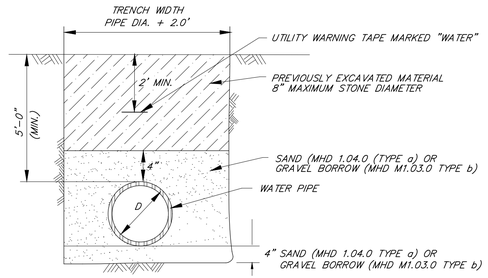
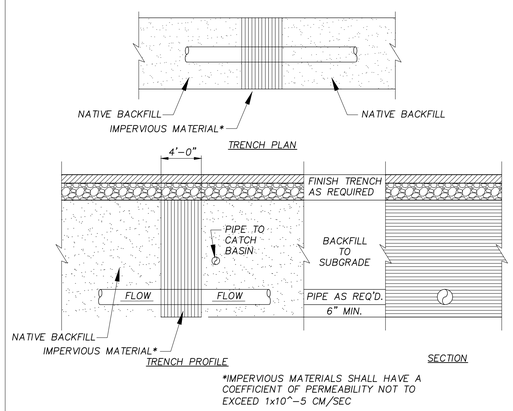


NOTES:
1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIALS IN MAXIMUM ONE FOOT LIFTS.
3. ALL WATER LINES SHALL BE SET A MINIMUM OF 5 FEET BELOW FINISH GRADE UNLESS OTHERWISE NOTED.

TYPICAL WATERMAIN TRENCH SECTION

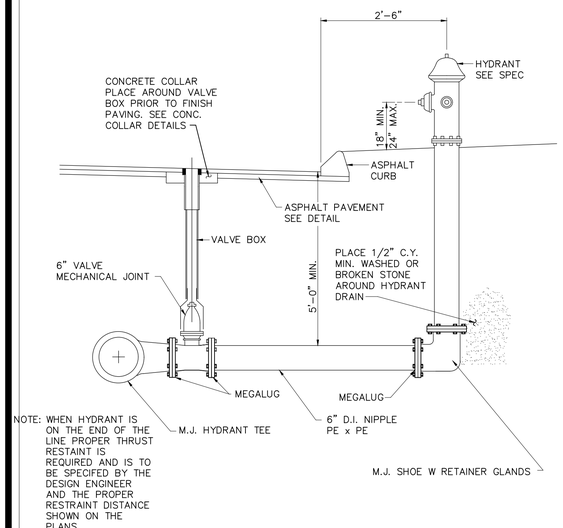
NO SCALE



*IMPERVIOUS MATERIALS SHALL HAVE A COEFFICIENT OF PERMEABILITY NOT TO EXCEED 1x10^-5 CM/SEC

IMPERVIOUS TRENCH DAM DETAIL (D-6)

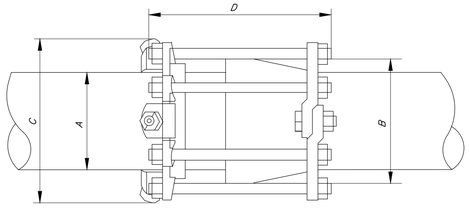
NO SCALE



NOTE: WHEN HYDRANT IS ON THE END OF THE LINE PROPER THRUST RESTAINT IS REQUIRED AND IS TO BE SPECIFED BY THE DESIGN ENGINEER AND THE PROPER RESTRAINT DISTANCE SHOWN ON THE PLANS

FIRE HYDRANT DETAIL (W-1)

NO SCALE



MEGALUG SERIES 1700 TABLE (*)					
NOMINAL PIPE SIZE	SERIES NUMBER	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C CASING CLEARANCE (W/NUTS OFF)	D THRUST ROD (QUANTY-SIZE)
4"	1704	4.80	6.60	9.90	4-3/4x13
6"	1706	6.90	8.60	12.00	6-3/4x13
8"	1708	9.05	10.90	14.15	6-3/4x13
10"	1710	11.10	13.10	16.20	8-3/4x18

* SEE MANUFACTURER FOR ADDITIONAL SPECIFICATIONS.

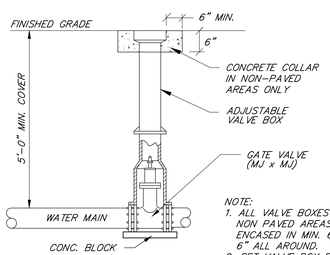
NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

SERIES 1700 MEGALUG RESTRAINT HARNESS

NO SCALE

SEDIMENTATION MARKER POST

NO SCALE



NOTE:
1. ALL VALVE BOXES LOCATED IN NON PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONC. 6" ALL AROUND.
2. SET VALVE BOX FLUSH IN PAVED AREAS.

TYPICAL BURIED VALVE

NO SCALE

PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES										
LENGTH OF RESTRAINT REQD (FEET)									DESIGN FORCE ON RESTRAINT REQD (KIPS) ⑤	
DEFLECTION ANGLE / PIPE	11 1/4	22 1/2°	45°	90° BEND	TEE	DEAD END	8"-4" REDUCER	8"-6" REDUCER	45°	TEE
	3	6	11	27	48	80	57	34	11	48

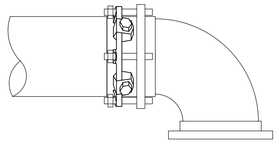
① ALL GATE VALVES MUST BE RESTAINED.

② THIS TABLE IS BASED ON A TEST PRESSURE OF 200 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY

③ IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.

④ IF TIE RODS ARE USED, USE 4 RODS MINIMUM AND ADD 1/8" TO BAR DIA AS CORROSION ALLOWANCE.

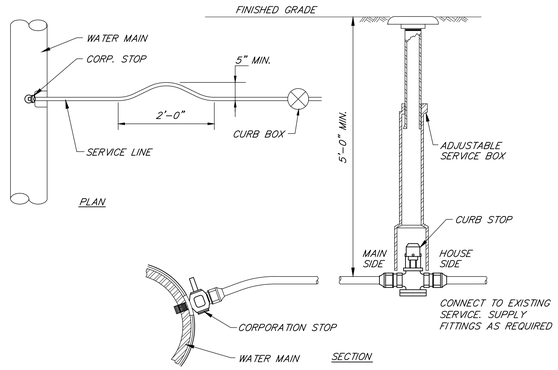
⑤ THE TABLE IS BASED ON THE PIPE LAYING CONDITIONS OF TYPE 4 TRENCH, BURIED DEPTH OF 5' OR MORE AND SOIL TYPE "ML".



NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

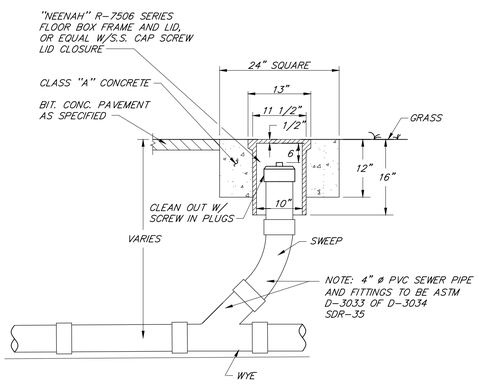
SERIES 1100 MEGALUG RESTRAINT HARNESS

NO SCALE



TYPICAL WATER SERVICE CONNECTION

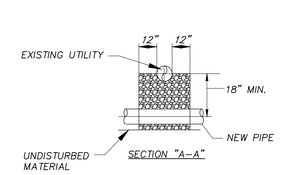
NO SCALE

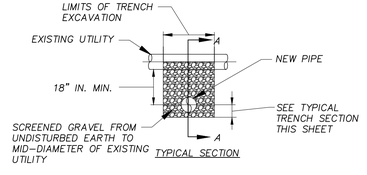


CLEANOUT REQUIRED EVERY 100' OF LATERAL (SANITARY)

TYPICAL CLEANOUT DETAIL

NO SCALE





UTILITY CROSSING DETAIL

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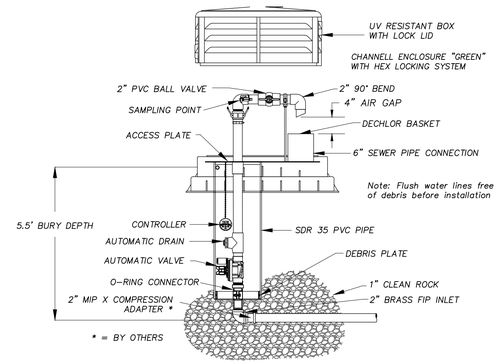
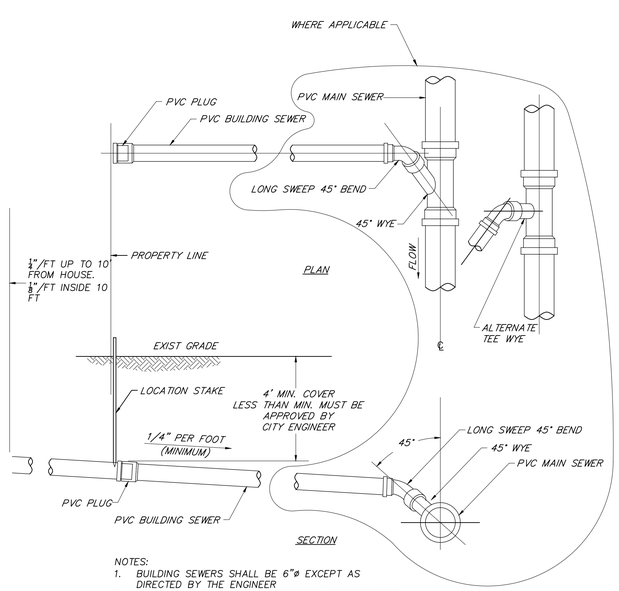


AUTOMATIC FLUSHING DEVICE SHALL HAVE A 2" BRASS FIP INLET, LEADING VERTICALLY INTO A 2" AUTOMATIC SOLENOID VALVE. AUTOMATIC SOLENOID VALVE SHALL HAVE A 150 PSI RATING. EACH UNIT SHALL BE FURNISHED WITH A STAND-ALONE VALVE CONTROLLER. VALVE CONTROLLER WILL NOT REQUIRE A SECOND HAND-HELD DEVICE FOR PROGRAMMING. CONTROLLER MUST HAVE MINIMUM OF 12 POSSIBLE FLUSHING CYCLES PER DAY, UP TO 6 HOURS PER FLUSH CYCLE AND SHALL BE SUBMERSIBLE TO 12 FEET, OPERATE WITH 9 VOLT BATTERY(COMPARTMENT HOLDS TWO BATTERS) AND HAVE RESIN-SEALED ELECTRICAL COMPONENTS. SOLENOID HALL HAVE NO LOOSE PARTS WHEN REMOVED FROM VALVE. EACH UNIT SHALL HAVE A DOUBLE-VALVE, ALL BRASS, SAMPLING POINT. REMOVAL OF 2" SOLENOID VALVE SHALL BE POSSIBLE VIA AN O-RING CONNECTOR LOCATED UNDER THE VALVE. AFTER REMOVAL OF STAINLESS STEEL ACCESS PLATE. VALVE ASSEMBLY SHALL BE HOUSED IN A PVC ENCLOSURE AND EACH UNIT SHALL BE SELF-DRAINING, NON-FREEZING, ALL ABOVE-GROUND COMPONENTS SHALL BE CONTAINED WITHIN A UV-RESISTANT LOCKING COVER, AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY. MODEL#9800 ST. LOUIS, MO. 1-800-231-3990, OR APPROVED EQUAL.

AUTOMATIC FLUSHING DEVICE - MODEL #9800

NO SCALE



NOTES:
1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL (S-4)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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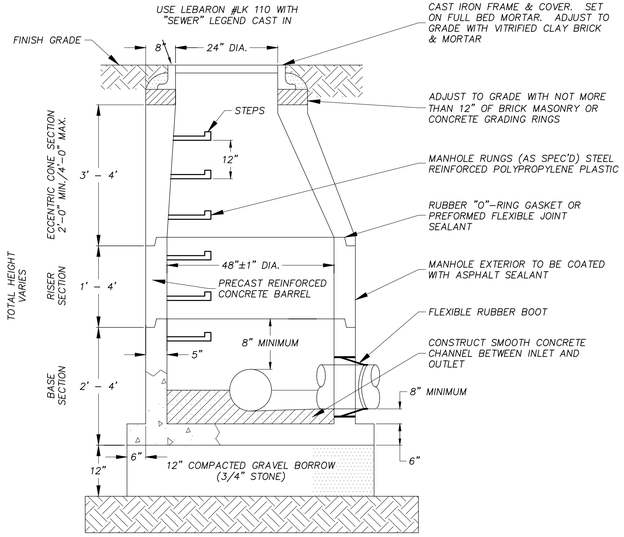
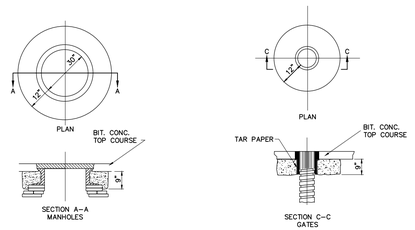


STANDARD SANITARY SEWER MANHOLE DETAIL

NO SCALE



PORTLAND CEMENT CONCRETE COLLARS

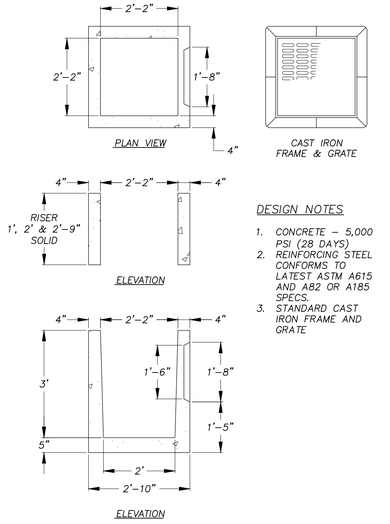
N.T.S

NOTES:

1. CONCRETE COLLARS ARE NOT REQUIRED FOR TYPE "C" OR "CL" PRECAST CATCH BASINS
2. ALL STRUCTURES ARE TO BE PLATED BEFORE PLACEMENT OF THE FIRST COURSE OF PAVEMENT AND RAISED PROMPTLY AFTERWARDS.
3. ALL RAISED STRUCTURES SHALL HAVE BITUMINOUS CONCRETE "DOUGHNUTS" PLACED AROUND THEM UNTIL THE FINISH COURSE OF PAVEMENT HAS BEEN COMPLETED.

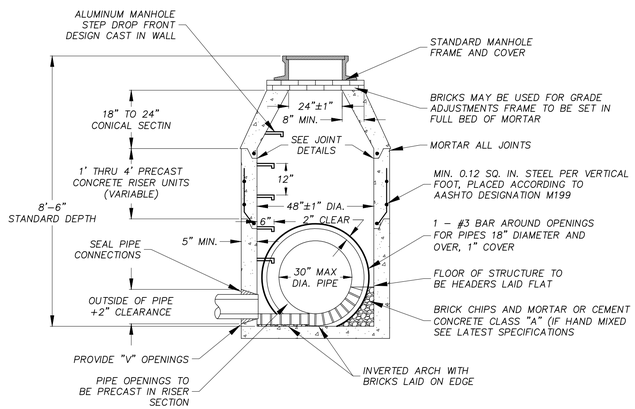
CONCRETE COLLARS

NO SCALE



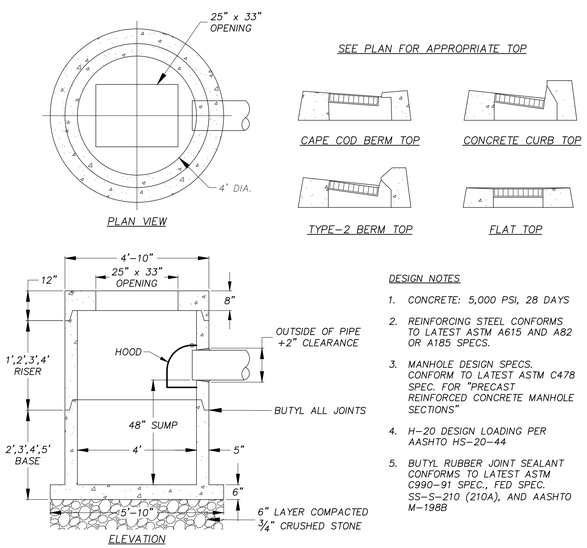
YARD DRAIN DETAIL

NO SCALE



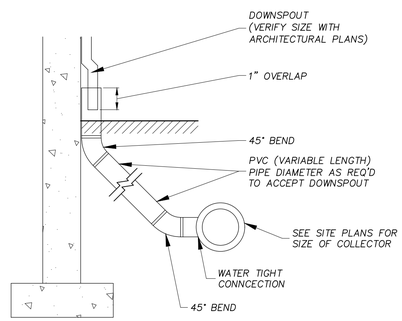
PRECAST CONCRETE MANHOLE

NO SCALE



PRECAST CONCRETE CATCH BASIN-CT STYLE/ROUND BASE

NO SCALE



DOWNSPOUT COLLECTOR DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC

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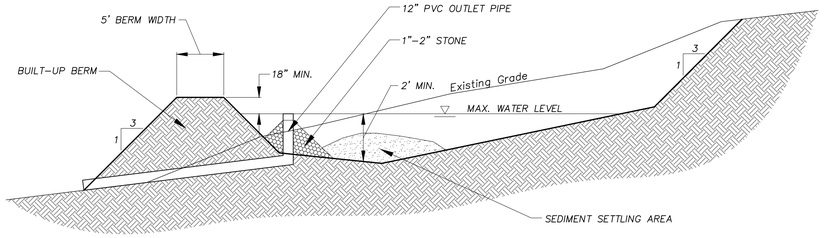


TEMPORARY SEDIMENT BASIN

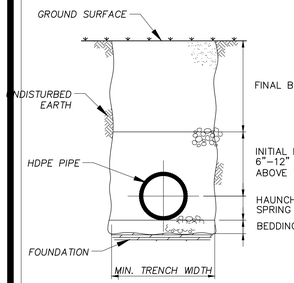
NO SCALE

HDPE TRENCH INSTALLATION DETAIL

NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY–FLOW APPLICATIONS," LATEST EDITION; AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

   UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 6" (150mm).
3. HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
4. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:



TYPICAL HDPE TRENCH CROSS–SECTION

NOMINAL ø in (mm)	MIN. RECOMMENDED TRENCH WIDTH, in (mm)
4 (100)	21 (530)
6 (150)	23 (580)
8 (200)	25 (630)
10 (250)	28 (710)
12 (300)	31 (790)
15 (375)	34 (860)
18 (450)	39 (990)
24 (600)	48 (1220)
30 (750)	66 (1680)
36 (900)	78 (1980)
42 (1050)	83 (2110)
48 (1200)	89 (2260)
60 (1500)	102 (2590)

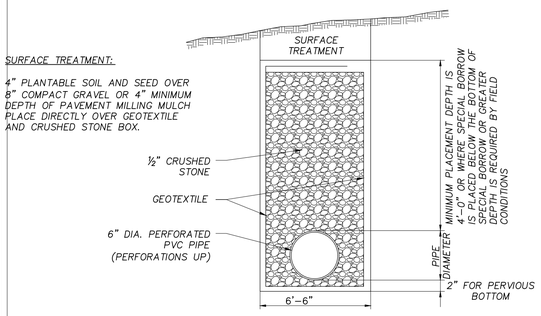
5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADING CONDITIONS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.

SURFACE LIVE LOADING CONDITION	MINIMUM RECOMMENDED COVER, in (mm)
H25 (FLEXIBLE PAVEMENT)	12 (300)
H25 (RIGID PAVEMENT)	12 (300)
E80 RAILWAY	24 (610)
HEAVY CONSTRUCTION	48 (1220)

*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

HDPE TRENCH INSTALLATION DETAIL

NO SCALE

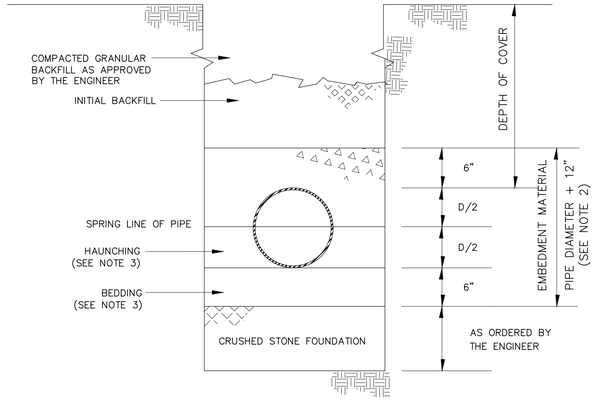


NOTES:

1. GEOTEXTILE FABRIC AS DESCRIBED IN SECTION M9.50.
2. PIPE SHALL BE SET AT BOTTOM OF TRENCH FOR IMPERVIOUS BOTTOM.
3. SUBDRAIN LOCATED APPROXIMATELY AT INTERSECTION OF TANGENTS (SEE DWG. E102.1.0).
4. GRAVEL (AND SPECIAL BORROW WHERE REQUIRED) SHALL INTERSECT CRUSHED STONE FOR SUBDRAIN.

SUBDRAIN DETAIL (MHD #E 209.1.0)

NO SCALE

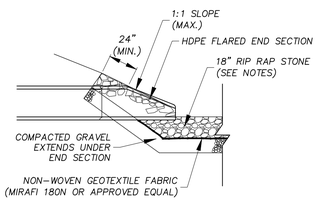


NOTES:

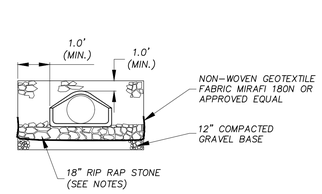
1. THE INSTALLATION OF PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD D–2321.
2. THE EMBEDMENT MATERIAL SHALL BE 3/4" CRUSHED STONE.
3. USE HAND OR MECHANICAL TAMPING TO COMPACT THE BEDDING AND HAUNCHING.
4. GEOTEXTILE TO BE USED WHERE AND AS DIRECTED BY ENGINEER.

SANITARY & STORM SEWER TRENCH SECTION (M-2)

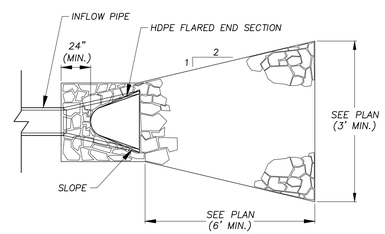
NO SCALE – AGAWAM DETAIL M–2



SIDE SECTION



FRONT SECTION



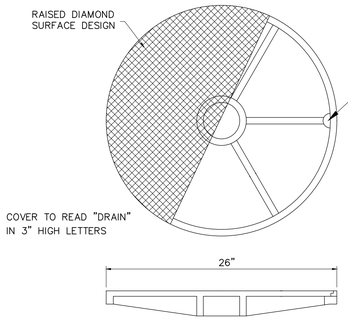
PLAN VIEW

NOTES

1. FLARED END SECTION PIPE JOINT SHALL BE SIMILAR TO THE MAIN RUN OF PIPE JOINTS
2. STONE RIPRAP SHALL NOT BE LESS THAN 50 POUNDS NOR MORE THAN 125 POUNDS AND AT LEAST 75% OF THE VOLUME SHALL BE AT LEAST 75 POUNDS

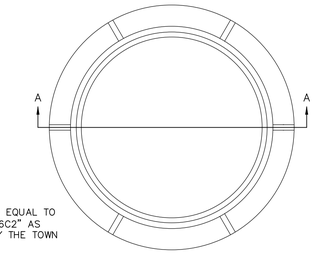
STANDARD RIP RAP PIPE OUTLET

NO SCALE

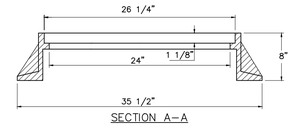


24" MANHOLE COVER

N.T.S.
202.8.1



COVER TO BE EQUAL TO "LEBARON L26C2" AS APPROVED BY THE TOWN ENGINEER



SECTION A–A

FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LK 110A"

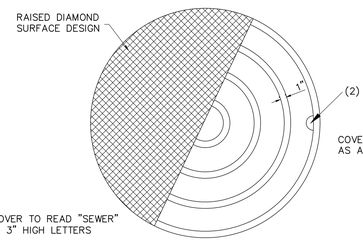
TOTAL WEIGHT OF FRAME & COVER = 485 LBS

24" MANHOLE FRAME

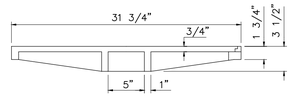
N.T.S.

DRAIN MANHOLE FRAME & COVER (D-2)

NO SCALE – AGAWAM DETAIL D–2

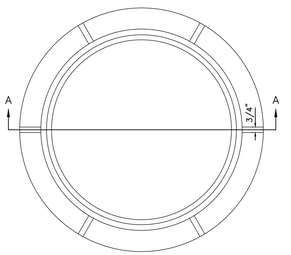


COVER TO BE EQUAL TO "LEBARON L32C19" AS APPROVED BY THE TOWN ENGINEER



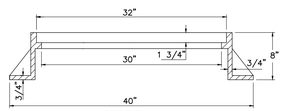
30" MANHOLE COVER

N.T.S.
202.8.1



FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LC328"

TOTAL WEIGHT OF FRAME & COVER = 551 LBS



SECTION A–A

30" MANHOLE FRAME TYPE 'C'

N.T.S.
202.7.1

SANITARY SEWER FRAME & COVER (S-3)

NO SCALE – AGAWAM DETAIL S–3

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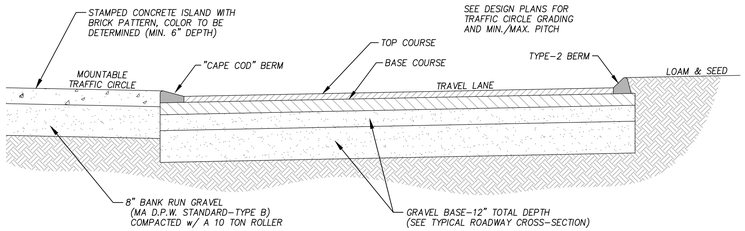
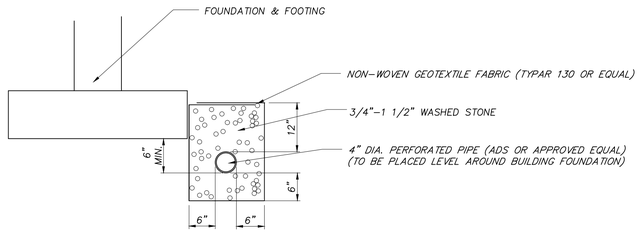


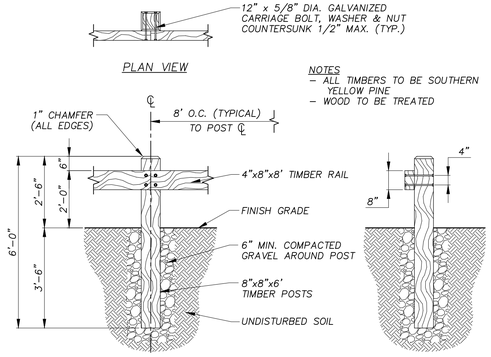
MOUNTABLE TRAFFIC CIRCLE ISLAND DETAIL

NO SCALE



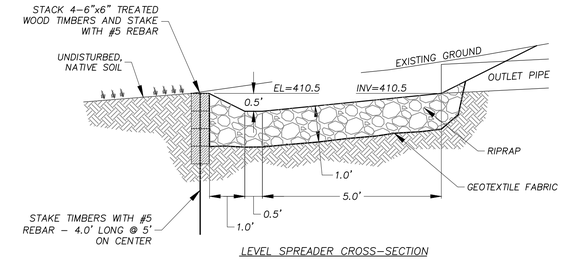
TYPICAL BUILDING FOUNDATION DRAIN DETAIL

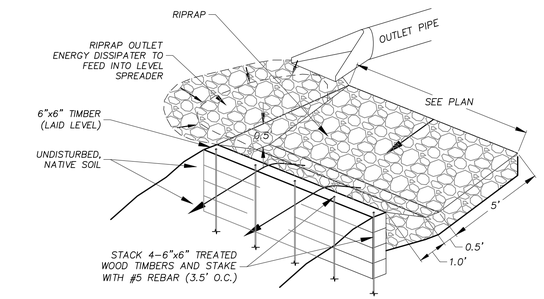
NO SCALE



WOOD GUARDRAIL

NO SCALE



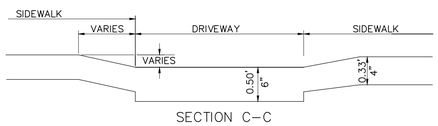


NOTES

1.) LEVEL SPREADER SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
2.) CONSTRUCTION OF LEVEL SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
3.) CONSTRUCT SPREADER WITH LIP AT EXISTING GRADE AS SPECIFIED.
4.) DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

LEVEL SPREADER DETAIL

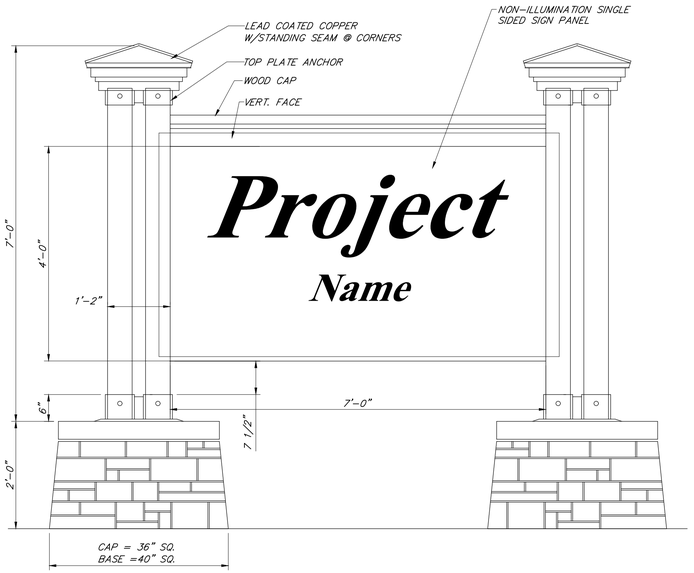
NO SCALE



SECTION C-C

NOTE:

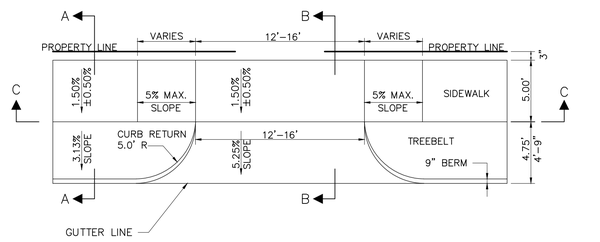
SIGN SIZE, COLORS, MATERIALS & HEIGHT AS SPECIFIED BY SIGN MANUFACTURER

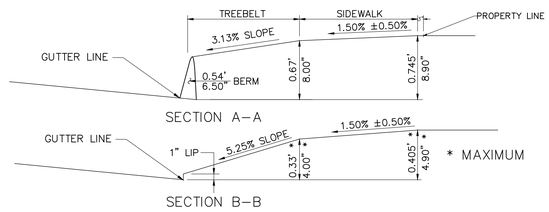


FOUNDATION SHALL BE DESIGNED ACCORDING TO PREVAILING SOIL CONDITIONS, WIND LOADS, AND SUBSURFACE EXPLORATION RESULTS.

FREESTANDING SIGN DETAIL

NO SCALE





NOTES

1.) CONCRETE SIDEWALK IS TO RUN CONTINUOUSLY THOUGH DRIVEWAYS.
2.) CONCRETE USED SHALL BE 4000 PSI WITH A MAX. AGGREGATE SIZE OF ¾"AND SHALL CONTAIN 5-7% ENTRANED AIR.
3.) CONCRETE DEPTH SHALL BE A MINIMUM OF 4" WITH A MIN. DEPTH OF 6" AT DRIVEWAYS.
4.) SIDEWALKS SHOULD BE INSTALLED PRIOR TO THE APPLICATION FOR A BUILDING PERMIT UNLESS THE BUILDER REQUESTS IN WRITING THAT THE SIDEWALKS BE DELAYED AND GUARANTEES THAT THE SIDEWALK WILL CONFORM TO THE STANDARD DRIVEWAY DETAIL.
5.) ALL DRIVEWAYS REQUIRE A DPW DRIVEWAY PERMIT.
6.) ALL SLOPES ARE MAXIMUM. DRIVEWAYS ARE TO BE DESIGNED SUCH THAT WATER WILL NOT FLOW INTO DRIVEWAY FROM THE ROADWAY.

STANDARD RESIDENTIAL DRIVEWAY (H-6)

NO SCALE

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Landscape Architects
Civil Engineers · Land Surveyors
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rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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D-6	-

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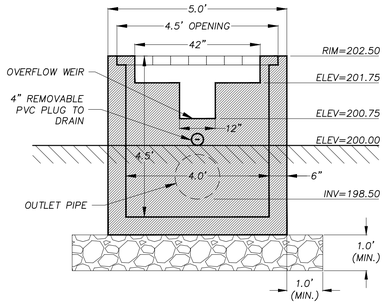
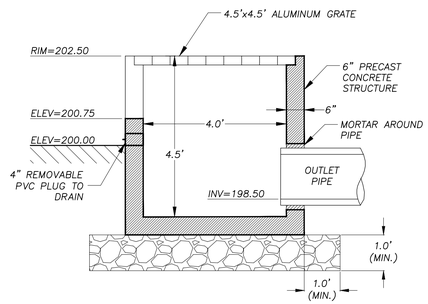
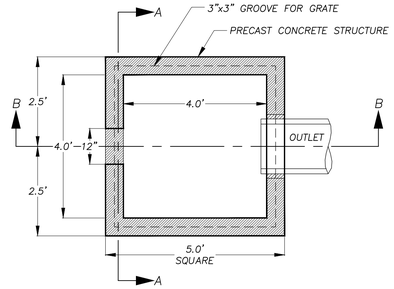


SECTION A–A



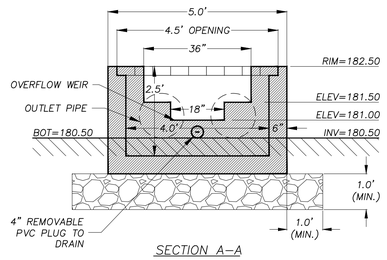
SECTION B–B



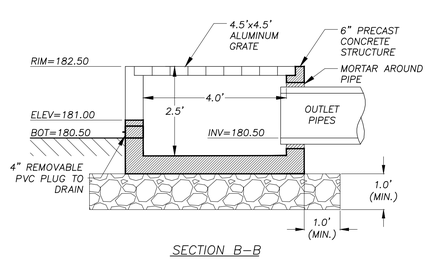
PLAN VIEW

INFILTRATION BASIN #1 OUTLET DETAIL (POCS-1)

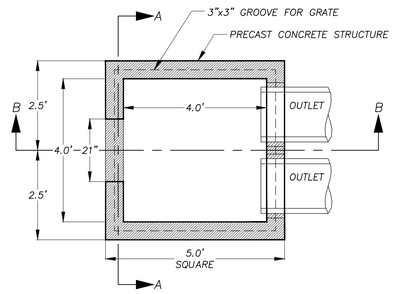
NO SCALE



SECTION A–A



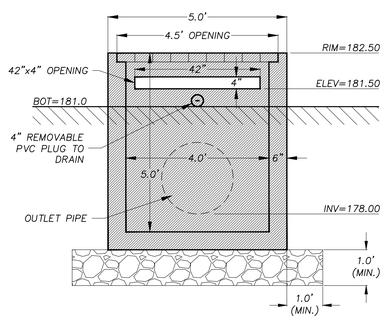
SECTION B–B



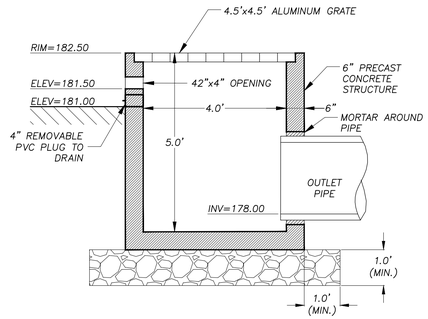
PLAN VIEW

INFILTRATION BASIN #2 OUTLET DETAIL (POCS-2)

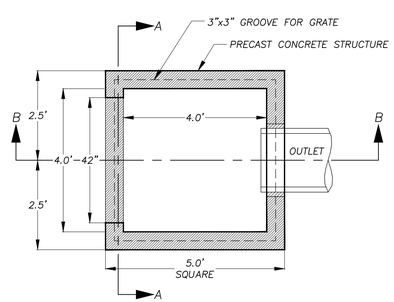
NO SCALE



SECTION A–A



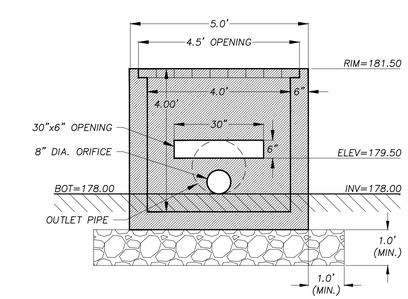
SECTION B–B



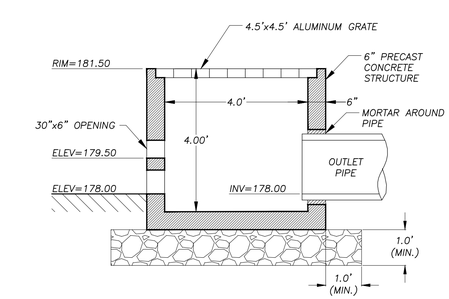
PLAN VIEW

INFILTRATION BASIN #3 OUTLET DETAIL (POCS-3)

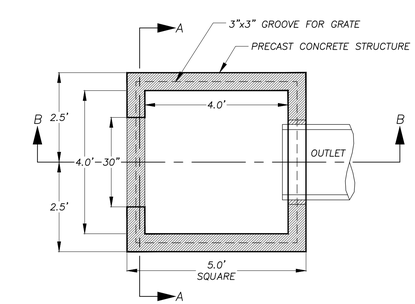
NO SCALE



SECTION A–A



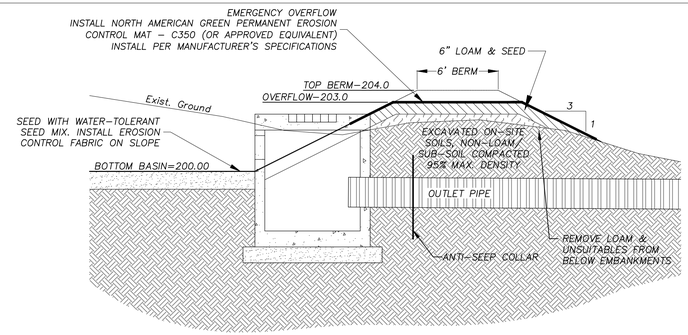
SECTION B–B

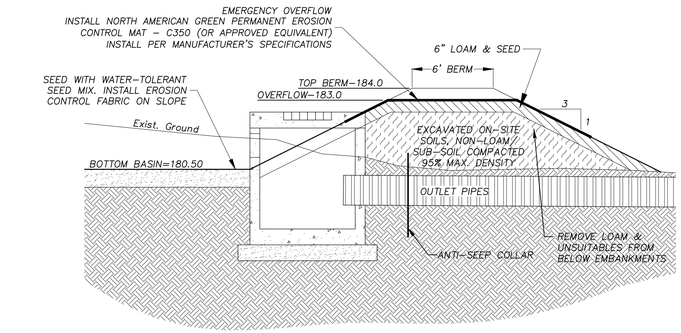


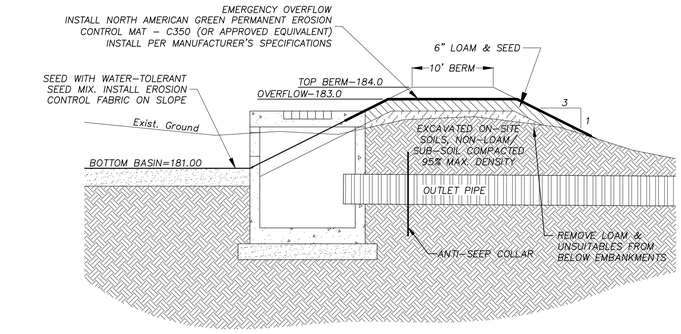
PLAN VIEW

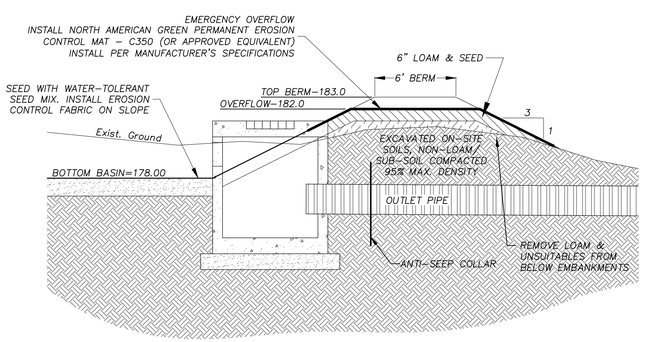
INFILTRATION BASIN #4 OUTLET DETAIL (POCS-4)

NO SCALE









INFILTRATION BASIN NOTES

1. INFILTRATION BASIN BOTTOM TO BE LOCATED A MINIMUM OF 2.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW).
2. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER–TOLERANT GRASS.
3. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE INFILTRATION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
6. IF INFILTRATION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
7. ALL DRAINAGE AREAS TO AN INFILTRATION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF TOPSOIL/COMPOST MIX AND SEED MIX.
8. INFILTRATION BASIN BOTTOMS AND EMBANKMENTS TO BE SEEDED AS NOTED ON PLANS. NO TREES OR SHRUBS TO BE PLANTED WITHIN INFILTRATION BASINS OR EMBANKMENTS. DO NOT USE SOD.

RLA
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Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

FILIPE J. CRAVO CIVIL No. 48376 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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Site Plans

Proposed Condominium Community

Assessor's Map 66, Block 2, Lot 8
497 South Westfield Street · Agawam, MA

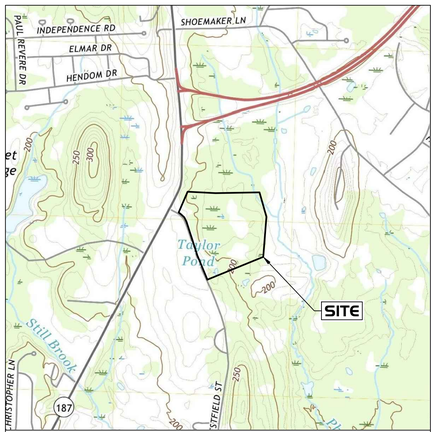
AS PREPARED FOR

Joe Tirone & Ralph Depalma

36 Canterbury Lane
Feeding Hills, MA 01030

SITE INFORMATION		
LOT INFORMATION		
ZONE	RESIDENCE A–3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

*ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS: 81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



SOURCE: USGS

NORTH

September 19, 2022

BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

DRAWING INDEX

SHEET NO.	SHEET NAME	ISSUE DATE	REVISION DATE
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EX–1	EXISTING SITE CONDITIONS	7/28/22	
C–1	NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS	9/19/22	
C–2	CONSTRUCTION NOTES	9/19/22	
C–3	SITE PREPARATION PLAN	9/19/22	
C–4	SITE LAYOUT – Southwesterly Section	9/19/22	
C–5	SITE LAYOUT – Northeasterly Section	9/19/22	
C–6	OVERALL SITE GRADING	9/19/22	
C–7	SITE GRADING & DRAINAGE – Southwesterly Section	9/19/22	
C–8	SITE GRADING & DRAINAGE – Northeasterly Section	9/19/22	
C–9	PLAN & PROFILE – Entrance Drive	9/19/22	
C–10	PLAN & PROFILE – Exit Drive	9/19/22	
C–11	PLAN & PROFILE – Cul–de–sac	9/19/22	
C–12	PLAN & PROFILE – Loop Drive	9/19/22	
C–13	PLAN & PROFILE – Along South Westfield Street	9/19/22	
C–14	SITE LANDSCAPING PLAN – Southwesterly Section	9/19/22	
C–15	SITE LANDSCAPING PLAN – Northeasterly Section	9/19/22	
C–16	OVERALL SITE UTILITY PLAN	9/19/22	
C–17	CUL–DE–SAC & INTERSECTION DETAILS	9/19/22	
C–18	EROSION & SEDIMENTATION CONTROL & PROJECT PHASING PLAN	9/19/22	
SL–1	SITE LIGHTING PLAN	5/2/22	
D–1	DETAILS	9/19/22	
D–2	DETAILS	9/19/22	
D–3	DETAILS	9/19/22	
D–4	DETAILS	9/19/22	
D–5	DETAILS	9/19/22	
D–6	DETAILS	9/19/22	
D–7	DETAILS	9/19/22	

RLA Project Number: 090506

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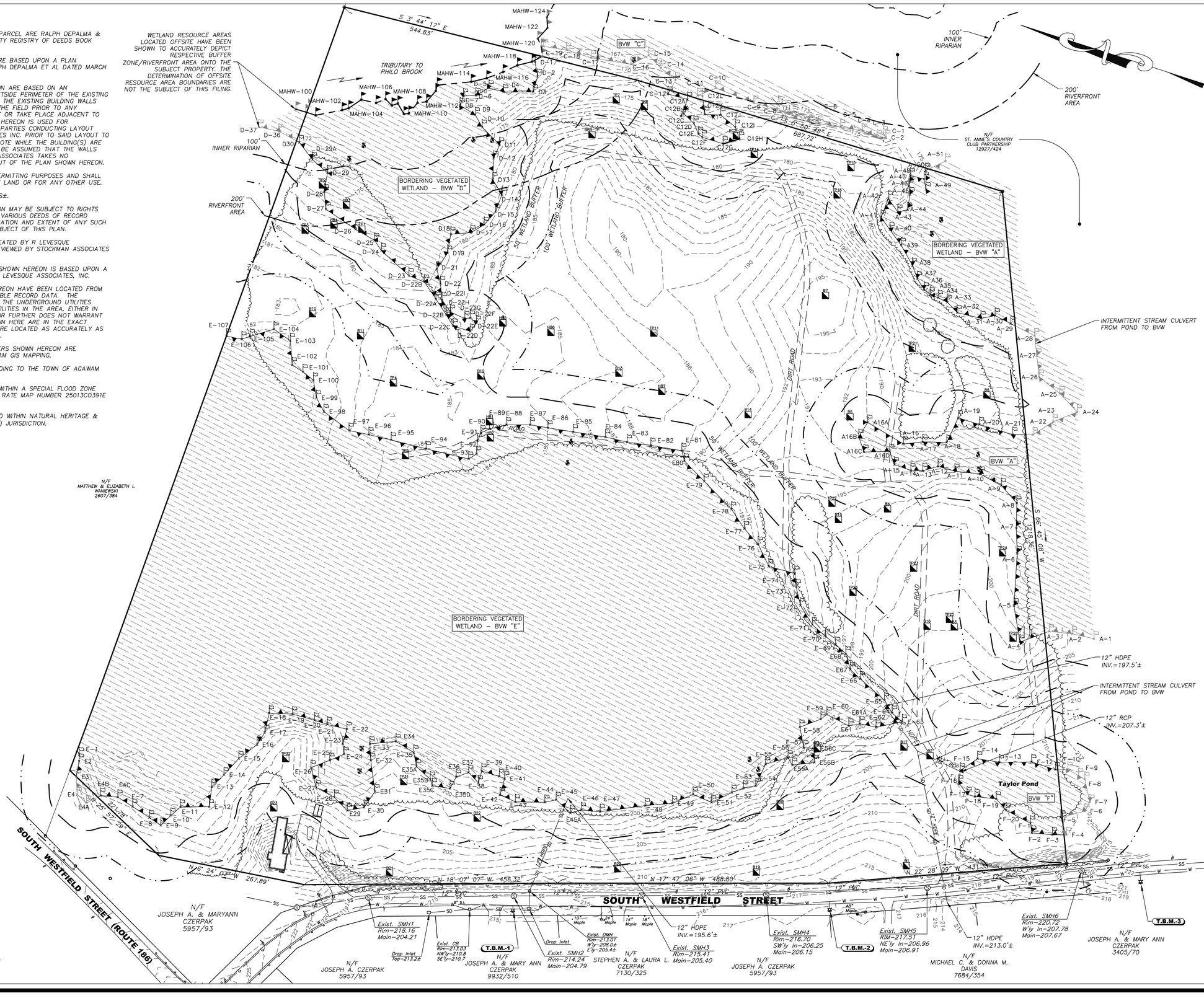
NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE RALPH DEPALMA & GIUSEPPE TIRONE. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 14554 PAGE 323.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON A PLAN PREPARED BY D.L. BEAN, INC. FOR RALPH DEPALMA ET AL DATED MARCH 21, 2005.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCEL CONTAINS 49.81 ACRES±.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLAND RESOURCE AREAS WERE DELINEATED BY R LEVESQUE ASSOCIATES, INC. IN 2021 AND PEER REVIEWED BY STOCKMAN ASSOCIATES IN JUNE 2022.
8. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND AVAILABLE RECORD DATA. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
11. SUBJECT PARCEL IS ZONED A–3 ACCORDING TO THE TOWN OF AGAWAM ZONING MAP.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0391E – EFFECTIVE DATE: 7/16/13.
13. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.



SCALE: 1"=80'

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40 School Street
Westfield, MA 01085

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WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 39610
REGISTERED LAND SURVEYOR

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

REVISIONS:	DATE:
A. Wetland Peer Review	6/17/22
B. Wetland Peer Review	6/22/22
C. Wetland Peer Review	7/26/22
D. Updated Riverfront Area	7/28/22

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SCALE: AS NOTED

RLA PROJ. NUMBER: 090506

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EX-1	D

SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- E EXISTING ELECTRIC MANHOLE
- T EXISTING TELEPHONE MANHOLE
- W EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VAVLE
- PROPOSED HYDRANT
- GV EXISTING GAS VALVE
- S EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- D EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- OH-1 OBSERVATION HOLE LOCATION
- P-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- WETLAND
- EXISTING STONE WALL
- TREE LINE
- × 102.3 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- • 99.4 PROPOSED SPOT GRADE
- PROPOSED CONTOUR
- OHW OHW EXISTING OVERHEAD WIRES
- UEL UEL EXISTING UNDERGROUND ELECTRIC
- TEL TEL EXISTING TELEPHONE LINE
- G G EXISTING GAS LINE
- W W EXISTING WATER LINE
- SD SD EXISTING STORM DRAIN
- SS SS EXISTING SANITARY SEWER
- LOW LOW LIMIT OF WORK LINE
- SF SF SF DOUBLE EROSION CONTROL BARRIER

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER/LANDSCAPE ARCHITECT AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.

A. SITE PREPARATION
   - -COMPLETE ALL ROUGH GRADING ACTIVITIES
   - -REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
   - -EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
   - -SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
   - -THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.

B. ESTABLISHMENT
   - -EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
   - -UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
   - -APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
   - -VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
   - -PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.

C. MAINTENANCE
   - -ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION. APPLICATION STANDARDS:
   - -REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
   - -SCARIFY SURFACE PRIOR TO SEED APPLICATION.
   - -APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS TO THE WETLAND. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:
   A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
   B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
   C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL NE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENVIRONMENTAL PROFESSIONALS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

DEMO NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
5. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
6. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. CONTRACTOR SHALL PROMPTLY TRANSPORT DEMOLISHED MATERIALS OFF OWNERS PROPERTY AND LEGALLY DISPOSE OF. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL PAY ANY DUMPING FEES.
8. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
9. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
10. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, LIGHT POLE BASES, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
13. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2) REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. FINAL FOUNDATION PLANTINGS PLANS AND LISTS TO BE PROVIDED BY LANDSCAPE CONTRACTOR AND SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
11. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
12. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
13. DURING THE INSTALLATION OF PLANT MATERIAL AND OTHER LANDSCAPE FEATURES LANDSCAPE/SITE/IRRIGATION CONTRACTORS SHALL PAY SPECIAL ATTENTION TO THE LOCATION OF PRE-EXISTING, AS WELL AS, NEWLY INSTALLED UTILITIES. CONTRACTOR SHALL REFER TO THE APPLICABLE SHEETS HEREIN AND KEEP A RECORD OF ON-SITE CHANGES AND PLAN/SKETCH REVISIONS THAT MAY AFFECT UTILITY AND DRAINAGE LOCATIONS.
14. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
15. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
   A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RAT OF 50 LBS/1,000 S.F.
   B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
   C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
   D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F.

SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

   E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F. UNLESS HYDROSEEDING WAS USED.
   F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHE IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.
16. ALL SLOPES STEEPER THAN 1:5 SHALL BE BLANKETED W/ EROSION CONTROL FABRIC AND /OR HYDROSEEDED AND INSPECTED BY THE LANDSCAPE ARCHITECT.

MATERIALS CONSTRUCTION NOTES

1. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 40, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE A MINIMUM CLEARANCE OF 2" BETWEEN OUTSIDE OF STEEL AND FACE OF CONCRETE. UNLESS CAST AGAINST EXPOSED SOIL, IN WHICH CASE A MINIMUM OF 3" OF CLEARANCE IS REQUIRED.

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATION

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.
2. THE OWNER AND R LEVESQUE ASSOCIATES, INC. AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.
4. CONTRACTOR SHALL PROVIDE TWO SETS OF AS-BUILT DRAWINGS, PRIOR TO FINAL PAYMENT. AS-BUILT DRAWINGS BY A REGISTERED LAND SURVEYOR SHALL INCLUDE ALL INSTALLED UTILITIES WITH VERTICAL AND HORIZONTAL LOCATIONS AND BE SATISFACTORY TO THE BUILDING OFFICIAL FOR ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
5. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150 AND SECTION 159-19C, OF TOWN CODE.
6. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
7. ALL WORK IN THE CITY RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
8. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.
9. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
10. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.
11. THE GENERAL CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.
12. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.
13. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.
14. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
15. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.
16. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.
17. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.
19. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
20. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
21. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.
22. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS HIGHWAY (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
23. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.
24. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.
25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.
26. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.
27. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. ALL CONSTRUCTION IN CITY RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.
3. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
4. SITE CONTRACTOR SHALL REFER TO ARCHITECTURAL DETAILS AND SPECIFICATIONS FOR REQUIREMENTS OF CONSTRUCTION AND JOINT SPACING OF SIDEWALKS, RAMPS, AND CURBING ADJACENT TO BUILDING.
5. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.
6. SITE CONTRACTOR SHALL PAINT ALL LIGHT POLE BASES, CURBS, FIRE HYDRANTS, PIPE BOLLARDS SIGN BASES, AND OTHER SITE AND UTILITY APPURTENANCES. CONTRACTOR SHALL PAINT OR REPAINT FIRE LANES WHERE REQUIRED BY LOCAL CODE.
7. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.
8. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASS HIGHWAY, AND THE TOWN OF AGAWAM. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.
9. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
10. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND LANDSCAPE ARCHITECT/ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.
11. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE LANDSCAPE ARCHITECT/ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.
13. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASS HIGHWAY AND/OR THE CITY/TOWN REGULATIONS.
14. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.
15. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
3. STORM PIPE SHALL BE AS NOTED ON PLANS.
4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20) LIDS SHALL BE LABELED "STORM SEWER".
10. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN.
12. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
13. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
14. TOPOGRAPHIC INFORMATION TAKEN FROM A EXISTING CONDITIONS PLAN BY R LEVESQUE ASSOCIATES, INC. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
15. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
16. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
17. EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.
18. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT. ALL FOOTINGS AND FOUNDATIONS FOR PROPOSED STRUCTURES SHALL BE EXCAVATED TO NATIVE SUBGRADE AND COMPACTED PER ARCHITECTURAL SPECIFICATIONS.
19. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.
20. CONTRACTOR TO SPREAD ON-SITE STOCKPILE TO A 4" DEPTH ON ALL AREAS TO BE SODDED/SEEDED AS SHOWN ON LANDSCAPE DRAWINGS. SITE CONTRACTOR FINE GRADE OF INSTALLED TOPSOIL PRIOR TO HYDROMULCHING BY LANDSCAPE SUB-CONTRACTOR.

SITE UTILITY NOTES

GENERAL:
1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.
3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. PRIOR TO CONSTRUCTION OF UTILITIES REFER TO ARCHITECTURAL INTERIOR PLUMBING DRAWINGS FOR ALL TIE-INS.
7. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.
8. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
9. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICE.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
11. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.
12. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.
13. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
14. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
16. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.
17. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:
1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.
2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.
3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.
4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.
5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.
6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.
7. ALL SANITARY SEWER MANHOLE INVERTS ARE TO BE BRICK AS SHOWN IN THE TOWN OF AGAWAM SEWER MANHOLE DETAIL.

WATER:
1. CONTRACTOR SHALL CONTACT THE CITY WATER RESOURCE DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.
2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.
3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).
4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.
5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).
6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.
7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER TOWN OF AGAWAM WATER DEPARTMENT STANDARDS.
9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.
10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE RESTRAINT SCHEDULE. (SEE DETAIL SHEETS)
11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.
12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.
13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.
14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.
15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.
16. ALL WATER MAINS SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.
17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.
18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.
19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER RESOURCE DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

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NOT FOR CONSTRUCTION

RLA
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Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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CONSTRUCTION NOTES

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE-CONSTRUCTION MEETING ON-SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI-TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.

MA+WW-100
MA+WW-102
MA+WW-106
MA+WW-108
TRIBUTARY TO PHILLIPS BROOK
MA+WW-112
MA+WW-114
MA+WW-116
MA+WW-118
MA+WW-120

100' INNER RIPARIAN
200' RIVERFRONT AREA
APPROXIMATE LIMIT OF TREE CLEARING
SILT FENCE/ LIMIT OF WORK
50' WETLAND BUFFER
100' WETLAND BUFFER
INTERMITTENT STREAM CULVERT FROM POND TO BVW

LAST SECTION OF PIPE TO ABANDONED IN PLACE
EXISTING 12" HDPE DRAIN PIPE TO BE REMOVED
EXISTING DRAIN MANHOLE TO BE REPLACED WITH OIL/SEDIMENT SEPARATOR
EXISTING DRIVEWAY TO BE REMOVED
EXISTING HOUSE & FOUNDATION TO BE REMOVED
APPROX. SAW CUT LINES/ LIMITS OF FULL OVERLAY (SEE DETAIL, SHEET D-4)
LAST FEW SECTIONS OF PIPE TO REMAIN IN PLACE (40'±)
12" HDPE INV.=197.5'±
12" RCP INV.=207.3'±
EXISTING 12" DRAIN PIPES TO BE RELAYED
INSTALL ANTI-TRACKING PAD

SOUTH WESTFIELD STREET (ROUTE 186)
SOUTH WESTFIELD STREET

Exist. SMH1 Rim=218.16 Main=204.21
Drop Inlet Top=213.2±
Exist. CB Rim=213.03 NW'ly=210.8 SE'ly=210.7
Drop Inlet
Exist. SMH2 Rim=214.24 Main=204.79
Exist. DMH Rim=213.01 W'ly=208.0± E'ly=205.4±
12" HDPE INV.=195.6'±
Exist. SMH3 Rim=215.41 Main=205.40
Exist. SMH4 Rim=216.70 SW'ly In=206.25 Main=206.15
Exist. SMH5 RIM=217.51 NE'ly In=206.96 Main=206.91
12" HDPE INV.=213.0'±
Exist. SMH6 Rim=220.72 W'ly In=207.78 Main=207.67

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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DEMOLITION & REMOVALS PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT LEVESQUE REGISTERED LANDSCAPE ARCHITECT NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

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LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS-SECTION ON SHEET C-7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D-5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

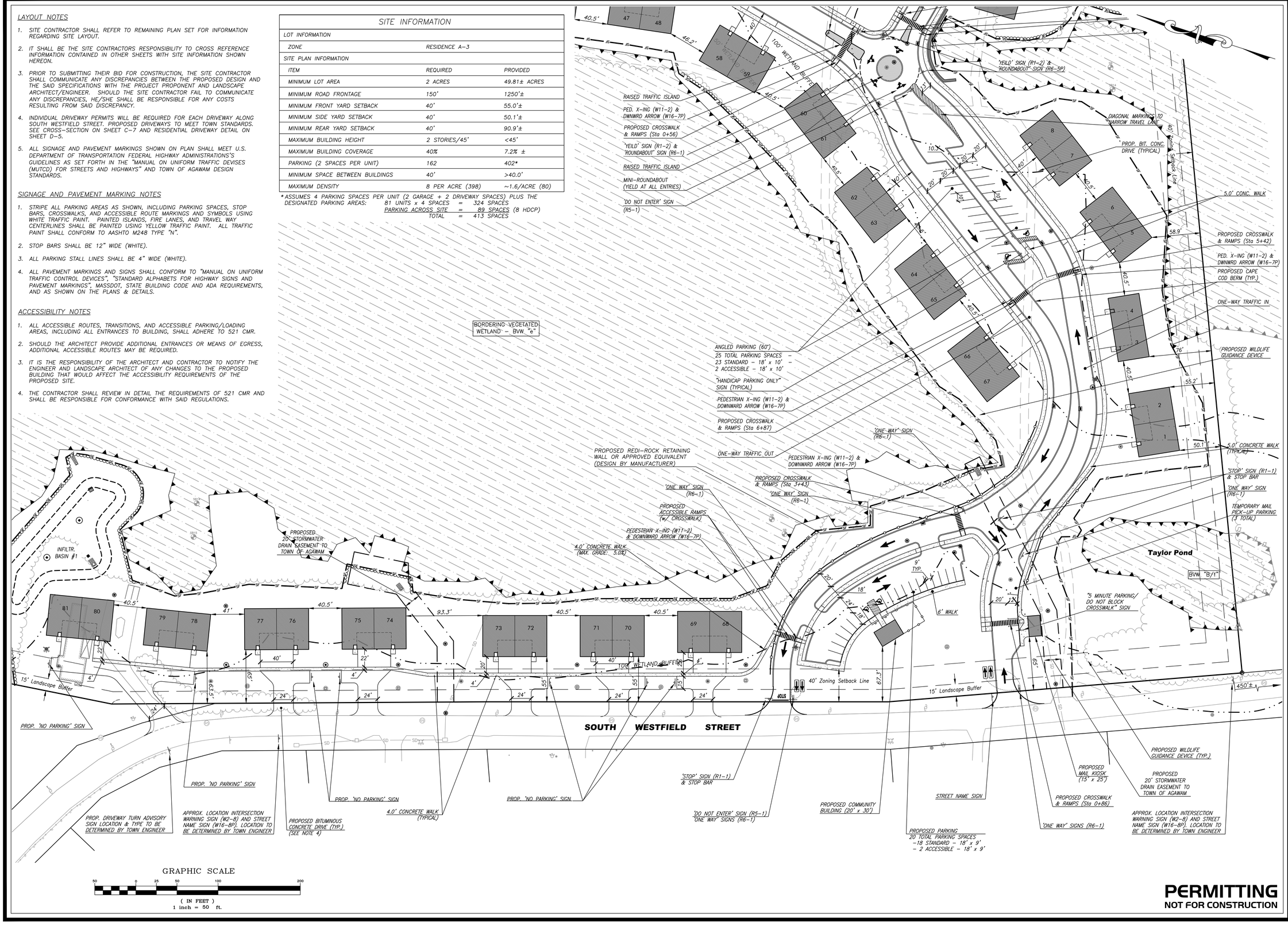
ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



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ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

LAYOUT & MATERIALS PLAN
(Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT S. LEVESQUE REGISTERED LANDSCAPE ARCHITECT NO. 1398
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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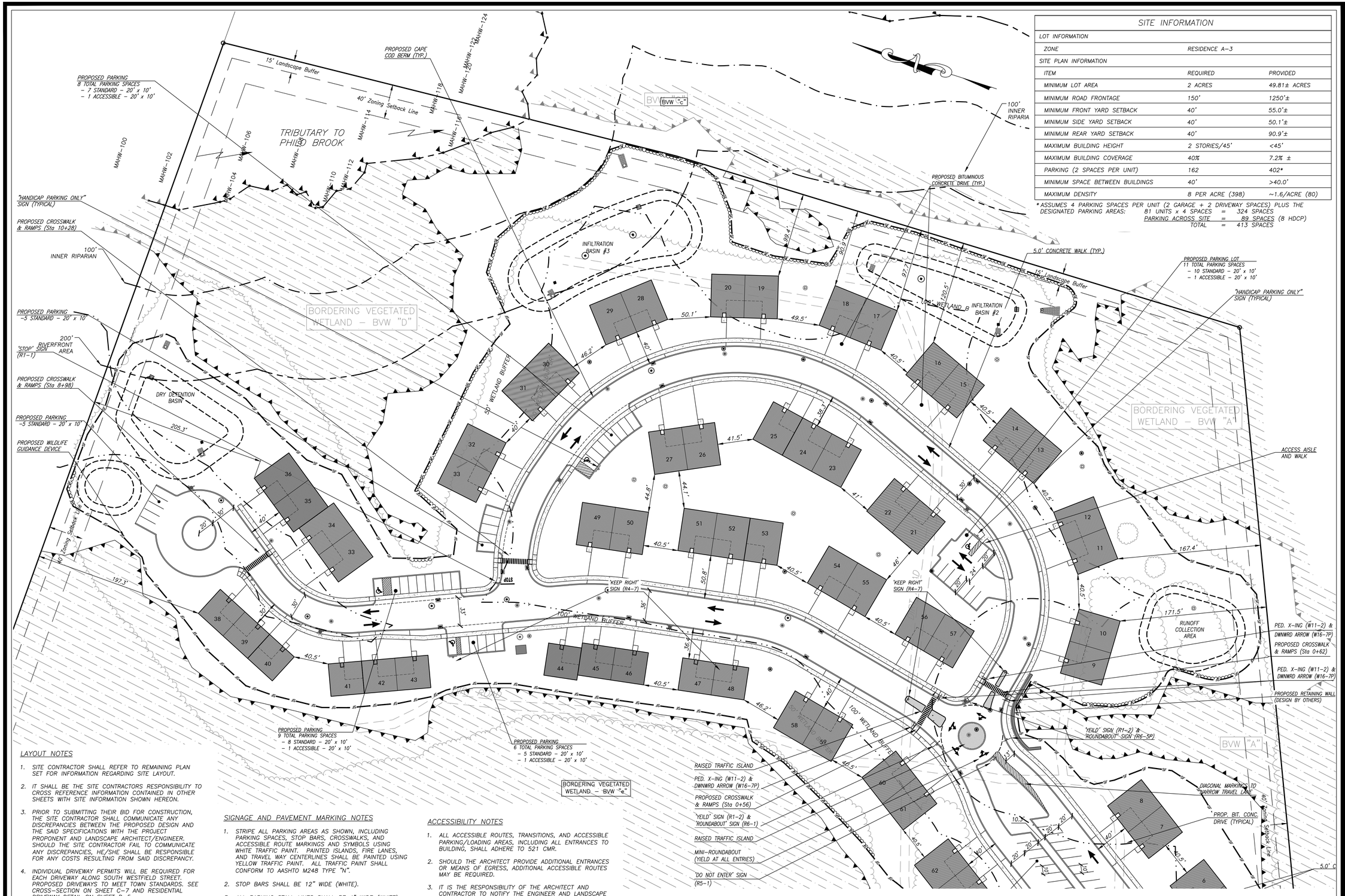

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A–3	
SITE PLAN INFORMATION		
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81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS–SECTION ON SHEET C–7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D–5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

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2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

ACCESSIBILITY NOTES

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3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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LAYOUT & MATERIALS PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT LEVESQUE MASSACHUSETTS REGISTERED LANDSCAPE ARCHITECT NO. 1398
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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CONSTRUCTION NOTES

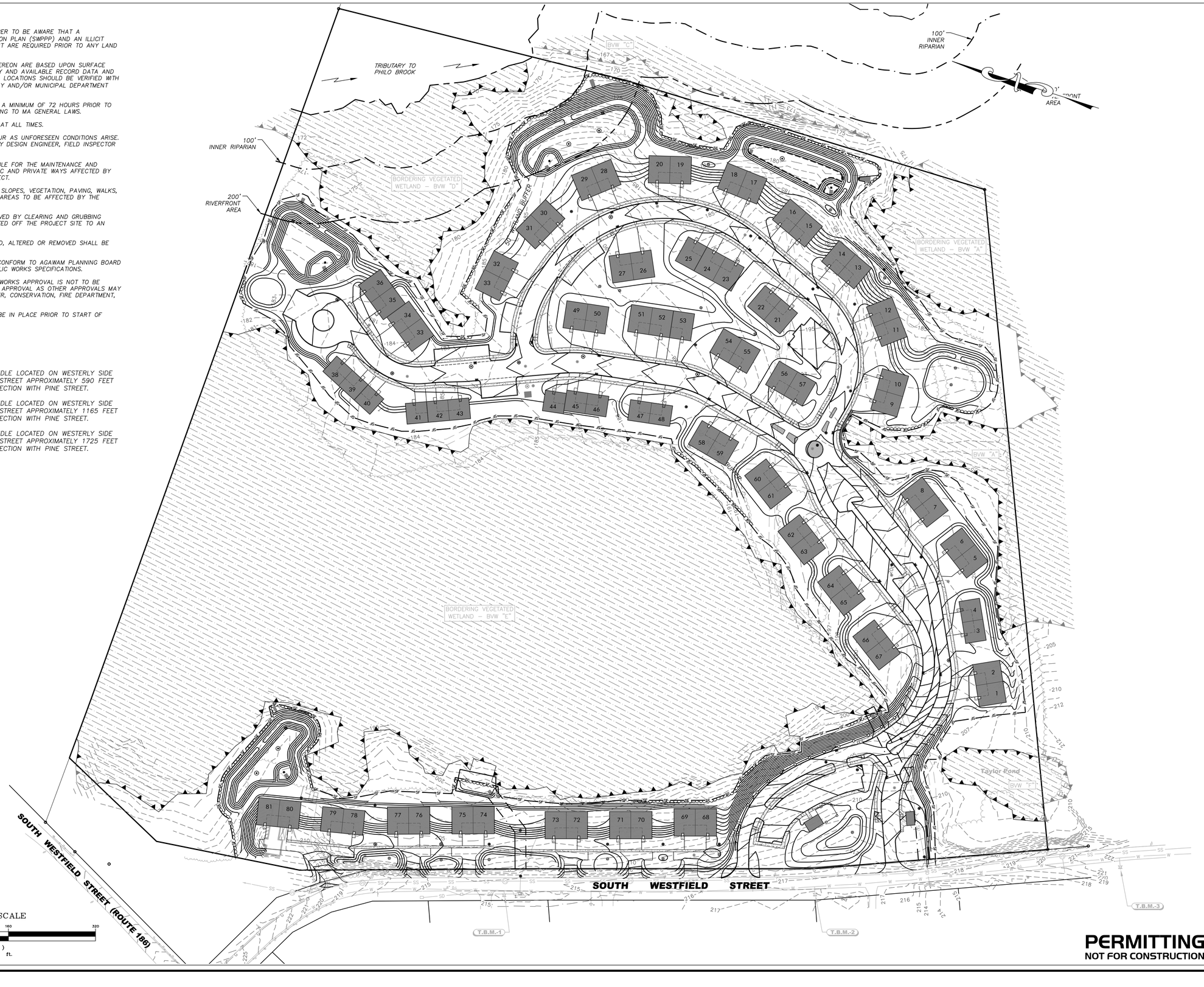
1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

BENCHMARKS

T.B.M.-1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 590 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 216.65

T.B.M.-2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 219.68

T.B.M.-3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 224.29



GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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rlaland.com

OVERALL SITE GRADING

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
MARK J. WESOLEVSKI
No. 1598
REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SHORT–TERM EROSION CONTROL MAINTENANCE

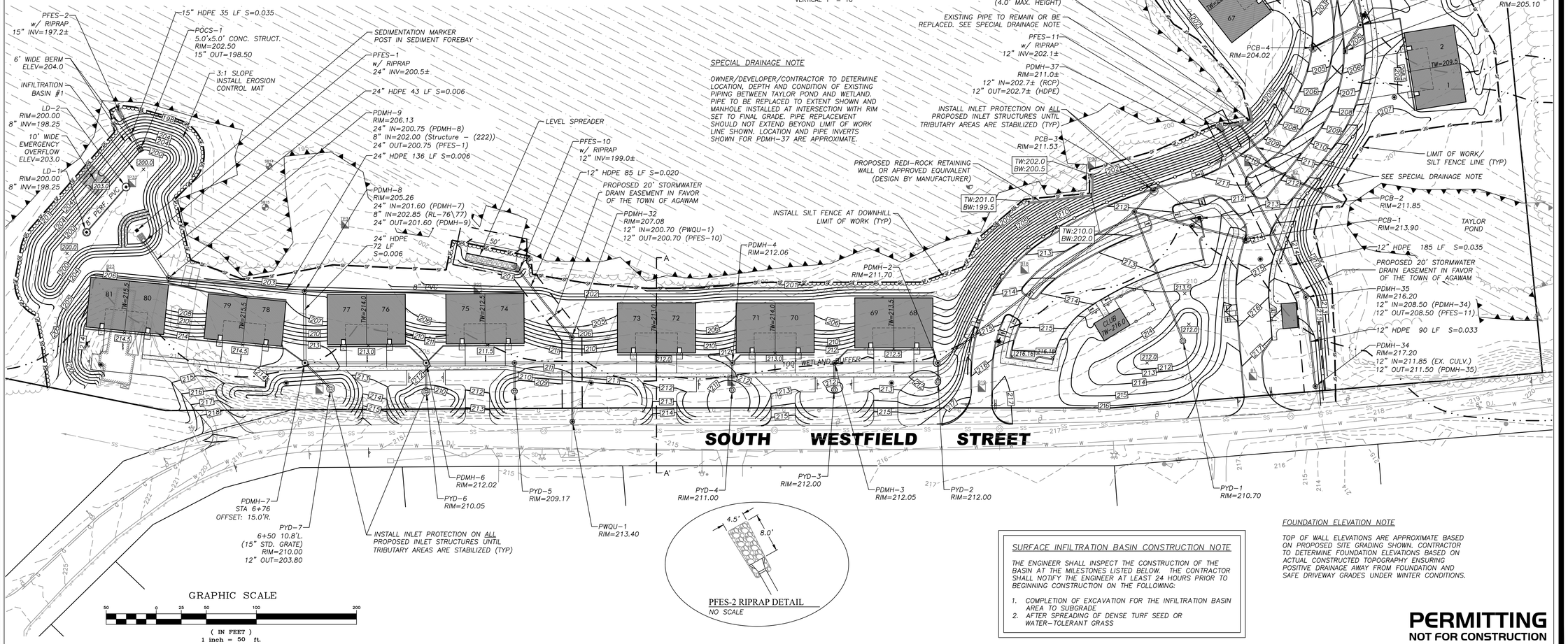
1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF–SITE SEDIMENTATION IF DEEMED NECESSARY BY ON–SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24–HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF–SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

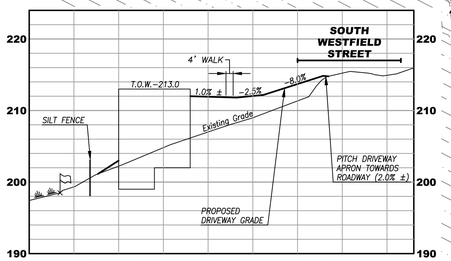
NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE–CONSTRUCTION MEETING ON–SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI–TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.





TYPICAL DRIVEWAY SECTION (A-A')
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'

SPECIAL DRAINAGE NOTE

OWNER/DEVELOPER/CONTRACTOR TO DETERMINE LOCATION, DEPTH AND CONDITION OF EXISTING PIPING BETWEEN TAYLOR POND AND WETLAND. PIPE TO BE REPLACED TO EXTENT SHOWN AND MANHOLE INSTALLED AT INTERSECTION WITH RIM SET TO FINAL GRADE. PIPE REPLACEMENT SHOULD NOT EXTEND BEYOND LIMIT OF WORK LINE SHOWN. LOCATION AND PIPE INVERTS SHOWN FOR PDMH–37 ARE APPROXIMATE.

PFES–2 RIPRAP DETAIL
NO SCALE

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER–TOLERANT GRASS

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

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GRADING & DRAINAGE PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
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RIVERFRONT AREA	
RIVERFRONT AREA ON SITE	168,123 SF ±
PROPOSED INNER RIPARIAN DISTURBANCE (0-100)	0 SF ±
PROPOSED RIVERFRONT AREA DISTURBANCE (100-200) *THIS DISTURBANCE (STORMWATER MANAGEMENT RELATED ACTIVITIES) IS EXCEMPT FROM RIVERFRONT AREA ALTERATION CALCULATIONS UNDER 310 CMR 10.58(4)(d)(1)	27,554 SF ±

PFES-8 DETAIL
NO SCALE

PFES-12 DETAIL
NO SCALE

PFES-3A & 4A DETAIL
NO SCALE

TRIBUTARY TO PHILO BROOK

BORDERING VEGETATED WETLAND – BVW "D"

BORDERING VEGETATED WETLAND – BVW "A"

100' WETLAND BUFFER

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

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1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER-TOLERANT GRASS

SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
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5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

PERMITTING
NOT FOR CONSTRUCTION

R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

GRADING & DRAINAGE PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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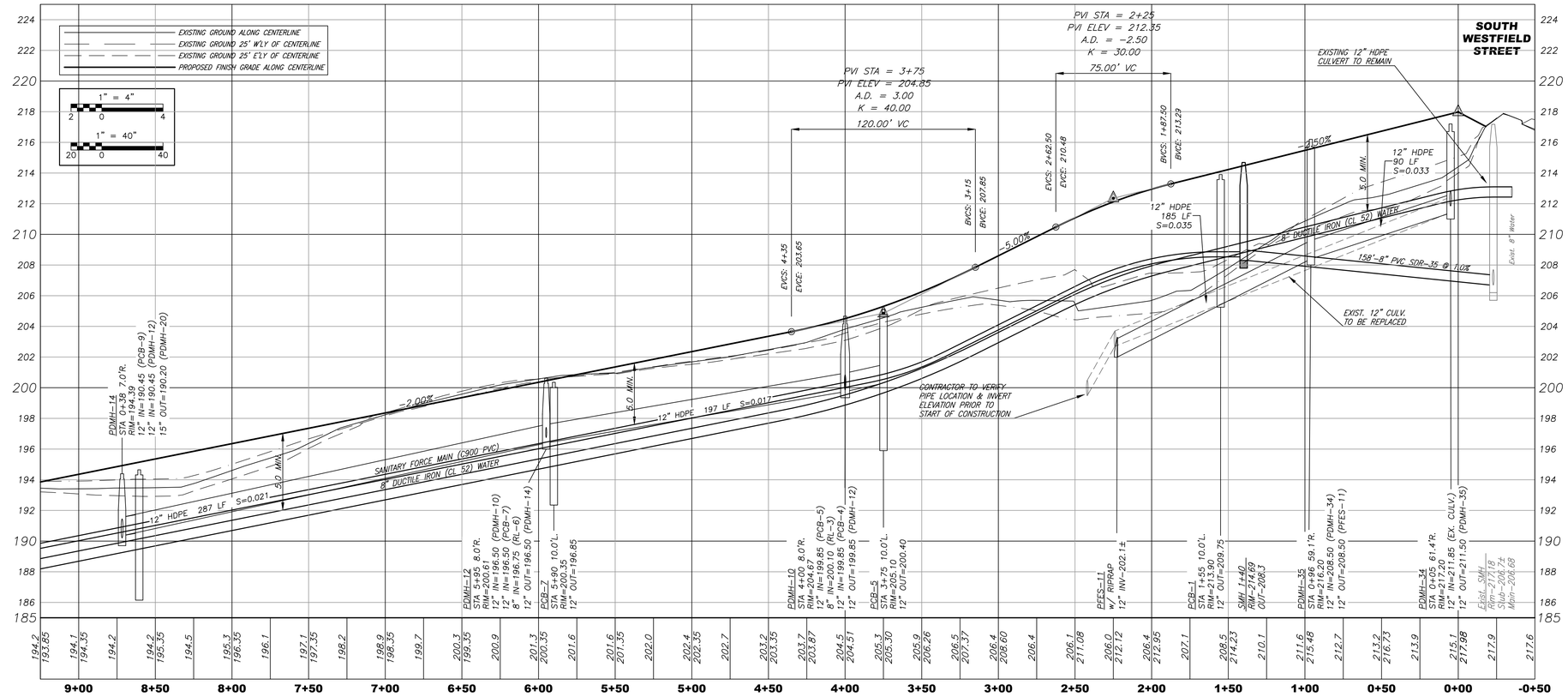
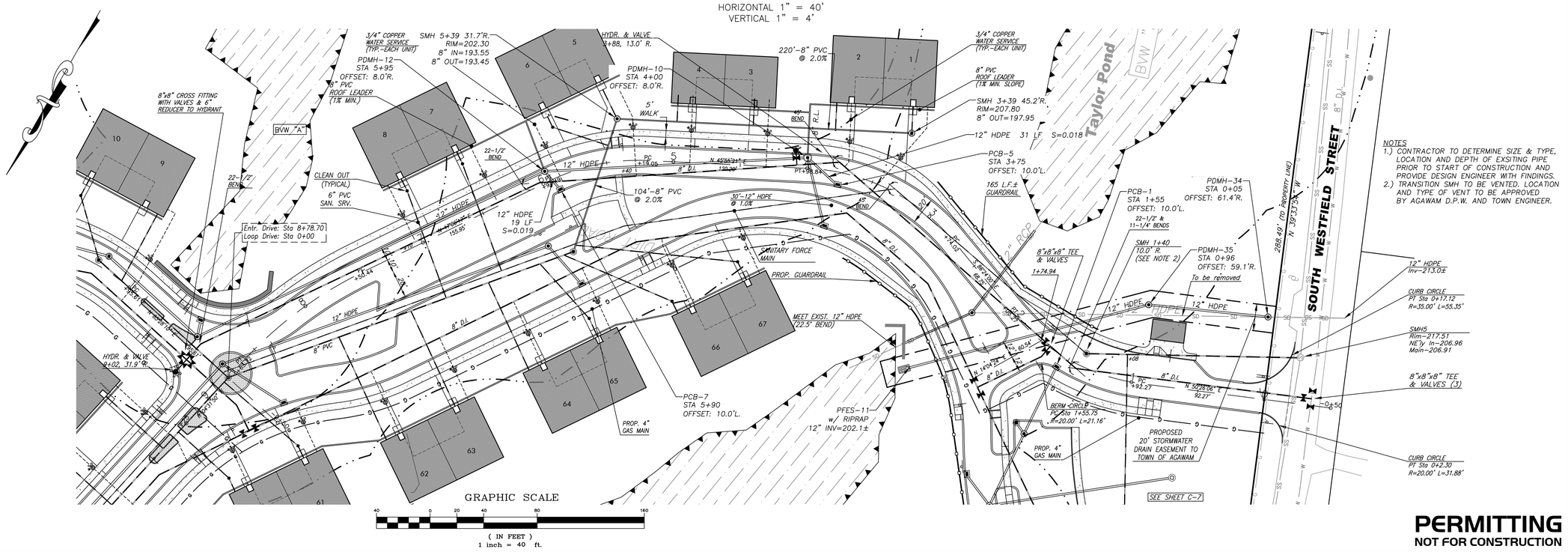


PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



NOTES

1.) CONTRACTOR TO DETERMINE SIZE & TYPE, LOCATION AND DEPTH OF EXSITING PIPE PRIOR TO START OF CONSTRUCTION AND PROVIDE DESIGN ENGINEER WITH FINDINGS.
2.) TRANSITION SMH TO BE VENTED. LOCATION AND TYPE OF VENT TO BE APPROVED BY AGAWAM D.P.W. AND TOWN ENGINEER.

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PLAN & PROFILE
ENTRANCE DRIVE
Sta 0+50 to Sta 9+25

Map 66, Block 2, Lot 8
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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

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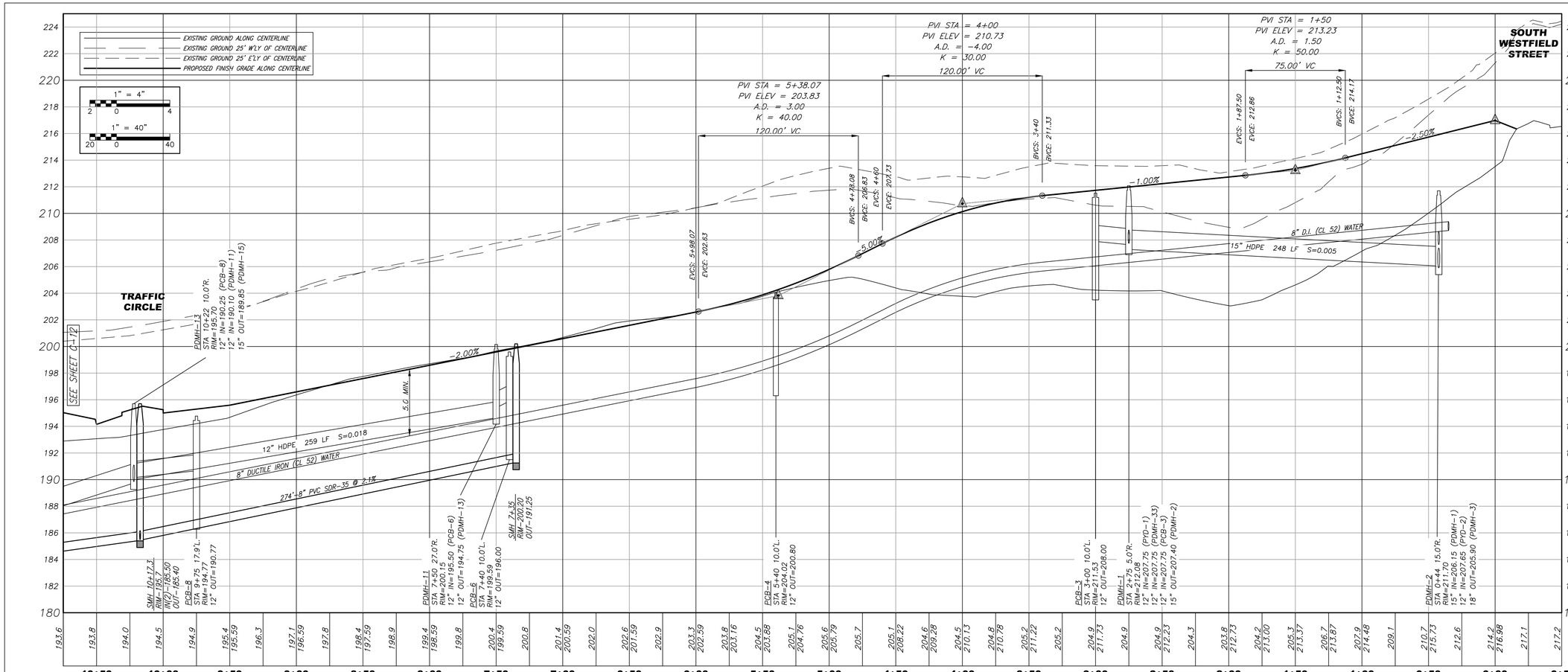

PROFILE SCALES

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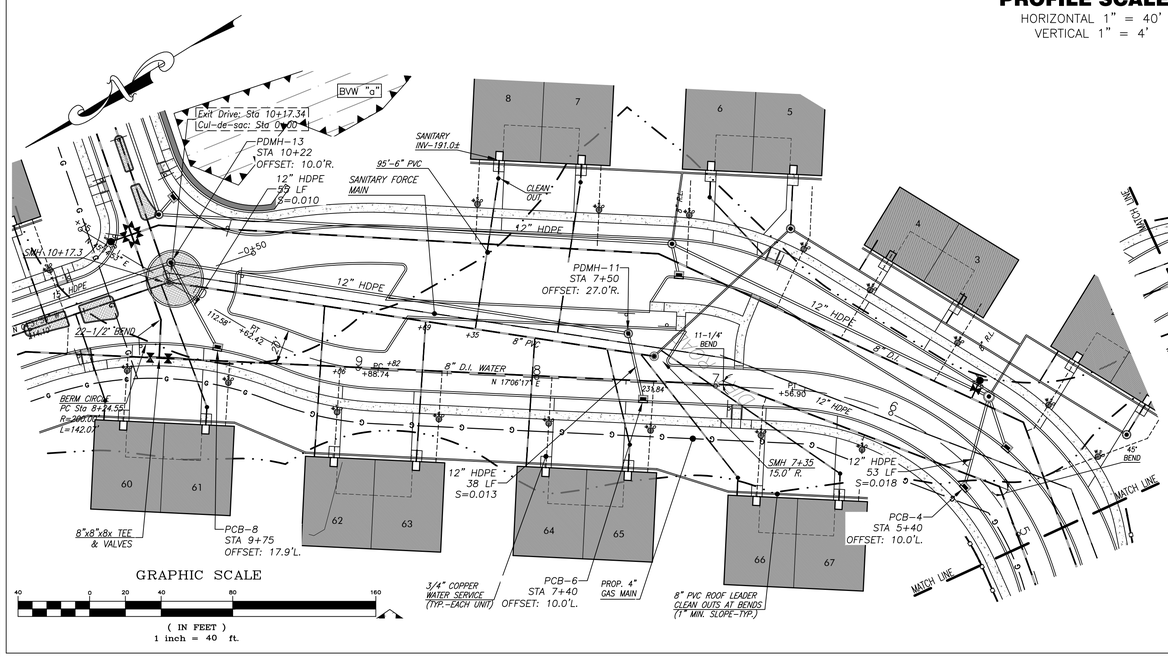

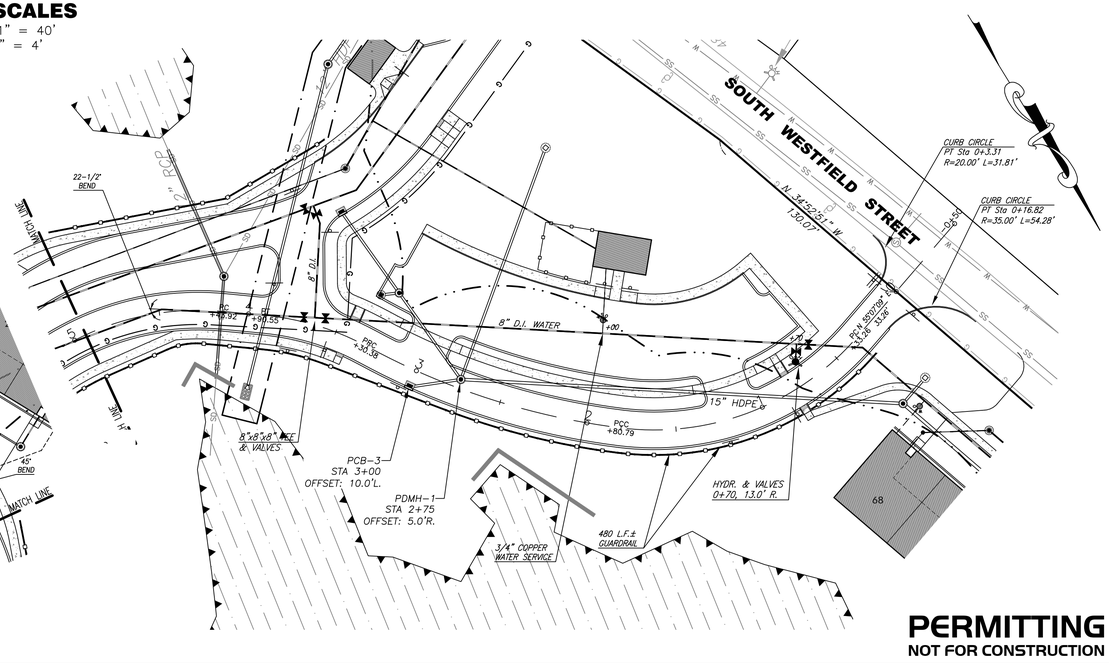

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PLAN & PROFILE
EXIT DRIVE
Sta 0+50 to Sta 10+75

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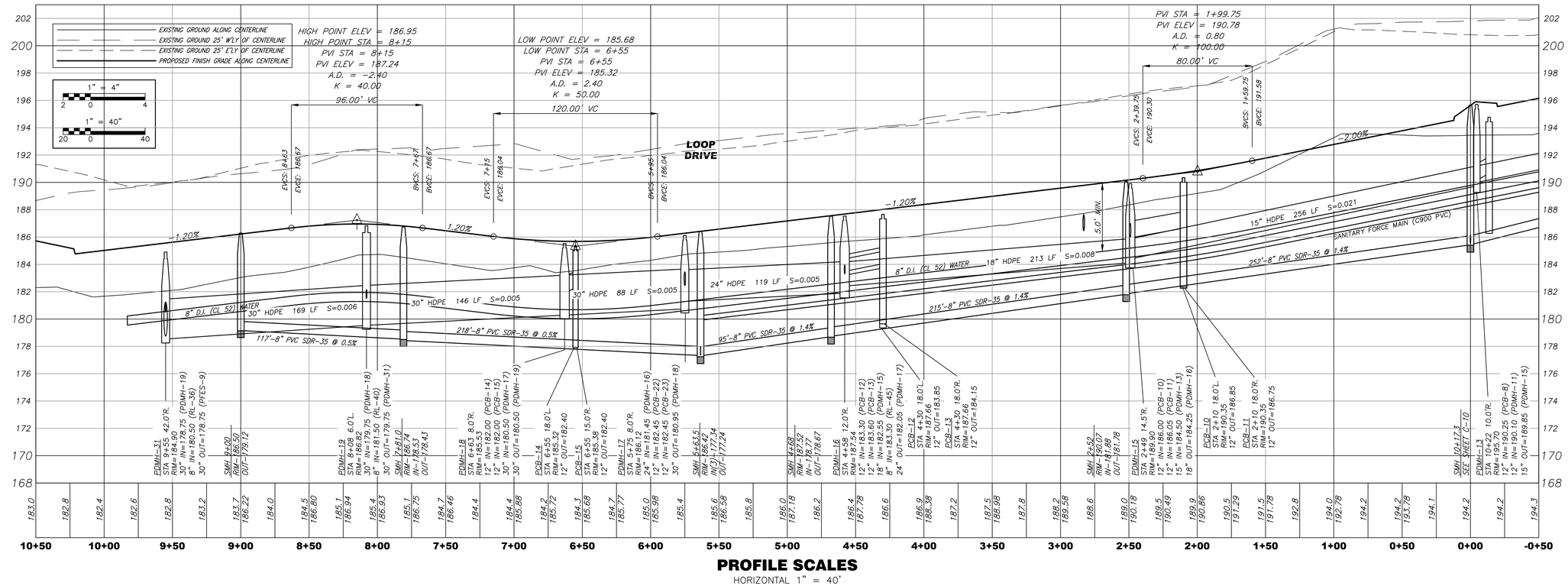
C-10	-



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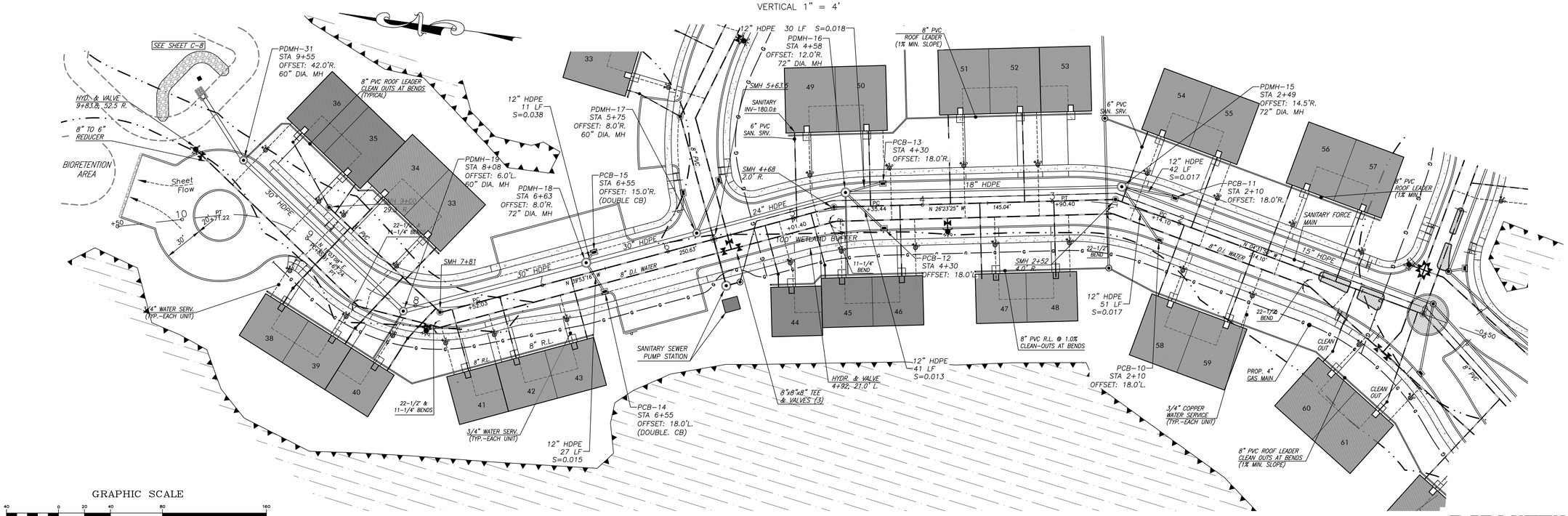
VERTICAL 1" = 4'



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

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PLAN & PROFILE
CUL-DE-SAC DRIVE
Sta 0+00 to Sta 10+50

Map 66, Block 2, Lot 8
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C-11	-

EXISTING GROUND ALONG CENTERLINE
EXISTING GROUND 25' W'LY OF CENTERLINE
EXISTING GROUND 25' E'LY OF CENTERLINE
PROPOSED FINISH GRADE ALONG CENTERLINE

1" = 4"
1" = 40"

CUL-DE-SAC DRIVE

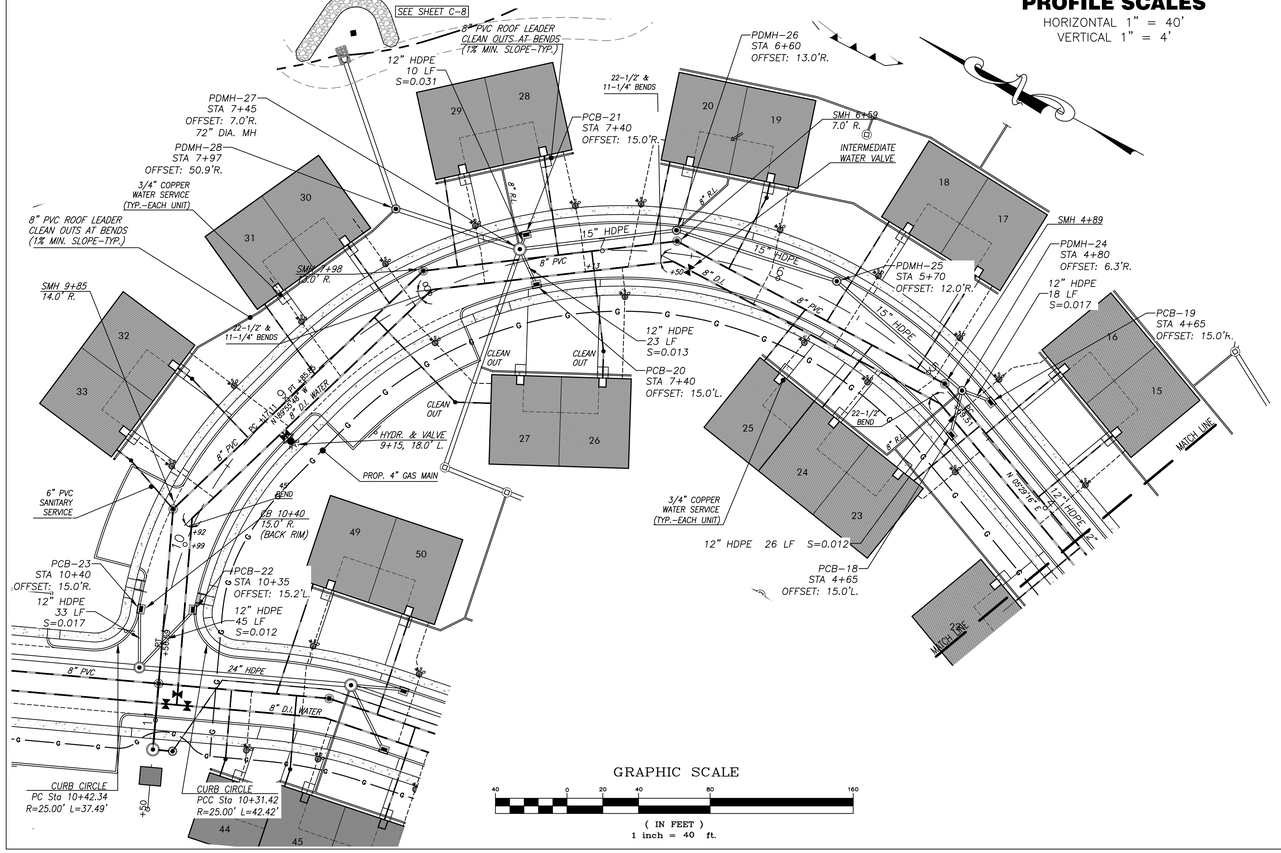
PCB-23 STA 10+40 15.0'R. RIM=188.36 12" OUT=183.00
PCB-22 STA 10+35 15.2'L. RIM=185.92 12" OUT=183.00
12" HDPE
5.0' MIN.
-0.50%
8" DUCTILE IRON (CL 52) WATER
192'-8" PVC SDR-35 @ 0.5%
96'-8" PVC SDR-35 @ 0.5%
SMH 5+63.5 SEE SHEET C-12
SMH 7+65 RIM=188.18 IN=178.43 OUT=177.82
SMH 7+98 RIM=187.44 IN=178.38 OUT=178.88
PDMH-27 STA 7+45 7.0'R. RIM=187.63 15" IN=183.35 (PDMH-26) 12" IN=183.60 (PCB-21) 12" IN=183.60 (PCB-20) 8" IN=184.00 (RL-28) 24" IN=182.60 (PYD-15) 24" OUT=182.60 (PDMH-28)
PVI STA = 7+63.05
PVI ELEV = 187.58
A.D. = 0.50
K = 100.00
50.00' VC
EVCS: 7+88.05
EVCE: 187.46
BVCS: 7+38.05
BVCE: 187.83
PCB-20 STA 7+40 15.0'L. RIM=187.53 12" OUT=183.90 (PDMH-27)
15" HDPE 88 LF S=0.010
PDMH-26 STA 6+60 13.0'R. RIM=188.36 15" IN=185.25 (PDMH-25) 8" IN=185.00 (RL-20) 15" OUT=184.25 (PDMH-27)
SMH 6+59 RIM=188.48 IN=179.79 OUT=179.69
15" HDPE 94 LF S=0.010
142'-8" PVC SDR-35 @ 0.5%
PDMH-25 STA 5+70 12.0'R. RIM=189.28 15" IN=185.20 (PDMH-24) 15" OUT=185.20 (PDMH-26)
15" HDPE 93 LF S=0.010
SMH 4+89 RIM=190.39 IN=180.70 OUT=180.60
PCB-18 STA 4+65 15.0'L. RIM=190.27 12" OUT=186.70
PCB-19 STA 4+65 15.0'R. RIM=190.27 12" OUT=186.70
PDMH-24 STA 4+80 6.3'R. RIM=192.09 12" IN=186.40 (PDMH-23) 12" IN=186.40 (PCB-18) 12" IN=186.40 (PCB-19) 8" IN=186.75 (RL-23) 15" OUT=186.15 (PDMH-25)
-1.00%
12" HDPE 150 LF S=0.010
8" DUCTILE IRON (CL 52) WATER
226'-8" PVC SDR-35 @ 1.0%
PDMH-23 STA 3+30 6.0'R. RIM=191.78 12" IN=187.90 (PCB-16) 12" IN=187.90 (PCB-17) 8" IN=188.40 (RL-14) 12" OUT=187.90 (PDMH-24)
PCB-16 STA 3+25 15.0'L. RIM=191.67 12" OUT=188.20
PCB-17 STA 3+25 15.0'R. RIM=191.67 12" OUT=188.20
5.0' MIN.
SMH 2+65 RIM=192.43 OUT=183.00
PDMH-21 STA 2+64 41.5'R. RIM=191.12 15" IN=186.65 (PDMH-20) 8" IN=187.00 (RL-12) 18" OUT=186.65 (PDMH-22)
15" HDPE 160 LF S=0.015
170'-8" PVC SDR-35 @ 0.5%
SMH 1+30 RIM=193.84 OUT=186.15
PDMH-20 STA 1+25 10.0'R. RIM=193.76 15" IN=189.30 (PDMH-14) 15" OUT=189.05 (PDMH-21)
PCB-9 STA 0+44 18.7'R. RIM=194.65 12" OUT=190.65
PDMH-14 STA 0+38 7.0'R. RIM=194.39 12" IN=190.45 (PCB-9) 12" IN=190.45 (PDMH-12) 12" OUT=190.20 (PDMH-20)
15" HDPE 89 LF S=0.010
115'-8" PVC SDR-35 @ 0.5%
SMH 1+21.7 SEE SHEET C-10
TRAFFIC CIRCLE

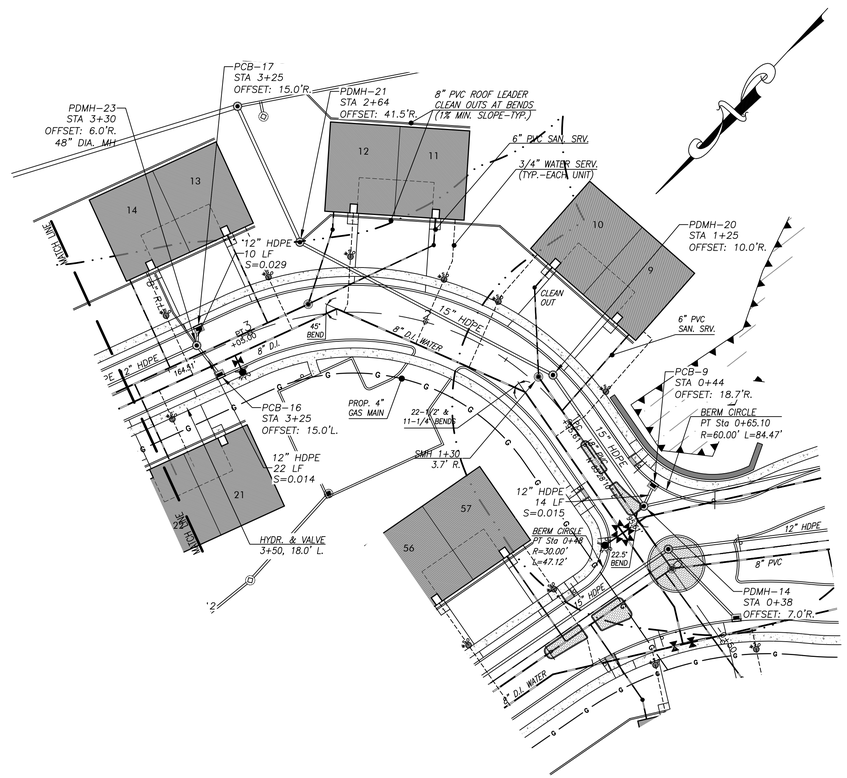
185.7 186.0 | 185.8 185.5 | 185.2 186.15 | 185.3 185.7 | 186.40 186.1 | 193.90 186.3 | 186.80 186.7 | 194.19 187.3 | 186.90 187.6 | 188.4 187.15 | 189.4 190.1 | 187.40 190.6 | 187.53 190.6 | 187.72 190.2 | 189.2 188.22 | 187.6 186.3 | 188.72 185.6 | 185.1 189.22 | 185.5 186.4 | 189.72 187.5 | 189.0 190.22 | 190.5 191.6 | 190.72 192.7 | 191.9 191.22 | 195.2 195.9 | 191.72 196.0 | 195.9 192.22 | 195.6 194.7 | 192.72 194.1 | 193.2 193.22 | 192.4 191.8 | 193.72 192.0 | 192.2 194.22 | 192.6 193.3 | 193.7 194.2 | 194.7 195.2

11+00 10+50 10+00 9+50 9+00 8+50 8+00 7+50 7+00 6+50 6+00 5+50 5+00 4+50 4+00 3+50 3+00 2+50 2+00 1+50 1+00 0+50 0+00 -0+50

PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'





GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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PLAN & PROFILE
LOOP DRIVE
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Map 66, Block 2, Lot 8
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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
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& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

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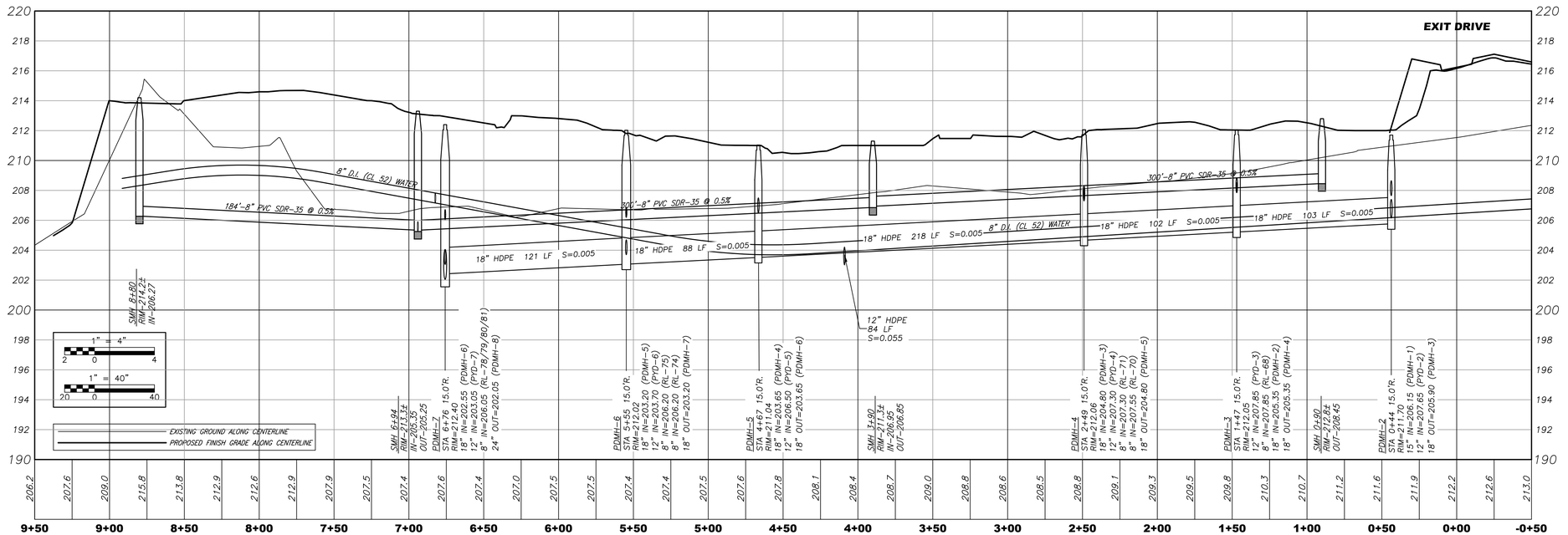

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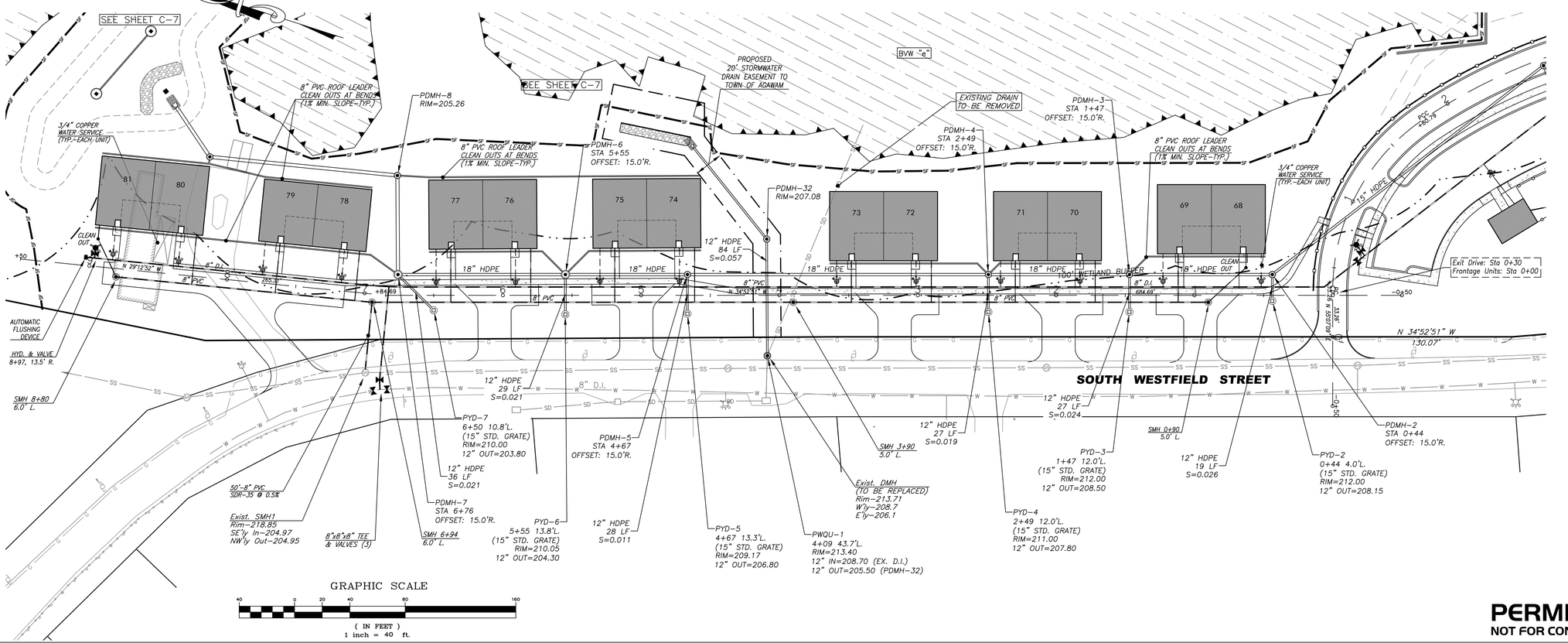

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ALONG SOUTH WESTFIELD STREET
Sta -0+50 to Sta 10+00

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LANDSCAPING NOTES

1.) SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.

2.) IT SHALL BE THE SITE CONTRACORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN TOERH SHEETS WITH LANDSCAPE INFORMATION SHOWN HEREIN.

3.) ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTORS RESPONSIBILITY TO ACQUIRE THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING.

4.) THE LANDSCAPE PLANTING SCHEME SHOWN REPRESENTS THE MINIMUM NECESSARY TO FULFILL THE INTENTION OF THESE PLANS. ADDITIONAL PLANTING WILL BE REQUIRED TO SELECTIVELY FILL VOIDS. LANDSCAPE ARCHITECT RESERVES THE RIGHT, SHOULD IT BE REQUIRED BY FIELD CONDITIONS TO UPWARDLY MODIFY THE PLANT QUANTITIES.

5.) PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

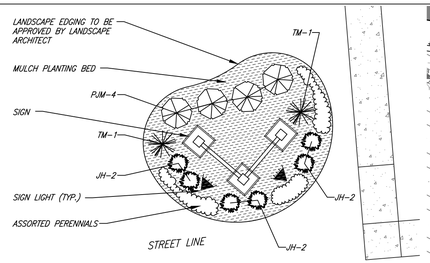
6.) LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATION CONTRACTOR MARK ALL UNDERGROUND UTILITIES AS WELL AS DIG-SAFE SITE PRIOR TO ANY PLANTINGS. LANDSCAPE CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE ANS STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

7.) IRRIGATION SYSTEM LIMITS FOR LAWN AREA TO BE DETERMINED BY OWNER.

8.) ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, R LEVESQUE ASSOCIATES, INC. (RLA) WILL CONDUCT POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENT TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.

9.) ALL PLANTINGS MUST BE MAINTAINED AND THAT PORTION OF THE PUBLIC WAY ABUTTING THE PARCEL AND INCLUDING THE TREEBELT SHALL BE MAINTAINED IN A SAFE AND ATTRACTIVE CONDITION BY THE OWNER OF THE PARCEL.

10.) SEE SHEETS C-15, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



SIGN PLANTING DETAIL
1" = 10'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
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SITE LANDSCAPING PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
C-14	-

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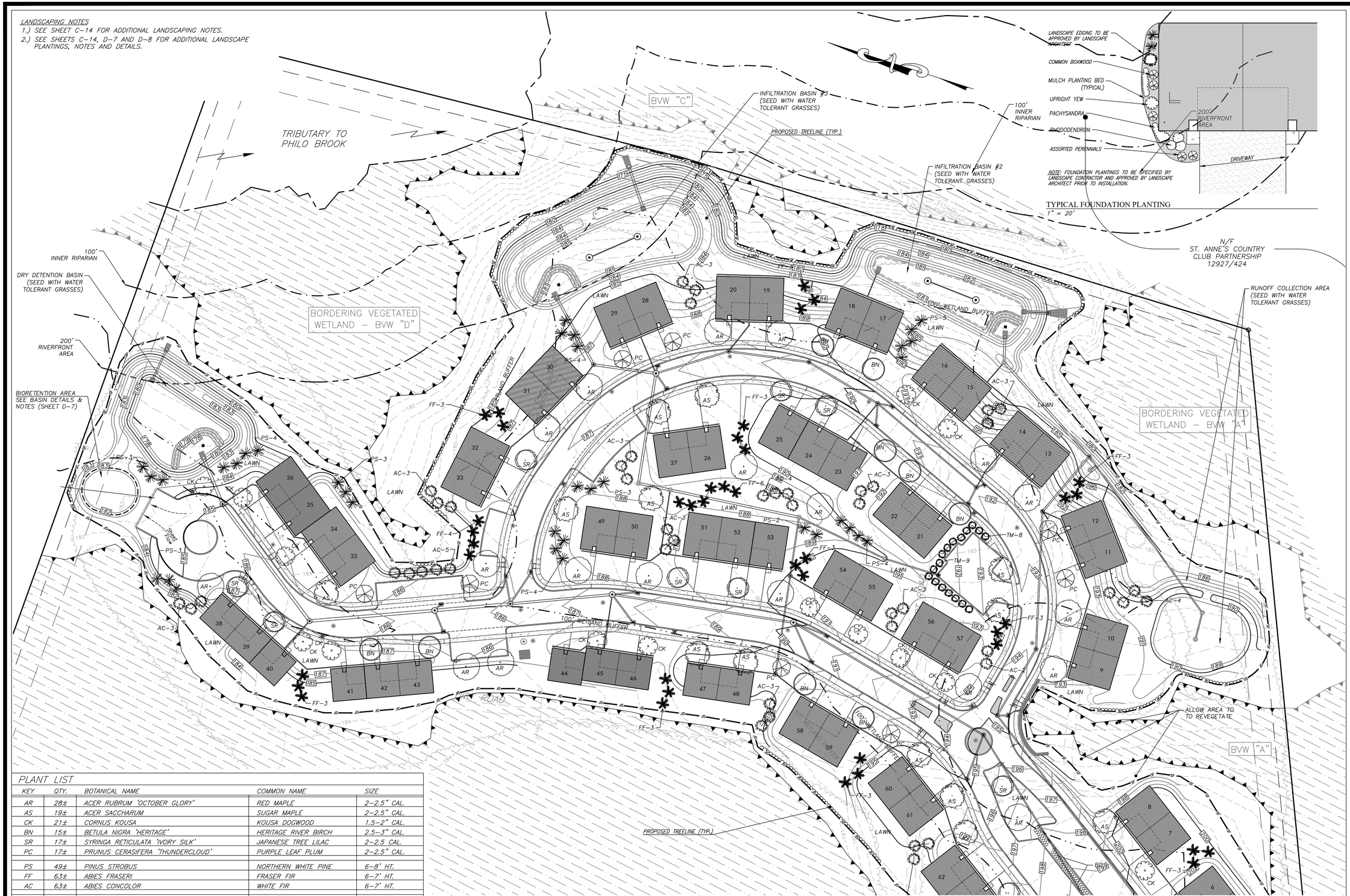
LANDSCAPING NOTES
1.) SEE SHEET C-14 FOR ADDITIONAL LANDSCAPING NOTES.
2.) SEE SHEETS C-14, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



TYPICAL FOUNDATION PLANTING
1" = 20'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PERMITTING
NOT FOR CONSTRUCTION

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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

SITE LANDSCAPING PLAN (Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT M. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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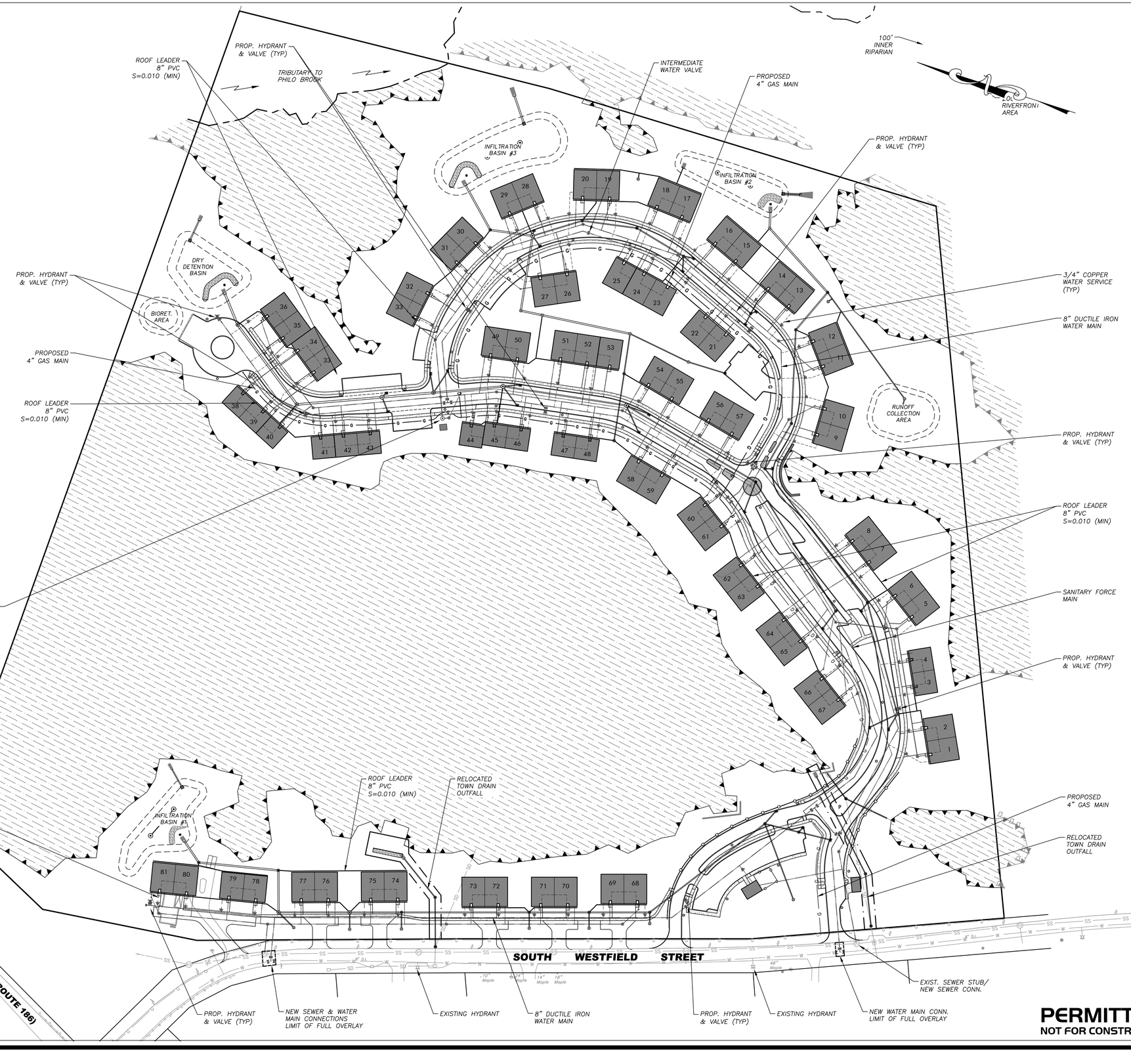
CONSTRUCTION NOTES

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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RLA

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40 School Street
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OVERALL SITE UTILITY PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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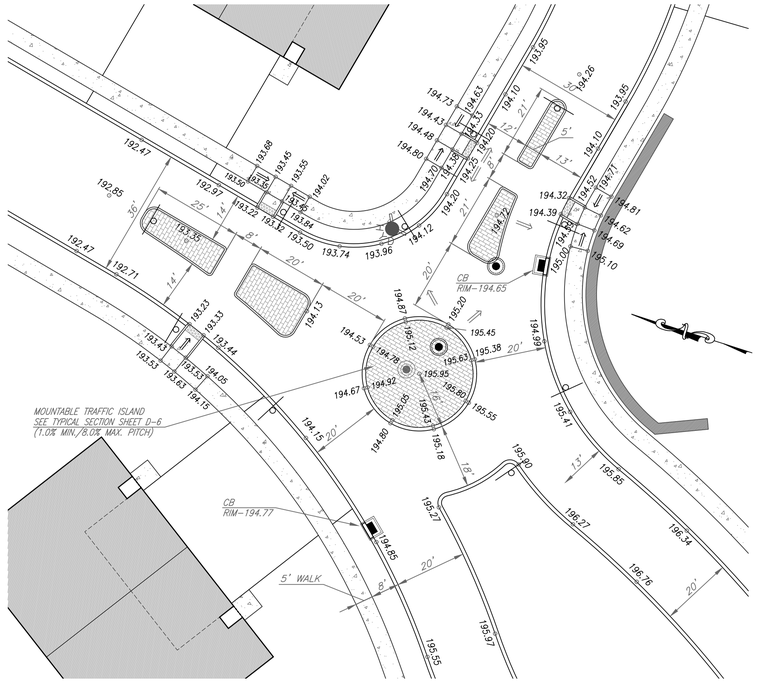
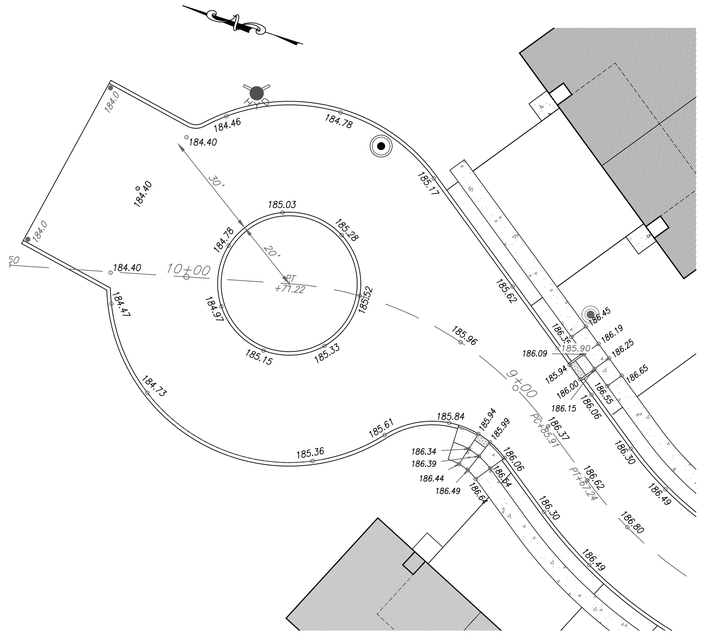
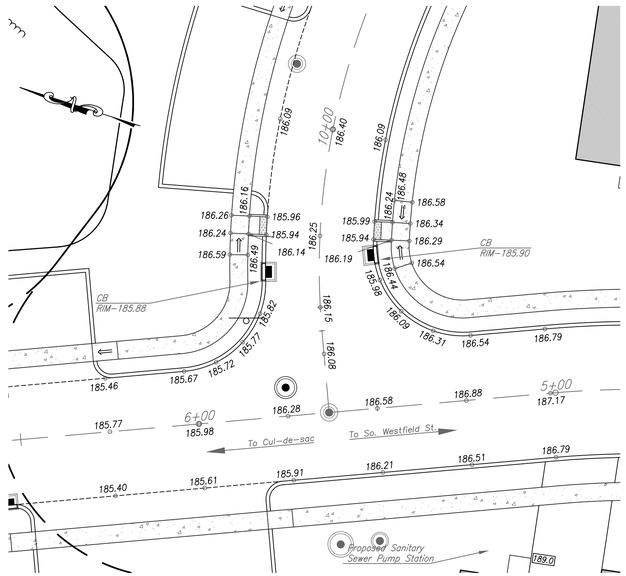


TRAFFIC CIRCLE DETAIL
1"=20'

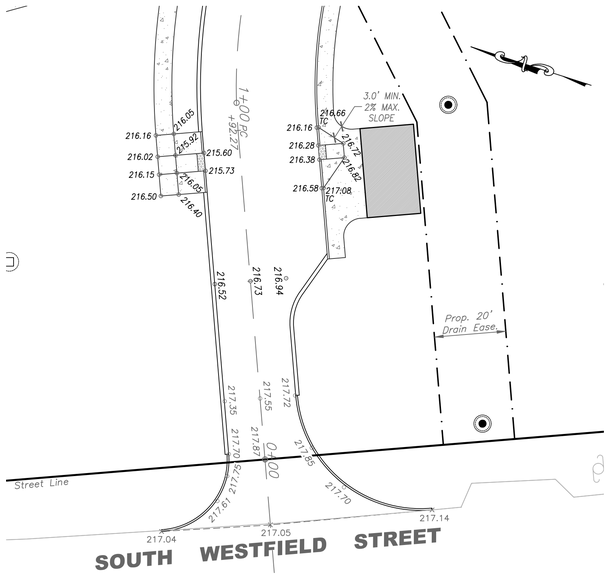


CUL-DE-SAC DETAIL
1"=20'

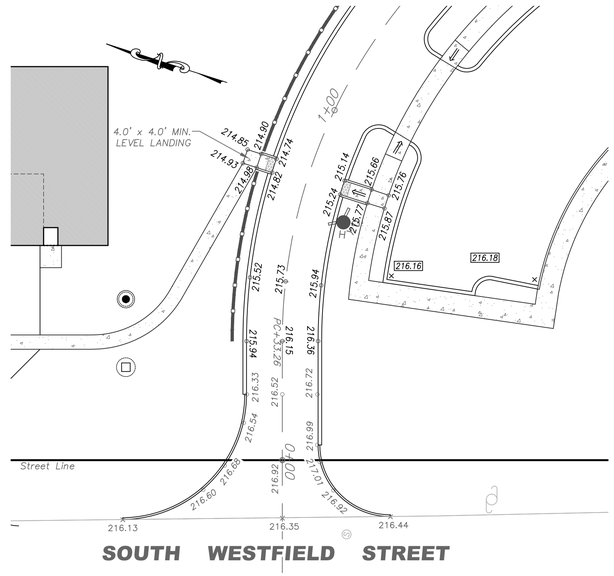
ACCESSIBLE RAMP NOTE
ACCESSIBLE ROUTE RAMPED SECTIONS NOT TO EXCEED 8.0% SLOPE. CROSS-SLOPE NOT TO EXCEED 2.0% IN ANY DIRECTION. SEE SHEET D-5 FOR ADDITIONAL ACCESSIBLE RAMP SPECIFICATIONS.



INTERSECTION DETAIL
1"=20'



CROSSWALK DETAIL - ENTRANCE DRIVE AT MAILBOX
1"=20'



CROSSWALK DETAIL - EXIT DRIVE NEAR S. WESTFIELD STREET
1"=20'

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40 School Street
Westfield, MA 01085
rlaland.com

INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
NO. 1396
REGISTERED LANDSCAPE ARCHITECT
4/11/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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EROSION & SEDIMENTATION CONTROL NOTE

THE EROSION/SEDIMENTATION MEASURES SHOWN HEREON ARE TO BE CONSIDERED THE MINIMUM EFFORT REQUIRED, AND SHOULD ACT AS A GUIDELINE FOR THE ANTICIPATED EROSION/SEDIMENTATION CONTROL EFFORT NECESSARY TO MAINTAIN CONTROL OVER THE PROJECT SITE. ACTUAL SITE CONDITIONS MAY VARY FROM THOSE SHOWN HEREON, AND THE EROSION/SEDIMENTATION CONTROL EFFORT SHALL BE ADJUSTED IN RESPONSE. SHOULD THE EROSION CONTROL PLAN NOT BE FOLLOWED AS THE MINIMUM REQUIREMENT, THE CONTRACTOR SHALL BEAR COMPLETE AND ULTIMATE RESPONSIBILITY FOR THE SITE-SPECIFIC LAYOUT, INSTALLATION, MAINTENANCE, AND — SHOULD FAILURE OCCUR — REPARATIONS TO ANY DAMAGED PROPERTY. R LEVESQUE ASSOCIATES, INC. (RLA) RESERVES THE RIGHT TO MAKE REQUIRED ADJUSTMENTS TO THE EROSION CONTROL PLAN AS SITE CONSTRUCTION EVOLVES AND AS RLA DEEMS NECESSARY.

GENERAL CONSTRUCTION SEQUENCE

1.) LOCATE AND STAKE BY SURVEY THE LIMITS OF WORK LINES, CENTERLINES OF PROPOSED ROADWAYS, PROPOSED DRAINAGE STRUCTURES, SEDIMENTATION BASINS (AS REQUIRED) AND DETENTION BASIN, RAIN GARDENS, ETC. LOCATIONS

2.) INSTALL EROSION CONTROLS AS SPECIFIED ON THESE PLANS AND REVIEW THEM WITH THE PROJECT ENGINEER, LANDSCAPE ARCHITECT AND SITE SUPERINTENDENT. SHOULD ADDITIONAL CONTROLS BE DEEMED REQUIRED THEY SHALL BE INSTALLED.

3.) CONSTRUCT ANTI-TRACKING APRONS AS SHOWN ON THESE PLANS.

4.) REMOVE TREES WITHIN THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING LOGS AND BRUSH FROM THE SITE.

5.) GRUB AND STUMP THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING STUMPS FROM THE SITE AND DISPOSING OF THEM IN ACCORDANCE WITH STATE AND LOCAL RULES AND REGULATIONS.

6.) CONSTRUCT THE SEDIMENTATION BASINS (AS REQUIRED) WITH THE OUTLET TEMPORARILY BLOCKED. ONCE THE BASIN HAS BEEN STABILIZED AND THE VERTICAL OVERFLOW STANDPIPE AND FOREBAY SEDIMENT STUMP AREA AT THE BASIN INLET ARE IN PLACE, THE OUTLET CAN BE ACTIVATED.

7.) EXCAVATE FOR THE ROADS AND SIDE SLOPES IN 1000 FOOT INTERVALS. UPON COMPLETING EACH 500 FOOT INTERVAL, ROAD SIDE CHANNELS (WITH STONE CHECK DAMS PLACED EVERY 200 FEET) LEADING TO THE SEDIMENTATION BASINS SHALL BE CONSTRUCTED. SHOULD SIGNIFICANT SEDIMENTION BE OBSERVED WITHIN THE CHANNEL, SILTATION FENCING SHOULD BE INSTALLED WITHIN THE CHANNEL AT AN INTERVAL OF EVERY 100 FOOT. WATER BARS SHALL BE UTILIZED TO DIRECT STORM FLOWS INTO THE CHANNELS AND SHALL BE SPACED AT 200 FOOT INTERVALS.

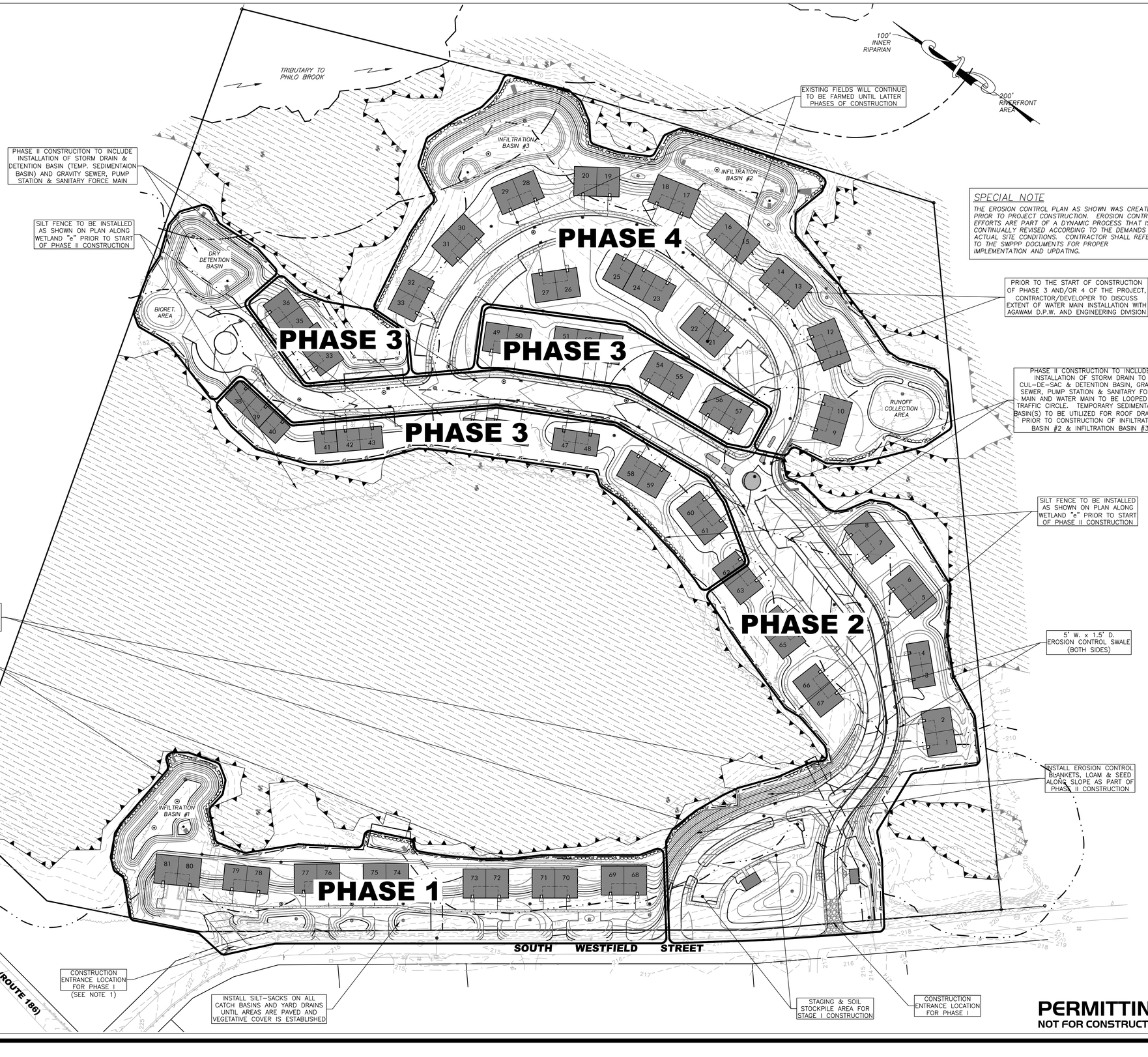
8.) EXCAVATE TO PLAN GRADES THE AREA SHOWN ON PLAN. STOCKPILE LOAM AT LOCATION DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. AREAS NOT DESIGNATED FOR PAVEMENT TO BE STABILIZED USING HYDROSEEDING AND EROSION CONTROL BLANKETS IF NECESSARY. GRASS SEED MIXTURES WILL BE DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. SUBSTITUTION OF SEED MIXTURE BY THE CONTRACTOR WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF THE ENGINEER OR LANDSCAPE ARCHITECT. EXCESS SOILS REMOVED AND STOCKPILE DURING SITE CONSTRUCTION WILL BE STABILIZED WITH A VEGETATIVE COVER IF SOILS ARE STOCKPILED FOR MORE THAN 14 DAYS.

9.) AT A MINIMUM, ROADWAY DRAINAGE CHANNELS AND THE SEDIMENTATION BASINS SHOULD BE CLEANED EVERY TWO WEEKS OR AFTER EVERY MAJOR RAIN EVENT.

10.) ONCE THE ROADS ARE CONSTRUCTED AND UTILITIES INSTALLED, THE ROADS WILL BE PAVED IN BINDER COURSE. ROAD SIDE CHANNELS WILL BE FILLED AND THE TREEBELT AREA CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS.

NOTE

EXISTING PAVED DRIVEWAY TO BE USED FOR SITE ACCESS. PAVEMENT CONDITION TO BE MONITORED AND SHALL BE REPLACED BY A PROPER ANTI-TRACKING APRON SHOULD DRIVEWAY FAIL TO PROVIDE ADEQUATE ANTI-TRACKING CAPABILITIES.



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

SPECIAL NOTE

THE EROSION CONTROL PLAN AS SHOWN WAS CREATED PRIOR TO PROJECT CONSTRUCTION. EROSION CONTROL EFFORTS ARE PART OF A DYNAMIC PROCESS THAT IS CONTINUALLY REVISED ACCORDING TO THE DEMANDS OF ACTUAL SITE CONDITIONS. CONTRACTOR SHALL REFER TO THE SWPPP DOCUMENTS FOR PROPER IMPLEMENTATION AND UPDATING.

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R LEVESQUE ASSOCIATES INC

Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

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40 School Street
Westfield, MA 01085

rlaland.com

PROJECT PHASING PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ROAD and PARKING_Planar	Illuminance	Fc	1.42	9.2	0.0	N.A.	N.A.

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	LLF	Description	Lum. Lumens	Lum. Watts
	14	SL5	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-5W	14875	159.1
	13	SL4	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-4W-H5	7602	159.1
	10	SL1	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-3-H5	7502	159.1

SOUTH WESTFIELD STREET

Project:
Agawam Condos

Contact:
Liza Tuttle
Specification Sales
(860) 751-4388
ltuttle@illuminatene.com

illuminate
44 Sixth Road
Woburn, MA 01801
(781) 935-8500

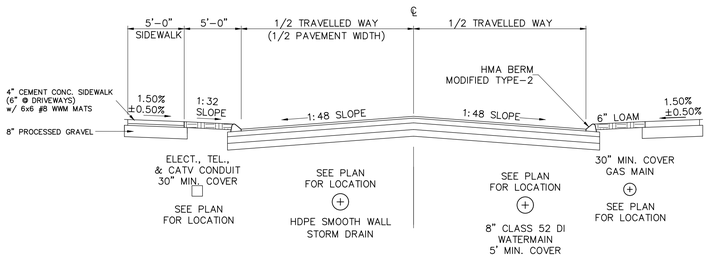
333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

Detail: Photometric Calculation
Date: 5/2/2022
Revision:A
Scale: 1" = 60'-0"
Drawn By: AJS

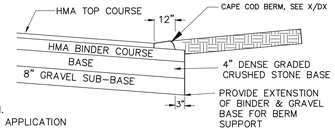
Drawing Number:

SL-1

Sheet 1 of 1



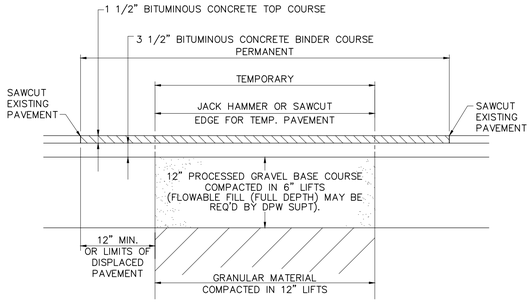
NOTE:
TACK COAT IS REQUIRED BETWEEN ALL COURSES OF HMA AND ON THE HMA BEFORE PLACING HMA BERM



TYPICAL ROADWAY SECTION
N.T.S.

PER MA HIGHWAY – 95% MINIMUM DRY DENSITY COMPACTION
BASED ON STANDARD PROCTOR – ALL ROADWAY CONSTRUCTION.
MODIFIED PROCTOR IS USED ONLY NEAR BRIDGE ABUTMENTS & HEAVY DUTY APPLICATION

TYPICAL ROADWAY SECTION (H-2) [MODIFIED]
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I–1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'–0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE

MINIMUM THICKNESS FOR PAVEMENT

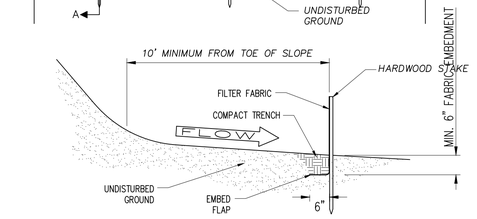
TYPE OF STREET	HOT MIX ASPHALT			GRAVEL BASE & GRAVEL SUB-BASE	
	SURFACE COURSE (INCHES)	BINDER COURSE (INCHES)	BASE (INCHES)	BASE (INCHES) DENSE GRADED CRUSHED STONE (M 201.7)	SUB-BASE (INCHES) (M 1.03.0 TYPE B, 3" MAX.)
PLACE	1.5"	3.0"	NA	4.0"	8.0"
LANE	1.5"	3.0"	NA	4.0"	8.0"
SUBCOLLECTOR	1.5"	2.0"	3.0"	4.0"	8.0"
COLLECTOR	1.5"	2.0"	4.0"	4.0"	10.0"
NOTE: THE ABOVE THICKNESS DO NOT APPLY TO INDUSTRIAL PARK ROADS					

1. THE MATERIAL TO BE USED FOR THE GRAVEL BASE (THE 4" OF MATERIAL DIRECTLY UNDER THE BINDER COURSE OF PAVING) IS TO BE DENSE GRADED CRUSHED STONE (NOT PROCESSED GRAVEL OR OTHER NATURAL STONE PRODUCT. MHD SPECIFICATION M2.01.7, WHICH MUST BE MET, STATES THAT COARSE AGGREGATE (#4 SIEVE AND LARGER) MUST BE CRUSHER RUN.
2. THE LINE, GRADE AND COMPACTION OF THE GRAVEL SUB–BASE (THE 8" LAYER OF GRAVEL BORROW DIRECTLY UNDER THE DENSE GRADED CRUSHED STONE) MUST BE APPROVED BY ENGINEERING BEFORE THE 4" LAYER OF DENSE GRADED CRUSHED STONE IS PLACED. IT IS IMPORTANT THAT ENOUGH TIME IS ALLOWED IN THE CONSTRUCTION SCHEDULE SO THAT FIELD DENSITY TESTS CAN BE MADE.
3. GRAVEL SAMPLES FOR THE SUB–BASE AND BASE WILL BE TAKEN BY THE ENGINEERING DIVISION FOR TESTING. THE SAMPLE MUST MEET ITS RESPECTIVE MHD SPECIFICATION AND BE APPROVED BY THE TOWN ENGINEER BEFORE ANY OF THE GRAVEL CAN BE SPREAD ON–SITE. THE TOWN ENGINEER OR THEIR AGENT ARE SOLELY RESPONSIBLE FOR CHAIN OF CUSTODY OF ALL SAMPLES; ANY TESTING PERFORMED OUTSIDE OF THE TOWN CHAIN OF CUSTODY WILL NOT BE ACCEPTED.
4. FIELD DENSITY TESTING IS TO BE MADE ON BOTH THE GRAVEL SUB–BASE AND GRAVEL BASE SEPARATELY. THE GRAVEL SUB–BASE IS TO BE TESTED BEFORE THE GRAVEL BASE WILL BE ALLOWED TO BE PLACED.
5. WHEN THE GRAVEL FOR THE SUB–BASE AND BASE IS SPREAD OUT, IT IS TO BE SPREAD INTO THE SITE STARTING AT THE SITE'S ENTRANCE AND WORKING INWARDS.
6. THE BINDER COURSE OF PAVING CANNOT BE LAID UNTIL THE ENGINEERING DIVISION HAS APPROVED THE GRADE FOR THE ROADWAY AND THE COMPACTION OF THE GRAVEL BASE.
7. PRIOR TO INSTALLING THE CURB, THE DEVELOPER SHALL HAVE THE LINES OF THE PROPOSED CURBING LAID OUT WITH RED PAINT OR OTHER MARKING AND THEN NOTIFY ENGINEERING THAT MARKING IS READY FOR INSPECTION. AFTER INSPECTION, ENGINEERING WILL NOTIFY THE DEVELOPER THAT CURBING IS EITHER READY FOR LAYING OR CORRECTIONS MUST BE MADE TO THE MARKINGS. IN THE LATTER CASE, THE DEVELOPER MUST MAKE THE CORRECTIONS PRIOR TO APPROVAL AND INSTALLATION. TACK COAT IS REQUIRED BEFORE PLACEMENT OF HMA BERMS.
8. PRIOR TO LAYING THE TOP COURSE OF PAVEMENT, AND AFTER THE CURB IS INSTALLED, THE PAVEMENT MUST BE FLOODED SO THAT ENGINEERING CAN OBSERVE AND SURVEY THE GRADES OF BINDER COURSE TO DETECT ANY DISCREPANCIES IN GRADE. THIS INFORMATION MUST BE FURNISHED TO THE PAVING SUBCONTRACTOR BY THE DEVELOPER SO THAT ANY NECESSARY SHIMMING OF THE PAVEMENT CAN BE MADE. ENGINEERING WILL CHECK SHIMS.
9. AS NOTED IN THE SUBDIVISION REGULATIONS AND STANDARD PERFORMANCE AGREEMENT, THE PRESENCE OF AN INSPECTOR WILL NOT RELIEVE THE DEVELOPER OF HIS OBLIGATIONS TO PROVIDE A SATISFACTORY INSTALLATION OF ALL FACILITIES WHICH ARE A PART OF THE SUBDIVISION.
10. TACK COAT WILL BE REQUIRED TO BE APPLIED AT A RATE OF 1/20 GAL/SY WHENEVER PLACING HMA OVER EXISTING PAVEMENT, OTHERWISE THE TACK COAT SHALL BE AS SPECIFIED IN SECTION 460.62 OF THE MHD STANDARD SPECIFICATIONS.

STREET DESIGN STANDARDS

TYPE OF STREET	RIGHT OF WAY WIDTH (FEET)	PAVEMENT WIDTH (FEET)
PLACE	46	26
LANE	50	30
SUBCOLLECTOR	60	36
COLLECTOR	66	40

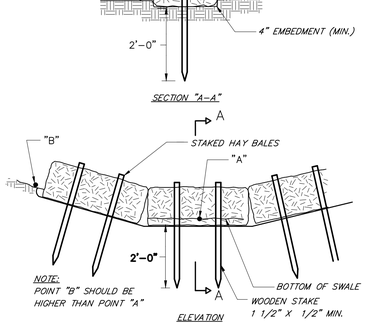
STREET STANDARDS
NO SCALE



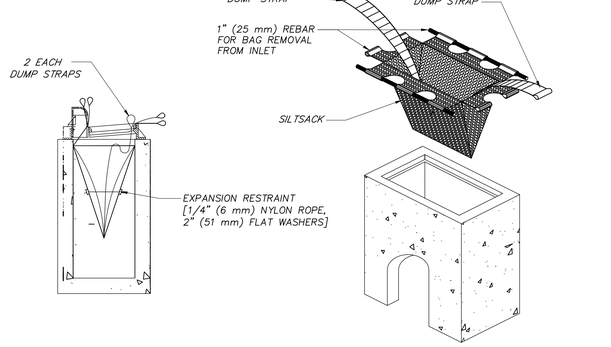
SECTION A–A

NOTES:
1. SILT FENCE IS TO BE INSTALLED BEFORE ANY LAND DISTURBING ACTIVATES START AT THE CONSTRUCTION SITE –OR– AS DIRECTED IN THE SITE'S EROSION AND SEDIMENTATION PLAN.
2. INSPECT SILT FENCE ON WEEKLY BASIS AND AFTER EACH RAIN ANY DETERIORATED/DAMAGED SILT FENCE MUST BE REPLACED IMMEDIATELY.
3. REMOVE SILT FROM FENCE AS NEEDED –OR– WHEN THE SILT HAS ACCUMULATED TO HALF THE ORIGINAL HEIGHT OF THE FENCE.
4. WHEN JOINING TWO SECTIONS OF FENCE, ROLL THE END STAKES TOGETHER SUCH THAT THERE IS NO GAP IN THE FENCE, OVERLAPPING FENCE SECTIONS IS NOT AN ACCEPTABLE ALTERNATIVE

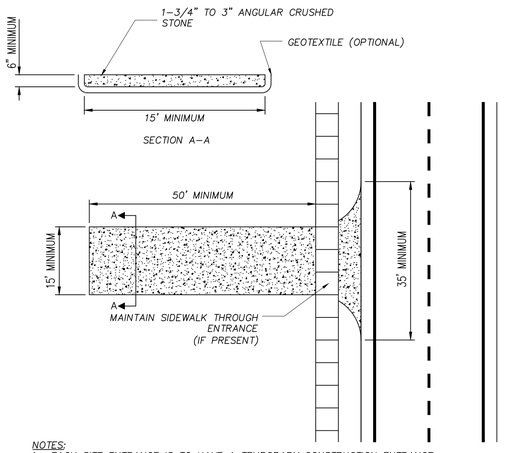
SILT FENCE
NO SCALE



HAY BALE CHECK DAM X-SECTION
NO SCALE

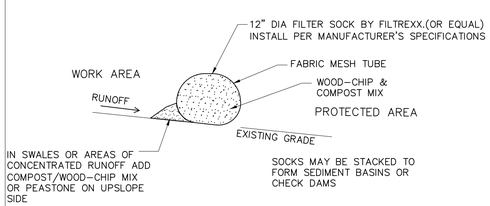


INLET PROTECTION, SEDIMENT FILTER SACK
NO SCALE



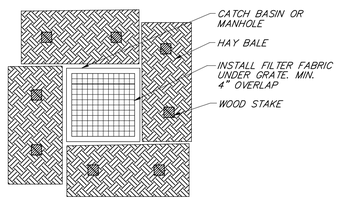
NOTES:
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMEADEITLY.
4. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
5. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
6. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE – AGAWAM DETAIL ES–1



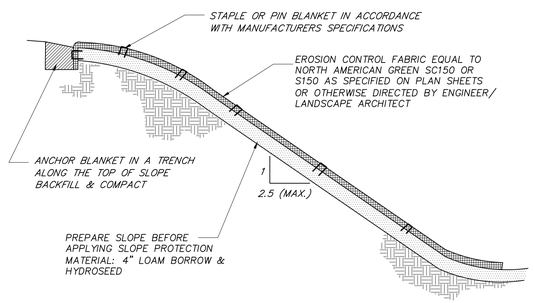
TYPICAL FILTER SOCK INSTALLATION

SEDIMENT BARRIER ALTERNATIVE - FILTER SOCK
NO SCALE



NOTES:
1. INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.
2. TWO (2) WOOD STAKES MINIMUM PER HAYBALE. STEEL DOWELS SHALL BE UTILIZED WHERE WOOD STAKES CAN NOR BE DRIVEN INTO GROUND

STORM INLET PROTECTION DETAIL
NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION
NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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D-1	-

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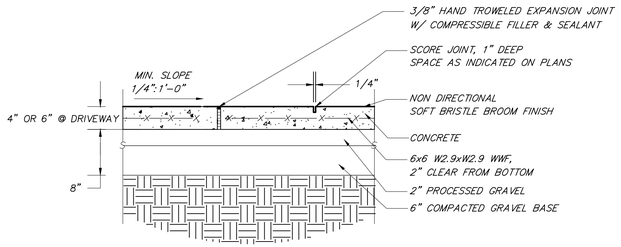
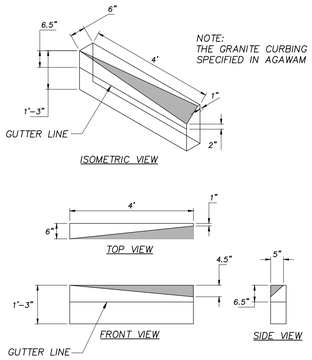


CONCRETE SIDEWALK

NO SCALE

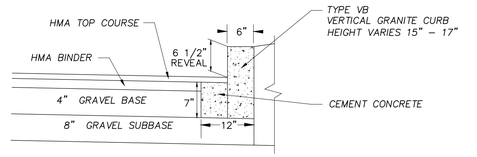


NOTE:
THE GRANITE CURBING SHALL BE INSTALLED AS SPECIFIED IN AGAWAM DETAIL H-4.

SLOPED GRANITE CURB/HMA BERM TO VERTICAL GRANITE CURB

GRANITE TRANSITION CURB DETAIL (H-5)

NO SCALE



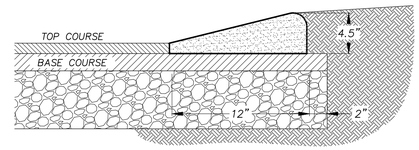
PROCEDURE DESCRIBED HEREIN IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE AND/OR BINDER COURSE ARE IN PLACE. OTHERWISE CEMENT CONCRETE WILL BE ELIMINATED AND GRAVEL WILL BE BROUGHT UP TO THE BOTTOM OF THE BASE COURSE. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE SPECIFICATIONS.

NOTES:
1. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BINDER, BASE AND STONE, AND REPLACE WITH CEMENT CONCRETE.
2. ACCEPTABLE CEMENT CONCRETE IS ANY CLASS UNDER SECTION M4 OF THE 1988 MHD STANDARD SPECIFICATIONS; ALL TEST REQUIREMENTS ARE WAIVED. HMA IS NOT AN ACCEPTABLE SUBSTITUTE
3. WHEN SET ON RADII, THE CURBING SHALL BE CUT WITH THE REQUIRED RADIUS OF CURVATURE.

VERTICAL GRANITE CURB DETAIL (H-4)

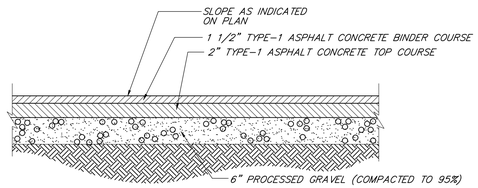
NO SCALE

NOTES:
1. ALL SIDEWALK SLOPES ARE MAXIMUMS, TREE BELT SLOPE IS TO BE MAINTAINED TO THE BEST EXTENT PRACTICABLE.
2. ALL SIDEWALKS ARE TO BE CONSTRUCTED TO THE SAME SPECIFICATION FOUND IN MHD SUPPLEMENTAL SPECIFICATIONS TO THE 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, ENGLISH UNITS, JUNE 6, 2006 SECTIONS 701.00 TO 701.61 INCLUSIVE, AS AMENDED – UNLESS OTHERWISE SPECIFIED.
3. ALL SIDEWALKS ARE TO BE 4000 PSI (28 DAY) PORTLAND CEMENT CONCRETE, 6%±1% AIR ENTRAINED.
4. CURBING TO BE VERTICAL GRANITE CURB –OR– CAST IN PLACE PORTLAND CEMENT CONCRETE IF SUBMITTED TO AND APPROVED BY DPW. SCORE LINES @ 5'-0" INTERVALS
6. WHEN THE SIDEWALK IS INSTALLED ON A CURVE, THE 5'-0" SCORE LINE INTERVAL IS MEASURE ON ALONG THE INSIDE THE CURVE.
10. TOOL ALL JOINTS AND EDGES
11. WHEN TRANSITIONING FROM VERTICAL GRANITE CURB TO MODIFIED TYPE 2 BERM A 4 FT GRANITE TRANSITION IS REQUIRED. ATTEMPTING TO BLEND THE MODIFIED TYPE 2 BERM TO THE GRANITE CURBING, OR FIELD CUTTING A GRANITE TRANSITION ARE NOT AN ACCEPTABLE ALTERNATIVE.
12. SIDEWALK IS TO BE POURED IN ALTERNATING 20' LENGTHS TO ACCOUNT FOR PANEL CONTRACTION DURING DRYING.
13. INSTALL 1/2" THICK PREFORMED EXPANSION JOINT FILLER (M.9.14.0) AT 20' INTERVALS
14. BROOM FINISH SIDEWALK OPPOSITE TO THE DIRECTION OF TRAVEL
15. SIDEWALK IS REQUIRED TO BE COVERED WITH PLASTIC AND KEPT MOIST FOR MINIMUM OF 72 HOURS AFTER IT HAS SET-UP.
16. DETECTABLE WARNING PANEL ARE TO COMPLY WITH ADA 4.29.2
17. DETECTABLE WARNING PANEL TO BE CAST IN PLACE DETECTABLE WARNING PANEL, 24"X60", FEDERAL YELLOW, ITEM#: 24601DPAD2Y, MFD. BY: ADA SOLUTIONS INC.. 1 SURVEY CIRCLE, 2ND FLR, N. BILLERICA, MA 01862, WWW.ADATILE.COM –OR– APPROVED EQUAL.
18. SIDEWALKS ARE TO BE INSTALLED THROUGH DRIVEWAYS. SIDEWALK FINISH IS TO BE BROOM FINISHED, NO ALTERNATE FINISH IS ALLOWED I.E. STAMPED, EPOXY FINISHED, ETC.... THE 1.50% (±0.50%) CROSS SLOPE MUST BE MAINTAINED THROUGH DRIVEWAYS.
19. ANY CHANGES IN BOUNDS, PINS, EASEMENTS, AND FORM-A'S SHOULD BE SHOWN ON AMENDED DEFINITIVE PLANS PRIOR TO THE SIGN OFF OF THE PUNCH LIST.
20. ALL MONUMENTATION IS TO COMPLY WITH AGAWAM TOWN CODE SECTION 159-33



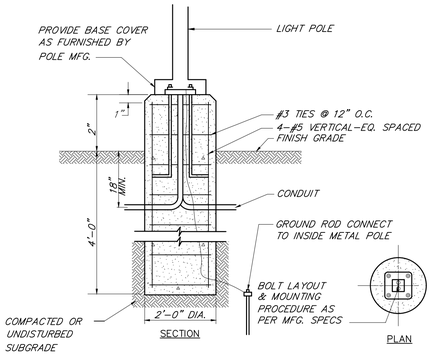
BITUMINOUS CONCRETE BERM (CAPE COD)

NO SCALE



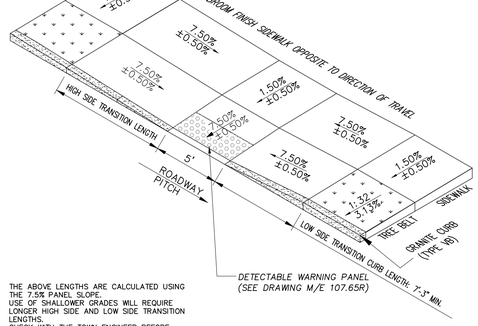
TYPICAL DRIVEWAY PAVEMENT DETAIL

NO SCALE



LIGHT POLE INSTALLATION DETAIL

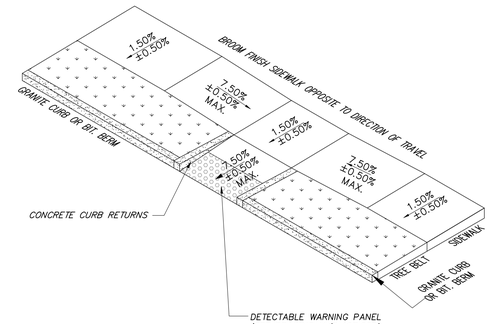
NO SCALE



- THE ABOVE LENGTHS ARE CALCULATED USING THE 7.5% PANEL SLOPE.
- USE OF SHALLOWER GRADES WILL REQUIRE LONGER HIGH SIDE AND LOW SIDE TRANSITION LENGTHS.
- CHECK WITH THE TOWN ENGINEER BEFORE USING ANY GRADES BESIDES THOSE LISTED IN THE TABLE ABOVE.

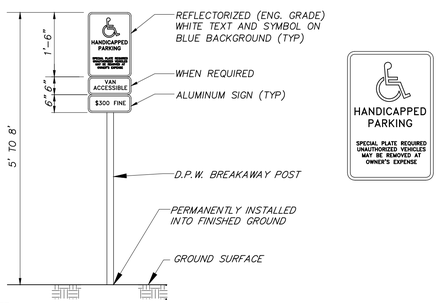
SIDEWALK CURB CUT

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

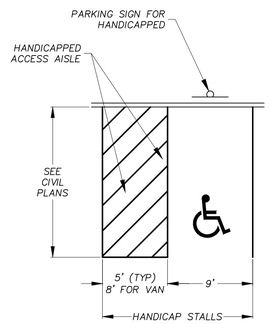
NO SCALE



NOTE:
MAXIMUM MOUNTING DISTANCE FROM HEAD OF STALL IS 10'.
PLEASE SEE: MGL C.40&21-22A, AAB 521 CMR 23.00, AGAWAM CODE &169-28

ACCESSIBLE PARKING SIGN (A-1)

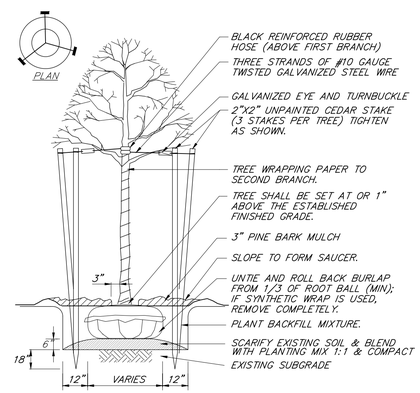
NO SCALE



NOTES:
1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" SOLID WHITE PAVEMENT MARKING PAINT UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO ENSURE HANDICAP ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
4. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER AND PROPORTION OF VAN ACCESSIBLE SPACES.

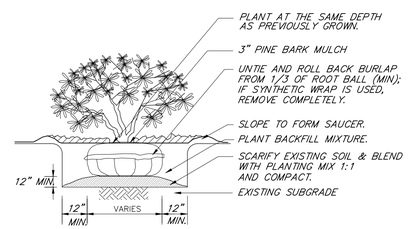
HANDICAP PARKING STALL

NO SCALE



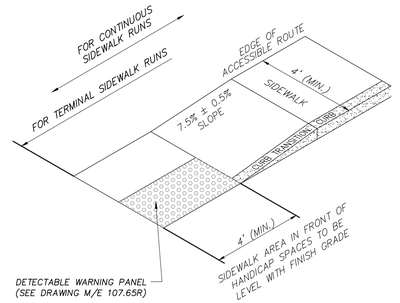
TREE PLANTING

NO SCALE



SHRUB PLANTING

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
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Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
No. 13316
REGISTERED LANDSCAPE ARCHITECT
7/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

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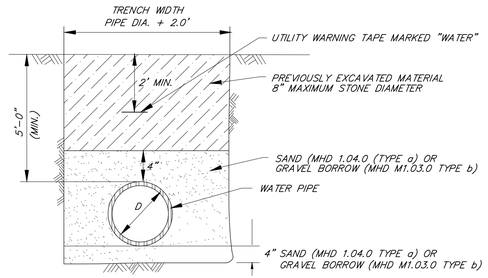
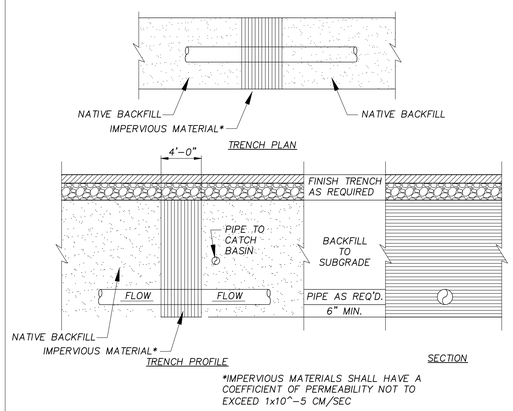


NOTES:
1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIALS IN MAXIMUM ONE FOOT LIFTS.
3. ALL WATER LINES SHALL BE SET A MINIMUM OF 5 FEET BELOW FINISH GRADE UNLESS OTHERWISE NOTED.

TYPICAL WATERMAIN TRENCH SECTION

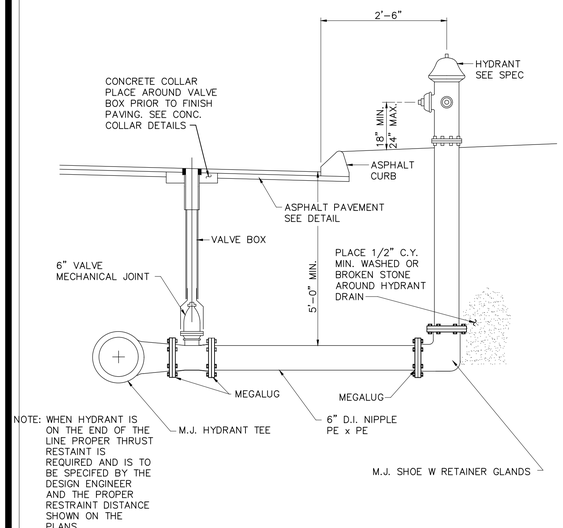
NO SCALE



*IMPERVIOUS MATERIALS SHALL HAVE A COEFFICIENT OF PERMEABILITY NOT TO EXCEED 1x10^-5 CM/SEC

IMPERVIOUS TRENCH DAM DETAIL (D-6)

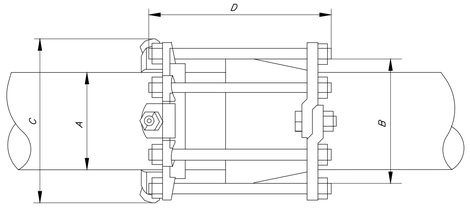
NO SCALE



NOTE: WHEN HYDRANT IS ON THE END OF THE LINE PROPER THRUST RESTAINT IS REQUIRED AND IS TO BE SPECIFED BY THE DESIGN ENGINEER AND THE PROPER RESTRAINT DISTANCE SHOWN ON THE PLANS

FIRE HYDRANT DETAIL (W-1)

NO SCALE



MEGALUG SERIES 1700 TABLE (*)					
NOMINAL PIPE SIZE	SERIES NUMBER	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C CASING CLEARANCE (W/NUTS OFF)	D THRUST ROD (QUANTY-SIZE)
4"	1704	4.80	6.60	9.90	4-3/4x13
6"	1706	6.90	8.60	12.00	6-3/4x13
8"	1708	9.05	10.90	14.15	6-3/4x13
10"	1710	11.10	13.10	16.20	8-3/4x18

* SEE MANUFACTURER FOR ADDITIONAL SPECIFICATIONS.

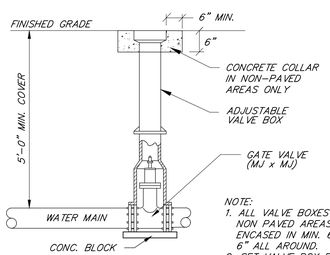
NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

SERIES 1700 MEGALUG RESTRAINT HARNESS

NO SCALE

SEDIMENTATION MARKER POST

NO SCALE



NOTE:
1. ALL VALVE BOXES LOCATED IN NON PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONC. 6" ALL AROUND.
2. SET VALVE BOX FLUSH IN PAVED AREAS.

TYPICAL BURIED VALVE

NO SCALE

PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES										
LENGTH OF RESTRAINT REQD (FEET)									DESIGN FORCE ON RESTRAINT REQD (KIPS) ⑤	
DEFLECTION ANGLE / PIPE	11 1/4	22 1/2	45°	90° BEND	TEE	DEAD END	8"-4" REDUCER	8"-6" REDUCER	45°	TEE
	3	6	11	27	48	80	57	34	11	48

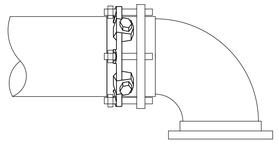
① ALL GATE VALVES MUST BE RESTAINED.

② THIS TABLE IS BASED ON A TEST PRESSURE OF 200 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY

③ IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.

④ IF TIE RODS ARE USED, USE 4 RODS MINIMUM AND ADD 1/8" TO BAR DIA AS CORROSION ALLOWANCE.

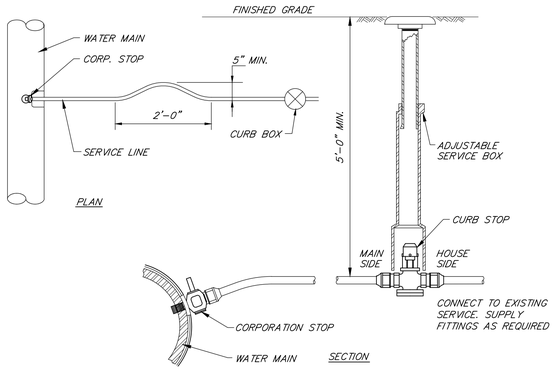
⑤ THE TABLE IS BASED ON THE PIPE LAYING CONDITIONS OF TYPE 4 TRENCH, BURIED DEPTH OF 5' OR MORE AND SOIL TYPE "ML".



NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

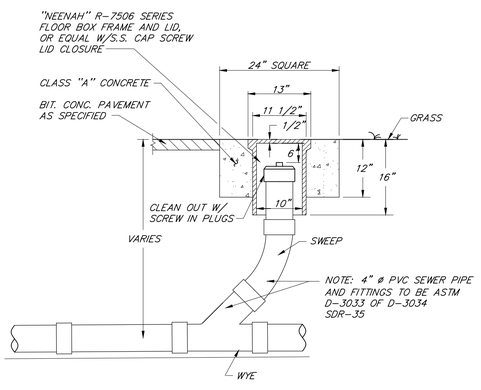
SERIES 1100 MEGALUG RESTRAINT HARNESS

NO SCALE



TYPICAL WATER SERVICE CONNECTION

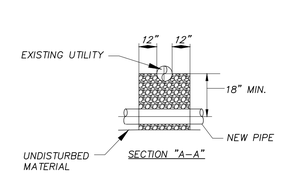
NO SCALE

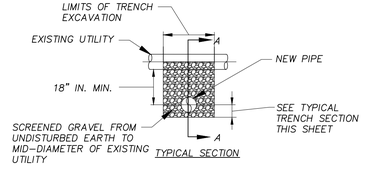


CLEANOUT REQUIRED EVERY 100' OF LATERAL (SANITARY)

TYPICAL CLEANOUT DETAIL

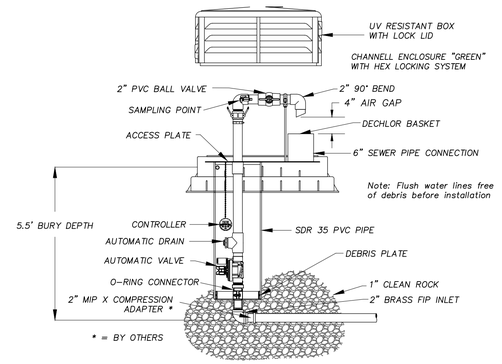
NO SCALE





UTILITY CROSSING DETAIL

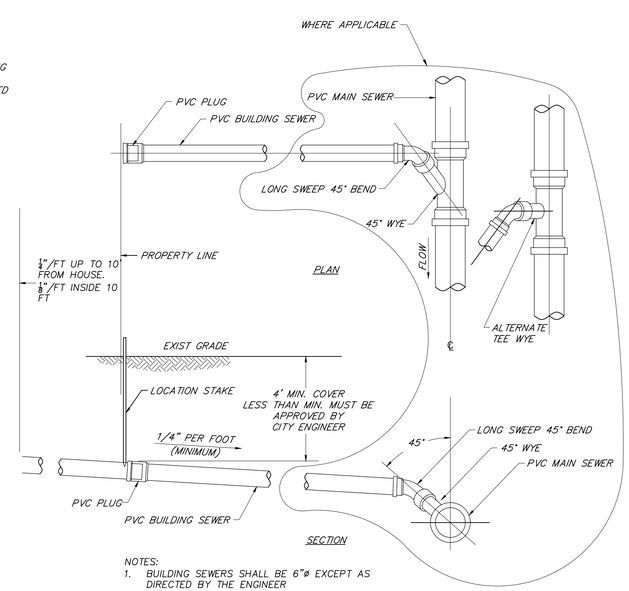
NO SCALE



AUTOMATIC FLUSHING DEVICE SHALL HAVE A 2" BRASS FIP INLET, LEADING VERTICALLY INTO A 2" AUTOMATIC SOLENOID VALVE. AUTOMATIC SOLENOID VALVE SHALL HAVE A 150 PSI RATING. EACH UNIT SHALL BE FURNISHED WITH A STAND-ALONE VALVE CONTROLLER. VALVE CONTROLLER WILL NOT REQUIRE A SECOND HAND-HELD DEVICE FOR PROGRAMMING. CONTROLLER MUST HAVE MINIMUM OF 12 POSSIBLE FLUSHING CYCLES PER DAY, UP TO 6 HOURS PER FLUSH CYCLE AND SHALL BE SUBMERSIBLE TO 12 FEET, OPERATE WITH 9 VOLT BATTERY(COMPARTMENT HOLDS TWO BATTERS) AND HAVE RESIN-SEALED ELECTRICAL COMPONENTS. SOLENOID HALL HAVE NO LOOSE PARTS WHEN REMOVED FROM VALVE. EACH UNIT SHALL HAVE A DOUBLE-VALVE, ALL BRASS, SAMPLING POINT. REMOVAL OF 2" SOLENOID VALVE SHALL BE POSSIBLE VIA AN O-RING CONNECTOR LOCATED UNDER THE VALVE. AFTER REMOVAL OF STAINLESS STEEL ACCESS PLATE. VALVE ASSEMBLY SHALL BE HOUSED IN A PVC ENCLOSURE AND EACH UNIT SHALL BE SELF-DRAINING, NON-FREEZING, ALL ABOVE-GROUND COMPONENTS SHALL BE CONTAINED WITHIN A UV-RESISTANT LOCKING COVER, AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY. MODEL#9800 ST. LOUIS, MO. 1-800-231-3990, OR APPROVED EQUAL.

AUTOMATIC FLUSHING DEVICE - MODEL #9800

NO SCALE



NOTES:
1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL (S-4)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
D-3	-

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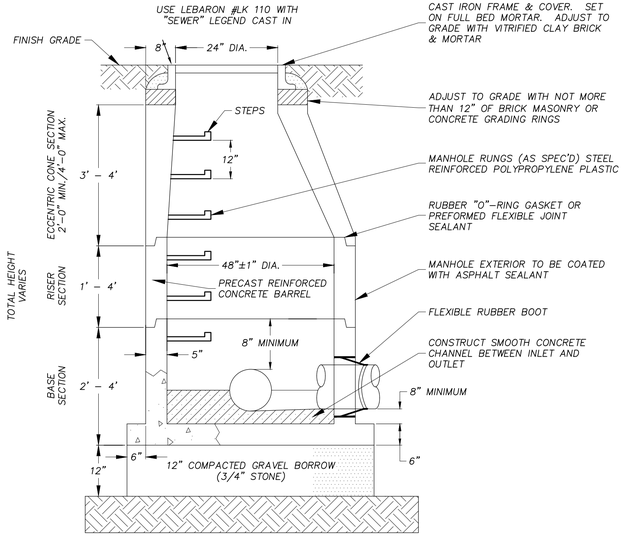
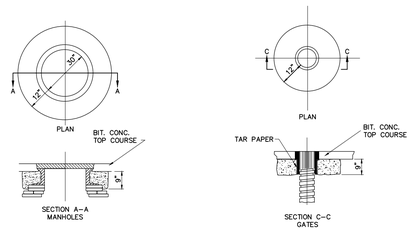


STANDARD SANITARY SEWER MANHOLE DETAIL

NO SCALE



PORTLAND CEMENT CONCRETE COLLARS

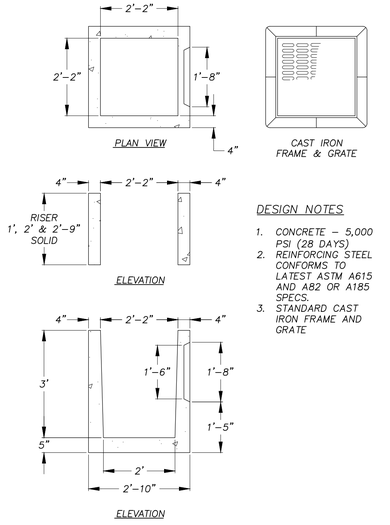
N.T.S

NOTES:

1. CONCRETE COLLARS ARE NOT REQUIRED FOR TYPE "C" OR "CL" PRECAST CATCH BASINS
2. ALL STRUCTURES ARE TO BE PLATED BEFORE PLACEMENT OF THE FIRST COURSE OF PAVEMENT AND RAISED PROMPTLY AFTERWARDS.
3. ALL RAISED STRUCTURES SHALL HAVE BITUMINOUS CONCRETE "DOUGHNUTS" PLACED AROUND THEM UNTIL THE FINISH COURSE OF PAVEMENT HAS BEEN COMPLETED.

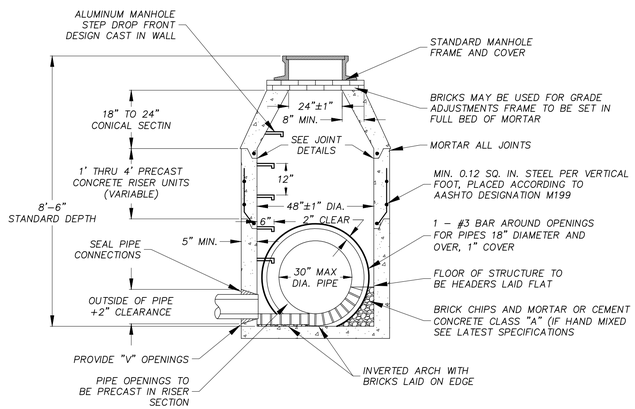
CONCRETE COLLARS

NO SCALE



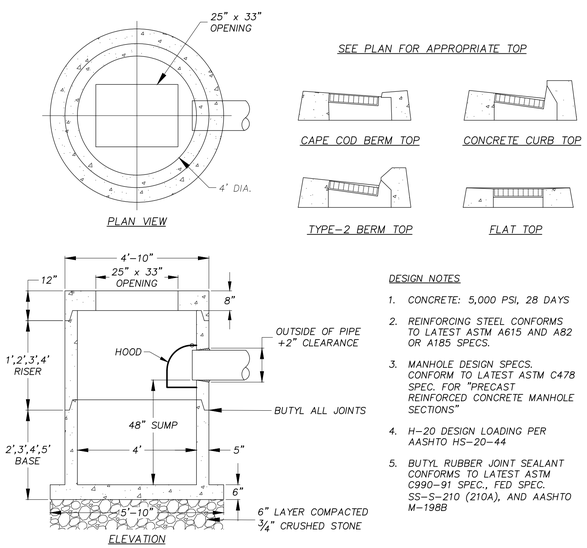
YARD DRAIN DETAIL

NO SCALE



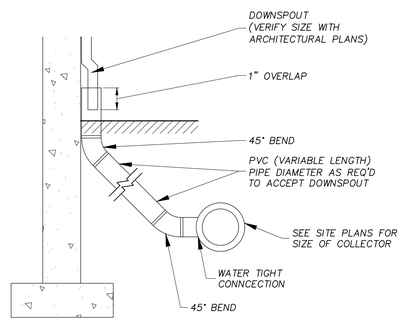
PRECAST CONCRETE MANHOLE

NO SCALE



PRECAST CONCRETE CATCH BASIN-CT STYLE/ROUND BASE

NO SCALE



DOWNSPOUT COLLECTOR DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
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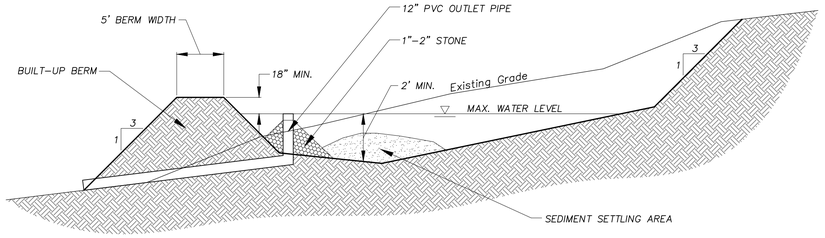


TEMPORARY SEDIMENT BASIN

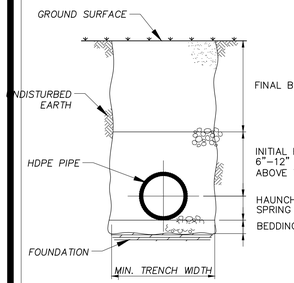
NO SCALE

HDPE TRENCH INSTALLATION DETAIL

NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY–FLOW APPLICATIONS," LATEST EDITION; AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

   UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 6" (150mm).
3. HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
4. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:



TYPICAL HDPE TRENCH CROSS–SECTION

NOMINAL ø in (mm)	MIN. RECOMMENDED TRENCH WIDTH, in (mm)
4 (100)	21 (530)
6 (150)	23 (580)
8 (200)	25 (630)
10 (250)	28 (710)
12 (300)	31 (790)
15 (375)	34 (860)
18 (450)	39 (990)
24 (600)	48 (1220)
30 (750)	66 (1680)
36 (900)	78 (1980)
42 (1050)	83 (2110)
48 (1200)	89 (2260)
60 (1500)	102 (2590)

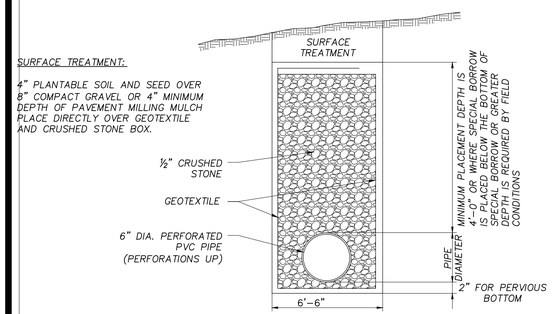
5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADING CONDITIONS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.

SURFACE LIVE LOADING CONDITION	MINIMUM RECOMMENDED COVER, in (mm)
H25 (FLEXIBLE PAVEMENT)	12 (300)
H25 (RIGID PAVEMENT)	12 (300)
E80 RAILWAY	24 (610)
HEAVY CONSTRUCTION	48 (1220)

*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

HDPE TRENCH INSTALLATION DETAIL

NO SCALE

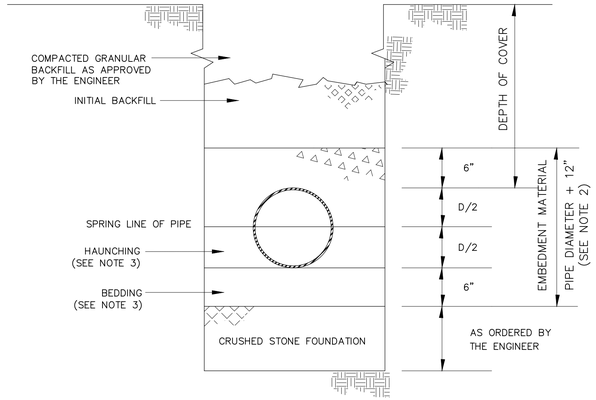


NOTES:

1. GEOTEXTILE FABRIC AS DESCRIBED IN SECTION M9.50.
2. PIPE SHALL BE SET AT BOTTOM OF TRENCH FOR IMPERVIOUS BOTTOM.
3. SUBDRAIN LOCATED APPROXIMATELY AT INTERSECTION OF TANGENTS (SEE DWG. E102.1.0).
4. GRAVEL (AND SPECIAL BORROW WHERE REQUIRED) SHALL INTERSECT CRUSHED STONE FOR SUBDRAIN.

SUBDRAIN DETAIL (MHD #E 209.1.0)

NO SCALE

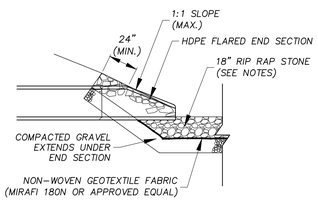


NOTES:

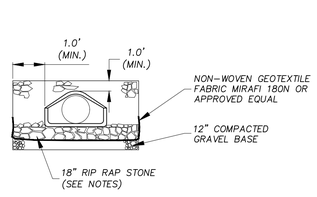
1. THE INSTALLATION OF PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD D–2321.
2. THE EMBEDMENT MATERIAL SHALL BE 3/4" CRUSHED STONE.
3. USE HAND OR MECHANICAL TAMPING TO COMPACT THE BEDDING AND HAUNCHING.
4. GEOTEXTILE TO BE USED WHERE AND AS DIRECTED BY ENGINEER.

SANITARY & STORM SEWER TRENCH SECTION (M-2)

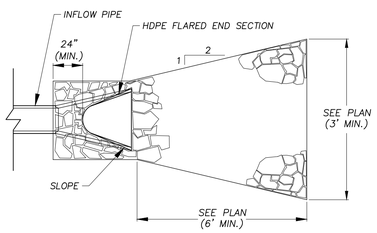
NO SCALE – AGAWAM DETAIL M–2



SIDE SECTION



FRONT SECTION



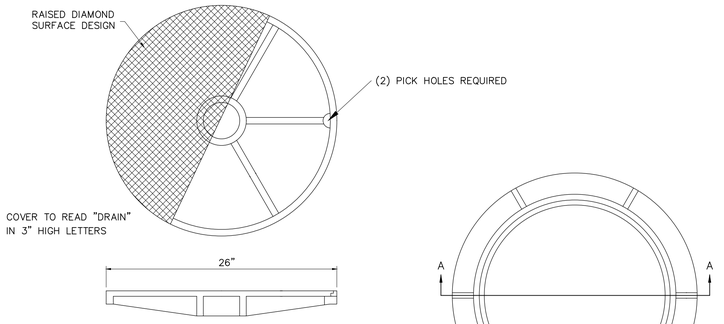
PLAN VIEW

NOTES

1. FLARED END SECTION PIPE JOINT SHALL BE SIMILAR TO THE MAIN RUN OF PIPE JOINTS
2. STONE RIPRAP SHALL NOT BE LESS THAN 50 POUNDS NOR MORE THAN 125 POUNDS AND AT LEAST 75% OF THE VOLUME SHALL BE AT LEAST 75 POUNDS

STANDARD RIP RAP PIPE OUTLET

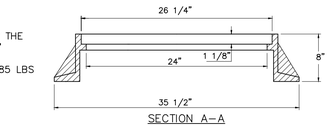
NO SCALE



24" MANHOLE COVER

N.T.S.
202.8.1

COVER TO BE EQUAL TO "LEBARON L26C2" AS APPROVED BY THE TOWN ENGINEER



FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LK 110A"

TOTAL WEIGHT OF FRAME & COVER = 485 LBS

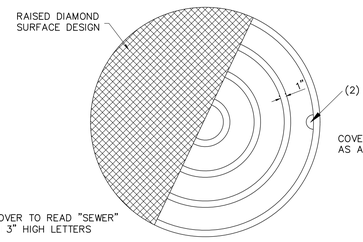
SECTION A–A

24" MANHOLE FRAME

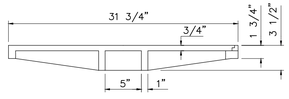
N.T.S.

DRAIN MANHOLE FRAME & COVER (D-2)

NO SCALE – AGAWAM DETAIL D–2

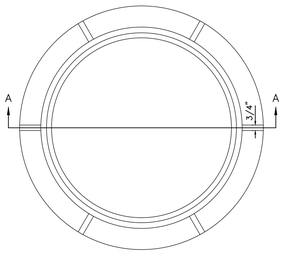


COVER TO BE EQUAL TO "LEBARON L32C19" AS APPROVED BY THE TOWN ENGINEER



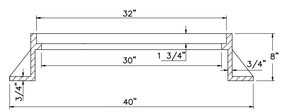
30" MANHOLE COVER

N.T.S.
202.8.1



FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LC328"

TOTAL WEIGHT OF FRAME & COVER = 551 LBS



SECTION A–A

30" MANHOLE FRAME
TYPE 'C'

N.T.S.
202.7.1

SANITARY SEWER FRAME & COVER (S-3)

NO SCALE – AGAWAM DETAIL S–3

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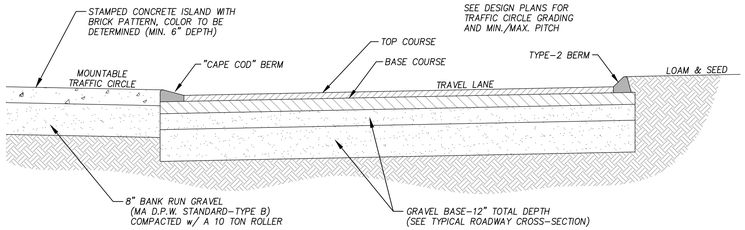
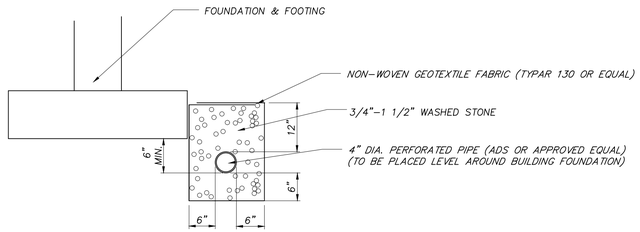


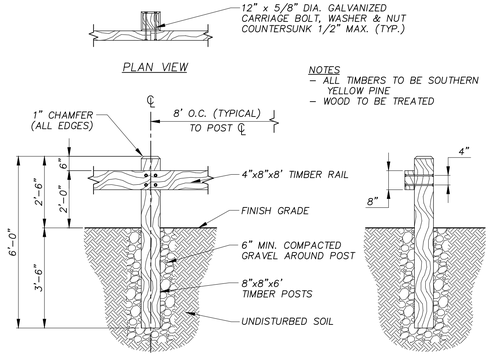
MOUNTABLE TRAFFIC CIRCLE ISLAND DETAIL

NO SCALE



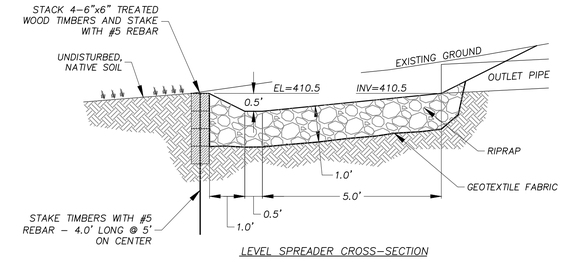
TYPICAL BUILDING FOUNDATION DRAIN DETAIL

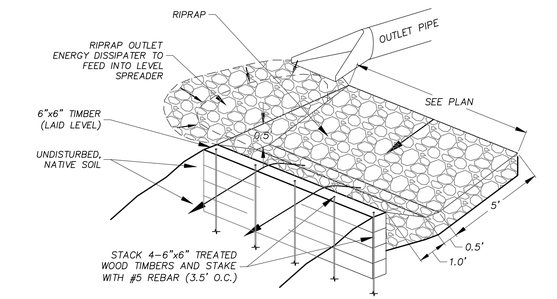
NO SCALE



WOOD GUARDRAIL

NO SCALE



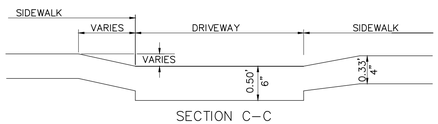


NOTES

1.) LEVEL SPREADER SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
2.) CONSTRUCTION OF LEVEL SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
3.) CONSTRUCT SPREADER WITH LIP AT EXISTING GRADE AS SPECIFIED.
4.) DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

LEVEL SPREADER DETAIL

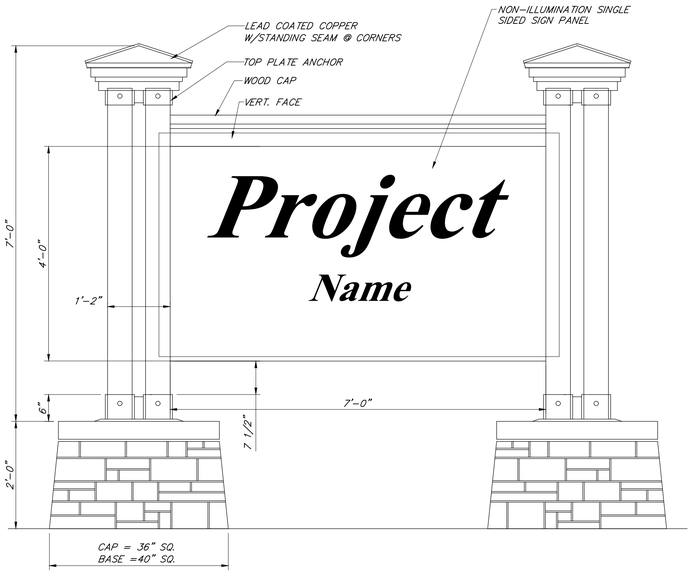
NO SCALE



SECTION C-C

NOTE:

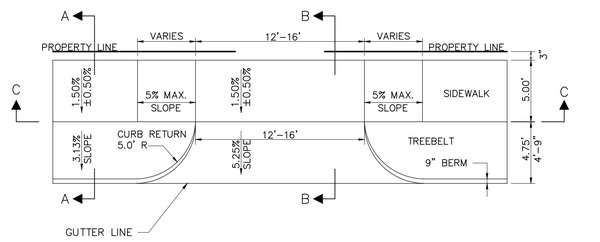
SIGN SIZE, COLORS, MATERIALS & HEIGHT AS SPECIFIED BY SIGN MANUFACTURER

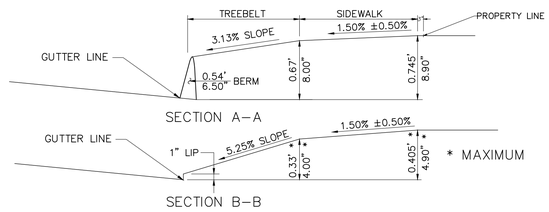


FOUNDATION SHALL BE DESIGNED ACCORDING TO PREVAILING SOIL CONDITIONS, WIND LOADS, AND SUBSURFACE EXPLORATION RESULTS.

FREESTANDING SIGN DETAIL

NO SCALE





NOTES

1.) CONCRETE SIDEWALK IS TO RUN CONTINUOUSLY THOUGH DRIVEWAYS.
2.) CONCRETE USED SHALL BE 4000 PSI WITH A MAX. AGGREGATE SIZE OF ¾"AND SHALL CONTAIN 5-7% ENTRANED AIR.
3.) CONCRETE DEPTH SHALL BE A MINIMUM OF 4" WITH A MIN. DEPTH OF 6" AT DRIVEWAYS.
4.) SIDEWALKS SHOULD BE INSTALLED PRIOR TO THE APPLICATION FOR A BUILDING PERMIT UNLESS THE BUILDER REQUESTS IN WRITING THAT THE SIDEWALKS BE DELAYED AND GUARANTEES THAT THE SIDEWALK WILL CONFORM TO THE STANDARD DRIVEWAY DETAIL.
5.) ALL DRIVEWAYS REQUIRE A DPW DRIVEWAY PERMIT.
6.) ALL SLOPES ARE MAXIMUM. DRIVEWAYS ARE TO BE DESIGNED SUCH THAT WATER WILL NOT FLOW INTO DRIVEWAY FROM THE ROADWAY.

STANDARD RESIDENTIAL DRIVEWAY (H-6)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
D-6	-

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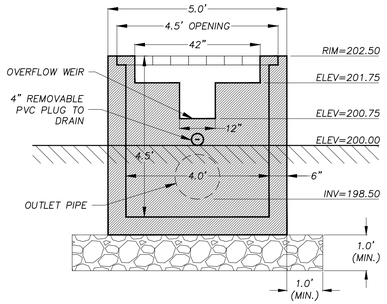
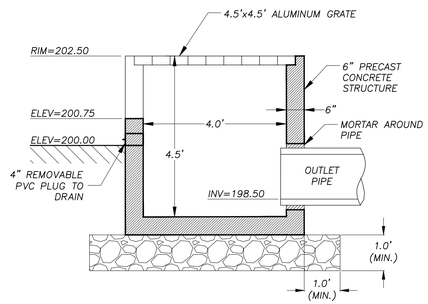


SECTION A–A



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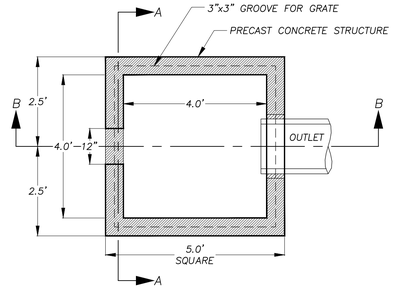
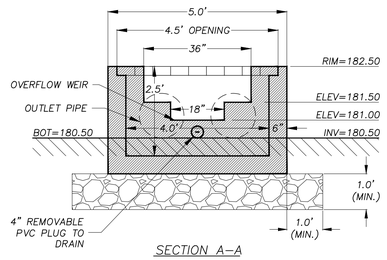


PLAN VIEW

INFILTRATION BASIN #1 OUTLET DETAIL (POCS-1)

NO SCALE



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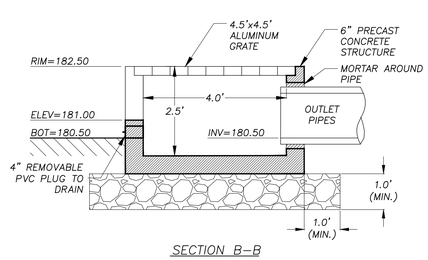

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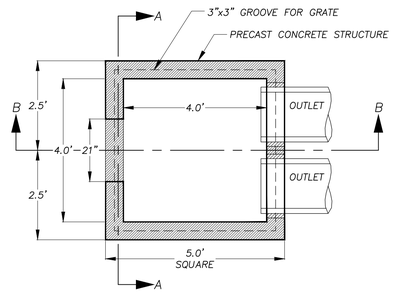
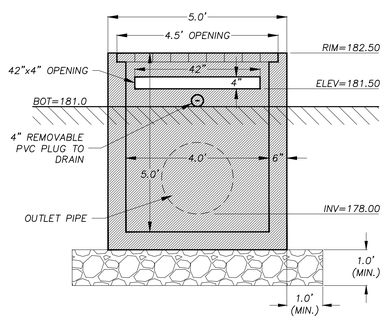


PLAN VIEW

INFILTRATION BASIN #2 OUTLET DETAIL (POCS-2)

NO SCALE



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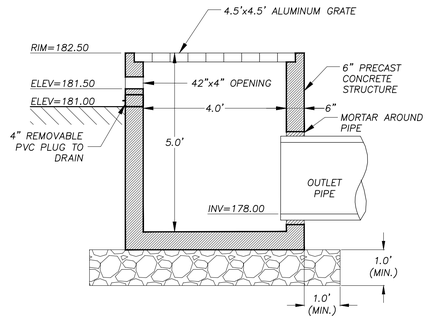

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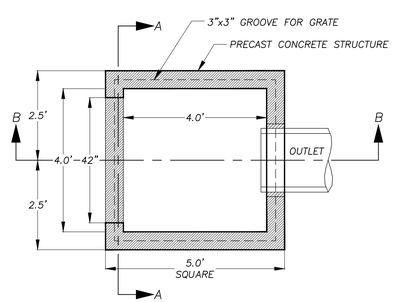
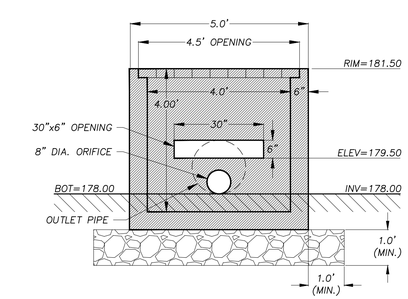


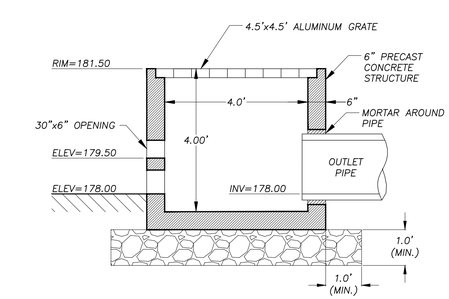
PLAN VIEW

INFILTRATION BASIN #3 OUTLET DETAIL (POCS-3)

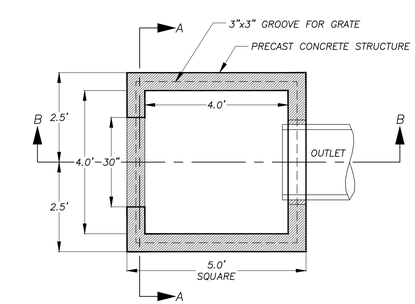
NO SCALE



SECTION A–A



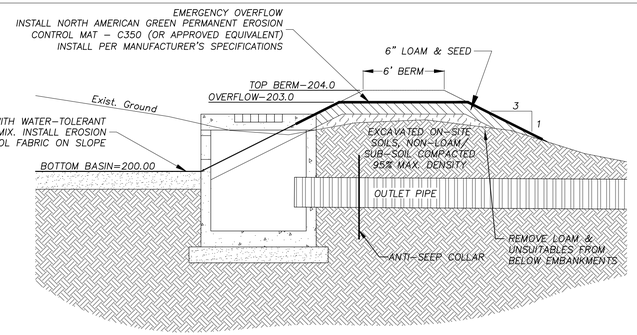
SECTION B–B

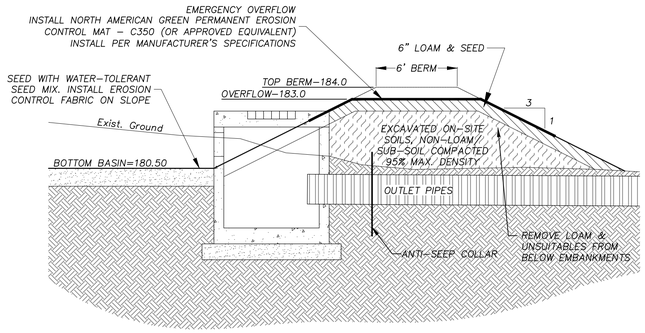


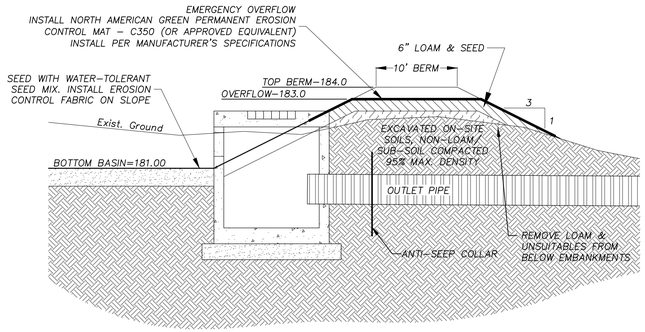
PLAN VIEW

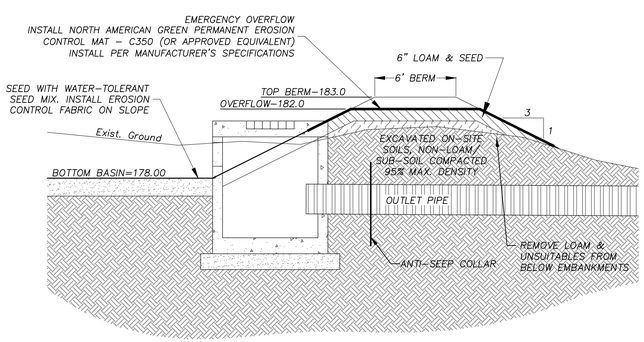
INFILTRATION BASIN #4 OUTLET DETAIL (POCS-4)

NO SCALE









INFILTRATION BASIN NOTES

1. INFILTRATION BASIN BOTTOM TO BE LOCATED A MINIMUM OF 2.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW).
2. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER–TOLERANT GRASS.
3. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE INFILTRATION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
6. IF INFILTRATION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
7. ALL DRAINAGE AREAS TO AN INFILTRATION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF TOPSOIL/COMPOST MIX AND SEED MIX.
8. INFILTRATION BASIN BOTTOMS AND EMBANKMENTS TO BE SEEDED AS NOTED ON PLANS. NO TREES OR SHRUBS TO BE PLANTED WITHIN INFILTRATION BASINS OR EMBANKMENTS. DO NOT USE SOD.

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
D-7	-

PERMITTING
NOT FOR CONSTRUCTION

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TOWN OF AGAWAM
Department of Public Works
1000 Suffield Street • Agawam, MA 01001
Tel (413) 821 0600 • Fax (413) 821 0631
Mario Mazza • Superintendent

MEMORANDUM

To:	Concervation Commission, R. Levesque Associates, Taryn Egerton – Department
CC:	File
From:	Engineering Division
Date:	March 24, 2022
Subject:	Proposed Condominium Community Tirone/Depalma – 497 South Westfield Street – SP-555

As per your request, Engineering has reviewed the Notice of Intent, Conservation Filing Plans and Stormwater Drainage Report, dated February 14, 2022, submitted for the proposed condominium community at #497 South Westfield Street, Agawam, MA, prepared by R. Levesque Associates, Inc. Based on our review, we have the following comments:

1. On June 21, 2018, the Engineering Department provided comments for the previously submitted Site Plans dated June 14, 2018 (see attached document). These comments should be addressed prior to project approval.
2. A complete plan set of the revised project site shall be submitted to Engineering for review including a detailed list of all changes made by the Developer from the previously approved 2018 plans. New details of all outlet control structures and cross-sections for all stormwater BMPs shall be included in the plans set.
3. The 2018 plans included an open-bottom box culvert near the site entrance which would serve as a wildlife guidance device between Taylor Pond and the vegetated wetland area on the western side of the subject parcel. The revised project site does not include this box culvert and does not show an alternative method for connecting the two wetland resource areas. The plans show a headwall on the northern side of the road, but it does not appear to be connected to any drainage structure.

   In addition, there is an existing culvert adjacent to #582 South Westfield Street that runs under the road and into the vegetated wetland area on the project site. The 2018 plans had included new drainage pipes that would allow the culvert to continue flowing into the wetlands. The revised site plans do not include these drainage pipes, potentially allowing for stormwater backup onto private property.
4. The existing contours shown on the revised plans appear to be different than those shown on the 2018 site plans. The 2018 site plans note that the existing contours are based on the Agawam vertical datum which is NGVD 29. However, the revised 2022 plans note that the existing contour elevations are based on the NAVD 88 datum.
5. The NOI narrative states that the wetland resource areas were re-delineated in 2021. The notes on Sheet CC-1 of the revised plans reference wetland flag locations from 2009.
6. The locations of all test pits shall be shown on the site plans.
7. Infiltration Basins #2 and #3 appear to be mislabeled on the site plans.

8. The Town will require the stormwater calculations in electronic HydroCAD format.
9. The Stormwater Drainage Report shows that redoximorphic features were found at test pit TP-3 (located within the proposed extended dry detention basin) at a depth of 22 inches. Since the existing ground elevation at TP-3 is approximately 178.7, this indicates that the seasonal high ground water at the detention basin is 176.9. The bottom elevation of the detention basin is listed as 176.5 in the Stormwater Drainage Report. The detention basin may experience standing water.
10. The riprap splash pads for the stormwater BMP outfalls appear to have decreased in size from the 2018 plans. Engineering requests that sizing calculations for the splash pads be submitted for review.
11. The site plans shall include spot grades for the emergency spillways on all stormwater BMPs.
12. Engineering recommends that a team meeting be held with the Developer and R. Levesque Associates to discuss the proposed changes to the project site.
13. Construction shall be sequenced such that heavy equipment does not enter areas reserved for infiltrations systems so as not to compact underlying soils and reduce permeability.

Engineering may have additional comments if any new information is provided. If you have any questions, please do not hesitate to contact us.

Sincerely,

Michael F. Albro, P.E.
Assistant Town Engineer

Michelle C. Chase, P.E.
Town Engineer

Elizabeth Lotter, M.S.
Civil Engineer

TOWN OF AGAWAM
Department of Public Works
1000 Suffield Street • Agawam, MA 01001
Tel (413) 821 0600 • Fax (413) 821 0631
Mario Mazza • Superintendent

MEMORANDUM

To:	Planning Board, Conservation Commission
CC:	File
From:	Engineering Division
Date:	October 20, 2022
Subject:	Proposed Condominium Community Tirone/Depalma – 497 South Westfield Street – SP-555

As per your request, Engineering has reviewed the Site Plans and Stormwater Drainage Report, dated September 19, 2022, submitted for the proposed condominium community at #497 South Westfield Street, Agawam, MA, prepared by R. Levesque Associates, Inc. Based on our review, we have the following comments:

1. The request for a traffic study has been reviewed internally. Both a traffic study and a trip generation study will be required prior to site plan approval. Due to recent development in the area, a traffic signal may be warranted at South Westfield Street and Pine Street. Conduits were installed as part of the Route 187 project to minimize pavement disturbance when/if a new signal is installed. If a signal is warranted, the cost of the signal may be shared amongst developers in the area. Percentage of costs may be based on trip generation.
2. Please provide updated HydroCAD files corresponding to the most updated version of the stormwater drainage report.
3. The stormwater runoff from South Westfield Street currently drains to the east for much of the frontage of this project. The plans call for the driveway aprons for units 68-81 to pitch toward the roadway. This will keep stormwater from flowing off the road and down the driveways. However, runoff will continue to flow to the east between the driveways based on the proposed grading. This stormwater will be captured by the proposed yard drains. The impervious area of South Westfield Street does not appear to be included in the stormwater drainage calculations. The Town is concerned that this stormwater will create erosion issues during construction and overwhelm the proposed drainage infrastructure during large storm events. This may also occur along the remaining frontage for this project.

Engineering may have additional comments if any new information is provided. If you have any questions, please do not hesitate to contact us.

Sincerely,

Michael F. Albro, P.E.
Assistant Town Engineer

Michelle C. Chase, P.E.
Town Engineer

Elizabeth Lotter, M.S.
Civil Engineer I

s: sp 555 depalma tirone condos - 497 south westfield st memos 10_con com and site plan review _20220915 submittal.doc

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**
City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-1A**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	18	10YR5/8	C	SL			SBK	FR	
21-100	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Saturated @ 20"
Weeping @ 27"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-1**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-10	Ap	10YR3/2				L			GR	FR	
10-34	B	7.5YR3/4	10	10YR5/8	C	SL			SBK	FR	
34-96	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 34"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-2**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	17	10YR5/8	C	SL			SBK	FR	
21-100	C	7.5YR3/4				SL	2		M	FR	

Additional Notes Weeping @ 21"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-3**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4				SL			SBK	FR	
21-36	C	7.5YR3/4	22	10YR5/8	C	SL	5		M	FR	
36-55	C2	7.5YR3/4				FSL			M	FR	
55-102	C3	7.5YR3/4				SL	5		M	F	

Additional Notes Weeping @ 40"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-4**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	Ap	10YR3/2				L			GR	FR	
11-18	B	7.5YR3/4	18	10YR5/8	C	SL			SBK	FR	
18-72	C	7.5YR3/4				SL	10		M	FR	

Additional Notes Weeping @ 48"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-5**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-22	B	7.5YR3/4	13	10YR5/8	C	S			SBK	FR	
22-80	C	7.5YR3/4				S	2		M	FR	

Additional Notes Standing water on surface

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-7**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-9	Ap	10YR3/2				L			GR	FR	
9-16	B	7.5YR3/4				SL			SBK	FR	
16-38	C1	2.5YR5/3	24	10YR5/8	C	SL			M	FR	
38-83	C2	2.5YR5/3				SILT			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-8**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	Ap	10YR3/2				L			GR	FR	
11-16	B	7.5YR3/4				SL			SBK	FR	
16-36	C1	2.5YR5/3	18	10YR5/8	C	SL			M	FR	
36-89	C2	2.5YR5/3				SILT			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-14**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-21	B	7.5YR3/4	20	10YR5/8	C	SL			SBK	FR	
21-65	C1	2.5YR5/2				SL			M	F	
65-93	C2	2.5YR5/3				LS	10		M	FR	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-15**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-27	B	7.5YR3/4	22	10YR5/8	C	SL			SBK	FR	
27-96	C1	2.5YR5/3				SL			M	F	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-16**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				L			GR	FR	
8-21	B	7.5YR3/4				SL			SBK	FR	
21-76	C1	2.5YR5/3				S	10		SG	L	
76-108	C2	2.5YR5/3				LS			M	FR	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-21**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	A	10YR3/2				L			GR	FR	
12-20	B	7.5YR3/4	18	10YR5/8	C	SL			SBK	FR	
20-40	C	2.5YR5/3				SL			M	F	
40-60	R					WR					

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-22**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	Ap	10YR3/2				L			GR	FR	
11-21	B	7.5YR3/4				SL			SBK	FR	
21-50	C1	2.5YR5/3	27	10YR5/8	C	FSL			M	FR	
50-104	C2	2.5YR5/3				SILTY FSL			M	F	

Additional Notes STANDING @ 50"
LAYER OF SAND/GRAVEL @ 54"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-23**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	Ap	10YR3/2				L			GR	FR	
11-16	B	7.5YR3/4				FS			SG	FR	
16-54	C1	7.5YR5/2	24	10YR5/8	C	FS			SG	FR	
54-100	C2	7.5YR4/3				S			SG	L	

Additional Notes Weeping @ 51"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-24**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	A	10YR3/2				LS			GR	FR	
11-24	B	7.5YR3/4	23	10YR5/8	C	FS			SBK	FR	
24-85	C	7.5YR3/4				FS			M	FR	

Additional Notes Weeping @ 36"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-25**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	Ap	10YR3/2				L			GR	FR	
8-26	B	7.5YR3/4	24	10YR5/8	C	LS			SBK	FR	
26-72	C1	7.5YR5/3				VFS			SG	FR	
72-100	C2	7.5YR5/3				S	5		SG	L	

Additional Notes _____

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-26**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2				LS			GR	FR	
8-100	C	7.5YR4/4	24	10YR5/8	C	FS			SG	L	

Additional Notes Weeping @ 36"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-28**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-11	Ap	10YR3/2				L			GR	FR	
11-17	B	7.5YR3/4	15	10YR5/8	C	SL			SBK	FR	
17-25	C1	7.5YR5/2				SILT/LOAM			M	F	
25-84	C2	2.5YR5/3				FS			SG	FR	
84-102	C3	7.5YR3/4				S			SG	L	

Additional Notes Standing @ 90"
Weeping @ 55"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-30**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-12	Ap	10YR3/2				L			GR	FR	
12-20	B	7.5YR3/4	19	10YR5/8	C	LS			SBK	FR	
20-100	C	7.5YR3/4				FS			M	FR	

Additional Notes Standing @ 48"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-31**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-7	A	10YR3/2				SL			GR	FR	
7-20	B	7.5YR3/4				LS			SBK	FR	
20-96	C1	7.5YR3/4	21	10YR5/8	C	FS			SG	FR	

Additional Notes Weeping @ 48"

Commonwealth of Massachusetts **479 South Westfield St., Agawam** **3/18/10**

City/Town of West Springfield

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole Number:**TP-32**

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-7	A	10YR3/2				SL			GR	FR	
7-22	B	7.5YR3/4				LS			SBK	FR	
22-38	C1	7.5YR5/3				S			SG	FR	
38-102	C2	7.5YR5/2				S			SG	FR	

Additional Notes Weeping @ 88"

8/28/13
1:30 P.M.

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD ST.
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: RG2 - TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-12"	A_P	10YR 3/6				LS			FRIABLE		
12"-26"	B	10YR 4/6		NONE		SL					
26"-95"	C_1	2.5YR 3/4		OBSERV.		SL		NONE		DRY	
95"-140"	C_2	7.5YR 4/3				SL	<15%	FEW STONES	MASSIVE FIRM	MOIST @ BOTTOM	

Additional Notes:

NO SEEPS

STANDING WATER @ 138" - STATIC

IN CORN FIELD - EL. 179 ±

8/20/15
2:30 P.M

Commonwealth of Massachusetts
City/Town of AGAWAM - SOUTH WESTFIELD STREET
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

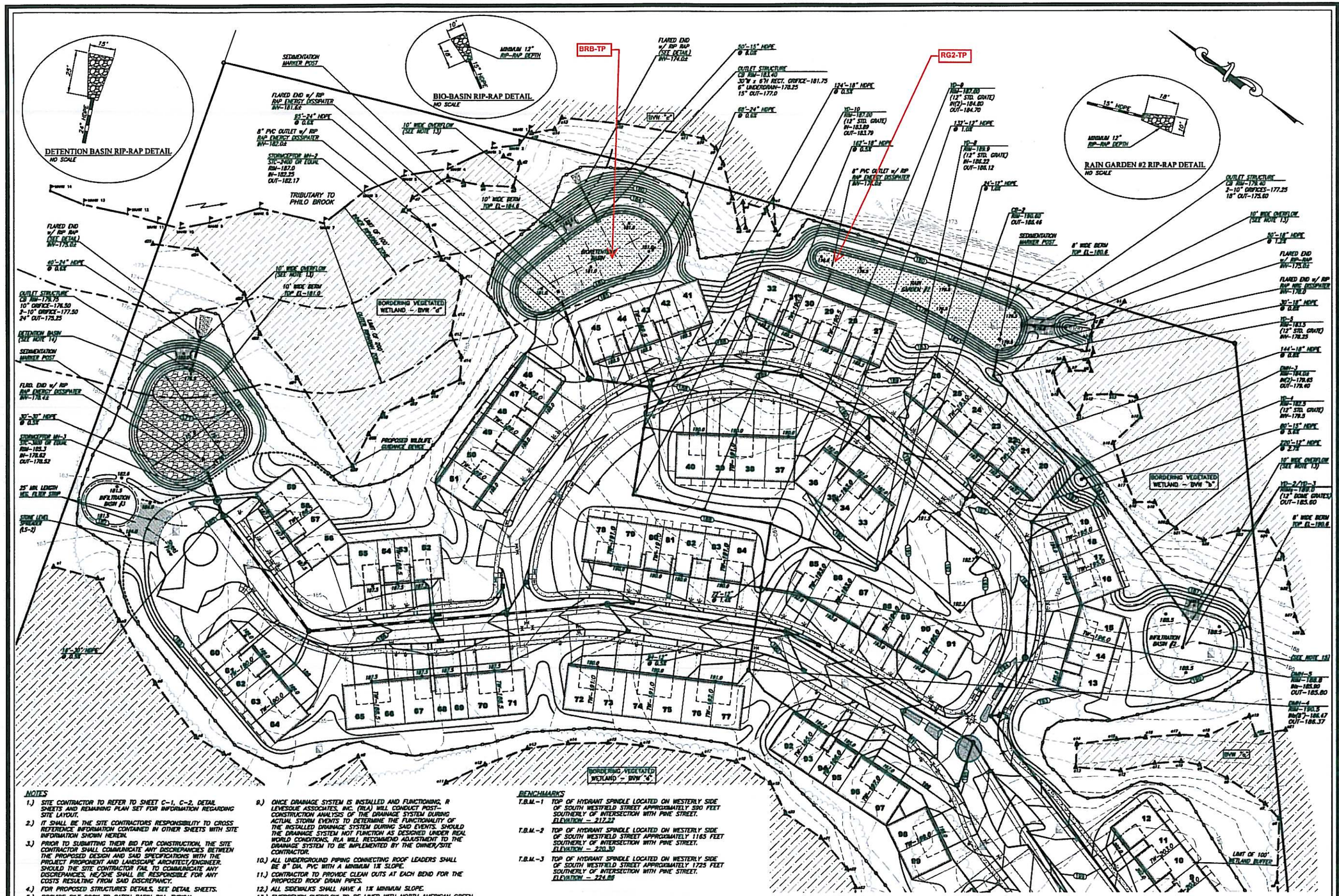
Deep Observation Hole Number: BRB -TP

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color- Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0"-14"	A_P	10YR 4/4				LS			FRIABLE		
14"-32"	B	10YR 4/6		NONE		SL					
32"-174"	C	5YR 4/4		OBSERV.		SL	<15%	FEW @ 14'	MASSIVE FIRM	DRY	

Additional Notes:

NO SEEPS

NO STANDING WATER



NOTES

1.) SITE CONTRACTOR TO REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.

2.) IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREIN.

3.) PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

4.) FOR PROPOSED STRUCTURES DETAILS, SEE DETAIL SHEETS.

5.) PROVIDE SILT SOCK TO CATCH BASIN RIM, TYPICAL.

6.) CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.

7.) CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.

8.) ON-SITE SOIL CONDITIONS FOR ALL SUBSURFACE STORMWATER SYSTEMS MUST BE EVALUATED AND CONFIRMED BY DESIGN ENGINEER PRIOR TO CONSTRUCTION.

8.) ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, R LEVESQUE ASSOCIATES, INC. (RLA) WILL CONDUCT POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENT TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.

10.) ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 6" DIA. PVC WITH A MINIMUM 1% SLOPE.

11.) CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.

12.) ALL SIDEWALKS SHALL HAVE A 1% MINIMUM SLOPE.

13.) EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

14.) DETENTION BASIN TO HAVE A MINIMUM 6" DEPTH OF 1-1/2" TO 2" WASHED STONE (W/ FABRIC) ON BOTTOM AND 1-FOOT UP SIDE SLOPE.

15.) CONTRACTOR TO DETERMINE DEPTH TO LEDGE (IF PRESENT) PRIOR TO START OF BASIN CONSTRUCTION AND NOTIFY DESIGN ENGINEER/LANDSCAPE ARCHITECT OF FINDINGS.

BENCHMARKS

T.B.M.-1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 530 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 217.27

T.B.M.-2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 220.30

T.B.M.-3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET.
ELEVATION = 224.89

RLA
R LEVESQUE ASSOCIATES, INC
Land Surveying, Site Design, Landscape Architecture, Planning Environmental Permitting
ph: 413.568.0985 fax: 413.568.0986
40 School Street • P.O. Box 640
Westfield, MA 01086
rlaland.com

SITE GRADING & DRAINAGE
(Northwesterly Section)

497 South Westfield Street
Map E6, Block 2, Lot 8
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
GARY R. WERNER
CIVIL
No. 35021
REGISTERED PROFESSIONAL ENGINEER
9/9/13

PREPARED FOR:

Joe Tirone &
Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE:	
November 5, 2012	
REVISIONS:	**DATE:**
Engineering & Peer Review	6/28/13
Peer Review Response	8/19/13

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: 1" = 50'

RLA PROJ. NUMBER: 090506

DRAWING: C-8 REV: A

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

September 30, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01001

RE: Notice of Intent – Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
MassDEP File #: 087-0675

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein responding to review comments received on June 21, 2018, issued by the Department of Public Works Engineering Department for the above-referenced project. The following response provides the original comment as stated in the review in italics, followed by the RLA response in blue bold text. The comment numbering and format is consistent with the original document for ease of review.

Traffic/Pedestrian

1. *A traffic study and trip generation study is required for this project. Due to the proposed future development in the area, a traffic signal may be warranted at South Westfield Street and Pine Street. Conduits will be installed as part of the upcoming project to minimize pavement disturbance when/if a new signal is installed. Per Mayor Sapelli, if a signal is warranted, the cost of the signal will be shared amongst the future developers in the area. Percentage of costs will be based on trip generation.*

   RLA Response: At a roundtable discussion held on March 29, 2022 between R Levesque Associates, the developers and Agawam engineering, Town Engineer Michelle Chase indicated she was going to review this request internally to determine the current plan for the intersection of South Westfield Street and Pine Street, therefore, RLA has no response at this time.

2. *In accordance with the Agawam Complete Streets policy, the DPW is currently working on plans to install sidewalks from the intersection of South Westfield Street and Pine Street, continuing north past Route 57 and connecting to the existing sidewalk at Hendom Drive. This will improve pedestrian traffic and safety and provide better connectivity to Feeding*

Hills Center. In an effort to further improve connectivity to residents of South Westfield Street (including the residents at Soldier On), the DPW is requesting a sidewalk be installed within the town layout along the frontage of the condominium project (between units 67-80) on South Westfield Street.

RLA Response: A sidewalk is proposed along the fronts of the units facing South Westfield Street. The proposed walk is on private property between 32-feet and 42-feet from South Westfield Street and approximately 20-feet from the face of each building unit. The walk was not proposed within the town layout because of how severe the existing grade drops from the paved portion of South Westfield Street. A typical driveway cross-section is shown on sheet C-7 of the plan set to illustrate the how access to the units will be achieved.

Site Layout

3. *The driveway of units 59 & 60 exits directly into the proposed mini-roundabout. Engineering recommends the driveway be redesigned so that vehicles are not exiting directly into roundabout traffic.*

   RLA Response: The 2022 layout shows the driveway of units 60/61 entering directly to the mini-roundabout. It was determined at the roundtable discussion between RLA, the developer and Agawam engineering that the number of vehicles within the roundabout at any given time would not be significant enough to warrant a redesign of the proposed driveway.

4. *Top of wall elevations for each unit should be noted on the site plans.*

   RLA Response: Top of wall elevations have been added to the site plans.

5. *Engineering understands that the accessible parking space locations may need to change based on resident need. However, the total number of accessible spaces will need to meet the minimum requirements and shall be evenly spaced throughout the site at all times.*

   RLA Response: Understood. There are a total of 89 parking spaces across several visitor parking areas on site of which eight (8) have been designated as accessible parking spaces. Based on current ADA parking standards a minimum of 4 accessible spaces would be required for a parking facility with 89 parking spaces. It should be noted that each unit will have a minimum of two parking spaces (garage and driveway) available to both residents and visitors that require special parking needs.

6. *"Crosswalk Ahead" signs are recommended but not required for the mid-block crosswalks.*

   RLA Response: "Crosswalk Ahead" signs have not been added to the plan, however, pedestrian crossing signs are proposed at the location of each mid-block crosswalk.

7. *Individual DPW Driveway Permits will be required for each of the driveways on South Westfield Street.*

   RLA Response: Understood.

8. *Engineering will be working with the developer, Fire and Police Department on the address assignments for this project. For emergency purposes, it is likely that the units on South Westfield Street will need to have South Westfield Street addresses even if their mail is delivered to the community mailbox.*

   RLA Response: Understood.

Stormwater

9. *There are proposed catch basins located at the end of the driveways of units 13 & 14, 25 & 26, 27 & 28, 45 & 46, and 53 & 54. These catch basins will require a flat basin top as opposed to a curb inlet. The Contractor shall provide a catch basin top detail without a curb inlet on the site plans.*

   RLA Response: The precast concrete catch basin detail shown on sheet D-1 has been replaced. The new detail includes a round base (as opposed to rectangular) for more flexibility with pipe connections. In addition, the detail shows a variety of catch basin tops that can be used depending on the location of the catch basin, including a Cape Cod berm top and flat top.

10. *Prior to the disturbance of any area in each phase, the Owner, Contractor, Town Engineer, and members of the Conservation Commission shall meet onsite to agree upon a location where fill and other materials will be stored as well as locations for each of the required temporary sedimentation basins and erosion control swales. No sedimentation basin shall be placed in an area where an infiltration basin, bio-retention pond or rain garden is proposed. The conservation commission may wish to require a tentative plan for sedimentation basin locations; however, these will likely need to be adjusted as the project progresses.*

    RLA Response: Understood. A note on sheets C-8 and C-9 of the plan set states, "The owner, contractor, town engineer and members of the conservation commission to hold a pre-construction meeting on-site prior to commencement of any demolition, construction, or earthwork activity on this project."

11. *The level spreader is to be inspected during and after rainfall events to ensure proper construction. Reconstruction and possible re-design may be necessary if it is not functioning properly.*

    RLA Response: The Long-Term Operation & Maintenance Plan has been updated to include an inspection and maintenance schedule for the level spreader.

12. *The Town of Agawam will need to have a legal right of entry to the property in order to maintain the municipal drainage system.*

    RLA Response: Understood. Proposed easement locations are shown on the site plans for the various town outfalls that discharge onto the subject property. Easement documents will be drafted upon approval of the project.

13. *A comprehensive Operations & Maintenance Plan for the stormwater drainage system including all pipes, structures, outfalls, basins, and rain gardens shall be made available to the Condominium Associates upon completion of construction. The O & M Plan is to include the names and contact information of all parties responsible for the maintenance of the drainage system.*

    RLA Response: Understood.

14. *According to the detention basin cross-section, the seasonal high groundwater elevation is above the bottom of the basin. Based on Greg Newman's review in 2013, extra care may be required during maintenance of this section of the pond to prevent stagnant water and mosquito breeding.*

    RLA Response: Understood. The outlet from the dry detention basin is set at the same elevation as the basin bottom which will allow the basin to fully drain between storm events.

15. *In 2013, Engineering commented on the condition of the existing municipal outfall near the proposed wildlife crossing. The pipe appeared to be in decent condition at that time but was impacted by several adjacent trees. Engineering has not had an opportunity to recently inspect the outfall. It is requested that the contractor be allowed to remove all trees (sumac) and other vegetation that may compromise the pipe in the easement. Engineering may have additional comments on this issue after a site inspection has been completed.*

    RLA Response: Understood.

Water/Sewer

16. *The Deputy Superintendent of Water and Sewer would like the proposed water main in front of units 79 & 80 to either be looped or a metered auto flushing device be installed at the end of the line.*

    RLA Response: An automatic flushing device has been added to the plan set and is shown on sheet C-13.

17. *The following details will need to be submitted for review prior to construction: Sewer pump station (with venting, back-up generator, and emergency notice), a detail for the proposed sewer transition manhole location and venting detail.*

    RLA Response: Understood. Sanitary sewer pump station and force main details will be provided as the design of the system is finalized.

Other

18. *Engineering will work with the developer during construction to ensure there is adequate overhead street lighting on South Westfield Street in this project location.*

    RLA Response: Understood.

Should you have any questions regarding the aforementioned information, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.



John Tomaszewski
Design Engineer

cc: Ralph DePalma & Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 ·
www.rlaland.com

September 30, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01001

RE: Notice of Intent – Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
MassDEP File #: 087-0675

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein responding to review comments received on March 24, 2022, issued by the Department of Public Works Engineering Department for the above-referenced project. The following response provides the original comment as stated in the review in italics, followed by the RLA response in blue bold text. The comment numbering and format is consistent with the original document for ease of review.

1. *On June 21, 2018, the Engineering Department provided comments for the previously submitted Site Plans dated June 14, 2018 (see attached document). These comments should be addressed prior to project approval.*

   RLA Response: The June 21, 2018 Engineering Department comments have been addressed in a separate response letter.

2. *A complete plan set of the revised project site shall be submitted to Engineering for review including a detailed list of all changes made by the Developer from the previously approved 2018 plans. New details of all outlet control structures and cross-sections for all stormwater BMPs shall be included in the plans set.*

   RLA Response: A revised project plan set has been submitted along with this response letter. The project details have been updated as needed based upon any design changes. The following is a list of changes from the 2018 project submission:

   General
   - Wetland boundaries and riverfront areas were re-delineated, peer reviewed and finalized in July 2022

- Open-bottom box culvert near project entrance has been eliminated as noted elsewhere in this letter (comment 3)
- Project datum changed to NAVD88

Layout Related

- The total number of units went from 80 on the 2018 plan to 81 units in the current project
- The footprint of units 3/4 and 38/39/40 through 47/48 and 78/79 have been reduced
- Duplex unit 34/35 has been combined with duplex unit 36/37 to create a 4-unit building east of the cul-de-sac. Additional guest parking has been added near where unit 34/35 was formerly located
- The units on the west side of the access drive approaching the cul-de-sac have been reconfigured from duplexes to triplexes. In the space between unit 41/42/43 and 44/45/46 additional guest parking has been provided. An additional unit was added to duplex unit 51/52 to create a 3-unit building
- Unit 23/24 within the "loop road" has been converted into a triplex. The number of spaces within the guest parking lot in that area has been reduced from 15 to 11 spaces
- The location of the parking stalls within the cul-de-sac were shifted to the northern tip
- A retaining wall has been added near the roundabout

Grading & Drainage Related

- Modified the grading of the surface infiltration basins, runoff collection area and dry detention basin based on revised wetland boundaries. Outlet control structures revised accordingly.
- Required TSS removal achieved through use of deep-sump hooded catch basins and sediment forebays within the infiltration basins, eliminating the need for the water-quality units
- Location of re-routed town outfalls modified due to revised wetland boundary

Please see plan "S-1- Site Revision Sketch" for additional information regarding these changes.

3. *The 2018 plans included an open-bottom box culvert near the site entrance which would serve as a wildlife guidance device between Taylor Pond and the vegetated wetland area on the western side of the subject parcel. The revised project site does not include this box culvert and does not show an alternative method for connecting the two wetland resource areas. The plans show a headwall on the northern side of the road, but it does not appear to be connected to any drainage structure.*

   In addition, there is an existing culvert adjacent to #582 South Westfield Street that runs under the road and into the vegetated wetland area on the project site. The 2018 plans had included new drainage pipes that would allow the culvert to continue flowing into the wetlands. The revised site plans do not include these drainage pipes, potentially allowing for stormwater backup onto private property.

RLA Response: For clarity's sake the response to comment 3 will be broken into bullet points to address each item:

- The wildlife guidance device is not needed since the project area is no longer under Natural Heritage Endangered Species Program jurisdiction. There are currently a series of pipes that connect Taylor Pond to the large wetland further north, however, the condition of said piping is unknown. It is noted on the plans that this piping is to be replaced and a manhole installed at an appropriate location with the rim set at final grade. The intent will be to maintain the hydraulic connection between Taylor Pond and the BVW.
- The short wall shown on the north side of the road is not meant for a pipe outfall but is being utilized to prevent slope grading into the existing wetland.
- The current site plan shows the existing town outfall adjacent to #582 South Westfield Street being rerouted to a location north of the proposed access road adjacent to the large on-site BVW. It will be independent of the pipe connection between Taylor Pond the BVW. A 20' wide stormwater drain easement in favor of the town of Agawam is proposed in the location of the re-routed outfall. See sheet C-7 of the plan set for additional detail.

4. *The existing contours shown on the revised plans appear to be different than those shown on the 2018 site plans. The 2018 site plans note that the existing contours are based on the Agawam vertical datum which is NGVD 29. However, the revised 2022 plans note that the existing contour elevations are based on the NA VD 88 datum.*

   RLA Response: This is correct. The datum of the current plan is NAVD88.

5. *The NOI narrative states that the wetland resource areas were re-delineated in 2021. The notes on Sheet CC-1 of the revised plans reference wetland flag locations from 2009.*

   RLA Response: The wetland resource areas shown on the current plan set were delineated and field located by R Levesque Associates in 2022.

6. *The locations of all test pits shall be shown on the site plans.*

   RLA Response: The test pit locations are shown on the existing conditions plan (EX-1) as well as the grading and drainage plans (C-6, C-7 & C-8).

7. *Infiltration Basins #2 and #3 appear to be mislabeled on the site plans.*

   RLA Response: The labels on the plans have been corrected.

8. *The Town will require the stormwater calculations in electronic HydroCAD format.*

   RLA Response: Understood. The HydroCAD file will be provided.

9. *The Stormwater Drainage Report shows that redoximorphic features were found at test pit TP-3 (located within the proposed extended dry detention basin) at a depth of 22 inches. Since the existing ground elevation at TP-3 is approximately 178.7, this indicates that the seasonal high ground water at the detention basin is 176.9. The*

bottom elevation of the detention basin is listed as 176.5 in the Stormwater Drainage Report. The detention basin may experience standing water.

RLA Response: Understood. The outlet from the dry detention basin is set at the same elevation as the basin bottom which will allow the basin to fully drain between storm events.

10. *The riprap splash pads for the stormwater BMP outfalls appear to have decreased in size from the 2018 plans. Engineering requests that sizing calculations for the splash pads be submitted for review.*

    RLA Response: The riprap pipe outlet sizing calculations are provided in Appendix E (MassDEP calculations) of the stormwater report and details have been added to the plan set.

11. *The site plans shall include spot grades for the emergency spillways on all stormwater BMPs.*

    RLA Response: Spot grades for the emergency spillways have been added to the plans.

12. *Engineering recommends that a team meeting be held with the Developer and R. Levesque Associates to discuss the proposed changes to the project site.*

    RLA Response: Understood. A roundtable discussion was held on March 29, 2022.

13. *Construction shall be sequenced such that heavy equipment does not enter areas reserved for infiltrations systems so as not to compact underlying soils and reduce permeability.*

    RLA Response: Understood.

Should you have any questions regarding the aforementioned information, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

John Tomaszewski
Design Engineer

cc: Ralph DePalma & Giuseppe Tirone

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HR-1 (Hole #) | 6-21-2021 (Date) | ____ (Time) | 70°F overcast (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | ____ (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-4 (Slope (%))

Description of Location: Upland side of E89 WF

2. Soil Parent Material: ____ | Landform: ____ | Position on Landscape (SU, SH, BS, FS, TS, Plain): Plain

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands 10 feet | Property Line >100 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: – Depth to Weeping in Hole | – Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	Ap	SL	10YR 4/3	–	Cnc : Dpl:	–	10	10	G	friable	
12-24"+	Bw	SL	7.5YR 5/4	18"	Cnc : 7.5YR 5/6 Dpl:	10%	–	–	M	"	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HB2 (Hole #) | 6-21-22 (Date) | ____ (Time) | 70°F overcast (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | ____ (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 1-2 (Slope (%))

Description of Location: wetland side of E89

2. Soil Parent Material: ____ | ____ (Landform) | Plain (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands - feet
Property Line >200 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: - Depth to Weeping in Hole | - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4"	Ap	SL	10YR 5/3	-	Cnc : Dpl:		-	-	G	friable	
4-20"+	Bg	fine SL	10YR 5/2	8"	Cnc : 10YR 5/6 Dpl:	15%	-	-	M	"	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HB3 (Hole #) | 6-21-22 (Date) | ____ (Time) | ____ (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | former willows (Vegetation) | cobbles (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-8% (Slope (%))

Description of Location: upland of D26

2. Soil Parent Material: ____ | Landform: ____ | Position on Landscape (SU, SH, BS, FS, TS, Plain): BS

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands – feet | Property Line >100 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: – Depth to Weeping in Hole | – Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A_p	SL	10YR 4/2	–	Cnc : Dpl:	–	–	–	G	friable	
8-24"+	B_w	SL	7.5YR 5/2	10"	Cnc : 7.5YR 5/6 Dpl:	25%	10	10	M	firm	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HB4 (Hole #) | 6-21-2022 (Date) | 2:00 pm (Time) | 75°F overcast (Weather) | _____ (Latitude) | _____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | Cobbles (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-8% (Slope (%))

Description of Location: _____

2. Soil Parent Material: _____ | Landform: _____ | BS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands _____ feet
Property Line >100 feet | Drinking Water Well >100 feet | Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ~ Depth to Weeping in Hole ~ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	Ap	SL	10YR 4/4	-	Cnc : Dpl:	-	20	5	G	friable	
10-24"+	Bw	SL	10YR 4/6	-	Cnc : Dpl:	-	10	10	M	"	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes: _____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HBS (Hole #) | 6-21-2022 (Date) | ____ (Time) | 75°F overcast (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | ____ (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-5% (Slope (%))

Description of Location: ____

2. Soil Parent Material: ____ | ____ (Landform) | ____ (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands >75 feet | Property Line >200 feet | Drinking Water Well >200 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: — Depth to Weeping in Hole — Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	Ap	SL	10YR 4/4	-	Cnc : Dpl:	-	5	10	G	friable	
8-20"+	Bw	SL	7.5YR 4/4	-	Cnc : Dpl:	-	15	20	M	friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes: ____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HB6 (Hole #) | 6-21-2022 (Date) | ____ (Time) | 75°F Overcast (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | loose cobbles (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-3 % (Slope (%))

Description of Location: ____

2. Soil Parent Material: ____ | ____ (Landform) | Plain (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands >100 feet | Property Line >100 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ~ Depth to Weeping in Hole ~ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8"	Ap	SL	10YR 5/2	Surface	Cnc: 7.5YR 4/6 Dpl:	10%	5	-	G	friable	
8-20"+	C	fine SL	10YR 6/1	8"	Cnc: 10YR 5/6 Dpl: 10YR 6/2	25%	10	-	M	firm	
					Cnc: Dpl:						
					Cnc: Dpl:						
					Cnc: Dpl:						
					Cnc: Dpl:						

Additional Notes: ____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: HB7 (Hole #) | 6-21-2022 (Date) | ____ (Time) | 75°F Overcast (Weather) | ____ (Latitude) | ____ (Longitude)

1. Land Use: Ag field (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | cobbles (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 1-2 (Slope (%))

Description of Location: ____

2. Soil Parent Material: ____ | ____ (Landform) | Plain (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet | Drainage Way >100 feet | Wetlands ____ feet
Property Line >100 feet | Drinking Water Well >100 feet | Other ____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: – Depth to Weeping in Hole | – Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A_p	SL	10YR 4/3	–	Cnc : Dpl:	–	5	1	G	friable	
12-26"+	B_w	SL	10YR 6/3	18"	Cnc : 10YR 5/6 Dpl:	10	–	–	M	"	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes: ____

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
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July 28, 2022

Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01001

RE: **Notice of Intent – Proposed Condominium Community**
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

R Levesque Associates, Inc. is in receipt of Stockman Associates' email dated 7/28/2022 and we are providing the following update/response:

1. The revised site plans (dated 7/28/2022) accompanying herein have been revised to show the entire 200-foot Riverfront Area boundary, originating from Philo Brook offsite, proximate to the eastern property line of the subject parcel. Said Riverfront Area has been delineated based on a combination of field survey and georeferenced aerial imagery that shows a clear stream bank traversing through the abutting golf course. The additional 200-foot Riverfront Area added does not extend onto the subject property beyond what was originally shown.

2. During the third-party reviewer's June 21, 2022 site visit at the above referenced project site, an area of relic hydric soils was found within the existing easterly agricultural field. The boundary of observed hydric soils underlying the active agricultural plow layer was flagged and located as G1 through G16. The delineation was performed using the criteria in "Section 5 Difficult Situations" of the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region.

   We agree with the reviewer's statement that all bordering and isolated wetlands must be shown on the Notice of Intent (NOI) plans per 314 CMR 9.03(1), however, we do not believe this said area is a jurisdictional isolated wetland, and therefore is not shown on the final plan to accompany the NOI.

   Underlying the active plowed layer of soil, relic hydric soils were observed. Per Section 5 of the aforementioned delineation manual, various indicators of hydrology can be used to help asses whether hydrology is present. Based on aerial imagery review and field observations, the property has not been altered with ditches or subsurface drainage systems that would dewater the subject

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40 School Street, P.O. BOX 640, Westfield, MA 01085
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area to the best of our knowledge. Surface hydrology was not present at the time of delineation and the area was being used to grow corn. The reviewer claims that current lack of hydrology for this area cannot be weighted due to the active drought status for the state of Massachusetts.

Upon review of historic aerial imagery, this agricultural field was being actively farmed since at least 1958, and likely much earlier. Attached are a series of chronological aerial images (available to the public online via Historic Aerials) from years 1958 to 2019 showing the vegetative cover, surrounding hydrologic signatures, and variety of farming uses on the property. There are no signs of visible hydrology in the area of discussion; even considering that many of the images were taken in Spring months when the seasonal hydrologic cycle is at its peak.

It is possible a vegetated wetland had existed in this location, however it was altered for farming activities many years before regulations existed that prohibited such activities. The Massachusetts Wetland Protection Act was enacted in 1972. Said area has been actively and continuously farmed since 1958. The designation of this subject area as a wetland far exceeds a reasonable statue of limitations given that there is clear proof this area was not a wetland at the time of adoption of state and federal wetland protection regulations. There are numerous cases in which similar development or agriculture had occurred within wetlands during the same era prior to wetland protection regulations. It does not appear to be the objective of current regulations or delineation manuals to determine relic wetland boundaries that existed prior to the regulations.

Should you have any questions or comments regarding this matter, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Ralph DePalma & Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085 p
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April 26, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for Thursday night, April 28, 2022, as we are awaiting a peer review of the wetland delineation to be conducted, so we can incorporate any possible revisions.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085 p
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May 9, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for Thursday night, May 12th, 2022, as we are continue working through any possible revisions following the peer review of the wetland delineation.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085 p
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May 26, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for tonight, Thursday, May 26th, 2022, as we are continue working through the revisions following the peer review of the wetland delineation.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085
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June 9, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for tonight, Thursday, June 9th, 2022, as we are continue working through the revisions following the peer review of the wetland delineation.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085
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July 14, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for tonight, Thursday, July 14th, 2022, as we continue working through the revisions following the peer review of the wetland delineation.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.
40 School Street, Westfield, MA 01085
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August 25, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for this evening, Thursday, August 25th, 2022, as we continue working through the revisions following the approval of the wetland boundaries.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time in advance.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

R LEVESQUE ASSOCIATES, INC.

40 School Street, Westfield, MA 01085

p 413.568.0985 · f 413.568.0986 · www.rlaland.com

September 22, 2022

Mr. Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01101

RE: Request for Continuance – Notice of Intent
Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma, and Mr. Giuseppe Tirone, our office is herein requesting that the Conservation Commission continue the Public Hearing scheduled for this evening, Thursday, September 22nd, 2022.

We are hereby requesting to be placed on the next Conservation Commission meeting.

Should you have any questions or comments regarding this request, please do not hesitate to contact our office at your earliest convenience. Thank you for your time in advance.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Alexandra Cichetti

Alexandra Cichetti
Permitting Project Manager

cc: Mr. Ralph DePalma & Mr. Giuseppe Tirone

TOWN OF AGAWAM
Department of Public Works
1000 Suffield Street • Agawam, MA 01001
Tel (413) 821 0600 • Fax (413) 821 0631
Mario Mazza • Superintendent

MEMORANDUM

To:	Planning Board, Conservation Commission
CC:	File
From:	Engineering Division
Date:	October 27, 2022
Subject:	Proposed Condominium Community Tirone/Depalma – 497 South Westfield Street – SP-555

As per your request, Engineering has reviewed the Site Plans and Stormwater Drainage Report, revised 10/26/2022, submitted for the proposed condominium community at #497 South Westfield Street, Agawam, MA, prepared by R. Levesque Associates, Inc. Engineering met with R.Levesque Associates on 10/25/22 to discuss the comments from our memo dated 10/20/2022. Based on our review, we have the following comments:

1. A trip generation study is requested as a condition of the site plan approval. Due to recent development in the area, a traffic signal may someday be warranted at South Westfield Street and Pine Street. Conduits were installed as part of the Route 187 project to minimize pavement disturbance when/if a new signal is installed. If, in the future, a signal is warranted, the cost of the signal may be shared amongst developers in the area at that time. Percentage of costs may be based on trip generation.
2. The stormwater runoff from South Westfield Street currently drains to the east for much of the frontage of this project. The plans call for the driveway aprons for units 68-81 to pitch toward the roadway. This will keep stormwater from flowing off the road and down the driveways. However, runoff will continue to flow to the east between the driveways based on the proposed grading. This stormwater will be captured by the proposed yard drains. On October 27, Engineering discussed the updated plans with R. Levesque Associates. The impervious area of South Westfield Street is now included in the stormwater drainage calculations and revisions have been made to the plans to accommodate roadway runoff while protecting the proposed condominium units from flooding up to at least the 100 year storm. The contractor/developer will need to take extra precautions to protect this area during construction from erosion, etc.

Engineering may have additional comments if any new information is provided. If you have any questions, please do not hesitate to contact us.

Sincerely,

Michelle C. Chase, P.E.
Town Engineer

Legal Ad

AGAWAM CONSERVATION COMMISSION

The Agawam Conservation Commission will hold a remote public hearing on Thursday, March 24, 2021 at 6:15 PM via Zoom. The purpose of this hearing will be to hear the Notice of Intent Application of Ralph Depalma and Giuseppe Tirone for work to be performed at 497 S. Westfield St, subject to the Massachusetts Wetlands Protection Act. Interested parties can contact the Conservation Commission at tegerton@agawam.ma.us for more information, to provide written comments prior to the meeting or attend via the following:

Join Zoom Meeting
https://us02web.zoom.us/j/81607614540?pwd=ZGIvc09uTHhJcUJMM0xlWitJbGhuUT09

Meeting ID: 816 0761 4540
Passcode: 111227
One tap mobile
+13017158592,,81607614540# US (Washington DC)
+13126266799,,81607614540# US (Chicago)

By Order of Henry A. Kozloski, Chairman
AGAWAM CONSERVATION COMMISSION

(Ad to be run 03/17/22)

Legal Ad

AGAWAM CONSERVATION COMMISSION

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By Order of Henry A. Kozloski, Chairman
AGAWAM CONSERVATION COMMISSION

(Ad to be run 03/17/22)

Town of Agawam
Interoffice Memorandum

To: Engineering Department
CC:
From: Conservation Commission
Date: 3/11/22
Subject: Notice of Intent - 497 S Westfield St - Depalma & Tirone

Please review and comment on the attached NOI for 497 S Westfield St prior to the Commission' s March 24th meeting.

Thank you.

FROM THE DESK OF...
YOUR NAME
TITLE
TOWN OF AGAWAM
36 MAIN ST
AGAWAM, MA 01001

Email address Here
413-786-0400 X Extension
Fax: 413-786-9927

Stockman Associates LLC

April 14, 2022

Mr. Henry Kozloski, Chairman
Town of Agawam Conservation Commission
750 Cooper Street
Agawam, MA 01001

Re: Notice of Intent – Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
Resource Area Boundary Delineation- Third Party Review Proposal

Dear Mr. Kozloski and Commissioners:

Foremost, thank you for considering Stockman Associates LLC. It is my understanding that the Agawam Conservation Commission is seeking an estimate for the third-party review of the resource area boundary delineation submitted with a Notice of Intent, prepared by R Leveque Associates, Inc. on behalf of their clients, Ralph DePalma and Giuseppe Tirone, regarding the proposed construction of a Condominium Community with associated site improvements located at 497 South Westfield Street in Agawam, MA. Portions of the project area, as described in the NOI, are located within the Buffer Zone to Bordering Vegetated Wetlands and Riverfront Area. The following scope is based on the Notice of Intent submittal prepared by R Leveque Associates, Inc. dated March 9, 2022. As requested by the Agawam Conservation Commission, the third-party review is limited to the on-site review of delineated resource area boundaries and the project area as submitted on the NOI site plans dated February 10, 2022. A review of the entire NOI submittal has not been requested and is not included with the scope of services.

Scope of Work

Field Work

Site Visit(s): Based on the NOI submittal, the boundaries of inland Bank, Bordering Vegetated Wetland and the Mean Annual High Water Line of a perennial tributary to Philo Brook were re-delineated by R Leveque Associates, Inc. in 2021 and will be reviewed in the field. During the site visit(s) the proposed project area will also be reviewed to confirm that there are no additional protected wetland resource areas.

It is anticipated that boundary delineation flagging will be clearly visible and labeled in the field. Any observation plots utilized by R Leveque Associates, Inc. to evaluate soils, vegetation, and hydrology should also be clearly marked on a site plan and in the field for review. It is expected that the project area will be clearly staked in the field.

Furthermore, it is anticipated that a representative from R Leveque Associates, Inc. as well as members of the Agawam Conservation Commission may be present during the site visit.

Estimated 2 Field Days

Materials Review

Notice of Intent (NOI) Review: limited to the review of the NOI plan set "*Conservation Filing Plan Set 497 South Westfield Street Map E6 Block 2 Lot 8 Agawam, MA*" (4 Sheets), resource area boundary delineation narrative and data forms submitted by R Leveque Associates, Inc. with the March 9, 2022 NOI.

Reporting

Review Findings: including a findings report and recommendations based on the materials review and the site visit(s). The report will specifically address concurrence and non-concurrence with resource area boundaries as presented in the NOI prepared by R Leveque Associates, Inc.

Meetings

Attendance: at two (2) Agawam Conservation Commission meetings

Total Cost Estimate

Estimated Hours (including travel) 34 hours
$3,550

Please note that the above cost estimate has been provided based on the NOI submittal dated March 9, 2022 and excludes follow-up review. Any additional submittals, additional site visits, and/or public meetings would be considered extra work beyond the proposed scope. If additional review is required during the process, Stockman Associates LLC will provide a scope of work cost estimate for these services.

Hourly Rates (including travel):	Wetland Scientist $100/hour Field Technician $55/hour

Our receipt of a signed copy of this proposal will serve to authorize Stockman Associates LLC to proceed with the work outlined above in our Scope of Services and on the attached General Contract Conditions.

Work will commence within 2 weeks of receiving a signed authorization to proceed. It is anticipated that work will begin with a materials review. The fieldwork will be scheduled upon coordination with the applicant and/or the applicant's representative and the Conservation Commission. Please note that aspects of the proposed timeline are subject to the scheduling and availability of others as well as site conditions and, therefore, may be subject to change.

I look forward to working with you on this project. Thank you for considering Stockman Associates LLC.

If you have any questions regarding the above estimate, please do not hesitate to contact me at emily@stockmanassociates.com or at 413-743-1372.

Sincerely,



Emily Stockman, M.S., P.W.S.
Senior Scientist/Principal
Stockman Associates LLC

AUTHORIZATION TO PROCEED

Agawam Conservation Commission

Notice of Intent – Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
Resource Area Boundary Delineation- Third Party Review Proposal

I hereby authorize Stockman Associates LLC to proceed with the above-referenced project in accordance with the Scope of Services described herein.

Agawam Conservation Commission

Printed Name	Date
Signature	Title

Stockman Associates LLC

June 23, 2022

Mr. Henry Kozloski, Chairman
Town of Agawam Conservation Commission
750 Cooper Street
Agawam, MA 01001

Re: Notice of Intent – Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
Resource Area Boundary Delineation- Third Party Review

Dear Mr. Kozloski and Commissioners:

Per request, Stockman Associates LLC has performed a wetland consultant peer review of the resource area boundary delineation submitted with a Notice of Intent, prepared by R Leveque Associates, Inc. (RLA) on behalf of their clients, Ralph DePalma and Giuseppe Tirone, regarding the proposed construction of a Condominium Community with associated site improvements located at 497 South Westfield Street in Agawam, MA. As requested by the Agawam Conservation Commission, the third-party review was limited to the on-site review of delineated resource area boundaries and the project area as submitted on the NOI site plans dated February 10, 2022. A review of the entire NOI submittal has not been requested and is not included with the scope of services. Based on the submitted revised site plan and multi-day field review, portions of the reviewed area contain protected Bank, Land Under Water Bodies and Waterways, Bordering Vegetated Wetland (BVW), Riverfront Area and jurisdictional Buffer Zone. Based on soils observed during the site visits, a portion of the easterly agricultural field contains a potential Isolated Wetland.

Materials Reviewed

- NOI plan set "*Conservation Filing Plan 497 South Westfield Street Map E6 Block 2 Lot 8 Agawam, MA*" (4 Sheets) prepared by R Leveque Associates, Inc. dated February 10, 2022
- Sheet EX-1"*Existing Conditions Plan Map E6 Block 2 Lot 8 497 South Westfield Street Agawam, MA*" prepared by R Leveque Associates, Inc. revised June 17, 2022.
- Sheet EX-1"*Existing Conditions Plan Map E6 Block 2 Lot 8 497 South Westfield Street Agawam, MA*" prepared by R Leveque Associates, Inc. revised June 17, 2022.
- "*Delineation Soil Logs*" prepared by R Leveque Associates, Inc. dated June 21, 2022

Site Visit

1) On May 2, 2022 and June 21, 2022 Ms. Emily Stockman (Stockman Associates LLC) and Mr. Ryan Nelson (RLA) visited the site to review the delineated resource areas and project area presented on the NOI plan set and subsequent June 16, 2022 revised "*Existing Conditions Plan Map E6 Block 2 Lot 8 497 South Westfield Street Agawam, MA*".

Review Comments

Resource Area Boundary Delineation Flagging Review

1) Due to recent and historic impacts associated with managed agricultural fields, the Bordering Vegetated Wetland (BVW) boundary review was performed using the criteria under 310 CMR 10.55(2)(c)3 and the delineation methodology presented in "Section 5 Difficult Situations" of the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center (Version 2.0), US Army Corps of Engineers, 2012.

2) During the May 2, 2022 site visit, flagging adjustments were made by Mr. Nelson for the E-series, D-series, C-series, and A-series BVW boundaries. Adjustments were made based upon agreed upon observations of dominant hydrophytic vegetation, indicators of wetland hydrology, and/or hydric (wetland) soils. The following adjustments were noted:

   A-Series BVW
   - Flags A4 was moved westerly.
   - Flags A12-A15 were replaced and moved southwesterly.
   - Flags A16A through A16D were added.
   - Flags A34 through A39 were moved westerly

   C-series BVW
   - Flags C12A through C12J were added to capture a BVW finger extending to the southwest.

   D-series BVW
   - Flags D3 and D4 were replaced and moved westerly.
   - Flags D8, D9, D11, D13 and D18 were moved southerly.
   - Flags D19 and D21 were moved southerly, and Flag D 20 was eliminated.
   - Stakes demarcating the BVW boundary along D22 to D30 had been damaged by clearing/plowing equipment and required replacement.

   E-series BVW
   - Flags E2 and E4 were moved westerly and flags E4A through E4C were added.
   - Flags E5 and E6 were removed.
   - Flag E16 was replaced.
   - Flags E29 and E30 were replaced.
   - Flag E31 was moved southerly.
   - Flags E35A through E35D were added and flags E 36 and E37 were moved westerly.
   - Flag E45A was added.
   - Flags E56A through E56C and flag E61A were added.
   - Flags E67 and E68 were moved easterly.
   - Flag E80 was moved easterly.
   - Stakes demarcating the BVW boundary along E81 to E107 had been damaged by plowing equipment and required replacement.

   MAHWL
   - Flag 107A was added to capture a meander bend extending closer to the project area.

3) During the June 21, 2022 site visit, further flagging adjustments were made by Mr. Nelson for the D-series BVW boundary. Adjustments were made based upon agreed upon observations of dominant hydrophytic vegetation, indicators of wetland hydrology, and/or hydric (wetland) soils. The following adjustments were noted:

   D-series BVW

   - Flags D26 and D27 were replaced and moved westerly.
   - Flag D22A was adjusted and Flags D22B through D22J were added to capture a BVW finger which extends southwesterly.

3) Stockman Associates LLC concurs with the BVW boundaries within the Project Site reviewed in the field. The following site plan revisions are recommended:
   a. The adjustment of flag A-4 is not apparent on the revised site plan and should be confirmed by the Applicant.
   b. Duplicate A-15 flags are depicted. The "old" A-15 flag should be removed from the site plan.
   c. Duplicate flags C-12D are labeled. The mislabeled C12-D should be correctly labeled C12-E.

4) Stockman Associates LLC concurs with the Riverfront Area boundary set by Flags MAHW-101 through MAHW-120. The following site plan revisions are recommended:
   a. Flag 107A should be labeled on the final site plan.

Identified Additional Resource Areas

1) Taylor Pond is depicted as a mapped waterbody on the latest USGS topographic map. The Commission should consider a finding that inland Bank and Land Under Water Bodies associated with Taylor Pond has not been assessed, delineated, reviewed, or approved.

   a. The Commission should note that the BVW boundary associated with the perimeter of Taylor Pond has been delineated. Stockman Associates LLC has reviewed the F-series BVW delineation within the Project Site and concurs with the boundary.

2) The F-series (Taylor Pond) BVW is connected to the larger E-series BVW to the north via a 12" RCP and 12" HDPE. As such the F-series has been correctly designated as Bordering Vegetated Wetland.

   Per 310 CMR. 10.04 Stream, "*A portion of a stream may flow through a culvert or beneath a bridge*." Therefore, the culverted flow from Taylor Pond meets the criteria for protected intermittent stream and contains protected Inland Bank and Land Under Waterways. Sections of flow which have daylighted due to the deterioration of the culvert(s) also qualify as protected intermittent stream under 10.04 Stream, "*Such a body of running water which does not flow throughout the year (i.e., which is intermittent) is a stream except for that portion upgradient of all bogs, swamps, wet meadows and marshes*."

   The culverted and daylighted intermittent stream should be identified on the final plan set and appropriately delineated per 310 CMR 10.00. The 100-FT Buffer Zone associated with inland Bank should also be depicted. Any work proposed within the area must demonstrate compliance with the applicable performance standards under 310 CMR 10.54(4), 310 CMR 10.56(4) and regulations under 310 10.53(3).

3) Based on the latest USGS topographic map and readily available satellite imagery, Philo Brook flows off the property to the east. Measurements taken using the MassGIS MassMapper program indicate that portions of the 200-FT Riverfront Area associated with Philo Brook project into the Project Site. The Riverfront Area appears to overlap with portions of the C-series and A-series BVWs which have been delineated.

   The Commission should consider a finding that additional Riverfront Area associated with Philo Brook is present within the Project Site but has not been delineated, reviewed, and approved.

4) During the June 21, 2002 site visit, an area of hydric soils within the easterly agricultural field (east of BVW boundary E-81-E90) was reviewed. Mr. Nelson flagged the boundary of observed hydric soils based on numerous hand-augured soil holes. Soils were examined in transect and flagging was placed based on observed non-hydric (upland) and hydric (wetland) soils. Flags G1 through G15 were placed in the field.

   a. Stockman Associates LLC concurs with the placement of flags G1 through G15 to demarcate the presence of hydric soils and a potential Isolated Wetland.

   b. Stockman Associates concurs that Isolated Wetlands are not subject to protection under 310 CMR 10.00.

   c. Stockman Associates recommends that the Applicant prepare and submit an assessment of identified G-series hydric soils polygon under 310 CMR 10.57(2)(b.) to determine whether the area qualifies as Isolated Land Subject to Flooding.

   d. At this time, Stockman Associates LLC does **not** concur with the designation of the area as a "*relic*" hydric soil. The Applicant has not presented data to establish a lack of wetland hydrology within the designated hydric soil polygon.
      i. An assessment of volunteer vegetation could not be made as the area is within an active agricultural field and had been recently plowed and planted.

      ii. A lack of primary wetland hydrology indicators during the June 21, 2022 assessment is not sufficient to conclude that the observed soils are relic. The assessment took place during a period of an EEA declared Level 1 – Mild Drought. No long-term monitoring of hydrology has been presented.

      It should be noted that data provided for the D and E-series BVW indicates a lack of observed groundwater within 20 and 24-inches. The absent of groundwater within agreed upon BVWs further demonstrates that dry conditions were present during the assessment of the G-series hydric soils.

      iii. The area in questions is mapped as a hydric soil (poorly drained Raynham silt loam) by the USGS NRCS.

   e. Isolated Wetlands may be subject to protection under Section 401 and 404 of the Clean Water Act. Proposed work within an Isolated Wetland may require a MA DEP Water Quality Certification and/or Army Corps of Engineers (ACOE) permitting.

Additional Comments/Recommendations

1) Based on the revised site plan and soil profile description, soil log HB6 appears to be misidentified as "upland of D26" rather than "wetland side of D26".

2) Numerous test pits are identified on the revised site plan. Test pits include recent data collection and data collection circa 2010. Soil profiles have only been provided for a portion of the depicted test pits. Stockman Associates recommended removing test pit locations that have not been supported by the submittal of soil profiles.

3) The "*Existing Conditions Plan Map E6 Block 2 Lot 8 497 South Westfield Street Agawam, MA*" has been submitted at a 1" = 80' scale. NOI requirements state that a scale of not more than 1" = 50' be used.

4) Stockman Associates recommends the removal of all resource area delineation flagging depicted outside of the Project Site as these flags should not be approved under an Order of Conditions.

5) Recent unpermitted activities were observed within the Project Site during the field review. The Commission is encouraged to review unpermitted activities within protected resource areas. The Commission should consider the issuance of an Enforcement Order to address the placement of authorization fill within BVW and Bank and the unauthorized ditching within BVW. Observations include:

    a. Improvements to an existing agricultural road, including the expansion and deposition of wood chips within the delineated BVW and along the perennial tributary stream to Philo Brook were observed (photos below).





    b. The expansion of historic agricultural field via clearing and plowing/tilling into the delineated D-series BVW and the creation of ditches within the BVW (photos below).





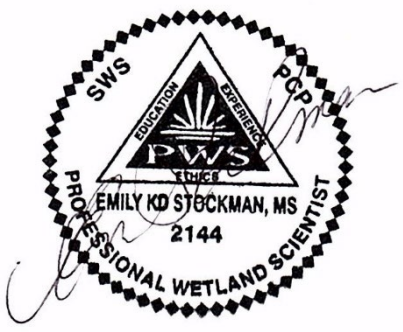
6) The Commission should be aware that delineation stakes placed by RLA prior to the May 2, 2022 site visit, following the May 2, 2022, and during the June 21, 2022 were damaged and moved during plowing. This damage occurred despite repeated reported requests by RLA to the farmer to avoid and preserve the delineation staking.

I trust that the above comments will assist the Commission in their review of the previously referenced NOI application. Please do not hesitate to contact me with any questions.

Sincerely,

Emily Stockman

Emily Stockman, M.S., P.W.S.
Senior Scientist/Principal
Stockman Associates LLC



Legal Ad
AGAWAM
CONSERVATION
COMMISSION

The Agawam Conservation Commission will hold a remote public hearing on **Thursday, March 24, 2021 at 6:15 PM via Zoom**. The purpose of this hearing will be to hear the Notice of Intent Application of Ralph Depalma and Giuseppe Tirone for work to be performed at 497 S. Westfield St., subject to the Massachusetts Wetlands Protection Act. Interested parties can contact the Conservation Commission at tegerton@agawam.ma.us for more information, to provide written comments prior to the meeting or attend via the following:

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By Order of
Henry A. Kozloski,
Chairman
AGAWAM
CONSERVATION
COMMISSION
03/17/2022

Site Plans

Proposed Condominium Community

Assessor's Map 66, Block 2, Lot 8
497 South Westfield Street · Agawam, MA

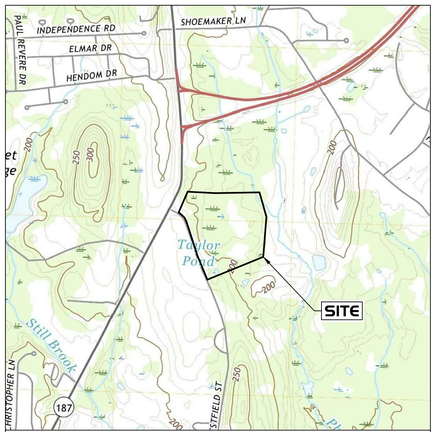
AS PREPARED FOR

Joe Tirone & Ralph Depalma

36 Canterbury Lane
Feeding Hills, MA 01030

SITE INFORMATION		
LOT INFORMATION		
ZONE	RESIDENCE A–3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

*ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



SOURCE: USGS

NORTH

September 19, 2022

BY

R LEVESQUE ASSOCIATES INC
A LAND PLANNING SERVICES COMPANY
40 School Street · Westfield, MA · 01085
ph 413.568.0985 · fax 413.568.0986
www.rlaland.com

DRAWING INDEX

SHEET NO.	SHEET NAME	ISSUE DATE	REVISION DATE
T–1	TITLE SHEET	9/19/22	
EX–1	EXISTING SITE CONDITIONS	7/28/22	
C–1	NOTES, SYMBOL & LINE LEGEND AND ABBREVIATIONS	9/19/22	
C–2	CONSTRUCTION NOTES	9/19/22	
C–3	SITE PREPARATION PLAN	9/19/22	
C–4	SITE LAYOUT – Southwesterly Section	9/19/22	
C–5	SITE LAYOUT – Northeasterly Section	9/19/22	
C–6	OVERALL SITE GRADING	9/19/22	
C–7	SITE GRADING & DRAINAGE – Southwesterly Section	9/19/22	
C–8	SITE GRADING & DRAINAGE – Northeasterly Section	9/19/22	
C–9	PLAN & PROFILE – Entrance Drive	9/19/22	
C–10	PLAN & PROFILE – Exit Drive	9/19/22	
C–11	PLAN & PROFILE – Cul–de–sac	9/19/22	
C–12	PLAN & PROFILE – Loop Drive	9/19/22	
C–13	PLAN & PROFILE – Along South Westfield Street	9/19/22	
C–14	SITE LANDSCAPING PLAN – Southwesterly Section	9/19/22	
C–15	SITE LANDSCAPING PLAN – Northeasterly Section	9/19/22	
C–16	OVERALL SITE UTILITY PLAN	9/19/22	
C–17	CUL–DE–SAC & INTERSECTION DETAILS	9/19/22	
C–18	EROSION & SEDIMENTATION CONTROL & PROJECT PHASING PLAN	9/19/22	
SL–1	SITE LIGHTING PLAN	5/2/22	
D–1	DETAILS	9/19/22	
D–2	DETAILS	9/19/22	
D–3	DETAILS	9/19/22	
D–4	DETAILS	9/19/22	
D–5	DETAILS	9/19/22	
D–6	DETAILS	9/19/22	
D–7	DETAILS	9/19/22	

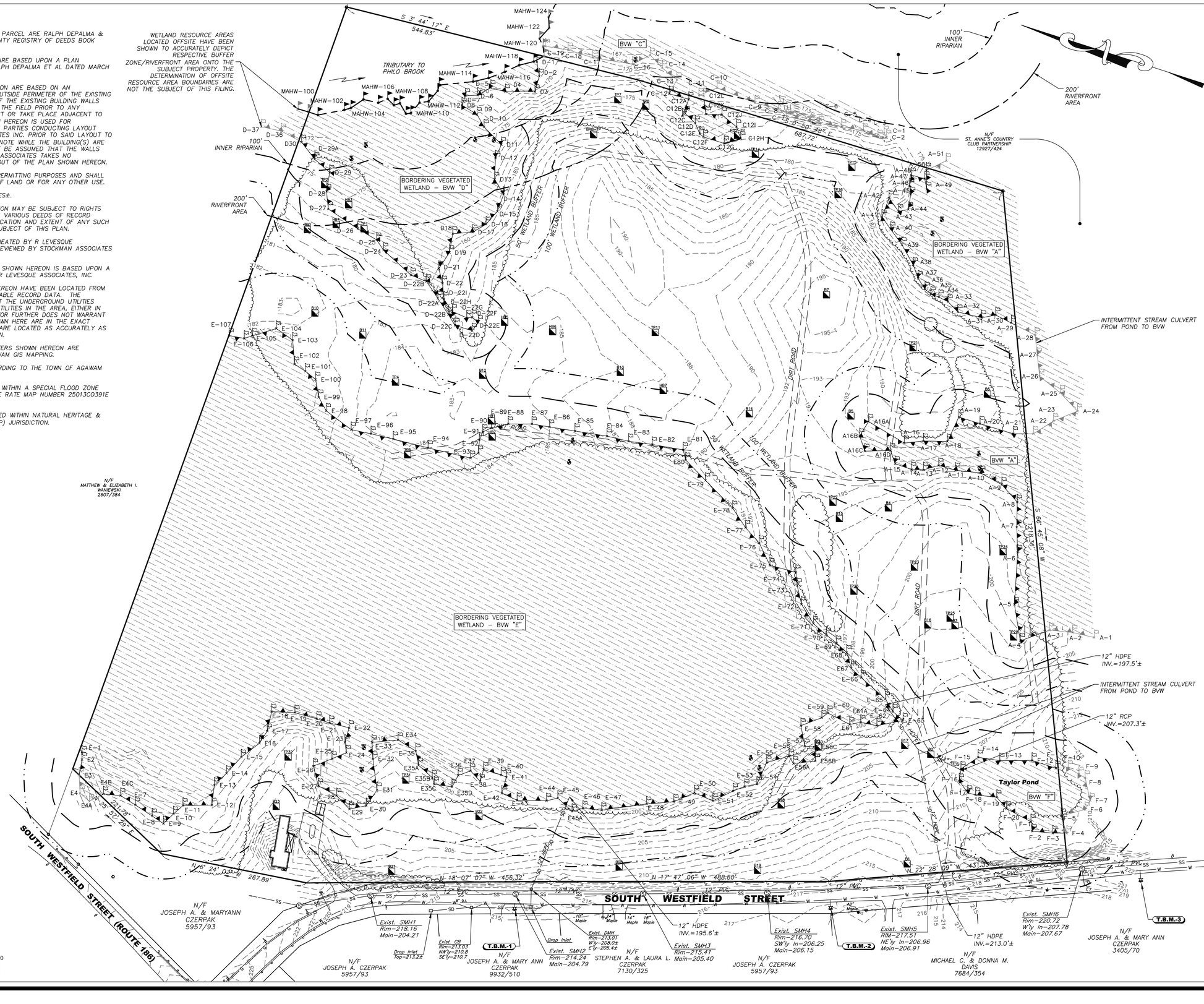
RLA Project Number: 090506

PERMITTING
NOT FOR CONSTRUCTION

NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE RALPH DEPALMA & GIUSEPPE TIRONE. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 14554 PAGE 323.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON A PLAN PREPARED BY D.L. BEAN, INC. FOR RALPH DEPALMA ET AL DATED MARCH 21, 2005.
3. THE EXISTING BUILDING(S) SHOWN HEREON ARE BASED ON AN APPROXIMATE MEASUREMENT OF THE OUTSIDE PERIMETER OF THE EXISTING STRUCTURES. THE ACTUAL LOCATION OF THE EXISTING BUILDING WALLS AND CORNERS SHOULD BE VERIFIED IN THE FIELD PRIOR TO ANY CONSTRUCTION WORK THAT WOULD ABUT OR TAKE PLACE ADJACENT TO THE EXISTING BUILDING(S). IF THE PLAN HEREON IS USED FOR CONSTRUCTION LAYOUT PURPOSES, THE PARTIES CONDUCTING LAYOUT SHALL CONTACT R. LEVESQUE ASSOCIATES INC. PRIOR TO SAID LAYOUT TO DETERMINE PROPER CONTROL. PLEASE NOTE WHILE THE BUILDING(S) ARE SHOWN TO BE SQUARE, IT SHOULD NOT BE ASSUMED THAT THE WALLS ARE SQUARE OR PLUMB. R. LEVESQUE ASSOCIATES TAKES NO RESPONSIBILITY FOR THIRD PARTY LAYOUT OF THE PLAN SHOWN HEREON.
4. THIS PLAN HAS BEEN PREPARED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
5. SUBJECT PARCEL CONTAINS 49.81 ACRES±.
6. THE SUBJECT PROPERTIES SHOWN HEREON MAY BE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PROPERTIES. THE LOCATION AND EXTENT OF ANY SUCH RIGHTS AND EASEMENTS IS NOT THE SUBJECT OF THIS PLAN.
7. WETLAND RESOURCE AREAS WERE DELINEATED BY R LEVESQUE ASSOCIATES, INC. IN 2021 AND PEER REVIEWED BY STOCKMAN ASSOCIATES IN JUNE 2022.
8. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC.
9. THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND AVAILABLE RECORD DATA. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN HERE ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION.
10. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
11. SUBJECT PARCEL IS ZONED A–3 ACCORDING TO THE TOWN OF AGAWAM ZONING MAP.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0391E – EFFECTIVE DATE: 7/16/13.
13. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.



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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

WETLAND RESOURCE AREA PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
MARC E. SHUTE
No. 39610
REGISTERED LAND SURVEYOR

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: April 22, 2022

REVISIONS:	DATE:
A. Wetland Peer Review	6/17/22
B. Wetland Peer Review	6/22/22
C. Wetland Peer Review	7/26/22
D. Updated Riverfront Area	7/28/22

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: AS NOTED

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
EX-1	D

SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- IRON PIPE TO BE SET
- CONCRETE BOUND FOUND
- CONCRETE BOUND TO BE SET
- COMPUTED POINT
- EXISTING SIGN
- MW EXISTING MONITORING WELL
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- E EXISTING ELECTRIC MANHOLE
- T EXISTING TELEPHONE MANHOLE
- W EXISTING WELL LOCATION
- WV EXISTING WATER VALVE
- EXISTING WATER SHUT-OFF
- EXISTING HYDRANT
- PROPOSED WATER VAVLE
- PROPOSED HYDRANT
- GV EXISTING GAS VALVE
- S EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- D EXISTING DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- PROPOSED MANHOLE
- SB-1 SOIL BORING LOCATION
- OH-1 OBSERVATION HOLE LOCATION
- P-1 PERC TEST LOCATION
- WF-1 WETLAND FLAG LOCATION
- R-1 M.A.H.W. FLAG LOCATION
- WETLAND
- EXISTING STONE WALL
- TREE LINE
- × 102.3 EXISTING SPOT GRADE
- 219 EXISTING CONTOUR
- • 99.4 PROPOSED SPOT GRADE
- PROPOSED CONTOUR
- OHW — OHW — EXISTING OVERHEAD WIRES
- UEL — UEL — EXISTING UNDERGROUND ELECTRIC
- TEL — TEL — EXISTING TELEPHONE LINE
- G — G — EXISTING GAS LINE
- W — W — EXISTING WATER LINE
- SD — SD — EXISTING STORM DRAIN
- SS — SS — EXISTING SANITARY SEWER
- LOW — LOW — LIMIT OF WORK LINE
- SF — SF — SF — DOUBLE EROSION CONTROL BARRIER

ABBREVIATIONS

A.F.F.	–	ABOVE FINISHED FLOOR
A.F.S.	–	ABOVE FINISHED SLAB
APPROX.	–	APPROXIMATE
A.T.F.	–	ABOVE TOP OF FOUNDATION
BLDG.	–	BUILDING
BLK.	–	BLOCK
BOT.	–	BOTTOM
B.O.W.	–	BOTTOM OF WALL
BRG.	–	BEARING
CB.	–	CATCH BASIN
CL	–	CENTERLINE
C.I.	–	CAST IRON
CLR.	–	CLEAR
CONC.	–	CONCRETE
CONT.	–	CONTINUOUS
CONTR.	–	CONTRACTOR
DBL.	–	DOUBLE
DET.	–	DETAIL
D.I.	–	DUCTILE IRON
DIA.	–	DIAMETER
DIM.	–	DIMENSION
DT'L.	–	DETAIL
DWG.	–	DRAWING
EA.	–	EACH
ELEC.	–	ELECTRIC
ELEV.	–	ELEVATION
EXIST.	–	EXISTING
EXT.	–	EXTERIOR
FIN.	–	FINISH
FLR.	–	FLOOR
FOUND.	–	FOUNDATION
FT.	–	FOOT OR FEET
INSTL.	–	INSTALLED
LT.	–	LIGHT
MAX.	–	MAXIMUM
M.A.H.W.	–	MEAN ANNUAL HIGH WATER
MH.	–	MANHOLE
MIN.	–	MINIMUM
MISC.	–	MISCELLANEOUS
N.T.S.	–	NOT TO SCALE
O.A.	–	OVERALL
O.C.	–	ON CENTER
P.S.I.	–	POUNDS PER SQUARE INCH
REINF.	–	REINFORCING
R.H.	–	RIGHT HAND
SHT.	–	SHEET
SPEC.	–	SPECIAL OR SPECIFICATIONS
SQ.	–	SQUARE
ST.	–	STEEL
STA.	–	STATION
T.O.F.	–	TOP OF FOUNDATION
T.O.W.	–	TOP OF WALL
T.S.	–	TOP OF STEEL
TYP.	–	TYPICAL
W/	–	WITH
WTR.	–	WATER
W.W.M.	–	WELDED WIRE MESH

EROSION & SEDIMENT CONTROL NOTES

MANAGEMENT STRATEGIES

1. CONSTRUCTION TRAFFIC SHALL BE LIMITED TO THE CONSTRUCTION ENTRANCE.
2. CONSTRUCTION SEQUENCE SHALL BE PHASED TO AVOID LEAVING LARGE AREAS EXPOSED FOR LONG PERIODS OF TIME.
3. TEMPORARY SEED AND MULCH SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING.
4. SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED CONTINUOUSLY, ESPECIALLY FOLLOWING STORM EVENTS TO LOCATE FAILING CONTROL MEASURES AND CONDUCT ROUTINE MAINTENANCE OPERATIONS.
5. THE CONSTRUCTION SUPERINTENDENT SHALL INFORM ALL ON-SITE WORKERS OF THE SEDIMENTATION CONTROL PROGRAM.

VEGETATIVE CONTROL PRACTICES

1. TOPSOIL STOCKPILING: TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE DISTURBED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEER/LANDSCAPE ARCHITECT AND BE WITHIN LIMIT OF WORK.
2. TEMPORARY SEEDING: THE TEMPORARY SEDIMENT BASIN, TOPSOIL STOCKPILE AND ROUGH GRADED AREAS SHALL BE SEEDED WITH WINTER RYE AT A RATE OF 30 LBS. PER ACRE ANY SOILS THAT ARE LEFT EXPOSED AND UNDISTURBED FOR MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED.
   A. SITE PREPARATION
      - -COMPLETE ALL ROUGH GRADING ACTIVITIES
      - -REMOVE ALL ROCKS AND DEBRIS LARGER THAN 3" IN DIAMETER FROM AREAS TO BE TEMPORARILY SEEDED. -EVENLY APPLY LIME TO ACHIEVE A PH VALUE OF 6.0.
      - -EVENLY APPLY 14 LBS. OF 5-10-10 ANALYSIS FERTILIZER TO A DEPTH OF 4" USING SUITABLE EQUIPMENT.
      - -SEEDBED IS TO BE LEFT IN FIRM AND SMOOTH CONDITION.
      - -THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE.
   B. ESTABLISHMENT
      - -EVENLY APPLY SEED IN ACCORDANCE WITH THE SPECIES AND RATE INDICATED ABOVE BY MEANS OF BROADCASTING OR HYDROSEEDING.
      - -UNLESS HYDROSEEDED, COVER SEED WITH 1/4" TO 1/2" OF TOPSOIL
      - -APPLY MULCH OR EROSION CONTROL BLANKET IMMEDIATELY FOLLOWING SEEDING.
      - -VERIFY SEEDING DATES WITH ENGINEER/LANDSCAPE ARCHITECT. IF ENGINEER/LANDSCAPE ARCHITECT DETERMINES THAT SEED CANNOT BE APPLIED DUE TO CLIMATE, TOPSOIL SHALL NOT BE SPREAD AND MULCHING SHALL BE APPLIED TO THE EXPOSED SURFACE TO STABILIZE SOILS UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
      - -PERMANENT SEEDING SHALL BE APPLIED BETWEEN APRIL 15 AND SEPTEMBER 30. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS OUTSIDE THIS TIME FRAME, UPON APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT.
   C. MAINTENANCE
      - -ALL SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

NONSTRUCTURAL CONTROL PRACTICES

1. SCARIFICATION: EXPOSED SLOPES EXCEEDING 4:1 SHALL BE SCARIFIED AT RIGHT ANGLES TO THE SLOPE. PROVIDE PERIODIC UPGRADING OF SERRATIONS DURING EXPOSED PERIOD UNTIL VEGETATION IS ESTABLISHED. PROVIDE VEGETATIVE COVER AS SOON AS POSSIBLE.
2. STRAW MULCH: STRAW MULCH SHALL BE APPLIED IN CONJUNCTION WITH TEMPORARY/PERMANENT SEEDING AND TO GRADED AREAS WHICH REMAIN EXPOSED OUTSIDE OF RECOMMENDED SEEDING DATES. MULCH SHALL BE APPLIED AT 90 LBS. PER 1000 S.F. CONTRACTOR SHALL PERIODICALLY INSPECT AND REAPPLY AS NECESSARY, PARTICULARLY FOLLOWING SIGNIFICANT STORM EVENTS.
3. TOPSOIL: DISTURBED AREAS SHALL BE TOPSOILED PRIOR TO SEED APPLICATION.
   APPLICATION STANDARDS:
   - -REMOVE ALL ROCKS AND DEBRIS OVER 1"-1 1/2" IN DIAMETER.
   - -SCARIFY SURFACE PRIOR TO SEED APPLICATION.
   - -APPLY 6" DEPTH OF TOPSOIL.
4. SILT FENCE: SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF THE SITE, AT CULVERT OUTLET LOCATIONS, OR AS INDICATED ON THE DRAWINGS. SILT FENCE SHALL BE INSPECTED AND REPAIRED ROUTINELY, ESPECIALLY FOLLOWING STORM EVENTS UNTIL THE SITE HAS BEEN STABILIZED (COVER > 70%) BY VEGETATION.

STRUCTURAL CONTROL PRACTICES

1. RIP-RAP OUTLET PROTECTION: RIP-RAP SHALL BE PROVIDED AT ALL PIPE OUTLETS TO THE WETLAND. MATERIAL SHALL BE HARD, DURABLE FIELD OR QUARRY STONE WHICH IS ANGULAR AND RESISTS BREAKING DOWN WHEN EXPOSED TO WATER OR WEATHERING.
2. CONSTRUCTION ENTRANCE: CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS.
3. DUST CONTROL: A WATER TRUCK SHOULD BE LOCATED ON-SITE FOR DUST CONTROL WHILE WORK IS PROCEEDING. MAINTENANCE SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR:
   A. RIP-RAP OUTLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT ACCUMULATION. IF SIGNIFICANT AMOUNTS OF SEDIMENT ACCUMULATE, RIP-RAP SHALL BE REMOVED AND REPLACED.
   B. SILT FENCING SHALL BE INSPECTED REGULARLY FOR UNDERMINING AND DETERIORATION. REMOVE SEDIMENT FROM BEHIND FENCE WHEN IT BECOMES 6 INCHES DEEP.
   C. SEEDED/MULCHED AREAS SHALL BE INSPECTED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE REPAIRED AS NECESSARY.

SILT FENCE INSTALLATION NOTES

1. THIS SEDIMENT BARRIER UTILIZES MIRAFI ENVIROFENCE (100X) OR EQUAL. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES (HIGHER BARRIERS MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE). IDEALLY THE FILTER FENCE SHALL BE PLACED 10 FEET AWAY FROM THE TOE OF SLOPE.
3. WHEN JOINTS ARE NECESSARY, FILTER FABRICS SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT STAKES WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATION.
4. STAKES SHALL NE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). IN APPLICATIONS WHERE HEAVY FLOWS ARE EXPECTED SUCH AS IN-STREAM INSTALLATIONS STAKE SPACING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND/OR THE ENVIRONMENTAL PROFESSIONALS RECOMMENDATIONS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF STAKES AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. THE PRE ASSEMBLED SILT FENCE SYSTEM SHALL BE UNROLLED, POSITION THE STAKES ON THE DOWNHILL SIDE OF THE TRENCH AND HAMMER THE STAKES AT LEAST 12 INCHES INTO THE GROUND.
7. THE BOTTOM SIX (6) INCHES OF THE FABRIC SHALL BE LAID INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUNOFF.
8. BACKFILL THE TRENCH OVER THE FILTER FABRIC AND COMPACT SUFFICIENTLY TO PREVENT THE RUNOFF FROM ERODING THE BACKFILL.
9. THE FABRIC SHALL NOT EXTEND MORE THAT 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES OR SUPPORTS OTHER THAN THE STANDARD STAKES.
10. INSTALLED SILT FENCE BARRIERS SHALL BE MAINTAINED ON A REGULAR SCHEDULE WHICH MAY BE PRESCRIBED BY THE LOCAL, STATE OF FEDERAL REGULATORY AUTHORITY; BUT, AT MINIMUM SHALL BE CHECKED WEEKLY AS WELL AS AFTER EACH STORM EVENT. MAINTENANCE SHALL CONSIST OF AN INSPECTION OF THE ENTIRE LENGTH OF THE BARRIER TO DETERMINE IF IT IS FUNCTIONING AS INTENDED. ALL BREAKS, DETACHED FABRIC, SLUMPED FABRIC, CLOGGED FABRIC, AND UNDERMINED AREAS SHALL BE FIXED THE DAY THAT THEY ARE DISCOVERED.
11. WHEN A MAXIMUM OF SIX (6) INCHES OF SEDIMENT HAS ACCUMULATED BEHIND THE SILT FENCE THIS SEDIMENT SHALL BE REMOVED AND THE FENCE SHALL BE INSPECTED FOR TEARS, CLOGGING OF BREAKS. ALL DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY EITHER BY REPAIR OF REPLACEMENT OF THE SILT FENCE BARRIER AND/OR STAKES AS NEEDED.
12. SILT FENCE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN CLEANED OF SILT AND PERMANENTLY STABILIZED.

HAY BALE INSTALLATION & MAINTENANCE

1. HAY BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.
2. ALL BALES SHALL BE EITHER WIRE BOUND OR STRING TIES. BALES SHALL BE INSTALLED SO THAT BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES TO PREVENT DETERIORATION OF THE BINDINGS.
3. THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR (4) INCHES AND A MAXIMUM DEPTH OF SIX (6) INCHES. AFTER THE BALES ARE STAKED AND CHINKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP TO FOUR (4) INCHES AGAINST THE UPHILL SIDE OF THE BARRIER.
4. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES OR REBARS SHALL BE DRIVEN DEEP ENOUGH INTO THE GROUND TO SECURELY ANCHOR THE BALES.
5. THE GAPS BETWEEN BALES SHALL BE CHINKED (FILLED BY WEDGING) WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES. (LOOSE STRAW SCATTERED OVER THE AREA IMMEDIATELY UPHILL FROM A STRAW BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.)
6. HAY BALES GENERALLY DETERIORATE IN 2-6 MONTHS AND THUS NEED REPLACEMENT.
7. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
8. BALE BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

DEMO NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
2. CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES AND POST PROPER NOTICES PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN.
5. CONTRACTOR SHALL MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM FROM DAMAGE DURING DEMOLITION OPERATIONS.
6. DO NOT DAMAGE EXISTING UTILITIES TO REMAIN WITHIN PROJECT AREA. ALL DAMAGE TO EXISTING UTILITIES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE UTILITY OWNER.
7. CONTRACTOR SHALL PROMPTLY TRANSPORT DEMOLISHED MATERIALS OFF OWNERS PROPERTY AND LEGALLY DISPOSE OF. DO NOT ALLOW DEMOLISHED MATERIAL TO COLLECT ON SITE. CONTRACTOR SHALL PAY ANY DUMPING FEES.
8. THERE SHALL BE NO BURNING OF DEMOLISHED MATERIAL ALLOWED ON SITE.
9. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ANY ITEMS TO BE TURNED OVER TO OWNER.
10. DEMOLISH AND REMOVE ALL PAVEMENT, SLABS, LIGHT POLE BASES, FOOTINGS, SUBSURFACE ELEMENTS, MISCELLANEOUS DEBRIS, ETC. WITHIN PROPERTY LINES UNLESS NOTED OTHERWISE.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST SO THAT DUST DOES NOT CREATE A NUISANCE ON ADJACENT ROADS OR PROPERTIES. SITE CONTRACTOR SHALL BE RESPONSIBLE FOR STREET SWEEPING AND CATCH BASIN CLEANING AFTER EACH PHASE OF CONSTRUCTION AND AS NEED IS DETERMINED BY THE LANDSCAPE ARCHITECT/ENGINEER.
12. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY ABANDONED SUBSURFACE SOIL ABSORPTION SYSTEM (SAS) AND MISCELLANEOUS DEBRIS.
13. NO ACTIVITY OTHER THAN NORMAL MAINTENANCE SHALL OCCUR OUTSIDE OF LIMIT OF WORK LINES AS SHOWN ON PLAN WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 PRIOR TO COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITY.

LANDSCAPE NOTES

1. THE CONTRACTOR SHALL VERIFY FINAL SELECTION OF PLANT MATERIALS WITH THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. NO PLANT MATERIAL WILL BE ACCEPTED WHICH DISPLAYS MAJOR IRREGULARITIES OR DAMAGE. THE OWNER/LANDSCAPE ARCHITECT RETAINS THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNFIT.
3. WARRANTEE: FOR A PERIOD OF TWO GROWING SEASONS FROM THE DATE THAT THE WORK UNDER THIS CONTRACT IS CERTIFIED AS SUBSTANTIALLY COMPLETE, THE CONTRACTOR SHALL: 1) WARRANTEE ALL PLANTS AND SEEDED AREAS UNDER THIS CONTRACT; 2) REMOVE AND REPLACE DURING THIS GUARANTEE PERIOD PLANTS WHICH DIE OR ARE IN POOR CONDITION AS DETERMINED BY THE OWNER; 3) REPLANT WITH STOCK OF SAME SIZE AND QUALITY AS ORIGINALLY SPECIFIED; 4) GUY AND MAINTAIN AS SPECIFIED HEREIN AT NO ADDITIONAL COST TO THE OWNER.
4. ALL NEW LAWN AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES TOPSOIL OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF LAWNS. THESE AREAS SHALL BE SEEDED WITH A FINE BLADE LAWN GRASS SEED OR SODDED. ADDITIONAL OFF-SITE TOPSOIL MAY BE REQUIRED.
5. ALL AREAS TO BE MULCHED SHALL RECEIVE 4 INCHES MINIMUM 100% SHREDDED BARK MULCH WITHIN 48 HOURS OF PLANTING UNLESS OTHERWISE NOTED IN PLANTING DETAILS.
6. ALL TREE AND SHRUB PITS SHALL BE AT LEAST 2 FEET WIDER AND 1 FOOT DEEPER THAN THE TREE OR SHRUB ROOT BALL TO BE PLANTED IN IT. BACKFILL SHALL BE HIGH QUALITY LOAM OF THE PROPER pH AND ORGANIC CONTENT SUITABLE FOR THE HEALTHY GROWTH OF PLANT MATERIALS.
7. ALL PLANTS SHALL BE NURSERY GROWN AND CONFORM TO THE LATEST EDITION OF "ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK".
8. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
9. EACH PLANT TO BE IN THE TOP OF ITS SIZE CLASS AFTER SHEARING AND PRUNING.
10. FINAL FOUNDATION PLANTINGS PLANS AND LISTS TO BE PROVIDED BY LANDSCAPE CONTRACTOR AND SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
11. ADJACENT TO THE TOP OF ANY WALLS OVER 36" A FENCE OR WALL SHALL BE CONSTRUCTED PER PLAN THAT MEETS LOCAL BUILDING CODE AND ALL OTHER APPLICABLE STATE AND FEDERAL LAWS.
12. SEE DETAIL SHEETS FOR ADDITIONAL DETAILS & SPECIFICATIONS.
13. DURING THE INSTALLATION OF PLANT MATERIAL AND OTHER LANDSCAPE FEATURES LANDSCAPE/SITE/IRRIGATION CONTRACTORS SHALL PAY SPECIAL ATTENTION TO THE LOCATION OF PRE-EXISTING, AS WELL AS, NEWLY INSTALLED UTILITIES. CONTRACTOR SHALL REFER TO THE APPLICABLE SHEETS HEREIN AND KEEP A RECORD OF ON-SITE CHANGES AND PLAN/SKETCH REVISIONS THAT MAY AFFECT UTILITY AND DRAINAGE LOCATIONS.
14. SHOULD GC OR ANY SUBCONTRACTOR ENCOUNTER A DISCREPANCE/CONFLICT IN THE PLAN AN THE ACTUAL LOCATION OF A SITE FEATURE, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY.
15. ALL AREAS DISTURBED DURING CONSTRUCTION NOT DESIGNATED TO RECEIVE OTHER TREATMENT SHALL BE LOAMED TO A MINIMUM DEPTH OF 4" AND SEEDED IN ACCORDANCE WITH THE FOLLOWING:
   A. INCORPORATE GROUND LIMESTONE INTO ALL AREAS TO BE SEEDED AT A RAT OF 50 LBS/1,000 S.F.
   B. APPLY 10-6-4 FERTILIZER TO ALL AREAS TO BE SEEDED AT A RATE OF 2 LBS/1,000 S.F.
   C. THOROUGHLY INCORPORATE LIME AND FERTILIZER INTO SEED BED TO DEPTH OF 3" BY DISCING OR OTHER APPROVED METHOD.
   D. SEED WITH THE FOLLOWING MIXTURE, APPLIED AT A RATE OF 10 LBS/1,000 S.F.
   SEED MIX:

NAME OF SEED	% BY WEIGHT IN MIXTURE	MIN. % PURITY	MIN. GERMINATION
POS PRETENSES "BARON" BARON BLUEGRASS	50	90	75
FESTUCA RUBRA "PENNLAWN" PENNLAWN FESCUE	25	95	85
LOLIUM PERENNE "PENNFINE" PENNFINE	25	98	95

   E. MULCH ALL SEEDED AREAS WITH STRAW AT A RATE OF 5 LBS/1,000 S.F. UNLESS HYDROSEEDING WAS USED.
   F. ALL SLOPES OF 3:1 OR GREATER AFTER BEING LOAMED, SEEDED AND MULCHE IN ACCORDANCE WITH THE ABOVE SHALL SECURED WITH EROSION CONTROL BLANKETS (NO. AMERICAN GREEN S150 OR EQUAL). OVERLAP ALL NETTING JOINTS A MINIMUM OF 6" AND SECURE WITH DOUBLE ROW OF STAPLES.
16. ALL SLOPES STEEPER THAN 1:5 SHALL BE BLANKETED W/ EROSION CONTROL FABRIC AND /OR HYDROSEEDED AND INSPECTED BY THE LANDSCAPE ARCHITECT.

MATERIALS CONSTRUCTION NOTES

1. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 40, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE A MINIMUM CLEARANCE OF 2" BETWEEN OUTSIDE OF STEEL AND FACE OF CONCRETE. UNLESS CAST AGAINST EXPOSED SOIL, IN WHICH CASE A MINIMUM OF 3" OF CLEARANCE IS REQUIRED.

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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
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NOTES, SYMBOL & LINE LEGEND AND ABBREVIATION

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT A. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
7/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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GENERAL CONSTRUCTION NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE BETWEEN THE CITY/TOWN REPRESENTATIVES, CONSULTING ENGINEER/LANDSCAPE ARCHITECT, UTILITY COMPANY REPRESENTATIVES, AND ANY OTHER AFFECTED PARTIES.
2. THE OWNER AND R LEVESQUE ASSOCIATES, INC. AND/OR THEIR REPRESENTATIVES, IN PREPARING THESE PLANS HAVE ATTEMPTED TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA. HOWEVER, THERE MAY BE UTILITIES THAT WERE NOT OR COULD NOT BE LOCATED. UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL CALL ALL APPROPRIATE UTILITY COMPANIES FOR LOCATIONS OF THEIR UTILITIES AT LEAST 48 HOURS BEFORE COMMENCING EXCAVATION. IN THE EVENT THAT A UTILITY IS SITUATED SUCH THAT CONSTRUCTION CANNOT PROCEED AS SHOWN ON THE PLANS, THE PROJECT ENGINEER/LANDSCAPE ARCHITECT AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
3. THE SITE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.
4. CONTRACTOR SHALL PROVIDE TWO SETS OF AS-BUILT DRAWINGS, PRIOR TO FINAL PAYMENT. AS-BUILT DRAWINGS BY A REGISTERED LAND SURVEYOR SHALL INCLUDE ALL INSTALLED UTILITIES WITH VERTICAL AND HORIZONTAL LOCATIONS AND BE SATISFACTORY TO THE BUILDING OFFICIAL FOR ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
5. ALL FILL WORK REQUIRED TO BRING THE PROPOSED ROADWAY UP TO SUB-GRADE LEVEL SHALL CONFORM TO MHD SPECIFICATIONS SECTION 150 AND SECTION 159-19C, OF TOWN CODE.
6. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
7. ALL WORK IN THE CITY RIGHT-OF-WAY AND EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN SPECIFICATIONS AND MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
8. THE CONTRACTOR SHALL GIVE THE CITY/TOWN A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION.
9. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
10. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH THE CONDITIONS OF APPROVAL OUTLINED IN ALL STATE AND LOCAL PERMITS. COPIES OF THE CONDITIONS ARE INCLUDED WITHIN THE PROJECTS TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THIS INFORMATION PRIOR TO CONSTRUCTION AND CONFORMING TO THE CONDITIONS AS REQUIRED DURING CONSTRUCTION.
11. THE GENERAL CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. THE WORK AREAS ARE TO BE PICKED UP AT THE END OF EACH WORK DAY.
12. ANY TEMPORARY FACILITIES FOR THE STORAGE OR PROTECTION OF TOOLS, EQUIPMENT OR MATERIALS SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SAFETY SHALL BE THE GENERAL CONTRACTORS RESPONSIBILITY.
13. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. NO EXTRAS DUE TO UNFAMILIARITY WITH THE EXISTING SITE OR WORKING CONDITIONS WILL BE ALLOWED.
14. CONTRACTOR SHALL BE REQUIRED TO PERFORM FINAL CLEANUP CONSISTING OF CLEANING THE PROPOSED DRAINAGE AND SEWER SYSTEMS OF ALL DEBRIS PRIOR TO THE ACCEPTANCE BY THE OWNER. ADDITIONALLY, THE PROPOSED ROADWAY SHALL BE CLEANED AND SWEPT BY THE CONTRACTOR PRIOR TO ACCEPTANCE.
15. ALL EXCAVATION SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE MANAGER AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER. THE OWNER, THROUGH ITS ENGINEER, SHALL EXPRESSLY NOT PROVIDE ANY OF THE ABOVE REQUIREMENTS DESIGNATED BY OSHA'S EXCAVATION STANDARD.
16. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COST OF LAYING OUT ALL ITEMS OF THE WORK BASED ON CERTAIN HORIZONTAL CONTROL AND BENCHMARK SUPPLIED BY THE SURVEYOR OF RECORD. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.
17. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, PERMITS AND APPURTENANCES NECESSARY TO PROVIDE A COMPLETE PROJECT AS INDICATED ON THE PLANS AND IN THESE SPECIFICATIONS.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION IN ORDER TO PREPARE SITE FOR CONSTRUCTION.
19. ANY AND ALL DEMOLISHED TREES, STRUCTURES AND OTHER RUBBLE MATERIAL PERTAINING TO THIS PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE IN ACCORDANCE WITH ALL OF THE CITY/TOWN ORDINANCES AND ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
20. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
21. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH STEEL PLATES.
22. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE CITY/TOWN DPW STANDARDS OR MASSACHUSETTS HIGHWAY (WHERE APPLICABLE), UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
23. PERMITS WILL BE REQUIRED BY CONTRACTOR WHEN WORKING WITHIN OR OCCUPYING PUBLIC WAY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED WORK PERMITS AND MAINTAINING A COPY OF ALL PERMITS IN A THREE RING BINDER OR PROJECT BOOK AND ON-SITE AT ALL TIMES.
24. BACKFILL WILL BE PLACED IN SUCCESSIVE LAYERS NOT MORE THAN TWELVE INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR TEST (ASTM 698) FOR ALL APPLICABLE TYPES OF BACKFILL MATERIAL. NO FROZEN MATERIAL SHALL BE USED AS BACKFILL. IF, IN THE OPINION OF THE ENGINEER OR THE DPW, THE EXCAVATED MATERIAL IS UNSUITABLE, THE ENTIRE MATERIAL FOR BACKFILLING SHALL CONSIST OF APPROVED GRAVEL OR APPROVED BORROW, AS DIRECTED. AFTER THOROUGH TAMPING AROUND AND BENEATH THE UTILITY, A SIX-INCH LAYER OF BACKFILL WILL BE THOROUGHLY COMPACTED AS FOLLOWS: IF DRY, SHALL BE MOISTENED AND THEN COMPACTED WITH MECHANICAL TAMPERS OR BY HAND TAMPERS HAVING A TAMPING FACE NOT EXCEEDING 25 SQUARE INCHES IN AREA. THE FINAL TWELVE INCHES OF FILLING WILL, IN ALL CASES, CONSIST OF APPROVED GRAVEL THOROUGHLY TAMPED.
25. CONTRACTOR SHALL PROVIDE FIELD COMPACTION VERIFICATION UTILIZING ASTM D5195-02, STANDARD TEST METHOD FOR DENSITY OF SOIL & ROCK IN-PLACE AT DEPTHS BELOW THE SURFACE BY NUCLEAR METHODS.
26. CONTRACTOR SHALL PROVIDE FIELD COMPACTION RESULTS TO ENGINEER WITHIN 24-HOURS PRIOR TO PLACEMENT OF INFRASTRUCTURE OR BITUMINOUS BINDER.
27. ALL FILL TO BRING PROPOSED ROADWAY UP TO THE SUB-GRADE LEVEL SHALL EXTEND PAST THE EDGE OF THE RIGHT-OF-WAY AT A 2:1 SLOPE. THIS IS TO PROVIDE ADEQUATE SUPPORT FOR THE RIGHT-OF-WAY.

LAYOUT NOTES

1. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. ALL CONSTRUCTION IN CITY RIGHT-OF-WAYS AND/OR EASEMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN STANDARD SPECIFICATIONS.
3. IN THE EVENT OF DISCREPANCIES BETWEEN LOCAL SPECIFICATIONS AND SITE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
4. SITE CONTRACTOR SHALL REFER TO ARCHITECTURAL DETAILS AND SPECIFICATIONS FOR REQUIREMENTS OF CONSTRUCTION AND JOINT SPACING OF SIDEWALKS, RAMPS, AND CURBING ADJACENT TO BUILDING.
5. SITE CONTRACTOR SHALL PROTECT ALL BENCHMARKS AND PROPERTY MONUMENTATION AND SHALL REPLACE OR REPAIR, AT HIS OWN EXPENSE, BENCHMARKS AND MONUMENTATION DISTURBED DURING CONSTRUCTION.
6. SITE CONTRACTOR SHALL PAINT ALL LIGHT POLE BASES, CURBS, FIRE HYDRANTS, PIPE BOLLARDS SIGN BASES, AND OTHER SITE AND UTILITY APPURTENANCES. CONTRACTOR SHALL PAINT OR REPAINT FIRE LANES WHERE REQUIRED BY LOCAL CODE.
7. ALL STRIPING, PAVEMENT MARKINGS, AND TRAFFIC SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, UNLESS OTHERWISE NOTED ON THE PLANS.
8. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL CODES AND ORDINANCES INCLUDING BUT NOT LIMITED TO: AASHTO, OSHA, EPA, DEP, MASS HIGHWAY, AND THE TOWN OF AGAWAM. THE GENERAL CONTRACTOR SHALL APPLY FOR ALL PERMITS AND SHALL PAY ALL PERMIT RELATED FEES. ALL NECESSARY PERMITS SHALL BE OBTAINED PRIOR TO THE START OF WORK.
9. ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS ARE TO BE VERIFIED BY THE CONTRACTOR. IF FIELD CONDITIONS VARY SIGNIFICANTLY ENOUGH TO REQUIRE A CHANGE TO THE CONTRACT DOCUMENTS, THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
10. THE SITE/GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL CONTACT THE OWNER AND LANDSCAPE ARCHITECT/ENGINEER SHOULD HE FIND ANY CONFLICT OR INCONSISTENCY BETWEEN THE WORK SHOWN ON THE DRAWINGS AND NORMAL ACCEPTED CONSTRUCTION PRACTICES, OR HE SHALL ASSUME RESPONSIBILITY FOR ALL CORRECTIONS.
11. ANY CORRECTIONS REQUIRED FOR REVISIONS TO THE CONTRACT DRAWINGS INITIATED BY THE GENERAL CONTRACTOR OR SUBCONTRACTORS WITHOUT PRIOR APPROVAL OF THE OWNER AND OR THE LANDSCAPE ARCHITECT/ENGINEER SHALL BE ACCOMPLISHED AT THE CONTRACTORS RISK.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL & LEGAL DISPOSAL OF ALL MATERIAL NECESSARY TO PREPARE THE SITE FOR THE NEW CONSTRUCTION AS SHOWN ON THE SITE DRAWINGS.
13. REPAIR DAMAGED CITY/TOWN ROADS AND CURBS IN ACCORDANCE WITH MASS HIGHWAY AND/OR THE CITY/TOWN REGULATIONS.
14. CONTRACTOR SHALL SAWCUT PAVEMENT EDGE WHERE PAVEMENT TO REMAIN IS ADJACENT TO PAVEMENT TO BE REMOVED.
15. CONTRACTOR SHALL PREPARE SITE AS NECESSARY FOR CONSTRUCTION SHOWN ON THE PLANS.

EARTHWORK NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.
3. STORM PIPE SHALL BE AS NOTED ON PLANS.
4. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. ALL STORM PIPE ENTERING STRUCTURES SHALL BE SEALED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
9. ALL STORM SEWER MANHOLES FRAMES AND GRATES ARE TO BE SET EQUAL TO FINISH GRADES, AND SHALL HAVE TRAFFIC BEARING RING & COVERS (H20) LIDS SHALL BE LABELED "STORM SEWER".
10. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN.
12. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
13. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
14. TOPOGRAPHIC INFORMATION TAKEN FROM A EXISTING CONDITIONS PLAN BY R LEVESQUE ASSOCIATES, INC. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
15. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
16. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
17. EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.
18. IF CONTRACTOR RELOCATES OR SETS NEW BENCHMARKS, THE VERTICAL ELEVATIONS OF THE BENCHMARKS SHALL BE SET WITHIN A TOLERANCE OF 0.010 FT. ALL FOOTINGS AND FOUNDATIONS FOR PROPOSED STRUCTURES SHALL BE EXCAVATED TO NATIVE SUBGRADE AND COMPACTED PER ARCHITECTURAL SPECIFICATIONS.
19. CONTRACTOR SHALL LEAVE GRADE BEHIND CURB IN ALL PLANTER AREAS A MINIMUM OF 4" LOW FOR THE PLACEMENT OF SUITABLE TOPSOIL OR PLANTING MIX.
20. CONTRACTOR TO SPREAD ON-SITE STOCKPILE TO A 4" DEPTH ON ALL AREAS TO BE SODDED/SEEDED AS SHOWN ON LANDSCAPE DRAWINGS. SITE CONTRACTOR FINE GRADE OF INSTALLED TOPSOIL PRIOR TO HYDROMULCHING BY LANDSCAPE SUB-CONTRACTOR.

SITE UTILITY NOTES

GENERAL:
1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. TOPS OF EXISTING MANHOLES SHALL BE SET EQUAL TO FINISH GRADE. IN GRASSED LANDSCAPED AREAS WITH WATER TIGHT LIDS.
3. ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
4. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
5. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. PRIOR TO CONSTRUCTION OF UTILITIES REFER TO ARCHITECTURAL INTERIOR PLUMBING DRAWINGS FOR ALL TIE-INS.
7. SITE/GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE SPECIFICATIONS OF THE LOCAL AUTHORITIES AT THE CITY WITH REGARD TO MATERIALS AND INSTALLATION OF THE WATER AND SEWER LINES.
8. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
9. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICE.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
11. CONTRACTOR SHALL COORDINATE INSPECTION OF UTILITY LINES WITH APPROPRIATE AUTHORITIES PRIOR TO BACKFILLING TRENCHES.
12. CONTRACTOR SHALL COMPLY WITH THE LATEST OSHA STANDARDS OR DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND MAINTENANCE OF ALL SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION.
13. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES WITH LOCAL COMPANIES TO AVOID CONFLICTS AND TO ASSURE THAT PROPER DEPTHS ARE ACHIEVED. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANIES FOR EXACT LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
14. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY, DUE TO THE LACK OF AVAILABLE DOCUMENTATION. ALL UTILITIES, INCLUDING CURB BOXES, MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL CALL THE "DIG SAFE CENTER" TO HAVE ALL UTILITIES MARKED ON THE GROUND PRIOR TO THE START OF CONSTRUCTION
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
16. DO NOT INTERRUPT EXISTING UTILITIES WITHOUT AUTHORIZATION FROM THE OWNER, OWNERS OF ADJACENT PROPERTIES, AND THE CORRESPONDING UTILITY OWNER. CONTRACTOR SHALL ARRANGE TO SHUT OFF UTILITIES, AS REQUIRED, WITH THE UTILITY OWNERS.
17. COORDINATE UTILITY TERMINATION WITH UTILITY OWNERS.

SEWER:
1. SANITARY SEWER MAINS AND LATERALS SHALL BE PVC PIPE CONFORMING TO ASTM D 3034-SDR35. THE MINIMUM SIZE FOR SEWER MAINS SHAL BE 8"; SEWER LATERALS SHALL BE 4" MIN.
2. ALL SANITARY SEWERS, SEWER FORCE MAINS, AND SEWER LATERALS SHALL BE INSTALLED IN FIRST-CLASS BEDDING AND IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. SEWERS SHALL BE INSTALLED TO THE LINE AND GRADE INDICATED ON THE PLANS.
3. ONLY PRECAST CONCRETE MANHOLES OF A DESIGN APPROVED BY THE TOWN ENGINEER SHALL BE INSTALLED ON A SANITARY SEWER MAIN.
4. NO GROUNDWATER OR SURFACE WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER.
5. WHERE ROCK IS ENCOUNTERED, IT SHALL BE REMOVED TO A DEPTH OF ONE FOOT BELOW THE FLOWLINE OF THE SEWER AND THE PIPE LAID IN A PROPERLY COMPACTED GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER.
6. ONLY GRANULAR MATERIAL APPROVED BY THE TOWN ENGINEER SHALL BE USED AS BACKFILL IN ANY TRENCH EXCAVATION.
7. ALL SANITARY SEWER MANHOLE INVERTS ARE TO BE BRICK AS SHOWN IN THE TOWN OF AGAWAM SEWER MANHOLE DETAIL.

WATER:
1. CONTRACTOR SHALL CONTACT THE CITY WATER RESOURCE DEPARTMENT FOR SPECIFICATIONS AND MAKE OF VALVES, VALVE BOXES, FIRE HYDRANTS AND ALL OTHER WATER LINE APPURTENANCES.
2. WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL DPW SPECIFICATIONS AND WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY WATER DEPARTMENT.
3. ALL WATER MAIN SHALL BE DUCTILE IRON (D.I.), CLASS 52, AWWA C-151 (ANSI A21.40). D.I. PIPE SHALL BE DOUBLE CEMENT LINED WITH A SEAL COAT CONFORMING TO AWWA C-104 (ANSI A-21.4).
4. JOINTS FOR D.I. PIPE SHALL BE PUSH-ON OR OTHERWISE APPROVED, AWWA C151(ANSI A-21.51) WITH GASKETS CONFORMING TO AWWA C-111 (ANSI A-21.11) MAXIMUM LENGTH OF PIPE TO BE 20 L.F.
5. ALL FITTINGS SHALL BE DUCTILE IRON CLASS 53 WITH PRESSURE RATING OF 350 PSI AND MECHANICAL JOINTS CONFORMING TO AWWA C-151 (ANSI A21.51).
6. RETAINER GLANDS: RETAINER GLANDS SHALL BE DESIGNED TO IMPART MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASE ITS RESISTANCE AS THE PRESSURE INCREASES. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. RESTRAINING DEVICES SHALL BE DUCTILE IRON HEAT-TREATED TO A MINIMUM HARNESS OF 370 BHN. TWIST-OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RETAINER GLAND. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARD MECHANICAL JOINT BELL AND TEE-HEADED BOLTS CONFORMING TO ANSI/AWWA A21.1 AND ANSI/WWA 153/A21.5. THE RETAINER GLAND SHALL HAVE A WORKING PRESSURE OF 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE PIPE CLASS AND PIPE MANUFACTURER FOR ALL SIZES PROVIDED ON THE JOB. THE RETAINER GLAND SHALL BE MEGA-LUG AS MANUFACTURED EBAA IRON, INC., OR APPROVED EQUAL.
7. ALL WATER MAINS, UNLESS OTHERWISE NOTED, SHALL BE INSTALLED WITH A MINIMUM FIVE FEET OF COVER. WHEN CROSSING ABOVE OR BELOW WATER PIPELINES, A MINIMUM VERTICAL SEPARATION OF SIX INCHES SHALL BE PROVIDED. WHEN CROSSING SANITARY SEWERS, A MINIMUM OF 18" SHALL BE PROVIDED.

SITE UTILITY NOTES (CONTINUED)

8. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED BY CONTRACTOR IN ACCORDANCE WITH AWWA C-600 AND AWWA C-651 OR PER TOWN OF AGAWAM WATER DEPARTMENT STANDARDS.
9. DUCTILE IRON PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-600.
10. ALL MECHANICAL JOINTS ARE TO BE RESTRAINED. FITTINGS SHALL BE RESTRAINED BY MECHANICAL JOINT RESTRAINTS. THE PIPE CONNECTED TO THE FITTING SHALL BE RESTRAINED PER THE RESTRAINT SCHEDULE. (SEE DETAIL SHEETS)
11. THE CONTRACTOR SHALL MARK THE LOCATION OF THE PROPOSED WATER MAIN AT LEAST 48 HOURS PRIOR TO EXCAVATING. EXCAVATION SHALL NOT PROCEED WITHOUT AUTHORIZATION BY THE ENGINEER.
12. ALL WATER MAINS, HYDRANT BRANCHES, AND SERVICES SHALL HAVE UTILITY WARNING TAPE. THE TAPE SHALL BE BURIED APPROXIMATELY 2 FEET BELOW FINISHED GRADE.
13. BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. COMPACTION EQUIPMENT USED MUST BE SPECIFICALLY DESIGNED FOR COMPACTION. TAMPING WITH THE BACK OF THE BACK HOE BUCKET IS UNACCEPTABLE COMPACTION.
14. ALL WATER SERVICES SHALL BE 1" DIA. COPPER TUBING TYPE K, SOFT TEMPER CONFORMING TO ASTM B88 UNLESS OTHERWISE NOTED.
15. DEPRESS WATER MAIN UNDER EXISTING SERVICES AND HYDRANT BRANCHES TO MAINTAIN 5'-0" OF COVER.
16. ALL WATER MAINS SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM EXISTING OR PROPOSED SANITARY SEWER. DISTANCE SHALL BE MEASURED EDGE TO EDGE.
17. IDENTIFY EACH PIPE LENGTH & FITTING CLEARLY WITH MANUFACTURE'S NAME & TRADEMARK. NOMINAL PIPE SIZE & MATERIAL DESIGNATION.
18. ALL WATER MAINS & SERVICE PIPES SHALL BE LAID IN A TRENCH SEPARATE FROM ANY OTHER UTILITY (GAS, ELECTRIC, TELEPHONE, ETC.) SHALL BE A MINIMUM NO LESS THAN FIVE (5) FEET FROM ANOTHER UTILITY.
19. ALL MATERIAL SHALL BE IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "RULES & REGULATIONS". ALL WORK TO BE PERFORMED IN ACCORDANCE WITH CITY/TOWN WATER RESOURCE DEPARTMENT "SPECIFICATIONS". CITY/TOWN WATER RESOURCE DEPARTMENT STANDARDS SHALL TAKE PRECEDENCE OVER ANY REQUIREMENTS LISTED ABOVE.

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RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
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Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

CONSTRUCTION NOTES

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE-CONSTRUCTION MEETING ON-SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI-TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.

WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT RESPECTIVE BUFFER ZONE/RIVERFRONT AREA ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE RESOURCE AREA BOUNDARIES ARE NOT THE SUBJECT OF THIS FILING.

MA1WW-100
MA1WW-102
MA1WW-104
MA1WW-106
TRIBUTARY TO PHILLIPS BROOK
MA1WW-108
MA1WW-110
MA1WW-112
MA1WW-114
MA1WW-116
MA1WW-118
MA1WW-120

100' INNER RIPARIAN
200' RIVERFRONT AREA
APPROXIMATE LIMIT OF TREE CLEARING
SILT FENCE/ LIMIT OF WORK
50' WETLAND BUFFER
100' WETLAND BUFFER
INTERMITTENT STREAM CULVERT FROM POND TO BVW
LAST SECTION OF PIPE TO ABANDONED IN PLACE
EXISTING 12" HDPE DRAIN PIPE TO BE REMOVED
EXISTING DRAIN MANHOLE TO BE REPLACED WITH OIL/SEDIMENT SEPARATOR
EXISTING DRIVEWAY TO BE REMOVED
EXISTING HOUSE & FOUNDATION TO BE REMOVED
APPROX. SAW CUT LINES/ LIMITS OF FULL OVERLAY (SEE DETAIL, SHEET D-4)
LAST FEW SECTIONS OF PIPE TO REMAIN IN PLACE (40'±)
12" HDPE INV.=197.5'±
12" RCP INV.=207.3'±
EXISTING 12" DRAIN PIPES TO BE RELAYED
INSTALL ANTI-TRACKING PAD

SOUTH WESTFIELD STREET (ROUTE 186)
SOUTH WESTFIELD STREET

Exist. SMH1 Rim-218.16 Main-204.21
Drop Inlet Top-213.2±
Exist. CB Rim-213.03 NW'ly-210.8 SE'ly-210.7
Drop Inlet
Exist. SMH2 Rim-214.24 Main-204.79
Exist. DMH Rim-213.01 W'ly-208.0± E'ly-205.4±
12" HDPE INV.=195.6'±
Exist. SMH3 Rim-215.41 Main-205.40
Exist. SMH4 Rim-216.70 SW'ly In-206.25 Main-206.15
Exist. SMH5 RIM-217.51 NE'ly In-206.96 Main-206.91
12" HDPE INV.=213.0'±
Exist. SMH6 Rim-220.72 W'ly In-207.78 Main-207.67

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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DEMOLITION & REMOVALS PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT LEVESQUE NO. 1358 REGISTERED LANDSCAPE ARCHITECT
4/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS-SECTION ON SHEET C-7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D-5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

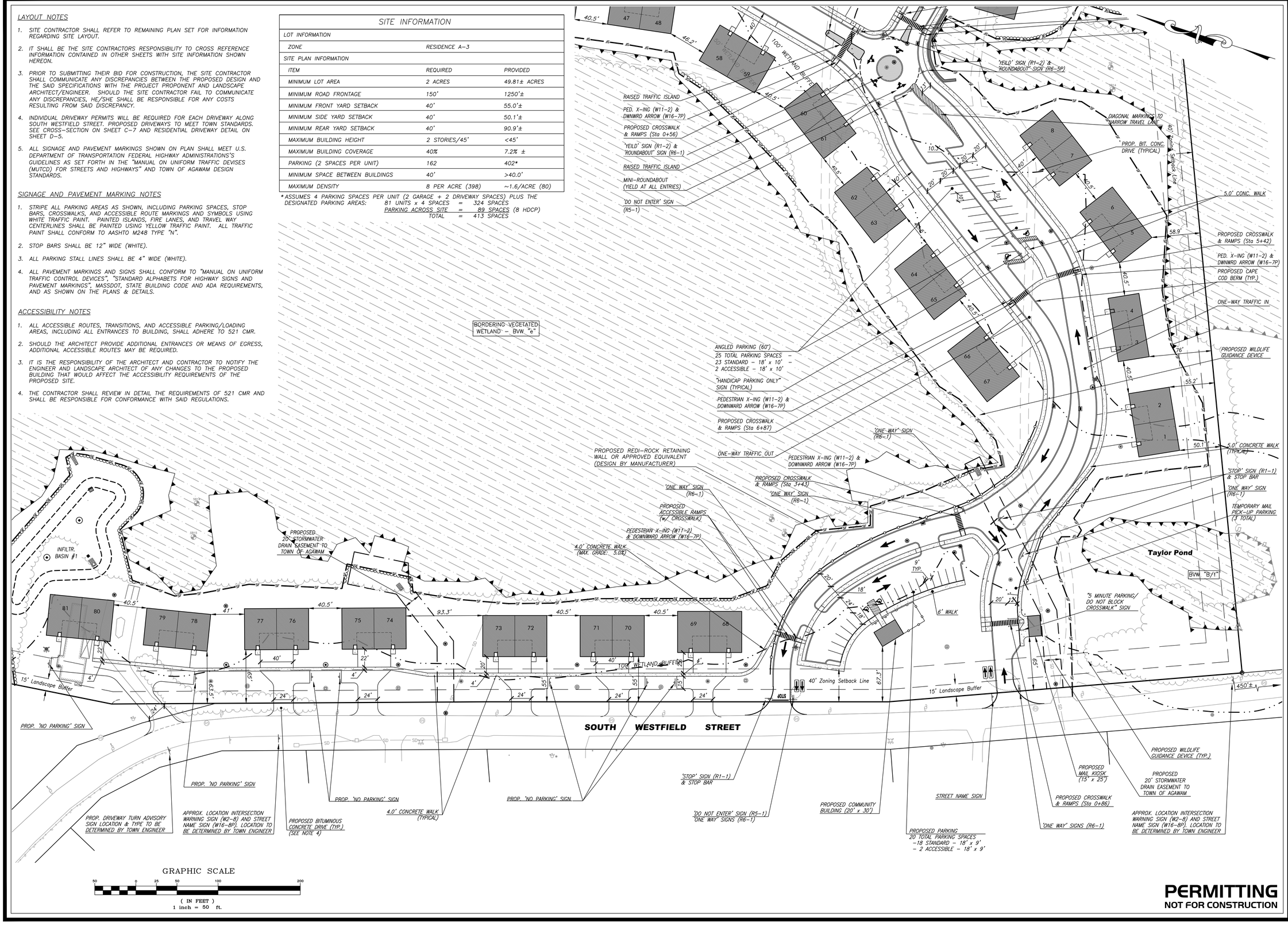
ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

* ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



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LAYOUT & MATERIALS PLAN
(Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT S. LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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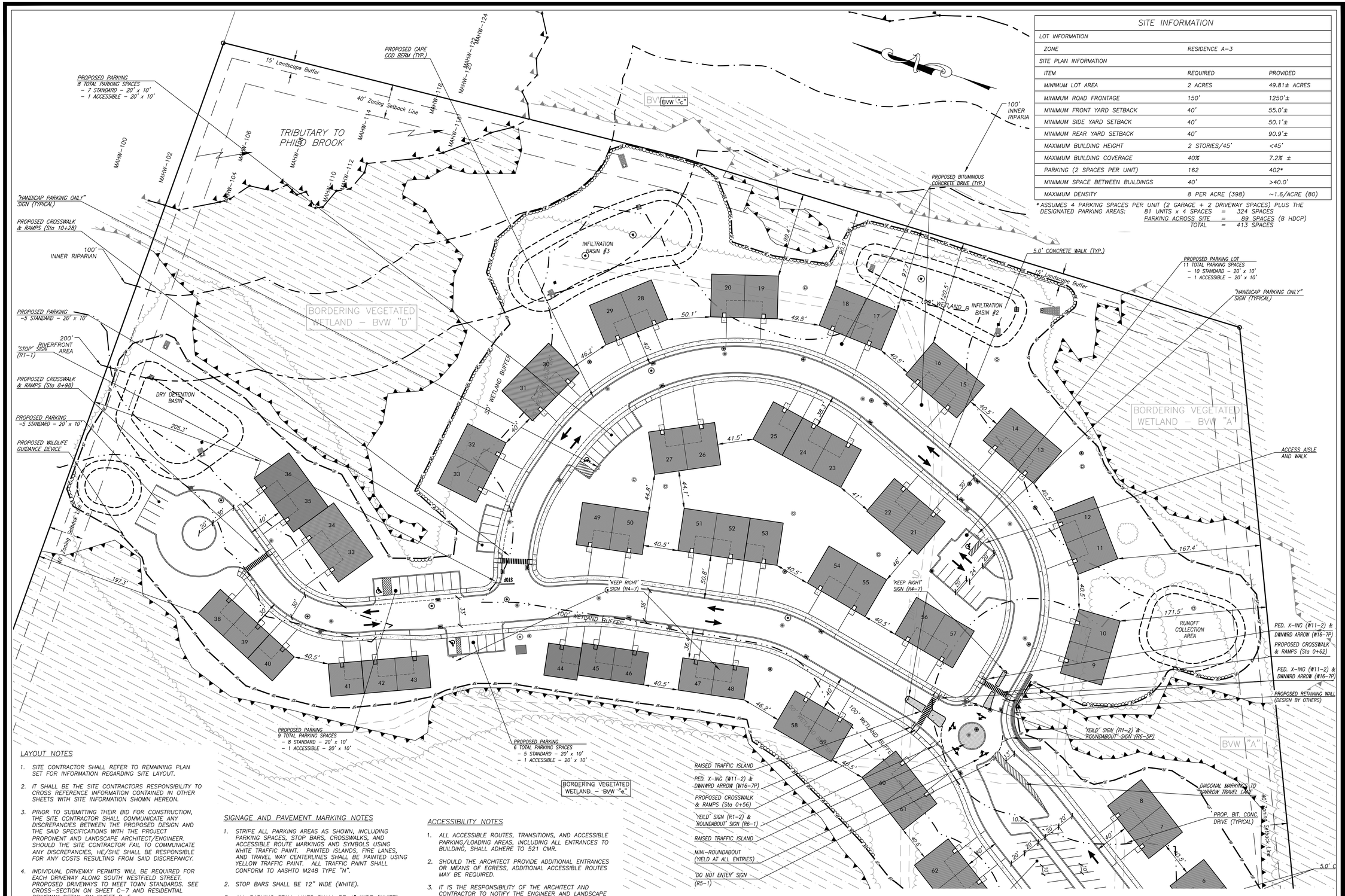

SITE INFORMATION		
LOT INFORMATION		
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ACCESSIBILITY NOTES

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4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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LAYOUT & MATERIALS PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1398
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

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CONSTRUCTION NOTES

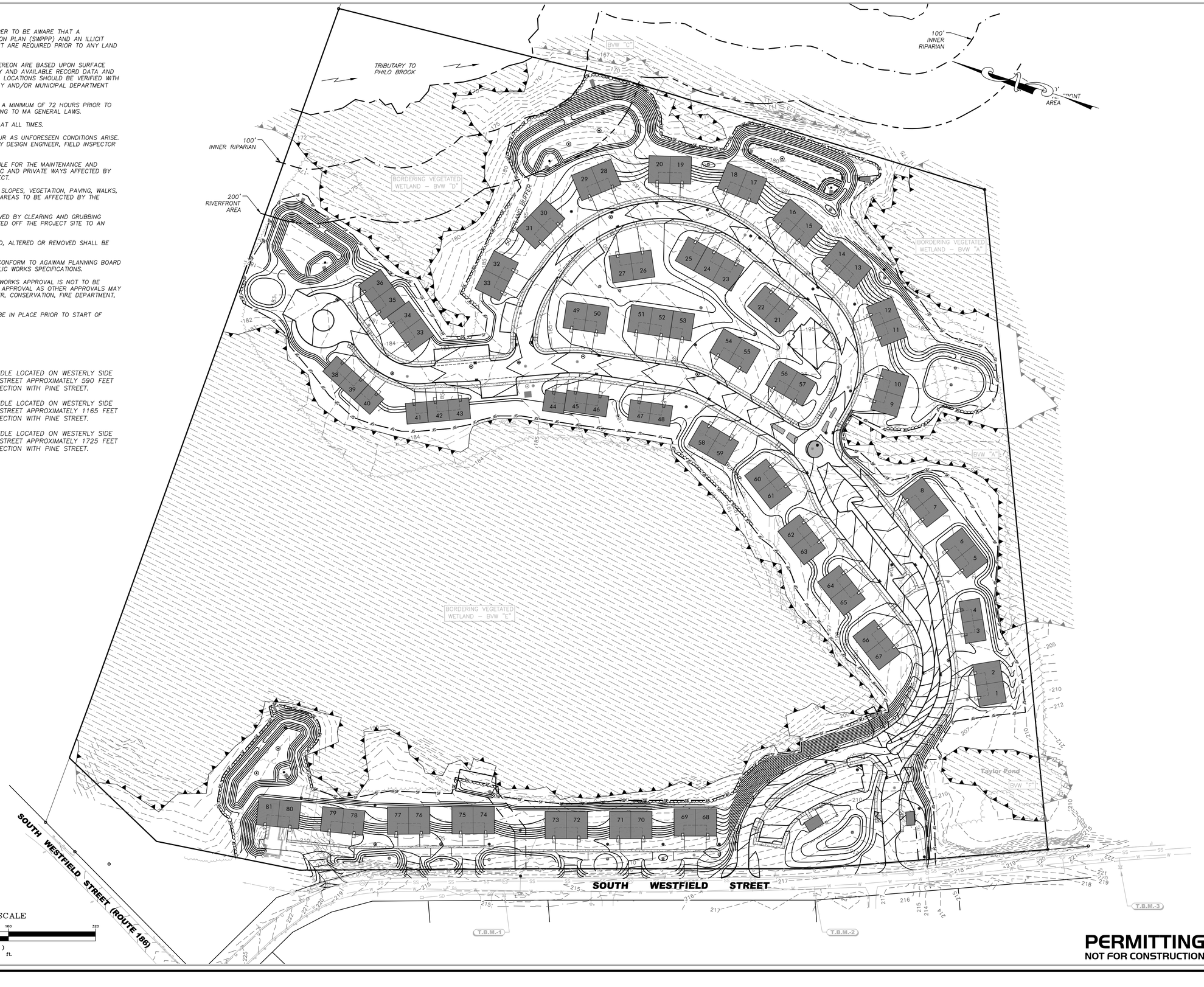
1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

BENCHMARKS

T.B.M.–1 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 590 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET. ELEVATION – 216.65

T.B.M.–2 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1165 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET. ELEVATION – 219.68

T.B.M.–3 TOP OF HYDRANT SPINDLE LOCATED ON WESTERLY SIDE OF SOUTH WESTFIELD STREET APPROXIMATELY 1725 FEET SOUTHERLY OF INTERSECTION WITH PINE STREET. ELEVATION – 224.29



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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OVERALL SITE GRADING

Map E6, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MASSACHUSETTS ROBERT M. LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

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SHORT–TERM EROSION CONTROL MAINTENANCE

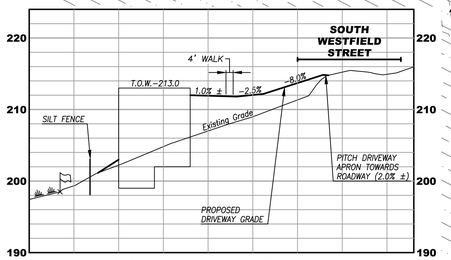
1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF–SITE SEDIMENTATION IF DEEMED NECESSARY BY ON–SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24–HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF–SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

CONSTRUCTION SEQUENCE

1. THE OWNER, CONTRACTOR, TOWN ENGINEER AND MEMBERS OF THE CONSERVATION COMMISSION TO HOLD A PRE–CONSTRUCTION MEETING ON–SITE PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION, OR EARTHWORK ACTIVITY ON THIS PROJECT.
2. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
3. CONSTRUCT ANTI–TRACKING PAD AT ENTRANCE AND INSTALL ANY REQUIRED INLET PROTECTION AS DEPICTED ON THE PLAN.
4. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
5. UPON COMPLETION OF EROSION CONTROL MEASURES, CLEARING AND GRUBBING AND EARTHWORK MAY COMMENCE.
6. CLEAR AND GRUB SITE. STOCKPILE ANY CHIPPING OR TOPSOIL MATERIAL TO REMAIN ON SITE FOR LONGER THAN 14 DAYS AND INSTALL SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
7. COMMENCE EARTHWORK BY EXCAVATING FOR THE CUT/FILL SLOPES AS SHOWN ON THE PLANS. STABILIZE/SEED ANY SLOPES THAT HAVE ACHIEVED FINAL GRADE.
8. INSTALL UTILITIES AS SHOWN ON PLANS INCLUDING WATER SERVICE, SEWER SERVICE, GAS SERVICE, ELECTRICAL SERVICE AND STORMWATER MANAGEMENT SYSTEM.
9. GRADE THE SITE TO ACCEPT PAVEMENT SECTION MATERIALS.
10. INSTALL PAVEMENT AS SPECIFIED ON THE PLANS.
11. UPON INSTALLATION OF PAVEMENT SURFACE, INSTALL INLET PROTECTION AS REQUIRED ON ANY NEW INLET STRUCTURES.
12. FINAL GRADING AND STABILIZATION OF ANY REMAINING EXPOSED AREAS.
13. AT THE DIRECTION OF THE TOWN OF AGAWAM, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED.



TYPICAL DRIVEWAY SECTION (A-A')
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'

SPECIAL DRAINAGE NOTE

OWNER/DEVELOPER/CONTRACTOR TO DETERMINE LOCATION, DEPTH AND CONDITION OF EXISTING PIPING BETWEEN TAYLOR POND AND WETLAND. PIPE TO BE REPLACED TO EXTENT SHOWN AND MANHOLE INSTALLED AT INTERSECTION WITH RIM SET TO FINAL GRADE. PIPE REPLACEMENT SHOULD NOT EXTEND BEYOND LIMIT OF WORK LINE SHOWN. LOCATION AND PIPE INVERTS SHOWN FOR PDMH–37 ARE APPROXIMATE.

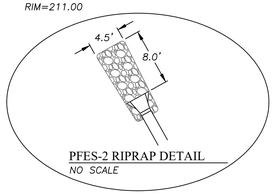
SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER–TOLERANT GRASS

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.



PFES–2 RIPRAP DETAIL
NO SCALE

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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GRADING & DRAINAGE PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS — ROBERT LEVESQUE — REGISTERED LANDSCAPE ARCHITECT — NO 1395 — 9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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RIVERFRONT AREA	
RIVERFRONT AREA ON SITE	168,123 SF ±
PROPOSED INNER RIPARIAN DISTURBANCE (0-100)	0 SF ±
PROPOSED RIVERFRONT AREA DISTURBANCE (100-200) *THIS DISTURBANCE (STORMWATER MANAGEMENT RELATED ACTIVITIES) IS EXCEMPT FROM RIVERFRONT AREA ALTERATION CALCULATIONS UNDER 310 CMR 10.58(4)(d)(1)	27,554 SF ±

PFES-8 DETAIL
NO SCALE

PFES-12 DETAIL
NO SCALE

PFES-3A & 4A DETAIL
NO SCALE

TRIBUTARY TO PHILO BROOK

FOUNDATION ELEVATION NOTE

TOP OF WALL ELEVATIONS ARE APPROXIMATE BASED ON PROPOSED SITE GRADING SHOWN. CONTRACTOR TO DETERMINE FOUNDATION ELEVATIONS BASED ON ACTUAL CONSTRUCTED TOPOGRAPHY ENSURING POSITIVE DRAINAGE AWAY FROM FOUNDATION AND SAFE DRIVEWAY GRADES UNDER WINTER CONDITIONS.

BORDERING VEGETATED WETLAND – BVW "D"

BORDERING VEGETATED WETLAND – BVW "A"

BVW "C"

BVW "B"

100' WETLAND BUFFER

100' INNER RIPARIAN

200' RIVERFRONT AREA

RIVERFRONT AREA DISTURBANCE 3,660 SF

RIVERFRONT AREA DISTURBANCE 23,884 SF

DRY DETENTION BASIN

INFILTRATION BASIN #3

INFILTRATION BASIN #2

BIORETENTION AREA

SPILLWAY ELEV=182.5

12" WIDE GRAVEL STRIP

10' WIDE EMERGENCY OVERFLOW ELEV=183.0

EMERGENCY OVERFLOW ELEV=182.0

6' WIDE BERM ELEV=183.0

6' WIDE BERM ELEV=184.0

8' WIDE BERM ELEV=190.0

10' WIDE OVERFLOW ELEV=189.6

10' WIDE EMERG. OVERFLOW ELEV=183.0

SEDIMENTATION MARKER POST IN SEDIMENT FOREBAY

3:1 SLOPE INSTALL EROSION CONTROL MAT

RUNOFF COLLECTION AREA

PROPOSED RETAINING WALL (DESIGN BY OTHERS)

PFES-12 w/ RIPRAP 18" INV=177.0±

PFES-8 w/ RIPRAP 24" INV=173.0±

PFES-5 w/ RIPRAP 8" INV=180.5±

PFES-6 w/ RIPRAP 24" INV=181.6±

PFES-9 w/ RIPRAP 30" INV=178.4±

PFES-4A & PFES-4B w/ RIPRAP 15" INV=179.0±

PFES-3 w/ RIPRAP 24" INV=180.5±

LD-6 RIM=181.00 8" INV=179.25

LD-5 RIM=181.00 8" INV=179.25

LD-4 RIM=180.50 8" INV=178.75

LD-3 RIM=180.50 8" INV=178.75 100' INNER

18" HDPE 38 LF S=0.026

24" HDPE 50 LF S=0.101

24" HDPE 129 LF S=0.005

24" HDPE 37 LF S=0.005

12" HDPE 110 LF S=0.010

12" HDPE 65 LF S=0.010

8" PERF. PVC

24" HDPE 87 LF S=0.006

24" HDPE 73 LF S=0.006

24" HDPE 153 LF S=0.005

12" HDPE 69 LF S=0.013

12" HDPE 115 LF S=0.005

15" HDPE (2) 28 LF S=0.053

24" HDPE 28 LF S=0.005

24" HDPE 147 LF S=0.005

18" HDPE 84 LF S=0.057

12" HDPE 224 LF S=0.012

POCS-4 RIM=181.30 OUT=178.00

POCS-3 5.0'x5.0' CONC. STRUCT. RIM=181.30 24" OUT=178.00

POCS-2 5.0'x5.0' CONC. STRUCT. RIM=183.52 15" OUT=180.50 15" OUT=180.50

PYD-15 RIM=187.25 24" IN=183.25 (PYD-14) 24" OUT=183.25 (PDMH-27)

PYD-14 RIM=187.50 24" IN=183.45 (PYD-13) 8" IN=184.70 (RL-51) 24" OUT=183.45 (PYD-15)

PYD-16 RIM=182.80 (12" STD. GRADE) 8" OUT=181.56

PYD-13 RIM=187.25 12" IN=185.25 (PYD-12) 12" IN=185.25 (PDMH-36) 24" OUT=184.25 (PYD-14)

PYD-12 RIM=189.90 12" IN=186.40 (PCB-24) 12" OUT=186.40 (PYD-13)

PYD-11 RIM=183.74 24" IN=180.65 (PDMH-22) 8" IN=181.50 (RL-15) 24" OUT=180.65 (PFES-3)

PYD-10 RIM=183.60 (12" STD. GRADE) 12" OUT=181.55

PYD-9 RIM=189.00 (12" DOME) 12" IN=185.60 12" OUT=185.00

PYD-8 RIM=189.00 (12" DOME) 12" OUT=185.60

PDMH-28 RIM=187.14 24" IN=182.15 (PDMH-27) 8" IN=181.98 (RL-29) 24" OUT=182.15 (PFES-6)

PDMH-31 RIM=184.90

PDMH-36 RIM=190.10 8" IN=186.40 (RL-54) 12" IN=186.40 (PDMH-29) 12" OUT=186.15 (PYD-13)

PDMH-29 RIM=190.94 8" IN=186.90 (RL-57) 8" IN=186.90 (RL-48) 12" OUT=187.00 (PDMH-36)

PDMH-22 RIM=184.55 12" IN=182.40 (PYD-9) 18" IN=181.90 (PDMH-21) 24" OUT=181.40 (PYD-11)

PDMH-14 RIM=194.39

PCB-23 RIM=185.90

PCB-15 RIM=185.38

PCB-22 RIM=185.92

PCB-13 RIM=187.66

PCB-12 RIM=187.66

PCB-14 RIM=185.32

PCB-24 RIM=191.50 12" OUT=187.05

PCB-9 RIM=194.65

PCB-8 RIM=194.77

TW=188.5 TW=190.0 TW=191.0 TW=191.5 TW=192.5 TW=193.5 TW=194.0 TW=195.0 TW=196.0 TW=202.0

SURFACE INFILTRATION BASIN CONSTRUCTION NOTE

THE ENGINEER SHALL INSPECT THE CONSTRUCTION OF THE BASIN AT THE MILESTONES LISTED BELOW. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION ON THE FOLLOWING:

1. COMPLETION OF EXCAVATION FOR THE INFILTRATION BASIN AREA TO SUBGRADE
2. AFTER SPREADING OF DENSE TURF SEED OR WATER-TOLERANT GRASS

SHORT-TERM EROSION CONTROL MAINTENANCE

1. THE CONTRACTOR OR SUBCONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFF-SITE SEDIMENTATION IF DEEMED NECESSARY BY ON-SITE INSPECTION.
3. EFFECTIVE EROSION CONTROL MEASURES SHALL BE INITIATED PRIOR TO THE COMMENCEMENT OF CLEARING, GRADING, EXCAVATION, OR OTHER OPERATIONS THAT WILL DISTURB THE NATURAL PROTECTION.
4. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD, AND THE INSPECTION SHALL BE DOCUMENTED IN WRITING. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.
5. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO AVOID EXCESS EROSION OF THE SITE DUE TO THE CONSTRUCTION OF THIS PROJECT.
6. SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED. SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.
7. DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.
8. ALL DITCHES SHALL BE STABILIZED AS SOON AS IS PRACTICABLE TO MINIMIZE EROSION.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES IN A GOOD, WORKING STATE OF REPAIR UNTIL THEIR USE IS NO LONGER WARRANTED. AT THAT TIME, THE EROSION CONTROL DEVICES SHALL BE REMOVED AND DISPOSED OF SO AS TO CAUSE NO OFF-SITE SILTATION.
10. INSPECT AND MAINTAIN CONSTRUCTION ENTRANCE STONE SUCH THAT SEDIMENT DOES NOT TRACK ONTO THE STREET. ANY SEDIMENT TRACKED ONTO THE STREET SHALL BE CLEANED DAILY.
11. AFTER CATCH BASINS HAVE BEEN CONSTRUCTED AND THE SITE HAS BEEN PAVED, THE CONTRACTOR SHALL PROTECT THE INLETS BY CONSTRUCTING INLET PROTECTION AS SHOWN ON THE PLANS. INLET PROTECTION TO REMAIN IN PLACE AND MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN STABILIZED, LOAMED AND SEEDED.
12. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SUBSTANTIALLY STABILIZED. AFTER REMOVAL OF MEASURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS NECESSARY.
13. THIS PLAN IS PROVIDED AS A BASIS FOR THE INITIAL SEDIMENTATION AND EROSION CONTROL MEASURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UPDATE AND EXPAND THIS PLAN AS SITE CONDITIONS DICTATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE OCCURRENCE OF SILTATION TO WETLAND RESOURCE AREAS AND THE MOVEMENT OF SEDIMENT BEYOND THE SITE BOUNDARIES.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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Westfield, MA 01085
rlaland.com

GRADING & DRAINAGE PLAN
(Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
NO. 1398
REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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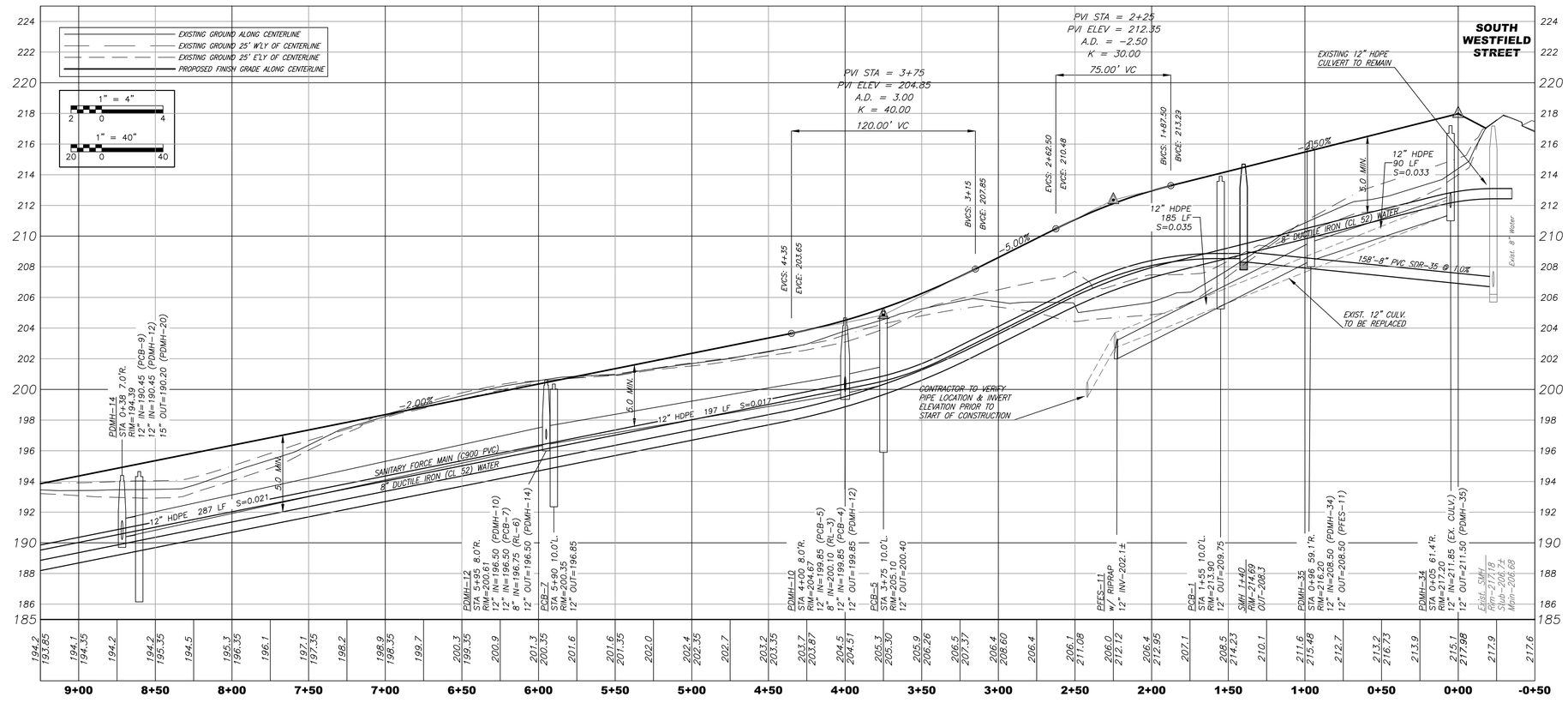
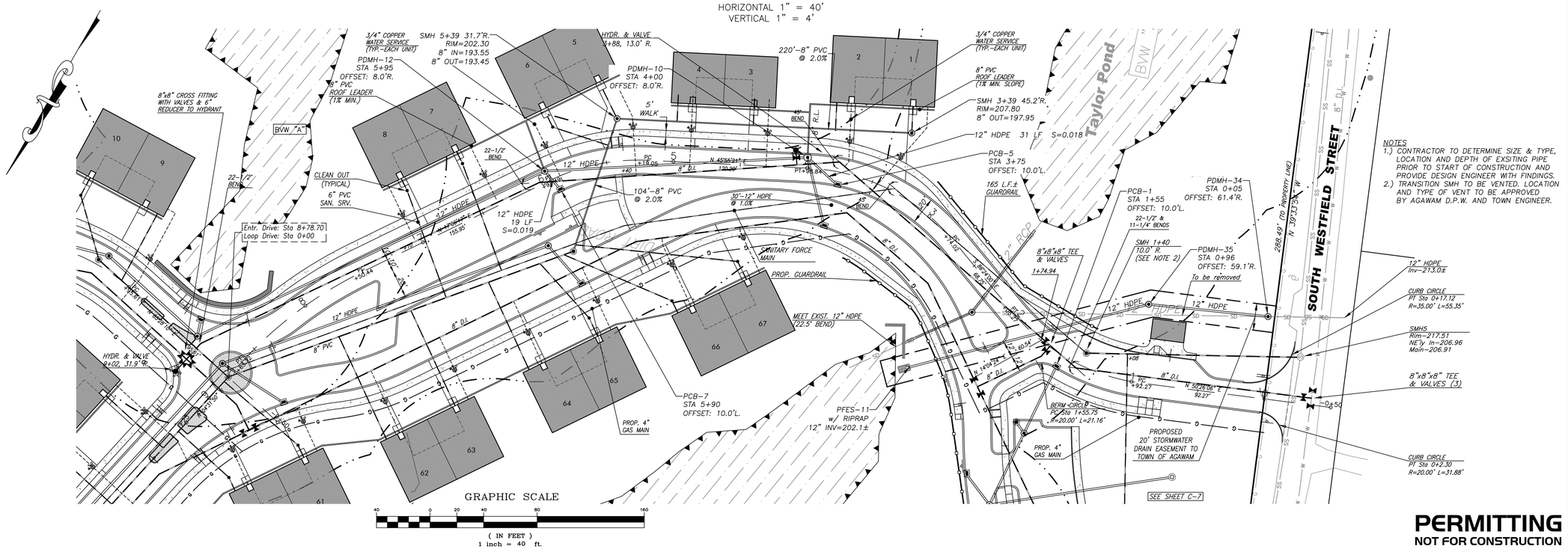


PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

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Sta 0+50 to Sta 9+25

Map 66, Block 2, Lot 8
497 South Westfield Street
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COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

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EXISTING GROUND ALONG CENTERLINE
EXISTING GROUND 25' W'LY OF CENTERLINE
EXISTING GROUND 25' E'LY OF CENTERLINE
PROPOSED FINISH GRADE ALONG CENTERLINE

1" = 4"
1" = 40"

TRAFFIC CIRCLE

SEE SHEET C-12

SOUTH WESTFIELD STREET

PVI STA = 5+38.07
PVI ELEV = 203.83
A.D. = -3.00
K = 40.00
120.00' VC

PVI STA = 4+00
PVI ELEV = 210.73
A.D. = -4.00
K = 30.00
120.00' VC

PVI STA = 1+50
PVI ELEV = 213.23
A.D. = 1.50
K = 50.00
75.00' VC

-2.00%
-5.00%
-1.00%
-2.50%

5.0' MIN.

12" HDPE 259 LF S=0.018
8" DUCTILE IRON (CL 52) WATER
274'-8" PVC SDR-35 @ 2.1%
8" D.I. (CL 52) WATER
15" HDPE 248 LF S=0.005

SMH 10+17.3
RIM=195.17
INV(2)=185.50
OUT=185.40

PCB-8
STA 9+75 17.9'L.
RIM=194.77
12" OUT=190.77

PDMH-13
STA 10+22 10.0'R.
RIM=195.70
12" IN=190.25 (PCB-8)
12" IN=190.10 (PDMH-11)
15" OUT=189.65 (PDMH-15)

PDMH-11
STA 7+50 27.0'R.
RIM=200.15
12" IN=194.50 (PCB-6)
12" OUT=194.75 (PDMH-13)

PCB-6
STA 7+40 10.0'L.
RIM=199.59
12" OUT=196.00

SMH 7+35
RIM=200.20
OUT=191.25

PCB-4
STA 5+40 10.0'L.
RIM=207.13
12" OUT=200.80

PCB-3
STA 3+00 10.0'L.
RIM=211.53
12" OUT=208.00

PDMH-1
STA 2+75 5.0'R.
RIM=212.08
12" IN=207.75 (PYD-1)
12" IN=207.75 (PDMH-33)
12" IN=207.75 (PCB-3)
15" OUT=207.40 (PDMH-2)

PDMH-2
STA 0+44 15.0'R.
RIM=211.70
15" IN=206.15 (PDMH-1)
12" IN=207.65 (PYD-2)
18" OUT=205.90 (PDMH-3)

EVCS: 5+98.07
EVCE: 202.83

BVCS: 4+78.08
BVCE: 206.83
EVCS: 4+60
EVCE: 203.73

BVCS: 3+40
BVCE: 211.33

EVCS: 1+87.50
EVCE: 212.66

BVCS: 1+12.50
BVCE: 214.17

10+50	10+00	9+50	9+00	8+50	8+00	7+50	7+00	6+50	6+00	5+50	5+00	4+50	4+00	3+50	3+00	2+50	2+00	1+50	1+00	0+50	0+00	-0+50
193.6	193.8	194.0	194.5	194.9	195.4 / 195.59	196.3	197.1 / 196.59	197.8	198.4 / 197.59	198.9	199.4 / 198.59	199.8	200.4 / 199.59	200.8	201.4 / 200.59	202.0	202.6 / 201.59	202.9	203.1 / 202.59	203.8 / 203.16	204.5 / 203.88	205.1 / 204.76	205.6 / 205.79	205.7	205.1 / 208.22	204.6 / 209.28	204.5 / 210.13	204.8 / 210.78	205.2 / 211.22	205.2	204.9 / 211.73	204.9	204.9 / 212.23	204.3	203.8 / 212.73	204.2 / 213.00	205.3 / 213.37	206.7 / 213.87	207.9 / 214.48	209.1	210.7 / 215.73	212.6	214.2 / 216.98	217.1	217.2

PROFILE SCALES

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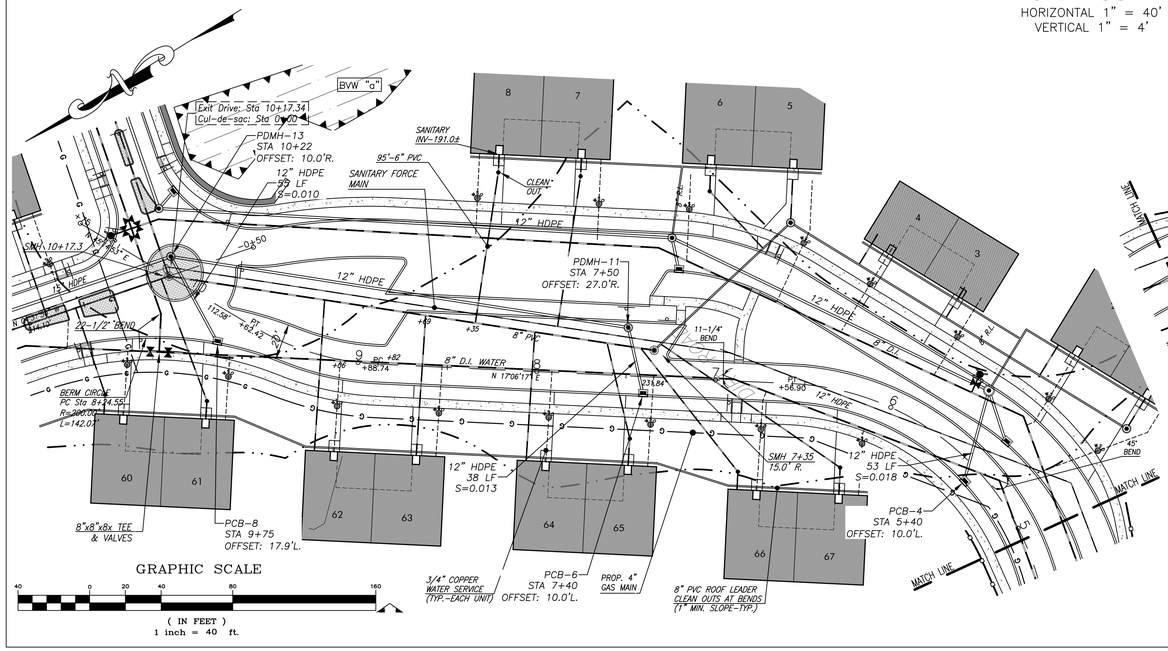

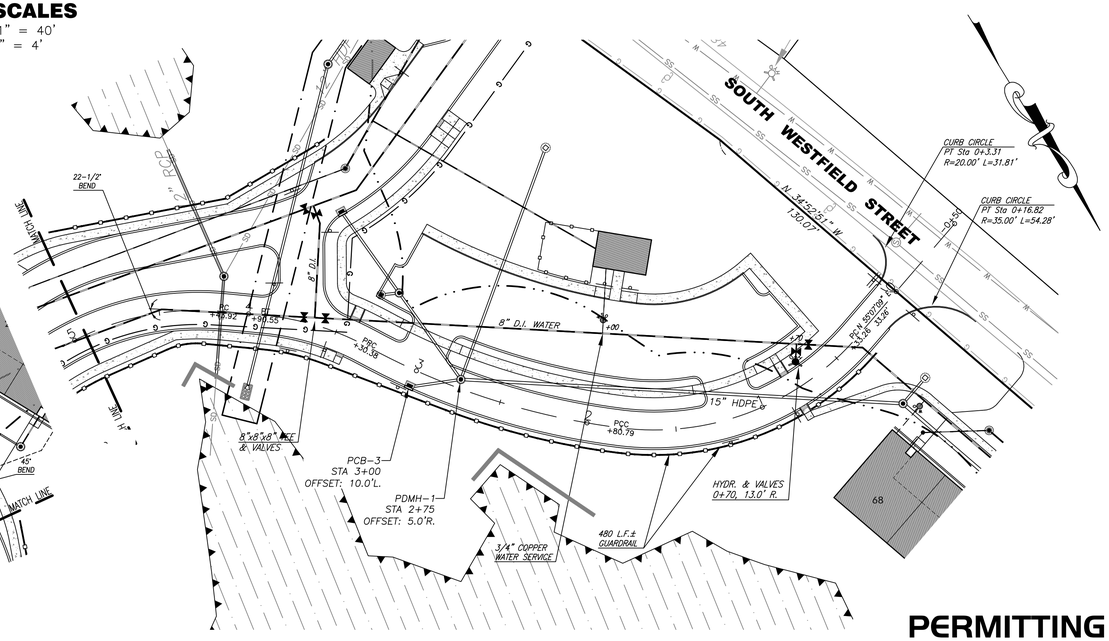

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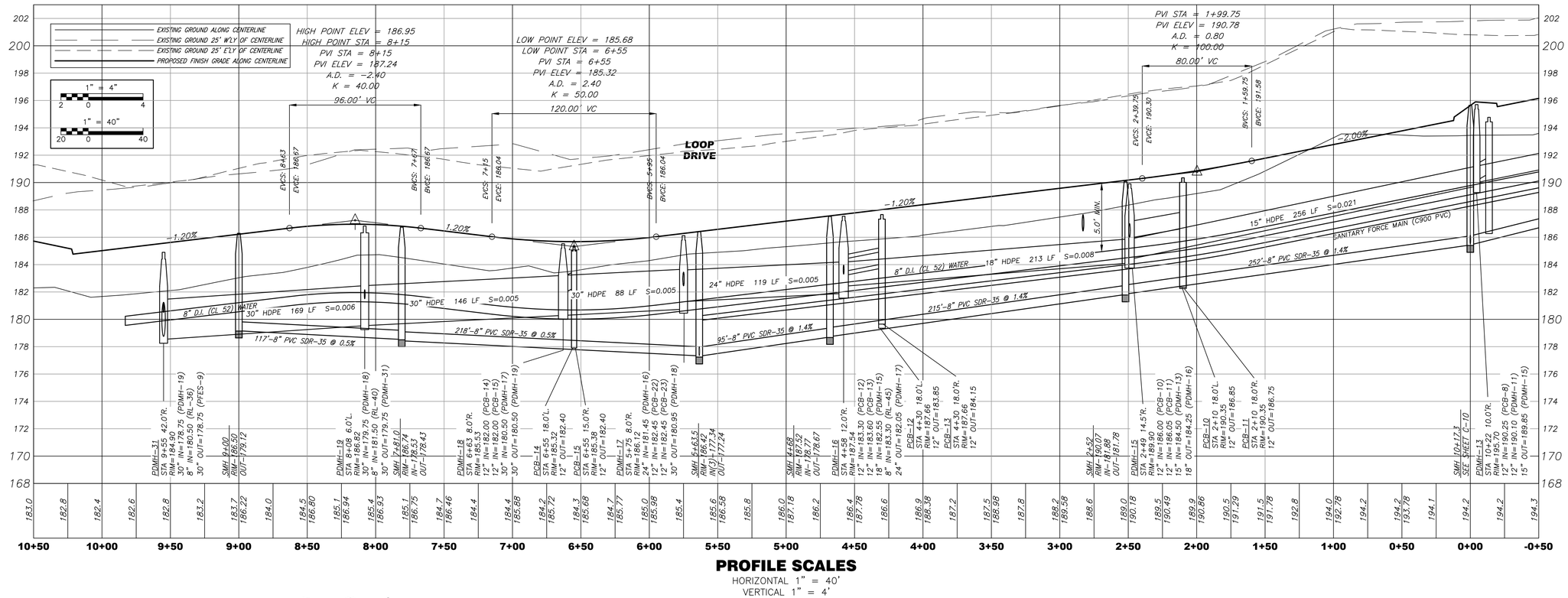

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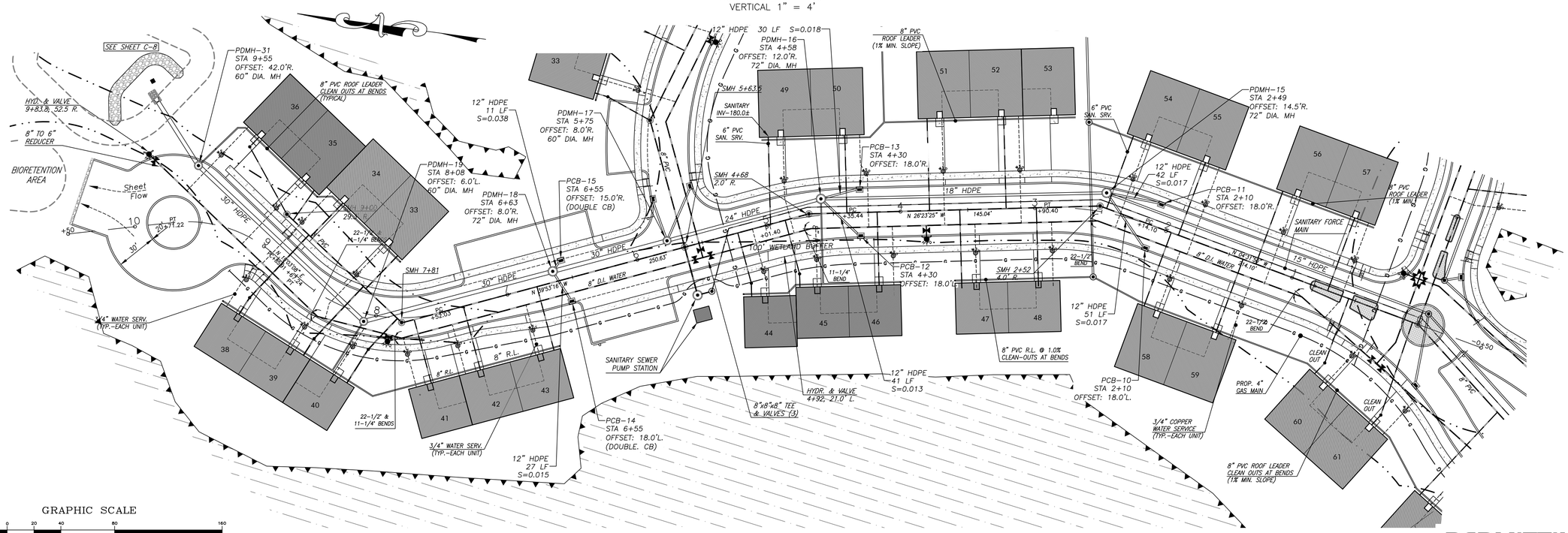

GRAPHIC SCALE

40 0 20 40 80 160
(IN FEET)
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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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C-11	-

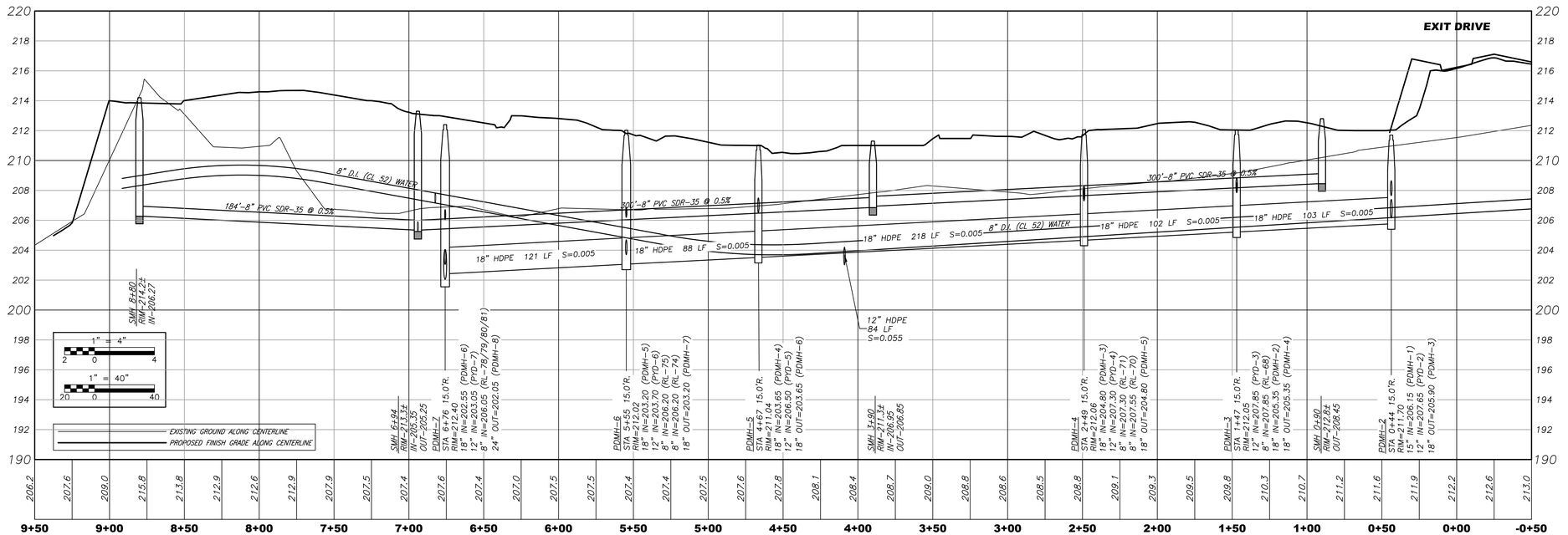
EXISTING GROUND ALONG CENTERLINE
EXISTING GROUND 25' W'LY OF CENTERLINE
EXISTING GROUND 25' E'LY OF CENTERLINE
PROPOSED FINISH GRADE ALONG CENTERLINE

1" = 4"
1" = 40"

CUL-DE-SAC DRIVE

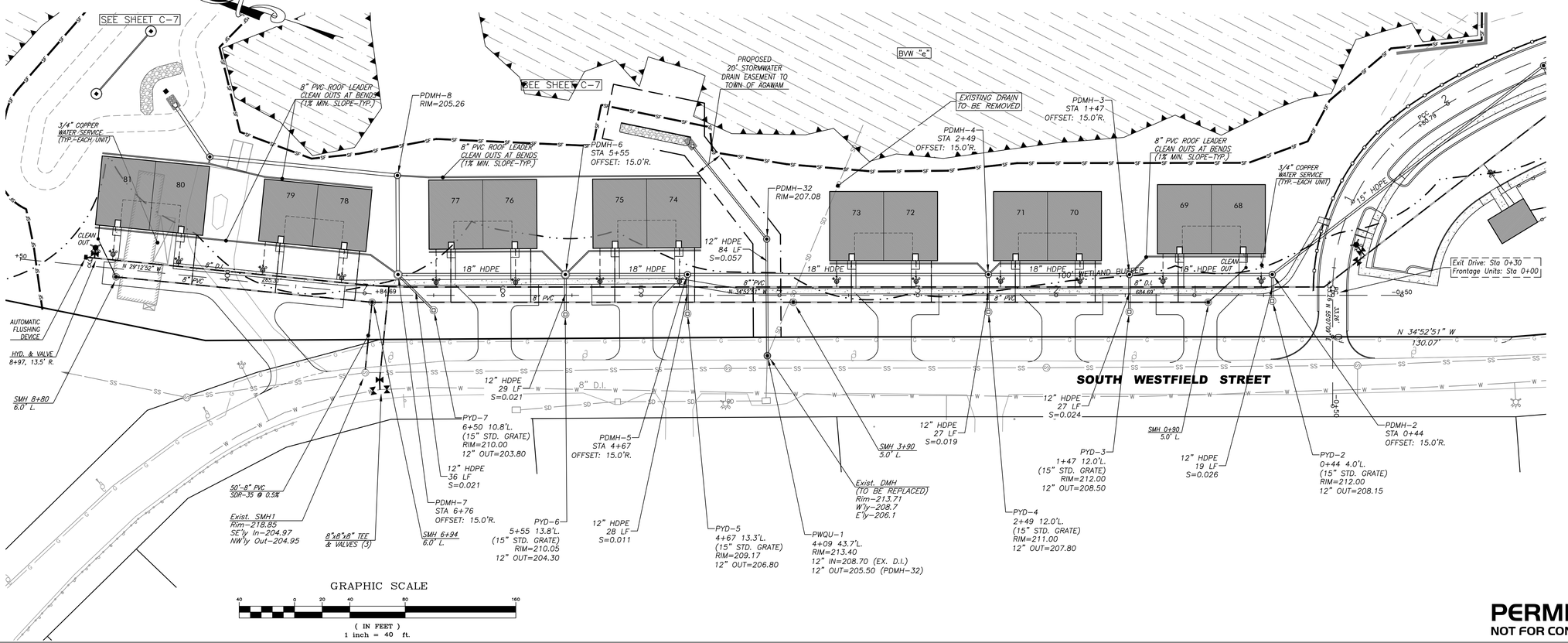
PCB-23 STA 10+40 15.0'R. RIM=188.36 12" OUT=183.00
PCB-22 STA 10+35 15.2'L. RIM=185.92 12" OUT=183.00
12" HDPE
5.0' MIN.
-0.50%
8" DUCTILE IRON (CL 52) WATER
192'-8" PVC SDR-35 @ 0.5%
96'-8" PVC SDR-35 @ 0.5%
SMH 5+63.5 SEE SHEET C-12
SMH 1+65 RIM=186.18 IN=178.83 OUT=177.82
SMH 7+08 RIM=187.14 IN=178.38 OUT=178.88
PVI STA = 7+63.05
PVI ELEV = 187.58
A.D. = 0.50
K = 100.00
50.00' VC
EVCS: 7+88.05
EVCE: 187.46
BVCS: 7+38.05
BVCE: 187.83
PDMH-27 STA 7+45 7.0'R. RIM=187.63 15" IN=183.35 (PDMH-26) 15" IN=183.60 (PCB-21) 12" IN=183.60 (PCB-21) 8" IN=184.00 (RL-28) 24" IN=182.60 (PYD-15) 24" OUT=182.60 (PDMH-28)
PCB-20 STA 7+40 15.0'L. RIM=187.52 12" OUT=183.90 (PDMH-27)
15" HDPE 88 LF S=0.010
PDMH-26 STA 6+60 13.0'R. RIM=188.36 15" IN=185.25 (PDMH-25) 8" IN=185.00 (RL-20) 15" OUT=184.25 (PDMH-27)
SMH 6+59 RIM=188.48 IN=179.79 OUT=179.69
15" HDPE 94 LF S=0.010
142'-8" PVC SDR-35 @ 0.5%
PDMH-25 STA 5+70 12.0'R. RIM=189.28 15" IN=185.20 (PDMH-24) 15" OUT=185.20 (PDMH-26)
15" HDPE 93 LF S=0.010
SMH 4+89 RIM=190.39 IN=180.70 OUT=180.60
PCB-18 STA 4+65 15.0'L. RIM=190.27 12" OUT=186.70
PCB-19 STA 4+65 15.0'R. RIM=190.27 12" OUT=186.70
PDMH-24 STA 4+80 6.3'R. RIM=192.39 12" IN=186.40 (PDMH-23) 12" IN=186.40 (PCB-18) 12" IN=186.40 (PCB-19) 8" IN=186.75 (RL-23) 15" OUT=186.15 (PDMH-25)
-1.00%
12" HDPE 150 LF S=0.010
8" DUCTILE IRON (CL 52) WATER
226-8" PVC SDR-35 @ 1.0%
PDMH-23 STA 3+30 6.0'R. RIM=192.28 12" IN=187.90 (PCB-16) 12" IN=187.90 (PCB-17) 8" IN=188.40 (RL-14) 12" OUT=187.90 (PDMH-24)
PCB-16 STA 3+25 15.0'L. RIM=191.67 12" OUT=188.20
PCB-17 STA 3+25 15.0'R. RIM=191.67 12" OUT=188.20
5.0' MIN.
SMH 2+65 RIM=192.43 OUT=183.00
15" HDPE 160 LF S=0.015
170'-8" PVC SDR-35 @ 0.5%
PDMH-21 STA 2+64 41.5'R. RIM=191.12 15" IN=186.65 (PDMH-20) 8" IN=187.00 (RL-12) 18" OUT=186.65 (PDMH-22)
TRAFFIC CIRCLE
15" HDPE 89 LF S=0.010
115'-8" PVC SDR-35 @ 0.5%
SMH 1+30 RIM=193.84 OUT=186.15
PDMH-20 STA 1+25 10.0'R. RIM=193.76 15" IN=189.30 (PDMH-14) 15" OUT=189.05 (PDMH-21)
PCB-9 STA 0+44 18.7'R. RIM=194.65 12" OUT=190.65
PDMH-14 STA 0+38 7.0'R. RIM=194.39 12" IN=190.45 (PCB-9) 12" IN=190.45 (PDMH-12) 12" OUT=190.20 (PDMH-20)
SMH 1+21.7 SEE SHEET C-10

| | | |



PROFILE SCALES

HORIZONTAL 1" = 40'
VERTICAL 1" = 4'



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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PLAN & PROFILE
ALONG SOUTH WESTFIELD STREET
Sta -0+50 to Sta 10+00
Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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C-13	-

LANDSCAPING NOTES

1.) SITE CONTRACTOR SHALL REFER TO SHEET C-1, C-2, DETAIL SHEETS AND REMAINING PLAN SET FOR INFORMATION REGARDING LANDSCAPING.

2.) IT SHALL BE THE SITE CONTRACORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN TOERH SHEETS WITH LANDSCAPE INFORMATION SHOWN HEREIN.

3.) ALL SITE PLANTINGS ARE TO MEET OR EXCEED THE MINIMUM SPECIFICATIONS DETAILED IN THE AFOREMENTIONED NOTES. IT IS THE CONTRACTORS RESPONSIBILITY TO ACQUIRE THE SPECIFICATIONS FOR EACH INDIVIDUAL PLANTING.

4.) THE LANDSCAPE PLANTING SCHEME SHOWN REPRESENTS THE MINIMUM NECESSARY TO FULFILL THE INTENTION OF THESE PLANS. ADDITIONAL PLANTING WILL BE REQUIRED TO SELECTIVELY FILL VOIDS. LANDSCAPE ARCHITECT RESERVES THE RIGHT, SHOULD IT BE REQUIRED BY FIELD CONDITIONS TO UPWARDLY MODIFY THE PLANT QUANTITIES.

5.) PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND SAID SPECIFICATIONS WITH THE PROJECT PROPONENT, LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.

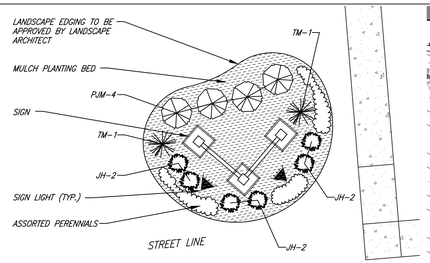
6.) LANDSCAPE CONTRACTOR SHALL HAVE EXCAVATION CONTRACTOR MARK ALL UNDERGROUND UTILITIES AS WELL AS DIG-SAFE SITE PRIOR TO ANY PLANTINGS. LANDSCAPE CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT AND PROJECT PROPONENT IF ANY CONFLICTS ARISE ANS STOP ALL WORK UNTIL CONFLICT IS RESOLVED.

7.) IRRIGATION SYSTEM LIMITS FOR LAWN AREA TO BE DETERMINED BY OWNER.

8.) ONCE DRAINAGE SYSTEM IS INSTALLED AND FUNCTIONING, R LEVESQUE ASSOCIATES, INC. (RLA) WILL CONDUCT POST-CONSTRUCTION ANALYSIS OF THE DRAINAGE SYSTEM DURING ACTUAL STORM EVENTS TO DETERMINE THE FUNCTIONALITY OF THE INSTALLED DRAINAGE SYSTEM DURING SAID EVENTS. SHOULD THE DRAINAGE SYSTEM NOT FUNCTION AS DESIGNED UNDER REAL WORLD CONDITIONS, RLA WILL RECOMMEND ADJUSTMENT TO THE DRAINAGE SYSTEM TO BE IMPLEMENTED BY THE OWNER/SITE CONTRACTOR.

9.) ALL PLANTINGS MUST BE MAINTAINED AND THAT PORTION OF THE PUBLIC WAY ABUTTING THE PARCEL AND INCLUDING THE TREEBELT SHALL BE MAINTAINED IN A SAFE AND ATTRACTIVE CONDITION BY THE OWNER OF THE PARCEL.

10.) SEE SHEETS C-15, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



SIGN PLANTING DETAIL
1" = 10'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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SITE LANDSCAPING PLAN (Southwesterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT J. LEVESQUE — COMMONWEALTH OF MASSACHUSETTS — NO. 1398 — REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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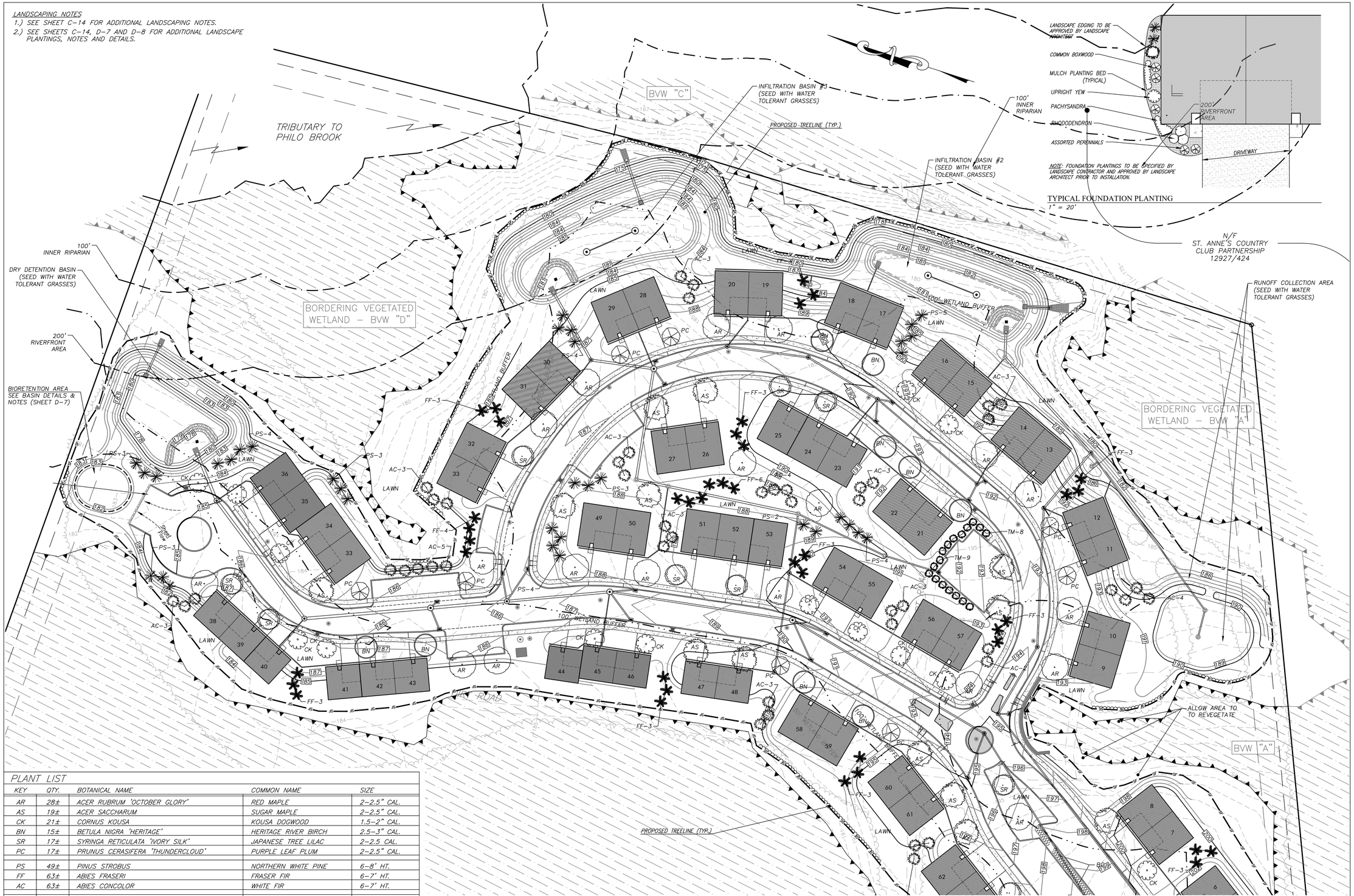
C-14	-

LANDSCAPING NOTES
1.) SEE SHEET C-14 FOR ADDITIONAL LANDSCAPING NOTES.
2.) SEE SHEETS C-14, D-7 AND D-8 FOR ADDITIONAL LANDSCAPE PLANTINGS, NOTES AND DETAILS.



TYPICAL FOUNDATION PLANTING
1" = 20'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
AR	28±	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	2-2.5" CAL.
AS	19±	ACER SACCHARUM	SUGAR MAPLE	2-2.5" CAL.
CK	21±	CORNUS KOUSA	KOUSA DOGWOOD	1.5-2" CAL.
BN	15±	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	2.5-3" CAL.
SR	17±	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	2-2.5 CAL.
PC	17±	PRUNUS CERASIFERA 'THUNDERCLOUD'	PURPLE LEAF PLUM	2-2.5" CAL.
PS	49±	PINUS STROBUS	NORTHERN WHITE PINE	6-8' HT.
FF	63±	ABIES FRASERI	FRASER FIR	6-7' HT.
AC	63±	ABIES CONCOLOR	WHITE FIR	6-7' HT.
PJM	TBD	RHODODENDRON 'PJM'	PJM RHODODENDRON	18-24" HT.
IG	TBD	ILEX GLABRA 'DENSA'	INKBERRY	18-24" HT.
JH	TBD	JUNIPERUS HORIZONTALIS 'PLUMOSA COMPACTA'	COMPACT ANDORRA JUNIPER	18-24" HT.
KL	TBD	KALMIA LATIFOLIA	MOUNTAIN LAUREL	24-30" HT.
BC	TBD	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	2.5 QUART
TM	TBD	TAXUS x MEDIA 'HICKSII'	HYBRID UPRIGHT YEW	24-30" HT.
BM	TBD	BUXUS MICROPHYLLA CULTVARS SEMPERVIRENS	COMMON BOXWOOD	18-24" HT.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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SITE LANDSCAPING PLAN (Northeasterly Section)

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS ROBERT J. LEVESQUE REGISTERED LANDSCAPE ARCHITECT NO. 1358
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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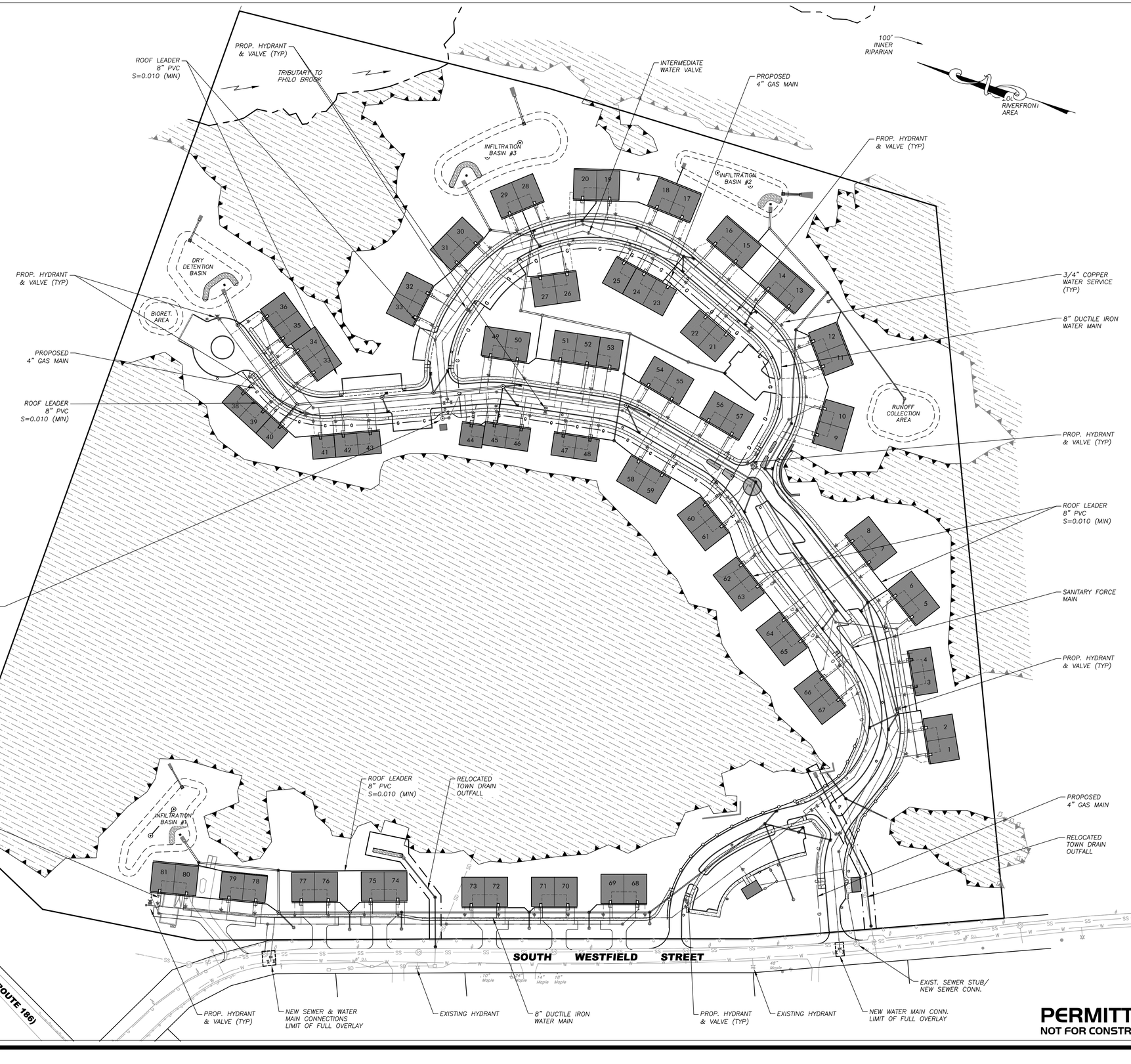
C-15	-

CONSTRUCTION NOTES

1. THE CONTRACTOR/OWNER/DEVELOPER TO BE AWARE THAT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND AN ILLICIT DISCHARGE COMPLIANCE STATEMENT ARE REQUIRED PRIOR TO ANY LAND DISTURBANCE.
2. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON SURFACE FEATURES AS LOCATED BY SURVEY AND AVAILABLE RECORD DATA AND ARE APPROXIMATE. ACTUAL FIELD LOCATIONS SHOULD BE VERIFIED WITH THE APPROPRIATE UTILITY COMPANY AND/OR MUNICIPAL DEPARTMENT PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO NOTIFY DIG SAFE A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION ACCORDING TO MA GENERAL LAWS.
4. APPROVED PLANS TO BE ON SITE AT ALL TIMES.
5. CHANGES TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES TO BE APPROVED BY DESIGN ENGINEER, FIELD INSPECTOR AND CITY/TOWN ENGINEER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
7. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
8. TREES, BRUSH AND STUMPS REMOVED BY CLEARING AND GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
9. ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE REAPPLIED.
10. ALL CONSTRUCTION METHODS TO CONFORM TO AGAWAM PLANNING BOARD REGULATIONS AND BOARD OF PUBLIC WORKS SPECIFICATIONS.
11. AGAWAM DEPARTMENT OF PUBLIC WORKS APPROVAL IS NOT TO BE CONSTRUED AS AN ALL INCLUSIVE APPROVAL AS OTHER APPROVALS MAY BE NECESSARY, I.E. TOWN ENGINEER, CONSERVATION, FIRE DEPARTMENT, WATER DEPARTMENT, ETC.
12. EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO START OF CONSTRUCTION.

NOTES

1. CONTRACTOR TO PROVIDE SANITARY SEWER CLEAN OUT AT BENDS IN PIPING AS WELL AS FOR EVERY 100 FEET OF LATERAL.
2. CONTRACTOR TO CONFIRM EXISTING SANITARY SEWER MAIN IN ROAD PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR TO PROVIDE CLEAN OUTS AT EACH BEND FOR THE PROPOSED ROOF DRAIN PIPES.
4. ALL UNDERGROUND PIPING CONNECTING ROOF LEADERS SHALL BE 8" DIA. PVC WITH A MINIMUM 1% SLOPE.
5. EMERGENCY OVERFLOW TO BE LINED WITH NORTH AMERICAN GREEN "SHOREMAX" SCOUR PROTECTION MAT. INSTALL PER MANUFACTURERS GUIDELINES.



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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OVERALL SITE UTILITY PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

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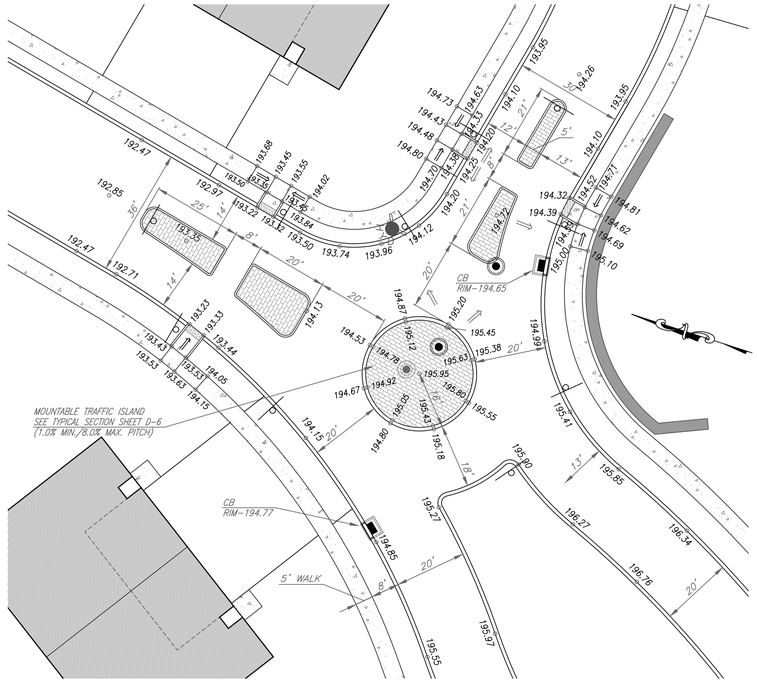
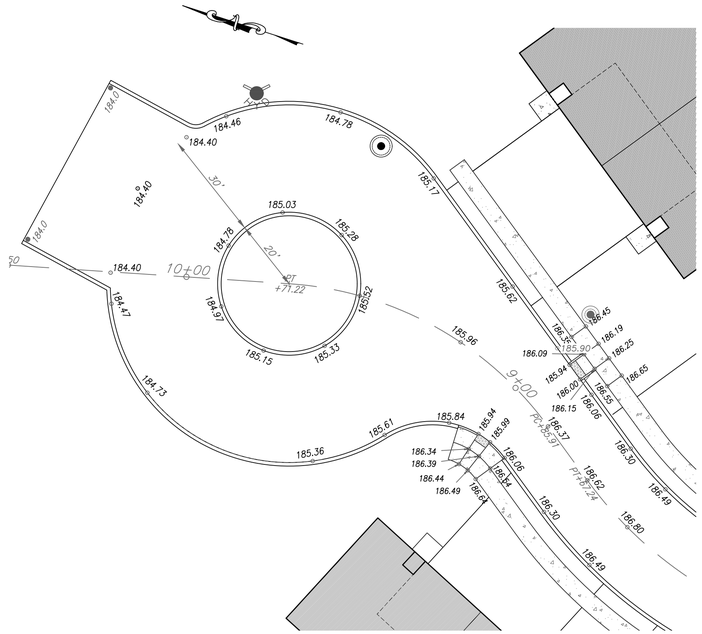
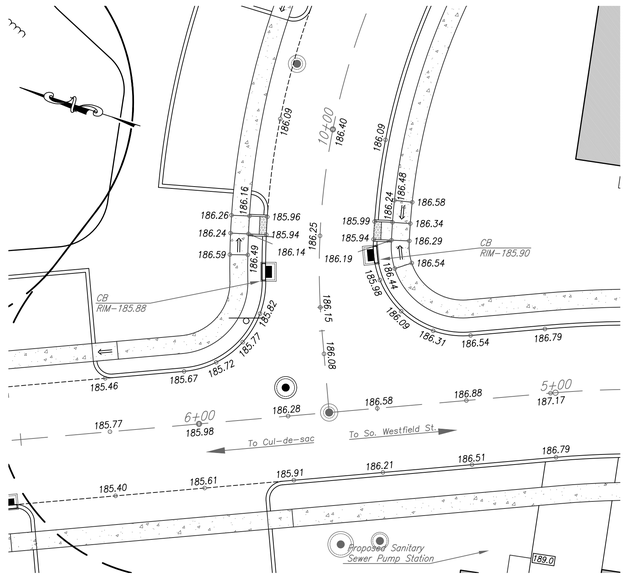


TRAFFIC CIRCLE DETAIL
1"=20'

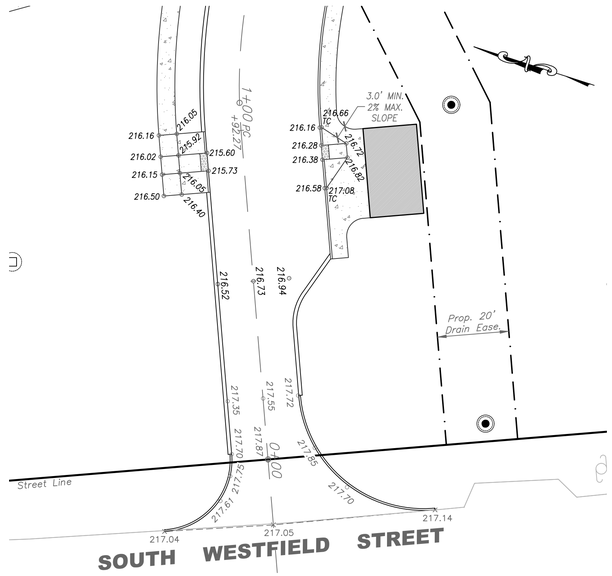


CUL-DE-SAC DETAIL
1"=20'

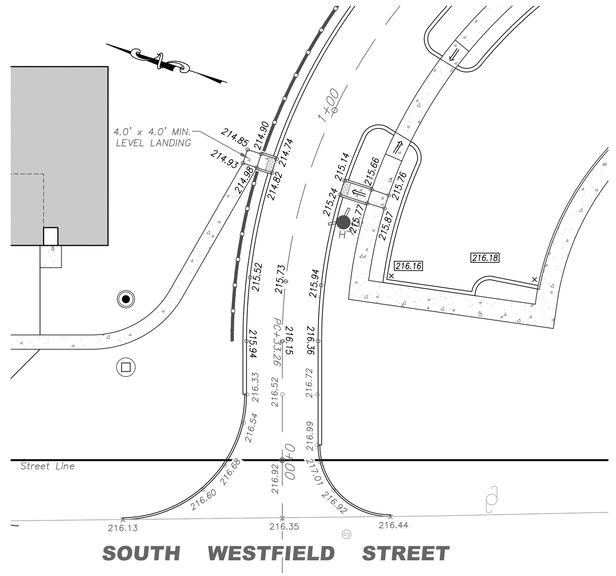
ACCESSIBLE RAMP NOTE
ACCESSIBLE ROUTE RAMPED SECTIONS NOT TO EXCEED 8.0% SLOPE.
CROSS-SLOPE NOT TO EXCEED 2.0% IN ANY DIRECTION. SEE
SHEET D-5 FOR ADDITIONAL ACCESSIBLE RAMP SPECIFICATIONS.



INTERSECTION DETAIL
1"=20'



CROSSWALK DETAIL - ENTRANCE DRIVE AT MAILBOX
1"=20'



CROSSWALK DETAIL - EXIT DRIVE NEAR S. WESTFIELD STREET
1"=20'

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INTERSECTION & CUL-DE-SAC GRADING DETAILS

Map E6, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

MASSACHUSETTS ROBERT A. LEVESQUE NO. 1398 REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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EROSION & SEDIMENTATION CONTROL NOTE

THE EROSION/SEDIMENTATION MEASURES SHOWN HEREON ARE TO BE CONSIDERED THE MINIMUM EFFORT REQUIRED, AND SHOULD ACT AS A GUIDELINE FOR THE ANTICIPATED EROSION/SEDIMENTATION CONTROL EFFORT NECESSARY TO MAINTAIN CONTROL OVER THE PROJECT SITE. ACTUAL SITE CONDITIONS MAY VARY FROM THOSE SHOWN HEREON, AND THE EROSION/SEDIMENTATION CONTROL EFFORT SHALL BE ADJUSTED IN RESPONSE. SHOULD THE EROSION CONTROL PLAN NOT BE FOLLOWED AS THE MINIMUM REQUIREMENT, THE CONTRACTOR SHALL BEAR COMPLETE AND ULTIMATE RESPONSIBILITY FOR THE SITE-SPECIFIC LAYOUT, INSTALLATION, MAINTENANCE, AND — SHOULD FAILURE OCCUR — REPARATIONS TO ANY DAMAGED PROPERTY. R LEVESQUE ASSOCIATES, INC. (RLA) RESERVES THE RIGHT TO MAKE REQUIRED ADJUSTMENTS TO THE EROSION CONTROL PLAN AS SITE CONSTRUCTION EVOLVES AND AS RLA DEEMS NECESSARY.

GENERAL CONSTRUCTION SEQUENCE

1.) LOCATE AND STAKE BY SURVEY THE LIMITS OF WORK LINES, CENTERLINES OF PROPOSED ROADWAYS, PROPOSED DRAINAGE STRUCTURES, SEDIMENTATION BASINS (AS REQUIRED) AND DETENTION BASIN, RAIN GARDENS, ETC. LOCATIONS

2.) INSTALL EROSION CONTROLS AS SPECIFIED ON THESE PLANS AND REVIEW THEM WITH THE PROJECT ENGINEER, LANDSCAPE ARCHITECT AND SITE SUPERINTENDENT. SHOULD ADDITIONAL CONTROLS BE DEEMED REQUIRED THEY SHALL BE INSTALLED.

3.) CONSTRUCT ANTI-TRACKING APRONS AS SHOWN ON THESE PLANS.

4.) REMOVE TREES WITHIN THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING LOGS AND BRUSH FROM THE SITE.

5.) GRUB AND STUMP THE ROAD CORRIDOR, DETENTION BASIN LOCATIONS AND BUILDING LOCATIONS TRANSPORTING STUMPS FROM THE SITE AND DISPOSING OF THEM IN ACCORDANCE WITH STATE AND LOCAL RULES AND REGULATIONS.

6.) CONSTRUCT THE SEDIMENTATION BASINS (AS REQUIRED) WITH THE OUTLET TEMPORARILY BLOCKED. ONCE THE BASIN HAS BEEN STABILIZED AND THE VERTICAL OVERFLOW STANDPIPE AND FOREBAY SEDIMENT STUMP AREA AT THE BASIN INLET ARE IN PLACE, THE OUTLET CAN BE ACTIVATED.

7.) EXCAVATE FOR THE ROADS AND SIDE SLOPES IN 1000 FOOT INTERVALS. UPON COMPLETING EACH 500 FOOT INTERVAL, ROAD SIDE CHANNELS (WITH STONE CHECK DAMS PLACED EVERY 200 FEET) LEADING TO THE SEDIMENTATION BASINS SHALL BE CONSTRUCTED. SHOULD SIGNIFICANT SEDIMENTION BE OBSERVED WITHIN THE CHANNEL, SILTATION FENCING SHOULD BE INSTALLED WITHIN THE CHANNEL AT AN INTERVAL OF EVERY 100 FOOT. WATER BARS SHALL BE UTILIZED TO DIRECT STORM FLOWS INTO THE CHANNELS AND SHALL BE SPACED AT 200 FOOT INTERVALS.

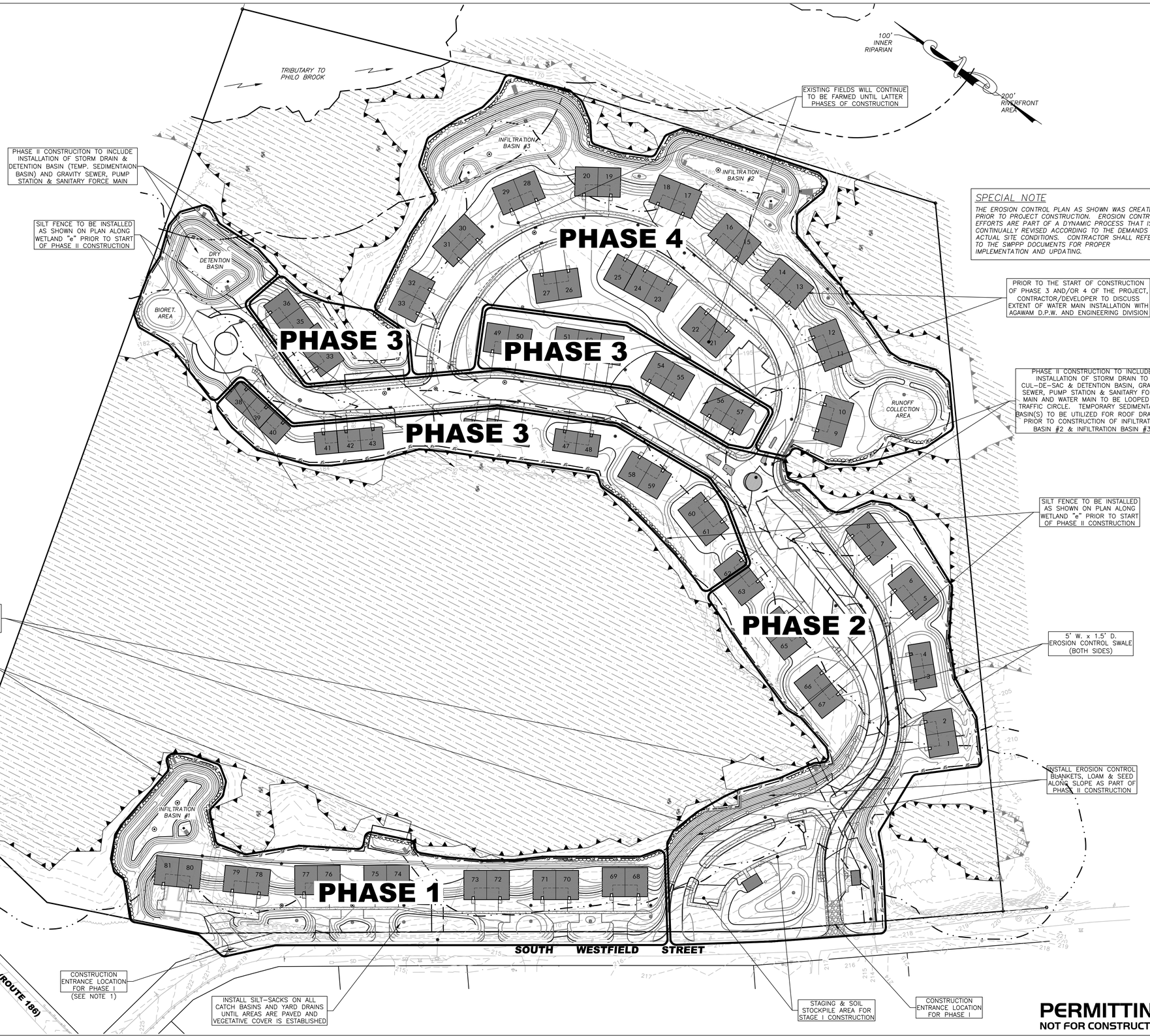
8.) EXCAVATE TO PLAN GRADES THE AREA SHOWN ON PLAN. STOCKPILE LOAM AT LOCATION DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. AREAS NOT DESIGNATED FOR PAVEMENT TO BE STABILIZED USING HYDROSEEDING AND EROSION CONTROL BLANKETS IF NECESSARY. GRASS SEED MIXTURES WILL BE DESIGNATED BY THE ENGINEER OR LANDSCAPE ARCHITECT. SUBSTITUTION OF SEED MIXTURE BY THE CONTRACTOR WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF THE ENGINEER OR LANDSCAPE ARCHITECT. EXCESS SOILS REMOVED AND STOCKPILE DURING SITE CONSTRUCTION WILL BE STABILIZED WITH A VEGETATIVE COVER IF SOILS ARE STOCKPILED FOR MORE THAN 14 DAYS.

9.) AT A MINIMUM, ROADWAY DRAINAGE CHANNELS AND THE SEDIMENTATION BASINS SHOULD BE CLEANED EVERY TWO WEEKS OR AFTER EVERY MAJOR RAIN EVENT.

10.) ONCE THE ROADS ARE CONSTRUCTED AND UTILITIES INSTALLED, THE ROADS WILL BE PAVED IN BINDER COURSE. ROAD SIDE CHANNELS WILL BE FILLED AND THE TREEBELT AREA CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS.

NOTE

EXISTING PAVED DRIVEWAY TO BE USED FOR SITE ACCESS. PAVEMENT CONDITION TO BE MONITORED AND SHALL BE REPLACED BY A PROPER ANTI-TRACKING APRON SHOULD DRIVEWAY FAIL TO PROVIDE ADEQUATE ANTI-TRACKING CAPABILITIES.



SPECIAL NOTE

THE EROSION CONTROL PLAN AS SHOWN WAS CREATED PRIOR TO PROJECT CONSTRUCTION. EROSION CONTROL EFFORTS ARE PART OF A DYNAMIC PROCESS THAT IS CONTINUALLY REVISED ACCORDING TO THE DEMANDS OF ACTUAL SITE CONDITIONS. CONTRACTOR SHALL REFER TO THE SWPPP DOCUMENTS FOR PROPER IMPLEMENTATION AND UPDATING.

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

PERMITTING
NOT FOR CONSTRUCTION

RLA

R LEVESQUE ASSOCIATES INC

Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

ph: 413.568.0985 fax: 413.568.0986

40 School Street
Westfield, MA 01085

rlaland.com

PROJECT PHASING PLAN

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1326
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
C-18	-

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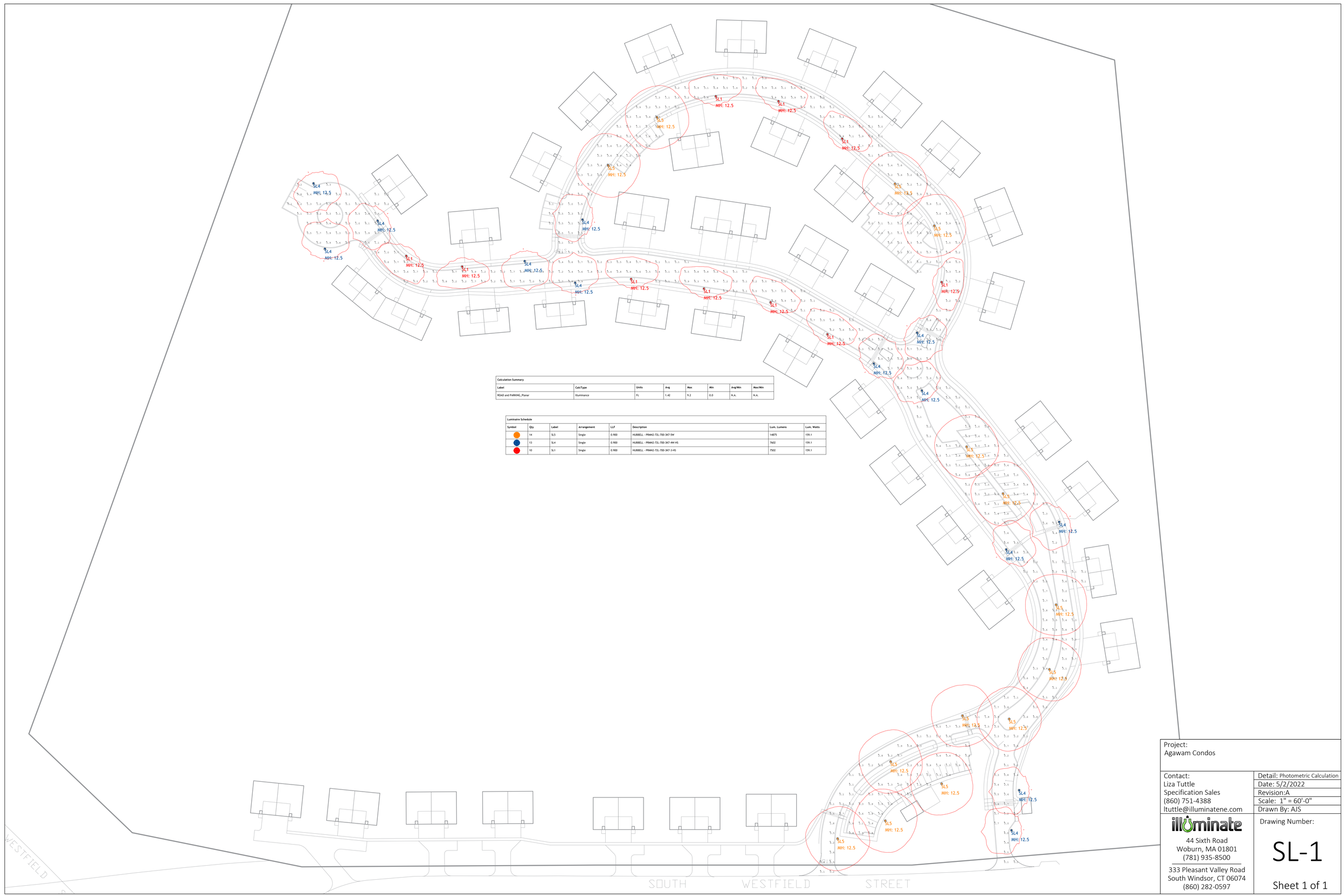


Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ROAD and PARKING_Planar	Illuminance	Fc	1.42	9.2	0.0	N.A.	N.A.

Luminaire Schedule

Symbol	Qty	Label	Arrangement	LLF	Description	Lum. Lumens	Lum. Watts
	14	SL5	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-5W	14875	159.1
	13	SL4	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-4W-H5	7602	159.1
	10	SL1	Single	0.900	HUBBELL - PRMN2-72L-700-3K7-3-H5	7502	159.1

Project:
Agawam Condos

Contact:
Liza Tuttle
Specification Sales
(860) 751-4388
ltuttle@illuminatene.com

Detail: Photometric Calculation
Date: 5/2/2022
Revision:A
Scale: 1" = 60'-0"
Drawn By: AJS

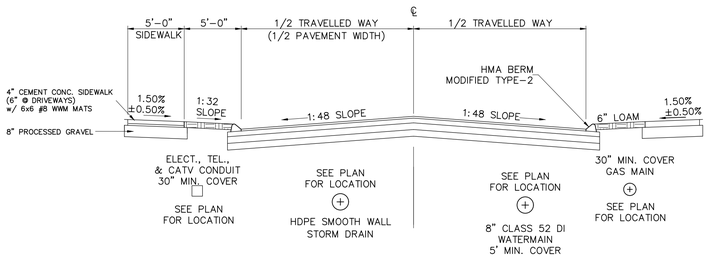
illuminate
44 Sixth Road
Woburn, MA 01801
(781) 935-8500

333 Pleasant Valley Road
South Windsor, CT 06074
(860) 282-0597

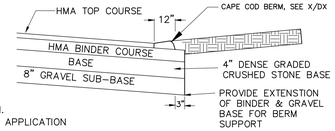
Drawing Number:

SL-1

Sheet 1 of 1



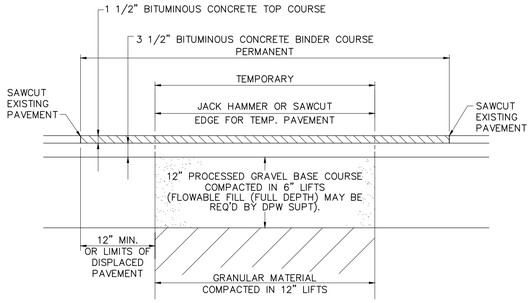
NOTE:
TACK COAT IS REQUIRED BETWEEN ALL COURSES OF HMA AND ON THE HMA BEFORE PLACING HMA BERM



TYPICAL ROADWAY SECTION
N.T.S.

PER MA HIGHWAY – 95% MINIMUM DRY DENSITY COMPACTION
BASED ON STANDARD PROCTOR – ALL ROADWAY CONSTRUCTION.
MODIFIED PROCTOR IS USED ONLY NEAR BRIDGE ABUTMENTS & HEAVY DUTY APPLICATION

TYPICAL ROADWAY SECTION (H-2) [MODIFIED]
NO SCALE



NOTES:

1. TEMPORARY PAVEMENT OVER TRENCHES IN STREET TO REMAIN FOR A MINIMUM OF 60 DAYS. TEMPORARY PAVEMENT 3" BINDER COURSE IN ONE LIFT – COLD PATCH KNOWN AS "QPR" MAYBE USED WHEN TYPE I–1 IS UNAVAILABLE.
2. REMOVE TEMPORARY PAVEMENT AND REPLACE WITH PERMANENT PAVEMENT
3. PAVEMENT THICKNESS TO BE 5" MINIMUM, OR GREATER TO MATCH EXISTING CONDITIONS.
4. WHERE PAVEMENT IS CUT 2'–0" OR LESS FROM EDGE OF ROAD, REPAVING TO EXTEND TO EDGE OF ROAD.
5. EDGE OF EXISTING PAVEMENT SHALL BE TREATED WITH A TACK COAT PRIOR TO PLACEMENT OF THE PERMANENT PATCH.
6. EXCEPT AS OTHERWISE DIRECTED BY THE D.P.W. SUPT., THE EDGE OF PAVEMENT ADJACENT TO PATCH SHALL BE HEATED WITH INFRARED EQUIPMENT TO SEAL THE JOINTS.

PERMANENT PAVEMENT REPLACEMENT PLAN
NO SCALE

MINIMUM THICKNESS FOR PAVEMENT

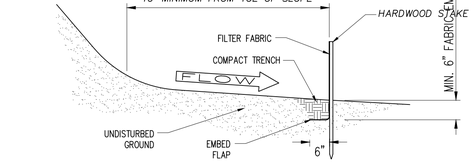
TYPE OF STREET	HOT MIX ASPHALT			GRAVEL BASE & GRAVEL SUB-BASE	
	SURFACE COURSE (INCHES)	BINDER COURSE (INCHES)	BASE (INCHES)	BASE (INCHES) DENSE GRADED CRUSHED STONE (M 201.7)	SUB-BASE (INCHES) (M 1.03.0 TYPE B, 3" MAX.)
PLACE	1.5"	3.0"	NA	4.0"	8.0"
LANE	1.5"	3.0"	NA	4.0"	8.0"
SUBCOLLECTOR	1.5"	2.0"	3.0"	4.0"	8.0"
COLLECTOR	1.5"	2.0"	4.0"	4.0"	10.0"
NOTE: THE ABOVE THICKNESS DO NOT APPLY TO INDUSTRIAL PARK ROADS					

1. THE MATERIAL TO BE USED FOR THE GRAVEL BASE (THE 4" OF MATERIAL DIRECTLY UNDER THE BINDER COURSE OF PAVING) IS TO BE DENSE GRADED CRUSHED STONE (NOT PROCESSED GRAVEL OR OTHER NATURAL STONE PRODUCT. MHD SPECIFICATION M2.01.7, WHICH MUST BE MET, STATES THAT COARSE AGGREGATE (#4 SIEVE AND LARGER) MUST BE CRUSHER RUN.
2. THE LINE, GRADE AND COMPACTION OF THE GRAVEL SUB–BASE (THE 8" LAYER OF GRAVEL BORROW DIRECTLY UNDER THE DENSE GRADED CRUSHED STONE) MUST BE APPROVED BY ENGINEERING BEFORE THE 4" LAYER OF DENSE GRADED CRUSHED STONE IS PLACED. IT IS IMPORTANT THAT ENOUGH TIME IS ALLOWED IN THE CONSTRUCTION SCHEDULE SO THAT FIELD DENSITY TESTS CAN BE MADE.
3. GRAVEL SAMPLES FOR THE SUB–BASE AND BASE WILL BE TAKEN BY THE ENGINEERING DIVISION FOR TESTING. THE SAMPLE MUST MEET ITS RESPECTIVE MHD SPECIFICATION AND BE APPROVED BY THE TOWN ENGINEER BEFORE ANY OF THE GRAVEL CAN BE SPREAD ON–SITE. THE TOWN ENGINEER OR THEIR AGENT ARE SOLELY RESPONSIBLE FOR CHAIN OF CUSTODY OF ALL SAMPLES; ANY TESTING PERFORMED OUTSIDE OF THE TOWN CHAIN OF CUSTODY WILL NOT BE ACCEPTED.
4. FIELD DENSITY TESTING IS TO BE MADE ON BOTH THE GRAVEL SUB–BASE AND GRAVEL BASE SEPARATELY. THE GRAVEL SUB–BASE IS TO BE TESTED BEFORE THE GRAVEL BASE WILL BE ALLOWED TO BE PLACED.
5. WHEN THE GRAVEL FOR THE SUB–BASE AND BASE IS SPREAD OUT, IT IS TO BE SPREAD INTO THE SITE STARTING AT THE SITE'S ENTRANCE AND WORKING INWARDS.
6. THE BINDER COURSE OF PAVING CANNOT BE LAID UNTIL THE ENGINEERING DIVISION HAS APPROVED THE GRADE FOR THE ROADWAY AND THE COMPACTION OF THE GRAVEL BASE.
7. PRIOR TO INSTALLING THE CURB, THE DEVELOPER SHALL HAVE THE LINES OF THE PROPOSED CURBING LAID OUT WITH RED PAINT OR OTHER MARKING AND THEN NOTIFY ENGINEERING THAT MARKING IS READY FOR INSPECTION. AFTER INSPECTION, ENGINEERING WILL NOTIFY THE DEVELOPER THAT CURBING IS EITHER READY FOR LAYING OR CORRECTIONS MUST BE MADE TO THE MARKINGS. IN THE LATTER CASE, THE DEVELOPER MUST MAKE THE CORRECTIONS PRIOR TO APPROVAL AND INSTALLATION. TACK COAT IS REQUIRED BEFORE PLACEMENT OF HMA BERMS.
8. PRIOR TO LAYING THE TOP COURSE OF PAVEMENT, AND AFTER THE CURB IS INSTALLED, THE PAVEMENT MUST BE FLOODED SO THAT ENGINEERING CAN OBSERVE AND SURVEY THE GRADES OF BINDER COURSE TO DETECT ANY DISCREPANCIES IN GRADE. THIS INFORMATION MUST BE FURNISHED TO THE PAVING SUBCONTRACTOR BY THE DEVELOPER SO THAT ANY NECESSARY SHIMMING OF THE PAVEMENT CAN BE MADE. ENGINEERING WILL CHECK SHIMS.
9. AS NOTED IN THE SUBDIVISION REGULATIONS AND STANDARD PERFORMANCE AGREEMENT, THE PRESENCE OF AN INSPECTOR WILL NOT RELIEVE THE DEVELOPER OF HIS OBLIGATIONS TO PROVIDE A SATISFACTORY INSTALLATION OF ALL FACILITIES WHICH ARE A PART OF THE SUBDIVISION.
10. TACK COAT WILL BE REQUIRED TO BE APPLIED AT A RATE OF 1/20 GAL/SY WHENEVER PLACING HMA OVER EXISTING PAVEMENT, OTHERWISE THE TACK COAT SHALL BE AS SPECIFIED IN SECTION 460.62 OF THE MHD STANDARD SPECIFICATIONS.

STREET DESIGN STANDARDS

TYPE OF STREET	RIGHT OF WAY WIDTH (FEET)	PAVEMENT WIDTH (FEET)
PLACE	46	26
LANE	50	30
SUBCOLLECTOR	60	36
COLLECTOR	66	40

STREET STANDARDS
NO SCALE

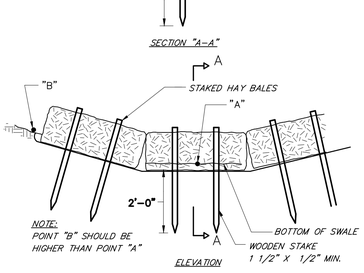


SECTION A–A

NOTES:

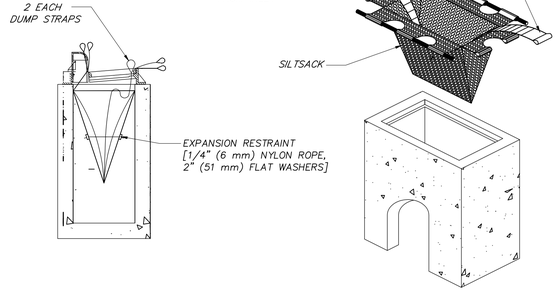
1. SILT FENCE IS TO BE INSTALLED BEFORE ANY LAND DISTURBING ACTIVATES START AT THE CONSTRUCTION SITE –OR– AS DIRECTED IN THE SITE'S EROSION AND SEDIMENTATION PLAN.
2. INSPECT SILT FENCE ON WEEKLY BASIS AND AFTER EACH RAIN ANY DETERIORATED/DAMAGED SILT FENCE MUST BE REPLACED IMMEDIATELY.
3. REMOVE SILT FROM FENCE AS NEEDED –OR– WHEN THE SILT HAS ACCUMULATED TO HALF THE ORIGINAL HEIGHT OF THE FENCE.
4. WHEN JOINING TWO SECTIONS OF FENCE, ROLL THE END STAKES TOGETHER SUCH THAT THERE IS NO GAP IN THE FENCE, OVERLAPPING FENCE SECTIONS IS NOT AN ACCEPTABLE ALTERNATIVE

SILT FENCE
NO SCALE

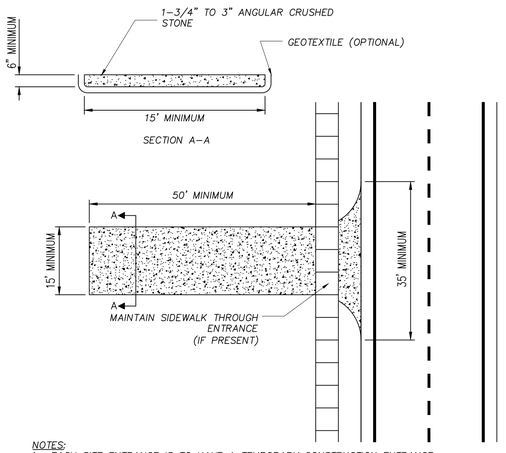


NOTE:
POINT "B" SHOULD BE HIGHER THAN POINT "A"

HAY BALE CHECK DAM X-SECTION
NO SCALE



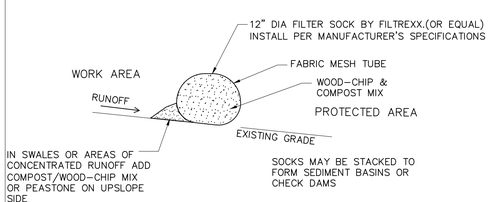
INLET PROTECTION, SEDIMENT FILTER SACK
NO SCALE



NOTES:

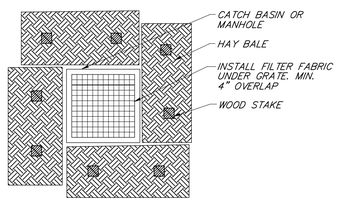
1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1–3/4" TO 3" ANGULAR CRUSHED STONE.
3. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMEADEITLY.
4. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.
5. ANY SIDEWALK DAMAGED DURING CONSTRUCTION MUST BE REPLACED AT THE CONTRACTORS/DEVELOPERS EXPENSE.
6. SIDEWALK MUST REMAIN PASSABLE, IF THE SIDEWALK BECOMES UNSAFE OR IMPASSABLE, A TEMPORARY SIDEWALK/ SIDEWALK DETOUR MUST BE PROVIDED.

TEMPORARY CONSTRUCTION ENTRANCE
NO SCALE – AGAWAM DETAIL ES–1



TYPICAL FILTER SOCK INSTALLATION

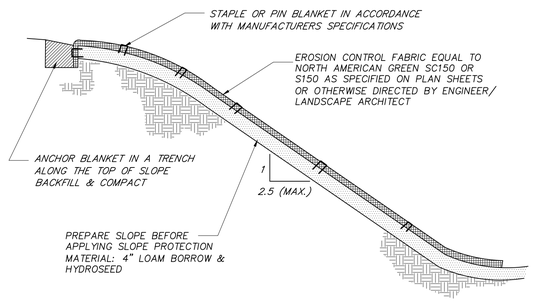
SEDIMENT BARRIER ALTERNATIVE - FILTER SOCK
NO SCALE



NOTES:

1. INSTALL BARRIER AT EACH CATCH BASIN AND DRAINAGE BASIN. CATCH BASINS IN PAVEMENT AREAS ARE TO RECEIVE ONLY THE FILTER FABRIC TREATMENT.
2. TWO (2) WOOD STAKES MINIMUM PER HAYBALE. STEEL DOWELS SHALL BE UTILIZED WHERE WOOD STAKES CAN NOR BE DRIVEN INTO GROUND

STORM INLET PROTECTION DETAIL
NO SCALE



SLOPE PROTECTION MATERIAL INSTALLATION
NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
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40 School Street
Westfield, MA 01085
rlaland.com

DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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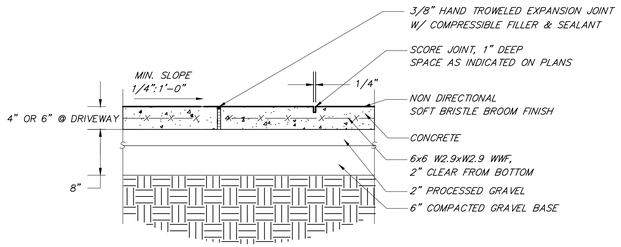
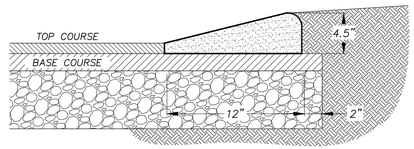


CONCRETE SIDEWALK

NO SCALE

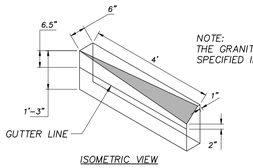


BITUMINOUS CONCRETE BERM (CAPE COD)

NO SCALE

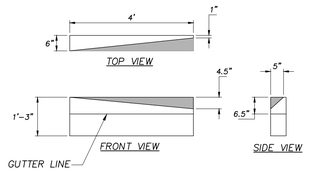
TYPICAL DRIVEWAY PAVEMENT DETAIL

NO SCALE



ISOMETRIC VIEW

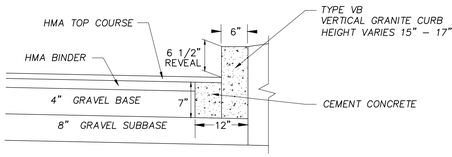
NOTE:
THE GRANITE CURBING SHALL BE INSTALLED AS SPECIFIED IN AGAWAM DETAIL H-4.



SLOPED GRANITE CURB/HMA BERM TO VERTICAL GRANITE CURB

GRANITE TRANSITION CURB DETAIL (H-5)

NO SCALE



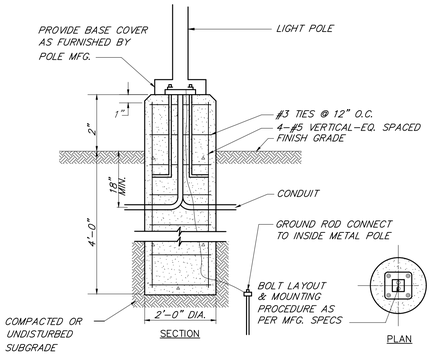
PROCEDURE DESCRIBED HEREIN IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE AND/OR BINDER COURSE ARE IN PLACE. OTHERWISE CEMENT CONCRETE WILL BE ELIMINATED AND GRAVEL WILL BE BROUGHT UP TO THE BOTTOM OF THE BASE COURSE. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE SPECIFICATIONS.

NOTES:
1. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BINDER, BASE AND STONE, AND REPLACE WITH CEMENT CONCRETE.
2. ACCEPTABLE CEMENT CONCRETE IS ANY CLASS UNDER SECTION M4 OF THE 1988 MHD STANDARD SPECIFICATIONS; ALL TEST REQUIREMENTS ARE WAIVED. HMA IS NOT AN ACCEPTABLE SUBSTITUTE
3. WHEN SET ON RADII, THE CURBING SHALL BE CUT WITH THE REQUIRED RADIUS OF CURVATURE.

VERTICAL GRANITE CURB DETAIL (H-4)

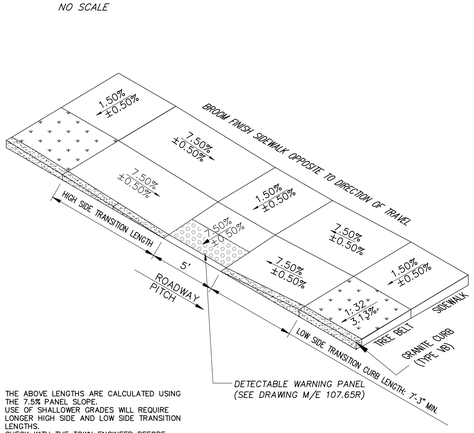
NO SCALE

NOTES:
1. ALL SIDEWALK SLOPES ARE MAXIMUMS, TREE BELT SLOPE IS TO BE MAINTAINED TO THE BEST EXTENT PRACTICABLE.
2. ALL SIDEWALKS ARE TO BE CONSTRUCTED TO THE SAME SPECIFICATION FOUND IN MHD SUPPLEMENTAL SPECIFICATIONS TO THE 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, ENGLISH UNITS, JUNE 6, 2006 SECTIONS 701.00 TO 701.61 INCLUSIVE, AS AMENDED - UNLESS OTHERWISE SPECIFIED.
3. ALL SIDEWALKS ARE TO BE 4000 PSI (28 DAY) PORTLAND CEMENT CONCRETE, 6%±1% AIR ENTRAINED.
4. CURBING TO BE VERTICAL GRANITE CURB -OR- CAST IN PLACE PORTLAND CEMENT CONCRETE IF SUBMITTED TO AND APPROVED BY DPW. SCORE LINES @ 5'-0" INTERVALS
6. WHEN THE SIDEWALK IS INSTALLED ON A CURVE, THE 5'-0" SCORE LINE INTERVAL IS MEASURE ON ALONG THE INSIDE THE CURVE.
10. TOOL ALL JOINTS AND EDGES
11. WHEN TRANSITIONING FROM VERTICAL GRANITE CURB TO MODIFIED TYPE 2 BERM A 4 FT GRANITE TRANSITION IS REQUIRED. ATTEMPTING TO BLEND THE MODIFIED TYPE 2 BERM TO THE GRANITE CURBING, OR FIELD CUTTING A GRANITE TRANSITION ARE NOT AN ACCEPTABLE ALTERNATIVE.
12. SIDEWALK IS TO BE POURED IN ALTERNATING 20' LENGTHS TO ACCOUNT FOR PANEL CONTRACTION DURING DRYING.
13. INSTALL 1/2" THICK PREFORMED EXPANSION JOINT FILLER (M.9.14.0) AT 20' INTERVALS
14. BROOM FINISH SIDEWALK OPPOSITE TO THE DIRECTION OF TRAVEL
15. SIDEWALK IS REQUIRED TO BE COVERED WITH PLASTIC AND KEPT MOIST FOR MINIMUM OF 72 HOURS AFTER IT HAS SET-UP.
16. DETECTABLE WARNING PANEL ARE TO COMPLY WITH ADA 4.29.2
17. DETECTABLE WARNING PANEL TO BE CAST IN PLACE DETECTABLE WARNING PANEL, 24"X60", FEDERAL YELLOW, ITEM#: 24601DPAD2Y, MFD. BY: ADA SOLUTIONS INC.. 1 SURVEY CIRCLE, 2ND FLR, N. BILLERICA, MA 01862, WWW.ADATILE.COM -OR- APPROVED EQUAL.
18. SIDEWALKS ARE TO BE INSTALLED THROUGH DRIVEWAYS. SIDEWALK FINISH IS TO BE BROOM FINISHED, NO ALTERNATE FINISH IS ALLOWED I.E. STAMPED, EPOXY FINISHED, ETC.... THE 1.50% (±0.50%) CROSS SLOPE MUST BE MAINTAINED THROUGH DRIVEWAYS.
19. ANY CHANGES IN BOUNDS, PINS, EASEMENTS, AND FORM-A'S SHOULD BE SHOWN ON AMENDED DEFINITIVE PLANS PRIOR TO THE SIGN OFF OF THE PUNCH LIST.
20. ALL MONUMENTATION IS TO COMPLY WITH AGAWAM TOWN CODE SECTION 159-33



LIGHT POLE INSTALLATION DETAIL

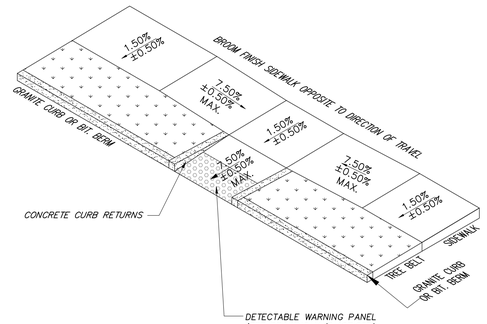
NO SCALE



- THE ABOVE LENGTHS ARE CALCULATED USING THE 7.5% PANEL SLOPE.
- USE OF SHALLOWER GRADES WILL REQUIRE LONGER HIGH SIDE AND LOW SIDE TRANSITION LENGTHS.
- CHECK WITH THE TOWN ENGINEER BEFORE USING ANY GRADES BESIDES THOSE LISTED IN THE TABLE ABOVE.

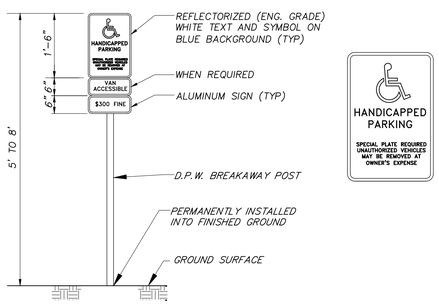
SIDEWALK CURB CUT

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

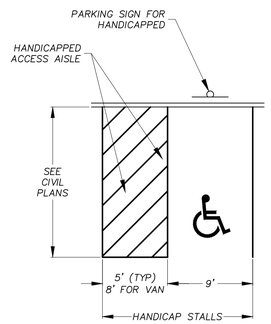
NO SCALE



NOTE:
MAXIMUM MOUNTING DISTANCE FROM HEAD OF STALL IS 10'.
PLEASE SEE: MGL C.40&21-22A, AAB 521 CMR 23.00, AGAWAM CODE &169-28

ACCESSIBLE PARKING SIGN (A-1)

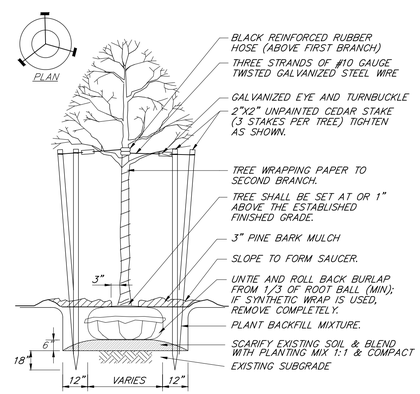
NO SCALE



NOTES:
1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" SOLID WHITE PAVEMENT MARKING PAINT UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO ENSURE HANDICAP ACCESSIBLE PARKING SPACE SHALL HAVE A SLOPE OF 2% OR LESS IN ALL DIRECTIONS.
4. SEE AAB 521 CMR 23.00 FOR REQUIRED NUMBER AND PROPORTION OF VAN ACCESSIBLE SPACES.

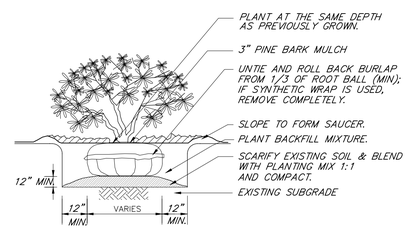
HANDICAP PARKING STALL

NO SCALE



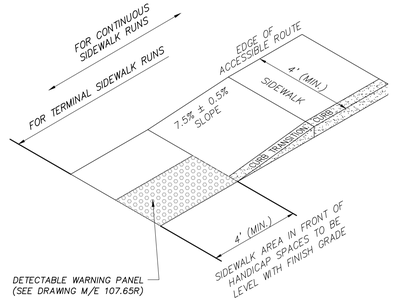
TREE PLANTING

NO SCALE



SHRUB PLANTING

NO SCALE



SIDEWALK CURB CUT (ALT. - SEE PLANS)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
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DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. LEVESQUE
No. 13316
REGISTERED LANDSCAPE ARCHITECT
9/19/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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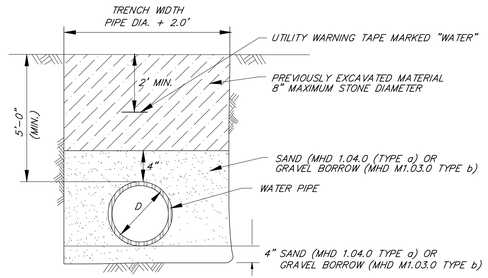
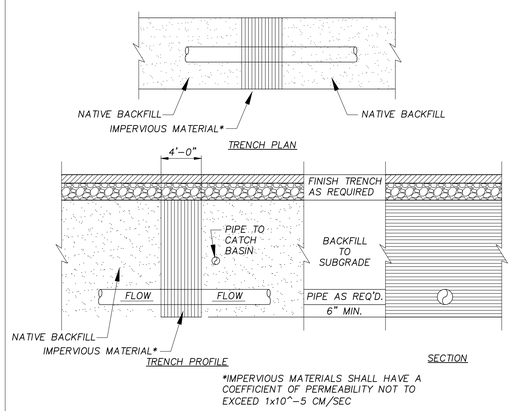


NOTES:
1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIALS IN MAXIMUM ONE FOOT LIFTS.
3. ALL WATER LINES SHALL BE SET A MINIMUM OF 5 FEET BELOW FINISH GRADE UNLESS OTHERWISE NOTED.

TYPICAL WATERMAIN TRENCH SECTION

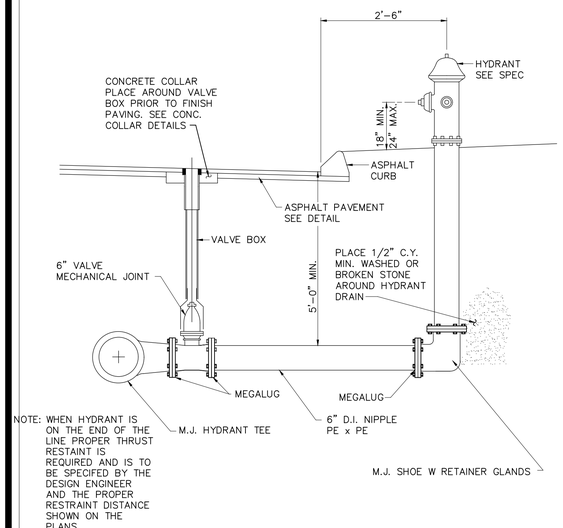
NO SCALE



*IMPERVIOUS MATERIALS SHALL HAVE A COEFFICIENT OF PERMEABILITY NOT TO EXCEED 1x10^-5 CM/SEC

IMPERVIOUS TRENCH DAM DETAIL (D-6)

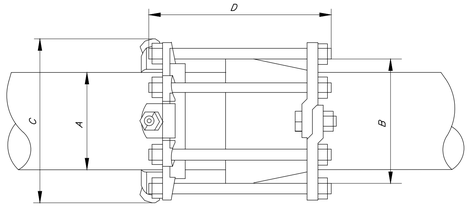
NO SCALE



NOTE: WHEN HYDRANT IS ON THE END OF THE LINE PROPER THRUST RESTAINT IS REQUIRED AND IS TO BE SPECIFED BY THE DESIGN ENGINEER AND THE PROPER RESTRAINT DISTANCE SHOWN ON THE PLANS

FIRE HYDRANT DETAIL (W-1)

NO SCALE



MEGALUG SERIES 1700 TABLE (*)					
NOMINAL PIPE SIZE	SERIES NUMBER	A PIPE O.D.	B MAX. BELL O.D. CLEARED	C CASING CLEARANCE (W/NUTS OFF)	D THRUST ROD (QUANTY-SIZE)
4"	1704	4.80	6.60	9.90	4-3/4x13
6"	1706	6.90	8.60	12.00	6-3/4x13
8"	1708	9.05	10.90	14.15	6-3/4x13
10"	1710	11.10	13.10	16.20	8-3/4x18

* SEE MANUFACTURER FOR ADDITIONAL SPECIFICATIONS.

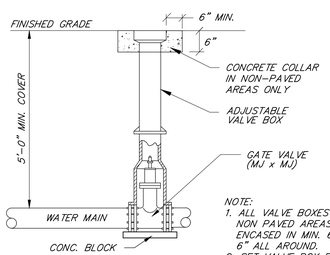
NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

SERIES 1700 MEGALUG RESTRAINT HARNESS

NO SCALE

SEDIMENTATION MARKER POST

NO SCALE



NOTE:
1. ALL VALVE BOXES LOCATED IN NON PAVED AREAS SHALL BE ENCASED IN MIN. 6" THICK CONC. 6" ALL AROUND.
2. SET VALVE BOX FLUSH IN PAVED AREAS.

TYPICAL BURIED VALVE

NO SCALE

PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES										
LENGTH OF RESTRAINT REQD (FEET)									DESIGN FORCE ON RESTRAINT REQD (KIPS) ⑤	
DEFLECTION ANGLE / PIPE	11 1/4	22 1/2°	45°	90° BEND	TEE	DEAD END	8"-4" REDUCER	8"-6" REDUCER	45°	TEE
	3	6	11	27	48	80	57	34	11	48

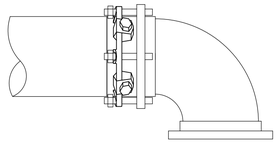
① ALL GATE VALVES MUST BE RESTAINED.

② THIS TABLE IS BASED ON A TEST PRESSURE OF 200 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY

③ IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.

④ IF TIE RODS ARE USED, USE 4 RODS MINIMUM AND ADD 1/8" TO BAR DIA AS CORROSION ALLOWANCE.

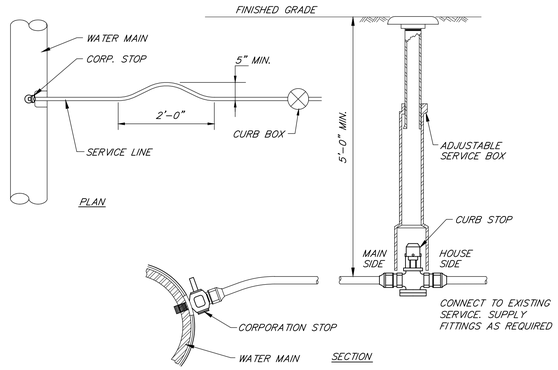
⑤ THE TABLE IS BASED ON THE PIPE LAYING CONDITIONS OF TYPE 4 TRENCH, BURIED DEPTH OF 5' OR MORE AND SOIL TYPE "ML".



NOTE:
THE PROPOSED WATER MAIN IS TO UTILIZE A RESTRAINED JOINT SYSTEM OF THRUST RESTRAINT SUCH AS MEGALUG (OR DPW APPROVED EQUAL).

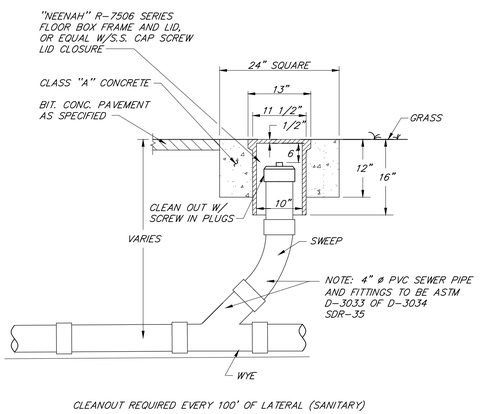
SERIES 1100 MEGALUG RESTRAINT HARNESS

NO SCALE



TYPICAL WATER SERVICE CONNECTION

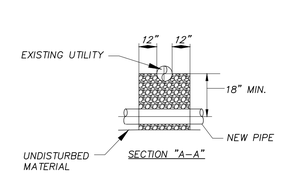
NO SCALE

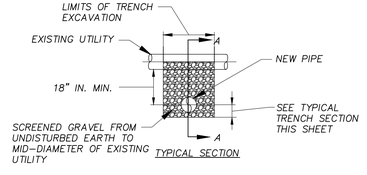


CLEANOUT REQUIRED EVERY 100' OF LATERAL (SANITARY)

TYPICAL CLEANOUT DETAIL

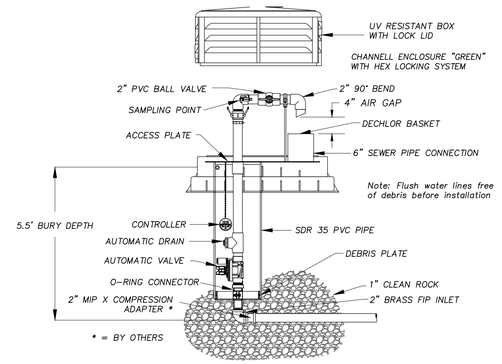
NO SCALE





UTILITY CROSSING DETAIL

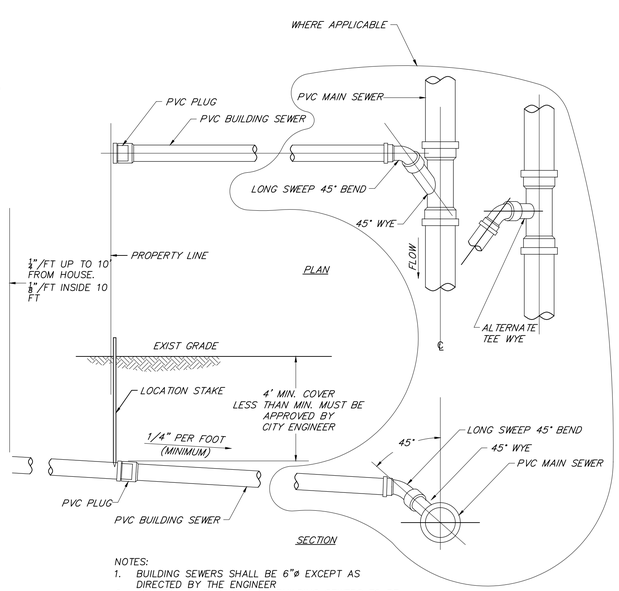
NO SCALE



AUTOMATIC FLUSHING DEVICE SHALL HAVE A 2" BRASS FIP INLET, LEADING VERTICALLY INTO A 2" AUTOMATIC SOLENOID VALVE. AUTOMATIC SOLENOID VALVE SHALL HAVE A 150 PSI RATING. EACH UNIT SHALL BE FURNISHED WITH A STAND-ALONE VALVE CONTROLLER. VALVE CONTROLLER WILL NOT REQUIRE A SECOND HAND-HELD DEVICE FOR PROGRAMMING. CONTROLLER MUST HAVE MINIMUM OF 12 POSSIBLE FLUSHING CYCLES PER DAY, UP TO 6 HOURS PER FLUSH CYCLE AND SHALL BE SUBMERSIBLE TO 12 FEET, OPERATE WITH 9 VOLT BATTERY(COMPARTMENT HOLDS TWO BATTERS) AND HAVE RESIN-SEALED ELECTRICAL COMPONENTS. SOLENOID HALL HAVE NO LOOSE PARTS WHEN REMOVED FROM VALVE. EACH UNIT SHALL HAVE A DOUBLE-VALVE, ALL BRASS, SAMPLING POINT. REMOVAL OF 2" SOLENOID VALVE SHALL BE POSSIBLE VIA AN O-RING CONNECTOR LOCATED UNDER THE VALVE. AFTER REMOVAL OF STAINLESS STEEL ACCESS PLATE. VALVE ASSEMBLY SHALL BE HOUSED IN A PVC ENCLOSURE AND EACH UNIT SHALL BE SELF-DRAINING, NON-FREEZING, ALL ABOVE-GROUND COMPONENTS SHALL BE CONTAINED WITHIN A UV-RESISTANT LOCKING COVER, AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY. MODEL#9800 ST. LOUIS, MO. 1-800-231-3990, OR APPROVED EQUAL.

AUTOMATIC FLUSHING DEVICE - MODEL #9800

NO SCALE



NOTES:
1. BUILDING SEWERS SHALL BE 6"ø EXCEPT AS DIRECTED BY THE ENGINEER
2. LOCATION AND DEPTHS OF BUILDING SEWERS TO BE DETERMINED IN THE FIELD BY THE ENGINEER

TYPICAL BUILDING SEWER CONNECTION DETAIL (S-4)

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
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DETAILS

Map 66, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
NO. 48376
REGISTERED PROFESSIONAL ENGINEER
9/19/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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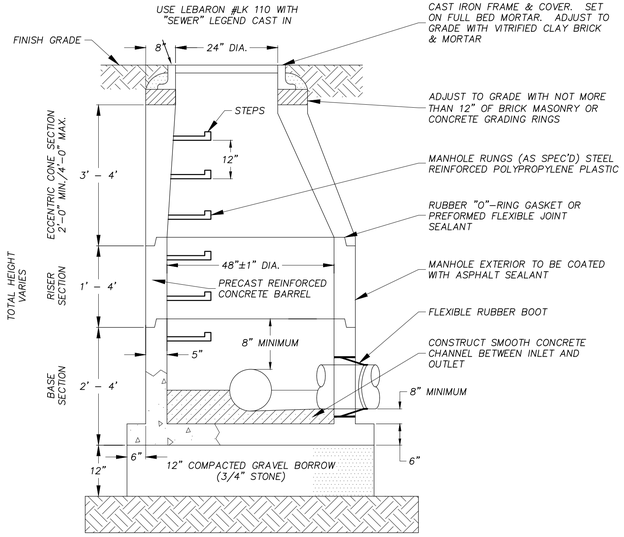
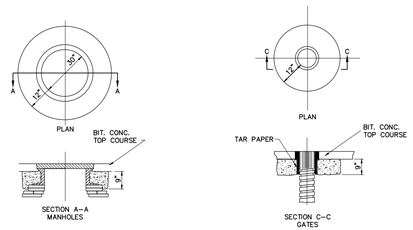


STANDARD SANITARY SEWER MANHOLE DETAIL

NO SCALE



PORTLAND CEMENT CONCRETE COLLARS

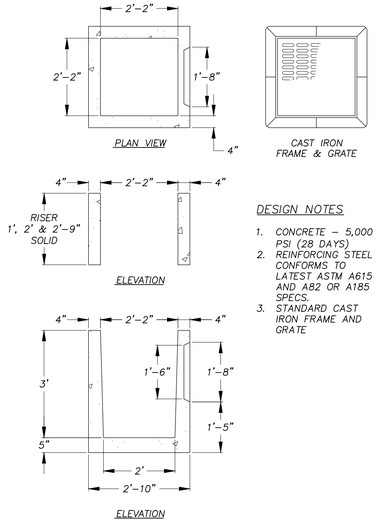
N.T.S

NOTES:

1. CONCRETE COLLARS ARE NOT REQUIRED FOR TYPE "C" OR "CL" PRECAST CATCH BASINS
2. ALL STRUCTURES ARE TO BE PLATED BEFORE PLACEMENT OF THE FIRST COURSE OF PAVEMENT AND RAISED PROMPTLY AFTERWARDS.
3. ALL RAISED STRUCTURES SHALL HAVE BITUMINOUS CONCRETE "DOUGHNUTS" PLACED AROUND THEM UNTIL THE FINISH COURSE OF PAVEMENT HAS BEEN COMPLETED.

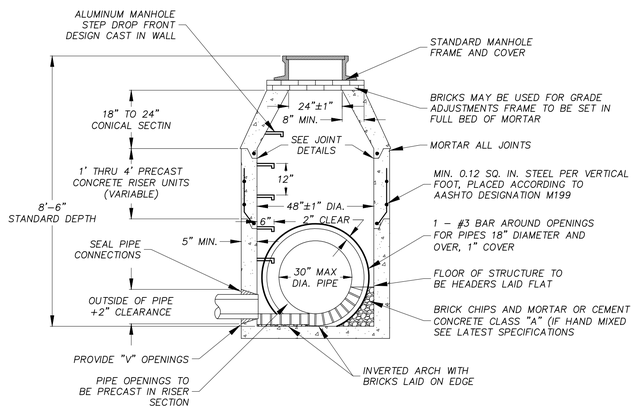
CONCRETE COLLARS

NO SCALE



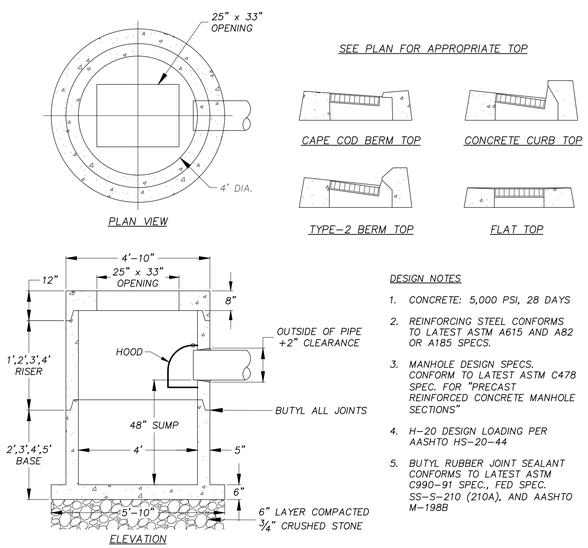
YARD DRAIN DETAIL

NO SCALE



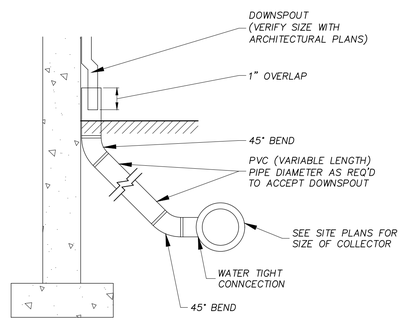
PRECAST CONCRETE MANHOLE

NO SCALE



PRECAST CONCRETE CATCH BASIN-CT STYLE/ROUND BASE

NO SCALE



DOWNSPOUT COLLECTOR DETAIL

NO SCALE

PERMITTING
NOT FOR CONSTRUCTION

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R LEVESQUE ASSOCIATES INC
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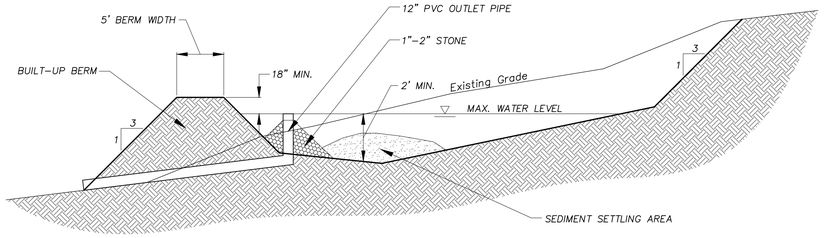


TEMPORARY SEDIMENT BASIN

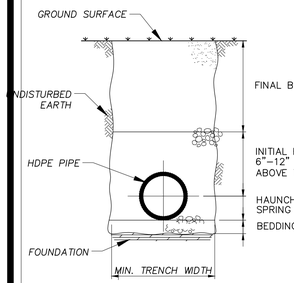
NO SCALE

HDPE TRENCH INSTALLATION DETAIL

NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY–FLOW APPLICATIONS," LATEST EDITION; AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

   UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 6" (150mm).
3. HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
4. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:



TYPICAL HDPE TRENCH CROSS–SECTION

NOMINAL ø in (mm)	MIN. RECOMMENDED TRENCH WIDTH, in (mm)
4 (100)	21 (530)
6 (150)	23 (580)
8 (200)	25 (630)
10 (250)	28 (710)
12 (300)	31 (790)
15 (375)	34 (860)
18 (450)	39 (990)
24 (600)	48 (1220)
30 (750)	66 (1680)
36 (900)	78 (1980)
42 (1050)	83 (2110)
48 (1200)	89 (2260)
60 (1500)	102 (2590)

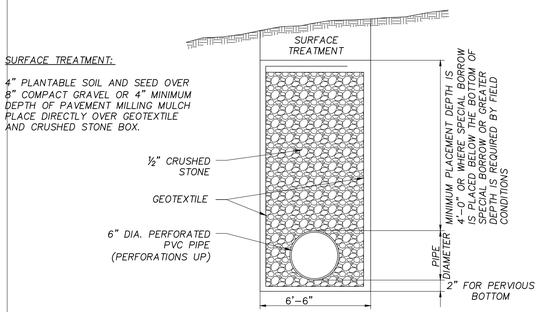
5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADING CONDITIONS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.

SURFACE LIVE LOADING CONDITION	MINIMUM RECOMMENDED COVER, in (mm)
H25 (FLEXIBLE PAVEMENT)	12 (300)
H25 (RIGID PAVEMENT)	12 (300)
E80 RAILWAY	24 (610)
HEAVY CONSTRUCTION	48 (1220)

*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

HDPE TRENCH INSTALLATION DETAIL

NO SCALE



SURFACE TREATMENT:

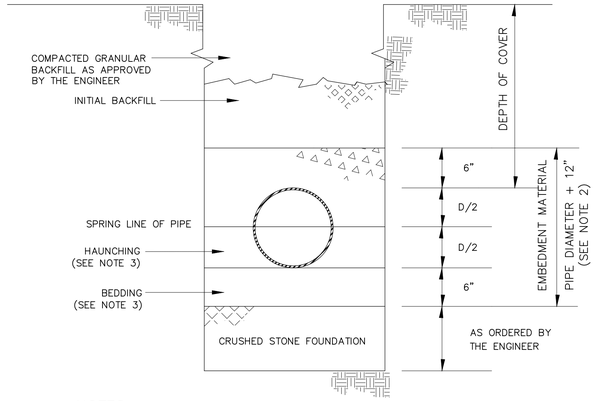
4" PLANTABLE SOIL AND SEED OVER 8" COMPACT GRAVEL OR 4" MINIMUM DEPTH OF PAVEMENT MILLING MULCH PLACE DIRECTLY OVER GEOTEXTILE AND CRUSHED STONE BOX.

NOTES:

1. *GEOTEXTILE FABRIC AS DESCRIBED IN SECTION M9.50.*
2. *PIPE SHALL BE SET AT BOTTOM OF TRENCH FOR IMPERVIOUS BOTTOM.*
3. *SUBDRAIN LOCATED APPROXIMATELY AT INTERSECTION OF TANGENTS (SEE DWG. E102.1.0).*
4. *GRAVEL (AND SPECIAL BORROW WHERE REQUIRED) SHALL INTERSECT CRUSHED STONE FOR SUBDRAIN.*

SUBDRAIN DETAIL (MHD #E 209.1.0)

NO SCALE

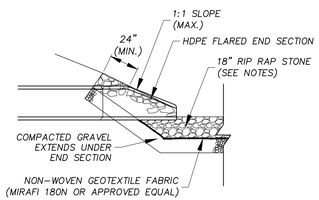


NOTES:

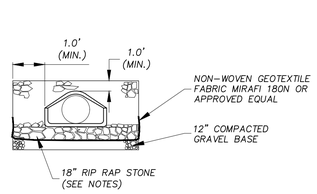
1. THE INSTALLATION OF PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD D–2321.
2. THE EMBEDMENT MATERIAL SHALL BE 3/4" CRUSHED STONE.
3. USE HAND OR MECHANICAL TAMPING TO COMPACT THE BEDDING AND HAUNCHING.
4. GEOTEXTILE TO BE USED WHERE AND AS DIRECTED BY ENGINEER.

SANITARY & STORM SEWER TRENCH SECTION (M-2)

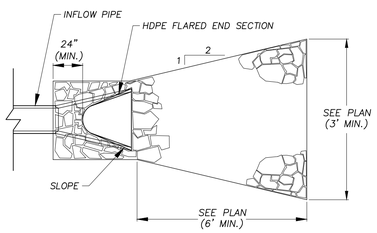
NO SCALE – AGAWAM DETAIL M–2



SIDE SECTION



FRONT SECTION



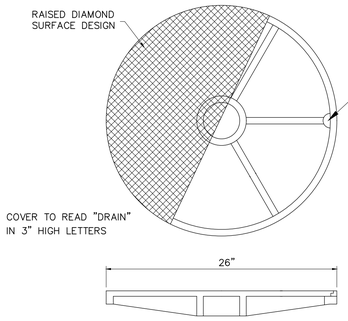
PLAN VIEW

NOTES

1. *FLARED END SECTION PIPE JOINT SHALL BE SIMILAR TO THE MAIN RUN OF PIPE JOINTS*
2. *STONE RIPRAP SHALL NOT BE LESS THAN 50 POUNDS NOR MORE THAN 125 POUNDS AND AT LEAST 75% OF THE VOLUME SHALL BE AT LEAST 75 POUNDS*

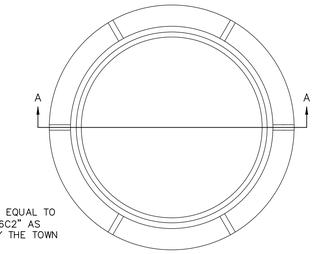
STANDARD RIP RAP PIPE OUTLET

NO SCALE

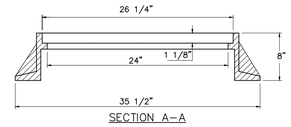


24" MANHOLE COVER

N.T.S.
202.8.1



COVER TO BE EQUAL TO "LEBARON L26C2" AS APPROVED BY THE TOWN ENGINEER



FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LK 110A"

TOTAL WEIGHT OF FRAME & COVER = 485 LBS

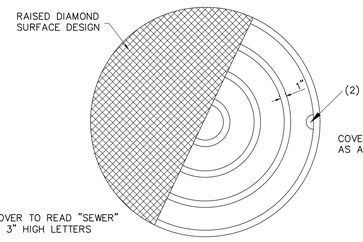
SECTION A–A

24" MANHOLE FRAME

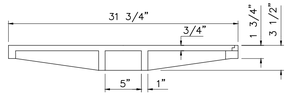
N.T.S.

DRAIN MANHOLE FRAME & COVER (D-2)

NO SCALE – AGAWAM DETAIL D–2

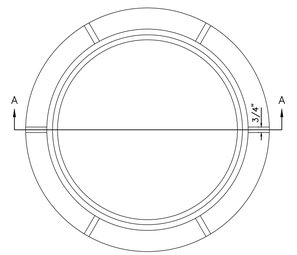


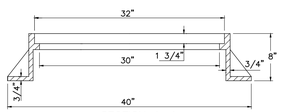
COVER TO BE EQUAL TO "LEBARON L32C19" AS APPROVED BY THE TOWN ENGINEER



30" MANHOLE COVER

N.T.S.
202.8.1





FRAME TO BE EQUAL (AS APPROVED BY THE TOWN ENGINEER) TO "LEBARON LC328"

TOTAL WEIGHT OF FRAME & COVER = 551 LBS

SECTION A–A

30" MANHOLE FRAME TYPE 'C'

N.T.S.
202.7.1

SANITARY SEWER FRAME & COVER (S-3)

NO SCALE – AGAWAM DETAIL S–3

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R LEVESQUE ASSOCIATES INC

Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants

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COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
CIVIL
No. 48376
REGISTERED PROFESSIONAL ENGINEER
9/1/22

PREPARED FOR:

Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:

DRAFTED BY: JT, JM & CK

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SCALE: As Noted

RLA PROJ. NUMBER: 090506

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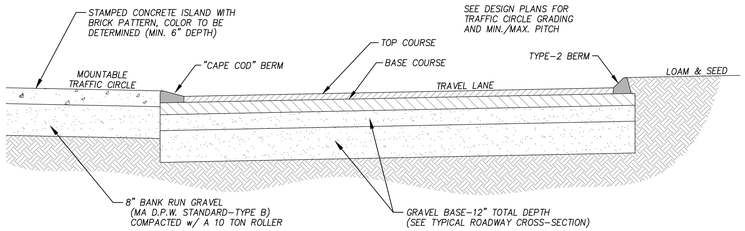
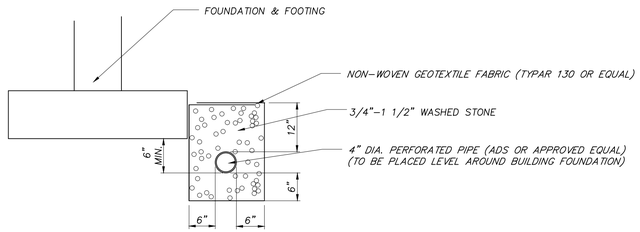


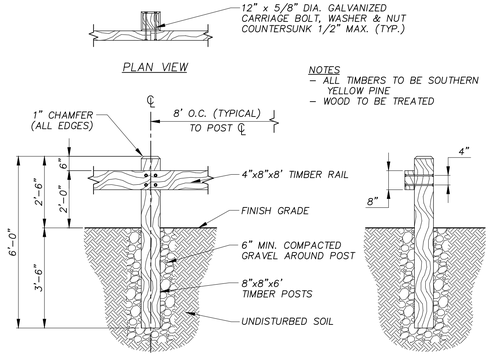
MOUNTABLE TRAFFIC CIRCLE ISLAND DETAIL

NO SCALE



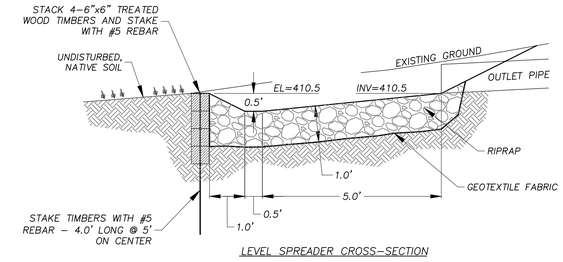
TYPICAL BUILDING FOUNDATION DRAIN DETAIL

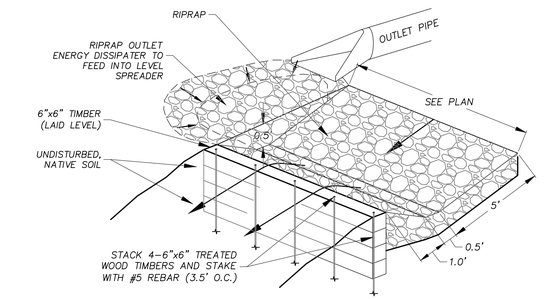
NO SCALE



WOOD GUARDRAIL

NO SCALE



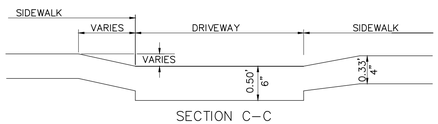


NOTES

1.) LEVEL SPREADER SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
2.) CONSTRUCTION OF LEVEL SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
3.) CONSTRUCT SPREADER WITH LIP AT EXISTING GRADE AS SPECIFIED.
4.) DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

LEVEL SPREADER DETAIL

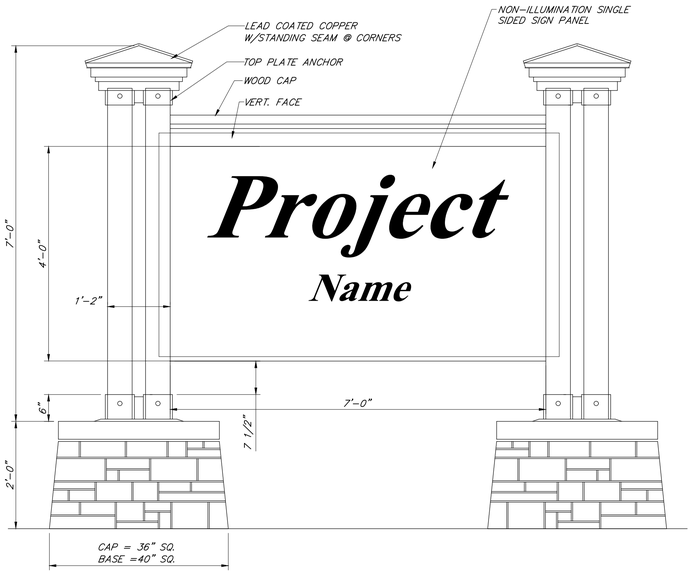
NO SCALE



SECTION C-C

NOTE:

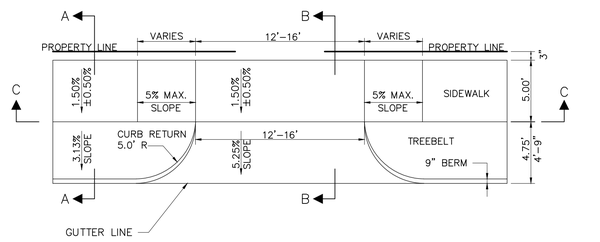
SIGN SIZE, COLORS, MATERIALS & HEIGHT AS SPECIFIED BY SIGN MANUFACTURER

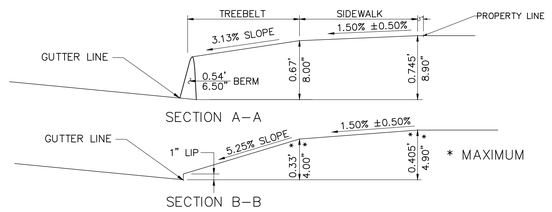


FOUNDATION SHALL BE DESIGNED ACCORDING TO PREVAILING SOIL CONDITIONS, WIND LOADS, AND SUBSURFACE EXPLORATION RESULTS.

FREESTANDING SIGN DETAIL

NO SCALE





NOTES

1.) CONCRETE SIDEWALK IS TO RUN CONTINUOUSLY THOUGH DRIVEWAYS.
2.) CONCRETE USED SHALL BE 4000 PSI WITH A MAX. AGGREGATE SIZE OF ¾"AND SHALL CONTAIN 5-7% ENTRANED AIR.
3.) CONCRETE DEPTH SHALL BE A MINIMUM OF 4" WITH A MIN. DEPTH OF 6" AT DRIVEWAYS.
4.) SIDEWALKS SHOULD BE INSTALLED PRIOR TO THE APPLICATION FOR A BUILDING PERMIT UNLESS THE BUILDER REQUESTS IN WRITING THAT THE SIDEWALKS BE DELAYED AND GUARANTEES THAT THE SIDEWALK WILL CONFORM TO THE STANDARD DRIVEWAY DETAIL.
5.) ALL DRIVEWAYS REQUIRE A DPW DRIVEWAY PERMIT.
6.) ALL SLOPES ARE MAXIMUM. DRIVEWAYS ARE TO BE DESIGNED SUCH THAT WATER WILL NOT FLOW INTO DRIVEWAY FROM THE ROADWAY.

STANDARD RESIDENTIAL DRIVEWAY (H-6)

NO SCALE

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COMMONWEALTH OF MASSACHUSETTS
FILIPE J. CRAVO
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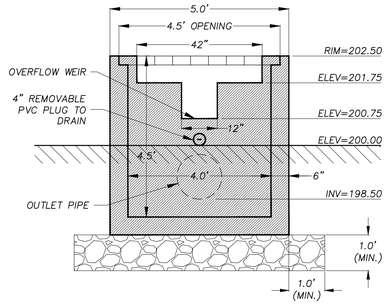
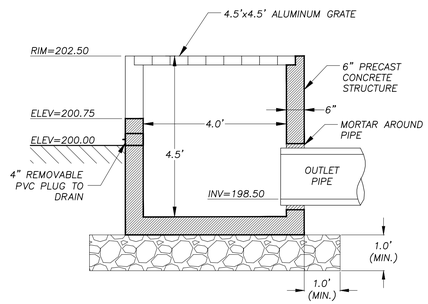
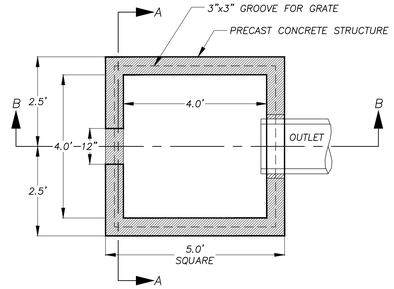


SECTION A–A



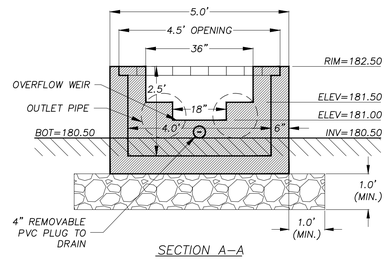
SECTION B–B



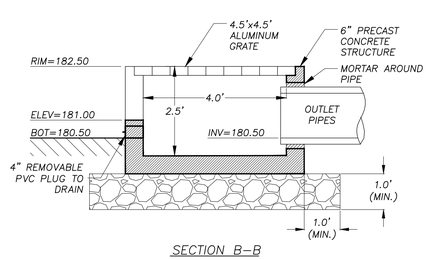
PLAN VIEW

INFILTRATION BASIN #1 OUTLET DETAIL (POCS-1)

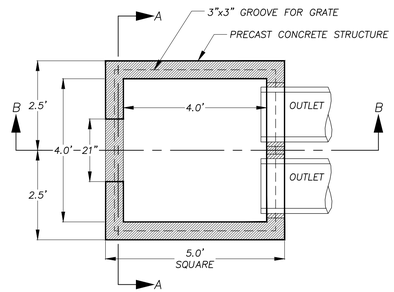
NO SCALE



SECTION A–A



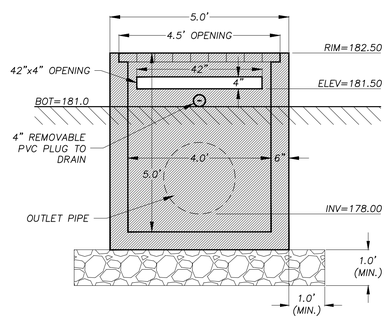
SECTION B–B



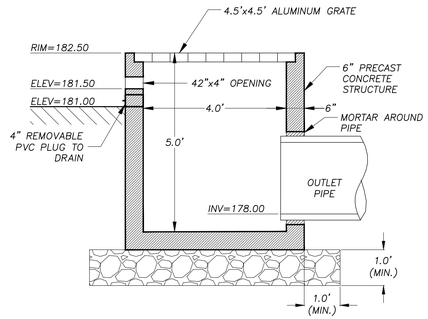
PLAN VIEW

INFILTRATION BASIN #2 OUTLET DETAIL (POCS-2)

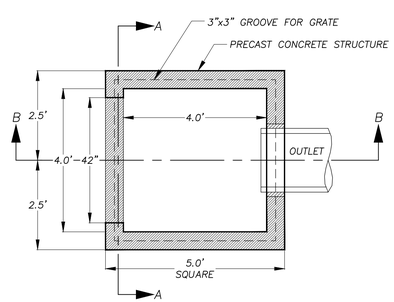
NO SCALE



SECTION A–A



SECTION B–B



PLAN VIEW

INFILTRATION BASIN #3 OUTLET DETAIL (POCS-3)

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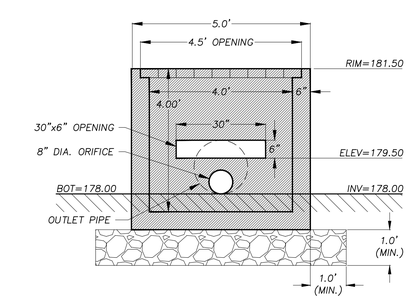
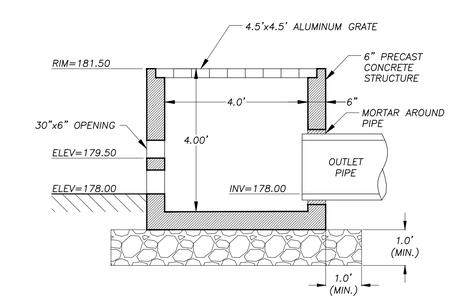


SECTION A–A



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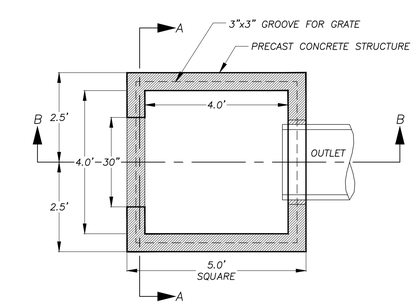

PLAN VIEW

INFILTRATION BASIN #4 OUTLET DETAIL (POCS-4)

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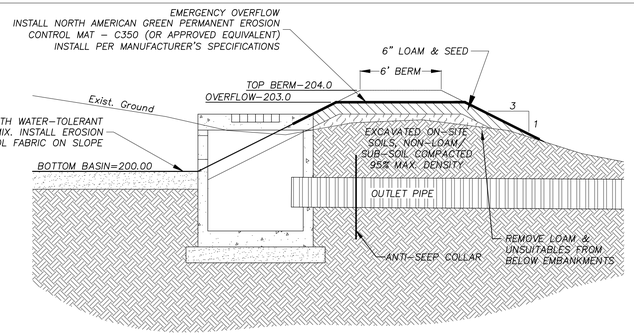

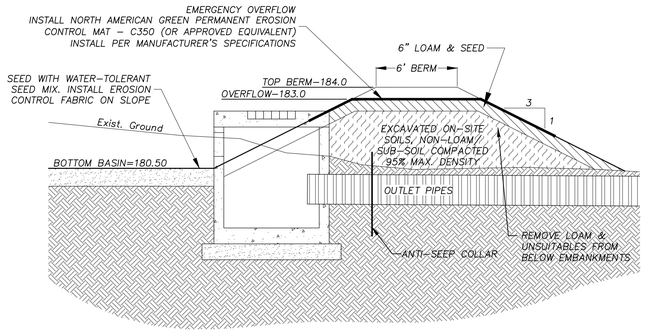

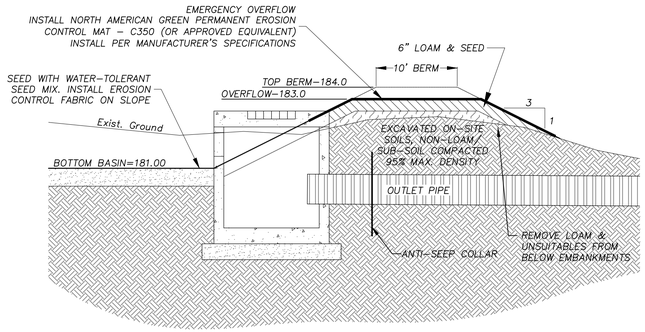

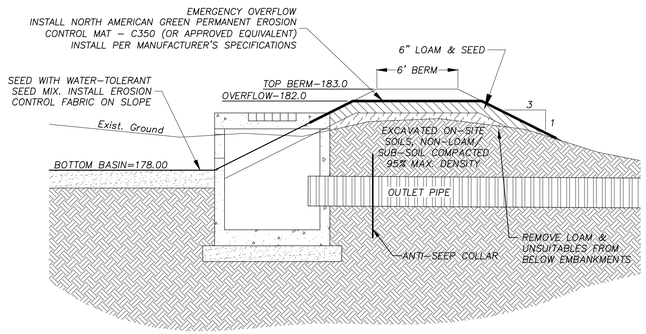

INFILTRATION BASIN NOTES

1. INFILTRATION BASIN BOTTOM TO BE LOCATED A MINIMUM OF 2.0' ABOVE ESTIMATED SEASONAL HIGH GROUNDWATER (ESHGW).
2. IMMEDIATELY AFTER CONSTRUCTING THE BASIN, STABILIZE THE BOTTOM AND SIDE SLOPES WITH WATER–TOLERANT GRASS.
3. DURING BASIN EXCAVATION, USE NATIVE SOILS THAT WERE EXCAVATED FROM THE A OR B HORIZONS AND MIX WITH COMPOST, PROPERLY AGED TO KILL ANY SEED STOCK. SCARIFY THE NATIVE MATERIALS AND USE THE COMPOST MATERIAL TO SHAPE THE BASIN. MIX INTO THE PARENT MATERIAL TO A DEPTH OF 12 INCHES.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS, ETC.) TO THE INFILTRATION BASIN AREAS DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH HEAVY CONSTRUCTION EQUIPMENT. PERFORM EXCAVATIONS WITH LIGHT EARTH–MOVING EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM IF FEASIBLE.
6. IF INFILTRATION BASIN AREAS ARE EXPOSED DURING CONSTRUCTION AND DO RECEIVE SEDIMENT DEPOSITS, BASIN BOTTOM MUST BE OVER EXCAVATED 6–8" INTO NATIVE MATERIAL TO REMOVE SEDIMENT DEPOSITS.
7. ALL DRAINAGE AREAS TO AN INFILTRATION BASIN FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF TOPSOIL/COMPOST MIX AND SEED MIX.
8. INFILTRATION BASIN BOTTOMS AND EMBANKMENTS TO BE SEEDED AS NOTED ON PLANS. NO TREES OR SHRUBS TO BE PLANTED WITHIN INFILTRATION BASINS OR EMBANKMENTS. DO NOT USE SOD.

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INTERSECTION & CUL-DE-SAC GRADING DETAILS

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FILIPE J. CRAVO CIVIL No. 48376 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
9/19/22

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RLA PROJ. NUMBER: 090506

DRAWING#	REV.
D-7	-

PERMITTING
NOT FOR CONSTRUCTION

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

A. General Information

1. Conservation Commission: AGAWAM
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	RALPH & GIUSEPPE	b. Last Name	DEPALMA & TIRONE
c. Organization			
d. Mailing Address	36 CANTERBURY LANE		
e. City/Town	FEEDING HILLS	f. State: MA	g. Zip Code: 01030

4. Property Owner

a. First Name	RALPH & GIUSEPPE	b. Last Name	DEPALMA & TIRONE
c. Organization			
d. Mailing Address	36 CANTERBURY LANE		
e. City/Town	FEEDING HILLS	f. State: MA	g. Zip Code: 01030

5. Project Location

a.Street Address	497 SOUTH WESTFIELD STREET		
b.City/Town	AGAWAM	c. Zip Code	01030
d. Assessors Map/Plat#	E6	e. Parcel/Lot#	2/8
f. Latitude	42.02548N	g. Longitude	72.40257W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
HAMPDEN		14554	323

7.Dates

a. Date NOI Filed : 3/21/2022	b. Date Public Hearing Closed: 10/27/2022	c. Date Of Issuance: 11/15/2022

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
"SITE PLANS PROPOSED CONDOMINIUM COMMUNITY, ASSESSOR'S MAP E6, BLOCK 2, LOT 8, 497 SOUTH WESTFIELD STREET, AGAWAM, MA"	R LEVESQUE ASSOCIATES, INC	FILIPE J. CRAVO, P.E.	10/26/2022	AS NOTED

"LONG TERM OPERATION & MAINTENANCE PLAN, PROPOSED CONDOMINIUM COMMUNITY 497 SOUTH WESTFIELD STREET AGAWAM, MA (PARCEL ID: E6-2-8)"	R LEVESQUE ASSOCIATES, INC	September 19, 2022

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

a. ☑ Public Water Supply	b. ☐ Land Containing Shellfish	c.☑ Prevention of Pollution
d. ☑ Private Water Supply	e. ☑ Fisheries	f. ☑ Protection of Wildlife Habitat
g. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

Approved subject to:

a.☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

b.☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c.☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3.☐ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a). _____ a. linear feet

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Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☑ Riverfront Area	32981 a. total sq. feet	0 b. total sq. feet		
Sq ft within 100 ft	0 c. square feet	0 d. square feet	0 e. square feet	0 f. square feet
Sq ft between 100-200 ft	32981 g. square feet	0 h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment

15. ☐ Coastal Banks
a. linear feet _____ b. linear feet _____

16. ☐ Rocky Intertidal Shores
a. square feet _____ b. square feet _____

17. ☐ Salt Marshes
a. square feet _____ b. square feet _____ c. square feet _____ d. square feet _____

18. ☐ Land Under Salt Ponds
a. square feet _____ b. square feet _____
c. c/y dredged _____ d. c/y dredged _____

19. ☐ Land Containing Shellfish
a. square feet _____ b. square feet _____ c. square feet _____ d. square feet _____

20. ☐ Fish Runs
Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above
c. c/y dredged _____ d. c/y dredged _____

21. ☐ Land Subject to Coastal Storm Flowage
a. square feet _____ b. square feet _____

22.
☐ Restoration/Enhancement (For Approvals Only)
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW _____ b. square feet of Salt Marsh _____

23.
☐ Streams Crossing(s)
If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings _____ b. number of replacement stream crossings _____

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:

a. the work is a maintenance dredging project as provided for in the Act; or
b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.

5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]
File Number :"087-0675"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During

construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the

proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

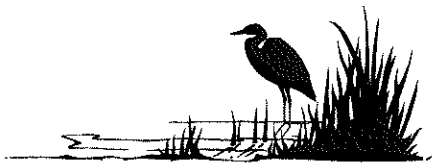
i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions:
SEE ATTACHED.



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS

DEP File #087-0675 | Ralph Depalma & Giuseppe Tirone | 497 South Westfield Street

Finding:

- The Conservation Commission finds that there is an isolated area of hydric soils located in the northerly extent of the central field. The jurisdictional status of the isolated area of hydric soils under Section 401 and 404 of the Clean Waters Act is to be determined by DEP/USACE.

Special Conditions:

1. This Order supersedes all previous Orders of Conditions issued for this work.

2. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

3. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

4. In advance of any work for each phase of the project, the applicant shall contact the Conservation Commission and arrange a conference between the Commission, contractor, designer/engineer, and applicant. The purpose of this conference is to insure that all of the Orders are understood. This conference shall take place at a regularly scheduled Commission meeting.

5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

6. The Commission shall be notified at least seventy-two hours prior to the start of site work (including tree cutting or clearing).

7. The Commission shall be notified when the erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

8. The project engineer/designer shall be held responsible and accountable for the true and accurate implementation and construction of his/her design or plan. Should any

accidental deviation from the approved plan occur, the engineer/designer shall notify the Commission immediately to determine of a new Notice of Intent is required. If any changes to the approved plan are anticipated, the engineer/designer shall likewise notify the Commission to determine if a new Notice of Intent is required. In any case the Commission may deny any deviation, accidental or intended, from the approved plan.

9. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

10. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

11. At no time shall any construction materials, soils, fills, sediments, dredging or any other substances be stockpiled or stored in any area of statutory interest.

12. All work within the area of statutory interest shall be performed so as to create minimum disturbance to the existing vegetative cover and contours.

13. The construction site shall be left in a stable condition at the close of each day. Erosion and sedimentation controls shall be continuously monitored to ensure proper operation.

14. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

15. Only tagged trees shall be removed. All limbs, branches, slash and deadwood shall be removed from the areas of statutory interest.

16. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

    The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

17. No liquid or solid chemical lawn fertilizers, pesticides, herbicides or chemical or petroleum dust control agents shall be applied within the area of statutory interest or anywhere that the surface drainage is discharged into an area of statutory interest. Also no petroleum or liquid or solid chemical storage is permitted in any areas of statutory interest.

18. During snow removal operations, snow shall not be piled or placed within an area of statutory interest, and snow containing extraneous matter shall be kept away from these areas. Road salt shall not be used in an area of statutory interest or on surfaces where

surface drainage discharges into these areas.

19. Where stone or rock fill has been specified for use in areas that will require subsequent seeding, a minimum of twelve (12) inches or compacted clean fill shall be placed prior to loam placement and seeding.

20. Periodic maintenance/cleaning of all drainage structures shall be conducted by the owner and all successors in interest or control of the property. The applicant, his successors or assigns shall have the continuing responsibility of this maintenance.

21. An as-built plan of the project shall be submitted to the Commission prior to the issuance of the Certificate of Compliance. Said plan shall fully define the geometry of the (basin, drainage channel, swale, catch basin or other structure) with at least one cross section detail.

22. Parcels abutting or containing wetland or resource areas shall carry the following restrictions, and a covenant so noted on each deed:

"This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

23. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

24. Commencing with the issuance of these Orders and continuing through the end of the construction phase of this project, the applicant or his successors and assigns shall submit to the Commission a written monthly progress report detailing the work that has been done of statutory interest.

25. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

26. The petitioner shall have recorded in the Hampden County Registry of Deeds an "Order of Conditions Form" provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

27. The restoration area is to commence in the next growing season (April 2023) and will be

monitored for two growing seasons with quarterly monitoring reports.

28. Prior to the start of construction, a plan shall be submitted and approved by the Conservation Commission showing the sign design and location of wetland boundary markers.

29. Signs and wetland boundary markers will be put up when each phase is at 75% completion.

30. The Conservation Commission is to be notified when responsibility of property management/maintenance is transferred to the Homeowners Association.

31. The Long Term Operation and Maintenance Plan shall be provided to each owner at the time of closing.

32. The Master Deed and Homeowners Association documents shall be submitted and approved by the Conservation Commission.

33. The contractor/developer will need to take extra precautions for units 68-81 to protect the area during construction from erosion, etc.

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☑ No

2. The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☐ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

057-0675
MassDEP File #

eDEP Transaction #

Agawam
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

11/15/22
1. Date of Issuance

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signature	Printed Name
	S. PAGE FALLON
	Cheryl Becker
	FRANK MEAGHER
	Henry Kozloski

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

11/15/22
Date

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

11/15/2022
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Henry Kozloski

S. Page Fallon

Sheryl Becker

Frank Meagher

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act

(M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

AGAWAM
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

AGAWAM
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

497 SOUTH WESTFIELD STREET — Project Location
087-0675 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

County — Book — Page

for:

Property Owner RALPH & GIUSEPPE DEPALMA & TIRONE

and has been noted in the chain of title of the affected property in:

Book — Page

In accordance with the Order of Conditions issued on:

Date

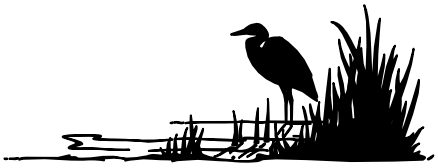
If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS

DEP File #087-0675 | Ralph Depalma & Giuseppe Tirone | 497 South Westfield Street

Finding:

- The Conservation Commission finds that there is an isolated area of hydric soils located in the northerly extent of the central field. The jurisdictional status of the isolated area of hydric soils under Section 401 and 404 of the Clean Waters Act is to be determined by DEP/USACE.

Special Conditions:

1. This Order supersedes all previous Orders of Conditions issued for this work.

2. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

3. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

4. In advance of any work for each phase of the project, the applicant shall contact the Conservation Commission and arrange a conference between the Commission, contractor, designer/engineer, and applicant. The purpose of this conference is to insure that all of the Orders are understood. This conference shall take place at a regularly scheduled Commission meeting.

5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

6. The Commission shall be notified at least seventy-two hours prior to the start of site work (including tree cutting or clearing).

7. The Commission shall be notified when the erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

8. The project engineer/designer shall be held responsible and accountable for the true and accurate implementation and construction of his/her design or plan. Should any

accidental deviation from the approved plan occur, the engineer/designer shall notify the Commission immediately to determine of a new Notice of Intent is required. If any changes to the approved plan are anticipated, the engineer/designer shall likewise notify the Commission to determine if a new Notice of Intent is required. In any case the Commission may deny any deviation, accidental or intended, from the approved plan.

9. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

10. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

11. At no time shall any construction materials, soils, fills, sediments, dredging or any other substances be stockpiled or stored in any area of statutory interest.

12. All work within the area of statutory interest shall be performed so as to create minimum disturbance to the existing vegetative cover and contours.

13. The construction site shall be left in a stable condition at the close of each day. Erosion and sedimentation controls shall be continuously monitored to ensure proper operation.

14. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

15. Only tagged trees shall be removed. All limbs, branches, slash and deadwood shall be removed from the areas of statutory interest.

16. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

    The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

17. No liquid or solid chemical lawn fertilizers, pesticides, herbicides or chemical or petroleum dust control agents shall be applied within the area of statutory interest or anywhere that the surface drainage is discharged into an area of statutory interest. Also no petroleum or liquid or solid chemical storage is permitted in any areas of statutory interest.

18. During snow removal operations, snow shall not be piled or placed within an area of statutory interest, and snow containing extraneous matter shall be kept away from these

areas. Road salt shall not be used in an area of statutory interest or on surfaces where surface drainage discharges into these areas.

19. Where stone or rock fill has been specified for use in areas that will require subsequent seeding, a minimum of twelve (12) inches or compacted clean fill shall be placed prior to loam placement and seeding.

20. Periodic maintenance/cleaning of all drainage structures shall be conducted by the owner and all successors in interest or control of the property. The applicant, his successors or assigns shall have the continuing responsibility of this maintenance.

21. An as-built plan of the project shall be submitted to the Commission prior to the issuance of the Certificate of Compliance. Said plan shall fully define the geometry of the (basin, drainage channel, swale, catch basin or other structure) with at least one cross section detail.

22. Parcels abutting or containing wetland or resource areas shall carry the following restrictions, and a covenant so noted on each deed:

"This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

23. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

24. Commencing with the issuance of these Orders and continuing through the end of the construction phase of this project, the applicant or his successors and assigns shall submit to the Commission a written monthly progress report detailing the work that has been done of statutory interest.

25. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

26. The petitioner shall have recorded in the Hampden County Registry of Deeds an “Order of Conditions Form” provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

27. The restoration area is to commence in the next growing season (April 2023) and will be monitored for two growing seasons with quarterly monitoring reports.

28. Prior to the start of construction, a plan shall be submitted and approved by the Conservation Commission showing the sign design and location of wetland boundary markers.

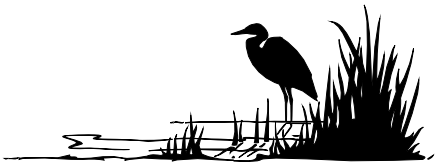
29. Signs and wetland boundary markers will be put up when each phase is at 75% completion.

30. The Conservation Commission is to be notified when responsibility of property management/maintenance is transferred to the Homeowners Association.

31. The Long Term Operation and Maintenance Plan shall be provided to each owner at the time of closing.

32. The Master Deed and Homeowners Association documents shall be submitted and approved by the Conservation Commission.

33. The contractor/developer will need to take extra precautions for units 68-81 to protect the area during construction from erosion, etc.



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Town of Agawam

Conservation Commission

36 Main Street, Agawam, Massachusetts 01001-1801

Tel. 413-726-9245 Fax 413-786-9927

February 23, 2024

Thomas L. Bretta
32 Eastwood Drive
Wilbraham, Ma 01095

Dear Mr. Bretta:

At its duly called meeting held on February 22, 2024, the Agawam Conservation Commission discussed the site visit at 497 South Westfield Street and voted to allow the removal of debris and dead tree stumps that was observed between stakes 14-18.

With any questions please call this office at 413-726-9737.

Sincerely,

Henry A. Kozloski, Chairman
AGAWAM CONSERVATION COMMISSION

Cc:
Town Clerk
File

Taryn Egerton

To: Conservation Commission
Subject: FW: 497 South Westfield Street

FYI

From: Tom Bretta <tommybretta@yahoo.com>
Sent: Thursday, February 22, 2024 2:30 PM
To: Taryn Egerton <TEgerton@agawam.ma.us>
Cc: Pamela Kerr <PKerr@agawam.ma.us>; Rob Levesque <RobL@rlaland.com>
Subject: Re: 497 South Westfield Street

Good afternoon
After a site visit with Henry at 497 South Westfield St there was a considerable amount of trash dumped in the wetlands between steaks 18-14. That we observed while walking the line. we are seeking permission to go in to that area with machines to do a cleanup so we can keep natural vegetation to keep growing.
Thank you,
Tom Bretta

Taryn Egerton

From: Ryan Nelson <RyanN@rlaland.com>
Sent: Thursday, April 14, 2022 9:04 AM
To: Taryn Egerton; Michelle Chase; Geri Tirone
Cc: Rob Levesque; Alexandra Cichetti; Filipe Cravo; John Tomaszewski; Christopher Karney
Subject: 497 South Westfield St - Test Pits

Hi Taryn,

As part of town engineering comments for the proposed condo project at 497 South Westfield Street, they are requesting additional information on the existing drainage structures between Taylor Pond and the BVW as well as a drainage pipe from #582 South Westfield Street that discharges on the subject property. The owner will be conducting test pits to determine the location, size, depth, and condition of these drain lines. These will be conducted within the existing tilled ag field and the test pits are an exempt minor activity under 310 CMR 10.02(2)(b)(2)(g). Please let us know if there are any questions or concerns.

Ryan Nelson
Environmental Scientist – Project Manager

R. Levesque Associates, Inc.
40 School Street
P.O. Box 640
Westfield, MA 01085
P: 413-729-6908
C: 860-485-3687
ryann@rlaland.com

This email may contain confidential and/or privileged information. If you are not the intended recipient, you are hereby notified that retention, dissemination, or copying of this communication is prohibited. If you have received this email in error, please notify the sender by reply email and permanently delete this email and any attachments. Thank you.

TOWN OF AGAWAM
STREET ADDRESS ASSIGNMENT/CHANGE

To: Mario Mazza, Elisa Dagenais, and Gina Carestia, DPW
Carolyn Reed and Donna Ruccio, Assessor's office
Kevin Duquette and Amanda Boissonneault, Inspection Services
Vincent Gioscia and Margaret McCarthy, Clerk's Office
Chief Alan Sirois, Fire Dept.
Chief Eric Gillis, Police Dept.
Christopher Caputo, Collector's Office
Pam Kerr and Taryn Egerton, Planning
Paul Nutting, MassGIS 911
Agawam Postmaster

From: DPW Engineering

Date: June 3, 2024

Subject: Parcel ID: E6 – 2 – 8

Current Street Address: 497 South Westfield Street

New Street Address: 507, 509, 515, 517, 523, 525 South Westfield Street
531, 533, 539, 541, 547, 549 South Westfield Street
555, 557 South Westfield Street

Requested by: Tom Bretta - Owner

Email/Phone: (413) 427-2386

Purpose of Address Assignment: Check All That Apply -

- [X] Building Permit
- [ ] White Form
- [ ] Form A - Parcel Boundary Change
- [ ] Other _____

Please alter the records in your department accordingly or contact us immediately if you have any questions or concerns.

LAYOUT NOTES

1. SITE CONTRACTOR SHALL REFER TO REMAINING PLAN SET FOR INFORMATION REGARDING SITE LAYOUT.
2. IT SHALL BE THE SITE CONTRACTORS RESPONSIBILITY TO CROSS REFERENCE INFORMATION CONTAINED IN OTHER SHEETS WITH SITE INFORMATION SHOWN HEREON.
3. PRIOR TO SUBMITTING THEIR BID FOR CONSTRUCTION, THE SITE CONTRACTOR SHALL COMMUNICATE ANY DISCREPANCIES BETWEEN THE PROPOSED DESIGN AND THE SAID SPECIFICATIONS WITH THE PROJECT PROPONENT AND LANDSCAPE ARCHITECT/ENGINEER. SHOULD THE SITE CONTRACTOR FAIL TO COMMUNICATE ANY DISCREPANCIES, HE/SHE SHALL BE RESPONSIBLE FOR ANY COSTS RESULTING FROM SAID DISCREPANCY.
4. INDIVIDUAL DRIVEWAY PERMITS WILL BE REQUIRED FOR EACH DRIVEWAY ALONG SOUTH WESTFIELD STREET. PROPOSED DRIVEWAYS TO MEET TOWN STANDARDS. SEE CROSS-SECTION ON SHEET C-7 AND RESIDENTIAL DRIVEWAY DETAIL ON SHEET D-5.
5. ALL SIGNAGE AND PAVEMENT MARKINGS SHOWN ON PLAN SHALL MEET U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATIONS'S GUIDELINES AS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC DEVISES (MUTCD) FOR STREETS AND HIGHWAYS" AND TOWN OF AGAWAM DESIGN STANDARDS.

SIGNAGE AND PAVEMENT MARKING NOTES

1. STRIPE ALL PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, AND ACCESSIBLE ROUTE MARKINGS AND SYMBOLS USING WHITE TRAFFIC PAINT. PAINTED ISLANDS, FIRE LANES, AND TRAVEL WAY CENTERLINES SHALL BE PAINTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL CONFORM TO AASHTO M248 TYPE "N".
2. STOP BARS SHALL BE 12" WIDE (WHITE).
3. ALL PARKING STALL LINES SHALL BE 4" WIDE (WHITE).
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", MASSDOT, STATE BUILDING CODE AND ADA REQUIREMENTS, AND AS SHOWN ON THE PLANS & DETAILS.

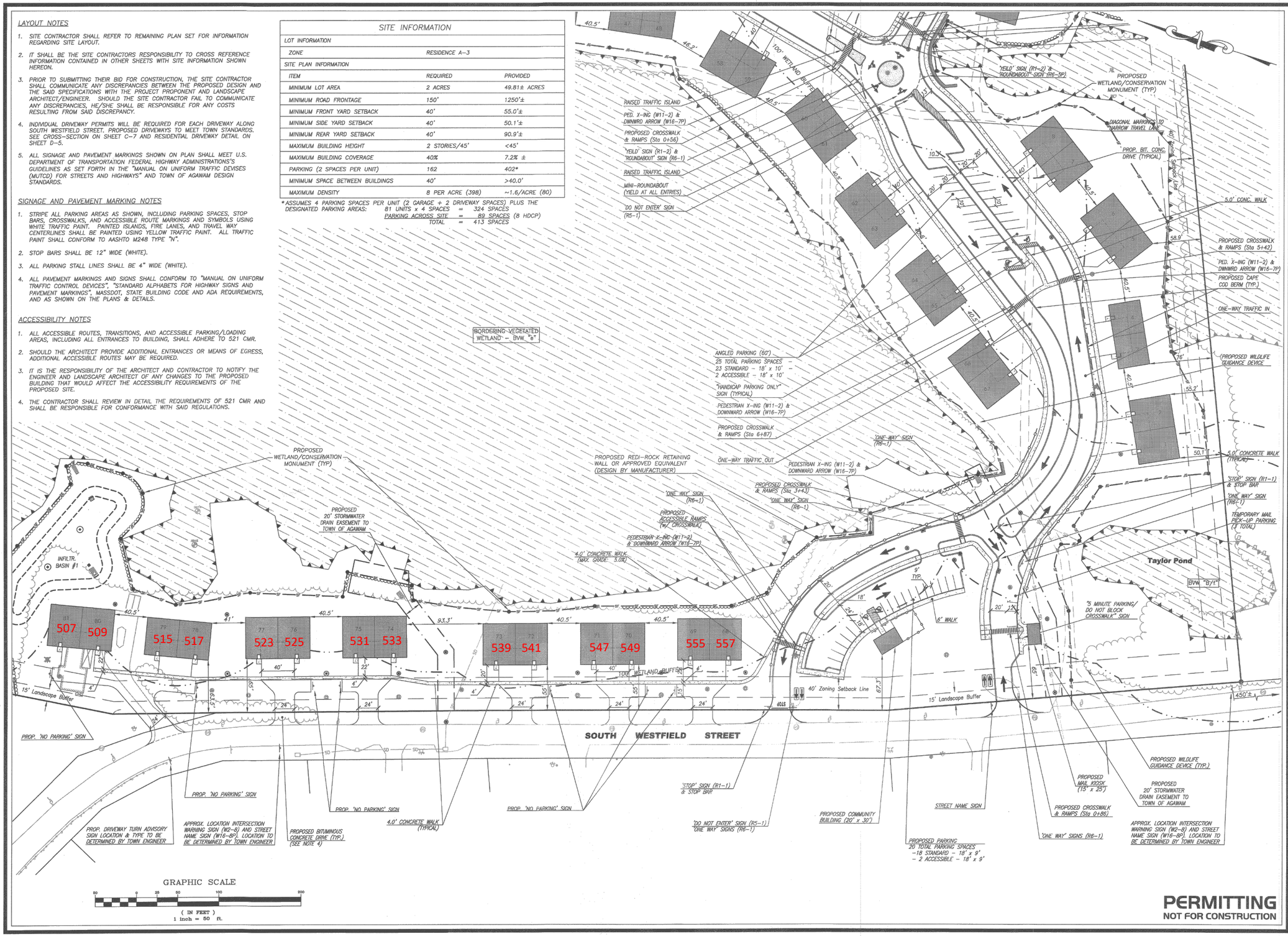
ACCESSIBILITY NOTES

1. ALL ACCESSIBLE ROUTES, TRANSITIONS, AND ACCESSIBLE PARKING/LOADING AREAS, INCLUDING ALL ENTRANCES TO BUILDING, SHALL ADHERE TO 521 CMR.
2. SHOULD THE ARCHITECT PROVIDE ADDITIONAL ENTRANCES OR MEANS OF EGRESS, ADDITIONAL ACCESSIBLE ROUTES MAY BE REQUIRED.
3. IT IS THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR TO NOTIFY THE ENGINEER AND LANDSCAPE ARCHITECT OF ANY CHANGES TO THE PROPOSED BUILDING THAT WOULD AFFECT THE ACCESSIBILITY REQUIREMENTS OF THE PROPOSED SITE.
4. THE CONTRACTOR SHALL REVIEW IN DETAIL THE REQUIREMENTS OF 521 CMR AND SHALL BE RESPONSIBLE FOR CONFORMANCE WITH SAID REGULATIONS.

SITE INFORMATION

LOT INFORMATION		
ZONE	RESIDENCE A-3	
SITE PLAN INFORMATION		
ITEM	REQUIRED	PROVIDED
MINIMUM LOT AREA	2 ACRES	49.81± ACRES
MINIMUM ROAD FRONTAGE	150'	1250'±
MINIMUM FRONT YARD SETBACK	40'	55.0'±
MINIMUM SIDE YARD SETBACK	40'	50.1'±
MINIMUM REAR YARD SETBACK	40'	90.9'±
MAXIMUM BUILDING HEIGHT	2 STORIES/45'	<45'
MAXIMUM BUILDING COVERAGE	40%	7.2% ±
PARKING (2 SPACES PER UNIT)	162	402*
MINIMUM SPACE BETWEEN BUILDINGS	40'	>40.0'
MAXIMUM DENSITY	8 PER ACRE (398)	~1.6/ACRE (80)

*ASSUMES 4 PARKING SPACES PER UNIT (2 GARAGE + 2 DRIVEWAY SPACES) PLUS THE DESIGNATED PARKING AREAS:
81 UNITS x 4 SPACES = 324 SPACES
PARKING ACROSS SITE = 89 SPACES (8 HDCP)
TOTAL = 413 SPACES



PERMITTING
NOT FOR CONSTRUCTION

S:\Projects\2009\090506_DePalma & Tirone\Civil 3D\090506 - SITE.dwg

RLA
R LEVESQUE ASSOCIATES INC
Landscape Architects
Civil Engineers · Land Surveyors
Environmental Consultants
ph: 413.568.0985 fax: 413.568.0986
40 School Street
Westfield, MA 01085
rlaland.com

LAYOUT & MATERIALS PLAN
(Southwesterly Section)

Map E6, Block 2, Lot 8
497 South Westfield Street
Agawam, MA

ROBERT A. LEVESQUE
REGISTERED LANDSCAPE ARCHITECT
NO. 1395
10/26/22

PREPARED FOR:
Joe Tirone
& Ralph Depalma
36 Canterbury Lane
Feeding Hills, MA 01030

ISSUANCE DATE: September 19, 2022

REVISIONS:	DATE:
A. Wetland monuments added	10/26/22

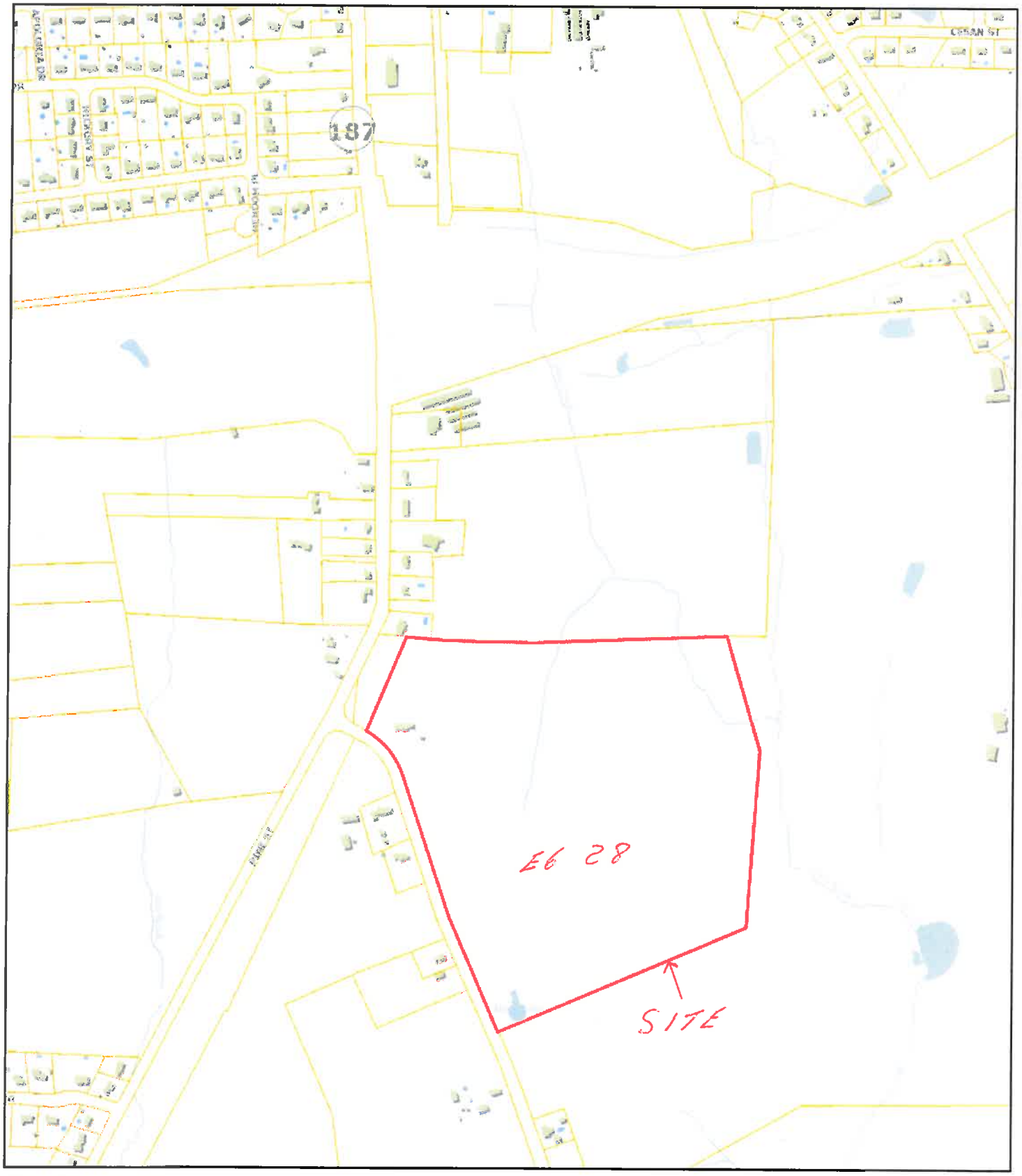
DRAFTED BY: JT, JM & CK

UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF MASSACHUSETTS STATE LAW

SCALE: As Noted

RLA PROJ. NUMBER: 090506

DRAWING#	REV.
C-4	A



The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

497 - South Westfield Street - E6 2 8

3/15/2016 1:14:39 PM

1:7200
1"=600'

1958

subject area


1970


1990


1997


2001


2003


2004


2005


2008


2009


2010


2012


2013


2019

Notice of Intent

Under
Massachusetts Wetlands Protection Act 310 CMR 10.00
Application, Narrative, & Supporting Documentation

Proposed Condominium Community

497 South Westfield Street
Agawam, MA 01030
(Map E6, Block 2, Parcel 8)

Submitted To:

Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01001

Applicants & Property Owners:

Mr. Ralph Depalma & Mr. Giuseppe Tirone
36 Canterbury Lane
Feeding Hills, MA 01030

RLA Project File No. 090506

R LEVESQUE ASSOCIATES, INC.
A LAND PLANNING SERVICES COMPANY
40 School Street, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

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NOTICE OF INTENT
PROPOSED CONDOMINIUM COMMUNITY
497 SOUTH WESTFIELD STREET
AGAWAM, MA 01030
(MAP E6, BLOCK 2, PARCEL 8)

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• AFFIDAVIT OF SERVICE	
• ABUTTERS NOTIFICATION LIST	
• NOTIFICATION TO ABUTTERS	
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SECTION 1

COVER LETTER

R LEVESQUE ASSOCIATES, INC.
40 School Street, P.O. BOX 640, Westfield, MA 01085
p 413.568.0985 · f 413.568.0986 · www.rlaland.com

March 9, 2022

Henry A. Kozloski, Chairman
Town of Agawam Conservation Commission
36 Main Street
Agawam, MA 01001

RE: **Notice of Intent – Proposed Condominium Community**
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
RLA Project File No. 090506

Dear Chairman Kozloski and Commissioners:

On behalf of the applicants and property owners, Mr. Ralph DePalma and Mr. Giuseppe Tirone, please find an original and requisite number of copies of a Notice of Intent (NOI) Application Packet and corresponding Site Plan Set for the above-referenced property in Agawam, Massachusetts. In addition, as required, a copy of this filing has been submitted electronically through eDEP and via email to the Town of Agawam Conservation Commission. The applicants propose the construction of a Condominium Community with associated site improvements to be located at the above-referenced property. Portions of the proposed work are located within the Buffer Zone to Bordering Vegetated Wetlands and Riverfront Area.

This proposed project was issued an Order of Conditions on 09/12/2013 (MassDEP File # 087-0593) and was extended to an expiration date of 09/12/2019; however, work never commenced and the OOC has since expired. Since the time of the previous OOC, the wetland boundaries of the subject site were redelineated in 2021. In certain limited areas, the boundary of wetlands has expanded and encroached into the previously permitted project site's limit of work. Accompanying this filing are revised site plans which have incorporated avoiding and minimizing disturbance to these above-mentioned resource areas to the greatest extent feasible while preserving the original project scope, stormwater management structures, and HydroCAD stormwater calculations.

We are hereby requesting to be placed on the Commission's next available agenda. Should you have any questions or comments regarding this Notice of Intent, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Environmental Scientist

cc: Ralph DePalma & Giuseppe Tirone

SECTION 2

WPA FORM 3 – NOTICE OF INTENT

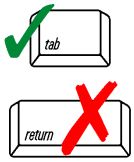
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Agawam
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

497 South Westfield Street — a. Street Address
Agawam — b. City/Town
01030 — c. Zip Code

Latitude and Longitude:
42.02548 N — d. Latitude
72.40257 W — e. Longitude

Map E6, Block 2 — f. Assessors Map/Plat Number
Parcel 8 — g. Parcel /Lot Number

2. Applicant:

Ralph & Giuseppe — a. First Name
Depalma & Tirone — b. Last Name
c. Organization
36 Canterbury Lane — d. Street Address
Feeding Hills — e. City/Town
MA — f. State
01030 — g. Zip Code
413-330-8722 — h. Phone Number
i. Fax Number
j. Email Address

3. Property owner (required if different from applicant): ☒ Check if more than one owner

Same as Applicants — a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Robert — a. First Name
Levesque — b. Last Name
R Levesque Associates, Inc. — c. Company
40 School Street — d. Street Address
Westfield — e. City/Town
MA — f. State
01085 — g. Zip Code
413-568-0985 — h. Phone Number
413-568-0986 — i. Fax Number
robl@rlaland.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$33,075.00 — a. Total Fee Paid
$16,525.00 — b. State Fee Paid
$16,550.00 — c. City/Town Fee Paid

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Bureau of Resource Protection - Wetlands

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Provided by MassDEP:

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A. General Information (continued)

6. General Project Description:

The applicants propose the construction of a Condominium Community with associated site improvements to be located at the above-referenced property. Portions of the proposed work are located within the Buffer Zone to Bordering Vegetated Wetlands and Riverfront Area. Please refer to the Narrative Addendum and accompanying Site Plan Set for further information.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☒ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

a. County	b. Certificate # (if registered land)
Hampden	
c. Book	d. Page Number
14554	323

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Tributary of Philo Brook 1. Name of Waterway (if available) - **specify coastal or inland**	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 168,123 +/- square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
32,981 +/-	0 +/-	32,981 +/-

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   MassMapper
   02/28/2022

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☐ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☐ Is this an aquaculture project? d. ☐ Yes ☐ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

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C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
      2. ☐ A portion of the site constitutes redevelopment
      3. ☒ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:
      1. ☐ Single-family house
      2. ☐ Emergency road repair
      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

"Conservation Filing Plans"
a. Plan Title

R Levesque Associates, Inc
b. Prepared By

Filipe J. Cravo, P.E.
c. Signed and Stamped by

02/10/2022
d. Final Revision Date

As Shown
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

294
2. Municipal Check Number

03/08/2022
3. Check date

291
4. State Check Number

03/08/2022
5. Check date

Giuseppe + Ralph
6. Payor name on check: First Name

Tirone + DePalma
7. Payor name on check: Last Name

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant — 2. Date: 03/09/2022

3. Signature of Property Owner (if different) — 4. Date: 03/09/2022

5. Signature of Representative (if any) — 6. Date: 3/9/2020

Ryan McGee, R. Levesque Associates, Inc. — 3/9/2022

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

SECTION 3

NARRATIVE ADDENDUM TO NOI

NARRATIVE ADDENDUM TO NOTICE OF INTENT

Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Parcel 8)
RLA Project File No. 090506

INTRODUCTION & SITE DESCRIPTION

On behalf of the applicants and property owners, Mr. Ralph Depalma and Mr. Giuseppe Tirone, R Levesque Associates, Inc. is herein providing this Narrative Addendum as a supplement to the Notice of Intent (NOI) for the proposed work to be located at 497 South Westfield Street. The applicants propose the construction of a condominium community with associated site improvements to be located at the above-referenced property. Portions of the proposed work are located within Buffer Zone to Bordering Vegetated Wetlands and Riverfront Area.

A similar project was issued an Order of Conditions on 09/12/2013 (MassDEP File # 087-0593) and was extended to an expiration date of 09/12/2019; however, work never commenced and the OOC has since expired. Since the time of the previous permit, the wetland boundaries of the subject site were re-delineated in 2021. In certain limited areas, the boundary of wetlands has expanded and encroached into the previously permitted project site's limit of work. Accompanying this filing are revised site plans which have incorporated avoiding and minimizing disturbance to these above-mentioned resource areas to the greatest extent feasible while preserving the original project scope, stormwater management system, and HydroCAD stormwater calculations.

The subject property (hereinafter referred to as the "project site") is located northeast of South Westfield Street and consists of approximately 49.81 ± acres and is shown on the accompanying site plans set entitled "Conservation Filing Plan" (Sheets CC-1, CC-2, CC-3 & D-1), prepared by R Levesque Associates, Inc., dated February 10, 2022. Said property is recorded in the Hampden County Registry of Deeds in Book 14554, Page 323.

Examination of GIS information for the Massachusetts Natural Heritage Atlas revealed that the subject property is not located within Natural Heritage and Endangered Species Program (NHESP) Jurisdiction. The project site is not located within the 100-year Special Flood Zone Area. Please see below for further information on resource areas related to this project site.

Topography

A USGS Topographic Map is included in Section 4, as Figure 1, of this NOI application packet. The topography within the subject site is gently rolling agricultural land and

varies. Please refer to the accompanying site plan set for further information regarding existing and proposed site contours.

Soils

According to Web Soil Survey Map, the soil types mapped on the project site consists of; Raynham silt loam, 0 to 3 percent slopes, (30A); Wareham loamy sand, 0 to 3 percent slopes, (32A); Merrimac fine sandy loam, 0 to 3 percent slopes (254A); Merriman fine sandy loam, 3 to 8 percent slopes, (254B); Windsor loamy sand, 3 to 8 percent slopes, (255B); Amostown fine sandy loam, 0 to 6 percent slopes, (258B); Enfield silt loam, 3 to 8 percent slopes, (265B); Agawam fine sandy loam, 3 to 8 percent slopes, (275B); Ninigret fine sandy loam, 0 to 3 percent slopes, (276B); Meckesville loam, 3 to 8 percent slopes, (327B); Meckesville loam, 8 to 15 percent slopes, (327C); Wethersfield fine sandy loam, 3 to 8 percent slopes, (397B); Pits, gravel, (600); Enosburg loamy sand, 0 to 3 percent slopes, (731A); and Scantic Variant silt loam, 0 to 3 percent slopes, (736A). Please refer to the attached NRCS Soil Map in Section 4, as Figure 3, of this NOI application packet for exact locations of the below defined soils.

The Raynham series consists of very deep, poorly drained soils that formed in silty estuarine or glaciolacustrine deposits on glacial lake plains and marine terraces. Saturated hydraulic conductivity is moderately high or high in the solum and moderately low or moderately high in the substratum. Slope ranges from 0 through 12 percent. The Taxonomic Class is coarse-silty, mixed, active, nonacid, mesic Aeric Epiaquepts.

The Wareham series consists of very deep, poorly, and somewhat poorly drained sandy soils formed in outwash on plains, deltas, and terraces. Slope ranges from 0 to 8 percent. Permeability is rapid throughout. The Taxonomic Class is mixed, mesic Humaqueptic Psammaquents.

The Merrimac series consists of very deep, somewhat excessively drained soils formed in outwash. They are nearly level through very steep soils on outwash terraces and plains and other glaciofluvial landforms. Slope ranges from 0 through 35 percent. Saturated hydraulic conductivity is high or very high. The Taxonomic Class is sandy, mixed, mesic Typic Dystrudepts.

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is high or very high. The Taxonomic Class is mixed, mesic Typic Udipsamments.

The Amostown series consists of very deep, moderately well drained soils formed in loamy glacial outwash overlying lacustrine sediments. They are nearly level to gently sloping soils on terraces, outwash plains, and deltas. Permeability is moderately rapid in the solum and slow to moderately slow in the substratum. Slope ranges from 0 to 8

percent. The Taxonomic Class is coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts.

The Enfield series consists of very deep, well drained loamy soils formed in a silty mantle overlying glacial outwash. They are nearly level to sloping soils on outwash plains and terraces. Slope ranges from 0 to 15 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. The Taxonomic Class is coarse-silty over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts.

The Agawam series consists of very deep, well drained soils formed in sandy, water deposited materials. They are level to steep soils on outwash plains and high stream terraces. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is moderately high or high in the upper solum and high or very high in the lower solum and substratum. The Taxonomic Class is coarse-loamy over sandy-skeletal, mixed, active, mesic Typic Dystrudepts.

The Ninigret series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainage ways. Slope ranges from 0 through 15 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. The Taxonomic Class is coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts.

The Meckesville series consists of very deep well drained soils formed in colluvium, glacial till, or congeliturbate from red acid sandstone, siltstone, and shale. They are on the concave sideslopes of upland ridges. Slope ranges from 0 to 60 percent. Permeability is moderately slow. The Taxonomic Class is fine-loamy, mixed, active, mesic Typic Fragiudults.

The Wethersfield series consists of very deep, well drained loamy soils formed in dense glacial till on uplands. The soils are moderately deep to dense basal till. They are nearly level to steep soils on till plains, low ridges, and drumlins. Saturated hydraulic conductivity is moderately low to high in the solum and low to moderately high in the substratum. Slope ranges from 0 to 35 percent. The Taxonomic Class is coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts.

The Enosburg series consists of very deep, poorly drained soils that formed in sandy glaciofluvial or aeolian deposits underlain by loamy estaurine or glaciolacustrine deposits. They are on glacial lake plains and glacial outwash areas. Permeability is rapid in the surface layer and upper part of the substratum and moderately slow or slow in the lower part of the substratum. Slope ranges from 0 to 8 percent. The Taxonomic Class is sandy over loamy, mixed, active, nonacid, mesic Aeric Epiaquents.

The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. The Taxonomic Class is fine, illitic, nonacid, frigid Typic Epiaquepts.

PROJECT DESCRIPTION

The proposed project will consist of the construction of an 81-unit condominium community with associated site improvements. Proposed site improvements include a community building, a roadway, access drives, site grading, installation of utilities, and stormwater management structures located throughout the property. Please see the accompanying Construction Sequencing for further detail on how construction activities will proceed.

Portions of the proposed stormwater management system is located within the 200-foot Riverfront Area to the Tributary of Philo Brook. The remaining majority of the project is located within the Buffer Zone to various other Bordering Vegetated Wetlands.

RESOURCE AREAS

The following is a description of the resource areas as they relate to the project site. The wetland resource areas observed within jurisdiction on the project site include Bordering Vegetated Wetlands and Riverfront Area. The wetland resource areas shown on the accompanying site plan set were re-delineated by R Levesque Associates, Inc. in 2021.

Bank

In 310 CMR 10.54(2), a "*Bank is the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland.*"

Per 310 CMR 10.58(2), "*Mean Annual High-water Line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts.*"

Bank is associated with a perennial stream known as a tributary of Philo Brook which traverses the northeastern corner of the subject property. A portion of the Mean Annual High-Water line of a tributary to Philo Brook has been delineated in the field with

sequentially numbered blue flagging labeled "MAHW-100" through "MAHW-125". Said stream originates off-site from the north and flows southerly to its confluence with Philo Brook. No bank will be disturbed as a result of this project.

Bank is also associated with a culverted intermittent stream that connects the overflow of the "F" wetland series (Taylor Pond) to the "E" wetland series. This culvert will remain undisturbed as part of this project and there will be no disturbance to bank.

Bank is also associated with other various intermittent streams located within BVW areas. These interior intermittent streams have not been delineated as they are not the outermost resource area in relation to the project site.

Bordering Vegetated Wetlands (BVW)

As stated in 310 CMR 10.55(2)(a), *"Bordering Vegetated Wetlands are freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support as predominance of wetland indicator plants."*

BVW is located to the east and west of the project site. BVW was delineated in the field with sequentially numbered pink flagging as shown on the accompanying site plans. The wetland boundary was identified according to the provision of the Wetlands Protection Act (WPA), its associated regulations 310 CMR 10.00, and the "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act" a Handbook, dated March 1995. The wetland boundaries were defined by a change in topography, vegetative plant composition, surface inundation, and contrasting hydric vs. nonhydric soils.

BVW – A (Flags A-1 through A-51) is located along the southern property boundary.

BVW – C (Flags C-1 through C-19) and BVW – D (Flags D-1 through D-37) are located in the east and northeast portions of the site adjacent to the tributary of Philo Brook. Portions of the "D" wetland series extends into the existing agricultural field.

BVW – E (Flags E-1 through E-107) is a forested wetland located centrally in the property.

BVW – F (flags F-1 through F-20) encompass Taylor Pond and are located in the southwest corner of the site. This wetland has an outlet culvert that drains to the "E" wetlands series.

No BVW will be disturbed as part of this project.

Buffer Zone

Buffer Zone as defined in 310 CMR 10.04 is *"the area of land extending 100 feet horizontally outward from the boundary of any areas specified in 310 CMR 10.02(1)(a)".*

Buffer Zone on the subject property is associated with BVW and Bank of the piped intermittent stream on the property and is shown on the accompanying plan to extend 50 and 100 feet from the boundary of the BVW and Bank of the intermittent stream. Work proposed within the Buffer Zone includes portions of the construction of the residential building units, access drives, stormwater management system features, and site grading. The majority of proposed work within the buffer zone will take place upon an existing actively farmed agricultural fields with some clearing of wooded forest areas required for this project. Erosion controls will be installed along the limit of work to prevent erosion and sedimentation of wetland resource areas. Please refer to the accompanying site plans for further information on the location of proposed work in relation to Buffer Zone.

Bordering Land Subject to Flooding (BLSF)

According to 310 CMR 10.57(2)(a)1., "*Bordering Land Subject to Flooding is an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetlands."*

According to Flood Insurance Rate Map Number 25013C0391E, effective date 7/16/2013, no BLSF exists within the subject property and therefore no disturbance to BLSF is proposed as part of this project. The FEMA Floodplain Map is included as Figure 2 in Section 4 of this application packet.

Land Under Water Bodies and Waterways (LUWW)

As defined in 310 CMR 10.56(2) "*Land Under Water Bodies and Waterways is the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rock or bedrock."*

LUWW is associated with the perennial stream known as a tributary of Phil Brook. No LUWW will be disturbed as part of this project.

Riverfront Area (RA)

310 CMR 10.58(2) states that a "*Riverfront Area is the area of land between a river's mean annual high-water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zone. The riverfront area does not have a buffer zone."*

The perennial stream known as a tributary of Philo Brook traverses the northeastern corner of the subject property. A 200-foot Riverfront Area has been shown to extend outward from the Mean Annual High-Water line of said stream, which encompasses a portion of the property. Portions of two of the proposed stormwater basins are located within Riverfront Area, totaling approximately 32,981 ± square feet of disturbance within Riverfront Area. However, this disturbance is exempt from the calculation of Riverfront Area alteration per the regulations at 310 CMR 10.58(4)(d)1 which states:

> *"The calculation of square footage of alteration shall exclude areas of replication or compensatory flood storage required to meet performance standards for other resource areas, or any area of restoration within the riverfront area. The calculation also shall exclude areas used for structural stormwater management measures, provided there is no practicable alternative to siting these structures within the riverfront area and provided a wildlife corridor is maintained (e.g. detention basins shall not be fenced)."*

Therefore, no regulatory alteration within Riverfront Area is proposed. All work has been sited outside of the 100-foot Inner Riparian corridor. Please see the accompanying alternatives analysis for further justification of disturbances to Riverfront Area.

EROSION CONTROLS & BEST MANAGEMENT PRACTICES

Measures proposed to minimize earth disturbing impacts of the proposed project will be undertaken through the use of Best Management Practices. This includes, but is not limited to limiting the area of disturbance, installing erosion controls between the work area and adjacent resource areas and their associate buffer zones, construction entrance anti-tracking pads, temporary stormwater controls, etc. The proposed project site disturbance area exceeds one (1) acre and a Stormwater Pollution Prevention Plan (SWPPP) will be required prior to construction activities. Please refer to the accompanying site plans which depict the locations and details on erosion controls. All exposed soils on the site will be stabilized as soon as possible. Barrier controls will not be removed until 70% stabilization has been achieved over 90% of the area. The Agawam Conservation Commission will be notified prior to the controls being removed. Please see the accompanying site plans which depict the location of barrier controls.

[END OF NARRATIVE ADDENDUM]

ALTERNATIVES ANALYSIS FOR WORK IN RIVERFRONT AREA

Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Lot 8)
RLA Project File No. 090506

Introduction

The work proposed by the applicant consists of the construction of a condominium community with access roads and associated site improvements. A portion of the proposed development takes place within the 200-foot Riverfront Area of the perennial stream known as a Tributary of Philo Brook. Said stream crosses through the property boundary in the northeastern most corner of the subject site. The proposed storm water management basins will be partially located within the 200-foot Riverfront Area. The work within the Riverfront Area has been proposed in the least intrusive manner possible and a thorough alternatives analysis has been explored prior to deciding on the current design. The work in the Riverfront Area is limited to work absolutely necessary to complete the proposed stormwater management basins. The total alteration of Riverfront Area on-site is approximately 32,981 square feet and is exclusively associated with the proposed stormwater basins; this figure is excluded from permitting calculations for Riverfront Area alteration as provided for in the Wetlands Protection Act at 310 CMR 10.58(4)(d)1.

Stormwater Basin Placement Alternatives:

Three stormwater basins have been proposed to be located adjacent to the access road in the northeastern portion of the property, two of which fall partially within the 200-foot Riverfront Area of the aforementioned Tributary of Philo Brook. The following are the alternatives explored prior to selecting the chosen locations for said basins:

Alternative # 1 – Alternate On-site Locations

Alternate on-site locations were explored during the planning of the proposed project. The predevelopment runoff flows were examined, and said flows were maintained to the extent possible. This approach required that all stormwater basins be located at the low points within the site to maintain the same general collection point for runoff. Therefore, alternative locations for stormwater basins would not be feasible or even possible without extreme earthwork operations to aggressively re-contour the land. Said efforts would drastically change the

watersheds and receiving wetlands within and adjacent to the subject parcel. For the aforementioned reasons, the above alternative is neither environmentally responsible nor economically feasible.

Alternative # 2 – Omit Stormwater Management

As you are aware, under State, local, and Federal regulations, a project of this nature cannot be permitted without the requisite stormwater controls nor would the site function in a manner suitable for vehicular circulation and human habitation without said controls. Therefore, it is not viable to omit Stormwater Management from the proposed project.

Alternative # 3 – Off-Site Alternatives

Due to the contour of the subject property, the adjacent Bordering Vegetated Wetlands, and the tributary to Philo Brook, off-site stormwater management locations are not feasible and would drastically change the hydrology of the subject property and adjacent resource areas. Per 310 CMR 10.58(4)(c)2.b. and as requested in the Request for Determination of Applicability dated November 4, 2009, the area under consideration for practicable alternatives is limited to the subject property. Under these conditions, the chosen locations are the only practicable sites for the work proposed within the Riverfront Area.

Alternative # 4 (Chosen Alternative) – Site stormwater basins partially within the Riverfront Area

As discussed in Alternative # 1, the stormwater basins have been strategically located to match pre- and post-development runoff flows. The basins have been located logically at low points to provide the best opportunity for collection, treatment, detainment, and controlled release. As one can see from the extensive stormwater report developed for this project, alternative locations are neither environmentally responsible nor economically feasible. The proposed stormwater basins are placed as far out of the Riverfront Area as possible to minimize potential impacts.

[END OF ALTERNATIVES ANALYSIS]

CONSTRUCTION SEQUENCING PLAN

Proposed Condominium Community
497 South Westfield Street
Agawam, Massachusetts 01030
(Map E6, Block 2, Lot 8)
RLA Project File No. 090506

The following outlines the sequence of proposed construction activities at the above-referenced project site:

1. The Applicant will schedule and attend a pre-construction meeting with the Conservation Commission, key Town personnel, and the Project Engineer;
2. The Limit of Work shall be staked by means of survey by a design professional;
3. The anti-tracking pad shall be installed at the construction entrance;
4. Perimeter erosion/sedimentation controls shall be installed. Intermediate erosion/sedimentation controls shall be installed as stormwater components come online and as construction progresses;
5. Trees and other woody vegetation within the Limit of Work shall be cleared;
6. The site shall be grubbed in preparation for construction;
7. The access roads and building pads shall be rough graded;
8. The water line shall be installed;
9. The drainage system shall be installed. Stormwater basins shall be constructed as "temporary sediment basins" to accommodate construction-period flows;
10. The sewer and site utilities shall be installed;
11. Condominiums foundations are to be excavated for forms and concrete pours;
12. Condominium foundations are to be backfilled and compacted;
13. Condominiums are to be constructed;
14. Condominium utilities are to be trenched, installed, and backfilled;
15. The site shall be finish graded;
16. Site plantings shall be installed;
17. Lawn areas shall be loamed and hydro-seeded. Turf shall be established on all slopes as required per plans;
18. At or near the close of construction, the Owner shall meet with the Conservation Commission on-site to review status of project;
19. The Owner shall request a Certificate of Compliance from the Conservation Commission; and
20. Erosion controls and any remaining accumulated sediment shall be removed as approved by Conservation Commission.

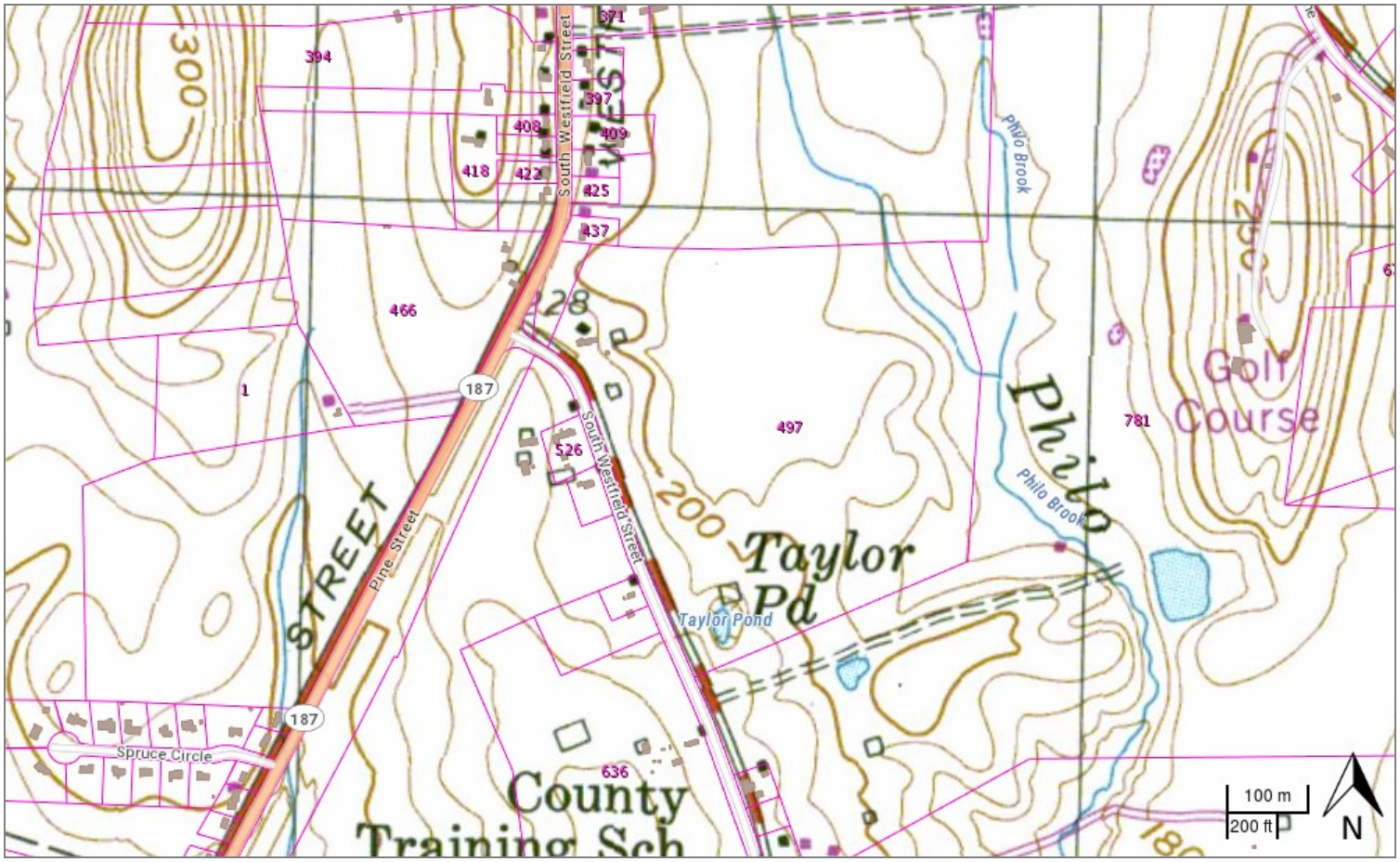
[END OF CONSTRUCTION SEQUENCING PLAN]

SECTION 4

FIGURES

- FIGURE 1 – USGS TOPOGRAPHIC MAP
- FIGURE 2 – FEMA FLOODPLAIN MAP
- FIGURE 3 – NRCS SOILS MAP

497 South Westfield Street



NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

Tax Parcels for Query

Detailed Features

Tax Parcels for Display

Structures

USGS Topographic Maps

MassGIS Statewide Basemap
MassGIS Topographic Features Bas

National Flood Hazard Layer FIRMette

FEMA

42°3'12.68"N

72°40'44.21"W



72°40'6.75"W

42°2'45.96"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

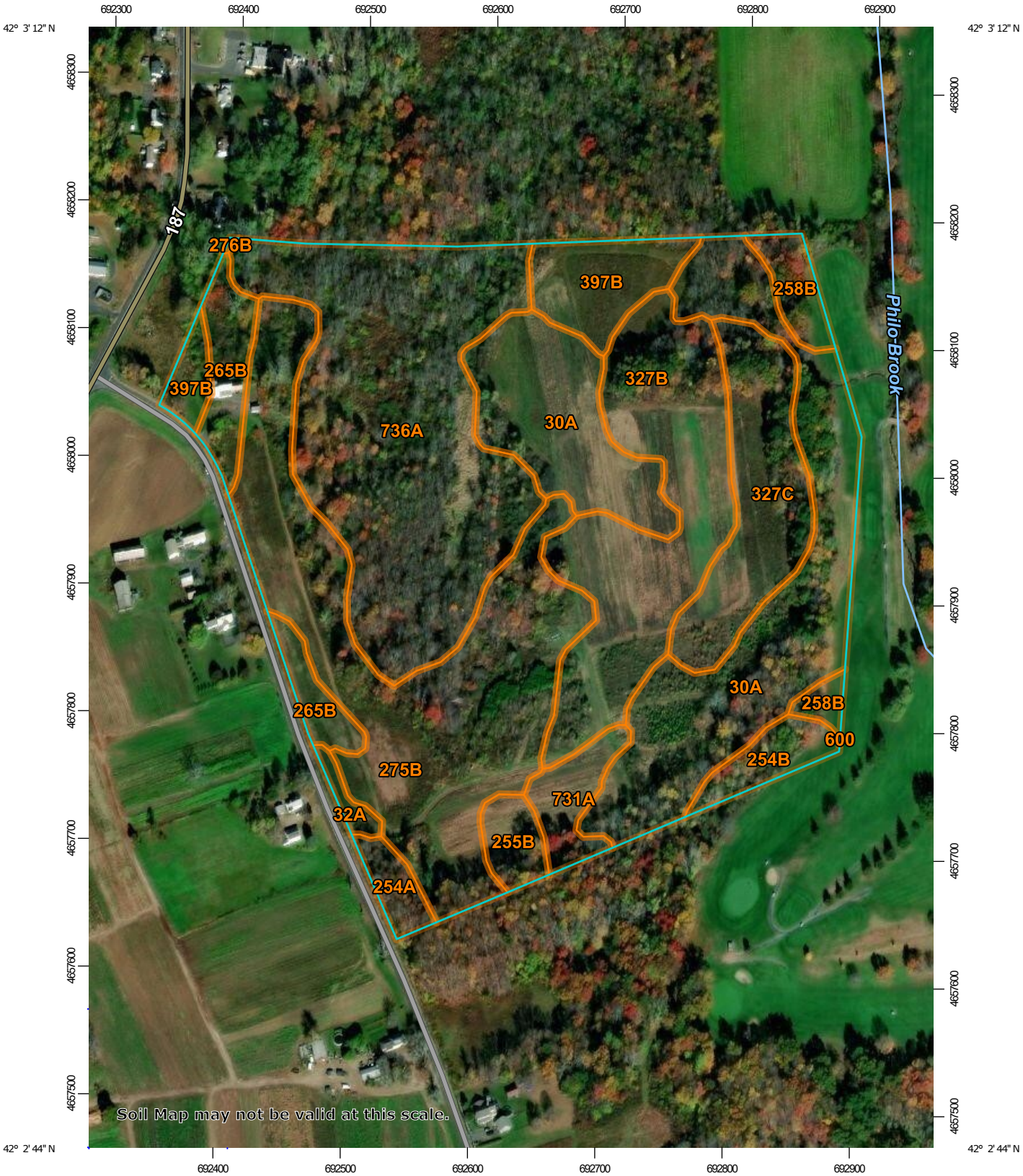
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/13/2020 at 12:59:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Hampden County, Massachusetts, Central Part
(497 South Westfield St, Agawam, MA)



Map Scale: 1:4,280 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 13, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Raynham silt loam, 0 to 3 percent slopes	11.5	20.9%
32A	Wareham loamy sand, 0 to 3 percent slopes	0.3	0.5%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.6	1.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.9	1.7%
255B	Windsor loamy sand, 3 to 8 percent slopes	0.8	1.4%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	1.1	2.0%
265B	Enfield silt loam, 3 to 8 percent slopes	2.0	3.6%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	11.3	20.5%
276B	Ninigret fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
327B	Meckesville loam, 3 to 8 percent slopes	7.0	12.8%
327C	Meckesville loam, 8 to 15 percent slopes	3.8	6.9%
397B	Wethersfield fine sandy loam, 3 to 8 percent slopes	2.3	4.3%
600	Pits, gravel	0.0	0.0%
731A	Enosburg loamy sand, 0 to 3 percent slopes	1.1	2.0%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	12.2	22.3%
Totals for Area of Interest		**54.9**	**100.0%**

SECTION 5

ADMINISTRATIVE FORMS

- WETLAND FEE TRANSMITTAL FORM
- COPY OF CHECKS
- AFFIDAVIT OF SERVICE
- ABUTTERS NOTIFICATION LISTS
- NOTIFICATION TO ABUTTERS

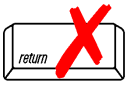
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A. Applicant Information

1. Location of Project:

497 South Westfield Street	Agawam
a. Street Address	b. City/Town
291	$16,525.00
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Ralph & Giuseppe		Depalma & Tirone	
a. First Name		b. Last Name	
c. Organization			
36 Canterbury Lane			
d. Mailing Address			
Feeding Hills	MA	01030	
e. City/Town	f. State	g. Zip Code	
413-330-8722			
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

Same as Applicants			
a. First Name		b. Last Name	
c. Organization			
d. Mailing Address			
e. City/Town	f. State	g. Zip Code	
h. Phone Number	i. Fax Number	j. Email Address	

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 3b	30	$1,050.00	$31,500.00
Category 3a (Riverfront Area)	1	1.5 x $1,050.00	$1,575.00

Step 5/Total Project Fee: $33,075.00

Step 6/Fee Payments:

Total Project Fee:	$33,075.00 a. Total Fee from Step 5
State share of filing Fee:	$16,525.00 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	$16,550.00 c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

GIUSEPPE TIRONE
RALPH DEPALMA
36 CANTERBURY LN.
FEEDING HILLS, MA 01030-1718

53-7160/2118
1000417871

294

DATE 3/8/2022

PAY TO THE ORDER OF Town of Agawam $ 2,500 00

Twenty Five Hundred Dollars 00/00 DOLLARS

Security Features Included. Details on Back.

WESTFIELD BANK
WESTFIELD, MA 01086

MEMO South Westfield St

Giuseppe Tirone MP

⑆211871604⑆ 1000417871 0294

© DELUXE WALLET OR DUPLICATE

SPECIALTY MINT

GIUSEPPE TIRONE
RALPH DEPALMA
36 CANTERBURY LN.
FEEDING HILLS, MA 01030-1718

53-7160/2118
1000417871

291

DATE 3/8/2022

PAY TO THE ORDER OF Commonwealth of MASS $ 16,525.00

Sixteen Thousand Five Hundred Twenty Five DOLLARS

Security Features Included. Details on Back.

WESTFIELD BANK
WESTFIELD, MA 01086

MEMO S Westfield St

Giuseppe Tirone MP

⑆211871604⑆ 1000417871 0291

© DELUXE WALLET OR DUPLICATE

SPECIALTY MINT

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

I, Alexandra Cichetti of R Levesque Associates, Inc., hereby certify under the pains and penalties of perjury that on or about March 10, 2022, I gave notification to abutters in compliance with the second paragraph of Mass General Law Chapter 131, Section 40, and the *DEP Guide to Abutter Notification* dated April 8, 1994, in accordance with the following matter:

> A Notice of Intent filed under the Massachusetts Wetlands Protection Act by Ralph Depalma & Giuseppe Tirone, with the Town of Agawam Conservation Commission on or about March 10, 2022, for property located at 497 South Westfield Street (Assessor's Map E6, Block 2, Parcel 8), Agawam, Massachusetts.

The form of notification, and a list of the abutters to whom it was given, and their addresses are attached to this Affidavit of Service.

Alexandra Cichetti _____ 03/10/2022

Alexandra Cichetti — Date

E6 2 7
AYKANIAN-MORIN GAIL A L/T
437 SO WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 5
CZERPAK JOSEPH A
636 SOUTH WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 1
CZERPAK JOSEPH A
636 SO WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 4
CZERPAK JOSEPH A
626 SOUTH WESTFIELD ST
FEEDING HILLS, MA 01030-

E4 1 1
CZERPAK JOSEPH A
636 SO WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 3
CZERPAK STEPHEN A
544 SO WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 6
DAVIS MICHAEL C L/T
582 SOUTH WESTFIELD ST
FEEDING HILLS, MA 01030-

E5 1 2
DAVIS MICHAEL C L/T
582 SOUTH WESTFIELD ST
FEEDING HILLS, MA 01030-

E6 2 8
DEPALMA RALPH
36 CANTERBURY LN
FEEDING HILLS, MA 01030

F6 1 1
ST. ANNE`S COUNTRY CLUB
781 SHOEMAKER LN
FEEDING HILLS, MA 01030-

E6 2 4
WHITE KAREN M
397 SOUTH WESTFIELD ST
FEEDING HILLS, MA 01030-

NOTIFICATION TO ABUTTERS

(Under the Massachusetts Wetlands Protection Act)

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, you are hereby notified of the following:

1. Name of Applicant: Ralph Depalma & Giuseppe Tirone

2. The applicant's representative, R Levesque Associates, Inc., has filed a Notice of Intent with the Conservation Commission in the Town of Agawam seeking permission to perform activities subject to the above regulations. The applicants propose the construction of a Condominium Community with associated site improvements to be located at the below-referenced property. Portions of the proposed work are located within the Buffer Zone to Bordering Vegetated Wetlands and Riverfront Area.

3. The address of the lot where the activity is proposed is 497 South Westfield Street, Agawam, Massachusetts – Map E6, Block 2, Parcel 8.

4. Copies of the Notice of Intent may be examined at the Conservation Commission office in the Agawam Town Hall Building located at 36 Main Street between the hours of 9:00 AM and 4:00 PM Monday – Friday.

5. Copies of the Notice of Intent may be obtained from the applicant's representative, R Levesque Associates, Inc. in Westfield, MA, between the hours of 9:00 AM and 4:00 PM, Monday through Friday by calling (413) 568-0985. There is a $95 copying fee for copies of the Notice of Intent, including plan sheets.

6. Information regarding the time of the Public Hearing may be obtained by calling the Town of Agawam Conservation Commission at (413) 726-9737.

7. Notice of the public hearing, including its date, time, and location will be published at least five (5) business days prior to the hearing in the local circulating newspaper.

8. Notice of the Public Hearing, including the date, time, and location, will be posted in the Agawam Town Hall at least forty-eight (48) hours in advance of the meeting date.

9. You may contact the local MA DEP, Western Regional Office at (413) 784-1100 for more information on this application or the Wetlands Protection Act.

APPENDIX

SITE PLAN SET ENTITLED "CONSERVATION FILING PLAN"
PREPARED BY R LEVESQUE ASSOCIATES, INC.
DATED FEBRUARY 10, 2022

STORMWATER DRAINAGE REPORT (UNDER SEPARATE COVER)

Town of Agawam
Conservation Commission

Conservation Commission
36 Main Street
Agawam, MA 01001
Ph: 413-786-0400 ext. 8737
Fax: 413-786-9927

June 14, 2024

Thomas L. Bretta
32 Eastwood Drive
Wilbraham, Ma 01095

Dear Mr. Bretta:

At its duly called meeting held on June 13, 2024, the Agawam Conservation Commission discussed your request to put concrete patios at the rear egress of each unit at 497 South Westfield Street. It was determined that all construction would be within the limit of work line and therefore the Commission voted to allow the installation of these concrete patios. In other business, the Conservation Commission requests notification prior to the installation of the monuments so they can be onsite to determine placement.

With any questions please call this office at 413-726-9737.

Sincerely,

Henry A. Kozloski, Chairman
AGAWAM CONSERVATION COMMISSION

Cc:
Town Clerk
File

Town of Agawam

Conservation Commission

36 Main Street, Agawam, Massachusetts 01001-1801

Tel. 413-726-9245 Fax 413-786-9927

February 23, 2024

Thomas L. Bretta
32 Eastwood Drive
Wilbraham, Ma 01095

Dear Mr. Bretta:

At its duly called meeting held on February 22, 2024, the Agawam Conservation Commission discussed the site visit at 497 South Westfield Street and voted to allow the removal of debris and dead tree stumps that was observed between stakes 14-18.

With any questions please call this office at 413-726-9737.

Sincerely,

Henry A. Kozloski, Chairman
AGAWAM CONSERVATION COMMISSION

Cc:
Town Clerk
File

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

A. General Information

1. Conservation Commission: AGAWAM
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details
   a. First Name: RALPH & GIUSEPPE b. Last Name: DEPALMA & TIRONE
   c. Organization:
   d. Mailing Address: 36 CANTERBURY LANE
   e. City/Town: FEEDING HILLS f. State: MA g. Zip Code: 01030
4. Property Owner
   a. First Name: RALPH & GIUSEPPE b. Last Name: DEPALMA & TIRONE
   c. Organization:
   d. Mailing Address: 36 CANTERBURY LANE
   e. City/Town: FEEDING HILLS f. State: MA g. Zip Code: 01030
5. Project Location

a.Street Address	497 SOUTH WESTFIELD STREET		
b.City/Town	AGAWAM	c. Zip Code	01030
d. Assessors Map/Plat#	E6	e. Parcel/Lot#	2/8
f. Latitude	42.02548N	g. Longitude	72.40257W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
HAMPDEN		14554	323

7.Dates

a. Date NOI Filed : 3/21/2022 b. Date Public Hearing Closed: 10/27/2022 c. Date Of Issuance: 11/15/2022

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
"SITE PLANS PROPOSED CONDOMINIUM COMMUNITY, ASSESSOR'S MAP E6, BLOCK 2, LOT 8, 497 SOUTH WESTFIELD STREET, AGAWAM, MA"	R LEVESQUE ASSOCIATES, INC	FILIPE J. CRAVO, P.E.	10/26/2022	AS NOTED

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

"LONG TERM OPERATION & MAINTENANCE PLAN, PROPOSED CONDOMINIUM COMMUNITY 497 SOUTH WESTFIELD STREET AGAWAM, MA (PARCEL ID: E6-2-8)"	R LEVESQUE ASSOCIATES, INC	September 19, 2022

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

a. ☑ Public Water Supply	b. ☐ Land Containing Shellfish	c. ☑ Prevention of Pollution
d. ☑ Private Water Supply	e. ☑ Fisheries	f. ☑ Protection of Wildlife Habitat
g. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

Approved subject to:

a. ☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

b. ☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a).

a. linear feet

Massachusetts Department of Environmental Protection
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Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☑ Riverfront Area	32981 a. total sq. feet	0 b. total sq. feet		
Sq ft within 100 ft	0 c. square feet	0 d. square feet	0 e. square feet	0 f. square feet
Sq ft between 100-200 ft	32981 g. square feet	0 h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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15.☐ Coastal Banks
a. linear feet b. linear feet

16.☐ Rocky Intertidal Shores
a. square feet b. square feet

17.☐ Salt Marshes
a. square feet b. square feet c. square feet d. square feet

18.☐ Land Under Salt Ponds
a. square feet b. square feet
c. c/y dredged d. c/y dredged

19.☐ Land Containing Shellfish
a. square feet b. square feet c. square feet d. square feet

20.☐ Fish Runs
Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above
c. c/y dredged d. c/y dredged

21.☐ Land Subject to Coastal Storm Flowage
a. square feet b. square feet

22.
☐ Restoration/Enhancement (For Approvals Only)
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW b. square feet of Salt Marsh

23.
☐ Streams Crossing(s)
If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:

a. the work is a maintenance dredging project as provided for in the Act; or
b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.

5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]
File Number :"087-0675"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During

construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the

proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions:
SEE ATTACHED.



TOWN OF AGAWAM, MASSACHUSETTS
CONSERVATION COMMISSION
ORDER OF CONDITIONS

DEP File #087-0675 | Ralph Depalma & Giuseppe Tirone | 497 South Westfield Street

Finding:

- The Conservation Commission finds that there is an isolated area of hydric soils located in the northerly extent of the central field. The jurisdictional status of the isolated area of hydric soils under Section 401 and 404 of the Clean Waters Act is to be determined by DEP/USACE.

Special Conditions:

1. This Order supersedes all previous Orders of Conditions issued for this work.

2. The Order of Conditions applies only to the work permitted by this Order. Any other work to be done within the area of statutory interests of Wetlands Protection shall require the filing of a new Notice of Intent or Request for Determination.

3. During the construction phase, the applicant shall be responsible for maintaining a copy of these Orders at the site. The applicant shall be responsible for compliance with the conditions of these Orders.

4. In advance of any work for each phase of the project, the applicant shall contact the Conservation Commission and arrange a conference between the Commission, contractor, designer/engineer, and applicant. The purpose of this conference is to insure that all of the Orders are understood. This conference shall take place at a regularly scheduled Commission meeting.

5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and until the site has become stabilized with permanent vegetative cover.

6. The Commission shall be notified at least seventy-two hours prior to the start of site work (including tree cutting or clearing).

7. The Commission shall be notified when the erosion control measures are in place to enable the Commission to ensure compliance with these Orders.

8. The project engineer/designer shall be held responsible and accountable for the true and accurate implementation and construction of his/her design or plan. Should any

accidental deviation from the approved plan occur, the engineer/designer shall notify the Commission immediately to determine of a new Notice of Intent is required. If any changes to the approved plan are anticipated, the engineer/designer shall likewise notify the Commission to determine if a new Notice of Intent is required. In any case the Commission may deny any deviation, accidental or intended, from the approved plan.

9. The erosion and sedimentation barrier shall serve as the alteration limit line. Said barrier shall fully protect the adjacent wetland/resource area, and no work shall be permitted beyond this limit line. No machinery shall be operated beyond this limit line.

10. There shall be no discharge or spillage of oil, fuel, any petroleum product or any other pollutant into any area of statutory interest.

11. At no time shall any construction materials, soils, fills, sediments, dredging or any other substances be stockpiled or stored in any area of statutory interest.

12. All work within the area of statutory interest shall be performed so as to create minimum disturbance to the existing vegetative cover and contours.

13. The construction site shall be left in a stable condition at the close of each day. Erosion and sedimentation controls shall be continuously monitored to ensure proper operation.

14. If any alteration of the wetland/resource area does occur, the Commission shall impose such measures as it finds necessary to protect and restore the areas of statutory interest.

15. Only tagged trees shall be removed. All limbs, branches, slash and deadwood shall be removed from the areas of statutory interest.

16. Whether from on-site or off-site, any fill used in connection with this project shall be clean fill as described here:

    The fill material shall be clean coarse washed sand or other clean granular material essentially free of clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood tree branches and waste material. Before the fill is put in place, all trees, brush and stumps shall be removed from the area to be filled. Topsoil, peat and other impervious materials shall be removed from all areas to be filled prior to the placement of the fill material.

17. No liquid or solid chemical lawn fertilizers, pesticides, herbicides or chemical or petroleum dust control agents shall be applied within the area of statutory interest or anywhere that the surface drainage is discharged into an area of statutory interest. Also no petroleum or liquid or solid chemical storage is permitted in any areas of statutory interest.

18. During snow removal operations, snow shall not be piled or placed within an area of statutory interest, and snow containing extraneous matter shall be kept away from these areas. Road salt shall not be used in an area of statutory interest or on surfaces where

surface drainage discharges into these areas.

19. Where stone or rock fill has been specified for use in areas that will require subsequent seeding, a minimum of twelve (12) inches or compacted clean fill shall be placed prior to loam placement and seeding.

20. Periodic maintenance/cleaning of all drainage structures shall be conducted by the owner and all successors in interest or control of the property. The applicant, his successors or assigns shall have the continuing responsibility of this maintenance.

21. An as-built plan of the project shall be submitted to the Commission prior to the issuance of the Certificate of Compliance. Said plan shall fully define the geometry of the (basin, drainage channel, swale, catch basin or other structure) with at least one cross section detail.

22. Parcels abutting or containing wetland or resource areas shall carry the following restrictions, and a covenant so noted on each deed:

"This lot contains certain areas or abuts areas protected by Chapter 131, Section 40 of the General Laws of Massachusetts known as the Wetlands Protection Act and comes under the jurisdiction of the Agawam Conservation Commission. No cutting of trees, clearing of brush, digging, filling in with soil or debris, or the building of bridges is permitted within one hundred (100) feet of the designated wetland areas or within 200' of any designated river without specific approval granted by the Conservation Commission."

23. The Commission reserves the right to impose additional conditions on any or all portions of this work to minimize the impact of potential site erosion or noticeable degradation of water quality discharging from the site at any time.

24. Commencing with the issuance of these Orders and continuing through the end of the construction phase of this project, the applicant or his successors and assigns shall submit to the Commission a written monthly progress report detailing the work that has been done of statutory interest.

25. This order shall apply to all successor or assignee in interest or control of the subject property. Any conveyance of interest or control in the subject property shall make reference to this order by stating that the conveyance is subject to the provisions of an Order of Conditions under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, and by giving the book and page reference in the Hampden County Registry of Deeds where this order is recorded.

26. The petitioner shall have recorded in the Hampden County Registry of Deeds an "Order of Conditions Form" provided by this Commission. The Commission will not allow work to begin until proof of recording is provided the Conservation Commission.

27. The restoration area is to commence in the next growing season (April 2023) and will be

monitored for two growing seasons with quarterly monitoring reports.

28. Prior to the start of construction, a plan shall be submitted and approved by the Conservation Commission showing the sign design and location of wetland boundary markers.

29. Signs and wetland boundary markers will be put up when each phase is at 75% completion.

30. The Conservation Commission is to be notified when responsibility of property management/maintenance is transferred to the Homeowners Association.

31. The Long Term Operation and Maintenance Plan shall be provided to each owner at the time of closing.

32. The Master Deed and Homeowners Association documents shall be submitted and approved by the Conservation Commission.

33. The contractor/developer will need to take extra precautions for units 68-81 to protect the area during construction from erosion, etc.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1.Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☑ No

2.The Conservation Commission hereby(check one that applies):

a.☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b.☐ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

3.The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

087-0675
MassDEP File #

eDEP Transaction #

Agawam
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

11/15/22
1. Date of Issuance

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

[signature]	S. PAGE FALLON
Signature	Printed Name
[signature]	Sheryl Becker
Signature	Printed Name
[signature]	FRANK MEAGHER
Signature	Printed Name
[signature]	Henry Kozloski
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

11/15/22
Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

11/15/2022
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Henry Kozloski

S. Page Fallon

Sheryl Becker

Frank Meagher

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act

(M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

AGAWAM
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

AGAWAM
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

497 SOUTH WESTFIELD STREET — Project Location
087-0675 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner RALPH & GIUSEPPE DEPALMA & TIRONE

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:087-0675
eDEP Transaction #:1446330
City/Town:AGAWAM

Document Number

Signature of Applicant **Giuseppe Tirone**

Rev. 4/1/2010

CHERYL A. COAKLEY-RIVERA, REGISTER
HAMPDEN COUNTY REGISTRY OF DEEDS
E-RECORDED

Taryn Egerton

From: emily@stockmanassociates.com
Sent: Thursday, July 28, 2022 9:59 AM
To: Taryn Egerton
Subject: RE: Revised Wetland Plan - 487 South Westfield St, Agawam

Good morning, Taryn.

Thank you for sending along the updated site plan.

I disagree with RLA's decision to remove the isolated wetland from the final NOI plans. The overlap between the MA WPA Act regulations and 401 Water Quality Certification regulations was discussed with Mr. Nelson in the field. While I agree that isolated wetlands do not fall under the Commission's authority, all wetlands (bordering and isolated) must be shown on the final plans. This is stated under 314 CMR 9.03(1) ***(emphasis added)***,

"The Department certifies the activities identified in 314 CMR 9.03(1) through (8) and therefore they do not require an individual 401 Water Quality Certification application provided the specified conditions are met. For activities meeting these specified conditions, the Final Order of Conditions or final Restoration Order of Conditions issued pursuant to 310 CMR 10.00: Wetlands Protection, as applicable, serves as the Water Quality Certification for the project.

(1) Less than 5000 Sq. Ft. with an Order of Conditions. Activities conducted in compliance with the Wetlands Protection Act and receiving a Final Order of Conditions which meets all applicable performance standards under 310 CMR 10.00: Wetlands Protection, provided that:
(a) the Final Order of Conditions permits work that results in the ***loss of up to 5,000 square feet cumulatively of bordering and isolated vegetated wetlands*** *and land under water.* ***Both bordering and isolated vegetated wetlands must be delineated on the plans contained in the Notice of Intent*** *and described on a form prescribed by the Department; and*
(b) the Final Order of Conditions includes conditions requiring at least 1:1 replacement of bordering vegetated wetlands under 310 CMR 10.55(4)(b);
(c) if applicable, the activity conforms to the stream crossing provisions of 310 CMR 10.24(10) and 10.53(8); and
(d) the proposed work is not subject to 314 CMR 9.04."

Regarding the Riverfront Area projecting on to the Site from the offsite reach of Philo Brook-

The revised plans do not indicate the entire 200-FT Riverfront Area proximal to the Site. The boundary ceases proximal to BVW flag C6 (does not continue southerly towards the southeast corner of the Site). I suggest that more information be provided by RLA regarding the determination of MAHWL and extent of 200-FT Riverfront Area boundary. MassMapper measurements indicate that Riverfront Area extends into the Site where the RLA plan shows it does not. This may be a limitation of scale associated with MassMapper but should be clarified/addressed by RLA.

Please feel free to contact me with any questions.
Stay safe. Be well.
Best,
Emily

Stockman Associates LLC

April 27, 2026

Mr. Henry Kozloski, Chair
Town of Agawam Conservation Commission
750 Cooper Street
Agawam, MA 01001

Re: Abbreviated Notice of Resource Area Delineation (ANRAD)
Ameresco, Inc.
311 Shoemaker Lane
Agawam, MA 01001
Parcel G4 1_11
MassDEP File # 087-0711
Wetland Consultant Peer Review

Dear Ms. Kozloski and Commissioners:

Per request of the Agawam Conservation Commission, Stockman Associates LLC has performed a wetland consultant peer review of an Abbreviated Notice of Resource Area Delineation (ANRAD) submitted by Fleetwood Environmental Solutions (Fleetwood) on behalf of their client, Ameresco, Inc., for the review of delineated resource area boundaries located at 311 Shoemaker Lane (Parcel G4 1_11) in Agawam, MA. Based on the WPA Form 4A prepared by Fleetwood dated February 24, 2026, the review consisted of approximately 5,762 linear feet of Bordering Vegetated Wetland (BVW) boundary and approximately 1,082 linear feet of Bank. The review also included an inspection of the subject property to determine whether additional unmapped protected wetland resource areas and/or Buffer Zone are present.

Materials Reviewed

- ANRAD WPA Form 4A and supporting documents within the February 24, 2026 submittal prepared by Fleetwood.
- March 5, 2026 MassDEP File Number Comment Letter
- 2021 ANRAD application prepared by PrimeAE including August 8, 2021 revised site plans. (Note: The 2021 ANRAD was withdrawn by the applicant with the withdrawal accepted by the Agawam Conservation Commission by vote during their October 14, 2021 meeting.)
- Final plans of record "*Site Development Plans for Shoemaker Lane Solar Project*" Sheets 1 through 7, scale varied, dated July 25, 2018 prepared Atlantic Design Engineers, Inc. (Note: The OOC for this project (MassDEP File # 087-0628) was issued on August 9, 2018 and the MassDEP Comment Letter indicates that a Certificate of Compliance (CoC) was issued. A recorded copy of the CoC was not located during a search of the Registry of Deeds database.)

Site Visit

- Emily Stockman (Stockman Associates) and David Cameron (Fleetwood) performed a site visit on April 20, 2026 and reviewed the delineated BVW and Mean Annual High Water Line boundaries and project area. The site inspection occurred during the early

growing season. The previous year's corn crop had been harvested, providing visibility to the ground surface, gentle slopes, and microtopography. Woody plants as well as several herbaceous plants were identifiable to species. Areas of inundation and saturated soils at/near the ground surface were observed at various locations throughout the site. The project site is within the Connecticut River Valley Region, which is within a declared Mild Drought (L1), declaration date April 8, 2026, effective date March 1, 2026.

Review Comments

The Commission and the applicant should note that the peer review included an assessment of past delineations approved by or submitted to the Agawam Conservation Commission for review. The 2018 approved delineation has expired. The 2021 delineation was withdrawn by the applicant prior to the completion of the peer review and recommended boundary adjustments. While these materials aid in the review of the current boundary it is important to note that past delineations are expired. The current delineation and review must address current conditions; as a result, the 2026 boundaries may differ.

Mean Annual High Water Line (Philo Brook)

1) During the site visit, Fleetwood confirmed that the ANRAD materials would be revised to indicate that Philo Brook is a perennial stream, withdrawing the attempt to overcome the perennial presumption due to observations made by GZA during July 2016 drought conditions. Fleetwood also stated that at the time of the delineation (prior to receiving the GZA materials), Philo Brook had been accessed as perennial (indicated by the "M" series labeling) and MAHWL was flagged.

2) At the time of the site visit, the majority of the MAHWL M-series delineation flags were clearly visible, and the labels were legible. Fleetwood replaced the following flags, which were missing or downed: M1-102, M1-105, M1- 110, M1-122, M1-123, M1-125. Downed flags M1-103 and M1-106, which are not depicted on the ANRAD site plan were also found and replaced. Flag M1-111A was added by Fleetwood.

BVW W2 Series

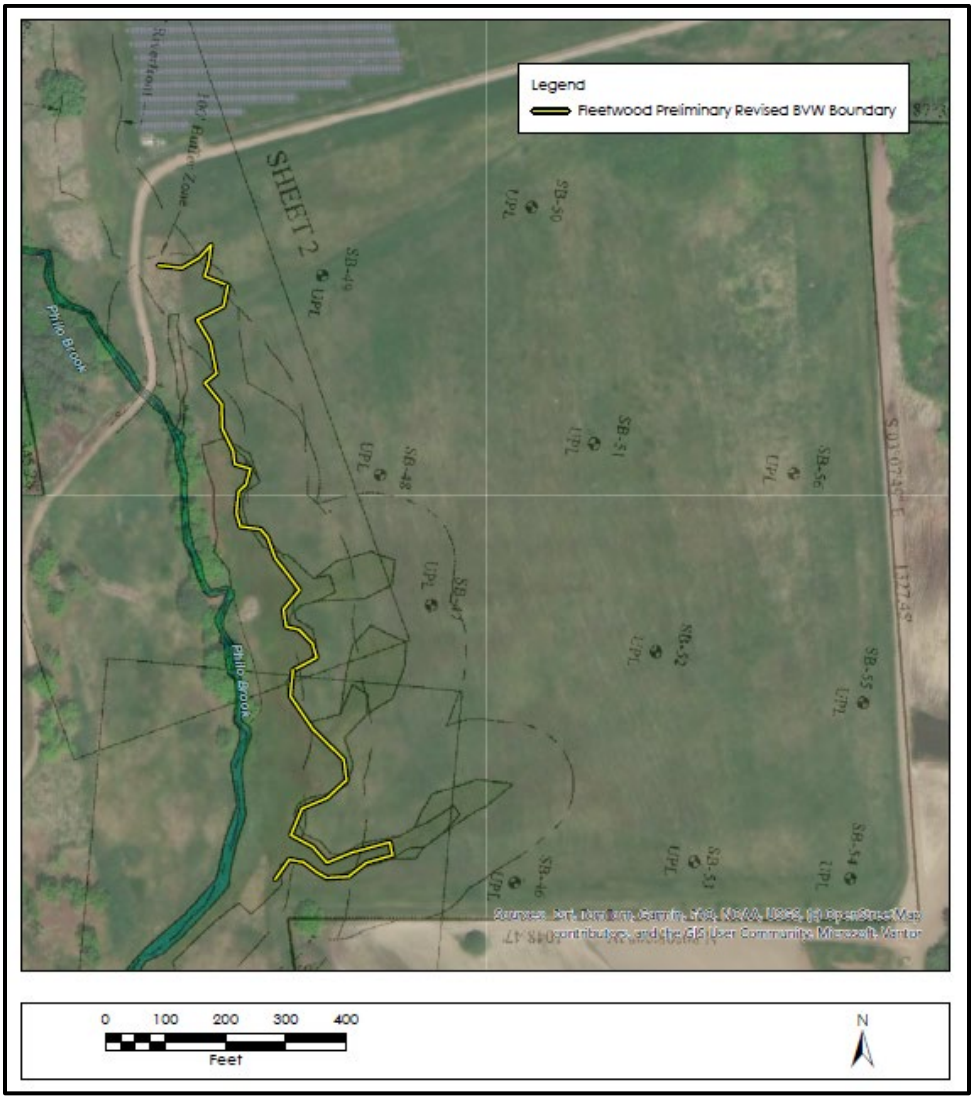
3) At the time of the site visit, many of the W2-series delineation flags were clearly visible, and the labels were legible. Flags locations had been further marked with orange stakes, which aided in the review. Fleetwood refreshed flags that were down and/or lacked legible labels.

4) Areas of inundation, saturated soils at/near the ground surface, and hydric soils were observed beyond the delineated W2-series BVW boundary within the cornfield to the north and east. With the exception of remnant cut corn stalks, vegetation was lacking due to the recent agricultural management. Stockman Associates discussed the prior 2021 ANRAD delineation that had been submitted by AEPrime and ultimately withdrawn by the applicant.

   Fleetwood and Stockman Associates reviewed areas previously delineated by AEPrime utilizing a handheld Submeter GNSS unit (Eos Arrow 100 and Esri field Maps). Note: The AEPrime delineation (plans dated 8-12-21) depicts the BVW boundary prior to the completed peer review and any revisions thereafter.

   As previously discussed, the landscape differed from the conditions during Fleetwood's September and October 2025 assessment. With the benefit of increased visibility and

early season growing conditions, Fleetwood reassessed the W2-series boundary. Fleetwood indicated that *preliminary* revised delineation flagging was being placed and additional assessment and refinement would be performed at a later date. Stockman Associates located the revised *preliminary* flagging using sub-meter GPS to aid in further future peer review. At the request of Fleetwood, the resultant map has been provided below. The map depicts Esri World Imagery overlaid by the 2021 AE Prime delineation (black) and the preliminary revised BVW boundary flagged by Fleetwood (yellow).



5) As discussed during the site visit, Stockman Associates recommends the collection of transect data during the reassessment of the W2-series BVW boundary, especially in areas where the boundary differs from the 2021 PrimeAE boundaries. Due to altered conditions, data collection should be performed following the procedures under 310 CMR 10.55(2)(c)3., the Massachusetts DEP Handbook: Delineating Bordering Vegetated Wetlands, Second Edition, 2022, as well as the 2012 Regional Supplement to the Corps of Engineers Delineation Manual: NC/NE Region Chapter 5 Difficult Wetland Situation.

BVW W1 Series

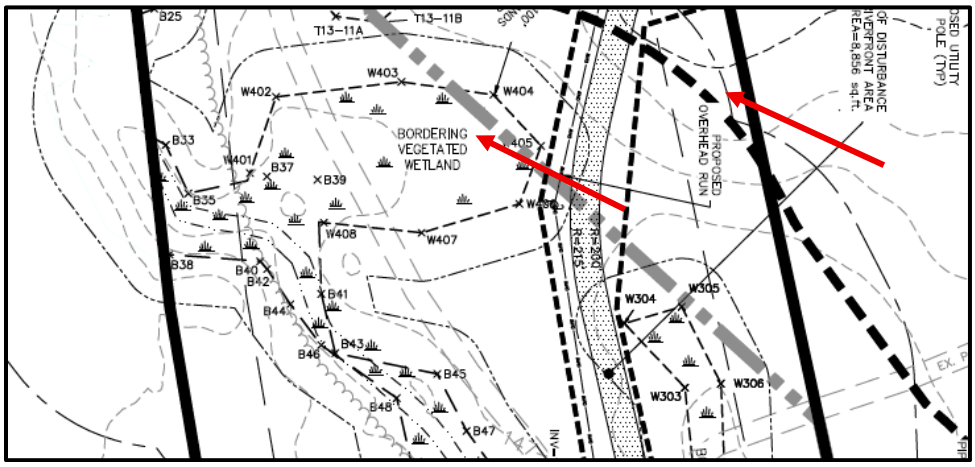
6) The vast majority of the W1-series BVW delineation flags were missing or downed during the site visit. The W1-series flagging demarcates the boundary of an anthropogenic agricultural BVW swale. The distinct features of the swale (topography and vegetation) were compared to the boundaries depicted on the surveyed site plan. Based on this comparison, Stockman Associates concurs with the general boundary of the W1-series BVW. The Commission should note that individual flags were not present for review and consensus.

Subject Site Review

7) Stockman Associates traversed the subject property to inspect for the presence of any additional unmapped, protected wetland resource areas and/or jurisdictional Buffer Zones.

8) During the review of the MAHWL a wetland system was observed to the east of the upper reach of Philo Brook. This area is located outside of the ANRAD subject site but had been reviewed to assess the projection of Riverfront Area and Buffer Zone into the subject site.

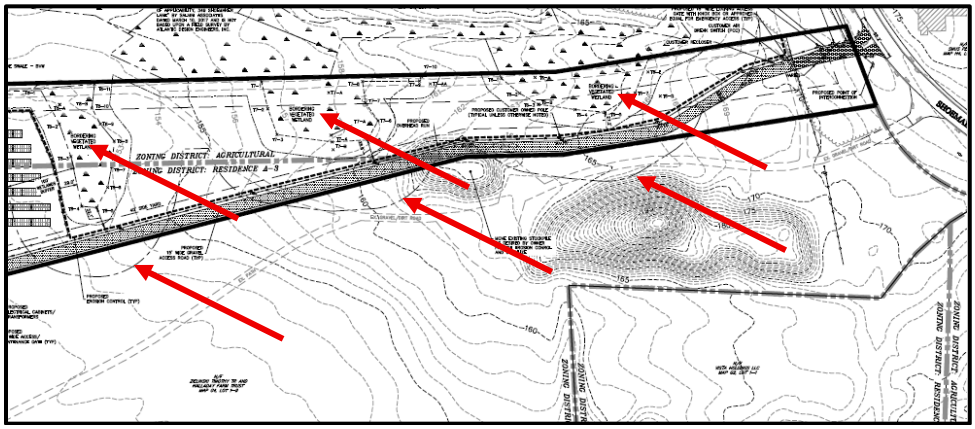
   a. Based on prior site visits and a review of the BVW delineation previously approved by the Commission in 2018 (Atlantic Design Engineers, Inc.), the observed wetland was classified as a BVW in 2018, with Buffer Zone projecting into the current 2026 subject site. See below.



   b. Stockman Associates recommends further review of the area to address the potential presence of additional Buffer Zone within the subject site.

9) During the site visit, Stockman Associates and Fleetwood discussed the presence of BVW located outside of the subject site to the north and the potential for Buffer Zone projecting south into the subject site.

   c. Subsequently, Stockman Associates reviewed the BVW delineation previously approved by the Commission in 2018 (Atlantic Design Engineers, Inc.). The 2018 site plans depict BVW to the north with Buffer Zone projecting into the current subject site. See below.



d. Stockman Associates recommends further review of the area to address the potential presence of additional BVW and/or Buffer Zone within the subject site, including the northeast portion of the field which contains wetness signatures raised in the MassDEP comment letter and buried hydric soils observed in 2021.

SITE PLAN REVIEW

10) At this time Stockman Associates has performed an interim review of the 2-3-2026 site plan submitted with the February 2026 ANRAD application. Submittal of a revised site plan and additional review are anticipated after revisions by Fleetwood have been completed.

11) The Riverfront Area associated with Philo Brook should be depicted on a revised site plan.

12) The legend would benefit from specific symbology related to BVW flags, MAHWL flags, BVW boundary, and MAHWL. Currently the site plan indicates the same line type for BVW and MAHWL and lacks point symbology for BVW flags and MAHWL flags.

13) The site plan identifies the subject property as G4-1-9 which differs from the ANRAD submittal which identifies the parcel as G4 1_11. The applicant should confirm the correct parcel number.

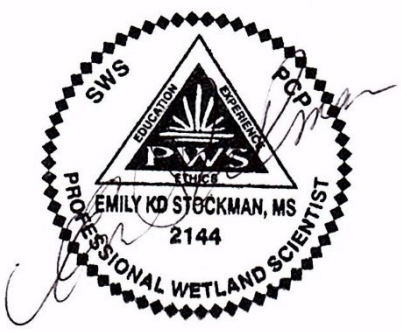
14) Stockman Associates suggests that the Commission require a written response to the MassDEP comments as well as the peer review comments.

I trust that the above comments will assist the Commission in their review of the previously referenced ANRAD application. Please do not hesitate to contact me with any questions.

Sincerely,

Emily Stockman

Emily Stockman, M.S., P.W.S.
Senior Scientist/Principal
Stockman Associates LLC



Stefanie Kesecker

From: David Cameron <david@fleetwoodenv.com>
Sent: Wednesday, April 22, 2026 11:16 AM
To: Stefanie Kesecker
Subject: Fwd: Public Meeting Continuance Request

Hi Stefanie,

Please see below. Can you please confirm receipt of this email message and request? Thank you!

David

---------- Forwarded message ---------
From: **David Cameron** <david@fleetwoodenv.com>
Date: Wed, Apr 22, 2026 at 11:14 AM
Subject: Public Meeting Continuance Request
To: Taryn Egerton <tegerton@agawam.ma.us>
Cc: Emily Stockman (emily@stockmanassociates.com) <emily@stockmanassociates.com>, Pollis, Nikkie <npollis@ameresco.com>

Good morning Taryn,

On behalf of Ameresco, Inc., Fleetwood E.S. requests a continuance to the Commission's first public meeting in May. I had a productive site walk with Stockman Associates Monday, but I do not believe Emily will have sufficient time to complete her report prior to the meeting tomorrow evening. Can you please confirm receipt of this email and let men know what the next public meeting date is? Thank you in advance for your help.

--

David Cameron, SPWS, Principal

Fleetwood Environmental Solutions, LLC

P.O. Box 1016

Belchertown, MA 01007

413.325.7372

david@fleetwoodenv.com

www.fleetwoodenv.com

Town of Agawam
Conservation Commission

Conservation Commission
1000 Suffield Street
Agawam, MA 01001
Ph: 413-786-0400 ext. 8737
Fax: 413-786-9927

March 27, 2026

Ameresco, Inc
c/o Nikki Pollis
20 Winthrop Square
Boston, Ma 02110

Dear Ms. Pollis:

At its duly called meeting held on March 26, 2026, the Agawam Conservation Commission voted to accept the Peer Review proposal submitted by Stockman Associates for the amount of $2,860.00 for an Abbreviated Notice of Resource Area Delineation on property at 311 Shoemaker Lane. Review by Stockman Associates will not commence until this Peer Review fee is submitted to the Conservation Commission in its entirety. The Commission shall be responsible for expenditures.

Sincerely,

Henry A. Kozloski, Chairman
Agawam Conservation Commission

Cc: David Cameron - Fleetwood Environmental
Town Clerk
File

Stockman Associates LLC

March 23, 2026

Mr. Henry Kozloski, Chairman
Town of Agawam Conservation Commission
750 Cooper Street
Agawam, MA 01001

Re: Abbreviated Notice of Resource Area Delineation (ANRAD)
Ameresco, Inc.
311 Shoemaker Lane
Agawam, MA 01001
Parcel G4 1_11
Wetland Consultant Peer Review Proposal

Dear Mr. Kozloski:

Foremost, thank you for considering Stockman Associates LLC. It is our understanding that the Agawam Conservation Commission is seeking an estimate for a wetland consultant peer review of an Abbreviated Notice of Resource Area Delineation (ANRAD) submitted by Fleetwood Environmental Solutions (Fleetwood) on behalf of their client, Ameresco, Inc., for the review of delineated resource area boundaries located at 311 Shoemaker Lane (Parcel G4 1_11) in Agawam, MA. Based on the WPA Form 4A prepared by Fleetwood dated February 24, 2026, approximately 5,762 linear feet of Bordering Vegetated Wetland (BVW) boundary and approximately 1,082 linear feet of Bank will be reviewed. It is our understanding that the scope will also include a review of the subject property to confirm that there are no additional unmapped protected wetland resource areas.

Scope of Work

Field Work

Site Visit: to review and confirm field work performed by Fleetwood and submitted under the February 24, 2026 ANRAD submittal, including the review of the delineated Bordering Vegetated Wetland and Bank boundaries and data plots. It is anticipated that boundary delineation flagging will be clearly visible and labeled in the field. Any observation plots utilized by Fleetwood to evaluated soils, vegetation, and hydrology should also be clearly marked on a site plan and in the field for review.

Furthermore, it is anticipated that a representative from Fleetwood as well as members of the Agawam Conservation Commission may be present during the site visits.

Estimated 1 Field Day

Materials Review

Abbreviated Notice of Resource Area Delineation (ANRAD) Review: including the review of the ANRAD WPA Form 4A and other supporting site plans and documents within the February 24, 2026 submittal prepared by Fleetwood.

The review will be performed under the Massachusetts Wetlands Protect Act (MA WPA) regulations (310 CMR 10.00). It is our understanding that the Town of Agawam does not have a local wetland protection bylaw.

Reporting

Review Findings: including a findings report and recommendations based on the materials review and the site visit. The report will specifically address concurrence and non-concurrence with resource area boundaries as presented in the ANRAD prepared by Fleetwood.

Meetings

Attendance: This proposal includes attendance at one (1) Agawam Conservation Commission meeting.

Total Cost Estimate

Estimated Hours (including travel) 26 hours
$2,860

Please note that the above cost estimate has been provided based on the ANRAD submittal dated February 24, 2026 and excludes any follow-up review. Any additional submittals, additional site visits, and/or public hearings would be considered extra work beyond the proposed scope. If additional review is requested during the process, Stockman Associates LLC will bill for those services at the rates provided below.

Hourly Rates (including travel):	Wetland Scientist $110/hour Field Technician $65/hour

This proposal is valid for 30 days. Our receipt of a signed copy of this proposal will serve to authorize Stockman Associates LLC to proceed with the work outlined above in our Scope of Services and on the attached General Contract Conditions.

Work will commence after receipt of a signed authorization to proceed and confirmation of funding. It is anticipated that work will begin with a materials review. It is anticipated that the fieldwork will be scheduled during the growing season. The fieldwork will be scheduled upon coordination with the applicant and/or the applicant's representative and the Conservation Commission. Please note that aspects of the proposed timeline are subject to the scheduling and availability of others as well as site conditions and, therefore, may be subject to change.

I look forward to working with you on this project. Thank you for considering Stockman Associates LLC.

If you have any questions regarding the above estimate, please do not hesitate to contact me at emily@stockmanassociates.com or at 413-743-1372.

Sincerely,



Emily Stockman, M.S., P.W.S.
Senior Scientist/Principal
Stockman Associates LLC

AUTHORIZATION TO PROCEED

Agawam Conservation Commission

Abbreviated Notice of Resource Area Delineation (ANRAD)
Ameresco, Inc.
311 Shoemaker Lane
Agawam, MA 01001
Parcel G4 1_11
Wetland Consultant Peer Review Proposal

I hereby authorize Stockman Associates LLC to proceed with the above-referenced project in accordance with the Scope of Services described herein.

Agawam Conservation Commission

Printed Name	Date
Signature	Title

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE
436 DWIGHT STREET, SPRINGFIELD, MA 01103 413-784-1100

MAURA T. HEALEY
Governor

KIMBERLEY DRISCOLL
Lieutenant Governor

REBECCA L. TEPPER
Secretary

BONNIE HEIPLE
Commissioner

DATE: March 5, 2026

Municipality AGAWAM
(city/town)

RE: NOTIFICATION OF WETLANDS PROTECTION ACT FILE NUMBER

The Department of Environmental Protection has received a Notice of Intent filed in accordance with the Wetlands Protection Act (M.G.L. c. 131, §40):

Applicant:	AMERESCO, INC.	Owner:	TIMOTHY ZIELINSKI
Address:	20 WINTHROP SQUARE BOSTON, MA 02110	Address:	85026 BARSONAGE CT FERNANDINA BEACH, FL, 32034
LOCUS:	311 SHOEMAKER LANE		

This project has been assigned the following file # : WE 087-0711

A FILE NUMBER ONLY INDICATES THAT THE APPLICATION CONTAINS THE MINIMAL SUBMITTAL REQUIREMENTS AND IS ADMINISTRATIVELY COMPLETE - NOT THAT THE INFORMATION IN THE APPLICATION IS ADEQUATE FOR ISSUANCE OF AN ORDER OF CONDITIONS.

Although a file # is being issued, please note the following:

[1] The commission might review the approved wetlands delineation (since expired as the OOC received a COC) from file number 087-0628, near the boundary with this lot. That file number did approve Riverfront alteration when the OOC was issued though the applicant in this case is attempting to overcome the perennial presumption. Guidance will be provided to the commission regarding overcoming said perennial presumption.

[2] The commission should make sure the correct map/parcel ID is correct.

[3] The applicant is only requesting approval of BVW and Bank (for the 100 foot buffer).

[4] Regarding the July 16, 2016 dry observation date, that date was considered to be in a drought watch, therefore it could not be used. Please review https://www.mass.gov/info-details/history-of-drought-declarations-in-massachusetts#drought-tables-before-2019

[5] Much of the field does show hydric soil like conditions. See Section 4.0 of the narrative. Aerial photos will be provided.

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD# 1-866-539-7622 or 1-617-574-6868.
http://www.mass.gov/dep
Printed on Recycled Paper

AMERESCO, INC.
20 WINTHROP SQUARE
BOSTON, MA 02110

[6] To help ensure that conservation commissions have sufficient expertise available to address specific issues regarding an applicant's filing, M.G.L. c. 44, section 53g gives Commissions authority to charge a fee for the employment of outside consultants that allow for the use of the fee to ensure that they have the necessary information for them to make a decision pursuant to the Wetlands Protection Act, M.G.L. c. 131, sec. 40 and 310 CMR 10.00.

If you have any questions regarding this letter, please contact: MARK STINSON @ (413)-961-9583

Cc: Agawam Conservation Commission, DPW Inspection Services 1000 Suffield Street, Agawam, MA, 01001
Owner: Timothy Zielinski, 85026 Barsonage CT, FERNANDINA BEACH, FL, 32034
Representative: Fleetwood Environmental Solutions, LLC, 84 Russell Street, HADLEY, MA, 01035

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD# 1-866-539-7622 or 1-617-574-6868.
http://www.mass.gov/dep
Printed on Recycled Paper


WESTFIELD ST
ARCEL 2B SHOEMAKER LN
G4_1_11
DEMAKER LN
SHOEMAKER LN
G4_1_9
281 SHOEMA
G2_1_
Long: -72.6534
Lat: 42.041430
dd


ELD ST
G4_1_9
MAKER LN
MAKER LN

Abbreviated Notice of Resource Area Delineation

Related to Property ID:

G4_1_11

at

311 Shoemaker Lane
Agawam, Massachusetts

February 24, 2026

Prepared on Behalf of:

Ameresco, Inc.
20 Winthrop Square
Boston, MA 02110
npollis@ameresco.com

Prepared by:

fleetwood
ENVIRONMENTAL SOLUTIONS
84 Russell Street
Hadley, MA 01035
413.325.7372
www.fleetwoodenv.com

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

A. General Information

1. Project Location (**Note:** electronic filers will click on button for GIS locator):

311 Shoemaker Lane (a. Street Address) | Agawam (b. City/Town) | 01001 (c. Zip Code)

Latitude and Longitude: 42.041429 (d. Latitude) | -72.653405 (e. Longitude)

G4 (f. Assessors Map/Plat Number) | 1_11 (g. Parcel /Lot Number)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

2. Applicant:

Nikki (a. First Name) | Pollis (b. Last Name)

Ameresco, Inc. (c. Organization)

20 Winthrop Square (d. Mailing Address)

Boston (e. City/Town) | MA (f. State) | 02110 (g. Zip Code)

508.598.3254 (h. Phone Number) | (i. Fax Number) | npollis@ameresco.com (j. Email Address)

3. Property owner (if different from applicant): ☐ Check if more than one owner (attach additional sheet with names and contact information)

Timothy (a. First Name) | Zielinski (b. Last Name)

(c. Organization)

85026 Barsonage CT (d. Mailing Address)

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

Fernandina Beach (e. City/Town) | FL (f. State) | 32034 (g. Zip Code)

413.246.7311 (h. Phone Number) | (i. Fax Number) | timzie218@gmail.com (j. Email Address)

4. Representative (if any):

David (a. Contact Person First Name) | Cameron (b. Contact Person Last Name)

Fleetwood Environmental Solutions, LLC (c. Organization)

35 Russell Street (d. Mailing Address)

Hadley (e. City/Town) | MA (f. State) | 01035 (g. Zip Code)

413.325.7372 (h. Phone Number) | (i. Fax Number) | david@fleetwoodenv.com (j. Email Address)

Fees will be calculated for online users.

5. Total WPA Fee Paid (from attached ANRAD Wetland Fee Transmittal Form):

$2,000.00 (a. Total Fee Paid) | $987.50 (b. State Fee Paid) | $1012.50 (c. City/Town Fee Paid)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

B. Area(s) Delineated

1. Bordering Vegetated Wetland (BVW) ~ 5,762 Linear Feet of Boundary Delineated

2. Check all methods used to delineate the Bordering Vegetated Wetland (BVW) boundary:

   a. ☐ MassDEP BVW Field Data Form (attached)

   b. ☒ Other Methods for Determining the BVW boundary (attach documentation):

      1. ☒ 50% or more wetland indicator plants
      2. ☒ Saturated/inundated conditions exist
      3. ☐ Groundwater indicators
      4. ☒ Direct observation
      5. ☒ Hydric soil indicators
      6. ☒ Credible evidence of conditions prior to disturbance

3. Indicate any other resource area boundaries that are delineated:

a. Resource Area	b. Linear Feet Delineated
Bank (off-site - just for the purposes of Buffer Zone projections)	~1,082
c. Resource Area	d. Linear Feet Delineated

C. Additional Information

Applicants must include the following plans with this Abbreviated Notice of Resource Area Delineation. See instructions for details. **Online Users:** Attach the Document Transaction Number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ ANRAD (Delineation Plans only)
2. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
3. ☒ Plans identifying the boundaries of the Bordering Vegetated Wetlands (BVW) (and/or other resource areas, if applicable).
4. ☒ List the titles and final revision dates for all plans and other materials submitted with this Abbreviated Notice of Resource Area Delineation.

D. Fees

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

The fees for work proposed under each Abbreviated Notice of Resource Area Delineation must be calculated and submitted to the Conservation Commission and the Department (see Instructions and Wetland Fee Transmittal Form).

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to the attached Wetland Fee Transmittal Form) to confirm fee payment:

254	2/9/26
2. Municipal Check Number	3. Check date
255	2/9/26
4. State Check Number	5. Check date
David	Cameron
6. Payor name on check: First Name	7. Payor name on check: Last Name

E. Signatures

I certify under the penalties of perjury that the foregoing Abbreviated Notice of Resource Area Delineation and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

I hereby grant permission, to the Agent or member of the Conservation Commission and the Department of Environmental Protection, to enter and inspect the area subject to this Notice at reasonable hours to evaluate the wetland resource boundaries subject to this Notice, and to require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

I acknowledge that failure to comply with these certification requirements is grounds for the Conservation Commission or the Department to take enforcement action.

1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:
Two copies of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; two copies of the ANRAD Wetland Fee Transmittal Form; and the city/town fee payment must be sent to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; one copy of the ANRAD Wetland Fee Transmittal Form; and a copy of the state fee payment must be sent to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery. (E-filers may submit these electronically.)

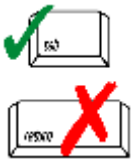
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

ANRAD Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

311 Shoemaker Lane	Agawam
a. Street Address	b. City/Town
$987.50	255
c. Fee amount	d. Check number

2. Applicant:

Nikki	Pollis	Ameresco, Inc.
a. First Name	b. Last Name	c. Company

20 Winthrop Square
d. Mailing Address

Boston	MA	02110
e. City/Town	f. State	g. Zip Code

508.598.3254
h. Phone Number

3. Property Owner (if different):

Timothy	Zielinski	
a. First Name	b. Last Name	c. Company

85026 Barsonage CT
d. Mailing Address

Fernandina	FL	32034
e. City/Town	f. State	g. Zip Code

413.246.7311
h. Phone Number

B. Fees

The fee is calculated as follows for each Resource Area Delineation included in the ANRAD (check applicable project type). The maximum fee for each ANRAD, regardless of the number of Resource Area Delineations, is $200 activities associated with a single-family house and $2,000 for any other activity.

☐ **Online users:** check box if fee exempt.

Bordering Vegetated Wetland Delineation Fee:

1. ☐	single family house project	a. feet of BVW	x $2.00 = 2	b. Fee for BVW
2. ☒	all other projects	5,762 a. feet of BVW	x $2.00 =	11,524 b. Fee for BVW

Other Resource Area (e.g., bank, riverfront area, etc.):

3. ☐	single family house project	a. linear feet	x $2.00 =	b. Fee
4. ☒	all other projects	1,082 a. linear feet	x $2.00 = 2	2,164 b. Fee

Total Fee for all Resource Areas: $2,000 Fee

State share of filing fee: $987.50 5. 1/2 of total fee **less** $12.50

City/Town share of filing fee: 1012.50 6. 1/2 of total fee **plus** $12.50

C. Submittal Requirements

a.) Send a copy of this form, with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts, to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Abbreviated Notice of Resource Area Delineation; a **copy** of this form; and the city/town fee payment.

c.) **To DEP Regional Office**: Send one copy of the Abbreviated Notice of Resource Area Delineation (and any additional documentation required as part of a Simplified Review Buffer Zone Project); a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4A – Abbreviated Notice of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

I hereby grant permission, to the Agent or member of the Conservation Commission and the Department of Environmental Protection, to enter and inspect the area subject to this Notice at reasonable hours to evaluate the wetland resource boundaries subject to this Notice, and to require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

I acknowledge that failure to comply with these certification requirements is grounds for the Conservation Commission or the Department to take enforcement action.

1. Signature of Applicant Timothy Richter Trustee	2. Date 2/20/2026
3. Signature of Property Owner (if different)	4. Date 2-5-2026
5. Signature of Representative (if any)	6. Date

For Conservation Commission:
Two copies of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; two copies of the ANRAD Wetland Fee Transmittal Form; and the city/town fee payment must be sent to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Abbreviated Notice of Resource Area Delineation (Form 4A), including supporting plans and documents; one copy of the ANRAD Wetland Fee Transmittal Form; and a copy of the state fee payment must be sent to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery. (E-filers may submit these electronically.)

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Taryn Egerton, Conservation Officer
Conservation Commission
1000 Suffield Street
Agawam, MA 01001

February 24, 2026

Subject: ***Abbreviated Notice of Resource Area Delineation*** **for 311 Shoemaker Lane, Agawam, MA.**

Dear Ms. Egerton:

On behalf of Ameresco, Inc., Fleetwood Environmental Solutions, LLC ("Fleetwood") conducted a field evaluation of resource areas subject to the Massachusetts Wetlands Protection Act ("WPA) at the address referenced above. The following provides the background of this Abbreviated Notice of Resource Area Delineation ("ANRAD"), as well as Fleetwood's methods and findings regarding the evaluation.

BACKGROUND

Fleetwood understands the subject property ("property", "parcel" or "Site") is presently designated as Assessors Map G4 Lot 1_11 (see site locus at Figure 1, below). The parcel is 36.4 acres in size, and owned by Timothy Zielinski (see Site Plan at Appendix B). The parcel is presently and has been an agricultural field for many decades. This ANRAD is seeking confirmation of the Resource Areas delineated on the parcel.

Figure 1. USGS Topographic/Site Locus Map (asterisk denotes Site location)



84 Russell Street
Hadley, MA 01035
413.325.7372

EVALUATION METHODS

During September and October of 2025, Fleetwood conducted a visual inspection of the Site, which entailed a meander survey throughout the parcel. These field investigations were preceded by a desktop evaluation of publicly-accessible maps, historic aerial images and related resources. A detailed description of the methods employed are outlined in the Wetland Delineation report provided at Appendix C.

Previous Evaluations

In 2015 and 2016 the property owner retained GZA to conduct a natural resources evaluation, including a streamflow assessment for a small stream immediately west of the subject parcel. The report that summarizes the methods and findings of that investigation is provided at Appendix D.

FINDINGS

The investigation resulted in the identification of the parcel being a large cornfield (Figure 2, below).

Figure 2. 2023 Aerial Image of Site



Three separate areas along its periphery were flagged as Resource Area boundaries: 1) a man-made ditch along the eastern and southern limits of the cornfield, which was designated as a linear Bordering Vegetated Wetland ("BVW"); 2) another BVW along much of the cornfield's western boundary; and 3) the Bank of an intermittent stream just off-site to the west, which partially projects 100-foot Buffer Zone onto the subject parcel. This stream was determined to have no flow at least four days within a consecutive 12-month period through an evaluation conducted by GZA in 2015 and 2016, and documentation of these conditions is provided in the aforementioned report at Appendix D. Ameresco is seeking the Commission's confirmation of the BVW boundaries, and those portions of Buffer Zone from the off-site stream that project into the parcel.

84 Russell Street
Hadley, MA 01035
413.325.7372

Thank you for your attention to this ANRAD. Do contact me with any questions.

Sincerely,

David Cameron

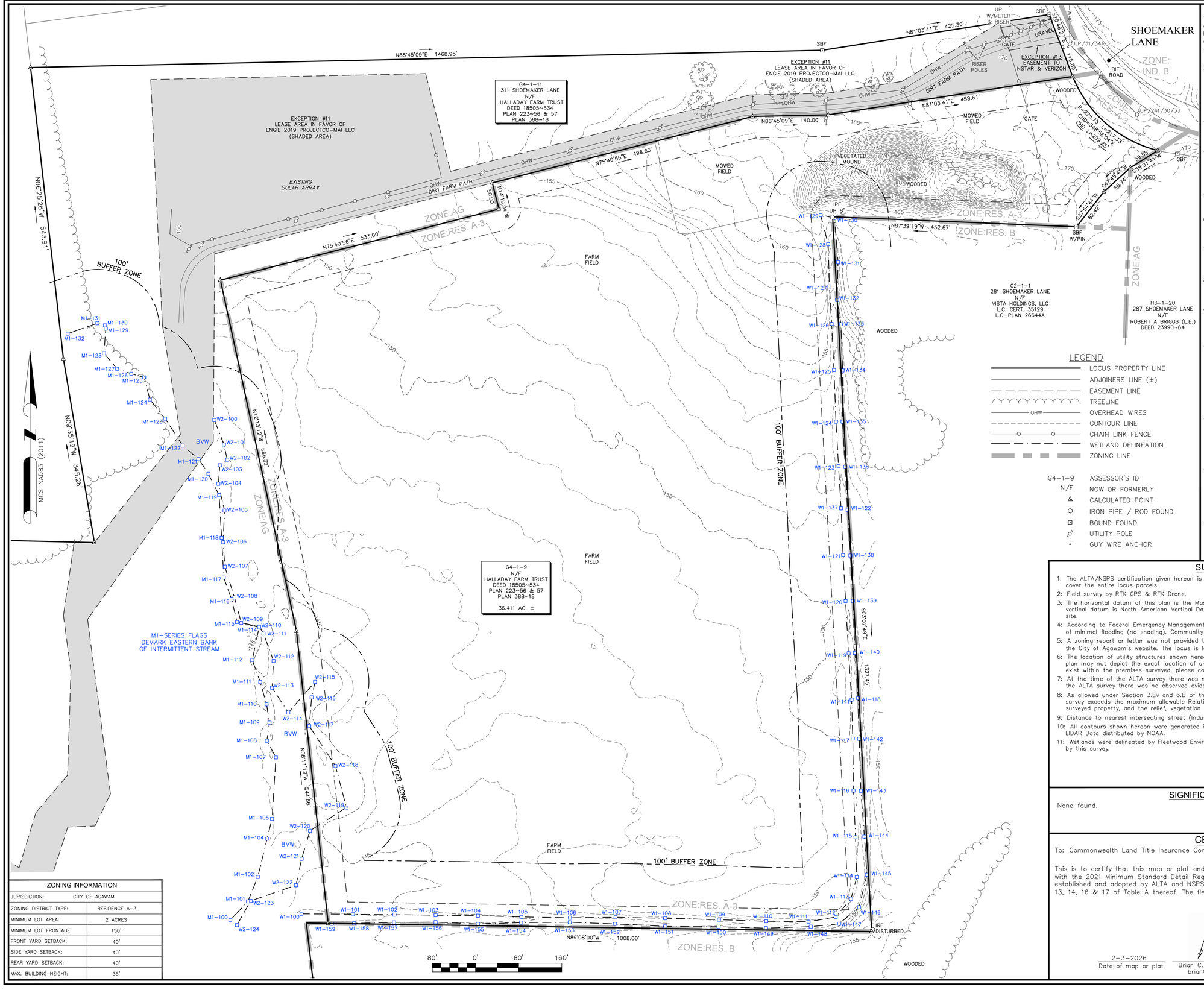
David Cameron, PWS, Principal
Fleetwood Environmental Solutions, LLC

Copy: Nikki Pollis, Ameresco, Inc.
MassDEP, WERO

84 Russell Street
Hadley, MA 01035
413.325.7372

APPENDIX B

Site Plan



LEGEND

- LOCUS PROPERTY LINE
- ADJOINERS LINE (±)
- EASEMENT LINE
- TREELINE
- OHW — OVERHEAD WIRES
- CONTOUR LINE
- CHAIN LINK FENCE
- WETLAND DELINEATION
- ZONING LINE

- G4-1-9 — ASSESSOR'S ID
- N/F — NOW OR FORMERLY
- CALCULATED POINT
- IRON PIPE / ROD FOUND
- BOUND FOUND
- UTILITY POLE
- GUY WIRE ANCHOR

ZONING INFORMATION

JURISDICTION:	CITY OF AGAWAM
ZONING DISTRICT TYPE:	RESIDENCE A-3
MINIMUM LOT AREA:	2 ACRES
MINIMUM LOT FRONTAGE:	150'
FRONT YARD SETBACK:	40'
SIDE YARD SETBACK:	40'
REAR YARD SETBACK:	40'
MAX. BUILDING HEIGHT:	35'

TITLE EXCEPTIONS:

The following exceptions were taken from a title commitment prepared by Commonwealth Land Title Insurance Company, file #BOS-250073-MS, commitment date 2/20/2025.

1. Rights or claims of persons in possession. **(not a survey matter)**
2. Easements or claims of easements not shown by the public records, boundary-line disputes, overlaps, encroachments, title to filled lands (if any) and any matters not of record which would be disclosed by an accurate survey and inspection of the premises. **(see Significant Observations for any such matters disclosed by this survey)**
3. Any lien, or right to a lien, for services, labor or material, heretofore or hereafter furnished, imposed by law and not shown by the public records. **(not a survey matter)**
4. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I-Requirements are met. **(not a survey matter)**
5. Liens for taxes and municipal charges which become due and payable subsequent to the date of said policy. **(not a survey matter)**
6. Order of Conditions by the Agawam Conservation Commission, recorded in Book 7605, Page 74; as affected by a Certificate of Compliance, recorded in Book 7863, Page 324. **(not a survey matter; pertains to locus)**
7. Order of Conditions by the Agawam Conservation Commission, recorded in Book 4850, Page 241; as affected by a Certificate of Compliance, recorded in Book 9155, Page 489. **(not a survey matter; non-locus)**
8. Consent Agreement by and between Zielinski Brothers II and Tennessee Gas Pipeline Company, dated December 23, 1997, recorded in Book 10563, Page 447. **(non-locus; not plotted)**
9. Order of Conditions by the Agawam Conservation Commission, recorded in Book 22315, Page 489; as affected by a Certificate of Compliance, recorded in Book 24050, Page 101. **(not a survey matter; pertains to locus)**
10. Solar Real Estate Lease Option Agreement, dated June 19, 2017, recorded in Book 22570, Page 231; as affected by Landowner Estoppel Certificate, dated December 18, 2018, recorded in Book 22570, Page 260; as further affected by Assignment and Assumption of Option to Lease, dated March 7, 2019, recorded in Book 22579, Page 157; as further affected by Assignment and Assumption of Option to Lease, dated June 3, 2019, recorded in Book 22713, Page 253. **(said option was exercised in #11 below)**
11. Notice of Lease by and between Timothy Zielinski, as Trustee of the Halladay Farm Trust, and ENGIE 2019 ProjectCo.-MA1 LLC, a Delaware limited liability company, dated November 12, 2019, recorded in Book 22981, Page 275; as affected by Amended and Restated Notice of Lease, dated February 21, 2020, recorded in Book 23129, Page 281. **(plotted)**
12. Temporary Construction Staging Easement Agreement, dated November 26, 2019, recorded in Book 23030, Page 228; as affected by First Amendment to Temporary Construction Staging Easement, dated January 23, 2020, recorded in Book 23080, Page 199. **(said easement once impacted the locus parcel, but is not plotted because it has expired)**
13. Easement to NStar Electric Company d/b/a Eversource Energy and Verizon New England, Inc., dated February 27, 2020, recorded in Book 23140, Page 193. **(plotted)**

SURVEY NOTES:

1: The ALTA/NSPS certification given hereon is for the proposed solar facility and access only and does not cover the entire locus parcels.
2: Field survey by RTK GPS & RTK Drone.
3: The horizontal datum of this plan is the Massachusetts Coordinate System North American Datum 1983, the vertical datum is North American Vertical Datum 1988, both are based on RTK GPS observations taken on site.
4: According to Federal Emergency Management Agency maps, the majority of the property is in Zone X, areas of minimal flooding (no shading). Community-panel number 25013C 0392 E, effective date 7/16/2013.
5: A zoning report or letter was not provided to the surveyor. All zoning information given hereon is taken from the City of Agawam's website. The locus is located in the "Residence A-3" zoning district.
6: The location of utility structures shown hereon are from observed field evidence & record plans only, this plan may not depict the exact location of underground utilities & does not show all of the utilities which exist within the premises surveyed. please contact dig-safe at 1-888-344-7233 before excavation.
7: At the time of the ALTA survey there was no observed evidence of active earth moving work. At the time of the ALTA survey there was no observed evidence of building construction or building additions.
8: As allowed under Section 3.Ev and 6.B of the 2021 ALTA/NSPS Minimum Standard Detail Requirements, this survey exceeds the maximum allowable Relative Positional Precision due to the size and configuration of the surveyed property, and the relief, vegetation and improvements on the surveyed property.
9: Distance to nearest intersecting street (Industrial Lane) is 1,450'±.
10: All contours shown hereon were generated in ArcMap from digital elevation models of the 2015 QL1 & QL2 LIDAR Data distributed by NOAA.
11: Wetlands were delineated by Fleetwood Environmental Solutions, LLC in September 2025. Flags were located by this survey.

SIGNIFICANT OBSERVATIONS:

None found.

CERTIFICATION:

To: Commonwealth Land Title Insurance Company

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes items 2, 3, 4, 5, 6a, 6b, 7a, 7b1, 8, 11a, 13, 14, 16 & 17 of Table A thereof. The fieldwork was completed on 10/14/2025.

2-3-2026
Date of map or plat

Brian C. Franetovich PLS #54258
brian@northeastsurvey.com

COMMONWEALTH OF MASSACHUSETTS
BRIAN C. FRANETOVICH
NO. 54258
REGISTERED PROFESSIONAL LAND SURVEYOR

NORTHEAST SURVEY CONSULTANTS
3 FERRY STREET
STUDIO 1 EAST
EASTHAMPTON, MA 01027
(413) 203-5144

EXISTING CONDITIONS

SURVEYOR:	BCF	ENGINEER:	-
DRAFTING:	BCF	DESIGN:	-
FIELD WORK:	NAE	HORZ. SCALE:	1" = 80'
PROJECT NUMBER:	25-161	VERT. SCALE:	-
DRAWING NAME:	25-161 ALTA.DWG	DATE:	2-3-2026

ALTA/NSPS LAND TITLE SURVEY
OF LAND IN AGAWAM, MA
SHOEMAKER LANE
PREPARED FOR
WESTON & SAMPSON ENGINEERS, INC.

SHEET NO. 1 OF 1

APPENDIX C

Wetland Delineation Report

Natural Resources Evaluation and Wetland Determination Report

for

311 Shoemaker Lane
Agawam, Massachusetts

October 25, 2025

Prepared for:

Ameresco
20 Winthrop Square
Boston, MA 02110

Prepared by:

fleetwood
ENVIRONMENTAL SOLUTIONS
84 Russell Street
Hadley, MA 01035
413.325.7372
www.fleetwoodenv.com

1.0 INTRODUCTION AND BACKGROUND

Per Ameresco's request, Fleetwood Environmental Solutions, LLC ("Fleetwood") conducted a natural resources-based evaluation for a parcel of land at 311 Shoemaker Lane in Agawam, Massachusetts, identified by MassMapper as property G4_1_9 per MassMapper (screenshot below, with parcel centered):



This property (the "Site", "parcel" or "property") is 36.4 acres in size. Ameresco is assessing the feasibility of a developing commercial solar array project at the Site, which is currently in agricultural use. The assessment was intended to provide detail regarding jurisdictional wetland determinations conducted by Fleetwood and the wetlands permitting implications for development at the Site.

2.0 REVIEW METHODS

2.1 *Desktop Analysis*

Fleetwood initially conducted a desktop investigation for the Site. The following project file was provided by Ameresco for Fleetwood's use:

- Conceptual design plan (Sheet E-100), prepared by Ameresco and dated May 9, 2024 (Appendix A).

Fleetwood additionally consulted historic and contemporary aerial imagery and resource maps depicting topography, elevation, land use, wetlands, floodplains, hydrologic connections, linear [hydrographic] features soils, Estimated Habitats of Rare Wildlife ("EH"), Priority Habitats of Rare Species ("PH"), Certified Vernal Pools ("CVPs"), Potential Vernal Pools ("PVP"), Areas of Critical Environmental Concern ("ACECs"), Outstanding Resource Waters ("ORWs"), Coldwater Fisheries Resources ("CFRs"), and the U.S. Geological Survey's ("USGS") StreamStats Program, as part of the desktop exercise.

2.2 Field-Based Analysis

Field evaluations were conducted by Fleetwood on September 12, 2025; September 26, 2025; and October 21, 2025. These evaluations initially entailed a meander survey to search for Resource Areas regulated under the Massachusetts Wetlands Protection Act ("WPA") and its implementing regulations (310 CMR 10.00), followed by the placement of survey flags along jurisdictional wetland features discovered on and immediately adjacent to the parcel. The requisite state and federal criteria were followed in order to delineate jurisdictional features, including plant communities, soils, and indicators of hydrology. Approximately 45 acres ("Study Area") were visually inspected during the field survey.

3.0 FINDINGS

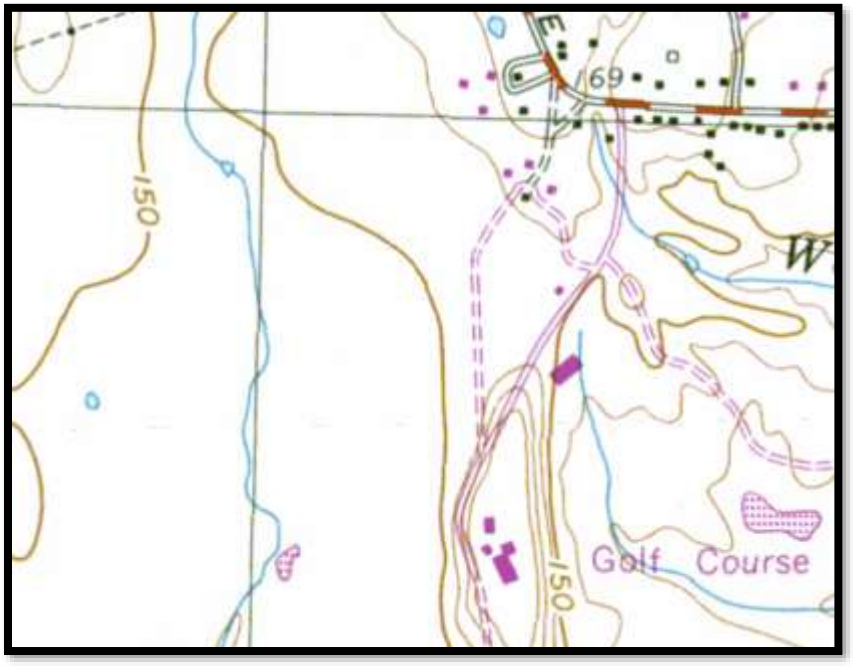
3.1 *General*

According to MassMapper data the Site is comprised of one parcel totaling 36.4 acres and is owned by Timothy Zielinski. Mr. Zielinski also owns the parcel to the immediate west. The Site consists of a large agricultural field, which was serving as an active corn crop during the time of the field evaluation.

3.2 *Historic and Contemporary Aerial Imagery, Topography, Elevation, and Land Use*

Elevation at this property is relatively homogenous, and ranges from 44-46 meters (~144-151) feet, with elevation gains occurring mainly from southwest to northeast. Based upon review of historic aerial images and maps, as well as anecdotal information provided by the property owner, the Site has been in substantially the same state (i.e., agricultural land) for at least several decades.

Current USGS topographic maps depict one stream very close to the western boundary of the Site, originating from the northwest and flowing off-site toward the south, ultimately discharging to Philo Brook. An image is provided below depicting an asterisk near the center of the subject parcel.

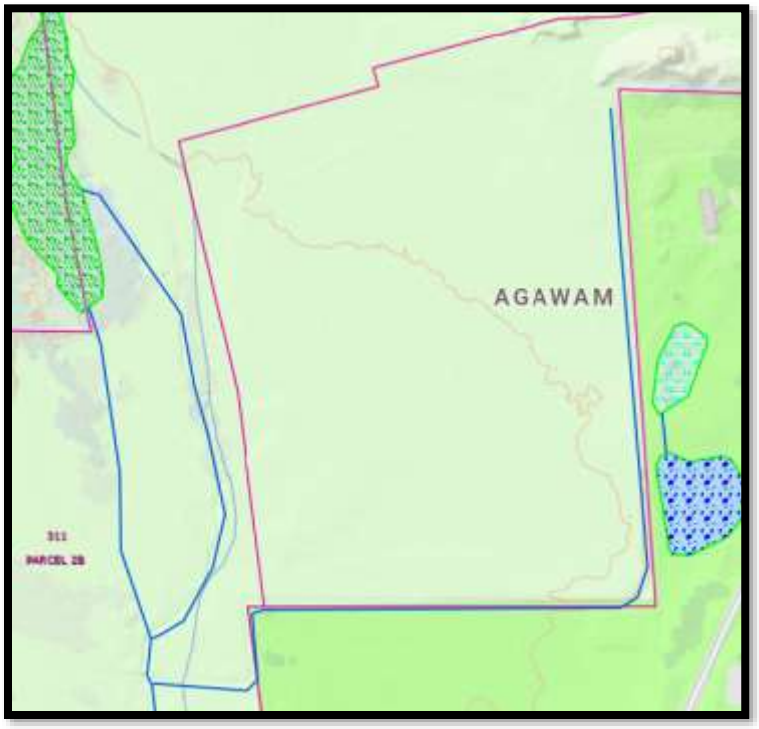


3.3 *Wetlands and Hydrologic Connections*

According to MassMapper's "DEP Wetlands" data layer the Study Area contains two wetland features:

- A hydrologic connection [stream] that wraps the property's eastern and southern boundaries; and
- Another stream along the property's western boundary

These features are depicted in the image below:



MassMapper does not indicate any polygons of "Wetlands Change" or "2005 Human Altered Areas" that have been detected on the Site, meaning no illicit alterations of wetlands have been detected by state regulatory agencies via remote sensing.

Based on Fleetwood's on-site investigations, the following additional information was obtained:

- The wetland features identified by USGS mapping and MassMapper exist and are located generally consistent with said mapping;
- The stream depicted by MassMapper along the eastern and southern property boundaries is a made-made drainage swale that is maintained as mowed herbaceous plants along its channel bottom and embankments. Given it is primarily a long, linear vegetated feature with no scoured channel bottom, it would be best characterized as a linear Bordering Vegetated Wetland ("BVW"), given it discharges to the aforementioned stream near the property's southwestern corner. This feature has an associated 100-foot Buffer Zone;
- An additional wetland along the western edge of the property was discovered, and is composed exclusively of herbaceous plant species, since it is within an active pasture. This wetland is hydrologically connected to the stream to the immediate west, and thus qualifies as a BVW, with an associated 100-foot Buffer Zone; and
- An isolated wetland near the northwestern corner of the parcel that was not flagged by Fleetwood.

The field-located and verified wetlands and streams were flagged accordingly:

- **Wetland 1**: BVW which is the grassy swale along the eastern and southern property boundaries (pink wire pin flags labeled W1-100 through W1-160);

- **Wetland 2**: BVW between the corn field and stream along the property's western boundary (pink tape flags affixed to fiberglass rods labeled W2-100 through W2-124); and
- **Stream**: the apparent Bank/mean annual high-water line ("MAHWL") along the eastern side of the stream was flagged with blue tape and blue wire pin flags labeled M1-100 through M1-132.

3.4 *Floodplain*

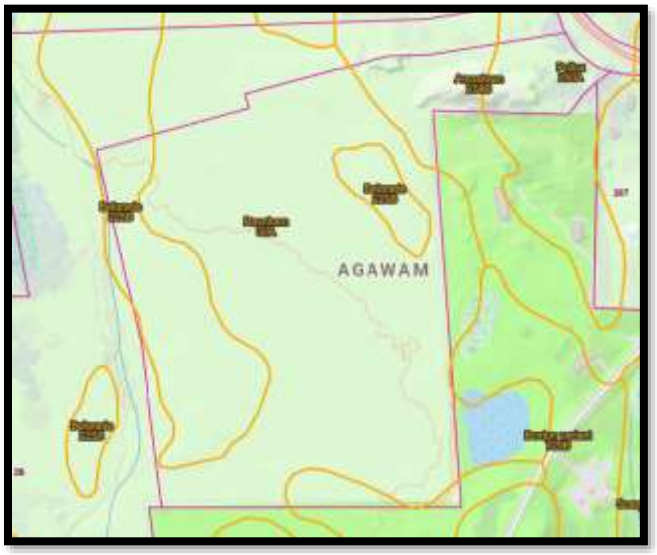
MassGIS does not depict any portion of the project footprint as encompassed by a 100-year [i.e., "Zone A"] floodplain. Neither does the corresponding Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Panel (Appendix C). This means that none of the conceptual solar array would fall within Bordering Land Subject to Flooding ("BLSF")---a Resource Area regulated under the WPA, short of credible documentation being provided by the Agawam Conservation Commission ("Commission") or a third party.

3.5 *Soils*

Four distinct soil types are mapped on the portion of the Site which encompasses the anticipated solar array footprint, per the Natural Resources Conservation Service's Hampden County Soil Survey (Central Part) and MassMapper, as summarized in Table 3-1, and depicted in the image, below.

Table 3-1. Soil Types Mapped within the Vicinity of the Anticipated Proposed Solar Project Footprint

Map Symbol and Unit Name	Portion of Site	Slopes	Hydric?	Prime or Statewide Important Farmland?	Drainage Class
250A Pollux fine sandy loam	northeastern	0-3%	No	Yes	Well drained
258B Amostown fine sandy loam	northeastern	0-6%	No	Yes	Moderately well drained
225B Belgrade silt loam	western	0-8%	No	Yes	Moderately well drained
30A Raynham silt loam	majority of project site	0-3%	Yes	No	poorly drained



Fleetwood's opinion is that the soil survey mapping appears to match the conditions observed in the field, but for the fact that the Raynham soil unit did not display contemporary hydrology (surface water nor groundwater), and was comprised primarily of a healthy corn crop---an agricultural commodity that is generally stunted when growing in wetlands at the margins of corn fields. This may be the result of the significant drainage that has occurred at the property due to the grassy swale.

3.6 *Estimated Habitats of Rare Wildlife*

According to MassGIS there is no EH on the Site.

3.7 *Priority Habitats of Rare Species*

According to MassGIS there is no PH on the Site.

3.8 *Certified Vernal Pools*

According to MassGIS there are no CVPs on the Site.

3.9 *Potential Vernal Pools*

According to MassGIS there are no PVPs on the Site.

3.10 *Areas of Critical Environmental Concern*

According to MassGIS the Site is not within or encompassed by any ACECs.

3.11 *Outstanding Resource Waters*

According to MassGIS there are no ORWs on the Site.

3.12 *Coldwater Fisheries Resources*

According to MassGIS there are no CFRs on the Site.

3.13 *U.S. Geological Survey's StreamStats Program*

StreamStats was consulted to assess the contributing drainage area and percentage of underlying stratified drift soils associated with the stream along the property's western boundary. The StreamStats report for this watercourse is provided at Appendix D, and these data indicate the contributing watershed to the stream is 0.60 square mile with 55% underlying stratified drift. While there is a presumptive perennial status for this stream, a previous streamflow monitoring evaluation by others (GZA) documented at least four days within a consecutive, non-drought period whereupon the stream exhibited no flow. Thus, it does not have an associated 200-Foot Riverfront Area.

Representative Site photographs are provided at Appendix E.

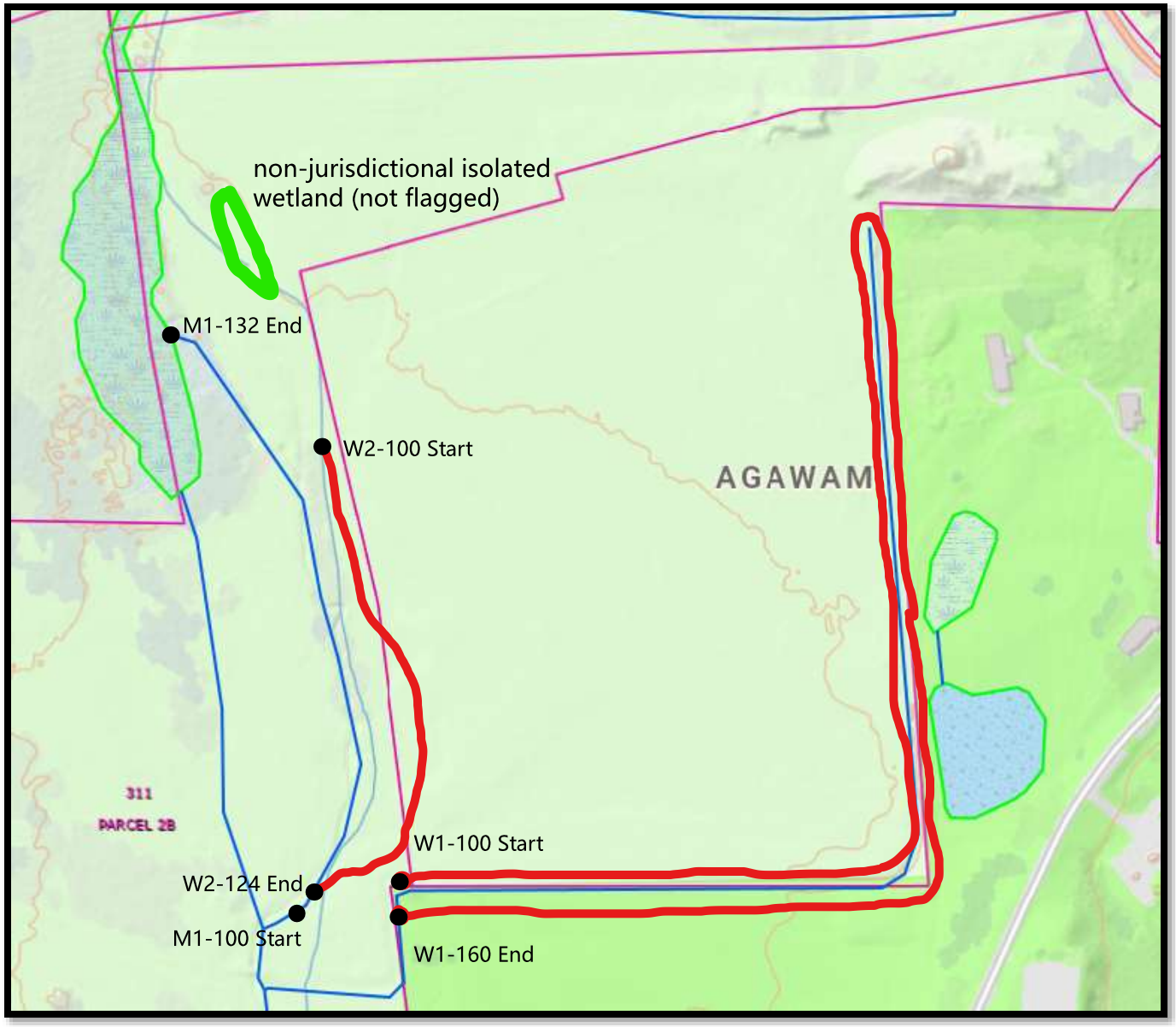
4.0 DISCUSSION AND RECOMMENDATIONS

It is important to note the hydric soil characterization over much of the site, despite it being able to sustain a robust corn crop. As previously discussed, Fleetwood did not flag the majority of this site as a wetland, given: 1) the lack of such a characterization on MassMapper by DEP; 2) the grass swale (Wetland 1) that was constructed to provide significant drainage of the farm field; and 3) anecdotal information from the property owner indicating a significant soils and hydrology investigation was conducted by the Agawam Conservation Commission in the past ruling out the field is a wetland.

APPENDIX B

Wetland Delineation Sketch

Approximate location of wetland flags placed at 311 Shoemaker Lane by Fleetwood Environmental Solutions, LLC - September 2025



W1 Flags = pink wire pin flags on either side of grassy swale [BVW] that are labeled "WETLAND DELINEATION"

W2 Flags = pink tape flags affixed to fiberglass driveway edge stakes that are labeled "WETLAND BOUNDARY" that demarcate the eastern edge of a Bordering Vegetated Wetland ("BVW")

M1 flags = blue wire pin and tape flags that demarcate the eastern mean annual high-water line of an unnamed tributary to Philo Brook

APPENDIX C

Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

72°39'28"W 42°2'52"N



72°38'51"W 42°2'25"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/24/2025 at 8:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

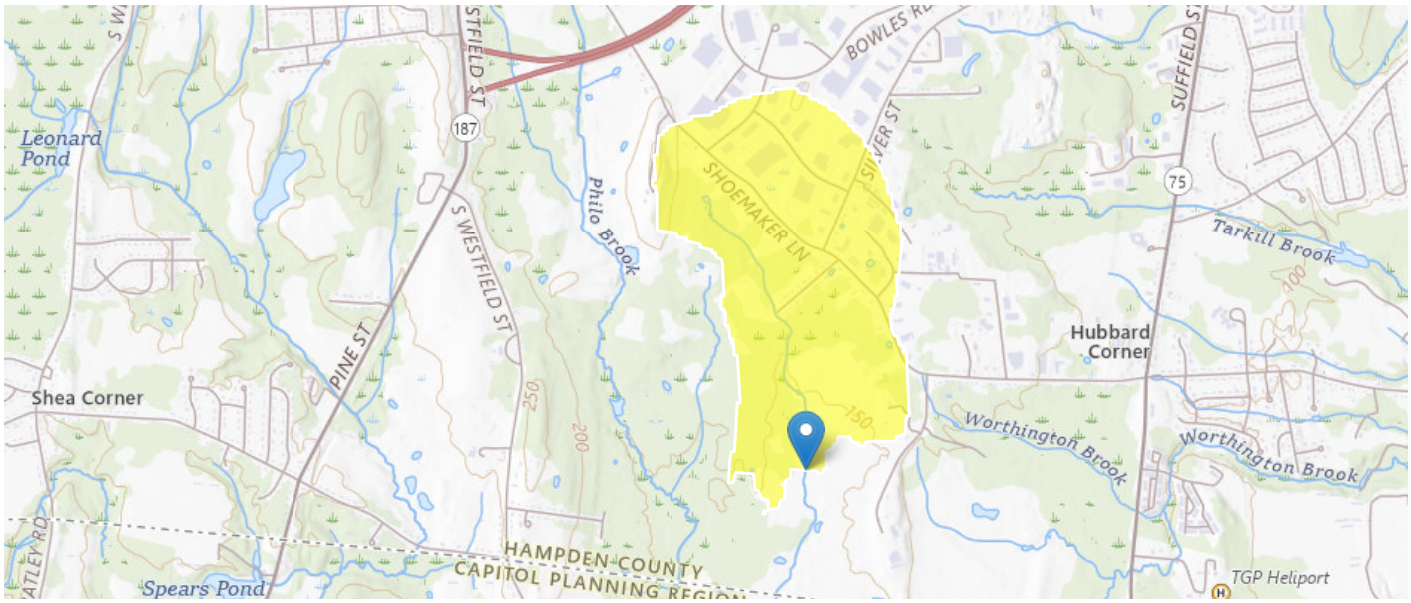
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D

USGS StreamStats Report

StreamStats Report

Region ID: MA
Workspace ID: MA20250929141929673000
Clicked Point (Latitude, Longitude): 42.03902, -72.65579
Time: 2025-09-29 10:19:51 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.6	square miles
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	54.65	percent

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

USGS Software Disclaimer: This software has been approved for release by the U.S. Geological Survey (USGS). Although the software has been subjected to rigorous review, the USGS reserves the right to update the software as needed pursuant to further analysis and review. No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the software and related material nor shall the fact of release constitute any such warranty. Furthermore, the software is released on condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from its authorized or unauthorized use.

USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.29.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX E

Site Photographs from September 26, 2025



Representtaive view of property---view southeast



Wetland 1 (farm ditch) at eastern edge of Site---view south



Wetland 1 (farm ditch) at southern edge of Site---view west



Stream near where it enters the property toward northwestern corner of Site---view west



Isolated wetland (not flagged) toward northwestern corner of Site---view north



Stream along the parcel's western property boundary---view downstream/southwest



Wetland 2 along the edge of cornfield near Site's western property boundary---view north



Wetland 2 near southwestern corner of property---view north

APPENDIX D

GZA Streamflow Monitoring Report



Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

1350 Main Street
Suite 1400
Springfield, MA 01103
413.726.2100
www.gza.com

5/31/2017

GZA File No.: 15.0166503.00

Note: annotations in red were made by Fleetwood Environmental Solutions, LLC upon confirmation of typos/errors in the original report upon discussion with the field scientist (Steven Riberdy) that conducted the evaluation.

Tim Zielinski
218 Shoemaker Lane
Agawam, MA 01001

Re: Shoemaker Lane-Intermittent Stream Monitoring 2014-2016

Dear Tim:

This letter report documents our on-site observations of the stream on your Shoemaker Lane property (see Figure 1) in order to document no-flow conditions in support of overturning the DEP map-based presumption of perennial status. The site was visited 5 occasions between August 2014 and July 2016 (8/15/14, 9/8/15, 9/9/15, 9/10/15, and 7/7/16). Figure 1 also depicts the location of stream monitoring stations that were visited during this timeframe. Photos of each station by date are included in this report.

(This was intended to say "within a consecutive 12-month period" vs. "calendar year.")

In summation, during the course of our site survey the stream was observed completely dry on three consecutive days between 9/8/15 and 9/~~10~~10/15 as well as a fourth date within the same calendar year on 7/7/16. Low flow was observed on our first observation in August 2014. The site was also visited on other occasions between 8/2014 and 7/2016 when some steam flow was observed. In general the upper potions of the stream (up-gradient of Station 6) were observed dry on other dates however the lower sections were observed wet and flowing, albeit in diminished capacity. There is a change in soil type between stations 5 and 7 where sandy soils of the upper stream reach transitions to glacio-lacustrine soils and hold water longer and contribute base-flow for longer in the year.

If you have any questions or concerns, please contact our office at your convenience.

Very truly yours,

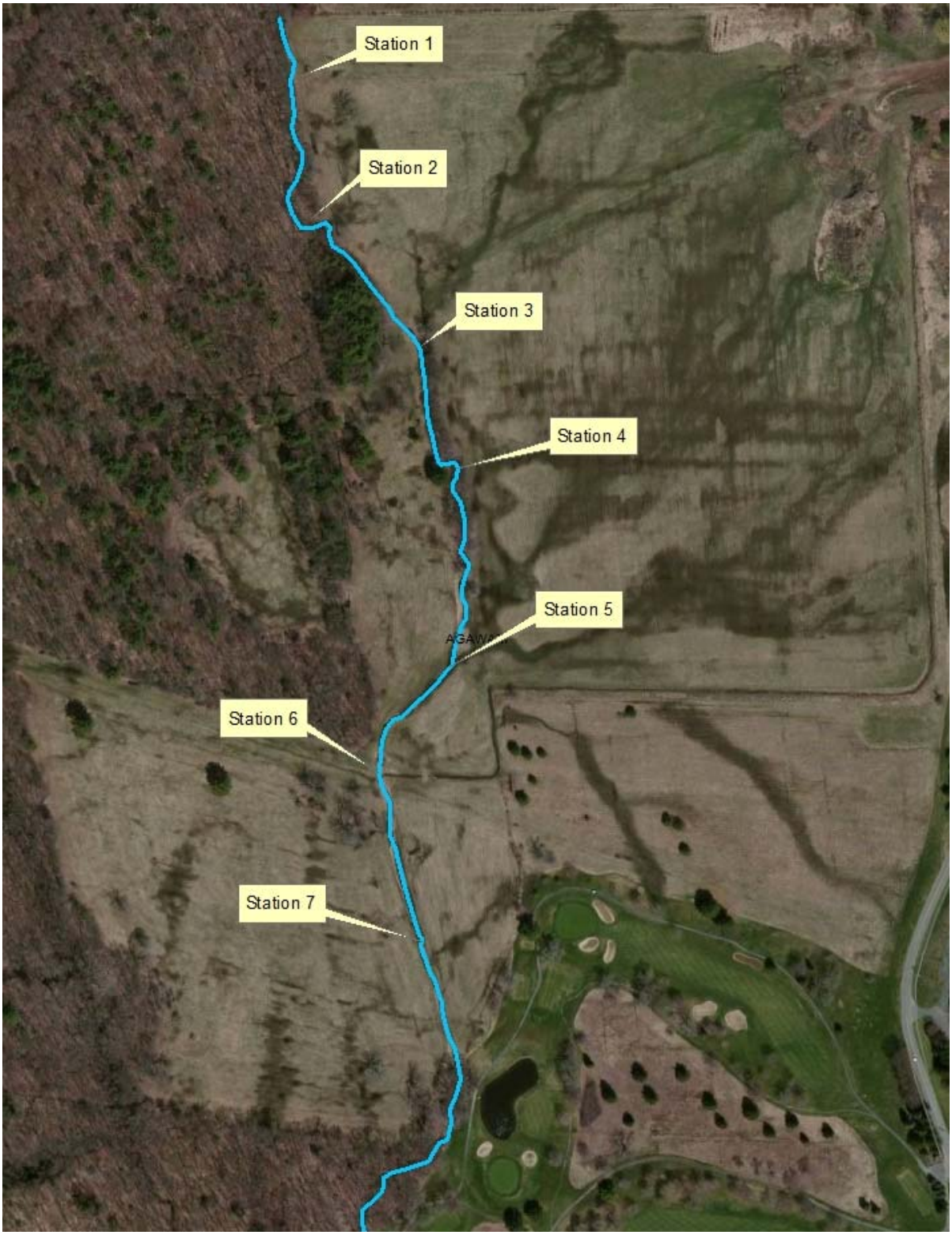
GZA, Inc.

Steven D. Riberdy, MS, PWS, CWB, CE
Senior Ecologist

Attached: Figure 1: Stream Monitoring Stations

Site Photos

Proactive by Design



SITE PHOTOS



8/15/14 Station 1: Wet



8/15/14 Station 2: Wet

SITE PHOTOS



8/15/14 Station 3: Wet



8/15/14 Station 4: Wet

SITE PHOTOS



8/15/14 Station 6: Wet



8/15/14 Station 7 downstream: wet

SITE PHOTOS



8/15/14 Station 7 Upstream: Wet



9/8/15 Station 1: Dry

SITE PHOTOS



9/8/15 Station 2: Dry



9/8/15 Station 2: Dry

SITE PHOTOS



9/8/15 Station 3 Upstream: Dry



9/8/15 Station 3 Downstream: Dry

SITE PHOTOS



9/8/15 Station 4: Dry



9/8/15 Station 4: Dry

SITE PHOTOS



9/8/15 Station 5: Dry



9/8/15 Station 5: Dry

SITE PHOTOS



9/8/15 Station 6: Dry



9/8/15 Station 7: Dry

SITE PHOTOS



9/9/17 Station 1: Dry (caption should be 9/9/15)



9/9/17 Station 2: Dry (caption should be 9/10/15)

SITE PHOTOS



9/9/17 Station 3: Dry (caption should be 9/9/15)



9/9/17 Station 3: Dry (caption should be 9/9/15)

SITE PHOTOS



9/9/17 Station 4: Dry (caption should be 9/9/15)



9/9/17 Station 4: Dry (caption should be 9/9/15)

SITE PHOTOS



9/9/17 Station 5: Dry (caption should be 9/9/15)



9/9/17 Station 6: Dry (caption should be 9/9/15)

SITE PHOTOS



9/10/16 Station 1: Dry (caption should be 9/10/15)



9/10/16 Station 2: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 2: Dry (caption should be 9/10/15)



9/10/16 Station 2: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 3: Dry (caption should be 9/10/15)



9/10/16 Station 3: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 4: Dry (caption should be 9/10/15)



9/10/16 Station 4: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 5: Dry (caption should be 9/10/15)



9/10/16 Station 5: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 6: Dry (caption should be 9/10/15)



9/10/16 Station 7: Dry (caption should be 9/10/15)

SITE PHOTOS



9/10/16 Station 7: Dry



7/7/16 Station 1: Dry

SITE PHOTOS



7/7/16 Station 2: Dry



7/7/16 Station 2: Dry

SITE PHOTOS



7/7/16 Station 3: Dry



7/7/16 Station 4: Dry

SITE PHOTOS



7/7/16 Station 5: Dry



7/7/16 Station 5: Dry

SITE PHOTOS



7/7/16 Station 6: Dry



7/7/16 Station 7: Dry

APPENDIX E

Certified Abutters List and Abutter Notification

Town of Agawam

Assessor's Office

36 Main St, Agawam, MA 01001-1837
Tel: 413-786-0400 x 8701 Fax: 413-726-2828
Email: assessor@agawam.ma.us

CERTIFIED LIST OF ABUTTERS

SUBJECT PROPERTY MAP, BLOCK + LOT	LOCATION OF SUBJECT PROPERTY	OWNERS AND MAILING ADDRESS
G4-01-0009	311 Shoemaker Ln.	Timothy Zielenski Tr Halladay Farm Trust 85026 Barsonage Ct. Fernandina Beach, FL 32034

PLEASE SEE ATTACHED LIST OF ABUTTERS

Per the Assessors records I certify that the attached lists of persons are the abutters of record for the subject properties within 100 feet of the outer perimeter.

To the best of our knowledge, this list represents the most current owners of the properties. The accuracy of this listing is based solely on the information currently available in our database.

**Please note that this parcel borders another community. Some of the abutters are not located in Agawam, and are not listed in the enclosed report. You will need to contact the bordering community for any additional abutter information required.*

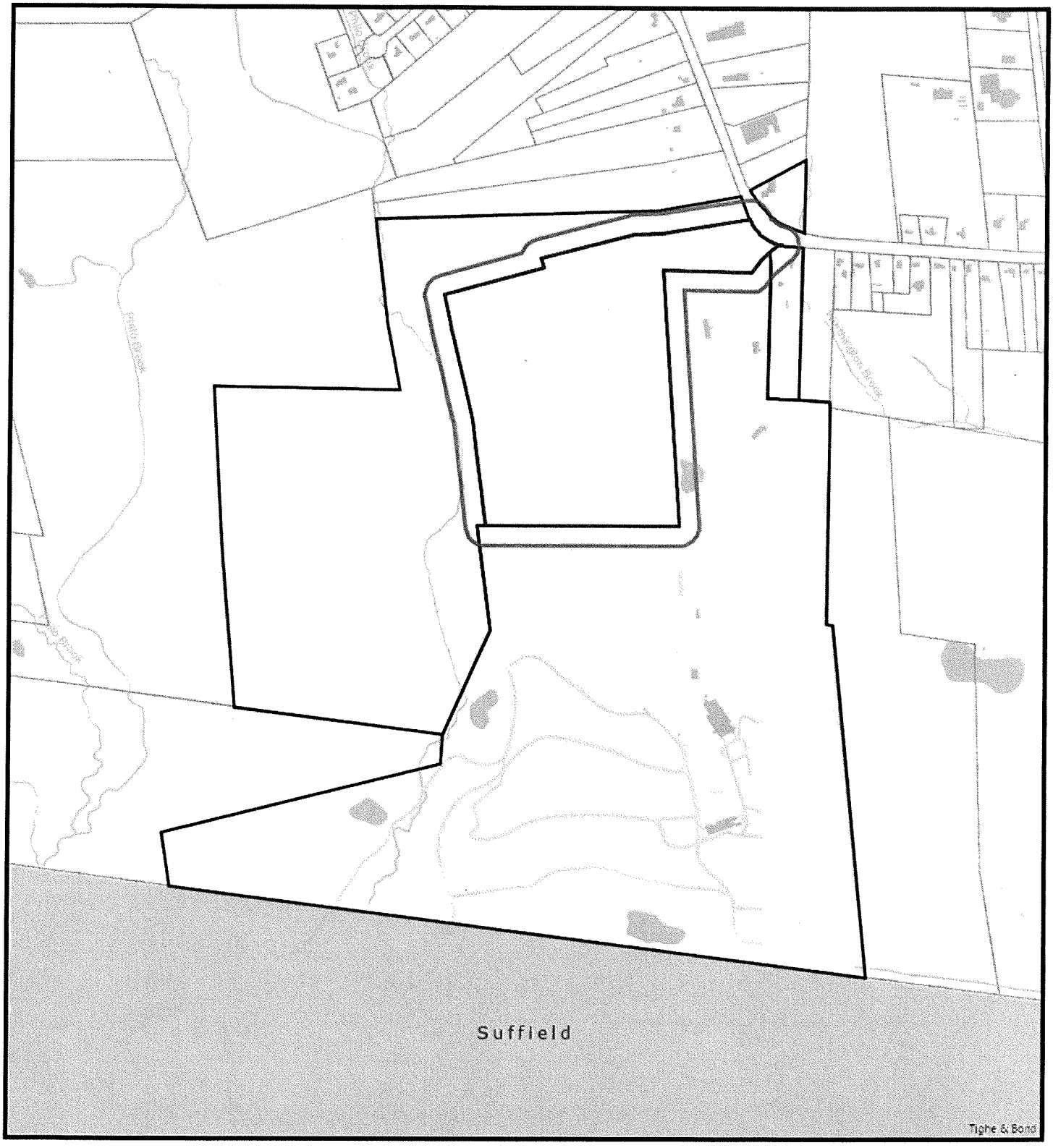
Kelly McCormick
Kelly McCormick, MAA
Agawam Assessor

2/9/24
Date

311 SHOEMAKER LN

100'

Parcel ID	Address	Owner	Owner 2	Owner Address	City	State	Zip
H3 1 20	287 SHOEMAKER LN	BRIGGS ROBERT A L/E		287 SHOEMAKER LN	AGAWAM	MA	01001
H4 2 15	318 SHOEMAKER LN	SMUS PETER J		318 SHOEMAKER LN	AGAWAM	MA	01001
G2 1 1	281 SHOEMAKER LN	VISTA HOLDINGS LLC		281 SHOEMAKER LN	AGAWAM	MA	01001
G4 1 11	PARCEL 2B SHOEMAKER LN	ZIELINSKI TIMOTHY TR	HALLADAY FARM TRUS	85026 BARSONAGE CT	FERNANDINA BEACH	FL	32034



311 SHOEMAKER LN 100'

2/3/2026 10:15:47 AM

Scale: 1"=700'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

Notification to Abutters
Under the Massachusetts Wetlands Protection Act

This is a notification required by law. You are receiving this notification because you have been identified as the owner of land abutting another parcel of land for which certain activities are proposed. Those activities require a permit under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40).

In accordance with the second paragraph of the Massachusetts Wetlands Protection Act, and 310 CMR 10.05(4)(a) of the Wetlands Regulations, you are hereby notified that:

A. An Abbreviated Notice of Resource Area Delineation ("ANRAD") was filed with the Agawam Conservation Commission on February 24, 2026 seeking confirmation of the boundaries of areas subject to protection under M.G.L. c. 131 §40.). The work proposed is:

No work proposed at this time.

B. The name of the applicant is: Ameresco, Inc.

C. The address of the land where the activity is proposed is: 311 Shoemaker Lane.

D. Copies of the ANRAD may be examined at the Public Works Municipal Annex, 1000 Suffield Street, between the hours of 9:00 a.m. and 3:00 p.m., Monday – Friday, and online at: www.agawam.ma.us/169/Conservation-Commission (see "Pending Applications").

E. Copies of the ANRAD may be obtained from the applicant's representative (Fleetwood Environmental Solutions, LLC) by calling 413.325.7372. An administrative fee may be applied for providing copies of the ANRAD and plans.

F. Information regarding the date, time, and place of the public hearing may be obtained by calling the Conservation Officer at 413.786.0400 x. 8245. Conservation Commission agendas are also posted at: www.agawam.ma.us/169/Conservation-Commission

Notification provided pursuant to the above requirement does not automatically confer standing to the recipient to request Departmental Action for the underlying matter. See 310 CMR 10.05(7)(a)4.

AGAWAM CONSERVATION COMMISSION
April 23, 2026

MEMBERS PRESENT:
Henry Kozloski, Chair
Magda Galiatsos
Keven Brown
Laura Fallon

MEMBERS ABSENT:
Jill Ward
Sheryl Becker
Frank Meagher

ALSO PRESENT:
Stefanie Kesecker

Mr. Kozloski called the meeting to order at 6:00pm.

1. 6:00PM Request for Determination-27 Mark Drive-Ruhland

Kristina Ruhland, 27 Mark Drive was present for this agenda item and stated the proposal is for a 260 sq. ft. addition to the existing deck to the existing pool. Mr. Brown asked if it was the same elevation. Ms. Ruhland stated it is one step up. Ms. Galiatsos asked if it would be on pillars. Ms. Ruhland stated it would be on stilts. Mr. Kozloski stated it is an exempt act under the Wetlands Protection Act.

Motion was made by Mr. Brown and seconded by Ms. Galiatsos to issue a Negative Determination for 27 Mark Drive.

VOTE 4-0-0

2. Request for Determination Cont.-769 Silver Street-Agawam Energy Center, LLC

Melissa Kaplan, BSC Group was present for this agenda item. Ms. Kaplan stated peer reviewer Stockman had been onsite and confirmed the delineation line after a few site visits. She stated Planning Board approval had also been received. Ms. Stockman stated she went onsite towards the end of March and there were a few areas in the western area of the site that gave pause, primarily because of the time of year. She stated she was onsite on April 20, 2026 and BSC presented a very detailed assessment that addressed all the concerns that were seen in March. She stated the two areas of concerns do not meet the criteria for Bordering Vegetated Wetland. She stated she concurs with the areas that were delineated with the exception of one flag. She went on to say the first question is whether or not the area is an area subject to protection. She stated bank and BVW have been delineated within the site and she is recommending a Positive Determination stating the area does include resources, with the finding that clearly documents

the two areas of concern were evaluated and the Commission has determined that those areas are not subject to the Wetlands Protection Act. She stated the delineated boundaries were accurate and she recommends a Positive Determination 2A that the boundaries are confirmed as accurate. She stated the concept of a proposed meadow was not in the first Plan and it appeared all the work would be outside the 100 ft. buffer zone. She stated the surveyor will demarcate where the 100 ft. buffer zone is with signage indicating to the construction crew that they cannot encroach the 100 ft. buffer zone during large construction, but they can get into it for the proposed meadow work. She recommends a Negative 3 Determination saying work is in the buffer zone, but as long it follows the conditions a Notice of Intent is not necessary with conditions. The first recommended condition would be that the surveyor is going to mark the 100 ft. buffer zone to ensure there is no encroachment by the larger construction. The second recommended condition would be the Commission received a stamped Engineer Plan to address comment #10 to show delineated boundaries and flags, and reflect the reviewed site map "Agawam Energy Center Environmental Site Plan" dated April 22, 2026 be submitted to the Commission by May 7, 2026 for review and approval prior to the start of work. The third recommended condition is prior to the start of work additional details regarding the proposed meadow seeding, including, but not limited to, seed mix composition, seedbed preparation, irrigation, stabilization, and management shall be submitted to the Commission for review and approval.
Mr. Kozloski stated the stamped Plan should be received by May 7, 2026. Mr. Kozloski asked about the seeding in the meadow area and if there was ruts. Ms. Kaplan stated yes there were ruts. He asked how this would be done. She stated it would be mowed and native seeded and if it doesn't take it will stay as it is. Mr. Kozloski asked the proposed start date. Ms. Kaplan stated April 2027. Mr. Kozloski stated the Commission would need to be notified 72 hours prior to the start of construction.
Mr. Brown asked about the conditions of the meadow area. Ms. Kaplan stated it is compact, but there is good vegetation there. Mr. Brown asked if it was jurisdictional. Ms. Kaplan stated it was in the buffer area.
Ms. Galiatsos asked if the areas of debris will be cleaned up. Ms. Kaplan stated grading and cleaning up will occur outside the buffer zone.
Mr. Kozloski suggested the meadow be seeded in the early Spring.

Motion was made by Mr. Brown and seconded by Ms. Galiatsos to issue a Positive Determination 1 on the area for the project with the acknowledgement the two areas of have been evaluated and are not jurisdictional.

VOTE 4-0-0

Motion was made by Mr. Brown and seconded by Ms. Galiatsos to issue a Positive Determination 2A to confirm the boundaries are accurate and the flags are cited.

VOTE 4-0-0

Motion was made by Mr. Brown and seconded by Ms. Galiatsos to issue a Negative Determination 3 for the work provided the core conditions are met the surveyor should mark the

100 ft. buffer zone prior to the start of work, the Site Plan stamped by an engineer is received by May 7, 2026, the details on the proposed meadow are received prior to the start of work, and the Commission is notified 72 hours prior to any work commencing.

VOTE 4-0-0

3. Public Hearing Cont.-Abbreviated Notice of Resource Area Delineation-311 Shoemaker Lane-Ameresco, Inc.

The Conservation Commission received a request to continue this agenda item to the May 14, 2026 meeting.

Motion was made by Ms. Galiatsos and seconded by Mr. Brown to continue the Public Hearing for the Abbreviated Notice of Resource Area Delineation for 311 Shoemaker Lane-Ameresco, Inc. to the May 14, 2026 meeting as requested.

VOTE 4-0-0

4. Request to Amend Order of Conditions-184 River Road-Kanegsberg

Mike Bowan, R. Levesque Associates and the petitioner Howard Kanegsberg were present for this agenda item. Mr. Bowan stated an NOI was approved in 2011 for a new house and garage, and an Order of Conditions which have both been extended. He stated they are requesting an amendment to this OOC for a slightly larger house and garage. He stated the total increased impervious area will be 600 sq. ft. Mr. Kozloski asked if there were be compensatory storage. Mr. Bowan stated the flood elevation is 58ft and the house elevation is 59 ft. so it is above flood area. Mr. Brown asked if the house was already built. Mr. Bowan stated the original house is currently there, but will be demoed and a new house built. Mr. Brown asked if it was generally in the same area. Mr. Bowan stated yes it will be a bit further north due to the increase and will be further away from the river area. Mr. Kozloski stated if the house is demolished the debris must be taken offsite. Mr. Brown asked if erosion controls are proposed. Mr. Bowan stated a silt fence is proposed. Mr. Kozloski stated a silt sock would be better. Mr. Bowan stated a silt sock could be used. Mr. Brown asked if there would be a disturbance to lawn area. Mr. Bowan stated only one tree will be removed.
Mr. Kanegsberg stated the purpose of wanting to increase is to keep his living quarters on one floor.

Motion was made by Mr. Brown and seconded by Ms. Fallon to amend the Order of Conditions for 184 River Road-Kanegsberg.

VOTE 4-0-0

The amended Order of Conditions will be written at the May 14, 2026 meeting.

5. Write Order of Conditions-699 Silver Street-MSR Properties, LLC

The Commission wrote the Order of Conditions for 699 Silver Street.

Motion was made by Mr. Brown and seconded by Ms. Galiatsos to issue the Order of Conditions for 699 Silver Street for MSR Properties, LLC, as written.

VOTE 4-0-0

6. Approval of Minutes-April 9, 2026

Motion was made by Ms. Galiatsos and seconded by Mr. Brown to approve the April 9, 2026 minutes, as written.

VOTE 4-0-0

7. Correspondence and Complaints

Mr. Kozloski stated the Town of Agawam applied for funding to remove bittersweet. Conservation Commission applied for the funds through CPA and $29,000 was approved to begin removal at School Street Park and a small section of the Bike Path.

Mr. Kozloski stated the Commission will send a letter to the School Board, asking that the trail through the woods at Agawam Junior High be dedicated to Page Fallon and a marker erected in his name.

Motion was made by Mr. Brown and seconded by Ms. Fallon to adjourn the meeting.

VOTE 4-0-0

Meeting adjourned at 6:50pm.