Conservation Commission
AGENDA

Thursday, September 10, 2026 - 6:00 PM

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

A. Conservation Commission

1) 6:00PM Public Hearing-Notice of Intent-1485 Suffield Street-Longbrook Condominium Association

2) Public Hearing Cont.-Abbreviated Notice of Resource Area Delineation-1399 Suffield Street & Parcel 2 Suffield Street-Charlie's Garden Park

3) Public Hearing Cont.-Notice of Intent-365 Main Street-O'Malley

4) Approval of MInutes-August 27, 2026

5) Correspondence & Complaints

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: September 1, 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:	LONGBROOK CONDOMINIUM	Owner:	LONGBROOK ESTATE CONDOMINIUM
Address:	476 COLLEGE HIGHWAY SOUTHWICK, MA 01077	Address:	476 COLLEGE HIGHWAY SOUTHWICK, , 01077
LOCUS:	1485 SUFFIELD STREET		

This project has been assigned the following file # : WE 087-0716

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] It appears that no Certificates of Compliance have been issued for Order of Conditions (OOC) MassDEP File No. 087-0494 within the Project Locus. The commission should be mindful of the “dual notices” policy (linked below). If the projects overlap, the commission may wish to consider issuing an OOC for this proposed project and subsequently issue a Certificate of Compliance for the original OOC.

https://www.mass.gov/info-details/wetlands-program-policy-88-3-multiple-filings

[2] The Notice of Intent (NOI) states in relevant part, “The Applicant proposes to permit the Project under 310 CMR 10.58(5) as redevelopment within previously developed RFAs since the proposed Project limit of work (LOW) is fully contained within the previously permitted development footprint” – referring specifically to the original condominium project that began in the mid to late 2000’s (MassDEP # 087-0494).

The Riverfront Redevelopment standards at 310 CMR 10.58(5) states in relevant part, “…A previously developed riverfront area contains areas degraded prior to August 7, 1996 by impervious surfaces from existing structures or pavement, absence of topsoil, junkyards, or abandoned dumping grounds…”. The NOI does not demonstrate that a developed Riverfront Area existed prior to August 7, 1996, therefore it doesn't appear to qualify.

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

LONGBROOK CONDOMINIUM ASSOCIATION
476 COLLEGE HIGHWAY
SOUTHWICK, MA 01077

For this reason, the commission should require the Applicant to demonstrate that the project complies with the Riverfront Area General Performance Standards at 310 CMR 10.58(4).

[3] Please reach out to Tom Gruszkos via phone at (617) 352-2604 with any questions. Thanks.

If you have any questions regarding this letter, please contact: THOMAS GRUSZKOS @ (413)-755-2260

Cc: Agawam Conservation Commission, DPW Inspection Services 1000 Suffield Street, Agawam, MA, 01001
Owner: LONGBROOK ESTATE CONDOMINIUM TRUST, 476 COLLEGE HIGHWAY, SOUTHWICK, , 01077
Representative: VHB, 120 FRONT STREET SUITE 500, WORCESTER, MA, 01608

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

Longbrook Condominium

1485 Suffield Street,
Agawam, Massachusetts

PREPARED FOR

Longbrook Condominium Association
476 College Highway
Southwick, MA 01077

PREPARED BY

120 Front Street, Suite 500
Worcester, MA 01608
508.752.1001

August, 2026

Table of Contents

1 Introduction 4

2 Site Description 5

2.1 Soils 5
2.2 Developed Areas 5
2.3 Upland Forest Areas 6

3 Regulated Resource Areas 7

3.1 Inland Bank 7
3.2 Land Under Water and Water Bodies 7
3.3 Bordering Vegetated Wetland 8
3.4 Buffer Zone 8
3.5 Riverfront Area 8

4 Other Environmental Constraints 9

4.1 WPA Aquatic Resource Areas 9
4.2 Vernal Pools 9
4.3 Rare Species Habitat 9
4.4 Areas of Critical Environmental Concern 9
4.5 Outstanding Resource Waters 9

5 Proposed Work and Impacts 10

5.1 Buffer Zone Impacts 10
5.2 Riverfront Area Impacts 10

6 Avoidance, Minimization, and Mitigation 12

6.1 Construction Schedule 12
6.2 Best Management Practices 12
6.3 Stormwater 13

7 Regulatory Compliance 14

7.1 General Provisions and Performance Standards 14
7.1 Redevelopment Within Previously Developed RFA (310 CMR 10.58(5)) 16

8 Summary 18

9 References 19

Appendix A: Figures ..... A

Appendix B: WPA Form and Check Copies ..... B

Appendix C: Abutter Informaiton C

Appendix D: Photo Log ..... D

Appendix E: Order of Resource Area Delineation (ORAD) ..... E

Appendix F: Site Plans ..... F

Appendix G: Stormwater Report ..... G

List of Tables

Table No.	Description	Page
Table 1	Resource Area Impact Summary	10
Table 2	General Provisions of the Wetlands Protection Act (310 CMR 10.03)	14
Table 3	Redevelopment Within Previously Developed Riverfront Area (310 CMR 10.58(5))	16

1

Introduction

Vanasse Hangen Brustlin, Inc. (VHB) is pleased to file this Notice of Intent (NOI) on behalf of the Longbrook Condominium Association (Applicant) in support of the proposed Longbrook Condominium Project (Project) at 1485 Suffield Street, Agawam, Massachusetts. The Project is proposed at the parcel located at 42.038555, -72.631448. The parcel ID is I2/39/306. Figure 1 (Appendix B) depicts the extent of the Project on an U.S. Geological Survey (USGS) topographic map.

The proposed Project consists of the construction of 11 condominium buildings, associated sidewalks and parking lots, access road, and stormwater infrastructure.

The Project will impact 100-foot Buffer Zone and 200-foot Riverfront Area (RFA). Impacts to all other resource areas including Inland Bank, Land Under Water Bodies and Waterways (LUWW), Bordering Vegetated Wetland (BVW), and Bordering Land Subject to Flooding (BLSF) have been avoided. Additionally, all temporary impacts will be restored following the completion of construction.

This NOI application has been developed in accordance with the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40) (WPA) and its implementing regulations (310 CMR 10.00 et seq.). The Town of Agawam has not enacted a separate wetlands protection bylaw.

Two hardcopies and an electronic copy of this NOI are being submitted to the Agawam Conservation Commission (Commission) and an electronic copy is being submitted to the Massachusetts Department of Environmental Protection (MassDEP) using the eDEP filing system. The Project is proposed as a Category 3b for the construction of a portion of five buildings within the 100-foot Buffer Zone and/or 200-foot RFA totaling $7,350. The Town's portion is $3,687.50; the Commonwealth's portion is $3,662.50. A copy of the WPA form and checks are included in Appendix B. Abutter information can be found in Appendix C

2

Site Description

The Project parcel is approximately 12 acres and is the site of a partially constructed condominium and associated infrastructure. Construction of the original condominium project began in the mid to late 2000's (MassDEP # 87-494). In 2008, while construction was underway, the onsite stormwater detention basin catastrophically failed. Construction was haled with one building having been completed and another partially completed. At present, the completed building is intact, but the partially completed building has collapsed. Roads and parking for the planned development have been constructed and are still in place. Vegetation has grown into abandoned areas and the original stormwater basin. The vegetation primarily consists of non-native invasive species and other pioneer species. The northeastern portion of the property consists of forested wetlands which border Worthington Brook. The topography of the site is generally flat in the areas of proposed development. However, the topography slopes steeply towards down towards Worthington Brook along the northeastern edge of the parcel. Photographs have been provided in Appendix D.

The site was previously approved for development with an Order of Conditions (OOC) being issued by the Commission on November 13, 2003, for the construction of condominiums. An extension of the order was granted on November 3, 2008. Construction was initiated; however, the stormwater detention basin for the project failed in 2008 leading to erosion and sedimentation within the downslope wetland and stream. The Commission issued an Enforcement Order on February 28, 2008. The erosion and sedimentation were not addressed, and the Commission turned the Enforcement Order over to MassDEP on March 26, 2009.

2.1 Soils

According to the Web Soil Survey (Natural Resources Conservation Service [NRCS] 2019), nine soil types are mapped within the Project area: Limerick silt loam, 0 to 3 percent slopes, frequently flooded; Pollux fine sandy loam, 0 to 3 percent slopes; Pollux fine sandy loam, 8 to 15 percent slopes; Merrimac fine sandy loam, 3 to 8 percent slopes; Merrimac fine sandy loam, 15 to 25 percent slopes; Amostown fine sandy loam, 0 to 6 percent slopes ; Agawam fine sandy loam, 0 to 3 percent slopes; Meckesville loam, 8 to 15 percent slopes; and Enosburg loamy sand, 0 to 3 percent slopes. Limerick silt loam and Enosburg loamy sand are listed as hydric.

2.2 Developed Areas

The majority of the site was cleared in the mid-2000s as part of the original development. One building containing eight units was completed and another building was partially completed. Access roads, parking, and stormwater management were also installed. The abandoned area surrounding the buildings and other infrastructure consists of early successional species such as false buckthorn (*Frangula alnus*) and aspen (*Populus tremuloides*).

2.3 Upland Forest Areas

The upland forested areas on site are dominated by northern red oak (*Quercus rubra*), American beech (*Fagus grandifolia*), and sugar maple (*Acer saccharum*).

3

Regulated Resource Areas

VHB reviewed multiple mapping resources available from the Massachusetts Bureau of Geographic Information System (MassGIS) and others including, but not limited to, MassDEP mapped wetlands and hydrologic connections, hydrography, aerial imagery, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), USGS topographic quadrangles, potential and certified vernal pools, NRCS soils, and Natural Heritage & Endangered Species Program (NHESP) rare species habitat mapping, among others.

An Abbreviated Notice of Resource Area Delineation (ANRAD) was filed with the n Commission on August 29, 2024, seeking confirmation of wetland resource boundaries and their jurisdictional status. The Commission issued an Order of Resource Area Delineation (ORAD) on December 14, 2024 (See Appendix D). The ORAD found confirmed that the jurisdictional resource areas present on sit included Inland Bank, Land Under Water and Waterbodies (LUWW), Bordering Vegetated Wetland (BVW) (i.e., Wetland 4), 100-foot Buffer Zone, and 200-foot RFA. The ORAD also determined that Wetlands 1, 2, 3, 4, 5, 6, and 7 do not meet the minimum qualifications to be BVWs or Isolated Land Subject to Flooding (ILSF); therefore, these areas are not subject to protection under the WPA. The following sections describe the on-site regulated resource areas.

3.1 Inland Bank

Inland Bank is the resource area which confines waterways and water bodies. For streams, it extends from the Mean Annual Low Water (MALW) to Mean Annual High Water (MAHW). As set forth in 310 CMR 10.54(2)(a)-(c), Inland Bank is defined as, “the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a BVW and adjacent floodplain, or in the absence of these, it occurs between a water body and an upland. The upper boundary is the first observable break in slope or the MAHW, whichever is lower. The lower boundary is the MALW level.”

Bank is present in the northwest corner of the project site where Worthington Brook passes through the corner of the parcel. Worthington Brook is located to the west and north of the Project site and flows west to east. Inland Bank is afforded a 100-foot Buffer Zone regulated by the WPA.

3.2 Land Under Water and Water Bodies

Land Under Water and Water Bodies (LUWW) is the resource area which confines waterways and water bodies. For streams, it extends from the MALW to MAHW. As set forth in 310 CMR 10.54(2)(a)-(c), Inland Bank is defined as, “the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a BVW and adjacent floodplain, or in the absence of these, it occurs between a water body and an upland. The upper boundary is the first observable break in slope or the MAHW, whichever is lower. The lower boundary is the MALW level.”

Bank is present in the northwest corner of the project site where Worthington Brook passes through the corner of the parcel. Worthington Brook is located to the west and north of the Project site and flows west to east. Inland Bank is afforded a 100-foot Buffer Zone regulated by the WPA.

3.3 Bordering Vegetated Wetland

As set forth in 310 CMR 10.55(2)(a-c), a BVW is defined as areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants and the BVW boundary is determined as "the line within which 50 percent or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist."

One BVW system was delineated within the Project area (see the Site Plans in Appendix C). The wetland consists of a palustrine forested (PFO) wetland dominated by red maple (*Acer rubrum*), sweet pepperbush (*Clethra alnifolia*), and eastern skunk cabbage (*Symplocus foetidus)*. Indicators of hydrology included high water table, water-stained leaves, and saturated soil. Indicators of hydric soils included depleted below dark surface and sandy redox.

3.4 Buffer Zone

The WPA regulates a 100-foot Buffer Zone associated with Inland Bank and BVW. No performance standards are set forth for Buffer Zone under the WPA. The 100-foot Buffer Zone within the Project area consists of upland mixed successional forest, scrub shrub, and the collapsed building from the previous development of the area. Various indicators of previous impacts such as grading, invasive species, and urban refuse as well as other anthropogenic alterations were present in the 100-foot Buffer Zone.

3.5 Riverfront Area

Perennial rivers are afforded a 200-foot RFA under the WPA. As set forth in 310 CMR 10.58(2)(a), the 200-foot RFA is defined as "the area of land between a river's MAHW line and a parallel line measured horizontally."

The Worthington Brook is a perennial stream according to 310 CMR 10.58(2)(a)1.a. which states, "A river or stream shown as perennial on the most recent USGS or more recent map by [MassDEP] is perennial," since it is depicted as a solid blue line on the most recent USGS Topographic Quadrangle (USGS 2024).

The MAHW was concurrent with the Banks of the Worthington Brook in the vicinity of the site.

Within the Project area, 200-foot RFA consists of areas previous cleared as part of the 2008 development including the collapsed building failed stormwater basin and associated infrastructure. The remaining portion of the RFA is undeveloped mixed successional forest.

4

Other Environmental Constraints

4.1 WPA Aquatic Resource Areas

Regulated aquatic resource areas that occur with the Project site include BVW, Bank, LUWW, 100-foot Buffer Zone, and 200-foot RFA. The site did not contain any other aquatic resource areas regulated under the WPA including, BLSF, ILSF, or other resource areas.

4.2 Vernal Pools

VHB biologists reviewed available MassGIS datasets to determine if the Project was located within or near mapped Certified Vernal Pools or Potential Vernal Pools. There were no certified or potential vernal pools mapped within or near the Project according to available MassGIS data (MassGIS 2026 and 2013). In addition, no PVPs were observed during the site visit.

4.3 Rare Species Habitat

VHB reviewed the MassGIS database to determine if the existing parcel was located within or adjacent to areas designated as NHESP Priority Habitats of Rare Species (Priority Habitat) or Estimated Habitats of Rare Wildlife (Estimated Habitat). There are no areas of Priority or Estimated Habitat on the Project site (MassGIS 2021a and 2021b).

4.4 Areas of Critical Environmental Concern

VHB reviewed MassGIS data layers to determine if the Project was located within any Areas of Critical Environmental Concern (ACEC). An ACEC is a designated area in Massachusetts that receives special recognition because of the quality, uniqueness, and significance of its natural and/or cultural resources. ACECs are identified so that they may be protected and maintained. There are no ACECSs within or near the site (MassGIS 2009).

4.5 Outstanding Resource Waters

VHB reviewed the MassGIS database to determine if the site was located within Outstanding Resource Waters (ORWs). ORWs are watershed areas that have been classified as such under the Massachusetts Surface Water Quality Standards and are areas that contain surface waters and their tributaries, including certain wetlands, that have been designated for protection based on their outstanding socio-economic, recreational, ecological and/or aesthetic values. These waters have been identified so that the quality of the waters may be protected and maintained. There are no ORWs located within or adjacent to the proposed Project area (MassGIS 2010).

5

Proposed Work and Impacts

The proposed Project consists of the construction of 11 condominium buildings, repaving of the associated access road and parking areas, installation of concrete driveways and sidewalks, access road construction, and the construction of an infiltration basin. Three of the 11 proposed buildings are located within Buffer Zone and RFA. The stormwater infiltration basin is also located in both Buffer Zone and RFA. Construction of the Project will require permanent and temporary impacts to 100-foot Buffer Zone and RFA. Table 1 summarizes the extent of proposed impacts within each resource area.

Table 1 Resource Area Impact Summary

Impact Type	Temporary Impacts	Permanent Impacts	Total Impacts
100-foot Buffer Zone*	11,804 sf	15,480 sf	27,284 sf
RFA*	23,245 sf	20,805 sf	66,135 sf

* 100-foot Buffer Zone and RFA impacts are concurrent and not cumulative
sf=square feet

5.1 Buffer Zone Impacts

Both temporary and permanent impacts to the Buffer Zone on-site are necessary to complete the proposed Project.

Approximately 17,335 square feet of temporary impacts and 25,501 square feet of permanent impacts are required to redevelop the Project site. Temporary impacts consist of repairs and upgrades to the previously failed stormwater basin. The basin will be upgraded to meet stormwater management requirements under 310 CMR 10.00 and to protect against future failure. Permanent impacts to the 100-foot Buffer Zone include the construction of condominiums, associated driveways, walkways, and common use areas on the north side of the Project parcel. Permanent impacts will also occur as part of parking and roadway repairs and improvements on the west side of the Project parcel. Following construction, temporarily impacted areas will be restored using appropriate native seed mixes.

5.2 Riverfront Area Impacts

Impacts to RFA include 21,295 square feet of temporary impacts and 44,840 square feet of permanent impacts. Temporary impacts consist of repairs and upgrades to the previously failed stormwater basin. Impacts within the inner 100 feet of RFA will consist of removing broken concrete and other debris associated with the previously failed stormwater detention, restoring the slope to previous grade and the construction of a larger berm for the stormwater basin. Permanent impacts to RFA will occur within the previously developed footprint in the outer 100 feet of the RFA and include the removal and reconstruction of the collapsed condominium unit

on the northwest side of the Project and the construction of two large units on the west side of the retention basins. Walkways and landscaped areas associated with these units will also be constructed within RFA. Following construction, temporarily impacted areas will be seeded with appropriate native seed mixes.

6

Avoidance, Minimization, and Mitigation

The Applicant has avoided and minimized impacts to the maximum extent practicable while also being able to achieve the Project goals.

6.1 Construction Schedule

Construction is expected to commence in April 2027 and is anticipated to extend through 2029.

The general construction sequence includes:

- Installation of erosion and sedimentation controls
- Clear and grub vegetation where necessary
- Install stormwater detention basin
- Construct condominiums
- Install walkways and driveways
- Loam, seed, and mulch exposed soils
- Apply pavement striping
- Remove erosion and sedimentation controls once all disturbed areas are permanently stabilized

6.2 Best Management Practices

Where work is proposed within or in proximity to regulated aquatic resource areas or their applicable Buffer Zones, the Applicant proposes to protect these areas and downgradient resource areas through the implementation of construction best management practices (BMPs). The following measures will be implemented to protect and minimize potential adverse impacts to downgradient wetlands and surface waters:

- Expediting construction and avoiding activities in wetlands and surface waters.
- Installing erosion and sedimentation (E&S) controls, as depicted in the Project site plans provided in Appendix C, to prevent sediment from entering downgradient resource areas or migrating off-site.
- Avoiding excessive vegetation removal or areas of exposed soils within and adjacent to resource areas.
- Repairing and maintaining all E&S controls in a timely manner in accordance with all applicable federal and state regulatory authorizations.

- Inspecting the work area following fill activities or work located adjacent to jurisdictional resources to ensure post-construction restoration is conducted in a timely manner.
- Prohibiting long-term parking and refueling of equipment within the 100-foot Buffer Zone.
- All temporary access areas will be restored to pre-construction conditions.

6.3 Stormwater

The proposed Project will result in the addition of new impervious surfaces resulting from the rehabilitation of existing access roads and parking, the construction of concrete driveways, and the construction of concrete walkways. Once construction has been completed, temporarily impacted areas will be restored to their pre-construction condition.

The Project is required to comply with MassDEP's Stormwater Management Standards found at 310 CMR 10.05(6)(k – q). The Project has completed a stormwater management report (completed by VHB dated June 17, 2025, and included as Appendix E) detailing compliance with the Stormwater Management Standards. Also included in Appendix E is the Operation and Maintenance Plan for the stormwater management system.

7

Regulatory Compliance

Proposed Projects that are subject to the WPA and its implementing regulations must demonstrate how they comply with the general provisions and applicable performance standards. The following tables provide a detailed overview of the general provisions and performance standards under the WPA.

Since the proposed Project will impact 100-foot Buffer Zone and 200-foot RFA, the following describes how the Project complies with the general provisions at 310 CMR 10.03 (Table 2) and 10.53 (Table 3) as well as the performance standards for RFA redevelopment at 310 CMR 10.58(5) (Table 4).

7.1 General Provisions and Performance Standards

Table 2 General Provisions of the Wetlands Protection Act (310 CMR 10.03)

Citation	Regulation	Compliance
310 CMR 10.03(1)(a)1.	The area is not significant to the protection of any of the interests of the WPA	The Project area predominantly consists of areas previously cleared for development or with infrastructure from the previous development in place. These areas have been previously impacted by grading, paving, and maintenance.
310 CMR 10.03(1)(a)2.	Work within a resource area will contribute to the protection of the interests of the WPA	The Project will result and further protects the interests of the WPA by reconstructing the previously failed stormwater system on site. Debris will be removed from portions of the degraded RFA and seeded with native plant mix.
310 CMR 10.03(1)(a)3.	Work within the Buffer Zone will contribute to the protection of the interests of the WPA; except that work within RFA and Buffer Zone to another resource area shall comply with the performance standards for RFA.	The proposed Project will further protect the interests of the WPA through improvement of previously degraded RFA through debris clean up and native plan seeding, improved stormwater management, and maintenance of the existing road. The Project meets all applicable performance standards for RFA.

310 CMR 10.03(1)(b)	Claims of work outside of any jurisdictional area impacting a jurisdictional area must demonstrate the work has had an adverse impact.	Not applicable
310 CMR 10.03(2)	Credible evidence from a competent source to support the position taken when contesting MassDEP's position	Not applicable
310 CMR 10.03(3)	Installation of subsurface sewage disposal systems	The development will be hooked up to the Town of Agawam sewer system.
310 CMR 10.03(4)	Presumption concerning point-source discharges.	The project meets the Massachusetts Stormwater Standards
310 CMR 10.03(5)	Each resource area is presumed to be significant to the interests of the WPA.	All resource areas within the Project area are presumed to be significant.
310 CMR 10.03(6)	Presumption concerning the application of herbicides.	Not applicable
310 CMR 10.03(7)	Filing fees for NOIs pursuant to the WPA.	Filing fees have been provided to the Town of Agawam ($2,375 for the town portion) and MassDEP ($2,350 for the state portion). See Appendix A for copies of the checks.

Table 3 General Provisions of Inland Resource Areas (310 CMR 10.53)

Citation	Regulation	Compliance
310 CMR 10.53(1)	Significance of resource areas within no presumption.	None of the resource areas within the Project area do not have presumptions.
310 CMR 10.53(2)	Sites subject to Restriction Orders.	No restriction orders known.
310 CMR 10.53(3)	Limited projects.	Not applicable
310 CMR 10.53(4)	Ecological restoration limited projects.	Not applicable
310 CMR 10.53(5)	Limited projects supporting existing agriculture and reconstruction or construction of certain water dependent projects.	Not applicable
310 CMR 10.53(6)	Limited projects for access to RFA	Not applicable
310 CMR 10.53(7)	Operation and maintenance plans for public or private infrastructure.	Operation and maintenance plans are included in the Stormwater Report in Appendix E.
310 CMR 10.53(8)	Stream crossings.	Not applicable

7.1 Redevelopment Within Previously Developed RFA (310 CMR 10.58(5))

The Applicant proposes to permit the Project under 310 CMR 10.58(5) as redevelopment within previously developed RFAs since the proposed Project limit of work (LOW) is fully contained within the previously permitted development footprint. Redevelopment of previously developed RFA is allowed under 310 CMR 10.58(5) if the proposed work will improve the existing conditions of the resource area. 310 CMR 10.04 defines "Redevelopment" as the, "replacement, rehabilitation, or expansion of existing structures, improvement of existing roads, or reuse of existing degraded or previously developed areas."

The Project proposes to redevelop approximately 66,135 sf square feet of RFA at Essex Drive in Agawam, Massachusetts. Table 4 details how the Project meets the requirements of 310 CMR 10.58(5).

Table 4 Redevelopment Within Previously Developed Riverfront Area (310 CMR 10.58(5))

Citation	Regulation	Compliance
310 CMR 10.58(5)(a)	Work shall be an improvement over existing conditions of the capacity of the RFA to protect the interests of the WPA.	The proposed Project will be an improvement over existing conditions as portions of the previously impacted RFA will be improved through seeding with native plants and the stormwater management system will be repaired. The Project will not reduce the capacity of the site to protect the interests of the WPA.
310 CMR 10.58(5)(b)	Stormwater management is provided in accordance with the Massachusetts Stormwater Standards.	The Project meets the Massachusetts Stormwater Standards. A copy of the Stormwater Report is included as Appendix E.
310 CMR 10.58(5)(c)	Proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less.	The proposed work is confined to the previously permitted footprint of the prior development and areas impacted by the failure of the old stormwater system.
310 CMR 10.58(5)(d)	Proposed work shall be located outside the RFA or toward the RFA boundary and away from the river	Proposed impacts have been located as far away from the river as practicable. The proposed condominiums and associated infrastructure are within the footprint of the previously degraded areas. All impacts have been avoided and minimized as much as practicable to avoid unnecessary impacts to RFA.

310 CMR 10.58(5)(e)	The area of proposed work shall not exceed the amount of degraded area. Proposed work may alter up to 10% if the degraded area is <10% of the RFA.	The proposed work is confined to the previously degraded areas.
310 CMR 10.58(5)(f)	Proposed on-site restoration of degraded RFA equaling at least 1:1 of restored degraded areas to non-conforming areas.	Proposed work is confined to previously degraded areas and conforms to the performance standards outlined in 310 CMR 10.58(5)(c), (d), and (e).
310 CMR 10.58(5)(g)	Proposed on-site or off-site restoration of degraded RFA equaling at least 2:1 of restored degraded areas to degraded areas.	Not applicable
310 CMR 10.58(5)(h)	Issuing authority may prohibit further alteration within restored RFA or mitigation area.	No response required

8

Summary

The Applicant is seeking an OOC from the Commission to redevelop a portion of the parcel located Essex Drive in Agawam, Massachusetts to construct 11 condominium buildings, associated sidewalks and parking, access road, and stormwater infrastructure. The Project will repair and upgrade the previously failed stormwater basin and remove debris and dilapidated structures from the site. The Project will impact portions of 100-foot Buffer Zone and RFA. No other resource areas will be impacted. Impacts have been avoided, minimized, and mitigated as much as practicable, and the Project complies with the general provisions, performance standards, and policies of the WPA as applicable. Additionally, erosion and sedimentation controls and BMPs will be installed to protect adjacent areas during construction.

9

References

Massachusetts Bureau of Geographic Information (MassGIS). 2009. Areas of Critical Environmental Concern. Available at: https://www.mass.gov/info-details/massgis-data-areas-of-critical-environmental-concern. Accessed December 9, 2025.

MassGIS. 2010. Outstanding Resource Waters. Available at: https://www.mass.gov/info-details/massgis-data-outstanding-resource-waters. Accessed December 9, 2025.

MassGIS. 2013. NHESP Potential Vernal Pools. Available at: https://www.mass.gov/info-details/massgis-data-nhesp-potential-vernal-pools. Accessed December 9, 2025.

MassGIS. 20121a. NHESP Estimated Habitats of Rare Wildlife. Available at: MassGIS Data: NHESP Estimated Habitats of Rare Wildlife | Mass.gov. Accessed December 9, 2025.

MassGIS. 2021b. NHESP Priority Habitats of Rare Species. Available at: MassGIS Data: NHESP Priority Habitats of Rare Species | Mass.gov. Accessed December 9, 2025.

MassGIS. 2025a. NHESP Priority Habitats of Rare Species. Available at: https://www.mass.gov/info-details/massgis-data-nhesp-priority-habitats-of-rare-species. Accessed December 9, 2025.

MassGIS. 2025b. NHESP Estimated Habitats of Rare Wildlife. Available at: https://www.mass.gov/info-details/massgis-data-nhesp-estimated-habitats-of-rare-wildlife. Accessed December 9, 2025.

MassGIS. 2025. NHESP Certified Vernal Pools. Available at: https://www.mass.gov/info-details/massgis-data-nhesp-certified-vernal-pools. Accessed December 9, 2025.

NRCS. 2019. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed December 9, 2025.

U.S. Geologic Survey. 2024. West Springfield, Massachusetts, 7.5-Minute Series. Available at: https://ngmdb.usgs.gov/topoview/viewer/#15/42.0414/-72.6362 Accessed January 14, 2025.

Appendix A: Figures

Figure 1: USGS Site Location
Longbrook Estate
Agawam, MA



Project Parcel

Path: \\vhb.com\gislibrary\Resources\Toolboxes\NOIFiguresUtility\Pro\NOI_Template\NOI_Template.aprx (gmsaGIS$, 11/2/2025)

Sources: VHB, MassGIS

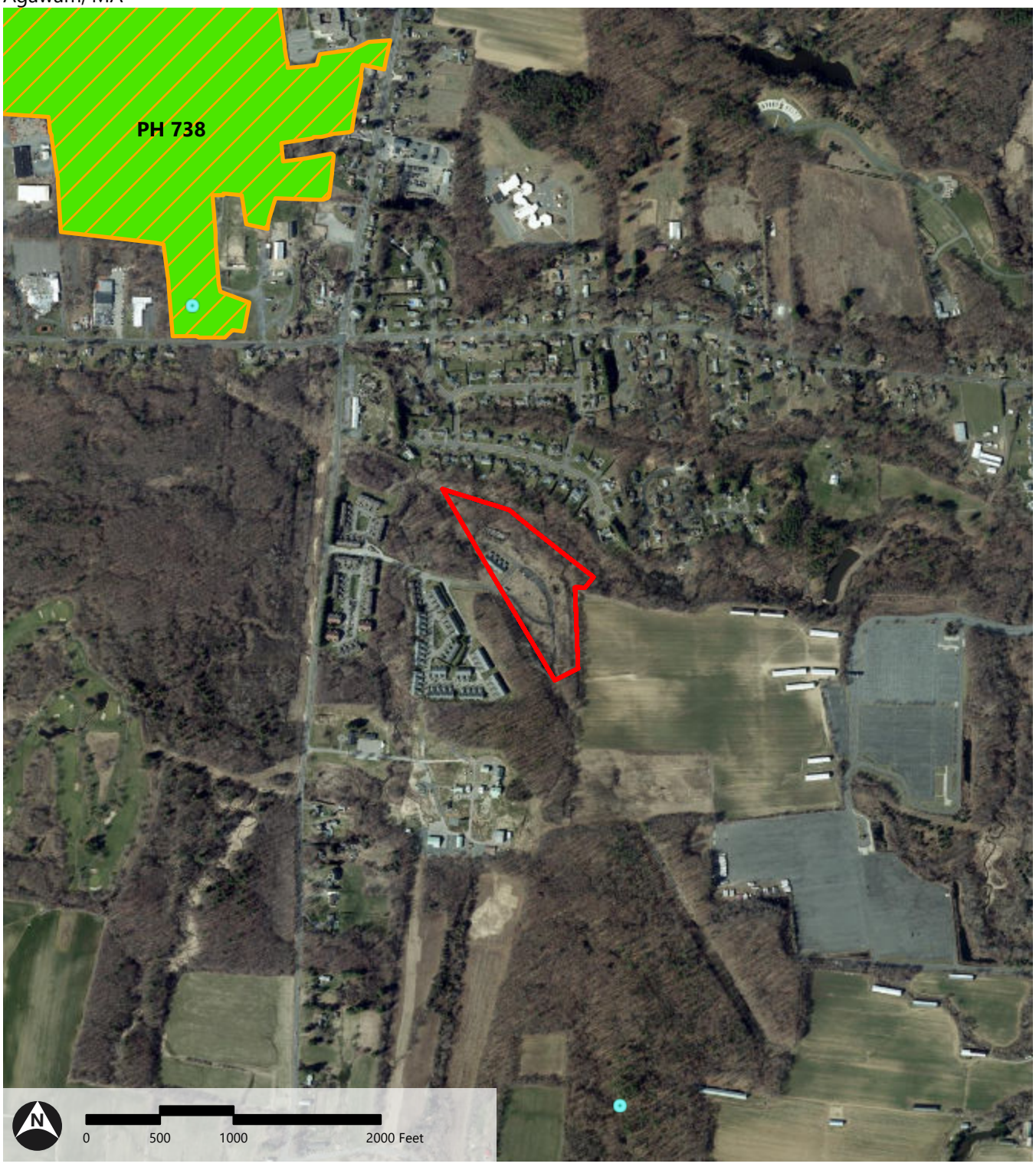
Figure 2: Aerial Overview
Longbrook Estate
Agawam, MA



Path: \\vhb.com\gislibrary\Resources\Toolboxes\NOIFiguresUtility\Pro\NOI_Template\NOI_Template.aprx (gmsaGIS$, 11/2/2025)

Sources: VHB, MassGIS

Figure 3: Priority Habitat
Longbrook Estate
Agawam, MA



Path: \\vhb.com\gislibrary\Resources\Toolboxes\NOIFiguresUtility\Pro\NOI_Template\NOI_Template.aprx (gmsaGIS$, 11/2/2025)

Sources: VHB, MassGIS

Appendix B: WPA Form and Check Copies

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 #:
eDEP Transaction #:1954222
City/Town:AGAWAM

A.General Information

1. Project Location:

a. Street Address	1485 SUFFIELD STREET		
b. City/Town	AGAWAM	c. Zip Code	01001
d. Latitude	42.03860N	e. Longitude	72.63136W
f. Map/Plat #	I2	g.Parcel/Lot #	39/306

2. Applicant:

☐ Individual ☑ Organization

a. First Name	MARIE	b.Last Name	IZZO		
c. Organization	LONGBROOK CONDOMINIUM ASSOCIATION				
d. Mailing Address	476 COLLEGE HIGHWAY				
e. City/Town	SOUTHWICK	f. State	MA	g. Zip Code	01077
h. Phone Number	413-569-5557	i. Fax		j. Email	atriumpropertyservices@comcast.net

3.Property Owner:

☐ more than one owner

a. First Name		b. Last Name			
c. Organization	LONGBROOK ESTATE CONDOMINIUM TRUST				
d. Mailing Address	476 COLLEGE HIGHWAY				
e. City/Town	SOUTHWICK	f.State		g. Zip Code	01077
h. Phone Number	413-569-5557	i. Fax		j.Email	atriumpropertyservices@comcast.net

4.Representative:

a. First Name	KIPP	b. Last Name	CALLAHAN		
c. Organization	VHB				
d. Mailing Address	120 FRONT STREET SUITE 500				
e. City/Town	WORCESTER	f. State	MA	g. Zip Code	01608
h.Phone Number	508-513-2704	i.Fax		j.Email	kcallahan@vhb.com

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

a.Total Fee Paid	4,725.00	b.State Fee Paid	2,350.00	c.City/Town Fee Paid	2,375.00

6.General Project Description:

LONGBROOK ESTATE CONDOMINIUM TRUST IS PROPOSING THE CONSTRUCTION OF 11 CONDOMINIUM BUILDINGS AND ASSOCIATED PARKING AND STORMWATER INFRASTRUCTURE AT ESSEX DRIVE, AGAWAM, MASSACHUSETTS

7a.Project Type:

1. ☐ Single Family Home	2. ☐ Residential Subdivision
3. ☐ Limited Project Driveway Crossing	4. ☐ Commercial/Industrial
5. ☐ Dock/Pier	6. ☐ Utilities
7. ☐ Coastal Engineering Structure	8. ☐ Agriculture (eg., cranberries, forestry)
9. ☐ Transportation	10. ☑ Other

7b.Is any portion of the proposed activity eligible to be treated as a 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:
2. Limited Project

8.Property recorded at the Registry of Deeds for:

a.County:	b.Certificate:	c.Book:	d.Page:
HAMPDEN		14354	481

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

1.Buffer Zone & Resource Area Impacts (temporary & permanent):

☐ This is a Buffer Zone only project - 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)

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	2. square feet
	3. cubic yards dredged	
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	Worthington Brook 1. Name of Waterway (if any)	
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		176481 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.
44050	7409	36641

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)

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 Beaches	Indicate size under Coastal Beaches and/or Coatstal Dunes, below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab, crea.
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

☐ Restoration/Replacement

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 entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5.Projects Involves Stream Crossings

☐ Project Involves Streams Crossings

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. Other Applicable Standards and Requirements

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 of Endangered Species program (NHESP)?

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

b. Date of map:FROM MAP VIEWER

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18)....

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

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

3.☐ Project plans for entire project site, including wetland resource areas and areas outside of wetland 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

c.☐ MESA filing fee (fee information available at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html)
Make check payable to "Natural Heritage & Endangered Species Fund" 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

d. 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, http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14; 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 Number

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.

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?
a. ☑ Not applicable - project is in inland resource area only
b. ☐ Yes ☐ No

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

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

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 S. Rodney French Blvd
New Bedford, MA 02744

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it 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.

3. 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 DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. 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

5. 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

6. 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, Explain why the project is exempt:
1. ☐ Single Family Home
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

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 by regular mail delivery.

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.
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.
☑

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
LONGBROOK CONDOMINIUMS SITE PLANS	VHB		08/18/26	

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:

396460	7/8/2026
2. Municipal Check Number	3. Check date
396459	7/8/2026
4. State Check Number	5. Check date
VHB	
6. Payer name on check: First Name	7. Payer name on check: Last Name

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	08/18/26 2. Date
3. Signature of Property Owner(if different)	4. Date
Kipp Callahan 5. Signature of Representative (if any)	08/18/26 6. Date

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 Section C, Items 1-3, 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
WPA Form 3 - Notice of Wetland FeeTransmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1954222
City/Town:AGAWAM

A. Applicant Information

1. Applicant:

a. First Name	JEFF	b.Last Name	GURNEY		
c. Organization	ATRIUM PROPERTY SERVICES, INC.				
d. Mailing Address	476 COLLEGE HIGHWAY				
e. City/Town	SOUTHWICK	f. State	MA	g. Zip Code	01077
h. Phone Number	4135695557	i. Fax		j. Email	atriumpropertyservices@comcast.net

2.Property Owner:(if different)

a. First Name		b. Last Name			
c. Organization	LONGBROOK ESTATE CONDOMINIUM TRUST				
d. Mailing Address	476 COLLEGE HIGHWAY				
e. City/Town	SOUTHWICK	f.State		g. Zip Code	01077
h. Phone Number	4135695557	i. Fax		j.Email	atriumpropertyservices@comcast.net

3. Project Location:

a. Street Address	REAR SUFFIELD STREET	b. City/Town	AGAWAM

Are you exempted from Fee? ☐

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

State agencies are only exempt if the fee is less than $100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
A.) SITE PREPARATION (FOR DEVELOPMENT) BEYOND NOTICE OF INTENT SCOPE;	3	1050.00	RFA MULTIPLIER 1.5	4725.00

City/Town share of filling fee	State share of filing fee	Total Project Fee
$2,375.00	$2,350.00	$4,725.00

VANASSE HANGEN BRUSTLIN, INC.
260 ARSENAL PLACE • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471-9151

CITIZENS BANK
MASSACHUSETTS
5-7017/2110

396459
CHECK DATE

July 8, 2026

Two Thousand Three Hundred Fifty and 00/100

AMOUNT
$2,350.00

Commonwealth of Massachusetts
DEP-Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

MP
AUTHORIZED SIGNATURE

VANASSE HANGEN BRUSTLIN, INC.
260 ARSENAL PLACE • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471-9151

CITIZENS BANK
MASSACHUSETTS
5-7017/2110

396460
CHECK DATE

July 8, 2026

Two Thousand Three Hundred Seventy Five and 00/100

AMOUNT
$2,375.00

Town of Agawam
36 Main Street
Agawam, MA 01001

MP

Appendix C: Abutter Information

Notification to Abutters Under the Wetlands Protection Act

Pursuant to the requirements of the Wetlands Protection Act, you are hereby notified of the following:

The Applicant, Longbrook Estate Condominium Trust, has filed a Notice of Intent (NOI) with the Agawam Conservation Commission seeking approval for the proposed condominium construction project at Essex Drive in Agawam, MA. This NOI is being filed pursuant to the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40).

Information regarding the NOI may be obtained by calling the Agawam Conservation Commission at (413)-786-0400 ext. 8245, Monday to Friday from 7:30 am - 3:30 pm. The NOI may be viewed at the Agawam Town Hall located at 1000 Suffield St. Agawam, MA 01001. You may also call or email Kipp Callahan at VHB at (508)-752-1001 or kcallahan@vhb.com, Monday to Friday 9:00 am – 5:00 pm to obtain a hard copy. A fee may be applied for copies.

The Agawam Conservation Commission will hold a public hearing on the NOI on September 10th, 2026 at 6:00 pm at the Agawam Senior Center 954 Main Street Agawam, MA 01001. Notice of the public hearing will be published in the Agawam Advertiser at least 5 business days in advance. You may also call the Agawam Conservation Commission (at the number identified above) to verify the date, time, and how to access the hearing.

Town of Agawam
Assessor's Office

36 Main Street
Agawam, MA 01001
Ph. 413-786-0400 x 8205
Fax: 413-726-2828

July 14, 2026

Dear Mr. Callahan:

On July 9, 2026, you requested a Certified Abutters' List on property located at Rear Suffield Street further identified as Map I02, Block 39, Lot 0306. The request was for abutters within 100 feet of the subject property.

The attached list to this cover letter represents, to the best of our knowledge, the current owners of the properties that were requested for Rear Suffield Street. We have also attached a map showing the subject parcel and the abutters as generated by our GIS Mapping System.

Sincerely,

Kelly Clarke

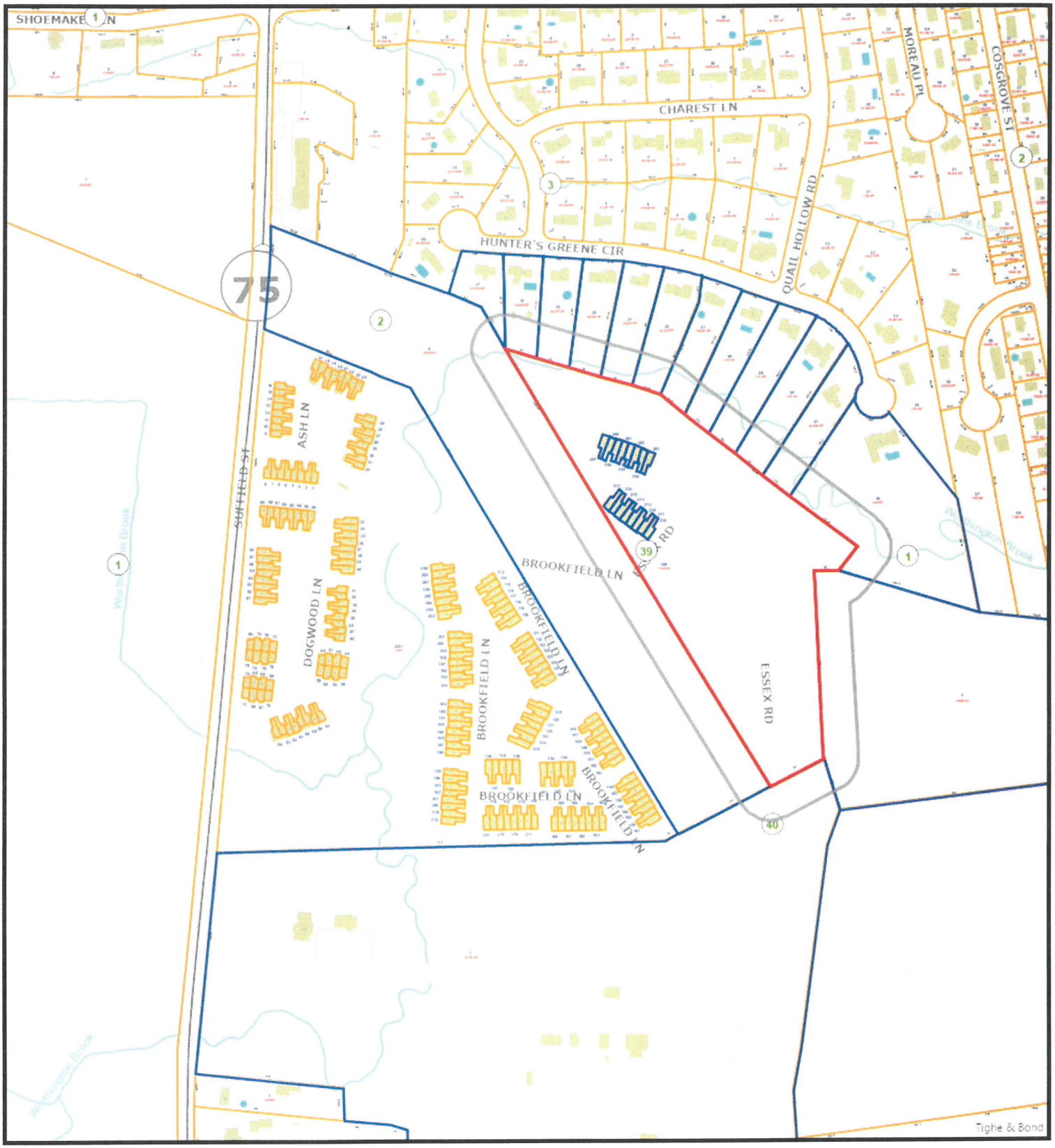
Kelly Clarke,
Agawam Assessor

Rear Suffield St.

July 14, 2026

100'

Parcel ID	Location	Owner	Owner 2	Mailing Address	City	State	Zip
J3 1 38	106 HUNTER`S GREENE CR	ARDOLINO MATTHEW D	ARDOLINO SHERRY A	106 HUNTER`S GREENE	AGAWAM	MA	01001 3683
J3 1 36	136 HUNTER`S GREENE CR	CLARK PETER J	BOWMAN-CLARKE CAROL	136 HUNTER`S GREENE CR	AGAWAM	MA	01001 3638
I3 2 22	66 HUNTER`S GREENE CR	DELPHIA DONALD J	BOUDREAU KATHLEEN	66 HUNTER`S GREENE CR	AGAWAM	MA	01001 3663
J3 1 40	86 HUNTER`S GREENE CR	DORANS DENNIS M	DORANS DONNA E	86 HUNTER`S GREENE CR	AGAWAM	MA	01001 3663
J3 1 41	76 HUNTER`S GREENE CR	ICHTON MATTHEW P	ICHTON BRIDGET C	76 HUNTER`S GREENE CR	AGAWAM	MA	01001 3663
I3 2 20	46 HUNTER`S GREENE CR	LIQUORI ANIELLO	LIQUORI ANNA	46 HUNTER`S GREENE CR	AGAWAM	MA	01001
I2 39 306	REAR SUFFIELD ST	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 210	210 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 211	211 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 212	212 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 213	213 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 214	214 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 215	215 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 216	216 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 28 217	217 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 305	305 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 304	304 ESSEX DR	LONGBROOK CONDO ASSOC	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 298	298 ESSEX DR	LONGBROOK ESTATES CONDO TR	C/O ATRIUM PROPERTY SVS	476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 303	303 ESSEX DR	LONGBROOK ESTATES LLC		476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 302	302 ESSEX DR	LONGBROOK ESTATES LLC		476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 301	301 ESSEX DR	LONGBROOK ESTATES LLC		476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 300	300 ESSEX DR	LONGBROOK ESTATES LLC		476 COLLEGE HWY	SOUTHWICK	MA	01077
I2 39 299	299 ESSEX DR	LONGBROOK ESTATES LLC		476 COLLEGE HWY	SOUTHWICK	MA	01077
J2 1 2	REAR MAIN ST	MARKOWSKI EDWARD SR ET AL		216 BABBS RD	WEST SUFFIELD	CT	06093
I3 2 21	56 HUNTER`S GREENE CR	NAZARENKO MICHAEL M		56 HUNTER`S GREENE CR	AGAWAM	MA	01001
J3 1 37	116 HUNTER`S GREENE CR	PAVELCSYK JEFFREY		116 HUNTER`S GREENE CR	AGAWAM	MA	01001
J3 1 39	96 HUNTER`S GREENE CR	PILOTTE BRUCE	PILOTTE KATHLEEN T	96 HUNTER`S GREENE CIR	AGAWAM	MA	01001 3663
I3 2 17	16 HUNTER`S GREENE CR	SZAFRAN CYNTHIA A	SZAFRAN LEON G	16 HUNTER`S GREENE CR	AGAWAM	MA	01001 3663
I3 2 18	26 HUNTER`S GREENE CR	TAPPLY STEVEN J	TAPPLY SUSAN H	26 HUNTER`S GREENE CIR	AGAWAM	MA	01001 3663
I2 40 1	1615 SUFFIELD ST	TENNESSEE GAS PIPELINE COMPANY	C/O PROPERTY TAX	P O BOX 4372	HOUSTON	TX	77210 4372
I3 2 8	SUFFIELD ST	WESTERN MASS ELECTRIC CO	PROPERTY TAX DEPT	P.O. BOX 270	HARTFORD	CT	06141
I3 2 19	36 HUNTER`S GREENE CR	WHITE WALTER F		36 HUNTER`S GREENE CR	AGAWAM	MA	01001



Rear Suffield St. - 100'

7/14/2026 11:24:57 AM

Scale: 1"=400'

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.

Appendix D: Photo Log

PHOTOGRAPHIC LOG

Engineers | Scientists | Planners | Designers

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 1 **Date:** 06/29/26

Description:

View facing north showing existing previously constructed units.



PHOTOGRAPHIC LOG

Engineers | Scientists | Planners | Designers

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 2 **Date:** 06/29/26

Description:

View facing east showing entrance gate to the parcel. Remnant access roads and structures can be seen.



PHOTOGRAPHIC LOG

Engineers | Scientists | Planners | Designers

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 3 **Date:** 06/29/26



Description:

View facing northwest from existing access road showing existing structures.

PHOTOGRAPHIC LOG

Engineers | Scientists | Planners | Designers

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 4 **Date:** 06/29/26



Description:

View facing northwest showing access road behind existing structures and proposed site of the northwestern building.

vhb Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 5 **Date:** 06/29/26



Description:

View facing northeast showing location of additional proposed buildings on the north east side of the parcel.

vhb Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 6 **Date:** 06/29/26



Description:

View facing west showing existing access on south side of parcel.

Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 7 **Date:** 06/29/26



Description:

View facing south showing debris on site and existing conditions.

Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 8 **Date:** 10/01/25



Description:

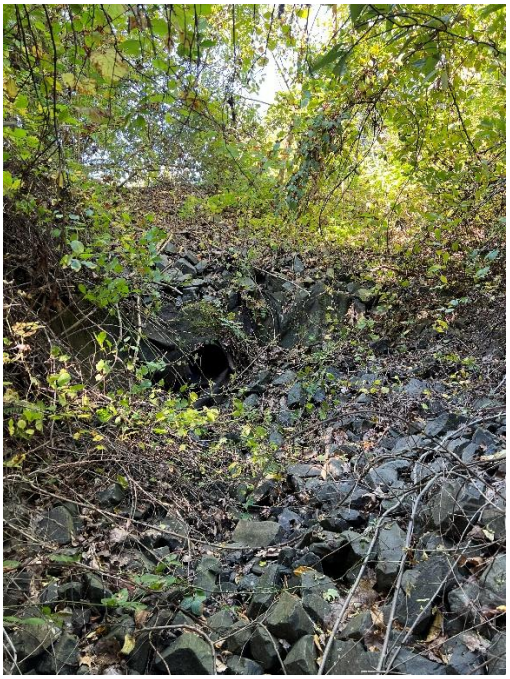
View facing southwest showing remanent destroyed infrastructure from failed stormwater basin.

vhb Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 9 **Date:** 10/01/25



Description:

View facing south showing outfall of previously installed stormwater infrastructure.

vhb Engineers | Scientists | Planners | Designers

PHOTOGRAPHIC LOG

Client Name: Longbrook Estate Condominiums Trust	**Site Location:** Agawam, MA	**Project No**: 43346.00

Photo No. : 10 **Date:** 08/24/24



Description:

View facing northwest showing Wetland 4.

Appendix E: Order of Resource Delineation (ORAD)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 4B - Order of Resource Area Delineation
Massachusetts Wetlands Protection Act M.G.L. c. 131 S40

Provided by MassDEP:
MassDEP File #:087-0702
eDEP Transaction #:1857898
City/Town:AGAWAM

A. General Information

1. Conservation Commission AGAWAM
2. This Issuance is for (Check one):
   a. ☑ Order of Resource Area Delineation
   b. ☐ Amended Order of Resource Area Delineation

3. Applicant Details

a. First Name	MARIE		b. Last Name	IZZO	
c. Organization	LONGBROOK CONDO ASSOCIATION				
d. Mailing Address	476 COLLEGE HWY				
e. City/Town	SOUTHWICK	f. State	MA	g. ZIP	01077

4. Property Owner (if different from applicant):

a. First Name			b. Last Name		
c. Organization	LONGBROOK ESTATE CONDOMINIUM TRUST				
d. Mailing Address	476 COLLEGE HIGHWAY				
e. City/Town	SOUTHWICK	f. State	MA	g. ZIP	01077

5. Project Location

a. Street Address	1485 SUFFIELD STREET		
b. City/Town	AGAWAM	c. Zip	01001
d. Assessors Map/Plat#	I1, I3, J2, J3	e. Parcel/Lot#	I2 39 306
f. Latitude	42.03836N	g. Longitude	72.63105W

6. Dates

a. Date ANRAD Filed	9/6/2024	b. Date Public Hearing Closed	12/12/2024	c. Date Of Issuance	12/13/2024

7. Final Approved Plans and Other Documents

Plan Title	Plan Prepared By	Plan Signed By	Plan Final Date	Plan Scale
"LONGBROOK CONDOMINIUM ESSEX DRIVE AGAWAM, MASSACHUSETTS EXISTING CONDITIONS PLAN OF LAND" (SHEETS SV-1, SV-2, SV-3)	VHB	CHRISTOPHER C. DANFORTH, PLS	November 11, 2024	AS NOTED

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable)

a. ☐ **Accurate:** The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically
   a.

b. ☑ **Modified:** The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

1. ☑ Bordering Vegetated Wetlands
2. ☑ Other resource area(s), specifically
   a.SEE ATTACHED FINDINGS

c. ☐ **Inaccurate::** The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Recource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically
   a.
3. The boundaries were determined to be inaccurate because:

C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, S 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation. This Order must be signed by a majority of the Conservation Commission. The Order must be sent 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 DEP Regional Office (see http://www.mass.gov/dep/about/region/findyour.htm).

D. 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 DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. 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 of Resource Area Delineation 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 Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination. 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, S 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
087-0702
MassDEP File Number

eDEP Transaction Number

Agawam
City/Town

12/13/24
Date of Issuance

5
1. Number of Signers

E. Signatures

Please indicate the number of members who will sign this form.

Signatures

Signature of Conservation Commission Member	Printed Name
S. Ty Ehm	S. PAGE FALLON
	Keven Brown
	Cheryl Becker
	FRANK MENARD
	Henry Kozloski

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires on unless extended in writing by the issuing authority.

This Order is issued to the applicant and the property owner (if different) as follows:

2. ☐ By hand delivery on

a. Date

3. ☒ By certified mail, return receipt requested on

December 13, 2024
a. Date

E. Signatures

1. Date of Original Order
2. No. of Signatures required 5

S Page Fallon

Henry Kozloski

Keven Brown

Sheryl Becker

Frank Meagher

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, and the Amended Order will expire on the date of the Original Final Order unless extended in writing by the Department.

This Order is issued to the applicant and the property owner (if different) as follows:

3. ☐ By hand delivery on

a. Date _____

4. ☐ By certified mail, return receipt requested on

a. Date _____

ORAD FINDINGS

Longbrook Condominiums
1485 Suffield Street
Agawam, MA 01001
(Parcel ID: I2-39-306)

DEP File # 087-0702

The following findings are based on the

- Final stamped plan set " "*Long Brook Condominium Essex Drive Agawam, Massachusetts Existing Conditions Plan of Land*" (Sheets Sv-1, Sv-2, Sv-3)," prepared by VHB and stamped by Christopher C. Danforth, PLS, final revision date November 11, 2024.
- The boundaries of the 11.75069-acre Site subject to the ORAD defined on Sheet Sv-1.

Findings

1) The Agawam Conservation Commission finds that wetland systems 1, 2, 3, 5, 6, and 7 do not meet the criteria for Bordering Vegetated Wetlands under 310 CMR 10.55(2).
2) The Agawam Conservation Commission finds that wetland systems 1, 2, 3, 5, 6, and 7 do not meet the criteria for Isolated Land Subject to Flooding under 310 CMR 10.57(2)(b).
3) The Agawam Conservation Commission finds that wetland systems 1, 2, 3, 5, 6, and 7 are not subject to protection under the Massachusetts Wetlands Protection Act (MA WPA) and its regulations (310 CMR 10.00).
4) The Agawam Conservation Commission approves the boundary of Bordering Vegetated Wetland 4 demarcated by flags WF4-100 through and including WF4-103; WF4-107 through and including WF4-126; and WF4-131 through and including WF4-137.
5) The Agawam Conservation Commission approves the Mean Annual High Water Line of Worthington Brook demarcated by flags BF1-160 through and including BF1-166.
6) The Agawam Conservation Commission approves the 200-FT Riverfront Area boundary depicted within the Site.
7) The Agawam Conservation Commission approves the boundary of the 100-FT Buffer Zone associated with Bordering Vegetated Wetland 4 depicted within the Site.
8) The Agawam Conservation Commission finds that additional 100-FT Buffer Zone associated with off property resource areas may exist within the Site, the boundaries of which have not been submitted, reviewed or approved under the ORAD.
9) Worthington Brook has been designated as a Coldwater Fisheries Resource (CFR # 3417450).

Appendix F: Site Plans

(Bound Separately)

Appendix G: Stormwater Report

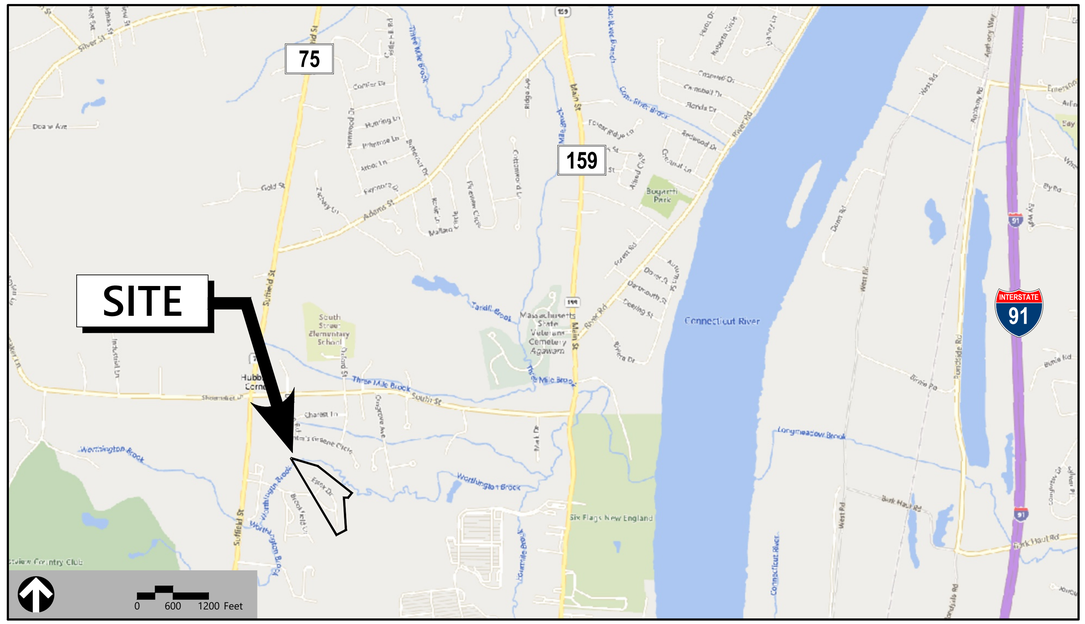
(Bound Separately)

Site Plans

Issued for	**Site Plan Approval**
Date Issued	**February 19, 2026**
Latest Issue	**February 19, 2026**

Longbrook Condominiums

1485 Suffield Street
Agawam, MA



Sheet Index

No.	Drawing Title	Latest Issue
C1.01	Legend, Abbreviation and General Notes	February 19, 2026
C2.01	Overall Plan	February 19, 2026
C3.01-C3.02	Layout and Materials Plan	February 19, 2026
C4.01-C4.02	Grading and Drainage Plan	February 19, 2026
C5.01-C5.02	Utility Plan	February 19, 2026
C6.01-C6.02	Erosion and Sediment Control Plan	February 19, 2026
C7.01-C7.06	Details	February 19, 2026
C8.01	Fire Truck Route Plan	February 19, 2026

Reference Drawings

No.	Drawing Title	Latest Issue
Sv-1	Existing Conditions Plan of Land	October 25, 2023
Sv-2	Existing Conditions Plan of Land	October 25, 2023
Sv-3	Existing Conditions Plan of Land	October 25, 2023
WT-1	Wetland Plan	February 14, 2026
WT-2	Wetland Buffer Disturbance Plan	February 14, 2026
WT-3	Riverfront Buffer Disturbance Plan	February 14, 2026
2 of 10	Site Layout Plan (Previously Approved)	March, 1987

Owner

Longbrook Estate Condominium Trust
476 College Highway
Southwick, MA 01077
(413) 569-5557

Applicant

Longbrook Condominium Association
476 College Highway
Southwick, MA 01077
(413) 569-5557

Assessor's Parcel ID: I2 39 306

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

John J. Furman PE 2026.08.18 11:59:40 -04'00'

VHB Project : 43346.00 Longbrook, Agawam, MA
Issued for : SPA 2/19/2026

\\VHB\GBL\PRO\SPRINGFIELD\43346.00 LONGBROOK ESTATE AGAWAM\CAD\LD\PLANSET\00-4334600-CV 18 August 2026

Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
		PARKING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
		WETLAND LINE WITH FLAG
		FLOODPLAIN
BLSF	BLSF	BORDERING LAND SUBJECT TO FLOODING
BZ	BZ	WETLAND BUFFER ZONE
NDZ	NDZ	NO DISTURB ZONE
200'RA	200'RA	200' RIVERFRONT AREA
		GRAVEL ROAD
EOP	EOP	EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VGC	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
		SILT SOCK / STRAW WATTLE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
10	10	PARKING COUNT
	C10	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		BUILDINGS
		RIPRAP
		CONSTRUCTION EXIT
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75 ×	132.75 ×	SPOT ELEVATION
45.0 TW× 38.5 BW×	45.0 TW× 38.5 BW×	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D>	DRAIN
6"RD	6"RD>	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	UGE	UNDERGROUND ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
COMM	UGC	UNDERGROUND COMMUNICATIONS
		CATCH BASIN CONCENTRIC
		CATCH BASIN ECCENTRIC
		DOUBLE CATCH BASIN CONCENTRIC
		DOUBLE CATCH BASIN ECCENTRIC
		GUTTER INLET
		DRAIN MANHOLE CONCENTRIC
		DRAIN MANHOLE ECCENTRIC
TD		TRENCH DRAIN
		PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
		SEWER MANHOLE CONCENTRIC
		SEWER MANHOLE ECCENTRIC
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		FIRE DEPARTMENT CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
W	W	WATER WELL
GC	GC	GAS GATE
GM	GM	GAS METER
	MH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
T	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
		MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EV	ELECTRIC VEHICLE CHARGING SPACE
EX	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PIV	POST INDICATOR VALVE
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
RIM=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes

General

1. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).
4. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 4 INCHES LOAM AND SEED.
5. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, THE SITE CONTRACTOR SHALL PERFORM EARTHWORK OPERATIONS REQUIRED UP TO SUBGRADE ELEVATIONS.
6. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
7. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
8. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
9. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
10. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
11. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
12. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
13. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
14. THIS PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NPDES CONSTRUCTION GENERAL PERMIT (CGP) PROGRAM AND EPA JURISDICTION. PRIOR TO THE START OF CONSTRUCTION CONTRACTOR IS TO FILE A CGP NOTICE OF INTENT WITH THE EPA AND PREPARE A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE NPDES REGULATIONS. CONTRACTOR SHALL CONFIRM THE OWNER HAS ALSO FILED A NOTICE OF INTENT WITH THE EPA.

Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
4. RIM ELEVATIONS FOR DRAIN AND SEWER MANHOLES, WATER VALVE COVERS, GAS GATES, ELECTRIC AND TELEPHONE PULL BOXES, AND MANHOLES, AND OTHER SUCH ITEMS, ARE APPROXIMATE AND SHALL BE SET/RESET AS FOLLOWS:
   A. PAVEMENTS AND CONCRETE SURFACES: FLUSH
   B. ALL SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   C. LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EARTH TO THE RIM ELEVATION.
5. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
6. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
7. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
   A. WATER PIPES SHALL BE CEMENT LINED DUCTILE IRON (CLDI) FOR MAINS AND TYPE 'K' COPPER FOR DOMESTIC SERVICES
   B. SANITARY SEWER PIPES SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE
   C. STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HDPE)
   D. PIPE INSTALLATION AND MATERIALS SHALL COMPLY WITH THE STATE PLUMBING CODE WHERE APPLICABLE. CONTRACTOR SHALL COORDINATE WITH LOCAL PLUMBING INSPECTOR PRIOR TO BEGINNING WORK.
8. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.
9. CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.
10. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN.) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS AND LOCAL MUNICIPAL STANDARDS. FOR MANHOLES THAT ARE 20 FEET IN DEPTH AND GREATER, THE MINIMUM DIAMETER SHALL BE 5 FEET.

Layout and Materials

1. DIMENSIONS ARE FROM THE FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
2. CURB RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
3. CURBING SHALL BE BITUMINOUS CURB (BC) WITHIN THE SITE UNLESS OTHERWISE INDICATED ON THE PLANS.
4. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.
5. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LAND SURVEYOR.
6. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.

Demolition

1. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS.
2. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
4. THE DEMOLITION LIMITS DEPICTED IN THE PLANS IS INTENDED TO AID THE CONTRACTOR DURING THE BIDDING AND CONSTRUCTION PROCESS AND IS NOT INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
5. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH. MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS (MINIMUM) OR AS REQUIRED PER THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

Existing Conditions Information

1. THE PROPERTY LINES SHOWN ON THESE PLANS ARE BASED UPON THE SURVEY MAP, LONGBROOK ESTATES, CONDOMINIUM, LONGBROOK ESTATES, 1485 SUFFIELD STREET, AGAWAM, MA, 01001, DATE: SEPT 1992, SCALE: 1"=80', ANDERSON ASSOCIATES.
2. THE EXISTING CONDITIONS SHOWN ON THESE PLANS ARE BASED UPON AN ACTUAL ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY VHB, INC. IN OCTOBER, 2023.
3. HORIZONTAL DATUM IS BASED ON MASS. GRID SYSTEM, NAD 1983. ELEVATIONS SHOWN ON THESE PLANS REFER TO NAVD 1988.
4. THE WETLANDS SHOWN ON THESE PLANS WERE FLAGGED BY VHB ENVIRONMENTAL DEPARTMENT ON 10/17/2023 AND 10/24/2023.
5. A GEOTECHNICAL REPORT WAS PREPARED BY O'REILLY, TALBOT & OKUN TITLED, TEST PIT INVESTIGATIONS AND INFILTRATION TESTING, DATED FEBRUARY 12, 2024.

Document Use

1. THESE PLANS AND CORRESPONDING CADD DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF VHB. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION, INCLUDING AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

vhb.com

One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Legend, Abbreviations and General Notes

JOHN J. FLEMMING — COMMONWEALTH OF MASSACHUSETTS — CIVIL — NO. 49090 — REGISTERED PROFESSIONAL ENGINEER

Drawing Number

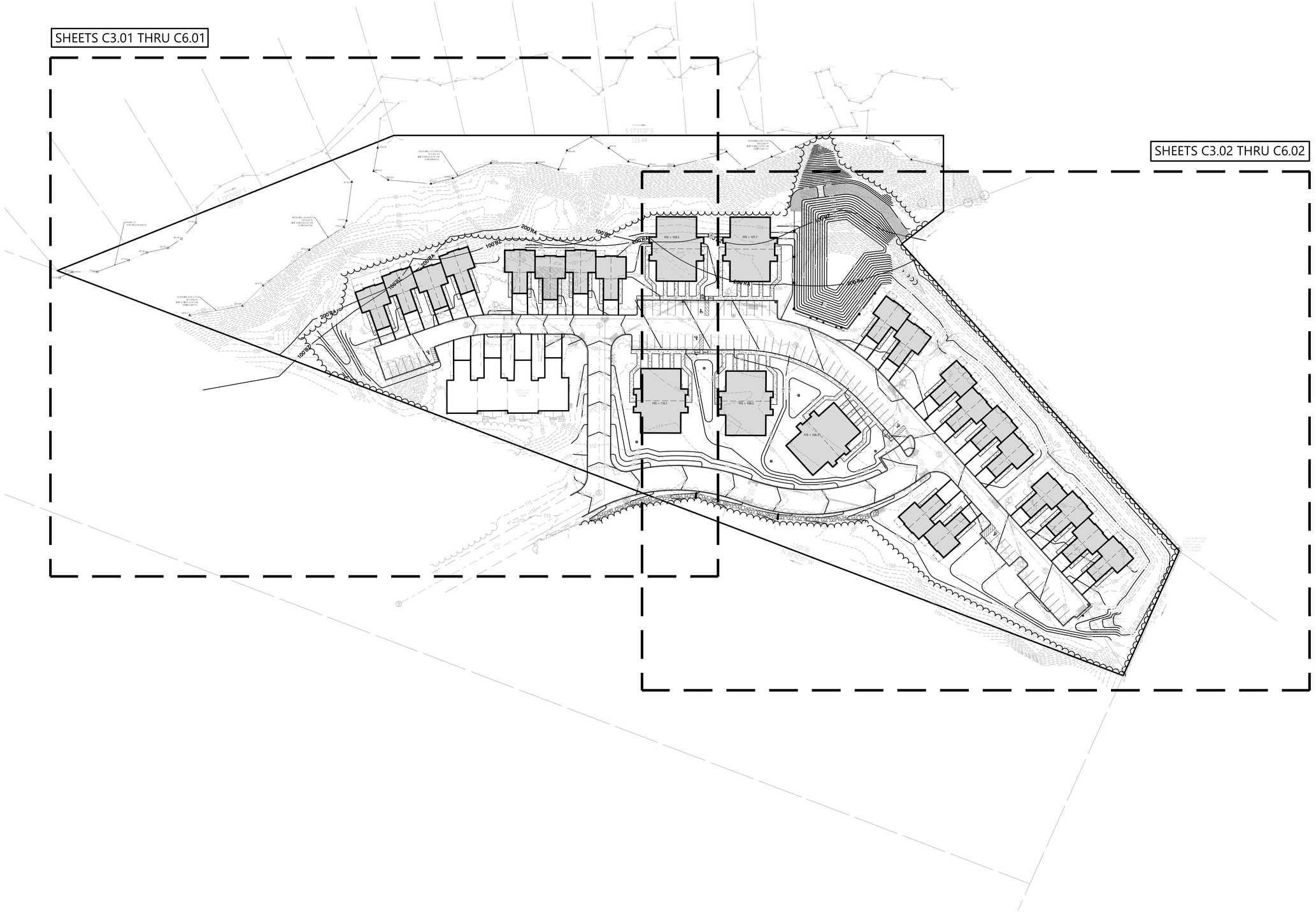
C1.01

Sheet 1 of 17

Project Number

43346.00

Saved Thursday, November 13, 2025 2:22:54 PM JGALARNEAU Plotted Thursday, February 19, 2026 9:11:11 AM Jeffrey Galarneau



vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

NOTES:

1) THIS PROJECT IS BEING CONSIDERED A REDEVELOPMENT BASED ON ALL OF THE TOPSOIL BEING REMOVED FROM THE SITE UNDER THE PREVIOUSLY APPROVED SITE PLANS.

0 30 60 120Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Overall Plan

COMMONWEALTH OF MASSACHUSETTS
JOHN J. FLOWERS
CIVIL
NO. 41010
REGISTERED PROFESSIONAL ENGINEER

Drawing Number

C2.01

Sheet 2 of 17

Project Number
43346.00

Saved Tuesday, February 24, 2026 1:36:46 PM JGALARNEAU Plotted Wednesday, July 8, 2026 1:56:37 PM John Furman

Zoning Summary Chart

Zoning District(S):	Residence A-3 (A3)	
Zoning Regulation Requirements	**Required***	**Provided**
MINIMUM LOT AREA	2 AC	11.75 AC
FRONTAGE	150 FT	N/A
FRONT YARD SETBACK	40 FT	41.4 FT **
SIDE YARD SETBACK	40 FT	50.6 FT
REAR YARD SETBACK	40 FT	41.3 FT
MAXIMUM BUILDING HEIGHT	35 FT (2 STORIES)	≤ 35 FT (2 STORIES)
MAXIMUM LOT COVERAGE BY BUILDING	40 %	12.5 %
MAXIMUM LIVING UNITS PER ACRE	8	7.49

* Zoning regulation requirements Adopted by the Town Council of the Town of Agawam 12-21-1972 as Ch. 20 of the Code of the Town of Agawam. Amendments noted where applicable.

** There is no frontage on a municipal roadway; therefore, the front setback will be considered to be along the property line where the driveway enters the Site.

Parking Summary Chart

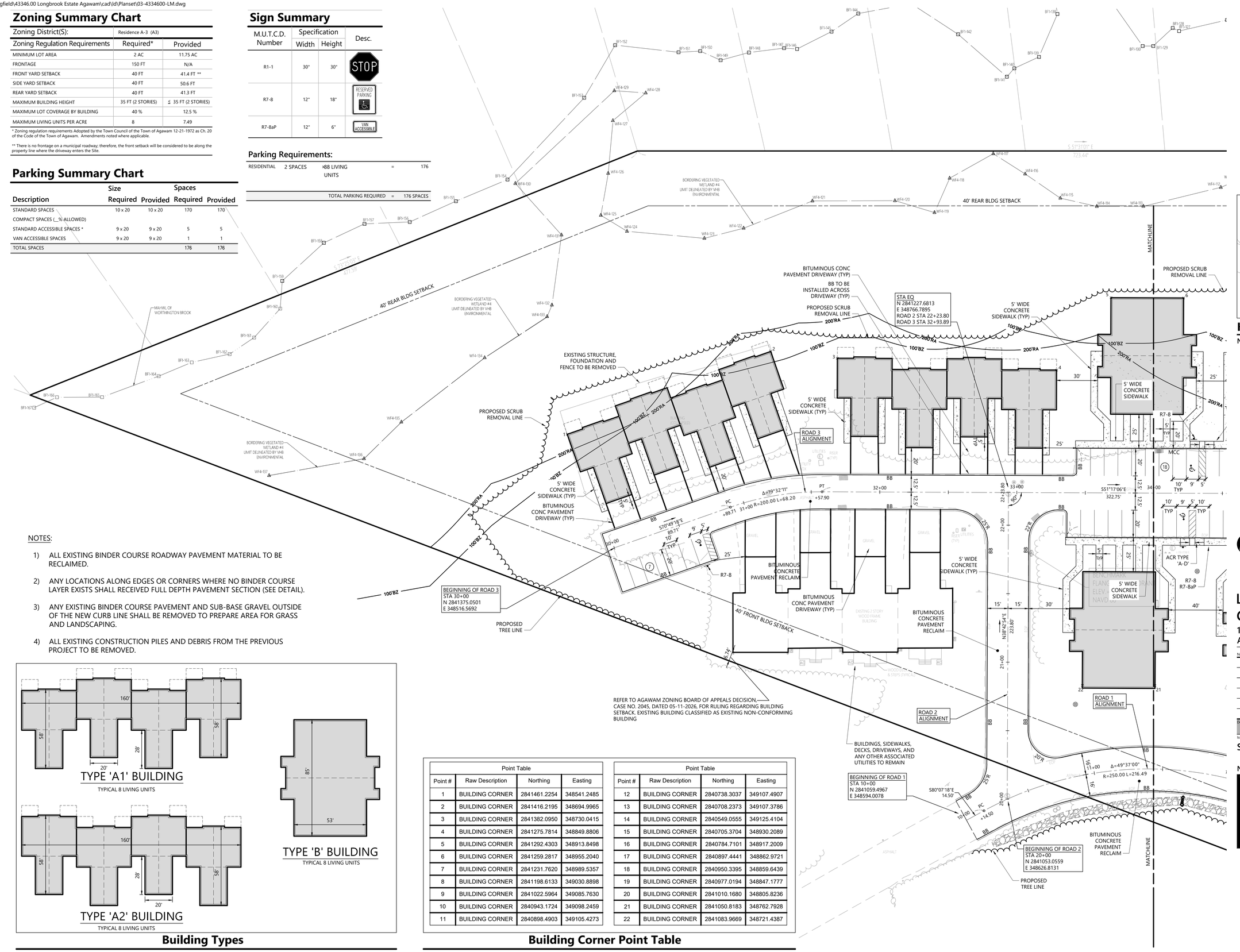
	Size		Spaces	
Description	**Required**	**Provided**	**Required**	**Provided**
STANDARD SPACES	10 x 20	10 x 20	170	170
COMPACT SPACES (__% ALLOWED)				
STANDARD ACCESSIBLE SPACES *	9 x 20	9 x 20	5	5
VAN ACCESSIBLE SPACES	9 x 20	9 x 20	1	1
TOTAL SPACES			176	176

Sign Summary

M.U.T.C.D. Number	Specification Width	Specification Height	Desc.
R1-1	30"	30"	STOP
R7-8	12"	18"	RESERVED PARKING
R7-8aP	12"	6"	VAN ACCESSIBLE

Parking Requirements:

RESIDENTIAL	2 SPACES	x88 LIVING UNITS	=	176
		TOTAL PARKING REQUIRED	=	176 SPACES



NOTES:

1) ALL EXISTING BINDER COURSE ROADWAY PAVEMENT MATERIAL TO BE RECLAIMED.

2) ANY LOCATIONS ALONG EDGES OR CORNERS WHERE NO BINDER COURSE LAYER EXISTS SHALL RECEIVED FULL DEPTH PAVEMENT SECTION (SEE DETAIL).

3) ANY EXISTING BINDER COURSE PAVEMENT AND SUB-BASE GRAVEL OUTSIDE OF THE NEW CURB LINE SHALL BE REMOVED TO PREPARE AREA FOR GRASS AND LANDSCAPING.

4) ALL EXISTING CONSTRUCTION PILES AND DEBRIS FROM THE PREVIOUS PROJECT TO BE REMOVED.

REFER TO AGAWAM ZONING BOARD OF APPEALS DECISION, CASE NO. 2045, DATED 05-11-2026, FOR RULING REGARDING BUILDING SETBACK. EXISTING BUILDING CLASSIFIED AS EXISTING NON-CONFORMING BUILDING

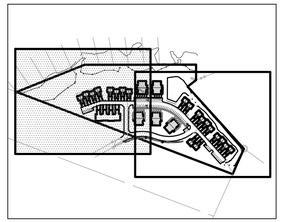
Building Types

Point Table			
Point #	Raw Description	Northing	Easting
1	BUILDING CORNER	2841461.2254	348541.2485
2	BUILDING CORNER	2841416.2195	348694.9965
3	BUILDING CORNER	2841382.0950	348730.0415
4	BUILDING CORNER	2841275.7814	348849.8806
5	BUILDING CORNER	2841292.4303	348913.8498
6	BUILDING CORNER	2841259.2817	348955.2040
7	BUILDING CORNER	2841231.7620	348989.5357
8	BUILDING CORNER	2841198.6133	349030.8898
9	BUILDING CORNER	2841022.5964	349085.7630
10	BUILDING CORNER	2840943.1724	349098.2459
11	BUILDING CORNER	2840898.4903	349105.4273

Point Table			
Point #	Raw Description	Northing	Easting
12	BUILDING CORNER	2840738.3037	349107.4907
13	BUILDING CORNER	2840708.2373	349107.3786
14	BUILDING CORNER	2840549.0555	349125.4104
15	BUILDING CORNER	2840705.3704	348930.2089
16	BUILDING CORNER	2840784.7101	348917.2009
17	BUILDING CORNER	2840897.4441	348862.9721
18	BUILDING CORNER	2840950.3395	348859.6439
19	BUILDING CORNER	2840977.0194	348847.1777
20	BUILDING CORNER	2841010.1680	348805.8236
21	BUILDING CORNER	2841050.8183	348762.7928
22	BUILDING CORNER	2841083.9669	348721.4387

Building Corner Point Table

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



Key

Not To Scale

0 15 30 60 Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Layout and Materials Plan

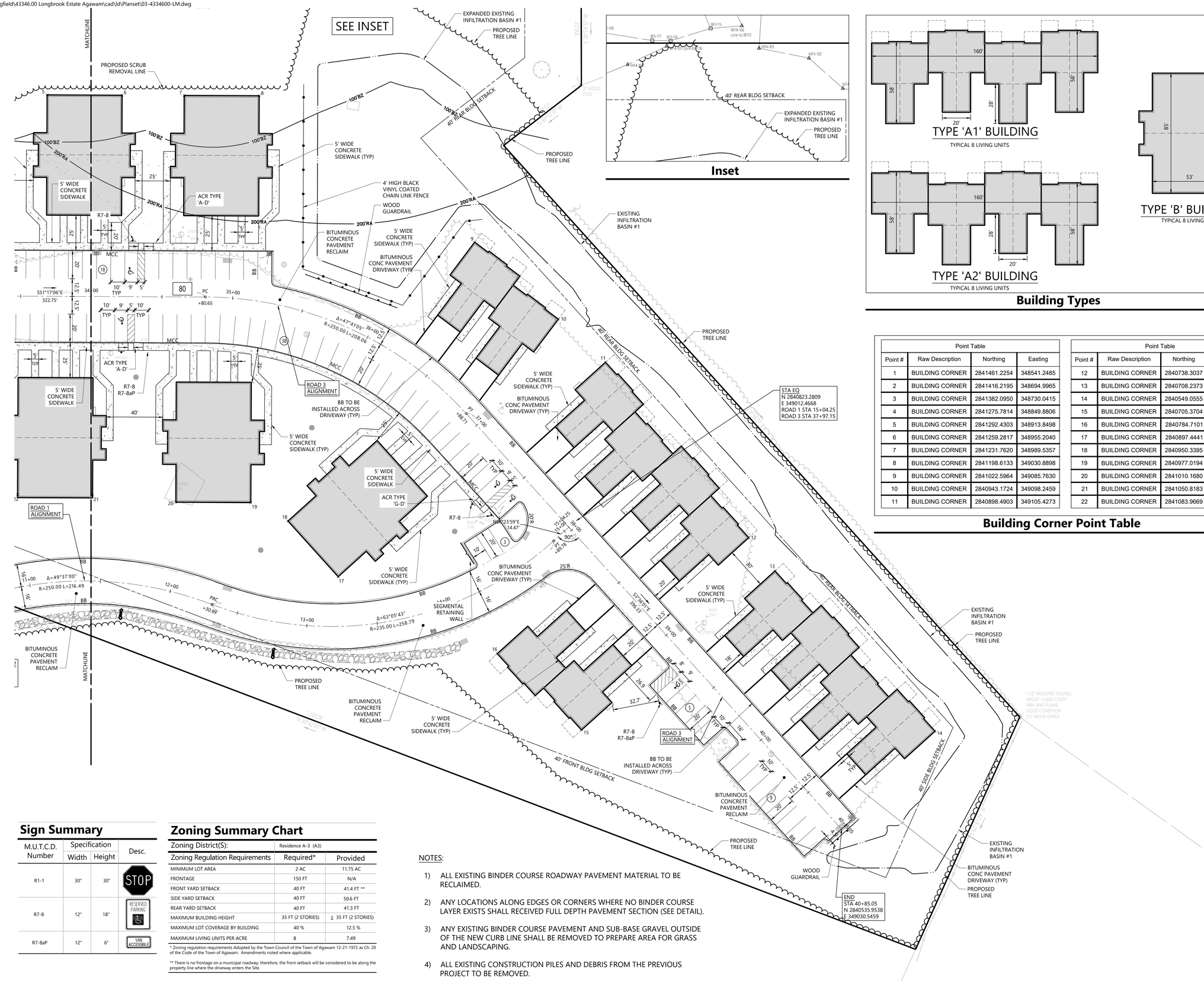
Drawing Number

C3.01

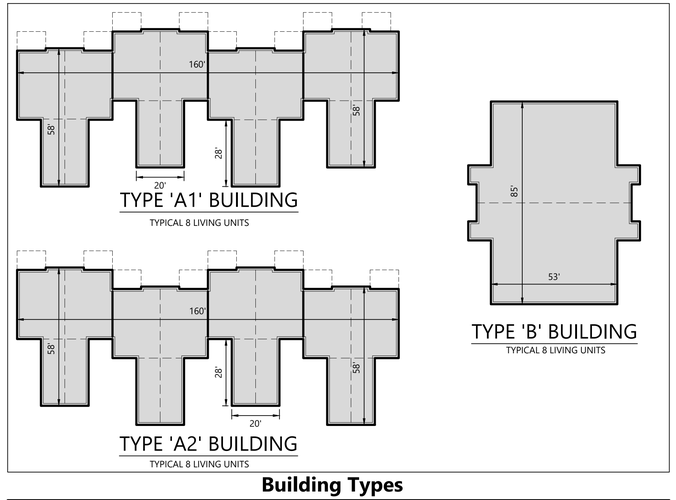
Sheet 3 of 17

Project Number 43346.00

JOHN J. FURMAN CIVIL NO. 49090 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER



Inset



Building Types

Point Table			
Point #	Raw Description	Northing	Easting
1	BUILDING CORNER	2841461.2254	348541.2485
2	BUILDING CORNER	2841416.2195	348694.9965
3	BUILDING CORNER	2841382.0950	348730.0415
4	BUILDING CORNER	2841275.7814	348849.8806
5	BUILDING CORNER	2841292.4303	348913.8498
6	BUILDING CORNER	2841259.2817	348955.2040
7	BUILDING CORNER	2841231.7620	348989.5357
8	BUILDING CORNER	2841198.6133	349030.8898
9	BUILDING CORNER	2841022.5964	349085.7630
10	BUILDING CORNER	2840943.1724	349098.2459
11	BUILDING CORNER	2840898.4903	349105.4273

Point Table			
Point #	Raw Description	Northing	Easting
12	BUILDING CORNER	2840738.3037	349107.4907
13	BUILDING CORNER	2840708.2373	349107.3786
14	BUILDING CORNER	2840549.0555	349125.4104
15	BUILDING CORNER	2840705.3704	348930.2089
16	BUILDING CORNER	2840784.7101	348917.2009
17	BUILDING CORNER	2840897.4441	348862.9721
18	BUILDING CORNER	2840950.3395	348859.6439
19	BUILDING CORNER	2840977.0194	348847.1777
20	BUILDING CORNER	2841010.1680	348805.8236
21	BUILDING CORNER	2841050.8183	348762.7928
22	BUILDING CORNER	2841083.9669	348721.4387

Building Corner Point Table

Sign Summary

M.U.T.C.D. Number	Specification Width	Specification Height	Desc.
R1-1	30"	30"	STOP
R7-8	12"	18"	RESERVED PARKING
R7-8aP	12"	6"	VAN ACCESSIBLE

Zoning Summary Chart

Zoning District(S):	Residence A-3 (A3)	
Zoning Regulation Requirements	Required*	Provided
MINIMUM LOT AREA	2 AC	11.75 AC
FRONTAGE	150 FT	N/A
FRONT YARD SETBACK	40 FT	41.4 FT **
SIDE YARD SETBACK	40 FT	50.6 FT
REAR YARD SETBACK	40 FT	41.3 FT
MAXIMUM BUILDING HEIGHT	35 FT (2 STORIES)	≤ 35 FT (2 STORIES)
MAXIMUM LOT COVERAGE BY BUILDING	40 %	12.5 %
MAXIMUM LIVING UNITS PER ACRE	8	7.49

* Zoning regulation requirements Adopted by the Town Council of the Town of Agawam 12-21-1972 as Ch. 20 of the Code of the Town of Agawam. Amendments noted where applicable.

** There is no frontage on a municipal roadway; therefore, the front setback will be considered to be along the property line where the driveway enters the Site.

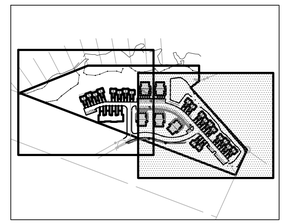
NOTES:

1) ALL EXISTING BINDER COURSE ROADWAY PAVEMENT MATERIAL TO BE RECLAIMED.

2) ANY LOCATIONS ALONG EDGES OR CORNERS WHERE NO BINDER COURSE LAYER EXISTS SHALL RECEIVED FULL DEPTH PAVEMENT SECTION (SEE DETAIL).

3) ANY EXISTING BINDER COURSE PAVEMENT AND SUB-BASE GRAVEL OUTSIDE OF THE NEW CURB LINE SHALL BE REMOVED TO PREPARE AREA FOR GRASS AND LANDSCAPING.

4) ALL EXISTING CONSTRUCTION PILES AND DEBRIS FROM THE PREVIOUS PROJECT TO BE REMOVED.



Key

Not To Scale

0 15 30 60 Feet

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Layout and Materials Plan

JOHN J. FURMAN CIVIL NO. 41010 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

Drawing Number

C3.02

Sheet 4 of 17

Project Number 43346.00

Saved Tuesday, July 7, 2026 5:02:22 PM JFURMAN Plotted Wednesday, July 8, 2026 2:33:02 PM John Furman



DRAINAGE STRUCTURE TABLE

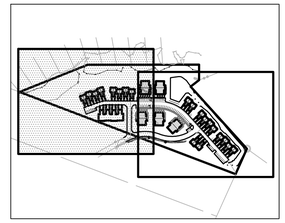
CB–1 R= 107.6 I = 98.6 (P59) I = 98.4 (OUT)	LDS–1 R= 107.6 I = 103.6 (OUT)	CDS1515-3-C WQU–1 R= 106.5 I = 96.9 (EXDMH) I = 96.9 (OUT)
CB–2 R= 106.6 I = 97.5 (CB–1) I = 97.4 (OUT)	LDS–2 R= 109.5 I = 106.6 (OUT)	CDS1515-3-C WQU–2 R= 105.8 I = 99.9± (EXCB) I = 99.9± (OUT)
	LDS–3 R= 106.1 I = 102.6 (OUT)	CDS1515-3-C WQU–3 R= 105.9 I = 100.0± (EXCB) I = 100.0± (OUT)
	LDS–4 R= 105.8 I = 102.0 (YD–3) I = 101.9 (OUT)	STC 450i WQU–4 R= 103.2 I = 99.7 (OUT)
	LDS–5 R= 105.8 I = 102.3 (OUT)	

NOTES:

1) ALL EXISTING CATCH BASINS TO BE VACUUM CLEANED OF SEDIMENT AND DEBRIS.

2) ADJUST ALL EXISTING CATCH BASIN GRATES TO BE FLUSH AGAINST THE NEW CURB LINE.

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



Key
Not To Scale

0 15 30 60 Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval February 19, 2026

Not For Construction

Drawing Title

Grading and Drainage Plan

Drawing Number

C4.01

Sheet 5 of 17

Project Number
43346.00

Saved Thursday, February 19, 2026 4:02:47 PM JGALARNEAU Plotted Wednesday, July 8, 2026 2:41:38 PM John Furman



Inset

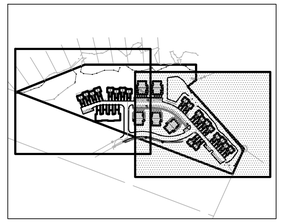
DRAINAGE STRUCTURE TABLE

CB-1 R=107.6 I = 98.6 (PS9) I = 98.4 (OUT)	LDS-1 R=107.6 I = 103.6 (OUT)	CDS1515-3-C WQU-1 R=106.5 I = 96.9 (EXDMH) I = 96.9 (OUT)
CB-2 R=106.6 I = 97.5 (CB-1) I = 97.4 (OUT)	LDS-2 R=109.5 I = 106.6 (OUT)	CDS1515-3-C WQU-2 R=105.8 I = 99.9± (EXCB) I = 99.9± (OUT)
	LDS-3 R=106.1 I = 102.6 (OUT)	CDS1515-3-C WQU-3 R=105.9 I = 100.0± (EXCB) I = 100.0± (OUT)
	LDS-4 R=105.8 I = 102.0 (YD-3) I = 101.9 (OUT)	STC 450i
	LDS-5 R=105.8 I = 102.3 (OUT)	WQU-4 R=103.2 I = 99.7 (OUT)

NOTES:

1) ALL EXISTING CATCH BASINS TO BE VACUUM CLEANED OF SEDIMENT AND DEBRIS.

2) ADJUST ALL EXISTING CATCH BASIN GRATES TO BE FLUSH AGAINST THE NEW CURB LINE.



Key

Not To Scale

0 15 30 60 Feet

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Grading and Drainage Plan

Drawing Number

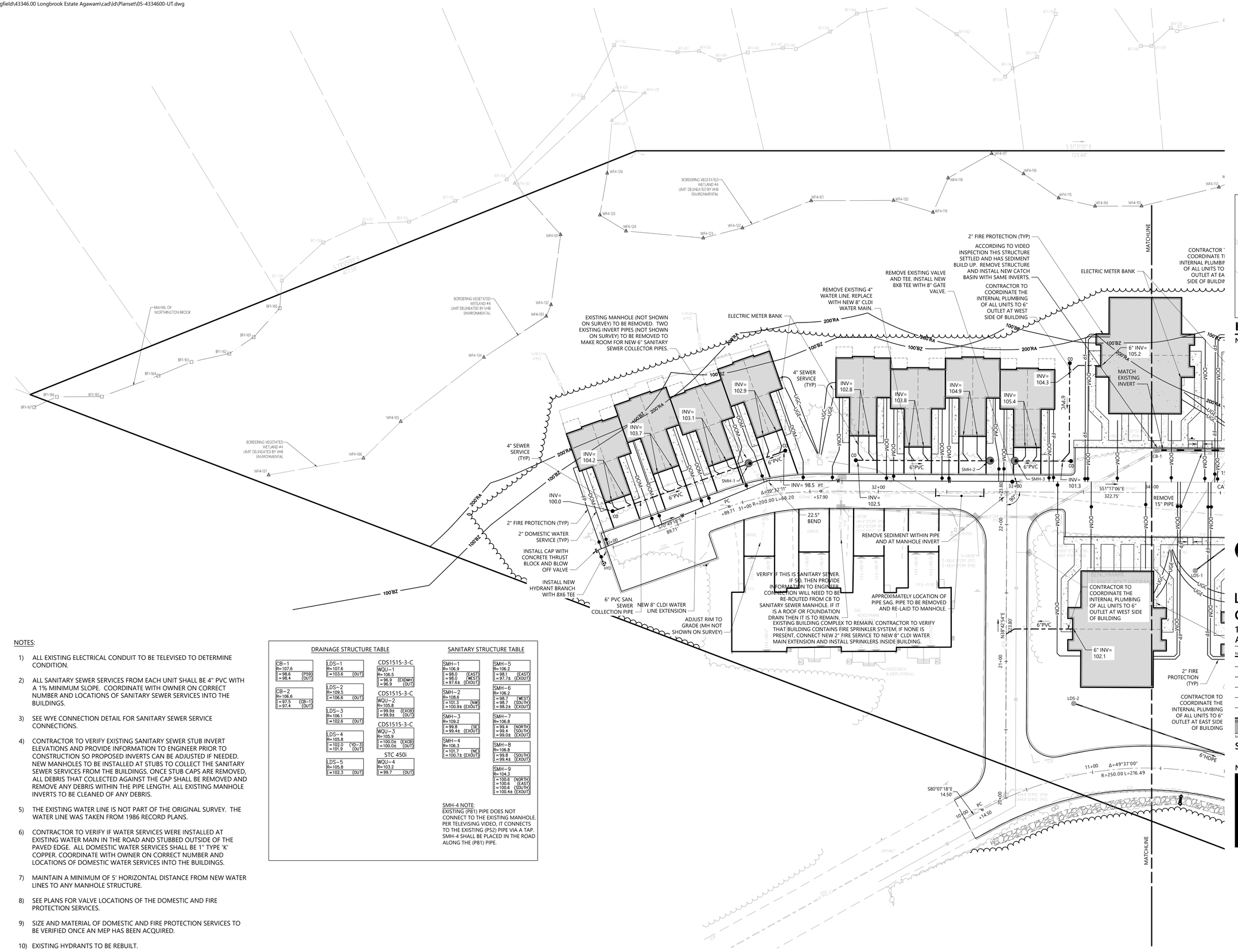
C4.02

Sheet 6 of 17

Project Number
43346.00

COMMONWEALTH OF MASSACHUSETTS
JOHN J. FURMAN
CIVIL
NO. 41010
REGISTERED PROFESSIONAL ENGINEER

Saved Thursday, February 19, 2026 4:02:47 PM JGALARNEAU Plotted Wednesday, July 8, 2026 2:43:35 PM John Furman



NOTES:

1) ALL EXISTING ELECTRICAL CONDUIT TO BE TELEVISED TO DETERMINE CONDITION.

2) ALL SANITARY SEWER SERVICES FROM EACH UNIT SHALL BE 4" PVC WITH A 1% MINIMUM SLOPE. COORDINATE WITH OWNER ON CORRECT NUMBER AND LOCATIONS OF SANITARY SEWER SERVICES INTO THE BUILDINGS.

3) SEE WYE CONNECTION DETAIL FOR SANITARY SEWER SERVICE CONNECTIONS.

4) CONTRACTOR TO VERIFY EXISTING SANITARY SEWER STUB INVERT ELEVATIONS AND PROVIDE INFORMATION TO ENGINEER PRIOR TO CONSTRUCTION SO PROPOSED INVERTS CAN BE ADJUSTED IF NEEDED. NEW MANHOLES TO BE INSTALLED AT STUBS TO COLLECT THE SANITARY SEWER SERVICES FROM THE BUILDINGS. ONCE STUB CAPS ARE REMOVED, ALL DEBRIS THAT COLLECTED AGAINST THE CAP SHALL BE REMOVED AND REMOVE ANY DEBRIS WITHIN THE PIPE LENGTH. ALL EXISTING MANHOLE INVERTS TO BE CLEANED OF ANY DEBRIS.

5) THE EXISTING WATER LINE IS NOT PART OF THE ORIGINAL SURVEY. THE WATER LINE WAS TAKEN FROM 1986 RECORD PLANS.

6) CONTRACTOR TO VERIFY IF WATER SERVICES WERE INSTALLED AT EXISTING WATER MAIN IN THE ROAD AND STUBBED OUTSIDE OF THE PAVED EDGE. ALL DOMESTIC WATER SERVICES SHALL BE 1" TYPE 'K' COPPER. COORDINATE WITH OWNER ON CORRECT NUMBER AND LOCATIONS OF DOMESTIC WATER SERVICES INTO THE BUILDINGS.

7) MAINTAIN A MINIMUM OF 5' HORIZONTAL DISTANCE FROM NEW WATER LINES TO ANY MANHOLE STRUCTURE.

8) SEE PLANS FOR VALVE LOCATIONS OF THE DOMESTIC AND FIRE PROTECTION SERVICES.

9) SIZE AND MATERIAL OF DOMESTIC AND FIRE PROTECTION SERVICES TO BE VERIFIED ONCE AN MEP HAS BEEN ACQUIRED.

10) EXISTING HYDRANTS TO BE REBUILT.

DRAINAGE STRUCTURE TABLE

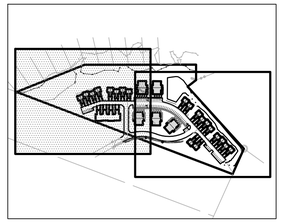
CB-1 R=107.6 I = 98.6 (P59) I = 98.4 (OUT)	LDS-1 R=107.6 I = 103.6 (OUT)	CDS1515-3-C WQU-1 R=106.5 I = 96.9 (EXDMH) I = 96.9 (OUT)
CB-2 R=106.6 I = 97.5 (CB-1) I = 97.4 (OUT)	LDS-2 R=109.5 I = 106.6 (OUT)	CDS1515-3-C WQU-2 R=105.8 I = 99.9± (EXCB) I = 99.9± (OUT)
	LDS-3 R=106.1 I = 102.6 (OUT)	CDS1515-3-C WQU-3 R=105.9 I = 100.0± (EXCB) I = 100.0± (OUT)
	LDS-4 R=105.8 I = 102.0 (YD-3) I = 101.9 (OUT)	STC 450i WQU-4 R=103.2 I = 99.7 (OUT)
	LDS-5 R=105.8 I = 102.3 (OUT)	

SANITARY STRUCTURE TABLE

SMH-1 R=106.9 I = 98.0 (EAST) I = 98.0 (WEST) I = 97.6± (EXOUT)	SMH-5 R=106.2 I = 98.1 (EAST) I = 97.7± (EXOUT)
SMH-2 R=108.6 I = 101.3 (NW) I = 100.9± (EXOUT)	SMH-6 R=106.2 I = 98.7 (WEST) I = 98.7 (SOUTH) I = 98.2± (EXOUT)
SMH-3 R=109.2 I = 99.8 (SE) I = 99.4± (EXOUT)	SMH-7 R=106.8 I = 99.4 (NORTH) I = 99.4 (SOUTH) I = 99.0± (EXOUT)
SMH-4 R=106.3 I = 101.7 (NE) I = 100.7± (EXOUT)	SMH-8 R=106.8 I = 99.8 (SOUTH) I = 99.4± (EXOUT)
	SMH-9 R=104.3 I = 100.6 (NORTH) I = 100.6 (EAST) I = 100.6 (SOUTH) I = 100.4± (EXOUT)

SMH-4 NOTE:
EXISTING (P81) PIPE DOES NOT CONNECT TO THE EXISTING MANHOLE. PER TELEVISING VIDEO, IT CONNECTS TO THE EXISTING (P52) PIPE VIA A TAP. SMH-4 SHALL BE PLACED IN THE ROAD ALONG THE (P81) PIPE.

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



Key

Not To Scale

0 15 30 60 Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Utility Plan

JOHN J. FLEMMING CIVIL NO. 49010 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

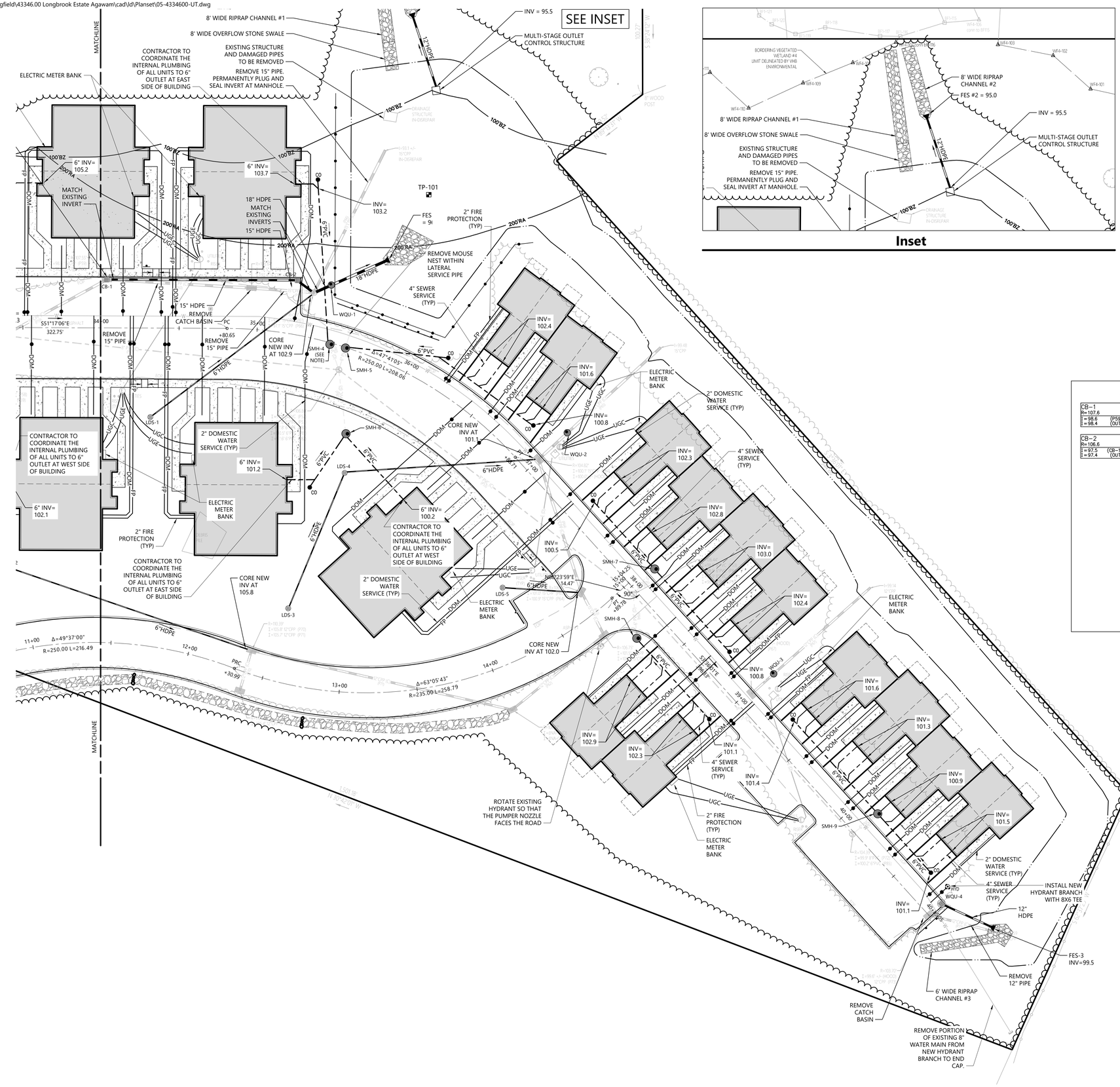
Drawing Number

C5.01

Sheet 7 of 17

Project Number

43346.00



Inset

NOTES:

1) ALL EXISTING ELECTRICAL CONDUIT TO BE TELEVISED TO DETERMINE CONDITION.
2) ALL SANITARY SEWER SERVICES FROM EACH UNIT SHALL BE 4" PVC WITH A 1% MINIMUM SLOPE. COORDINATE WITH OWNER ON CORRECT NUMBER AND LOCATIONS OF SANITARY SEWER SERVICES INTO THE BUILDINGS.
3) SEE WYE CONNECTION DETAIL FOR SANITARY SEWER SERVICE CONNECTIONS.
4) CONTRACTOR TO VERIFY EXISTING SANITARY SEWER STUB INVERT ELEVATIONS AND PROVIDE INFORMATION TO ENGINEER PRIOR TO CONSTRUCTION SO PROPOSED INVERTS CAN BE ADJUSTED IF NEEDED. NEW MANHOLES TO BE INSTALLED AT STUBS TO COLLECT THE SANITARY SEWER SERVICES FROM THE BUILDINGS. ONCE STUB CAPS ARE REMOVED, ALL DEBRIS THAT COLLECTED AGAINST THE CAP SHALL BE REMOVED AND REMOVE ANY DEBRIS WITHIN THE PIPE LENGTH. ALL EXISTING MANHOLE INVERTS TO BE CLEANED OF ANY DEBRIS.
5) THE EXISTING WATER LINE IS NOT PART OF THE ORIGINAL SURVEY. THE WATER LINE WAS TAKEN FROM 1986 RECORD PLANS.
6) CONTRACTOR TO VERIFY IF WATER SERVICES WERE INSTALLED AT EXISTING WATER MAIN IN THE ROAD AND STUBBED OUTSIDE OF THE PAVED EDGE. ALL DOMESTIC WATER SERVICES SHALL BE 1" TYPE 'K' COPPER. COORDINATE WITH OWNER ON CORRECT NUMBER AND LOCATIONS OF DOMESTIC WATER SERVICES INTO THE BUILDINGS.
7) MAINTAIN A MINIMUM OF 5' HORIZONTAL DISTANCE FROM NEW WATER LINES TO ANY MANHOLE STRUCTURE.
8) SEE PLANS FOR VALVE LOCATIONS OF THE DOMESTIC AND FIRE PROTECTION SERVICES.
9) SIZE AND MATERIAL OF DOMESTIC AND FIRE PROTECTION SERVICES TO BE VERIFIED ONCE AN MEP HAS BEEN ACQUIRED.
10) EXISTING HYDRANTS TO BE REBUILT.

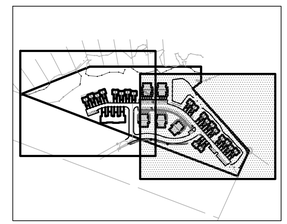
DRAINAGE STRUCTURE TABLE

CB-1 R= 107.6 I = 98.6 (P59) I = 98.4 (OUT)	LDS-1 R= 107.6 I = 103.6 (OUT)	CDS1515-3-C WQU-1 R= 106.5 I = 96.9 (EXOMH) I = 96.9 (OUT)
CB-2 R= 106.6 I = 97.5 (CB-1) I = 97.4 (OUT)	LDS-2 R= 109.5 I = 106.6 (OUT)	CDS1515-3-C WQU-2 R=105.8 I = 99.9± (EXCB) I = 99.9± (OUT)
	LDS-3 R= 106.1 I = 102.6 (OUT)	CDS1515-3-C WQU-3 R=105.9 I = 100.0± (EXCB) I = 100.0± (OUT)
	LDS-4 R=105.8 I = 102.0 (YD-3) I = 101.9 (OUT)	STC 450i WQU-4 R=103.2 I = 99.7 (OUT)
	LDS-5 R=105.8 I = 102.3 (OUT)	

SANITARY STRUCTURE TABLE

SMH-1 R= 106.9 I = 98.0 (EAST) I = 98.0 (WEST) I = 97.6± (EXOUT)	SMH-5 R= 106.2 I = 98.1 (EAST) I = 97.7± (EXOUT)
SMH-2 R= 108.6 I = 101.3 (NW) I = 100.9± (EXOUT)	SMH-6 R= 106.2 I = 98.7 (WEST) I = 98.7 (SOUTH) I = 98.2± (EXOUT)
SMH-3 R= 109.2 I = 99.9 (SE) I = 99.4± (EXOUT)	SMH-7 R= 106.8 I = 99.4 (NORTH) I = 99.4 (SOUTH) I = 99.0± (EXOUT)
SMH-4 R= 106.3 I = 101.7 (NE) I = 100.7± (EXOUT)	SMH-8 R= 106.8 I = 99.8 (SOUTH) I = 99.4± (EXOUT)
	SMH-9 R= 104.3 I = 100.6 (NORTH) I = 100.6 (EAST) I = 100.6 (SOUTH) I = 100.4± (EXOUT)

SMH-4 NOTE:
EXISTING (P81) PIPE DOES NOT CONNECT TO THE EXISTING MANHOLE. PER TELEVISING VIDEO, IT CONNECTS TO THE EXISTING (P52) PIPE VIA A TAP. SMH-4 SHALL BE PLACED IN THE ROAD ALONG THE (P81) PIPE.



Key

Not To Scale

0 15 30 60 Feet

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval February 19, 2026

Not For Construction

Drawing Title

Utility Plan

Drawing Number

C5.02

Sheet 8 of 17

Project Number
43346.00

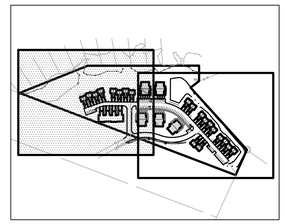
JOHN J. FURMAN
CIVIL
NO. 49090
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS



vhb.com

vhb

One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



Key

Not To Scale

NOTES:

1) TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND REMOVED AT THE COMPLETION OF CONSTRUCTION.

0 15 30 60 Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for: Site Plan Approval

Date: February 19, 2026

Not For Construction

Drawing Title

Erosion and Sediment Control Plan

JOHN J. FURMAN CIVIL NO. 49090 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

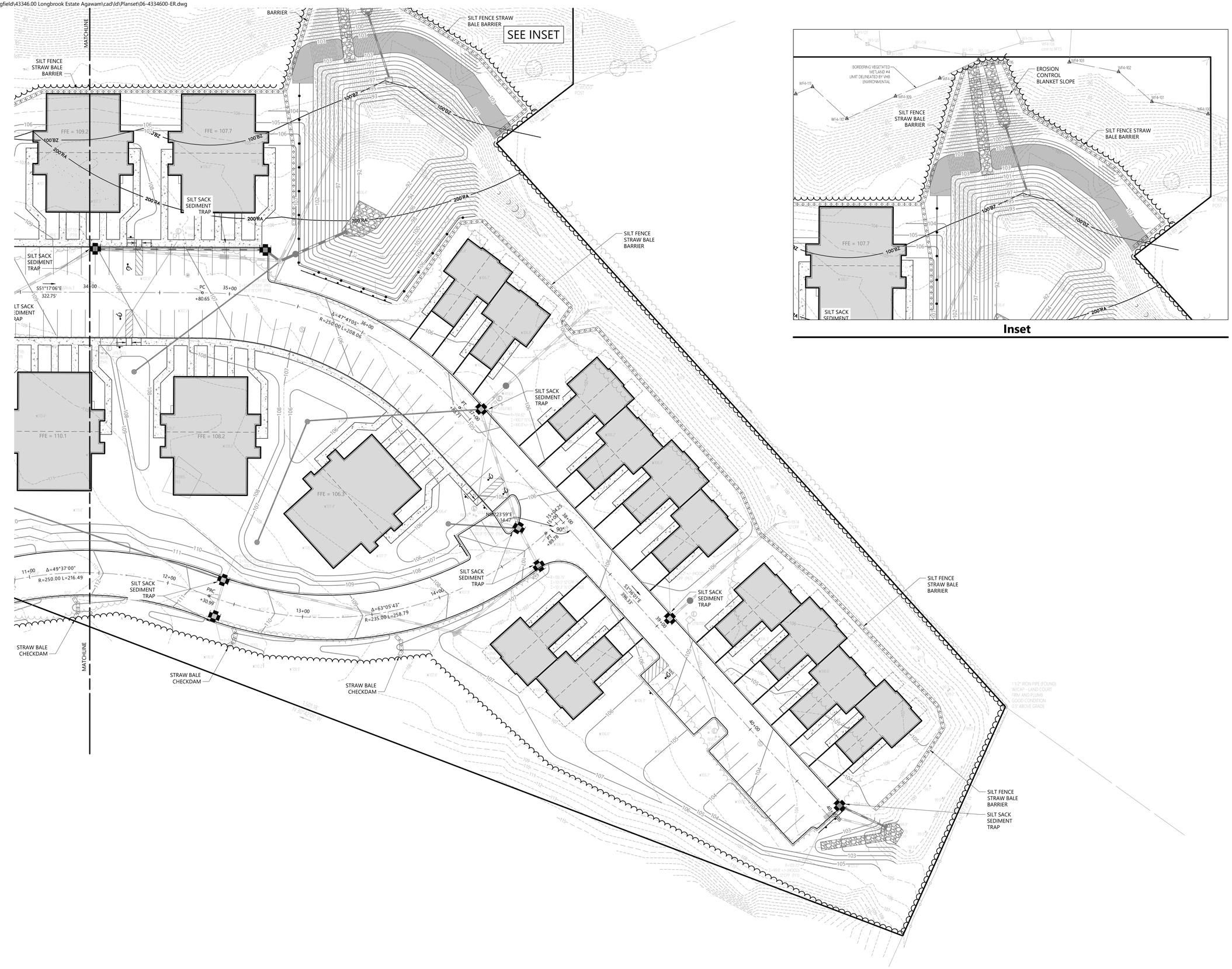
Drawing Number

C6.01

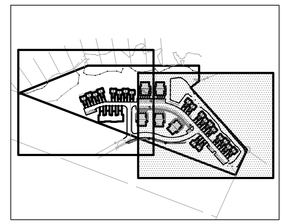
Sheet 9 of 17

Project Number 43346.00

Saved Thursday, February 19, 2026 4:08:14 PM JGALARNEAU Plotted Wednesday, July 8, 2026 2:51:49 PM John Furman



Inset



Key

Not To Scale

NOTES:

1) TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND REMOVED AT THE COMPLETION OF CONSTRUCTION.

0 15 30 60 Feet

vhb.com

vhb

One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval | February 19, 2026

Not For Construction

Drawing Title

Erosion and Sediment Control Plan

JOHN J. FURMAN CIVIL NO. 44092 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

Drawing Number

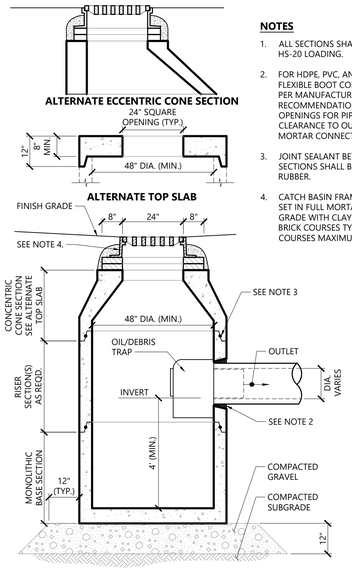
C6.02

Sheet 10 of 17

Project Number

43346.00

Saved Thursday, February 19, 2026 4:08:14 PM JGALARNEAU Plotted Wednesday, July 8, 2026 2:52:51 PM John Furman



NOTES

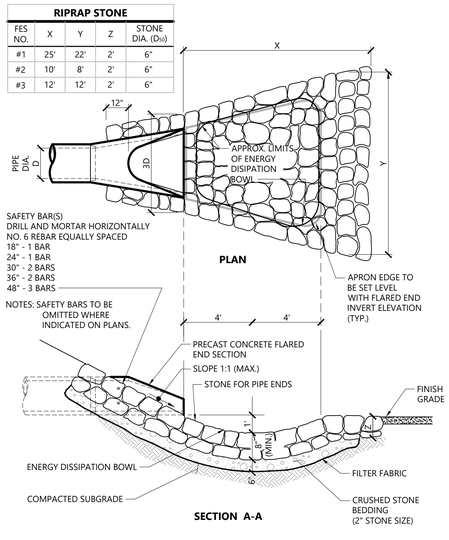
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).

Catch Basin (CB) With Oil/Debris Trap

3/21

N.T.S. Source: VHB LD_101

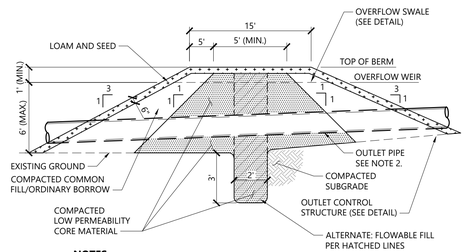
RIPRAP STONE				
FES NO.	X	Y	Z	STONE DIA. (D_{50})
#1	25'	22'	2'	6"
#2	10'	8'	2'	6"
#3	12'	12'	2'	6"



Flared End Section (FES) with Stone Protection

3/19

N.T.S. Source: VHB REV LD_134



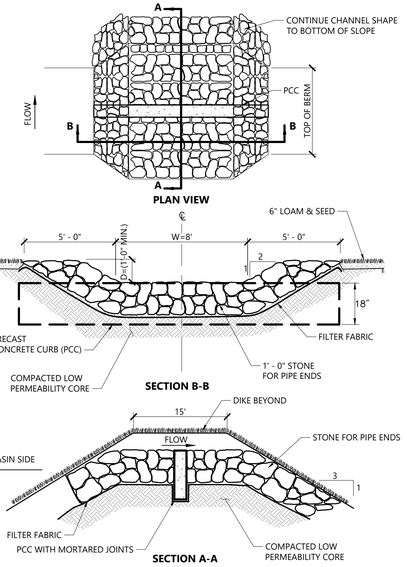
NOTES

1. LOW PERMEABILITY CORE MATERIAL IS CONTINUOUS FOR THE FULL LENGTH OF THE EMBANKMENT.
2. WHERE PIPES PENETRATE THE LOW PERMEABILITY CORE, PIPE SHALL BE BEDDED IN THE LOW PERMEABILITY CORE MATERIAL.
3. THE BERM SECTION IS SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

Detention Basin Berm Section

12/20

N.T.S. Source: VHB REV LD_160

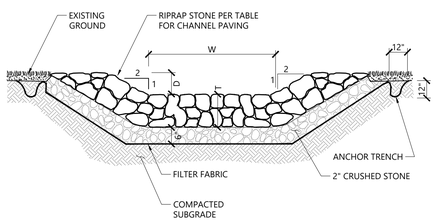


Overflow Stone Swale

1/16

N.T.S. Source: VHB REV LD_161

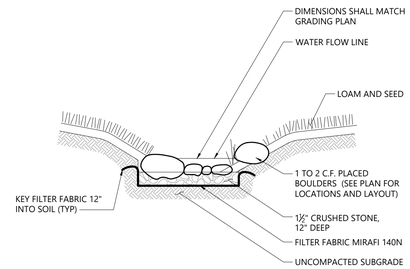
TABLE				
CHANNEL DESIGNATION	W	T	D	STONE DIA. (D_{50})
#1	8'	2'	1'	6"
#2	8'	2'	1'	6"
#3	6'	2'	1'	6"



Riprap Channel

1/16

N.T.S. Source: VHB REV LD_170

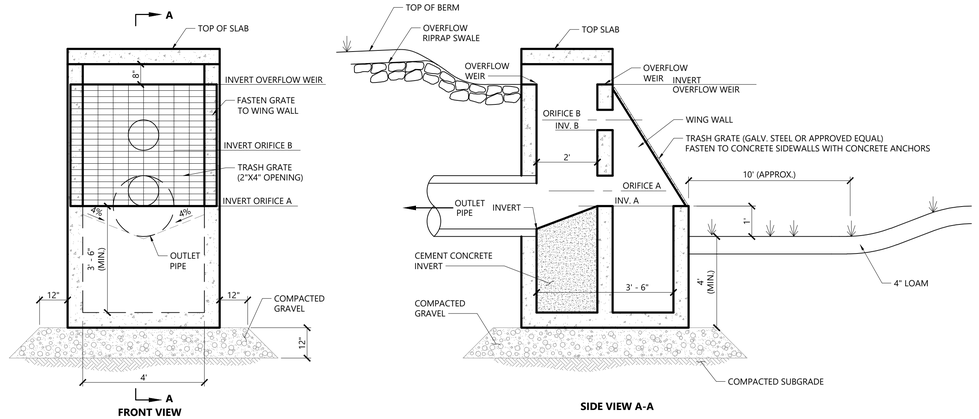


Stone Channel Swale

12/20

N.T.S. Source: VHB REV LD_197

DETENTION BASIN										
INFILTRATION BASIN NO.	DIAMETER ORIFICE A	INVERT ORIFICE A	DIAMETER ORIFICE B	INVERT ORIFICE B	DIAMETER OUTLET PIPE	OUTLET PIPE INVERT	OVERFLOW WEIR ELEV.	OVERFLOW RIPRAP SWALE DIMENSIONS	OVERFLOW SWALE ELEEV.	TOP OF BERM
#1	11"	95.8	11"	97.7	12"	95.5	102.0	W= 8' D= 1'	102.0	103.0



Basin Multi-Stage Outlet Control Structure (OCS)

2/20

N.T.S. Source: VHB REV LD_162B

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Details

JOHN J. FURMAN CIVIL NO. 49010 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

Drawing Number

C7.01

Sheet 11 of 17

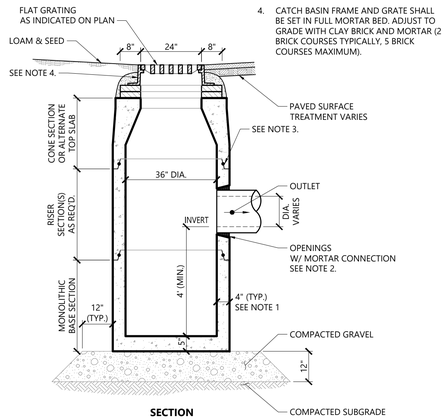
Project Number

43346.00

Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:56:34 AM John Furman

NOTES

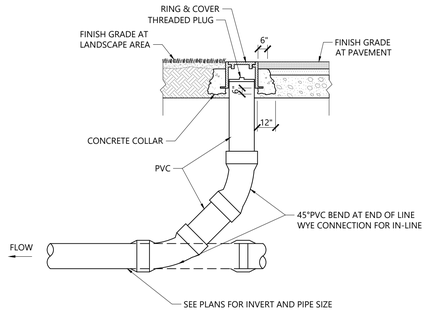
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).



SECTION

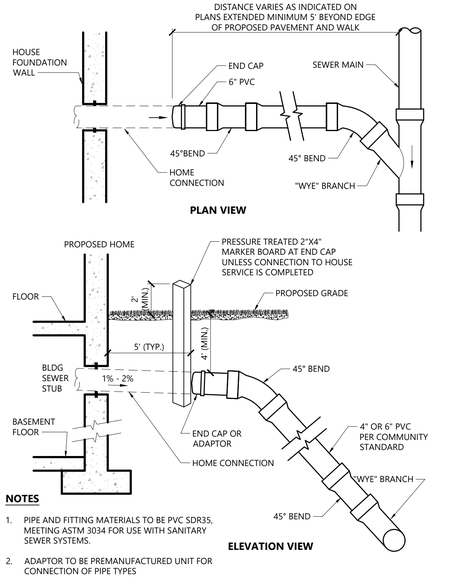
Landscape Drain with Sump (LDS) 1/16

N.T.S. Source: VHB REV LD_109



Cleanout (CO) 12/19

N.T.S. Source: VHB LD_303

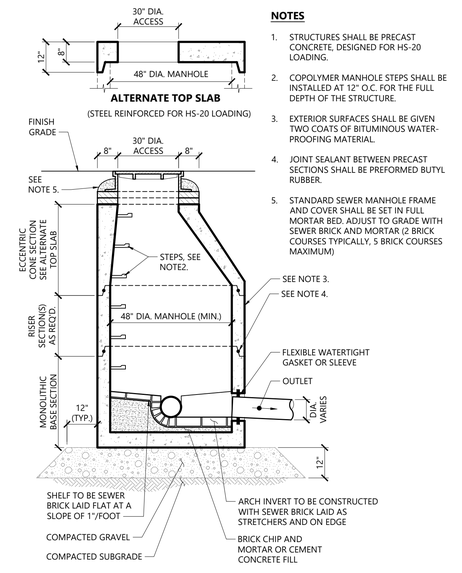


NOTES

1. PIPE AND FITTING MATERIALS TO BE PVC SDR35, MEETING ASTM 3034 FOR USE WITH SANITARY SEWER SYSTEMS.
2. ADAPTOR TO BE PREMANUFACTURED UNIT FOR CONNECTION OF PIPE TYPES

Typical Wye and Chimney Detail (Residential) 1/16

N.T.S. Source: VHB REV LD_222

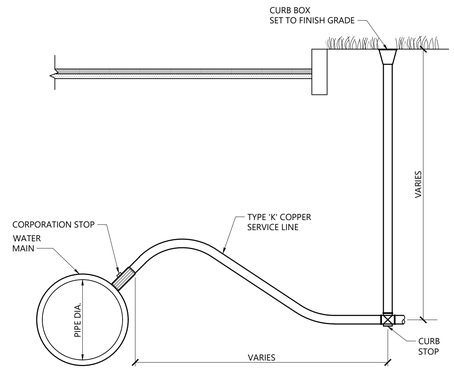


NOTES

1. STRUCTURES SHALL BE PRECAST CONCRETE, DESIGNED FOR HS-20 LOADING.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. STANDARD SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH SEWER BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Sanitary Sewer Manhole (SMH) 1/16

N.T.S. Source: VHB LD_200



NOTES

1. INSTALLATIONS SHALL CONFORM WITH MUNICIPAL WATER WORKS SPECIFICATIONS AND STANDARDS.

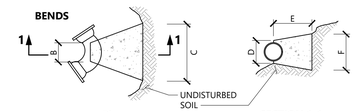
Corporation/Curb Stop with Box 1/16

N.T.S. Source: VHB LD_256

TABLE OF DIMENSIONS

BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 11 ¼°	8"	15"	12"	24"	12"	6" 45°	8"	30"	12"	24"	14"
6" 22 ½°	"	19"	"	"	13"	6" 90°	"	30"	"	"	27"
8" 11 ¼°	"	20"	"	"	12"	8" 45°	"	30"	"	"	24"
8" 22 ½°	"	22"	"	"	17"	8" 90°	"	38"	"	"	36"
12" 11 ¼°	"	30"	"	"	15"	12" 45°	"	40"	"	"	40"
12" 22 ½°	"	35"	"	"	25"	12" 90°	"	60"	"	"	52"

BENDS

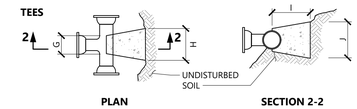


Plan SECTION 1-1

TABLE OF DIMENSIONS

TEES	G	H	I	J	TEES	G	H	I	J
6"X6"X6"	12"	24"	24"	18"	12"X12"X6"	12"	24"	24"	18"
8"X8"X6"	"	"	"	"	12"X12"X8"	"	"	"	24"
8"X8"X8"	"	"	"	24"	12"X12"X12"	"	36"	"	36"

TEES



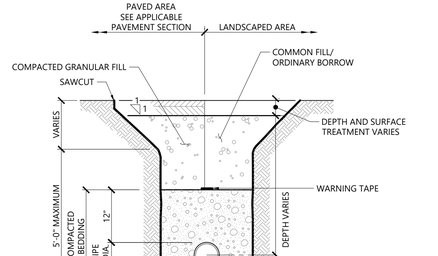
PLAN SECTION 2-2

NOTES

1. PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES, AND VERTICAL BENDS (SAME SIZE AS REQUIRED FOR TEES). PROVIDE ANCHOR RODS AT VERTICAL BENDS AND GATE VALVES.
2. CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.
3. CONCRETE SHALL BE 3,000 PSI-TYPE I.

Concrete Thrust Block 1/16

N.T.S. Source: VHB LD_260

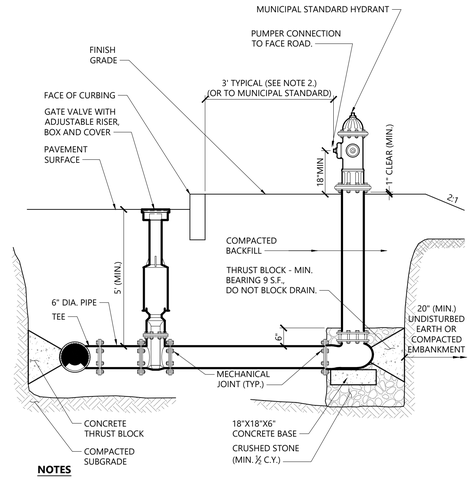


NOTES

1. WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
2. USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.
3. COMPACTED GRANULAR FILL MAY CONSIST OF GRAVEL, CRUSHED STONE, SAND, OR OTHER MATERIAL AS APPROVED BY ENGINEER.

Utility Trench 11/19

N.T.S. Source: VHB LD_300



NOTES

1. CONCRETE THRUST BLOCKS TO BE USED ONLY WHERE THEY CAN BEAR ON UNDISTURBED EARTH AS SHOWN. USE CLAMPS AND TIE RODS OR OTHER ACCEPTABLE METHOD OF JOINT RESTRAINT WHERE SOIL CONDITIONS PROHIBIT THE USE OF THRUST BLOCKS.
2. HYDRANT IN SIDEWALK AREAS TO BE LOCATED TO PROVIDE MINIMUM CLEAR SIDEWALK PASSAGE WIDTH OF 3 FEET AT HYDRANT.
3. A 36-INCH CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT UNLESS OTHERWISE APPROVED BY AUTHORITY HAVING JURISDICTION.

Hydrant Construction 12/19

N.T.S. Source: VHB LD_250

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval February 19, 2026

Not For Construction

Drawing Title

Details



Drawing Number

C7.02

Sheet 12 of 17

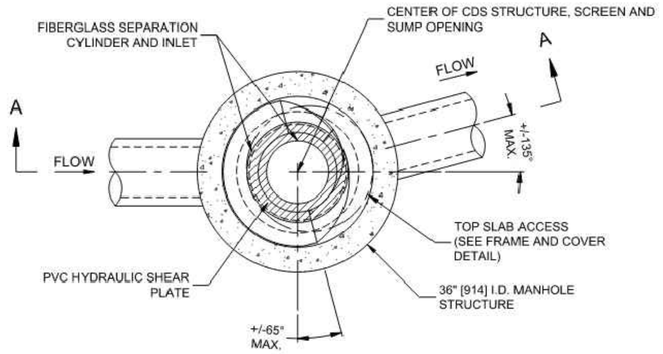
Project Number

43346.00

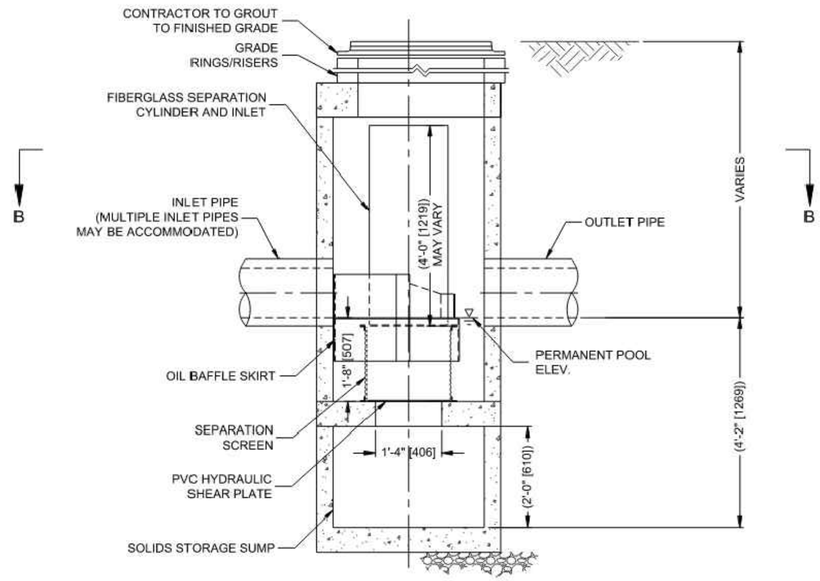
Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:57:19 AM John Furman

\\vhb\gbl\proj\Springfield\43346.00 Longbrook Estate Agawam\cad\ld\Planset\07-4334600-DT.dwg

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



PLAN VIEW B-B
N.T.S.

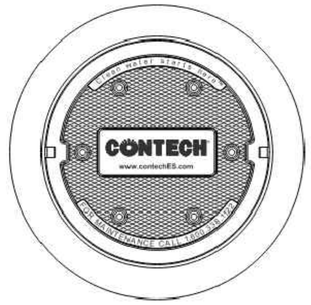


ELEVATION A-A
N.T.S.

CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

WQU

Longbrook Condominiums
1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date
Site Plan Approval | February 19, 2026

Not For Construction

Drawing Title
Details

Drawing Number
C7.03

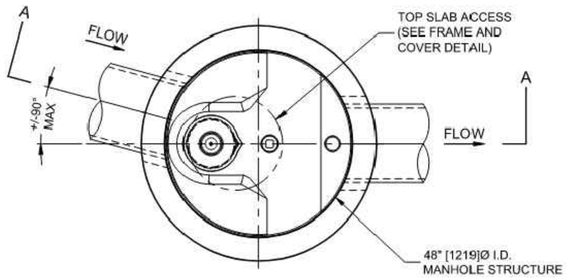
Sheet 13 of 17

Project Number
43346.00

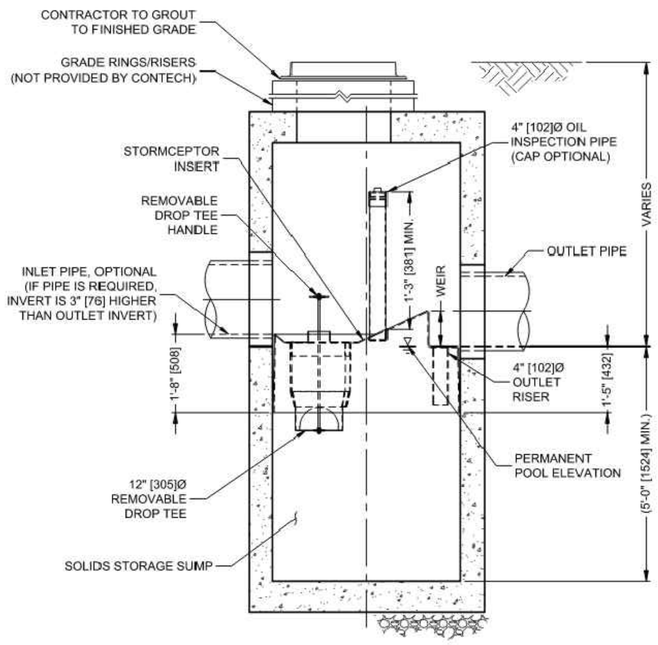
Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:57:52 AM John Furman
\\AD.CONTECH-CPI.COM\ROOT\STORMWATER\JURISDICTIONS\USA\MA_SDE DESIGN TOOLS_STANDARD DETAILS\CDS1515-3-C-DTL.DWG 8/6/2018 4:16 PM

\\vhb\gbl\proj\Springfield\43346.00 Longbrook Estate Agawam\cad\ld\Planset\07-4334600-DT.dwg

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113



PLAN VIEW
TOP SLAB NOT SHOWN



SECTION A-A

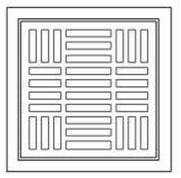
Stormceptor®
FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

STORMCEPTOR DESIGN NOTES

THE STANDARD STC450I CONFIGURATION WITH ROUND, SOLID FRAME AND COVER, AND INLET PIPE IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
STORMCEPTOR STC450I RATED TREATMENT CAPACITY IS 0.40 CFS, OR PER LOCAL REGULATIONS
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER
(MAY VARY)
NOT TO SCALE



FRAME AND GRATE
(MAY VARY)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	
PEAK FLOW RATE (cfs [L/s])	
RETURN PERIOD OF PEAK FLOW (yrs)	
RIM ELEVATION	

PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

NOTES / SPECIAL REQUIREMENTS:

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. STORMCEPTOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STORMCEPTOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. STORMCEPTOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMCEPTOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

STC450i
STORMCEPTOR
STANDARD DETAIL

WQU

I:\STORMWATER\JURISDICTIONS\USA\MA_SDE DESIGN TOOLS_STANDARD DETAILS\STORMCEPTOR\STC450I-DTL.DWG
8/24/2020 9:49 AM

Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:58:23 AM John Furman

Longbrook Condominiums
1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date
Site Plan Approval | February 19, 2026

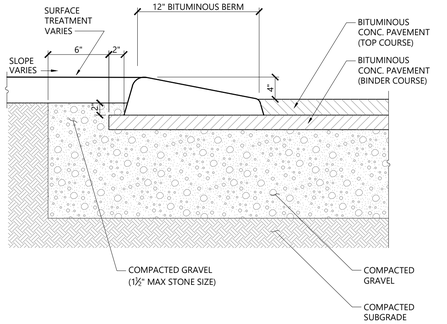
Not For Construction

Drawing Title
Details

Drawing Number
C7.04

Sheet 14 of 17

Project Number
43346.00

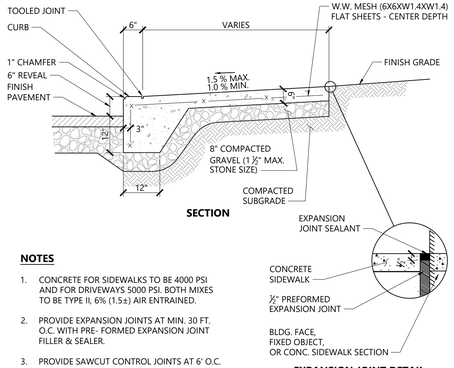


NOTES

ALL CURBING TO BE MACHINE EXTRUDED

Bituminous Berm (BB) 1/16

N.T.S. Source: VHB LD_407



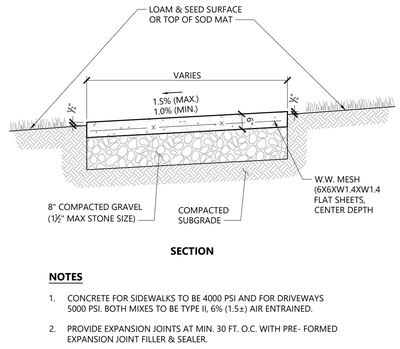
EXPANSION JOINT DETAIL

NOTES

1. CONCRETE FOR SIDEWALKS TO BE 4000 PSI AND FOR DRIVEWAYS 5000 PSI. BOTH MIXES TO BE TYPE II, 6% (1.5±) AIR ENTRAINED.
2. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE- FORMED EXPANSION JOINT FILLER & SEALER.
3. PROVIDE SAWCUT CONTROL JOINTS AT 6' O.C. OR AS NOTED ON PLANS.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
5. ALL EXPOSED CONCRETE SURFACES SHALL BE SEALED WITH A SILANE-SILOXANE PRODUCT.

Monolithic Concrete Curb (MCC) & Sidewalk 3/20

N.T.S. Source: VHB LD_421



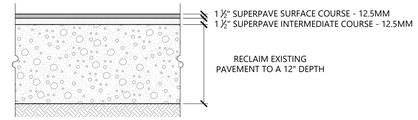
SECTION

NOTES

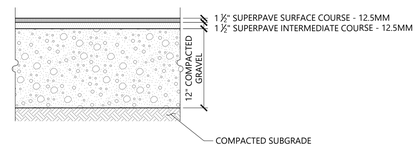
1. CONCRETE FOR SIDEWALKS TO BE 4000 PSI AND FOR DRIVEWAYS 5000 PSI. BOTH MIXES TO BE TYPE II, 6% (1.5±) AIR ENTRAINED.
2. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE- FORMED EXPANSION JOINT FILLER & SEALER.
3. PROVIDE SAWCUT CONTROL JOINTS AT 6' O.C. OR AS NOTED ON PLANS.
4. PROVIDE MEDIUM BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
5. ALL EXPOSED CONCRETE SURFACES SHALL BE SEALED WITH A SILANE-SILOXANE PRODUCT.

Concrete Sidewalk in Landscape Area 3/21

N.T.S. Source: VHB LD_426



PAVEMENT RECLAIM FOR ROADWAY



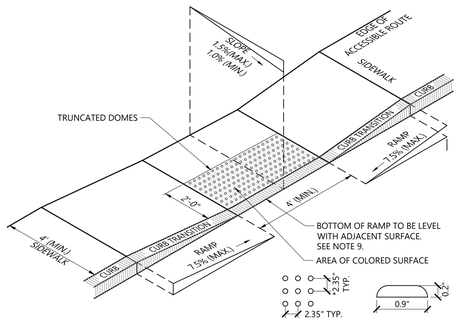
FULL DEPTH PAVEMENT FOR DRIVEWAYS

NOTES

PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

Bituminous Concrete Pavement Sections 6/23

N.T.S. Source: VHB REV LD_430



TRUNCATED DOMES

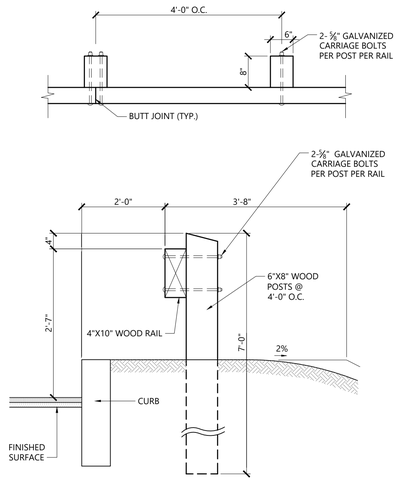
*DIMENSIONS ARE CENTER TO CENTER

NOTES

1. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.).
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
4. A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. RAMP, CURB, AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
8. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
9. ELIMINATE CURBING AT RAMP (OTHER THAN VERTICAL CURBING, WHICH SHALL BE SET FLUSH) WHERE IT ABUTS ROADWAY.
10. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES.
11. DETECTABLE WARNINGS SHALL BE INSTALLED PERPENDICULAR TO ACCESSIBLE ROUTE.

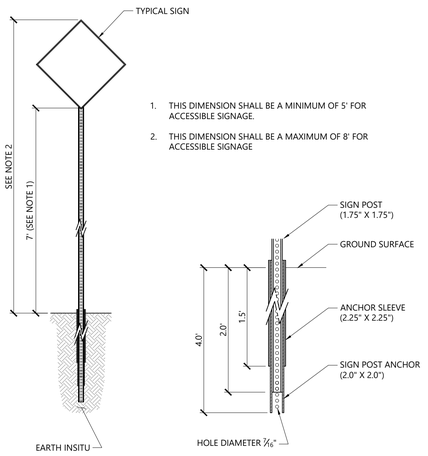
Accessible Curb Ramp (ACR) Type 'A-D' 12/20

N.T.S. Source: VHB LD_500



Wood Guardrail 10/20

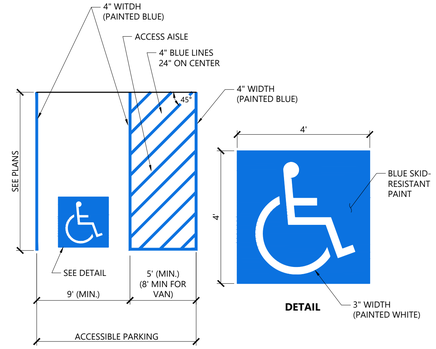
N.T.S. Source: VHB LD_450



1. THIS DIMENSION SHALL BE A MINIMUM OF 5' FOR ACCESSIBLE SIGNAGE.
2. THIS DIMENSION SHALL BE A MAXIMUM OF 8' FOR ACCESSIBLE SIGNAGE

Sign Post - Type 'B' 3/19

N.T.S. Source: VHB LD_702



NOTES

1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL SLOPES THROUGHOUT THE ACCESSIBLE PARKING AND AISLE AREAS SHALL NOT EXCEED 1.5%.

Accessible Parking Space 12/19

N.T.S. Source: VHB REV LD_552B

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval February 19, 2026

Not For Construction

Drawing Title

Details

Drawing Number

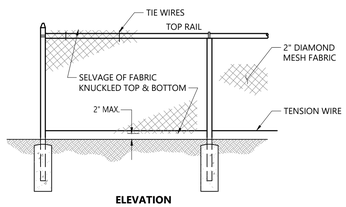
C7.05

Sheet 15 of 17

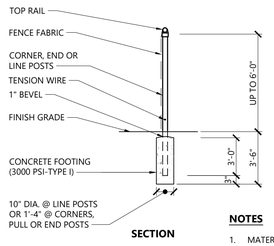
Project Number 43346.00

COMMONWEALTH OF MASSACHUSETTS JOHN J. FURMAN CIVIL NO. 49010 REGISTERED PROFESSIONAL ENGINEER

Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:58:58 AM John Furman



ELEVATION



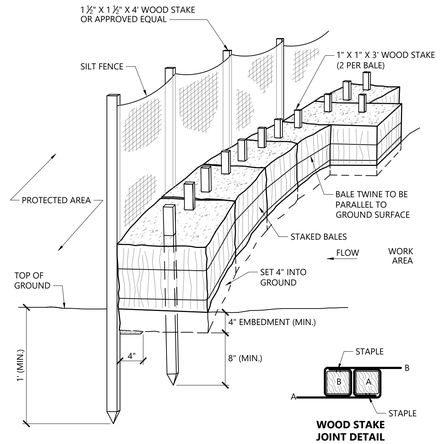
SECTION

NOTES

1. MATERIALS TO BE SUPPLIED AND INSTALLED IN CONFORMANCE WITH "CHAIN LINK MANUFACTURER'S INSTITUTE" PRODUCT MANUAL.

Chain Link Fence up to 6' 10/20

N.T.S. Source: VHB LD_481



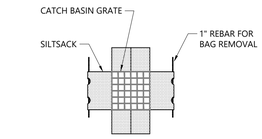
WOOD STAKE JOINT DETAIL

NOTES

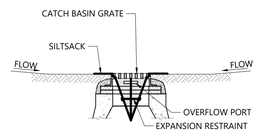
PLACE ONE BALE PERPENDICULAR ALONG BALE BARRIER (100' O.C.).

Silt Fence / Straw Bale Barrier (Embedded) 1/16

N.T.S. Source: VHB LD_656



PLAN VIEW



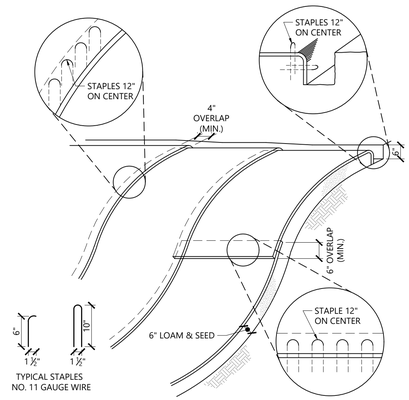
SECTION VIEW

NOTES

1. INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND STRAW BALES HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED

Siltsack Sediment Trap 1/20

N.T.S. Source: VHB LD_674

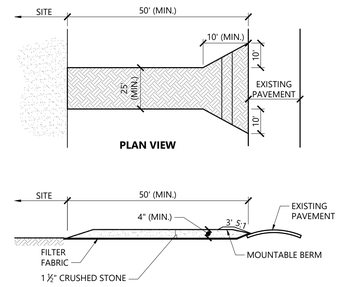


NOTES

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation 10/20

N.T.S. Source: VHB LD_680



PLAN VIEW

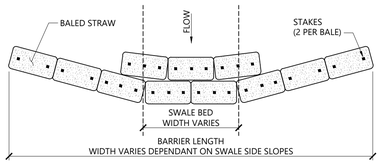
CROSS-SECTION

NOTES

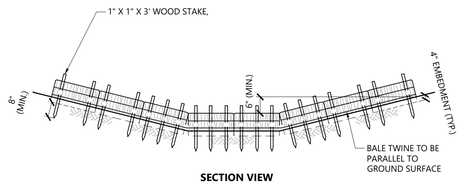
1. EXIT WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit 1/16

N.T.S. Source: VHB LD_682



PLAN VIEW



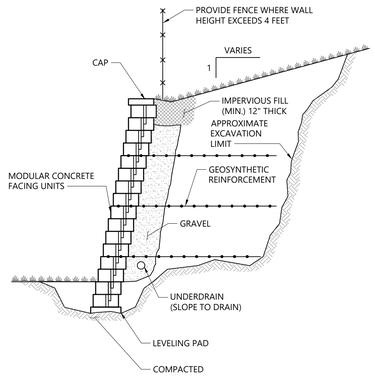
SECTION VIEW

NOTES

1. THIS CHECKDAM SHALL BE INSTALLED IN A DRAINAGE SWALE WITH BED WIDTHS OF 2 FT. OR MORE.
2. THE DISTANCE BETWEEN BALE CHECKDAMS SHALL BE DETERMINED BY THE SLOPE OF THE SWALE. CHECKDAMS SHALL BE SET AT EVERY 2 FT. DROP IN SWALE ELEVATION.
3. BALES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
4. INSTALL 3 STAKES PER BALE WITHIN SWALE BED AREA.

Straw Bale Checkdam (Wide Swale) 1/16

N.T.S. Source: VHB REV LD_670



NOTES

DETAIL PROVIDED FOR GENERAL INFORMATION ONLY. STAMPED FINAL DESIGN OF MODULAR WALL SYSTEM TO BE PROVIDED BY CONTRACTOR BASED ON GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

Modular Retaining Wall 10/20

N.T.S. Source: VHB LD_750

vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Details



Drawing Number

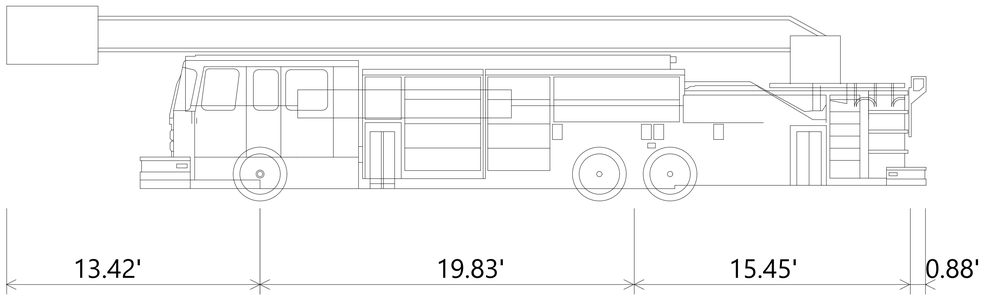
C7.06

Sheet 16 of 17

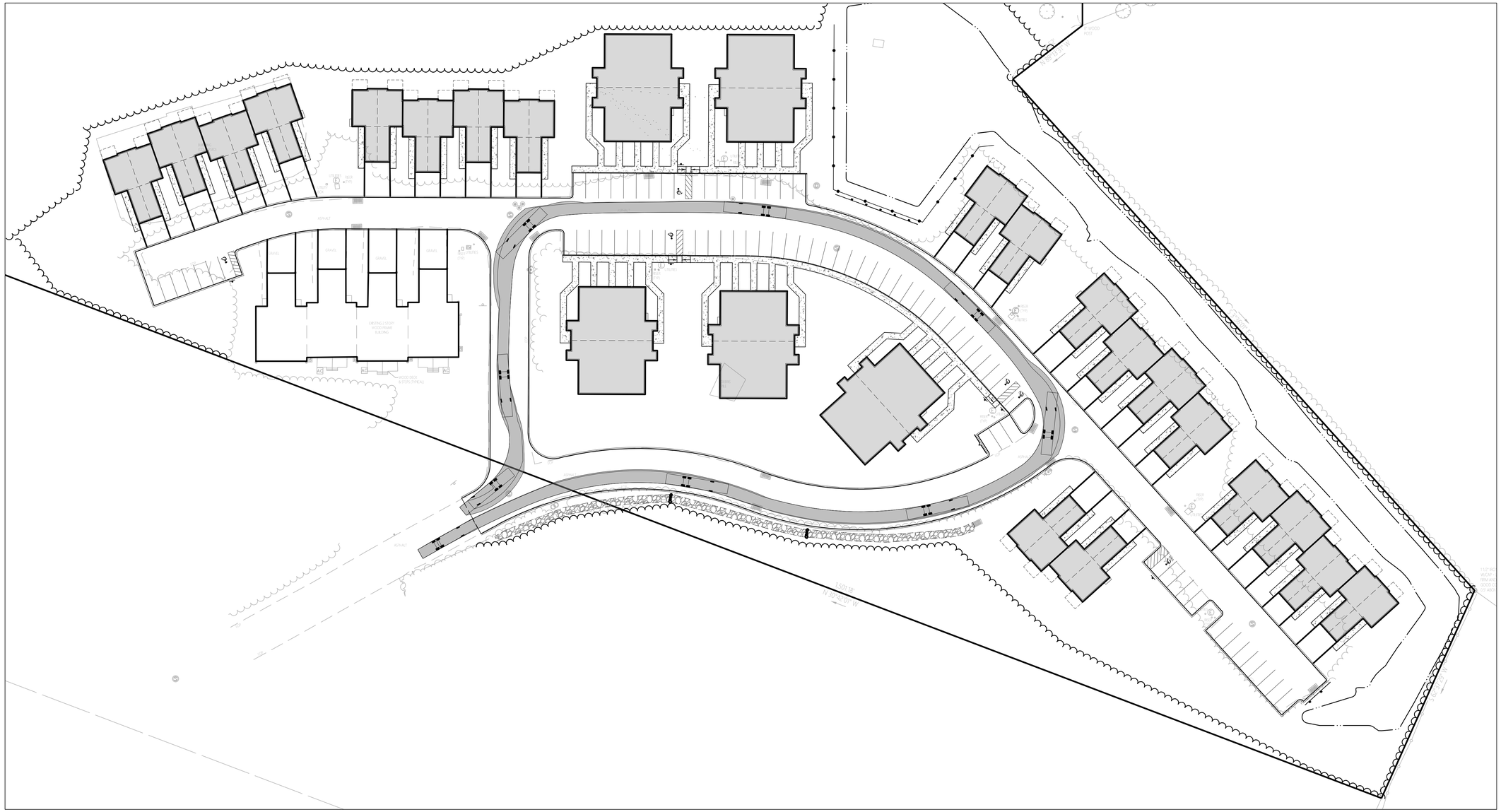
Project Number

43346.00

Saved Thursday, February 19, 2026 4:10:55 PM JFURMAN Plotted Thursday, July 9, 2026 10:59:32 AM John Furman



Agawam Fire Truck	
Overall Length	49.54 ft
Overall Width	8.33 ft
Overall Body Height	7.75 ft
Min Body Ground Clearance	0.66 ft
Track Width	8.29 ft
Lock-to-lock time	5.0 s
Curb to Curb Turning Radius	36.8 ft



vhb.com
vhb
One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

0 20 40 80 Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Fire Truck Route Plan

JOHN J. FURMAN
CIVIL
NO. 41010
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS

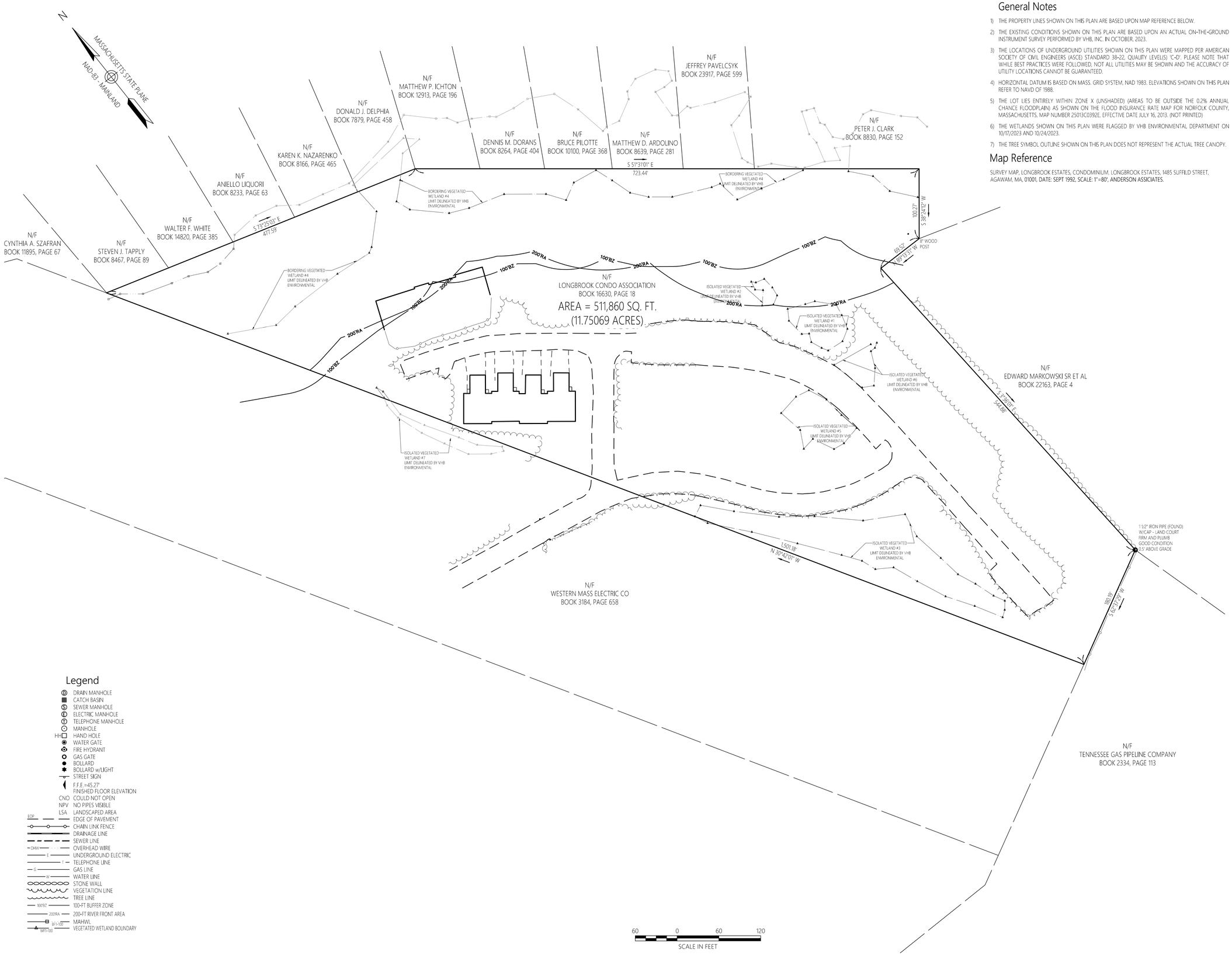
Drawing Number

C8.01

Sheet 17 of 17

Project Number
43346.00

Saved Tuesday, July 7, 2026 4:04:35 PM JFURMAN Plotted Thursday, July 9, 2026 11:01:17 AM John Furman



General Notes

1) THE PROPERTY LINES SHOWN ON THIS PLAN ARE BASED UPON MAP REFERENCE BELOW.
2) THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY VHB, INC. IN OCTOBER, 2023.
3) THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THIS PLAN WERE MAPPED PER AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD 38-22, QUALITY LEVEL(S) 'C-D'. PLEASE NOTE THAT WHILE BEST PRACTICES WERE FOLLOWED, NOT ALL UTILITIES MAY BE SHOWN AND THE ACCURACY OF UTILITY LOCATIONS CANNOT BE GUARANTEED.
4) HORIZONTAL DATUM IS BASED ON MASS. GRID SYSTEM, NAD 1983. ELEVATIONS SHOWN ON THIS PLAN REFER TO NAVD OF 1988.
5) THE LOT LIES ENTIRELY WITHIN ZONE X (UNSHADED) (AREAS TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR NORFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25013C0392E, EFFECTIVE DATE JULY 16, 2013. (NOT PRINTED)
6) THE WETLANDS SHOWN ON THIS PLAN WERE FLAGGED BY VHB ENVIRONMENTAL DEPARTMENT ON 10/17/2023 AND 10/24/2023.
7) THE TREE SYMBOL OUTLINE SHOWN ON THIS PLAN DOES NOT REPRESENT THE ACTUAL TREE CANOPY.

Map Reference

SURVEY MAP, LONGBROOK ESTATES, CONDOMINIUM, LONGBROOK ESTATES, 1485 SUFFIELD STREET, AGAWAM, MA, 01001, DATE: SEPT 1992, SCALE: 1"=80', ANDERSON ASSICIATES.

Legend

- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- MANHOLE
- HH HAND HOLE
- WATER GATE
- FIRE HYDRANT
- GAS GATE
- BOLLARD
- BOLLARD w/LIGHT
- STREET SIGN
- F.F.E.=45.27' FINISHED FLOOR ELEVATION
- CNO COULD NOT OPEN
- NPV NO PIPES VISIBLE
- LSA LANDSCAPED AREA
- EOP EDGE OF PAVEMENT
- CHAIN LINK FENCE
- DRAINAGE LINE
- SEWER LINE
- OHW OVERHEAD WIRE
- E UNDERGROUND ELECTRIC
- T TELEPHONE LINE
- G GAS LINE
- W WATER LINE
- STONE WALL
- VEGETATION LINE
- TREE LINE
- 100'BZ 100-FT BUFFER ZONE
- 200'RA 200-FT RIVER FRONT AREA
- BF1=100 MAHWL
- WF1=100 VEGETATED WETLAND BOUNDARY

vhb.com
vhb
100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300



Locus Map
(NOT TO SCALE)

Longbrook Condominium

Essex Drive
Agawam, Massachusetts

No.	Revision	Date	Appvd.
1	Update Wetland 7, line colors	11-11-2024	

Designed by | Checked by

Issued for | Date

October 25, 2023

Drawing Title
Existing Conditions Plan of Land

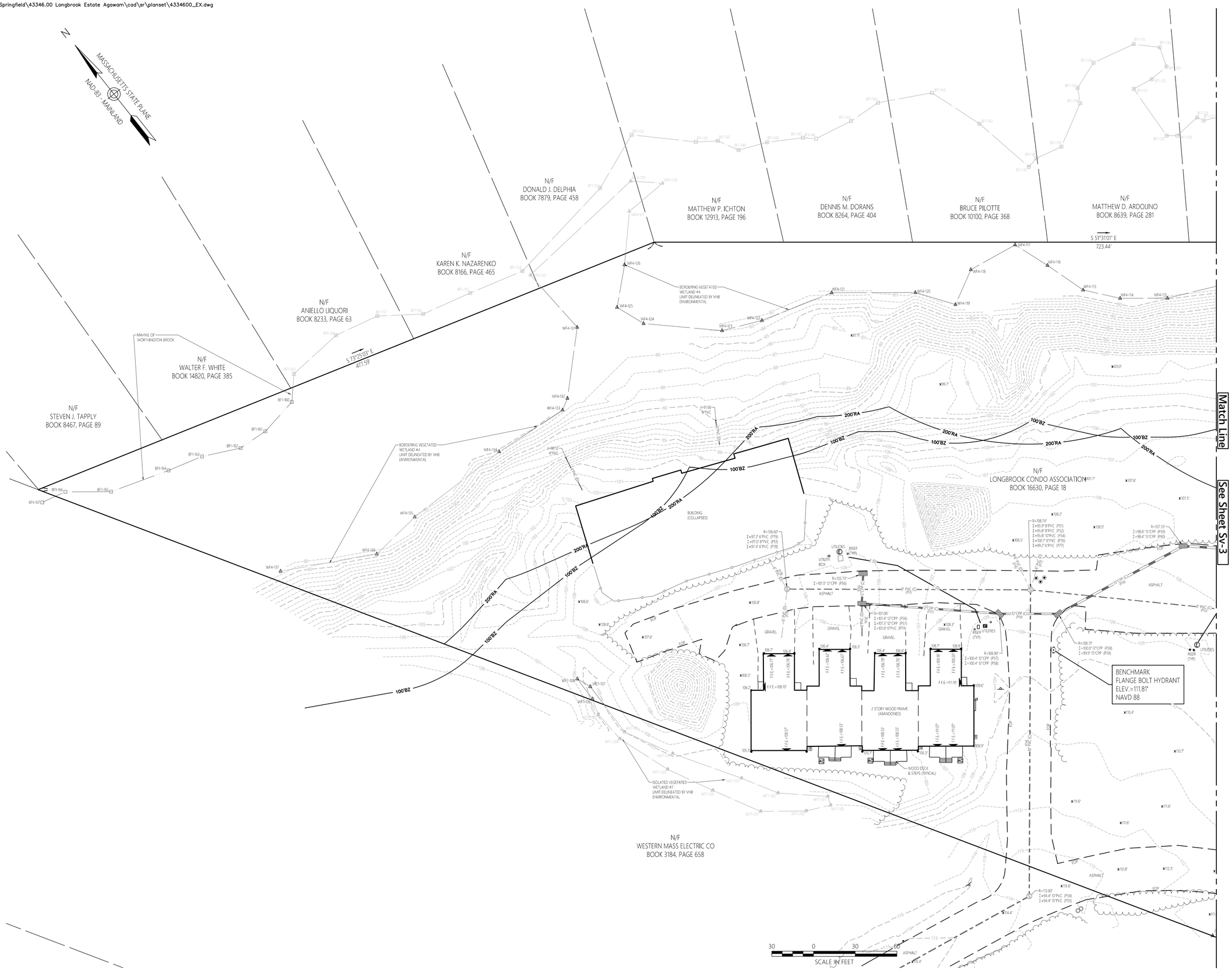
Drawing Number
Sv-1

Sheet 1 of 3

Project Number
43346.00

Commonwealth of Massachusetts Christopher North 49477 Registered Professional Land Surveyor

Saved: Friday, November 15, 2024 12:07:24 PM JFURMAN Plotted: Friday, November 15, 2024 12:09:25 PM John Furman



vhb.com

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300

Legend

- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- MANHOLE
- HH HAND HOLE
- WATER GATE
- FIRE HYDRANT
- GAS GATE
- BOLLARD
- BOLLARD w/LIGHT
- STREET SIGN
- F.F.E.=45.27' FINISHED FLOOR ELEVATION
- CNO COULD NOT OPEN
- NPV NO PIPES VISIBLE
- LSA LANDSCAPED AREA
- EOP EDGE OF PAVEMENT
- CHAIN LINK FENCE
- DRAINAGE LINE
- SEWER LINE
- OHW OVERHEAD WIRE
- UNDERGROUND ELECTRIC
- T TELEPHONE LINE
- G GAS LINE
- W WATER LINE
- STONE WALL
- VEGETATION LINE
- TREE LINE
- 100'BZ 100-FT BUFFER ZONE
- 200'RA 200-FT RIVER FRONT AREA
- BF1=101 MAHWL
- WF1=100 VEGETATED WETLAND BOUNDARY

Longbrook Condominium

Essex Drive
Agawam, Massachusetts

No.	Revision	Date	Appvd.
1	Update Wetland 7, line colors	11-11-2024	

Designed by | Checked by

Issued for | Date

October 25, 2023

Drawing Title

Existing Conditions Plan of Land

Drawing Number

Sv-2

Sheet 2 of 3

Project Number

43346.00

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER J. POST
PROFESSIONAL LAND SURVEYOR

\\vhb.com\gbl\proj\Springfield\43346.00 Longbrook Estate Agawam\cad\sr\planset\4334600_EX.dwg

vhb.com
vhb
100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300

N

MASSACHUSETTS STATE PLANE
NAD-83 - MAINLAND

N/F
JEFFREY PAVELCSYK
BOOK 23917, PAGE 599

N/F
PETER J. CLARK
BOOK 8830, PAGE 152

N/F
EDWARD MARKOWSKI SR ET AL
BOOK 22163, PAGE 4

N/F
WESTERN MASS ELECTRIC CO
BOOK 3184, PAGE 658

Match Line — See Sheet Sv-2

Match Line — See Above

See Sheet Sv-2

BENCHMARK
FLANGE BOLT HYDRANT
ELEV.=109.82'
NAVD 88

BENCHMARK
FLANGE BOLT HYDRANT
ELEV.=109.82'
NAVD 88

BORDERING VEGETATED WETLAND #4
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

ISOLATED VEGETATED WETLAND #1
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

ISOLATED VEGETATED WETLAND #2
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

ISOLATED VEGETATED WETLAND #3
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

ISOLATED VEGETATED WETLAND #5
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

ISOLATED VEGETATED WETLAND #6
LIMIT DELINEATED BY VHB
ENVIRONMENTAL

DRAINAGE MANHOLE
EXISTING CATCH BASIN
IN DISREPAIR

100'BZ
200'RA

DEBRIS PILE

ASPHALT

UTILITIES
RISER (TYP)

8" WOOD POST

N 69°45'31" W 69.52'

S 38°24'42" W 100.27'

N 30°42'01" W 1,501.18'

S 37°30'10" E 544.88'

SCALE IN FEET
30 0 30 60

Legend

- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- MANHOLE
- HH — HAND HOLE
- WATER GATE
- FIRE HYDRANT
- GAS GATE
- BOLLARD
- BOLLARD w/LIGHT
- STREET SIGN
- F.F.E.=45.27' FINISHED FLOOR ELEVATION
- CNO — COULD NOT OPEN
- NPV — NO PIPES VISIBLE
- LSA — LANDSCAPED AREA
- EOP — EDGE OF PAVEMENT
- CHAIN LINK FENCE
- DRAINAGE LINE
- SEWER LINE
- OHW — OVERHEAD WIRE
- E — UNDERGROUND ELECTRIC
- T — TELEPHONE LINE
- G — GAS LINE
- W — WATER LINE
- STONE WALL
- VEGETATION LINE
- TREE LINE
- 100'BZ — 100-FT BUFFER ZONE
- 200'RA — 200-FT RIVER FRONT AREA
- MAHWL
- BF=100 — WF1=100 — VEGETATED WETLAND BOUNDARY

Longbrook Condominium

Essex Drive
Agawam, Massachusetts

No.	Revision	Date	Appvd.
1	Update Wetland 7, line colors	11-11-2024	

Designed by — Checked by

Issued for — Date

October 25, 2023

Drawing Title

Existing Conditions Plan of Land

Drawing Number

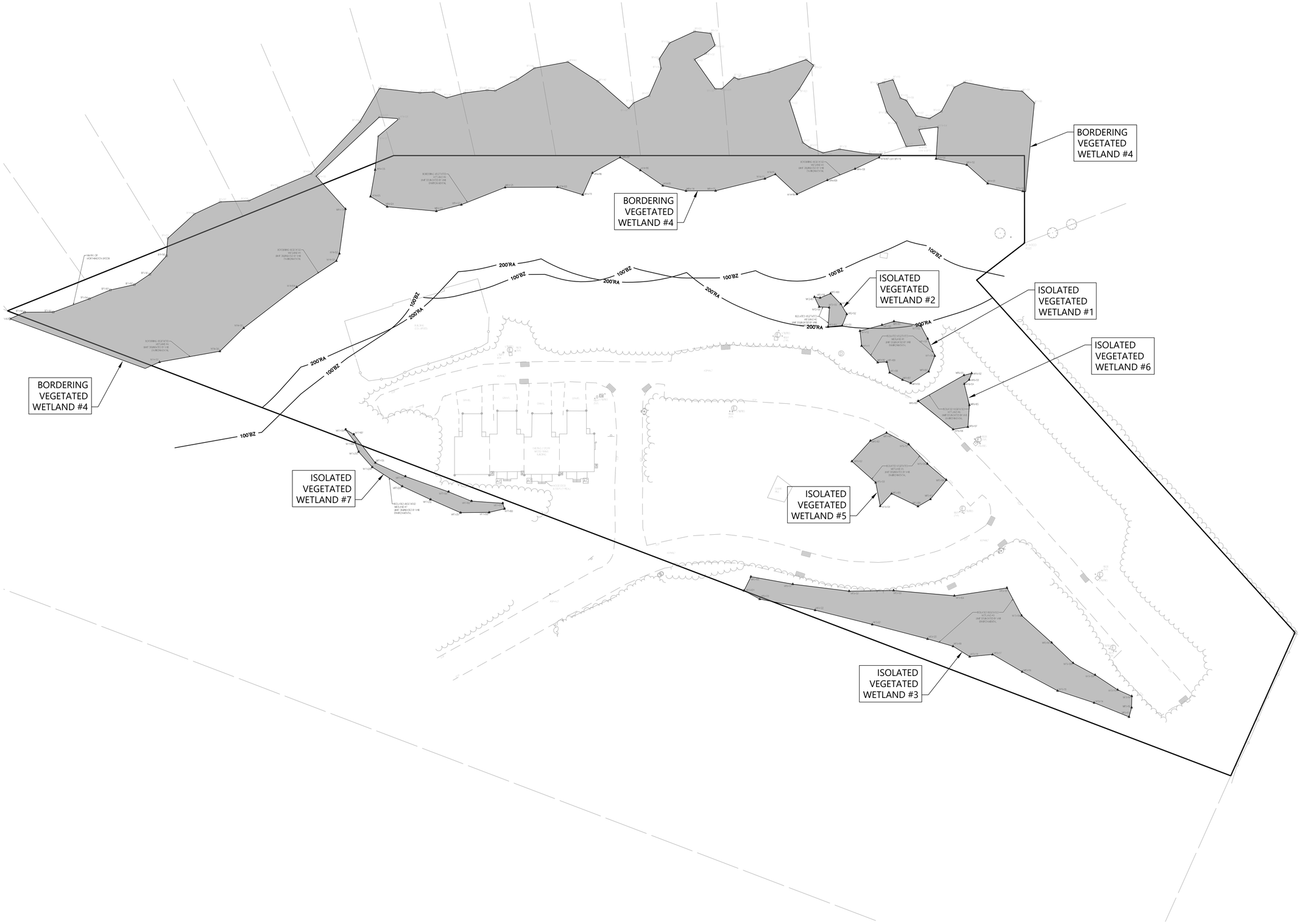
Sv-3

Sheet 3 of 3

Project Number
43346.00

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER J. CURTIS
No. 49911
REGISTERED PROFESSIONAL LAND SURVEYOR

Saved Friday, November 15, 2024 12:07:24 PM JFURMAN Plotted Friday, November 15, 2024 12:11:34 PM John Furman



vhb.com

vhb

One Federal Street
Building 103-3N
Springfield, MA 01105
413.747.7113

0 25 50 100Feet

Longbrook Condominiums

1485 Suffield Street
Agawam, MA

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

Site Plan Approval — February 19, 2026

Not For Construction

Drawing Title

Wetland Plan (Existing)

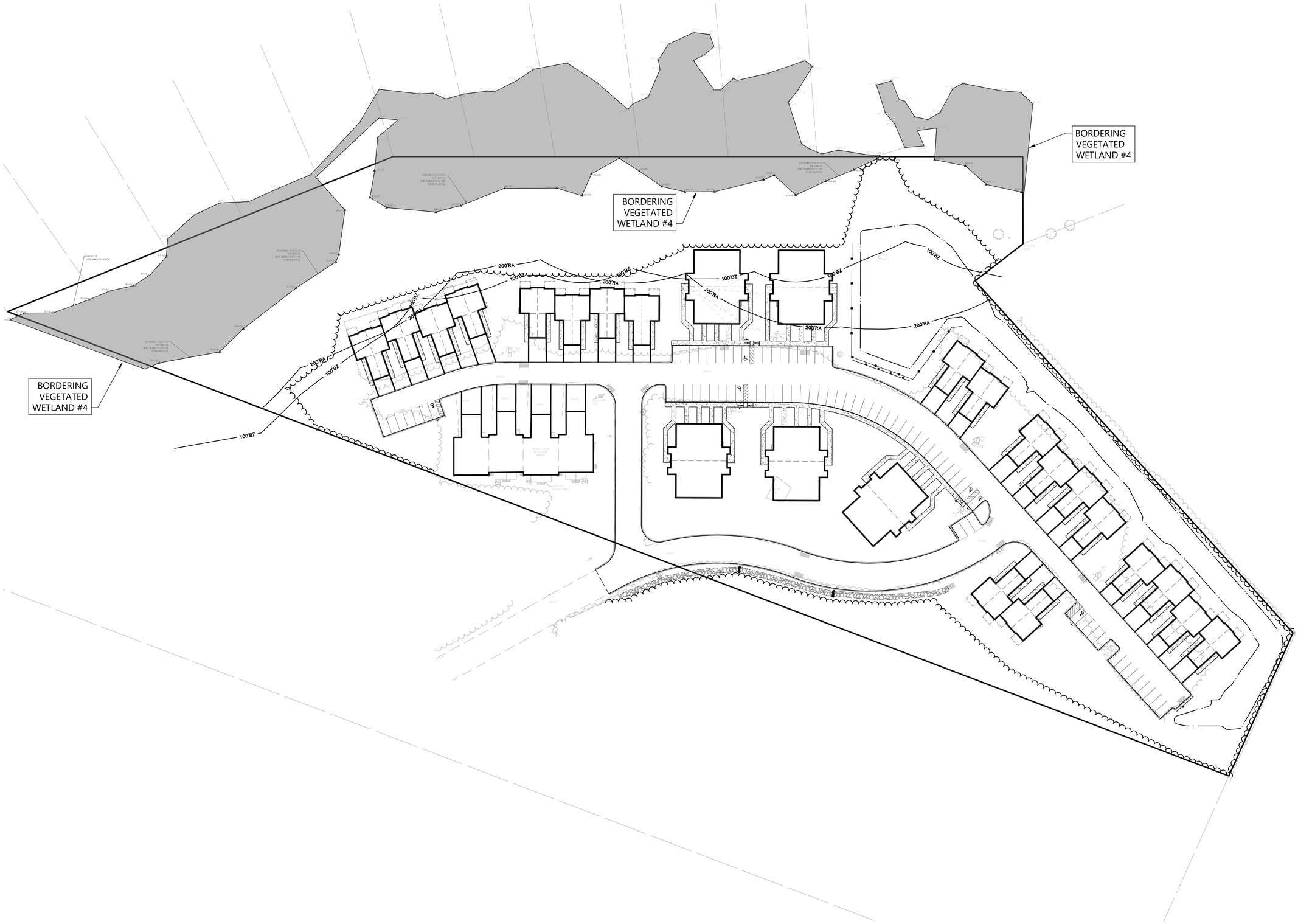
Drawing Number

WT-1

Sheet 1 of 2

Project Number
43346.00

Saved Thursday, February 19, 2026 4:19:58 PM JGALARNEAU Plotted Thursday, February 19, 2026 4:32:22 PM Jeffrey Galarneau


BORDERING VEGETATED WETLAND #4
BORDERING VEGETATED WETLAND #4
BORDERING VEGETATED WETLAND #4
200'RA
100'BZ
100'BZ
200'RA
100'BZ
200'RA
100'BZ
200'RA
100'BZ
200'RA
100'BZ
200'RA
100'BZ
100'BZ
200'RA
100'BZ
100'BZ
200'RA
100'BZ

SITE DATA

TOTAL AREA OF PARCEL :	40.73 ACRES
ZONE : RESIDENCE A-3 :	
ACERAGE :	38.14 ACRES
TOTAL NUMBER OF UNITS :	305
UNITS PER ACRE :	7.99
ZONE : AGRICULTURAL :	
ACERAGE :	2.59 ACRES
EXTERIOR PARKING SPACES :	405
GARAGE PARKING SPACES :	241
TOTAL PARKING SPACES :	646
PARKING SPACES PER UNIT :	2.12

NOTE: All Primary Roadways "LANES" Are 30' Wide, "PLACES" And Roadways within Parking Areas are 24' Wide.

TYPICAL CURB RADII:

Suffield St. – LANE : 35' R

LANE – LANE : 25' R

LANE – PLACE : 10' R

PLACE – Driveway : 6' R

Note: Supplemental alignment information has been submitted under separate cover

Note : See Sheet 6 for additional information concerning site detailing at building.

NO.	DATE	REVISION	BY
2	3/87	WMECO REVISIONS	JLW
1	12/8/86	Planning Board Revisions	KS

SHEET TITLE: SITE LAYOUT PLAN #1485 Suffield St.

PROJECT: SUFFIELD COMMONS
Suffield St. Agawam, Massachusetts

PROJECT NO. 86-048
SCALE 1"=80'
DATE 10/31/86
DRAWN BY ks/jlw/sp
CHECKED BY ks/jw

BAYSTATE ENVIRONMENTAL CONSULTANTS, INC.
Engineers Planners Scientists
296 North Main Street East Longmeadow, MA 01028

DRAWING NO. 2 OF 10 SHTS

COMMONWEALTH OF MASSACHUSETTS JAMES E. WALSH 20955 REGISTERED PROFESSIONAL ENGINEER

James E. Walsh

Longbrook Condominiums

1485 Suffield Street, Agawam, MA

PREPARED FOR

Longbrook Condominium Association
476 College Highway
Southwick, MA 01077
413.569.5557

PREPARED BY

1 Federal Street
Building 103-3B
Springfield, MA 01105
413.747.7113

January 2026

John J. Furman PE 2026.07.09 13:50:33 -04'00'



Table of Contents

Checklist for Stormwater Report **3**

Stormwater Report Narrative **4**

Project Description 4
Site Description 5
Existing Drainage Conditions 5
Proposed Drainage Conditions 6
Environmentally Sensitive and Low Impact Development (LID) Techniques 6

Regulatory Compliance **12**

Massachusetts Department of Environmental Protection (DEP) – Stormwater Management Standards 12
Standard 1: No New Untreated Discharges or Erosion to Wetlands 12
Standard 2: Peak Rate Attenuation 12
Standard 3: Stormwater Recharge 13
Standard 4: Water Quality 13
Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs) 13
Standard 6: Critical Areas 14
Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable 14
Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls 14
Standard 9: Operation and Maintenance Plan 14
Standard 10: Prohibition of Illicit Discharges 14

Appendices

Appendix A: Standard 1 Computations and Supporting Information A-1
Appendix B: Standard 2 Computations and Supporting Information B-1
Appendix C: Standard 3 Computations and Supporting Documentation C-1
Appendix D: Standard 4 Computations and Supporting Information D-1
Appendix E: Standard 7 Supporting Information E-1
Appendix F: Standard 8 Supporting Information F-1

List of Tables

Table No.	Description	Page
Table 1	Existing Wetland Resource/Regulatory Areas	5
Table 2	Existing Conditions Hydrologic Data	6
Table 3	Proposed Conditions Hydrologic Data	6
Table 4	Peak Discharge Rates*	13

List of Figures

Figure No.	Description
Figure 1	Site Location Map
Figure 2	Pre-Existing Conditions Drainage Areas
Figure 3	Proposed Conditions Drainage Areas
Figure 4	Original Grading and Drainage Plan
Figure 5	FEMA Map

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



July 9, 2026

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): Aboveground infiltration basin and disconnection of roof water

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.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00).

Project Description

The history of the project is discussed below.

1) **Pre-Existing Conditions**: Pre-existing conditions prior to the original development consisted entirely of woods. The grades slope from southwest to northeast towards the large wetland area with a grade change of approximately 30-35 feet. We only have record plans from 1986 for the grades on Site.

2) **Original Design**: Proposed conditions as designed in 1986. The project consisted of a newly paved roadway with parking areas. It also consisted of several condominium buildings throughout the Site. The project began construction and was built in phases over several years. The road was built but only up to the binder course. One of the buildings was fully constructed and then only the foundation of another was built. All utilities were constructed under the roadway and left with stubs for future building connections. The infiltration basin was also constructed at the rear of the Site. During a period around 2008, the infiltration basin had failed, and the embankment and outlet control structure were washed down the slope towards the existing wetlands. Once the basin failed, the construction was halted and the Site has remained in the same condition since. Without having the original drainage report analysis showing the breakdown of what areas went to where, what overall areas and impervious areas went to the infiltration basin, the size of the basin, the top elevation of the basin, and how the outlet control structure was designed, we cannot recreate the conditions to accurately analyze the original design; therefore, it is unclear how the basin failed. It is assumed that the existing basin may not have had an impermeable core along the berm which allowed water to infiltrate through the berm.

3) **New Design**: Proposed conditions currently being designed. The intent of this project is to reclaim the existing roadway and parking areas, install new pavement in the same location as the existing road, install the remaining units from the previously approved development, make all utility connections to the building units, and redesign/reconstruct the existing infiltration basin that had failed under the previous development.

The analysis in this report compares the Pre-Existing Conditions and the New Design to provide calculations and documentation for the new infiltration basin.

Site Description

The Project Site is a 11.7-acre parcel of land (the Site) located at 1485 Suffield Street in Agawam, Massachusetts (see Figure 1). The Site lies within the surface watershed of Worthington Brook and the Connecticut River, and is bounded by woods to the north, woods and electrical transmission lines to the south, woods and farmland to the east, and woods and the remainder of the condominium development to the west. See Figure 1, Site Location Map.

Wetland Resource Areas on the Site include the following:

Table 1 Existing Wetland Resource/Regulatory Areas

Name	Critical Area (yes/no)	Zone 1 or Zone A (yes/no)	ORW or SRW (yes/no)	Zone II or IWPA (yes/no)	Other
Wetland 4	no	no	no	no	

The areas at wetlands 1, 2, 3, 5, 6 and 7 shown on the survey were designed to be building areas for the original development. Once that construction was halted, these areas were left as low points which eventually collected water. Under this proposed design, wetland areas 1, 2, 3, 5 and 6 will be graded out and the building units will be constructed as originally intended. Under the original design, the grading to the northwest of Wetland area 7 was designed to drain that area low area towards Wetland 4 once the building was constructed; however, once construction was halted, that area remained a low point. Under this proposed design, that area will be graded as originally intended to allow that area to drain towards Wetland 4. Wetland 4 is the originally occurring wetland located at the rear of the Site and will not be impacted.

See the soils map in Appendix C, Figure 2 and Figure 3 for the Natural Resources Conservation Service (NRCS) soil map and descriptions. On-site soils are classified as Hydrologic Soil Groups (HSG) A, B, C, and D. Based on the Geotechnical soil evaluations included in Appendix C, the original report had varying hydraulic conductivity rates at the upper elevations between 2.5 and 4.5 feet. These rates were between <0.01 to 32 feet per day. In the second report, a test pit was conducted within the proposed infiltration basin area at a depth of 9 feet and had a result of 15 feet per day (7.5 in/hr). Half of the rate (3.75 in/hr) was used in the report to adhere to the MA DEP Stormwater Regulations. The site is considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour).

The Project is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL).

Existing Drainage Conditions

Figure 2 illustrates the existing drainage patterns on the Site. Currently, the Site is divided into 2 drainage areas as stormwater runoff flows to 2 Design Points. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2 Existing Conditions Hydrologic Data

Drainage Area	Discharge Location	Design Point	Area (sf)	Curve Number	Time of Concentration (min)
20	Off-Site Northwest	x2000	355,202	67	40.2
30	Off-Site Northeast	x3000	361,061	50	28.9

Proposed Drainage Conditions

Figure 3 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into 6 drainage areas that discharge treated stormwater to the 2 existing Design Points. Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3 Proposed Conditions Hydrologic Data

Drainage Area	Discharge Location	Design Point	Area (sf)	Curve Number	Time of Concentration (min)
200	Off-Site Northwest	x2000	259,497	73	50.3
300	Off-Site Northeast	x3000	144,557	91	6
310	Off-Site Northeast	x3000	54,317	62	9.9
320	Off-Site Northeast	x3000	109,281	32	23.5
330	Off-Site Northeast	x3000	131,604	61	11.9
340	Off-Site Northeast	x3000	17,007	63	9.1

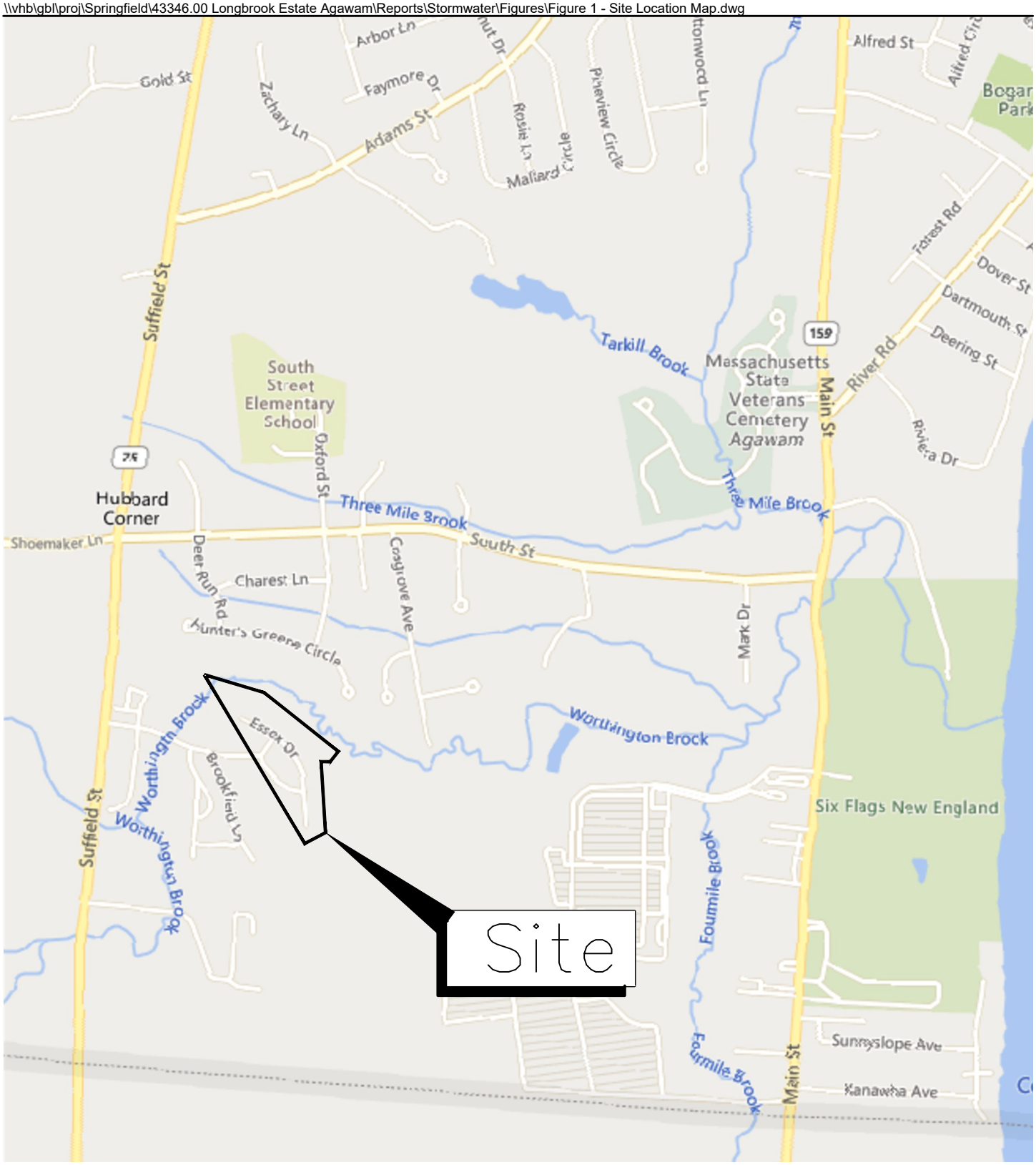
The site design integrates a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. Because the Project is located within an area of rapid infiltration, the proposed stormwater management system has been designed to treat the one-inch Water Quality Volume and provide 44% Total Suspended Solids (TSS) pretreatment prior to infiltration.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include an above ground infiltration basin and disconnection of roof water which allows roof water to drain to grade and infiltrate. In general, stormwater from the proposed impervious surfaces is allowed to enter the already constructed drainage system on Site. Some new deep-sump catch basins with oil debris traps need to be installed on Site. Water Quality units were installed on the existing drainage system prior to stormwater entering the infiltration basin.

Figure 1 Site Location Map

\\vhb\gbl\proj\Springfield\43346.00 Longbrook Estate Agawam\Reports\Stormwater\Figures\Figure 1 - Site Location Map.dwg



Vanasse Hangen Brustlin, Inc.

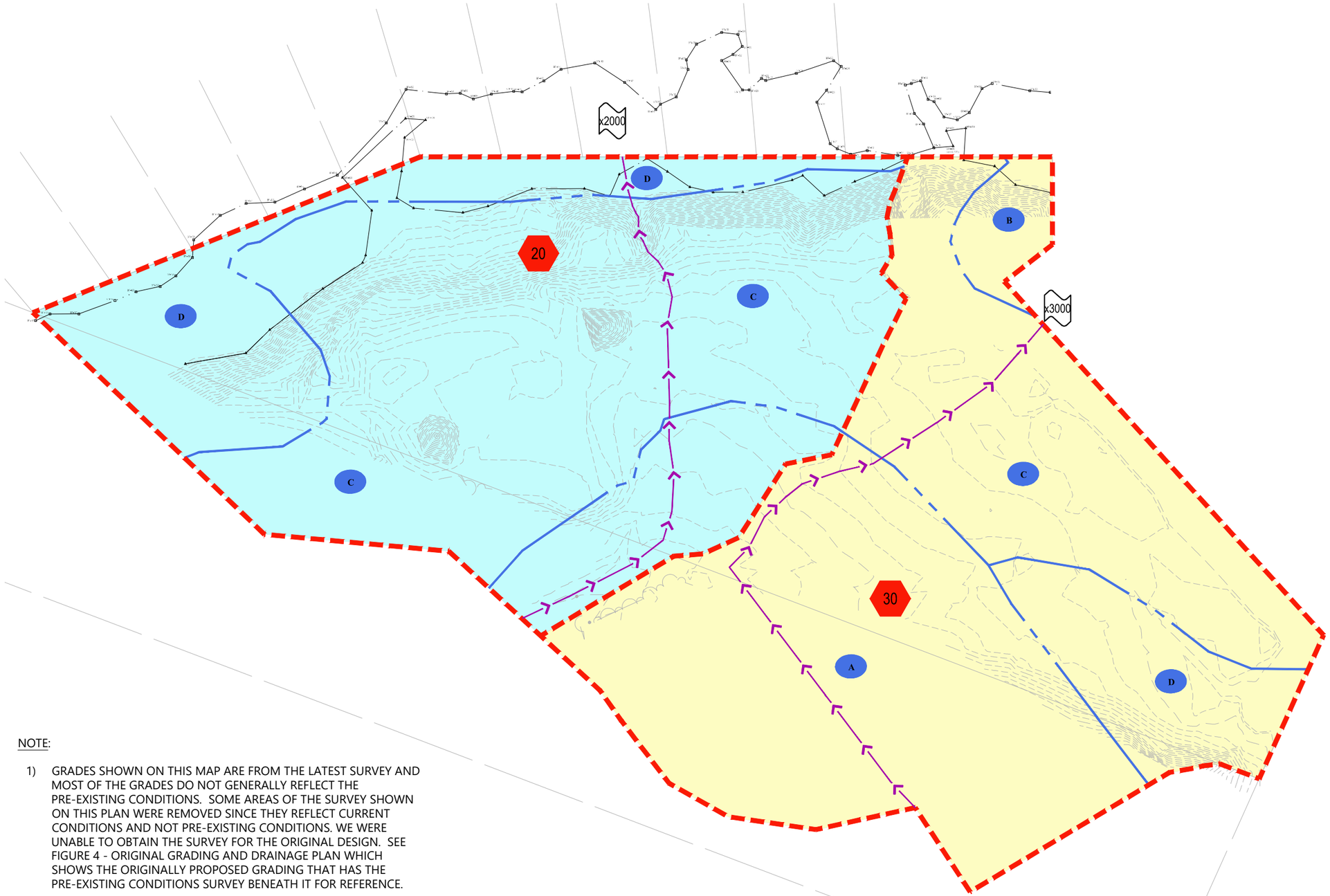
Longbrook Condominiums

1485 Suffield Street
Agawam, MA

Figure 1 - Site Location Map
September 2025

N.T.S.

Figure 2 Pre-Existing Conditions Drainage Areas



NOTE:

1) GRADES SHOWN ON THIS MAP ARE FROM THE LATEST SURVEY AND MOST OF THE GRADES DO NOT GENERALLY REFLECT THE PRE-EXISTING CONDITIONS. SOME AREAS OF THE SURVEY SHOWN ON THIS PLAN WERE REMOVED SINCE THEY REFLECT CURRENT CONDITIONS AND NOT PRE-EXISTING CONDITIONS. WE WERE UNABLE TO OBTAIN THE SURVEY FOR THE ORIGINAL DESIGN. SEE FIGURE 4 - ORIGINAL GRADING AND DRAINAGE PLAN WHICH SHOWS THE ORIGINALLY PROPOSED GRADING THAT HAS THE PRE-EXISTING CONDITIONS SURVEY BENEATH IT FOR REFERENCE.

2) THIS EXISTING CONDITIONS ON THIS PLAN WAS ANALYZED AS ALL WOODED AREA WHICH IS WHAT THE EXISTING CONDITIONS WERE PRIOR TO ANY CLEARING CONDUCTED FOR THE ORIGINAL PROJECT.

Legend

SYMBOLS

x2000 — DESIGN POINT

20 — DRAINAGE AREA DESIGNATION

LINETYPES

DRAINAGE AREA BOUNDARY

SOIL TYPE BOUNDARY

TIME OF CONCENTRATION FLOW LINE

4–220 4–219 — WETLAND BOUNDARY

SCS SOIL CLASSIFICATIONS

HSG		
A	254B	MERRIMAC FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
	254D	MERRIMAC FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES
B	275A	AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
C	205A	POLLUX FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
	250C	POLLUX FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
D	8A	LIMERICK SILT LOAM, 0 TO 3 PERCENT SLOPES, FREQUENTLY FLOODED
	731A	ENOSBURG LOAMY SAND, 0 TO 3 PERCENT SLOPES
	327C	MECKESVILLE LOAM, 8 TO 15 PERCENT SLOPES

0 60 120 Feet

Pre-Existing Conditions Drainage Areas **Figure 2**
Longbrook Condominiums

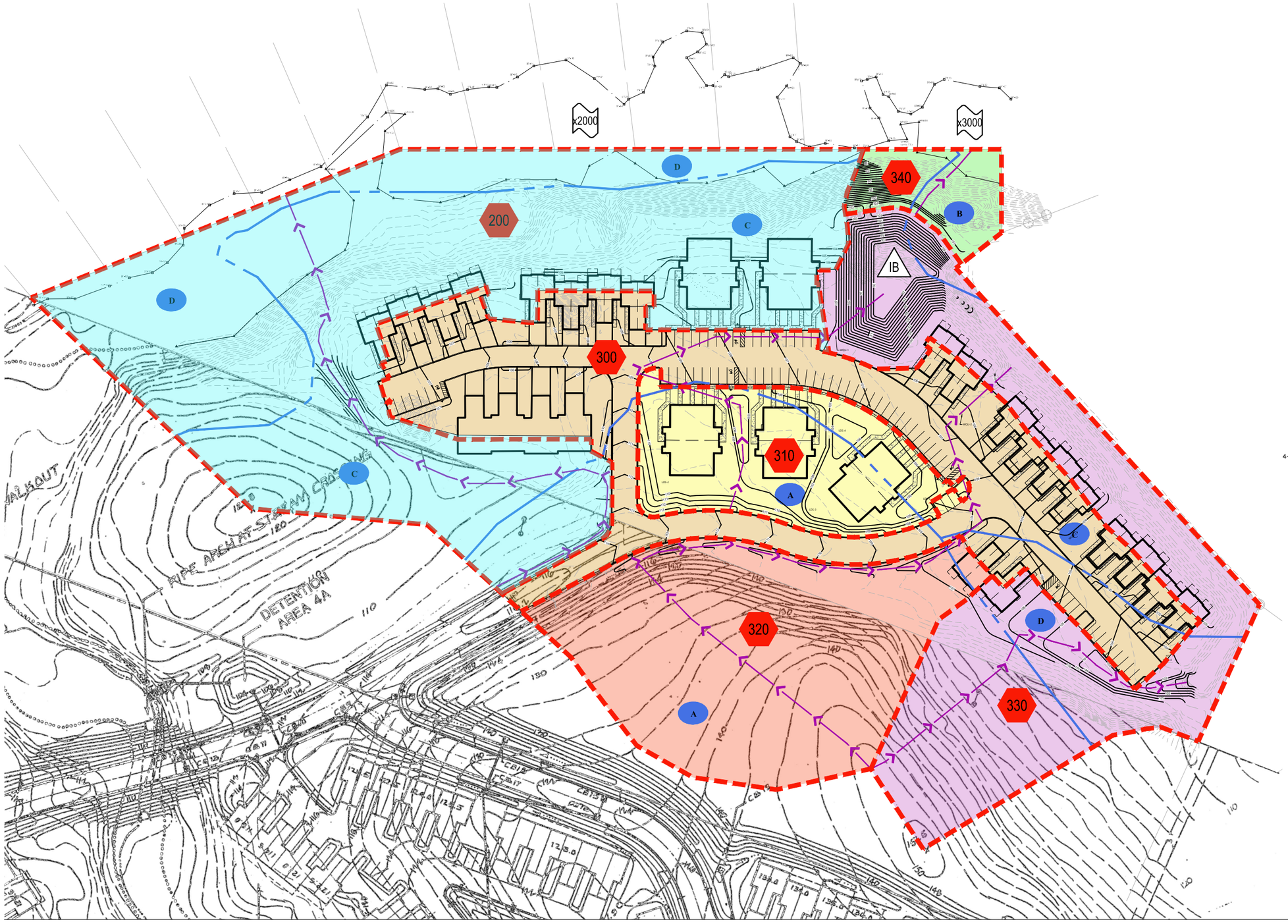
January 2026

1485 Suffield St., Agawam, MA

Existing Drainage Areas (SF)

Area 20 =	355,202	
	Woods A =	43,319
	Woods C =	235,701
	Woods D =	76,182
Area 30 =	361,061	
	Woods A =	186,370
	Woods B =	13,470
	Woods C =	116,794
	Woods D =	44,427
	TOTAL =	716,263

Figure 3 Proposed Conditions Drainage Areas



Legend

SYMBOLS

- x2000 — DESIGN POINT
- 200 — DRAINAGE AREA DESIGNATION
- IB — INFILTRATION BASIN

LINETYPES

- DRAINAGE AREA BOUNDARY
- SOIL TYPE BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- 4–220 / 4–219 — WETLAND BOUNDARY

SCS SOIL CLASSIFICATIONS

HSG		
A	254B	MERRIMAC FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
	254D	MERRIMAC FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES
B	275A	AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
C	205A	POLLUX FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
	250C	POLLUX FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
D	8A	LIMERICK SILT LOAM, 0 TO 3 PERCENT SLOPES, FREQUENTLY FLOODED
	731A	ENOSBURG LOAMY SAND, 0 TO 3 PERCENT SLOPES
	327C	MECKESVILLE LOAM, 8 TO 15 PERCENT SLOPES

0 60 120 Feet

Proposed Conditions Drainage Areas **Figure 3**

Longbrook Condominiums
1485 Suffield St., Agawam, MA

September 2025

Proposed Drainage Areas (SF)

Area 200 =	259,497	
	Woods A =	7,738
	Woods C =	101,884
	Woods D =	76,182
	Grass A =	6,822
	Grass C =	48,482
	Impervious =	18,389
Area 300 =	144,557	
	Grass A =	290
	Grass C =	33,271
	Grass D =	7,527
	Impervious =	103,469
Area 310 =	54,317	
	Grass A =	28,915
	Grass C =	10,417
	Impervious =	14,985
Area 320 =	109,281	
	Woods A =	99,439
	Grass A =	8,120
	Grass D =	548
	Impervious =	1,174
Area 330 =	131,604	
	Woods A =	41,033
	Woods B =	621
	Woods C =	19,648
	Woods D =	11,093
	Grass A =	1,925
	Grass B =	2,914
	Grass C =	31,962
	Grass D =	14,933
	Impervious =	7,475

Area 340 =	17,007
Woods B =	7,752
Woods C =	3,123
Grass B =	2,185
Grass C =	3,947
TOTAL =	716,263

Figure 4 Original Grading and Drainage Plan

DRAINAGE SCHEDULE :

AD 3
TC = 120.5
IE = 116.00

AD 2 - CB 1 : 12" DIA ± 15' @ .01

CB 1
TC = 119.6
12" IE OUT = 115.40
12" IE IN = 115.85

CB 1 - CB 2 : 12" DIA ± 45' @ .01

AD 3
TC = 120.5
IE = 116.00

AD 3 - CB 2 : 12" DIA ± 15' @ .01

CB 2
TC = 119.6
12" IE = 115.35
12" IE IN (AD 3) = 115.65

CB 2 - DET AREA 2 : 12" DIA ± 150' @ .005
12" IE OUT = 114.40

AD 4
TC = 123.0
IE = 121.0

AD 4 - DET AREA 2 : 12" DIA ± 115' @ .01
12" IE OUT = 119.85

CB 3
TC = 120.6
12" IE OUT = 116.66

CB 3 - CB 4 : 12" DIA ± 14' @ .01

CB 4
TC = 120.6
12" IE = 116.46

CB 4 - DET AREA 2 : 12" DIA ± 250' @ .005
12" IE OUT = 115.21

DET AREA 2 - OUTLET : 15" DIA ± 120' @ .015
15" IE IN = 112.75
15" IE OUT = 111.80

AD 1
TC = 125.0
IC = 121.00

AD 1 - DET AREA 1 : 12" DIA ± 130' @ .01
12" IE OUT = 119.50

DET AREA 1 - OUTLET : 12" DIA ± 180' @ .015
12" IE IN = 113.50
12" IE OUT = 112.80

CB 5
TC = 119.6
12" IE OUT = 115.60

CB 5 - CB 6 : 12" DIA ± 275' @ .01

CB 6
TC = 120.5
IE = 116.85

CB 6 - OUTLET: 12" DIA ± 50' @ .02
12" IE OUT = 107.85

CB 7
TC = 119.0
IE OUT = 115.00

CB 7 - CB 8 : 12" DIA @ 20' @ .01

CB 8
TC = 120.6
IE = 116.80

CB 8 - CB 9 : 12" DIA ±50' @ .01

CB 9
TC = 119.7
12" IE = 115.50

CB 9 - CB 10 : 12" DIA ±100' @ .01

CB 11
TC = 120.6
12" IE OUT = 117.60

CB 11 - CB 10 : 12" DIA @ 50' @ .01

CB 10
TC = 119.6
12" IE IN (CB 9) = 115.50
12" IE IN CB 11 = 117.05
15" IE OUT = 114.05

CB 10 - CB 12 : 15" DIA @ 35' @ .01

CB 13
TC = 121.0
12" IE OUT = 117.00

CB 13 - CB 14 : 12" DIA @ 26' @ .01

CB 14
TC = 119.9
IE = 116.74

CB 14 - CB 12 : 12" DIA @ 130' @ .01

CB 12
TC = 123.6
12" IE IN (CB 10) = 114.05
12" IE IN CB 13 = 116.58
15" IE OUT = 113.58

CB 12 - DET AREA 2a : 15" DIA @ 45' @ .01
15" IE OUT = 113.09

DET AREA 2a - OUTLET : 8" DIA @ 70' @ .015
8" IE IN = 109.99
8" IE OUT = 109.89

CB 15
TC = 119.2
IE = 116.36

CB 15 - CB 16 : 12" DIA @ 26' @ .01

CB 16
TC = 119.3
12" IE IN = 116.79
12" IE OUT = 116.79

CB 16 - CB 17 : 12" DIA @ 140' @ .027

CB 18
TC = 119.6
12" IE OUT = 115.60

CB 18 - CB 17 : 12" DIA @ 65' @ .01

CB 17
TC = 119.6
12" IE IN (CB 16) = 116.79
12" IE IN CB 18 = 115.60
12" IE OUT = 114.98

CB 17 - DET AREA 2a : 12" DIA @ 155' @ .01
12" IE OUT = 112.75

CB 15
TC = 119.6
12" IE OUT = 115.60

CB 19 - CB 20 : 12" @ 100' @ .01

CB 20
TC = 122.3
IE IN = 119.60

CB 20 - MH 1 : 12" @ 45' @ .01

CB 21
TC = 124.2
IE OUT = 120.67

CB 21 - MH 1 : 12" @ 164' @ .037

MH 1
TC = 123.6
12" IE IN (CB 20) = 119.60
12" IE IN CB 21 = 119.46
12" IE OUT = 118.06

MH 1 - CB 22 : 12" @ 250' @ .012

CB 23
TC = 121.0
12" IE OUT = 117.00

CB 23 - CB 24 : 12" @ 35' @ .015

CB 24
TC = 121.0
12" IE IN = 117.35
12" IE OUT = 117.35

CB 24 - CB 22 : 12" @ 95' @ .015

CB 22
TC = 123.6
12" IE IN (CB 23) = 117.35
12" IE IN CB 21 = 114.98
12" IE OUT = 114.60

CB 22 - DET AREA 2a : 15" @ 115' @ .015
15" IE OUT = 113.17

DET AREA 4a - OUTLET: 18" DIA ± 150' @ .015
18" IE IN = 113.70
18" IE OUT = 111.50

CB 25
TC = 120.5
12" IE OUT = 116.50

CB 25 - CB 26 : 12" DIA @ 25' @ .01

CB 26
TC = 120.5
12" IE = 116.50

CB 26 - CB 27 : 12" DIA @ 115' @ .01

CB 27
TC = 120.5
12" IE = 116.15

CB 27 - CB 28 : 12" DIA @ 35' @ .01

CB 28
TC = 120.5
12" IE IN = 116.09
12" IE OUT = 115.99

CB 28 - CB 29 : 15" DIA @ 110' @ .01

CB 29
TC = 120.5
12" IE = 116.45

CB 29 - CB 30 : 15" DIA @ 100' @ .01

CB 30
TC = 120.5
15" IE = 114.15

CB 30 - MH 2 : 15" DIA @ 40' @ .01

MH 2
TC = 122.5
15" IE = 114.15

MH 2 - DET AREA 2 : 15" DIA @ 100' @ .01
15" IE OUT = 97.15

CB 31
TC = 121.0
12" IE OUT = 117.00

CB 31 - CB 32 : 12" DIA @ 25' @ .01

CB 32
TC = 121.0
12" IE IN = 117.00
12" IE OUT = 116.88

CB 32 - CB 33 : 12" DIA @ 205' @ .017

CB 33
TC = 122.5
12" IE IN = 116.88
15" IE OUT = 113.39

CB 33 - CB 34 : 15" DIA @ 70' @ .015

CB 34
TC = 122.5
12" IE = 116.70

CB 34 - CB 35 : 15" DIA @ 26' @ .015

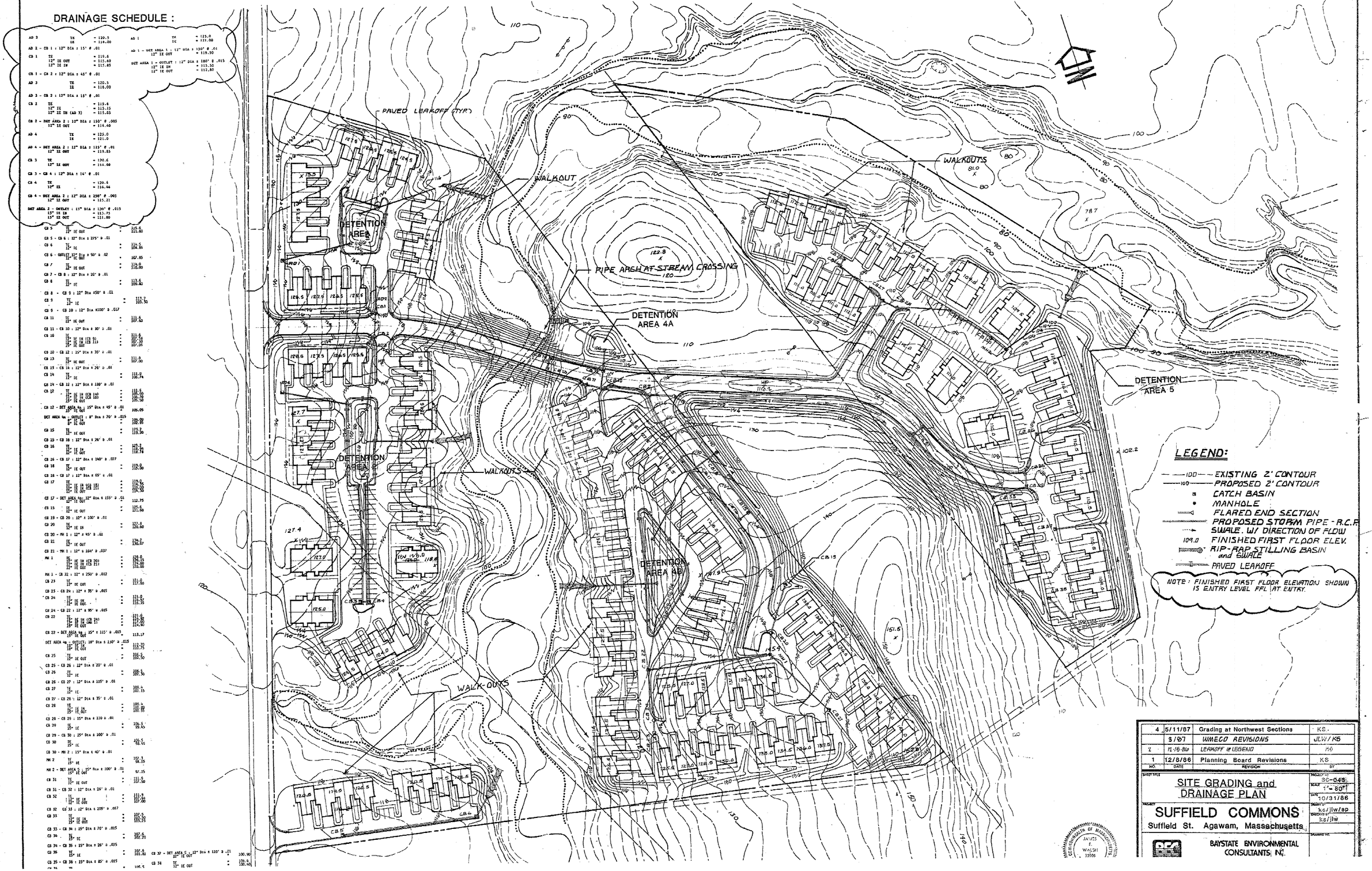
CB 35
TC = 122.5
12" IE = 116.31

CB 35 - CB 36 : 15" DIA @ 85' @ .015

CB 36
TC = 125.5
15" IE = 113.01

CB 37 - DET AREA 5 : 12" DIA ± 110' @ .01
12" IE OUT = 100.90

CB 38
TC = 126.0
12" IE OUT = 120.00



LEGEND:

- 100 — EXISTING 2' CONTOUR
- 100 — PROPOSED 2' CONTOUR
- CATCH BASIN
- MANHOLE
- FLARED END SECTION
- PROPOSED STORM PIPE - R.C.P.
- SWALE. W/ DIRECTION OF FLOW
- 109.0 FINISHED FIRST FLOOR ELEV.
- RIP-RAP STILLING BASIN and SWALE
- PAVED LEAKOFF

NOTE : FINISHED FIRST FLOOR ELEVATION SHOWN IS ENTRY LEVEL FFL AT ENTRY.

NO.	DATE	REVISION	BY
4	5/11/87	Grading at Northwest Sections	KS.
3	3/87	WMECO REVISIONS	JLW / KS
2	11-16-86	LEAKOFF & LEGEND	KS
1	12/8/86	Planning Board Revisions	KS

SHEET TITLE: SITE GRADING and DRAINAGE PLAN

PROJECT: SUFFIELD COMMONS
Suffield St. Agawam, Massachusetts

PROJECT NO. 86-043
SCALE 1" = 80'
DATE 10/31/86
DRAWN BY ks/jlw/sp
CHECKED BY ks/jlw
DRAWING NO.

BAYSTATE ENVIRONMENTAL CONSULTANTS, INC.

COMMONWEALTH OF MASSACHUSETTS JAMES F. WALSH 30096

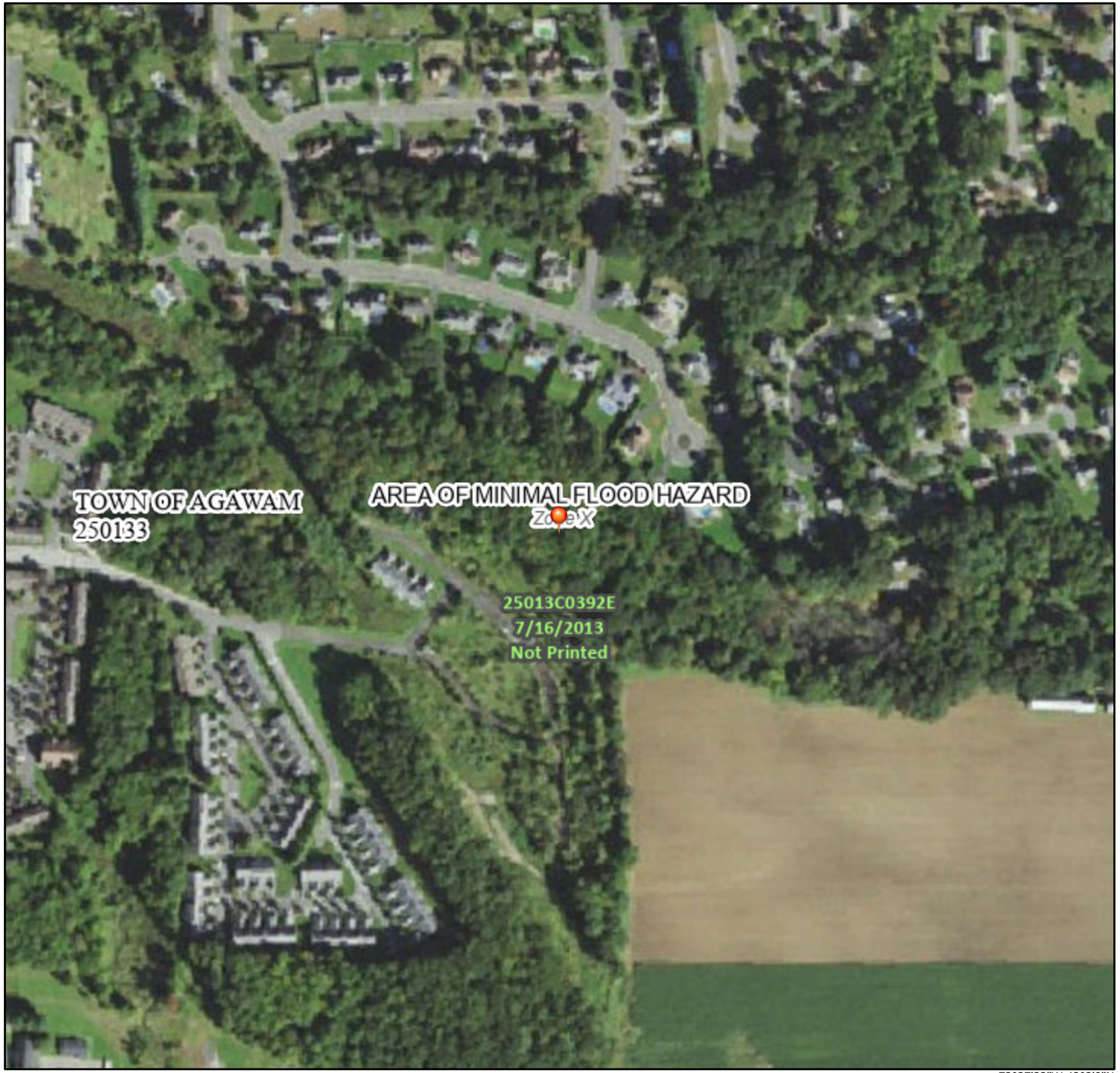
Figure 5 FEMA Map

Figure 5 - FEMA Map

National Flood Hazard Layer FIRMette

FEMA

72°38'9"W 42°2'34"N



72°37'32"W 42°2'8"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
- 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 8/20/2025 at 7:54 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.

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) – Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMP's that impound stormwater have been designed with stone to protect downgradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, 25 and 100 years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions for the 2, 10, 25 and 100-year storm events.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4 Peak Discharge Rates*

Design Point	2-year	10-year	25-year	100-year
Design Point: x2000				
Existing	3.80	11.15	18.13	30.67
Proposed	3.64	9.02	13.84	22.25
Design Point: x3000				
Existing	0.45	4.72	10.43	22.29
Proposed	0.23	3.95	8.90	12.98

*All values listed in cubic feet per second (cfs)

Standard 3: Stormwater Recharge

The Project has been designed to comply with Standard 3.

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is 4,694 cubic feet. The provided Recharge Volume for the Project is 21,427 cubic feet at elevation 95.8.

Recharge of stormwater has been provided through the use of an infiltration basin, which has been sized using the Dynamic Field method. The infiltration BMP has been designed to drain completely within 72 hours.

Soil evaluation (including Geotechnical Report), computations, and supporting information are included in Appendix C.

Standard 4: Water Quality

The Project has been designed to comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide at least 80% TSS removal of stormwater runoff from all proposed impervious surfaces as well as 44% pretreatment prior to infiltration BMPs.

Computations and supporting information, including the Long-Term Pollution Prevention Plan, are included in Appendix D.

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

The Project is not considered a LUHPPL.

For computations and supporting information regarding the sizing of BMPs suitable for treatment of runoff from LUHPPLs, see Appendix D.

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

For computations and supporting information regarding the sizing of BMPs suitable for treatment of runoff near or to critical areas, see Appendix D.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project has been designed to comply with all ten of the Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

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

The Project will disturb approximately 8.2 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) will be developed and submitted before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls to be finalized in the SWPPP are included in Appendix E.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan has been developed for the Project. The O&M Plan is included in Appendix D as part of the Long-Term Pollution Prevention Plan.

Standard 10: Prohibition of Illicit Discharges

Sanitary sewer and storm drainage structures remaining from the original development will be used for this project. The new building units that will be constructed on Site will connect to the existing utilities already constructed as part of the original design. The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges.

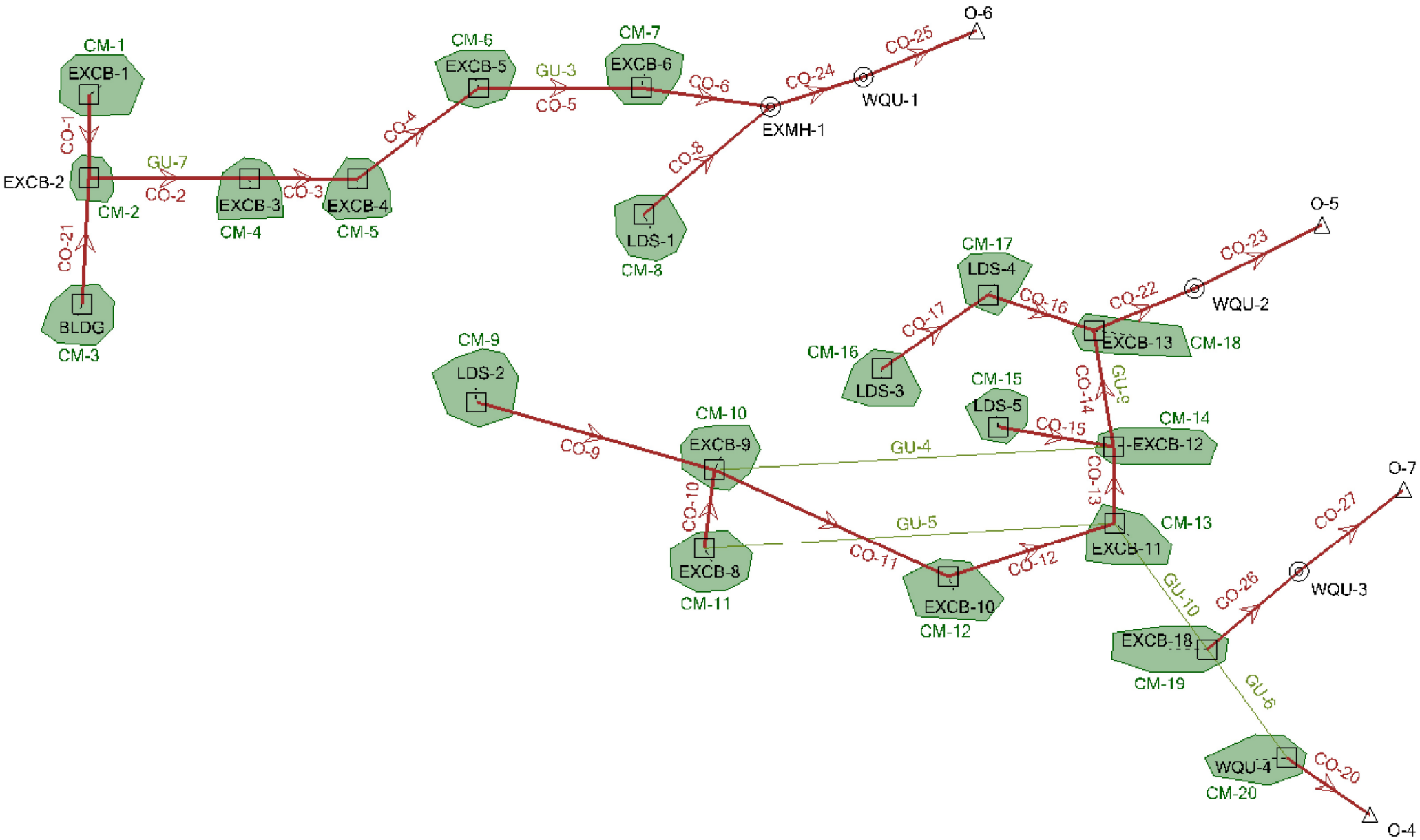
Appendix A: Standard 1 Computations and Supporting Information

- Pipe Sizing Calculations
- Stone outlet protection for pipe ends (See Virginia Erosion and Sediment Control Handbook, Chapter 3.18)

Pipe Sizing Calculations

The closed drainage system was designed for the 10-year storm event.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Additionally, the performance of the system was analyzed using StormCAD, a HEC-22 based program.


CM-1
EXCB-1
CO-1
EXCB-2
CM-2
GU-7
CO-2
EXCB-3
CM-4
CO-3
EXCB-4
CM-5
CO-4
CM-6
EXCB-5
GU-3
CO-5
CM-7
EXCB-6
CO-6
EXMH-1
CO-24
CO-25
WQU-1
O-6
CO-8
LDS-1
CM-8
CO-21
BLDG
CM-3
CM-9
LDS-2
CO-9
CM-10
EXCB-9
GU-4
CO-10
EXCB-8
CM-11
GU-5
CO-11
EXCB-10
CM-12
CO-12
CM-13
EXCB-11
CO-13
CM-14
EXCB-12
CO-14
GU-9
CM-15
LDS-5
CO-15
CM-16
LDS-3
CO-17
CM-17
LDS-4
CO-16
CO-22
CO-23
WQU-2
O-5
EXCB-13
CM-18
GU-10
CO-26
CO-27
WQU-3
O-7
EXCB-18
CM-19
GU-6
WQU-4
CM-20
CO-20
O-4

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Conduit Table

ID	Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Depth (Out) (ft)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)	Depth (Normal) / Rise (%)
40	CO-1	EXCB-1	101.50	EXCB-2	101.40	18.0	25.9	0.006	Circle	12.0	0.010	1.20	4.00	0.57	3.45	34.8	40.7
41	CO-2	EXCB-2	101.30	EXCB-3	100.40	95.0	50.0	0.009	Circle	12.0	0.010	2.48	5.88	0.74	4.51	55.0	52.9
42	CO-3	EXCB-3	100.40	EXCB-4	100.00	37.0	33.7	0.011	Circle	12.0	0.010	2.95	6.44	0.58	4.82	61.2	56.5
43	CO-4	EXCB-4	99.90	EXCB-5	98.60	97.0	47.1	0.013	Circle	15.0	0.010	3.40	7.22	0.51	9.72	35.0	40.8
44	CO-5	EXCB-5	98.40	EXCB-6	97.50	89.0	50.8	0.010	Circle	15.0	0.010	3.62	6.62	0.78	8.44	42.9	45.7
46	CO-6	EXCB-6	97.40	EXMH-1	97.20	36.0	40.7	0.006	Circle	15.0	0.010	4.69	5.59	0.81	6.26	74.9	64.5
51	CO-8	LDS-1	103.60	EXMH-1	102.90	128.0	51.8	0.005	Circle	6.0	0.010	0.09	2.06	0.14	0.54	17.3	28.1
59	CO-9	LDS-2	106.60	EXCB-9	105.80	158.0	77.1	0.005	Circle	6.0	0.010	0.08	1.93	0.31	0.52	15.9	27.0
60	CO-10	EXCB-8	106.40	EXCB-9	105.80	23.0	24.7	0.026	Circle	12.0	0.010	0.49	5.38	0.31	7.48	6.6	17.4
61	CO-11	EXCB-9	105.70	EXCB-10	103.60	167.0	80.1	0.013	Circle	12.0	0.010	0.96	5.05	0.29	5.19	18.5	29.2
62	CO-12	EXCB-10	103.50	EXCB-11	101.50	69.0	54.3	0.029	Circle	12.0	0.010	0.90	6.68	0.23	7.89	11.4	22.8
63	CO-13	EXCB-11	101.30	EXCB-12	101.00	26.0	23.8	0.012	Circle	15.0	0.010	1.32	5.24	0.34	9.02	14.6	25.8
64	CO-14	EXCB-12	100.90	EXCB-13	100.10	83.0	36.8	0.010	Circle	15.0	0.010	1.77	5.35	0.68	8.24	21.4	31.4
67	CO-15	LDS-5	102.30	EXCB-12	102.00	45.0	36.4	0.007	Circle	6.0	0.010	0.07	2.07	0.12	0.60	12.4	23.8
68	CO-16	LDS-4	101.90	EXCB-13	101.10	120.0	34.6	0.007	Circle	6.0	0.010	0.17	2.63	0.18	0.60	29.1	36.9
70	CO-17	LDS-3	102.60	LDS-4	102.00	90.0	40.4	0.007	Circle	6.0	0.010	0.11	2.32	0.15	0.60	18.5	29.1
78	CO-20	WQU-4	99.70	O-4	99.50	34.0	31.3	0.006	Circle	12.0	0.010	1.16	4.05	0.39	3.55	32.8	39.4
81	CO-21	BLDG	102.00	EXCB-2	101.60	58.0	39.2	0.007	Circle	6.0	0.010	0.32	3.13	0.37	0.61	52.6	51.5
84	CO-22	EXCB-13	100.00	WQU-2	99.90	20.0	34.0	0.005	Circle	15.0	0.010	3.72	5.11	0.72	5.94	62.6	57.3
85	CO-23	WQU-2	99.90	O-5	99.48	78.0	44.4	0.005	Circle	15.0	0.010	3.71	5.25	0.70	6.16	60.1	55.9
88	CO-24	EXMH-1	97.10	WQU-1	96.90	8.0	30.4	0.025	Circle	18.0	0.010	4.75	9.80	0.64	21.59	22.0	31.9
89	CO-25	WQU-1	96.90	O-6	96.00	38.0	38.1	0.024	Circle	18.0	0.010	4.74	9.61	0.53	21.01	22.6	32.3
92	CO-26	EXCB-18	100.20	WQU-3	100.00	14.0	37.3	0.014	Circle	12.0	0.010	0.62	4.65	0.24	5.54	11.1	22.5
93	CO-27	WQU-3	100.00	O-7	99.14	79.0	41.6	0.011	Circle	12.0	0.010	0.61	4.22	0.24	4.83	12.7	24.1

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Gutter Table

ID	Label	Start Node	Stop Node	Has User Defined Length?	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Gutter Shape	Irregular Channel Section	Bottom Width (Ditch) (ft)	Height (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Manning's n (Gutter)	Flow (Start) (cfs)	Notes
104	GU-3	EXCB-5	EXCB-6	True	90.0	50.8	0.016	<None>	-	-	-	-	-	-	0.00	-
105	GU-4	EXCB-9	EXCB-12	True	220.0	124.5	0.017	<None>	-	-	-	-	-	-	0.00	-
106	GU-5	EXCB-8	EXCB-11	True	245.0	127.9	0.016	<None>	-	-	-	-	-	-	0.00	-
107	GU-6	EXCB-18	WQU-4	True	177.0	42.0	0.012	<None>	-	-	-	-	-	-	0.00	-
120	GU-7	EXCB-3	EXCB-2	True	100.0	50.0	0.031	<None>	-	-	-	-	-	-	0.00	-
122	GU-9	EXCB-12	EXCB-13	True	100.0	36.8	0.020	<None>	-	-	-	-	-	-	0.00	-
123	GU-10	EXCB-11	EXCB-18	True	104.0	48.8	0.014	<None>	-	-	-	-	-	-	0.00	-

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Type	Inflow-Capture Curve	Capture Efficiency (Calculated) (%)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
34	EXCB-1	105.40	105.40	101.50	Full Capture	<Collection: 0 items>	100.0	1.20	101.96	5.9
35	EXCB-2	105.40	105.40	101.30	Full Capture	<Collection: 0 items>	100.0	1.00	101.97	5.5
36	EXCB-3	108.50	108.50	100.40	Full Capture	<Collection: 0 items>	100.0	0.51	101.14	4.0
37	EXCB-4	108.90	108.90	99.90	Full Capture	<Collection: 0 items>	100.0	0.48	100.64	5.1
38	EXCB-5	108.00	108.00	98.40	Full Capture	<Collection: 0 items>	100.0	0.27	99.17	3.9
39	EXCB-6	106.60	106.60	97.40	Full Capture	<Collection: 0 items>	100.0	1.17	98.28	6.8
50	LDS-1	107.60	107.60	103.60	Full Capture	<Collection: 0 items>	100.0	0.09	103.75	(N/A)
52	EXCB-8	110.60	110.60	106.40	Full Capture	<Collection: 0 items>	100.0	0.49	106.69	4.7
53	EXCB-9	110.60	110.60	105.70	Full Capture	<Collection: 0 items>	100.0	0.46	106.11	4.5
54	EXCB-10	106.77	106.77	103.50	Full Capture	<Collection: 0 items>	100.0	0.08	103.90	19.2
55	EXCB-11	106.75	106.75	101.30	Full Capture	<Collection: 0 items>	100.0	0.53	101.75	5.0
56	EXCB-12	106.81	106.81	100.90	Full Capture	<Collection: 0 items>	100.0	0.50	101.43	4.3
57	EXCB-13	104.82	104.82	100.00	Full Capture	<Collection: 0 items>	100.0	2.35	100.78	10.2
58	LDS-2	109.50	109.50	106.60	Full Capture	<Collection: 0 items>	100.0	0.08	106.74	19.1
65	LDS-5	105.80	105.80	102.30	Full Capture	<Collection: 0 items>	100.0	0.07	102.43	18.3
66	LDS-4	105.80	105.80	101.90	Full Capture	<Collection: 0 items>	100.0	0.07	102.11	17.8
69	LDS-3	106.10	106.10	102.60	Full Capture	<Collection: 0 items>	100.0	0.11	102.76	21.3
73	EXCB-18	105.28	105.28	100.20	Full Capture	<Collection: 0 items>	100.0	0.62	100.53	7.4
76	WQU-4	103.20	103.20	99.70	Full Capture	<Collection: 0 items>	100.0	1.16	100.15	8.8
80	BLDG	106.00	106.00	101.60	Full Capture	<Collection: 0 items>	100.0	0.32	102.29	1.8

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Manhole Table

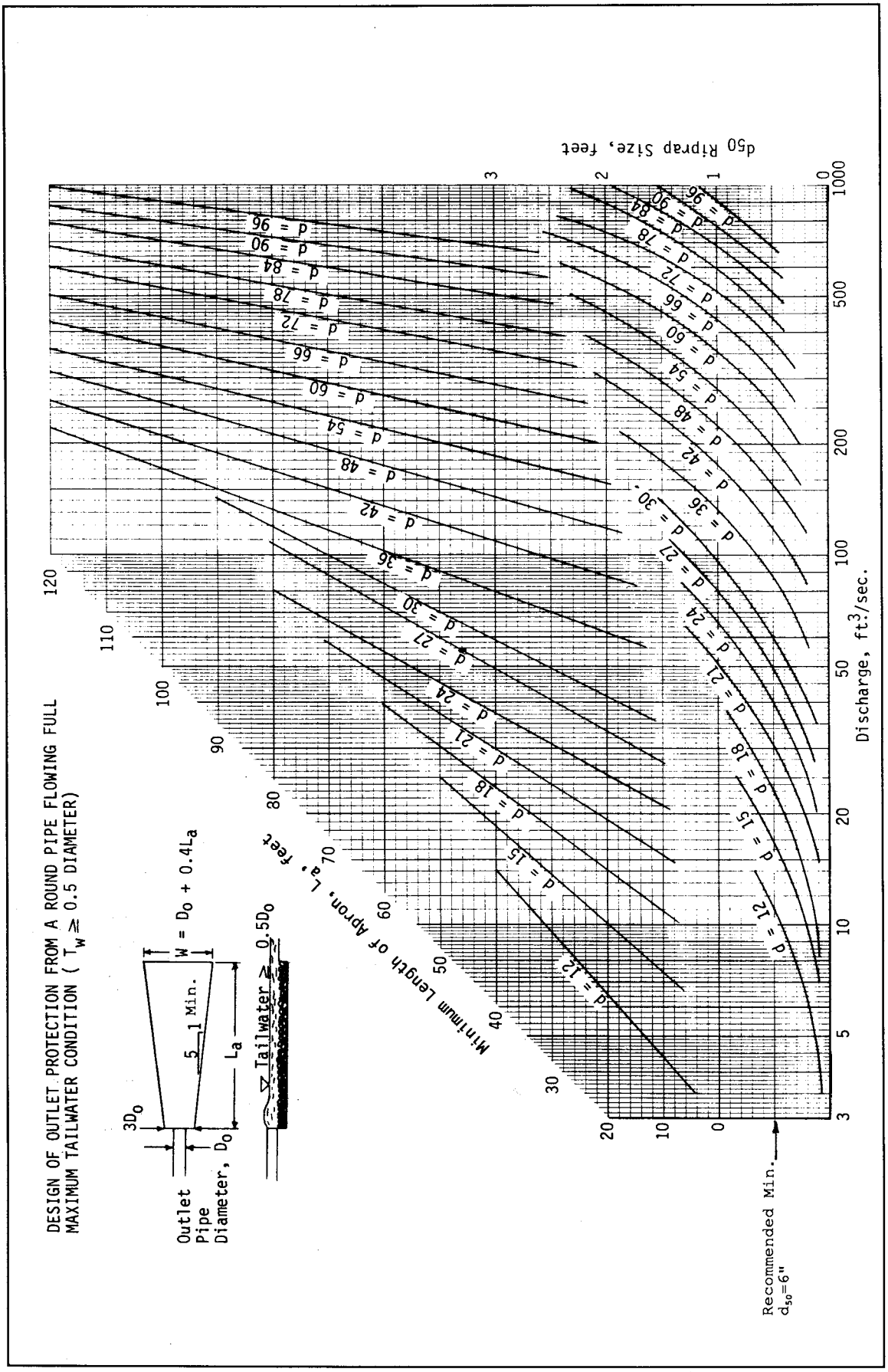
ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert in 1) (ft)	Flow (Total Out) (cfs)	Depth (Out) (ft)	Hydraulic Grade Line (Out) (ft)	Headloss Method	Hydraulic Grade Line (In) (ft)
45	EXMH-1	107.17	107.17	97.20	4.75	0.84	97.94	Absolute	97.94
82	WQU-2	105.80	105.80	99.90	3.71	0.78	100.68	Absolute	100.68
86	WQU-1	106.50	106.50	96.90	4.74	0.84	97.74	Absolute	97.74
90	WQU-3	105.90	105.90	100.00	0.61	0.33	100.33	Absolute	100.33

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Outfall Table

ID	Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Hydraulic Grade (ft)	Flow (Total Out) (cfs)
77	O-4	100.50	99.50	Free Outfall	99.89	1.16
83	O-5	100.98	99.48	Free Outfall	100.18	3.67
87	O-6	97.50	96.00	Free Outfall	96.53	4.73
91	O-7	100.14	99.14	Free Outfall	99.38	0.61

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (ft²)	Runoff Coefficient (Rational)	Time of Concentration (min)	Flow (Total Out) (cfs)
94	CM-1	EXCB-1	8,680.000	0.950	5.000	1.20
95	CM-2	EXCB-2	7,200.000	0.950	5.000	1.00
96	CM-3	BLDG	2,300.000	0.950	5.000	0.32
97	CM-4	EXCB-3	3,700.000	0.950	5.000	0.51
98	CM-5	EXCB-4	3,500.000	0.950	5.000	0.48
99	CM-6	EXCB-5	1,930.000	0.950	5.000	0.27
100	CM-7	EXCB-6	8,430.000	0.950	5.000	1.17
101	CM-8	LDS-1	6,400.000	0.100	5.000	0.09
108	CM-9	LDS-2	5,670.000	0.100	5.000	0.08
109	CM-10	EXCB-9	3,290.000	0.950	5.000	0.46
110	CM-11	EXCB-8	3,544.000	0.950	5.000	0.49
111	CM-12	EXCB-10	7,300.000	0.100	10.000	0.08
112	CM-13	EXCB-11	3,860.000	0.950	5.000	0.53
113	CM-14	EXCB-12	3,630.000	0.950	5.000	0.50
114	CM-15	LDS-5	5,075.000	0.100	5.000	0.07
115	CM-16	LDS-3	7,570.000	0.100	5.000	0.11
116	CM-17	LDS-4	4,700.000	0.100	5.000	0.07
117	CM-18	EXCB-13	17,000.000	0.950	5.000	2.35
118	CM-19	EXCB-18	4,450.000	0.950	5.000	0.62
119	CM-20	WQU-4	8,400.000	0.950	5.000	1.16



Source: USDA-SCS

Plate 3.18-4

Page 153 of 692

Appendix B: Standard 2 Computations and Supporting Information

The rainfall-runoff response of the Site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 10, 25 and 100-years. Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm and NOAA Atlas 14 precipitation depths for the site: 3.61, 5.86, 7.70, and 10.8 inches, respectively. Runoff coefficients for the pre- and post-development conditions, as previously shown in Tables 2 and 3 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. Drainage areas used in the analyses were described in previous sections and shown on Figures 2 and 3. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

NOAA Atlas 14, Volume 10, Version 3
Location name: Agawam, Massachusetts, USA*
Latitude: 42.0388°, Longitude: -72.6364°
Elevation: 127 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	0.341 (0.263-0.439)	0.410 (0.315-0.529)	0.522 (0.401-0.677)	0.616 (0.470-0.801)	0.744 (0.551-1.02)	0.841 (0.611-1.18)	0.943 (0.666-1.37)	1.06 (0.709-1.57)	1.21 (0.785-1.88)	1.34 (0.850-2.12)
10-min	0.483 (0.372-0.622)	0.580 (0.447-0.749)	0.739 (0.567-0.957)	0.872 (0.666-1.14)	1.05 (0.781-1.44)	1.19 (0.866-1.66)	1.34 (0.943-1.94)	1.49 (1.00-2.22)	1.72 (1.11-2.66)	1.90 (1.20-3.01)
15-min	0.568 (0.438-0.732)	0.683 (0.526-0.881)	0.871 (0.668-1.13)	1.03 (0.784-1.34)	1.24 (0.919-1.69)	1.40 (1.02-1.96)	1.57 (1.11-2.28)	1.76 (1.18-2.62)	2.02 (1.31-3.13)	2.24 (1.42-3.54)
30-min	0.766 (0.591-0.988)	0.923 (0.711-1.19)	1.18 (0.905-1.53)	1.39 (1.06-1.82)	1.69 (1.25-2.30)	1.91 (1.39-2.67)	2.14 (1.51-3.10)	2.40 (1.61-3.57)	2.76 (1.79-4.27)	3.05 (1.93-4.82)
60-min	0.964 (0.743-1.24)	1.16 (0.897-1.50)	1.49 (1.14-1.93)	1.76 (1.34-2.30)	2.14 (1.58-2.91)	2.42 (1.75-3.37)	2.71 (1.91-3.93)	3.04 (2.04-4.52)	3.50 (2.26-5.40)	3.87 (2.45-6.11)
2-hr	1.24 (0.960-1.58)	1.48 (1.15-1.90)	1.89 (1.46-2.43)	2.23 (1.71-2.89)	2.69 (2.01-3.66)	3.04 (2.22-4.24)	3.41 (2.43-4.95)	3.84 (2.59-5.69)	4.48 (2.91-6.90)	5.02 (3.18-7.89)
3-hr	1.42 (1.11-1.81)	1.71 (1.33-2.18)	2.18 (1.69-2.79)	2.57 (1.98-3.31)	3.10 (2.33-4.21)	3.50 (2.58-4.88)	3.93 (2.82-5.72)	4.45 (3.00-6.58)	5.23 (3.40-8.03)	5.90 (3.76-9.25)
6-hr	1.78 (1.39-2.25)	2.16 (1.69-2.74)	2.78 (2.17-3.54)	3.30 (2.56-4.22)	4.01 (3.03-5.42)	4.53 (3.36-6.30)	5.10 (3.70-7.43)	5.82 (3.94-8.56)	6.94 (4.52-10.6)	7.92 (5.05-12.3)
12-hr	2.18 (1.72-2.74)	2.69 (2.12-3.39)	3.53 (2.77-4.46)	4.22 (3.30-5.37)	5.18 (3.94-6.98)	5.87 (4.39-8.14)	6.65 (4.87-9.68)	7.64 (5.19-11.2)	9.21 (6.02-14.0)	10.6 (6.78-16.4)
24-hr	2.55 (2.02-3.19)	~~3.20~~3.61 (2.54-4.01)	4.26 (3.37-5.36)	~~5.15~~5.86 (4.05-6.51)	~~6.36~~7.70 (4.87-8.55)	7.25 (5.46-10.0)	~~8.24~~10.8 (6.09-12.0)	9.53 (6.50-13.9)	11.6 (7.62-17.6)	13.5 (8.65-20.8)
2-day	2.88 (2.30-3.58)	3.65 (2.92-4.54)	4.92 (3.91-6.14)	5.97 (4.72-7.49)	7.41 (5.72-9.92)	8.45 (6.42-11.7)	9.63 (7.18-14.0)	11.2 (7.67-16.3)	13.8 (9.09-20.8)	16.2 (10.4-24.8)
3-day	3.15 (2.52-3.89)	3.99 (3.20-4.94)	5.37 (4.29-6.68)	6.52 (5.18-8.16)	8.10 (6.27-10.8)	9.24 (7.04-12.7)	10.5 (7.88-15.3)	12.3 (8.42-17.7)	15.2 (9.99-22.8)	17.8 (11.4-27.2)
4-day	3.39 (2.73-4.18)	4.29 (3.45-5.30)	5.77 (4.62-7.15)	6.99 (5.56-8.72)	8.67 (6.73-11.5)	9.89 (7.56-13.6)	11.3 (8.45-16.3)	13.1 (9.02-18.9)	16.2 (10.7-24.3)	19.0 (12.2-29.0)
7-day	4.06 (3.28-4.98)	5.08 (4.10-6.24)	6.75 (5.43-8.32)	8.13 (6.51-10.1)	10.0 (7.82-13.3)	11.4 (8.74-15.5)	13.0 (9.74-18.6)	15.0 (10.4-21.6)	18.4 (12.2-27.5)	21.4 (13.9-32.6)
10-day	4.72 (3.84-5.77)	5.81 (4.71-7.11)	7.58 (6.12-9.31)	9.04 (7.26-11.2)	11.1 (8.64-14.5)	12.5 (9.61-17.0)	14.2 (10.6-20.2)	16.3 (11.3-23.3)	19.8 (13.1-29.4)	22.9 (14.8-34.7)
20-day	6.80 (5.56-8.25)	7.94 (6.48-9.65)	9.81 (7.98-12.0)	11.4 (9.19-14.0)	13.5 (10.6-17.5)	15.1 (11.6-20.1)	16.8 (12.5-23.4)	18.9 (13.1-26.8)	22.1 (14.8-32.7)	24.9 (16.2-37.6)
30-day	8.55 (7.02-10.3)	9.72 (7.97-11.8)	11.6 (9.50-14.1)	13.2 (10.7-16.2)	15.4 (12.1-19.8)	17.0 (13.1-22.4)	18.8 (13.9-25.8)	20.8 (14.5-29.3)	23.7 (15.9-34.8)	26.1 (17.0-39.3)
45-day	10.7 (8.84-12.9)	11.9 (9.83-14.4)	13.9 (11.4-16.9)	15.6 (12.7-19.0)	17.8 (14.0-22.7)	19.6 (15.0-25.5)	21.3 (15.7-28.8)	23.2 (16.3-32.5)	25.7 (17.2-37.6)	27.6 (18.0-41.5)
60-day	12.6 (10.4-15.1)	13.8 (11.4-16.6)	15.9 (13.1-19.2)	17.6 (14.4-21.4)	20.0 (15.7-25.2)	21.8 (16.7-28.2)	23.6 (17.3-31.6)	25.3 (17.8-35.4)	27.5 (18.5-40.1)	29.1 (19.0-43.5)

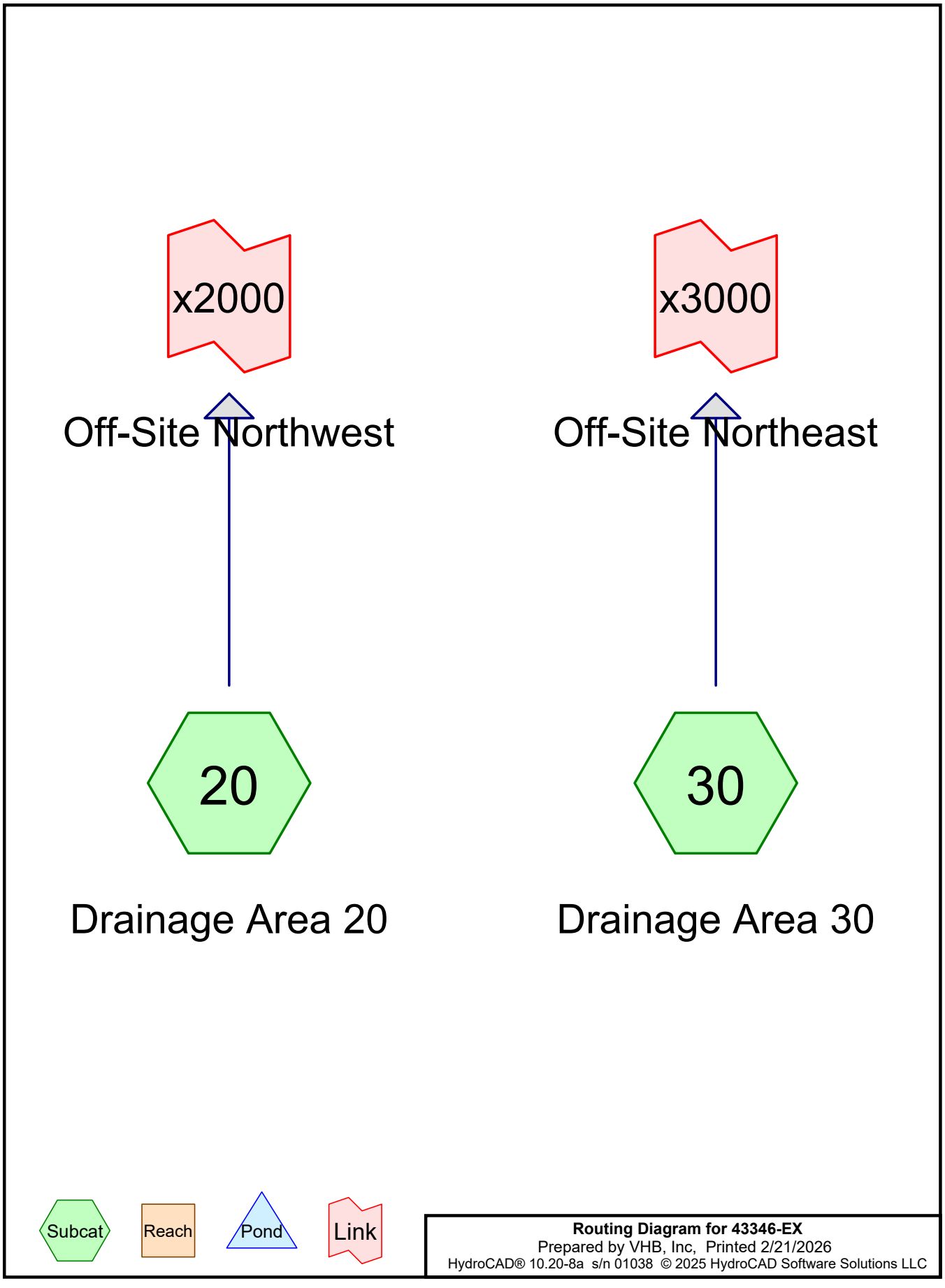
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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.

HydroCAD Analysis: Existing Conditions

2-Year Storm Event – Existing


x2000
x3000
Off-Site Northwest
Off-Site Northeast
20
30
Drainage Area 20
Drainage Area 30
Subcat
Reach
Pond
Link
Routing Diagram for 43346-EX
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	Type III 24-hr		Default	24.00	1	3.61	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.273	30	Woods, Good, HSG A (20, 30)
0.309	55	Woods, Good, HSG B (30)
8.092	70	Woods, Good, HSG C (20, 30)
2.769	77	Woods, Good, HSG D (20, 30)
16.443	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.273	HSG A	20, 30
0.309	HSG B	30
8.092	HSG C	20, 30
2.769	HSG D	20, 30
0.000	Other	
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
5.273	0.309	8.092	2.769	0.000	16.443	Woods, Good	20, 30
5.273	**0.309**	**8.092**	**2.769**	**0.000**	**16.443**	**TOTAL AREA**	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment20: Drainage Area 20 Runoff Area=355,202 sf 0.00% Impervious Runoff Depth>0.81"
Flow Length=640' Tc=40.2 min CN=67 Runoff=3.80 cfs 0.549 af

Subcatchment30: Drainage Area 30 Runoff Area=361,061 sf 0.00% Impervious Runoff Depth>0.18"
Flow Length=810' Tc=28.9 min CN=50 Runoff=0.45 cfs 0.124 af

Link x2000: Off-Site Northwest Inflow=3.80 cfs 0.549 af
Primary=3.80 cfs 0.549 af

Link x3000: Off-Site Northeast Inflow=0.45 cfs 0.124 af
Primary=0.45 cfs 0.124 af

Total Runoff Area = 16.443 ac Runoff Volume = 0.674 af Average Runoff Depth = 0.49"
100.00% Pervious = 16.443 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 20: Drainage Area 20

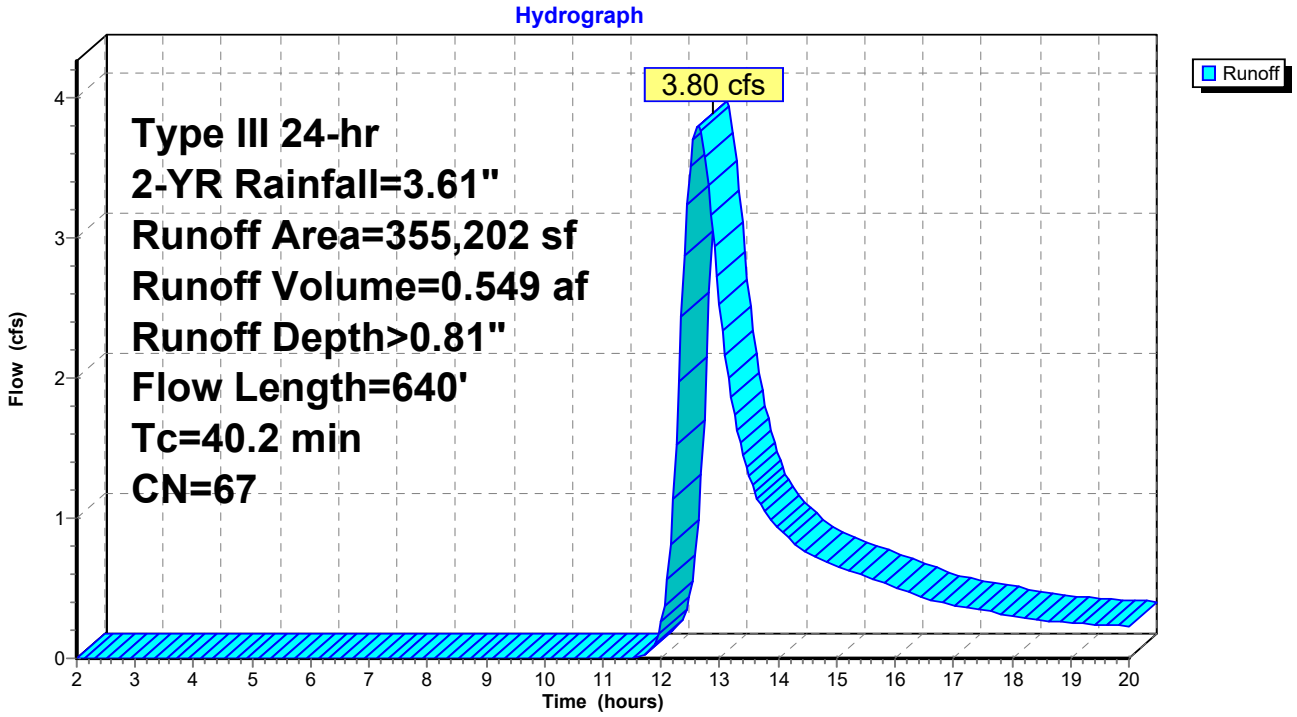
Runoff = 3.80 cfs @ 12.63 hrs, Volume= 0.549 af, Depth> 0.81"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

Area (sf)	CN	Description
43,319	30	Woods, Good, HSG A
235,701	70	Woods, Good, HSG C
76,182	77	Woods, Good, HSG D
355,202	67	Weighted Average
355,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	50	0.0100	0.03		**Sheet Flow, First 50 feet of woods** Woods: Dense underbrush n= 0.800 P2= 3.61"
3.0	90	0.0100	0.50		**Shallow Concentrated Flow, Next 90 feet of woods** Woodland Kv= 5.0 fps
3.8	200	0.0300	0.87		**Shallow Concentrated Flow, Next 200 feet of woods** Woodland Kv= 5.0 fps
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
0.6	30	0.0300	0.87		**Shallow Concentrated Flow, Next 30 feet of woods** Woodland Kv= 5.0 fps
0.4	35	0.1000	1.58		**Shallow Concentrated Flow, Next 35 feet of woods** Woodland Kv= 5.0 fps
0.4	95	0.5000	3.54		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
2.1	45	0.0050	0.35		**Shallow Concentrated Flow, Lest 45 feet of woods** Woodland Kv= 5.0 fps
40.2	640	Total			

Subcatchment 20: Drainage Area 20



Summary for Subcatchment 30: Drainage Area 30

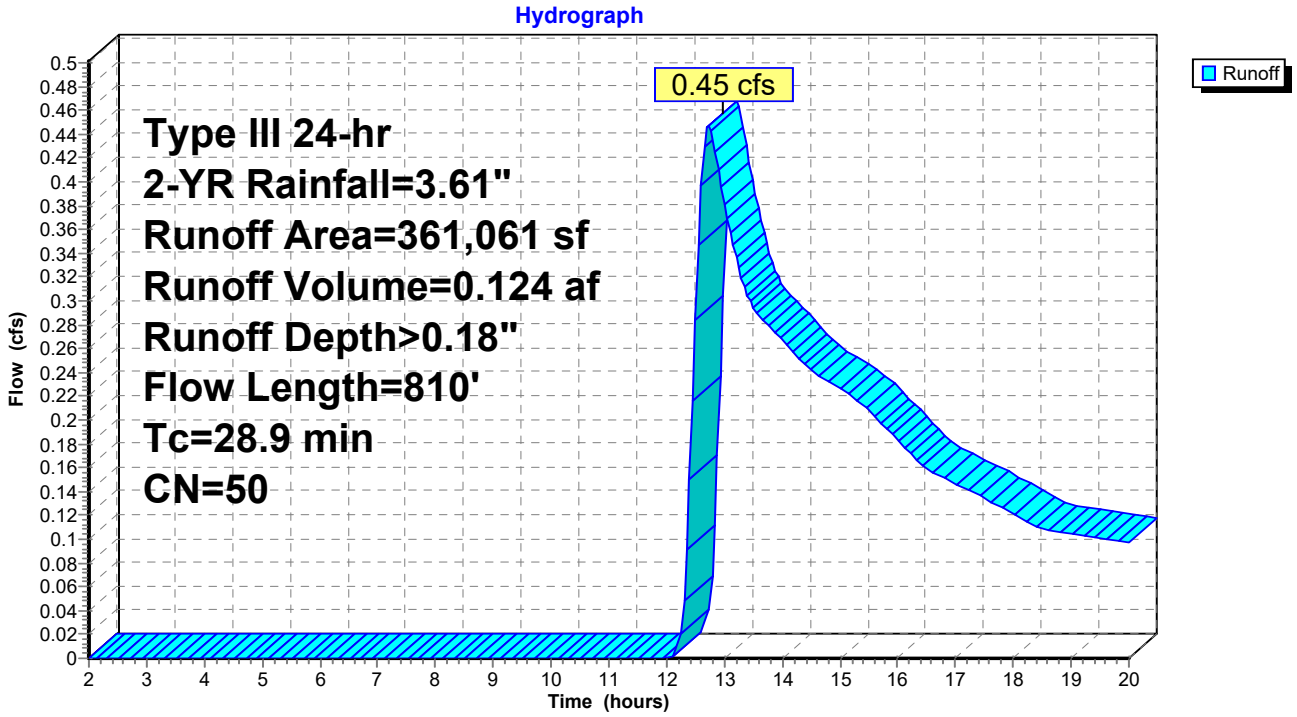
Runoff = 0.45 cfs @ 12.73 hrs, Volume= 0.124 af, Depth> 0.18"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

Area (sf)	CN	Description
186,370	30	Woods, Good, HSG A
13,470	55	Woods, Good, HSG B
116,794	70	Woods, Good, HSG C
44,427	77	Woods, Good, HSG D
361,061	50	Weighted Average
361,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
2.6	165	0.0450	1.06		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.5	45	0.0100	0.50		**Shallow Concentrated Flow, Next 45 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
5.2	165	0.0110	0.52		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.2	90	0.0600	1.22		**Shallow Concentrated Flow, Last 90 feet** Woodland Kv= 5.0 fps
28.9	810	Total			

Subcatchment 30: Drainage Area 30

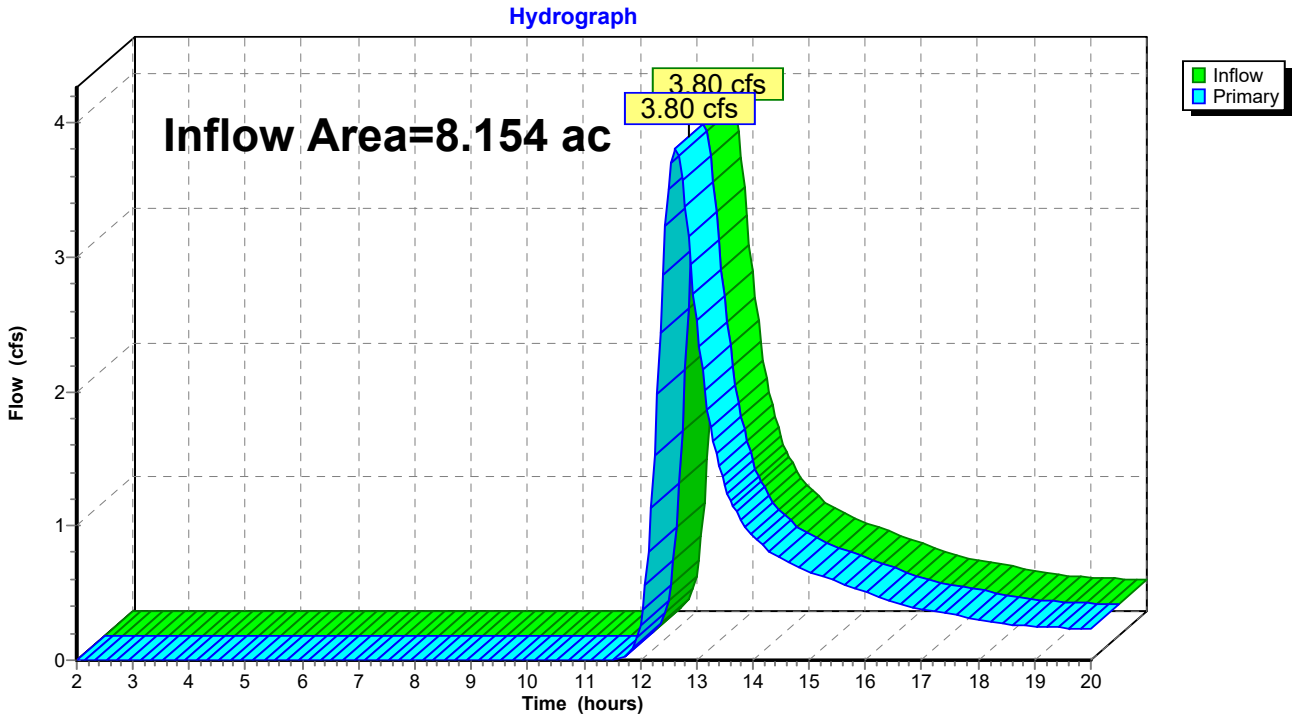


Summary for Link x2000: Off-Site Northwest

Inflow Area = 8.154 ac, 0.00% Impervious, Inflow Depth > 0.81" for 2-YR event
Inflow = 3.80 cfs @ 12.63 hrs, Volume= 0.549 af
Primary = 3.80 cfs @ 12.63 hrs, Volume= 0.549 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

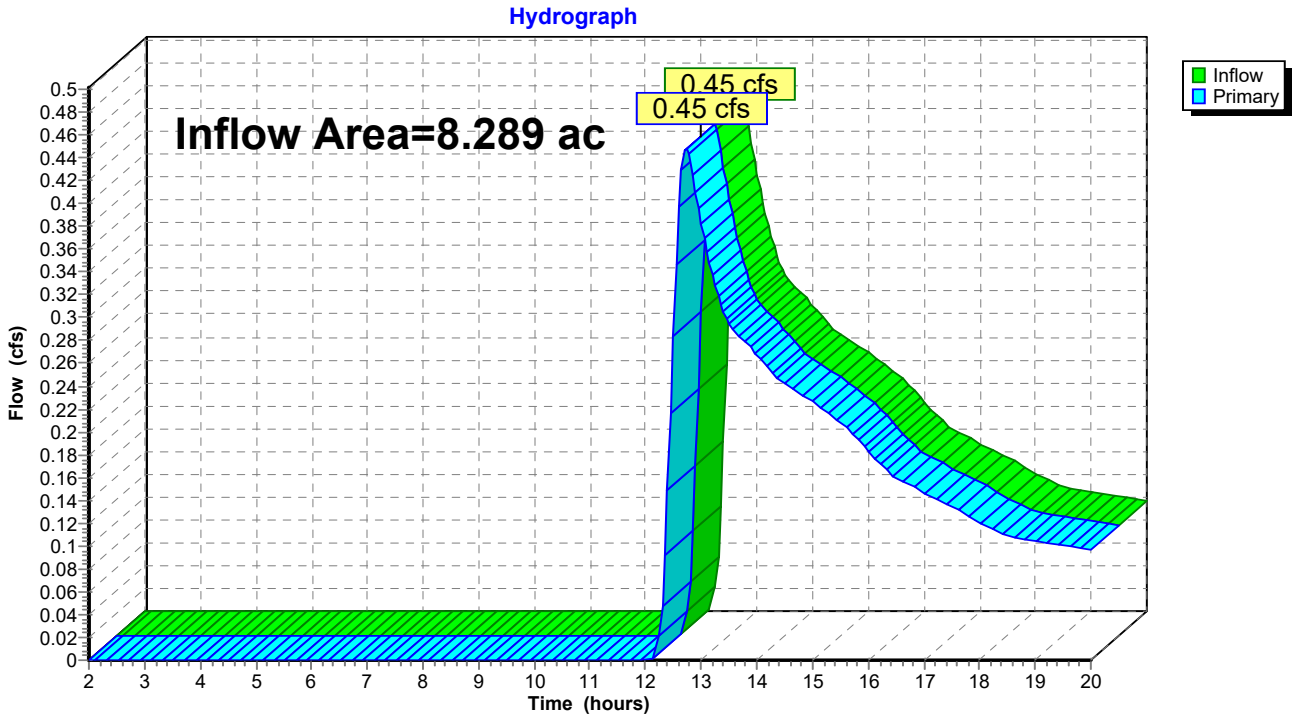


Summary for Link x3000: Off-Site Northeast

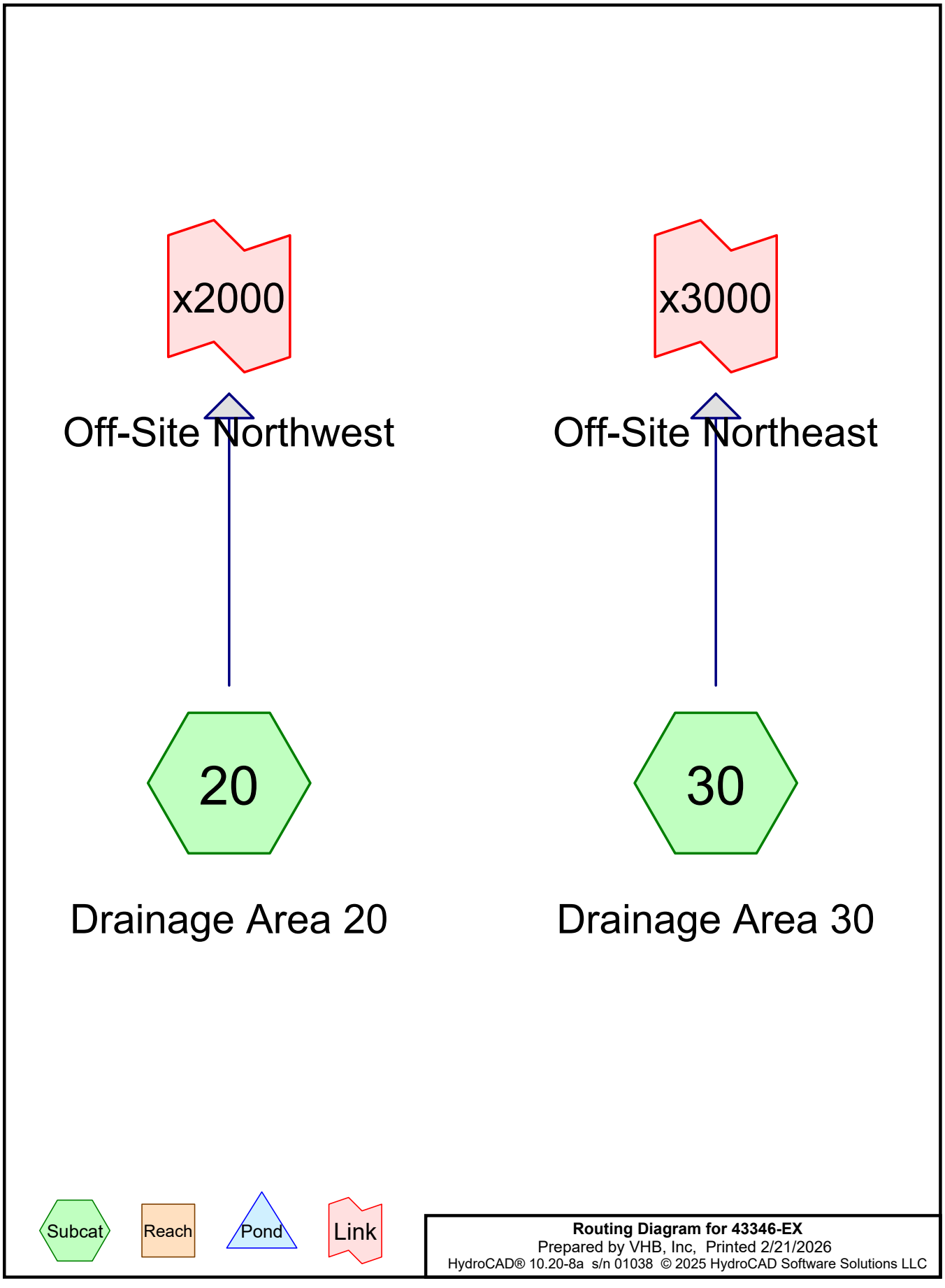
Inflow Area = 8.289 ac, 0.00% Impervious, Inflow Depth > 0.18" for 2-YR event
Inflow = 0.45 cfs @ 12.73 hrs, Volume= 0.124 af
Primary = 0.45 cfs @ 12.73 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



10-Year Storm Event – Existing


x2000
x3000
Off-Site Northwest
Off-Site Northeast
20
30
Drainage Area 20
Drainage Area 30
Subcat
Reach
Pond
Link
Routing Diagram for 43346-EX
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-YR	Type III 24-hr		Default	24.00	1	5.86	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.273	30	Woods, Good, HSG A (20, 30)
0.309	55	Woods, Good, HSG B (30)
8.092	70	Woods, Good, HSG C (20, 30)
2.769	77	Woods, Good, HSG D (20, 30)
16.443	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.273	HSG A	20, 30
0.309	HSG B	30
8.092	HSG C	20, 30
2.769	HSG D	20, 30
0.000	Other	
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
5.273	0.309	8.092	2.769	0.000	16.443	Woods, Good	20, 30
5.273	**0.309**	**8.092**	**2.769**	**0.000**	**16.443**	**TOTAL AREA**	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment20: Drainage Area 20 Runoff Area=355,202 sf 0.00% Impervious Runoff Depth>2.20"
Flow Length=640' Tc=40.2 min CN=67 Runoff=11.15 cfs 1.497 af

Subcatchment30: Drainage Area 30 Runoff Area=361,061 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=810' Tc=28.9 min CN=50 Runoff=4.72 cfs 0.650 af

Link x2000: Off-Site Northwest Inflow=11.15 cfs 1.497 af
Primary=11.15 cfs 1.497 af

Link x3000: Off-Site Northeast Inflow=4.72 cfs 0.650 af
Primary=4.72 cfs 0.650 af

Total Runoff Area = 16.443 ac Runoff Volume = 2.148 af Average Runoff Depth = 1.57"
100.00% Pervious = 16.443 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 20: Drainage Area 20

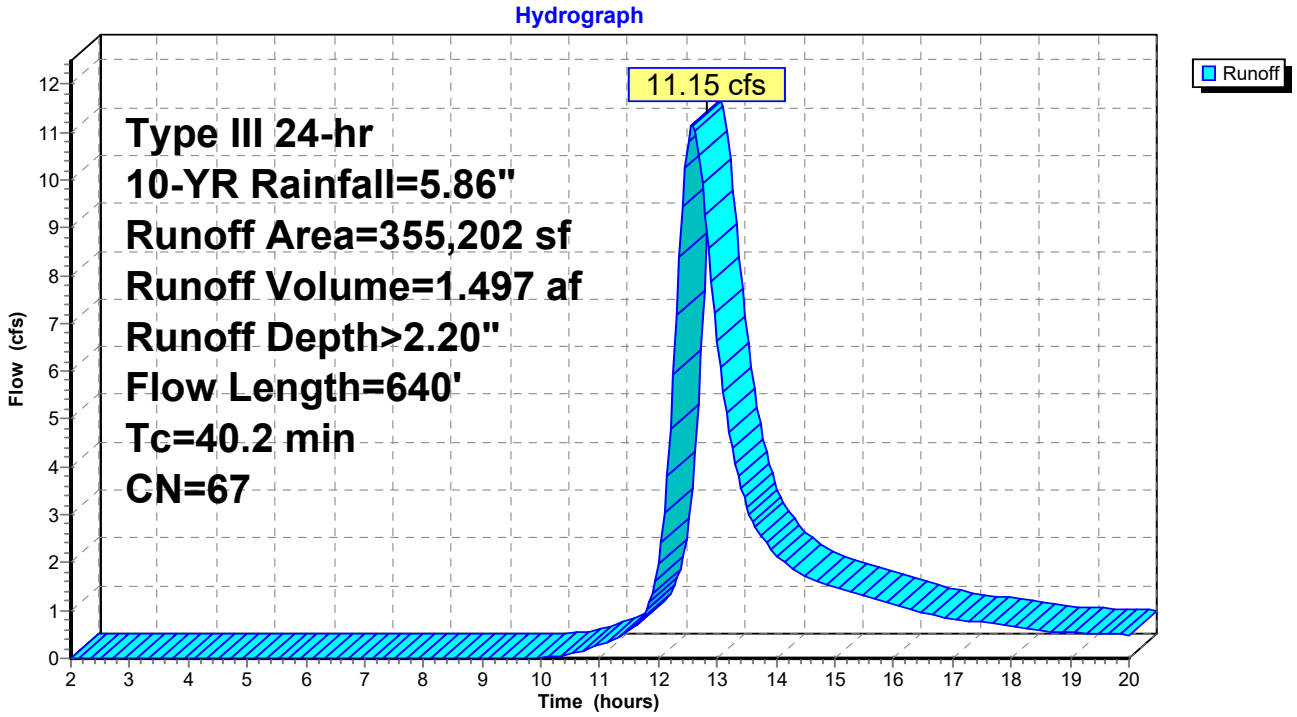
Runoff = 11.15 cfs @ 12.58 hrs, Volume= 1.497 af, Depth> 2.20"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

Area (sf)	CN	Description
43,319	30	Woods, Good, HSG A
235,701	70	Woods, Good, HSG C
76,182	77	Woods, Good, HSG D
355,202	67	Weighted Average
355,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	50	0.0100	0.03		**Sheet Flow, First 50 feet of woods** Woods: Dense underbrush n= 0.800 P2= 3.61"
3.0	90	0.0100	0.50		**Shallow Concentrated Flow, Next 90 feet of woods** Woodland Kv= 5.0 fps
3.8	200	0.0300	0.87		**Shallow Concentrated Flow, Next 200 feet of woods** Woodland Kv= 5.0 fps
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
0.6	30	0.0300	0.87		**Shallow Concentrated Flow, Next 30 feet of woods** Woodland Kv= 5.0 fps
0.4	35	0.1000	1.58		**Shallow Concentrated Flow, Next 35 feet of woods** Woodland Kv= 5.0 fps
0.4	95	0.5000	3.54		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
2.1	45	0.0050	0.35		**Shallow Concentrated Flow, Lest 45 feet of woods** Woodland Kv= 5.0 fps
40.2	640	Total			

Subcatchment 20: Drainage Area 20



Summary for Subcatchment 30: Drainage Area 30

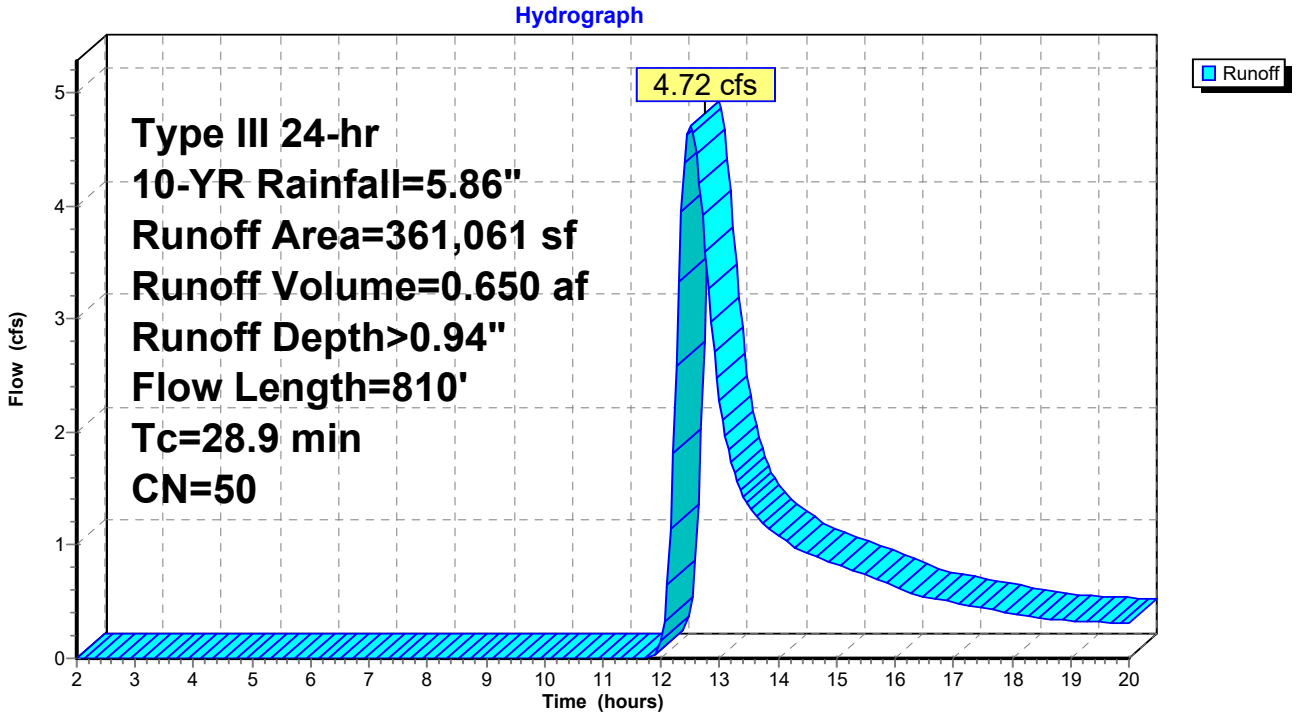
Runoff = 4.72 cfs @ 12.50 hrs, Volume= 0.650 af, Depth> 0.94"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

Area (sf)	CN	Description
186,370	30	Woods, Good, HSG A
13,470	55	Woods, Good, HSG B
116,794	70	Woods, Good, HSG C
44,427	77	Woods, Good, HSG D
361,061	50	Weighted Average
361,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
2.6	165	0.0450	1.06		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.5	45	0.0100	0.50		**Shallow Concentrated Flow, Next 45 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
5.2	165	0.0110	0.52		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.2	90	0.0600	1.22		**Shallow Concentrated Flow, Last 90 feet** Woodland Kv= 5.0 fps
28.9	810	Total			

Subcatchment 30: Drainage Area 30

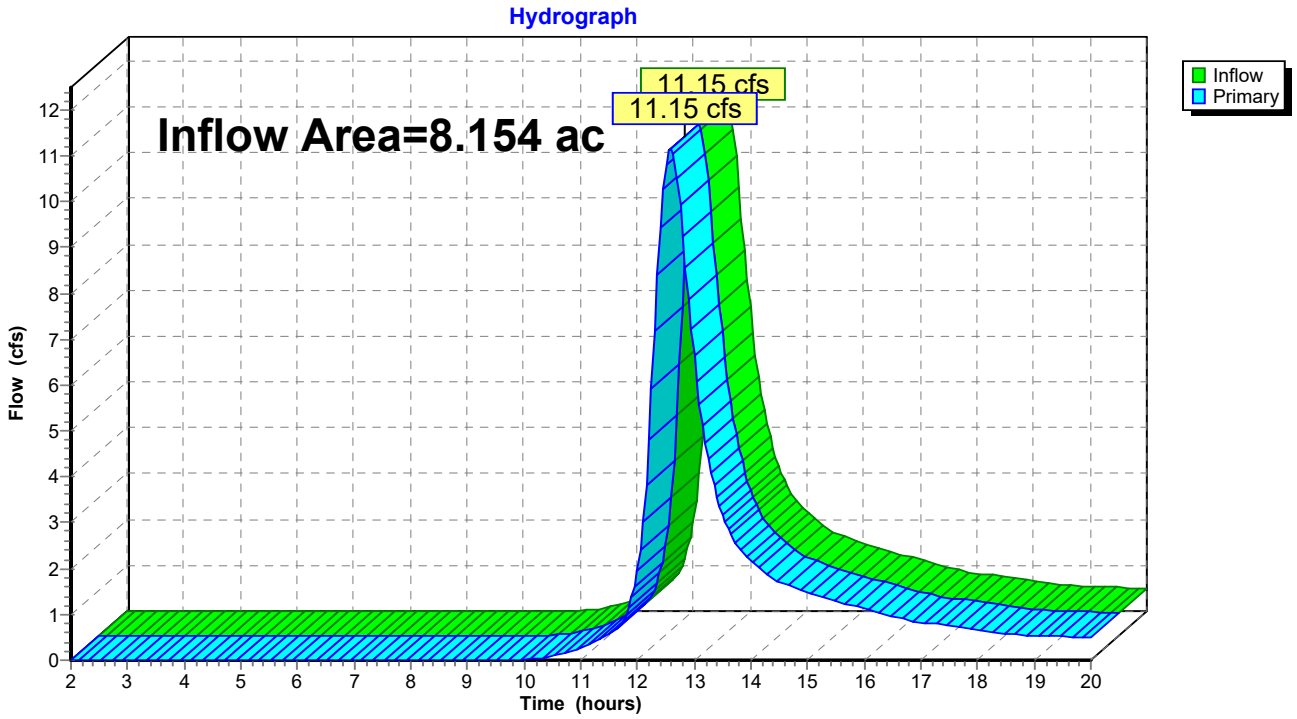


Summary for Link x2000: Off-Site Northwest

Inflow Area = 8.154 ac, 0.00% Impervious, Inflow Depth > 2.20" for 10-YR event
Inflow = 11.15 cfs @ 12.58 hrs, Volume= 1.497 af
Primary = 11.15 cfs @ 12.58 hrs, Volume= 1.497 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

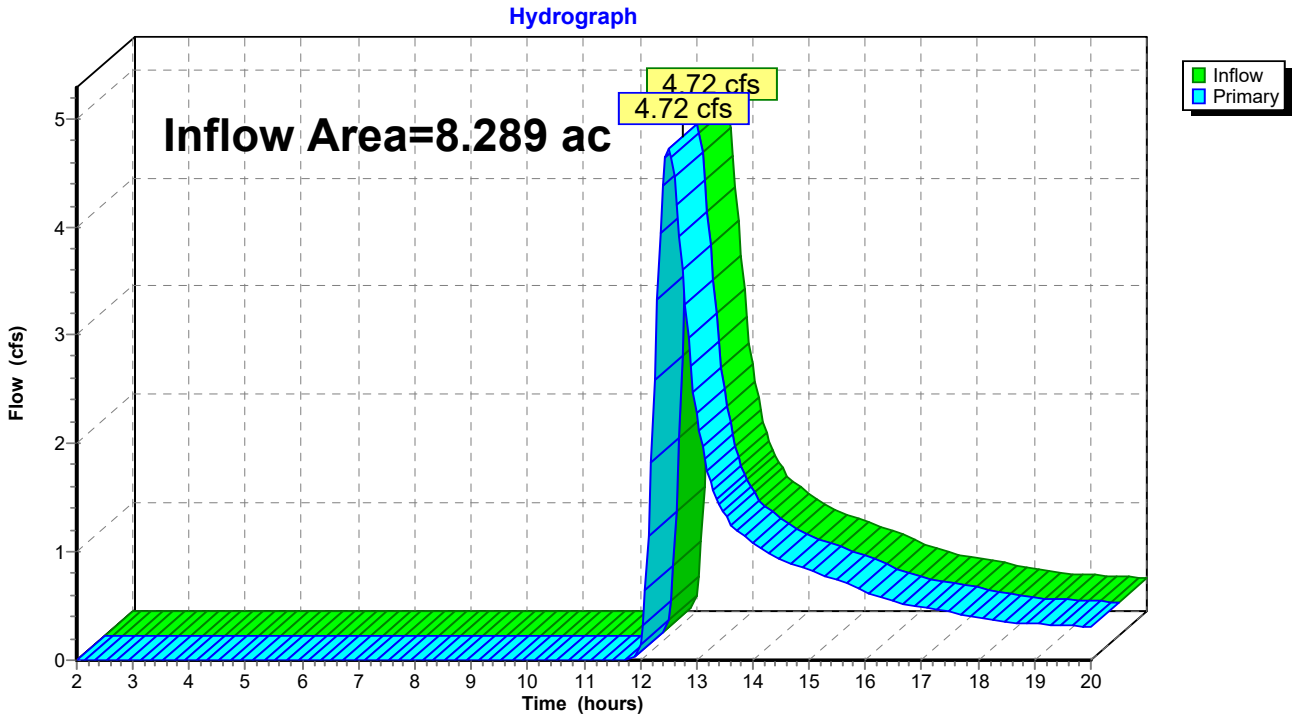


Summary for Link x3000: Off-Site Northeast

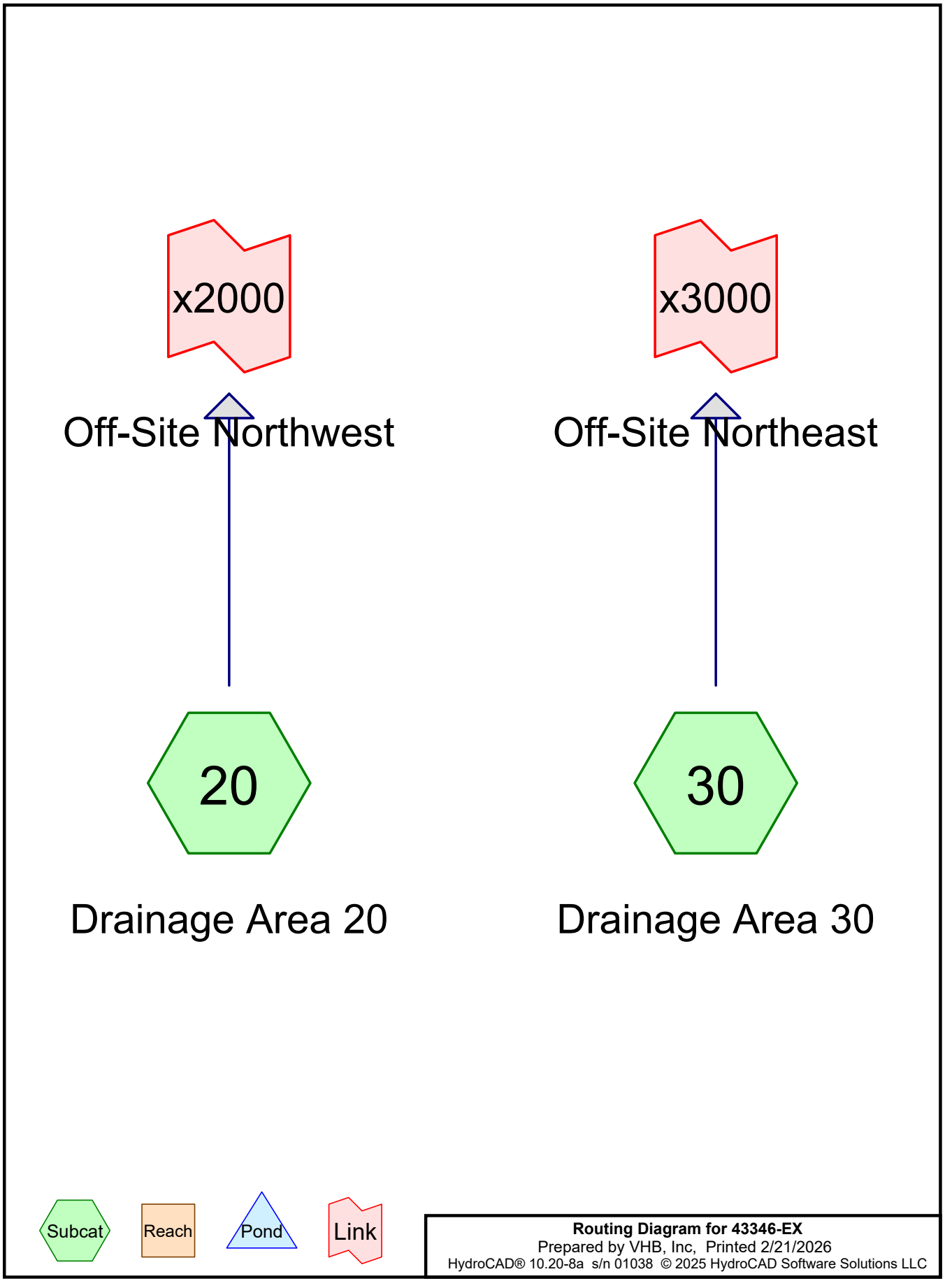
Inflow Area = 8.289 ac, 0.00% Impervious, Inflow Depth > 0.94" for 10-YR event
Inflow = 4.72 cfs @ 12.50 hrs, Volume= 0.650 af
Primary = 4.72 cfs @ 12.50 hrs, Volume= 0.650 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



25-Year Storm Event – Existing


x2000
x3000
Off-Site Northwest
Off-Site Northeast
20
30
Drainage Area 20
Drainage Area 30
Subcat
Reach
Pond
Link
Routing Diagram for 43346-EX
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	7.70	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.273	30	Woods, Good, HSG A (20, 30)
0.309	55	Woods, Good, HSG B (30)
8.092	70	Woods, Good, HSG C (20, 30)
2.769	77	Woods, Good, HSG D (20, 30)
16.443	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.273	HSG A	20, 30
0.309	HSG B	30
8.092	HSG C	20, 30
2.769	HSG D	20, 30
0.000	Other	
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
5.273	0.309	8.092	2.769	0.000	16.443	Woods, Good	20, 30
5.273	**0.309**	**8.092**	**2.769**	**0.000**	**16.443**	**TOTAL AREA**	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment20: Drainage Area 20 Runoff Area=355,202 sf 0.00% Impervious Runoff Depth>3.55"
Flow Length=640' Tc=40.2 min CN=67 Runoff=18.13 cfs 2.414 af

Subcatchment30: Drainage Area 30 Runoff Area=361,061 sf 0.00% Impervious Runoff Depth>1.85"
Flow Length=810' Tc=28.9 min CN=50 Runoff=10.43 cfs 1.278 af

Link x2000: Off-Site Northwest Inflow=18.13 cfs 2.414 af
Primary=18.13 cfs 2.414 af

Link x3000: Off-Site Northeast Inflow=10.43 cfs 1.278 af
Primary=10.43 cfs 1.278 af

Total Runoff Area = 16.443 ac Runoff Volume = 3.693 af Average Runoff Depth = 2.69"
100.00% Pervious = 16.443 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 20: Drainage Area 20

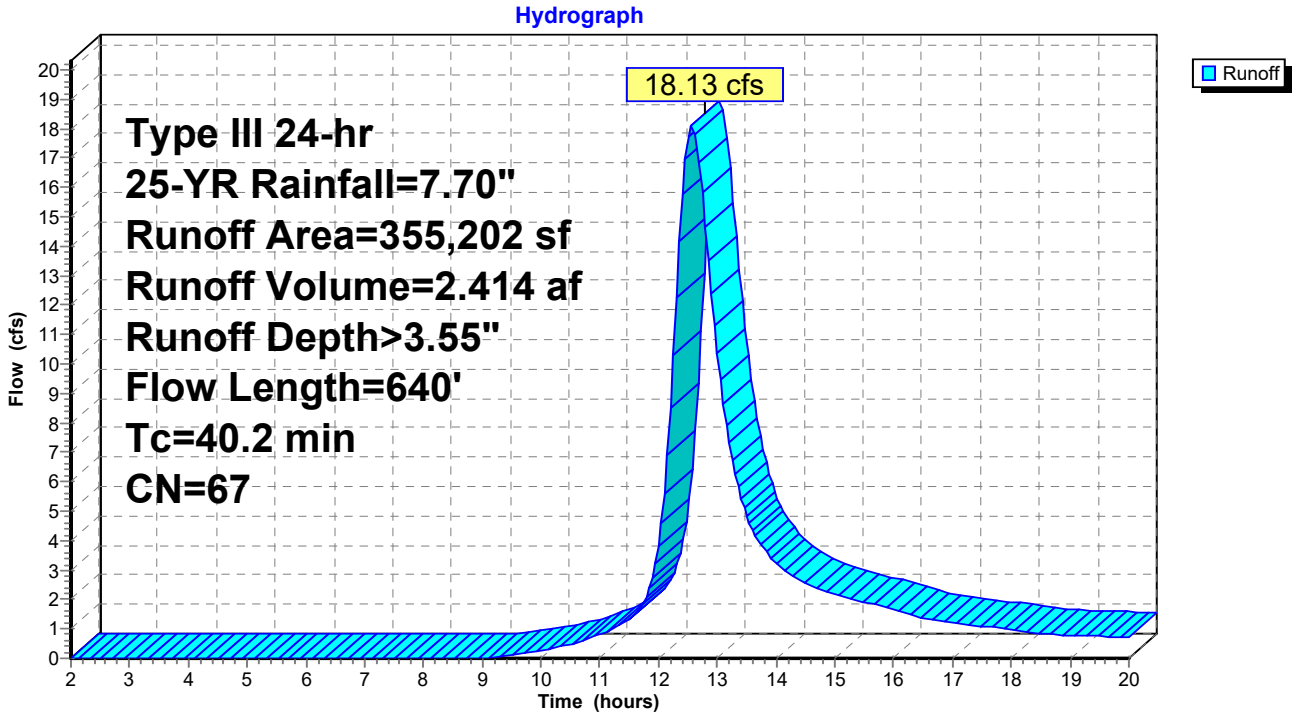
Runoff = 18.13 cfs @ 12.56 hrs, Volume= 2.414 af, Depth> 3.55"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

Area (sf)	CN	Description
43,319	30	Woods, Good, HSG A
235,701	70	Woods, Good, HSG C
76,182	77	Woods, Good, HSG D
355,202	67	Weighted Average
355,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	50	0.0100	0.03		**Sheet Flow, First 50 feet of woods** Woods: Dense underbrush n= 0.800 P2= 3.61"
3.0	90	0.0100	0.50		**Shallow Concentrated Flow, Next 90 feet of woods** Woodland Kv= 5.0 fps
3.8	200	0.0300	0.87		**Shallow Concentrated Flow, Next 200 feet of woods** Woodland Kv= 5.0 fps
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
0.6	30	0.0300	0.87		**Shallow Concentrated Flow, Next 30 feet of woods** Woodland Kv= 5.0 fps
0.4	35	0.1000	1.58		**Shallow Concentrated Flow, Next 35 feet of woods** Woodland Kv= 5.0 fps
0.4	95	0.5000	3.54		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
2.1	45	0.0050	0.35		**Shallow Concentrated Flow, Lest 45 feet of woods** Woodland Kv= 5.0 fps
40.2	640	Total			

Subcatchment 20: Drainage Area 20



Summary for Subcatchment 30: Drainage Area 30

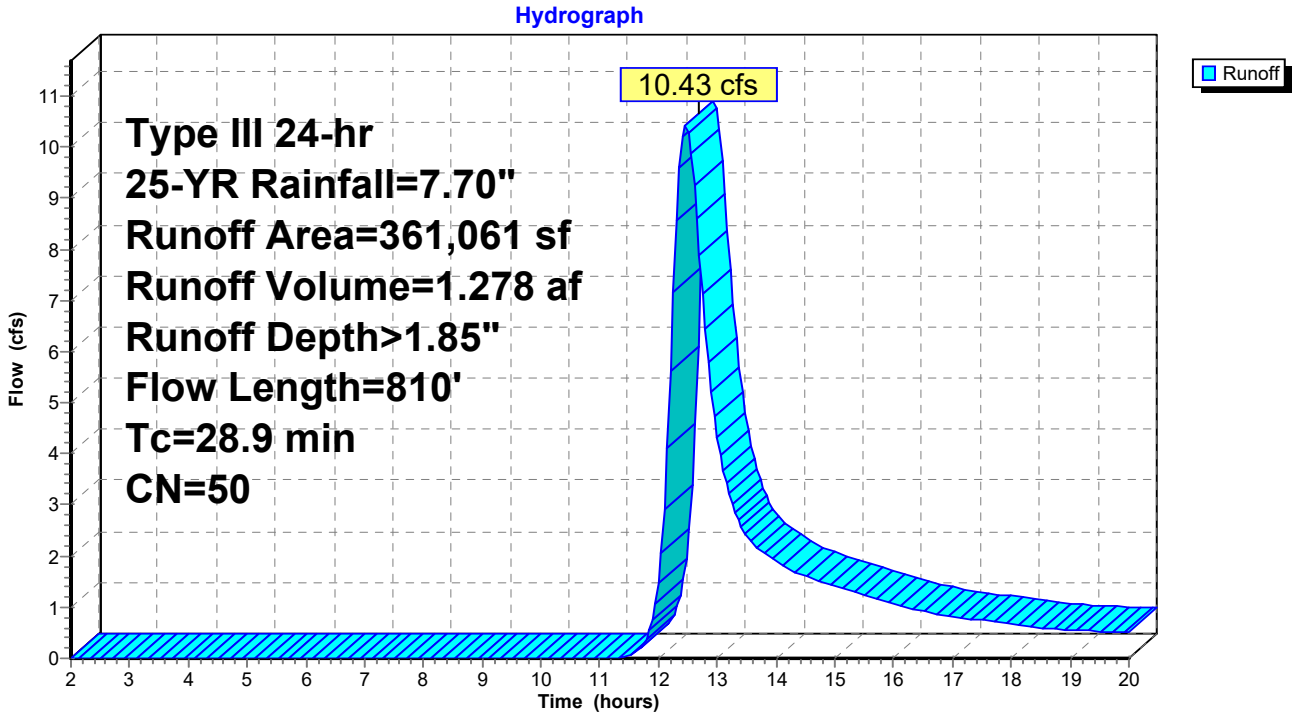
Runoff = 10.43 cfs @ 12.46 hrs, Volume= 1.278 af, Depth> 1.85"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

Area (sf)	CN	Description
186,370	30	Woods, Good, HSG A
13,470	55	Woods, Good, HSG B
116,794	70	Woods, Good, HSG C
44,427	77	Woods, Good, HSG D
361,061	50	Weighted Average
361,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
2.6	165	0.0450	1.06		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.5	45	0.0100	0.50		**Shallow Concentrated Flow, Next 45 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
5.2	165	0.0110	0.52		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.2	90	0.0600	1.22		**Shallow Concentrated Flow, Last 90 feet** Woodland Kv= 5.0 fps
28.9	810	Total			

Subcatchment 30: Drainage Area 30

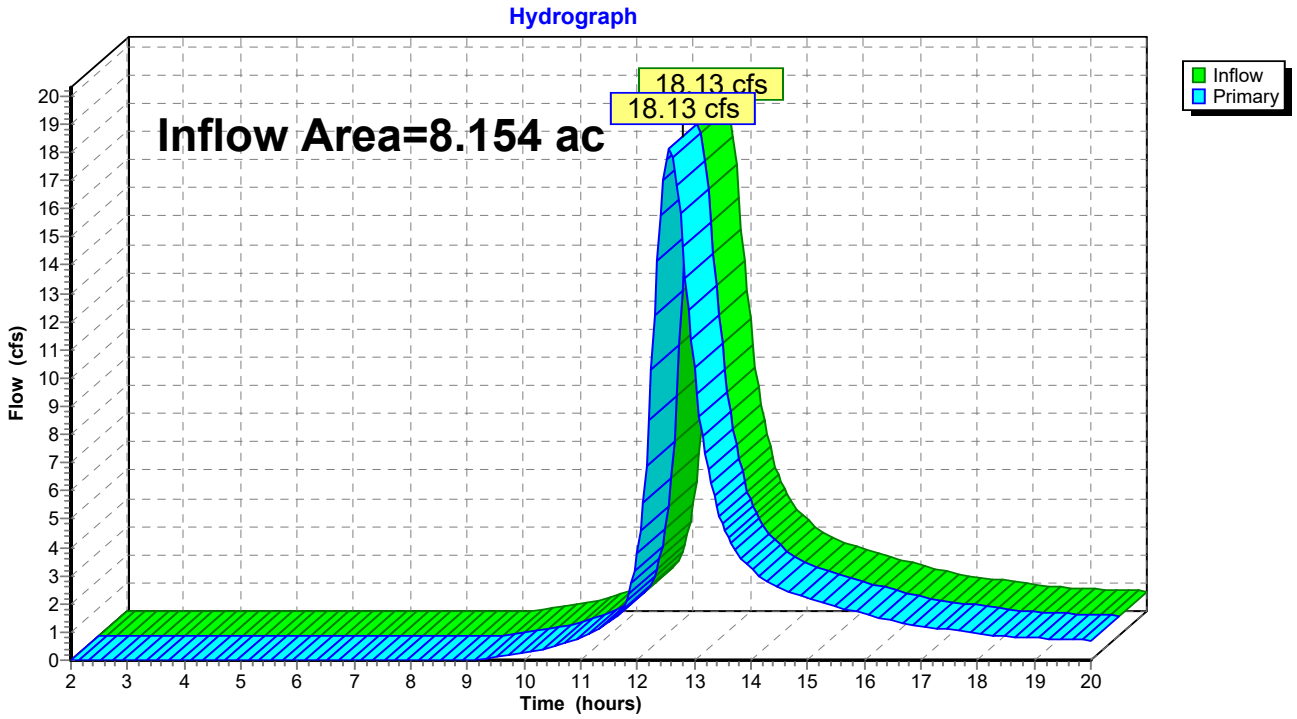


Summary for Link x2000: Off-Site Northwest

Inflow Area = 8.154 ac, 0.00% Impervious, Inflow Depth > 3.55" for 25-YR event
Inflow = 18.13 cfs @ 12.56 hrs, Volume= 2.414 af
Primary = 18.13 cfs @ 12.56 hrs, Volume= 2.414 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

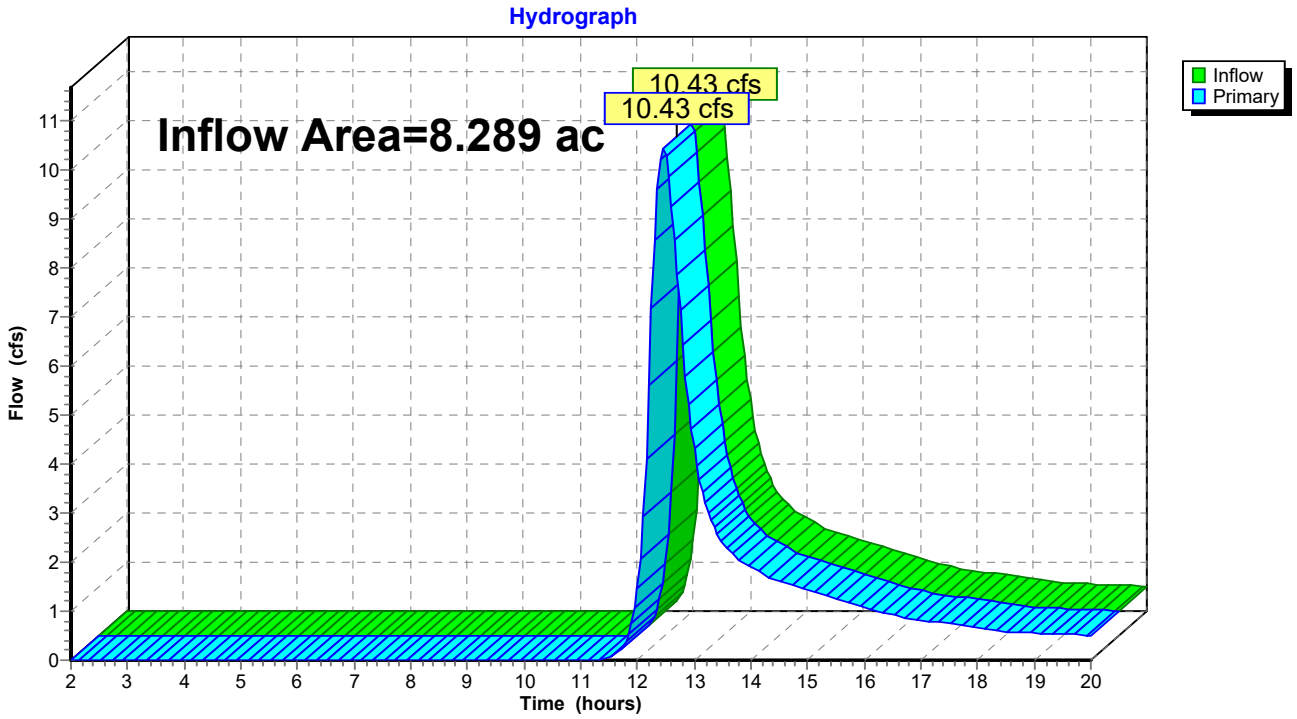


Summary for Link x3000: Off-Site Northeast

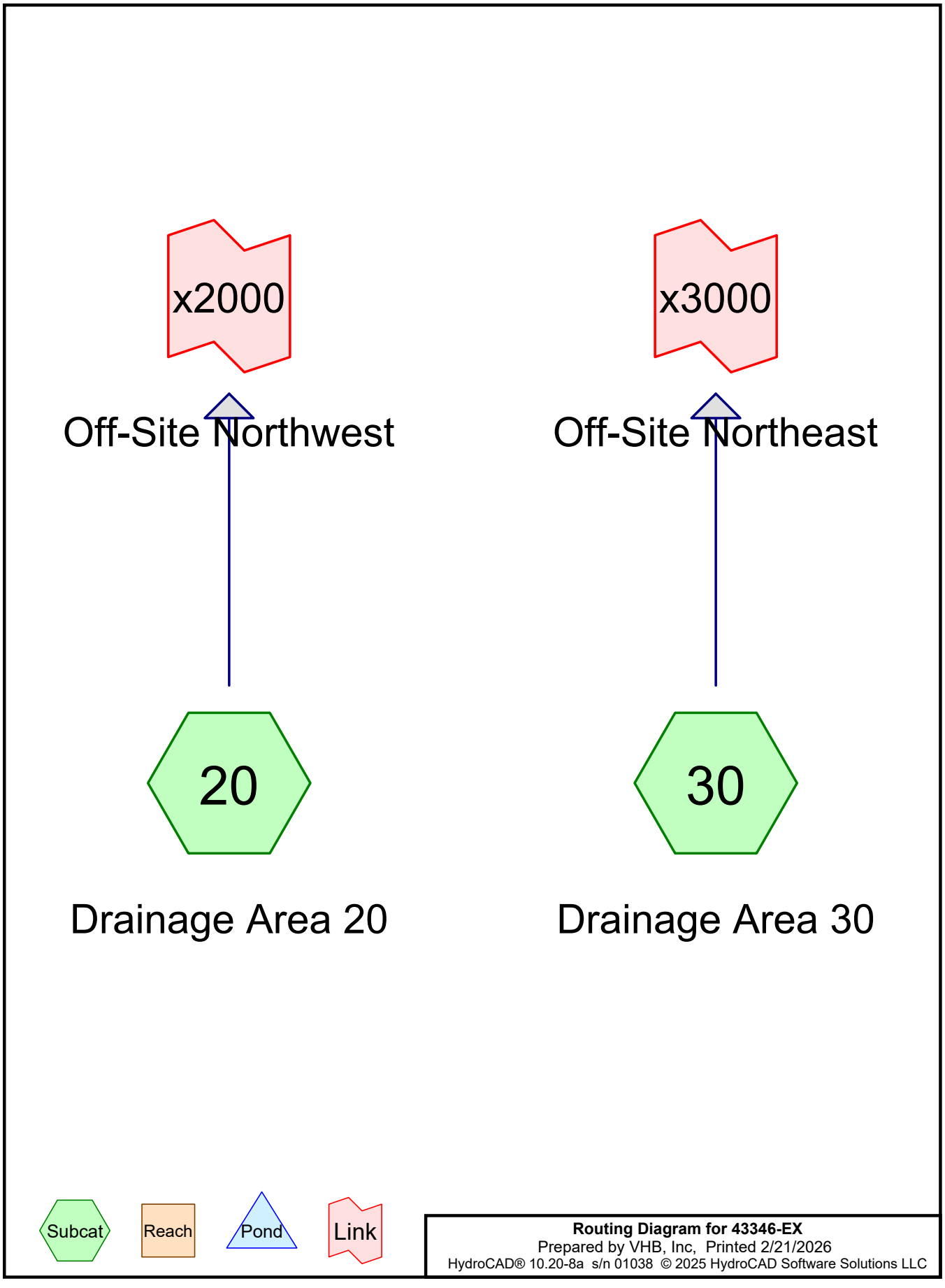
Inflow Area = 8.289 ac, 0.00% Impervious, Inflow Depth > 1.85" for 25-YR event
Inflow = 10.43 cfs @ 12.46 hrs, Volume= 1.278 af
Primary = 10.43 cfs @ 12.46 hrs, Volume= 1.278 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



100-Year Storm Event – Existing


x2000
x3000
Off-Site Northwest
Off-Site Northeast
20
30
Drainage Area 20
Drainage Area 30
Subcat
Reach
Pond
Link
Routing Diagram for 43346-EX
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-YR	Type III 24-hr		Default	24.00	1	10.80	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.273	30	Woods, Good, HSG A (20, 30)
0.309	55	Woods, Good, HSG B (30)
8.092	70	Woods, Good, HSG C (20, 30)
2.769	77	Woods, Good, HSG D (20, 30)
16.443	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.273	HSG A	20, 30
0.309	HSG B	30
8.092	HSG C	20, 30
2.769	HSG D	20, 30
0.000	Other	
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
5.273	0.309	8.092	2.769	0.000	16.443	Woods, Good	20, 30
5.273	**0.309**	**8.092**	**2.769**	**0.000**	**16.443**	**TOTAL AREA**	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment20: Drainage Area 20 Runoff Area=355,202 sf 0.00% Impervious Runoff Depth>6.05"
Flow Length=640' Tc=40.2 min CN=67 Runoff=30.67 cfs 4.110 af

Subcatchment30: Drainage Area 30 Runoff Area=361,061 sf 0.00% Impervious Runoff Depth>3.75"
Flow Length=810' Tc=28.9 min CN=50 Runoff=22.29 cfs 2.588 af

Link x2000: Off-Site Northwest Inflow=30.67 cfs 4.110 af
Primary=30.67 cfs 4.110 af

Link x3000: Off-Site Northeast Inflow=22.29 cfs 2.588 af
Primary=22.29 cfs 2.588 af

Total Runoff Area = 16.443 ac Runoff Volume = 6.697 af Average Runoff Depth = 4.89"
100.00% Pervious = 16.443 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 20: Drainage Area 20

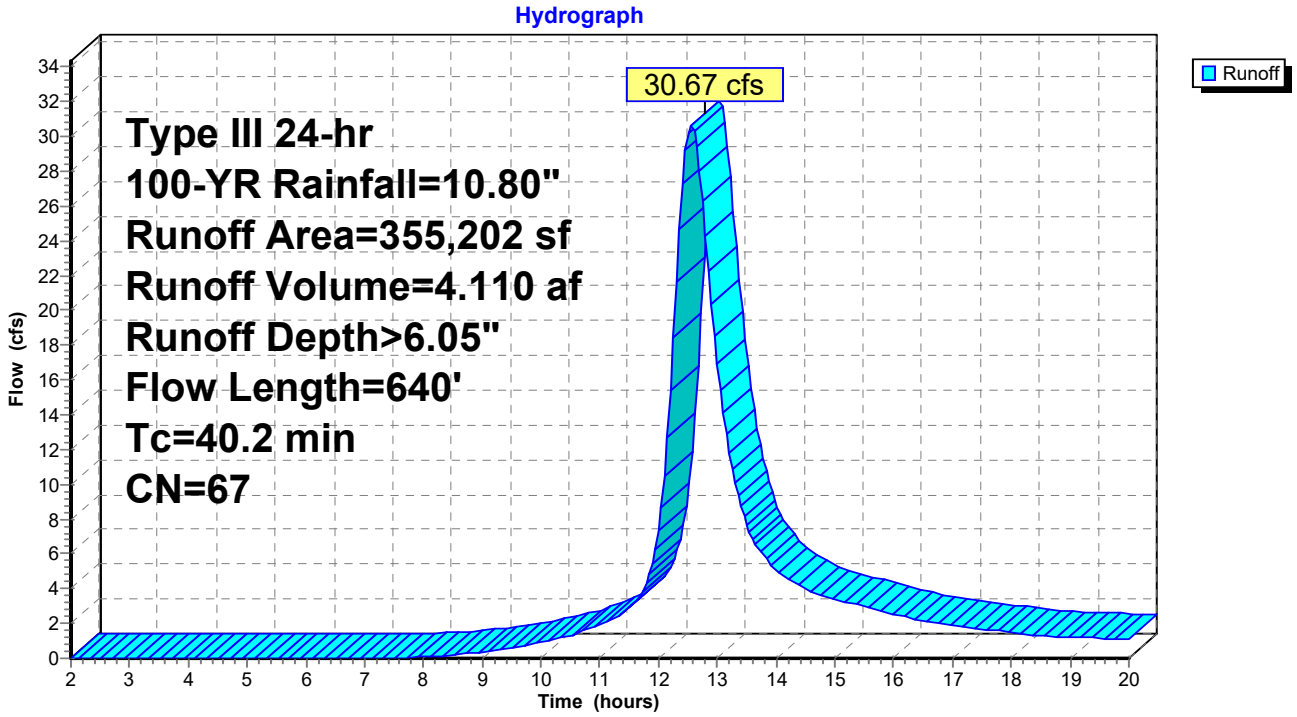
Runoff = 30.67 cfs @ 12.55 hrs, Volume= 4.110 af, Depth> 6.05"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

Area (sf)	CN	Description
43,319	30	Woods, Good, HSG A
235,701	70	Woods, Good, HSG C
76,182	77	Woods, Good, HSG D
355,202	67	Weighted Average
355,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	50	0.0100	0.03		**Sheet Flow, First 50 feet of woods** Woods: Dense underbrush n= 0.800 P2= 3.61"
3.0	90	0.0100	0.50		**Shallow Concentrated Flow, Next 90 feet of woods** Woodland Kv= 5.0 fps
3.8	200	0.0300	0.87		**Shallow Concentrated Flow, Next 200 feet of woods** Woodland Kv= 5.0 fps
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
0.6	30	0.0300	0.87		**Shallow Concentrated Flow, Next 30 feet of woods** Woodland Kv= 5.0 fps
0.4	35	0.1000	1.58		**Shallow Concentrated Flow, Next 35 feet of woods** Woodland Kv= 5.0 fps
0.4	95	0.5000	3.54		**Shallow Concentrated Flow, Next 95 feet of woods** Woodland Kv= 5.0 fps
2.1	45	0.0050	0.35		**Shallow Concentrated Flow, Lest 45 feet of woods** Woodland Kv= 5.0 fps
40.2	640	Total			

Subcatchment 20: Drainage Area 20



Summary for Subcatchment 30: Drainage Area 30

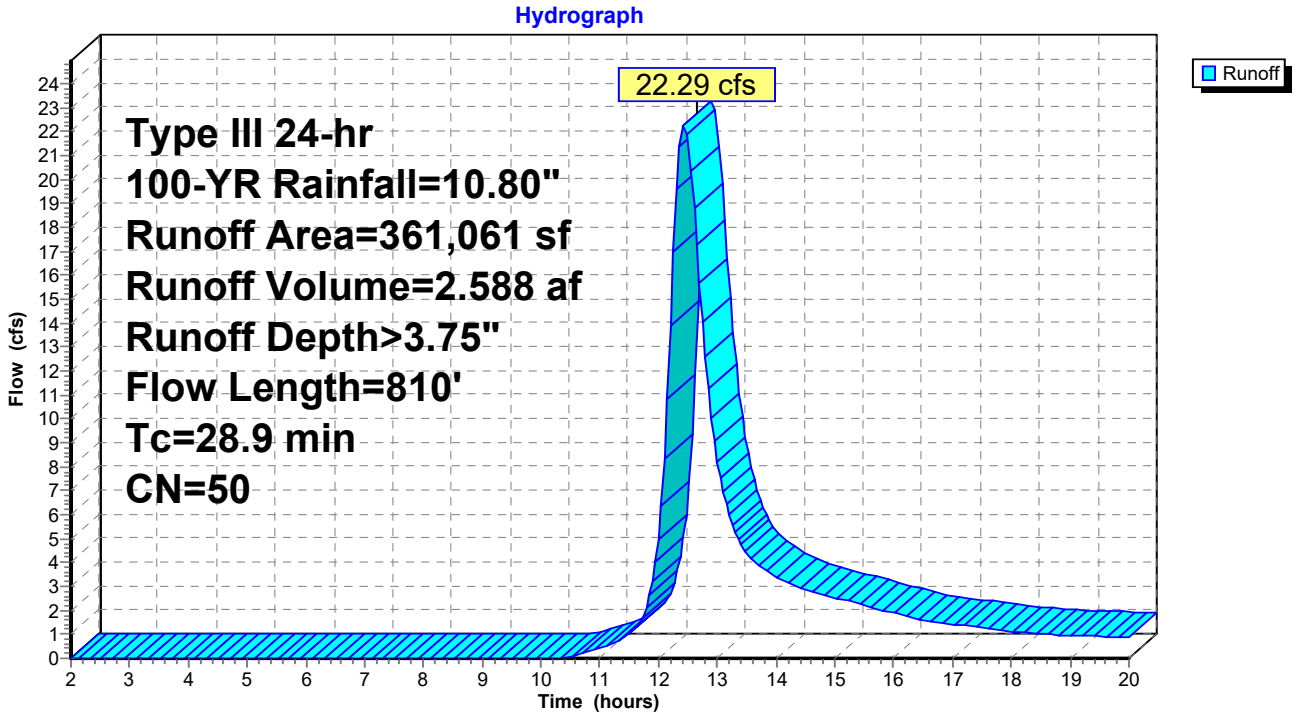
Runoff = 22.29 cfs @ 12.43 hrs, Volume= 2.588 af, Depth> 3.75"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

Area (sf)	CN	Description
186,370	30	Woods, Good, HSG A
13,470	55	Woods, Good, HSG B
116,794	70	Woods, Good, HSG C
44,427	77	Woods, Good, HSG D
361,061	50	Weighted Average
361,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
2.6	165	0.0450	1.06		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.5	45	0.0100	0.50		**Shallow Concentrated Flow, Next 45 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
5.2	165	0.0110	0.52		**Shallow Concentrated Flow, Next 165 feet of woods** Woodland Kv= 5.0 fps
1.2	90	0.0600	1.22		**Shallow Concentrated Flow, Last 90 feet** Woodland Kv= 5.0 fps
28.9	810	Total			

Subcatchment 30: Drainage Area 30

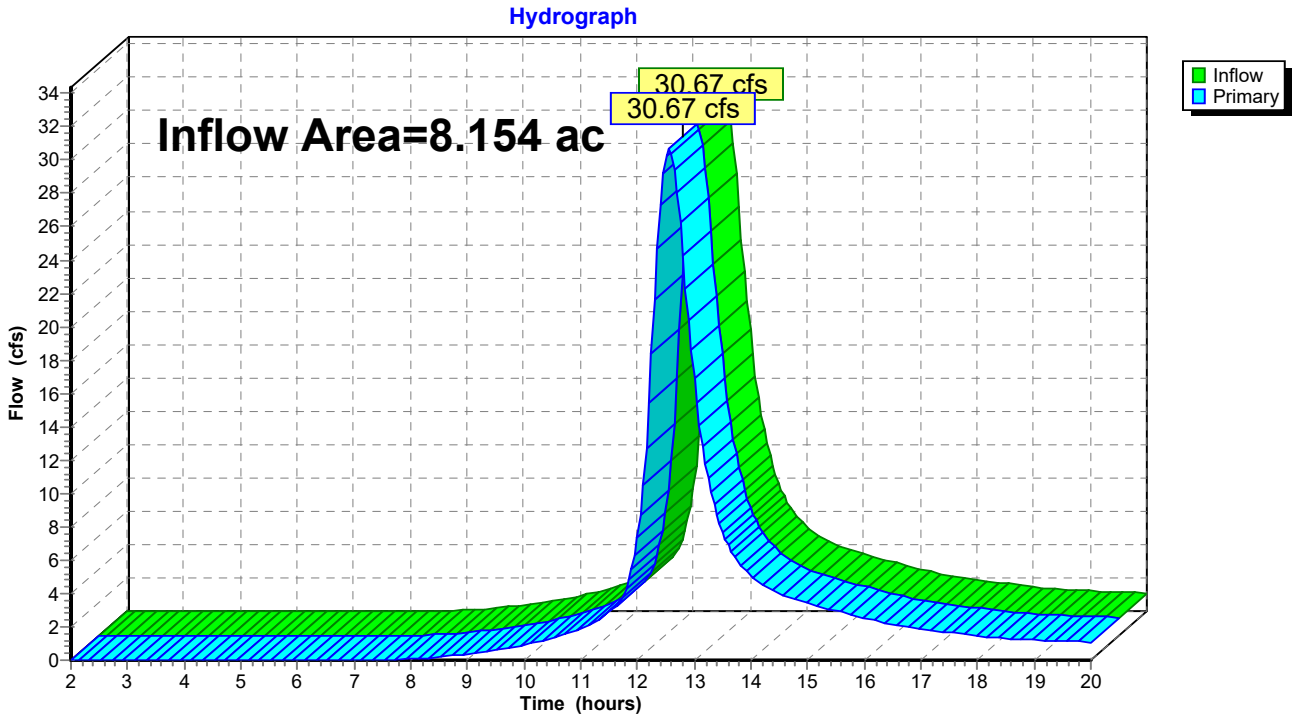


Summary for Link x2000: Off-Site Northwest

Inflow Area = 8.154 ac, 0.00% Impervious, Inflow Depth > 6.05" for 100-YR event
Inflow = 30.67 cfs @ 12.55 hrs, Volume= 4.110 af
Primary = 30.67 cfs @ 12.55 hrs, Volume= 4.110 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

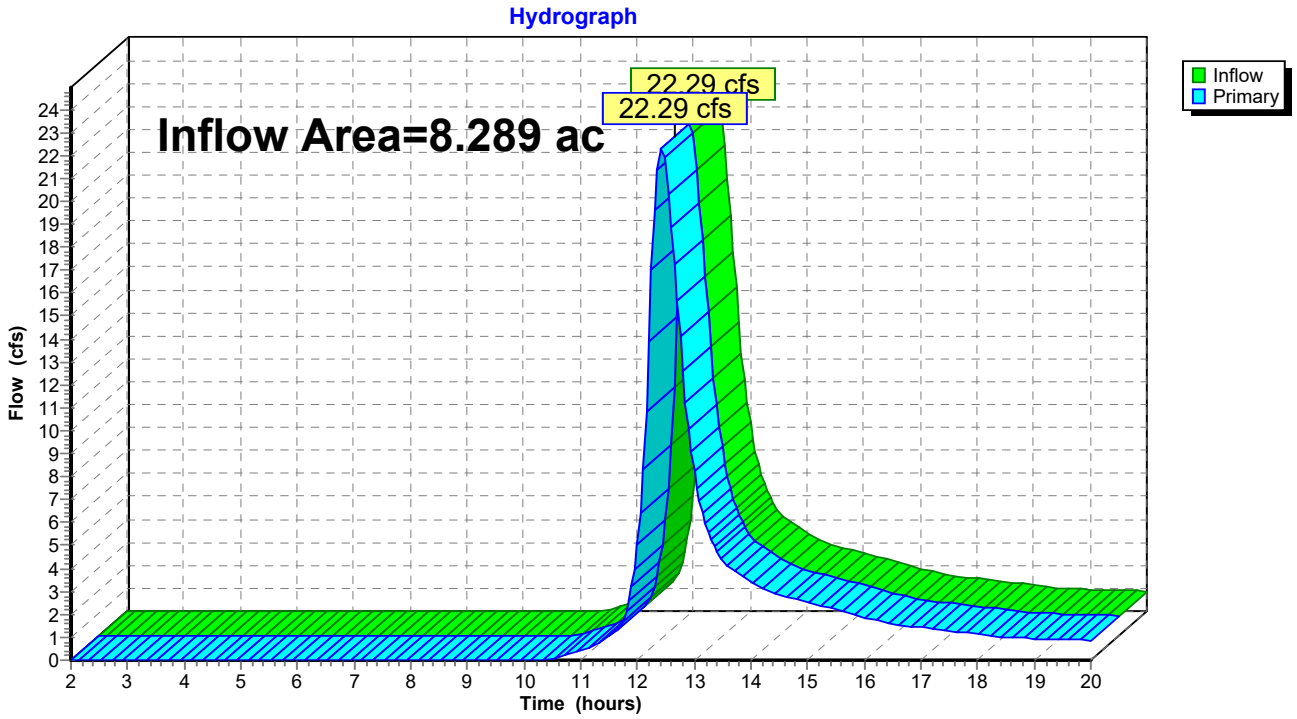


Summary for Link x3000: Off-Site Northeast

Inflow Area = 8.289 ac, 0.00% Impervious, Inflow Depth > 3.75" for 100-YR event
Inflow = 22.29 cfs @ 12.43 hrs, Volume= 2.588 af
Primary = 22.29 cfs @ 12.43 hrs, Volume= 2.588 af, Atten= 0%, Lag= 0.0 min

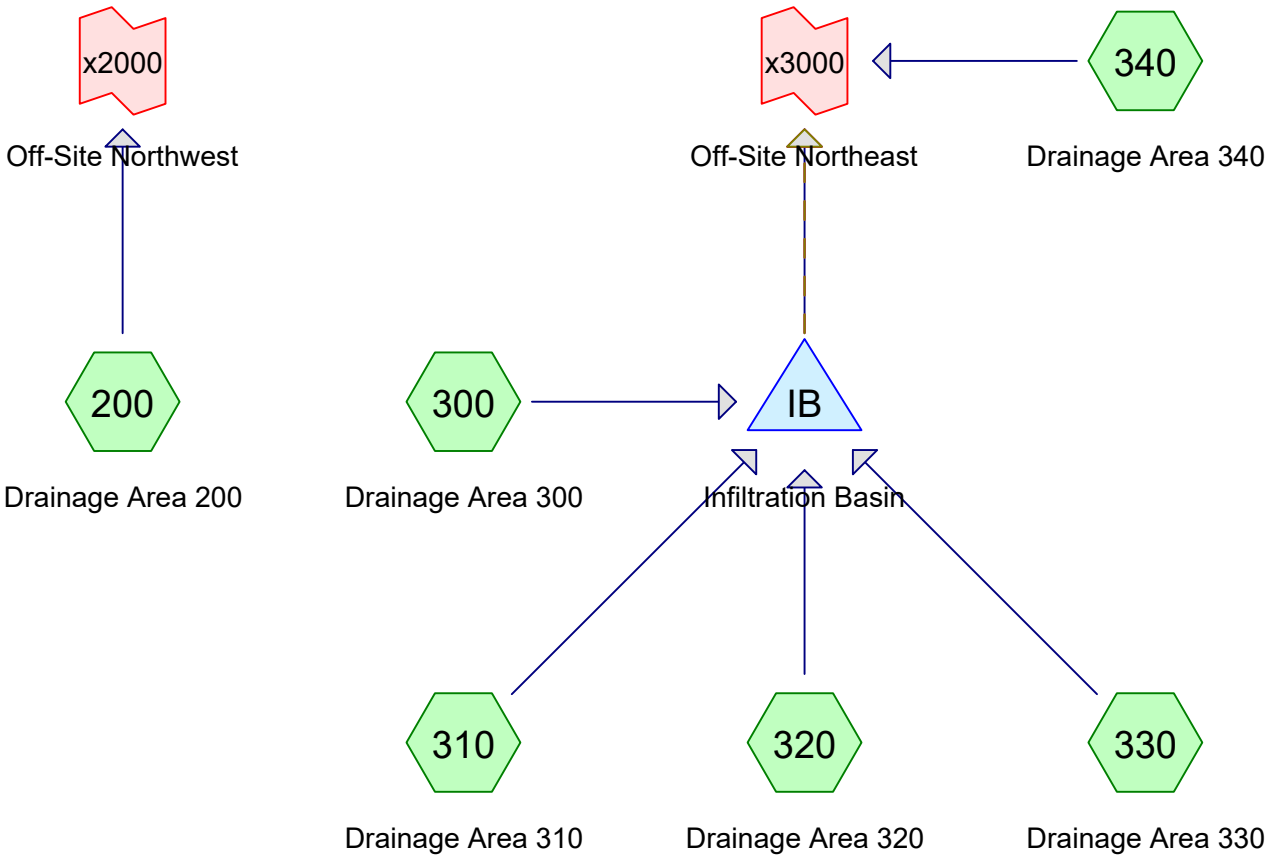
Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



HydroCAD Analysis: Proposed Conditions

2-Year Storm Event – Proposed



Subcat Reach Pond Link

Routing Diagram for 43346-PR
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	Type III 24-hr		Default	24.00	1	3.61	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.058	39	>75% Grass cover, Good, HSG A (200, 300, 310, 320, 330)
0.117	61	>75% Grass cover, Good, HSG B (330, 340)
2.940	74	>75% Grass cover, Good, HSG C (200, 300, 310, 330, 340)
0.528	80	>75% Grass cover, Good, HSG D (300, 320, 330)
3.340	98	Impervious (200, 300, 310, 320, 330)
3.402	30	Woods, Good, HSG A (200, 320, 330)
0.192	55	Woods, Good, HSG B (330, 340)
2.862	70	Woods, Good, HSG C (200, 330, 340)
2.004	77	Woods, Good, HSG D (200, 330)
16.443	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.460	HSG A	200, 300, 310, 320, 330
0.309	HSG B	330, 340
5.802	HSG C	200, 300, 310, 330, 340
2.532	HSG D	200, 300, 320, 330
3.340	Other	200, 300, 310, 320, 330
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.058	0.117	2.940	0.528	0.000	4.643	>75% Grass cover, Good	200, 300, 310, 320, 330, 340
0.000	0.000	0.000	0.000	3.340	3.340	Impervious	200, 300, 310, 320, 330
3.402	0.192	2.862	2.004	0.000	8.460	Woods, Good	200, 320, 330, 340
4.460	**0.309**	**5.802**	**2.532**	**3.340**	**16.443**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	310	0.00	0.00	125.0	0.0100	0.013	0.0	6.0	0.0	
2	310	0.00	0.00	100.0	0.0130	0.013	0.0	15.0	0.0	
3	310	0.00	0.00	90.0	0.0100	0.013	0.0	15.0	0.0	
4	310	0.00	0.00	35.0	0.0060	0.013	0.0	15.0	0.0	
5	310	0.00	0.00	90.0	0.0070	0.013	0.0	15.0	0.0	
6	320	0.00	0.00	275.0	0.0100	0.013	0.0	12.0	0.0	
7	320	0.00	0.00	125.0	0.0100	0.013	0.0	15.0	0.0	
8	320	0.00	0.00	105.0	0.0050	0.013	0.0	15.0	0.0	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment200: Drainage Area 200 Runoff Area=259,497 sf 7.09% Impervious Runoff Depth>1.12"
Flow Length=980' Tc=50.3 min CN=73 Runoff=3.64 cfs 0.558 af

Subcatchment300: Drainage Area 300 Runoff Area=144,557 sf 71.58% Impervious Runoff Depth>2.50"
Tc=6.0 min CN=91 Runoff=9.83 cfs 0.690 af

Subcatchment310: Drainage Area 310 Runoff Area=54,317 sf 27.59% Impervious Runoff Depth>0.59"
Flow Length=563' Tc=9.9 min CN=62 Runoff=0.65 cfs 0.061 af

Subcatchment320: Drainage Area 320 Runoff Area=109,281 sf 1.07% Impervious Runoff Depth=0.00"
Flow Length=1,325' Tc=23.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment330: Drainage Area 330 Runoff Area=131,604 sf 5.68% Impervious Runoff Depth>0.55"
Flow Length=465' Tc=11.9 min CN=61 Runoff=1.33 cfs 0.138 af

Subcatchment340: Drainage Area 340 Runoff Area=17,007 sf 0.00% Impervious Runoff Depth>0.64"
Flow Length=140' Tc=9.1 min CN=63 Runoff=0.23 cfs 0.021 af

Pond IB: Infiltration Basin Peak Elev=95.77' Storage=21,189 cf Inflow=11.12 cfs 0.890 af
s 0.510 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.510 af

Link x2000: Off-Site Northwest Inflow=3.64 cfs 0.558 af
Primary=3.64 cfs 0.558 af

Link x3000: Off-Site Northeast Inflow=0.23 cfs 0.021 af
Primary=0.23 cfs 0.021 af

Total Runoff Area = 16.443 ac Runoff Volume = 1.469 af Average Runoff Depth = 1.07"
79.69% Pervious = 13.103 ac 20.31% Impervious = 3.340 ac

Summary for Subcatchment 200: Drainage Area 200

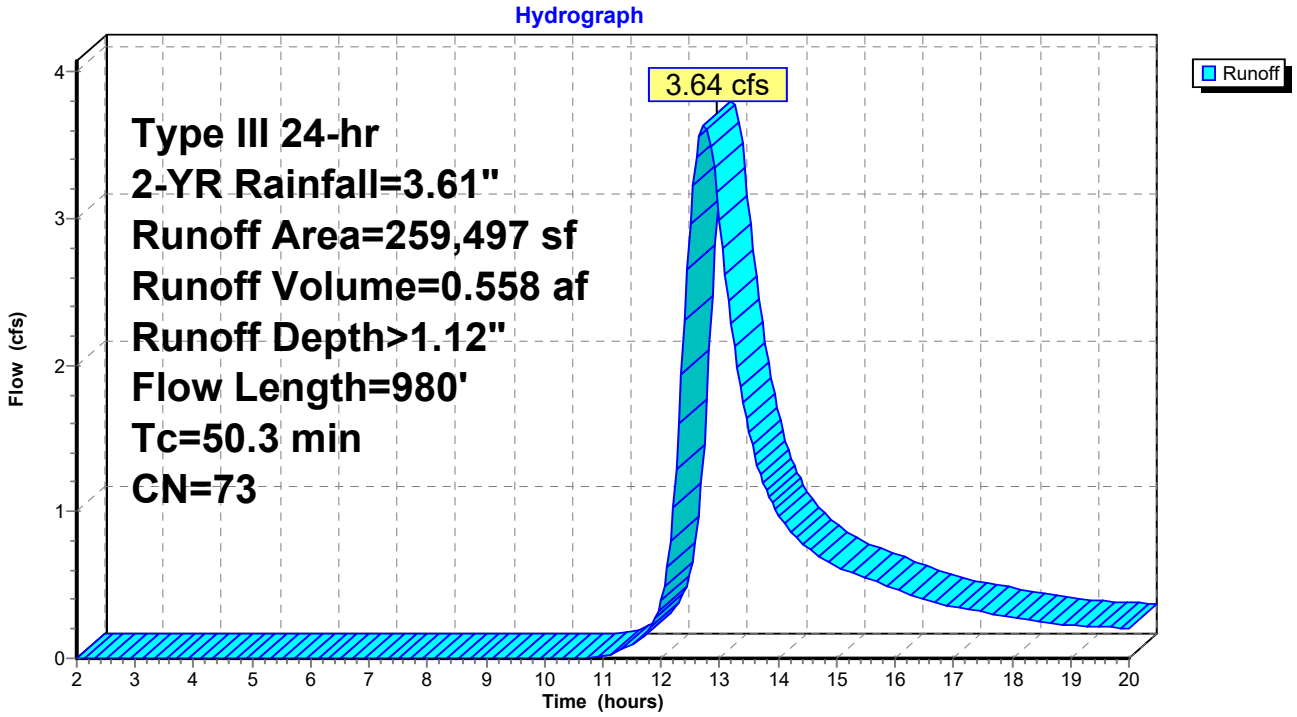
Runoff = 3.64 cfs @ 12.73 hrs, Volume= 0.558 af, Depth> 1.12"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

	Area (sf)	CN	Description
	7,738	30	Woods, Good, HSG A
	101,884	70	Woods, Good, HSG C
	76,182	77	Woods, Good, HSG D
	6,822	39	>75% Grass cover, Good, HSG A
	48,482	74	>75% Grass cover, Good, HSG C
*	18,389	98	Impervious
	259,497	73	Weighted Average
	241,108		92.91% Pervious Area
	18,389		7.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	50	0.0100	0.05		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
2.1	90	0.0100	0.70		**Shallow Concentrated Flow, Next 90 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.1	75	0.0250	1.11		**Shallow Concentrated Flow, Next 75 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.2000	3.13		**Shallow Concentrated Flow, Next 35 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.0500	1.57		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.1	145	0.0070	0.59		**Shallow Concentrated Flow, Next 145 feet of grass** Short Grass Pasture Kv= 7.0 fps
15.8	260	0.0030	0.27		**Shallow Concentrated Flow, Next 260 feet of woods along low p** Woodland Kv= 5.0 fps
1.7	40	0.0030	0.38		**Shallow Concentrated Flow, Next 40 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	65	0.0180	0.94		**Shallow Concentrated Flow, Next 65 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	56	0.0250	0.79		**Shallow Concentrated Flow, Next 56 feet of woods** Woodland Kv= 5.0 fps
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Next 20 feet of woods** Woodland Kv= 5.0 fps
0.1	12	0.1670	2.04		**Shallow Concentrated Flow, Next 12 feet of woods** Woodland Kv= 5.0 fps
0.1	17	0.4000	3.16		**Shallow Concentrated Flow, Next 17 feet of woods** Woodland Kv= 5.0 fps
7.1	95	0.0020	0.22		**Shallow Concentrated Flow, Last 95 feet of woods** Woodland Kv= 5.0 fps
50.3	980	Total			

Subcatchment 200: Drainage Area 200



Summary for Subcatchment 300: Drainage Area 300

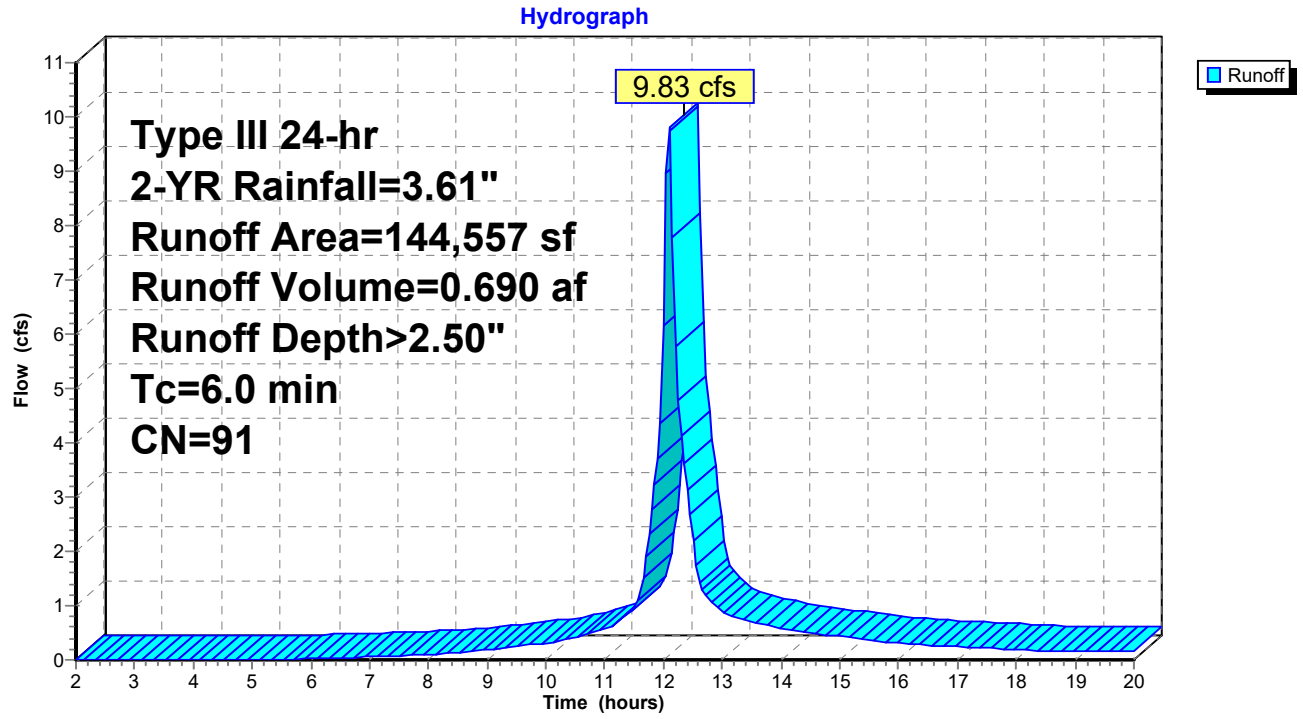
Runoff = 9.83 cfs @ 12.09 hrs, Volume= 0.690 af, Depth> 2.50"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

	Area (sf)	CN	Description
	290	39	>75% Grass cover, Good, HSG A
	33,271	74	>75% Grass cover, Good, HSG C
	7,527	80	>75% Grass cover, Good, HSG D
*	103,469	98	Impervious
	144,557	91	Weighted Average
	41,088		28.42% Pervious Area
	103,469		71.58% Impervious Area

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

Subcatchment 300: Drainage Area 300



Summary for Subcatchment 310: Drainage Area 310

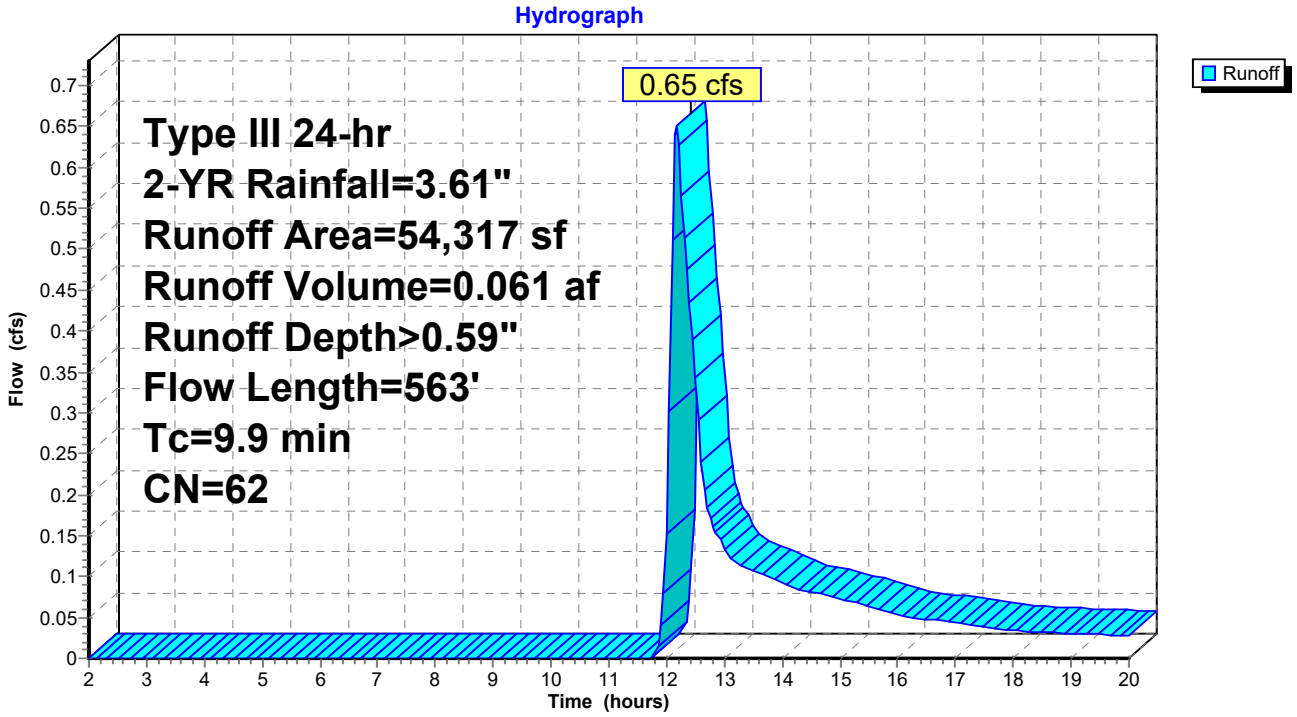
Runoff = 0.65 cfs @ 12.17 hrs, Volume= 0.061 af, Depth> 0.59"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

	Area (sf)	CN	Description
	28,915	39	>75% Grass cover, Good, HSG A
	10,417	74	>75% Grass cover, Good, HSG C
*	14,985	98	Impervious
	54,317	62	Weighted Average
	39,332		72.41% Pervious Area
	14,985		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	20	0.1670	0.21		**Sheet Flow, First 20 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
4.2	30	0.0330	0.12		**Sheet Flow, Next 30 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.0	3	0.3330	4.04		**Shallow Concentrated Flow, Next 3 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.4	70	0.0050	0.49		**Shallow Concentrated Flow, Next 70 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.7	125	0.0100	2.86	0.56	**Pipe Channel, Next 125 feet of 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.3	100	0.0130	6.00	7.37	**Pipe Channel, Next 100 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0100	5.26	6.46	**Pipe Channel, Next 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	35	0.0060	4.08	5.00	**Pipe Channel, Next 35 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0070	4.40	5.40	**Pipe Channel, Last 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.9	563	Total			

Subcatchment 310: Drainage Area 310



Summary for Subcatchment 320: Drainage Area 320

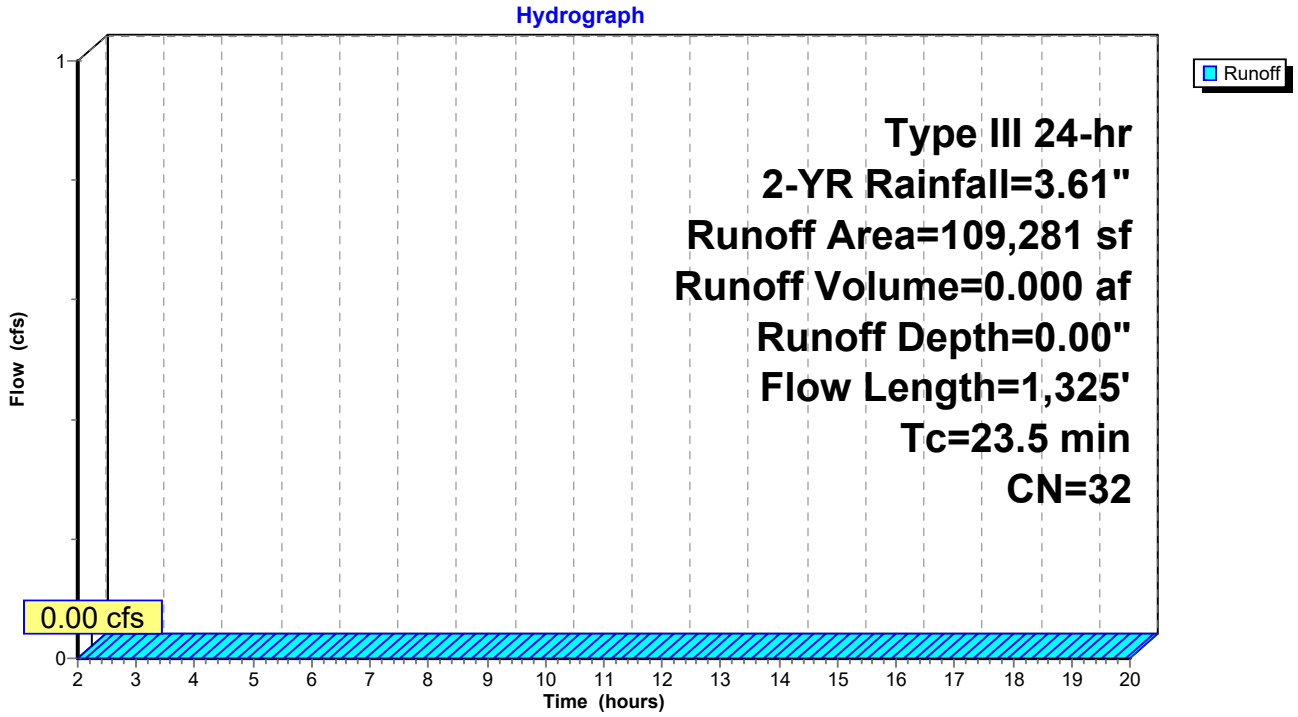
Runoff = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

	Area (sf)	CN	Description
	99,439	30	Woods, Good, HSG A
	8,120	39	>75% Grass cover, Good, HSG A
	548	80	>75% Grass cover, Good, HSG D
*	1,174	98	Impervious
	109,281	32	Weighted Average
	108,107		98.93% Pervious Area
	1,174		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
0.5	85	0.1667	2.86		**Shallow Concentrated Flow, Next 85 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.7	390	0.0160	2.38	7.15	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 8.0' r= 0.38' n= 0.041 Riprap, 2-inch
1.0	275	0.0100	4.54	3.56	**Pipe Channel, Next 275 feet of 12" pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	125	0.0100	5.26	6.46	**Pipe Channel, Next 125 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.5	105	0.0050	3.72	4.57	**Pipe Channel, Next 105 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
23.5	1,325	Total			

Subcatchment 320: Drainage Area 320



Summary for Subcatchment 330: Drainage Area 330

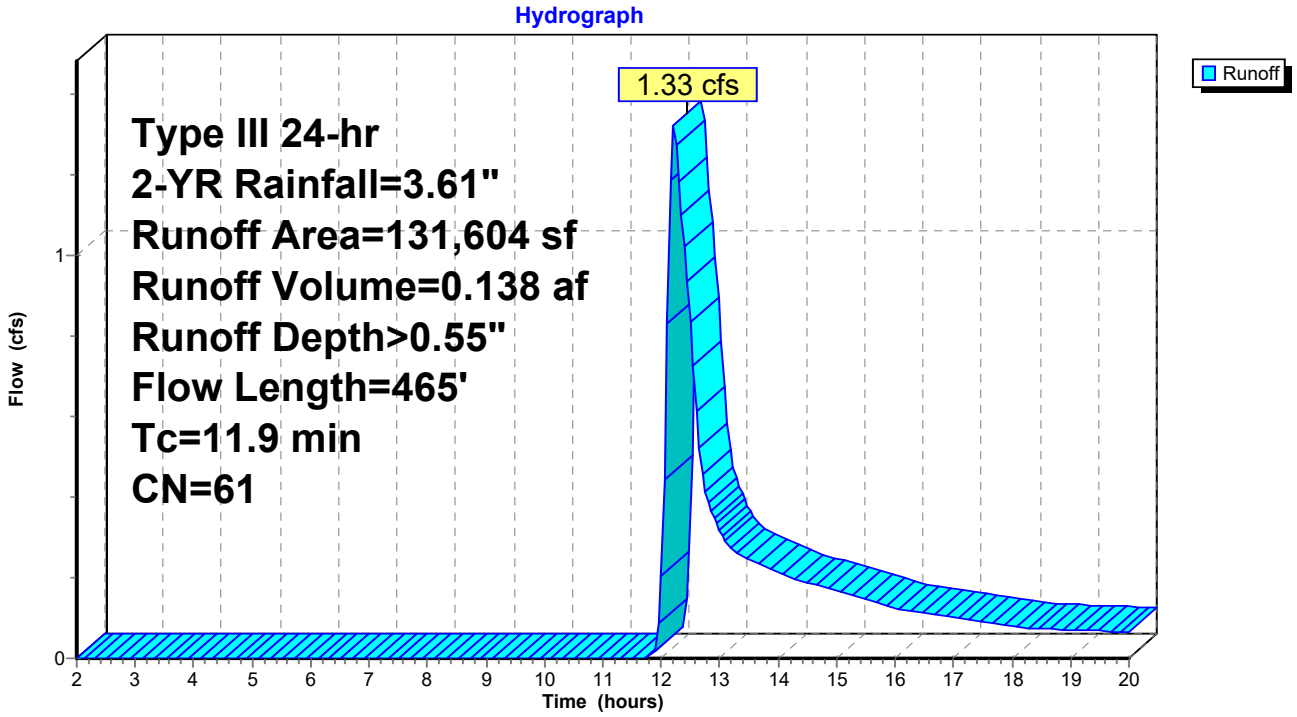
Runoff = 1.33 cfs @ 12.21 hrs, Volume= 0.138 af, Depth> 0.55"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

	Area (sf)	CN	Description
	41,033	30	Woods, Good, HSG A
	621	55	Woods, Good, HSG B
	19,648	70	Woods, Good, HSG C
	11,093	77	Woods, Good, HSG D
	1,925	39	>75% Grass cover, Good, HSG A
	2,914	61	>75% Grass cover, Good, HSG B
	31,962	74	>75% Grass cover, Good, HSG C
	14,933	80	>75% Grass cover, Good, HSG D
*	7,475	98	Impervious
	131,604	61	Weighted Average
	124,129		94.32% Pervious Area
	7,475		5.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1400	0.16		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.6	175	0.1400	1.87		**Shallow Concentrated Flow, Next 175 feet of woods** Woodland Kv= 5.0 fps
0.2	20	0.0800	1.98		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.8	220	0.0120	0.77		**Shallow Concentrated Flow, Next 220 feet of grass** Short Grass Pasture Kv= 7.0 fps
11.9	465	Total			

Subcatchment 330: Drainage Area 330



Summary for Subcatchment 340: Drainage Area 340

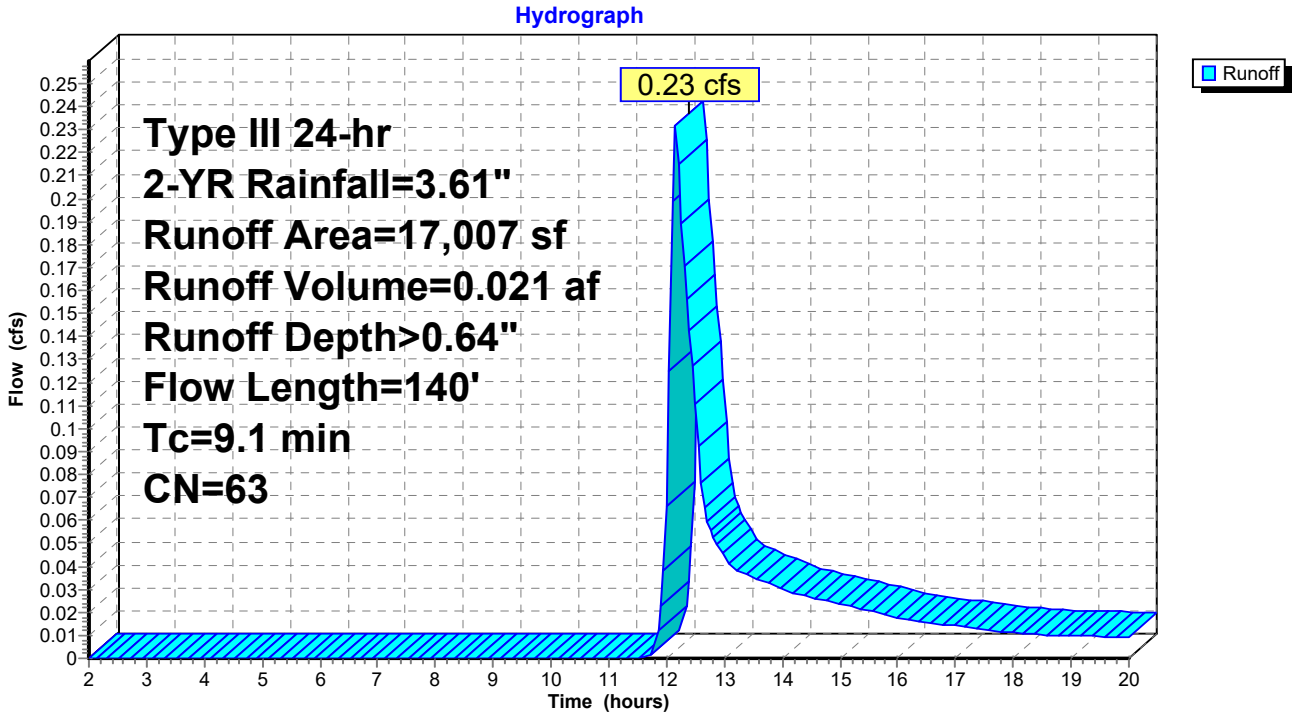
Runoff = 0.23 cfs @ 12.16 hrs, Volume= 0.021 af, Depth> 0.64"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.61"

Area (sf)	CN	Description
7,752	55	Woods, Good, HSG B
3,123	70	Woods, Good, HSG C
2,185	61	>75% Grass cover, Good, HSG B
3,947	74	>75% Grass cover, Good, HSG C
17,007	63	Weighted Average
17,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	10	0.0050	0.04		**Sheet Flow, First 10 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.4	4	0.2500	0.18		**Sheet Flow, Next 4 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
3.3	36	0.0900	0.18		**Sheet Flow, Next 36 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.3	60	0.4000	3.16		**Shallow Concentrated Flow, Next 60 feet of woods** Woodland Kv= 5.0 fps
1.4	30	0.0050	0.35		**Shallow Concentrated Flow, Last 30 feet of woods** Woodland Kv= 5.0 fps
9.1	140	Total			

Subcatchment 340: Drainage Area 340



Summary for Pond IB: Infiltration Basin

Inflow Area = 10.095 ac, 28.90% Impervious, Inflow Depth > 1.06" for 2-YR event
Inflow = 11.12 cfs @ 12.10 hrs, Volume= 0.890 af
Outflow = 0.66 cfs @ 15.10 hrs, Volume= 0.510 af, Atten= 94%, Lag= 180.1 min
Discarded = 0.66 cfs @ 15.10 hrs, Volume= 0.510 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast
Tertiary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.77' @ 15.10 hrs Surf.Area= 7,583 sf Storage= 21,189 cf

Plug-Flow detention time= 197.4 min calculated for 0.509 af (57% of inflow)
Center-of-Mass det. time= 113.2 min (898.6 - 785.5)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	145,977 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	3,830	0	0
93.00	4,696	4,263	4,263
94.00	5,704	5,200	9,463
95.00	6,739	6,222	15,685
96.00	7,837	7,288	22,973
97.00	9,041	8,439	31,412
98.00	10,289	9,665	41,077
99.00	11,633	10,961	52,038
100.00	18,457	15,045	67,083
101.00	23,555	21,006	88,089
102.00	28,709	26,132	114,221
103.00	34,803	31,756	145,977

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.00'	**3.750 in/hr Exfiltration over Surface area**
#2	Primary	95.80'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	97.70'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Tertiary	102.00'	**8.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

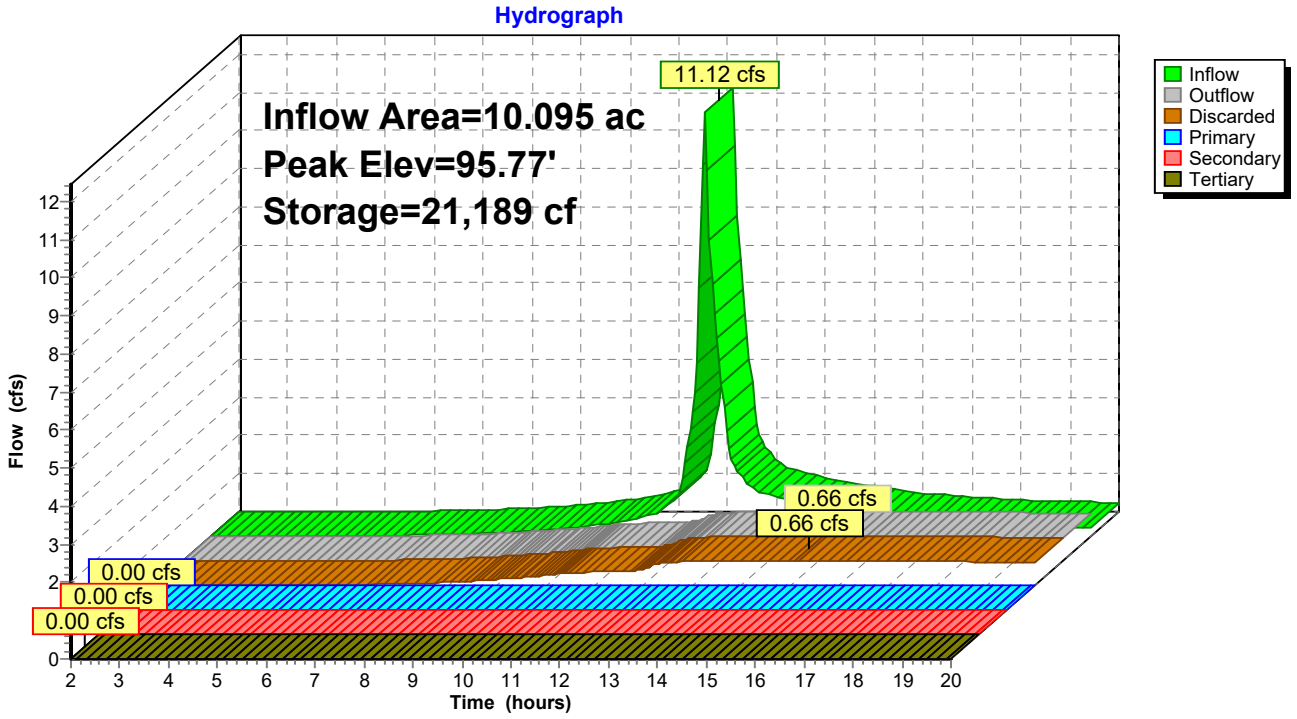
Discarded OutFlow Max=0.66 cfs @ 15.10 hrs HW=95.77' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.66 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond IB: Infiltration Basin



Stage-Area-Storage for Pond IB: Infiltration Basin

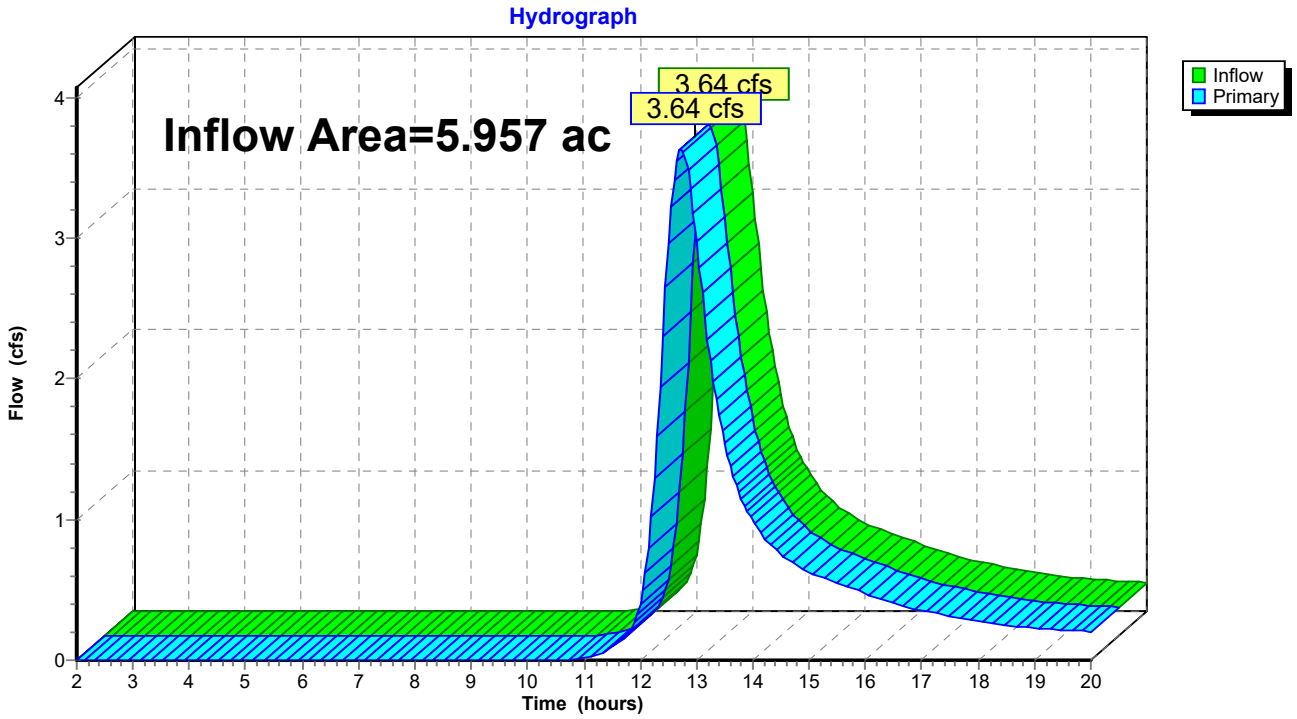
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
92.00	3,830	0
92.20	4,003	783
92.40	4,176	1,601
92.60	4,350	2,454
92.80	4,523	3,341
93.00	4,696	4,263
93.20	4,898	5,222
93.40	5,099	6,222
93.60	5,301	7,262
93.80	5,502	8,342
94.00	5,704	9,463
94.20	5,911	10,625
94.40	6,118	11,827
94.60	6,325	13,072
94.80	6,532	14,357
95.00	6,739	15,685
95.20	6,959	17,054
95.40	7,178	18,468
95.60	7,398	19,926
95.80	7,617	21,427
96.00	7,837	22,973
96.20	8,078	24,564
96.40	8,319	26,204
96.60	8,559	27,891
96.80	8,800	29,627
97.00	9,041	31,412
97.20	9,291	33,245
97.40	9,540	35,128
97.60	9,790	37,061
97.80	10,039	39,044
98.00	10,289	41,077
98.20	10,558	43,161
98.40	10,827	45,300
98.60	11,095	47,492
98.80	11,364	49,738
99.00	11,633	52,038
99.20	12,998	54,501
99.40	14,363	57,237
99.60	15,727	60,246
99.80	17,092	63,528
100.00	18,457	67,083
100.20	19,477	70,876
100.40	20,496	74,873
100.60	21,516	79,074
100.80	22,535	83,479
101.00	23,555	88,089
101.20	24,586	92,903
101.40	25,617	97,923
101.60	26,647	103,149
101.80	27,678	108,582
102.00	28,709	114,221
102.20	29,928	120,084
102.40	31,147	126,192
102.60	32,365	132,543
102.80	33,584	139,138
103.00	**34,803**	**145,977**

Summary for Link x2000: Off-Site Northwest

Inflow Area = 5.957 ac, 7.09% Impervious, Inflow Depth > 1.12" for 2-YR event
Inflow = 3.64 cfs @ 12.73 hrs, Volume= 0.558 af
Primary = 3.64 cfs @ 12.73 hrs, Volume= 0.558 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

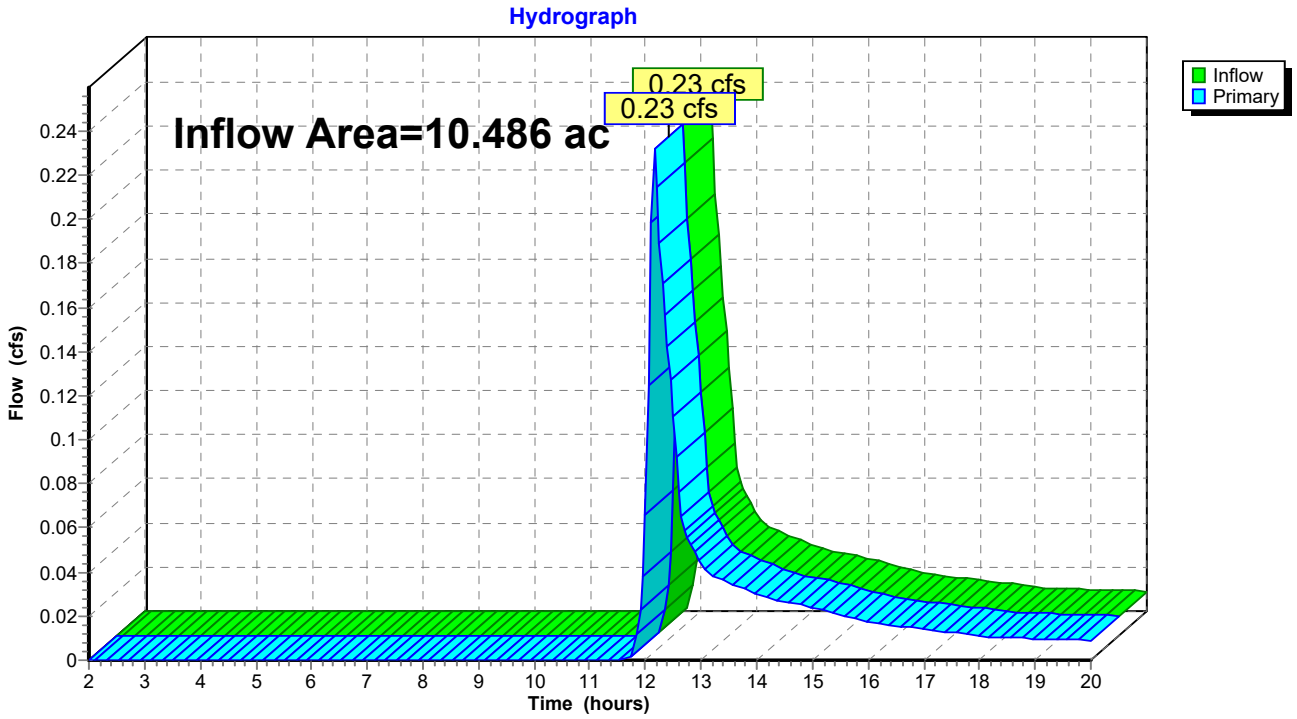


Summary for Link x3000: Off-Site Northeast

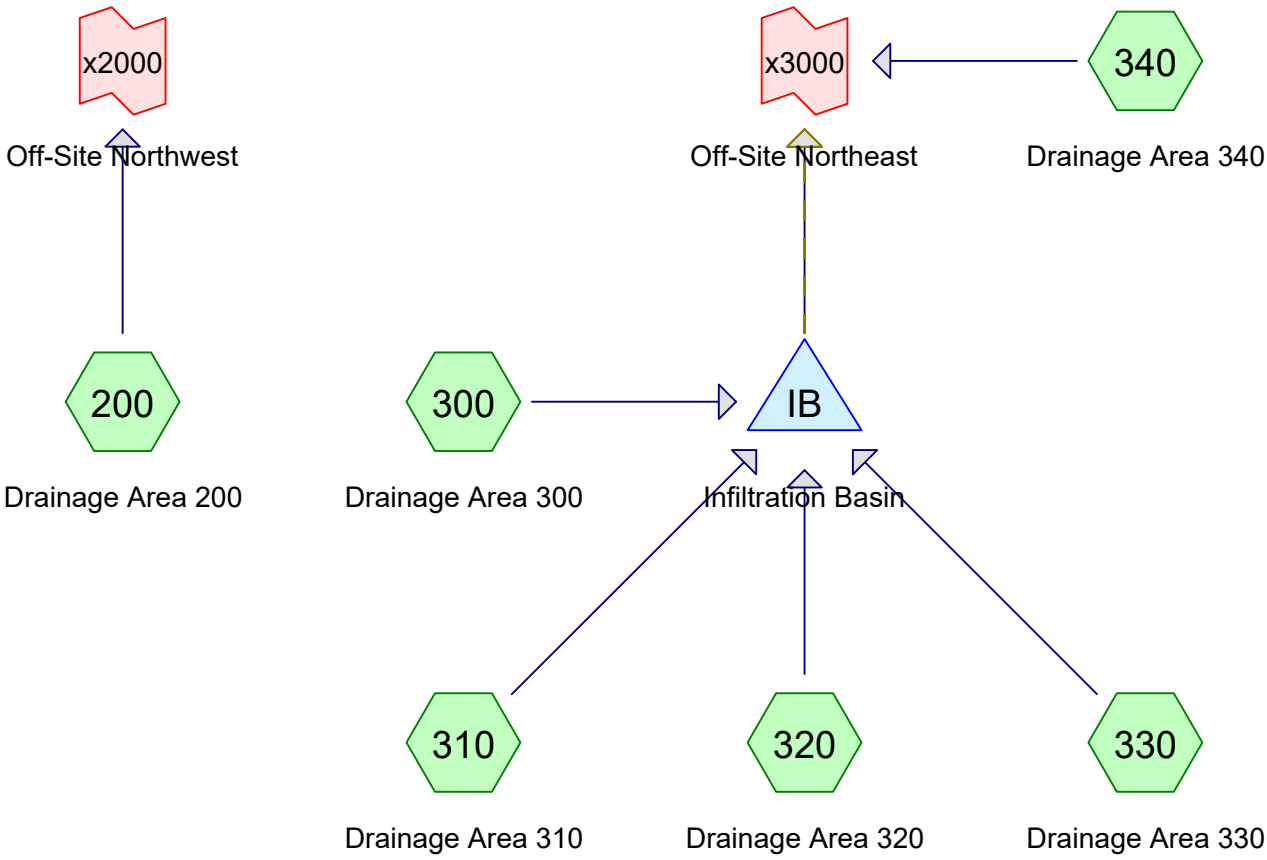
Inflow Area = 10.486 ac, 27.83% Impervious, Inflow Depth > 0.02" for 2-YR event
Inflow = 0.23 cfs @ 12.16 hrs, Volume= 0.021 af
Primary = 0.23 cfs @ 12.16 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



10-Year Storm Event – Proposed



Subcat Reach Pond Link

Routing Diagram for 43346-PR
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-YR	Type III 24-hr		Default	24.00	1	5.86	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.058	39	>75% Grass cover, Good, HSG A (200, 300, 310, 320, 330)
0.117	61	>75% Grass cover, Good, HSG B (330, 340)
2.940	74	>75% Grass cover, Good, HSG C (200, 300, 310, 330, 340)
0.528	80	>75% Grass cover, Good, HSG D (300, 320, 330)
3.340	98	Impervious (200, 300, 310, 320, 330)
3.402	30	Woods, Good, HSG A (200, 320, 330)
0.192	55	Woods, Good, HSG B (330, 340)
2.862	70	Woods, Good, HSG C (200, 330, 340)
2.004	77	Woods, Good, HSG D (200, 330)
16.443	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.460	HSG A	200, 300, 310, 320, 330
0.309	HSG B	330, 340
5.802	HSG C	200, 300, 310, 330, 340
2.532	HSG D	200, 300, 320, 330
3.340	Other	200, 300, 310, 320, 330
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.058	0.117	2.940	0.528	0.000	4.643	>75% Grass cover, Good	200, 300, 310, 320, 330, 340
0.000	0.000	0.000	0.000	3.340	3.340	Impervious	200, 300, 310, 320, 330
3.402	0.192	2.862	2.004	0.000	8.460	Woods, Good	200, 320, 330, 340
4.460	**0.309**	**5.802**	**2.532**	**3.340**	**16.443**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	310	0.00	0.00	125.0	0.0100	0.013	0.0	6.0	0.0	
2	310	0.00	0.00	100.0	0.0130	0.013	0.0	15.0	0.0	
3	310	0.00	0.00	90.0	0.0100	0.013	0.0	15.0	0.0	
4	310	0.00	0.00	35.0	0.0060	0.013	0.0	15.0	0.0	
5	310	0.00	0.00	90.0	0.0070	0.013	0.0	15.0	0.0	
6	320	0.00	0.00	275.0	0.0100	0.013	0.0	12.0	0.0	
7	320	0.00	0.00	125.0	0.0100	0.013	0.0	15.0	0.0	
8	320	0.00	0.00	105.0	0.0050	0.013	0.0	15.0	0.0	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment200: Drainage Area 200 Runoff Area=259,497 sf 7.09% Impervious Runoff Depth>2.72"
Flow Length=980' Tc=50.3 min CN=73 Runoff=9.02 cfs 1.349 af

Subcatchment300: Drainage Area 300 Runoff Area=144,557 sf 71.58% Impervious Runoff Depth>4.57"
Tc=6.0 min CN=91 Runoff=17.36 cfs 1.264 af

Subcatchment310: Drainage Area 310 Runoff Area=54,317 sf 27.59% Impervious Runoff Depth>1.82"
Flow Length=563' Tc=9.9 min CN=62 Runoff=2.41 cfs 0.189 af

Subcatchment320: Drainage Area 320 Runoff Area=109,281 sf 1.07% Impervious Runoff Depth>0.08"
Flow Length=1,325' Tc=23.5 min CN=32 Runoff=0.04 cfs 0.016 af

Subcatchment330: Drainage Area 330 Runoff Area=131,604 sf 5.68% Impervious Runoff Depth>1.74"
Flow Length=465' Tc=11.9 min CN=61 Runoff=5.19 cfs 0.438 af

Subcatchment340: Drainage Area 340 Runoff Area=17,007 sf 0.00% Impervious Runoff Depth>1.90"
Flow Length=140' Tc=9.1 min CN=63 Runoff=0.81 cfs 0.062 af

Pond IB: Infiltration Basin Peak Elev=97.63' Storage=37,363 cf Inflow=23.52 cfs 1.907 af
s 0.632 af Primary=3.72 cfs 0.780 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=4.58 cfs 1.413 af

Link x2000: Off-Site Northwest Inflow=9.02 cfs 1.349 af
Primary=9.02 cfs 1.349 af

Link x3000: Off-Site Northeast Inflow=3.95 cfs 0.842 af
Primary=3.95 cfs 0.842 af

Total Runoff Area = 16.443 ac Runoff Volume = 3.318 af Average Runoff Depth = 2.42"
79.69% Pervious = 13.103 ac 20.31% Impervious = 3.340 ac

Summary for Subcatchment 200: Drainage Area 200

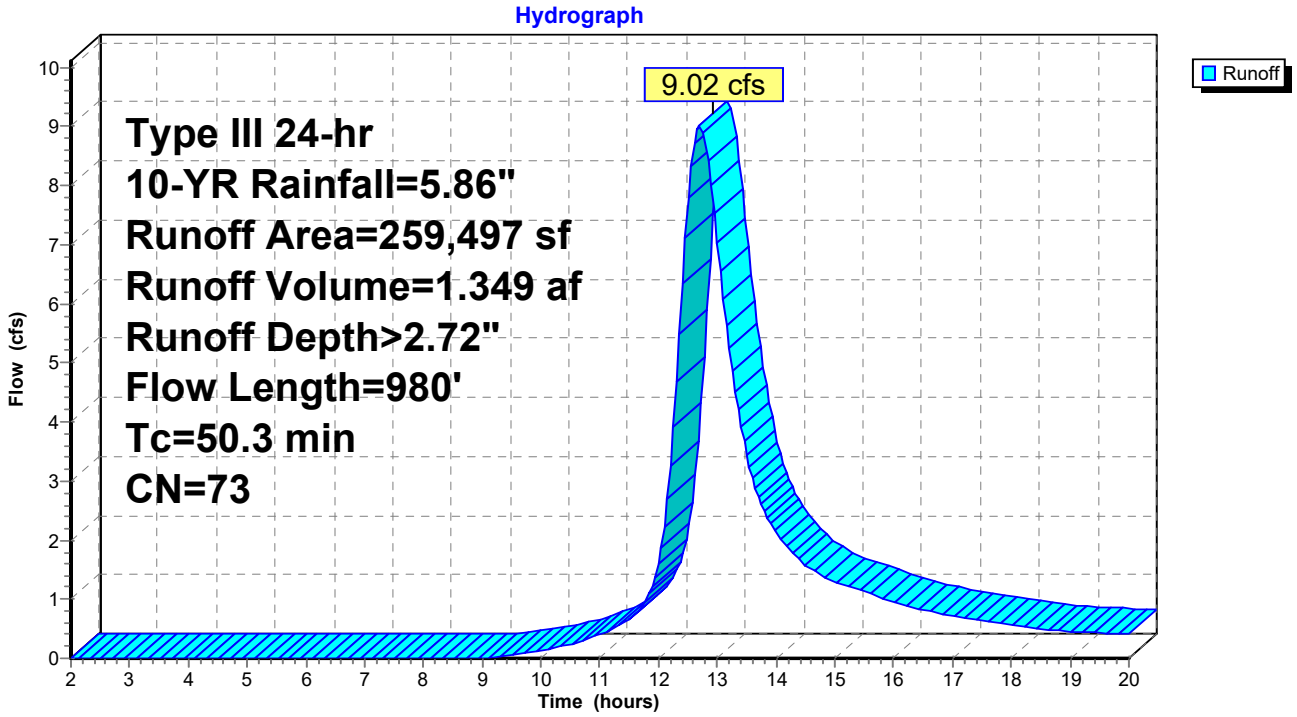
Runoff = 9.02 cfs @ 12.70 hrs, Volume= 1.349 af, Depth> 2.72"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

	Area (sf)	CN	Description
	7,738	30	Woods, Good, HSG A
	101,884	70	Woods, Good, HSG C
	76,182	77	Woods, Good, HSG D
	6,822	39	>75% Grass cover, Good, HSG A
	48,482	74	>75% Grass cover, Good, HSG C
*	18,389	98	Impervious
	259,497	73	Weighted Average
	241,108		92.91% Pervious Area
	18,389		7.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	50	0.0100	0.05		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
2.1	90	0.0100	0.70		**Shallow Concentrated Flow, Next 90 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.1	75	0.0250	1.11		**Shallow Concentrated Flow, Next 75 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.2000	3.13		**Shallow Concentrated Flow, Next 35 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.0500	1.57		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.1	145	0.0070	0.59		**Shallow Concentrated Flow, Next 145 feet of grass** Short Grass Pasture Kv= 7.0 fps
15.8	260	0.0030	0.27		**Shallow Concentrated Flow, Next 260 feet of woods along low p** Woodland Kv= 5.0 fps
1.7	40	0.0030	0.38		**Shallow Concentrated Flow, Next 40 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	65	0.0180	0.94		**Shallow Concentrated Flow, Next 65 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	56	0.0250	0.79		**Shallow Concentrated Flow, Next 56 feet of woods** Woodland Kv= 5.0 fps
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Next 20 feet of woods** Woodland Kv= 5.0 fps
0.1	12	0.1670	2.04		**Shallow Concentrated Flow, Next 12 feet of woods** Woodland Kv= 5.0 fps
0.1	17	0.4000	3.16		**Shallow Concentrated Flow, Next 17 feet of woods** Woodland Kv= 5.0 fps
7.1	95	0.0020	0.22		**Shallow Concentrated Flow, Last 95 feet of woods** Woodland Kv= 5.0 fps
50.3	980	Total			

Subcatchment 200: Drainage Area 200



Summary for Subcatchment 300: Drainage Area 300

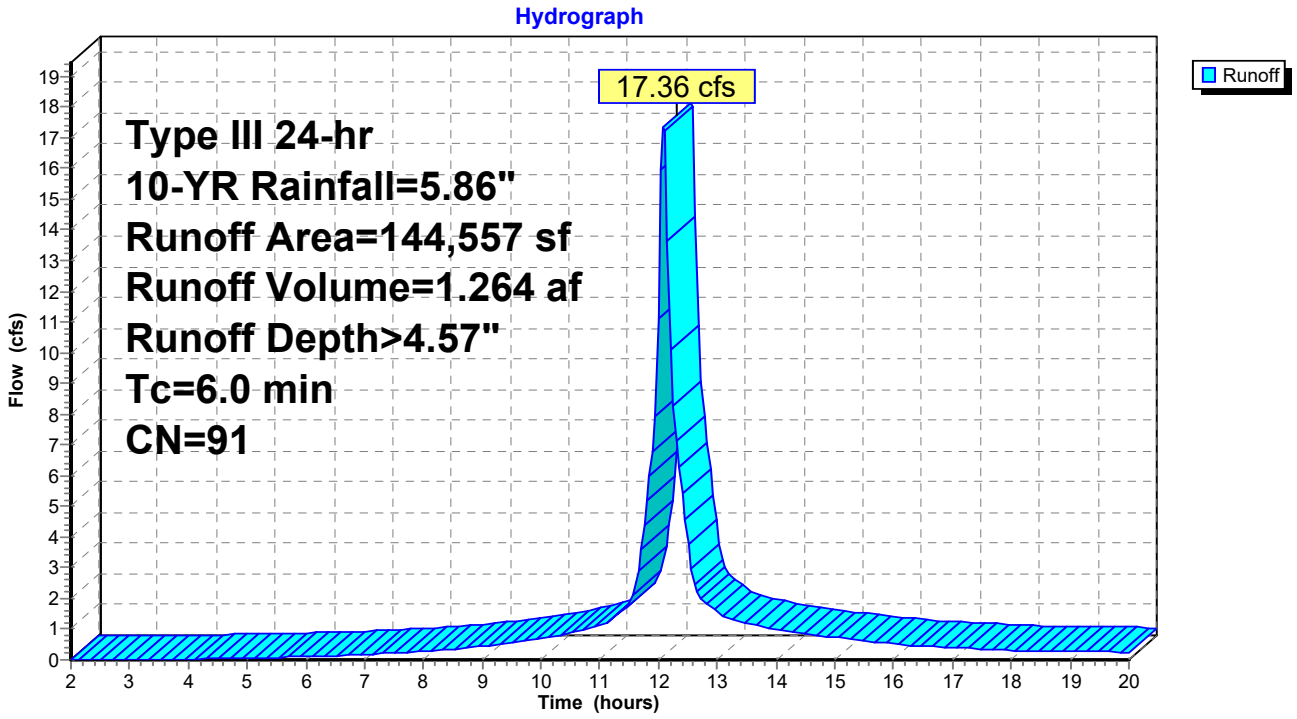
Runoff = 17.36 cfs @ 12.09 hrs, Volume= 1.264 af, Depth> 4.57"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

	Area (sf)	CN	Description
	290	39	>75% Grass cover, Good, HSG A
	33,271	74	>75% Grass cover, Good, HSG C
	7,527	80	>75% Grass cover, Good, HSG D
*	103,469	98	Impervious
	144,557	91	Weighted Average
	41,088		28.42% Pervious Area
	103,469		71.58% Impervious Area

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

Subcatchment 300: Drainage Area 300



Summary for Subcatchment 310: Drainage Area 310

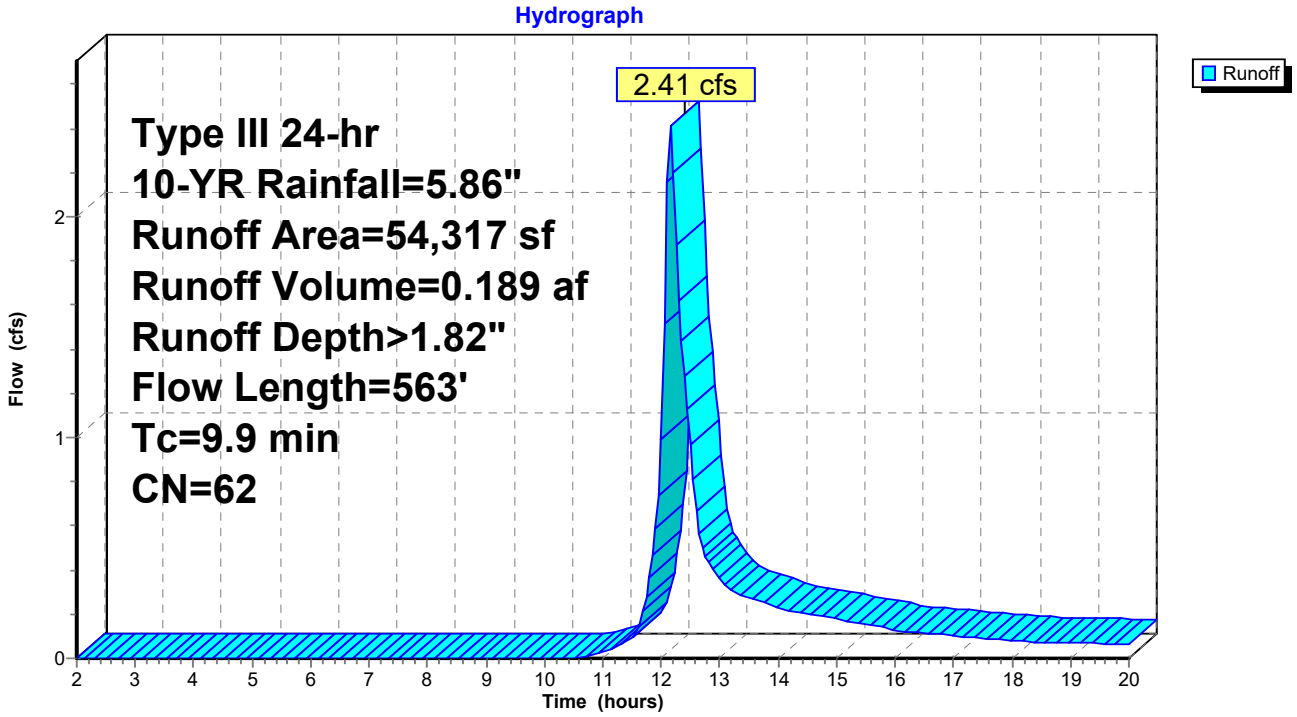
Runoff = 2.41 cfs @ 12.15 hrs, Volume= 0.189 af, Depth> 1.82"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

	Area (sf)	CN	Description
	28,915	39	>75% Grass cover, Good, HSG A
	10,417	74	>75% Grass cover, Good, HSG C
*	14,985	98	Impervious
	54,317	62	Weighted Average
	39,332		72.41% Pervious Area
	14,985		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	20	0.1670	0.21		**Sheet Flow, First 20 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
4.2	30	0.0330	0.12		**Sheet Flow, Next 30 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.0	3	0.3330	4.04		**Shallow Concentrated Flow, Next 3 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.4	70	0.0050	0.49		**Shallow Concentrated Flow, Next 70 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.7	125	0.0100	2.86	0.56	**Pipe Channel, Next 125 feet of 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.3	100	0.0130	6.00	7.37	**Pipe Channel, Next 100 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0100	5.26	6.46	**Pipe Channel, Next 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	35	0.0060	4.08	5.00	**Pipe Channel, Next 35 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0070	4.40	5.40	**Pipe Channel, Last 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.9	563	Total			

Subcatchment 310: Drainage Area 310



Summary for Subcatchment 320: Drainage Area 320

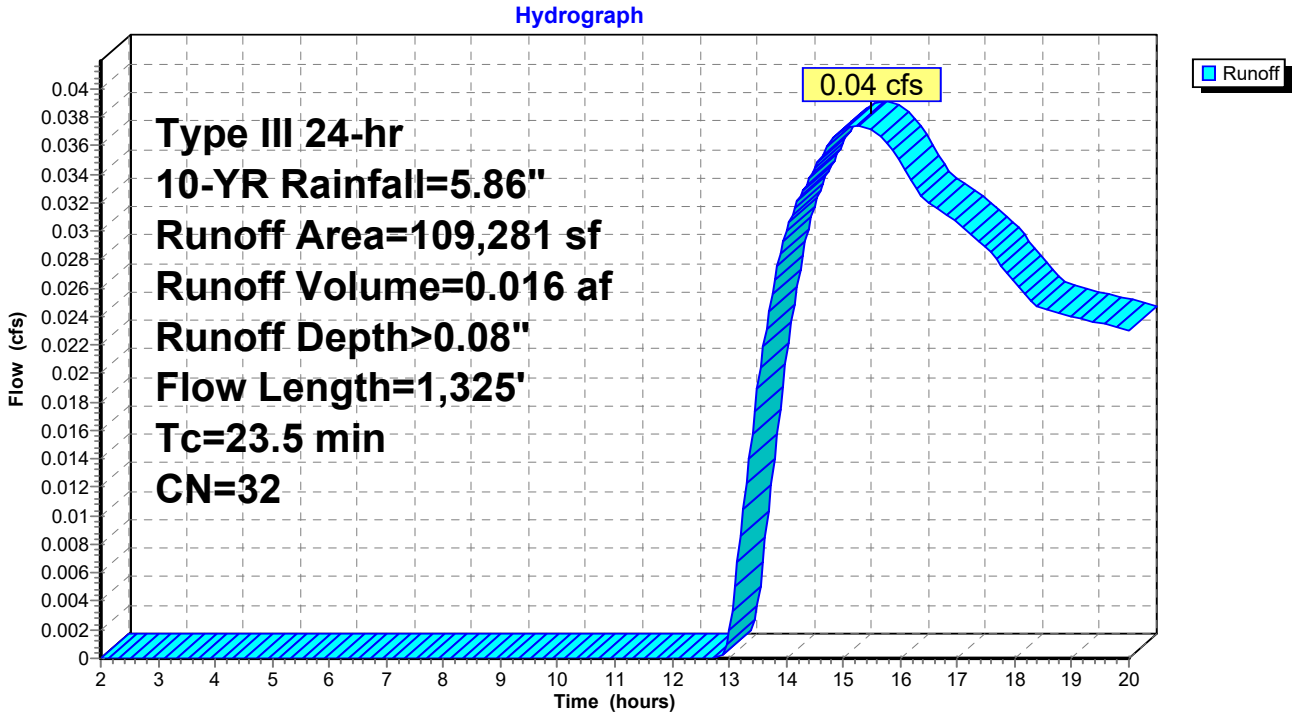
Runoff = 0.04 cfs @ 15.25 hrs, Volume= 0.016 af, Depth> 0.08"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

	Area (sf)	CN	Description
	99,439	30	Woods, Good, HSG A
	8,120	39	>75% Grass cover, Good, HSG A
	548	80	>75% Grass cover, Good, HSG D
*	1,174	98	Impervious
	109,281	32	Weighted Average
	108,107		98.93% Pervious Area
	1,174		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
0.5	85	0.1667	2.86		**Shallow Concentrated Flow, Next 85 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.7	390	0.0160	2.38	7.15	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 8.0' r= 0.38' n= 0.041 Riprap, 2-inch
1.0	275	0.0100	4.54	3.56	**Pipe Channel, Next 275 feet of 12" pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	125	0.0100	5.26	6.46	**Pipe Channel, Next 125 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.5	105	0.0050	3.72	4.57	**Pipe Channel, Next 105 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
23.5	1,325	Total			

Subcatchment 320: Drainage Area 320



Summary for Subcatchment 330: Drainage Area 330

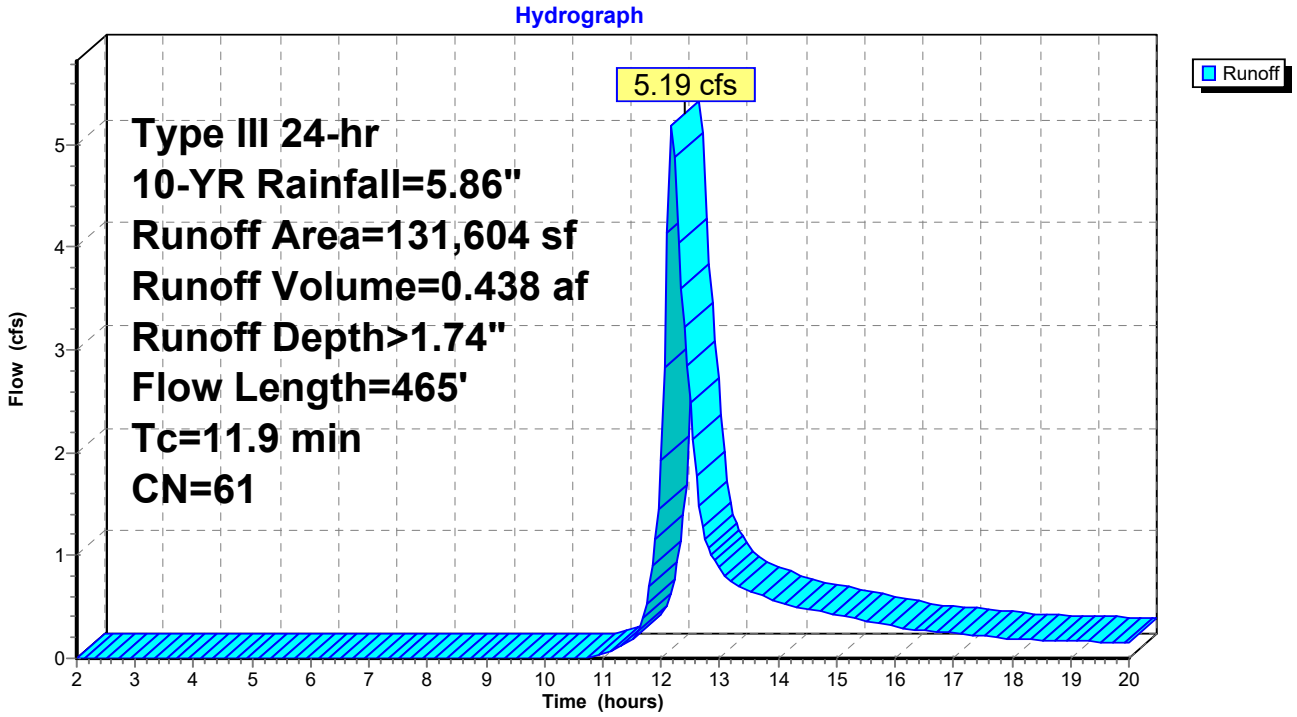
Runoff = 5.19 cfs @ 12.18 hrs, Volume= 0.438 af, Depth> 1.74"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

	Area (sf)	CN	Description
	41,033	30	Woods, Good, HSG A
	621	55	Woods, Good, HSG B
	19,648	70	Woods, Good, HSG C
	11,093	77	Woods, Good, HSG D
	1,925	39	>75% Grass cover, Good, HSG A
	2,914	61	>75% Grass cover, Good, HSG B
	31,962	74	>75% Grass cover, Good, HSG C
	14,933	80	>75% Grass cover, Good, HSG D
*	7,475	98	Impervious
	131,604	61	Weighted Average
	124,129		94.32% Pervious Area
	7,475		5.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1400	0.16		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.6	175	0.1400	1.87		**Shallow Concentrated Flow, Next 175 feet of woods** Woodland Kv= 5.0 fps
0.2	20	0.0800	1.98		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.8	220	0.0120	0.77		**Shallow Concentrated Flow, Next 220 feet of grass** Short Grass Pasture Kv= 7.0 fps
11.9	465	Total			

Subcatchment 330: Drainage Area 330



Summary for Subcatchment 340: Drainage Area 340

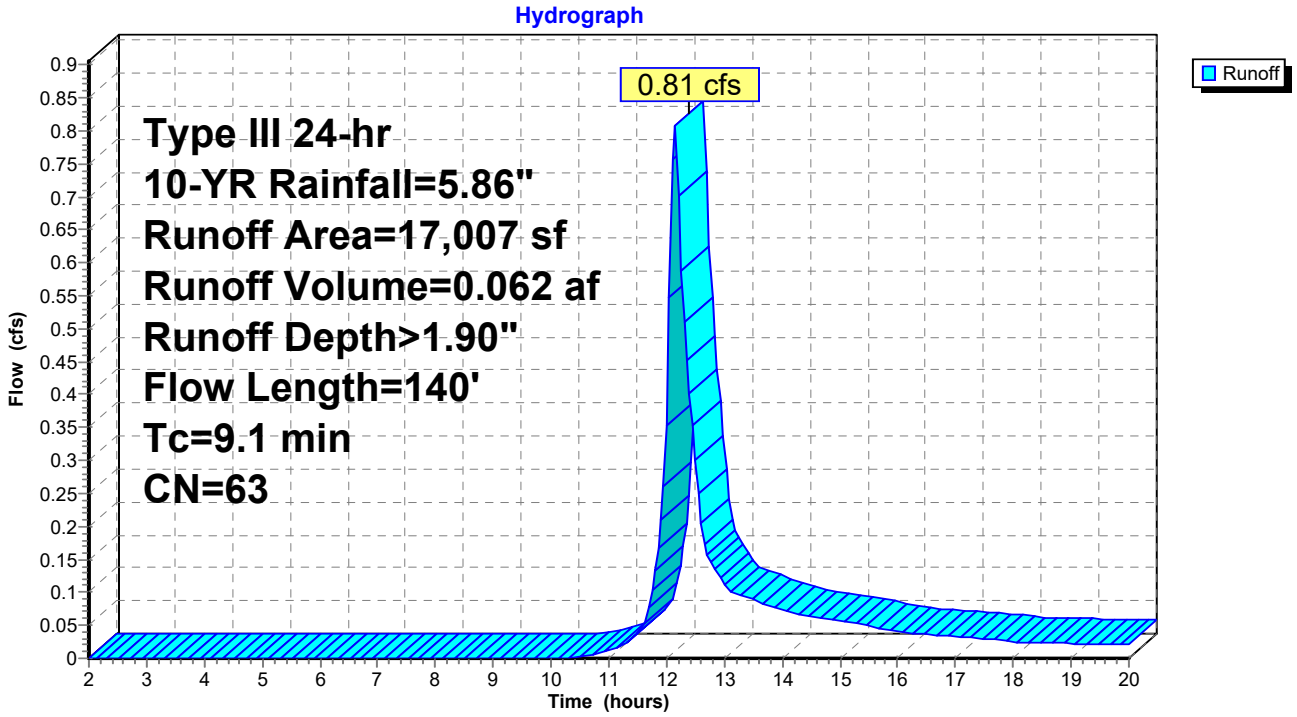
Runoff = 0.81 cfs @ 12.14 hrs, Volume= 0.062 af, Depth> 1.90"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.86"

Area (sf)	CN	Description
7,752	55	Woods, Good, HSG B
3,123	70	Woods, Good, HSG C
2,185	61	>75% Grass cover, Good, HSG B
3,947	74	>75% Grass cover, Good, HSG C
17,007	63	Weighted Average
17,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	10	0.0050	0.04		**Sheet Flow, First 10 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.4	4	0.2500	0.18		**Sheet Flow, Next 4 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
3.3	36	0.0900	0.18		**Sheet Flow, Next 36 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.3	60	0.4000	3.16		**Shallow Concentrated Flow, Next 60 feet of woods** Woodland Kv= 5.0 fps
1.4	30	0.0050	0.35		**Shallow Concentrated Flow, Last 30 feet of woods** Woodland Kv= 5.0 fps
9.1	140	Total			

Subcatchment 340: Drainage Area 340



Summary for Pond IB: Infiltration Basin

Inflow Area = 10.095 ac, 28.90% Impervious, Inflow Depth > 2.27" for 10-YR event
Inflow = 23.52 cfs @ 12.10 hrs, Volume= 1.907 af
Outflow = 4.58 cfs @ 12.62 hrs, Volume= 1.413 af, Atten= 81%, Lag= 31.3 min
Discarded = 0.85 cfs @ 12.62 hrs, Volume= 0.632 af
Primary = 3.72 cfs @ 12.62 hrs, Volume= 0.780 af
Routed to Link x3000 : Off-Site Northeast
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast
Tertiary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.63' @ 12.62 hrs Surf.Area= 9,828 sf Storage= 37,363 cf

Plug-Flow detention time= 132.6 min calculated for 1.409 af (74% of inflow)
Center-of-Mass det. time= 67.5 min (844.7 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	145,977 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	3,830	0	0
93.00	4,696	4,263	4,263
94.00	5,704	5,200	9,463
95.00	6,739	6,222	15,685
96.00	7,837	7,288	22,973
97.00	9,041	8,439	31,412
98.00	10,289	9,665	41,077
99.00	11,633	10,961	52,038
100.00	18,457	15,045	67,083
101.00	23,555	21,006	88,089
102.00	28,709	26,132	114,221
103.00	34,803	31,756	145,977

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.00'	**3.750 in/hr Exfiltration over Surface area**
#2	Primary	95.80'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	97.70'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Tertiary	102.00'	**8.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

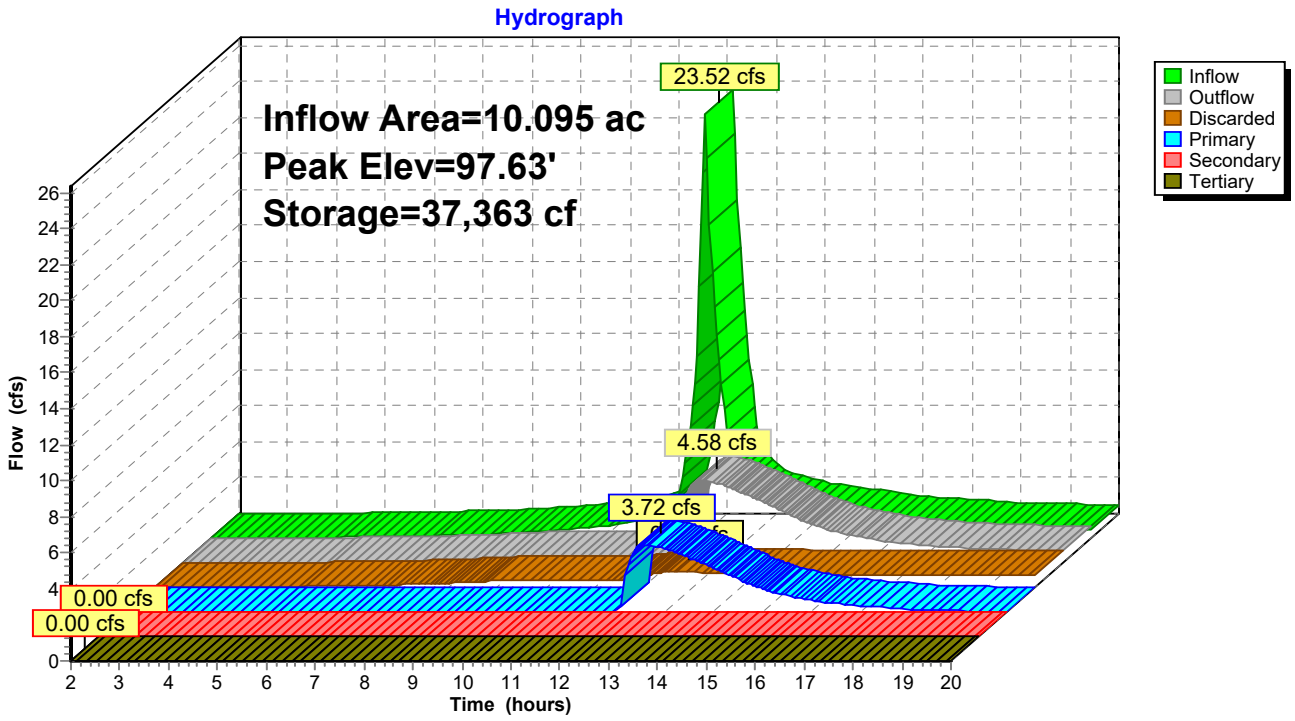
Discarded OutFlow Max=0.85 cfs @ 12.62 hrs HW=97.63' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.85 cfs)

Primary OutFlow Max=3.72 cfs @ 12.62 hrs HW=97.63' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 3.72 cfs @ 5.64 fps)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond IB: Infiltration Basin



Stage-Area-Storage for Pond IB: Infiltration Basin

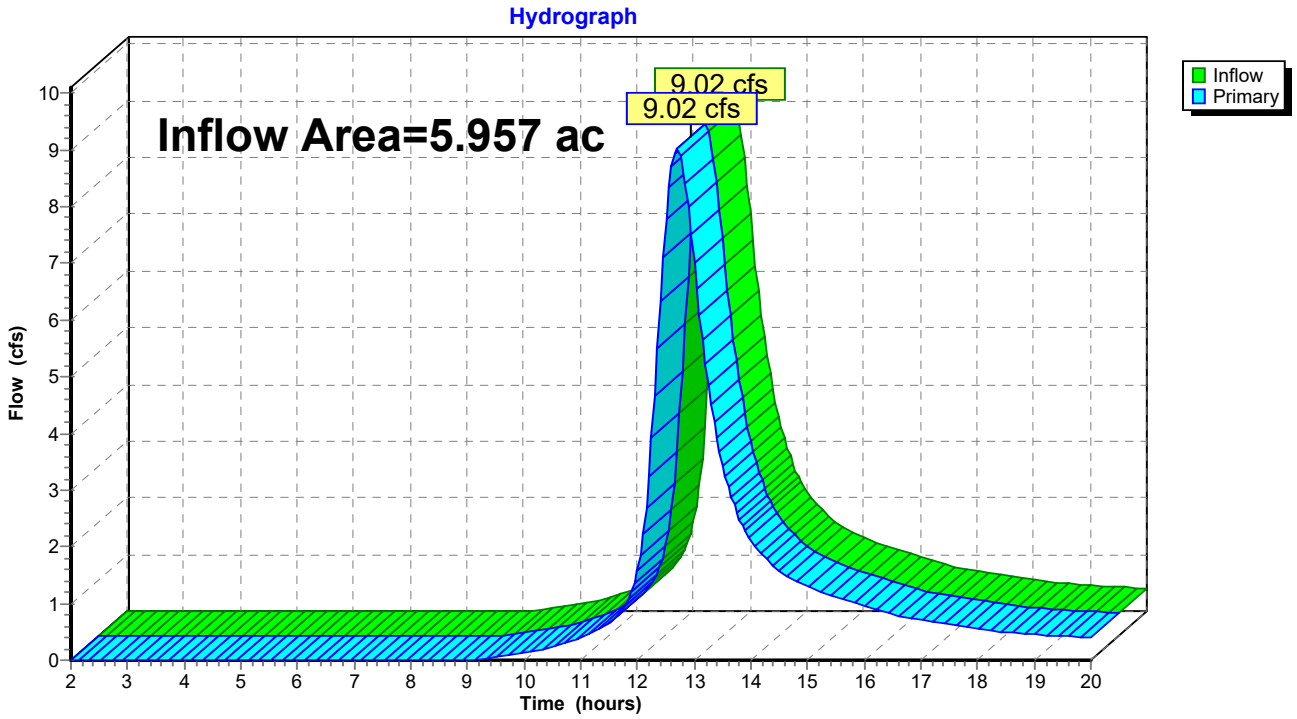
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
92.00	3,830	0
92.20	4,003	783
92.40	4,176	1,601
92.60	4,350	2,454
92.80	4,523	3,341
93.00	4,696	4,263
93.20	4,898	5,222
93.40	5,099	6,222
93.60	5,301	7,262
93.80	5,502	8,342
94.00	5,704	9,463
94.20	5,911	10,625
94.40	6,118	11,827
94.60	6,325	13,072
94.80	6,532	14,357
95.00	6,739	15,685
95.20	6,959	17,054
95.40	7,178	18,468
95.60	7,398	19,926
95.80	7,617	21,427
96.00	7,837	22,973
96.20	8,078	24,564
96.40	8,319	26,204
96.60	8,559	27,891
96.80	8,800	29,627
97.00	9,041	31,412
97.20	9,291	33,245
97.40	9,540	35,128
97.60	9,790	37,061
97.80	10,039	39,044
98.00	10,289	41,077
98.20	10,558	43,161
98.40	10,827	45,300
98.60	11,095	47,492
98.80	11,364	49,738
99.00	11,633	52,038
99.20	12,998	54,501
99.40	14,363	57,237
99.60	15,727	60,246
99.80	17,092	63,528
100.00	18,457	67,083
100.20	19,477	70,876
100.40	20,496	74,873
100.60	21,516	79,074
100.80	22,535	83,479
101.00	23,555	88,089
101.20	24,586	92,903
101.40	25,617	97,923
101.60	26,647	103,149
101.80	27,678	108,582
102.00	28,709	114,221
102.20	29,928	120,084
102.40	31,147	126,192
102.60	32,365	132,543
102.80	33,584	139,138
103.00	**34,803**	**145,977**

Summary for Link x2000: Off-Site Northwest

Inflow Area = 5.957 ac, 7.09% Impervious, Inflow Depth > 2.72" for 10-YR event
Inflow = 9.02 cfs @ 12.70 hrs, Volume= 1.349 af
Primary = 9.02 cfs @ 12.70 hrs, Volume= 1.349 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

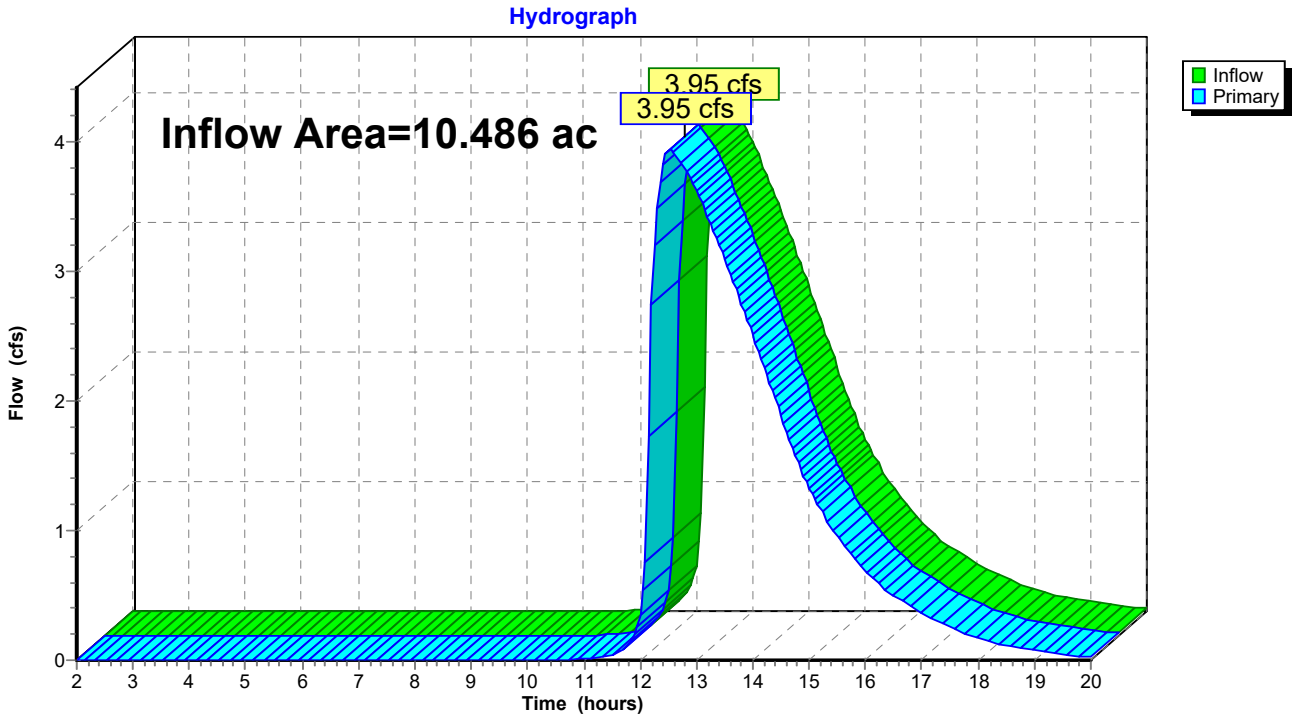


Summary for Link x3000: Off-Site Northeast

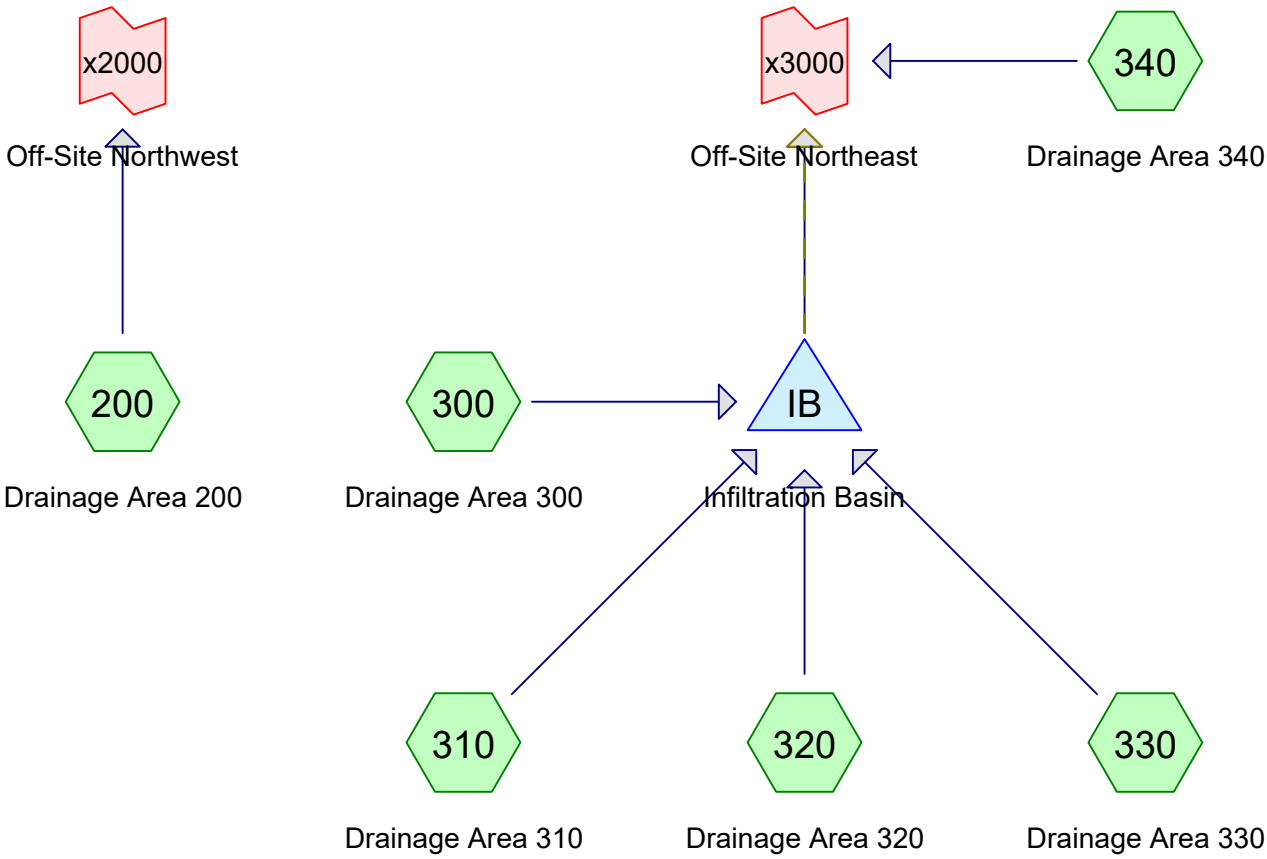
Inflow Area = 10.486 ac, 27.83% Impervious, Inflow Depth > 0.96" for 10-YR event
Inflow = 3.95 cfs @ 12.53 hrs, Volume= 0.842 af
Primary = 3.95 cfs @ 12.53 hrs, Volume= 0.842 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



25-Year Storm Event – Proposed



Subcat Reach Pond Link

Routing Diagram for 43346-PR
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	7.70	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.058	39	>75% Grass cover, Good, HSG A (200, 300, 310, 320, 330)
0.117	61	>75% Grass cover, Good, HSG B (330, 340)
2.940	74	>75% Grass cover, Good, HSG C (200, 300, 310, 330, 340)
0.528	80	>75% Grass cover, Good, HSG D (300, 320, 330)
3.340	98	Impervious (200, 300, 310, 320, 330)
3.402	30	Woods, Good, HSG A (200, 320, 330)
0.192	55	Woods, Good, HSG B (330, 340)
2.862	70	Woods, Good, HSG C (200, 330, 340)
2.004	77	Woods, Good, HSG D (200, 330)
16.443	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.460	HSG A	200, 300, 310, 320, 330
0.309	HSG B	330, 340
5.802	HSG C	200, 300, 310, 330, 340
2.532	HSG D	200, 300, 320, 330
3.340	Other	200, 300, 310, 320, 330
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.058	0.117	2.940	0.528	0.000	4.643	>75% Grass cover, Good	200, 300, 310, 320, 330, 340
0.000	0.000	0.000	0.000	3.340	3.340	Impervious	200, 300, 310, 320, 330
3.402	0.192	2.862	2.004	0.000	8.460	Woods, Good	200, 320, 330, 340
4.460	**0.309**	**5.802**	**2.532**	**3.340**	**16.443**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	310	0.00	0.00	125.0	0.0100	0.013	0.0	6.0	0.0	
2	310	0.00	0.00	100.0	0.0130	0.013	0.0	15.0	0.0	
3	310	0.00	0.00	90.0	0.0100	0.013	0.0	15.0	0.0	
4	310	0.00	0.00	35.0	0.0060	0.013	0.0	15.0	0.0	
5	310	0.00	0.00	90.0	0.0070	0.013	0.0	15.0	0.0	
6	320	0.00	0.00	275.0	0.0100	0.013	0.0	12.0	0.0	
7	320	0.00	0.00	125.0	0.0100	0.013	0.0	15.0	0.0	
8	320	0.00	0.00	105.0	0.0050	0.013	0.0	15.0	0.0	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment200: Drainage Area 200 Runoff Area=259,497 sf 7.09% Impervious Runoff Depth>4.19"
Flow Length=980' Tc=50.3 min CN=73 Runoff=13.84 cfs 2.078 af

Subcatchment300: Drainage Area 300 Runoff Area=144,557 sf 71.58% Impervious Runoff Depth>6.30"
Tc=6.0 min CN=91 Runoff=23.43 cfs 1.741 af

Subcatchment310: Drainage Area 310 Runoff Area=54,317 sf 27.59% Impervious Runoff Depth>3.07"
Flow Length=563' Tc=9.9 min CN=62 Runoff=4.16 cfs 0.319 af

Subcatchment320: Drainage Area 320 Runoff Area=109,281 sf 1.07% Impervious Runoff Depth>0.39"
Flow Length=1,325' Tc=23.5 min CN=32 Runoff=0.32 cfs 0.082 af

Subcatchment330: Drainage Area 330 Runoff Area=131,604 sf 5.68% Impervious Runoff Depth>2.96"
Flow Length=465' Tc=11.9 min CN=61 Runoff=9.16 cfs 0.745 af

Subcatchment340: Drainage Area 340 Runoff Area=17,007 sf 0.00% Impervious Runoff Depth>3.17"
Flow Length=140' Tc=9.1 min CN=63 Runoff=1.37 cfs 0.103 af

Pond IB: Infiltration Basin Peak Elev=99.10' Storage=53,221 cf Inflow=34.59 cfs 2.886 af
s 0.717 af Primary=5.36 cfs 1.398 af Secondary=3.08 cfs 0.244 af Tertiary=0.00 cfs 0.000 af Outflow=9.50 cfs 2.360 af

Link x2000: Off-Site Northwest Inflow=13.84 cfs 2.078 af
Primary=13.84 cfs 2.078 af

Link x3000: Off-Site Northeast Inflow=8.90 cfs 1.745 af
Primary=8.90 cfs 1.745 af

Total Runoff Area = 16.443 ac Runoff Volume = 5.067 af Average Runoff Depth = 3.70"
79.69% Pervious = 13.103 ac 20.31% Impervious = 3.340 ac

Summary for Subcatchment 200: Drainage Area 200

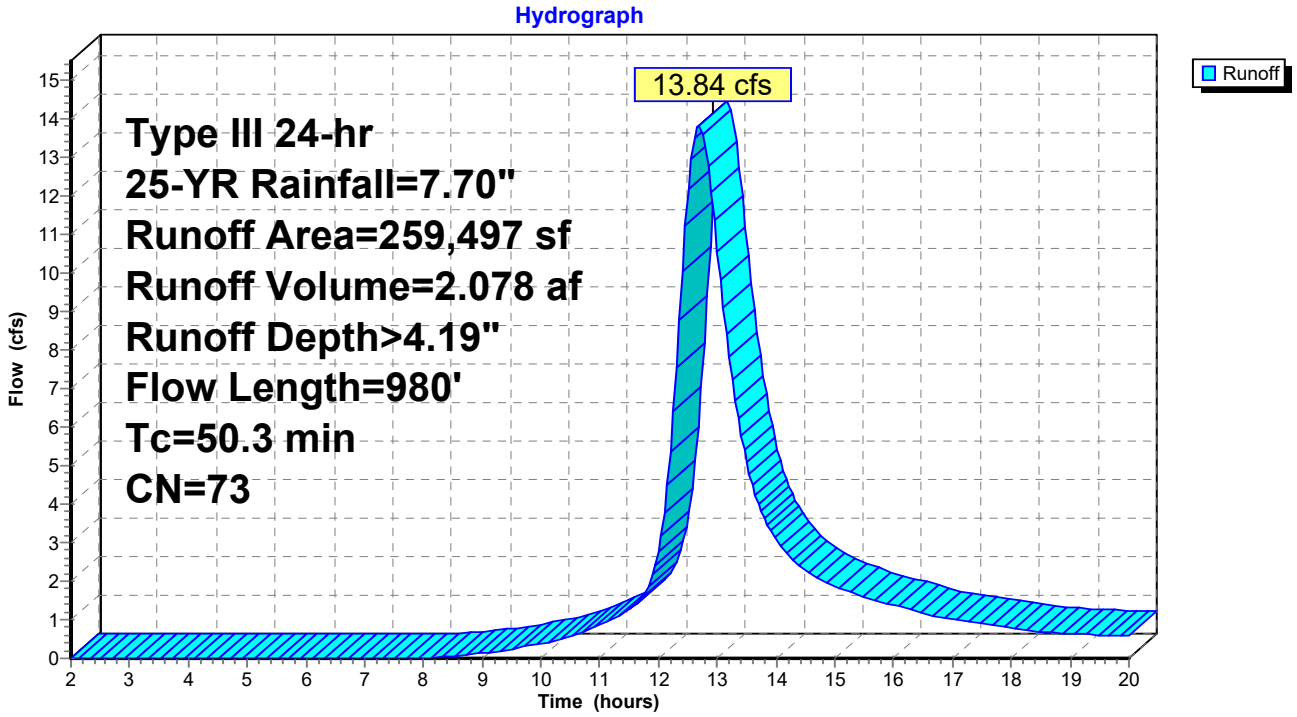
Runoff = 13.84 cfs @ 12.69 hrs, Volume= 2.078 af, Depth> 4.19"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

	Area (sf)	CN	Description
	7,738	30	Woods, Good, HSG A
	101,884	70	Woods, Good, HSG C
	76,182	77	Woods, Good, HSG D
	6,822	39	>75% Grass cover, Good, HSG A
	48,482	74	>75% Grass cover, Good, HSG C
*	18,389	98	Impervious
	259,497	73	Weighted Average
	241,108		92.91% Pervious Area
	18,389		7.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	50	0.0100	0.05		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
2.1	90	0.0100	0.70		**Shallow Concentrated Flow, Next 90 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.1	75	0.0250	1.11		**Shallow Concentrated Flow, Next 75 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.2000	3.13		**Shallow Concentrated Flow, Next 35 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.0500	1.57		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.1	145	0.0070	0.59		**Shallow Concentrated Flow, Next 145 feet of grass** Short Grass Pasture Kv= 7.0 fps
15.8	260	0.0030	0.27		**Shallow Concentrated Flow, Next 260 feet of woods along low p** Woodland Kv= 5.0 fps
1.7	40	0.0030	0.38		**Shallow Concentrated Flow, Next 40 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	65	0.0180	0.94		**Shallow Concentrated Flow, Next 65 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	56	0.0250	0.79		**Shallow Concentrated Flow, Next 56 feet of woods** Woodland Kv= 5.0 fps
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Next 20 feet of woods** Woodland Kv= 5.0 fps
0.1	12	0.1670	2.04		**Shallow Concentrated Flow, Next 12 feet of woods** Woodland Kv= 5.0 fps
0.1	17	0.4000	3.16		**Shallow Concentrated Flow, Next 17 feet of woods** Woodland Kv= 5.0 fps
7.1	95	0.0020	0.22		**Shallow Concentrated Flow, Last 95 feet of woods** Woodland Kv= 5.0 fps
50.3	980	Total			

Subcatchment 200: Drainage Area 200



Summary for Subcatchment 300: Drainage Area 300

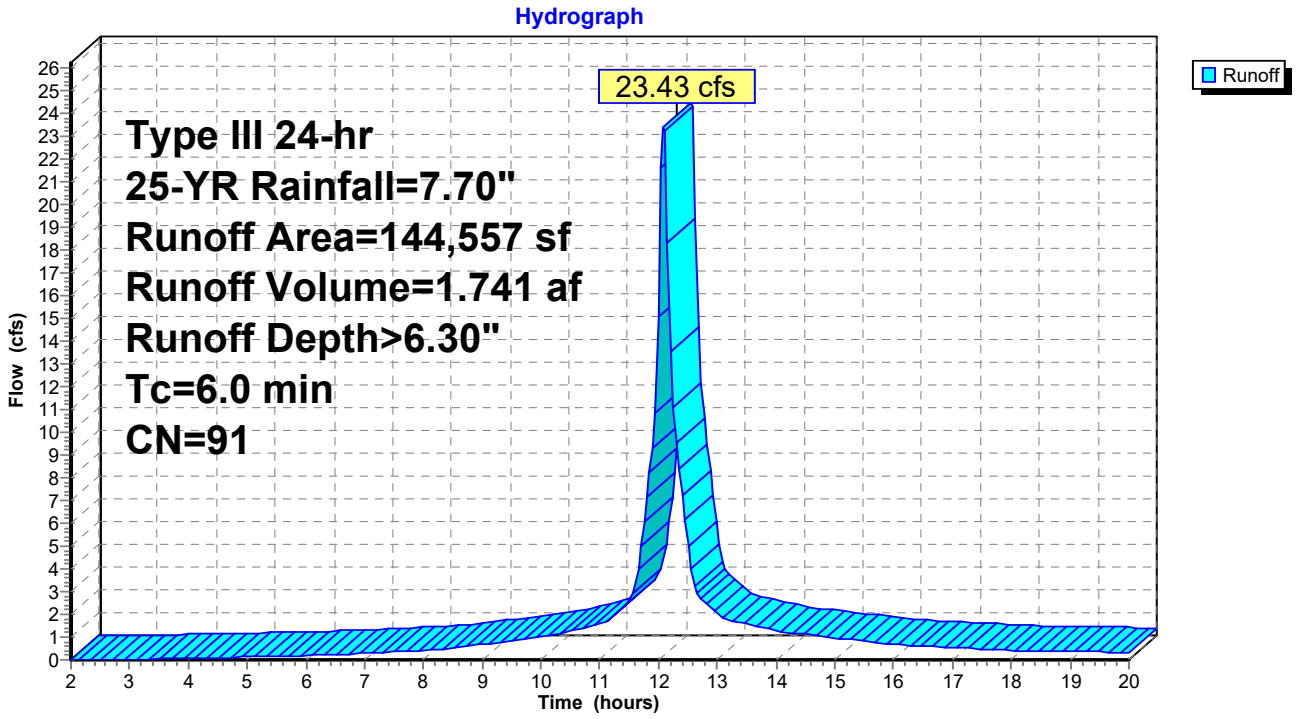
Runoff = 23.43 cfs @ 12.09 hrs, Volume= 1.741 af, Depth> 6.30"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

	Area (sf)	CN	Description
	290	39	>75% Grass cover, Good, HSG A
	33,271	74	>75% Grass cover, Good, HSG C
	7,527	80	>75% Grass cover, Good, HSG D
*	103,469	98	Impervious
	144,557	91	Weighted Average
	41,088		28.42% Pervious Area
	103,469		71.58% Impervious Area

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

Subcatchment 300: Drainage Area 300



Summary for Subcatchment 310: Drainage Area 310

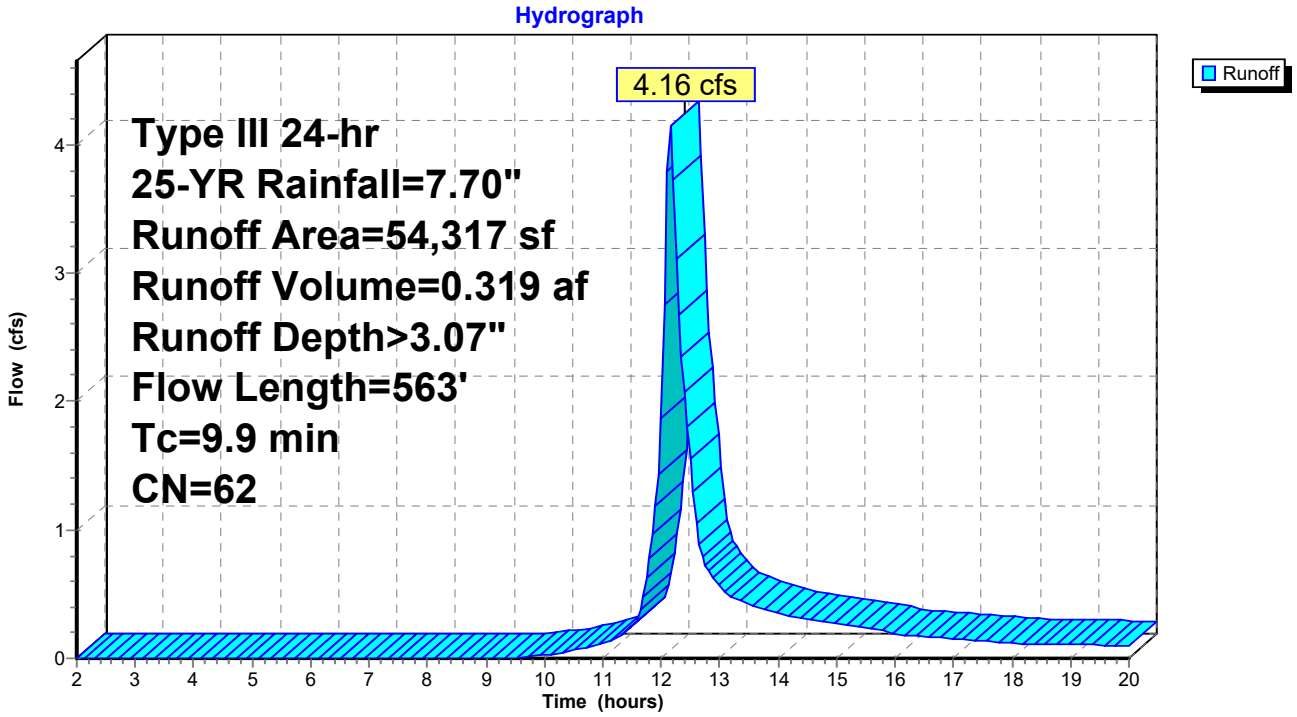
Runoff = 4.16 cfs @ 12.15 hrs, Volume= 0.319 af, Depth> 3.07"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

	Area (sf)	CN	Description
	28,915	39	>75% Grass cover, Good, HSG A
	10,417	74	>75% Grass cover, Good, HSG C
*	14,985	98	Impervious
	54,317	62	Weighted Average
	39,332		72.41% Pervious Area
	14,985		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	20	0.1670	0.21		**Sheet Flow, First 20 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
4.2	30	0.0330	0.12		**Sheet Flow, Next 30 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.0	3	0.3330	4.04		**Shallow Concentrated Flow, Next 3 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.4	70	0.0050	0.49		**Shallow Concentrated Flow, Next 70 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.7	125	0.0100	2.86	0.56	**Pipe Channel, Next 125 feet of 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.3	100	0.0130	6.00	7.37	**Pipe Channel, Next 100 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0100	5.26	6.46	**Pipe Channel, Next 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	35	0.0060	4.08	5.00	**Pipe Channel, Next 35 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0070	4.40	5.40	**Pipe Channel, Last 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.9	563	Total			

Subcatchment 310: Drainage Area 310



Summary for Subcatchment 320: Drainage Area 320

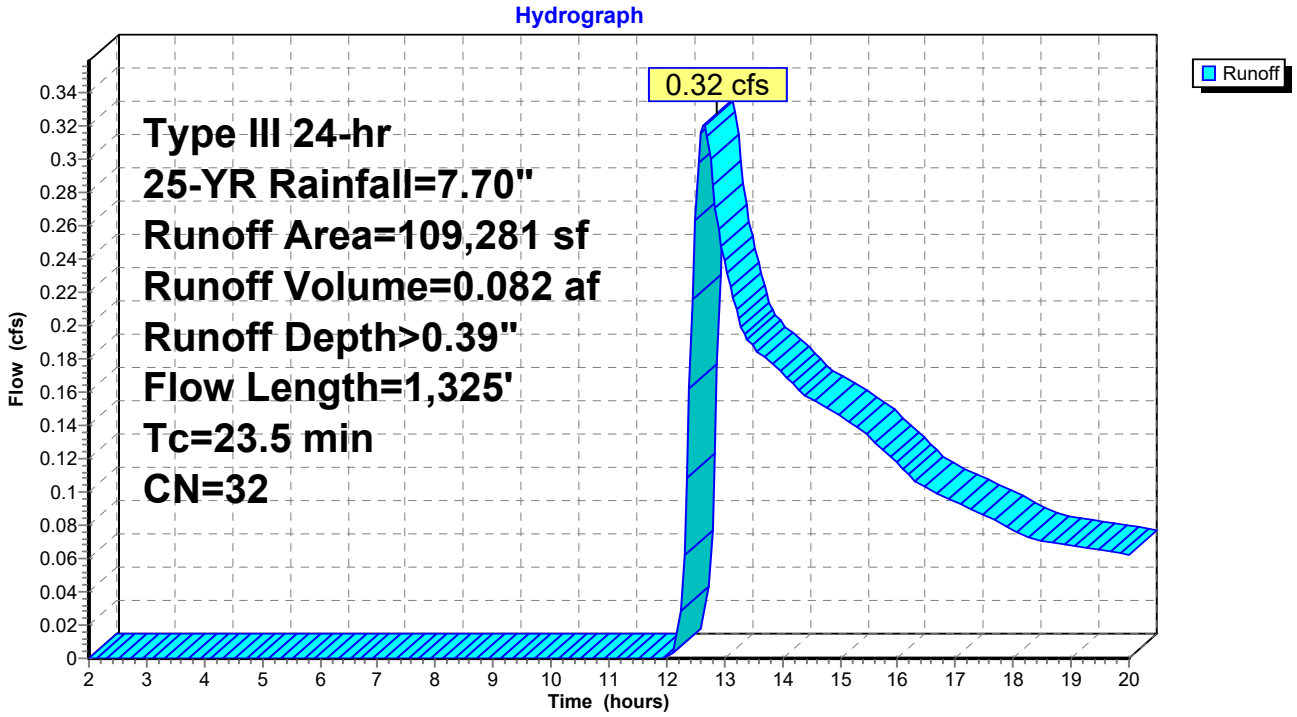
Runoff = 0.32 cfs @ 12.64 hrs, Volume= 0.082 af, Depth> 0.39"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

	Area (sf)	CN	Description
	99,439	30	Woods, Good, HSG A
	8,120	39	>75% Grass cover, Good, HSG A
	548	80	>75% Grass cover, Good, HSG D
*	1,174	98	Impervious
	109,281	32	Weighted Average
	108,107		98.93% Pervious Area
	1,174		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
0.5	85	0.1667	2.86		**Shallow Concentrated Flow, Next 85 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.7	390	0.0160	2.38	7.15	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 8.0' r= 0.38' n= 0.041 Riprap, 2-inch
1.0	275	0.0100	4.54	3.56	**Pipe Channel, Next 275 feet of 12" pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	125	0.0100	5.26	6.46	**Pipe Channel, Next 125 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.5	105	0.0050	3.72	4.57	**Pipe Channel, Next 105 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
23.5	1,325	Total			

Subcatchment 320: Drainage Area 320



Summary for Subcatchment 330: Drainage Area 330

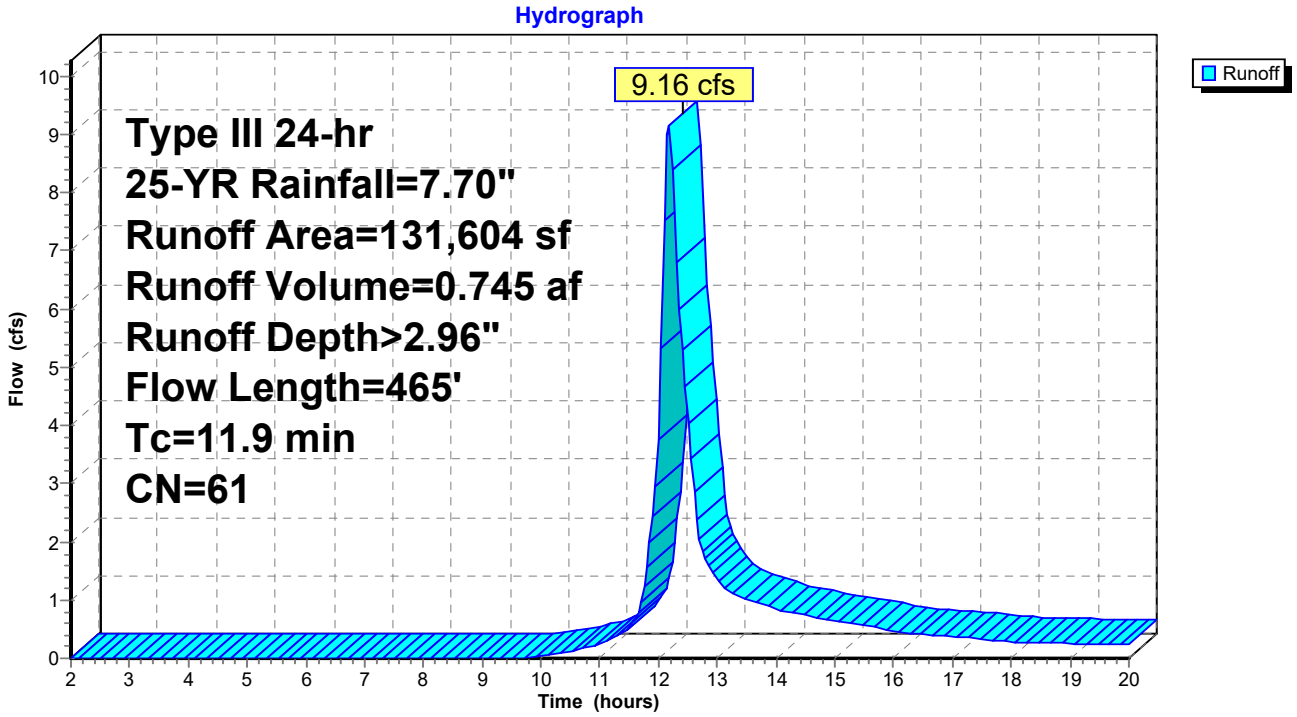
Runoff = 9.16 cfs @ 12.17 hrs, Volume= 0.745 af, Depth> 2.96"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

	Area (sf)	CN	Description
	41,033	30	Woods, Good, HSG A
	621	55	Woods, Good, HSG B
	19,648	70	Woods, Good, HSG C
	11,093	77	Woods, Good, HSG D
	1,925	39	>75% Grass cover, Good, HSG A
	2,914	61	>75% Grass cover, Good, HSG B
	31,962	74	>75% Grass cover, Good, HSG C
	14,933	80	>75% Grass cover, Good, HSG D
*	7,475	98	Impervious
	131,604	61	Weighted Average
	124,129		94.32% Pervious Area
	7,475		5.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1400	0.16		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.6	175	0.1400	1.87		**Shallow Concentrated Flow, Next 175 feet of woods** Woodland Kv= 5.0 fps
0.2	20	0.0800	1.98		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.8	220	0.0120	0.77		**Shallow Concentrated Flow, Next 220 feet of grass** Short Grass Pasture Kv= 7.0 fps
11.9	465	Total			

Subcatchment 330: Drainage Area 330



Summary for Subcatchment 340: Drainage Area 340

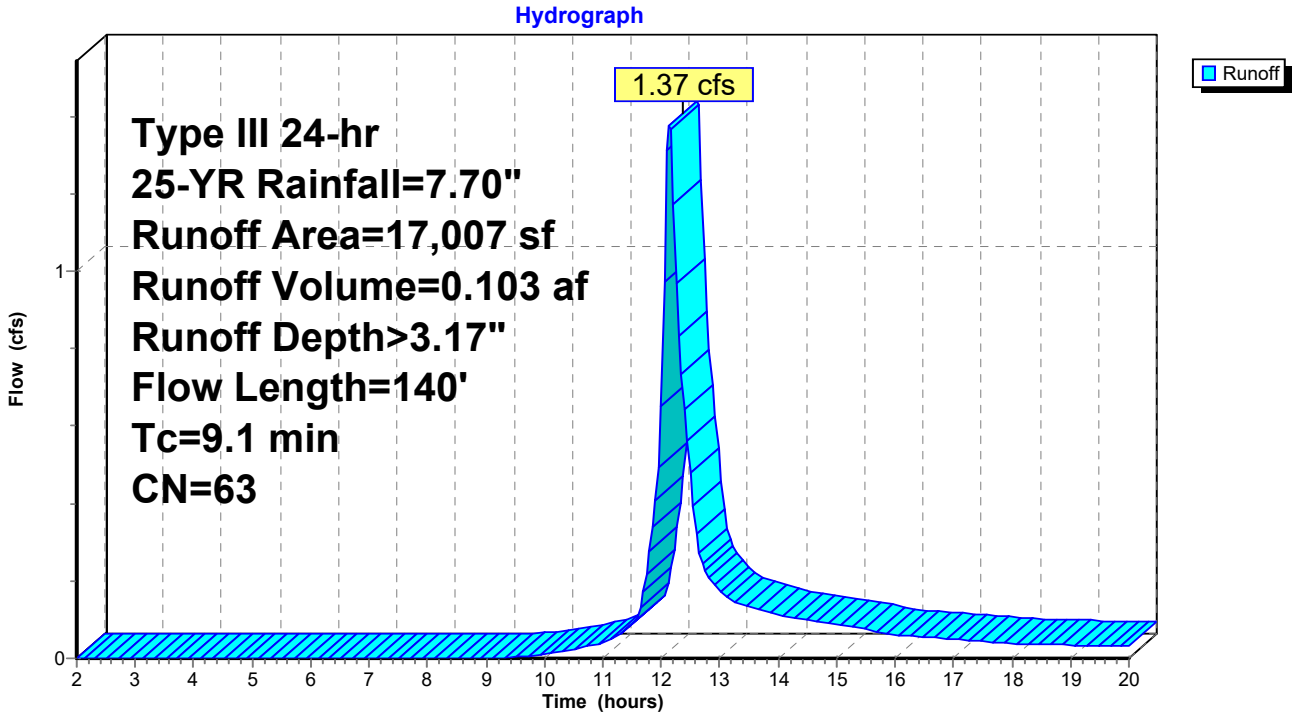
Runoff = 1.37 cfs @ 12.14 hrs, Volume= 0.103 af, Depth> 3.17"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=7.70"

Area (sf)	CN	Description
7,752	55	Woods, Good, HSG B
3,123	70	Woods, Good, HSG C
2,185	61	>75% Grass cover, Good, HSG B
3,947	74	>75% Grass cover, Good, HSG C
17,007	63	Weighted Average
17,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	10	0.0050	0.04		**Sheet Flow, First 10 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.4	4	0.2500	0.18		**Sheet Flow, Next 4 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
3.3	36	0.0900	0.18		**Sheet Flow, Next 36 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.3	60	0.4000	3.16		**Shallow Concentrated Flow, Next 60 feet of woods** Woodland Kv= 5.0 fps
1.4	30	0.0050	0.35		**Shallow Concentrated Flow, Last 30 feet of woods** Woodland Kv= 5.0 fps
9.1	140	Total			

Subcatchment 340: Drainage Area 340



Summary for Pond IB: Infiltration Basin

Inflow Area = 10.095 ac, 28.90% Impervious, Inflow Depth > 3.43" for 25-YR event
Inflow = 34.59 cfs @ 12.11 hrs, Volume= 2.886 af
Outflow = 9.50 cfs @ 12.54 hrs, Volume= 2.360 af, Atten= 73%, Lag= 26.0 min
Discarded = 1.07 cfs @ 12.54 hrs, Volume= 0.717 af
Primary = 5.36 cfs @ 12.54 hrs, Volume= 1.398 af
Routed to Link x3000 : Off-Site Northeast
Secondary = 3.08 cfs @ 12.54 hrs, Volume= 0.244 af
Routed to Link x3000 : Off-Site Northeast
Tertiary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 99.10' @ 12.54 hrs Surf.Area= 12,308 sf Storage= 53,221 cf

Plug-Flow detention time= 116.0 min calculated for 2.360 af (82% of inflow)
Center-of-Mass det. time= 63.3 min (836.9 - 773.6)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	145,977 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	3,830	0	0
93.00	4,696	4,263	4,263
94.00	5,704	5,200	9,463
95.00	6,739	6,222	15,685
96.00	7,837	7,288	22,973
97.00	9,041	8,439	31,412
98.00	10,289	9,665	41,077
99.00	11,633	10,961	52,038
100.00	18,457	15,045	67,083
101.00	23,555	21,006	88,089
102.00	28,709	26,132	114,221
103.00	34,803	31,756	145,977

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.00'	**3.750 in/hr Exfiltration over Surface area**
#2	Primary	95.80'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	97.70'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Tertiary	102.00'	**8.0' long x 15.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

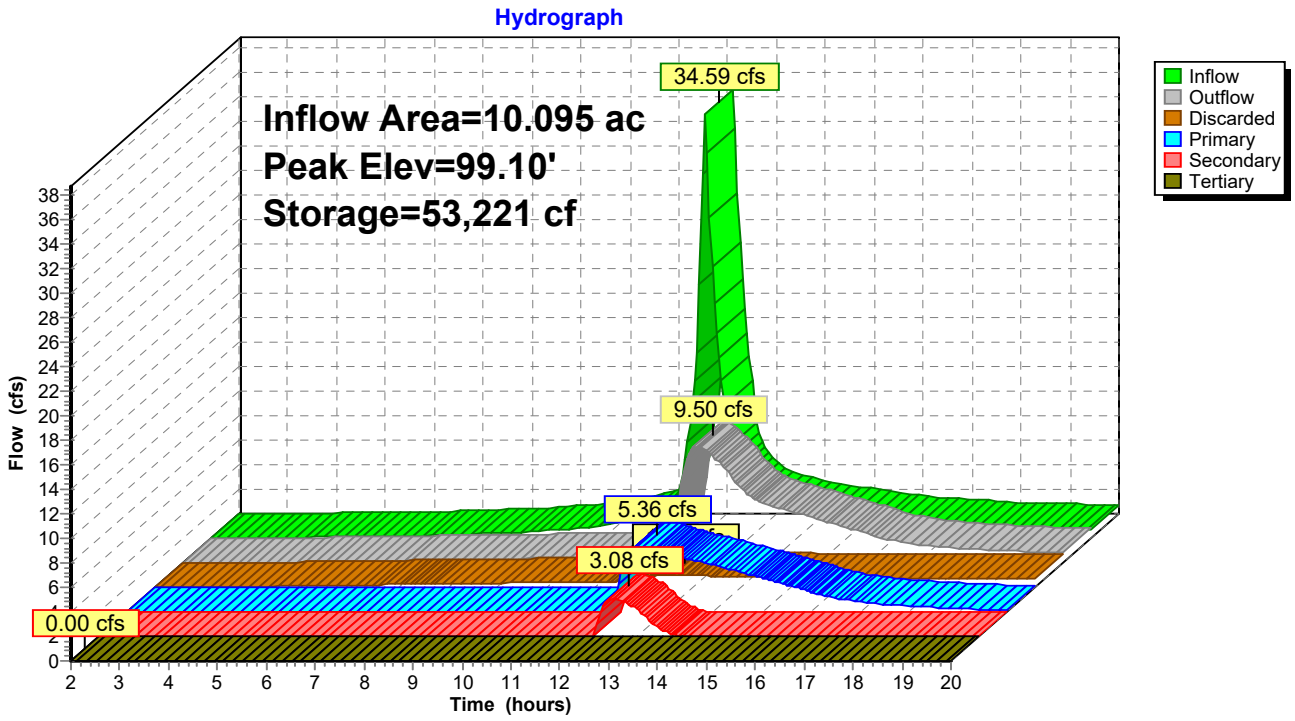
Discarded OutFlow Max=1.07 cfs @ 12.54 hrs HW=99.10' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.07 cfs)

Primary OutFlow Max=5.35 cfs @ 12.54 hrs HW=99.10' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 5.35 cfs @ 8.11 fps)

Secondary OutFlow Max=3.08 cfs @ 12.54 hrs HW=99.10' (Free Discharge)
└**3=Orifice/Grate** (Orifice Controls 3.08 cfs @ 4.66 fps)

Tertiary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond IB: Infiltration Basin



Stage-Area-Storage for Pond IB: Infiltration Basin

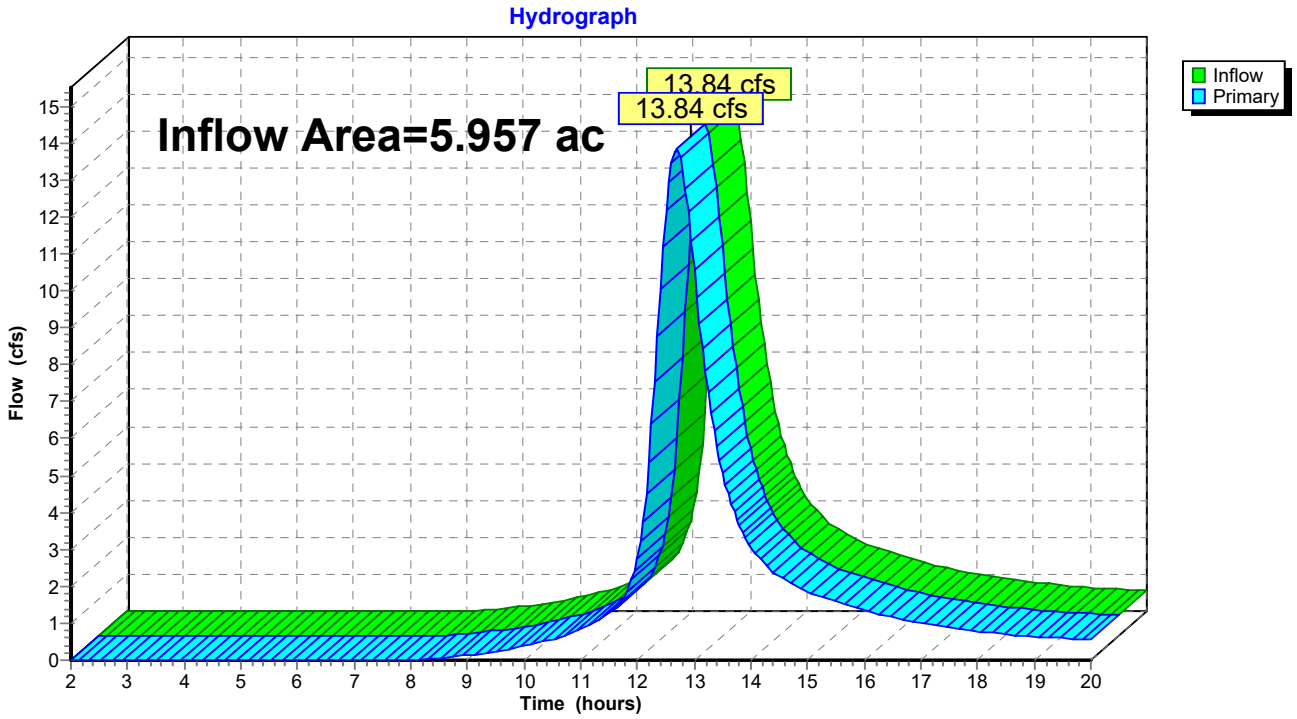
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
92.00	3,830	0
92.20	4,003	783
92.40	4,176	1,601
92.60	4,350	2,454
92.80	4,523	3,341
93.00	4,696	4,263
93.20	4,898	5,222
93.40	5,099	6,222
93.60	5,301	7,262
93.80	5,502	8,342
94.00	5,704	9,463
94.20	5,911	10,625
94.40	6,118	11,827
94.60	6,325	13,072
94.80	6,532	14,357
95.00	6,739	15,685
95.20	6,959	17,054
95.40	7,178	18,468
95.60	7,398	19,926
95.80	7,617	21,427
96.00	7,837	22,973
96.20	8,078	24,564
96.40	8,319	26,204
96.60	8,559	27,891
96.80	8,800	29,627
97.00	9,041	31,412
97.20	9,291	33,245
97.40	9,540	35,128
97.60	9,790	37,061
97.80	10,039	39,044
98.00	10,289	41,077
98.20	10,558	43,161
98.40	10,827	45,300
98.60	11,095	47,492
98.80	11,364	49,738
99.00	11,633	52,038
99.20	12,998	54,501
99.40	14,363	57,237
99.60	15,727	60,246
99.80	17,092	63,528
100.00	18,457	67,083
100.20	19,477	70,876
100.40	20,496	74,873
100.60	21,516	79,074
100.80	22,535	83,479
101.00	23,555	88,089
101.20	24,586	92,903
101.40	25,617	97,923
101.60	26,647	103,149
101.80	27,678	108,582
102.00	28,709	114,221
102.20	29,928	120,084
102.40	31,147	126,192
102.60	32,365	132,543
102.80	33,584	139,138
103.00	**34,803**	**145,977**

Summary for Link x2000: Off-Site Northwest

Inflow Area = 5.957 ac, 7.09% Impervious, Inflow Depth > 4.19" for 25-YR event
Inflow = 13.84 cfs @ 12.69 hrs, Volume= 2.078 af
Primary = 13.84 cfs @ 12.69 hrs, Volume= 2.078 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

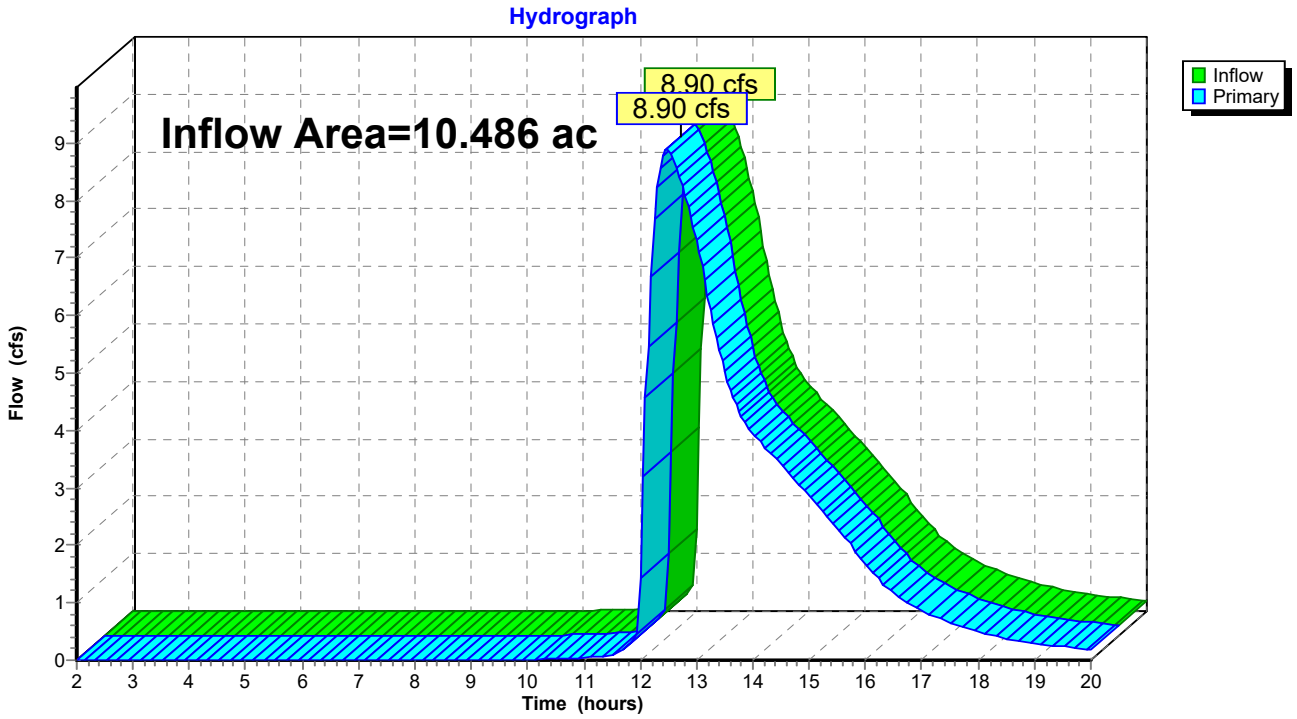


Summary for Link x3000: Off-Site Northeast

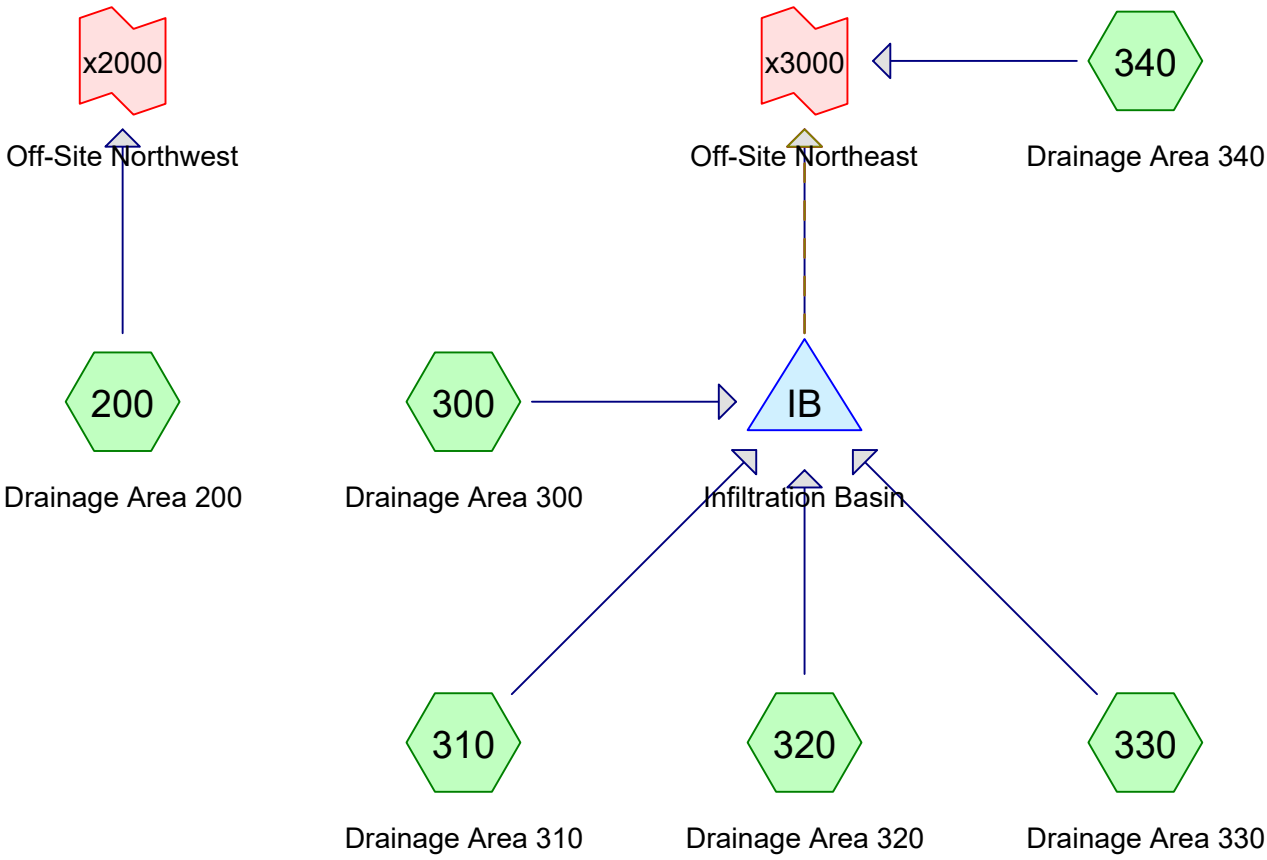
Inflow Area = 10.486 ac, 27.83% Impervious, Inflow Depth > 2.00" for 25-YR event
Inflow = 8.90 cfs @ 12.48 hrs, Volume= 1.745 af
Primary = 8.90 cfs @ 12.48 hrs, Volume= 1.745 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



100-Year Storm Event – Proposed



Subcat Reach Pond Link

Routing Diagram for 43346-PR
Prepared by VHB, Inc, Printed 2/21/2026
HydroCAD® 10.20-8a s/n 01038 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-YR	Type III 24-hr		Default	24.00	1	10.80	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.058	39	>75% Grass cover, Good, HSG A (200, 300, 310, 320, 330)
0.117	61	>75% Grass cover, Good, HSG B (330, 340)
2.940	74	>75% Grass cover, Good, HSG C (200, 300, 310, 330, 340)
0.528	80	>75% Grass cover, Good, HSG D (300, 320, 330)
3.340	98	Impervious (200, 300, 310, 320, 330)
3.402	30	Woods, Good, HSG A (200, 320, 330)
0.192	55	Woods, Good, HSG B (330, 340)
2.862	70	Woods, Good, HSG C (200, 330, 340)
2.004	77	Woods, Good, HSG D (200, 330)
16.443	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.460	HSG A	200, 300, 310, 320, 330
0.309	HSG B	330, 340
5.802	HSG C	200, 300, 310, 330, 340
2.532	HSG D	200, 300, 320, 330
3.340	Other	200, 300, 310, 320, 330
16.443		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.058	0.117	2.940	0.528	0.000	4.643	>75% Grass cover, Good	200, 300, 310, 320, 330, 340
0.000	0.000	0.000	0.000	3.340	3.340	Impervious	200, 300, 310, 320, 330
3.402	0.192	2.862	2.004	0.000	8.460	Woods, Good	200, 320, 330, 340
4.460	**0.309**	**5.802**	**2.532**	**3.340**	**16.443**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	310	0.00	0.00	125.0	0.0100	0.013	0.0	6.0	0.0	
2	310	0.00	0.00	100.0	0.0130	0.013	0.0	15.0	0.0	
3	310	0.00	0.00	90.0	0.0100	0.013	0.0	15.0	0.0	
4	310	0.00	0.00	35.0	0.0060	0.013	0.0	15.0	0.0	
5	310	0.00	0.00	90.0	0.0070	0.013	0.0	15.0	0.0	
6	320	0.00	0.00	275.0	0.0100	0.013	0.0	12.0	0.0	
7	320	0.00	0.00	125.0	0.0100	0.013	0.0	15.0	0.0	
8	320	0.00	0.00	105.0	0.0050	0.013	0.0	15.0	0.0	

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment200: Drainage Area 200 Runoff Area=259,497 sf 7.09% Impervious Runoff Depth>6.82"
Flow Length=980' Tc=50.3 min CN=73 Runoff=22.25 cfs 3.387 af

Subcatchment300: Drainage Area 300 Runoff Area=144,557 sf 71.58% Impervious Runoff Depth>9.23"
Tc=6.0 min CN=91 Runoff=33.55 cfs 2.552 af

Subcatchment310: Drainage Area 310 Runoff Area=54,317 sf 27.59% Impervious Runoff Depth>5.43"
Flow Length=563' Tc=9.9 min CN=62 Runoff=7.39 cfs 0.564 af

Subcatchment320: Drainage Area 320 Runoff Area=109,281 sf 1.07% Impervious Runoff Depth>1.34"
Flow Length=1,325' Tc=23.5 min CN=32 Runoff=1.94 cfs 0.279 af

Subcatchment330: Drainage Area 330 Runoff Area=131,604 sf 5.68% Impervious Runoff Depth>5.29"
Flow Length=465' Tc=11.9 min CN=61 Runoff=16.51 cfs 1.332 af

Subcatchment340: Drainage Area 340 Runoff Area=17,007 sf 0.00% Impervious Runoff Depth>5.57"
Flow Length=140' Tc=9.1 min CN=63 Runoff=2.42 cfs 0.181 af

Pond IB: Infiltration Basin Peak Elev=100.93' Storage=86,416 cf Inflow=54.40 cfs 4.727 af
0.943 af Primary=6.87 cfs 2.323 af Secondary=5.29 cfs 0.900 af Tertiary=0.00 cfs 0.000 af Outflow=14.17 cfs 4.167 af

Link x2000: Off-Site Northwest Inflow=22.25 cfs 3.387 af
Primary=22.25 cfs 3.387 af

Link x3000: Off-Site Northeast Inflow=12.98 cfs 3.405 af
Primary=12.98 cfs 3.405 af

Total Runoff Area = 16.443 ac Runoff Volume = 8.296 af Average Runoff Depth = 6.05"
79.69% Pervious = 13.103 ac 20.31% Impervious = 3.340 ac

Summary for Subcatchment 200: Drainage Area 200

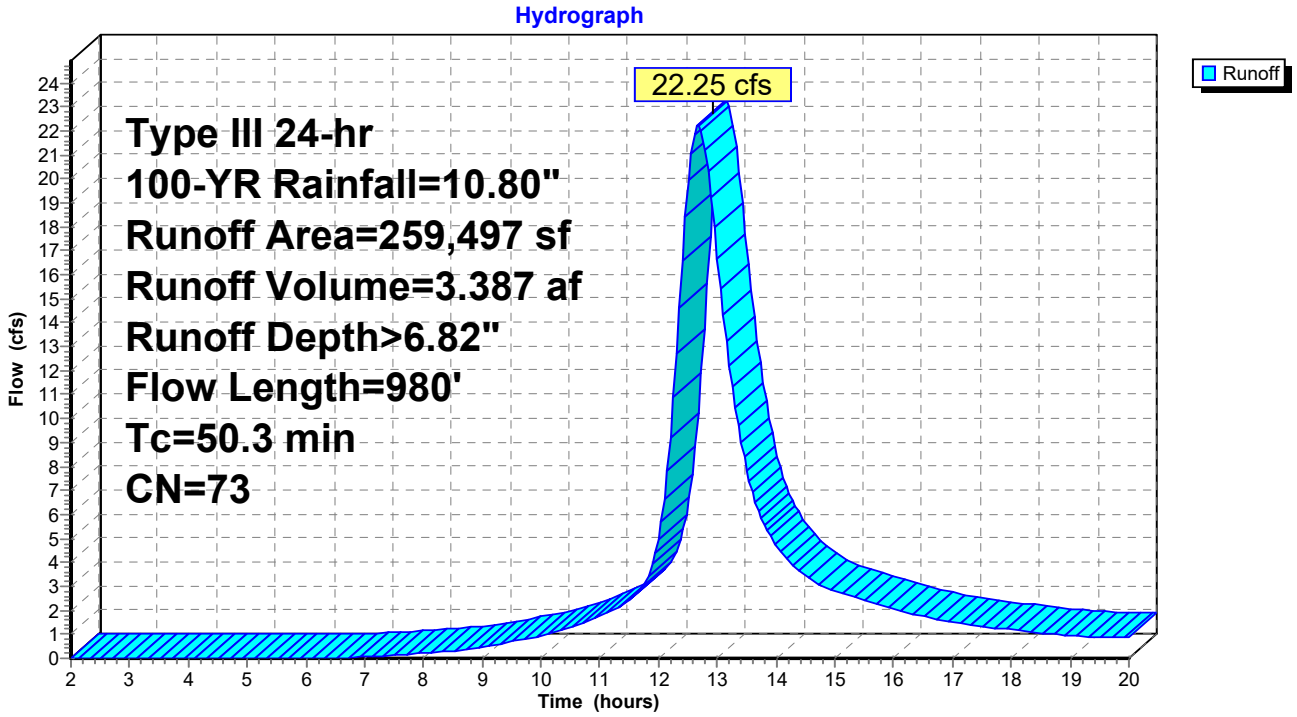
Runoff = 22.25 cfs @ 12.68 hrs, Volume= 3.387 af, Depth> 6.82"
Routed to Link x2000 : Off-Site Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

	Area (sf)	CN	Description
	7,738	30	Woods, Good, HSG A
	101,884	70	Woods, Good, HSG C
	76,182	77	Woods, Good, HSG D
	6,822	39	>75% Grass cover, Good, HSG A
	48,482	74	>75% Grass cover, Good, HSG C
*	18,389	98	Impervious
	259,497	73	Weighted Average
	241,108		92.91% Pervious Area
	18,389		7.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	50	0.0100	0.05		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
2.1	90	0.0100	0.70		**Shallow Concentrated Flow, Next 90 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.1	75	0.0250	1.11		**Shallow Concentrated Flow, Next 75 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.2000	3.13		**Shallow Concentrated Flow, Next 35 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.0500	1.57		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.1	145	0.0070	0.59		**Shallow Concentrated Flow, Next 145 feet of grass** Short Grass Pasture Kv= 7.0 fps
15.8	260	0.0030	0.27		**Shallow Concentrated Flow, Next 260 feet of woods along low p** Woodland Kv= 5.0 fps
1.7	40	0.0030	0.38		**Shallow Concentrated Flow, Next 40 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	65	0.0180	0.94		**Shallow Concentrated Flow, Next 65 feet of grass** Short Grass Pasture Kv= 7.0 fps
1.2	56	0.0250	0.79		**Shallow Concentrated Flow, Next 56 feet of woods** Woodland Kv= 5.0 fps
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Next 20 feet of woods** Woodland Kv= 5.0 fps
0.1	12	0.1670	2.04		**Shallow Concentrated Flow, Next 12 feet of woods** Woodland Kv= 5.0 fps
0.1	17	0.4000	3.16		**Shallow Concentrated Flow, Next 17 feet of woods** Woodland Kv= 5.0 fps
7.1	95	0.0020	0.22		**Shallow Concentrated Flow, Last 95 feet of woods** Woodland Kv= 5.0 fps
50.3	980	Total			

Subcatchment 200: Drainage Area 200



Summary for Subcatchment 300: Drainage Area 300

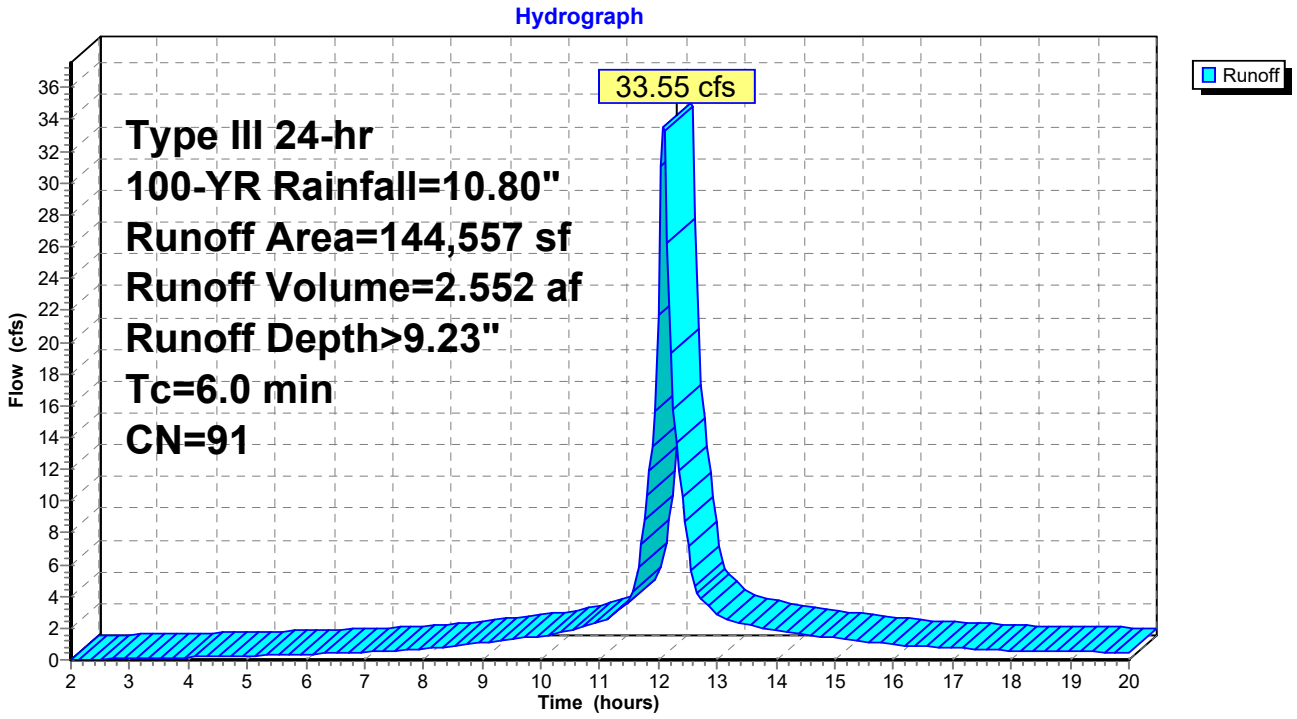
Runoff = 33.55 cfs @ 12.09 hrs, Volume= 2.552 af, Depth> 9.23"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

	Area (sf)	CN	Description
	290	39	>75% Grass cover, Good, HSG A
	33,271	74	>75% Grass cover, Good, HSG C
	7,527	80	>75% Grass cover, Good, HSG D
*	103,469	98	Impervious
	144,557	91	Weighted Average
	41,088		28.42% Pervious Area
	103,469		71.58% Impervious Area

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

Subcatchment 300: Drainage Area 300



Summary for Subcatchment 310: Drainage Area 310

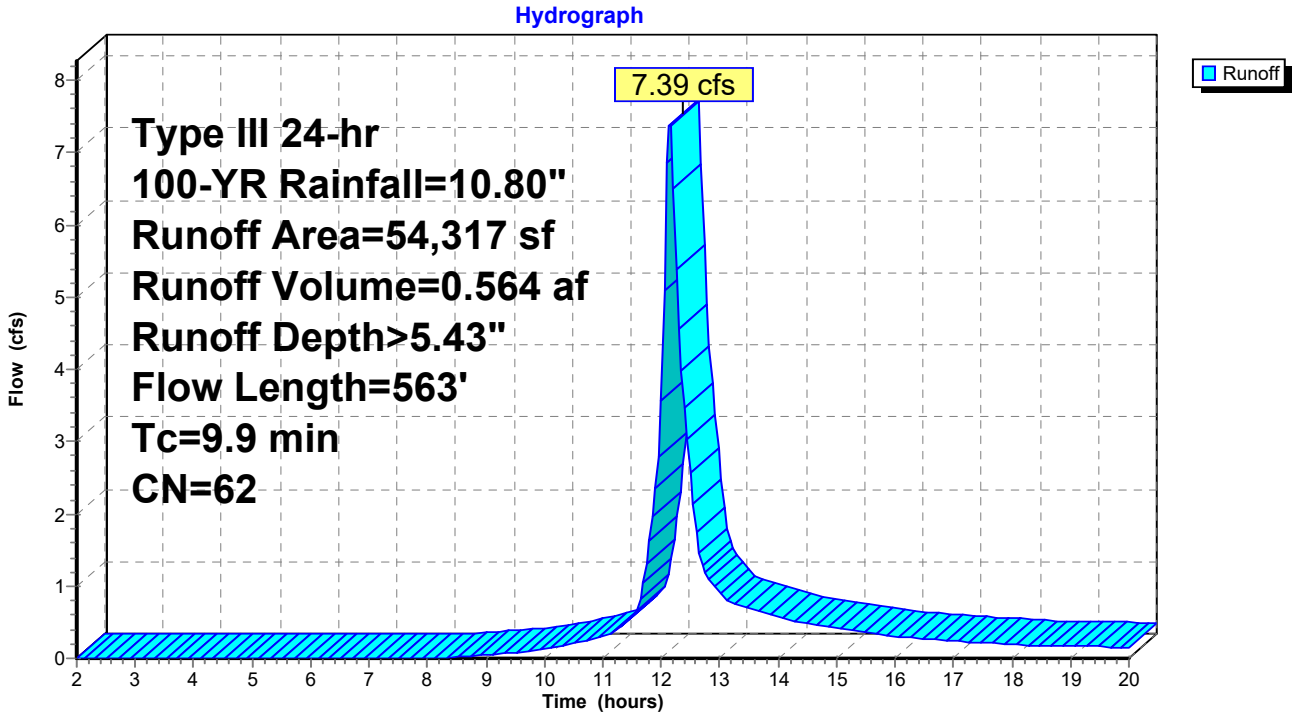
Runoff = 7.39 cfs @ 12.14 hrs, Volume= 0.564 af, Depth> 5.43"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

	Area (sf)	CN	Description
	28,915	39	>75% Grass cover, Good, HSG A
	10,417	74	>75% Grass cover, Good, HSG C
*	14,985	98	Impervious
	54,317	62	Weighted Average
	39,332		72.41% Pervious Area
	14,985		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	20	0.1670	0.21		**Sheet Flow, First 20 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
4.2	30	0.0330	0.12		**Sheet Flow, Next 30 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.0	3	0.3330	4.04		**Shallow Concentrated Flow, Next 3 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.4	70	0.0050	0.49		**Shallow Concentrated Flow, Next 70 feet of grass** Short Grass Pasture Kv= 7.0 fps
0.7	125	0.0100	2.86	0.56	**Pipe Channel, Next 125 feet of 6" pipe** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior
0.3	100	0.0130	6.00	7.37	**Pipe Channel, Next 100 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0100	5.26	6.46	**Pipe Channel, Next 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.1	35	0.0060	4.08	5.00	**Pipe Channel, Next 35 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	90	0.0070	4.40	5.40	**Pipe Channel, Last 90 feet of 15" pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
9.9	563	Total			

Subcatchment 310: Drainage Area 310



Summary for Subcatchment 320: Drainage Area 320

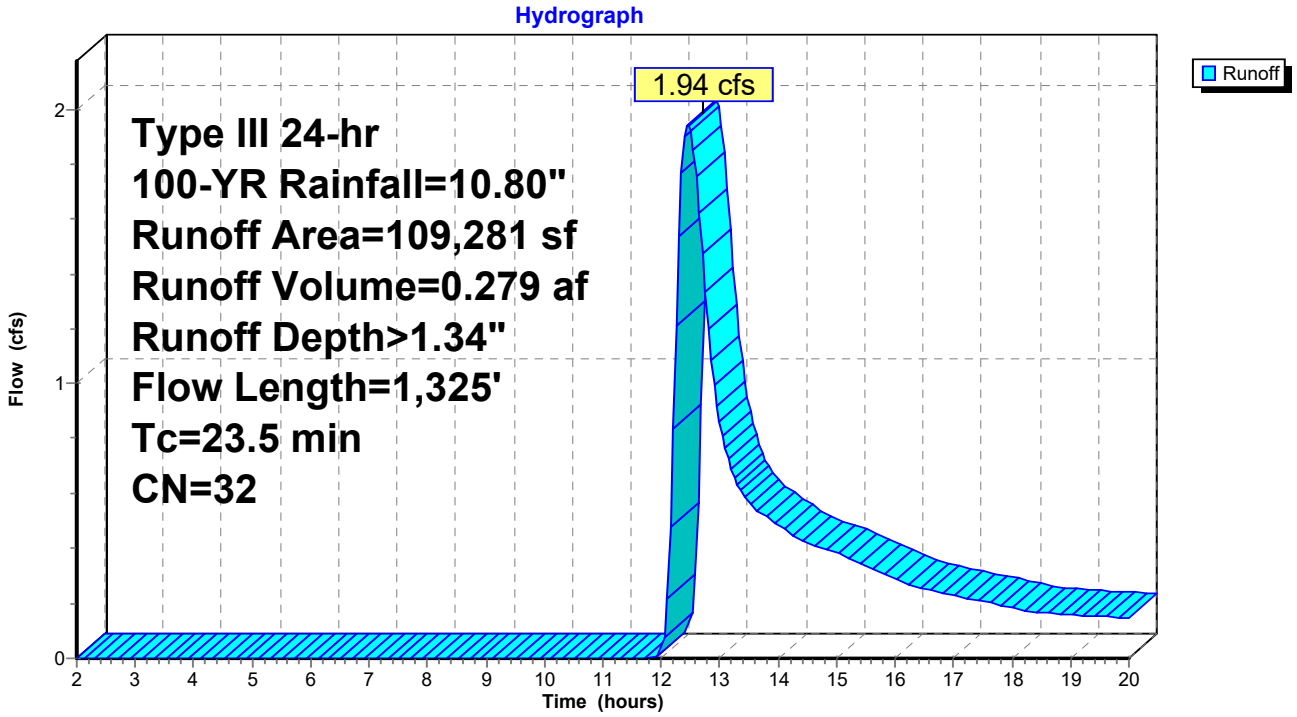
Runoff = 1.94 cfs @ 12.46 hrs, Volume= 0.279 af, Depth> 1.34"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

	Area (sf)	CN	Description
	99,439	30	Woods, Good, HSG A
	8,120	39	>75% Grass cover, Good, HSG A
	548	80	>75% Grass cover, Good, HSG D
*	1,174	98	Impervious
	109,281	32	Weighted Average
	108,107		98.93% Pervious Area
	1,174		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0170	0.07		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.9	80	0.0200	0.71		**Shallow Concentrated Flow, Next 80 feet of woods** Woodland Kv= 5.0 fps
4.1	215	0.0300	0.87		**Shallow Concentrated Flow, Next 215 feet of woods** Woodland Kv= 5.0 fps
0.5	85	0.1667	2.86		**Shallow Concentrated Flow, Next 85 feet of grass** Short Grass Pasture Kv= 7.0 fps
2.7	390	0.0160	2.38	7.15	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 8.0' r= 0.38' n= 0.041 Riprap, 2-inch
1.0	275	0.0100	4.54	3.56	**Pipe Channel, Next 275 feet of 12" pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	125	0.0100	5.26	6.46	**Pipe Channel, Next 125 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.5	105	0.0050	3.72	4.57	**Pipe Channel, Next 105 feet of 15" pipe flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
23.5	1,325	Total			

Subcatchment 320: Drainage Area 320



Summary for Subcatchment 330: Drainage Area 330

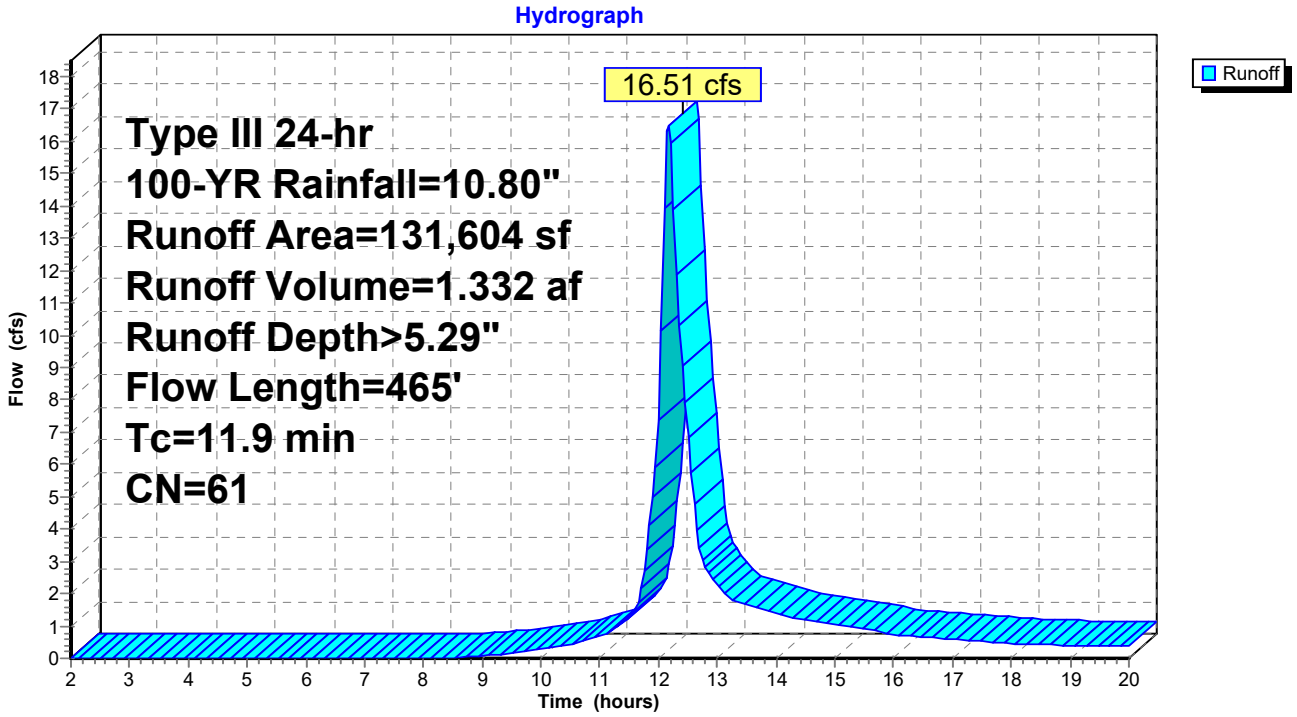
Runoff = 16.51 cfs @ 12.17 hrs, Volume= 1.332 af, Depth> 5.29"
Routed to Pond IB : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

	Area (sf)	CN	Description
	41,033	30	Woods, Good, HSG A
	621	55	Woods, Good, HSG B
	19,648	70	Woods, Good, HSG C
	11,093	77	Woods, Good, HSG D
	1,925	39	>75% Grass cover, Good, HSG A
	2,914	61	>75% Grass cover, Good, HSG B
	31,962	74	>75% Grass cover, Good, HSG C
	14,933	80	>75% Grass cover, Good, HSG D
*	7,475	98	Impervious
	131,604	61	Weighted Average
	124,129		94.32% Pervious Area
	7,475		5.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1400	0.16		**Sheet Flow, First 50 feet of woods** Woods: Light underbrush n= 0.400 P2= 3.61"
1.6	175	0.1400	1.87		**Shallow Concentrated Flow, Next 175 feet of woods** Woodland Kv= 5.0 fps
0.2	20	0.0800	1.98		**Shallow Concentrated Flow, Next 20 feet of grass** Short Grass Pasture Kv= 7.0 fps
4.8	220	0.0120	0.77		**Shallow Concentrated Flow, Next 220 feet of grass** Short Grass Pasture Kv= 7.0 fps
11.9	465	Total			

Subcatchment 330: Drainage Area 330



Summary for Subcatchment 340: Drainage Area 340

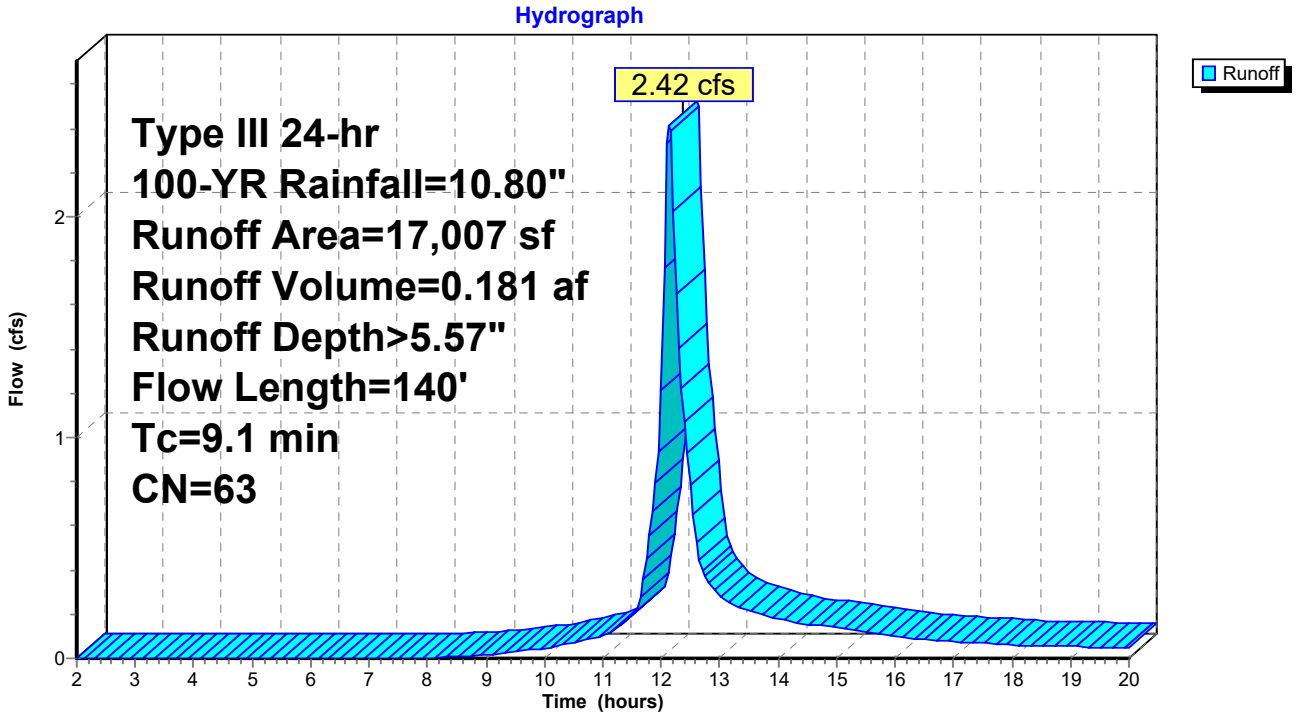
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 0.181 af, Depth> 5.57"
Routed to Link x3000 : Off-Site Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=10.80"

Area (sf)	CN	Description
7,752	55	Woods, Good, HSG B
3,123	70	Woods, Good, HSG C
2,185	61	>75% Grass cover, Good, HSG B
3,947	74	>75% Grass cover, Good, HSG C
17,007	63	Weighted Average
17,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	10	0.0050	0.04		**Sheet Flow, First 10 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.4	4	0.2500	0.18		**Sheet Flow, Next 4 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
3.3	36	0.0900	0.18		**Sheet Flow, Next 36 feet of grass** Grass: Dense n= 0.240 P2= 3.61"
0.3	60	0.4000	3.16		**Shallow Concentrated Flow, Next 60 feet of woods** Woodland Kv= 5.0 fps
1.4	30	0.0050	0.35		**Shallow Concentrated Flow, Last 30 feet of woods** Woodland Kv= 5.0 fps
9.1	140	Total			

Subcatchment 340: Drainage Area 340



Summary for Pond IB: Infiltration Basin

Inflow Area = 10.095 ac, 28.90% Impervious, Inflow Depth > 5.62" for 100-YR event
Inflow = 54.40 cfs @ 12.11 hrs, Volume= 4.727 af
Outflow = 14.17 cfs @ 12.57 hrs, Volume= 4.167 af, Atten= 74%, Lag= 28.0 min
Discarded = 2.01 cfs @ 12.57 hrs, Volume= 0.943 af
Primary = 6.87 cfs @ 12.57 hrs, Volume= 2.323 af
Routed to Link x3000 : Off-Site Northeast
Secondary = 5.29 cfs @ 12.57 hrs, Volume= 0.900 af
Routed to Link x3000 : Off-Site Northeast
Tertiary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Routed to Link x3000 : Off-Site Northeast

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.93' @ 12.57 hrs Surf.Area= 23,190 sf Storage= 86,416 cf

Plug-Flow detention time= 107.1 min calculated for 4.167 af (88% of inflow)
Center-of-Mass det. time= 68.4 min (837.0 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	145,977 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	3,830	0	0
93.00	4,696	4,263	4,263
94.00	5,704	5,200	9,463
95.00	6,739	6,222	15,685
96.00	7,837	7,288	22,973
97.00	9,041	8,439	31,412
98.00	10,289	9,665	41,077
99.00	11,633	10,961	52,038
100.00	18,457	15,045	67,083
101.00	23,555	21,006	88,089
102.00	28,709	26,132	114,221
103.00	34,803	31,756	145,977

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.00'	**3.750 in/hr Exfiltration over Surface area**
#2	Primary	95.80'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	97.70'	**11.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Tertiary	102.00'	**8.0' long x 15.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

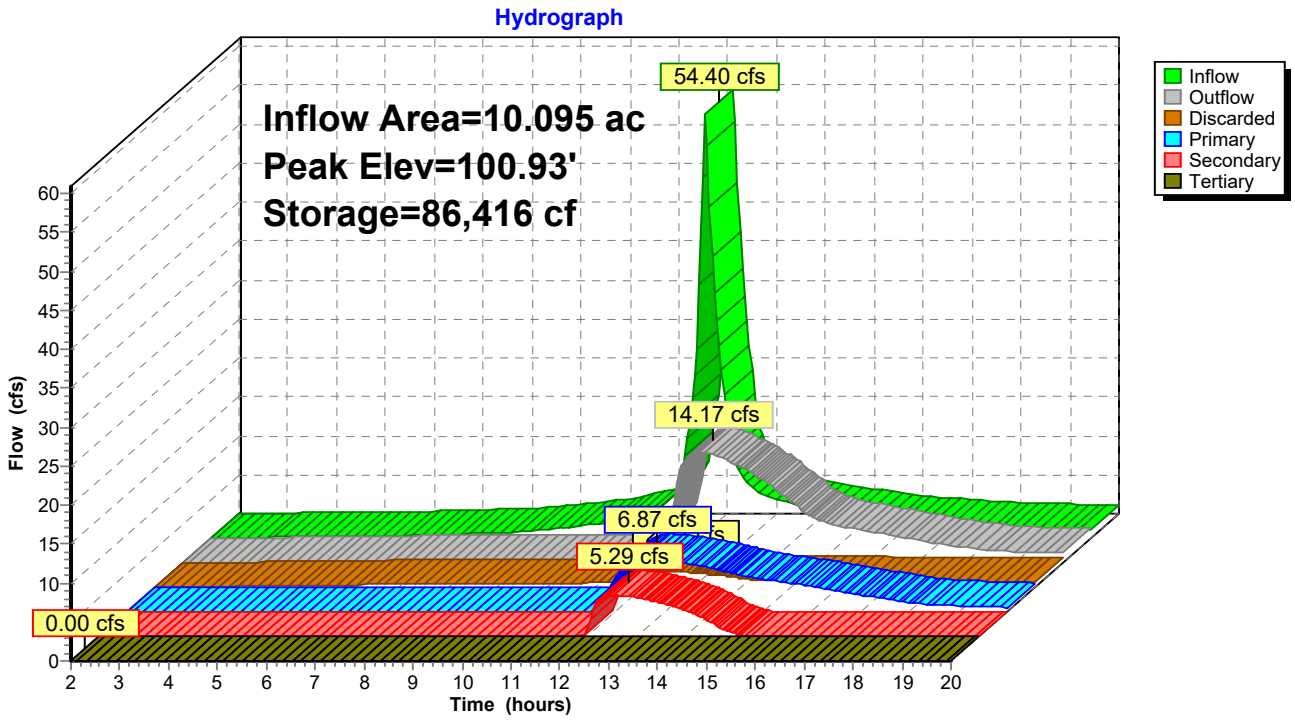
Discarded OutFlow Max=2.01 cfs @ 12.57 hrs HW=100.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.01 cfs)

Primary OutFlow Max=6.87 cfs @ 12.57 hrs HW=100.93' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 6.87 cfs @ 10.40 fps)

Secondary OutFlow Max=5.29 cfs @ 12.57 hrs HW=100.93' (Free Discharge)
└**3=Orifice/Grate** (Orifice Controls 5.29 cfs @ 8.01 fps)

Tertiary OutFlow Max=0.00 cfs @ 2.00 hrs HW=92.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond IB: Infiltration Basin



Stage-Area-Storage for Pond IB: Infiltration Basin

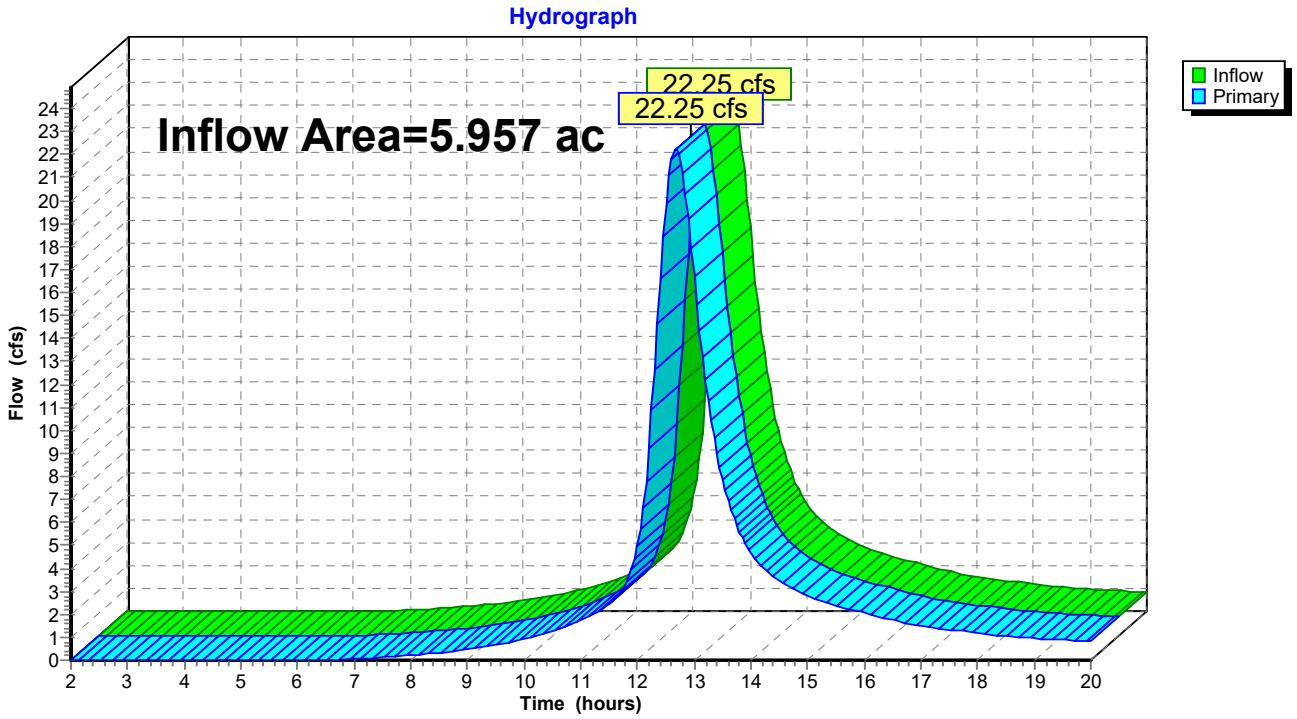
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
92.00	3,830	0
92.20	4,003	783
92.40	4,176	1,601
92.60	4,350	2,454
92.80	4,523	3,341
93.00	4,696	4,263
93.20	4,898	5,222
93.40	5,099	6,222
93.60	5,301	7,262
93.80	5,502	8,342
94.00	5,704	9,463
94.20	5,911	10,625
94.40	6,118	11,827
94.60	6,325	13,072
94.80	6,532	14,357
95.00	6,739	15,685
95.20	6,959	17,054
95.40	7,178	18,468
95.60	7,398	19,926
95.80	7,617	21,427
96.00	7,837	22,973
96.20	8,078	24,564
96.40	8,319	26,204
96.60	8,559	27,891
96.80	8,800	29,627
97.00	9,041	31,412
97.20	9,291	33,245
97.40	9,540	35,128
97.60	9,790	37,061
97.80	10,039	39,044
98.00	10,289	41,077
98.20	10,558	43,161
98.40	10,827	45,300
98.60	11,095	47,492
98.80	11,364	49,738
99.00	11,633	52,038
99.20	12,998	54,501
99.40	14,363	57,237
99.60	15,727	60,246
99.80	17,092	63,528
100.00	18,457	67,083
100.20	19,477	70,876
100.40	20,496	74,873
100.60	21,516	79,074
100.80	22,535	83,479
101.00	23,555	88,089
101.20	24,586	92,903
101.40	25,617	97,923
101.60	26,647	103,149
101.80	27,678	108,582
102.00	28,709	114,221
102.20	29,928	120,084
102.40	31,147	126,192
102.60	32,365	132,543
102.80	33,584	139,138
103.00	**34,803**	**145,977**

Summary for Link x2000: Off-Site Northwest

Inflow Area = 5.957 ac, 7.09% Impervious, Inflow Depth > 6.82" for 100-YR event
Inflow = 22.25 cfs @ 12.68 hrs, Volume= 3.387 af
Primary = 22.25 cfs @ 12.68 hrs, Volume= 3.387 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x2000: Off-Site Northwest

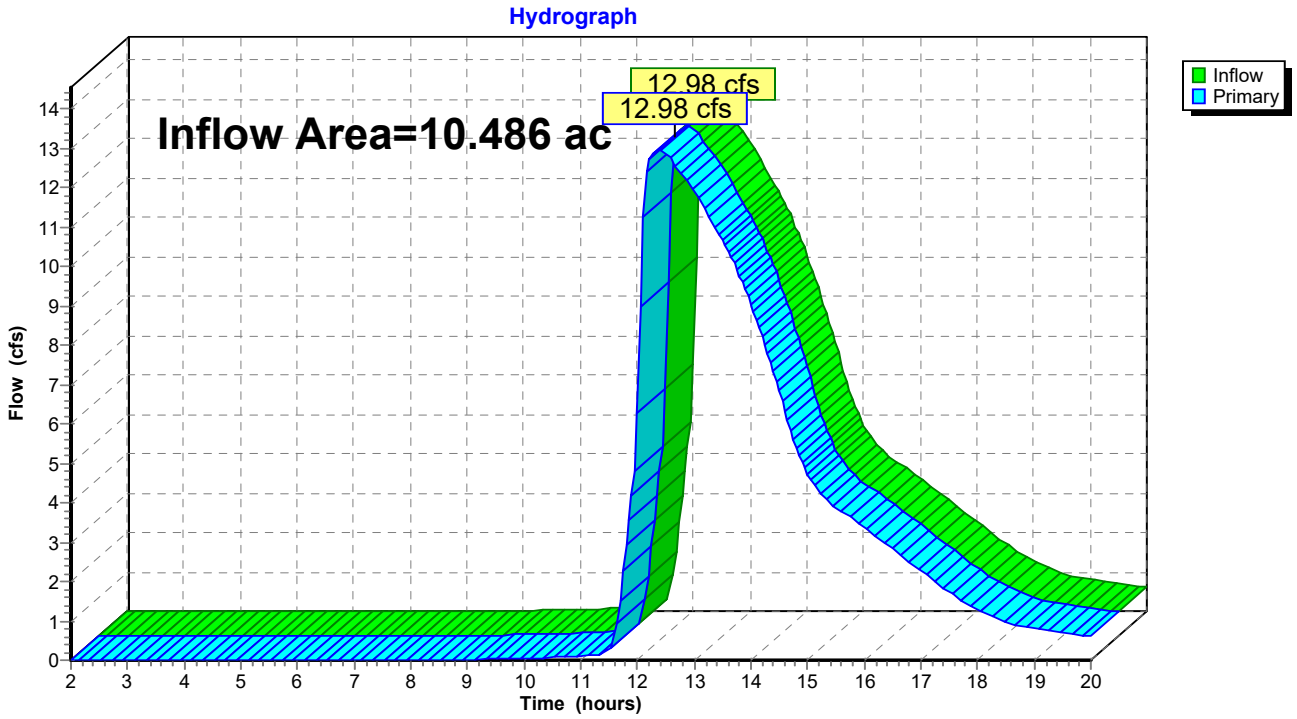


Summary for Link x3000: Off-Site Northeast

Inflow Area = 10.486 ac, 27.83% Impervious, Inflow Depth > 3.90" for 100-YR event
Inflow = 12.98 cfs @ 12.40 hrs, Volume= 3.405 af
Primary = 12.98 cfs @ 12.40 hrs, Volume= 3.405 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Link x3000: Off-Site Northeast



Appendix C: Standard 3 Computations and Supporting Documentation

- Soil Evaluation in accordance with Volume 3, Chapter 1 of the Handbook
- Required and Provided Recharge Volume
- 72-hour Drawdown Analysis
- Capture Area Adjustment Calculations

Soil Evaluation and Analysis

- NRCS Web Soil Survey Data
- Geotechnical Report



Map Scale: 1:3,430 if printed on A landscape (11" x 8.5") 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 1:15,800.

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 18, Aug 27, 2024

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	2.4	10.2%
250A	Pollux fine sandy loam, 0 to 3 percent slopes	7.9	33.1%
250C	Pollux fine sandy loam, 8 to 15 percent slopes	2.6	10.8%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	4.5	18.6%
254D	Merrimac fine sandy loam, 15 to 25 percent slopes	2.9	11.9%
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.1	0.4%
275A	Agawam fine sandy loam, 0 to 3 percent slopes	0.6	2.3%
327C	Meckesville loam, 8 to 15 percent slopes	1.6	6.7%
731A	Enosburg loamy sand, 0 to 3 percent slopes	1.3	5.5%
736A	Scantic Variant silt loam, 0 to 3 percent slopes	0.1	0.3%
Totals for Area of Interest		**24.0**	**100.0%**

Hampden County, Massachusetts, Central Part

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: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
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 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
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
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: 3 percent
Landform: Dunes, deltas, outwash terraces, outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Walpole

Percent of map unit: 1 percent
Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

254D—Merrimac fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2tyrg
Elevation: 0 to 1,890 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: Not prime farmland

Map Unit Composition

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

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
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: 15 to 25 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): 2e
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 10 percent
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

Windsor

Percent of map unit: 5 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 5 percent
Landform: Kame terraces, outwash plains, outwash terraces, moraines, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

275A—Agawam fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tyqw
Elevation: 0 to 1,040 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: Moraines, kames, kame terraces, outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread, 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 39 inches: loamy fine sand
2C2 - 39 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 0 to 3 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 supply, 0 to 60 inches: 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

Ninigret

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Windsor

Percent of map unit: 4 percent
Landform: Dunes, deltas, outwash terraces, outwash plains
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Walpole

Percent of map unit: 3 percent
Landform: Deltas, depressions, outwash terraces, depressions, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Hinckley

Percent of map unit: 3 percent
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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

250A—Pollux fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99qx
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

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

Description of Pollux

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-loamy glaciofluvial deposits over hard silty glaciolacustrine deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 34 inches: fine sandy loam
H3 - 34 to 60 inches: stratified very fine sand to silt loam to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F145XY009CT - Well Drained Outwash

Hydric soil rating: No

Minor Components

Amostown

Percent of map unit: 10 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

250C—Pollux fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99qz
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: Farmland of statewide importance

Map Unit Composition

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

Description of Pollux

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy glaciofluvial deposits over hard silty glaciolacustrine deposits derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 34 inches: fine sandy loam
H3 - 34 to 60 inches: stratified very fine sand to silt loam to silt

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F145XY009CT - Well Drained Outwash

Hydric soil rating: No

Minor Components

Amostown

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

Enosburg

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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

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 supply, 0 to 60 inches: 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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

Hampden County, Massachusetts, Central Part

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 supply, 0 to 60 inches: 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

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

Data Source Information

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 18, Aug 27, 2024

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

J1305-80-01
February 12, 2024

Mr. John Furman
Vanasse Hangen Brustlin, Inc.
One Federal Street, Building 103-3 N
Springfield, Massachusetts 01105

Re: Test Pit Investigations and Infiltration Testing
Suffield Commons Housing Development Project
Suffield Street
Agawam, Massachusetts

Dear Mr. Furman:

O'Reilly Talbot & Okun Associates, Inc. (OTO) is pleased to provide this letter report summarizing our investigations of subsurface soil conditions for the design of stormwater infiltration systems for the proposed Suffield Commons housing/condominium development to be located off Suffield Street in Agawam, Massachusetts. A Site Locus is provided as Figure 1. This report is subject to the attached limitations.

1.0 GENERAL INFORMATION

The Site is located to the east of the existing Long Brook Estates Condominiums, off Suffield Street in Agawam, Massachusetts. We understand that the Site was partially developed and subsequently abandoned by a previous developer. Therefore, unmaintained private roads, unfinished buildings, and some utilities are present. In addition, an existing stormwater control area (basin) is present along a portion of the eastern Site boundary. We note that the basin and some of its associated drainage structures are in disrepair. It appears that the Site has not been maintained, and the area of the stormwater basin is currently heavily vegetated. Topography at the Site generally slopes downward to the east, toward Worthington Brook.

Project plans call for a new residential development in the area of the previously abandoned project. We anticipate that the project will include repair or reconstruction of existing roads, utilities, buildings, and stormwater basin; construction of new residential buildings; and installation of utilities.

2.0 SUBSURFACE EXPLORATIONS AND TESTING

Four test pits (TP-1 through TP-4) were performed within or adjacent to the existing infiltration basin, in areas accessible with an excavator at the time of the explorations. The test pits were performed on February 9, 2024 by Mark's Property Services of Southwick, Massachusetts. The test pits were completed using a CAT 305.5 E2 CR excavator equipped with a 0.3 cubic yard bucket.

The test pits extended to a maximum depth of between 6 to 8 feet below the existing ground surface (approximate elevations between 91.5 to 97.5 feet). Hydraulic conductivity (permeability) tests were performed in test pits TP-3 and TP-4. A permeability test could not be performed in TP-1 due to shallow ground water conditions encountered at the time of the explorations. Further information is provided below.

An OTO geotechnical engineer logged the test pits and performed the hydraulic conductivity testing. Test pit logs are attached. Approximate test pit locations are shown on the attached Site Plan (Figure 2).

3.0 SUBSURFACE CONDITIONS

3.1 Test Pits and Soil Conditions

Soil conditions in the test pits consisted of the following:

- In TP-1, a surficial layer of sand and silt, underlain by variable sandy fill, over native silt and clay
- In TP-2, layers of variable granular or debris fill over native silt and clay
- In TP-3 and TP-4, a surficial silty sand layer with trace amounts of organics (roots), underlain by natural fine to medium sand with discontinuous layers or pockets of silt and fine sand

Soils in TP-1 and TP-2 began to cave into the excavation after the groundwater seepage was encountered. Soil descriptions are presented on the attached test pit logs.

Groundwater/Estimated Seasonal High Groundwater

Groundwater seepage was observed in TP-1 at a depth of between 0.5 to 1.5 feet below ground surface (approximate elevation 97.5 to 98.5 feet). In TP-2 and TP-3, groundwater seepage or saturated soils were encountered at a depth of 6.5 feet (elevation 98.5 and 93 feet, respectively). No groundwater or saturated soils were observed in TP-4.

The near surface groundwater seepage in TP-1 appears to be associated with a perched groundwater layer in the upper two feet. We note that standing water was present near TP-1, including near the end of a drain pipe (P73) located nearby to the northwest.

Redoximorphic features were observed in each test pit as follows:

- In TP-1, trace amounts (0-5%) in the upper 4.5 feet, and some (approximately 20%) in the native silt and clay layer below 4.5 feet
- In TP-2, little (10-15%) in the native silt and clay layer below 7.5 feet

- In TP-3 and TP-4 trace amounts (0-5%) in the natural sandy or silty soils below 1.5 feet

We note that frequent areas of standing water were observe at the ground surface throughout the existing infiltration basin. Additional observations and notes are included in the attached test pit logs.

4.0 FIELD AND LABORATORY TESTING RESULTS

4.1 Field Hydraulic Conductivity Testing

A total of four in-situ hydraulic conductivity (or permeability) tests were performed adjacent to two of the test pits (TP-3 and TP-4) to aid in design of the infiltration basins. The testing procedure and results are described below.

The hydraulic conductivity tests were performed with a Guelph permeameter using a constant head testing methodology. The Guelph permeameter allows the rate of water recharge into an unsaturated soil to be measured while a constant water head is maintained. The permeability test was performed by augering a shallow hole into the soil at the base of a test pit. The Guelph apparatus was then inserted, water was added to the apparatus, and the change in the rate of water flow from a reservoir over time was recorded. These data are then used to measure the coefficient of permeability or hydraulic conductivity.

The tests were performed at a depth of between 2.5 to 4.5 feet below ground surface. Each test was performed within the unsaturated natural soils present at those depths. The hydraulic conductivity (K) values determined by these tests are presented in Table 1.

Table 1
Hydraulic Conductivity Test Results

Test Pit	Test ID	Test Depth (ft)	Soil Conditions	K Value (feet/day)
TP-3	TP-3A	2.5	Light brown, fine to medium sand, trace (+) silt	29
	TP-3B	3.0	Light brown, silt and fine sand	<0.01
TP-4	TP-4A	3.3	Light brown, silt and fine sand, little medium sand	0.18
	TP-4B	4.5	Light brown, fine to medium sand, trace (+) silt	32

Hydraulic conductivity tests were not performed in test pits TP-1 and TP-2, due to the presence of shallow groundwater conditions and non-engineered fill soils, respectively.

We appreciated the opportunity to be of service on this project. If you have any questions, please contact the undersigned.

Sincerely yours,
O'Reilly, Talbot & Okun Associates, Inc.

Stephen McLaughlin, EIT
Senior Project Manager

Michael J. Talbot, P.E.
Principal

Pierre J. Carriere, EIT
Engineer I

Attachments: Limitations, Site Locus, Site Plan, Test Pit Logs & Photographs

LIMITATIONS

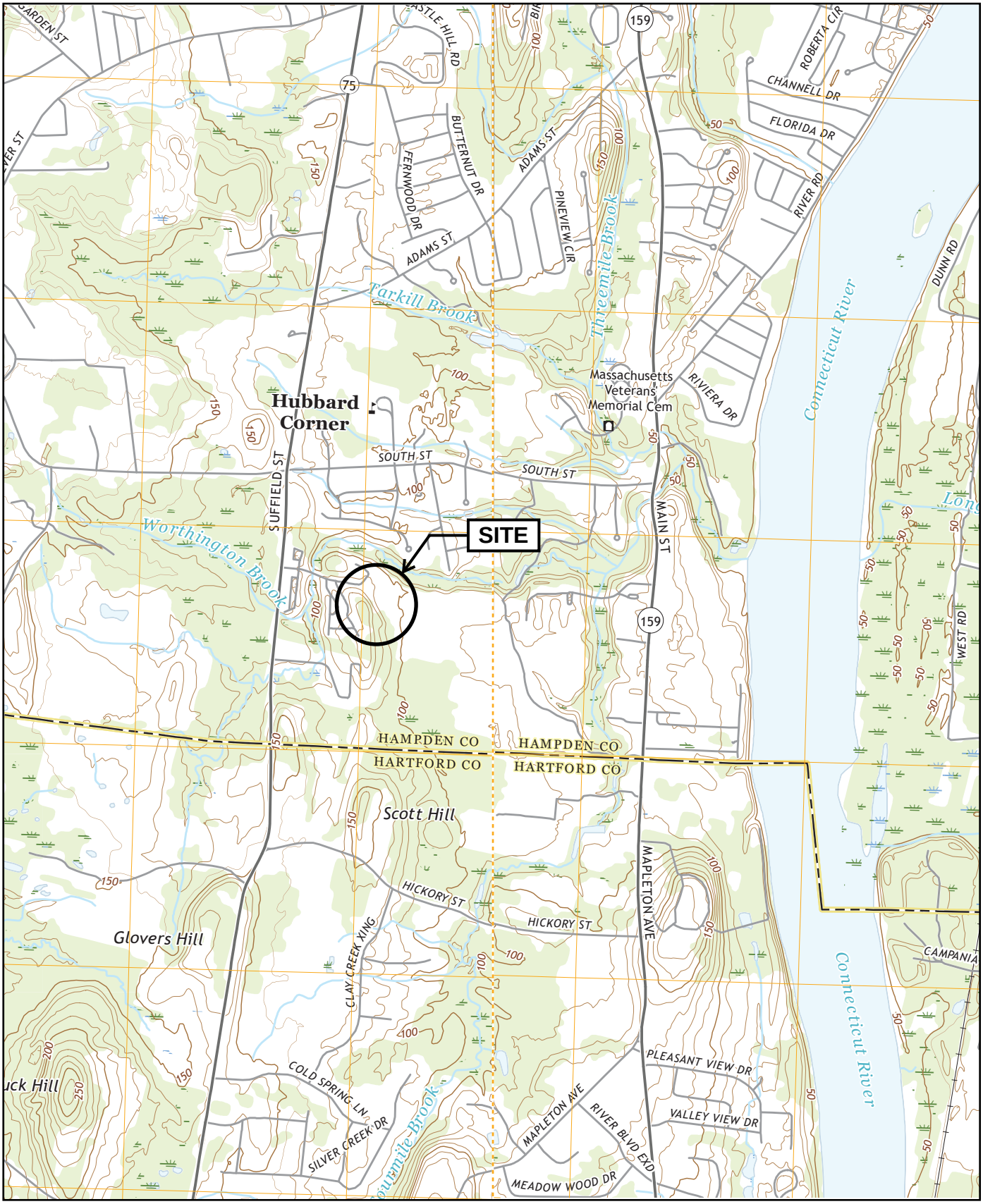
1. The observations presented in this report were made under the conditions described herein. The conclusions presented in this report were based solely upon the services described in the report and not on scientific tasks or procedures beyond the scope of the project or the time and budgetary constraints imposed by the client. The work described in this report was carried out in accordance with the Statement of Terms and Conditions attached to our proposal.

2. The analysis and recommendations submitted in this report are based in part upon the data obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it may be necessary to reevaluate the recommendations of this report.

3. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the boring logs.

4. In the event that any changes in the nature, design or location of the proposed structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by O'Reilly, Talbot & Okun Associates Inc. It is recommended that we be retained to provide a general review of final plans and specifications.

5. Our report was prepared for the exclusive benefit of our client. Reliance upon the report and its conclusions is not made to third parties or future property owners.



0 1000 FEET | 0 0.5 1.0 MILES | 0 0.5 1 KILOMETERS

1:24,000 SCALE NORTH AMERICAN VERTICAL DATUM OF 1988 10 FOOT CONTOUR INTERVAL

O:\J13001305 Vanasse Hangen Brustlin Inc\80-01 Suffield Commons, Agawam - Geotech\Report and Figures\Figure 1 - Site Locus (24k scale).pdf

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

SUFFIELD COMMONS HOUSING DEVELOPENT

1405 SUFFIELD STREET
AGAWAM, MASSACHUSETTS

SITE LOCUS

Topographic Map Quadrants:
WEST SPRINGFIELD, MA
SPRINGFIELD SOUTH, MA

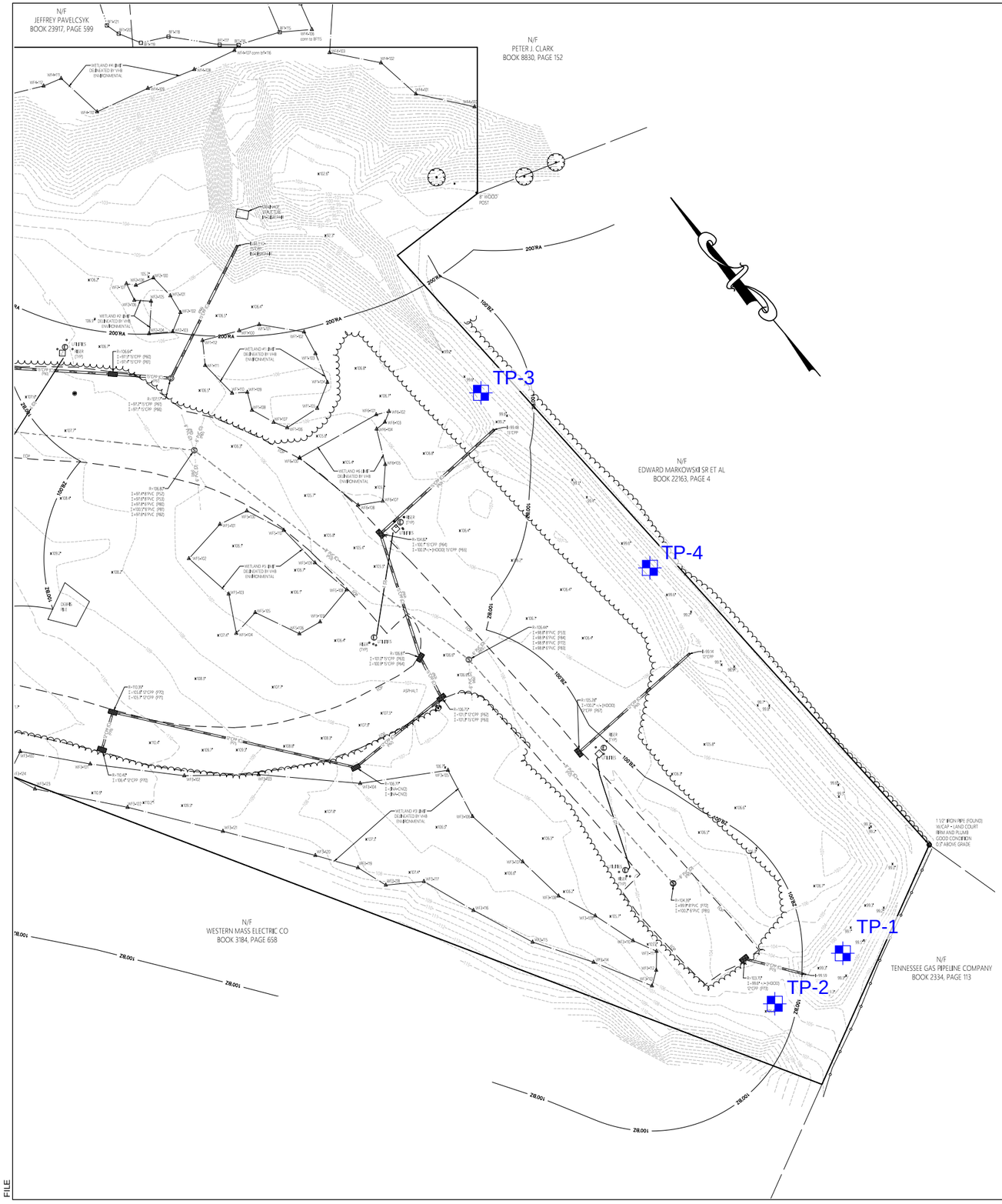
Map Version: 2021

Current As Of: 2021

Date: FEBRUARY 2024

PROJECT No.
J1305-80-01

FIGURE No.
1



NOTES:

1. BASE PLAN PROVIDED TO OTO IN ELECTRONIC FORMAT, TITLED "EXISTING CONDITIONS PLAN OF LAND" (SHEET SV-3), DATED OCTOBER 25, 2023.
2. APPROXIMATE SAMPLE LOCATIONS ARE SHOWN ACCORDING TO MOBILE GPS APPLICATIONS.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHODS USED IN THE DEVELOPMENT OF THIS PLAN.

LEGEND:

APPROXIMATE LOCATION OF TEST PIT PERFORMED BY MARK'S PROPERTY SERVICES ON FEBRUARY 9, 2024, OBSERVED BY OTO

SCALE IN FEET
1" = 80'

0' 40' 80' 160'

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY:
DATE: 02/12/2024
REV. DATE:

SUFFIELD COMMONS HOUSING DEVELOPMENT

SUFFIELD STREET
AGAWAM, MASSACHUSETTS

SITE PLAN

PROJECT NO.
J1305-80-01

FIGURE NO.
2

FILE

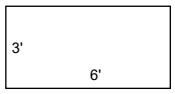
O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

LOG OF TEST PIT TP-1

PROJECT	Suffield Commons Housing Development Project			CONTRACTOR	Mark's Property Services
JOB NO.	1305-80-01	DATE	2/9/2024	OPERATOR	Mark
LOCATION	Agawam, MA	WEATHER	Cloudy, 37°F	BACKHOE	CAT 305.5E2 CR
TEST PIT LOCATION	Base of south end of existing stormwater basin	START TIME	08:15	CAPACITY (cy)	0.33
		FINISH TIME	08:45	GS ELEV. (ft)	99.0
		OTO STAFF	Pierre Carriere	FINAL DEPTH (ft)	6.0

DEPTH (ft)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDERS/ COBBLES COUNT	BOULDERS/ COBBLES CLASS	SAMPLE NO.	FIELD TEST DATA	REMARKS
	0.0'-0.4': Dark brown, fine to medium SAND and SILT, little medium sand, moist	E	0	--	--	--	
1'	0.4'-4.5': Brown to reddish-brown, fine to medium SAND, little gravel, little to trace silt, trace coarse sand, trace organics (roots), moist (FILL) (0-5% redoximorphic features) Perched, heavy groundwater seepage between 0.5'-1.5'		0	--	--	--	1.
2'							
3'							
4'							
5'	4.5'-6.0': Brown to gray, SILT and CLAY, trace fine sand, moist (20% redoximorphic features)		0	--	--	--	
6'	End of exploration at 6.0'						2.
7'							
8'							
9'							
10'							
11'							

TEST PIT PLAN



APPROXIMATE VOLUME = 4.0 cy

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Very Difficult	V

BOULDER/COBBLE CLASS

Type	Size	Abbr.
Cobble	3" - 6"	C
Small	6" - 18"	S
Medium	18" - 36"	M
Large	36" and Larger	L

PROPORTIONS USED

Term	Relative Quantity
and	35% - 50%
some	20% - 35%
little	10% - 20%
trace	10% or less

GROUNDWATER CONDITIONS

GW Encountered?:	Yes (Perched)
GW Depth (ft):	0.5 - 1.5 (Perched)
GW Elevation (ft):	--
Elapsed Time (min):	N/A

Remarks:
1. Heavy (perched) groundwater seepage into test pit between 0.5'-1.5' below surface. Seepage present on all sides of test pit, but most prominent at west side (closest side to drainage pipe from catch basin).
2. Test pit terminated at 6.0' below ground surface due to heavy water seepage filling hole and causing caving of test pit side walls.

PROJECT NO.

1305-80-01

LOG OF TEST PIT

TP-1

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

TEST PIT PHOTOGRAPHS TP-1



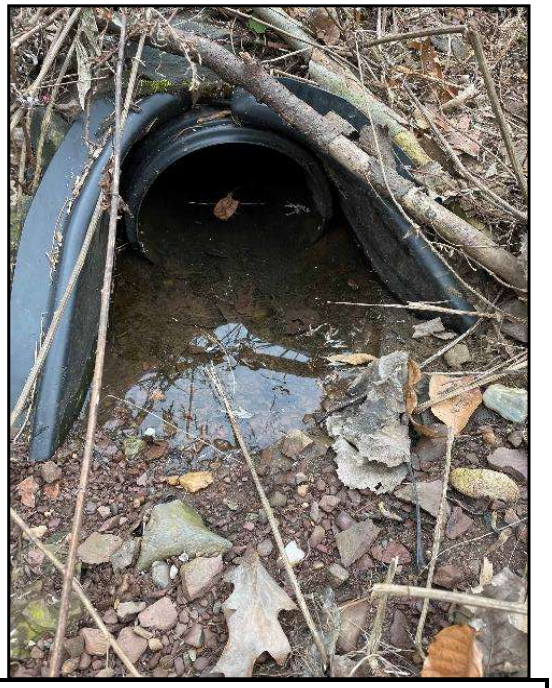
Test pit TP-1



Test pit TP-1



TP-1 side wall



Standing water at drain pipe near TP-1

Remarks:	**PROJECT NO.** **1305-80-01**
	LOG OF TEST PIT **TP-1**

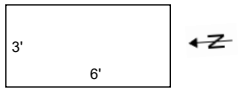
O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

LOG OF TEST PIT TP-2

PROJECT	Suffield Commons Housing Development Project			CONTRACTOR	Mark's Property Services
JOB NO.	1305-80-01	DATE	2/9/2024	OPERATOR	Mark
LOCATION	Agawam, MA	WEATHER	Cloudy, 37°F	BACKHOE	CAT 305.5E2 CR
TEST PIT LOCATION	West of south end of existing stormwater basin	START TIME	08:50	CAPACITY (cy)	0.33
		FINISH TIME	09:35	GS ELEV. (ft)	105.0
		OTO STAFF	Pierre Carriere	FINAL DEPTH (ft)	7.5

DEPTH (ft)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDERS/ COBBLES COUNT	BOULDERS/ COBBLES CLASS	SAMPLE NO.	FIELD TEST DATA	REMARKS
1'	0.0'-2.0': Brown, fine to medium SAND, little silt, trace organics (roots), damp (FILL)	E	0	--	--	--	
3'	2.0'-4.0': Red, GRAVEL and medium to coarse SAND, little fine sand, little silt, damp (FILL)	D	0	--	--	--	
5'	4.0'-6.0': Brown, fine to medium SAND, little coarse sand, trace (+) silt, trace gravel, moist	E	0	--	--	--	
7'	6.0'-7.5': Gray, fine to coarse SAND and DEBRIS (brick, wood), little gravel, trace fine sand, trace silt, moist (wet at 6.5') Groundwater seepage at 6.5'		0	--	--	--	1.
8'	7.5'-8.0': Brown to gray, SILT and CLAY, trace fine sand, wet (10-15% faint redoximorphic features)		0	--	--	--	2.
9'	End of exploration at 8.0'						
10'							
11'							

TEST PIT PLAN



APPROXIMATE VOLUME = 5.3 cy

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Very Difficult	V

BOULDER/COBBLE CLASS

Type	Size	Abbr.
Cobble	3" - 6"	C
Small	6" - 18"	S
Medium	18" - 36"	M
Large	36" and Larger	L

PROPORTIONS USED

Term	Relative Quantity
and	35% - 50%
some	20% - 35%
little	10% - 20%
trace	10% or less

GROUNDWATER CONDITIONS

GW Encountered?: Yes
GW Depth (ft): 6.5
GW Elevation (ft): --
Elapsed Time (min): N/A

Remarks:
1. Groundwater seepage into test pit at 6.5' below surface.
2. Test pit terminated in wet soils at 8.0' below ground surface due to water seepage and caving of test pit side walls.

PROJECT NO.

1305-80-01

LOG OF TEST PIT

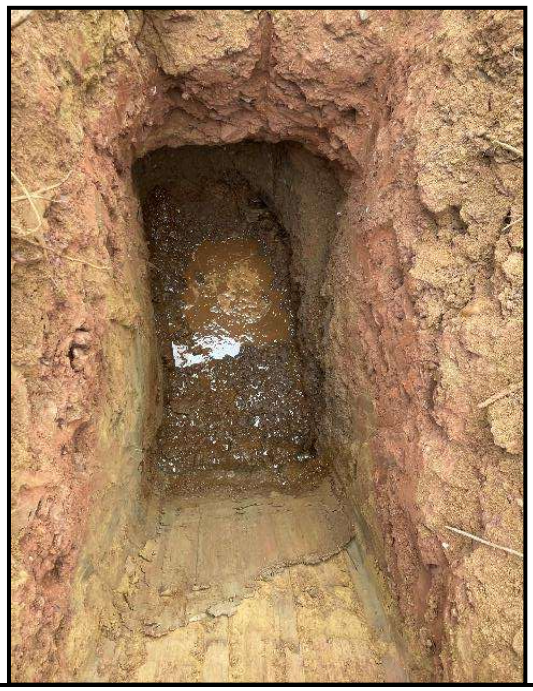
TP-2

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

TEST PIT PHOTOGRAPHS TP-2



Test pit TP-2



Test pit TP-2 and groundwater seepage



TP-2 side wall



TP-2 spoils pile

Remarks:	**PROJECT NO.** **1305-80-01**
	LOG OF TEST PIT **TP-2**

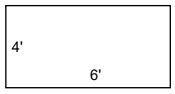
O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

LOG OF TEST PIT TP-3

PROJECT	Suffield Commons Housing Development Project			CONTRACTOR	Mark's Property Services
JOB NO.	1305-80-01	DATE	2/9/2024	OPERATOR	Mark
LOCATION	Agawam, MA	WEATHER	Cloudy, 37°F	BACKHOE	CAT 305.5E2 CR
TEST PIT LOCATION	Middle portion of existing stormwater basin, south of beginning of washed out portion	START TIME	09:45	CAPACITY (cy)	0.33
		FINISH TIME	10:30	GS ELEV. (ft)	99.5
		OTO STAFF	Pierre Carriere	FINAL DEPTH (ft)	7.5

DEPTH (ft)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDERS/ COBBLES COUNT	BOULDERS/ COBBLES CLASS	SAMPLE NO.	FIELD TEST DATA	REMARKS
1'	0.0'--1.5': Dark brown to brown, fine to medium SAND, little to trace (+) silt, trace gravel, trace organics (roots), moist	E	0	--	--	--	
2'	1.5'-7.5': Light brown, fine to medium SAND, trace (+) silt, moist (wet at 6.5') (5-10% faint redoximorphic features throughout; discontinuous layers or pockets of SILT and fine SAND between approximately 3.0'-4.0' and 6.0'-7.0')		0	--	--	--	
3'							
4'							
5'							
6'							
7'	Wet soils encountered at 6.5'						
8'	End of exploration at 7.5'						
9'							
10'							
11'							

TEST PIT PLAN



APPROXIMATE VOLUME = 6.7 cy

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Very Difficult	V

BOULDER/COBBLE CLASS

Type	Size	Abbr.
Cobble	3" - 6"	C
Small	6" - 18"	S
Medium	18" - 36"	M
Large	36" and Larger	L

PROPORTIONS USED

Term	Relative Quantity
and	35% - 50%
some	20% - 35%
little	10% - 20%
trace	10% or less

GROUNDWATER CONDITIONS

GW Encountered?:	Yes
GW Depth (ft):	6.5
GW Elevation (ft):	--
Elapsed Time (min):	N/A

Remarks:
1. Wet soils encountered at 6.5' below surface.
2. Test pit terminated within wet soils at 7.5' below ground surface due to location of excavator and caving/risk of caving of sandy test pit side walls.

PROJECT NO.

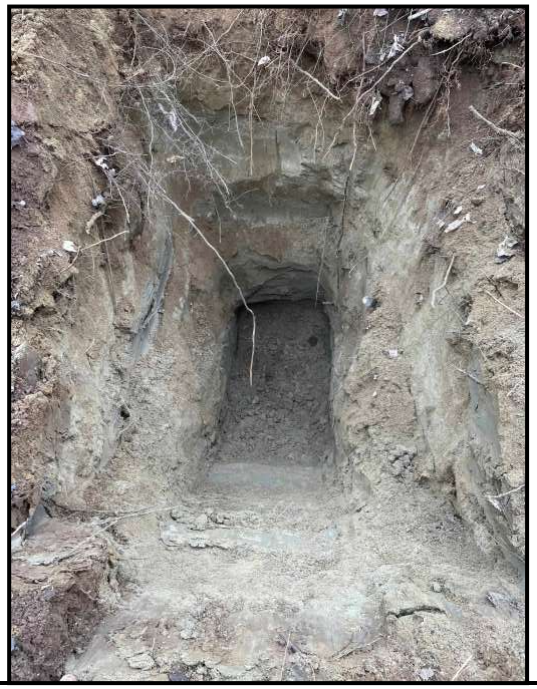
1305-80-01

LOG OF TEST PIT

TP-3

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

TEST PIT PHOTOGRAPHS TP-3



Test pit TP-3



TP-3 side wall



TP-3 spoils pile



TP-3 spoils pile

Remarks:	**PROJECT NO.** **1305-80-01**
	LOG OF TEST PIT **TP-3**

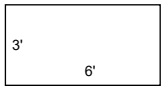
O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

LOG OF TEST PIT TP-4

PROJECT	Suffield Commons Housing Development Project			CONTRACTOR	Mark's Property Services
JOB NO.	1305-80-01	DATE	2/9/2024	OPERATOR	Mark
LOCATION	Agawam, MA	WEATHER	Cloudy, 44°F	BACKHOE	CAT 305.5E2 CR
TEST PIT LOCATION	South portion of existing stormwater basin	START TIME	11:10	CAPACITY (cy)	0.33
		FINISH TIME	11:50	GS ELEV. (ft)	99.5
		OTO STAFF	Pierre Carriere	FINAL DEPTH (ft)	8.0

DEPTH (ft)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDERS/ COBBLES COUN	CLASS	SAMPLE NO.	FIELD TEST DATA	REMARKS
1'	0.0'--1.5': Brown, fine to medium SAND, little silt, trace organics (roots), mois	E	0	--	--	--	
2'	1.5'-7.5': Light brown, fine to medium SAND, trace (+) silt, trace coarse sand, trace gravel, moist (5-10% faint redoximorphic features throughout; discontinuous layers or pock of SILT and fine SAND between approximately 3.0'-4.0' and 5.0'-6.0')		0	--	--	--	
3'							
4'							
5'							
6'							
7'							
8'							1.
	End of exploration at 8.0'						
9'							
10'							
11'							

TEST PIT PLAN



APPROXIMATE VOLUME = 5.3 cy

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Very Difficult	V

BOULDER/COBBLE CLASS

Type	Size	Abbr.
Cobble	3" - 6"	C
Small	6" - 18"	S
Medium	18" - 36"	M
Large	36" and Larger	L

PROPORTIONS USED

Term	Relative Quantity
and	35% - 50%
some	20% - 35%
little	10% - 20%
trace	10% or less

GROUNDWATER CONDITIONS

GW Encountered?: No
GW Depth (ft): N/E
GW Elevation (ft): N/E
Elapsed Time (min): N/A

Remarks:
1. Test pit terminated at 8.0' below ground surface due to location of excavator and caving/risk of caving of sandy test pit side walls.

PROJECT NO.

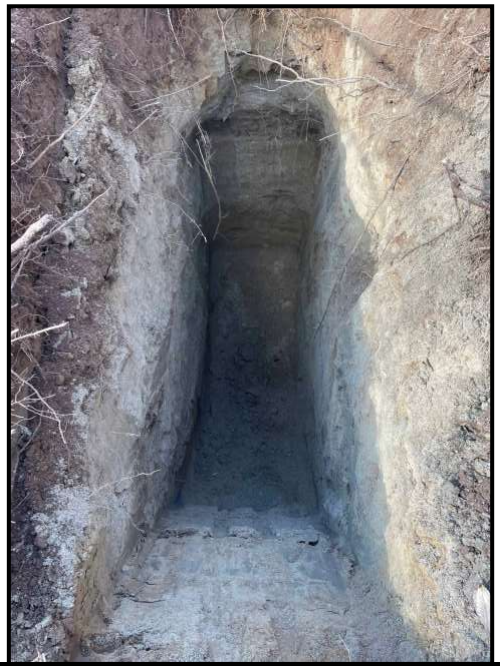
1305-80-01

LOG OF TEST PIT

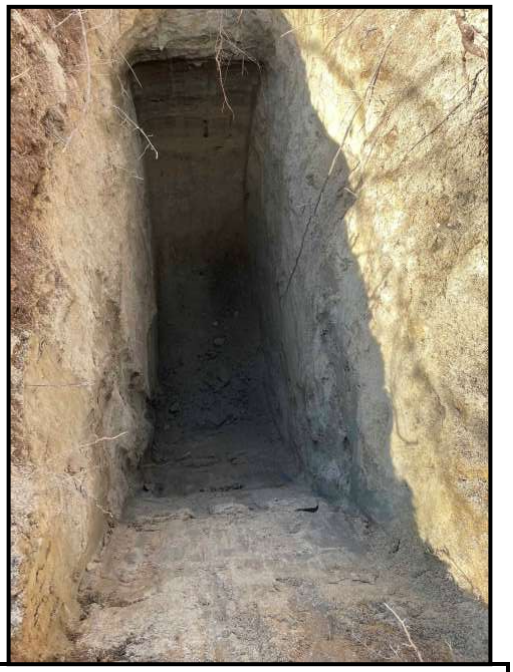
TP-4

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

TEST PIT PHOTOGRAPHS TP-4



Test pit TP-4



Test pit TP-4



TP-4 spoils pile



TP-4 spoils pile

Remarks:	**PROJECT NO.** **1305-80-01**
	LOG OF TEST PIT **TP-4**

J1305-80-02
December 29, 2025

Mr. John Furman
Vanasse Hangen Brustlin, Inc.
One Federal Street, Building 103-3 N
Springfield, Massachusetts 01105

Re: Supplemental Test Pit Investigations and Infiltration Testing
Long Brook Estates Housing Development
Suffield Street
Agawam, Massachusetts

Dear Mr. Furman:

O'Reilly Talbot & Okun Associates, Inc. (OTO) is pleased to provide this letter report summarizing our supplemental investigations of subsurface soil conditions for the design of stormwater management systems for the proposed housing/condominium development to be located at the Long Brook Estates off Suffield Street in Agawam, Massachusetts. A Site Locus is provided as Figure 1. This report is subject to the attached limitations.

1.0 GENERAL INFORMATION

The Site is located to the east of the existing Long Brook Estates condominiums, off Suffield Street in Agawam, Massachusetts. We understand that the Site was partially developed and subsequently abandoned by a previous developer. Therefore, unmaintained private roads, unfinished buildings, and some utilities are present. In addition, an existing stormwater control area (basin) is present along a portion of the eastern Site boundary. We note that the basin and some of its associated drainage structures are in disrepair. It appears that the Site has not been maintained, and the area of the stormwater basin is currently heavily vegetated. Topography at the Site generally slopes downward to the east, toward Worthington Brook.

Project plans call for a new residential development in the area of the previously abandoned project. We anticipate that the project will include repair or reconstruction of existing roads, utilities, buildings, and stormwater basin; construction of new residential buildings; and installation of utilities. We understand that current project plans include expanding the existing stormwater basin. The anticipated bottom elevation of the basin is approximately 92 feet, which is up to 14 feet below existing grade in a portion of the expanded basin.

2.0 SUBSURFACE EXPLORATIONS AND TESTING

To provide information for the proposed expanded stormwater basin, one test pit (TP-101) was performed in the area of the proposed expansion. The test pit was performed on December 17, 2025 by Mark's Property Services of Southwick, Massachusetts. The test

pit was completed using a CAT 308 E2 CR excavator equipped with a 0.5 cubic yard bucket (approximate).

The test pit was extended to a depth of approximately 18 feet below the existing ground surface (approximate bottom elevation 88 feet). A hydraulic conductivity (permeability) test was performed in the test pit at a depth of 9 feet (approximate elevation 97 feet). Further information is provided below.

An OTO geotechnical engineer logged the test pit and performed the hydraulic conductivity test. The test pit log is attached. The approximate location of the test pit is shown on the attached Site Plan (Figure 2).

3.0 SUBSURFACE CONDITIONS

3.1 Test Pits and Soil Conditions

Soil conditions in the test pit consisted of a surficial layer of topsoil, followed by fill and natural sandy soils. Soil descriptions are presented on the attached test pit log and discussed below.

The topsoil layer was approximately 12 inches thick and consisted of dark brown, silty fine sand with trace amounts of organics (roots). It was underlain by dark reddish brown sandy soil containing trace amounts of debris (brick, plastic, concrete, and wood). This reddish layer appears to consist of imported fill which was placed to level the Site during previous development efforts.

The near-surface fill was underlain by approximately 1 foot of natural, yellowish-brown, fine sand. The color and texture of this stratum was somewhat variable both laterally and with depth, occasionally including areas of dark brown, silty soil. Therefore, this layer is likely the original subsoil (B-horizon) with remnants of a former topsoil layer. Portions of this layer appeared relatively dense and were heavily rust-stained, which may indicate that the natural soils were proof compacted prior to the placement of imported fill.

Between a depth of 5.3 and 8 feet below ground surface, soils consisted of a very light brown, uniform fine sand with trace amounts of silt and occasional coarser particles (medium to coarse sand). At a depth of 8 feet, the natural soils transitioned to a somewhat coarser, brown, fine to medium sand with little to trace amounts of gravel and trace amounts of silt and coarse sand. Throughout this layer, small pockets (approximately 6 inches in diameter, or smaller) of slightly clayey, silt and fine sand were observed. Test pit TP-101 was terminated within the natural fine to medium sand layer, at an approximate depth of 18 feet (elevation 88).

These soil conditions are generally consistent with the conditions observed in our February 2024 test pits performed to the south.

3.2 Groundwater/Estimated Seasonal High Groundwater

No groundwater seepage or moist or saturated soils were observed in test pit TP-101. Trace amounts of redoximorphic features were noted within the upper natural fine sand layer. However, the rust mottling was limited to this layer, generally faint and made up a small proportion of the soil mass (less than 5 percent). Therefore, it is our opinion that these features are a result from surface water infiltration, and they do not appear indicative of the seasonal high groundwater table. No other redoximorphic features or signs of the estimated seasonal high groundwater table (ESHGWT) were observed in the test pit.

4.0 FIELD TESTING RESULTS

4.1 Field Hydraulic Conductivity Testing

One hydraulic conductivity (or permeability) test was performed in test pit TP-101 to aid in design of the stormwater basin. The testing procedure and results are described below.

The hydraulic conductivity test was performed with a Guelph permeameter using a constant head testing methodology. The Guelph permeameter allows the rate of water recharge into an unsaturated soil to be measured while a constant water head is maintained. The permeability test was performed by augering a shallow hole into the soil at the base of the test pit. The Guelph apparatus was then inserted, water was added to the apparatus, and the change in the rate of water flow from a reservoir over time was recorded. These data are used to measure the coefficient of permeability or hydraulic conductivity.

The test was performed at a depth of approximately 9 feet below ground surface (elevation 97 feet). The test was performed within the unsaturated natural sandy soils present at that depth. The hydraulic conductivity (K) value determined by this test is presented in Table 1.

Table 1
Hydraulic Conductivity Test Result

Test ID	Test Depth (ft)	Soil Conditions	K Value (feet/day)
TP-101	9.0	Brown, fine to medium sand, trace (+) silt, trace gravel, trace coarse sand	15

We appreciated the opportunity to be of service on this project. If you have any questions, please contact the undersigned.

Sincerely yours,
O'Reilly, Talbot & Okun Associates, Inc.

Pierre J. Carriere, EIT, SE
Engineer II

Stephen McLaughlin, EIT, SE
Senior Project Manager

Attachments: Limitations, Site Locus, Site Plan, Test Pit Log & Photographs

LIMITATIONS

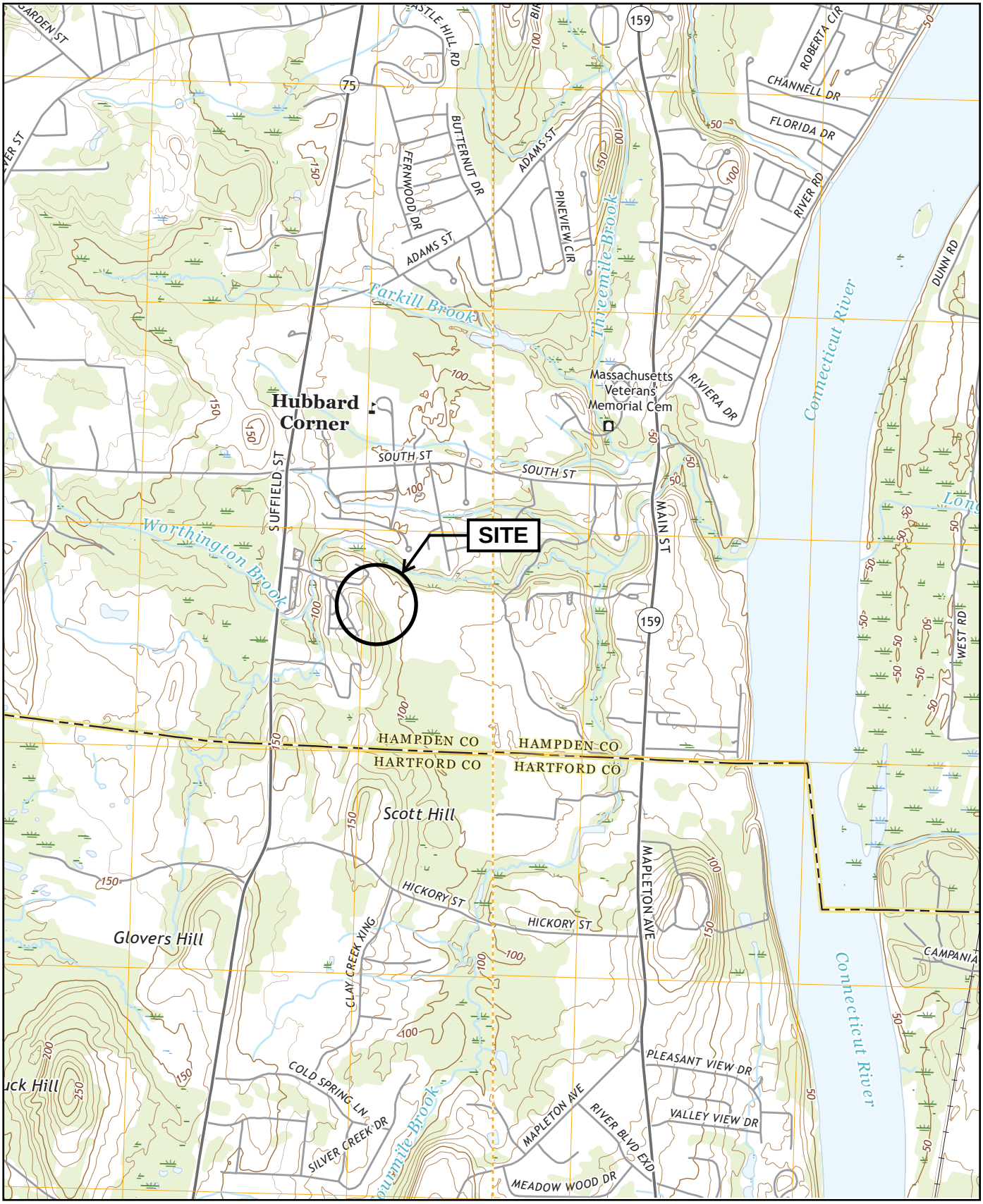
1. The observations presented in this report were made under the conditions described herein. The conclusions presented in this report were based solely upon the services described in the report and not on scientific tasks or procedures beyond the scope of the project or the time and budgetary constraints imposed by the client. The work described in this report was carried out in accordance with the Statement of Terms and Conditions attached to our proposal.

2. The analysis and recommendations submitted in this report are based in part upon the data obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it may be necessary to reevaluate the recommendations of this report.

3. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the boring logs.

4. In the event that any changes in the nature, design or location of the proposed structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by O'Reilly, Talbot & Okun Associates Inc. It is recommended that we be retained to provide a general review of final plans and specifications.

5. Our report was prepared for the exclusive benefit of our client. Reliance upon the report and its conclusions is not made to third parties or future property owners.



0 1000 FEET
0 0.5 1.0 MILES
0 0.5 1 KILOMETERS

1:24,000 SCALE NORTH AMERICAN VERTICAL DATUM OF 1988 10 FOOT CONTOUR INTERVAL

O:\J13001305 Vanasse Hangen Brustlin Inc\80-01 Suffield Commons, Agawam - Geotech\Report and Figures\Figure 1 - Site Locus (24k scale).pdf

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

LONG BROOK ESTATES HOUSING DEVELOPENT

SUFFIELD STREET
AGAWAM, MASSACHUSETTS

SITE LOCUS

Topographic Map Quadrants:
WEST SPRINGFIELD, MA
SPRINGFIELD SOUTH, MA

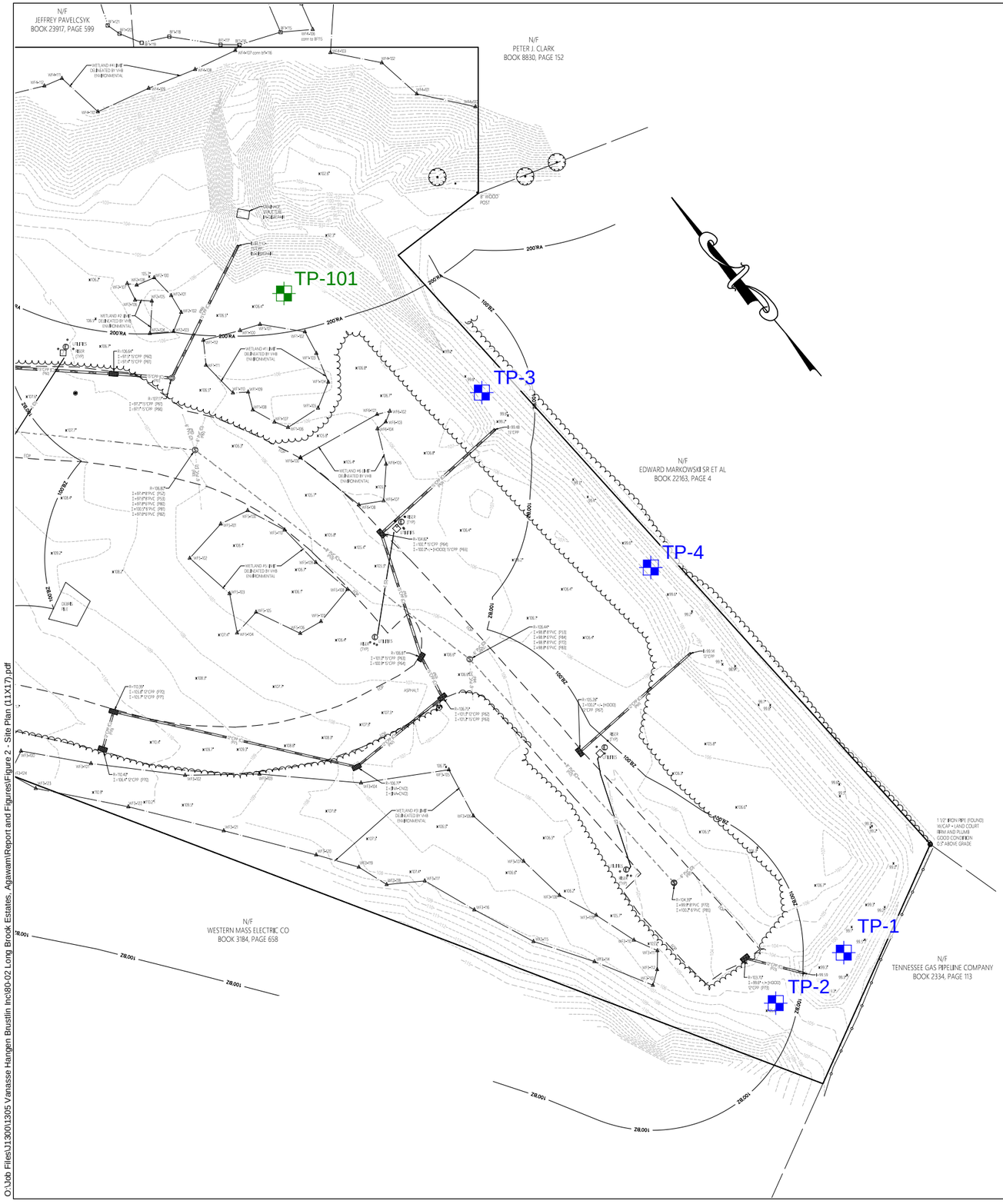
Map Version: 2021

Current As Of: 2021

Date: DECEMBER 2025

PROJECT No.
J1305-80-02

FIGURE No.
1



NOTES:

1. BASE PLAN PROVIDED TO OTO IN ELECTRONIC FORMAT, TITLED "EXISTING CONDITIONS PLAN OF LAND" (SHEET SV-3), DATED OCTOBER 25, 2023.
2. APPROXIMATE SAMPLE LOCATIONS ARE SHOWN ACCORDING TO MOBILE GPS APPLICATIONS.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHODS USED IN THE DEVELOPMENT OF THIS PLAN.

LEGEND:

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY MARK'S PROPERTY SERVICES ON FEBRUARY 9, 2024, OBSERVED BY OTO
- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY MARK'S PROPERTY SERVICES ON DECEMBER 17, 2025, OBSERVED BY OTO

SCALE IN FEET
1" = 80'

0' 40' 80' 160'

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: SMM
DATE: 12/17/2025
REV. DATE:

LONG BROOK ESTATES
HOUSING DEVELOPMENT
SUFFIELD STREET
AGAWAM, MASSACHUSETTS

SITE PLAN

PROJECT NO.
J1305-80-02

FIGURE NO.
2

O:\Job Files\1130013\05 Vanasse Hangen Brustlin Inc\80-02 Long Brook Estates, Agawam\Report and Figures\Figure 2 - Site Plan (11X17).pdf

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

LOG OF TEST PIT TP-101

PROJECT	Long Brook Estates Housing Development			CONTRACTOR	Mark's Property Services
JOB NO.	1305-80-02	DATE	12/17/2025	OPERATOR	Mark
LOCATION	Agawam, MA	WEATHER	Cloudy, 30s°F	EQUIPMENT	CAT 308 E2 CR
TEST PIT LOCATION	Area of proposed detention basin expansion	START TIME	08:00	CAPACITY (cy)	0.5
		FINISH TIME	11:00	GS ELEV. (ft)	106.0
		OTO STAFF	Pierre Carriere	FINAL DEPTH (ft)	18.0

DEPTH (ft)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDERS/ COBBLES COUNT	BOULDERS/ COBBLES CLASS	SAMPLE NO.	FIELD TEST DATA	REMARKS
	0.0'-1.0': Dark brown (10YR 3/4), fine SAND, some silt, little medium to coarse sand, trace organics (roots), damp (TOPSOIL; SANDY LOAM)	E	3	C	--	--	
	1.0'-4.3': Dark brown (7.5 YR 3/4) to dark reddish brown (5 YR 3/3), fine to medium SAND, little silt, trace coarse sand, trace gravel, trace debris (brick, plastic, concrete, wood), trace organics (roots), damp (FILL; LOAMY SAND)		8 20	S C	--	--	
5'	4.3'-5.3': Yellowish brown (10YR 4/6), fine SAND, little medium sand, trace (+) silt, trace coarse sand, damp (LOAMY SAND)		0	--	--	--	
	5.3'-8.0': Very light brown (2.5Y 6/3), fine SAND, trace silt, damp (SAND) Trace (<5%) redox. features (7.5YR 5/6) at 5.3'		0	--	--	--	1. 2.
10'	8.0'-18.0': Brown (10YR 4/3), fine to medium SAND, little to trace gravel, trace (+) silt, trace coarse sand, damp (SAND) (Occasional 3"-6" pockets of slightly clayey, dark grayish brown (2.5Y 4/2), SILT and fine SAND throughout this layer)		0	--	--	--	
15'							
20'	End of exploration at 18'						

EXCAVATION EFFORT		BOULDER/COBBLE CLASS			PROPORTIONS USED		GROUNDWATER CONDITIONS	
		Type	Size	Abbr.	Term	Relative Quantity		
Easy	.....E	Cobble	3" - 6"	C	and	35% - 50%	GW Encountered?:	No
Moderate	.....M	Small	6" - 18"	S	some	20% - 35%	GW Depth (ft):	N/E
Difficult	.....D	Medium	18" - 36"	M	little	10% - 20%	GW Elevation (ft):	N/E
Very Difficult	V	Large	36" and Larger	L	trace	10% or less	Elapsed Time (min):	N/A

Remarks:
1. Trace redoximorphic features (rust mottling) observed between 5.3'-8'. Presence of redox. features likely due to surface water infiltration; features likely not indicative of the ESHGWT.
2. Test pit excavation paused at 6'; hand augered 6'-9'. Encountered hand auger refusal upon gravel or small cobble at 9'. Hydraulic conductivity test performed at depth of 9' using Guelph permeameter.

PROJECT NO.

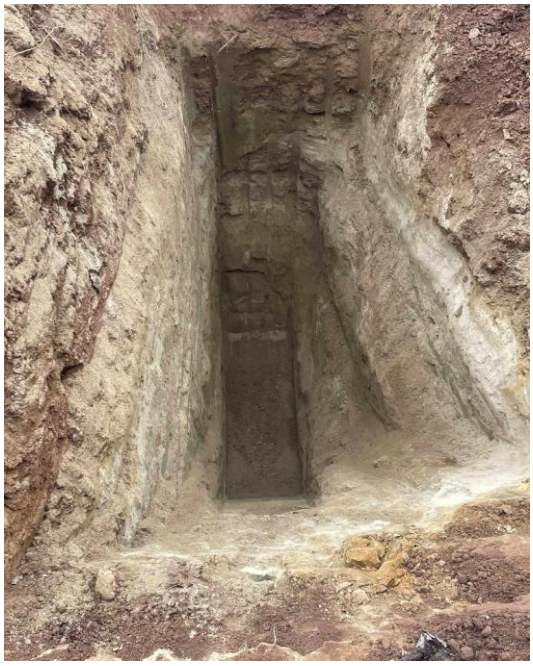
1305-80-02

LOG OF TEST PIT

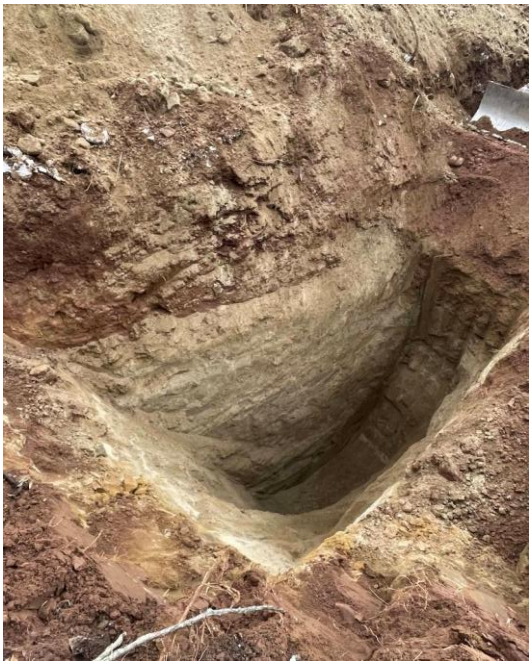
TP-101

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

TEST PIT PHOTOGRAPHS TP-101



Test pit TP-101



TP-101 side wall



TP-101 side wall



TP-101 spoils pile

Remarks:	**PROJECT NO.** **1305-80-02**
	LOG OF TEST PIT **TP-101**

Required and Provided Recharge Volumes, 72-hr Drawdown Analysis, Capture Area Adjustment Calculations

Recharge Calculations

Project	Longbrook	**Project #**	43346
Calculated by	JAG	**Date**	1/12/2026
Checked by		**Date**	

REQUIRED RECHARGE VOLUME

Hydrologic Soil Group (HSG)	Area (ft^2)	Inches of Runoff (in)	Volume (ft^3)
A	37,286	0.60	1,864
B	0	0.35	0
C	106,771	0.25	2,224
D	1,435	0.10	12
TOTAL			**4,101**

CAPTURE AREA ADJUSTMENT

Required Recharge Volume (ft^3)	4,101
Total Site Net Impervious Area (ft^2)	145,492
Total Site Impervious Area Draining to Recharge Facilities (ft^2)	127,103
Capture Area Adjustment Factor	1.14
Adjusted Required Recharge Volume (ft^3)	**4,694**

PROVIDED RECHARGE VOLUME

BASIN IB:

Existing Basin that is being expanded

Volumes provided below the lowest outlet at elevation: 95.8

Provided Volume:	Bottom Area (ft^2)	Volume (ft^3)
	3,830	**21,427**

Drawdown: ($V_{Infiltration}/A_{Bottom}$)/Rawl's Rate

Rawls Recharge Rate:	3.75	(in/hr)
Drawdown Time:	17.90	(hours)

RECHARGE VOLUME SUMMARY

Required Recharge Volume:	**4,694**	(ft^3)

Recharge Calculations

Project	Longbrook	**Project #**	43346
Calculated by	JAG	**Date**	1/12/2026
Checked by		**Date**	

Total Recharge Volume Provided:	**21,427**	(ft^3)

Appendix D: Standard 4 and 9 Computations and Supporting Information

- Long Term Stormwater Operation and Maintenance Measures
- Long Term BMP Checklist
- Water Quality Volume Calculations
- TSS Removal Worksheets
- Total Phosphorus Removal

Long Term Stormwater Operations and Maintenance Measures

Project Information

Site

Project Name: _____

Address or Locus: _____

City, State & Zip: _____

Developer

Client Name: _____

Client Address: _____

Client City, State & Zip: _____

Client Telephone No.: _____

Client Cell Phone: _____

Client E-Mail: _____

Site Supervisor

Site Manager Name: _____

Site Manager Address: _____

Site Manager City, State & Zip: _____

Site Manager Telephone No.: _____

Site Manager Cell Phone: _____

Site Manager E-Mail: _____

Long Term Stormwater Maintenance Measures –

The following maintenance program is proposed to ensure the continued effectiveness of the structural water quality controls previously described.

- Inspect stormwater basins once annually, in the spring, for cracking or erosion of side slopes, embankments, and accumulated sediment. Necessary sediment removal, earth repair, and/or reseeding will be performed immediately upon identification.
- Clean all catch basins twice annually to remove accumulated sand, sediment, and floatable products or as needed based on use.
- Clean all water quality units per the manufacturers requirements.
- Paved areas will be swept, at a minimum, 4 times per year.
- Routinely pick up and remove litter from the parking areas, islands and perimeter landscape areas in addition to regular pavement sweeping.
- Routinely inspect all dumpster and compactor locations for spills. Remove all trash litter from the enclosure and dispose of properly.

Pavement Systems

Standard Asphalt Pavement

- Sweep or vacuum standard asphalt pavement areas at least four times per year with a commercial cleaning unit and properly dispose of removed material.
- Recommended sweeping schedule:
  - Oct/Nov
  - Feb/Mar
  - Apr/May
  - Aug/Sep
- More frequent sweeping of paved surfaces will result in less accumulation in catch basins, less cleaning of subsurface structures, and less disposal costs.
- Check loading docks and dumpster areas frequently for spillage and/or pavement staining and clean as necessary.

Structural Stormwater Management Devices

Catch Basins

- All catch basins shall be inspected and cleaned a minimum of at least once per year.

- Sediment (if more than six inches deep) and/or floatable pollutants shall be pumped from the basin and disposed of at an approved offsite facility in accordance with all applicable regulations.
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary
- During colder periods, the catch basin grates must be kept free of snow and ice.
- During warmer periods, the catch basin grates must be kept free of leaves, litter, sand, and debris.

Structural Water Quality Devices

- CHECK SPECIFIC MANUFACTURER'S INSTRUCTIONS ON O&M REQUIREMENTS AND METHODOLOGY
- Inspect devices monthly for the first three months after construction.
- After initial three month period, all water quality units are to be inspected at least four times per year and cleaned a minimum of at least once per year or when sediment reaches 8" in depth.
- Follow manufacturer instructions for inspection and cleaning and contact manufacturer if system is malfunctioning.

Stormwater Outfalls

- Inspect outfall locations monthly for the first three months after construction to ensure proper functioning and correct any areas that have settled or experienced washouts.
- Inspect outfalls annually after initial three month period.
- Annual inspections should be supplemented after large storms, when washouts may occur.
- Maintain vegetation around outfalls to prevent blockages at the outfall.
- Maintain rip rap pad below each outfall and replace any washouts.
- Remove and dispose of any trash or debris at the outfall.

Roof Drain Leaders

- Perform routine roof inspections quarterly.
- Keep roofs clean and free of debris.
- Keep roof drainage systems clear.
- Keep roof access limited to authorized personnel.
- Clean inlets draining to the subsurface bed twice per year as necessary.

Vegetated Stormwater Management Devices

Infiltration Basin

Initial Post-Construction Inspection

- Infiltration basins should be inspected after every major storm for the first few months to ensure proper stabilization and function.

Long-Term Maintenance

- The grass on the side slopes and in the buffer areas should be mowed, and grass clippings, organic matter, and accumulated trash and debris removed, at least twice during the growing season.
- Eroded or barren spots should be reseeded immediately after inspection to prevent additional erosion and accumulation of sediment.
- Sediment should be removed from the basin as necessary. Removal procedures should not take place until the floor of the basin is thoroughly dry.

Inspections and Cleaning

- Infiltration basins should be inspected at least twice a year to ensure proper stabilization and function.
- Light equipment, which will not compact the underlying soil, should be used to remove the top layer.

Vegetated Areas Maintenance

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- The grass vegetation should be cut to a height between three and four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

Long Term BMP Checklist

Longbrook Condominiums, Agawam, MA

Long Term Best Management Practices – Maintenance/ Evaluation Checklist

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Water Quality Unit	Bi-annually				☐yes ☐no		
Deep Sump and Hooded Catch basin	Quarterly				☐yes ☐no		
Detention Basin	Bi-annually				☐yes ☐no		
Stone Chennel Swale	Bi-annually				☐yes ☐no		
Street Sweeping	Quarterly				☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		

Stormwater Control Manager _____

Water Quality Volume Calculations

Project: Longbrook
Location: Agawam, MA
Prepared For: VHB

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 3 or 4. Figure 4 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 3 or Table in Figure 4. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

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

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
WQU 1 (P66	0.76	0.0011837	6.0	0.100	1.00	774.00	0.92
WQU 2 (P65	0.73	0.0011478	6.0	0.100	1.00	774.00	0.89
WQU 3 (P67	0.09	0.0001471	6.0	0.100	1.00	774.00	0.11
CB 3 WQU	0.20	0.0003049	6.0	0.100	1.00	774.00	0.24

The WQf sizing calculation selects the minimum size CDS/Cascade/StormCeptor model capable of operating at the computed WQf peak flowrate prior to bypassing. It assumes free discharge of the WQf through the unit and ignores the routing effect of any upstream storm drain piping. As with all hydrodynamic separators, there will be some impact to the Hydraulic Gradient of the corresponding drainage system, and evaluation of this impact should be considered in the design.

Water Quality Volume Calculations

Project	Longbrook	**Project #**	43346
Calculated by	JAG	**Date**	1/12/2026
Checked by		**Date**	

BASIN IB

Runoff from subcatchment areas 300, 310, 320, 330, 340

Water Quality Storm Runoff Depth	(in)	1.0
Total Impervious Area	(ft^2)	127,103

BASIN WQV:

Required Volume:	Runoff Depth to be Treated (in)	Required Volume (ft^3)
	1.0	**10,592**

Provided Volume:	Elevation	Area (ft^2)	Cumulative Volume (ft^3)
	92.0	3,830	0
	93.0	4,696	4,263
	94.0	5,704	9,463
	95.0	6,739	15,685
	96.0	7,837	22,973
	97.0	9,041	31,412
	98.0	10,289	41,077
	99.0	11,633	52,038
	100.0	18,457	67,083
	101.0	23,555	88,089
	102.0	28,709	**114,221**

FREEBOARD CHECK:

100-YR Peak Elevation:	100.93
Maximum Basin Elevation below highest outlet weir:	102.0
Maximum Basin Elevation at top of berm:	103.0
Basin Freeboard at highest outlet weir:	**1.1**
Basin Freeboard at top of berm:	**2.1**

** Per MassDEP Treatment Requirement*

TSS Removal Worksheets

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

LONGBROOK
AGAWAM, MA

Area	0.76 ac	Unit Site Designation	WQU 1 (P66)
Weighted C	0.9	Rainfall Station #	70
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.04	15.1%	15.1%	0.03	0.03	15.1
0.08	24.6%	39.7%	0.05	0.05	24.3
0.12	13.7%	53.4%	0.08	0.08	13.4
0.16	9.4%	62.8%	0.11	0.11	9.1
0.20	6.6%	69.5%	0.14	0.14	6.3
0.24	5.2%	74.7%	0.16	0.16	4.9
0.28	4.8%	79.5%	0.19	0.19	4.4
0.32	3.1%	82.6%	0.22	0.22	2.9
0.36	2.7%	85.3%	0.25	0.25	2.4
0.40	2.1%	87.4%	0.27	0.27	1.9
0.48	2.5%	89.9%	0.33	0.33	2.1
0.56	2.0%	91.9%	0.38	0.38	1.7
0.64	1.4%	93.3%	0.44	0.44	1.1
0.72	1.0%	94.3%	0.49	0.49	0.8
0.80	1.1%	95.4%	0.55	0.55	0.8
1.00	1.6%	97.1%	0.68	0.68	1.1
1.20	0.9%	98.0%	0.82	0.82	0.6
1.40	0.6%	98.6%	0.95	0.95	0.3
1.60	0.5%	99.1%	1.09	1.00	0.2
1.80	0.5%	99.6%	1.23	1.00	0.2
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
					93.6
				Removal Efficiency Adjustment[2] =	0.0%
				Predicted % Annual Rainfall Treated =	99.4%
				Predicted Net Annual Load Removal Efficiency =	**93.6%**

1 - Based on 14 years of 15-minute rainfall data from NCDC Station 2107, East Brimfield Lake, Worcester County, M
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

LONGBROOK
AGAWAM, MA

Area	0.73 ac	Unit Site Designation	WQU 2 (P65)
Weighted C	0.9	Rainfall Station #	70
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.04	15.1%	15.1%	0.03	0.03	15.1
0.08	24.6%	39.7%	0.05	0.05	24.3
0.12	13.7%	53.4%	0.08	0.08	13.4
0.16	9.4%	62.8%	0.11	0.11	9.1
0.20	6.6%	69.5%	0.13	0.13	6.3
0.24	5.2%	74.7%	0.16	0.16	4.9
0.28	4.8%	79.5%	0.19	0.19	4.4
0.32	3.1%	82.6%	0.21	0.21	2.9
0.36	2.7%	85.3%	0.24	0.24	2.4
0.40	2.1%	87.4%	0.26	0.26	1.9
0.48	2.5%	89.9%	0.32	0.32	2.1
0.56	2.0%	91.9%	0.37	0.37	1.7
0.64	1.4%	93.3%	0.42	0.42	1.2
0.72	1.0%	94.3%	0.48	0.48	0.8
0.80	1.1%	95.4%	0.53	0.53	0.8
1.00	1.6%	97.1%	0.66	0.66	1.2
1.20	0.9%	98.0%	0.79	0.79	0.6
1.40	0.6%	98.6%	0.93	0.93	0.3
1.60	0.5%	99.1%	1.06	1.00	0.2
1.80	0.5%	99.6%	1.19	1.00	0.2
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
					93.8
				Removal Efficiency Adjustment[2] =	0.0%
				Predicted % Annual Rainfall Treated =	99.5%
				Predicted Net Annual Load Removal Efficiency =	**93.8%**

1 - Based on 14 years of 15-minute rainfall data from NCDC Station 2107, East Brimfield Lake, Worcester County, M
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

LONGBROOK
AGAWAM, MA

Area	0.09 ac	Unit Site Designation	WQU 3 (P67)
Weighted C	0.9	Rainfall Station #	70
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.04	15.1%	15.1%	0.00	0.00	15.1
0.08	24.6%	39.7%	0.01	0.01	24.6
0.12	13.7%	53.4%	0.01	0.01	13.7
0.16	9.4%	62.8%	0.01	0.01	9.4
0.20	6.6%	69.5%	0.02	0.02	6.6
0.24	5.2%	74.7%	0.02	0.02	5.2
0.28	4.8%	79.5%	0.02	0.02	4.8
0.32	3.1%	82.6%	0.03	0.03	3.1
0.36	2.7%	85.3%	0.03	0.03	2.7
0.40	2.1%	87.4%	0.03	0.03	2.1
0.48	2.5%	89.9%	0.04	0.04	2.5
0.56	2.0%	91.9%	0.05	0.05	2.0
0.64	1.4%	93.3%	0.05	0.05	1.4
0.72	1.0%	94.3%	0.06	0.06	1.0
0.80	1.1%	95.4%	0.07	0.07	1.1
1.00	1.6%	97.1%	0.08	0.08	1.6
1.20	0.9%	98.0%	0.10	0.10	0.9
1.40	0.6%	98.6%	0.12	0.12	0.6
1.60	0.5%	99.1%	0.14	0.14	0.5
1.80	0.5%	99.6%	0.15	0.15	0.5
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
0.00	0.0%	99.6%	0.00	0.00	0.0
					99.3
				Removal Efficiency Adjustment[2] =	0.0%
				Predicted % Annual Rainfall Treated =	99.6%
				Predicted Net Annual Load Removal Efficiency =	**99.3%**

1 - Based on 14 years of 15-minute rainfall data from NCDC Station 2107, East Brimfield Lake, Worcester County, M
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Brief Stormceptor Sizing Report - CB 3 WQU

Project Information & Location			
Project Name	Longbrook	**Project Number**	875045
City	Agawam	**State/ Province**	Massachusetts
Country	United States of America	**Date**	10/9/2025
Designer Information		**EOR Information (optional)**	
Name	David Adams	**Name**	
Company	Contech Engineered Solutions	**Company**	VHB
Phone #	207-885-6191	**Phone #**	
Email	dadams@conteches.com	**Email**	

Stormwater Treatment Recommendation
The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 3 WQU
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	97
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	100

Sizing Details

Drainage Area

Total Area (acres)	0.20
Imperviousness %	100.0

Rainfall

Station Name	EAST BRIMFIELD LAKE
State/Province	Massachusetts
Station ID #	2107
Years of Records	45
Latitude	42°7'0"N
Longitude	72°8'0"W

Water Quality Objective

TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage

Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion

Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

OK-110

Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

TSS Removal Calculation Worksheet

101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
P 617.924.1770

Project Name:	**Longbrook Condominiums**	Sheet:	**1 of 1**
Project Number:	**43346.00**	Date:	**28-Oct-2025**
Location:	**Agawam, MA**	Computed by:	**JAG**
Discharge Point:	**x3000**	Checked by:	
Drainage Area(s):	**Areas 300, 310, 320, 330**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Street Sweeping - 5% (Quarterly)	**5%**	**100%**	**5%**	**95%**
WQU's	**93%**	**95%**	**88%**	**7%**
	0%	**7%**	**0%**	**7%**
		Pre-Treatment TSS Removal =		**93%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Street Sweeping - 5% (Quarterly)	**5%**	**100%**	**5%**	**95%**
WQU's	**93%**	**95%**	**88%**	**7%**
Infiltration Basin	**80%**	**7%**	**5%**	**1%**
	0%	**1%**	**0%**	**1%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.

** Equals remaining load from previous BMP €

Treatment Train TSS Removal = **99%**

Total Phosphorus Removal

Project LONGBROOK
Location AGAWAM, MA
Calculated by JAG
Checked by
Title TOTAL PHOSPHORUS REMOVAL

Project # 43346.00
Sheet 1 of 1
Date 1-19-26
Date

vhb
Computations

IMPERVIOUS AREA = 127,103 SF

× 1.0 INCH

10,592 CF TO BE RETAINED/INFILTRATED

VOLUME OF BASIN @ ELEV. 95.8 = 21,427 CF

PROVIDED > REQUIRED
21,427 CF > 10,592 CF

THEREFORE, ACHIEVE 60% TP REMOVAL

Appendix E: Standard 8 Supporting Information

- Construction Period Pollution Prevention and Erosion and Sedimentation Controls
- Recommended Construction Period BMPs checklist

Construction Period Pollution Prevention and Erosion and Sedimentation Controls

Erosion and Sedimentation Control Measures

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with EPA NPDES regulations.

Straw Wattle Barriers

Straw wattle barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site.

Straw Bale Barriers

Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff

Silt Fencing

In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and straw bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Newly constructed and existing catch basins will be protected with straw bale barriers (where appropriate) or silt sacks throughout construction.

Gravel and Construction Entrance/Exit

A temporary crushed-stone construction entrance/exit will be constructed. A cross slope will be placed in the entrance to direct runoff to a protected catch basin inlet or settling area. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site.

Vegetative Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased, unless there is sufficient snow cover to prohibit implementation. Vegetative slope stabilization will be used to minimize erosion on slopes of 3:1 or flatter. Annual grasses, such as

annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods. Mulch will also be used after permanent seeding to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

Maintenance

- The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with EPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood.

- The on-site contractor will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on-site by the contractor.

- Silt shall be removed from behind barriers if greater than 6-inches deep or as needed.

- Damaged or deteriorated items will be repaired immediately after identification.

- The underside of straw wattles should be kept in close contact with the earth and reset as necessary.

- Sediment that is collected in structures shall be disposed of properly and covered if stored on-site.

- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

The sedimentation and erosion control plan is included in project plan set. The Erosion Control Maintenance checklist is included here for quick reference.

Recommended Construction Period BMPs Checklist

Longbrook Condominiums, Agawam, MA
Construction Best Management Practices – Maintenance/ Evaluation Checklist

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by:
Straw Bales/Silt Fencing	Weekly and after storm events				☐yes ☐no		
Strawbale Checkdam	Weekly and after storm events				☐yes ☐no		
Gravel Construction Entrance	Weekly and after storm events				☐yes ☐no		
Catch Basin Protection	Weekly and after storm events				☐yes ☐no		
Vegetated Slope Stabilization	Weekly and after storm events				☐yes ☐no		
					☐yes ☐no		
					☐yes ☐no		

Stormwater Control Manager _____

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: September 2, 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:	CHARLIE'S GARDEN PARK, LLC	Owner:	CHARLIE'S GARDEN PARK, LLC
Address:	1775 MAIN STREET AGAWAM, MA 01001	Address:	1775 MAIN STREET AGAWAM, MA, 01001

LOCUS: 1399 SUFFIELD STREET & PARCEL 2 SUFFIELD STREET

This project has been assigned the following file # : WE 087-0717

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] 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, s. 40 and 310 CMR 10.00.
[2] 2025 Google Earth aerial imagery shows earth disturbing activities within the subject parcels. The Commission should review if these activities occurred within an area subject to jurisdiction and if they were authorized.
[3] The filing indicates that there is no Buffer Zone on the subject properties; however, Bank of the perennial stream is afforded a Buffer Zone.
[4] The Commission should review the site for the presence of Bordering Vegetated Wetland.

If you have any questions regarding this letter, please contact: MARY GROVER @ (413)-755-2154

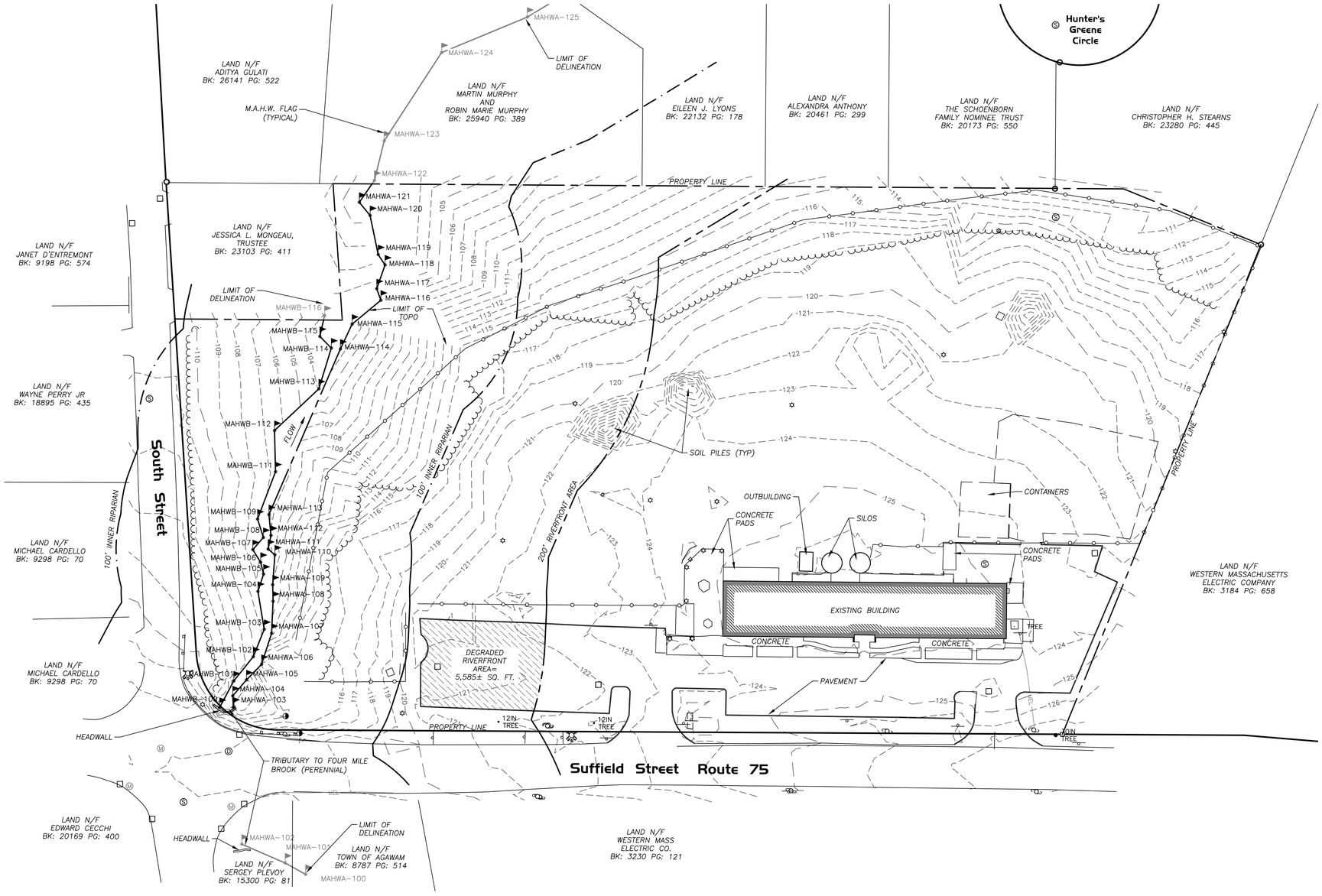
Cc: Agawam Conservation Commission, DPW Inspection Services 1000 Suffield Street, Agawam, MA, 01001
Owner: CHARLIE'S GARDEN PARK, LLC, 1775 MAIN STREET, AGAWAM, MA, 01001
Representative: R LEVESQUE ASSOCIATES, INC., 40 SCHOOL STREET, WESTFIELD, MA, 01085

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

CHARLIE'S GARDEN PARK, LLC
1775 MAIN STREET
AGAWAM, MA 01001

NOTES

1. THE RECORD OWNER OF THE SUBJECT PARCEL IS CHARLIE'S GARDEN PARK, LLC. SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 25589 PAGE 309.
2. THE PROPERTY LINES SHOWN HEREON ARE BASED UPON THE FOLLOWING PLANS RECORDED IN THE HAMPDEN COUNTY REGISTRY OF DEEDS:
   2.1. PLAN BOOK 256 PAGE 59
   2.2. PLAN BOOK 281 PAGE 53
3. THIS PLAN HAS BEEN PREPARED FOR WETLAND PERMITTING PURPOSES AND SHALL NOT BE USED FOR THE CONVEYANCE OF LAND OR FOR ANY OTHER USE.
4. SUBJECT PARCEL CONTAINS 6.28± ACRES.
5. 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.
6. WETLAND RESOURCE AREAS DELINEATED BY R LEVESQUE ASSOCIATES ON 04–03–2026.
7. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED UPON A TOPOGRAPHIC SURVEY PERFORMED BY R LEVESQUE ASSOCIATES, INC. ON 08–04–2026 AND 08–05–2026.
8. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE THE TOWN OF AGAWAM WEB GIS.
9. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A SPECIAL FLOOD ZONE AREA ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0392E – EFFECTIVE DATE: 07–16–2013.
10. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) JURISDICTION.
11. WETLAND RESOURCE AREAS LOCATED OFFSITE HAVE BEEN SHOWN TO ACCURATELY DEPICT JURISDICTIONAL AREAS ONTO THE SUBJECT PROPERTY. THE DETERMINATION OF OFFSITE WETLAND RESOURCE AREAS ON LAND OWNED BY OTHERS IS NOT THE SUBJECT OF THIS PLAN.



SYMBOL & LINE LEGEND

- IRON PIPE FOUND
- EXISTING LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- EXISTING WATER VALVE
- EXISTING WATER SHUT–OFF
- EXISTING HYDRANT
- EXISTING HYDRANT
- EXISTING GAS VALVE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- R–1 M.A.H.W. FLAG LOCATION
- TREE LINE
- 219 EXISTING CONTOUR
- FENCE LINE
- GUARDRAIL
- GAS GAS EXISTING GAS LINE
- SD SD EXISTING STORM DRAIN

NOTE: TOTAL RIVERFRONT AREA ON SUBJECT PROPERTY IS APPROX. 105,609 S.F.

40 0 20 40 80
SCALE: 1"=40'

S:\Projects\2026\260116 - Dore - 1399 Suffield St. (Twin Silos), Agawam\05 Civil 3D\260116 - EXIST - 2026-08-13.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

ANRAD FILING PLAN

1399 Suffield Street & Par 2 Suffield Street
Agawam, Massachusetts
Parcel IDs : 13-2-7 & 13-2-31

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. HUBERT — NO. 39308 — REGISTERED LANDSCAPE ARCHITECT — 8/13/26

PREPARED FOR:
Charlie's Garden Park, LLC
c/o Clark Dore, Manager
1775 Main Street
Agawam, MA

ISSUANCE DATE: August 13, 2026

REVISIONS:	DATE:

DRAFTED BY: J.L.

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

SCALE: As Noted

RLA PROJ. NUMBER: 260116

DRAWING#	REV.
W-1	-

Abbreviated Notice of Resource Area Delineation

Under the Wetlands Protection Act 310 CMR 10.00

Wetland Resource Area Delineation

Subject Property:
1399 Suffield Street & Parcel 2 Suffield Street
Agawam, Massachusetts 01001
(Parcel IDs: 13-2-7 & 13-2-31)

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

Applicant & Property Owner:
Charlie's Garden Park, LLC
c/o Clark Dore, Manager
1775 Main Street
Agawam, Massachusetts 01001

RLA Project File No. 260116
August 13, 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

TABLE OF CONTENTS

SECTIONS

1. COVER LETTER
2. ADMINISTRATIVE FORMS
   - 2.1 WPA FORM 4A – ABBREVIATED NOTICE OF RESOURCE AREA DELINEATION
   - 2.2 ANRAD WETLAND FEE TRANSMITTAL FORM
3. DELINEATION REPORT
4. FIGURES
   - 4.1 FIGURE 1 – USGS TOPOGRAPHIC MAP
   - 4.2 FIGURE 2 – FEMA FLOODPLAIN MAP
   - 4.3 FIGURE 3 – NRCS SOILS MAP
5. PUBLIC NOTICE
   - 5.1 ABUTTER NOTIFICATION LIST – 100'
   - 5.2 ABUTTER NOTIFICATION LETTER

LIST OF APPENDICES

APPENDIX A: SITE PLAN

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

August 13, 2026

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

RE: Abbreviated Notice of Resource Area Delineation (ANRAD)
1399 Suffield Street & Parcel 2 Suffield Street
Agawam, Massachusetts 01001
(Parcel IDs: I3-2-7 & I3-2-31)
RLA Project File No. 260116

Dear Chairman Kozloski and Commissioners:

On behalf of the applicant and property owner, Charlie's Garden Park, LLC c/o Clark Dore, Manager, please find the requisite number of copies of an Abbreviated Notice of Resource Area Delineation (ANRAD) and associated documentation. The applicant is filing this ANRAD to confirm whether the boundaries of resource areas on the subject properties are accurately delineated under the Wetlands Protection Act 310 CMR 10.00.

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 4A – ABBREVIATED NOTICE OF RESOURCE AREA DELINEATION

2.2 ANRAD WETLAND FEE TRANSMITTAL FORM

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

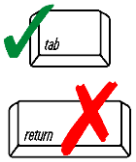
1. Project Location (**Note:** electronic filers will click on button for GIS locator):

1399 Suffield Street & Parcel 2 Suffield Street — a. Street Address
Agawam — b. City/Town
01001 — c. Zip Code

Latitude and Longitude:
42.04188 — d. Latitude
72.63585 — e. Longitude

I3-2 — f. Assessors Map/Plat Number
7 & 31 — 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:

Clark — a. First Name
Dore — b. Last Name
Charlie's Garden Park, LLC — c. Organization
1775 Main Street — d. Mailing Address
Agawam — e. City/Town
MA — f. State
01001 — g. Zip Code
413-315-0587 — h. Phone Number
i. Fax Number
cdroofer@comcast.net — j. Email Address

3. Property owner (if different from applicant):

☐ Check if more than one owner (attach additional sheet with names and contact information)

Same as applicant — 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

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

4. Representative (if any):

Robert — a. Contact Person First Name
Levesque — b. Contact Person Last Name
R Levesque Associates, Inc. — c. Organization
40 School Street — d. Mailing 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

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
$1,012.50 — 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) — 0' (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	1,080'
Riverfront Area	475'

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:

2796	08-12-2026
2. Municipal Check Number	3. Check date
2795	08-12-2026
4. State Check Number	5. Check date
CDA Roofing & Siding Contractors, LLC	
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.

X

1. Signature of Applicant

2. Date

3. Signature of Property Owner (if different)

4. Date 8/12/26

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.)

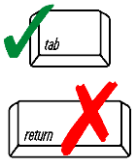
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

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:

1399 Suffield Street & Parcel 2 Suffield Street	Agawam
a. Street Address	b. City/Town
$987.50	2795
c. Fee amount	d. Check number

2. Applicant:

Clark	Dore	Charlie's Garden Park, LLC
a. First Name	b. Last Name	c. Company

1775 Main Street
d. Mailing Address

Agawam	MA	01001
e. City/Town	f. State	g. Zip Code

413-315-0587
h. Phone Number

3. Property Owner (if different):

Same as applicant		
a. First Name	b. Last Name	c. Company

d. Mailing Address

e. City/Town	f. State	g. Zip Code

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 =	b. Fee for BVW
2. ☐	all other projects	0'	$0.00	$0.00
		a. feet of BVW	x $2.00 =	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	1,555'	$3,110.00	$2,000.00
		a. linear feet	x $2.00 =	b. Fee

Total Fee for all Resource Areas:	$2,000.00
	Fee
State share of filing fee:	$987.50
	5. 1/2 of total fee **less** $12.50
City/Town share of filing fee:	$1,012.50
	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.)

3. DELINEATION REPORT

DELINEATION REPORT

For

1399 SUFFIELD STREET & PARCEL 2 SUFFIELD STREET
AGAWAM, MASSACHUSETTS 01001
(PARCEL IDS: I3-2-7 & I3-2-31)

INTRODUCTION

On behalf of the applicant and property owner, Charlie's Garden Park, LLC c/o Clark Dore, Manager, R Levesque Associates, Inc. is providing this Delineation Report as a supplement to the Abbreviated Notice of Resource Area Delineation (ANRAD). The applicant is filing this ANRAD to confirm whether the boundaries of resource areas on the subject properties are accurately delineated under the Wetlands Protection Act 310 CMR 10.00.

PROPERTY DESCRIPTION

The subject properties are located on the corner of Suffield Street and South Street and consist of approximately 6.28 ± cumulative acres. The subject properties are owned by Charlie's Garden Park, LLC and are recorded under the Hampden County Registry of Deeds in Book 25589, Page 309.

Examination of GIS information from the Massachusetts Natural Heritage Atlas revealed that the subject properties are not located within Natural Heritage and Endangered Species Program jurisdiction.

EXISTING CONDITIONS & TOPOGRAPHY

The subject properties were previously developed and occupied by a commercial structure ("Twin Silos") with associated site improvements. In general, the topography of the properties varies, sloping from the southwest to the northeast. On-site elevations range from 103 to 126. Please refer to the USGS Topographic Map included within this application packet under Section 4 as Figure 1.

SOILS

According to the Web Soil Survey Map, the soil types mapped on the subject property consist of: Amostown fine sandy loam, 0 to 6 percent slopes (258B), Agawam fine sandy loam, 3 to 8 percent slopes (275B), and Paxton fine sandy loam, 3 to 8 percent slopes

(305B). Please refer to the attached NRCS Soil Map included within this application packet under Section 4 as Figure 3 for the location of the below-defined soils.

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 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.

The Paxton series consists of well drained loamy soils formed in lodgment till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level to steep soils on hills, drumlins, till plains, and ground moraines. Slope ranges from 0 to 45 percent.

WETLAND RESOURCE AREAS

The wetland resource areas were flagged in the field by R Levesque Associates, Inc. in August 2026. The definition of each applicable resource area is presented below in *italic text*, followed by a description of the resource area presented below in **boldface text**.

Please note that wetlands delineated off-site have been shown to accurately portray buffer zone onto the subject property. The delineation of wetland resource areas off-site is not the subject of this filing.

Resource Area	Length of Delineation
Bordering Vegetated Wetland	0' (none)
Bank	1,080'
Riverfront Area	475'

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…".*

Bordering Vegetated Wetlands (BVW) were not identified on the subject properties during RLA's field delineation. The site was evaluated in accordance with the criteria set forth in 310 CMR 10.55 and the Massachusetts Wetlands Delineation Manual. Field observations included an evaluation of vegetation, soils, and hydrologic indicators. No areas were observed exhibiting a predominance of hydrophytic vegetation in conjunction with hydric soils and wetland hydrology to meet the regulatory definition of Bordering Vegetated Wetland. Accordingly, no BVW boundary was delineated or flagged on the subject properties

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 the perennial stream known as Four Mile Brook. The upper limit of Bank was identified, and in this case synonymous with the Mean Annual High Water (MAHW) line, based on observable physical characteristics, including a break in slope, changes in vegetation, evidence of scour, and other indicators consistent with the guidance contained within applicable MassDEP wetland delineation practices. The MAHW line was marked in the field using sequentially numbered flagging labeled "MAHW-A100" through "MAHW-A125" and "MAHW-B100" through "MAHW-B116".

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)".*

No Buffer Zone is present on the subject property since no Bordering Vegetated Wetlands or Bank of intermittent streams are present within a jurisdictional vicinity to the subject property.

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." .

The FEMA Flood Insurance Rate Map No. 25013C0392E, effective date July 16, 2013, illustrates that the properties are not located within a special flood hazard area. Please refer to the attached FEMA Floodplain Map, which is included under Section 4, as Figure 2, of this application packet.

Riverfront Area

Riverfront Area (RA) as defined in 310 CMR 10.58(3) "*…is the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away. The riverfront area may include or overlap other resource areas or their buffer zone. The riverfront area does not have a buffer zone.*"

Riverfront Area is associated with Four Mile Brook and is shown to extend 200' horizontally from the delineated Mean Annual High Water (MAHW) line of the stream. The 100' Inner Riparian corridor is also shown on the accompanying filing plan. The total Riverfront Area on the property is 106,609 ± SF. There is approximately 5,585 ± SF of degraded Riverfront Area on the subject property, as defined under 310 CMR 10.58(5).

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, rocks or bedrock."*

Land Under Water Bodies and Waterways (LUWW) is present, associated with Four Mile Brook. The limit of LUWW is not being requested to be determined, since the lower limit of bank was not delineated as part of this filing.

[END OF DELINEATION REPORT]

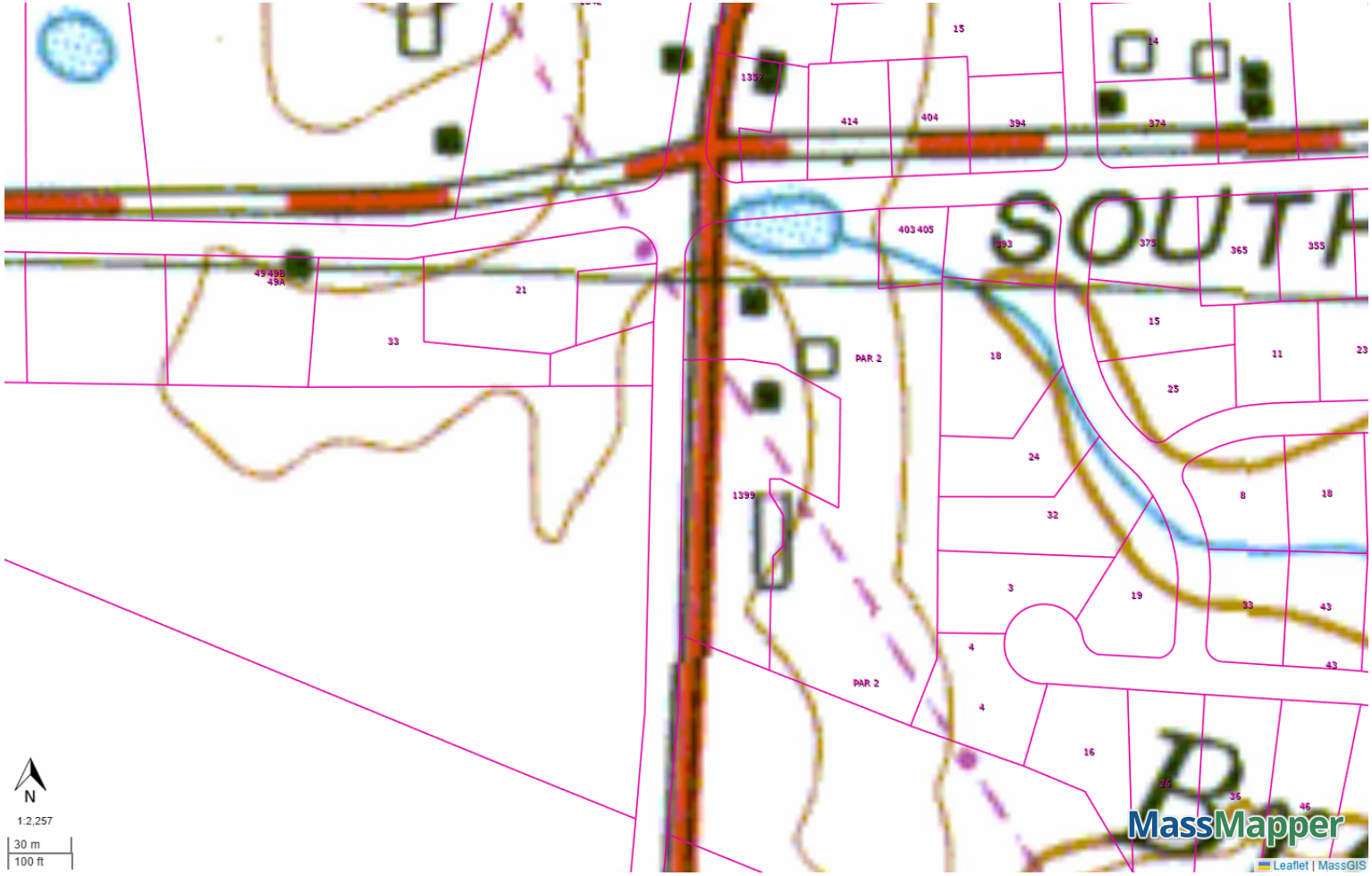
4. FIGURES

4.1 FIGURE 1 – USGS TOPOGRAPHIC MAP

4.2 FIGURE 2 – FEMA FLOODPLAIN MAP

4.3 FIGURE 3 – NRCS SOILS MAP

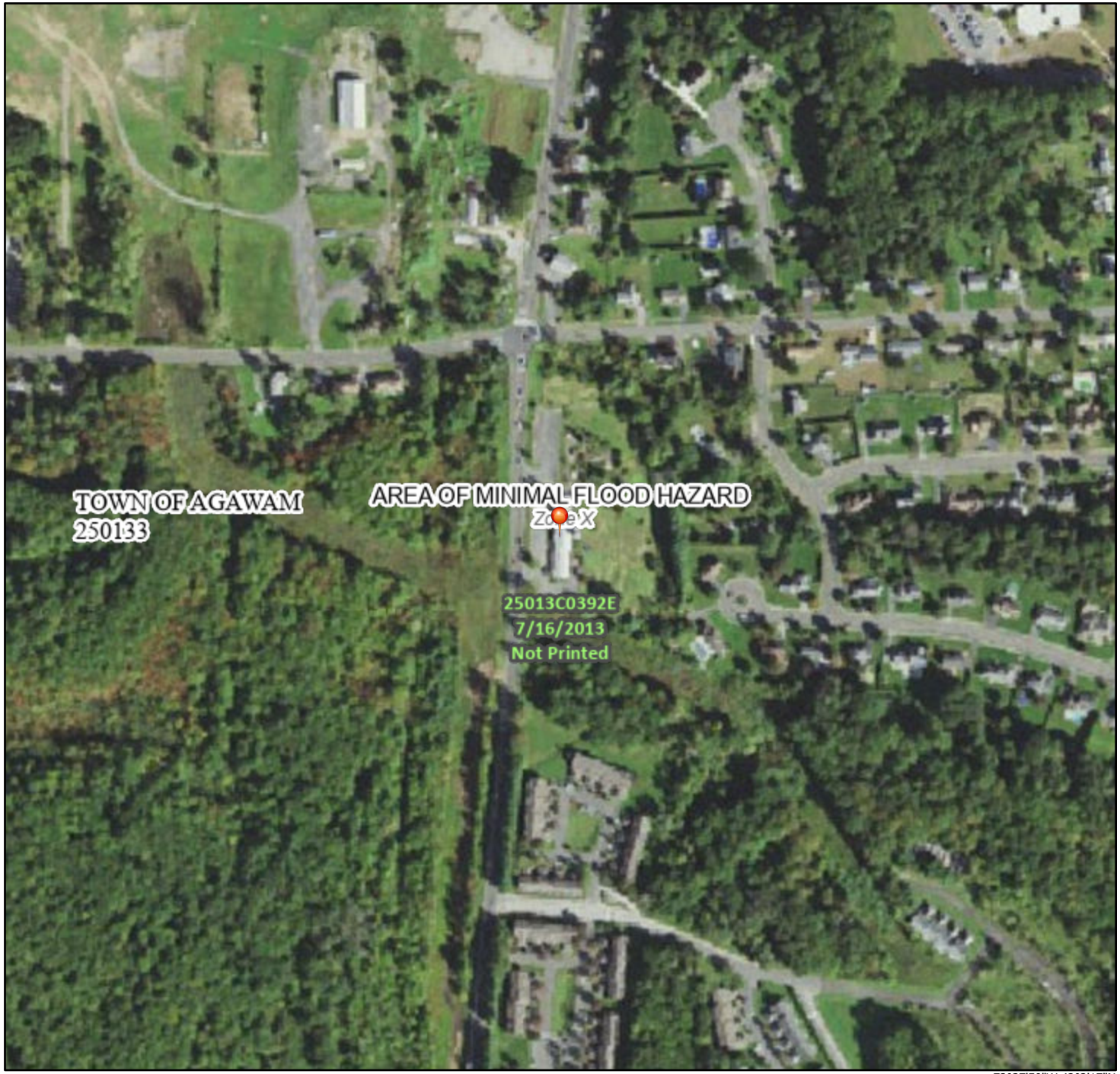
Figure 1 - USGS Topographic Map



National Flood Hazard Layer FIRMette

FEMA

72°38'27"W 42°2'43"N



72°37'50"W 42°2'17"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 7/30/2026 at 1:11 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
(Figure 3 - NRCS Soil Map)



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
258B	Amostown fine sandy loam, 0 to 6 percent slopes	0.5	8.0%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	1.9	31.3%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	3.7	60.8%
Totals for Area of Interest		**6.1**	**100.0%**

5. PUBLIC NOTICE

5.1 ABUTTER NOTIFICATION LIST – 100'

5.2 ABUTTER NOTIFICATION LETTER

I3 2 13
ANTHONY ALEXANDRA
32 DEER RUN RD
AGAWAM, MA 01001 3669

I4 2 11
CARDELLO MICHAEL J
PO BOX 308
AGAWAM, MA 01001 0216

I4 2 12
CARDELLO MICHAEL J
P.O. BOX 308
AGAWAM, MA 01001

I4 1 2
CECCHI EDWARD J
1342 SUFFIELD ST
AGAWAM, MA 01001 3802

I3 2 31
CHARLIE`S GARDEN PARK
1775 MAIN ST
AGAWAM, MA 01001

I3 2 31
CHARLIE`S GARDEN PARK
1775 MAIN ST
AGAWAM, MA 01001

I3 2 7
CHARLIE'S GARDEN PARK
1775 MAIN ST
AGAWAM, MA 01001

I4 2 19
D`ENTREMONT JANET M
PO BOX 27
AGAWAM, MA 01001 0027

I3 2 6
GULATI ADITYA K TR
393 SOUTH ST
AGAWAM, MA 01001

I3 2 12
LYONS EILEEN J
24 DEER RUN RD
AGAWAM, MA 01001

I3 2 29
MONGEAU JESSICA L TR
16 MOCKINGBIRD LN
WESTFIELD, MA 01085

I3 2 11
MURPHY MARTIN
PO BOX 604
WARE, MA 01082

I4 2 18
PERRY WAYNE D JR
414 SOUTH ST
AGAWAM, MA 01001 3633

I3 1 6
POLEVOY SERGEY
21 WISTERIA LN
AGAWAM, MA 01001

I3 2 14
SCHOENBORN WILLIAM F L/E
3 HUNTER`S GREENE CR
AGAWAM, MA 01001

I3 2 16
STERNS CHRISTOPHER H
4 HUNTER`S GREENE CR
AGAWAM, MA 01001

I3 1 7
TOWN OF AGAWAM
36 MAIN ST
AGAWAM, MA 01001 1825

I3 1 8
TOWN OF AGAWAM
36 MAIN ST
AGAWAM, MA 01001 1825

I3 1 1
WESTERN MASS ELECTRIC CO
P.O. BOX 270
HARTFORD, CT 06141

I3 2 8
WESTERN MASS ELECTRIC CO
P.O. BOX 270
HARTFORD, CT 06141

Notification to Abutters

By Hand Delivery, Certified Mail (return receipt requested), or Certificates of Mailing

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 Town of Agawam Conservation Commission on or about August 13, 2026 for an area subject to protection under M.G.L. c. 131 §40. The following is a description of the application:

The applicant requests confirmation of the wetland resource area delineation as shown on the filing plans. There is no work proposed.

B. The name of the applicant is: Charlie's Garden Park, LLC

C. The address of the land is: 1399 Suffield Street & Parcel 2 Suffield Street, Agawam, MA 01001 (Parcel IDs: I3-2-7 & I3-2-31)

D. Copies of the ANRAD may be examined or obtained at the office of the Town of Agawam Conservation Commission, located at 1000 Suffield Street, Agawam, MA 01001. The office hours of the Commission are Monday-Friday 7:30am-3:30pm, and the Commission may be reached at 413-786-0400 x8245.

E. Copies of the ANRAD 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 NOI and plans.

F. Information regarding the date, time, and location of the public hearing may be obtained from the Town of Agawam Conservation Commission. Notice of the public hearing was 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

SITE PLAN ENTITLED “ANRAD FILING PLAN”

PREPARED FOR CHARLIE’S GARDEN PARK, LLC

PREPARED BY R LEVESQUE ASSOCIATES, INC.

DATED AUGUST 13, 2026

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 2, 2026

Via email: tegerton@agawam.ma.us

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

RE: Response to MassDEP Comments (File #087-0717)
1399 Suffield Street & Parcel 2 Suffield Street
Agawam, Massachusetts 01001
(Parcel IDs: I3-2-7 & I3-2-31)
RLA Project File No. 260116

Dear Chairman Kozloski and Commissioners:

On behalf of the applicant and property owner, Charlie's Garden Park, LLC c/o Clark Dore, Manager, R Levesque Associates, Inc. is providing this response letter to review comments issued for the above-referenced project. The review comment is presented below in *italic text*, followed by an RLA Response presented below in blue, boldface text. The comment number and format are consistent with the original document for ease of review.

[1] 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, s. 40 and 310 CMR 10.00.

RLA Response: Understood.

[2] 2025 Google Earth aerial imagery shows earth disturbing activities within the subject parcels. The Commission should review if these activities occurred within an area subject to jurisdiction and if they were authorized.

RLA Response: Our office is unaware of when these activities occurred and the permitting status related to such. The current filing is to confirm resource boundaries and any unpermitted actives, if jurisdictional, can be addressed under separate cover.

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

[3] The filing indicates that there is no Buffer Zone on the subject properties; however, Bank of the perennial stream is afforded a Buffer Zone.

RLA Response: The narrative can be clarified if needed. The MAHW has an associated 200' Riverfront Area which would extend far beyond the 100' buffer zone to Bank of perennial stream (synonymous with the 100' Inner Riparian depicted).

[4] The Commission should review the site for the presence of Bordering Vegetated Wetland.

RLA Response: BVW was not identified during site evaluation, but the Commission / peer reviewer is encouraged to confirm.

Should you have any questions or comments regarding this information, please do not hesitate to contact our office at your earliest convenience.

Sincerely,
R LEVESQUE ASSOCIATES, INC.

Ryan Nelson
Wetland/Soil Scientist & Project Manager

Tunison Environmental Consultants, LLC

May 6, 2026

Agawam Conservation Commission
1000 Suffield Street
Agawam, Massachusetts 01001

RE: Notice of Intent for Wetland Resource Area Restoration at 365 Main in Agawam, Massachusetts

Dear Agent and Members of the Commission:

On behalf of Mr. Joseph O'Malley, Tunison Environmental Consultants, LLC is pleased to submit two copies of this Notice of Intent (NOI), including project plans at the above referenced site for the ecological restoration of a Bordering Vegetated Wetland and Bordering Land Subject to Flood. Some trees and shrubs were cut from an approximately 2.5-acre area that consists of wetland and floodplain. Most of the vegetation has begun to grow back in this area. The proposed restoration will consist of planting approximately 136 shrubs and 48 trees. The abutter's mailings have been prepared and will be immediately sent out upon receiving the information for the proposed Agawam Conservation Commission hearing.

As requested in WPA Form 3-Notice of Intent, Section D, Additional Information, all additional information is included in the narrative or attachments (see Table of Contents) to the enclosed NOI. The attached plan set has not been revised.

Please call me (508) 737-7104 or email me garretttunison@gmail.com if you have any questions or concerns.

Sincerely,

Garrett M. Tunison

Garrett M. Tunison, PWS
Principal
Tunison Environmental Consultants, LLC

Cc: Mr. Joseph O'Malley
TEC File #: 2308-001

Tunison Environmental Consultants, LLC

Notice of Intent for Wetland Resource Area Restoration at 365 Main Street in Agawam, Massachusetts

Prepared for:

Mr. Joseph O'Malley
361 Main Street
Agawam, MA 01001

Prepared by:

Tunison Environmental Consultants, LLC
P.O. Box 992
Plymouth, Massachusetts 02362

May 6, 2026

TEC #: 2308-001

Tunison Environmental Consultants, LLC

Table of Contents

WPA Form 3- Notice of Intent Form

Attachments

Appendix A Invasive Plant Species Eradication and Wetland Restoration Plan
Appendix B Abutters' Notification
Appendix C Affidavit of Service

Commonwealth of Massachusetts
Department of Environmental Protection
Notice of Intent Form (WPA Form 3)

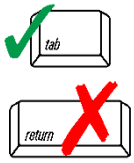
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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):

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

Latitude and Longitude:
42.083 N — d. Latitude
-72.612 W — e. Longitude

L131 & L13 — f. Assessors Map/Plat Number
1/5 & 1/3 — g. Parcel /Lot Number

2. Applicant:

Joseph — a. First Name
O'Malley — b. Last Name
Property owner — c. Organization
351 Main Street — d. Street Address
Agawam — e. City/Town
MA — f. State
01001 — g. Zip Code
(413) 626-8212 — h. Phone Number
N/A — i. Fax Number
xtremepbma@yahoo.com — j. Email Address

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

Same as above — 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):

Garrett — a. First Name
Tunison — b. Last Name
Tunison Environmental Consultants, LLC — c. Company
P.O. Box 992 — d. Street Address
Plymouth — e. City/Town
MA — f. State
02362 — g. Zip Code
(508) 737-7104 — h. Phone Number
N/A — i. Fax Number
garretttunison@gmail.com — j. Email address

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

$2,500.00 — a. Total Fee Paid
$1,237.50 — b. State Fee Paid
$1,262.50 — 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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

A. General Information (continued)

6. General Project Description:

The applicant was clearing land remvoed 8 to 10 trees and cut the shrub layer) for a tree farm that turned out to be Bordering Land Subject to Flooding and Bordering Vegetated Wetland. He received a WPA-9 Form and stopped cutting. A wetland restoration has been proposed and is included in the attached Wetland Restoration Plan and additional details are provided in the attached narrative.

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)

310 CMR 10.53
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:

Hampden	N/A
a. County	b. Certificate # (if registered land)
24430 & 25309	259 & 166
c. Book	d. Page Number

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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	N/A (1. linear feet)	N/A (2. linear feet)
b. ☒ Bordering Vegetated Wetland	80,031 +/- (cut shrubs & trees) (1. square feet)	80,031 +/- restoration (2. square feet)
c. ☐ Land Under Waterbodies and Waterways	N/A (1. square feet); N/A (3. cubic yards dredged)	N/A (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☒ Bordering Land Subject to Flooding	(1. square feet); N/A (3. cubic feet of flood storage lost)	(2. square feet); N/A (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	N/A (1. square feet); N/A (2. cubic feet of flood storage lost)	N/A (3. cubic feet replaced)
f. ☐ Riverfront Area	N/A (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: N/A 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.
N/A	N/A	N/A

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:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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	N/A (1. square feet); N/A (2. cubic yards dredged)	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	N/A (1. square feet)	N/A (2. cubic yards beach nourishment)
e. ☐ Coastal Dunes	N/A (1. square feet)	N/A (2. cubic yards dune nourishment)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	N/A (1. linear feet)	
g. ☐ Rocky Intertidal Shores	N/A (1. square feet)	
h. ☐ Salt Marshes	N/A (1. square feet)	N/A (2. sq ft restoration, rehab., creation)
i. ☐ Land Under Salt Ponds	N/A (1. square feet); N/A (2. cubic yards dredged)	
j. ☐ Land Containing Shellfish	N/A (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	
	N/A (1. cubic yards dredged)	
l. ☐ Land Subject to Coastal Storm Flowage	N/A (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.

N.A
a. square feet of BVW

N/A
b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

N/A
a. number of new stream crossings

N/A
b. number of replacement stream crossings

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

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

August 2021
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 — N/A (percentage/acreage)

(b) outside Resource Area — N/A (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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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. N/A (a. NHESP Tracking #) N/A (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:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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

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.

N/A
b. ACEC

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

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:

MassDEP File Number

Document Transaction Number

Agawam
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.

Wetland Filing Plan
a. Plan Title

R Levesque Associates, Inc.
b. Prepared By

c. Signed and Stamped by

2/20/24
d. Final Revision Date

1" = 50'
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:

1092
2. Municipal Check Number

05/04/26
3. Check date

1091
4. State Check Number

05/04/26
5. Check date

Joseph
6. Payor name on check: First Name

O'Malley
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: 5/4/26

3. Signature of Property Owner (if different)

4. Date

Barbett M. Timm

5. Signature of Representative (if any)

6. Date: 5/6/26

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.

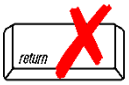
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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:

365 Main Street	Agawam
a. Street Address	b. City/Town
1091	$1,237.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Joseph		O'Malley	
a. First Name		b. Last Name	
Property owner			
c. Organization			
351 Main Street			
d. Mailing Address			
Agawam		MA	01001
e. City/Town		f. State	g. Zip Code
(413) 626-8212	N/A	xtremepbma@yahoo.com	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

Same as above			
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.

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Cat. 2, j. Cutting vegetation	1	$500	$500
Cat. 6 Wetland Delineation	1 @ $2/ln. ft.		$2,000

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	$2,500.00 (a. Total Fee from Step 5)
State share of filing Fee:	$1,237.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$1,262.50 (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.)

Appendix A

Invasive Plant Species Eradication and Wetland Restoration Plan

Tunison Environmental Consultants, LLC

Invasive Plant Species Eradication and Wetland Restoration Plan for 365 Main Street in Agawam, Massachusetts

Prepared for:

Mr. Joseph O'Malley
361 Main Street
Agawam, MA 01001

Prepared by:

Tunison Environmental Consultants, LLC
P.O. Box 992
Plymouth, Massachusetts 02362

February 26, 2026

TEC #: 2308-001

Tunison Environmental Consultants, LLC

Table of Contents

1.0 Introduction 1
2.0 Wetland Resource Areas 3
3.0 Cutting of Vegetation 3
4.0 Wetland Restoration 4
4.1 Goals of the Wetland Restoration 4
4.2 Invasive Plant Species Eradication or Management Plan 4
4.3 Invasive Plant Species Eradication 5
4.6 Invasive Plants 6
4.3.1 Oriental Bittersweet 7
4.3.2 Glossy Buckthorn 9
4.3.3 Multiflora Rose 10
4.3.4 Tartarian Honeysuckle 11
4.3.5 Autumn Olive 12
4.3.6 Tree of Heaven 13
4.3.7 Black Locust 14
4.5 Invasive Plant Species Removal 15
4.6 Herbicide Use 16
4.7 Solarization and Disposal 17
4.8 Decontamination Plan 17
5.0 Wetland Restoration Plan 18
5.1 Existing Conditions and Functions 19
5.2 Vegetation 19
5.3 Wildlife Habitat 22
5.4 Plan 22
5.5 Stormwater Management 23
5.6 Erosion Control 23
5.7 Considerations During Construction 23
5.8 Schedule & Sequencing 23
5.8.1 Invasive Plant Species Eradication 23
5.8.1.1 Construction Sequencing 24

5.9 Ecological Restoration Area Monitoring 26

Figures

Figure 1 Site Locus Map 2

Tables

Table 1 Wetland Restoration Area Planting Table 20
Table 2 Floodplain Restoration Area Planting Table 21

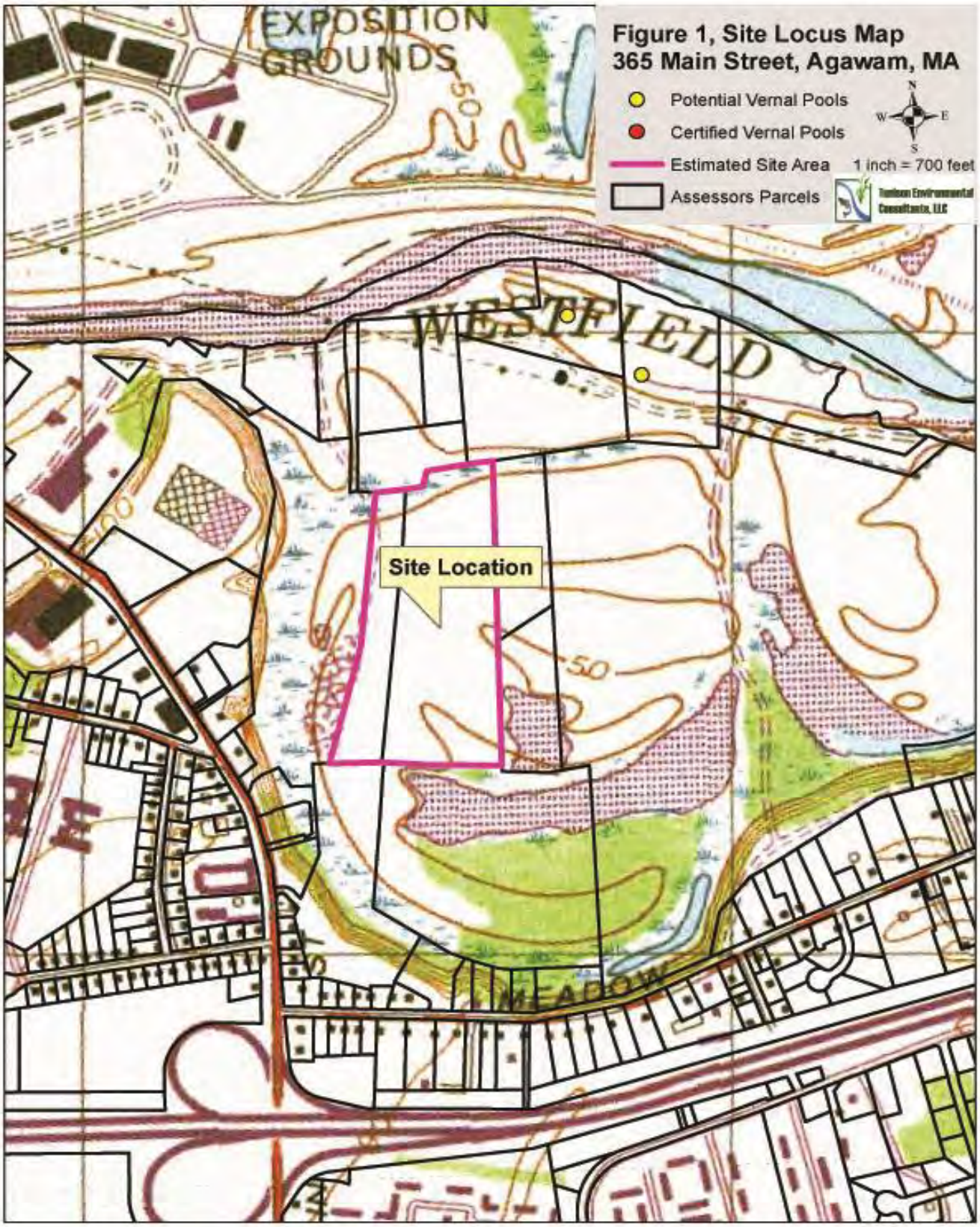
Attachments

Attachment 1 Agawam Conservation Commission Violation Letter
Attachment 2 Site Photographs
Attachment 3 Wetland Resource Areas Delineation Report
Attachment 4 Restoration Planting Plan

1.0 Introduction

On August 23, 2023, Garrett M. Tunison, PWS of Tunison Environmental Consultants, LLC, visited the property at 365 Main Street (Assessor's Parcel ID Numbers: L 131/ 1/ 5 & L13/ 1/ 3), Agawam, Massachusetts (refer to Figure 1, Site Locus Map) to inspect the wetland alterations under a current Agawam Conservation Commission Wetlands Violation (refer to Attachment 1, Agawam Conservation Commission Violation Letter). The soils and ground cover within the area where the vegetation was cut appeared to be intact except for a few tire marks in the wetland (refer to Attachment 2, Site Photographs, Photos 1 through 4). The wetland alterations consisted of cutting vegetation including many herbs, shrubs and some trees. TEC identified the cutting of 17 trees including 2 Red Maple (*Acer rubrum*), 1 Eastern White Pine (*Pinus strobus*), 2 Quaking Aspens (*Populus tremuloides*), 2 Pin Oaks (*Quercus palustris*), 3 Tree of Heaven (*Ailanthus altissima*) and 7 Black Locust (*Robinia pseudoacacia*). The cutting occurred in the southern half of the site with the 16 cut trees that were mostly visible but there could be 1 or 2 additional trees in the pile of removed trees that weren't visible. Most of the trees were from the 100 yr. floodplain and not the delineated vegetated wetlands. Almost all of the vines cut on the site were invasive Oriental Bittersweet. The shrubs were mostly Blackberries, Black Raspberry, Multiflora Rose, Glossy Buckthorn and Common Buckthorn with a few of the native shrubs mentioned above with some sporadic Common Witch Hazels (*Hamamelis virginiana*) and Smooth Sumacs (*Rhus glabra*). At the time of the wetland delineation, many of the cut stalks were beginning to regrow, including most of the cut tree stumps. Hundreds of invasive plant stalks were observed at the site and in the attached photographs that were cut. These invasive plant stalks were mostly Oriental Bittersweet (*Celastrus orbiculata*) and Common Mugwort (*Artemisia vulgaris*). These species have begun to regrow on the site and are dominating the western portion of the cut area between the access drive, Wetland C and along the western edge of Wetland A. The area where shrubs had been cut along with the 17 trees occurred is approximately 1.8 ac. of Wetland A and the adjacent floodplain to the east. Many of these areas have sprouted new herbs, shrubs and trees along with new sprouts on the basal areas of the cut shrubs and trees. This is the same for the 100-yr. floodplain. Native wetland vegetation is thriving within the cut areas of Wetland A and B.

The site is approximately 25.3 acres and appears to be relatively flat with only a slight slope from north to south and east to west. All areas of the site are highly disturbed and appeared to have been cleared in the past. Most areas of the site lack an "O" and "A" Horizon soils and there is a lot of trash and debris on the site that likely came from the old landfill and previous paintball playing fields (Attachment 2, Site Photographs, Photos 5 through 12). There are many invasive plants including Garlic Mustard (*Alliaria petiolata*), Common Mugwort and Oriental Bittersweet in the herbaceous layer; Glossy Buckthorn (*Frangula alnus*), Multiflora Rose (*Rosa multiflora*), Tartarian Honeysuckle and an occasional Autumn Olive (*Elaeagnus umbellata*) in the shrub layer and Tree-of-


Figure 1, Site Locus Map
365 Main Street, Agawam, MA
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
Assessors Parcels
1 inch = 700 feet
Tunison Environmental Consultants, LLC
N
W
E
S
EXPOSITION GROUNDS
WESTFIELD
Site Location
MEADOW
50
100

Heaven and Black Locust in the tree layer (refer to the attached Site Plant List within Attachment 3, Wetland Resource Areas Delineation Report). The site is highly disturbed including garbage, yard debris, and fill materials (asphalt, brick and concrete chunks) scattered throughout the western portion of the site (refer to Attachment 2, Photos 5 through 12). Please note, these areas of trash and debris precede the current ownership of property and the wetland violation. The northern portions of the site consist of an existing paintball and air-soft facility that also precede the current owner.

2.0 Wetland Resource Areas

Three wetland resource areas were delineated on the site as Wetlands A, B and C. A Wetland Resource Area Report has been prepared and is included as an attachment to this Wetland Restoration Plan (Attachment 3). Wetlands A and B likely connect east of the site along the drainage wetlands to the adjacent farm fields. Wetland C is an isolated wetland that appears to have been dug and is a drainage ditch that connects to a larger stormwater basin. The entire site is within the 100 yr. floodplain or Bordering Land Subject to Flooding to the Westfield River. Wetlands A and B are gently sloping where water appears to occur within 12 in. of the soil surface during periods of substantial precipitation. The area of the wetlands has likely occurred in recent years as soil matrix colors mostly ranged from 10YR 6/1 to 10YR 6/4 in the "B" Horizon with depletions that were approximately 10YR 6/1 or 10YR 6/2 in color. There were many upland plants (UPL) or facultative upland (FACU) occurring in the delineated wetlands and most wetland plants were facultative (FAC). There were a few pockets of mostly dominant facultative wetland (FACW) plants such as Sensitive Fern (*Onoclea sensibilis*) in the herbaceous layer and Silky Dogwood (*Cornus amomum*) in the shrub layer. Sensitive Fern appeared to be popping up throughout Wetland A after the tree and shrub layers had been cut along with a few patches of Oriental Bittersweet.

3.0 Cutting of Vegetation

Invasive plant species exist along the eastern and northeastern edge of Wetland A and the 100 yr. floodplain. Most of these invasive plants in the wetland included Oriental Bittersweet in the vine layer; Common Buckthorn, Glossy Buckthorn and Multiflora Rose in the shrub layer and Black Locust and Tree-of-Heaven in the tree layer. The majority or approximately 60% to 70% of the vegetation cut was invasive plants and only the remaining vegetation consisting of native herbs, shrubs and trees (refer to Attachment 2, Site Photographs, Photos 13 through 17). The native plant species that occurred within the wetland area and surrounding 100 yr. floodplain included Wild or False Lily-of-the-Valley (*Maianthemum canadense*), Thin-leaved Sunflower (*Helianthus divaricalus*), Purple or Red Clover (*Trifolium pratense*), White Heath Aster (*Symphyotrichum ericoides*), several species of goldenrods (*Solidago spp.*), Sensitive Fern, Cinnamon Fern (*Osmundastrum cinnamomeum*), a few Royal Fern (*Osmunda spectabilis*), Hay-scented Fern (*Dennstaedtia punctilobula*) and upland and wetland

grasses (*Gramineae spp.*) in the herbaceous layer; Poison Ivy (*Toxicodendron radicans*), Virginia Creeper (*Parthenocissus quinquefolia*) in the vine layer; Silky Dogwood, Blackberries (*Rubus spp.*), Black Raspberry (*Rubus occidentalis*), Highbush Blueberry(*Vaccinium corymbosum*), Southern Arrowwood (*Viburnam dentatum*) and some Common Winterberry (*Ilex verticillata*) and Northern Spicebush (*Lindera benzoin*).

4.0 Wetland Restoration

Restoration of the tree and shrub layers is proposed within the cut area along with seeding of the herbaceous layer with native wetland vegetation found within Wetland A in areas of bare soils or where the majority of the herbaceous layer was removed since it was mostly invasive plants. Wetland C has not been cut or disturbed but contain some invasive plants and Wetland B has only been partially cut within the northern 2/3's of the delineated aera. Wetland B only contains a few invasive plants that will be weeded first. Prior to the restoration, the invasive plant species will be removed as part of an Invasive Plant Species Eradication or Management Plan.

4.1 Goals of the Wetland Restoration

Our goals resulting from the invasive plant species eradication plan and the wetlands and restoration of the naturally forested 100-yr. floodplain area are to: 1) removal and eradicate any invasive plant species from identified within or adjacent to the disturbed areas; 2) restore the areas of cut wetland vegetation with native vegetation; and 3) ensure the wetland restoration area flourishes with native vegetation. This wetland restoration area should contain native vegetation observed on the site that provides significant wildlife habitat. It is anticipated the wetland restoration area and remaining ecological restoration area (including impacted 100-yr. floodplain area) will contain at least 75% native vegetation from planting and seeding after two growing seasons if this plan is followed.

4.2 Invasive Plant Species Eradication or Management Plan

Invasive plant species eradication is discussed below that has been prepared from our site visits. This document has been developed to ensure success of the eradication or management of invasive plant species and wetland restoration to occur within the areas that have been recently disturbed by cutting and removing vegetation (mostly invasive plant species) without a permit. A few additional areas of invasive plants have been identified along the western and northern portions of the site that will need to be addressed under this plan (refer to Attachment 2, Photographs, Photos 13 through 15). This document will provide a guide for the landscaper or contractor to complete the invasive plant species eradication and wetland restoration properly and successfully.

It is the experience of TEC to prioritize the removal all of the invasive plants during the first year of the wetland restoration. There has been extensive invasive plant growth in the disturbed portions of the wetlands and 100-yr. floodplain areas for many years. We recommend removing the remaining invasive plant species from the wetland and natural 100-yr. floodplain areas on the site. This will benefit the restoration efforts and the property owner as the eradication or management of these species will be complete or manageable once the below restoration plan is followed which will result in minimal costs and a successful wetland and floodplain area restoration. Without removing the remaining invasive plants, weeding and cut-and-treating the remaining large invasive plants; the invasive plants will remain and dominate the site as they have for years.

4.3 Invasive Plant Species Eradication

This Restoration Plan has been designed to first remove the majority of the remaining plants through weeding and using the "cut-and-treat" method of invasive plant eradication for large shrubs and trees. This plan is designed for complete eradication of the invasive plant species over numerous growing seasons with the bulk of this work occurring during the first one to three growing seasons with only light maintenance thereafter. There are invasive plants located on the properties to the north and west of the subject property so it is uncertain if we can fully eradicate the invasive plants on the site or almost eliminate them with light annual maintenance after the first three years. Regardless if eradication or light maintenance is needed, the removal of the invasive plants will benefit both the wetlands and the site as the invasive plants will need to be addressed from both a conservation and land management prospectives. This work should be done regardless of the wetland resource area protection.

This eradication program is structured to begin in the summer (late August to September) and/or fall of 2024 (September and/or October) and continue through at least the 2027 growing season. Upon completion of the initial eradication of invasive plant species removal and treatment, the restoration area will be evaluated in the following spring to determine if a significant amount of the invasive plants (80% to 85% reduction or greater) have been removed. The invasive plant species eradication plan will continue throughout the planting and monitoring of the wetlands and floodplain restoration. These areas will be weeded in the summer for any seedlings and will be weeded and if they have root systems that are difficult to remove such as large woody shrubs and vines, they will also be cut and treated or pulled and the remaining roots will be treated. Invasive plant species make up approximately 30% to 95+% coverage within the wetland (eastern portion of Wetland A) and floodplain restoration areas. Areas of invasive plants within the current tree line contain fewer invasive plants (approximately 10% to 40% invasive plants) than areas such as the

northern and eastern portions of Wetland A (approximately 95+% invasive plants).

4.4 Invasive Plants

Ten invasive plant species were observed on the site (refer to Attachment 2, Photographs, Photos 13 through 17). Most were woody shrubs or vines. Nine of these species will be targeted which include Garlic Mustard, Common Mugwort, Oriental Bittersweet, Glossy Buckthorn, Multiflora Rose, Tartarian Honeysuckle, Autumn Olive, Tree-of-Heaven and Black Locust. Three other invasive plant species observed on the site and within the wetlands and floodplain which included Curly Dock, Common Mugwort and Climbing Nightshade will not be further discussed as they will be weeded from the site. These three invasive plant species will not be discussed further in this document as they will be weeded and discarded into plastic contractor's bags as they are encountered in the wetlands and floodplain area. All invasive plants that are weeded and cut will be placed on large tarps and cut up and put into large contractor's black bags for solarization.

There are a few large Oriental Bittersweets, Glossy Buckthorns, Multiflora Roses, Autumn Olives, Tree-of-Heavens and Black Locust that will need to be cut down and their stumps/stalks treated. There are only patches of Garlic Mustard that can easily weeded and there is a lot of Common Mugwort in large patches or areas but it can also be easily weeded. All weeded plants will immediately be placed in 5 gal. buckets, contractor's bags or on tarps to be placed into black contractor's bags to be removed from the forested area of the site and placed in an open area for solarization.

The seven of the ten invasive plants listed above are described below in detail in Sections 4.3.1 through 4.3.7. Information provided below for each plant species was acquired from publications (such as factsheets, invasive plant books or booklets) and websites from the Plant Conservation Alliance's Alien Plant Working Group, Penn State University, University of Connecticut, National Park Service, The Nature Conservancy, the NRCS, U.S. Fish and Wildlife Plant Data Base (online) and the Massachusetts Natural Heritage Program.

Invasive plants become established and can often dominate landscapes causing over $120 billion dollars in damages in the U.S. alone each year. The plants typically have very few native or natural enemies and as a result often thrive in our local environments. They are spread by: 1) animals though their waste, on their skin, fur or feathers; 2) by treads on shoes, tires, tracked vehicles, or other machinery; 3) being transported down streams, other waterways, water bodies, or coastal waters; 4) airborne seeds; 5) people's clothes; 6) yard or construction debris; 7) soils containing seed banks; or even by 8) landscapers or being supplied by plant nurseries. Invasive plants alter natural habitats often reducing

the numbers and diversities of native plants and animals. This can be detrimental to our natural environment and significantly alter ecosystems.

4.4.1 Oriental Bittersweet

Oriental Bittersweet (refer to Attachment 2, Photographs, Photo 25) is a deciduous woody vine that was introduced to the United States in the mid-1800's and has spread throughout much of the Country. This species grows around the trunks, stems and stalks of surrounding vegetation and chokes them out. They can change the natural nutrient cycling systems that take place in our natural environments. These plants can be found along roadsides, trails, fields, wastelands, landscaped areas, sand dunes, and forest interiors.

Oriental Bittersweet looks similar to native American Bittersweet (*Celastrus scandens*) but it can be distinguished by their leaves and fruit. Oriental Bittersweet has fruit and flowers located within the leaf axils along the length of the stem. Their fruit ripen in the fall and have yellow capsules. American Bittersweet only has fruit and flowers in terminal clusters. Their fruit also ripen in the fall as do Oriental Bittersweet but their capsules are orange. Leaves are used as the most distinguishable feature to tell the difference between Oriental Bittersweet and American Bittersweet throughout their life cycle (seedling to maturity). The best time and way to identify the difference between these two species is to observe them at leaf out when two sides of the leaf of the Oriental Bittersweet are folded against each other (conduplicate) and tightly packed in the bud when they emerge in the spring. The leaves of the American Bittersweet have leaf margins rolled in like a scroll (involute) and are not as tightly packed in the bud. An additional method to distinguish the leaves, although not as reliable, is to use the ratio of length-to-width of the leaves which is often greatest for American Bittersweet (90% chance) when it is equal to or greater than 2. If the ratio is less than or equal to 1.4, it is likely (90% chance) Oriental Bittersweet.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. When hand weeding, make sure to get all of the roots to avoid re-growth. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Cutting should include cutting the vine near its base (within 2 inches of the ground) and removing the vine from surrounding vegetation, followed by treating the basal area of the vine with herbicide containing 25% glyphosate (such as Accord or Roundup Pro) works best. Remove all cut vines including any berries observed to reduce local seeding by placing them in containers or large plastic bags from where

they were cut. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This woody vine occurs throughout the wetland and riverfront area restoration and makes up approximately 70% to 80% of the invasive plant species at the site. The largest densities of this vine occur in the southeastern portion of the site in and around Wetland C.
Tartarian Honeysuckle (refer to Attachment 2, Invasive Plant Photographs, Photo 21) is a tall rounded or upright oval deciduous shrub that can reach heights of 7 to 12 feet. This plant often is one of the first shrubs to leaf out in the spring and one of the last to lose its leaves in the fall holding an advantage over other native shrubs. It often grows with a few to several stems occurring from the base that are spreading. It has a shallow woody root system that prefers mesic loamy soils but often grows in sandy loam to sandy soils. Leaves are rounded to slightly ovulate in shape and smooth along their margins. The base of each leaf is rounded to slightly cordate but the tip tapers to a blunt point. The upper leaf surface is a medium green color while the lower surface is light green. Leaves grow in opposite pairs along their shoots and rain from 1-½ in. to 2 in. long and ¾ to 1-½ in. wide. Their bark is gray to brown with narrow ridges that develop vertically shredded strips of bark as they age. Young shoots appear light green to reddish brown that are predominantly smooth. Its branches are quite fragile as they are hollow. These branches appear glabrous with a brownish to grey color in winter and a yellow to tannish color during spring and summer. The fruit is small in size (average 0.25 in. or 0.6 cm. in diameter) and range in color from orange to red that may persist throughout the winter. Each berry contains several small seeds. Its flowers appear in mid-spring (May through June) that form in pairs in the axils of the leaves. The flowers are tubular and pink to red and white in color and bloom for approximately three weeks. These flowers have a sweet fragrance common to other honeysuckles and are approximately ¾ in. long and across. The flowers consist of a corolla with five long and narrow petals containing five stamens of white filaments and yellow anthers with a pistil carrying a single style.

This plant was introduced to the United States in 1752 as an ornamental plant from central China. It is native to Siberia and other parts of eastern Asia. It grows in uplands along roadsides and trails, in old fields, thickets, fencerows, woodland edges, woodlands, and disturbed areas. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are moderately difficult to remove once in large numbers due to their seed base.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its

roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This vine occurs along the western and northern portions of the site and makes up approximately 8% to 10% of the invasive plants in the areas identified to contain invasive plant species. The property owner was trying to remove these vines when they were stopped under the violation.

4.4.2 Glossy Buckthorn

Glossy Buckthorn is a tall deciduous shrub or small tree that can reach heights of 20 to 25 feet and have a trunk up to 10 inches in diameter. It often grows with a few to several stems occurring from the base that are spreading with loosely branched crowns. Leaves are thin and glossy with an oval or elliptical shape (not toothed). The upper leaf surface is shiny while the lower leaf surface can be hairy or smooth. Their bark is gray to brown with prominent elongated and light-colored lenticels. The fruit is small in size and range in color from green to red to blackish.

This plant was introduced in Wisconsin in 1849 as an ornamental plant to be used in a hedgerow where it spread across Canada and the northern United States. It grows in wetlands and uplands, along roadsides and trails, in old fields, and in woodlands. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are difficult to remove once in large numbers.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this

project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

Glossy Buckthorn was observed scattered throughout the wetland areas making up approximately 5% to 7% of the invasive plant species.

4.4.3 Multiflora Rose

Multiflora Rose is a large deciduous, woody shrub that was introduced in 1866 from rootstock sent from Japan for ornamental roses. Its use was promoted in the 1930's for use in erosion control and "live fences" for livestock. It occurs along roadsides, paths, in disturbed lands or wastelands, adjacent to and within fields, forest edges and light gaps in forest areas. Most of these plants develop from seeds in the soil and are often spread by wildlife that feed on the rose fruits which are called, "hips". They can also form new plants when long branches touch the ground and get covered with dirt which start to grow roots. They can be dispersed over long distances and seeds can remain viable for up to 10 to 20 years in the soil.

These rose bushes are thorny with arching brown (mature stems) to greenish and/or reddish stems. The leaves are divided into five to eleven sharply toothed leaflets with a pair of fringed bracts at the base of each leaf stalk. Beginning in May or June this rose has abundant small (about an inch across) white to pinkish showy flowers. Small rose hips develop in summer, become leathery in the fall, and remain on the plant through winter. These roses can grow up to 10 feet high and 10 feet wide. The closest relatives to this rose are the Scott Rose (*Rosa spinosissima*) and the Memorial Rose (*Rosa wichuraiana*) which are not present on the site.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older established plant or its roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing works well were applicable but often requires 6 to 8 times a year over 4 to 6 years to achieve complete removal but this method will not be used in this eradication plan as there will not be any mowing in the buffer zone area. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This shrub makes up approximately 2% to 3% of the invasive plant species at the site and was observed along the western portion of the site.

4.4.4 Tartarian Honeysuckle

Tartarian Honeysuckle is a tall rounded or upright oval deciduous shrub that can reach heights of 7 to 12 feet (refer to Attachment 2, Site Photographs, Photo 16). This plant often is one of the first shrubs to leaf out in the spring and one of the last to lose its leaves in the fall holding an advantage over other native shrubs. It often grows with a few to several stems occurring from the base that are spreading. It has a shallow woody root system that prefers mesic loamy soils but often grows in sandy loam to sandy soils. Leaves are rounded to slightly ovulate in shape and smooth along their margins. The base of each leaf is rounded to slightly cordate but the tip tapers to a blunt point. The upper leaf surface is a medium green color while the lower surface is light green. Leaves grow in opposite pairs along their shoots and rain from 1-½ in. to 2 in. long and ¾ to 1-½ in. wide. Their bark is gray to brown with narrow ridges that develop vertically shredded strips of bark as they age. Young shoots appear light green to reddish brown that are predominantly smooth. Its branches are quite fragile as they are hollow. These branches appear glabrous with a brownish to grey color in winter and a yellow to tannish color during spring and summer. The fruit is small in size (average 0.25 in. or 0.6 cm. in diameter) and range in color from orange to red that may persist throughout the winter. Each berry contains several small seeds. Its flowers appear in mid-spring (May through June) that form in pairs in the axils of the leaves. The flowers are tubular and pink to red and white in color and bloom for approximately three weeks. These flowers have a sweet fragrance common to other honeysuckles and are approximately ¾ in. long and across. The flowers consist of a corolla with five long and narrow petals containing five stamens of white filaments and yellow anthers with a pistil carrying a single style.

This plant was introduced to the United States in 1752 as an ornamental plant from central China. It is native to Siberia and other parts of eastern Asia. It grows in uplands along roadsides and trails, in old fields, thickets, fencerows, woodland edges, woodlands, and disturbed areas. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are moderately difficult to remove once in large numbers due to their seed base.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its

roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This shrub occurs along the western edge and within Wetland A and is only about 1% to 2% of the invasive plants on the site. Several of these shrubs were cut down during the violation by the property owner.

4.4.5 Autumn Olive

Autumn Olive is a deciduous shrub that can grow to 20 feet in height. Leaves are alternate and egg or lance-shaped and smooth margined. The leaves are dull green on the upper surface and often silvery with brownish scales on the underside. The stems and buds are often silvery to rusty colored with scales. Autumn Olive have dense clusters of pale-yellow flowers that occur in June and July. Small reddish brown to pink fruit dotted with brown or silvery scales are produced in August through October. This plant was introduced to the United States in 1830 and was widely planted as an ornamental and in clusters as a windbreak.

Hand pulling (weeding), cutting, and the use of herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its roots. It is best to pull these seedlings after recent rains when the soil is loose. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

Autumn Olive was observed scattered in the western portion of the site and consists of approximately 1% to 2% percent of the invasive plant species. Most of these shrubs were cut down by the property owner during the violation.

4.4.6 Tree of Heaven

Tree of Heaven is a fast growing deciduous tree that can reaches heights of 80 to 100 ft. with a diameter of 3 to 6 ft. It was introduced to the United States in the Philadelphia, PA area in 1784 and was later introduced to the West Coast in the 1850's by immigrants. It was initially used as an urban street tree and has been well documented to have been used along the streets in Baltimore and Washington D.C. This tree is native to northeast and central China and Taiwan. A single female tree can produce up to 300,000 seeds which are often wind spread and they can produce seeds once a sapling becomes two years old. These trees are not only prolific but have allelopathic chemicals in their roots, leaves, and bark that can limit or prevent other native plants from becoming established. If the roots, leaves, twigs, bark or any other portion of this tree are crushed or damaged, they will give off a strong odor. This tree's sap can affect human health resulting in skin irritation, dermatitis, and may even lead to myocarditis (inflammation of the heart muscle) in rare occasions if any portions of the plant puncture skin. It is recommended that gloves and protective clothing be wore when removing this tree. Tree of Heaven can be found along roadsides, parking lots, railways, trails, fencerows, woodland edges, wastelands, fields, logging sites, mining sites, and forest openings.

Tree of Heaven looks similar to Black Walnut (*Juglans nigra*) and Sumacs (*Rhus spp.*) but it can be distinguished by their leaves, fruit, and bark. Their leaves are pinnately compound having a central stem with leaflets that are attached on each side. A leaf can range from approximately 1 to 4 ft. in length with 10 to 40 leaflets. These leaflets are lance shaped with smooth margins and one or two protruding bumps known as glandular teeth. The bark of this tree is smooth and green when it is young turning light brown to grey resembling the skin of a cantaloupe as it ages. Their twigs are brittle and alternate on the tree with a greenish to brown color. They lack a terminal bud but have large "v" or heart shaped leaf scars. Once their twigs are broken, a large spongy brown center or pith is exposed. The Tree of Heaven has small yellowish-green flowers that occur in June. Seeds appear during summer as 1 to 2 in. long twisted samara or wings with one seed per samara. Samaras occur in clusters which can be produced in the hundreds of thousands on a single tree and persist through winter.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. When hand weeding, make sure to get all of the roots to avoid re-growth. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Cutting should include cutting the vine near its base (within 2 inches of the ground) and removing the vine from surrounding

vegetation, followed by treating the basal area of the vine with herbicide containing 25% glyphosate (such as Accord or Roundup Pro) works best. Remove all cut vines including any berries observed to reduce local seeding by placing them in containers or large plastic bags from where they were cut. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This tree species occurred in the tree and sapling layers but only makes up approximately 2% to 3% of the restoration area. Several of these trees were cut down by the property owner during the violation.

4.4.7 Black Locust

Black Locust is a medium sized deciduous tree that is originally from the southeastern (southern Appalachia) and central (Ozarks) United States and some areas of Europe (refer to Attachment 2, Site Photographs, Photo 17). It has spread north throughout the northeastern and northern central United States. Black Locust was used in construction projects since their root systems are great for stabilizing soils. Seedlings and sprouts of this tree can grow rapidly and can be identified by their long paired thorns. They can rapidly overtake an area creating a dense tree layer that crowds or shades out native plants by blocking sun light and depleting soil moisture. This tree produces many seeds that seldom germinate but they spread from root suckering. Their nitrogen-fixing root nodules allow these plants to grow just about anywhere, even areas with little nutrients. They grow best in well drained soils with full sunlight. These trees are most often found along woodland edges, in abandoned fields, pastures, wastelands, and along roadsides.

The Black Locust typically grows between 40 to 50 feet tall but can grow from 70 to 100 feet in height. This tree grows relatively upright with a somewhat narrow crown that is widest at the top. Its bark can be a dark greyish brown to a greenish brown to a yellowish brown with distinctive thick rope-like ridges with furrows interlaced. The trunk is long and straight and its branches are often upright to irregular. Leaves are alternate along the stem with smaller oval or elliptical leaflets. Leaves are 6 to 14 inches long and include 7 to 19 leaflets. The leaflets are dark dull green to bluish green above and yellow below. This tree produces clusters of pea-like flowers that are creamy white in color with a yellow patch on the uppermost petal and are very fragrant. Its flower clusters are 4 to 8 inches long that occur in late May through early June for approximately one week. This tree's fruit consists of flat long smooth pods that is approximately 2 to 4 inches in length which mature in October and persist as a dried brown fruit. Each pod contains 4 to 8 seeds.

This species was observed scattered along the western and northern areas of the site in the floodplain and in Wetland A. This tree is approximately 8% to 10% of the invasive plant species on the site. Several of these trees were cut down by the property owner during the violation.

4.5 Invasive Plant Species Removal

The invasive plant species removal or eradication will be considered to be the first part of the Wetland Restoration Plan.

Removal of the invasive plants will begin along the northeastern portion of the site and continue south and then west to the driveway until all invasive plants have been weeded and/or cut-and-treated. The ecologist or wetland scientist will identify the invasive plants and show the landscapers how to identify each species seen. They will also show the landscapers how to cut, tell them which plants to weed or pull, and how to bag the plant waste to avoid seed dispersion. The plants will be weeded, cut, plant waste removed, and the basal area of large shrubs, saplings and trees will be treated with herbicide as the team moves along the site from east to west. The majority of the invasive plants that are immature or easy to extricate from the soil will be weeded/hand pulling such as young Glossy Buckthorn, Japanese Honeysuckle, Tartarian Honeysuckle, Eastern Burning Bush, Multiflora Rose, Japanese Barberry, Oriental Bittersweet, and Autumn Olive. Seedling Japanese Knotweed will also be weeded.

Common Mugwort, Curly Dock, Garlic Mustard and Climbing Nightshade plants identified that will only be weeded and not cut-and-treated. Plants with a stem or stalk that is greater than ½ in. diameter may be cut and treated with herbicide but weeding them from the site will also be attempted prior or in place of the cut-and-treat method. Any plant with a stem or trunk greater than 1-½ in. will but cut and treated with herbicide dabbed on its cut stem or trunk (with a dabbing brush or dapping wand) by an herbicide applicator with a MA Herbicide Applicator's License under the direct supervision of a wetland scientist or ecologist. The wetland and floodplain area to be restored may be divided into transects to aid with coverage of the area and to avoid additional movement within the restoration area that could damage native vegetation. The team will consist of at least three individuals. These individuals include: 1) the ecologist; 2) a landscaper who is cutting/weeding and possibly bagging; 3) a landscaper (who has an MA Herbicide Applicator's License) that is treating the cut basal area of large shrubs under the guidance of the ecologist; and 4) possibly an additional landscaper that is cutting/weeding and bagging the plant waste. Once a contractor's bag is full of plant waste, it will be tied closed and placed on the lawn edge by the driveway to be picked up by the landscapers once a transect is completed and placed in a truck bed. Mowing of invasive shrubs and herbs will not occur on this site as all work is within wetland resource areas. After a section or transect of the restoration is completed, the site ecologist or wetland

scientist will inspect each section or transect to ensure that all invasive plants have been removed.

All invasive plant species above will be weeded except for large Oriental Bittersweet, Glossy Buckthorn, Multiflora Roses, Tartarian Honeysuckle, Autumn Olive and Black Locust as stated above. The small to medium sized invasive plant species will be weeded and discarded in black contractor's bags for offsite removal or in an open area outside of the forested area of the site for solarization.

4.6 Herbicide Use

Herbicide use has been designed into this plan with the intention of using it as infrequently or as sparingly as possible. It is the opinion of this office as a result of several recently published studies that large-scale use of herbicides, including those with glyphosate, negatively impact the environment. Glyphosate that enters surface waters has been linked to DNA damage in fish and other species. Glyphosate is a heavy salt that does breakdown organically into natural elements over time. No spraying release of this herbicide over large areas will occur under this plan. Two brands of glyphosate based herbicides may be used one is Accord XRT II for any aquatic invasive plant stalks or roots and the other will be either RoundUp Pro or Roundup Custom. This herbicide will be applied directly and sparingly to cut basal areas or visible roots only when physical removal of the plant is not possible or is more damaging to surrounding natural vegetation. Herbicide application will occur through the use of cotton swabs, paintbrushes and/or dabbing wands. Dapping wands are typically sheaths of material that are secured to the sprayer tip and metal shaft of the sprayer to become soaked with herbicide that can be gently placed on the cut basal area of the plant where is will accumulate on the cut area.

Three brands of herbicide have been mentioned within this plan. All three brands contain the active ingredient glyphosate. Accord XRT II is a brand/product that is typically used in aquatic settings to control emergent vegetation. Roundup Pro or Roundup Custom and Accord XRT II contain surfactants which help the herbicide stick to the plant surface where it is applied. This helps it penetrate into the plants tissue, especially when it is a hard woody surface and may be exposed to rain within 3 to 6 days of application. Without the surfactants, the life of the herbicide is greatly reduced and may not be effective. This is especially true when dealing with areas where rainfall may occur within 3 to 6 days after the application of the herbicide.

The application method chosen in this plan (direct basal area application) was determined based on experience and research to provide the most effective manner of application with the highest level of protection for the environment. The time of application has been based upon the end of the growing season so that the plant will absorb the herbicide and store the herbicide in its root system

with its sugars to draw from when it needs energy to grow in the spring. This provides a high rate of efficiency for eliminating invasive plant species within 2 to 3 years if proper weeding programs are in place and areas surrounding the Restoration Area are also free of invasive. Targeting the basal and exposed root areas of shrubs and trees minimizes the herbicide application so that it is almost completely absorbed by the plant unlike foliar spraying. Our Company's experience and research of herbicides that contain glyphosate are that it is harmful to fish and other aquatic organisms if it enters a waterway, waterbody, or coastal waters. It can act as a bio-inhibiter impacting fish reproduction. This is why we have the herbicide applied to the basal area of invasive plants and not sprayed. It is likely that RoundUp Pro or Roundup Custom will be the herbicide chosen to be applied on the cut basal areas of the invasive plant species. The majority of the proposed cut-and-treat method will occur west or north of the wetlands with a few potential spots in the wetlands. Please note, these wetlands rarely contain water but contain high groundwater that reaches the upper 12 in. of the soil.

4.7 Solarization and Disposal

Once the invasive plants are placed in large black contractor's bags, they will be removed from the forested area of the site at the end of each work day and placed along the parking lot of the site. The bags of invasive plant material will either be removed from the site for offsite solarization or kept in an open area of the site for solarization. Solarization will occur over 6 months to ensure the plant material (roots, small branches that could contain seeds, fruits and seeds) will be dead and rotting to ensure no invasive plants can't spread. The best method of disposal is to bring them to a transfer station or place them in a dumpster that is picked up by a contracted waste disposal company that takes its waste to a facility with an incinerator but this process has become unfeasible as costs have risen sharply ($4,000+ per roll-off dumpster). Burying the plant waste deep such as in a landfill or other location is also a potential solution is the next best option following solarization but taking them anywhere where them can be used for mulch, compost or future top soil should be prohibited. This method of disposal will ensure that no invasive plants will be allowed to spread or resurface in the surrounding environment. It is recommended that a contractor who performs the invasive plant species eradication or is a disposal company that either transfers the plant waste and any refuse from the site follows the decontamination processes discussed below in Section 4.7 Decontamination Plan to a private or public incinerator.

4.8 Decontamination Plan

The spread of invasive plants can occur as a result of the distribution of seeds, roots, and even stem fragments from invasive plant species and can occur on many different sources such as personnel clothing, vehicles and/or machinery.

Any of these sources, such as clothing, tools, or vehicles, need to be inspected and likely cleaned daily prior to leaving the site and at the end of the project or any time before or after leaving the site. Vehicles and mechanical equipment shouldn't be an issue at this site so they will not be part of the decontamination. The decontamination protocols will only apply to workers clothing, footwear and mechanical cutting or treatment equipment.

Inspections should be carried out on a staging area dedicated to cleaning personnel, equipment, and vehicles (on the driveway). Effective inspections require good lighting conditions, personnel trained to look for problem areas that are not apparent upon casual observation, and development of protocols and lists of priority invasive species. Effective inspections also require persons who have the task of inspecting vehicles, equipment, and personnel to be dedicated and accountable for their actions. Inspections should include personnel, vehicles, and equipment that are used in locations known to be infested with invasive species. The equipment should undergo a pre-inspection, followed by thorough cleaning and a post-inspection before being allowed to leave the site.

Decontamination of any and all: 1) clothes; 2) shoes, boots, and any other footwear worn on the site; 3) vehicles; 4) trailers; 5) mowing equipment, 6) any earth-moving equipment; and 7) any other machinery or object brought onto the site that may make contact with the ground or site vegetation during the proposed ecological restoration. Decontamination will occur when anything leaves the site at the end of the work day or when work is completed and will include the removal of seeds, fruits, soils, mud, and plant cuttings/fragments from any of the seven itemized categories listed above. Numerous cleaning methods are available to decontaminate workers and equipment of invasive species. A lint roller and whisk broom or small broom works best with a dust pan. Materials removed from each site worker should be swept up or off personnel, boots, and equipment and placed in one of the black contractor's bags containing the plant waste. The use of mowing and construction equipment is unlikely to occur during the times the invasive plant species eradication program will be executed at the site.

5.0 Wetland Restoration Plan

The success of the ecological restoration can only be accomplished with a well-developed and thoroughly followed restoration plan. Portions of the ecological restoration plan described below has been developed from the Massachusetts Department of Environmental Protection, Massachusetts Inland Wetland Replacement Guidelines, September 2022 such as planting densities and percent coverage of restored plants for qualification of the restoration area after two years of monitoring. All activities identified within the ecological restoration area will be supervised by a qualified wetland scientist. Restoration of Wetland A and B and the floodplain area will not occur until approximately 80% to 85% reduction in invasive plant species occurs within the

restoration area. Once the majority of the invasive plants have been removed from the restoration area, the restoration plantings will commence. This will likely occur in the spring (April to early May) or fall of 2025 when the regrowth or sprouting of invasive plants can be evaluated prior to planting.

5.1 Existing Conditions and Functions

The site consists of an area that was recently disturbed from the removal of invasive plants and some native vegetation that was cut in the process within the eastern portion of the site. The remaining portions of the site consist of forested wetland and mixed forested upland that occur within the 100-yr. floodplain to the Westfield River. The areas of the wetland and floodplain restoration include areas of invasive plant species.

5.2 Vegetation

All vegetation chosen to be planted in the ecological restoration areas was observed on or adjacent to the site. Other dominant native vegetation that contains high wildlife habitat value throughout the forested areas of the site will be used for the ecological restoration as described below. The purpose of revegetating the areas where the invasive plant species are being eradicated is to avoid these areas from becoming re-infested with invasive plant species. Re-vegetating areas once occupied by invasive plant species has shown these areas can be ecologically restored and will become re-established with native plants instead of invasive species (invasive plant species numbers typically dwindle to near zero in a few growing seasons). This results in effective restorations that cost less and are successful which occurs in a much shorter period of time, typically within one to two growing seasons for dominant nave plants when compared to just treating the invasive plant species.

The planting sequence will include planting the trees first at approximately 10 to 15 ft. on-center, then shrubs will be planted approximately 8 to 12 ft. on-center, followed by seeding. The spacing for most of the wetland restoration area and many portions of the floodplain will be at these planting densities but will not reflect this due to the existing shrubs and trees that have regrown or sprouted on their stumps. The proposed Planting Plan (refer to Attachment 4, Restoration Planting Plan) reflects the general locations of the new or regrowth of native shrubs and trees at the site. Once the plant stock is delivered to the site, the plants will be evaluated to ensure they are the proposed plants, they are delivered with the requested quantities of each plant species, and that they are healthy. The plants will be laid out within the ecological restoration area prior to planting. When all nursery stock is planted, the New England Wetmix will be applied to Wetland A in the areas where the invasive herbs have been removed and any other areas where the herbaceous layer has been damaged from the invasive plant species eradication. New England Conservation/Wildlife Seed Mix

will be applied to 100-yr. floodplain within the restoration area. The same native plant species that are located within the existing buffer zone with high wildlife habitat value will be planted in the restoration area.

There are numerous native trees, shrubs, and many herbs in the restoration area that have been estimated in our planting plan (refer to Attachment 4, Restoration Planting Plan). The densities of native plants have been estimated conservatively as any significant open areas in the vegetative cover following the two years of invasive plant species eradication plan will allow the invasive plants to repopulate and dominate these open patches. This would create additional time, costs, and effort to eradicate the invasive plant species from the restoration area.

The wetland restoration area will be seeded with New England Wetmix in the herbaceous layer within the boundaries of Wetland A and B where the herbaceous layer has been weeded or damaged from the invasive plant species eradication and with New England Conservation/Wildlife Seed Mix in the herbaceous layer in the remaining 100-yr. floodplain of the ecological restoration area where the invasive plant species have been removed. The proposed wetland restoration area will include 13 Silky Dogwoods, 12 Highbush Blueberries, 18 Northern Spicebushes, 13 Southern Arrowwoods, 7 Common Witch Hazels, and 7 Common Winterberry in the shrub layer; and 8 Red Maples and 2 Pin Oaks trees for the tree layer (Refer to Table 1 below).

Table 1 Wetland Restoration Areas Planting Table				
Plant Species	# of Plants	Plant On Center	Plant Height	Size
New England Wetmix Seed Mix application rates to bare wetland restoration areas: 1 lb./1,200 sq. ft.				
Northern Spicebush (*Lindera benzoin*)	18	8 – 10 ft.	18 - 24 in.	2 - 4 gal. container
Highbush Blueberry (*Vaccinium corymbosum*)	12	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Southern Arrowwood (*Viburnam dentatum*)	15	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Silky Dogwood (*Cornus amomum*)	13	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Common Winterberry (*Ilex verticillata*)	7	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Pin Oaks (*Quercus palustris*)	2	10 – 15 ft.	24-30 in.	2 - 4 gal. container
Red Maple (*Acer rubrum*)	8	10 – 15 ft.	24-30 in.	2 - 4 gal. container
The altered area of Wetlands A and B will include planting of 10 trees and 65 shrubs.				

Table 2 Floodplain Restoration Area Planting Table				
Plant Species	# of Plants	Plant On Center	Plant Height	Size
New England Conservation/Wildlife Seed Mix application rates to bare 100-yr. Floodplain areas: 1 lb./1,200 sq. ft.				
Highbush Blueberry (*Vaccinium corymbosum*)	7	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Common Witch Hazel (*Hamamelis virginiana*)	32	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Southern Arrowwood (*Viburnam dentatum*)	32	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Pin Oaks (*Quercus palustris*)	19	10 – 15 ft.	24 – 30 in.	2 - 4 gal. container
Red Maple (*Acer rubrum*)	19	10 – 15 ft.	24 – 30 in.	2 - 4 gal. container
The altered floodplain restoration area will include planning of 38 trees and 71 shrubs.				

The proposed floodplain restoration area will include 7 Highbush Blueberries, 32 Southern Arrowwoods, and 32 Common Witch Hazels in the shrub layer; and 19 Red Maples and 19 Pin Oaks trees for the tree layer (Refer to Table 1 below).

New England Wetmix seed mix will be used for the native herbaceous layer within Wetland A and B where invasive plants have been removed. This seed mix contains Fox Sedge (*Carex vulpiniodea*), Hop Sedge (*Carex lupullina*), Bearded Sedge (*Carex comosa*), Lurid Sedge (*Carex lurida*), Nodding Bur Marigold (*Bidens cernua*), Soft Rush (*Juncus effusus*), Grass-leaved Goldenrod (*Solidago graminifolia*), Blue Vervain (*Verbana hastata*), Boneset (*Eupatorium perfoliatum*), Flat-top Aster (*Aster umbellatus*), Hard-stem Bulrush (*Scirpus acutus*), Green Bulrush (*Scirpus atrovirens*), Woolgrass (*Scirpus cyperinus*), Sensitive Fern (*Onoclea sensibilis*), Spotted Joe-Pye Weed (*Eupatorium maculatum*), Water Plantain (*Alisma plantago-aquatica*), Soft-Stem Bulrush (*Scirpus validus*), and Ditch Stonecrop (*Penthorum sedoides*). The New England Wetmix will be applied at a rate of 800 sq. ft./lb. to Wetlands A and C.

New England Conservation/Wildlife Seed Mix will be used in the 100-yr. floodplain where invasive plants have been removed which includes: Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), and Upland Bentgrass (*Agrostis perennans*). The New England Erosion Control/Restoration Mix for Dry Sites includes: Red Fescue (*Festuca rubra*), Canada Wild Rye (*Elymus canadensis*), Annual Ryegrass (*Lolium multiflorum*), Perennial Ryegrass (*Lolium perenne*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*), Switch Grass (*Panicum virgatum*), Upland

Bentgrass (*Agrostis perennans*). The Conservation Mix will be applied at a rate of 800 sq. ft./lb. to the riverfront area restoration.

Planting of the restoration area will follow the invasive plant species eradication plan and will likely occur in spring or fall 2025 following the reduction in invasive plant species by at least 80% to 85%. The seeding for the ecological restoration area will only be spread in the spring as the seed mix contains plant seeds that are food sources for native animals and will often be eaten before they can germinate. The ecological restoration area will be planted with shrubs will be planted 8 to 12 ft. on center and trees will be planted 10 to 15 ft. on center. It is anticipated that the vegetation within the ecological restoration area will thrive (establishment of 75% or greater of the native plant species planted in the ecological restoration area) after two consecutive growing seasons. The success of the ecological restoration area will depend upon whether or not predicted conditions, such as normal or average seasonal weather, occur and are met within the ecological restoration area, and that the planting plan is closely followed.

An invasive plant species prevention plan is proposed to continue after the restoration plantings to ensure that the vegetation within the restoration area takes hold and is not dominated by invasive or opportunistic vegetation, a weeding program will be incorporated into this planting plan for all new seedlings. Potential sources of new infestations of invasive vegetation are onsite construction/maintenance equipment, local wildlife populations, or airborne seeds. Invasive plant species have been identified not only on the site in the existing buffer zone but also on the surrounding properties.

Watering of the vegetation is a concern for the success of the ecological restoration. Watering will likely need to occur if planting occurs in the fall or in the spring if we have a dry spring and/or summer.

5.3 Wildlife Habitat

All of the eight native plant species that are to be used in the ecological restoration area are native to the area and site and contain significant wildlife habitat value. According to Readington 1994 and DeGraaf 2002, small mammals, birds, reptiles, amphibians, and insects use these native plant species for feeding, breeding, and shelter.

5.4 Plan

A planting plan has been included as Attachment 7, Restoration Planting Plan that shows the location of the ecological restoration area plantings.

5.5 Stormwater Management

The ecological restoration areas will not receive storm water discharge from the proposed stormwater management system.

5.6 Erosion Control Plan

No sediment or erosion controls are currently proposed as the site is completely vegetated. Areas where invasive plants will be removed will be planted with shrubs and trees and seeded with herbaceous seed mixes.

5.7 Considerations During Construction

Proper scheduling and sequencing of events to prepare and complete work associated with the restoration area will be necessary for the wetland and floodplain restorations to be successful. This includes the eradication plan and planting within the restoration area as described below. The invasive plant species eradication plan will be conducted for the first one to two years to ensure that when the proposed restoration plants are planted, they aren't overtaken by invasive plant species. Prior to planting, the restorations areas will be inspected to ensure that most of the invasive plants have been eradicated. If 80% to 85% or greater removal of the invasive plant species has occurred, the planting of the ecological restoration area will commence. Proposed planting orders will be submitted to the restoration plant suppliers once it is determined that enough of the invasive plants have been eradicated in late summer and/or early fall of 2024. The proposed ecological restoration plantings will be ordered in late winter/early spring 2025 to ensure the availability of the plant stock for the restoration area.

5.8 Schedule & Sequencing

The restoration area must be constructed in a sequenced plan to ensure its success. The construction sequencing for the restoration area is listed below.

5.8.1 Invasive Plant Eradication

Weeding of the invasive plants will commence at the end of summer or early fall of 2024. The way in which the ecological restoration plan will be executed is described below in Section 5.8.1.1 Construction Sequencing.

5.8.1.1 Construction Sequencing

This section will be followed closely by the site's wetland scientist and the landscaping crew to ensure each task is completed in proper sequence and thoroughly to avoid additional contamination on and off the site of invasive plant species. If each step of the construction sequencing is performed fully and accurately, the ecological restoration should be successful.

1. In late summer and/or early fall of 2024, the wetland scientist will instruct the landscaping crew on how to identifying each invasive plant species at the seedling, juvenile and adult plant stages at the site. Each person's task(s) will be conveyed so that everyone will know who is weeding, cutting and removing the slash or plant matter and placing it in black contractor's bags. The location for the placement of full bags is along on the edge of the access drive where they will be picked up and either placed in an open area along the existing parking lot or move to another offsite location for solarization.
2. Once the instruction is completed, the eradication of invasive plant species will begin with weeding and cut-and-treat of larger woody plants along the northern and eastern extent of the site moving (moving south to west) around and in Wetland A and removal of the few invasive plants from the cut area of Wetland B.
3. A transect that is approximately 20 ft. wide will be established to keep trampling of the native vegetation to a minimum and to focus on the invasive plants in the transect so none are missed.
4. The herbicide applicator with the MA Herbicide Applicator's License will dab the cut stalk or stump of the invasive plants along the path of the transect as needed.
5. Upon completion of the invasive plant species removal and treatment, all slash or plant waste (except for the trunks and large branches from the trees and shrubs that don't contain any seeds or fruits) will be collected and put into black contractor's bags. All personnel that have been in the field will have to be inspected for any plant materials, especially seeds, berries, and roots. Once all personnel have been inspected and cleaned off with a lint roller and nylon brush. Any dirt from

boots, lint rollers, and brushes and dust pans will be discarded into the remaining plant materials bag.

6. In spring 2025, the area will be inspected in late April or early May to determine the extent of regrowth or new invasive plant species. If less than 20% are present, planting could begin.
7. If a fall 2025 planting is proposed, the areas of invasive plants will be inspected at the end of August to determine if another treatment is necessary prior to planting and what level of weeding, cutting and treatment is needed to eradicate new and plants with regrowth.
8. Planting will include coordinating the plant stock ordering, establishing a staging area, evaluating plant stock once it arrives on the site.
9. Prior to planting, the shrubs and trees will be laid out in the locations by the site's wetland scientist and proper planting procedures will be discussed and monitoring of planting will occur by the wetland scientist to ensure the plants are planted properly according to the Restoration Planting Plan.
10. Shrubs will be planted 8 to 12 ft. apart and trees will be planted 10 to 15 ft. apart.
11. The seed mixes for the herbaceous area will be cast across the bare areas of the ecological restoration areas at a rate of 1 lb./1,200 sq. ft.
12. All plants will be watered immediately following planting.
13. The restored ecological restoration areas will be inspected by the wetland scientist following planting.
14. All activities described in #1 through #12 will be supervised and authorized by the wetland scientist until completed and approved.
15. Activities listed above are subject to change due to site conditions, weather, failure of equipment or other unforeseen issues that may arise and will be addressed by the supervising wetland scientist. If any changes do occur, they will be documented and discussed in full detail in the first report to the Conservation Commission, MassDEP and the U.S. Army Corps of Engineers following completion of the restoration area.

5.9 Ecological Restoration Monitoring

Monitoring of the restoration area will occur twice (during spring and fall) following planting to observe the health of the plantings and to determine when watering is necessary during the first growing season and if there are any issues with the plants. A quick monitoring will be performed twice in the first one to two weeks following the planting to ensure the plants aren't in shock (are healthy) and there isn't any evidence of animals eating the plants. Monitoring at the end of the growing seasons for both years will include observing the health of the plantings and to evaluate any replaced plantings. This monitoring will include evaluating the location of each shrub and tree planted, health of the vegetation, the overall success of the wetland restoration and riverfront area, and to set two sample plot monitoring locations to evaluate the wetland restoration area based on percent coverage of wetland vegetation and to sample soils in the center of each sample plot. One sample plot location will be established within the riverfront area restoration. The plots will be marked in the field with flagging tape and marked "TEC Sample Plot 1", "TEC Sample Plot 2" and "TEC Sample Plot 3". Any dead or significantly stressed vegetation will be marked with flagging tape and will be photographed and discussed in the monitoring report. The area of the wetland restoration will be documented for hydrology, wetland vegetated coverage, soils, potential for erosion, colonizing wetland plant species, any evidence of invasive plants, signs or observation of wildlife utilization, and the ability of the wetland restoration to blend into or become part of the adjacent existing wetland system. The 100-yr. floodplain will be monitored for all parameters of the wetland restoration area minus the hydrology. If any plantings are dead, they will be marked with flagging tape, their location within the restoration area will be marked on a plan and the plant species will be documented both in field notes and in the monitoring report.

Access to the restoration area will be limited to prevent damage to the vegetation and disturbance of the soils. Water will be obtained onsite and vegetation will be watered by hose or by buckets during the first month after planting if necessary. If a drought or extreme wet weather occurs, monitoring will be increased and necessary action taken to prevent damage or stress to the plantings. The restoration area will also be monitored to ensure invasive or unwanted plant species from becoming established during the two site visits. If invasive or unwanted species are found in the restoration area, a weeding program will be implemented to remove these species.

The first year of monitoring will include two site visits during the first full growing season, in early summer and late September. Each site visit will involve inspecting and documenting any changes in the health and growth of the planted vegetation. Photographs of the restoration area will be taken to show how the vegetation throughout these areas has fared. The locations of where the photos were taken will be marked for subsequent site visits. Photos of planted vegetation and volunteer species will be taken and included in the monitoring reports. A qualified wetland scientist will conduct all inspections of the

restoration area for plant vitality, vegetational coverage, and any potential erosion or sedimentation in the restoration area. A report regarding the inspection will be completed and submitted to the Agawam Conservation Commission, MassDEP and the Army Corps of Engineers after every inspection. A yearly monitoring report will be prepared after each growing season to document the yearly success.

Attachment 1

Agawam Conservation Commission
Violation Letter

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

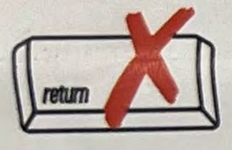
WPA Form 9 – Enforcement Order

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

DEP File Number: _____

A. Violation Information

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



This Enforcement Order is issued by:

Agawam — Conservation Commission (Issuing Authority)

8/11/2023 — Date

To:

Joseph O'Malley — Name of Violator

351 Main Street, Agawam, MA 01001 — Address

1. *Location of Violation:*

Tree House S LLC — Property Owner (if different)

"Meadow Lot & Kirkland," "Meadow Lot," "Rear Meadow Lot" — Street Address

Agawam — City/Town

01001 — Zip Code

L13 — Assessors Map/Plat Number

1/3,1/4, 1/5 — Parcel/Lot Number

2. Extent and Type of Activity (if more space is required, please attach a separate sheet):

The Agawam Conservation Commission received an anonymous complaint of clear cutting on Saturday, August 5, 2023 and a second complaint on Monday, August 6, 2023 stating acres of the wooded area have been cut down. The Conservation Commission went onsite and verified the tree cutting. See attached pictures. They were told that the area would be replanted with tomatoes and that they would be starting a Christmas tree farm. This area is in Bordering Land Subject to Flooding.

B. Findings

The Issuing Authority has determined that the activity described above is in a resource area and/or buffer zone and is in violation of the Wetlands Protection Act (M.G.L. c. 131, § 40) and its Regulations (310 CMR 10.00), because:

☒ the activity has been/is being conducted in an area subject to protection under c. 131, § 40 or the buffer zone without approval from the issuing authority (i.e., a valid Order of Conditions or Negative Determination).

Attachment 2

Site Photographs



Photo 1. Area that was clearcut with trees cut down east and north of Wetland A.



Photo 2. Cut area east of Wetland A, note ground cover is intact and Oriental Bittersweet vines on tree.



Photo 3. Cut stumps of Pin Oak and Tree of Heaven east of Wetland A.



Photo 4. Cleared area of Wetland A and floodplain to the upper left of photograph.



Photo 5. A few of the many tires observed on the site within the cut or cleared area.



Photo 6. Tire and metal cylinder between Wetland A and Wetland C.



Photo 7. Tires and vehicle parts just southwest of Wetlands A and C.



Photo 8. Piles of trash and debris west of Wetland C and north of Wetland A.



Photo 9. Plastic debris, tires, plastic drums, etc. west of Wetland C and north of Wetland A.



Photo 10. Tires, trash and other debris just west of Wetland C and the eastern most portion of Wetland A.



Photo 11. Trash and debris strewn across the western edge of the site.



Photo 12. Another image of the trash and debris along the western edge of the site.



Photo 13. Area along the southwestern edge of the site, note the Common Mugwort.



Photo 14. Area just west of Wetland A and C along the western edge of the site, note C. Mugwort.



Photo 15. Area on the edge of Wetland A, note Black Locust and Quaking Aspen saplings re-growth.



Photo 16. Tartarian Honeysuckle along the eastern edge of Wetland A.



Photo 17. Black Locust with Fox Grape and goldenrods east of Wetland A.



Photo 18. Native grasses, goldenrods and Eastern Poison Ivy just east of Wetland A.



Photo 19. White Heath Aster, goldenrods and Purple Clover southeast of Wetland A.



Photo 20. White Heath Asters east of Wetland A.



Photo 21. Cut area of Wetland A, note Sensitive Fern and goldenrods in the cut area.



Photo 22. Area southeast of Wetland A, note White Heath Asters and goldenrods.



Photo 23. Area to the east of Wetland A in the southern most portion of the cut area of floodplain.



Photo 24. Raspberry bush near the edge of Wetland A.



Photo 25. Quaking Aspen, Virginia Creeper, goldenrod, Purple Clover, blackberries, Poison Ivy and a couple of Oriental Bittersweets in the 100-yr. floodplain.

Attachment 3

Wetland Resource Areas

Delineation Report

Tunison Environmental Consultants, LLC

Wetland Resource Area Delineation Report for 365 Main Street in Agawam, Massachusetts

Prepared for:

Mr. Joseph O'Malley
351 Main Street
Agawam, MA 01001

Prepared by:

Tunison Environmental Consultants, LLC
P.O. Box 992, 11 South Park Avenue
Plymouth, Massachusetts 02362

July 12, 2024

TEC #: 2308-001

Tunison Environmental Consultants, LLC

TABLE OF CONTENTS

Section	Page#
1.0 Introduction	1
2.0 Wetland Resource Areas	1
3.0 Definitions of Wetland Resource Areas Normally Delineated in the Field	3
4.0 Methodologies Delineation of BVW	4
4.1 Description of Criteria	4
4.1.1 Wetland Indicator Plants	5
4.1.2 Indicators of Hydrology	5
4.2 Field Methodology	6
4.2.1 Boundary Flagging	7
4.2.2 Boundary Documentation	7
4.2.2.1 Vegetation	8
4.2.2.2 Hydrology	9
5.0 Site Description and Wetland Delineation	10
5.1 Wetland Resources Delineated on the Site	10
5.1.1 Wetland A	11
5.1.2 Wetland B	11
5.1.3 Wetland C	12
5.2 Regulations that Apply to Delineated Resource Areas	12
5.2.1 Massachusetts Wetlands Protection Act (310 CMR 10.00)	12
5.2.2 Federal Clean Water Act	13
5.2.3 Local Regulations and Bylaws	13
6.0 Rare Species	14

Figures

Figure 1 Site Locus

Attachments

Attachment 1 Site Plant List
Attachment 2 DEP Bordering Vegetated Wetland Delineation Field Data Forms
Attachment 3 Natural Heritage and Endangered Species Program Estimated Habitat of Rare Wildlife and Certified Vernal Pools, Springfield South Quadrangle Map
Attachment 4 ACOE Wetland Determination Data Forms – Northcentral and Northeast Region
Attachment 5 NRCS Soil Report
Attachment 6 Wetland Plan

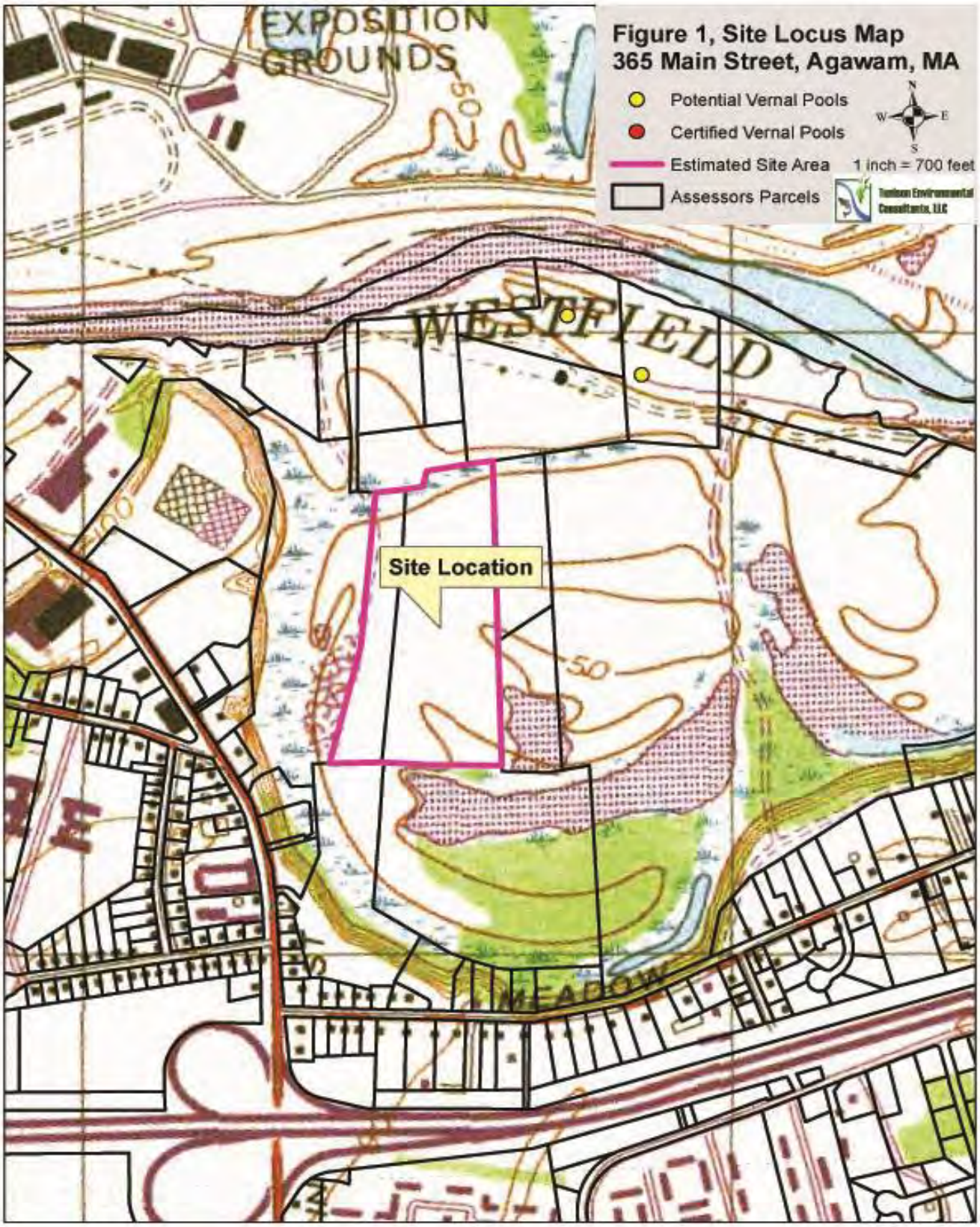
1.0 Introduction

This document presents the methodologies that were used to delineate and identify wetland resources at the property at 365 Main Street (Assessor's Parcel ID Numbers: L 131/ 1/ 5 & L13/ 1/ 3) in Agawam, Massachusetts (refer to Figure 1, Site Locus). The wetlands at this site were delineated on August 23, 2023 by Garrett M. Tunison, of Tunison Environmental Consultants, LLC who applied the methodologies described below.

2.0 Wetland Resource Areas

Under the Massachusetts Wetlands Protection Act (MWPA) (M.G.L. Ch. 131, S.40) and its implementing regulations (310 CMR 10.00), five freshwater resource area categories are defined. These categories are: (1) Bank, (2) Bordering Vegetated Wetlands (BVW), (3) Land Under Water Bodies and Waterways, (4) Land Subject to Flooding (Bordering and Isolated), and (5) Riverfront Area.

Bank, BVW, and Riverfront Area can be delineated in the field. The boundaries of Land Under Water Bodies and Waterways and Land Subject to Flooding are typically not physically delineated on a site for the following reasons. 310 CMR 10.56(2)(c) states: "The boundary of Land Under Water Bodies and Waterways is the mean annual low water level." As a result, this resource is not present within intermittent streams and is below bank resources in perennial streams. 310 CMR 10.57(2)(a)3 states: "The boundary of Bordering Land Subject to Flooding is the


Figure 1, Site Locus Map
365 Main Street, Agawam, MA
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
Assessors Parcels
1 inch = 700 feet
N
W
E
S
EXPOSITION GROUNDS
WESTFIELD
Site Location
MEADOW

estimated maximum lateral extent of flood water which will theoretically result from statistical 100-year frequency storm." As such, this boundary is normally obtained from NFIP Profile data or by calculation and is represented on a site plan based upon elevation. The boundary of Isolated Land Subject to Flooding is based upon the "Perimeter of the largest observed or recorded volume of water confined in said area." (310 CMR 10.57(2)(b)). Often historical data is lacking and the boundary is determined by calculation using the extent of flood water which will result from the statistical 100-year frequency storm.

3.0 Definitions of Wetland Resource Areas Normally Delineated in the Field

BVW is defined 310 CMR 10.55(2) as:

> "…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…" The boundary of BVW is defined in 310 CMR 10.55(2)(c) as "…the line within which 50% or more of the vegetated community consists of wetland indicator plants and saturated or inundated conditions exist."

Bank is defined in 310 CMR 10.54(2)(a) as:

> "…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." The boundary of the Bank is defined in 310 CMR 10.54(2)(c) as "the upper boundary of the Bank is the first observable break in slope or the mean annual flood level, whichever

is lower. The lower boundary of a Bank is the mean annual low flow level."

River is defined in 310.CMR 10.58(2)(a) as:

"...any natural flowing body of water that empties to any ocean, lake, pond or other river and which flows throughout the year."

Riverfront is defined in 310 CMR 10.58(2)(a)3 as:

"...the area between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet[1] away..." 310 CMR 10.58(2)(a)2 states: "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 predominately terrestrial land."

4.0 Methodologies for Delineation of BVW

Bordering Vegetated Wetlands were delineated in accordance with the methodology set forth in the document entitled "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook," dated March 1995, produced by the Massachusetts Department of Environmental Protection, Division of Wetlands and Waterways. Vegetated wetlands are defined by the presence of 50% or more of wetland indicator plants and saturated or inundated conditions.

[1]In some instances, the riverfront area may extend outward less than 200 feet.

4.1 Description of Criteria

4.1.1 Wetland Indicator Plants

Wetland indicator plants are defined in the MWPA regulations as any of the following:

1. Plant species listed in the Wetlands Protection Act
2. Plants listed in the National List of Plant Species That Occur in Wetlands, published by the U.S. Army Corps of Engineers, 2012, with an indicator category of: OBL, FACW, and FAC.
3. Individual plants that exhibit morphological or physiological adaptations of life in saturated or inundated conditions.

Wetland indicator species categories are defined as:

OBL: Obligate Wetland. Occur almost always (estimated probability >99%) under natural conditions in wetlands.

FACW: Facultative Wetland. Usually occur in wetlands (estimated probability 67%-99%) but occasionally found in non-wetlands.

FAC: Facultative. Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

Morphological adaptations are evident in the form or shape of a plant. Two examples of a morphological adaptation are a shallow root system and a flared or buttress tree trunk.

4.1.2 Indicators of Hydrology

While wetlands must have saturated or inundated conditions, these conditions do not have to be present throughout the year. Saturation or inundation can be as short as two weeks if it occurs in the right type of soil during the growing season. As a result, indicators of hydrology can be used to satisfy the hydrology criterion when no flooding or saturation is observed.

The presence of hydric soil is an indicator of hydrology. Hydric soil is defined in Appendix D of "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetland Protection Act: A Handbook," as "…a soil that is saturated, ponded, or flooded long enough during the growing season to cause anaerobic conditions at or near the surface." Soils with at least 8 inches of organic material measured from the ground surface are hydric soils. Anaerobic conditions create physical and chemical changes in hydric mineral soils that are observable primarily by color mottling.

Other evidence of hydrology includes "groundwater, including the capillary fringe, within a major portion of the root zone;" and "observation of prolonged or frequent flowing or standing surface water" (310 CMR 10.55(2)(c)2). Examples of evidence for surface water are watermarks on trees and rocks, water-stained leaves, or drainage patterns. Examples of soil saturation include free water in the test hole and saturated soil within 12 inches of the ground surface.

4.2 Field Methodology

When conducting delineations, it is important to know if the wetland is isolated or borders on a creek, river, stream, pond or lake. This information is used to classify the resource area as either an Isolated Wetland of Bordering Vegetated Wetland. 310 CMR 10.04 states: "Bordering means touching. An area listed in 310 CMR 10.02(1)(a) is bordering on a water body listed in 310 CMR 10.02(1)(a) if some portion of the area is touching the water body or if some portion of the area is touching another area listed in 310 CMR 10.02(1)(a) some portion of which is in turn touching the water body." In practice, the "bordering" test is passed if the wetland somehow extends without a break to the bank of a creek, river, stream, pond or lake.

4.2.1 Boundary Flagging

A search for wetlands is made on a site by walking throughout the site with special attention paid to low lying areas and areas along streams, ponds and lakes. Visual inspection of vegetation allows for a preliminary determination as to the presence of a wetland[2]. Once an area is suspected of being a wetland, detailed observations of vegetation and hydrology indicators are made to confirm that the area qualifies as a vegetated wetland. Once confirmed, observations are made along a transect that extends into adjacent uplands. When the composition of the vegetation changes such that less than 50% of the vegetation is composed of wetland indicator plants, or when indicators of wetland hydrology are lost, the wetland boundary is marked (usually with numbered flagging). This procedure is repeated along the wetland boundary frequently enough so that, when the flag locations are mapped, the resulting line accurately reflects the wetland boundary.

4.2.2 Boundary Documentation

At representative boundary locations data is collected sufficient to complete Department of Environmental Protection Agency (DEP) delineation field data forms. These data support the accurate placement of boundary flags. At a representative boundary location data are collected concerning vegetation, soils and other hydrology indicators from each of two sets of plots. One plot set is located just down gradient of the boundary while the second plot set is located just up gradient of the boundary.

[2]Disturbed situations require special procedures that are not discussed in this document.

4.2.2.1 Vegetation

Vegetation is evaluated on a layer by layer basis. Vegetation layers consist of ground cover (non-woody vegetation and all woody vegetation less than three feet in height), shrubs (woody vegetation greater than or equal to 3 feet, but less than 20 feet in height), saplings (woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches), climbing woody vines, and trees (woody plants with a dbh of 5 inches or greater and a height of 20 feet of more). To be included in the analysis, a layer must contain at least 5 percent plant coverage.

The abundance of each species in a layer is evaluated by estimating percent coverage over a standard plot size. To be included in this analysis, a species must provide over 2 percent coverage within a plot. Generally, circular plots are established for each layer. Ground cover is evaluated using a 5' radius plot. Shrubs and saplings are evaluated using a 15' radius plot. Climbing woody vines and trees are evaluated utilizing a 30' radius plot. The size and shape of the plots may vary based on field conditions.

The dominance of each plant species within each layer is then calculated. This calculation is made by dividing the abundance of a species within a layer by the total plant abundance within that layer and multiplying by 100 to obtain a percent dominance. Those species that individually provide at least 20 percent dominance to the layer are always designated as "dominated species". The species within a layer are arranged by percent dominance in descending order. Those species that cumulatively provide 50% of the percent dominance for the layer, regardless as to whether or not they provide a minimum of 20 percent are designated "dominant species". This is often referred to as the "20/50" rule. Once the dominant species within each layer are determined, the number of dominant wetland indicator species are compared with the number of dominant

non-wetland indicator species. The vegetative criterion is met if at least half of the dominant species are wetland indicator species.

4.2.2.2 Hydrology

The presence of hydric soil is commonly used to indicate the presence of wetland hydrology. To identify whether hydric soils are present, the soil horizons within a test pit are evaluated. Hydric soil indicators as identified in "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetland Protection Act: A Handbook," include:

- Histosols (organic soils). Histosols are soils with at least 16 inches of organic material measured from the soil surface.
- Histic epipedons. These are soils with 8 to 16 inches of organic material measured from the soil surface.
- Sulfidic material. A strong 'rotten egg' smell generally is noticed immediately after the soil test hold is a dug.
- Gleyed soils. Soils that are predominately neutral gray, or occasionally greenish or bluish gray in color within 12 inches from the bottom O-horizon. (The Munsell Soil color charts have special pages for gleyed soils.)
- Soils with a matrix chroma of 0 or 1 and values of 4 or higher within 12 inches from the bottom of O-horizon.
- Within 12 inches from the bottom of the O-horizon, soils with a chroma of 2 or less and values of 4 or higher in the matrix, and mottles with a chroma of 3 or higher.
- Within 12 inches from the bottom of the O-horizon, soils with a matrix chroma of 3 and values of 4 or higher, with 10 percent or more low-chroma mottles, as well as indicators of saturation (i.e. mottles, oxidized rhizospheres, concretions, nodules) within 6 inches of the soil surface."

Other indicators of wetland hydrology include the presence of surface water flooding, groundwater (including the capillary fringe) within a major portion of the root zone in the test pit, water marks on trees, water-stained leaves, sediment deposits, drift lines, scoured areas, and/or drainage patterns.

5.0 Site Description and Wetland Delineation

The site is approximately 25.3 acres in size and is located at 365 Main Street (Assessor's Parcel ID Numbers: L 131/ 1/ 5 & L13/ 1/ 3) in Agawam, Massachusetts (refer to Figure 1, Site Locus). The property is bound by forested upland and a paintball playing field to the north; forested upland, forested wetland and farm fields to the east; forested upland and farm fields to the South; and a dirt access road and a capped landfill with a solar array on top of it to the west. A cell tower is also located just west of the site or south of the paintball fields parking area.

The site appears to be relatively flat with only a slight slope from north to south and east to west. All areas of the site are highly disturbed and appeared to have been cleared in the past. Most areas of the site lack an "O" and "A" Horizon soils and there is a lot of trash and debris on the site that likely came from the old landfill and previous paintball playing fields. There are many invasive plants including Garlic Mustard (*Alliaria petiolata*), Common Mugwort (*Artemisia vulgaris*) and Oriental Bittersweet (*Celastrus orbiculata*) in the herbaceous layer; Glossy Buckthorn (*Frangula alnus*), Multiflora Rose (*Rosa multiflora*) and an occasional Autumn Olive (*Elaeagnus umbellata*) in the shrub layer and Tree-of-Heaven (*Ailanthus altissima*) and Black Locust (*Robinia pseudoacacia*) in the tree layer (refer to Attachment 1, Plant List). The site is highly disturbed including garbage, yard debris, and fill materials (asphalt, brick and concrete chunks) scattered throughout the western portion of the site.

5.1 Wetland Resources Delineated on the Site

Three wetland resource areas have been delineated on the site which consists of two areas of BVW to bank of an intermittent stream and an isolated wetland.

Wetlands A and B likely join together offsite as one wetland just east of the site property.

5.1.1 Wetland A

Flagging series A-1 through A-9, A-11 through A-28, A-50 through A-78 and A-82 through A-101 delineates a BVW. Flags A-9 through A-11 and A-78 through A-82 delineate bank to an intermittent stream. This intermittent stream appears to have been dug a long time ago and was likely constructed or expanded for farm drainage. Dominant wetland vegetation includes Sensitive Fern (*Solidago gigantea*) in the herbaceous layer and Red Maple (*Acer rubrum*) in the tree layer. The herbaceous and shrub layers in many areas were thin or missing in areas where cutting has occurred. Dominant vegetation in areas outside of our sample plots in addition to the dominant species within our sample plots consisted of sedges (*Carex spp.*), Cinnamon Fern (*Osmundastrum cinnamomeum*), and some Royal Fern (*Osmunda spectabilis*) in the herbaceous layer; Northern Spicebush (*Lindera benzoin*), Glossy Buckthorn (*Frangula alnus*), Silky Dogwood (*Cornus amomum*) and some Highbush Blueberry (*Vaccinium corymbosum*) in the shrub layer; Poison Ivy (Toxicodendron radicans) in the vine layer and Box Elder (*Acer negundo*), American Elm (*Ulmus americana*), Pin Oak (*Quercus palustris*) in the tree layer. Evidence of hydrology includes hydric soils (refer to Attachment 2, DEP Bordering Vegetated Wetland Delineation Field Data Forms).

5.1.2 Wetland B

Flagging series B-1 through B-10 delineates a BVW just south of Wetland A to bank of an intermittent stream. Dominant wetland vegetation includes Sensitive Fern in the herbaceous layer and American Elm (*Ulmus*

americana) and Red Maple in the tree layer. Evidence of hydrology includes hydric soils (refer to Attachment 2, DEP Bordering Vegetated Wetland Delineation Field Data Forms).

5.1.3 Wetland C

Flagging series C-1 through C-13 and C-50 through C-54 delineates an isolated wetland west of Wetland A, east of the dirt road and paintball playing field. Dominant wetland vegetation includes Sensitive Fern in the herbaceous layer; Grey Willow (*Salix bebbiana*) and Silky Dogwood (*Cornus amomum*) in the shrub layer and Red Maple in the tree layer. Evidence of hydrology includes hydric soils (refer to Attachment 2, DEP Bordering Vegetated Wetland Delineation Field Data Forms).

5.2 Regulations that Apply to Delineated Resources Areas

The interests and functions of wetland resources areas are protected as defined by federal, state, and local regulations. Depending upon the type of wetland present, federal, state and local regulations may all apply to the wetland resources delineated and described above in this report, or only local and/or federal regulations may apply to wetland resources such as small isolated wetlands. The wetland resources delineated on the attached plans and described above in this report are discussed below as they relate to state, federal and local regulations.

5.2.1 Massachusetts Wetlands Protection Act (310 CMR 10.00)

Under the Massachusetts Wetlands Protection Act, 310 CMR 10.55, flag series Flags A-9 through A-11 and A-78 through A-82 delineates bank to

an intermittent stream. Flags A-1 through A-9, A-11 through A-28, A-50 through A-78, A-82 through A-101 and B-1 through B-10 delineate BVW. Both bank (310 CMR 10.54) and BVW (310 CMR 10.55) have a 100 ft. buffer zone extending horizontally outward from the BVW line (refer to Attachment 5, Wetland Plan).

Massachusetts Department of Environmental Protection (DEP) Bordering Vegetated Wetland Delineation Field Data Forms were completed for observation plots located in the wetlands and uplands along each wetland transect discussed above and are presented as Attachment 2.

5.2.2 Federal Clean Water Act

Wetlands A and B drain to intermittent streams east and south of the site that discharge into the Westfield River that drains to the Connecticut River which is a tributary that flows into Long Island Sound. Since the wetland listed above (Wetland E) discharge into coastal waters, it is considered as contiguous to a tributary to "waters of the U.S.", and regulated by the U.S. Army Corps of Engineers under the Clean Water Act.

5.2.3 Local Regulations and Bylaws

The Town of Agawam, MA, doesn't have any wetlands bylaw, regulations or policies.

6.0 Rare Species and Other Environmental Resources

This evaluation also included a review of the MA Natural Heritage Atlas, 2021, 15th edition, published by MA Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife, Westborough, MA. Based on review of the Springfield South Quadrangle, the site property is **not** within Priority or Estimated Habitats of Rare Species (refer to Attachment 3, Environmental Resources Map) Based on review of the Weymouth Quadrangle, the site is **not** within an area designated as Priority/Estimated Habitat of Rare Wildlife or within any Certified Vernal Pools. Mass/GIS data layers, including Priority/Estimated Habitat of rare species (updated August, 2021), certified vernal pools (updated continually), and potential vernal pools (July 2013) have been layered on an ortho-photo of the site that has been included as Attachment 3.

Attachment 1

Site Plant List

Attachment 1

List of Plants Observed in Field

The following species were observed growing on site. They are listed classified relative to their affinity for wetland habitats. Classifications are based upon the U.S. Army Corps of Engineers, NWPL-National Wetland Plant List, Northcentral and Northeast 2020 Regional Wetland Plant List. This publication does not list all plants that grow in New England. "NL" which represents "not listed" or listed as "NA" which indicates "no agreement" indicates species not listed in the publication. Plant species listed as "NL" or "NA" below should be considered upland (UPL) plants since they are not included in the 2020 National Wetland Plant List for the Northcentral and Northeast Region.

In certain cases, plants may have been identified only on the family or genus level. In these cases, the indicator status, SESW (wetland) or SESU (upland), is listed by the most typical status of the genus or based upon characteristics of the plant as observed in the field.

Not withstanding classifications, it must be emphasized that individual plants of almost any species may be found in almost any habitat. It is not uncommon to find individual plants of OBL species growing in uplands or individual plants of UPL species growing in wetlands. For this reason, the total vegetation best serves as an indicator of wetlands rather than any individual species.

INDICATOR CATEGORIES AS DEFINED BY THE U.S. Army Corps of Engineers:

OBL: Obligate Wetland (OBL). Occur almost always (estimated probability > 99%) under natural conditions in wetlands.

FACW: Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67%-99%) but occasionally found in non-wetlands.

FAC: Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

FACU: Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).

UPL: Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands in the region specified.

HABIT: The plant characteristics and life forms assigned to each species.

A: Annual
B: Biennial
C: Clubmoss
E: Emergent
@: Epiphytic
F: Forb
/: Floating
F3: Fern
G: Grass
GL: Grasslike
H: Partly woody
HS: Half shrub
H2: Horsetail
I: Introduced
N: Native
P: Perennial
+: Parasitic
P3: Pepperwort
Q: Quillwort
S: Shrub
- : Saprophytic
Z: Submerged
$: Succulent
T: Tree
V: Herbaceous Vine
W: Waterfern
WV: Woody Vine

Plant List for 365 Main Street in Agawam, MA

Scientific Name	Common Name	MA Ind	Habit
Acer negundo	BOX-ELDER OR ASH-LEAF MAPLE	FAC	NT
Acer platanoides	MAPLE, NORWAY	UPL	IT
Acer rubrum	MAPLE, RED	FAC	NT
Achillea millefolium	YARROW, COMMON	FACU	PNF
Agrostis penennans	UPLAND BENT GRASS	FACU	PIG
Ailanthus altissima	TREE-OF-HEAVEN	UPL	IT
Alliaria petiolata	MUSTARD, GARLIC	FACU	BIF
Allium canadense	ONION, MEADOW GARLIC OR	FACU	PNF
Alnus incana	ALDER, SPECKLED	FACW	NS
Ambrosia artemisiifolia	RAGWEED, ANNUAL	FACU	ANF
Artemisia vulgaris	MUGWORT, COMMON	FACU	ANF
Betula alleghaniensis	BIRCH, YELLOW	FAC	NT
Betula papyrifera	BIRCH, PAPER	FAC	NTS
Betula populifolia	BIRCH, GRAY	FAC	NT
Bidens frondosa	BEGGAR-TICK, DEVIL'S	FACW	ANF
Brassica rapa	MUSTARD, FIELD OR RAPE	UPL	ANF
Carex flava	SEDGE, YELLOW-GREEN	OBL	PNGL
Carex blanda	SEDGE, EASTERN WOODLAND	FAC	PNGL
Carex crinita	SEDGE, FRINGED	OBL	PNEGL
Carex digitalis	SEDGE, SLENDER WOOD	UPL	PNGL
Carex flava	SEDGE, YELLOW-GREEN	OBL	PNGL
Carex leptonervia	SEDGE, NERVELESS WOOD	FAC	PNGL
Carex lupulina	SEDGE, HOP	OBL	PNEGL
Carex lurida	SEDGE, SHALLOW	OBL	PNEGL
Carex novae-angliae	SEDGE, NEW ENGLAND	FACU	PNGL
Carex scoparia	SEDGE, POINTED BROOM	FACW	PNGL
Carex stricta	SEDGE, UPTIGHT OR TUSSOCK	OBL	PNEGL
Carex sylvatica	SEDGE, EUROPEAN WOODLAND	FACU	PNEGL
Carex vulpinoidea	SEDGE, COMMON FOX	OBL	PNEGL
Catalpa speciosa	CATALPA, NORTHERN	FACU	NT
Celastrus orbiculata	BITTER-SWEET ORIENTAL OR ASIAN	UPL*	IWV
Comptonia peregrina	FERN, SWEET	NL	NS
Cornus amomum	DOGWOOD, SILKY	FACW	NS
Daucus carota	QUEEN ANNE'S LACE	UPL	F
Dennstaedtia punctilobula	FERN, HAYSCENTED	UPL	F3

Scientific Name	Common Name	MA Ind	Habit
Dichanthelium clandestinum	GRASS, DEER-TONGUE ROSETTE	FACW	PNG
Dryopteris carthusiana	FERN, SPINULOSE WOOD	FACW	F3
Echinochloa crusgalli	GRASS, BARNYARD, LARGE	FAC	AIG
Elaeagnus umbellata	AUTUMN OLIVE	NL	
Eurybia divaricata	ASTER, WHITE WOOD	NL	PNF
Frangula alnus	BUCKTHORN, FALSE GLOSSY	FAC	IS
Gramineae (Hydrophilic)	GRASSES, HYDROPHILIC	SESW	G
Gramineae (Upland)	GRASSES, UPLAND	SESU	G
Hamamelis virginiana	WITCH-HAZEL, COMMON OR AMERICAN	FACU	NST
Hypericum perforatum	ST. JOHN'S-WORT, COMMON	UPL	PNF
Ilex verticillata	WINTERBERRY, COMMON	FACW	NST
Impatiens capensis	TOUCH-ME-KNOT, SPOTTED	FACW	ANF
Lepidium virginicum	PEPPER-WORT, POORMAN'S	FACU	ABNF
Lespedeza capitata	BUSH-CLOVER, ROUND-HEAD	FACU	PNF
Ligustrum sinense	PRIVET, CHINESE	FACU	NS
Linaria vulgaris	BUTTER & EGGS	NL	IP
Lindera benzoin	SPICEBUSH, NORTHERN	FACW	NST
Lonicera tatarica	HONEYSUCKLE, TWINSISTERS OR TARTARIAN	FACU*	IS
Lythrum salicaria	LOOSESTRIFE, PURPLE	OBL	PIF
Maianthemum canadense	LILY-OF-THE-VALLEY, WILD-OR FALSE	FACU	PNF
Melilotus alba	SWEETCLOVER, WHITE	FACU	ABIF
Medicago lupulina	MEDIC, BLACK	FACU	AIF
Musci	MOSSES	NL	
Nyssa sylvatica	TUPELO, BLACK	FAC	NT
Oenothera parviflora	EVENING-PRIMROSE, NORTHERN	FACU	BIF
Onoclea sensibilis	FERN, SENSITIVE	FACW	PNEF3
Osmundastrum cinnamomeum	FERN, CINNAMON	FACW	PNEF3
Osmunda claytoniana	FERN, INTERUPTED	FAC	PNEF3
Osmunda spectabilis	FERN, ROYAL	OBL	PNF3
Oxalis stricta	WOODSORREL, UPRIGHT YELLOW	FACU	PIF
Parthenocissus quinquefolia	CREEPER, VIRGINIA	FACU	NWV
Plantago lanceolata	PLANTAIN, ENGLISH	FACU	ABPIF
Plantago major	PLANTAIN, COMMON OR GREAT	FACU	PIF
Pinus strobus	PINE, EASTERN WHITE	FACU	NT
Polygonum pensylvanicum	SMARTWEED, PENNSYLVANIA	FACW	ANEF
Populus grandidentata	ASPEN, BIG-TOOTH	FACU	NT
Populus tremula	ASPEN, QUAKING	FACU	IT
Potentilla simplex	CINQUEFOIL, OLD FIELD	FACU	PNF

Scientific Name	Common Name	MA Ind	Habit
Prunus serotina	CHERRY, BLACK	FACU	NT
Pteridium aquilinum	FERN, BRACKEN	FACU	PNF3
Pyrus malus	APPLE	NL	IT
Quercus alba	OAK, NORTHERN WHITE	FACU-	NT
Quercus palustris	OAK, PIN	FACW	NT
Quercus rubra	OAK, NORTHERN RED	FACU	NT
Rhamnus cathartica	BUCKTHORN, COMMON OR ALDERLEAF	UPL	IT
Rhexia virginica	MEADOW-BEAUTY OR HANSOME-HARRY	OBL	PNF
Robinia pseudoacacia	LOCUST, BLACK	FACU	NT
Rosa multiflora	ROSE, MULTIFLORA OR RAMBLER	FACU	IS
Rudbeckia hirta	SUSAN, BLACK-EYED	FACU	BPNF
Rubus allegheniensis	BLACKBERRY, ALLEGHENY	FACU	NS
Rubus alumnus	BLACKBERRY, OLD FEILD	FACU	NS
Rubus flagellaris	DEWBERRY, WHIPLASH	FACU	NS
Rubus hispidus	DEWBERRY, BRISTLY	FACW	NS
Rubus semisetosus	BLACKBERRY, NEW ENGLAND	FAC	NS
Rumex crispus	DOCK, CURLY	FAC	PIF
Salix bebbiana	WILLOW, BEBB OR GREY	FACW	NS
Salix daphnoides	WILLOW, VIOLET	FAC	IT
Salix discolor	WILLOW, PUSSY	FACW	NS
Salix nigra	WILLOW, BLACK	OBL	NT
Sambucus nigra	ELDER, BLACK	FACW	NS
Saxifraga virginiensis	SAXIFRAGE, VIRGINIA	FAC	PNF
Smilax rotundifolia	GREENBRIER, COMMON OR HORSE	FAC	NWV
Solanum dulcamara	NIGHTSHADE, CLIMBING	FAC	PIF
Solidago altissima	GOLDENROD, TALL	FACU	PNF
Solidago canadensis	GOLDEN-ROD, CANADIAN	FACU	PNF
Solidago gigantea	GOLDEN-ROD, GIANT OR LATE	FACW	PNF
Solidago rugosa	GOLDEN-ROD, WRINKLED-LEAF	FAC	PNF
Sparganium americanum	BURREED, AMERICAN	OBL	PNEF
Spiraea alba	MEADOW-SWEET, WHITE	FACW	NS
Symphyotrichum ericoides	ASTER, WHITE HEATH AMERICAN	FACU	PNF
Symphyotrichum laevis	ASTER, SMOOTH BLUE	NL	PNF
Taraxacum officinale	DANDELION, COMMON	FACU	PIF
Toxicodendron radicans	IVY, EASTERN POISON	FAC	NWVS
Trientalis borealis	STARFLOWER, MAYSTAR OR AMERICAN	FAC	PNF
Trifolium pratense	CLOVER, RED	FACU	BPIF
Trifolium repens	CLOVER, WHITE	FACU	PIF

Scientific Name	Common Name	MA Ind	Habit
Ulmus americana	ELM, AMERICAN	FACW	NT
Ulmus rubra	ELM, SLIPPERY	FAC	NT
Urtica dioica	NETTLE, STINGING	FAC	PIF
Vaccinium corymbosum	BLUEBERRY, HIGHBUSH	FACW	NS
Verbascum thapsus	MULLEIN, COMMON OR GREAT	UPL	F
Viburnum dentatum	ARROW-WOOD, SOUTHERN	FAC	NTS
Viburnam lentago	NANNY-BERRY OR WILD RASIN	FAC	NTS
Viola septentrionalis	VIOLET, NORTHERN WOODLAND	FACU	PNF
Viola papilionacea	VIOLET, COMMON	FAC	PNF
Vitis labrusca	GRAPE, FOX	FACU	NWV
Vitis riparia	GRAPE, RIVER-BANK	FAC	NWV

Attachment 2

DEP Bordering Vegetated Wetland Delineation Field Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-4, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	If yes, optional Wetland Site ID: Wetland A (northeastern lobe)

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: A-4, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	63	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	63%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	63	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	63%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	38	Yes	FACU
3.			
4.			
	41%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	63	x 2 =	126.00
FAC species	63	x 3 =	189.00
FACU species	38	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	164	(A)	467 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

The northwestern portion of Wetland A is mostly a mix of FACW, FAC, FACU and UPL plant species.

SOIL

Sampling Point: A-4, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 4/1	100	None			M	FSL*	"B1" Horizon
3-7	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
3-7	10YR 6/2	55	10YR 5/1	10	D	M	FSL	"B2" Horizon
7-21	10YR 6/8	100	None			M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4.5

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-4, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-4, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quaking Aspen (Populus tremula)	63	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	63% = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Multiflora Rose (Rosa rugosa)	3	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	3% = Total Cover		
Herb Stratum (Plot size: 5 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	63	Yes	FACU
3.			
4.			
	66% = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species		x 3 =	189.00
FACU species	129	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	129 (A)		516 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

The northwestern portion of Wetland A is mostly a mix of FACW, FAC, FACU and UPL plant species.

SOIL

Sampling Point: A-4, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/1	100	None			M	FSL*	"B1" Horizon
3-7	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
3-7	10YR 6/2	55	10YR 5/1	10	D	M	FSL	"B2" Horizon
7-21	10YR 6/8	100	None			M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-62, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	If yes, optional Wetland Site ID: Wetland A

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: A-62, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Big-Tooth Aspen (Populus grandidentata)	20.5	Yes	FACU
2. Red Maple (Acer rubrum)	63	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	38	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	38%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1.			
2.			
3.			
4.			
	0.0%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 121.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	38	x 2 =	76.00
FAC species	63	x 3 =	189.00
FACU species	20.5	x 4 =	82.00
UPL species		x 5 =	
Column Totals:	121.5 (A)		347 (B)

Prevalence Index = B/A = 2.86

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-7	10YR 6/2	55	7.5YR 4/6	35	C	M	FSL	"B1" Horizon
7-21	10YR 6/6	100				M	FSL	"B2" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4.5

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-62, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.998 N Long: -72 36.636 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-62, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	20.5	Yes	FACU
2. Quaking Aspen (Populus tremula)	63	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea ordiculata)	10.5	Yes	FACW
2. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	21%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Virginia Creeper (Parthenocissus quinquefolia)	10.5	Yes	FACU
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species	31	x 3 =	189.00
FACU species	74	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	105 (A)		387 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	10YR 6/6	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: B-4, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.981 N Long: -72 36.651 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	If yes, optional Wetland Site ID: Wetland B

Remarks: (Explain alternative procedures here or in a separate report.)

* The area is listed as a NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: B-4, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Apple (Pyrus malus)	3.0	Yes	FAC
2. American Elm (Ulmus americana)	38	Yes	FAC
3. Red Maple (Acer rubrum)	38	Yes	FAC
4.			
5.			
6.			
7.			
	79%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	3	Yes	UPL
2. Sensitive Fern (Onoclea sensibilis)	63	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	66%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	38	Yes	FACU
3.			
4.			
	41%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	63	x 2 =	126
FAC species	76	x 3 =	228
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	139 (A)		354 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: B-4, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/1	100	None			M	FSL*	"B1" Horizon
2-6	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
6-21	10YR 6/6	100				M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: B-4, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.981 N Long: -72 36.651 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B-4, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pin Oak (Quercus palustris)	3	No	FAC
2. Red Maple (Acer rubrum)	38	Yes	FAC
3. Quaking Aspen (Populus tremula)	38	Yes	FACU
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	63	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	63%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Virginia Creeper (Parthenocissus quinquefolia)	10.5	Yes	FACU
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species	31	x 3 =	189.00
FACU species	74	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	105 (A)		387 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Please note, Oriental Bittersweet was included as an herb and not a woody vine as all plants were seedlings and not growing as a vine during our evaluation. We have listed this plant in the herbaceous layer on other data forms as it was also growing as an herb and not vine like during its early stages of life.

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-21	10YR 6/8	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: C-2, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.016 N Long: -72 36.727 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** _____
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID:	Wetland C

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: C-2, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	38	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	38% = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Grey Willow (Salix bebbiana)	20.5	Yes	FACW
2. Silky Dogwood (Cornus amomum)	63	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	83.5% = Total Cover		
Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	20.5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	38% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
2.			
3.			
4.			
	10.5% = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	104	x 2 =	208.00
FAC species	38	x 3 =	114.00
FACU species		x 4 =	00.00
UPL species	11	x 5 =	52.50
Column Totals:	152.5 (A)		347.5 (B)

Prevalence Index = B/A = 2.46

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: C-2, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	10YR 5/1	85	7.5YR 4/6	15	C	M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks: * FSL stands for Fine Sandy Loam soils. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: C-2, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.016 N Long: -72 36.727 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: C-2, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	38	Yes	FAC
2. Tree-of-Heaven (Ailanthus altissima)	38	Yes	UPL
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea ordiculata)	10.5	Yes	FACW
2. Oriental Bittersweet (Celastrus orbiculata)	20.5	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	31%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	11	x 2 =	21.00
FAC species	38	x 3 =	114.00
FACU species		x 4 =	00.00
UPL species	69	x 5 =	345.00
Column Totals:	117.5 (A)		480 (B)

Prevalence Index = B/A = 4.09

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	7.5YR 4/6	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

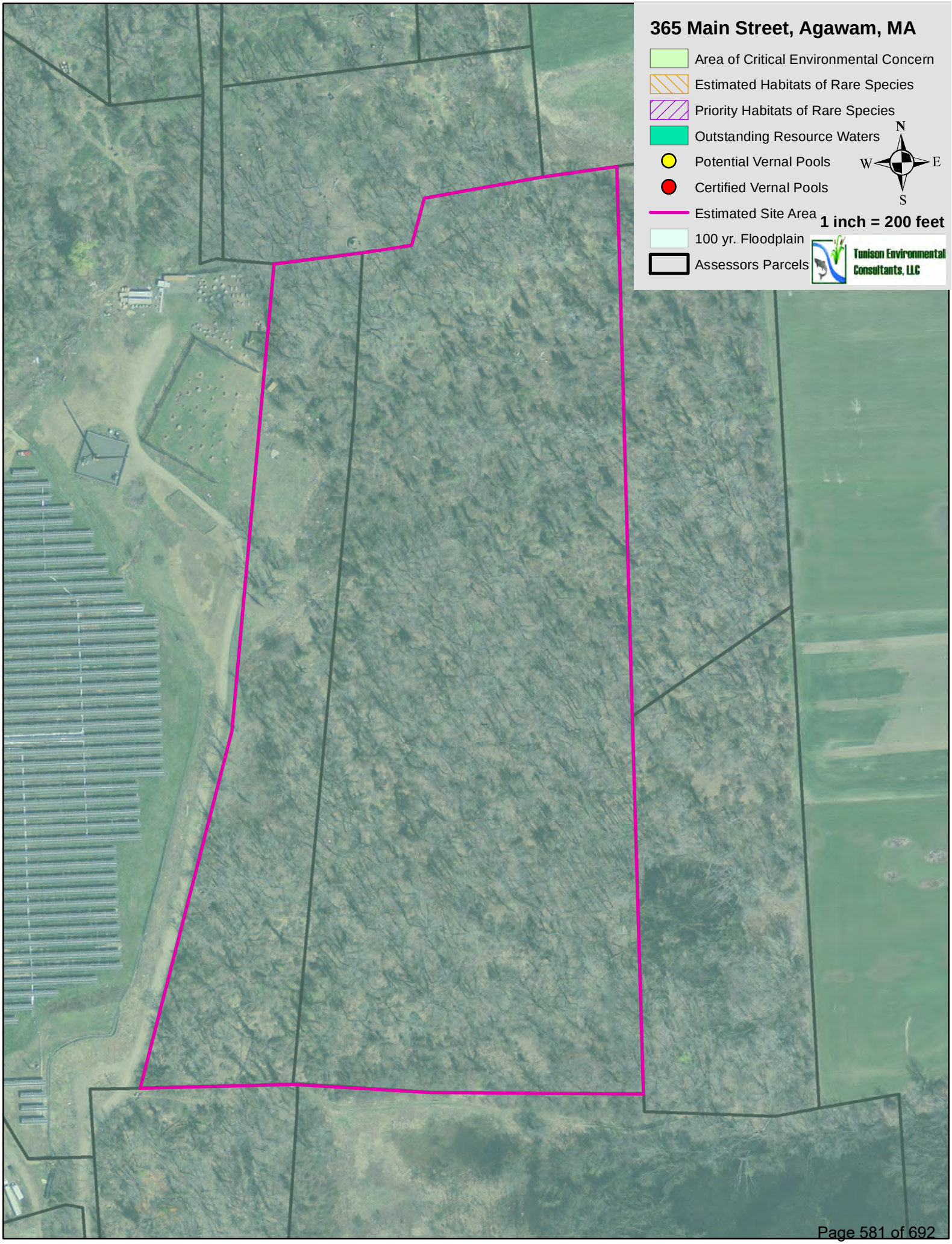
Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

Attachment 3

Natural Heritage and Endangered Species Program Estimated Habitat of Rare Wildlife and Certified Vernal Pools, Springfield South Quadrangle Map


365 Main Street, Agawam, MA
Area of Critical Environmental Concern
Estimated Habitats of Rare Species
Priority Habitats of Rare Species
Outstanding Resource Waters
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
100 yr. Floodplain
Assessors Parcels
N
W
E
S
1 inch = 200 feet
Tunison Environmental Consultants, LLC

Attachment 4

ACOE Wetland Determination Data Form – Northcentral and Northeast Region

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-4, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID:	Wetland A (northeastern lobe)
Wetland Hydrology Present?	Yes X No _____		

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: A-4, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	63	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	63%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	63	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	63%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	38	Yes	FACU
3.			
4.			
	41%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	63	x 2 =	126.00
FAC species	63	x 3 =	189.00
FACU species	38	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	164 (A)		467 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

The northwestern portion of Wetland A is mostly a mix of FACW, FAC, FACU and UPL plant species.

SOIL

Sampling Point: A-4, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 4/1	100	None			M	FSL*	"B1" Horizon
3-7	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
3-7	10YR 6/2	55	10YR 5/1	10	D	M	FSL	"B2" Horizon
7-21	10YR 6/8	100	None			M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4.5

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-4, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-4, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quaking Aspen (Populus tremula)	63	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	63% = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Multiflora Rose (Rosa rugosa)	3	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	3% = Total Cover		

Herb Stratum (Plot size: 5 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0% = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	63	Yes	FACU
3.			
4.			
	66% = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species		x 3 =	189.00
FACU species	129	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	129 (A)		516 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

The northwestern portion of Wetland A is mostly a mix of FACW, FAC, FACU and UPL plant species.

SOIL

Sampling Point: A-4, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/1	100	None			M	FSL*	"B1" Horizon
3-7	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
3-7	10YR 6/2	55	10YR 5/1	10	D	M	FSL	"B2" Horizon
7-21	10YR 6/8	100	None			M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-62, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.006 N Long: -72 36.704 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	Yes X No _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID:	Wetland A
Wetland Hydrology Present?	Yes X No _____		

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: A-62, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Big-Tooth Aspen (Populus grandidentata)	20.5	Yes	FACU
2. Red Maple (Acer rubrum)	63	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	38	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	38%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1.			
2.			
3.			
4.			
	0.0%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 121.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	38	x 2 =	76.00
FAC species	63	x 3 =	189.00
FACU species	20.5	x 4 =	82.00
UPL species		x 5 =	
Column Totals:	121.5 (A)		347 (B)

Prevalence Index = B/A = 2.86

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-7	10YR 6/2	55	7.5YR 4/6	35	C	M	FSL	"B1" Horizon
7-21	10YR 6/6	100				M	FSL	"B2" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4.5

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: A-62, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.998 N Long: -72 36.636 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-62, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	20.5	Yes	FACU
2. Quaking Aspen (Populus tremula)	63	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea ordiculata)	10.5	Yes	FACW
2. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	21%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Virginia Creeper (Parthenocissus quinquefolia)	10.5	Yes	FACU
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species	31	x 3 =	189.00
FACU species	74	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	105 (A)		387 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	10YR 6/6	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: B-4, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.981 N Long: -72 36.651 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** _____
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID:	Wetland B

Remarks: (Explain alternative procedures here or in a separate report.)

* The area is listed as a NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The majority of the soils in Wetland A are spodosols with a 2.5 to 4.5 inch ("B2" Horizon) that is 10YR 6/2 to 10YR 6/3 with mottles and depletions as indicated in the "Soil" section below. Hydrophyllic vegetation was observed to be dominant within Wetland A and hydric soils were present. It is likely that this wetland has a relatively short hydroperiod after large precepitiation events as the spodosol horizon slowly infiltrates water. The soils in the wetland and surrounding floodplain were similar minus the spodosol horizon in the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: B-4, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Apple (Pyrus malus)	3.0	Yes	FAC
2. American Elm (Ulmus americana)	38	Yes	FAC
3. Red Maple (Acer rubrum)	38	Yes	FAC
4.			
5.			
6.			
7.			
	79%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	3	Yes	UPL
2. Sensitive Fern (Onoclea sensibilis)	63	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	66%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Eastern Poison Ivy (Toxicodendron radicans)	3	No	FAC
2. Virginia Creeper (Parthenocissus quinquefolia)	38	Yes	FACU
3.			
4.			
	41%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	63	x 2 =	126
FAC species	76	x 3 =	228
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	139 (A)		354 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: B-4, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/1	100	None			M	FSL*	"B1" Horizon
2-6	10YR 6/2	55	10YR 6/6	35	C	M	FSL	"B2" Horizon
6-21	10YR 6/6	100				M	FSL	"B3" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Spodosol

Depth (inches): 4

Hydric Soil Present? Yes X No ___

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B2" Horizon was 10YR 6/2 with 10YR 6/8 mottles (35+/-%) and 10YR 5/1 (10 +/-%) depletions. The soils are highly disturbed and missing "O" and "A" Horizons are missing in most areas. There are some areas of a 10YR 2/2 FSL "A" Horizon. The other closest surface soils to an "A" or "O" layer are a mineral soil of 10YR 4/1 FSL with an approximately 30% silt content. The delineated wetlands contained a spodosol that occurred approximately 3 to 4 in. below the soil surface and was approximately 2.5 to 4.5 in. thick. The soil below the hydric layer was typically a "B" Horizon of 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: B-4, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 4.981 N Long: -72 36.651 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B-4, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pin Oak (Quercus palustris)	3	No	FAC
2. Red Maple (Acer rubrum)	38	Yes	FAC
3. Quaking Aspen (Populus tremula)	38	Yes	FACU
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	63	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	63%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Virginia Creeper (Parthenocissus quinquefolia)	10.5	Yes	FACU
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 126 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	126.00
FAC species	31	x 3 =	189.00
FACU species	74	x 4 =	152.00
UPL species		x 5 =	
Column Totals:	105 (A)		387 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Please note, Oriental Bittersweet was included as an herb and not a woody vine as all plants were seedlings and not growing as a vine during our evaluation. We have listed this plant in the herbaceous layer on other data forms as it was also growing as an herb and not vine like during its early stages of life.

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-21	10YR 6/8	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The "B" Horizon soils were mostly 10YR 6/6 to 10YR 6/8. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: C-2, Wet

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.016 N Long: -72 36.727 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Partial FEW*

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: Wetland C
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland. The northwestern corner of this wetland appears to be in the edge of the cut area were some shrubs and herbs were cut. The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: C-2, Wet

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	38	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	38% = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Grey Willow (Salix bebbiana)	20.5	Yes	FACW
2. Silky Dogwood (Cornus amomum)	63	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	83.5% = Total Cover		
Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea sensibilis)	20.5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	38% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
2.			
3.			
4.			
	10.5% = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	104	x 2 =	208.00
FAC species	38	x 3 =	114.00
FACU species		x 4 =	00.00
UPL species	11	x 5 =	52.50
Column Totals:	152.5 (A)		347.5 (B)

Prevalence Index = B/A = 2.46

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: C-2, Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	10YR 5/1	85	7.5YR 4/6	15	C	M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks: * FSL stands for Fine Sandy Loam soils. The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 365 Main Street City/County: Agawam Sampling Date: 8/23/23

Applicant/Owner: Joseph O'Malley State: MA Sampling Point: C-2, Up

Investigator(s): Garrett M. Tunison Section, Township, Range: Agawam

Landform (hillslope, terrace, etc.): Gental slope 0-3% Local relief (concave, convex, none): concaved Slope (%): 0-3%

Subregion (LRR or MLRA): _____ Lat: 42 5.016 N Long: -72 36.727 W Datum: NAD83

Soil Map Unit Name: Hadley fine sandy loam, 0 to 3 percent slopes NWI classification: Not applicable

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

* A portion of the site contains an NWI wetland identified as a Freshwater Emergent Wetland.The site has previously been disturbed for agriculture and the western and northern portions of the site have been used as a dump and a paintball and airsoft playing field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: C-2, Up

Tree Stratum (Plot size: 30 ft. radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Maple (Acer rubrum)	38	Yes	FAC
2. Tree-of-Heaven (Ailanthus altissima)	38	Yes	UPL
3.			
4.			
5.			
6.			
7.			
	83.5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0.0%	= Total Cover	

Herb Stratum (Plot size: 5 ft. radius)			
1. Sensitive Fern (Onoclea ordiculata)	10.5	Yes	FACW
2. Oriental Bittersweet (Celastrus orbiculata)	20.5	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	31%	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft. radius)			
1. Oriental Bittersweet (Celastrus orbiculata)	10.5	Yes	UPL
2.			
3.			
4.			
	10.5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	11	x 2 =	21.00
FAC species	38	x 3 =	114.00
FACU species		x 4 =	00.00
UPL species	69	x 5 =	345.00
Column Totals:	117.5 (A)		480 (B)

Prevalence Index = B/A = 4.09

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: A-62, Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	None			M	FSL*	"A" Horizon
2-20	7.5YR 4/6	100	None			M	FSL	"B" Horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks: * FSL stands for Fine Sandy Loam soils. ** The soils were classified as "fine sandy loam" but contained approximately 30% to 35% silt.

Attachment 5

NRCS Soil Report

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



March 3, 2024

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....12
Map Unit Descriptions.....12
Hampden County, Massachusetts, Central Part.....14
8A—Limerick silt loam, 0 to 3 percent slopes, frequently flooded.....14
95A—Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded.....15
96A—Hadley very fine sandy loam, 0 to 3 percent slopes.....16
98A—Winooski silt loam, 0 to 3 percent slopes, occasionally flooded.....17
602—Urban land.....19
718A—Saco Variant silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded.....19
References.....21

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.

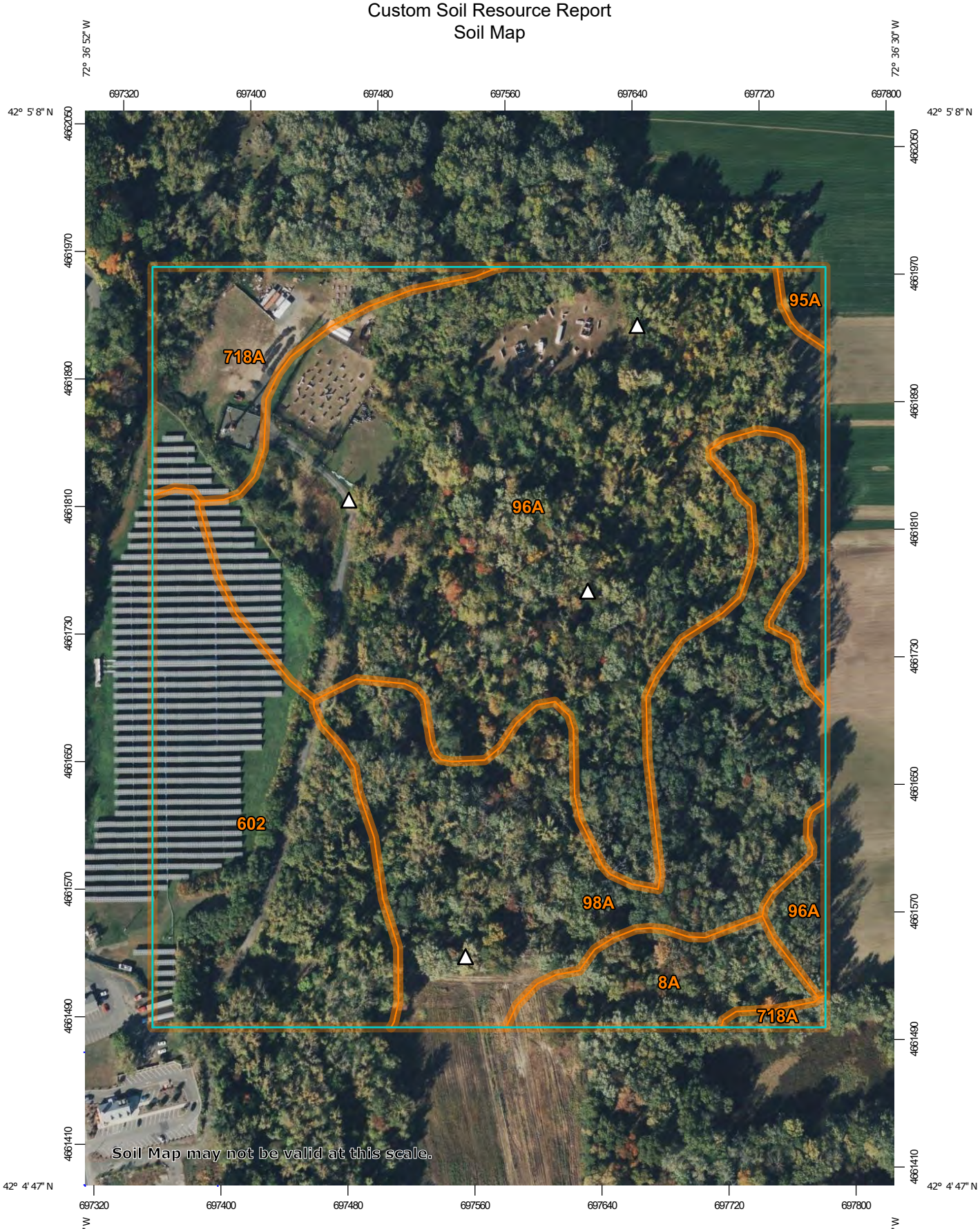
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:3,280 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

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 1:15,800.

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 17, Sep 10, 2023

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	2.2	4.3%
95A	Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded	0.3	0.6%
96A	Hadley very fine sandy loam, 0 to 3 percent slopes	23.3	46.4%
98A	Winooski silt loam, 0 to 3 percent slopes, occasionally flooded	12.0	23.9%
602	Urban land	8.8	17.5%
718A	Saco Variant silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	3.7	7.3%
Totals for Area of Interest		**50.1**	**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

95A—Podunk fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2zvdf
Elevation: 10 to 2,000 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

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

Description of Podunk

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 24 inches: fine sandy loam
H3 - 24 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F144BY110ME - Broad Floodplain Riparian Complex
Hydric soil rating: No

Minor Components

Rumney

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

Saco variant

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

96A—Hadley very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 99p7
Elevation: 50 to 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

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

Description of Hadley

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Friable coarse-silty alluvium

Typical profile

H1 - 0 to 12 inches: very fine sandy loam
H2 - 12 to 26 inches: very fine sandy loam

H3 - 26 to 66 inches: very fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
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: About 39 to 67 inches
Frequency of flooding: Common
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F145XY001MA - Silty High Floodplain
Hydric soil rating: No

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

Suncook

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

98A—Winooski silt loam, 0 to 3 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2zvdk
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: All areas are prime farmland

Map Unit Composition

Winooski and similar soils: 80 percent

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

Description of Winooski

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
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 21 inches: silt loam
H3 - 21 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: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 22 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F145XY002MA - Silty Low Floodplain
Hydric soil rating: No

Minor Components

Limerick

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

Hadley

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

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

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

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment 6

Wetland Plan

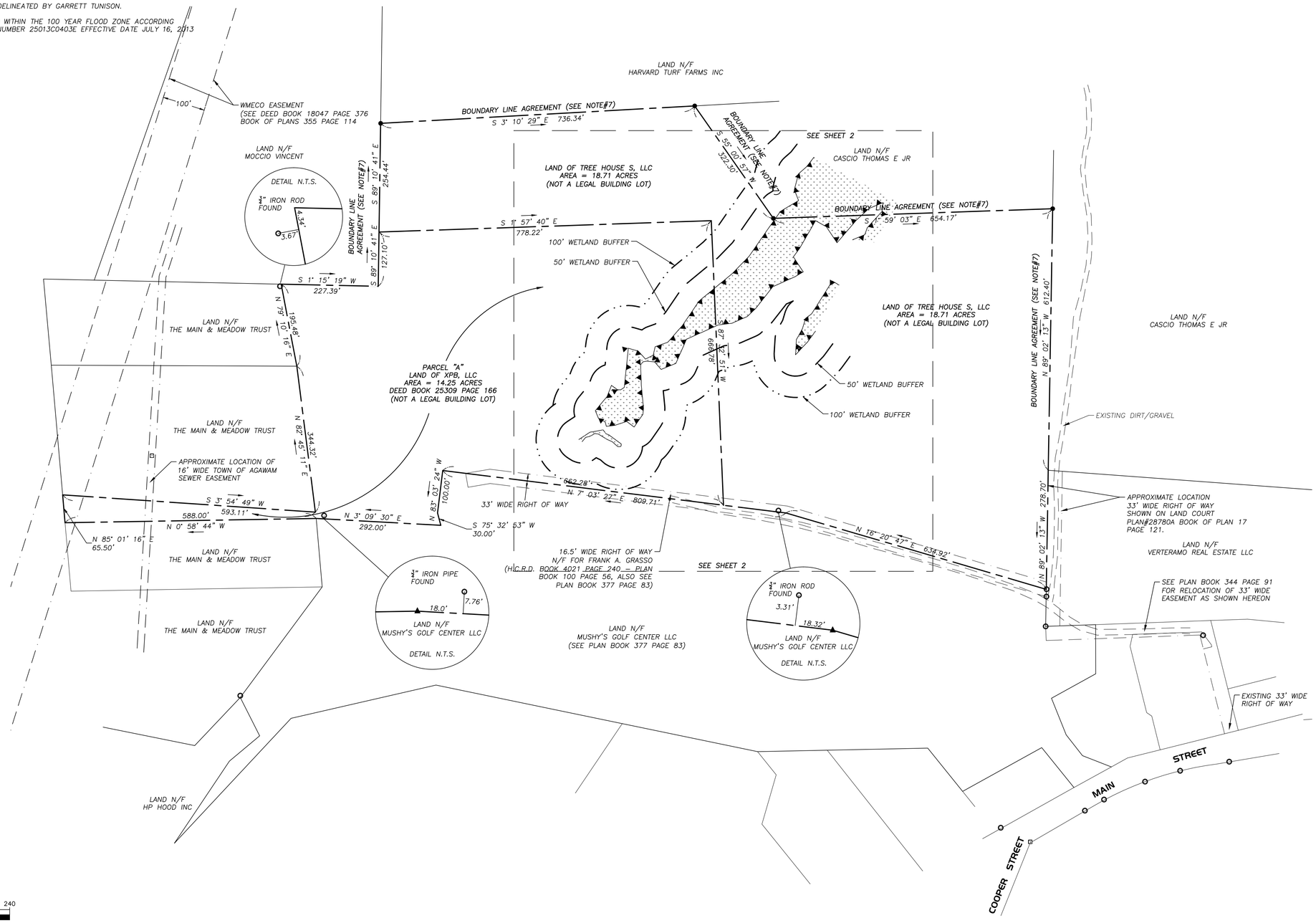
Titled: Wetland Filing Plan

Prepared by: R Levesque Associates Inc.

Dated: February 20, 2024

NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE TREE HOUSE S, LLC. AND XPB, LLC SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 24430 PAGE 259 ALSO BOOK 25309 PAGE 166.
2. BOUNDARY SURVEY PREPARED BY THIS OFFICE AND RECORDED IN PLAN BOOK 399 PAGE 102.
3. 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.
4. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
7. BOUNDARY LINE AGREEMENT IS RECOMMENDED ALONG THESE LINE DUE TO LACK OF PHYSICAL EVIDENCE
8. THIS PLAN IS PREPARED FOR CONSERVATION FILING ONLY SHALL NOT BE USED FOR CONVEYANCE.
9. WETLAND RESOURCE AREAS WERE DELINEATED BY GARRETT TUNISON.
9. THE SUBJECT PARCEL IS LOCATED WITHIN THE 100 YEAR FLOOD ZONE ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0403E EFFECTIVE DATE JULY 16, 2013 100 YEAR FLOOD ELEVATION 60.0.



120 0 60 120 240
SCALE: 1"=120'

DRAFT

SHEET 1 OF 2

S:\Projects\2023\230818 - O'Malley - Northerly of Main Street - Agawam\05 Civil 3D\230818 - Wetland Filing Plan plan.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

WETLAND FILING PLAN

Northerly of Main Street Agawam, MA

PREPARED FOR:

Mr. Joseph O'Malley

Xtreme Paintball
351 Main Street
Agawam, MA 01001

ISSUANCE DATE: 02-20-2024

REVISIONS:	DATE:

DRAFTED BY: t.a.

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

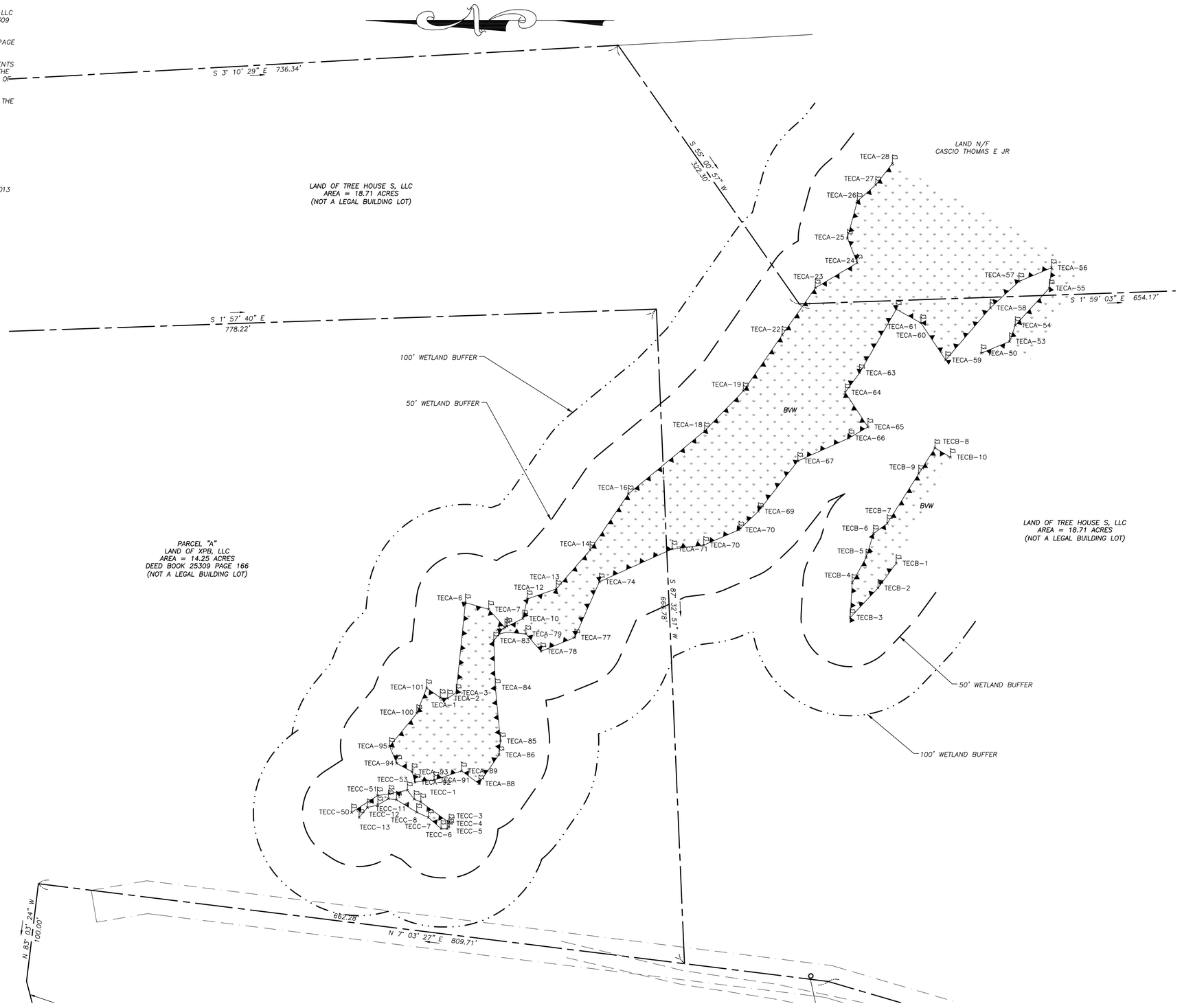
SCALE: As Noted

RLA PROJ. NUMBER: 230818

DRAWING#	REV.
W-1	-

NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE TREE HOUSE S, LLC. AND XPB, LLC SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 24430 PAGE 259 ALSO BOOK 25309 PAGE 166.
2. BOUNDARY SURVEY PREPARED BY THIS OFFICE AND RECORDED IN PLAN BOOK 399 PAGE 102.
3. 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.
4. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
7. BOUNDARY LINE AGREEMENT IS RECOMMENDED ALONG THESE LINE DUE TO LACK OF PHYSICAL EVIDENCE
8. THIS PLAN IS PREPARED FOR CONSERVATION FILING ONLY SHALL NOT BE USED FOR CONVEYANCE.
9. WETLAND RESOURCE AREAS WERE DELINEATED BY GARRETT TUNISON.
9. THE SUBJECT PARCEL IS LOCATED WITHIN THE 100 YEAR FLOOD ZONE ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0403E EFFECTIVE DATE JULY 16, 2013 100 YEAR FLOOD ELEVATION 60.0.



50 0 25 50 100
SCALE: 1"=50'

DRAFT

SHEET 2 OF 2

S:\Projects\2023\230818 - O'Malley - Northerly of Main Street - Agawam\05 Civil 3D\230818 - Wetland Filing Plan plan.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

WETLAND FILING PLAN

Northerly of Main Street Agawam, MA

PREPARED FOR:

Mr. Joseph O'Malley

Xtreme Paintball
351 Main Street
Agawam, MA 01001

ISSUANCE DATE: 02-20-2024

REVISIONS:	DATE:

DRAFTED BY: l.a.

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

SCALE: As Noted

RLA PROJ. NUMBER: 230818

DRAWING#	REV.
W-2	-

Attachment 4

Restoration Planting Plan

Base Plan Titled:

Wetland Filing Plan – Draft (Sheet 2 of 2)

Base Plan Prepared by:

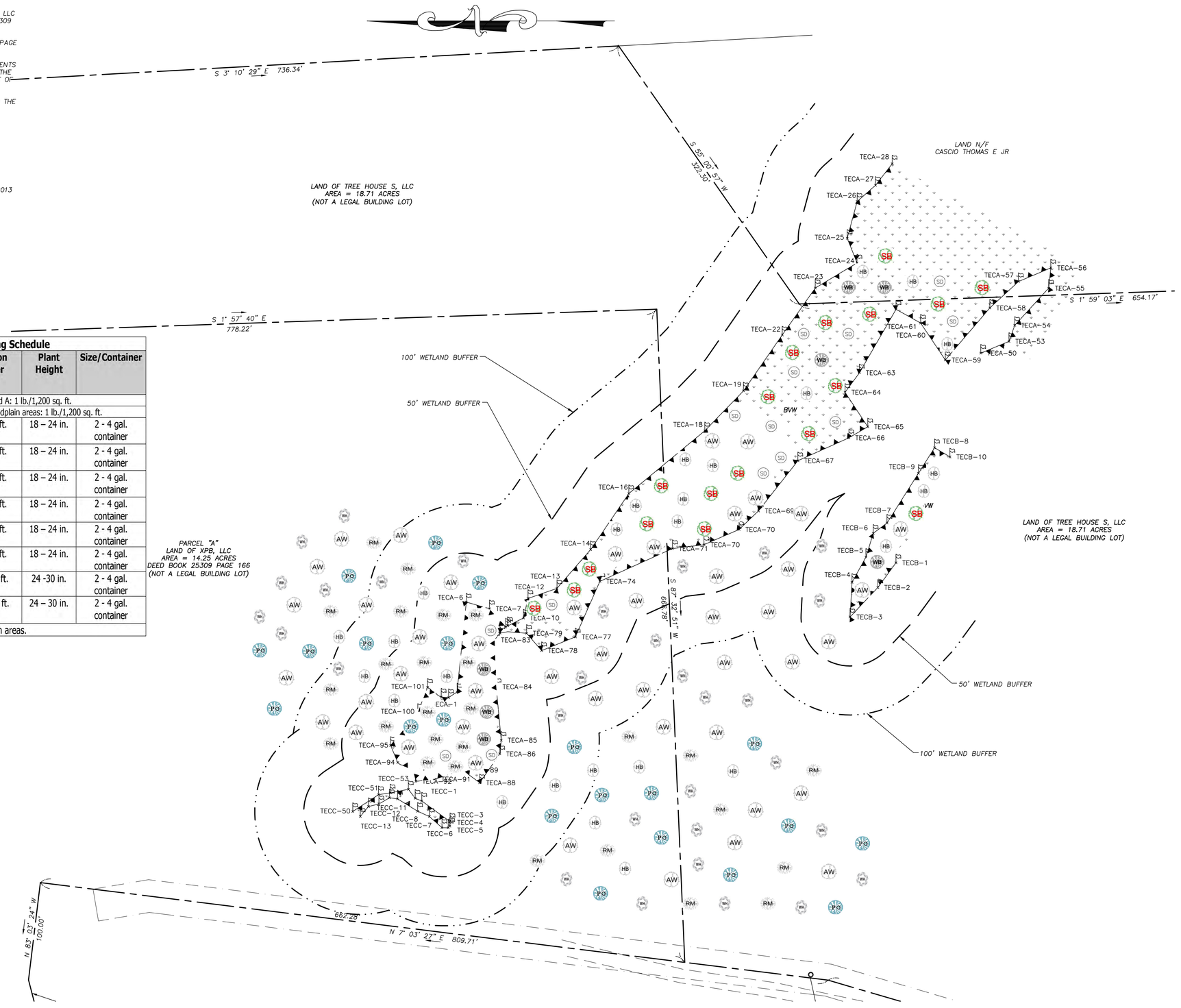
R Levesque Associates Inc.

NOTES

1. THE RECORD OWNERS OF THE SUBJECT PARCEL ARE TREE HOUSE S, LLC. AND XPB, LLC SEE HAMPDEN COUNTY REGISTRY OF DEEDS BOOK 24430 PAGE 259 ALSO BOOK 25309 PAGE 166.
2. BOUNDARY SURVEY PREPARED BY THIS OFFICE AND RECORDED IN PLAN BOOK 399 PAGE 102.
3. 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.
4. ADJACENT PROPERTY LINES AND ABUTTERS SHOWN HEREON ARE REFERENCED FROM THE TOWN OF AGAWAM GIS MAPPING.
7. BOUNDARY LINE AGREEMENT IS RECOMMENDED ALONG THESE LINE DUE TO LACK OF PHYSICAL EVIDENCE
8. THIS PLAN IS PREPARED FOR CONSERVATION FILING ONLY SHALL NOT BE USED FOR CONVEYANCE.
9. WETLAND RESOURCE AREAS WERE DELINEATED BY GARRETT TUNISON.
9. THE SUBJECT PARCEL IS LOCATED WITHIN THE 100 YEAR FLOOD ZONE ACCORDING TO FLOOD INSURANCE RATE MAP NUMBER 25013C0403E EFFECTIVE DATE JULY 16, 2013 100 YEAR FLOOD ELEVATION 60.0.

Wetland Restoration Area and Floodplain Planting Schedule

Plant Symbol	Plant Species	# of Plants	Plant on Center	Plant Height	Size/Container
New England Wetmix Seed Mix application rates to bare areas of Wetland A: 1 lb./1,200 sq. ft.					
New England Conservation/Wildlife Seed Mix application rates to bare 100-yr. Floodplain areas: 1 lb./1,200 sq. ft.					
SB	Northern Spicebush (*Lindera benzoin*)	18	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
HB	Highbush Blueberry (*Vaccinium corybosum*)	19	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
WH	Common Witch Hazel (*Hamamelis virginiana*)	37	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
AW	Southern Arrowwood (*Viburnam dentatum*)	46	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
SD	Silky Dogwood (*Cornus amomum*)	13	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
WB	Common Winterberry (*Ilex verticillata*)	7	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
PO	Pin Oaks (*Quercus palustris*)	21	10 - 15 ft.	24 -30 in.	2 - 4 gal. container
RM	Red Maple (*Acer rubrum*)	27	10 – 12 ft.	24 – 30 in.	2 - 4 gal. container
There are a total of 140 shrubs and 48 trees proposed to be planted in the restoration areas.					



50 0 25 50 100
SCALE: 1"=50'

Restoration Planting Plan

DRAFT

SHEET 2 OF 2

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 FILING PLAN

Northerly of Main Street
Agawam, MA

PREPARED FOR:

Mr. Joseph O'Malley
Xtreme Paintball
351 Main Street
Agawam, MA 01001

ISSUANCE DATE: 02-20-2024	
REVISIONS:	DATE:

DRAFTED BY: t.a.

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

SCALE: As Noted

RLA PROJ. NUMBER: 230818

DRAWING#	REV.
W-2	-

S:\Projects\2023\230818 - O'Malley - Northerly of Main Street - Agawam\05 Civil 3D\230818 - Wetland Filing Plan plan.dwg

Appendix B

Abutters' Notification

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 Milton Conservation Commission on May 6, 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:

An ecological restoration within a portion of Bordering Vegetated Wetland (BVW) under 310 CMR 10.55 to bank (310 CMR 10.54) of an intermittent stream and within the 100-year floodplain also known as Bordering Land Subject to Flooding (BLSF) under 310 CMR 10.57.

B. The name of the applicant is: Joseph O'Malley.

C. The address of the land where the activity is proposed is: 365 Main Street, Agawam, MA.

D. Copies of the Notice of Intent may be examined or obtained at the office of the Agawam Conservation Commission, located at the Public Works and Municipal Annex, 1000 Suffield Street, Agawam, MA 01001. The regular business hours of the Commission are Monday through Friday, 7:30 a.m. to 4 p.m., and the Commission may be reached at (413) 726-9737.

E. Copies of the Notice of Intent may be obtained from the applicant or their representative by calling Tunison Environmental Consultants, LLC at (508) 737-7104. An administrative fee may be applied for providing copies of the NOI and plans.

F. Information regarding the date, time, and location of the public hearing regarding the Notice of Intent may be obtained from the Agawam Conservation Commission. Notice of the public hearing will be published at least five business days in advance, in the Agawam Advisor.

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 C

Affidavit of Service

Affidavit of Service

Under the Massachusetts Wetlands Protection Act

(to be submitted to the Massachusetts Department of
Environmental Protection and the Conservation Commission
when filing a Notice of Intent (NOI)

I, **Garrett M. Tunison** hereby certify under the pains and penalties of perjury that on **May 67 2026** I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the **DEP Guide to Abutter Notification** dated April 8, 1994, in connection with the following matter:
Notice of Intent (NOI) for invasive plant species eradication and wetland restoration at 365 Main Street in Agawam, Massachusetts.

A Notice of Intent (NOI) filed under the Massachusetts Wetlands Protection Act by **Joseph O'Mallay** with the **Agawam** Conservation Commission on **May 7, 2025** for the property at 365 Main Street in Agawam, Massachusetts.

The form of the notification, and a list of the abutters to whom it was given and their addresses, are attached to this Affidavit of Service.

Garrett M. Tunison
Name

05/07/26
Date

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: June 1, 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:	JOSEPH O'MALLEY	Owner:	
Address:	351 MAIN STREET AGAWAM, MA	Address:	
LOCUS:	365 MAIN STREET		

This project has been assigned the following file # : WE 087-0714

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] Section 1 of the NOI, Street Address, does not appear to be correct. Form 3 may need to be corrected. Also, the map/parcel ID information needs to be verified. Name of property owner may also be different.

[2] The restoration work is not apparently a limited project and only the generic citation of 310 CMR 10.53 is even noted. Only the invasive species removal could be considered an Ecological Restoration Limited Project. However, since the NOI submittal does not include an Appendix A, nor was notice apparently placed in the Environmental Monitor, then it cannot be reviewed that way. The applicant needs to comply with the requirements of 310 CMR 10.11, 310 CMR 10.12 and 310 CMR 10.53(4)(e)5.

[3] The commission needs to understand the definition of BLSF and how BVW boundaries are reviewed. Per the regulations in the definition of BLSF, it states It (BLSF) extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. One cannot have BVW and BLSF in the same footprint. The specific footprint is either one or the other resource area, it cannot be both.

[4] Any use of herbicides in BVW likely requires a WM04 permit from MassDEP. https://www.mass.gov/how-to/wm-04-herbicide-application

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

JOSEPH O'MALLEY
351 MAIN STREET
AGAWAM, MA

[5] Multiple locations in the NOI mention work occurring in the year 2024. Elsewhere it notes work to occur in the year 2025. All dates need to be checked.

[6] The restoration plants list needs to note the plants wetland indicator status.

[7] Page 26 of 27 mentions Riverfront restoration, yet there is no Riverfront on the mentioned parcels.

[8] The submitted plans do not appear to show what vertical elevation datum is being used. Since the flood plain elevation is based upon NAVD88, the plans need to show that.

[9] 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
Representative: Tunison Env. Consultants, LLC, PO Box 992, PLYMOUTH, MA, 02362

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

Tunison Environmental Consultants, LLC

June 5, 2026

Attn: Mark Stinson
MassDEP
Western Regional Office
Town Hall
436 Dwight Street
Springfield, Massachusetts 01103

RE: Response to MassDEP Comments (MassDEP File #: WE 087-0714) for Wetland and Ecological Restorations at a site off of Main Street (Assessor's ID: L14 1 3) in Agawam, Massachusetts

Dear Agent Stinson:

Below are our responses to the nine comments listed on the June 1, 2026, Notification of Wetland Protection Act File Number. The comments are listed below in parenthesis and italics followed by the response.

1. *"Section 1 of the NOI, Street Address, does not appear to be correct. Form 3 may need to be corrected. Also, the map/parcel ID information needs to be verified. Name of property owner may be different."*

   Both parcels were included on the site plan from the engineers and was also presented to the U.S. Army Corps of Engineers (USACE) when requesting a determination for filing the project as a "General Permit" and not an "Individual Permit" as to the area where some brush was cut. The response from the USACE was that they would not take jurisdiction over this site so no USACE Permit was required. We kept the information the same when filing the Notice of Intent (NOI). We have since removed the 365 Main Street address even though it is shown on the plans as the applicant doesn't own this parcel but leases it. The alteration to the vegetation in the Bordering Vegetated Wetland (BVW) and Bordering Land Subject to Flooding only occurs on the parcel owned by the applicant so the other parcel (Parcel ID: L14 1 3) was removed from the application on the attached updated NOI Form 3 (Attachment 1, Updated NOI Form 3).

2. *"The restoration work is not apparently a limited project and only the generic citation of 310 CMR 10.53 is even noted. Only the invasive species removal could be considered an Ecological Restoration Limited Project. However, since the NOI submitted does not include an Appendix A, nor was notice apparently placed in the Environmental Monitor, then it can't be reviewed that way. The applicant needs to comply with the requirements of 310 CMR 10.11, 310 CMR 10.12 and 310 CMR 10.53(4)(e)5."*

   The checkbox was accidentally checked when the Form 3 was filled out back in November of 2023 just prior to providing the project information to the USACE. This checkbox has been unchecked on the updated Form 3. The Appendix A is attached (refer to Attachment 2, Appendix A) which was prepared back in 2023 but updated on June 4, 2026. Please note, even though the shrub and some tree cutting occurred in an area greater than 5,000 sq. ft. of wetland, the USACE has decided the project will not be under USACE jurisdiction.

3. *"The Commission needs to understand the definition of BLSF and how BVW boundaries are reviewed. Per the regulations in the definition of BLSF, it states it (BLSF) extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. One can't have BVW and BLSF in the same footprint. The specific footprint is either one or the other resource area, it can't be both."*

   No comment.

4. *"Any use of herbicides in BVW likely requires a WM04 Permit from MassDEP."*

   This is understood and typically required under a Special Condition within the Order of Conditions (OOC). The majority of the herbicide applicators that we use have both aquatic applications and right-of-way applications. It states that an herbicide applicator's license is required in five locations within the Ecological Restoration Plan which is generic as our reports are often used for rights-of-way and/or aquatic applications. This is always a request for the municipality or if a state agency is contracting the herbicide applicator to provide a copy of this license prior to the commencement of work.

5. *"Multiple locations in the NOI mention work occurring in the year 2024. Elsewhere it notes work to occur in the year 2025. All dates need to be checked."*

   Yes, the report references 2025 as it has been updated multiple times since 2023. Prior to mentioning the year listed in the report it states in several areas

that, "*This will **LIKELY** occur in…."* This is done since most ecological restorations take several years to complete and the years for certain actions are unknown. Invasive plants typically aren't under control in one to two years as some of the plant basis (roots) will survive and the existing seed bank will sprout new plants once the ones targeted are eradicated. In addition, the lack of native plants if not ordered a year in advance will often extend the timeline of an ecological restoration. These delays make the actual year irrelevant but we include an estimated year for permitting purposes. The report has been updated (refer to Attachment 3, Ecological Restoration Plan Updated Narrative).

6. *"The restoration plants list needs to note the plants wetland indicator status."*

Table 1 from our report has been included with the wetland indicator status shown below.

Table 1	**Wetland Restoration Areas Planting Table**				
Plant Species	**# of Plants**	**Plant On Center**	**Plant Height**	**Size**	**Wetland Indicator Status***
New England Wetmix Seed Mix application rates to bare wetland restoration areas: 1 lb./1,200 sq. ft.					
Northern Spicebush (*Lindera benzoin*)	22	8 – 10 ft.	18 - 24 in.	2 - 4 gal. container	FACW
Highbush Blueberry (*Vaccinium corymbosum*)	17	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container	FACW
Southern Arrowwood (*Viburnam dentatum*)	15	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container	FAC
Silky Dogwood (*Cornus amomum*)	13	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container	FACW
Common Winterberry (*Ilex verticillata*)	7	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container	FACW
Pin Oaks (*Quercus palustris*)	2	10 – 15 ft.	24-30 in.	2 - 4 gal. container	FACW
Red Maple (*Acer rubrum*)	8	10 – 15 ft.	24-30 in.	2 - 4 gal. container	FAC
The altered area of Wetlands A and B will include planting of 10 trees and 74 shrubs.					
Status based on USACE National Plant List: Northcentral and Northeast Region, 2022					

7. *"Page 26 of 27 mentions Riverfront restoration, yet there is no Riverfront on the mentioned parcels."*

This was a typo that existed from our report template as it should have been "BLSF" or "restoration area". It has been removed from the updated report that is attached.

8. *"The submitted plans do not appear to show what vertical elevation datum is being used. Since the flood plain elevation is based upon NAVD88, the plans need to show that."*

   The client is not proposing to file a Letter of Map Amendment (LOMA) with the Federal Emergency Management Agency (FEMA) for the floodplain. No filling, earthwork or location of any structures or materials are proposed within the Bordering Land Subject to Flooding so we don't see the need for a vertical elevation datum for planting of small shrubs and trees that existed before they were cut. Any soil removed for a plant's root ball will be placed on a section of tarp or in a 5-gallon bucket to avoid any piles of soil and permanent damage to surrounding vegetation. The soil will be disposed of offsite.

Please call (508) 737-7104 or email me at garretttunisontec@gmail.com if you have any questions or concerns.

Sincerely,

Garrett M. Tunison, PWS, Principal
Tunison Environmental Consultants, LLC

CC: Agawam Conservation Commission
Mr. Joseph O'Malley
TEC File #: 2308-001

Attachment 1

Updated NOI Form 3

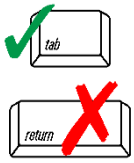
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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):

Off of 365 Main Street (a. Street Address) | Agawam (b. City/Town) | 01001 (c. Zip Code)

Latitude and Longitude: 42.083 N (d. Latitude) | -72.612 W (e. Longitude)

L14 (f. Assessors Map/Plat Number) | 1/3 (g. Parcel /Lot Number)

2. Applicant:

Joseph (a. First Name) | O'Malley (b. Last Name)

Property owner (c. Organization)

351 Main Street (d. Street Address)

Agawam (e. City/Town) | MA (f. State) | 01001 (g. Zip Code)

(413) 626-8212 (h. Phone Number) | N/A (i. Fax Number) | xtremepbma@yahoo.com (j. Email Address)

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

Same as above (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):

Garrett (a. First Name) | Tunison (b. Last Name)

Tunison Environmental Consultants, LLC (c. Company)

P.O. Box 992 (d. Street Address)

Plymouth (e. City/Town) | MA (f. State) | 02362 (g. Zip Code)

(508) 737-7104 (h. Phone Number) | N/A (i. Fax Number) | garretttunison@gmail.com (j. Email address)

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

$2,500.00 (a. Total Fee Paid) | $1,237.50 (b. State Fee Paid) | $1,262.50 (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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

A. General Information (continued)

6. General Project Description:

The applicant was clearing land remvoed 8 to 10 trees and cut the shrub layer) for a tree farm that turned out to be Bordering Land Subject to Flooding and Bordering Vegetated Wetland. He received a WPA-9 Form and stopped cutting. A wetland restoration has been proposed and is included in the attached Wetland Restoration Plan and additional details are provided in the attached narrative.

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:

Hampden	N/A
a. County	b. Certificate # (if registered land)
24430 & 25309	259 & 166
c. Book	d. Page Number

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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	N/A (1. linear feet)	N/A (2. linear feet)
b. ☒ Bordering Vegetated Wetland	80,031 +/- (cut shrubs & trees) (1. square feet)	80,031 +/- restoration (2. square feet)
c. ☐ Land Under Waterbodies and Waterways	N/A (1. square feet) N/A (3. cubic yards dredged)	N/A (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☒ Bordering Land Subject to Flooding	(1. square feet) N/A (3. cubic feet of flood storage lost)	(2. square feet) N/A (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	N/A (1. square feet) N/A (2. cubic feet of flood storage lost)	N/A (3. cubic feet replaced)
f. ☐ Riverfront Area	N/A (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: N/A 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.
N/A	N/A	N/A

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:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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	N/A (1. square feet) N/A (2. cubic yards dredged)	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	N/A (1. square feet)	N/A (2. cubic yards beach nourishment)
e. ☐ Coastal Dunes	N/A (1. square feet)	N/A (2. cubic yards dune nourishment)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	N/A (1. linear feet)	
g. ☐ Rocky Intertidal Shores	N/A (1. square feet)	
h. ☐ Salt Marshes	N/A (1. square feet)	N/A (2. sq ft restoration, rehab., creation)
i. ☐ Land Under Salt Ponds	N/A (1. square feet) N/A (2. cubic yards dredged)	
j. ☐ Land Containing Shellfish	N/A (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 N/A (1. cubic yards dredged)	
l. ☐ Land Subject to Coastal Storm Flowage	N/A (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.

N.A
a. square feet of BVW

N/A
b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

N/A
a. number of new stream crossings

N/A
b. number of replacement stream crossings

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

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

   August 2021
   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 — N/A (percentage/acreage)

         (b) outside Resource Area — N/A (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

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

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. N/A (a. NHESP Tracking #) N/A (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:

MassDEP File Number

Document Transaction Number

Agawam
City/Town

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

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.

N/A
b. ACEC

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

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:

MassDEP File Number

Document Transaction Number

Agawam
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.

Wetland Filing Plan
a. Plan Title

R Levesque Associates, Inc.
b. Prepared By

c. Signed and Stamped by

2/20/24
d. Final Revision Date

1" = 50'
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:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

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

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.

Wetland Filing Plan
a. Plan Title

R Levesque Associates, Inc.
b. Prepared By

c. Signed and Stamped by

2/20/24
d. Final Revision Date

1" = 50'
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:

1092
2. Municipal Check Number

05/04/26
3. Check date

1091
4. State Check Number

05/04/26
5. Check date

Joseph
6. Payor name on check: First Name

O'Malley
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: 5/4/26

3. Signature of Property Owner (if different)

4. Date

Barbett M. Timm

5. Signature of Representative (if any)

6. Date: 5/6/26

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.

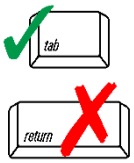
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

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:

365 Main Street	Agawam
a. Street Address	b. City/Town
1091	$1,237.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Joseph	O'Malley	
a. First Name	b. Last Name	
Property owner		
c. Organization		
351 Main Street		
d. Mailing Address		
Agawam	MA	01001
e. City/Town	f. State	g. Zip Code
(413) 626-8212	N/A	xtremepbma@yahoo.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

Same as above		
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.

Attachment 2

Appendix A

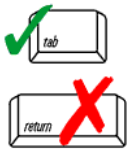
Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands program

Wildlife Habitat Protection Guidance

Appendix A: Simplified Wildlife Habitat Evaluation

Project Information

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



Off of Main Street (Parcel ID: L14 1 3)
Project Location (from NOI)

Garrett M. Tunison
Name of Person Completing Form

6/4/26
Date

Important Habitat Features

Direct alterations to the following important habitat features in resource areas may be permitted only if they will have no adverse effect (refer to Section V).

☐ Habitat for state-listed animal species (receipt of a positive opinion or permit from MNHESP shall be presumed to be correct. Do not refer to Section V).

☐ Sphagnum hummocks and pools suitable to serve as nesting habitat for four-toed salamanders

☐ Trees with large cavities (≥18" tree diameter at cavity entrance)

☐ Existing beaver, mink or otter dens

☐ Areas within 100 feet of existing beaver, mink or otter dens (if significant disturbance)

☐ Existing nest trees for birds that traditionally reuse nests (bald eagle, osprey, great blue heron)

☐ Land containing freshwater mussel beds

☐ Wetlands and waterbodies known to contain open water in winter with the capacity to serve as waterfowl winter habitat

☐ Turtle nesting areas

☐ Vertical sandy banks (bank swallows, rough-winged swallows or kingfishers)

The following habitat characteristics when not commonly encountered in the surrounding area:

☐ Stream bed riffle zones (e.g. in eastern MA)

☐ Springs

☐ Gravel stream bottoms (trout and salmon nesting substrate)

☐ Plunge pools (deep holes) in rivers or streams

☐ Medium to large, flat rock substrates in streams

Wildlife Habitat Protection Guidance

Appendix A: Simplified Wildlife Habitat Evaluation

Activities

When any one of the following activities is proposed within resource areas, applicants should complete a Detailed Wildlife Habitat Evaluation (refer to Appendix B).

☐ Activities located in mapped "Habitat of Potential Regional or Statewide Importance"

☐ Activities affecting certified or documented vernal pool habitat, including habitat within 100' of a certified or documented vernal pool when within a resource area

☐ Activities in bank, land under water, bordering land subject to flooding (presumed significant) where alterations are more than twice the size of thresholds

☒ Activities affecting vegetated wetlands >5000 sq. ft. occurring in resource areas other than Bordering Vegetated Wetland

☐ Activities affecting the sole connector between habitats >50 acres in size

☐ Installation of structures that prevent animal movement

☐ Activities for the purpose of bank stabilization using hard structure solutions that significantly affect ability of stream channel to shift and meander, or disrupt continuity in cover that would inhibit animal passage

☐ Dredging (greater than 5,000 sf)

Attachment 3

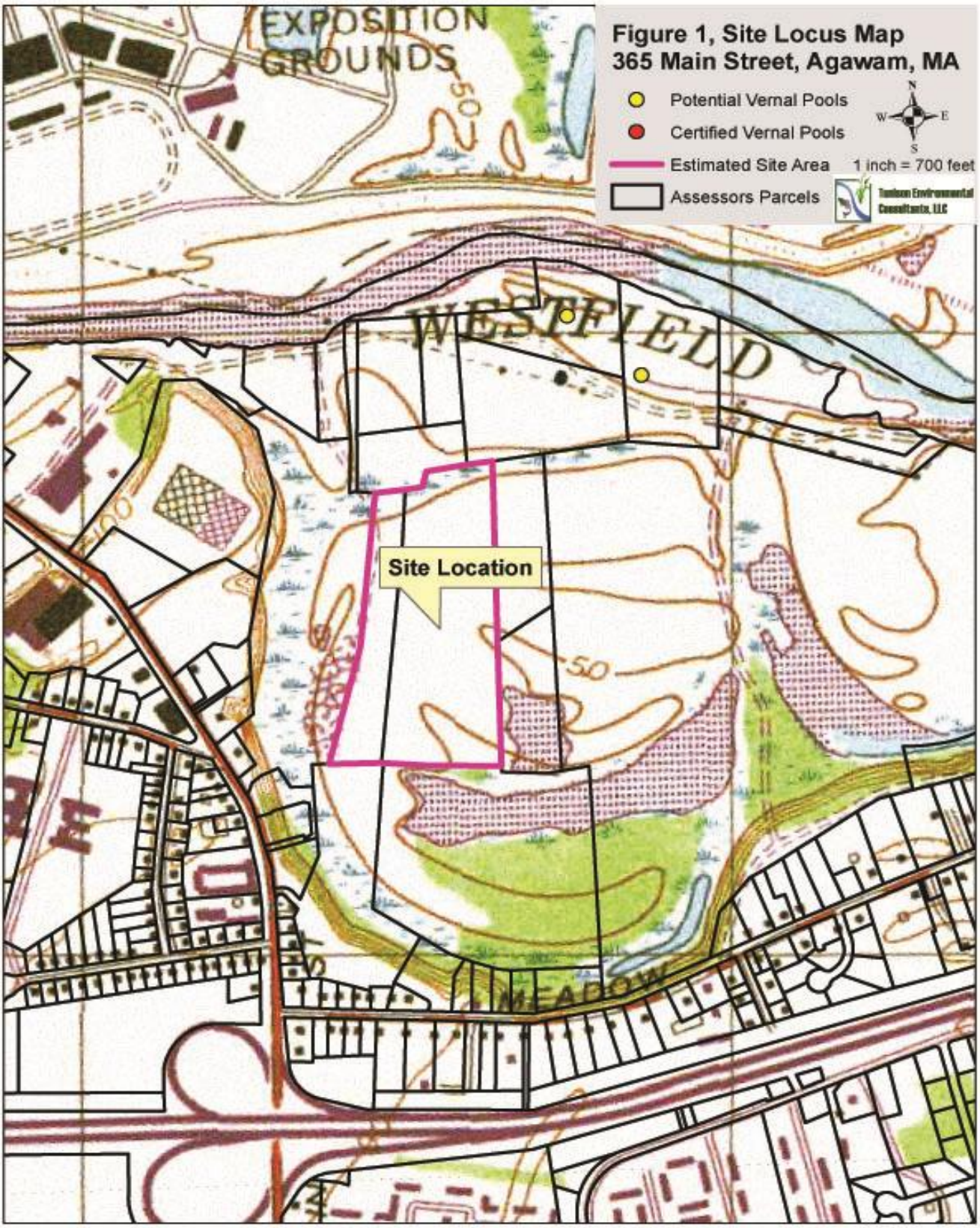
Ecological Restoration Plan

Updated Narrative

1.0 Introduction

On August 23, 2023, Garrett M. Tunison, PWS of Tunison Environmental Consultants, LLC, visited the property at 365 Main Street (Assessor's Parcel ID Numbers: L 131/ 1/ 5 & L13/ 1/ 3), Agawam, Massachusetts (refer to Figure 1, Site Locus Map) to inspect the wetland alterations under a current Agawam Conservation Commission Wetlands Violation (refer to Attachment 1, Agawam Conservation Commission Violation Letter). The soils and ground cover within the area where the vegetation was cut appeared to be intact except for a few tire marks in the wetland (refer to Attachment 2, Site Photographs, Photos 1 through 4). The wetland alterations consisted of cutting vegetation including many herbs, shrubs and some trees. TEC identified the cutting of 17 trees including 2 Red Maple (*Acer rubrum*), 1 Eastern White Pine (*Pinus strobus*), 2 Quaking Aspens (*Populus tremuloides*), 2 Pin Oaks (*Quercus palustris*), 3 Tree of Heaven (*Ailanthus altissima*) and 7 Black Locust (*Robinia pseudoacacia*). The cutting occurred in the southern half of the site with the 16 cut trees that were mostly visible but there could be 1 or 2 additional trees in the pile of removed trees that weren't visible. Most of the trees were from the 100 yr. floodplain and not the delineated vegetated wetlands. Almost all of the vines cut on the site were invasive Oriental Bittersweet. The shrubs were mostly Blackberries, Black Raspberry, Multiflora Rose, Glossy Buckthorn and Common Buckthorn with a few of the native shrubs mentioned above with some sporadic Common Witch Hazels (*Hamamelis virginiana*) and Smooth Sumacs (*Rhus glabra*). At the time of the wetland delineation, many of the cut stalks were beginning to regrow, including most of the cut tree stumps. Hundreds of invasive plant stalks were observed at the site and in the attached photographs that were cut. These invasive plant stalks were mostly Oriental Bittersweet (*Celastrus orbiculata*) and Common Mugwort (*Artemisia vulgaris*). These species have begun to regrow on the site and are dominating the western portion of the cut area between the access drive, Wetland C and along the western edge of Wetland A. The area where shrubs had been cut along with the 17 trees occurred is approximately 1.8 ac. of Wetland A and the adjacent floodplain to the east. Many of these areas have sprouted new herbs, shrubs and trees along with new sprouts on the basal areas of the cut shrubs and trees. This is the same for the 100-yr. floodplain. Native wetland vegetation is thriving within the cut areas of Wetland A and B.

The site is approximately 25.3 acres and appears to be relatively flat with only a slight slope from north to south and east to west. All areas of the site are highly disturbed and appeared to have been cleared in the past. Most areas of the site lack an "O" and "A" Horizon soils and there is a lot of trash and debris on the site that likely came from the old landfill and previous paintball playing fields (Attachment 2, Site Photographs, Photos 5 through 12). There are many invasive plants including Garlic Mustard (*Alliaria petiolata*), Common Mugwort and Oriental Bittersweet in the herbaceous layer; Glossy Buckthorn (*Frangula alnus*), Multiflora Rose (*Rosa multiflora*), Tartarian Honeysuckle and an occasional Autumn Olive (*Elaeagnus umbellata*) in the shrub layer and Tree-of-


Figure 1, Site Locus Map
365 Main Street, Agawam, MA
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
Assessors Parcels
1 inch = 700 feet
N
W
E
S
Tunison Environmental Consultants, LLC
EXPOSITION GROUNDS
WESTFIELD
Site Location
MEADOW

Heaven and Black Locust in the tree layer (refer to the attached Site Plant List within Attachment 3, Wetland Resource Areas Delineation Report). The site is highly disturbed including garbage, yard debris, and fill materials (asphalt, brick and concrete chunks) scattered throughout the western portion of the site (refer to Attachment 2, Photos 5 through 12). Please note, these areas of trash and debris precede the current ownership of property and the wetland violation. The northern portions of the site consist of an existing paintball and air-soft facility that also precede the current owner.

2.0 Wetland Resource Areas

Three wetland resource areas were delineated on the site as Wetlands A, B and C. A Wetland Resource Area Report has been prepared and is included as an attachment to this Wetland Restoration Plan (Attachment 3). Wetlands A and B likely connect east of the site along the drainage wetlands to the adjacent farm fields. Wetland C is an isolated wetland that appears to have been dug and is a drainage ditch that connects to a larger stormwater basin. The entire site is within the 100 yr. floodplain or Bordering Land Subject to Flooding to the Westfield River. Wetlands A and B are gently sloping where water appears to occur within 12 in. of the soil surface during periods of substantial precipitation. The area of the wetlands has likely occurred in recent years as soil matrix colors mostly ranged from 10YR 6/1 to 10YR 6/4 in the "B" Horizon with depletions that were approximately 10YR 6/1 or 10YR 6/2 in color. There were many upland plants (UPL) or facultative upland (FACU) occurring in the delineated wetlands and most wetland plants were facultative (FAC). There were a few pockets of mostly dominant facultative wetland (FACW) plants such as Sensitive Fern (*Onoclea sensibilis*) in the herbaceous layer and Silky Dogwood (*Cornus amomum*) in the shrub layer. Sensitive Fern appeared to be popping up throughout Wetland A after the tree and shrub layers had been cut along with a few patches of Oriental Bittersweet.

3.0 Cutting of Vegetation

Invasive plant species exist along the eastern and northeastern edge of Wetland A and the 100 yr. floodplain. Most of these invasive plants in the wetland included Oriental Bittersweet in the vine layer; Common Buckthorn, Glossy Buckthorn and Multiflora Rose in the shrub layer and Black Locust and Tree-of-Heaven in the tree layer. The majority or approximately 60% to 70% of the vegetation cut was invasive plants and only the remaining vegetation consisting of native herbs, shrubs and trees (refer to Attachment 2, Site Photographs, Photos 13 through 17). The native plant species that occurred within the wetland area and surrounding 100 yr. floodplain included Wild or False Lily-of-the-Valley (*Maianthemum canadense*), Thin-leaved Sunflower (*Helianthus divaricalus*), Purple or Red Clover (*Trifolium pratense*), White Heath Aster (*Symphyotrichum ericoides*), several species of goldenrods (*Solidago spp.*), Sensitive Fern, Cinnamon Fern (*Osmundastrum cinnamomeum*), a few Royal Fern (*Osmunda spectabilis*), Hay-scented Fern (*Dennstaedtia punctilobula*) and upland and wetland

grasses (*Gramineae spp.*) in the herbaceous layer; Poison Ivy (*Toxicodendron radicans*), Virginia Creeper (*Parthenocissus quinquefolia*) in the vine layer; Silky Dogwood, Blackberries (*Rubus spp.*), Black Raspberry (*Rubus occidentalis*), Highbush Blueberry(*Vaccinium corymbosum*), Southern Arrowwood (*Viburnam dentatum*) and some Common Winterberry (*Ilex verticillata*) and Northern Spicebush (*Lindera benzoin*).

4.0 Wetland Restoration

Restoration of the tree and shrub layers is proposed within the cut area along with seeding of the herbaceous layer with native wetland vegetation found within Wetland A in areas of bare soils or where the majority of the herbaceous layer was removed since it was mostly invasive plants. Wetland C has not been cut or disturbed but contain some invasive plants and Wetland B has only been partially cut within the northern 2/3's of the delineated aera. Wetland B only contains a few invasive plants that will be weeded first. Prior to the restoration, the invasive plant species will be removed as part of an Invasive Plant Species Eradication or Management Plan.

4.1 Goals of the Wetland Restoration

Our goals resulting from the invasive plant species eradication plan and the wetlands and restoration of the naturally forested 100-yr. floodplain area are to: 1) removal and eradicate any invasive plant species from identified within or adjacent to the disturbed areas; 2) restore the areas of cut wetland vegetation with native vegetation; and 3) ensure the wetland restoration area flourishes with native vegetation. This wetland restoration area should contain native vegetation observed on the site that provides significant wildlife habitat. It is anticipated the wetland restoration area and remaining ecological restoration area (including impacted 100-yr. floodplain area) will contain at least 75% native vegetation from planting and seeding after two growing seasons if this plan is followed.

4.2 Invasive Plant Species Eradication or Management Plan

Invasive plant species eradication is discussed below that has been prepared from our site visits. This document has been developed to ensure success of the eradication or management of invasive plant species and wetland restoration to occur within the areas that have been recently disturbed by cutting and removing vegetation (mostly invasive plant species) without a permit. A few additional areas of invasive plants have been identified along the western and northern portions of the site that will need to be addressed under this plan (refer to Attachment 2, Photographs, Photos 13 through 15). This document will provide a guide for the landscaper or contractor to complete the invasive plant species eradication and wetland restoration properly and successfully.

It is the experience of TEC to prioritize the removal all of the invasive plants during the first year of the wetland restoration. There has been extensive invasive plant growth in the disturbed portions of the wetlands and 100-yr. floodplain areas for many years. We recommend removing the remaining invasive plant species from the wetland and natural 100-yr. floodplain areas on the site. This will benefit the restoration efforts and the property owner as the eradication or management of these species will be complete or manageable once the below restoration plan is followed which will result in minimal costs and a successful wetland and floodplain area restoration. Without removing the remaining invasive plants, weeding and cut-and-treating the remaining large invasive plants; the invasive plants will remain and dominate the site as they have for years.

4.3 Invasive Plant Species Eradication

This Restoration Plan has been designed to first remove the majority of the remaining plants through weeding and using the "cut-and-treat" method of invasive plant eradication for large shrubs and trees. This plan is designed for complete eradication of the invasive plant species over numerous growing seasons with the bulk of this work occurring during the first one to three growing seasons with only light maintenance thereafter. There are invasive plants located on the properties to the north and west of the subject property so it is uncertain if we can fully eradicate the invasive plants on the site or almost eliminate them with light annual maintenance after the first three years. Regardless if eradication or light maintenance is needed, the removal of the invasive plants will benefit both the wetlands and the site as the invasive plants will need to be addressed from both a conservation and land management prospectives. This work should be done regardless of the wetland resource area protection.

This eradication program is structured to begin in the summer (late August to September) and/or fall of 2024 (September and/or October) and continue through at least the 2027 growing season. Upon completion of the initial eradication of invasive plant species removal and treatment, the restoration area will be evaluated in the following spring to determine if a significant amount of the invasive plants (80% to 85% reduction or greater) have been removed. The invasive plant species eradication plan will continue throughout the planting and monitoring of the wetlands and floodplain restoration. These areas will be weeded in the summer for any seedlings and will be weeded and if they have root systems that are difficult to remove such as large woody shrubs and vines, they will also be cut and treated or pulled and the remaining roots will be treated. Invasive plant species make up approximately 30% to 95+% coverage within the wetland (eastern portion of Wetland A) and floodplain restoration areas. Areas of invasive plants within the current tree line contain less invasive plants (approximately 10% to 40% invasive plants) than areas such as the

northern and eastern portions of Wetland A (approximately 95+% invasive plants).

4.4 Invasive Plants

Ten invasive plant species were observed on the site (refer to Attachment 2, Photographs, Photos 13 through 17). Most were woody shrubs or vines. Nine of these species will be targeted which include Garlic Mustard, Common Mugwort, Oriental Bittersweet, Glossy Buckthorn, Multiflora Rose, Tartarian Honeysuckle, Autumn Olive, Tree-of-Heaven and Black Locust. Three other invasive plant species observed on the site and within the wetlands and floodplain which included Curly Dock, Common Mugwort and Climbing Nightshade will not be further discussed as they will be weeded from the site. These three invasive plant species will not be discussed further in this document as they will be weeded and discarded into plastic contractor's bags as they are encountered in the wetlands and floodplain area. All invasive plants that are weeded and cut will be placed on large tarps and cut up and put into large contractor's black bags for solarization.

There are a few large Oriental Bittersweets, Glossy Buckthorns, Multiflora Roses, Autumn Olives, Tree-of-Heavens and Black Locust that will need to be cut down and their stumps/stalks treated. There are only patches of Garlic Mustard that can easily weeded and there is a lot of Common Mugwort in large patches or areas but it can also be easily weeded. All weeded plants will immediately be placed in 5 gal. buckets, contractor's bags or on tarps to be placed into black contractor's bags to be removed from the forested area of the site and placed in an open area for solarization.

The seven of the ten invasive plants listed above are described below in detail in Sections 4.3.1 through 4.3.7. Information provided below for each plant species was acquired from publications (such as factsheets, invasive plant books or booklets) and websites from the Plant Conservation Alliance's Alien Plant Working Group, Penn State University, University of Connecticut, National Park Service, The Nature Conservancy, the NRCS, U.S. Fish and Wildlife Plant Data Base (online) and the Massachusetts Natural Heritage Program.

Invasive plants become established and can often dominate landscapes causing over $120 billion dollars in damages in the U.S. alone each year. The plants typically have very few native or natural enemies and as a result often thrive in our local environments. They are spread by: 1) animals though their waste, on their skin, fur or feathers; 2) by treads on shoes, tires, tracked vehicles, or other machinery; 3) being transported down streams, other waterways, water bodies, or coastal waters; 4) airborne seeds; 5) people's clothes; 6) yard or construction debris; 7) soils containing seed banks; or even by 8) landscapers or being supplied by plant nurseries. Invasive plants alter natural habitats often reducing

the numbers and diversities of native plants and animals. This can be detrimental to our natural environment and significantly alter ecosystems.

4.4.1 Oriental Bittersweet

Oriental Bittersweet (refer to Attachment 2, Photographs, Photo 25) is a deciduous woody vine that was introduced to the United States in the mid-1800's and has spread throughout much of the Country. This species grows around the trunks, stems and stalks of surrounding vegetation and chokes them out. They can change the natural nutrient cycling systems that take place in our natural environments. These plants can be found along roadsides, trails, fields, wastelands, landscaped areas, sand dunes, and forest interiors.

Oriental Bittersweet looks similar to native American Bittersweet (*Celastrus scandens*) but it can be distinguished by their leaves and fruit. Oriental Bittersweet has fruit and flowers located within the leaf axils along the length of the stem. Their fruit ripen in the fall and have yellow capsules. American Bittersweet only has fruit and flowers in terminal clusters. Their fruit also ripen in the fall as do Oriental Bittersweet but their capsules are orange. Leaves are used as the most distinguishable feature to tell the difference between Oriental Bittersweet and American Bittersweet throughout their life cycle (seedling to maturity). The best time and way to identify the difference between these two species is to observe them at leaf out when two sides of the leaf of the Oriental Bittersweet are folded against each other (conduplicate) and tightly packed in the bud when they emerge in the spring. The leaves of the American Bittersweet have leaf margins rolled in like a scroll (involute) and are not as tightly packed in the bud. An additional method to distinguish the leaves, although not as reliable, is to use the ratio of length-to-width of the leaves which is often greatest for American Bittersweet (90% chance) when it is equal to or greater than 2. If the ratio is less than or equal to 1.4, it is likely (90% chance) Oriental Bittersweet.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. When hand weeding, make sure to get all of the roots to avoid re-growth. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Cutting should include cutting the vine near its base (within 2 inches of the ground) and removing the vine from surrounding vegetation, followed by treating the basal area of the vine with herbicide containing 25% glyphosate (such as Accord or Roundup Pro) works best. Remove all cut vines including any berries observed to reduce local seeding by placing them in containers or large plastic bags from where

they were cut. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This woody vine occurs throughout the wetland and restoration area restoration and makes up approximately 70% to 80% of the invasive plant species at the site. The largest densities of this vine occur in the southeastern portion of the site in and around Wetland C.
Tartarian Honeysuckle (refer to Attachment 2, Invasive Plant Photographs, Photo 21) is a tall rounded or upright oval deciduous shrub that can reach heights of 7 to 12 feet. This plant often is one of the first shrubs to leaf out in the spring and one of the last to lose its leaves in the fall holding an advantage over other native shrubs. It often grows with a few to several stems occurring from the base that are spreading. It has a shallow woody root system that prefers mesic loamy soils but often grows in sandy loam to sandy soils. Leaves are rounded to slightly ovulate in shape and smooth along their margins. The base of each leaf is rounded to slightly cordate but the tip tapers to a blunt point. The upper leaf surface is a medium green color while the lower surface is light green. Leaves grow in opposite pairs along their shoots and rain from 1-½ in. to 2 in. long and ¾ to 1-½ in. wide. Their bark is gray to brown with narrow ridges that develop vertically shredded strips of bark as they age. Young shoots appear light green to reddish brown that are predominantly smooth. Its branches are quite fragile as they are hollow. These branches appear glabrous with a brownish to grey color in winter and a yellow to tannish color during spring and summer. The fruit is small in size (average 0.25 in. or 0.6 cm. in diameter) and range in color from orange to red that may persist throughout the winter. Each berry contains several small seeds. Its flowers appear in mid-spring (May through June) that form in pairs in the axils of the leaves. The flowers are tubular and pink to red and white in color and bloom for approximately three weeks. These flowers have a sweet fragrance common to other honeysuckles and are approximately ¾ in. long and across. The flowers consist of a corolla with five long and narrow petals containing five stamens of white filaments and yellow anthers with a pistil carrying a single style.

This plant was introduced to the United States in 1752 as an ornamental plant from central China. It is native to Siberia and other parts of eastern Asia. It grows in uplands along roadsides and trails, in old fields, thickets, fencerows, woodland edges, woodlands, and disturbed areas. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are moderately difficult to remove once in large numbers due to their seed base.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its

roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This vine occurs along the western and northern portions of the site and makes up approximately 8% to 10% of the invasive plants in the areas identified to contain invasive plant species. The property owner was trying to remove these vines when they were stopped under the violation.

4.4.2 Glossy Buckthorn

Glossy Buckthorn is a tall deciduous shrub or small tree that can reach heights of 20 to 25 feet and have a trunk up to 10 inches in diameter. It often grows with a few to several stems occurring from the base that are spreading with loosely branched crowns. Leaves are thin and glossy with an oval or elliptical shape (not toothed). The upper leaf surface is shiny while the lower leaf surface can be hairy or smooth. Their bark is gray to brown with prominent elongated and light-colored lenticels. The fruit is small in size and range in color from green to red to blackish.

This plant was introduced in Wisconsin in 1849 as an ornamental plant to be used in a hedgerow where it spread across Canada and the northern United States. It grows in wetlands and uplands, along roadsides and trails, in old fields, and in woodlands. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are difficult to remove once in large numbers.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this

project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

Glossy Buckthorn was observed scattered throughout the wetland areas making up approximately 5% to 7% of the invasive plant species.

4.4.3 Multiflora Rose

Multiflora Rose is a large deciduous, woody shrub that was introduced in 1866 from rootstock sent from Japan for ornamental roses. Its use was promoted in the 1930's for use in erosion control and "live fences" for livestock. It occurs along roadsides, paths, in disturbed lands or wastelands, adjacent to and within fields, forest edges and light gaps in forest areas. Most of these plants develop from seeds in the soil and are often spread by wildlife that feed on the rose fruits which are called, "hips". They can also form new plants when long branches touch the ground and get covered with dirt which start to grow roots. They can be dispersed over long distances and seeds can remain viable for up to 10 to 20 years in the soil.

These rose bushes are thorny with arching brown (mature stems) to greenish and/or reddish stems. The leaves are divided into five to eleven sharply toothed leaflets with a pair of fringed bracts at the base of each leaf stalk. Beginning in May or June this rose has abundant small (about an inch across) white to pinkish showy flowers. Small rose hips develop in summer, become leathery in the fall, and remain on the plant through winter. These roses can grow up to 10 feet high and 10 feet wide. The closest relatives to this rose are the Scott Rose (*Rosa spinosissima*) and the Memorial Rose (*Rosa wichuraiana*) which are not present on the site.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older established plant or its roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing works well were applicable but often requires 6 to 8 times a year over 4 to 6 years to achieve complete removal but this method will not be used in this eradication plan as there will not be any mowing in the buffer zone area. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This shrub makes up approximately 2% to 3% of the invasive plant species at the site and was observed along the western portion of the site.

4.4.4 Tartarian Honeysuckle

Tartarian Honeysuckle is a tall rounded or upright oval deciduous shrub that can reach heights of 7 to 12 feet (refer to Attachment 2, Site Photographs, Photo 16). This plant often is one of the first shrubs to leaf out in the spring and one of the last to lose its leaves in the fall holding an advantage over other native shrubs. It often grows with a few to several stems occurring from the base that are spreading. It has a shallow woody root system that prefers mesic loamy soils but often grows in sandy loam to sandy soils. Leaves are rounded to slightly ovulate in shape and smooth along their margins. The base of each leaf is rounded to slightly cordate but the tip tapers to a blunt point. The upper leaf surface is a medium green color while the lower surface is light green. Leaves grow in opposite pairs along their shoots and rain from 1-½ in. to 2 in. long and ¾ to 1-½ in. wide. Their bark is gray to brown with narrow ridges that develop vertically shredded strips of bark as they age. Young shoots appear light green to reddish brown that are predominantly smooth. Its branches are quite fragile as they are hollow. These branches appear glabrous with a brownish to grey color in winter and a yellow to tannish color during spring and summer. The fruit is small in size (average 0.25 in. or 0.6 cm. in diameter) and range in color from orange to red that may persist throughout the winter. Each berry contains several small seeds. Its flowers appear in mid-spring (May through June) that form in pairs in the axils of the leaves. The flowers are tubular and pink to red and white in color and bloom for approximately three weeks. These flowers have a sweet fragrance common to other honeysuckles and are approximately ¾ in. long and across. The flowers consist of a corolla with five long and narrow petals containing five stamens of white filaments and yellow anthers with a pistil carrying a single style.

This plant was introduced to the United States in 1752 as an ornamental plant from central China. It is native to Siberia and other parts of eastern Asia. It grows in uplands along roadsides and trails, in old fields, thickets, fencerows, woodland edges, woodlands, and disturbed areas. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are moderately difficult to remove once in large numbers due to their seed base.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its

roots. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. Mowing will not occur on this project. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This shrub occurs along the western edge and within Wetland A and is only about 1% to 2% of the invasive plants on the site. Several of these shrubs were cut down during the violation by the property owner.

4.4.5 Autumn Olive

Autumn Olive is a deciduous shrub that can grow to 20 feet in height. Leaves are alternate and egg or lance-shaped and smooth margined. The leaves are dull green on the upper surface and often silvery with brownish scales on the underside. The stems and buds are often silvery to rusty colored with scales. Autumn Olive have dense clusters of pale-yellow flowers that occur in June and July. Small reddish brown to pink fruit dotted with brown or silvery scales are produced in August through October. This plant was introduced to the United States in 1830 and was widely planted as an ornamental and in clusters as a windbreak.

Hand pulling (weeding), cutting, and the use of herbicides work best, especially in conjunction with each other. Hand weeding only works with newly established seedlings that are not part of an older, established plant or its roots. It is best to pull these seedlings after recent rains when the soil is loose. Make sure to get all of the roots to avoid re-growth when weeding any seedlings. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab) application of herbicide. Mowing or cutting the stalks or stems near its base (within 2 inches of the ground), removing the plant in large contractor's bags followed by treating the remaining basal area of the plant with herbicide containing glyphosate (such as Roundup Pro) seem to work best. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

Autumn Olive was observed scattered in the western portion of the site and consists of approximately 1% to 2% percent of the invasive plant species. Most of these shrubs were cut down by the property owner during the violation.

4.4.6 Tree of Heaven

Tree of Heaven is a fast growing deciduous tree that can reaches heights of 80 to 100 ft. with a diameter of 3 to 6 ft. It was introduced to the United States in the Philadelphia, PA area in 1784 and was later introduced to the West Coast in the 1850's by immigrants. It was initially used as an urban street tree and has been well documented to have been used along the streets in Baltimore and Washington D.C. This tree is native to northeast and central China and Taiwan. A single female tree can produce up to 300,000 seeds which are often wind spread and they can produce seeds once a sapling becomes two years old. These trees are not only prolific but have allelopathic chemicals in their roots, leaves, and bark that can limit or prevent other native plants from becoming established. If the roots, leaves, twigs, bark or any other portion of this tree are crushed or damaged, they will give off a strong odor. This tree's sap can affect human health resulting in skin irritation, dermatitis, and may even lead to myocarditis (inflammation of the heart muscle) in rare occasions if any portions of the plant puncture skin. It is recommended that gloves and protective clothing be wore when removing this tree. Tree of Heaven can be found along roadsides, parking lots, railways, trails, fencerows, woodland edges, wastelands, fields, logging sites, mining sites, and forest openings.

Tree of Heaven looks similar to Black Walnut (*Juglans nigra*) and Sumacs (*Rhus spp.*) but it can be distinguished by their leaves, fruit, and bark. Their leaves are pinnately compound having a central stem with leaflets that are attached on each side. A leaf can range from approximately 1 to 4 ft. in length with 10 to 40 leaflets. These leaflets are lance shaped with smooth margins and one or two protruding bumps known as glandular teeth. The bark of this tree is smooth and green when it is young turning light brown to grey resembling the skin of a cantaloupe as it ages. Their twigs are brittle and alternate on the tree with a greenish to brown color. They lack a terminal bud but have large "v" or heart shaped leaf scars. Once their twigs are broken, a large spongy brown center or pith is exposed. The Tree of Heaven has small yellowish-green flowers that occur in June. Seeds appear during summer as 1 to 2 in. long twisted samara or wings with one seed per samara. Samaras occur in clusters which can be produced in the hundreds of thousands on a single tree and persist through winter.

Hand pulling (weeding), cutting, and herbicides work best, especially in conjunction with each other. When hand weeding, make sure to get all of the roots to avoid re-growth. Any remaining roots that can't be removed should be treated with a direct (apply directly with a cotton swab, small paint brush or dabbing wand applicator) application of herbicide. Cutting should include cutting the vine near its base (within 2 inches of the ground) and removing the vine from surrounding

vegetation, followed by treating the basal area of the vine with herbicide containing 25% glyphosate (such as Accord or Roundup Pro) works best. Remove all cut vines including any berries observed to reduce local seeding by placing them in containers or large plastic bags from where they were cut. These methods will likely require 2 to 3 years of repeat efforts to ensure full removal of these plants.

This tree species occurred in the tree and sapling layers but only makes up approximately 2% to 3% of the restoration area. Several of these trees were cut down by the property owner during the violation.

4.4.7 Black Locust

Black Locust is a medium sized deciduous tree that is originally from the southeastern (southern Appalachia) and central (Ozarks) United States and some areas of Europe (refer to Attachment 2, Site Photographs, Photo 17). It has spread north throughout the northeastern and northern central United States. Black Locust was used in construction projects since their root systems are great for stabilizing soils. Seedlings and sprouts of this tree can grow rapidly and can be identified by their long paired thorns. They can rapidly overtake an area creating a dense tree layer that crowds or shades out native plants by blocking sun light and depleting soil moisture. This tree produces many seeds that seldom germinate but they spread from root suckering. Their nitrogen-fixing root nodules allow these plants to grow just about anywhere, even areas with little nutrients. They grow best in well drained soils with full sunlight. These trees are most often found along woodland edges, in abandoned fields, pastures, wastelands, and along roadsides.

The Black Locust typically grows between 40 to 50 feet tall but can grow from 70 to 100 feet in height. This tree grows relatively upright with a somewhat narrow crown that is widest at the top. Its bark can be a dark greyish brown to a greenish brown to a yellowish brown with distinctive thick rope-like ridges with furrows interlaced. The trunk is long and straight and its branches are often upright to irregular. Leaves are alternate along the stem with smaller oval or elliptical leaflets. Leaves are 6 to 14 inches long and include 7 to 19 leaflets. The leaflets are dark dull green to bluish green above and yellow below. This tree produces clusters of pea-like flowers that are creamy white in color with a yellow patch on the uppermost petal and are very fragrant. Its flower clusters are 4 to 8 inches long that occur in late May through early June for approximately one week. This tree's fruit consists of flat long smooth pods that is approximately 2 to 4 inches in length which mature in October and persist as a dried brown fruit. Each pod contains 4 to 8 seeds.

This species was observed scattered along the western and northern areas of the site in the floodplain and in Wetland A. This tree is approximately 8% to 10% of the invasive plant species on the site. Several of these trees were cut down by the property owner during the violation.

4.5 Invasive Plant Species Removal

The invasive plant species removal or eradication will be considered to be the first part of the Wetland Restoration Plan.

Removal of the invasive plants will begin along the northeastern portion of the site and continue south and then west to the driveway until all invasive plants have been weeded and/or cut-and-treated. The ecologist or wetland scientist will identify the invasive plants and show the landscapers how to identify each species seen. They will also show the landscapers how to cut, tell them which plants to weed or pull, and how to bag the plant waste to avoid seed dispersion. The plants will be weeded, cut, plant waste removed, and the basal area of large shrubs, saplings and trees will be treated with herbicide as the team moves along the site from east to west. The majority of the invasive plants that are immature or easy to extricate from the soil will be weeded/hand pulling such as young Glossy Buckthorn, Japanese Honeysuckle, Tartarian Honeysuckle, Eastern Burning Bush, Multiflora Rose, Japanese Barberry, Oriental Bittersweet, and Autumn Olive. Seedling Japanese Knotweed will also be weeded.

Common Mugwort, Curly Dock, Garlic Mustard and Climbing Nightshade plants identified that will only be weeded and not cut-and-treated. Plants with a stem or stalk that is greater than ½ in. diameter may be cut and treated with herbicide but weeding them from the site will also be attempted prior or in place of the cut-and-treat method. Any plant with a stem or trunk greater than 1-½ in. will but cut and treated with herbicide dabbed on its cut stem or trunk (with a dabbing brush or dapping wand) by an herbicide applicator with a MA Herbicide Applicator's License under the direct supervision of a wetland scientist or ecologist. The wetland and floodplain area to be restored may be divided into transects to aid with coverage of the area and to avoid additional movement within the restoration area that could damage native vegetation. The team will consist of at least three individuals. These individuals include: 1) the ecologist; 2) a landscaper who is cutting/weeding and possibly bagging; 3) a landscaper (who has an MA Herbicide Applicator's License) that is treating the cut basal area of large shrubs under the guidance of the ecologist; and 4) possibly an additional landscaper that is cutting/weeding and bagging the plant waste. Once a contractor's bag is full of plant waste, it will be tied closed and placed on the lawn edge by the driveway to be picked up by the landscapers once a transect is completed and placed in a truck bed. Mowing of invasive shrubs and herbs will not occur on this site as all work is within wetland resource areas. After a section or transect of the restoration is completed, the site ecologist or wetland

scientist will inspect each section or transect to ensure that all invasive plants have been removed.

All invasive plant species above will be weeded except for large Oriental Bittersweet, Glossy Buckthorn, Multiflora Roses, Tartarian Honeysuckle, Autumn Olive and Black Locust as stated above. The small to medium sized invasive plant species will be weeded and discarded in black contractor's bags for offsite removal or in an open area outside of the forested area of the site for solarization.

4.6 Herbicide Use

Herbicide use has been designed into this plan with the intention of using it as infrequently or as sparingly as possible. It is the opinion of this office as a result of several recently published studies that large-scale use of herbicides, including those with glyphosate, negatively impact the environment. Glyphosate that enters surface waters has been linked to DNA damage in fish and other species. Glyphosate is a heavy salt that does breakdown organically into natural elements over time. No spraying release of this herbicide over large areas will occur under this plan. Two brands of glyphosate based herbicides may be used one is Accord XRT II for any aquatic invasive plant stalks or roots and the other will be either RoundUp Pro or Roundup Custom. This herbicide will be applied directly and sparingly to cut basal areas or visible roots only when physical removal of the plant is not possible or is more damaging to surrounding natural vegetation. Herbicide application will occur through the use of cotton swabs, paintbrushes and/or dabbing wands. Dapping wands are typically sheaths of material that are secured to the sprayer tip and metal shaft of the sprayer to become soaked with herbicide that can be gently placed on the cut basal area of the plant where is will accumulate on the cut area.

Three brands of herbicide have been mentioned within this plan. All three brands contain the active ingredient glyphosate. Accord XRT II is a brand/product that is typically used in aquatic settings to control emergent vegetation. Roundup Pro or Roundup Custom and Accord XRT II contain surfactants which help the herbicide stick to the plant surface where it is applied. This helps it penetrate into the plants tissue, especially when it is a hard woody surface and may be exposed to rain within 3 to 6 days of application. Without the surfactants, the life of the herbicide is greatly reduced and may not be effective. This is especially true when dealing with areas where rainfall may occur within 3 to 6 days after the application of the herbicide.

The application method chosen in this plan (direct basal area application) was determined based on experience and research to provide the most effective manner of application with the highest level of protection for the environment. The time of application has been based upon the end of the growing season so that the plant will absorb the herbicide and store the herbicide in its root system

with its sugars to draw from when it needs energy to grow in the spring. This provides a high rate of efficiency for eliminating invasive plant species within 2 to 3 years if proper weeding programs are in place and areas surrounding the Restoration Area are also free of invasive. Targeting the basal and exposed root areas of shrubs and trees minimizes the herbicide application so that it is almost completely absorbed by the plant unlike foliar spraying. Our Company's experience and research of herbicides that contain glyphosate are that it is harmful to fish and other aquatic organisms if it enters a waterway, waterbody, or coastal waters. It can act as a bio-inhibiter impacting fish reproduction. This is why we have the herbicide applied to the basal area of invasive plants and not sprayed. It is likely that RoundUp Pro or Roundup Custom will be the herbicide chosen to be applied on the cut basal areas of the invasive plant species. The majority of the proposed cut-and-treat method will occur west or north of the wetlands with a few potential spots in the wetlands. Please note, these wetlands rarely contain water but contain high groundwater that reaches the upper 12 in. of the soil.

4.7 Solarization and Disposal

Once the invasive plants are placed in large black contractor's bags, they will be removed from the forested area of the site at the end of each work day and placed along the parking lot of the site. The bags of invasive plant material will either be removed from the site for offsite solarization or kept in an open area of the site for solarization. Solarization will occur over 6 months to ensure the plant material (roots, small branches that could contain seeds, fruits and seeds) will be dead and rotting to ensure no invasive plants can't spread. The best method of disposal is to bring them to a transfer station or place them in a dumpster that is picked up by a contracted waste disposal company that takes its waste to a facility with an incinerator but this process has become unfeasible as costs have risen sharply ($4,000+ per roll-off dumpster). Burying the plant waste deep such as in a landfill or other location is also a potential solution is the next best option following solarization but taking them anywhere where them can be used for mulch, compost or future top soil should be prohibited. This method of disposal will ensure that no invasive plants will be allowed to spread or resurface in the surrounding environment. It is recommended that a contractor who performs the invasive plant species eradication or is a disposal company that either transfers the plant waste and any refuse from the site follows the decontamination processes discussed below in Section 4.7 Decontamination Plan to a private or public incinerator.

4.8 Decontamination Plan

The spread of invasive plants can occur as a result of the distribution of seeds, roots, and even stem fragments from invasive plant species and can occur on many different sources such as personnel clothing, vehicles and/or machinery.

Any of these sources, such as clothing, tools, or vehicles, need to be inspected and likely cleaned daily prior to leaving the site and at the end of the project or any time before or after leaving the site. Vehicles and mechanical equipment shouldn't be an issue at this site so they will not be part of the decontamination. The decontamination protocols will only apply to workers clothing, footwear and mechanical cutting or treatment equipment.

Inspections should be carried out on a staging area dedicated to cleaning personnel, equipment, and vehicles (on the driveway). Effective inspections require good lighting conditions, personnel trained to look for problem areas that are not apparent upon casual observation, and development of protocols and lists of priority invasive species. Effective inspections also require persons who have the task of inspecting vehicles, equipment, and personnel to be dedicated and accountable for their actions. Inspections should include personnel, vehicles, and equipment that are used in locations known to be infested with invasive species. The equipment should undergo a pre-inspection, followed by thorough cleaning and a post-inspection before being allowed to leave the site.

Decontamination of any and all: 1) clothes; 2) shoes, boots, and any other footwear worn on the site; 3) vehicles; 4) trailers; 5) mowing equipment, 6) any earth-moving equipment; and 7) any other machinery or object brought onto the site that may make contact with the ground or site vegetation during the proposed ecological restoration. Decontamination will occur when anything leaves the site at the end of the work day or when work is completed and will include the removal of seeds, fruits, soils, mud, and plant cuttings/fragments from any of the seven itemized categories listed above. Numerous cleaning methods are available to decontaminate workers and equipment of invasive species. A lint roller and whisk broom or small broom works best with a dust pan. Materials removed from each site worker should be swept up or off personnel, boots, and equipment and placed in one of the black contractor's bags containing the plant waste. The use of mowing and construction equipment is unlikely to occur during the times the invasive plant species eradication program will be executed at the site.

5.0 Wetland Restoration Plan

The success of the ecological restoration can only be accomplished with a well-developed and thoroughly followed restoration plan. Portions of the ecological restoration plan described below has been developed from the Massachusetts Department of Environmental Protection, Massachusetts Inland Wetland Replacement Guidelines, September 2022 such as planting densities and percent coverage of restored plants for qualification of the restoration area after two years of monitoring. All activities identified within the ecological restoration area will be supervised by a qualified wetland scientist. Restoration of Wetland A and B and the floodplain area will not occur until approximately 80% to 85% reduction in invasive plant species occurs within the

restoration area. Once the majority of the invasive plants have been removed from the restoration area, the restoration plantings will commence. This will likely occur in the summer (weeding only) or fall of 2026 when the regrowth or sprouting of invasive plants can be evaluated prior to planting.

5.1 Existing Conditions and Functions

The site consists of an area that was recently disturbed from the removal of invasive plants and some native vegetation that was cut in the process within the eastern portion of the site. The remaining portions of the site consist of forested wetland and mixed forested upland that occur within the 100-yr. floodplain to the Westfield River. The areas of the wetland and floodplain restoration include areas of invasive plant species.

5.2 Vegetation

All vegetation chosen to be planted in the ecological restoration areas was observed on or adjacent to the site. Other dominant native vegetation that contains high wildlife habitat value throughout the forested areas of the site will be used for the ecological restoration as described below. The purpose of revegetating the areas where the invasive plant species are being eradicated is to avoid these areas from becoming re-infested with invasive plant species. Re-vegetating areas once occupied by invasive plant species has shown these areas can be ecologically restored and will become re-established with native plants instead of invasive species (invasive plant species numbers typically dwindle to near zero in a few growing seasons). This results in effective restorations that cost less and are successful which occurs in a much shorter period of time, typically within one to two growing seasons for dominant nave plants when compared to just treating the invasive plant species.

The planting sequence will include planting the trees first at approximately 10 to 15 ft. on-center, then shrubs will be planted approximately 8 to 12 ft. on-center, followed by seeding. The spacing for most of the wetland restoration area and many portions of the floodplain will be at these planting densities but will not reflect this due to the existing shrubs and trees that have regrown or sprouted on their stumps. The proposed Planting Plan (refer to Attachment 4, Restoration Planting Plan) reflects the general locations of the new or regrowth of native shrubs and trees at the site. Once the plant stock is delivered to the site, the plants will be evaluated to ensure they are the proposed plants, they are delivered with the requested quantities of each plant species, and that they are healthy. The plants will be laid out within the ecological restoration area prior to planting. When all nursery stock is planted, the New England Wetmix will be applied to Wetland A in the areas where the invasive herbs have been removed and any other areas where the herbaceous layer has been damaged from the invasive plant species eradication. New England Conservation/Wildlife Seed Mix

will be applied to 100-yr. floodplain within the restoration area. The same native plant species that are located within the existing buffer zone with high wildlife habitat value will be planted in the restoration area.

There are numerous native trees, shrubs, and many herbs in the restoration area that have been estimated in our planting plan (refer to Attachment 4, Restoration Planting Plan). The densities of native plants have been estimated conservatively as any significant open areas in the vegetative cover following the two years of invasive plant species eradication plan will allow the invasive plants to repopulate and dominate these open patches. This would create additional time, costs, and effort to eradicate the invasive plant species from the restoration area.

The wetland restoration area will be seeded with New England Wetmix in the herbaceous layer within the boundaries of Wetland A and B where the herbaceous layer has been weeded or damaged from the invasive plant species eradication and with New England Conservation/Wildlife Seed Mix in the herbaceous layer in the remaining 100-yr. floodplain of the ecological restoration area where the invasive plant species have been removed. Planting of shrubs and trees will not be distinguished from wetland and 100-yr. floodplain as relatively the same in both areas. 15 Silky Dogwoods, 32 Highbush Blueberries, 22 Northern Spicebushes, 53 Southern Arrowwoods, 37 Common Witch Hazels, and 7 Common Winterberry in the shrub layer; and 27 Red Maples and 21 Pin Oaks trees for the tree layer (Refer to Table 1 below).

Table 1 Wetland Restoration Areas Planting Table

Plant Species	**# of Plants**	**Plant On Center**	**Plant Height**	**Size**
New England Wetmix Seed Mix application rates to bare wetland restoration areas: 1 lb./1,200 sq. ft.				
Northern Spicebush (*Lindera benzoin*)	22	8 – 10 ft.	18 - 24 in.	2 - 4 gal. container
Highbush Blueberry (*Vaccinium corymbosum*)	17	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Southern Arrowwood (*Viburnam dentatum*)	15	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Silky Dogwood (*Cornus amomum*)	13	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Common Winterberry (*Ilex verticillata*)	7	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Pin Oaks (*Quercus palustris*)	2	10 – 15 ft.	24-30 in.	2 - 4 gal. container
Red Maple (*Acer rubrum*)	8	10 – 15 ft.	24-30 in.	2 - 4 gal. container
The altered area of Wetlands A and B will include planting of 10 trees and 74 shrubs.				

Table 2 Floodplain Restoration Area Planting Table				
Plant Species	**# of Plants**	**Plant On Center**	**Plant Height**	**Size**
New England Conservation/Wildlife Seed Mix application rates to bare 100-yr. Floodplain areas: 1 lb./1,200 sq. ft.				
Highbush Blueberry (*Vaccinium corymbosum*)	15	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Common Witch Hazel (*Hamamelis virginiana*)	37	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Southern Arrowwood (*Viburnam dentatum*)	38	8 – 10 ft.	18 – 24 in.	2 - 4 gal. container
Pin Oaks (*Quercus palustris*)	19	10 – 15 ft.	24 – 30 in.	2 - 4 gal. container
Red Maple (*Acer rubrum*)	19	10 – 15 ft.	24 – 30 in.	2 - 4 gal. container
The altered floodplain restoration area will include planning of 38 trees and 90 shrubs.				

New England Wetmix seed mix will be used for the native herbaceous layer within Wetland A and B where invasive plants have been removed. This seed mix contains Fox Sedge (*Carex vulpiniodea*), Hop Sedge (*Carex lupullina*), Bearded Sedge (*Carex comosa*), Lurid Sedge (*Carex lurida*), Nodding Bur Marigold (*Bidens cernua*), Soft Rush (*Juncus effusus*), Grass-leaved Goldenrod (*Solidago graminifolia*), Blue Vervain (*Verbana hastata*), Boneset (*Eupatorium perfoliatum*), Flat-top Aster (*Aster umbellatus*), Hard-stem Bulrush (*Scirpus acutus*), Green Bulrush (*Scirpus atrovirens*), Woolgrass (*Scirpus cyperinus*), Sensitive Fern (*Onoclea sensibilis*), Spotted Joe-Pye Weed (*Eupatorium maculatum*), Water Plantain (*Alisma plantago-aquatica*), Soft-Stem Bulrush (*Scirpus validus*), and Ditch Stonecrop (*Penthorum sedoides*). The New England Wetmix will be applied at a rate of 800 sq. ft./lb. to Wetlands A and C.

New England Conservation/Wildlife Seed Mix will be used in the 100-yr. floodplain where invasive plants have been removed which includes: Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), and Upland Bentgrass (*Agrostis perennans*). The New England Erosion Control/Restoration Mix for Dry Sites includes: Red Fescue (*Festuca rubra*), Canada Wild Rye (*Elymus canadensis*), Annual Ryegrass (*Lolium multiflorum*), Perennial Ryegrass (*Lolium perenne*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*), Switch Grass (*Panicum virgatum*), Upland Bentgrass (*Agrostis perennans*). The Conservation Mix will be applied at a rate of 800 sq. ft./lb. to the restoration area.

Planting of the restoration area will follow the invasive plant species eradication plan and will likely occur in spring or fall 2027 or 2028 following the reduction in invasive plant species by at least 80% to 85%. The seeding for the ecological restoration area will only be spread in the spring as the seed mix contains plant seeds that are food sources for native animals and will often be eaten before they can germinate. The ecological restoration area will be planted with shrubs will be planted 8 to 12 ft. on center and trees will be planted 10 to 15 ft. on center. It is anticipated that the vegetation within the ecological restoration area will thrive (establishment of 75% or greater of the native plant species planted in the ecological restoration area) after two consecutive growing seasons. The success of the ecological restoration area will depend upon whether or not predicted conditions, such as normal or average seasonal weather, occur and are met within the ecological restoration area, and that the planting plan is closely followed.

An invasive plant species prevention plan is proposed to continue after the restoration plantings to ensure that the vegetation within the restoration area takes hold and is not dominated by invasive or opportunistic vegetation, a weeding program will be incorporated into this planting plan for all new seedlings. Potential sources of new infestations of invasive vegetation are onsite construction/maintenance equipment, local wildlife populations, or airborne seeds. Invasive plant species have been identified not only on the site in the existing buffer zone but also on the surrounding properties.

Watering of the vegetation is a concern for the success of the ecological restoration. Watering will likely need to occur if planting occurs in the fall or in the spring if we have a dry spring and/or summer.

5.3 Wildlife Habitat

All of the eight native plant species that are to be used in the ecological restoration area are native to the area and site and contain significant wildlife habitat value. According to Readington 1994 and DeGraaf 2002, small mammals, birds, reptiles, amphibians, and insects use these native plant species for feeding, breeding, and shelter.

5.4 Plan

A planting plan has been included as Attachment 7, Restoration Planting Plan that shows the location of the ecological restoration area plantings.

5.5 Stormwater Management

The ecological restoration areas will not receive storm water discharge from the proposed stormwater management system.

5.6 Erosion Control Plan

No sediment or erosion controls are currently proposed as the site is completely vegetated. Areas where invasive plants will be removed will be planted with shrubs and trees and seeded with herbaceous seed mixes.

5.7 Considerations During Construction

Proper scheduling and sequencing of events to prepare and complete work associated with the restoration area will be necessary for the wetland and floodplain restorations to be successful. This includes the eradication plan and planting within the restoration area as described below. The invasive plant species eradication plan will be conducted for the first one to two years to ensure that when the proposed restoration plants are planted, they aren't overtaken by invasive plant species. Prior to planting, the restorations areas will be inspected to ensure that most of the invasive plants have been eradicated. If 80% to 85% or greater removal of the invasive plant species has occurred, the planting of the ecological restoration area will commence. Proposed planting orders will be submitted to the restoration plant suppliers once it is determined that enough of the invasive plants have been eradicated in late summer and/or early fall of 2027. The proposed ecological restoration plantings will be ordered in late winter/early spring 2027 to ensure the availability of the plant stock for the restoration area.

5.8 Schedule & Sequencing

The restoration area must be constructed in a sequenced plan to ensure its success. The construction sequencing for the restoration area is listed below.

5.8.1 Invasive Plant Eradication

Weeding of the invasive plants will commence at the end of summer or early fall of 2024. The way in which the ecological restoration plan will be executed is described below in Section 5.8.1.1 Construction Sequencing.

5.8.1.1 Construction Sequencing

This section will be followed closely by the site's wetland scientist and the landscaping crew to ensure each task is completed in proper sequence and thoroughly to avoid additional contamination on and off the site of invasive plant species. If each step of the construction sequencing is performed fully and accurately, the ecological restoration should be successful.

1. In late summer and/or early fall of 2024, the wetland scientist will instruct the landscaping crew on how to identifying each invasive plant species at the seedling, juvenile and adult plant stages at the site. Each person's task(s) will be conveyed so that everyone will know who is weeding, cutting and removing the slash or plant matter and placing it in black contractor's bags. The location for the placement of full bags is along on the edge of the access drive where they will be picked up and either placed in an open area along the existing parking lot or move to another offsite location for solarization.
2. Once the instruction is completed, the eradication of invasive plant species will begin with weeding and cut-and-treat of larger woody plants along the northern and eastern extent of the site moving (moving south to west) around and in Wetland A and removal of the few invasive plants from the cut area of Wetland B.
3. A transect that is approximately 20 ft. wide will be established to keep trampling of the native vegetation to a minimum and to focus on the invasive plants in the transect so none are missed.
4. The herbicide applicator with the MA Herbicide Applicator's License will dab the cut stalk or stump of the invasive plants along the path of the transect as needed.
5. Upon completion of the invasive plant species removal and treatment, all slash or plant waste (except for the trunks and large branches from the trees and shrubs that don't contain any seeds or fruits) will be collected and put into black contractor's bags. All personnel that have been in the field will have to be inspected for any plant materials, especially seeds, berries, and roots. Once all personnel have been inspected and cleaned off with a lint roller and nylon brush. Any dirt from boots, lint rollers, and brushes and dust pans will be discarded into the remaining plant materials bag.

6. In spring 2027, the area will be inspected in late April or early May to determine the extent of regrowth or new invasive plant species. If less than 20% are present, planting could begin.
7. If a fall 2027 planting is proposed, the areas of invasive plants will be inspected at the end of August to determine if another treatment is necessary prior to planting and what level of weeding, cutting and treatment is needed to eradicate new and plants with regrowth.
8. Planting will include coordinating the plant stock ordering, establishing a staging area, evaluating plant stock once it arrives on the site.
9. Prior to planting, the shrubs and trees will be laid out in the locations by the site's wetland scientist and proper planting procedures will be discussed and monitoring of planting will occur by the wetland scientist to ensure the plants are planted properly according to the Restoration Planting Plan.
10. Shrubs will be planted 8 to 12 ft. apart and trees will be planted 10 to 15 ft. apart.
11. The seed mixes for the herbaceous area will be cast across the bare areas of the ecological restoration areas at a rate of 1 lb./1,200 sq. ft.
12. All plants will be watered immediately following planting.
13. The restored ecological restoration areas will be inspected by the wetland scientist following planting.
14. **All activities described in #1 through #12 will be supervised and authorized by the wetland scientist until completed and approved.**
15. **Activities listed above are subject to change due to site conditions, weather, failure of equipment or other unforeseen issues that may arise and will be addressed by the supervising wetland scientist.** If any changes do occur, they will be documented and discussed in full detail in the first report to the Conservation Commission, MassDEP and the U.S. Army Corps of Engineers following completion of the restoration area.

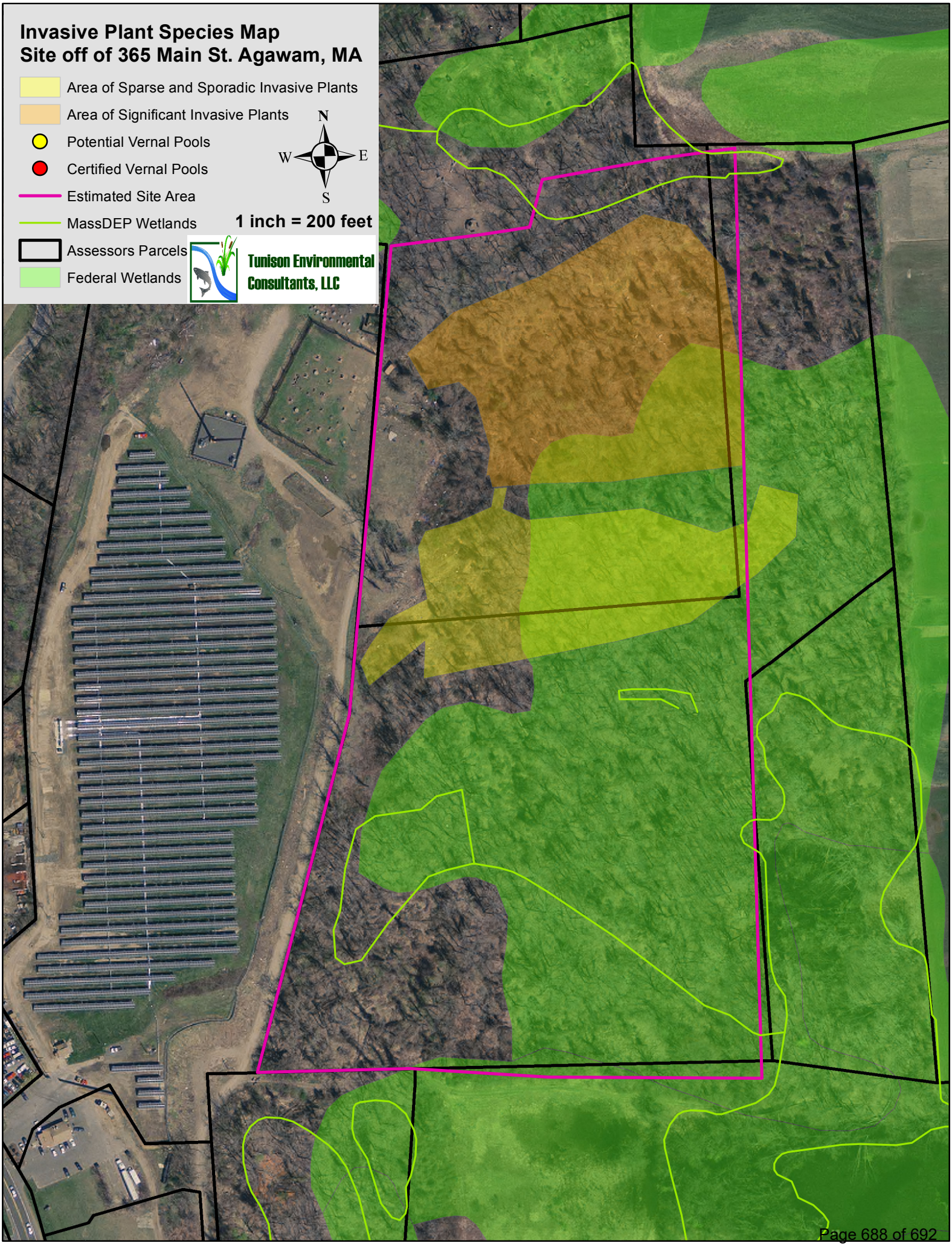
5.9 Ecological Restoration Monitoring

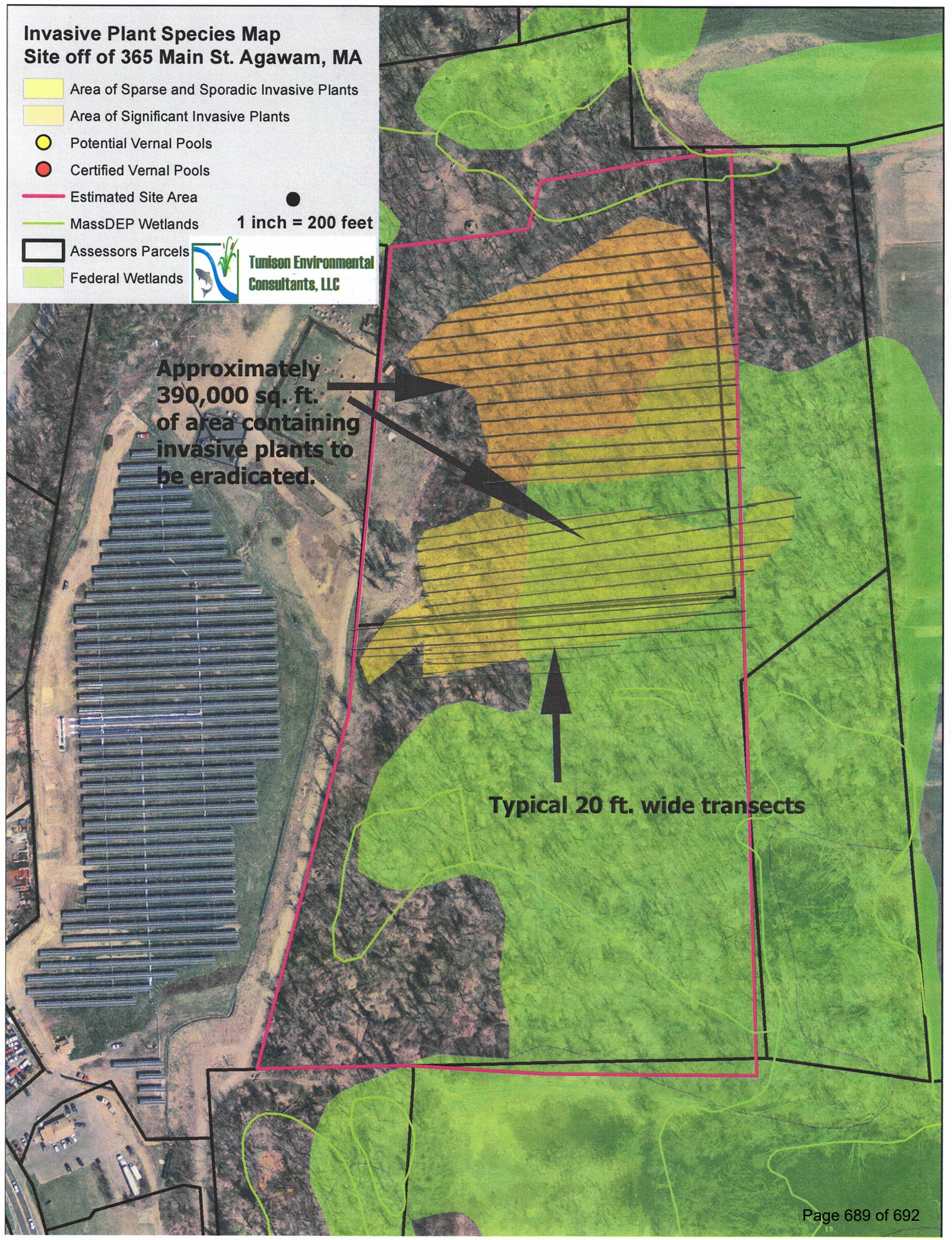
Monitoring of the restoration area will occur twice (during spring and fall) following planting to observe the health of the plantings and to determine when watering is necessary during the first growing season and if there are any issues with the plants. A quick monitoring will be performed twice in the first one to two weeks following the planting to ensure the plants aren't in shock (are healthy) and there isn't any evidence of animals eating the plants. Monitoring at the end of the growing seasons for both years will include observing the health of the plantings and to evaluate any replaced plantings. This monitoring will include evaluating the location of each shrub and tree planted, health of the vegetation, the overall success of the wetland restoration and BLSF restoration area, and to set two sample plot monitoring locations to evaluate the wetland restoration area based on percent coverage of wetland vegetation and to sample soils in the center of each sample plot. One sample plot location will be established within the BLSF area restoration. The plots will be marked in the field with flagging tape and marked "TEC Sample Plot 1", "TEC Sample Plot 2" and "TEC Sample Plot 3". Any dead or significantly stressed vegetation will be marked with flagging tape and will be photographed and discussed in the monitoring report. The area of the wetland restoration will be documented for hydrology, wetland vegetated coverage, soils, potential for erosion, colonizing wetland plant species, any evidence of invasive plants, signs or observation of wildlife utilization, and the ability of the wetland restoration to blend into or become part of the adjacent existing wetland system. The 100-yr. floodplain will be monitored for all parameters of the wetland restoration area minus the hydrology. If any plantings are dead, they will be marked with flagging tape, their location within the restoration area will be marked on a plan and the plant species will be documented both in field notes and in the monitoring report.

Access to the restoration area will be limited to prevent damage to the vegetation and disturbance of the soils. Water will be obtained onsite and vegetation will be watered by hose or by buckets during the first month after planting if necessary. If a drought or extreme wet weather occurs, monitoring will be increased and necessary action taken to prevent damage or stress to the plantings. The restoration area will also be monitored to ensure invasive or unwanted plant species from becoming established during the two site visits. If invasive or unwanted species are found in the restoration area, a weeding program will be implemented to remove these species.

The first year of monitoring will include two site visits during the first full growing season, in early summer and late September. Each site visit will involve inspecting and documenting any changes in the health and growth of the planted vegetation. Photographs of the restoration area will be taken to show how the vegetation throughout these areas has fared. The locations of where the photos were taken will be marked for subsequent site visits. Photos of planted vegetation and volunteer species will be taken and included in the monitoring reports. A qualified wetland scientist will conduct all inspections of the

restoration area for plant vitality, vegetational coverage, and any potential erosion or sedimentation in the restoration area. A report regarding the inspection will be completed and submitted to the Agawam Conservation Commission, MassDEP and the Army Corps of Engineers after every inspection. A yearly monitoring report will be prepared after each growing season to document the yearly success.


Invasive Plant Species Map
Site off of 365 Main St. Agawam, MA
Area of Sparse and Sporadic Invasive Plants
Area of Significant Invasive Plants
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
MassDEP Wetlands
Assessors Parcels
Federal Wetlands
N
W
E
S
1 inch = 200 feet
Tunison Environmental Consultants, LLC


Invasive Plant Species Map
Site off of 365 Main St. Agawam, MA
Area of Sparse and Sporadic Invasive Plants
Area of Significant Invasive Plants
Potential Vernal Pools
Certified Vernal Pools
Estimated Site Area
MassDEP Wetlands
Assessors Parcels
Federal Wetlands
1 inch = 200 feet
Tunison Environmental Consultants, LLC
Approximately 390,000 sq. ft. of area containing invasive plants to be eradicated.
Typical 20 ft. wide transects

AGAWAM CONSERVATION COMMISSION
August 27, 2026

MEMBERS PRESENT:
Henry Kozloski, Chair
Sheryl Becker
Frank Meagher
Laura Fallon

MEMBERS ABSENT:
Jill Ward
Keven Brown
Magda Galiatsos

ALSO PRESENT:
Taryn Egerton
Stefanie Kesecker

Mr. Kozloski called the meeting to order at 6:00pm.

1. 6:00PM Public Hearing-Abbreviated Notice of Resource Area Delineation-1399 Suffield & Parcel 2 Suffield Street-Charlie's Garden Park

Filipe Cravo, R. Levesque Associates and the applicants Clark Dore, Harold Murphy, and Nick Zelley were present for this agenda item. He stated this is the property known as Twin Silos. The application has been submitted to the DEP and they are awaiting the file number and comments from DEP. Mr. Cravo there is an existing commercial building that runs along Route 75 and will remain. He stated at Suffield and South Streets there is a perennial stream that runs west to east and has associated Riverfront area. He stated there are plans for future development of the property, but this application is just to establish the median annual high water line. Mr. Cravo also requested an onsite visit with the Commission. Mr. Cravo requested to continue this agenda item to the September 10, 2026 meeting.
Mr. Meagher stated a peer review of the property would be necessary.

Motion was made by Mr. Meagher and seconded by Ms. Fallon to require a peer review of the 1399 Suffield Street & Parcel 2 Suffield Street for Charlie's Garden Park.

VOTE 4-0-0

Mr. Kozloski opened the hearing for public comment and there was none.

Motion was made by Mr. Meagher and seconded by Ms. Becker to continue the Public Hearing for the Abbreviated Notice of Resource Area Delineation for 1399 Suffield Street & Parcel 2 Suffield Street for Charlie's Garden Park to the September 10, 2026 meeting as requested.

VOTE 4-0-0

2. Public Hearing Cont.-Notice of Intent-Adams Street Culvert –Town of Agawam

R.J. Dowling, Woodard & Curran was present for this agenda item. He stated since the last public hearing the Commission performed a site visit on August 18, 2026.
Mr. Kozloski asked if the trees on the north side of the project would be taken down. Mr. Dowling stated some trees near the existing culvert will be taken down.
Mr. Kozloski asked if there will be a decrease in the flooding on the north side, considering the elevation and the stream that comes in from the west. Mr. Dowling stated it will decrease the flooding and a hydraulic study supported this. He stated from Three Mile Brook it flows through Elm Street Culvert before coming to Adams Street. He stated the water surface elevation will be reduced because the water will no longer be impounded in the existing 8ft. culvert, but will now flow through a 19ft. area and the velocity will be reduced. The existing culvert is creating the restraint and when it is removed the water will come through at a lower velocity and elevation.
Mr. Kozloski stated the Commission would require a sequential and dewatering plan.
Mr. Meagher stated his concern was the narrowness of the street and how the bypass would work. Mr. Dowling the water would be impounded and put in a diversion pipe, with pumping used if necessary, and potential coffer dams or sheet piles will be utilized. Mr. Meagher asked if the bypass pipe would be outside the culvert. Mr. Dowling stated yes.
Ms. Fallon asked how long the road would be closed. Mr. Dowling stated 4-6 months.
Mr. Kozloski asked if the staging area would be on the west side. Mr. Dowling stated there may also be offsite staging area, but the contractor would secure the location.
Mr. Meagher asked if there would be provisions for a camera. Mr. Dowling stating it can be put in the Order of Conditions.

Mr. Kozloski opened the hearing for public comment and there was none.

Motion as made by Ms. Becker and seconded by Mr. Meagher to close the Public Hearing for the Notice of Intent for the Adams Street Culvert for the Town of Agawam.

VOTE 4-0-0

The Commission wrote the Order of Conditions.

Motion was made by Mr. Meagher and seconded by Ms. Becker to issue the Order of Conditions for the Adams Street Culvert as written.

VOTE 4-0-0

3. Public Hearing Cont.-Notice of Intent-365 Main Street-O'Malley

The Commission received a request to continue this agenda item to the September 10, 2026 meeting.

Motion was made by Mr. Meagher and seconded by Ms. Fallon to continue the Public Hearing for the Notice of Intent for 365 Main Street for O'Malley to the September 10, 2026 meeting as requested.

VOTE 4-0-0

4. Approval of Minutes-August 13, 2026

Motion was made by Ms. Becker and seconded by Mr. Meagher to approve the August 13, 2026 minutes as written.

VOTE 3-0-1(Fallon)

5. Correspondence and Complaints

35 Winthrop Street and 136 Parker Street-The Enforcement Orders were turned over to the Law Department and the Town Solicitor has sent letters to both property owners.

10 River Street-The owner of the location called and has been working on finding a consultant to do a Notice of Intent.

Motion was made by Ms. Becker and seconded by Mr. Meagher to adjourn the meeting.

VOTE 4-0-0

Meeting adjourned at 6:45pm.

DRAFT