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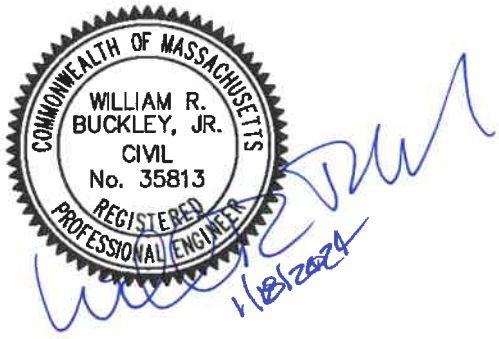
Storm Water Management Report
Ridge Road
Foxborough, MA



January, 2024

Prepared for:

FED CAP, Inc.
P.O. Box 669
Foxborough, MA 02035

Table of Contents:

1.0 Introduction

The project involves the construction of 389+/- feet of roadway and 4 single-family homes on a 7.13+/- acre parcel of land located on the northeasterly side of Ridge Road about 0.45 miles north of the intersection with Chestnut Street. The property is bordered by a small section of vacant land to the northwest, the Neponset Reservoir to the north and east, residential properties to the south and Ridge Road to the west.

Bay Colony Group, Inc. conducted a storm water management study to ensure that the proposed project meets the ten MA DEP Stormwater Management Standards, the storm water standards outlined in the Town of Foxborough Subdivision Control Regulations, and standard engineering practice. The scope of this study includes:

- Determining existing storm water conditions;
- Developing proposed storm water conditions;
- Designing a storm water management system.

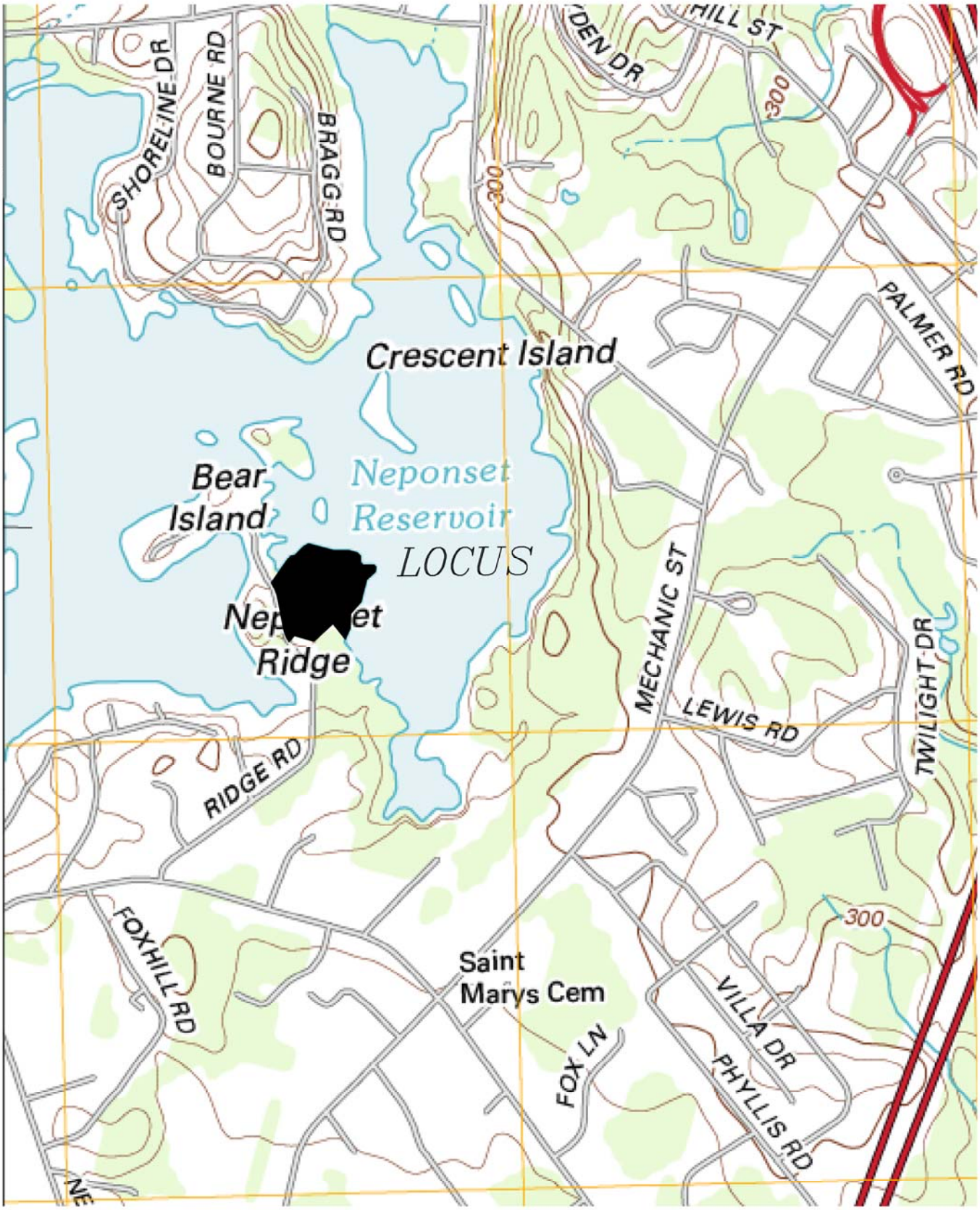
2.0 Existing Conditions

The property consists of two parcels (Map 35, Parcel 006 & 007) of land totaling approximately 7.13-acres that is currently undeveloped and consist of a wooded area. The property slopes up from Ridge Road to a high point in the central portion of the property at elevation 304' before sloping down to the Neponset Reservoir at elevation 268'. The resource areas onsite include Bordering Vegetated Wetlands (BVW), Inland Bank (IB) and Bordering Land Subject to Flooding.

The NRCS has logged the soils on the site as Hinckley fine sandy loam **Appendix F.** Hinckley fine sandy loam is classified as an A soil. BCG conducted soil evaluations throughout the site to determine the general soil condition, depth to ground water and depth to refusal in order to design a storm water system in accordance with the DEP Stormwater Standards and septic systems in accordance with the State Sanitary Code, Title 5. A laboratory sieve analysis was run on the samples under the two infiltration basins and the textural analysis determined the soils under Basin #1 are SAND and under Basin #2 are SANDY LOAM. According to the RAWLS table found in the DEP Stormwater Management Standards, Volume 3, Chapter 1 yields an infiltration rate of 8.27 inches per hour for SAND and 1.02 inches per hour for SANDY LOAM. All test holes and percolation test for the septic systems were witnessed by the Town of Foxborough Health Agent. Copies of the soil logs and laboratory textural analysis are included in **Appendix F** and the locations of the test pits are shown on the topographic plan sheets **Sheet 3**.

3.0 Flood Condition Analyses and Flood Control

The storm water management system will consist of roof drainage, roadway drainage (runoff collection, pretreatment, and conveyance) and flood control and treatment. This report will concentrate on the storm water basin designs, the ten DEP storm water management standards and the Town of Foxborough performance standards.



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USGS QUADRANGLE EXTRACT
RIDGE ROAD
FOXBOROUGH, MA
MANSFIELD QUADRANGLE
SCALE: 1"= 1000'

The proposed design will achieve flood control through the use of two infiltration basins. All runoff from the roadways will be pretreated by deep sump catch basins with oil traps before being discharged into Stormceptors (or equivalent) and then to the infiltration basins, which all contain sediment forebays. The forebays have been designed in accordance with the MassDEP standards (**see Sheet 7**). All of the runoff entering the basins will meet the 44% TSS removal requirement necessary since they are located within a Zone II.

Infiltration Basin #1 is located in the northwest portion of the site at the back of Lot 1. It will capture the runoff from a portion of the roadway and Lots 1 and 4. Infiltration Basin #2 is located in the northeast portion of the site on Lot 3 in an existing low area. Designed similar to the first basin in that it will capture the runoff from a portion of the roadway and Lots 2 and 3. Both infiltration basins will accommodate all of the runoff, up to and including the 100-year storm event with no runoff. The basins will ensure that the post-development condition is less than the pre-development condition. Both infiltration basins will also contain a traprock overflow weir that will be located above the projected 100-year storm elevation. The closed roadway drainage system was designed using the Rational Method with the capability of handling a 25-year storm event in accordance with the Foxborough rules and regulations. The spreadsheet summary of the system is attached to this report in **APPENDIX D**.

The current land uses are primary and secondary growth woods. Proposed land uses include a subdivision roadway, driveways, lawn, landscape, and woods. The land uses for existing and proposed conditions are summarized in **Tables 1a** and **1b**. We have chosen 3 study lines to develop the existing and proposed condition models. Subarea EA is located in the in the western portion of the property along Ridge Road and drains to Ridge Road. Subarea EB is located in the southern portion of the property and drains to the southern property line. Subarea EC is a majority of the site located in the in the eastern and northern portion of the property and drains to the Neponset Reservoir. See the plan in **Appendix A – Existing Subareas**.

Table 1a – Summary of Existing Land Uses

Subarea	Total Area (acre)	Land use	Area (acre)
EA	0.92	Woods, Good, HSG A	0.92
EB	1.10	Woods, Good, HSG A	1.10
EC	5.11	Woods, Good, HSG A	5.11
Total:	7.13	Total:	7.13

For the proposed conditions the watershed is divided into five separate subareas. We have assumed each lot will have a 2,076-sf house footprint. Subarea PA is located in the western portion of the site along Ridge Road and flows to Infiltration Basin #1. Subarea PB is

located in the central portion of the site and flows to Infiltration Basin #2. Subarea PC is located in the southwest portion of the site and will sheet flow to Ridge Road. Subarea PD is located in the southern portion of the site and sheet flows to the southern property line. Subarea PE is the remainder of the site and flows to the Neponset Reservoir. See the plan in **Appendix A – Developed Subareas.**

Table 1b – Summary of Proposed Land Uses

Subarea	Total Area (acre)	Land use	Area (acre)
PA	1.39	Paved Parking, HSG A	0.07
		Paved roads w/curbs & sewers, HSG A	0.17
		>75% Grass cover, Good, HSG A	0.99
		Unconnected roofs, HSG A	0.10
		Water Surface, HSG A	0.06
PB	1.37	Paved Parking, HSG A	0.07
		Paved roads w/curbs & sewers, HSG A	0.23
		>75% Grass cover, Good, HSG A	0.85
		Water Surface, HSG A	0.12
		Roofs, HSG A	0.10
PC	0.20	>75% Grass cover, Good, HSG A	0.14
		Woods, Good, HSG A	0.06
PD	0.51	>75% Grass cover, Good, HSG A	0.18
		Woods, Good, HSG A	0.33
PE	3.66	>75% Grass cover, Good, HSG A	2.67
		Woods, Good, HSG A	0.99
Total:	7.13	Total:	7.13

The runoff conditions based on the land uses in **Tables 1a** and **1b** are summarized in **Table 2** and detailed calculations can be found in **Appendix A**. Storm water control is necessary due to the change in land use.

Table 2: Summary of Peak Runoff (cfs) at the Study Points

Condition		2-year (cfs)	10-year (cfs)	100-year (cfs)
Existing Conditions	Ridge Road	0.0	0.0	0.0
	Southern Property Line	0.0	0.0	0.0
	Neponset Reservoir	0.0	0.0	0.1
Proposed Conditions	Ridge Road	0.0	0.0	0.0
	Southern Property Line	0.0	0.0	0.0
	Neponset Reservoir	0.0	0.0	0.1

The detailed storm routing calculations are attached in **Appendix A**. The infiltration rates used were those outlined in the RAWLs Table in the DEP Stormwater Management Standards and was discussed in **Section 2.0 Existing Conditions**.
The on-site runoff collection and conveyance system (catch basins and pipes) are designed based on the Rational Method and the TP40 25-year design storm. Details of the inverts and rims can be found on the site plans and **Appendix D**.

4.0 Stormwater Management

The site is located in a Water Resource Protection Overlay District (Zone II). There are no other critical areas downgradient of the project site based on 314 CMR 4.00 (Massachusetts Surface Water Quality Standards). There are no certified vernal pools on or near the site. The DEP Stormwater Standards apply to this proposed project and the project design is based on the latest edition of these documents.

DEP STORMWATER MANAGEMENT STANDARDS

Standard #1: NO UNTREATED DISCHARGE OR EROSION TO WETLANDS

No untreated stormwater from the proposed project area will be discharged to a resource area. Runoff from all pavement will be discharged to deep sump catch basins equipped with "Snout" water quality elbows, then to a Stormceptor and finally to the above-ground storm water basin. This treatment train will achieve a TSS removal rate of 97%, which exceeds the DEP standard of 80% TSS Removal. All of the outfalls have been designed to accept the maximum flow from the basin without causing erosion in the soils **Appendix B**.

Standard #2: PEAK RATE ATTENUATION

Stormwater controls have been designed for 2, 10, and 100-year storms according to both state and local regulations. Measurement of peak discharge rates is calculated at a design point, typically the lowest point of discharge at the downgradient property line (Massachusetts Stormwater Handbook, Vol. 1, Ch. 1, P.5). This design ensures that the post-development peak rates of runoff do not exceed the pre-development conditions at any of the design points chosen. Proponents must also evaluate the impact of peak discharges from the 100-year storm. If this evaluation shows that increased off-site flooding will result from peak discharge from the storm then BMPs must also attenuate that discharge (Massachusetts Stormwater Handbook, Vol. 1, Ch. 1, P.5). In this case, the post-development peak rates for the 100-year event are less than the pre-development condition **Table 2.**

Standard #3: STORMWATER RECHARGE

1) The proposed project is located on a plot with hydrologic class A soils based on the NRCS soil survey and the target depth factor for an A soil is 0.6 inches. Soil textural analyses have been conducted under the infiltration basins where recharge

is proposed and Basin #1 is a SAND and Basin #2 is a SANDY LOAM. The RAWLS rate for SAND is 8.27 inches per hour and for a SANDY LOAM is 1.02 inches per hour. These rates will be used for the recharge calculations. The calculations for the separate subareas recharge volume are located in **Appendix B**.

2) The infiltration BMPs that will be used will be the above-ground infiltration basins as well as roof recharge systems for each house which will be designed to capture the first 2" of runoff. The individual systems have not been included in the Inflow-Outflow analysis in order for the basin design to be conservative. The calculations for the separate subareas recharge volumes are located in **Appendix B**.

3) The infiltration basins are located in a Zone II as well as an area of rapid infiltration, the TSS removal must be at least 44% before the water reaches the basins. Largely due to the use of the Stormceptors in the treatment train, the TSS removal is approximately 97% and so the standard is met **Appendix B**.

4) Using the RAWLS rates for the different infiltration basins shows that the drawdown of the Required Recharge Volume will take 3 hours in Basin #1 and 4.5 hours in Basin #2. Both of these values meet the required 72 hours dewatering standard **APPENDIX B**.

5) Capture area adjustment is not necessary since all of the infiltration will take place within the infiltration basin.

6) A mounding analysis is necessary under the Infiltration Basin #2 per the DEP Stormwater Standards since the vertical separation from the bottom of the basin and the estimated high ground water elevation is less than 4'. In accordance with the "Simple Dynamic" methodology, the RAWLS rate is used as the hydraulic conductivity and the mounding analysis assumes that the Required Recharge Volume is applied during a 2-hour period during the storm. The specific yield at the basins is based on the USDA Textural Analysis and USGS Water Supply Paper 1662-D **Appendix F**. The model used is the AQTESOLV V.4.50.002 program that uses the ground water mounding solution by Hantush (1967). The analysis found that the top of the mound is below the bottom of the basin. Therefore, the mound does not breache the bottom of the pond and will not impact the ability of the basin to drain within 72 hours as was previously discussed. **Appendix B**

Standard # 4: WATER QUALITY

1) The required water quality volume is based on the amount of impervious area and 1.0 inch water quality depth. An analysis was performed which calculates the WQV and demonstrates that the basins can contain that volume prior to discharge **Appendix B**.

2) The BMPs used for the proposed project to enhance water quality include: deep sump catch basins, Stomrceptors, forebays and infiltration basins. All of the runoff

from the roadways will go through a deep sump catch basins with "Snout" water quality elbows and Stormceptors before being conveyed to the above-ground infiltration basins. Roof runoff will be infiltrated through direct discharge to individual on-site infiltration systems. The estimated overall TSS removal for the treatment train will be greater than 80% **Appendix B.**

3) Because the infiltration basins are being used to fulfill the requirements of Standards 3 and 4 they must handle the larger of the water quality volumes. Basin #1 has a Water Quality Volume of 0.0283 ac-ft and a storage volume of 0.091 ac-ft below discharge. Basin #2 has a Water Quality Volume of 0.0333 ac-ft and a storage volume of 0.220 ac-ft below discharge. **Appendix B**

Standard # 5: LAND USES WITH HIGHER POTENTIAL POLLUTION LOADS

The site will consist of a typical residential subdivision, which is not considered to have a high potential pollutant load. The site will be compatible with the surrounding environment, which is a residential area.

Standard #6: CRITICAL AREAS

According to 314 CMR 14.400 and MASS GIS the project site lies within a Zone 2. Therefore, the storm water system must meet enhanced requirements outlined in the DEP Stormwater Management Standards. These include a Required Water Quality Volume of 1" of the impervious area. This standard is being used in the design as discussed in Standard 4. At least 44% TSS removal must take place prior to discharge to a recharge BMP as shown in Table 4. This standard is being met as discussed in Standard 4 and **Table 3.** Proprietary BMPs must be verified by TARP or STEP and the Stormceptor has been verified by STEP **APPENDIX B.** To mee the standard we chose to utilize the BMPs discussed in the DEP standards, Volume 1, Table CA 3, Standard 6. The pretreatment BMPs being proposed include: deep sump catch basins, proprietary separators, and sediment forebays. The proposed infiltration BMPs are infiltration trenches and infiltration basins. These pretreatment BMPs and infiltration BMPs are "highly recommended" in the aforementioned standard.

Standard #7: REDEVELOPMENT

The proposed activity is not a redevelopment project.

Standard #8: CONSTRUCTION PERIOD CONTROLS

Silt sock barriers will be installed at the downgradient limits of work before any excavation starts. A stone pad shall be spread at the entrances from the existing roadway to the project site to prevent mud from escaping the site during construction. Silt sacks will be installed within the catch basins.

A Draft Stormwater Pollution Prevention Plan has been developed in accordance with the EPA General Permit for Construction Activities. A final SWPPP will be prepared once the construction schedule is finalized and the contractors are chosen. A copy of the Draft SWPPP is included in **Appendix E**

Standard #9: OPERATION AND MAINTENANCE PLAN

Pre- and Post-Development Operation and Maintenance Plans have been developed for the project **Appendix C**.

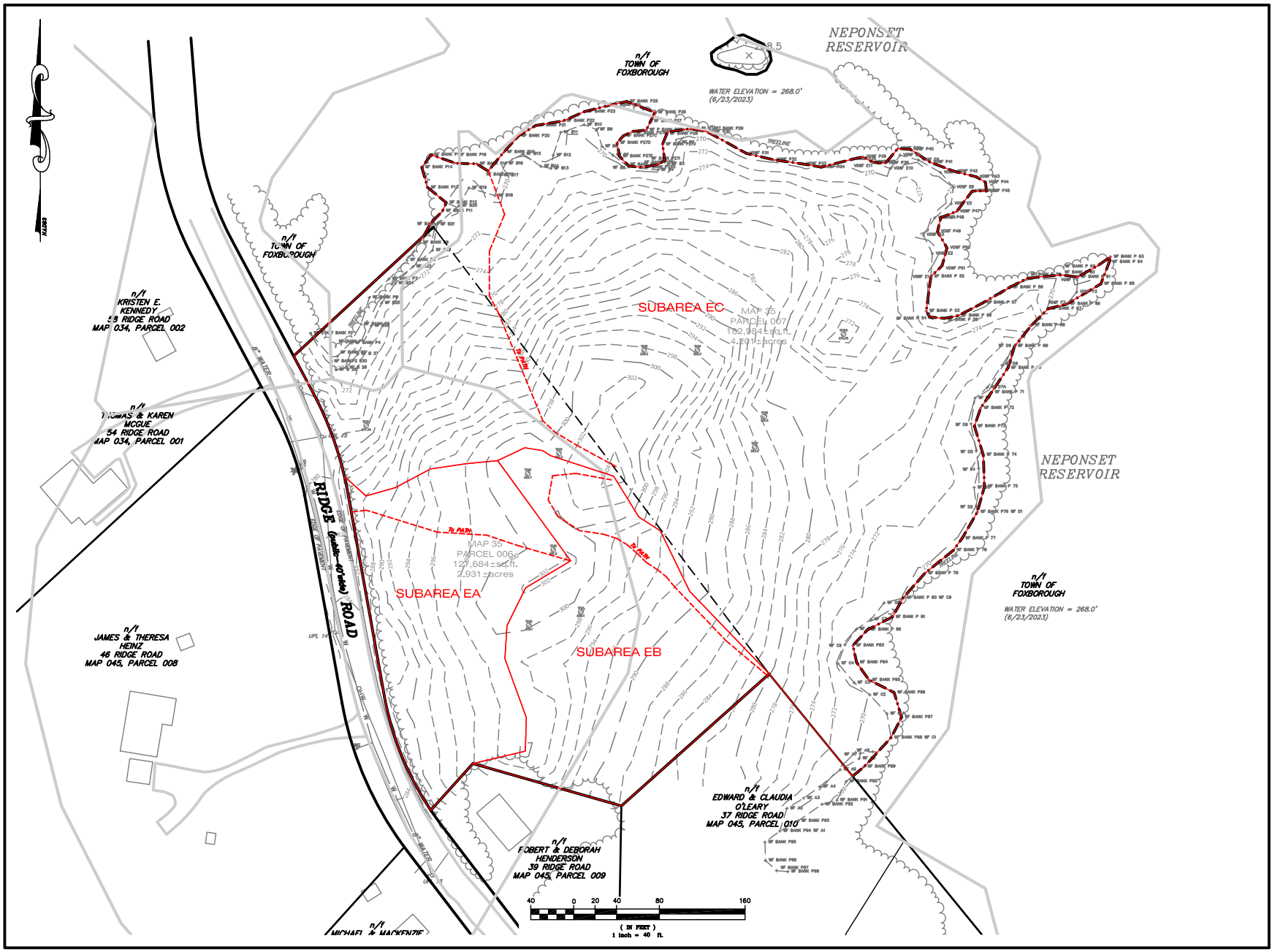
Standard # 10: ILLICIT DISCHARGES TO DRAINAGE SYSTEM

I certify to the best of my professional knowledge, information and belief that there are no illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease. The proposed systems as shown on the referenced plans do not allow entry of any illicit discharges into the system and there are no connections between the stormwater and wastewater management systems.

To be signed prior to construction _____
Owner

_____
Date

APPENDIX A – Pre- and Post-DEVELOPMENT ANALYSIS AND STORM WATER BASIN DESIGNS



PROJECT:

Ridge Road
Foxborough, MA
02035

OWNER:

FED CAP, Inc.
P.O. Box 669
Foxborough, MA
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Professional Civil Engineers & Professional Land Surveyors
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508-543-3939

REFERENCES:

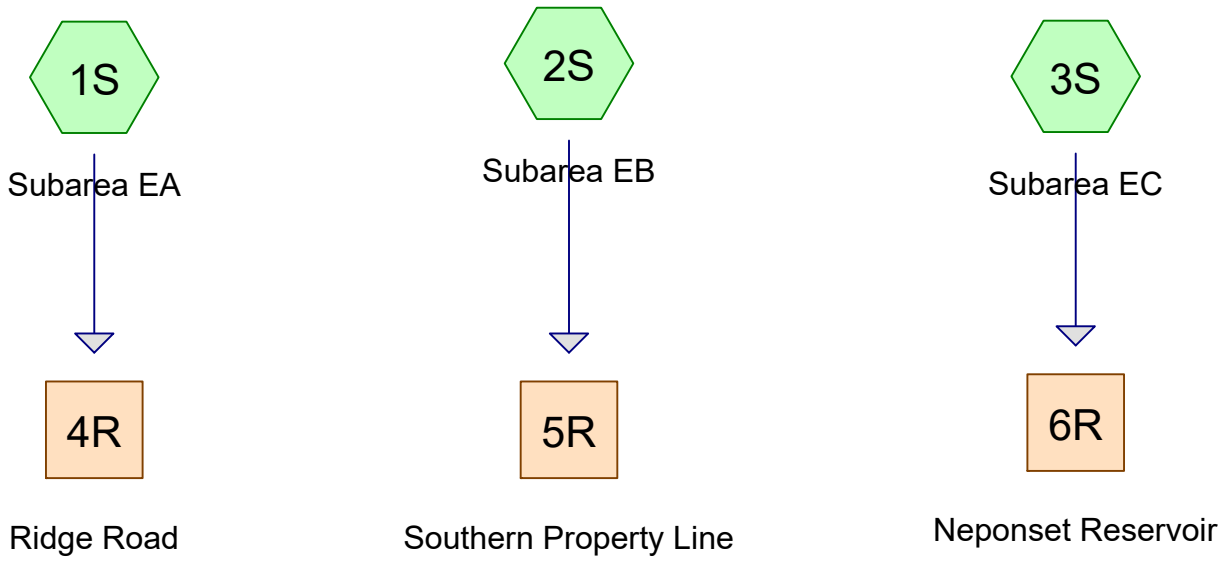
STAMP

DRAWING TITLE

Existing Subareas

SCALE: 1" = 40'

JAN. 5, 2024	SHEET NUMBER
23-0138D	EX



Subcat Reach Pond Link

Routing Diagram for 23-0138 Existing
Prepared by Bay Colony Group, Printed 1/11/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.130	30	Woods, Good, HSG A (1S, 2S, 3S)
7.130	**30**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
7.130	HSG A	1S, 2S, 3S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
7.130		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea EA Runoff Area=0.920 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=10.3 min CN=30 Runoff=0.0 cfs 0.000 af

Subcatchment 2S: Subarea EB Runoff Area=1.100 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=347' Tc=11.6 min CN=30 Runoff=0.0 cfs 0.000 af

Subcatchment 3S: Subarea EC Runoff Area=5.110 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=330' Tc=11.2 min CN=30 Runoff=0.0 cfs 0.000 af

Reach 4R: Ridge Road Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 5R: Southern Property Line Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 6R: Neponset Reservoir Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 7.130 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Subarea EA

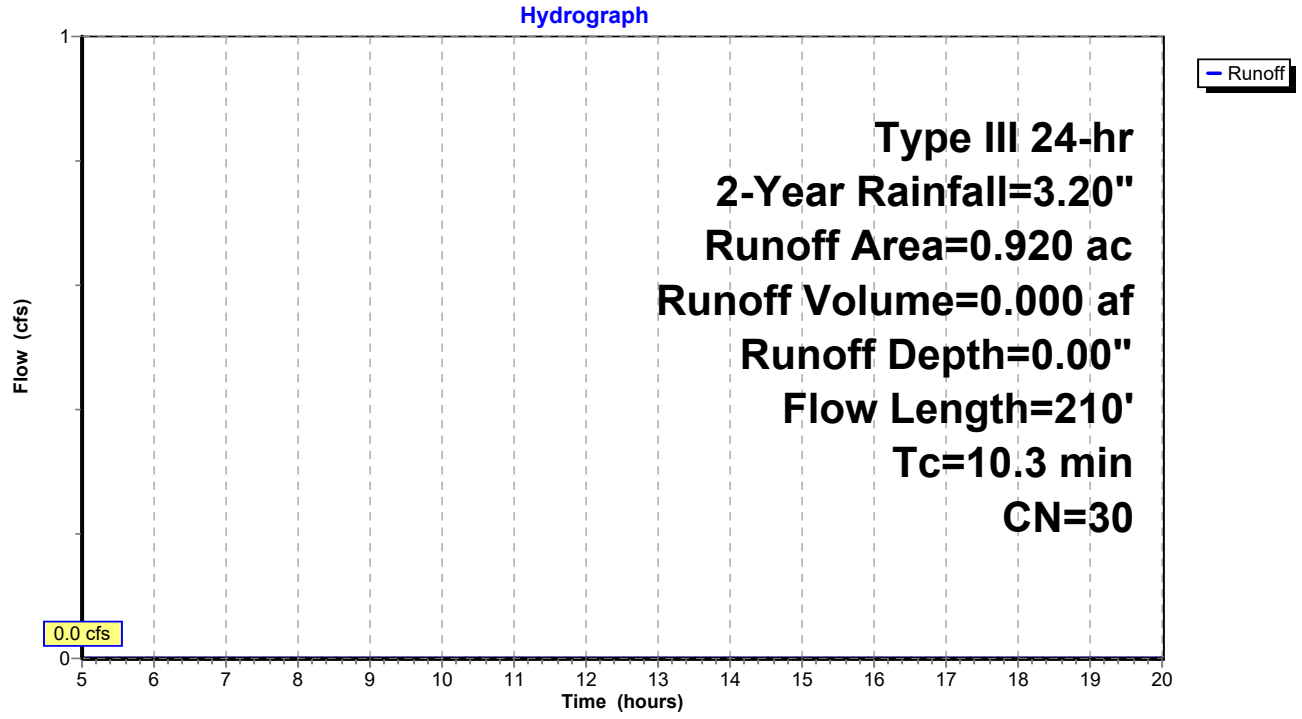
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 4R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
0.920	30	Woods, Good, HSG A
0.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	160	0.0870	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.3	210	Total			

Subcatchment 1S: Subarea EA



Summary for Subcatchment 2S: Subarea EB

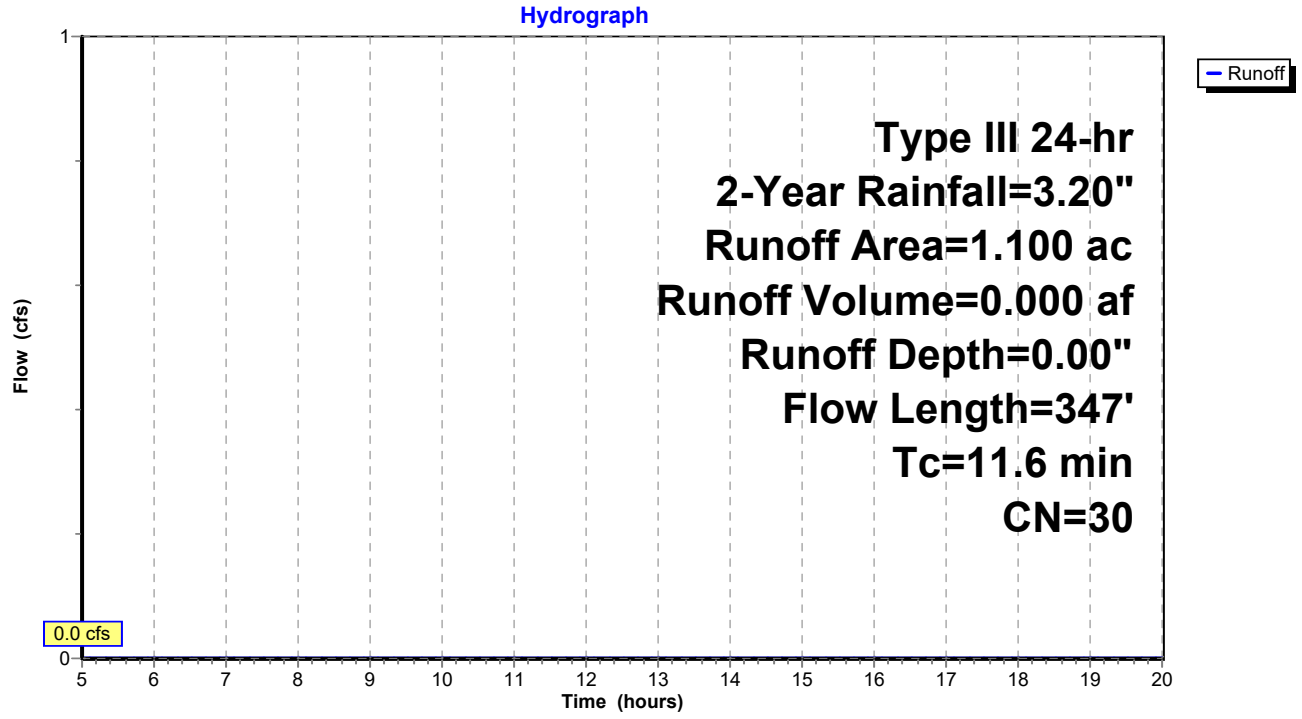
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 5R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
1.100	30	Woods, Good, HSG A
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.7	297	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.6	347	Total			

Subcatchment 2S: Subarea EB



Summary for Subcatchment 3S: Subarea EC

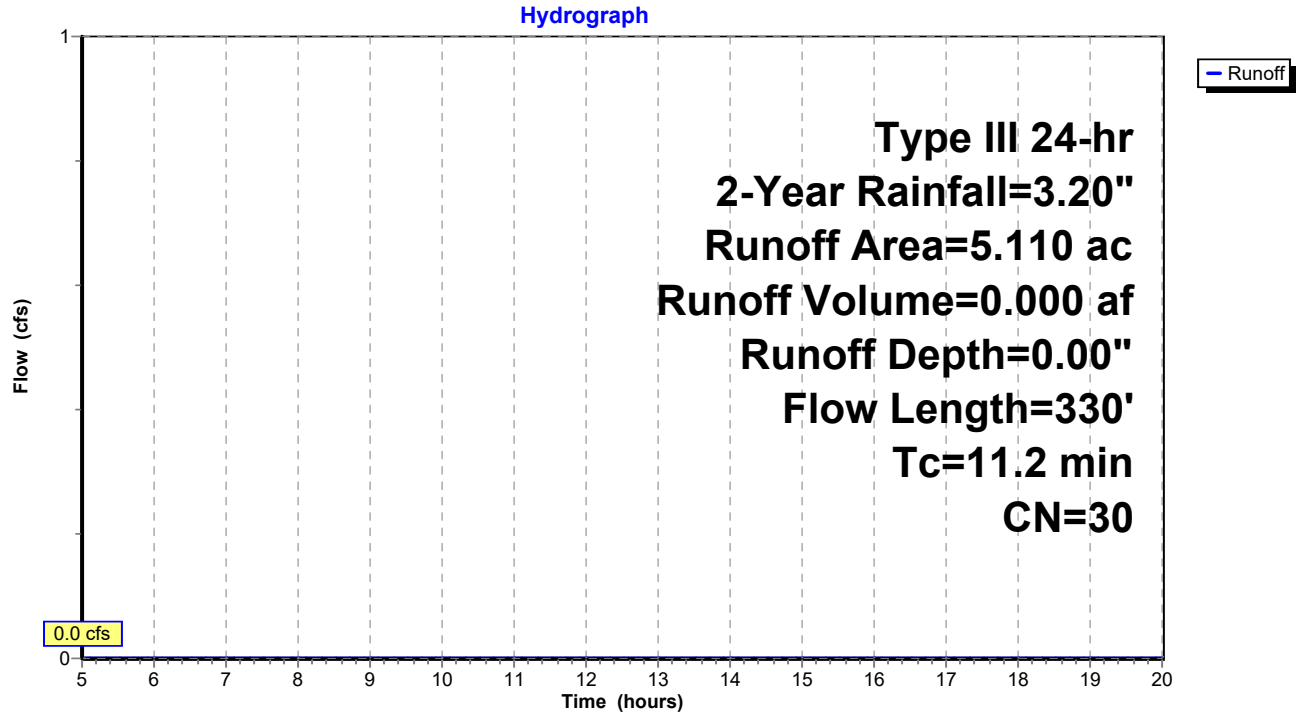
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 6R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
5.110	30	Woods, Good, HSG A
5.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0520	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	280	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	330	Total			

Subcatchment 3S: Subarea EC

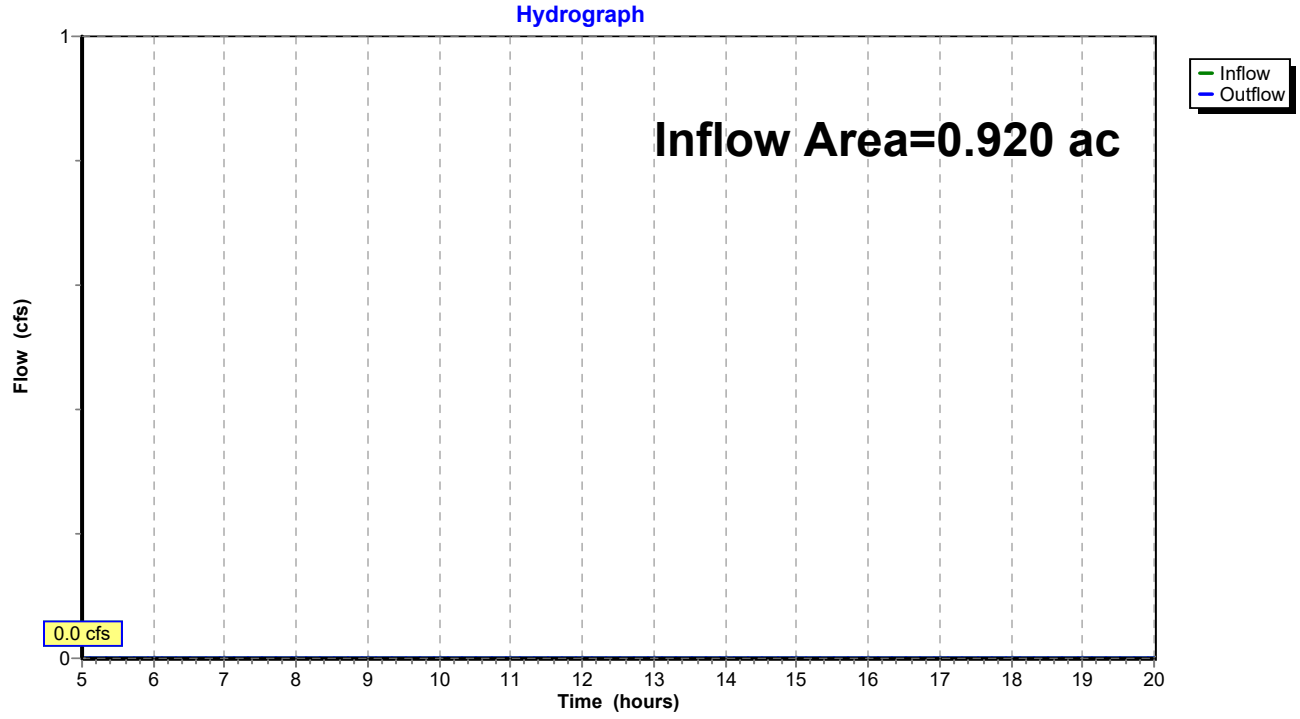


Summary for Reach 4R: Ridge Road

Inflow Area = 0.920 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: Ridge Road

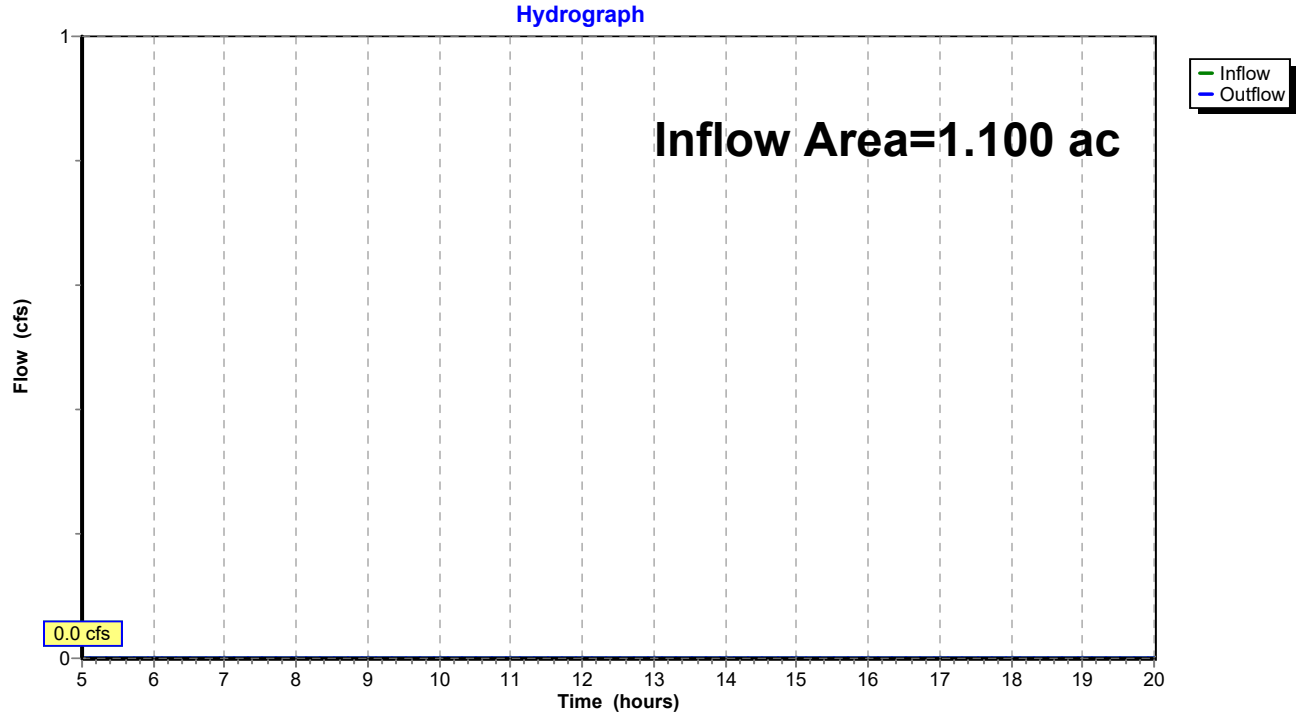


Summary for Reach 5R: Southern Property Line

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Southern Property Line

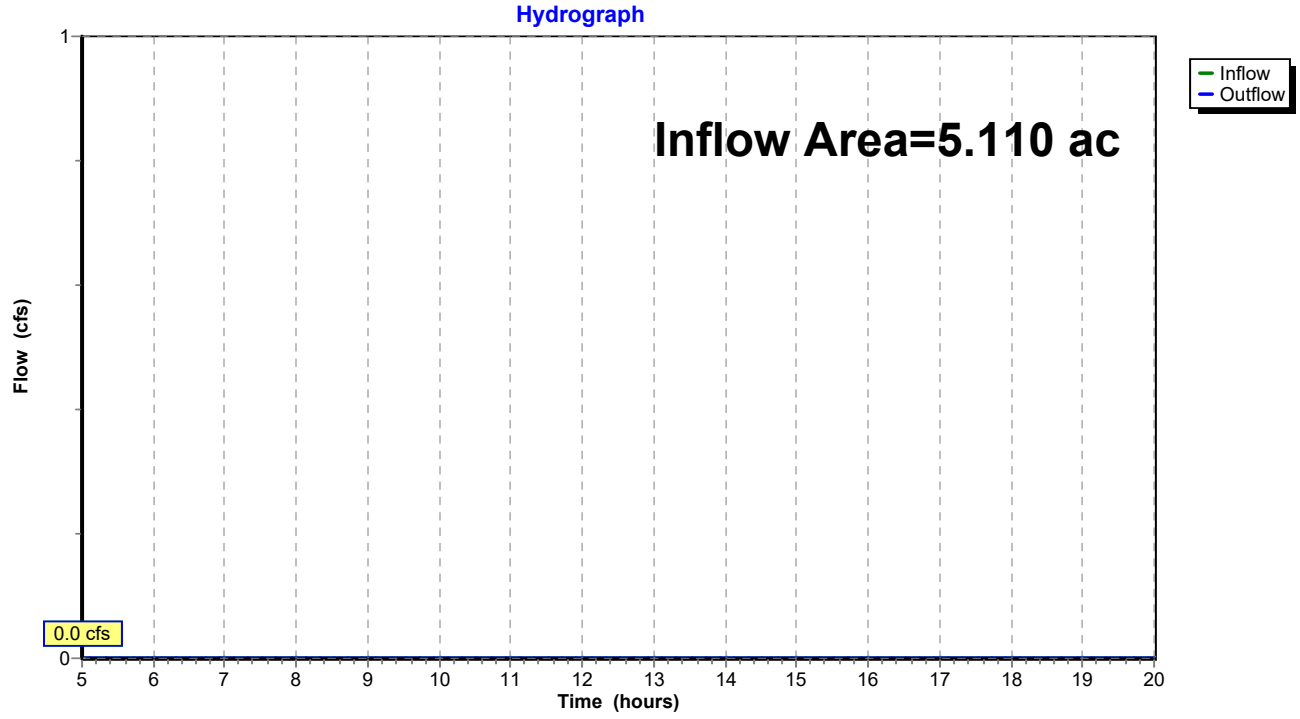


Summary for Reach 6R: Neponset Reservoir

Inflow Area = 5.110 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: Neponset Reservoir



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea EA Runoff Area=0.920 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=10.3 min CN=30 Runoff=0.0 cfs 0.000 af

Subcatchment 2S: Subarea EB Runoff Area=1.100 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=347' Tc=11.6 min CN=30 Runoff=0.0 cfs 0.000 af

Subcatchment 3S: Subarea EC Runoff Area=5.110 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=330' Tc=11.2 min CN=30 Runoff=0.0 cfs 0.000 af

Reach 4R: Ridge Road Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 5R: Southern Property Line Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 6R: Neponset Reservoir Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 7.130 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Subarea EA

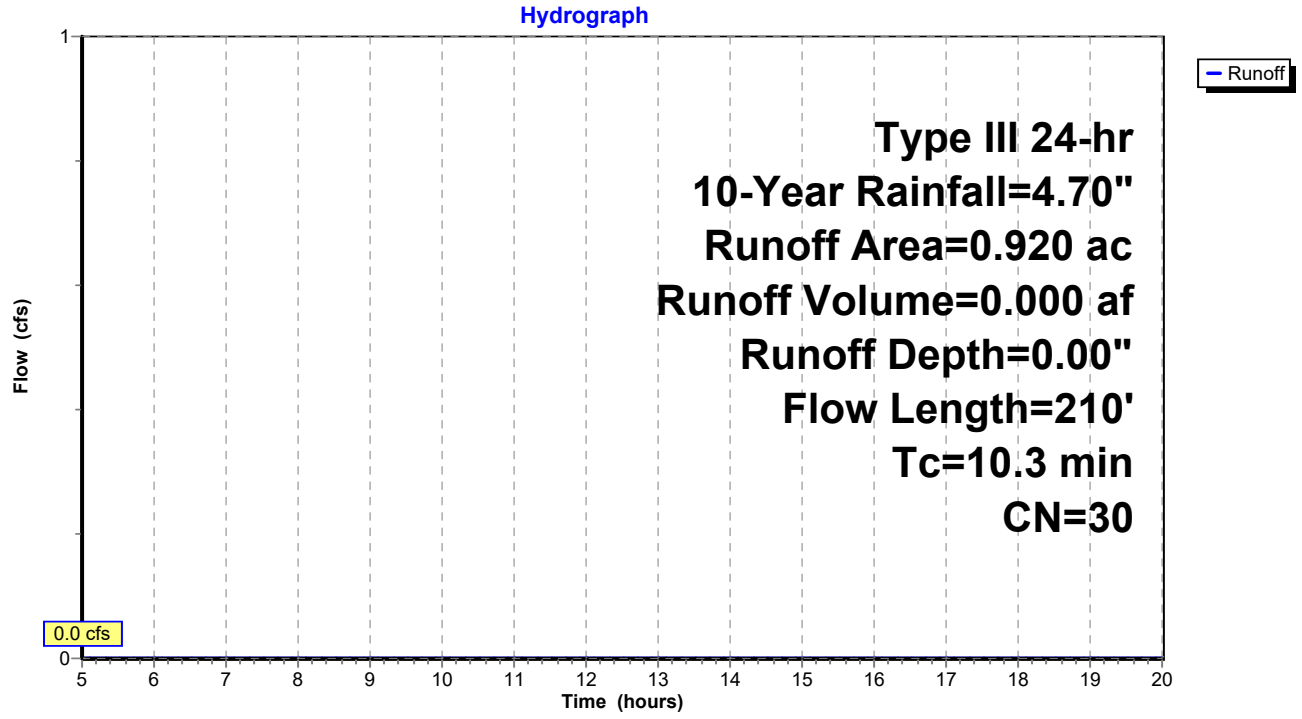
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 4R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
0.920	30	Woods, Good, HSG A
0.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	160	0.0870	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.3	210	Total			

Subcatchment 1S: Subarea EA



Summary for Subcatchment 2S: Subarea EB

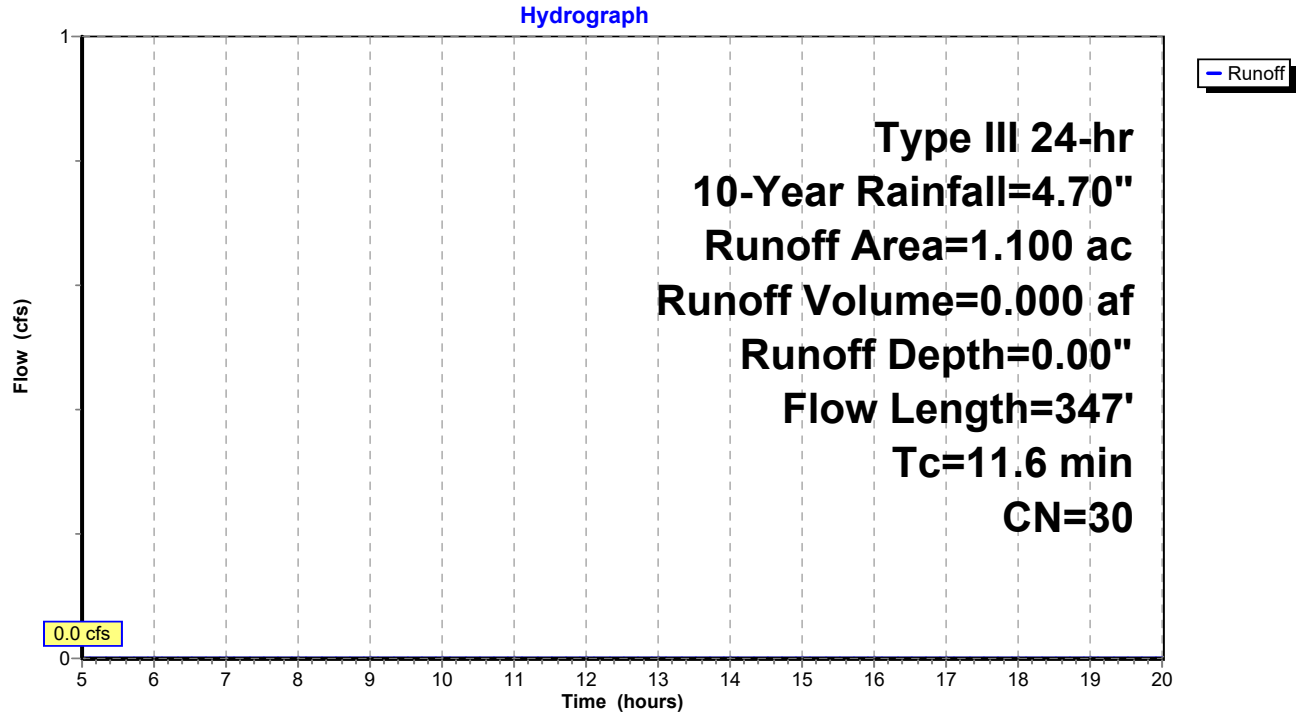
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 5R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
1.100	30	Woods, Good, HSG A
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.7	297	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.6	347	Total			

Subcatchment 2S: Subarea EB



Summary for Subcatchment 3S: Subarea EC

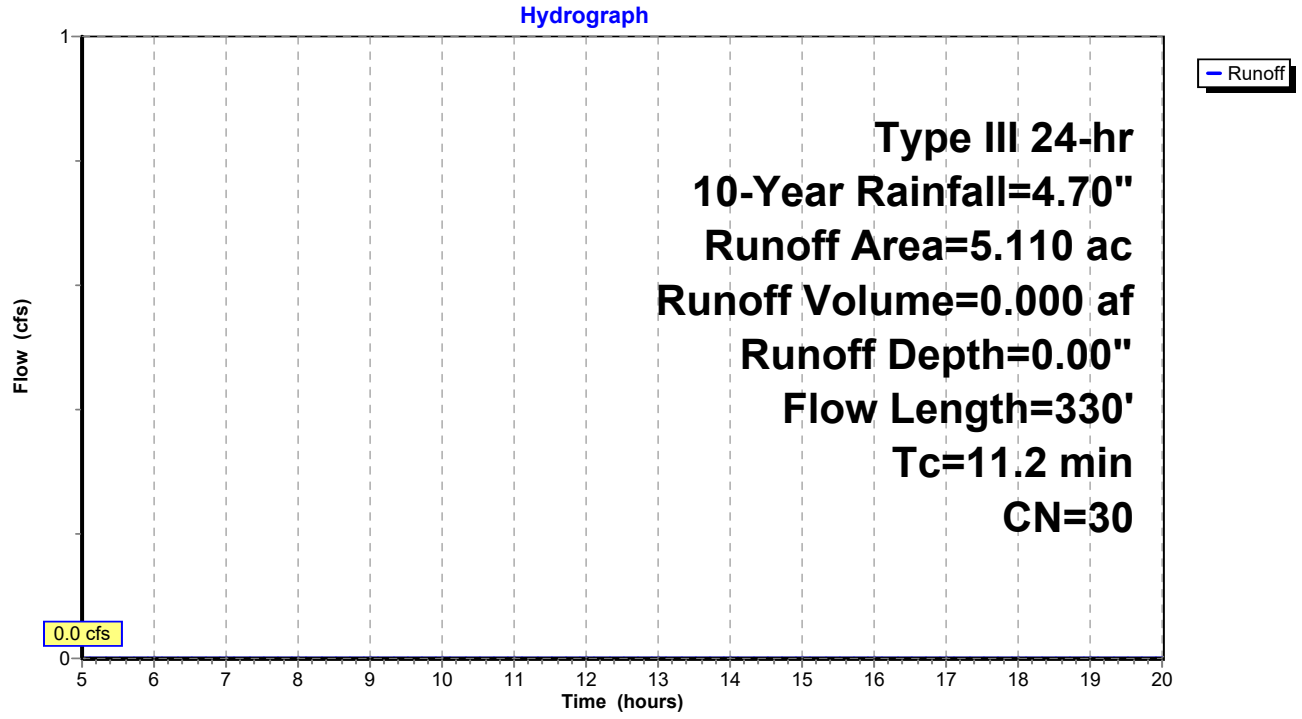
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 6R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
5.110	30	Woods, Good, HSG A
5.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0520	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	280	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	330	Total			

Subcatchment 3S: Subarea EC

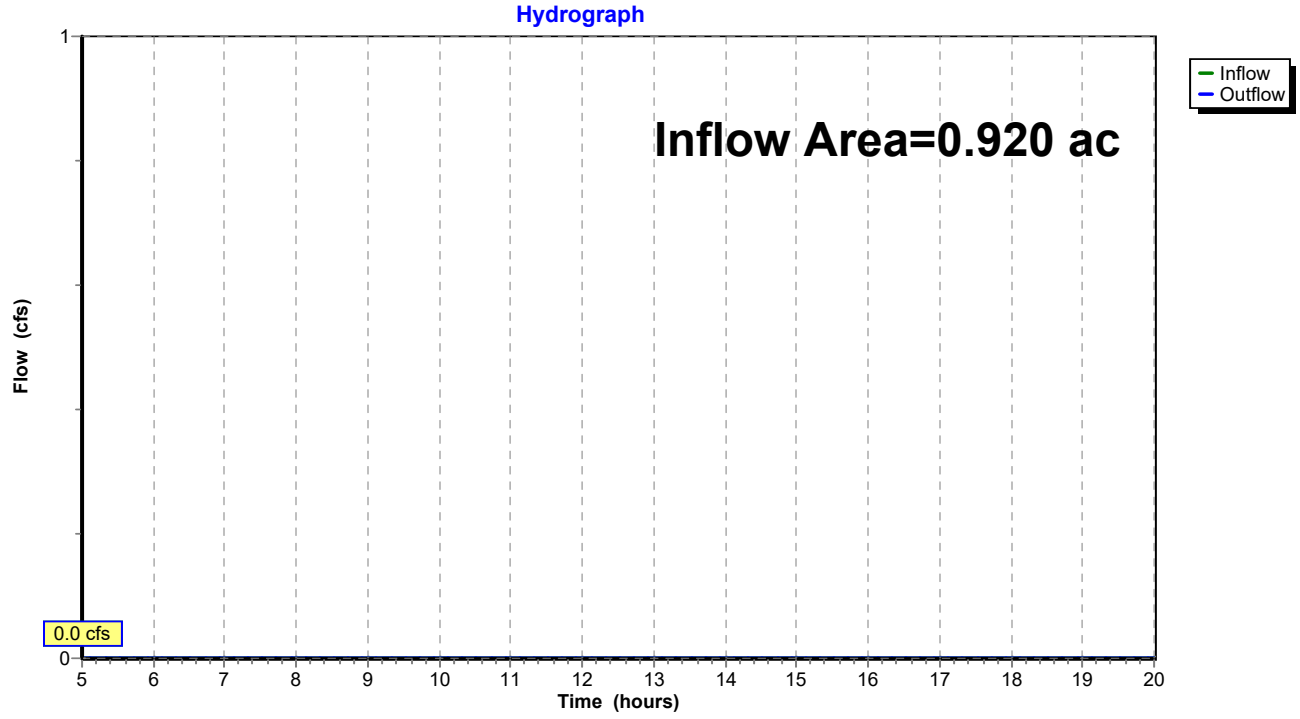


Summary for Reach 4R: Ridge Road

Inflow Area = 0.920 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: Ridge Road

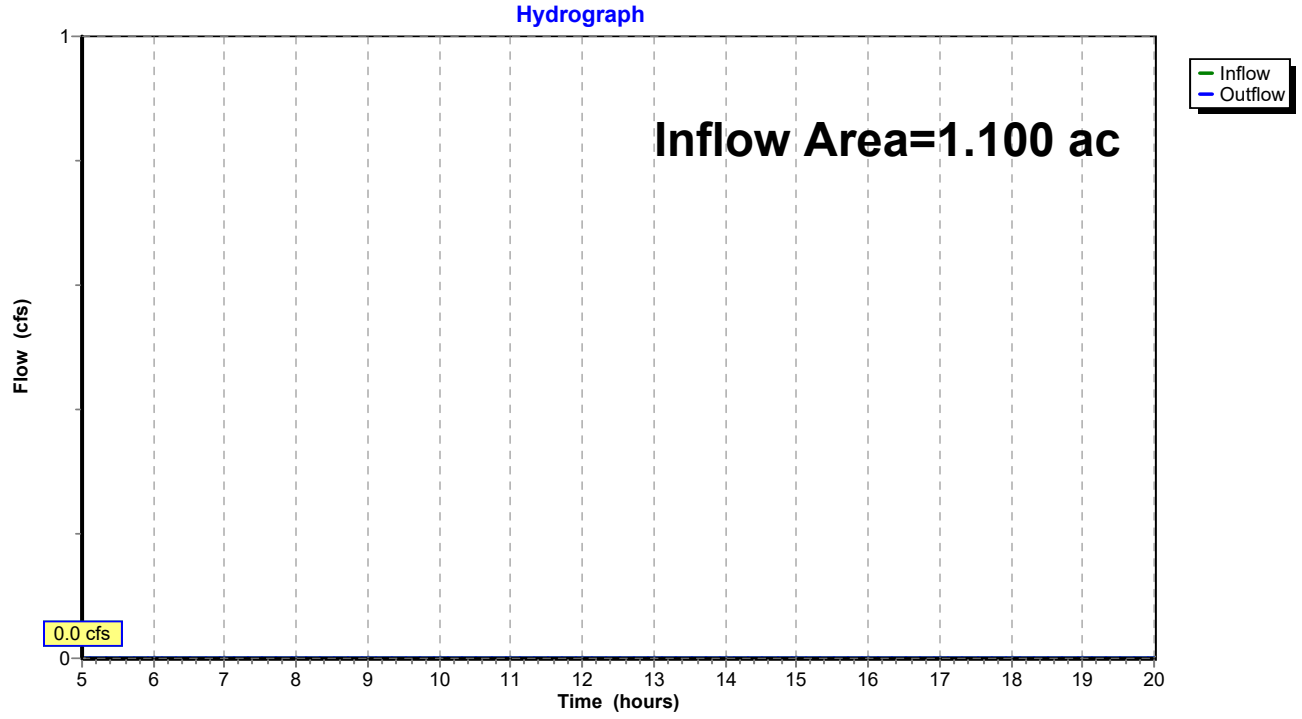


Summary for Reach 5R: Southern Property Line

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Southern Property Line

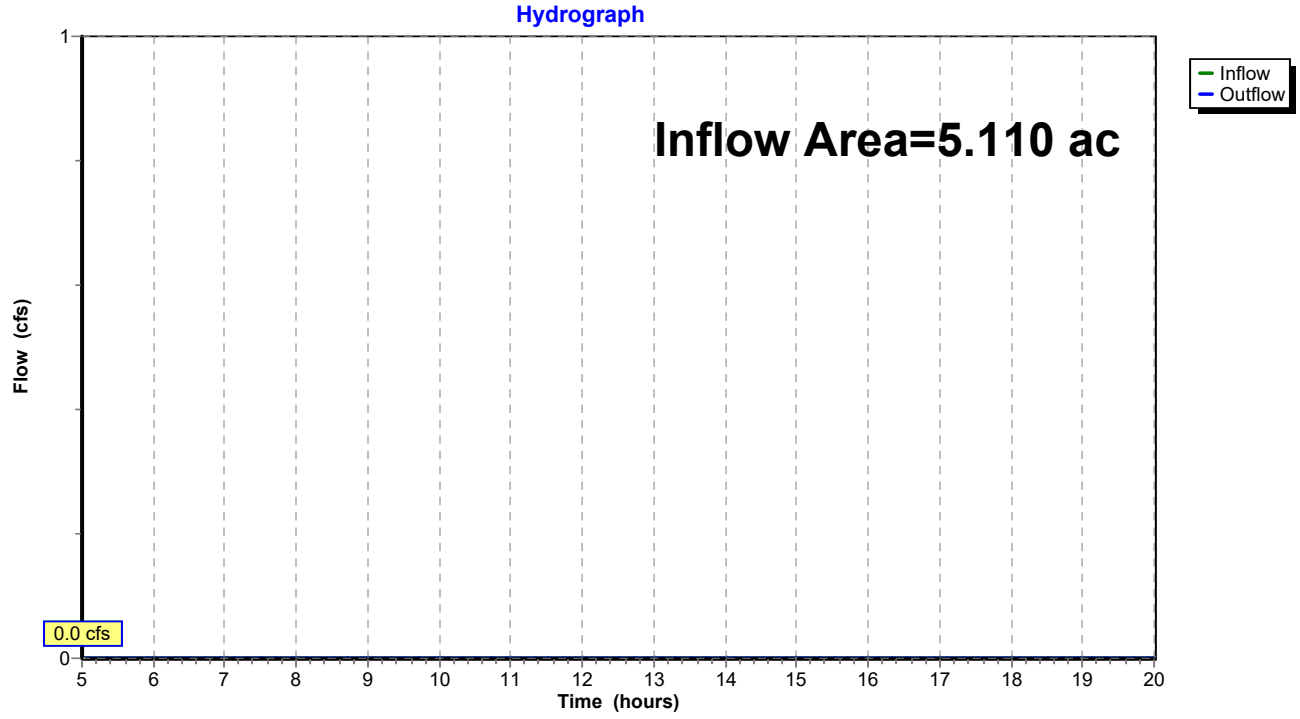


Summary for Reach 6R: Neponset Reservoir

Inflow Area = 5.110 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: Neponset Reservoir



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea EA Runoff Area=0.920 ac 0.00% Impervious Runoff Depth>0.12"
Flow Length=210' Tc=10.3 min CN=30 Runoff=0.0 cfs 0.009 af

Subcatchment 2S: Subarea EB Runoff Area=1.100 ac 0.00% Impervious Runoff Depth>0.12"
Flow Length=347' Tc=11.6 min CN=30 Runoff=0.0 cfs 0.011 af

Subcatchment 3S: Subarea EC Runoff Area=5.110 ac 0.00% Impervious Runoff Depth>0.12"
Flow Length=330' Tc=11.2 min CN=30 Runoff=0.1 cfs 0.051 af

Reach 4R: Ridge Road Inflow=0.0 cfs 0.009 af
Outflow=0.0 cfs 0.009 af

Reach 5R: Southern Property Line Inflow=0.0 cfs 0.011 af
Outflow=0.0 cfs 0.011 af

Reach 6R: Neponset Reservoir Inflow=0.1 cfs 0.051 af
Outflow=0.1 cfs 0.051 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.071 af Average Runoff Depth = 0.12"
100.00% Pervious = 7.130 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Subarea EA

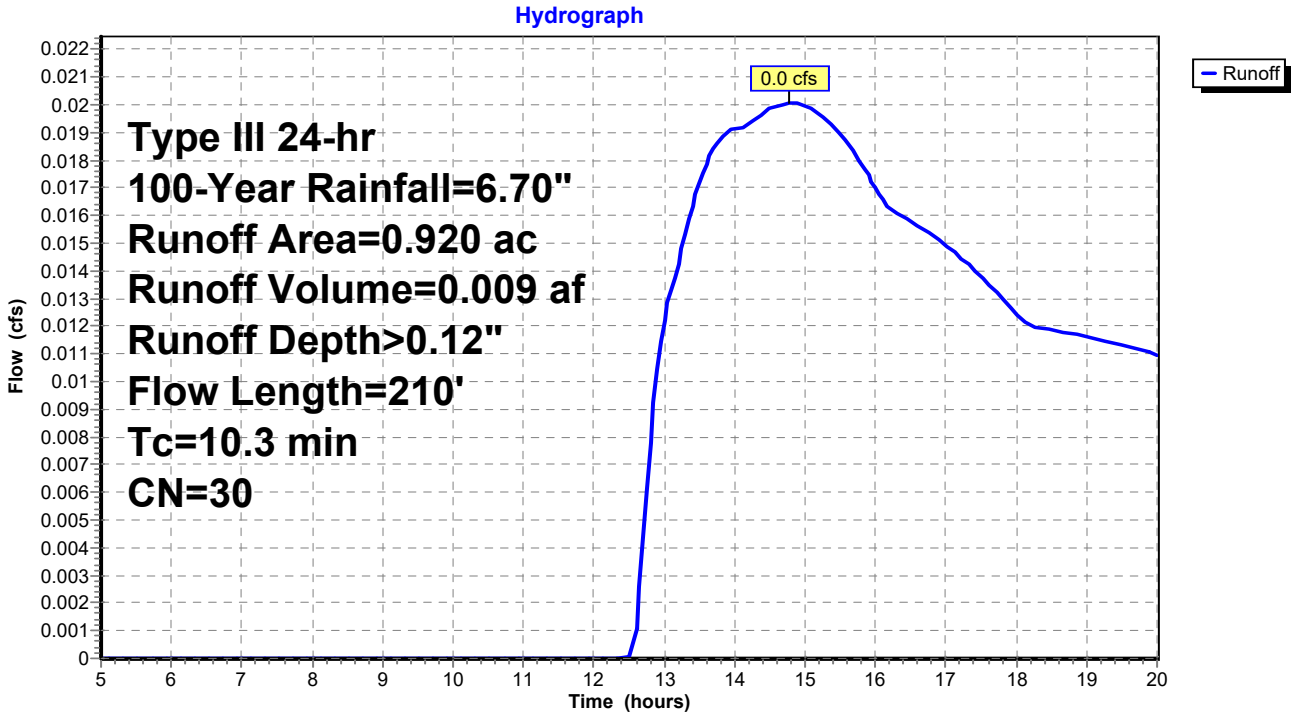
Runoff = 0.0 cfs @ 14.79 hrs, Volume= 0.009 af, Depth> 0.12"
Routed to Reach 4R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
0.920	30	Woods, Good, HSG A
0.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	160	0.0870	1.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.3	210	Total			

Subcatchment 1S: Subarea EA



Summary for Subcatchment 2S: Subarea EB

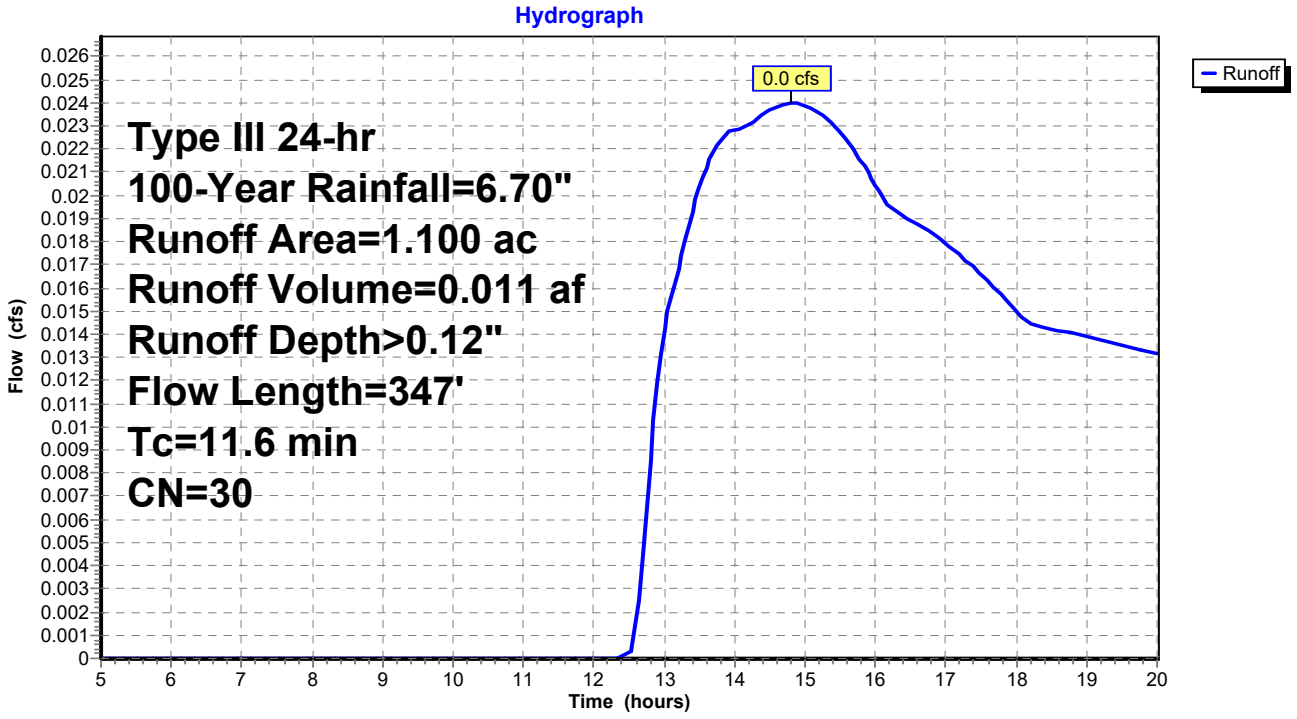
Runoff = 0.0 cfs @ 14.81 hrs, Volume= 0.011 af, Depth> 0.12"
Routed to Reach 5R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
1.100	30	Woods, Good, HSG A
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.7	297	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.6	347	Total			

Subcatchment 2S: Subarea EB



Summary for Subcatchment 3S: Subarea EC

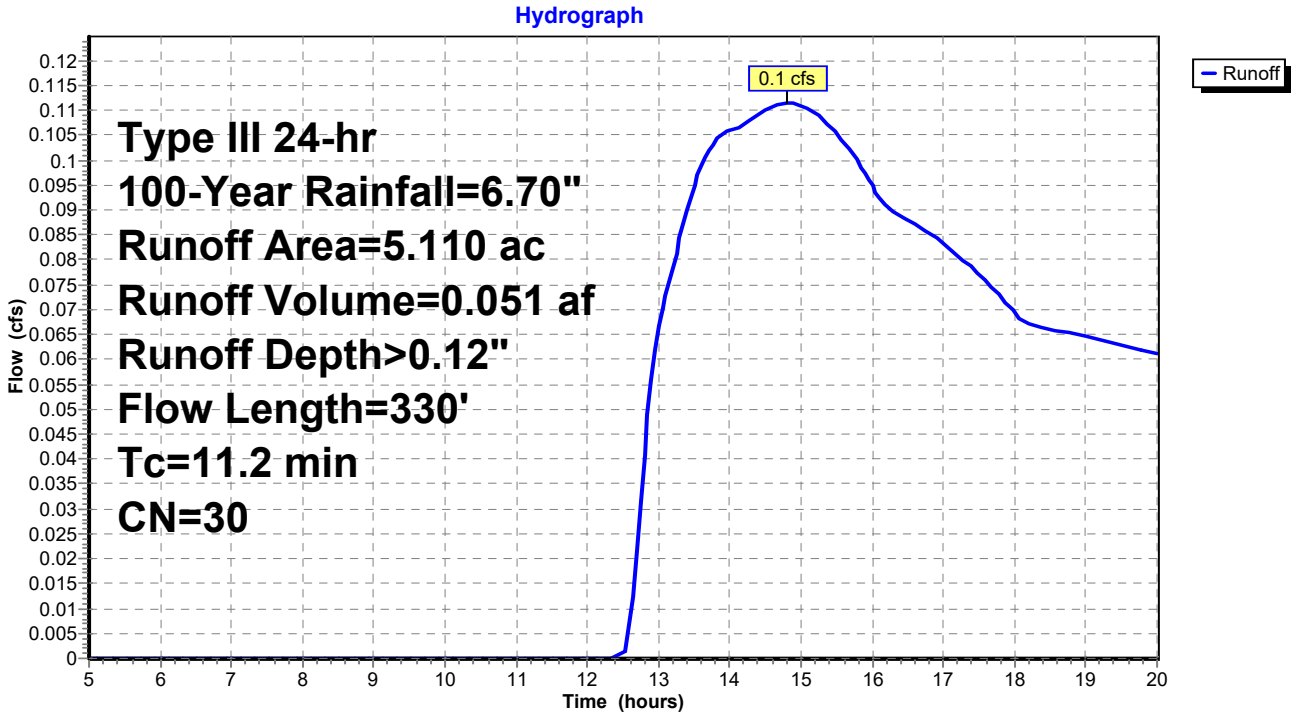
Runoff = 0.1 cfs @ 14.80 hrs, Volume= 0.051 af, Depth> 0.12"
Routed to Reach 6R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
5.110	30	Woods, Good, HSG A
5.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0520	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	280	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	330	Total			

Subcatchment 3S: Subarea EC

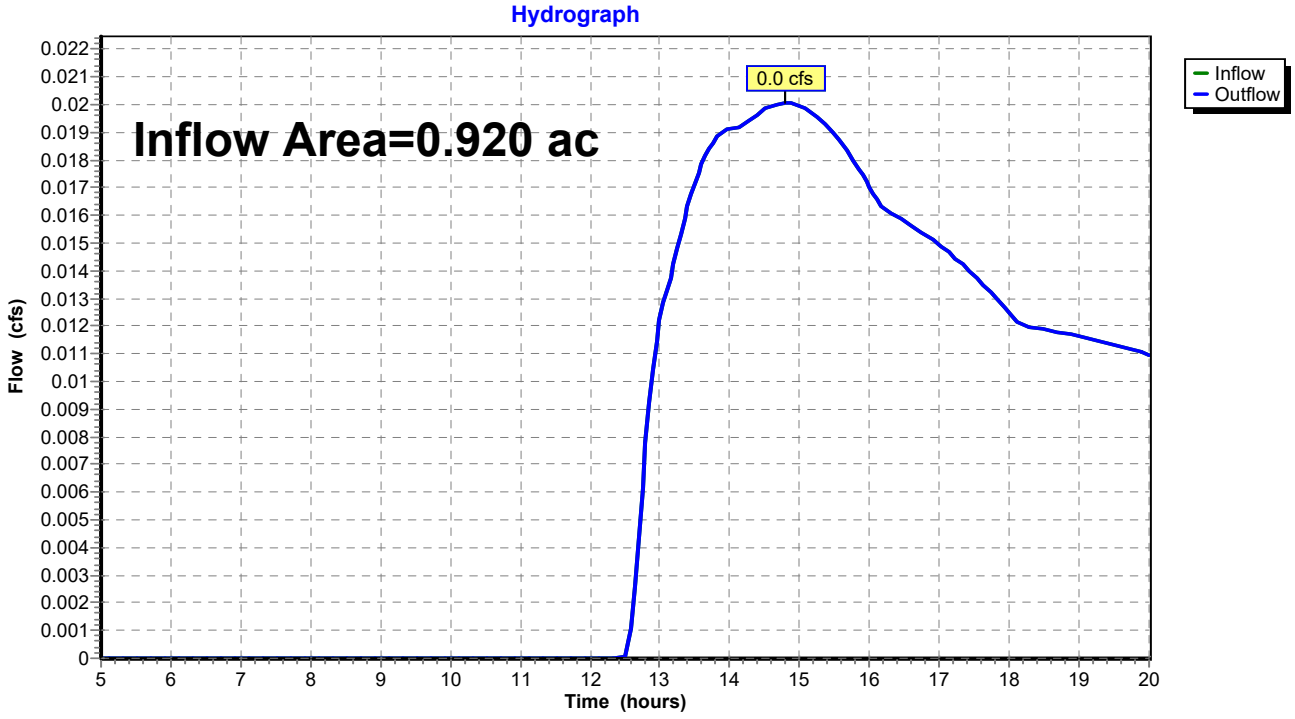


Summary for Reach 4R: Ridge Road

Inflow Area = 0.920 ac, 0.00% Impervious, Inflow Depth > 0.12" for 100-Year event
Inflow = 0.0 cfs @ 14.79 hrs, Volume= 0.009 af
Outflow = 0.0 cfs @ 14.79 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: Ridge Road

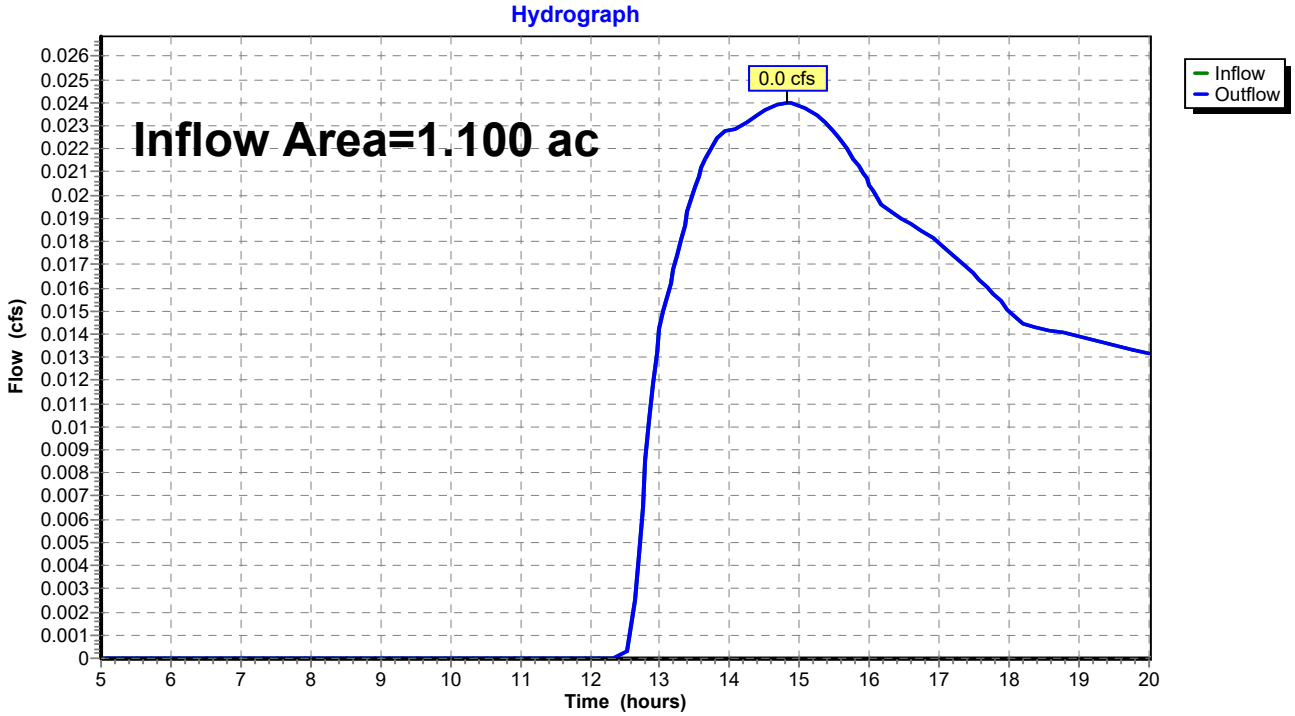


Summary for Reach 5R: Southern Property Line

Inflow Area = 1.100 ac, 0.00% Impervious, Inflow Depth > 0.12" for 100-Year event
Inflow = 0.0 cfs @ 14.81 hrs, Volume= 0.011 af
Outflow = 0.0 cfs @ 14.81 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: Southern Property Line

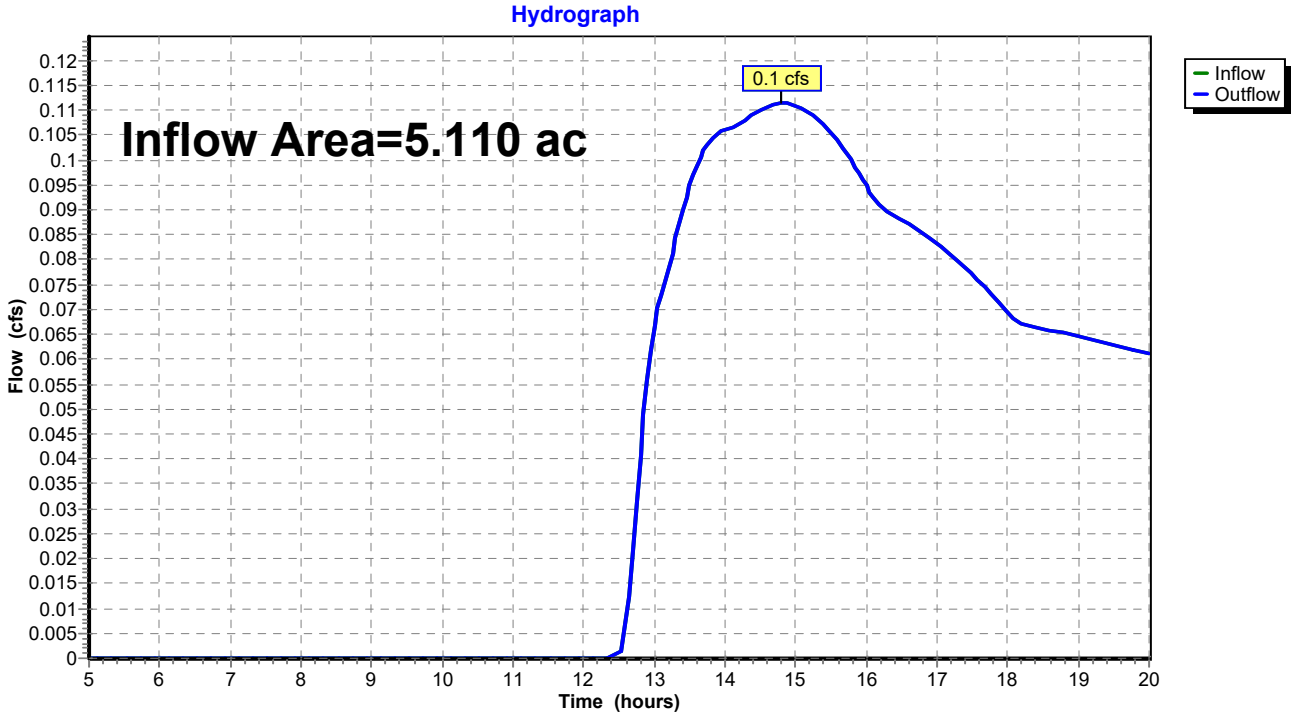


Summary for Reach 6R: Neponset Reservoir

Inflow Area = 5.110 ac, 0.00% Impervious, Inflow Depth > 0.12" for 100-Year event
Inflow = 0.1 cfs @ 14.80 hrs, Volume= 0.051 af
Outflow = 0.1 cfs @ 14.80 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: Neponset Reservoir



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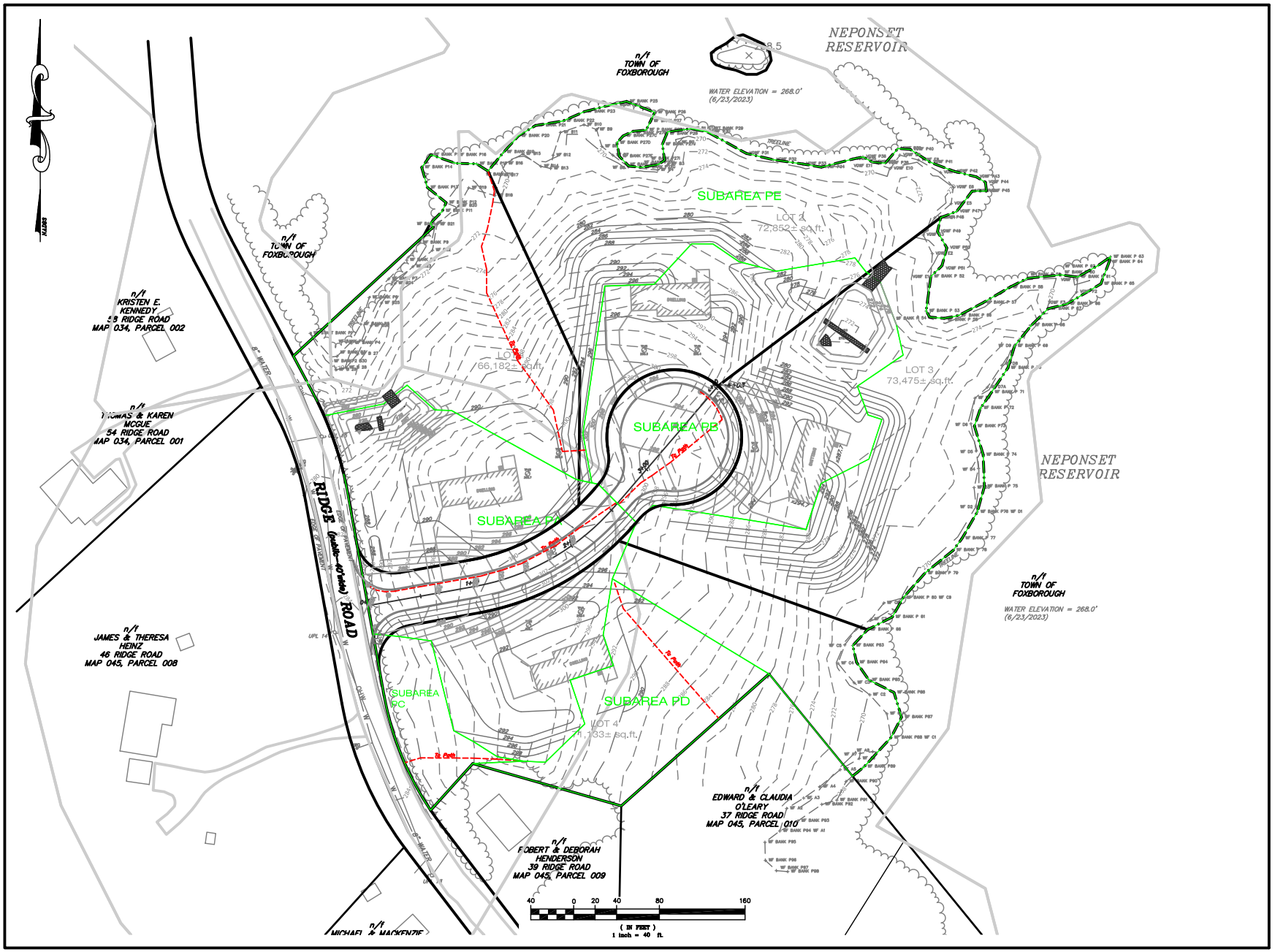


PROJECT:

Ridge Road
Foxborough, MA
02035

OWNER:

FED CAP, Inc.
P.O. Box 669
Foxborough, MA
02035

Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors
FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

REFERENCES:

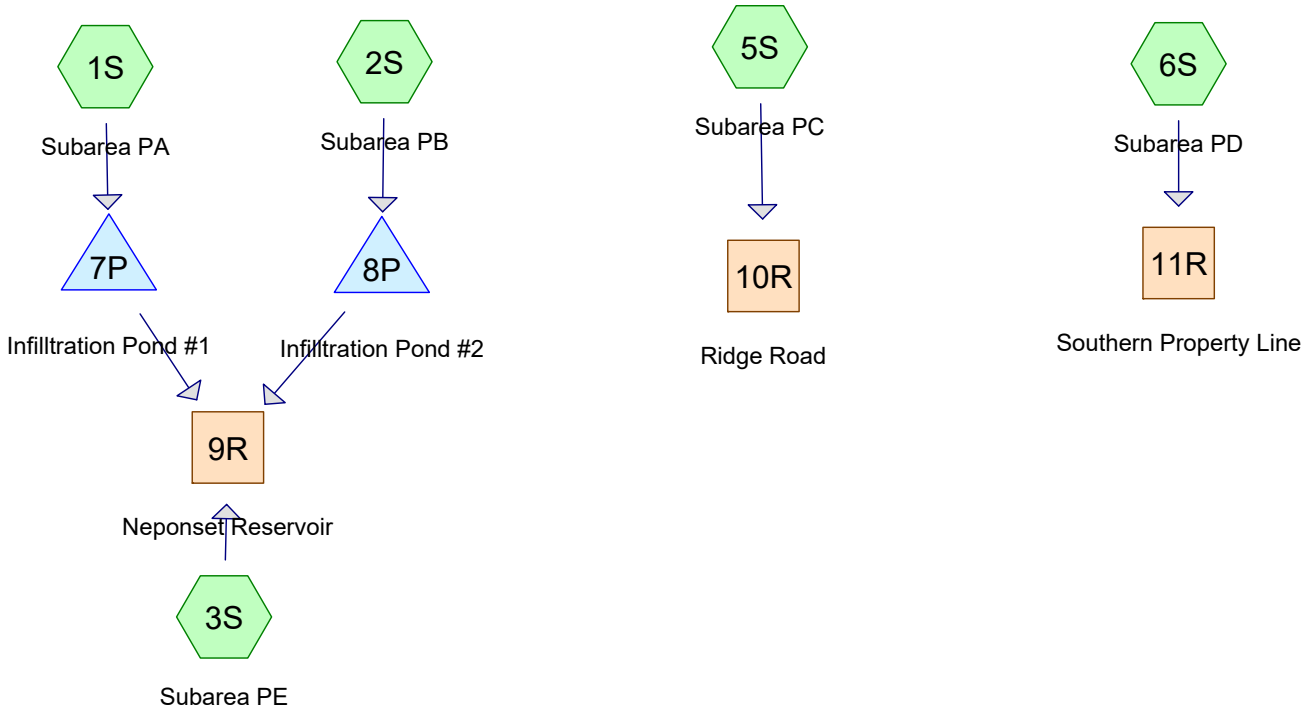
STAMP

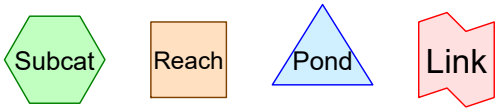
DRAWING TITLE

Proposed Subareas

SCALE: 1" = 40'

JAN. 5, 2024	SHEET NUMBER
23-0138D	PR





Routing Diagram for 23-0138 Proposed V2
Prepared by Bay Colony Group, Printed 1/19/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.150	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 5S, 6S)
0.140	98	Paved parking, HSG A (1S, 2S)
0.400	98	Paved roads w/curbs & sewers, HSG A (1S, 2S)
0.200	98	Unconnected roofs, HSG A (1S, 2S)
0.180	98	Water Surface, HSG A (1S, 2S)
3.060	30	Woods, Good, HSG A (3S, 5S, 6S)
7.130	**43**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
7.130	HSG A	1S, 2S, 3S, 5S, 6S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
7.130		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea PA Runoff Area=1.390 ac 28.78% Impervious Runoff Depth>0.19"
Flow Length=252' Tc=6.0 min UI Adjusted CN=54 Runoff=0.1 cfs 0.022 af

Subcatchment 2S: Subarea PB Runoff Area=1.370 ac 37.96% Impervious Runoff Depth>0.39"
Flow Length=157' Tc=6.0 min CN=61 Runoff=0.4 cfs 0.044 af

Subcatchment 3S: Subarea PE Runoff Area=3.660 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=303' Tc=9.7 min CN=32 Runoff=0.0 cfs 0.000 af

Subcatchment 5S: Subarea PC Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=107' Tc=8.3 min CN=36 Runoff=0.0 cfs 0.000 af

Subcatchment 6S: Subarea PD Runoff Area=0.510 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=161' Tc=6.0 min CN=33 Runoff=0.0 cfs 0.000 af

Reach 9R: Neponset Reservoir Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 10R: Ridge Road Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Reach 11R: Southern Property Line Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Pond 7P: Infilltration Pond #1 Peak Elev=278.14' Storage=0.001 af Inflow=0.1 cfs 0.022 af
Outflow=0.1 cfs 0.021 af

Pond 8P: Infilltration Pond #2 Peak Elev=272.29' Storage=0.016 af Inflow=0.4 cfs 0.044 af
Outflow=0.1 cfs 0.040 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.066 af Average Runoff Depth = 0.11"
87.10% Pervious = 6.210 ac 12.90% Impervious = 0.920 ac

Summary for Subcatchment 1S: Subarea PA

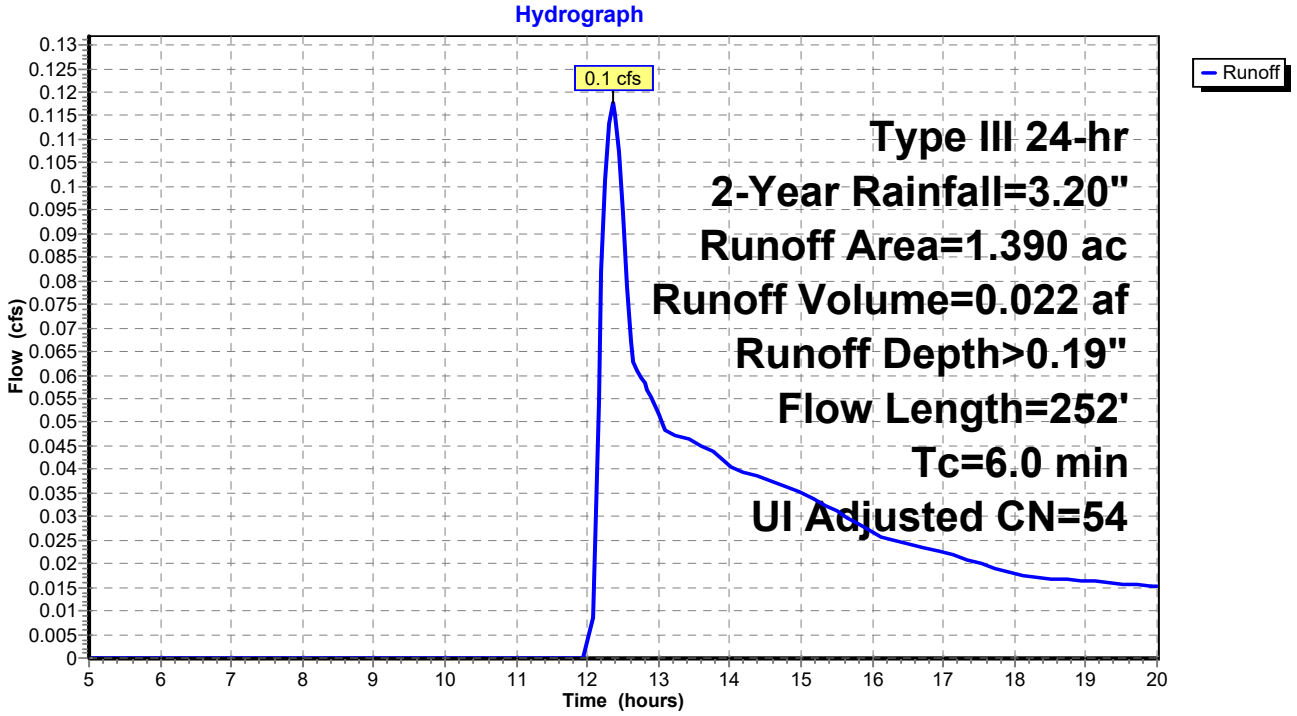
Runoff = 0.1 cfs @ 12.36 hrs, Volume= 0.022 af, Depth> 0.19"
Routed to Pond 7P : Infilltration Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Adj	Description
0.070	98		Paved parking, HSG A
0.170	98		Paved roads w/curbs & sewers, HSG A
0.990	39		>75% Grass cover, Good, HSG A
0.100	98		Unconnected roofs, HSG A
0.060	98		Water Surface, HSG A
1.390	56	54	Weighted Average, UI Adjusted
0.990			71.22% Pervious Area
0.400			28.78% Impervious Area
0.100			25.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0360	1.51		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	202	0.0610	5.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	252	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Subarea PA



Summary for Subcatchment 2S: Subarea PB

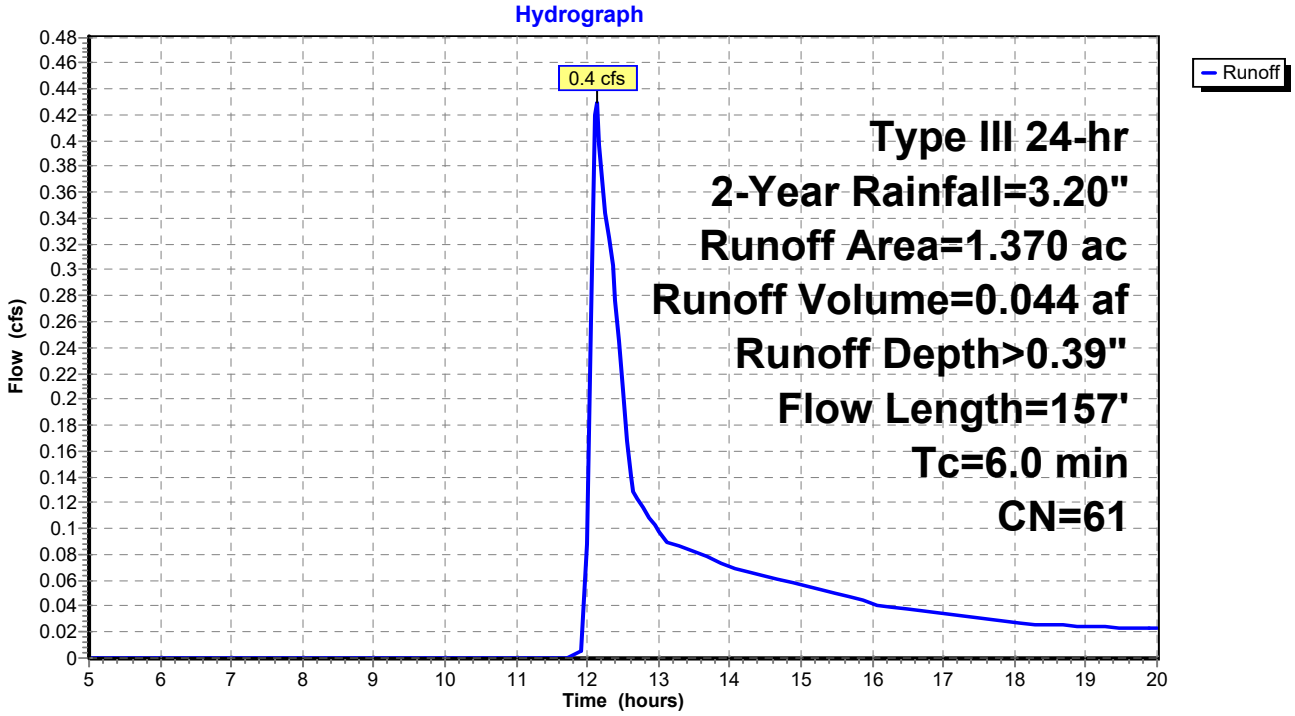
Runoff = 0.4 cfs @ 12.13 hrs, Volume= 0.044 af, Depth> 0.39"
Routed to Pond 8P : Infilltration Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG A
0.230	98	Paved roads w/curbs & sewers, HSG A
0.850	39	>75% Grass cover, Good, HSG A
0.120	98	Water Surface, HSG A
0.100	98	Unconnected roofs, HSG A
1.370	61	Weighted Average
0.850		62.04% Pervious Area
0.520		37.96% Impervious Area
0.100		19.23% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0340	1.48		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	107	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	157	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: Subarea PB



Summary for Subcatchment 3S: Subarea PE

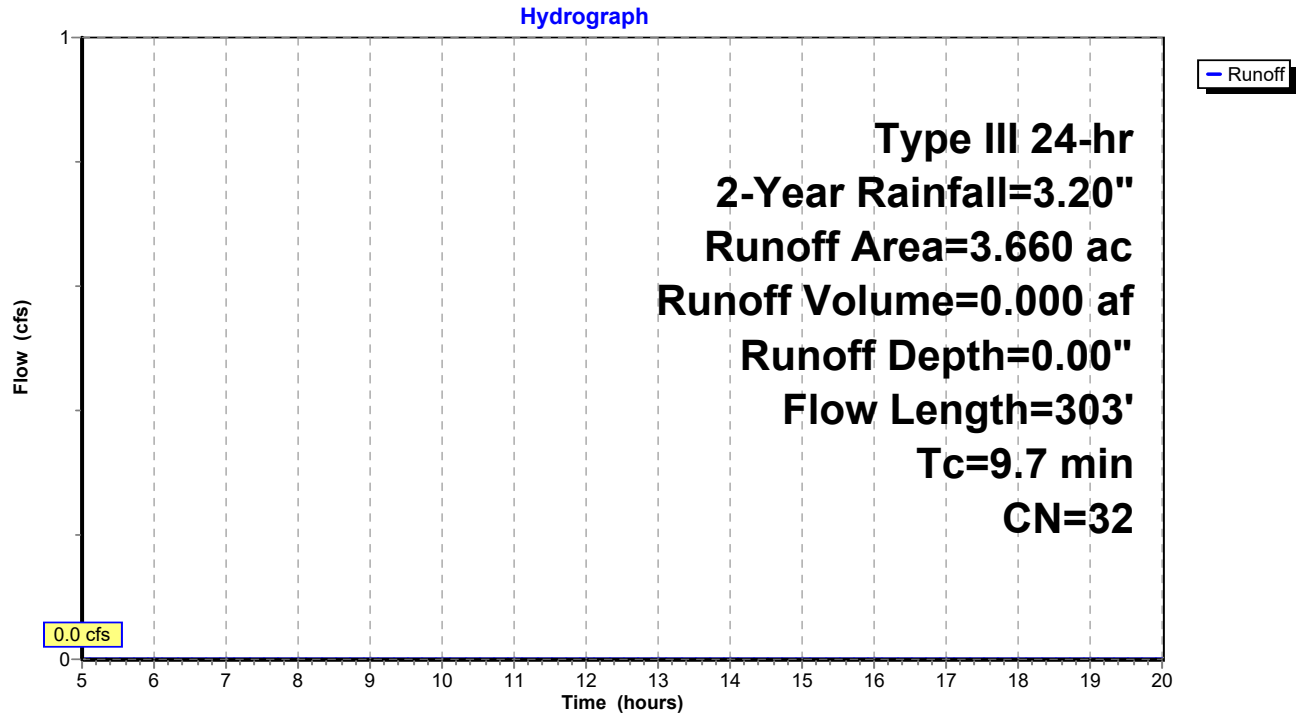
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 9R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
2.670	30	Woods, Good, HSG A
0.990	39	>75% Grass cover, Good, HSG A
3.660	32	Weighted Average
3.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	21	0.2800	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.3	29	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.0	61	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	192	0.0990	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.7	303	Total			

Subcatchment 3S: Subarea PE



Summary for Subcatchment 5S: Subarea PC

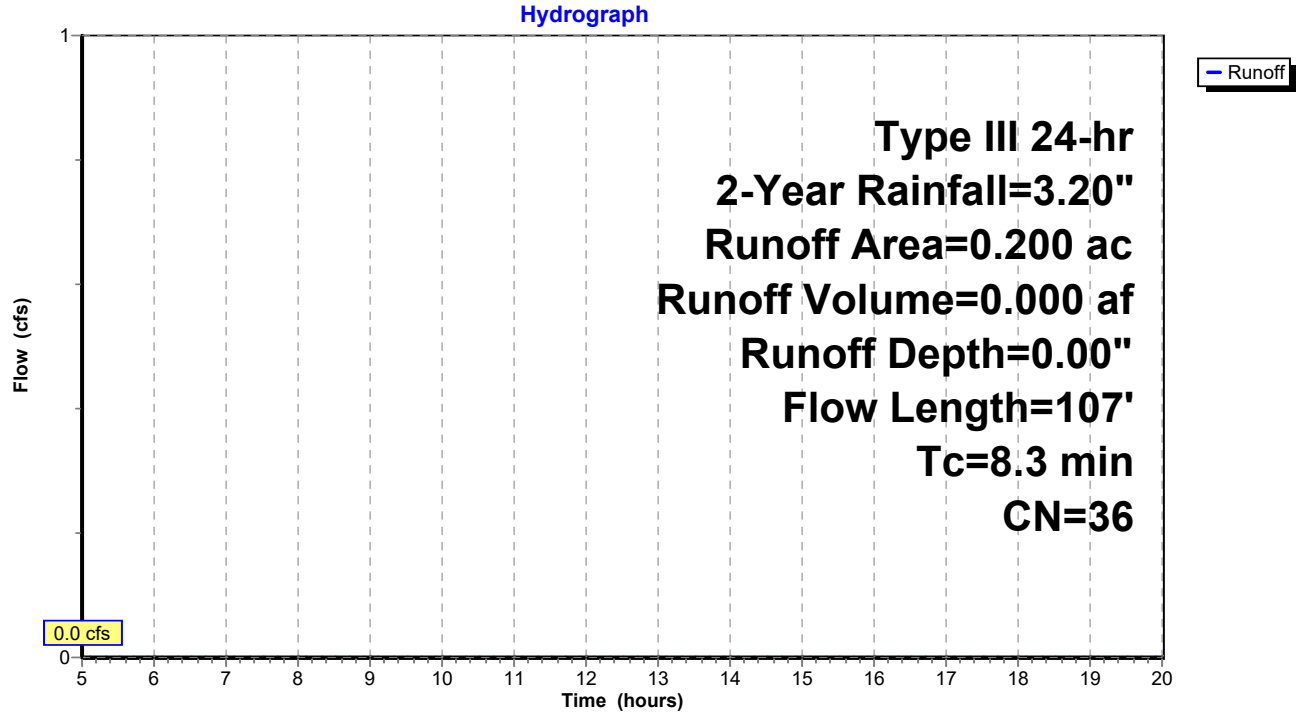
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 10R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
0.060	30	Woods, Good, HSG A
0.140	39	>75% Grass cover, Good, HSG A
0.200	36	Weighted Average
0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0620	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	57	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	107	Total			

Subcatchment 5S: Subarea PC



Summary for Subcatchment 6S: Subarea PD

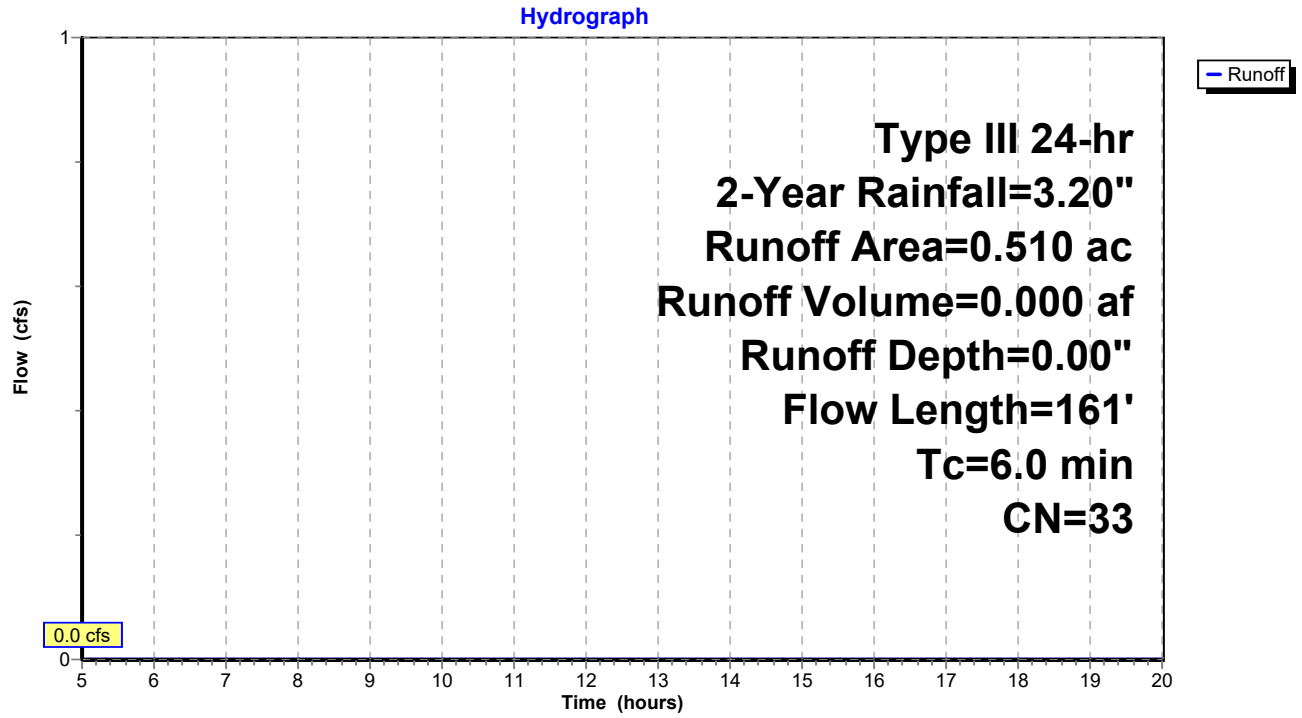
Runoff = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach 11R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (ac)	CN	Description
0.330	30	Woods, Good, HSG A
0.180	39	>75% Grass cover, Good, HSG A
0.510	33	Weighted Average
0.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.3	27	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	84	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.9	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6S: Subarea PD

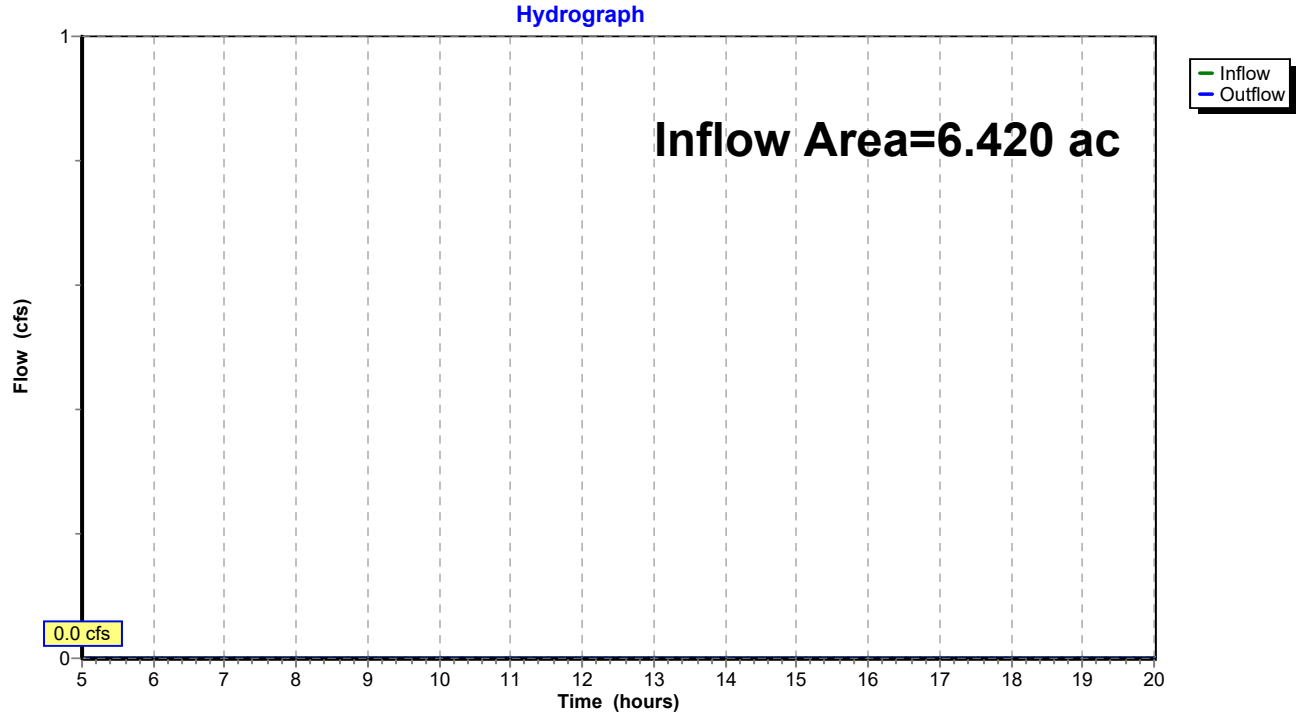


Summary for Reach 9R: Neponset Reservoir

Inflow Area = 6.420 ac, 14.33% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 9R: Neponset Reservoir

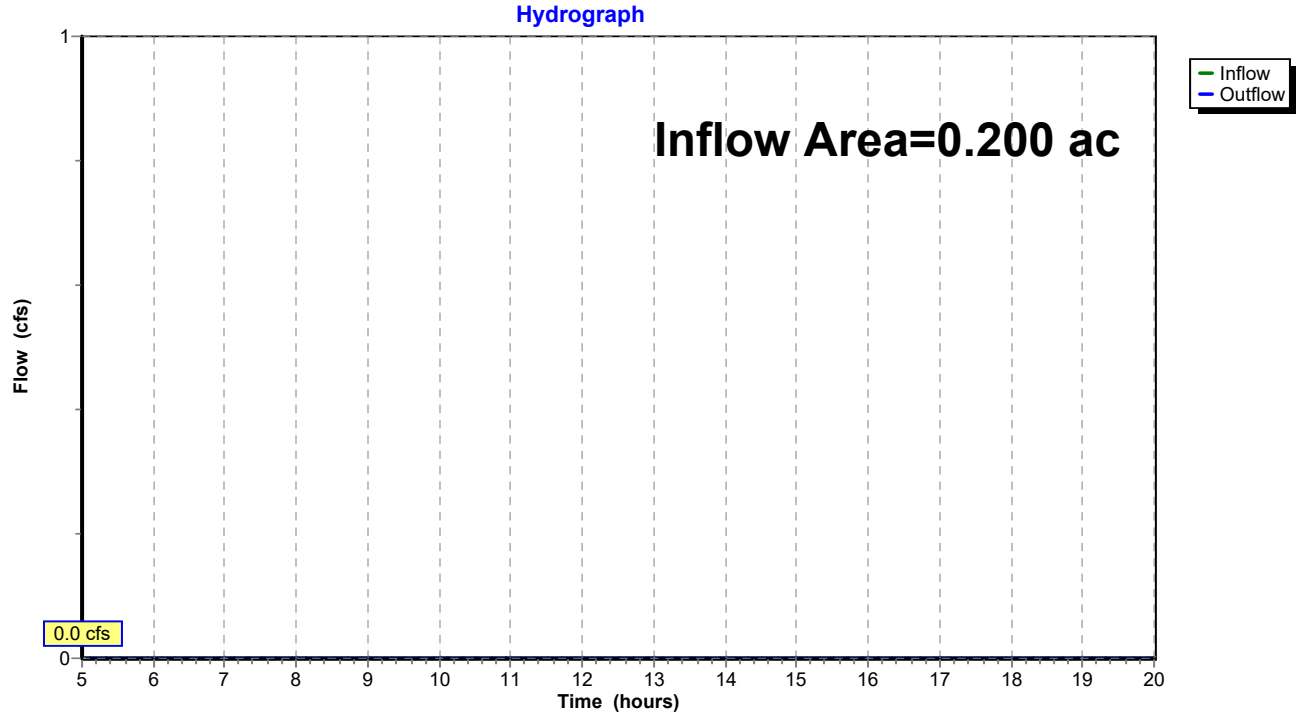


Summary for Reach 10R: Ridge Road

Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 10R: Ridge Road

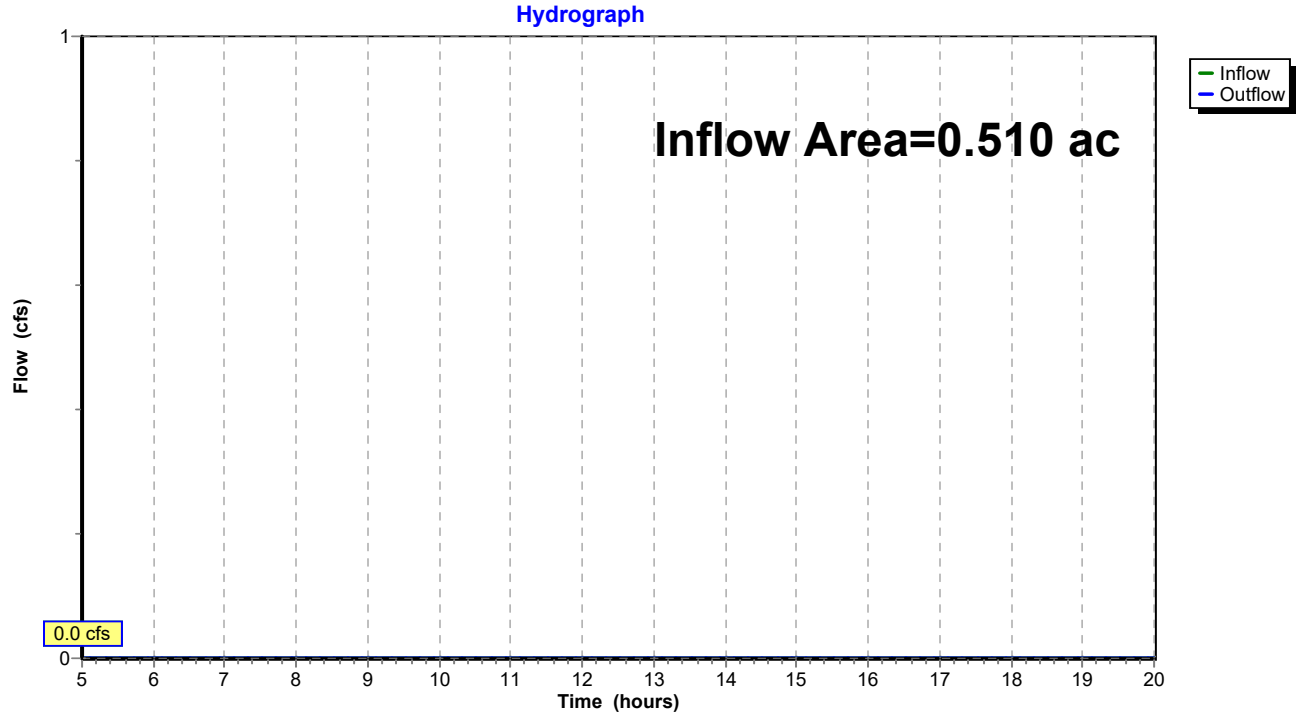


Summary for Reach 11R: Southern Property Line

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 11R: Southern Property Line



Summary for Pond 7P: Infilltration Pond #1

Inflow Area = 1.390 ac, 28.78% Impervious, Inflow Depth > 0.19" for 2-Year event
Inflow = 0.1 cfs @ 12.36 hrs, Volume= 0.022 af
Outflow = 0.1 cfs @ 12.56 hrs, Volume= 0.021 af, Atten= 35%, Lag= 12.3 min
Discarded = 0.1 cfs @ 12.56 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 278.14' @ 12.56 hrs Surf.Area= 0.009 ac Storage= 0.001 af

Plug-Flow detention time= 4.6 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 3.6 min (897.2 - 893.5)

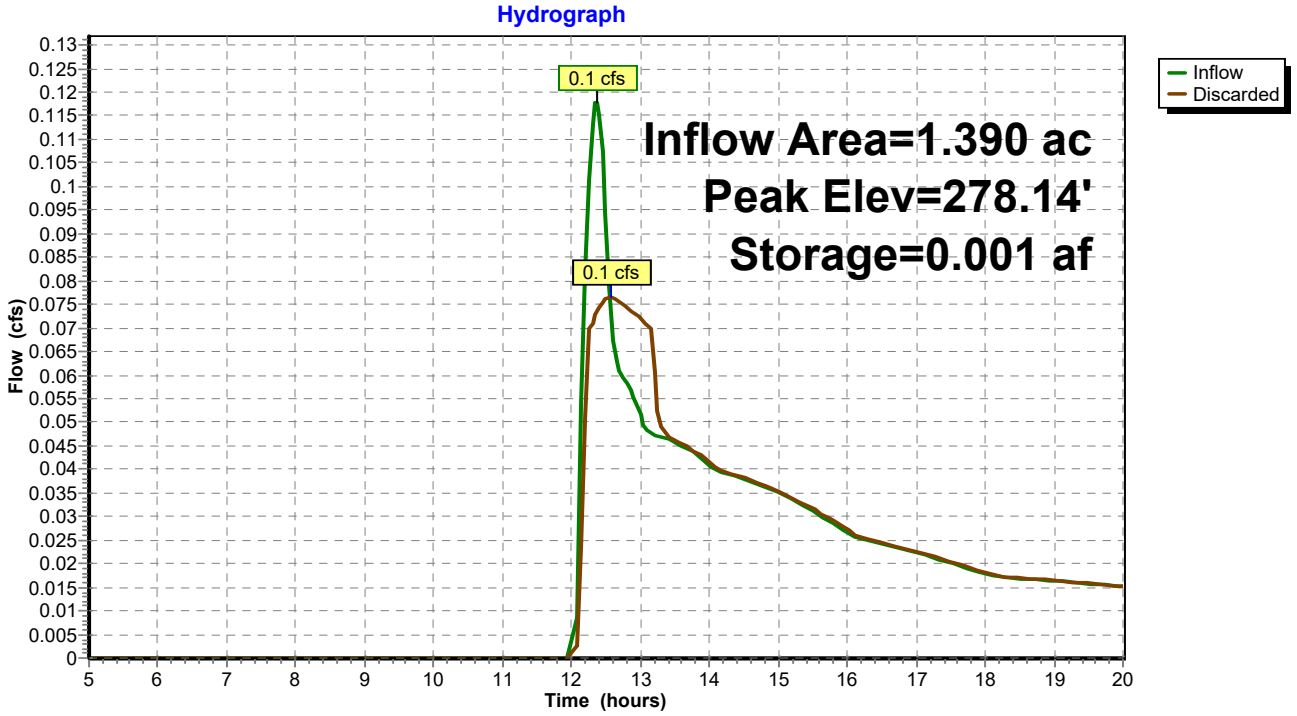
Volume	Invert	Avail.Storage	Storage Description
#1	278.00'	0.124 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
278.00	0.008	124.0	0.000	0.000	0.008
280.00	0.030	178.0	0.036	0.036	0.039
282.00	0.060	237.0	0.088	0.124	0.084

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.00'

Discarded OutFlow Max=0.1 cfs @ 12.56 hrs HW=278.14' (Free Discharge)
↑**1=Exfiltration** (Controls 0.1 cfs)

Pond 7P: Infilltration Pond #1



Summary for Pond 8P: Infilltration Pond #2

Inflow Area = 1.370 ac, 37.96% Impervious, Inflow Depth > 0.39" for 2-Year event
Inflow = 0.4 cfs @ 12.13 hrs, Volume= 0.044 af
Outflow = 0.1 cfs @ 14.60 hrs, Volume= 0.040 af, Atten= 86%, Lag= 148.1 min
Discarded = 0.1 cfs @ 14.60 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 272.29' @ 14.60 hrs Surf.Area= 0.056 ac Storage= 0.016 af

Plug-Flow detention time= 135.1 min calculated for 0.040 af (89% of inflow)
Center-of-Mass det. time= 102.8 min (959.7 - 856.9)

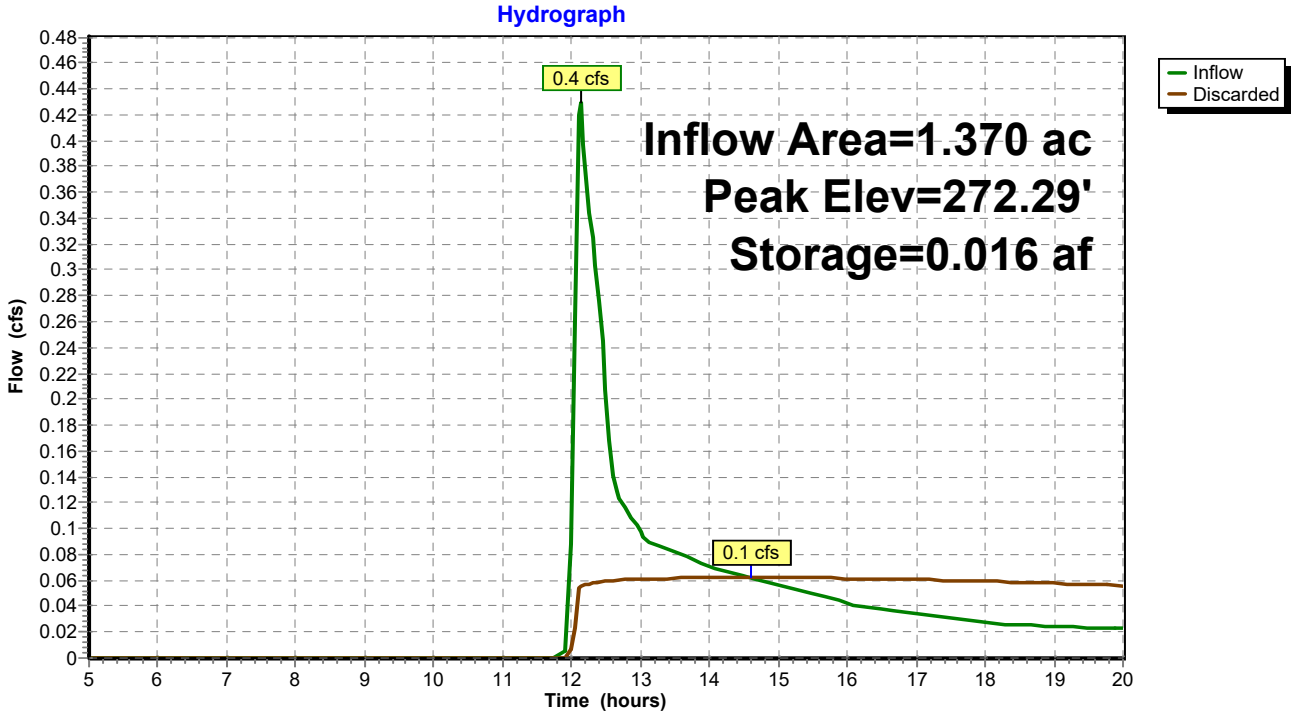
Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	0.328 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
272.00	0.052	184.0	0.000	0.000	0.052
274.00	0.080	226.0	0.131	0.131	0.085
276.00	0.118	275.0	0.197	0.328	0.131

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.75'

Discarded OutFlow Max=0.1 cfs @ 14.60 hrs HW=272.29' (Free Discharge)
↑**1=Exfiltration** (Controls 0.1 cfs)

Pond 8P: Infilltration Pond #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea PA Runoff Area=1.390 ac 28.78% Impervious Runoff Depth>0.69"
Flow Length=252' Tc=6.0 min UI Adjusted CN=54 Runoff=0.9 cfs 0.080 af

Subcatchment 2S: Subarea PB Runoff Area=1.370 ac 37.96% Impervious Runoff Depth>1.08"
Flow Length=157' Tc=6.0 min CN=61 Runoff=1.7 cfs 0.123 af

Subcatchment 3S: Subarea PE Runoff Area=3.660 ac 0.00% Impervious Runoff Depth>0.00"
Flow Length=303' Tc=9.7 min CN=32 Runoff=0.0 cfs 0.001 af

Subcatchment 5S: Subarea PC Runoff Area=0.200 ac 0.00% Impervious Runoff Depth>0.05"
Flow Length=107' Tc=8.3 min CN=36 Runoff=0.0 cfs 0.001 af

Subcatchment 6S: Subarea PD Runoff Area=0.510 ac 0.00% Impervious Runoff Depth>0.01"
Flow Length=161' Tc=6.0 min CN=33 Runoff=0.0 cfs 0.000 af

Reach 9R: Neponset Reservoir Inflow=0.0 cfs 0.001 af
Outflow=0.0 cfs 0.001 af

Reach 10R: Ridge Road Inflow=0.0 cfs 0.001 af
Outflow=0.0 cfs 0.001 af

Reach 11R: Southern Property Line Inflow=0.0 cfs 0.000 af
Outflow=0.0 cfs 0.000 af

Pond 7P: Infilltration Pond #1 Peak Elev=279.44' Storage=0.021 af Inflow=0.9 cfs 0.080 af
Outflow=0.2 cfs 0.080 af

Pond 8P: Infilltration Pond #2 Peak Elev=273.20' Storage=0.072 af Inflow=1.7 cfs 0.123 af
Outflow=0.1 cfs 0.060 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.205 af Average Runoff Depth = 0.34"
87.10% Pervious = 6.210 ac 12.90% Impervious = 0.920 ac

Summary for Subcatchment 1S: Subarea PA

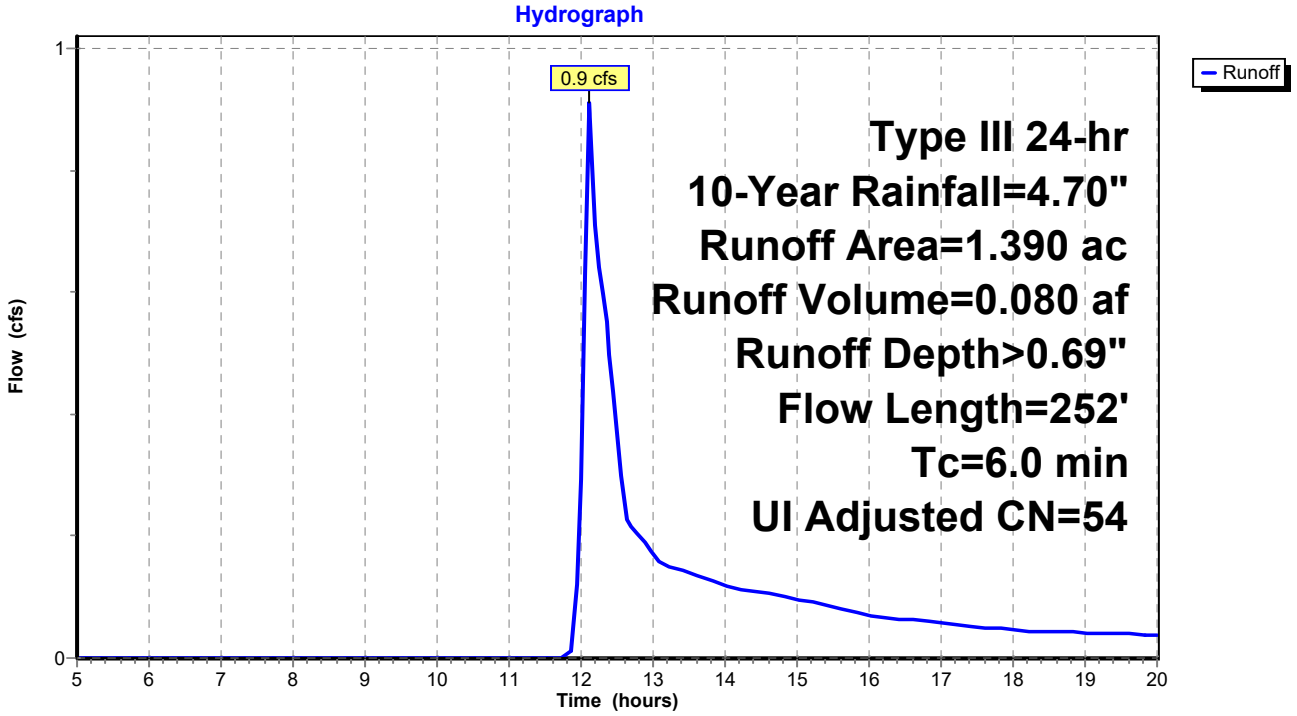
Runoff = 0.9 cfs @ 12.12 hrs, Volume= 0.080 af, Depth> 0.69"
Routed to Pond 7P : Infilltration Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Adj	Description
0.070	98		Paved parking, HSG A
0.170	98		Paved roads w/curbs & sewers, HSG A
0.990	39		>75% Grass cover, Good, HSG A
0.100	98		Unconnected roofs, HSG A
0.060	98		Water Surface, HSG A
1.390	56	54	Weighted Average, UI Adjusted
0.990			71.22% Pervious Area
0.400			28.78% Impervious Area
0.100			25.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0360	1.51		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	202	0.0610	5.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	252	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Subarea PA



Summary for Subcatchment 2S: Subarea PB

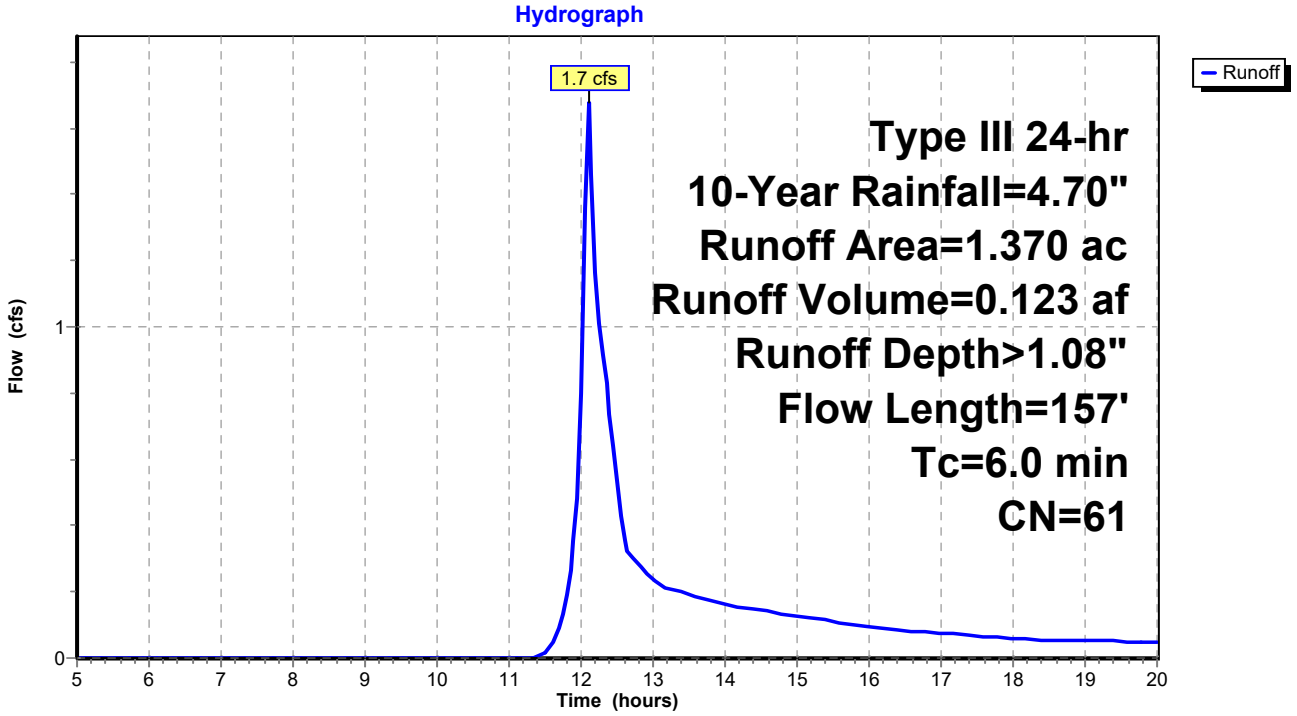
Runoff = 1.7 cfs @ 12.10 hrs, Volume= 0.123 af, Depth> 1.08"
Routed to Pond 8P : Infilltration Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG A
0.230	98	Paved roads w/curbs & sewers, HSG A
0.850	39	>75% Grass cover, Good, HSG A
0.120	98	Water Surface, HSG A
0.100	98	Unconnected roofs, HSG A
1.370	61	Weighted Average
0.850		62.04% Pervious Area
0.520		37.96% Impervious Area
0.100		19.23% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0340	1.48		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	107	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	157	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: Subarea PB



Summary for Subcatchment 3S: Subarea PE

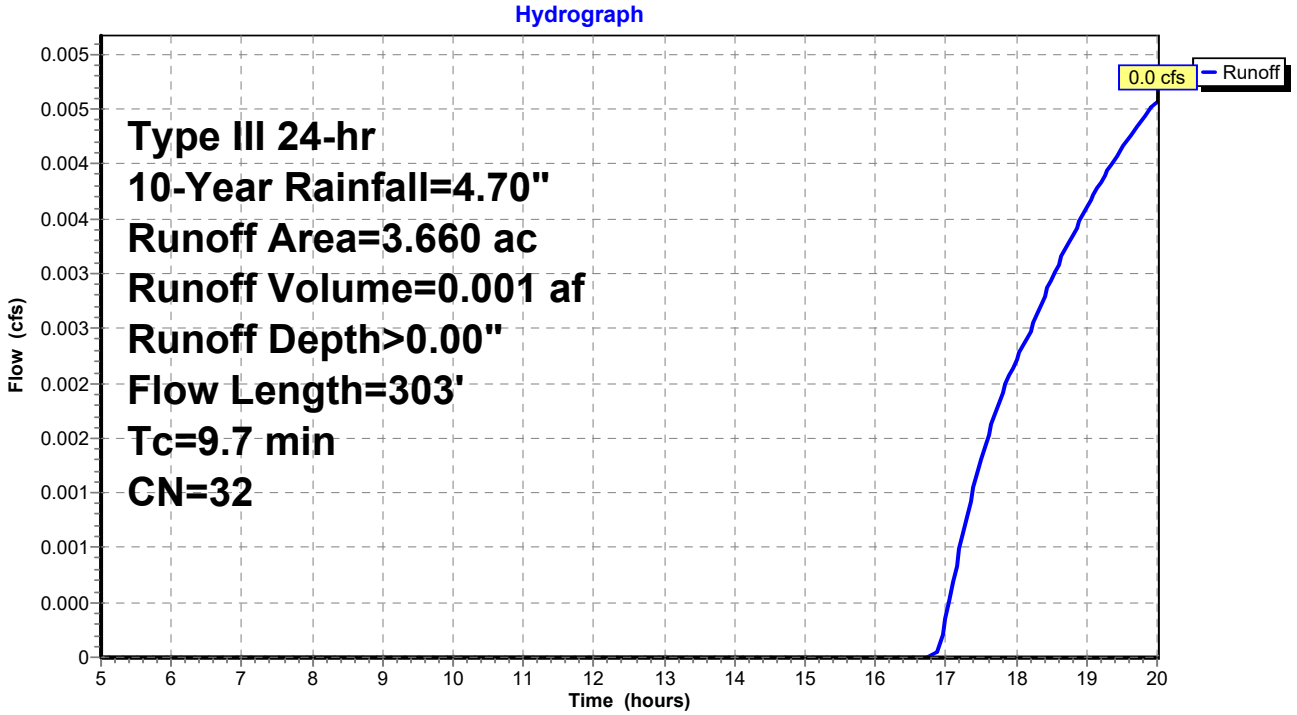
Runoff = 0.0 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.00"
Routed to Reach 9R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
2.670	30	Woods, Good, HSG A
0.990	39	>75% Grass cover, Good, HSG A
3.660	32	Weighted Average
3.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	21	0.2800	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.3	29	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.0	61	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	192	0.0990	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.7	303	Total			

Subcatchment 3S: Subarea PE



Summary for Subcatchment 5S: Subarea PC

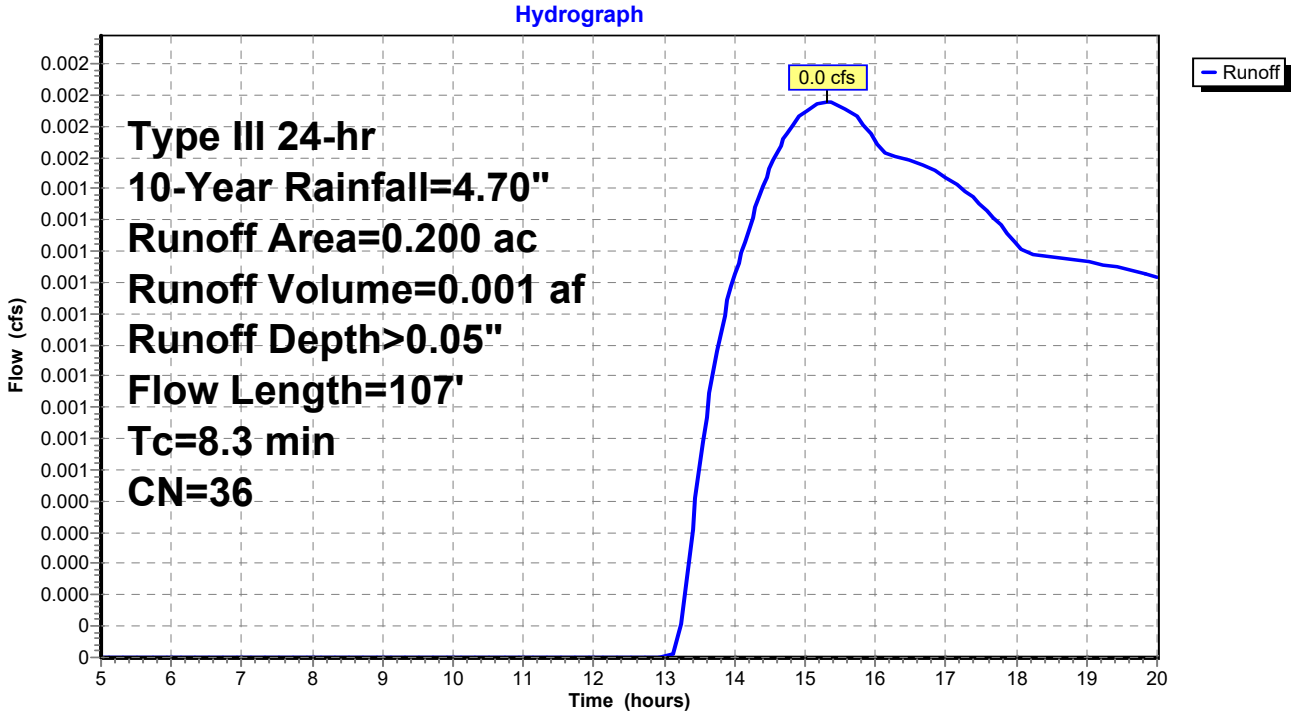
Runoff = 0.0 cfs @ 15.31 hrs, Volume= 0.001 af, Depth> 0.05"
Routed to Reach 10R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
0.060	30	Woods, Good, HSG A
0.140	39	>75% Grass cover, Good, HSG A
0.200	36	Weighted Average
0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0620	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	57	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	107	Total			

Subcatchment 5S: Subarea PC



Summary for Subcatchment 6S: Subarea PD

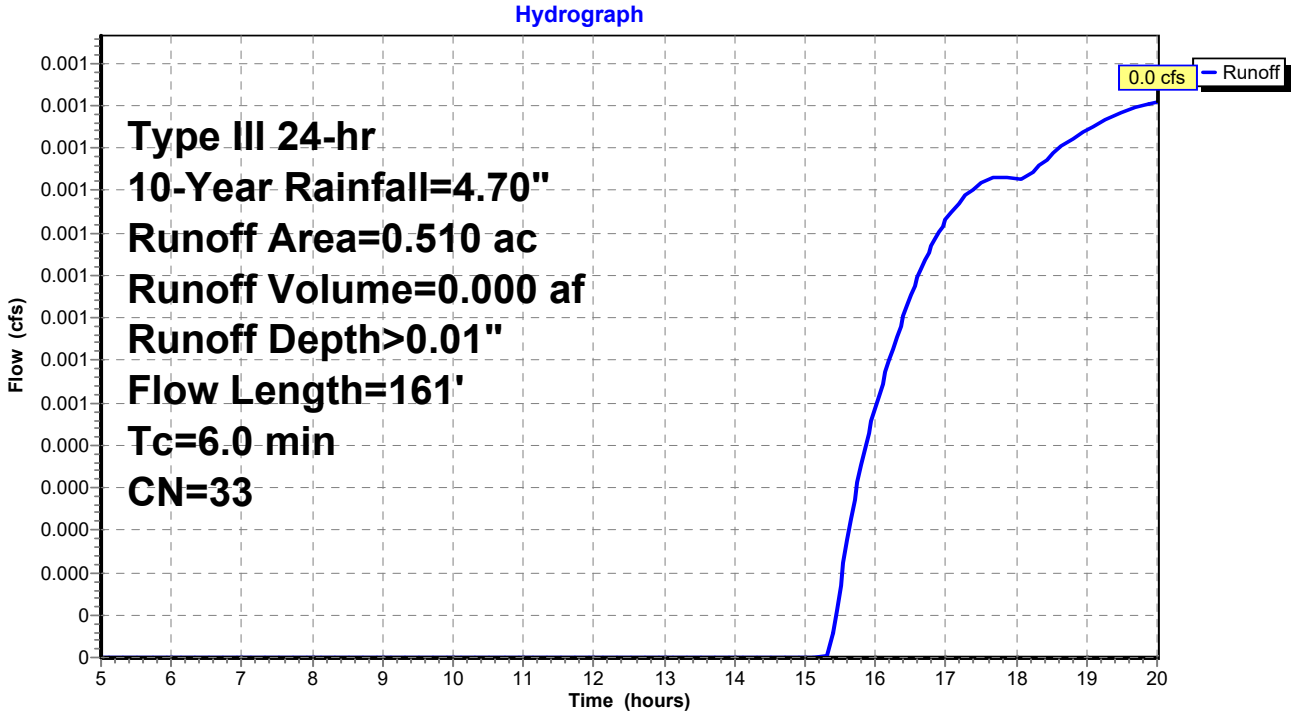
Runoff = 0.0 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.01"
Routed to Reach 11R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
0.330	30	Woods, Good, HSG A
0.180	39	>75% Grass cover, Good, HSG A
0.510	33	Weighted Average
0.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.3	27	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	84	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.9	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6S: Subarea PD

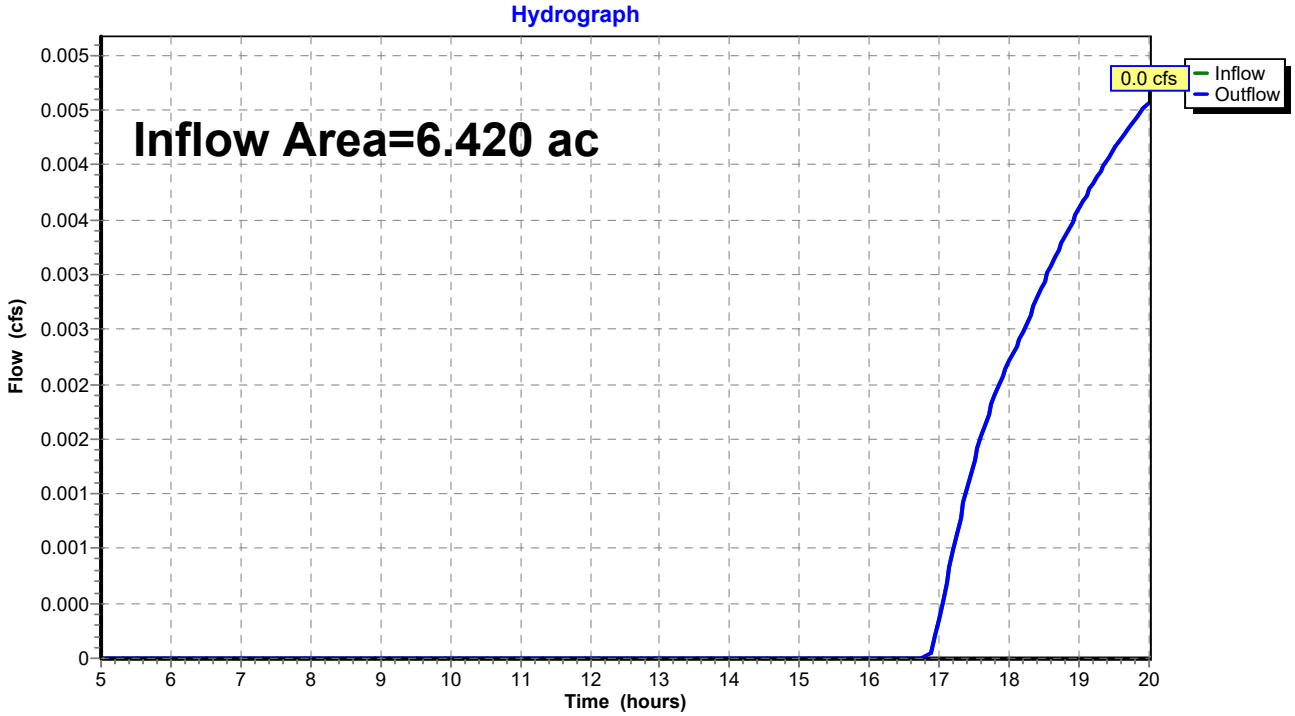


Summary for Reach 9R: Neponset Reservoir

Inflow Area = 6.420 ac, 14.33% Impervious, Inflow Depth > 0.00" for 10-Year event
Inflow = 0.0 cfs @ 20.00 hrs, Volume= 0.001 af
Outflow = 0.0 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 9R: Neponset Reservoir

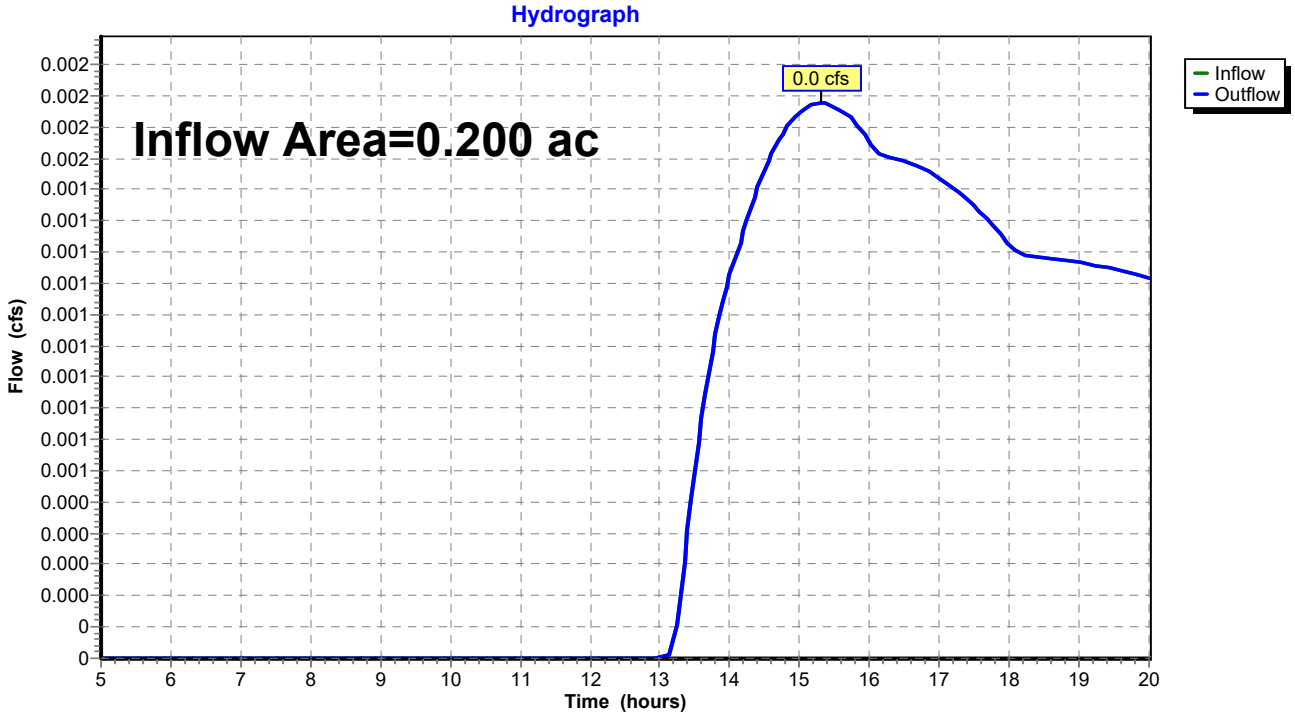


Summary for Reach 10R: Ridge Road

Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth > 0.05" for 10-Year event
Inflow = 0.0 cfs @ 15.31 hrs, Volume= 0.001 af
Outflow = 0.0 cfs @ 15.31 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 10R: Ridge Road

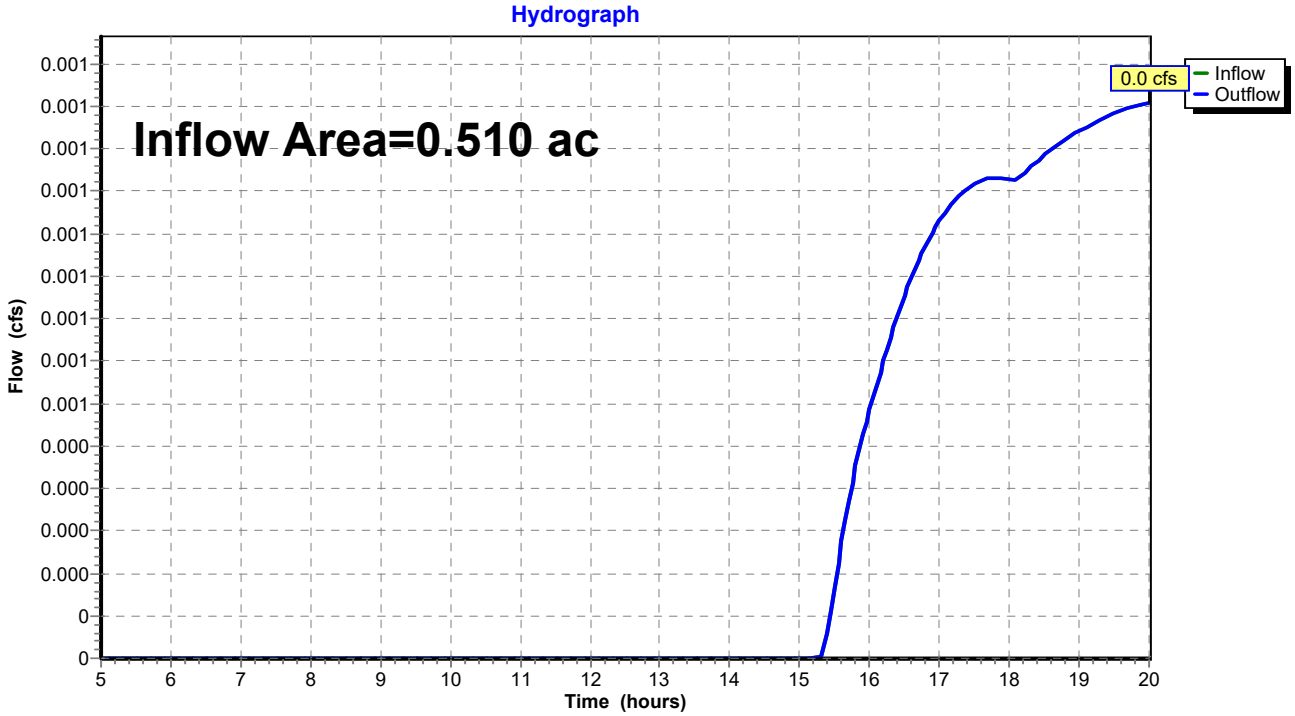


Summary for Reach 11R: Southern Property Line

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth > 0.01" for 10-Year event
Inflow = 0.0 cfs @ 20.00 hrs, Volume= 0.000 af
Outflow = 0.0 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 11R: Southern Property Line



Summary for Pond 7P: Infilltration Pond #1

Inflow Area = 1.390 ac, 28.78% Impervious, Inflow Depth > 0.69" for 10-Year event
Inflow = 0.9 cfs @ 12.12 hrs, Volume= 0.080 af
Outflow = 0.2 cfs @ 12.78 hrs, Volume= 0.080 af, Atten= 78%, Lag= 39.5 min
Discarded = 0.2 cfs @ 12.78 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.44' @ 12.78 hrs Surf.Area= 0.022 ac Storage= 0.021 af

Plug-Flow detention time= 51.0 min calculated for 0.079 af (99% of inflow)
Center-of-Mass det. time= 50.1 min (898.5 - 848.4)

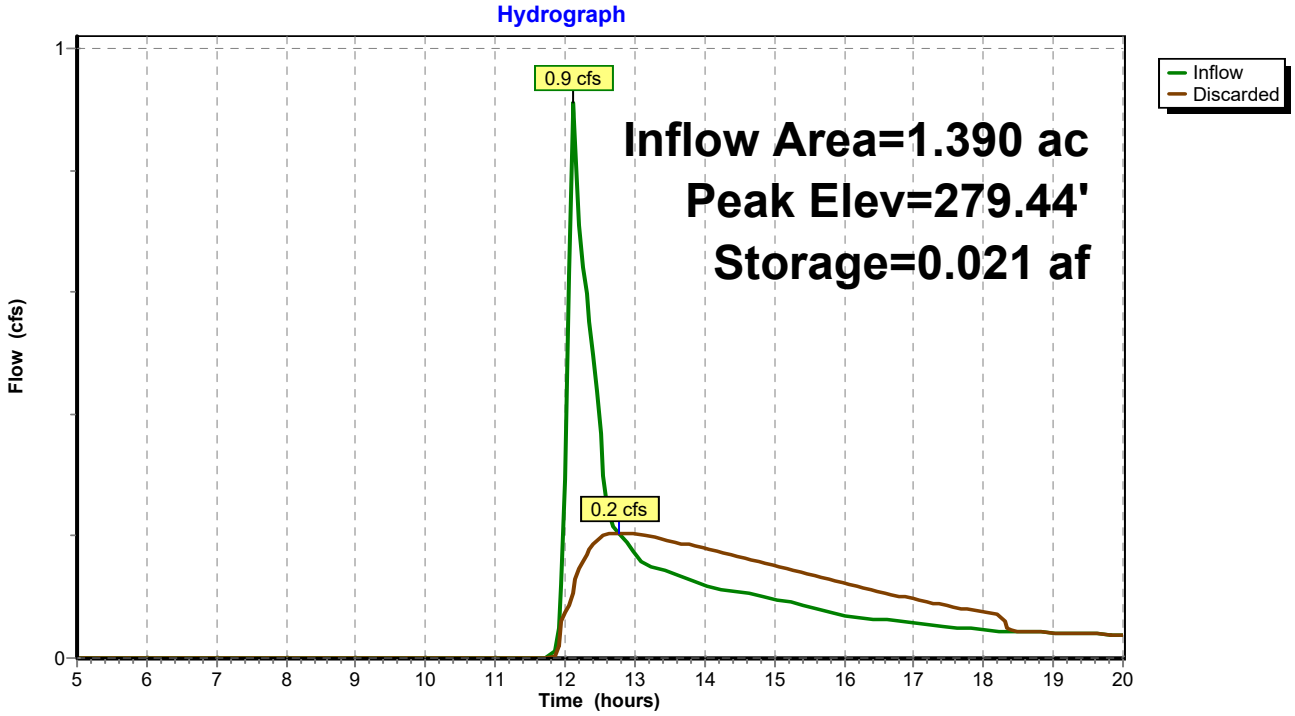
Volume	Invert	Avail.Storage	Storage Description
#1	278.00'	0.124 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
278.00	0.008	124.0	0.000	0.000	0.008
280.00	0.030	178.0	0.036	0.036	0.039
282.00	0.060	237.0	0.088	0.124	0.084

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.00'

Discarded OutFlow Max=0.2 cfs @ 12.78 hrs HW=279.44' (Free Discharge)
↑**1=Exfiltration** (Controls 0.2 cfs)

Pond 7P: Infilltration Pond #1



Summary for Pond 8P: Infilltration Pond #2

Inflow Area = 1.370 ac, 37.96% Impervious, Inflow Depth > 1.08" for 10-Year event
Inflow = 1.7 cfs @ 12.10 hrs, Volume= 0.123 af
Outflow = 0.1 cfs @ 15.99 hrs, Volume= 0.060 af, Atten= 95%, Lag= 233.3 min
Discarded = 0.1 cfs @ 15.99 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 273.20' @ 15.99 hrs Surf.Area= 0.068 ac Storage= 0.072 af

Plug-Flow detention time= 226.6 min calculated for 0.060 af (49% of inflow)
Center-of-Mass det. time= 130.6 min (959.8 - 829.3)

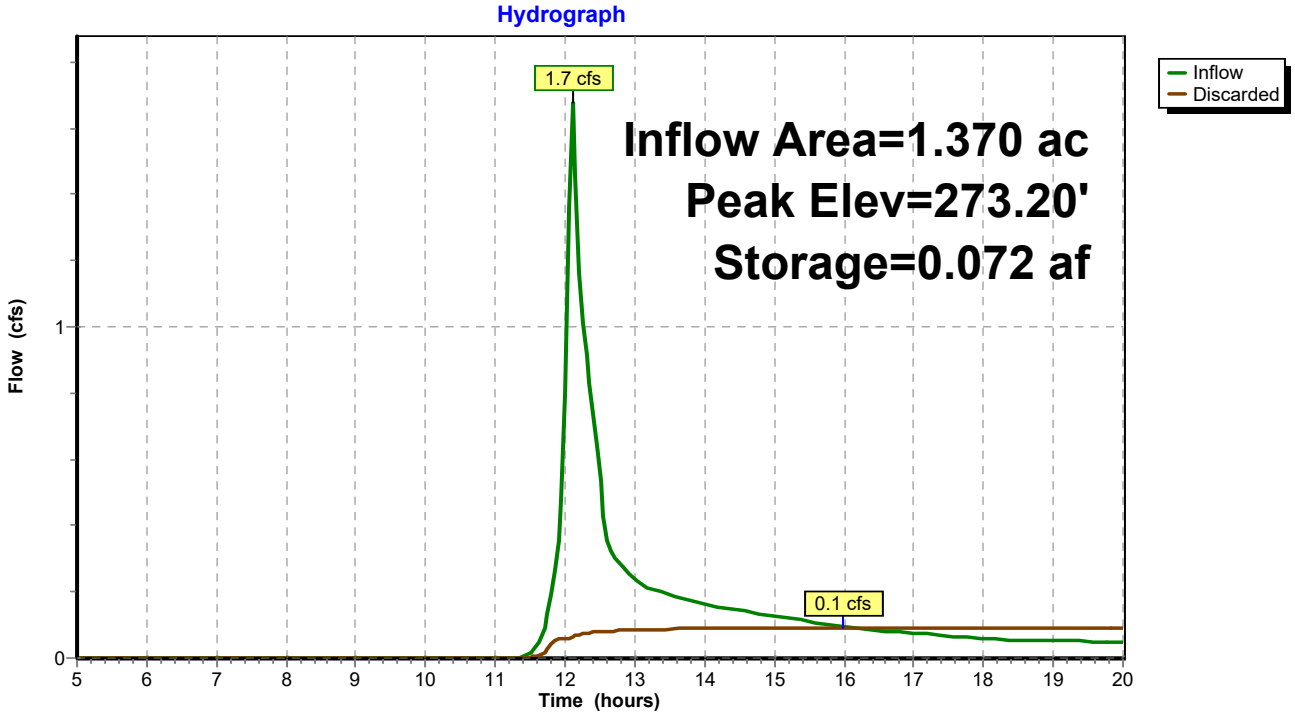
Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	0.328 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
272.00	0.052	184.0	0.000	0.000	0.052
274.00	0.080	226.0	0.131	0.131	0.085
276.00	0.118	275.0	0.197	0.328	0.131

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.75'

Discarded OutFlow Max=0.1 cfs @ 15.99 hrs HW=273.20' (Free Discharge)
1=Exfiltration (Controls 0.1 cfs)

Pond 8P: Infilltration Pond #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subarea PA Runoff Area=1.390 ac 28.78% Impervious Runoff Depth>1.67"
Flow Length=252' Tc=6.0 min UI Adjusted CN=54 Runoff=2.7 cfs 0.194 af

Subcatchment 2S: Subarea PB Runoff Area=1.370 ac 37.96% Impervious Runoff Depth>2.28"
Flow Length=157' Tc=6.0 min CN=61 Runoff=3.8 cfs 0.261 af

Subcatchment 3S: Subarea PE Runoff Area=3.660 ac 0.00% Impervious Runoff Depth>0.20"
Flow Length=303' Tc=9.7 min CN=32 Runoff=0.1 cfs 0.060 af

Subcatchment 5S: Subarea PC Runoff Area=0.200 ac 0.00% Impervious Runoff Depth>0.39"
Flow Length=107' Tc=8.3 min CN=36 Runoff=0.0 cfs 0.007 af

Subcatchment 6S: Subarea PD Runoff Area=0.510 ac 0.00% Impervious Runoff Depth>0.24"
Flow Length=161' Tc=6.0 min CN=33 Runoff=0.0 cfs 0.010 af

Reach 9R: Neponset Reservoir Inflow=0.1 cfs 0.060 af
Outflow=0.1 cfs 0.060 af

Reach 10R: Ridge Road Inflow=0.0 cfs 0.007 af
Outflow=0.0 cfs 0.007 af

Reach 11R: Southern Property Line Inflow=0.0 cfs 0.010 af
Outflow=0.0 cfs 0.010 af

Pond 7P: Infilltration Pond #1 Peak Elev=280.98' Storage=0.071 af Inflow=2.7 cfs 0.194 af
Outflow=0.4 cfs 0.187 af

Pond 8P: Infilltration Pond #2 Peak Elev=274.52' Storage=0.175 af Inflow=3.8 cfs 0.261 af
Outflow=0.1 cfs 0.096 af

Total Runoff Area = 7.130 ac Runoff Volume = 0.531 af Average Runoff Depth = 0.89"
87.10% Pervious = 6.210 ac 12.90% Impervious = 0.920 ac

Summary for Subcatchment 1S: Subarea PA

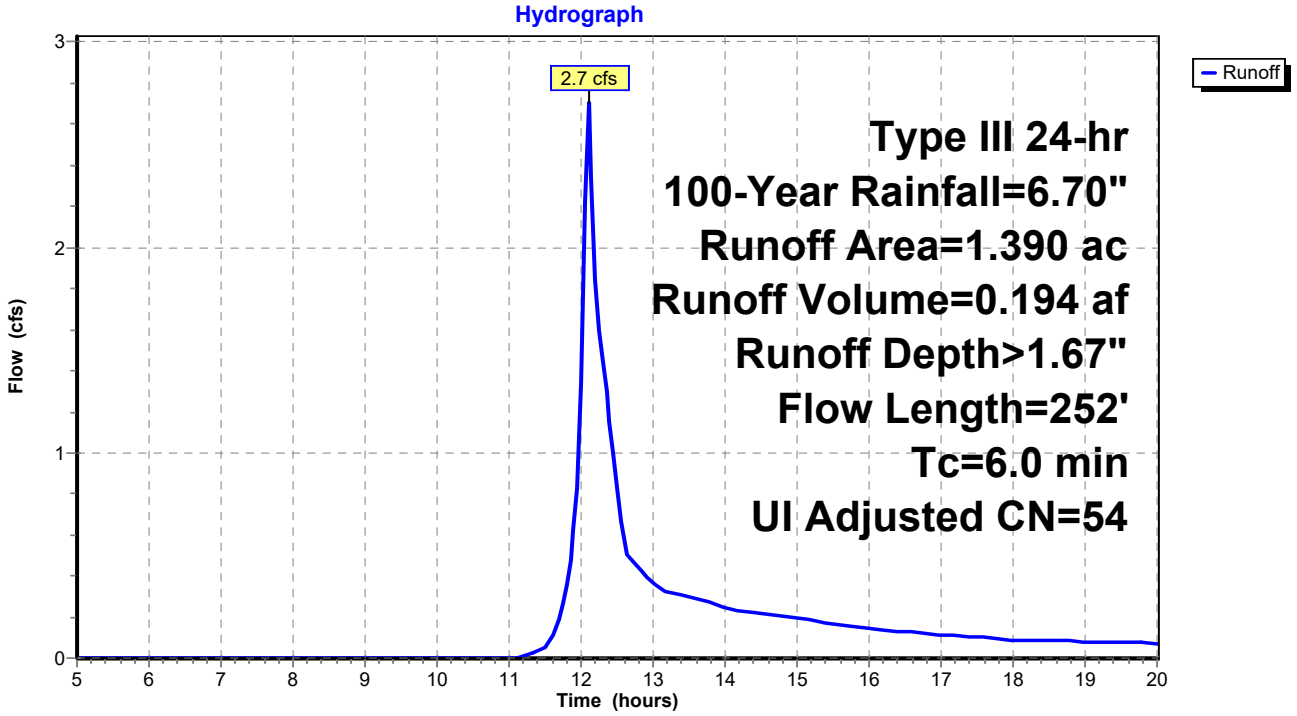
Runoff = 2.7 cfs @ 12.10 hrs, Volume= 0.194 af, Depth> 1.67"
Routed to Pond 7P : Infilltration Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Adj	Description
0.070	98		Paved parking, HSG A
0.170	98		Paved roads w/curbs & sewers, HSG A
0.990	39		>75% Grass cover, Good, HSG A
0.100	98		Unconnected roofs, HSG A
0.060	98		Water Surface, HSG A
1.390	56	54	Weighted Average, UI Adjusted
0.990			71.22% Pervious Area
0.400			28.78% Impervious Area
0.100			25.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0360	1.51		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	202	0.0610	5.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	252	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Subarea PA



Summary for Subcatchment 2S: Subarea PB

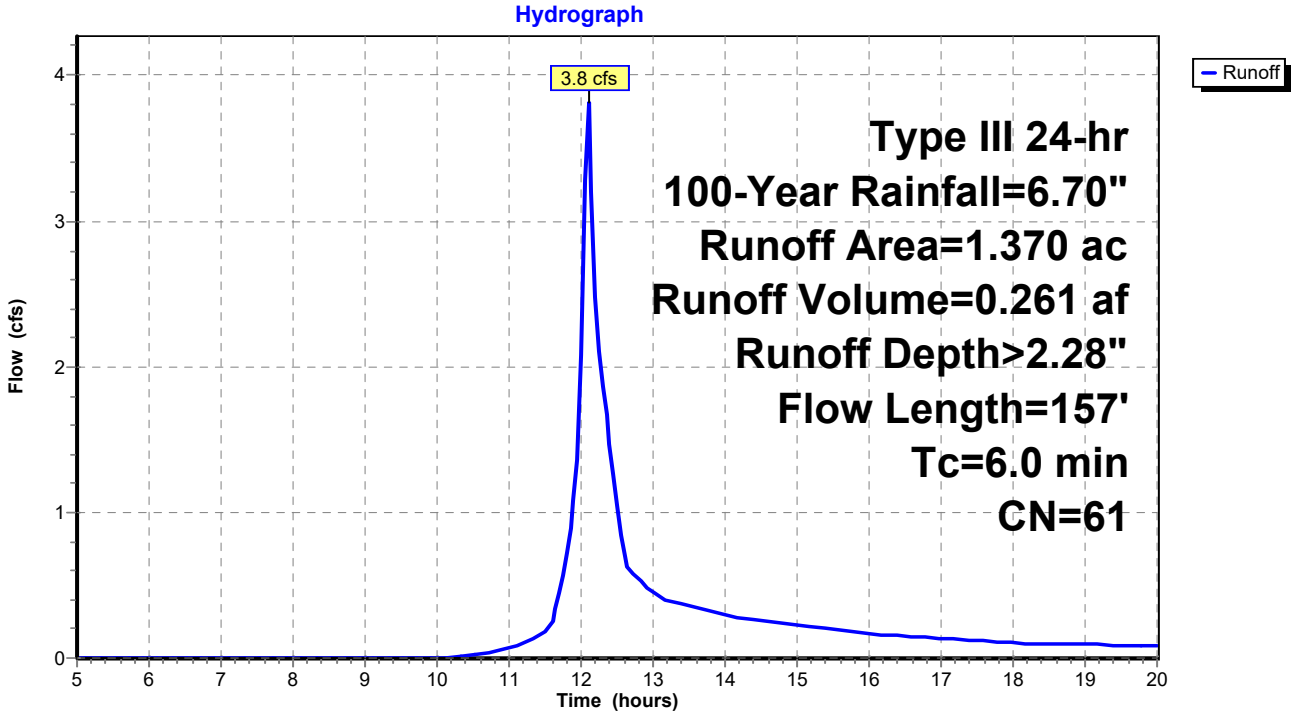
Runoff = 3.8 cfs @ 12.10 hrs, Volume= 0.261 af, Depth> 2.28"
Routed to Pond 8P : Infilltration Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG A
0.230	98	Paved roads w/curbs & sewers, HSG A
0.850	39	>75% Grass cover, Good, HSG A
0.120	98	Water Surface, HSG A
0.100	98	Unconnected roofs, HSG A
1.370	61	Weighted Average
0.850		62.04% Pervious Area
0.520		37.96% Impervious Area
0.100		19.23% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0340	1.48		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.5	107	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	157	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: Subarea PB



Summary for Subcatchment 3S: Subarea PE

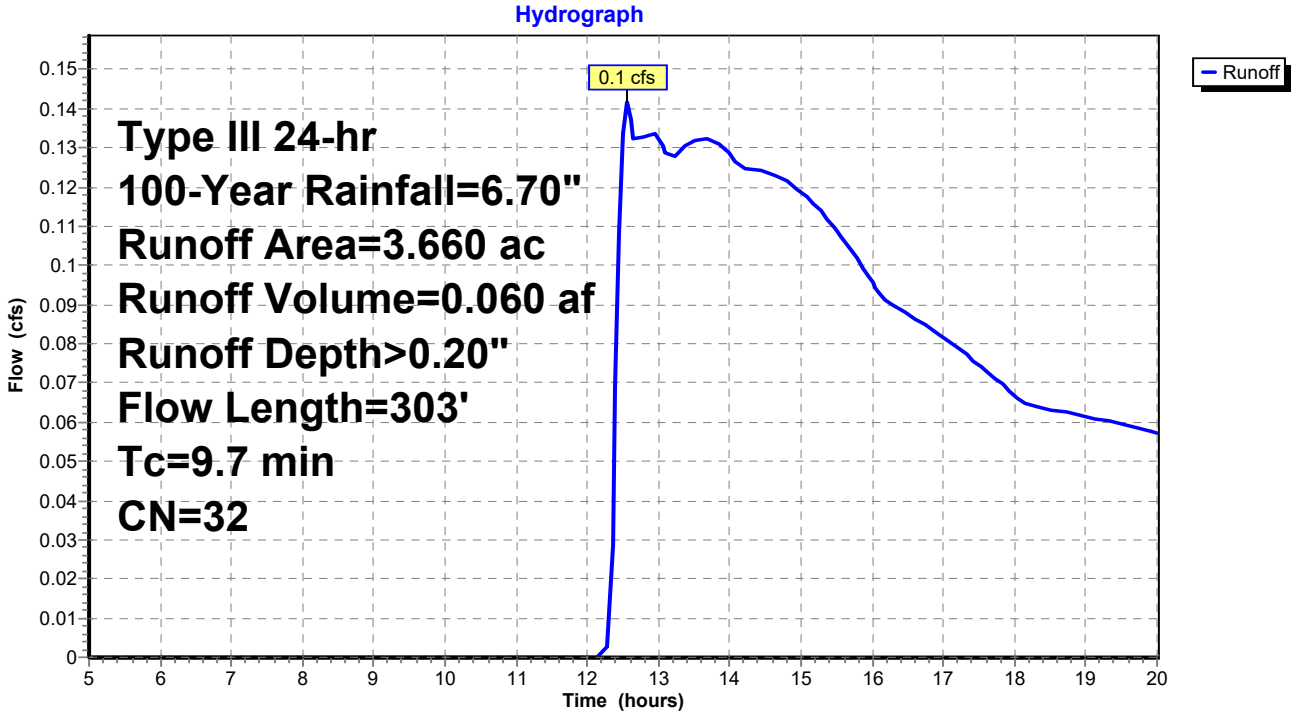
Runoff = 0.1 cfs @ 12.56 hrs, Volume= 0.060 af, Depth> 0.20"
Routed to Reach 9R : Neponset Reservoir

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
2.670	30	Woods, Good, HSG A
0.990	39	>75% Grass cover, Good, HSG A
3.660	32	Weighted Average
3.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	21	0.2800	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
5.3	29	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
1.0	61	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	192	0.0990	1.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.7	303	Total			

Subcatchment 3S: Subarea PE



Summary for Subcatchment 5S: Subarea PC

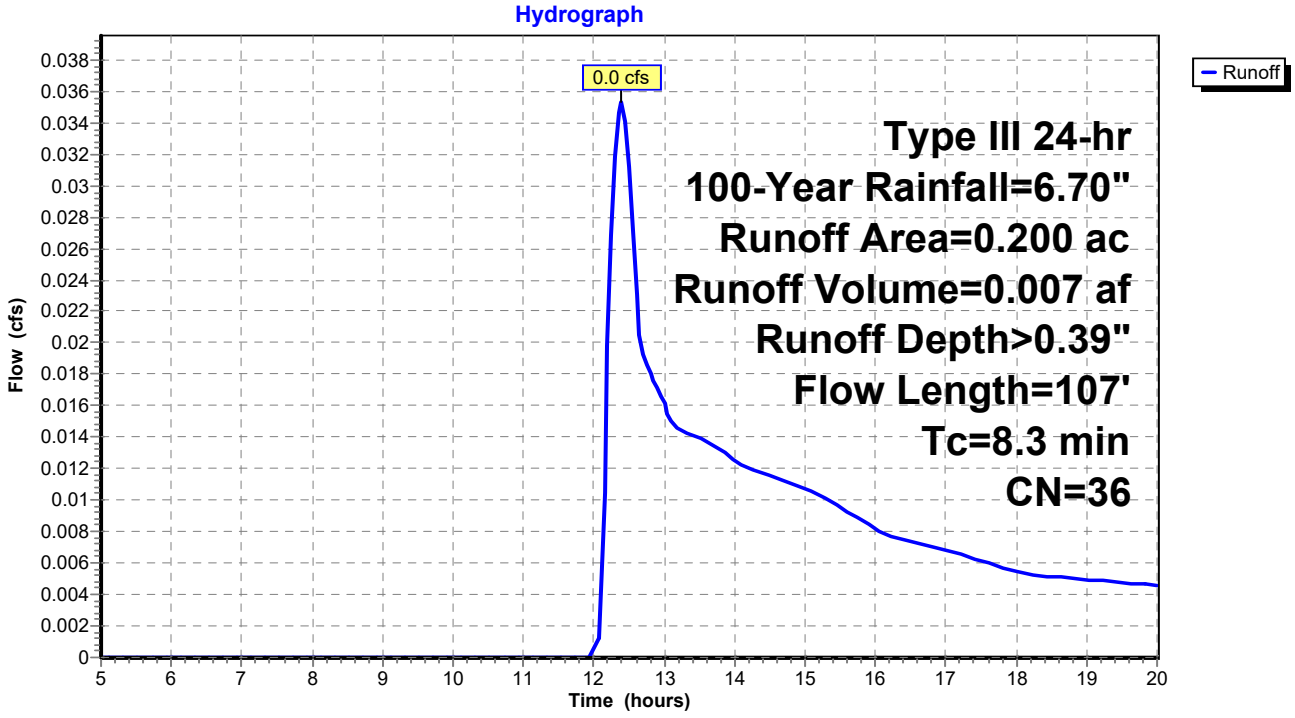
Runoff = 0.0 cfs @ 12.39 hrs, Volume= 0.007 af, Depth> 0.39"
Routed to Reach 10R : Ridge Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
0.060	30	Woods, Good, HSG A
0.140	39	>75% Grass cover, Good, HSG A
0.200	36	Weighted Average
0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0620	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	57	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	107	Total			

Subcatchment 5S: Subarea PC



Summary for Subcatchment 6S: Subarea PD

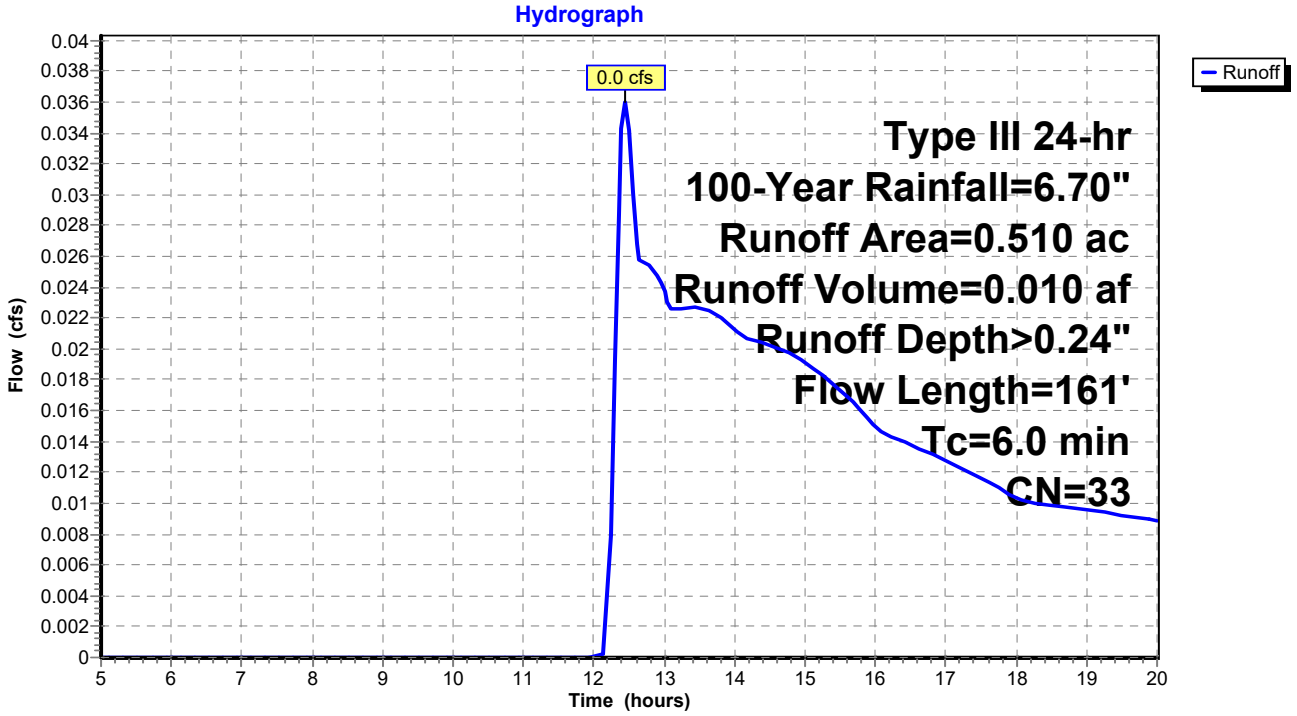
Runoff = 0.0 cfs @ 12.45 hrs, Volume= 0.010 af, Depth> 0.24"
Routed to Reach 11R : Southern Property Line

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (ac)	CN	Description
0.330	30	Woods, Good, HSG A
0.180	39	>75% Grass cover, Good, HSG A
0.510	33	Weighted Average
0.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
0.3	27	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	84	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.9	161	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6S: Subarea PD

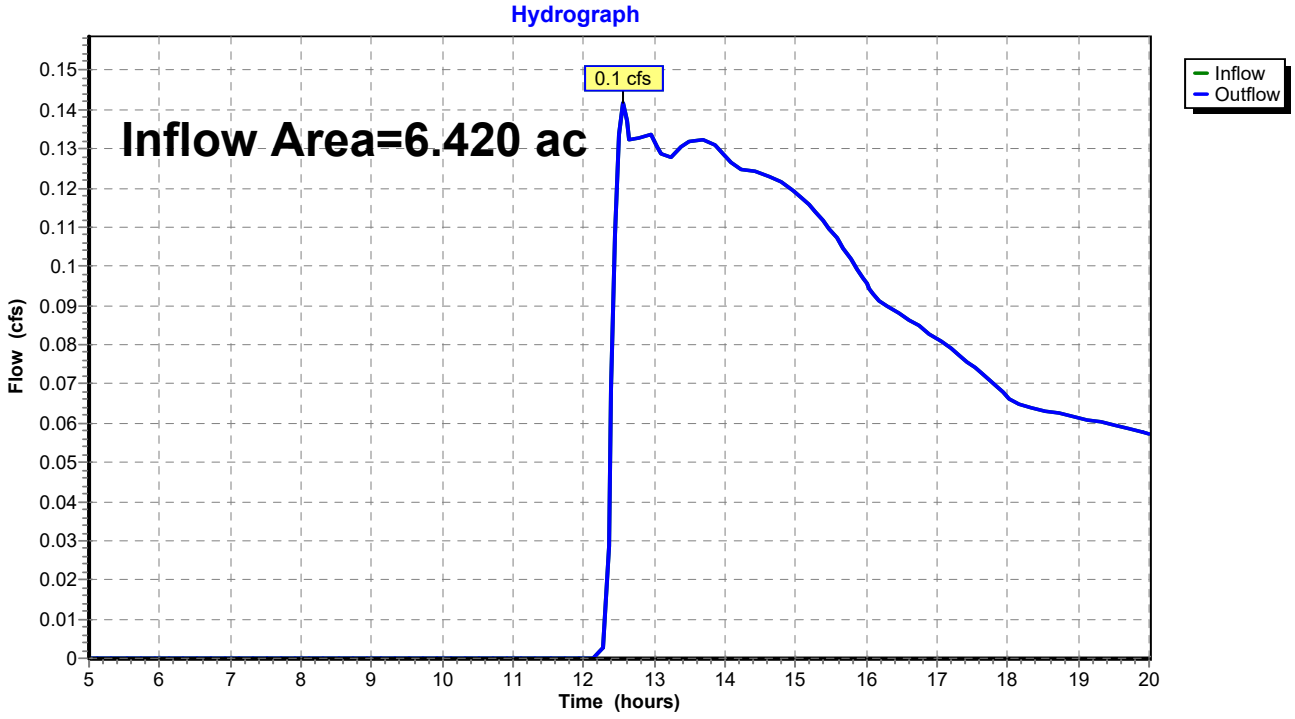


Summary for Reach 9R: Neponset Reservoir

Inflow Area = 6.420 ac, 14.33% Impervious, Inflow Depth > 0.11" for 100-Year event
Inflow = 0.1 cfs @ 12.56 hrs, Volume= 0.060 af
Outflow = 0.1 cfs @ 12.56 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 9R: Neponset Reservoir

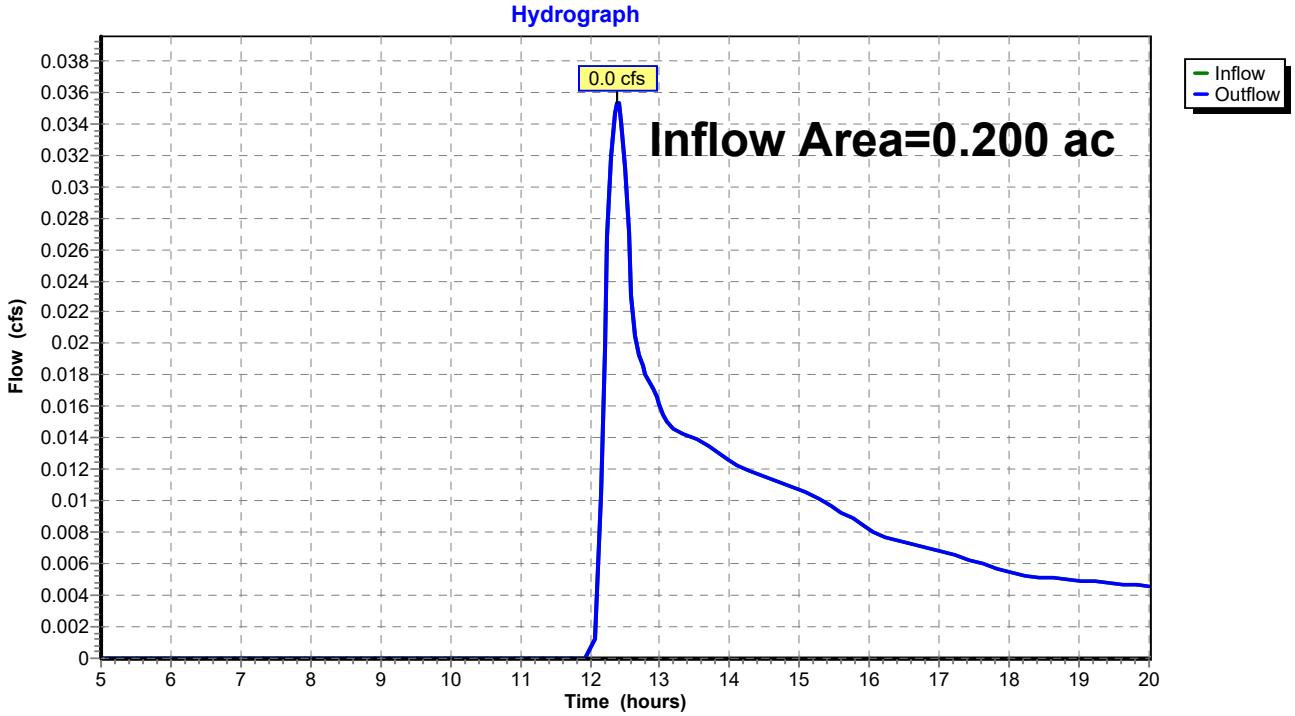


Summary for Reach 10R: Ridge Road

Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth > 0.39" for 100-Year event
Inflow = 0.0 cfs @ 12.39 hrs, Volume= 0.007 af
Outflow = 0.0 cfs @ 12.39 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 10R: Ridge Road

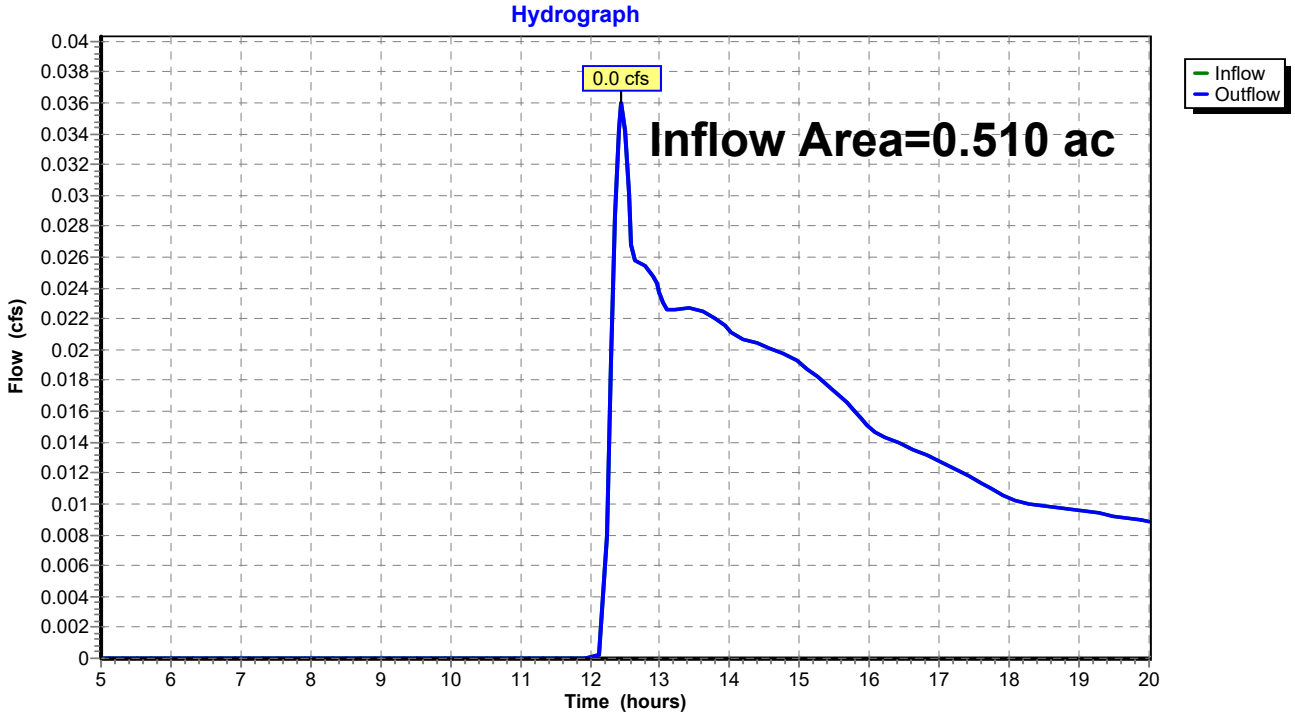


Summary for Reach 11R: Southern Property Line

Inflow Area = 0.510 ac, 0.00% Impervious, Inflow Depth > 0.24" for 100-Year event
Inflow = 0.0 cfs @ 12.45 hrs, Volume= 0.010 af
Outflow = 0.0 cfs @ 12.45 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 11R: Southern Property Line



Summary for Pond 7P: Infilltration Pond #1

Inflow Area = 1.390 ac, 28.78% Impervious, Inflow Depth > 1.67" for 100-Year event
Inflow = 2.7 cfs @ 12.10 hrs, Volume= 0.194 af
Outflow = 0.4 cfs @ 12.86 hrs, Volume= 0.187 af, Atten= 85%, Lag= 45.5 min
Discarded = 0.4 cfs @ 12.86 hrs, Volume= 0.187 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.98' @ 12.86 hrs Surf.Area= 0.043 ac Storage= 0.071 af

Plug-Flow detention time= 97.0 min calculated for 0.187 af (97% of inflow)
Center-of-Mass det. time= 85.0 min (910.6 - 825.6)

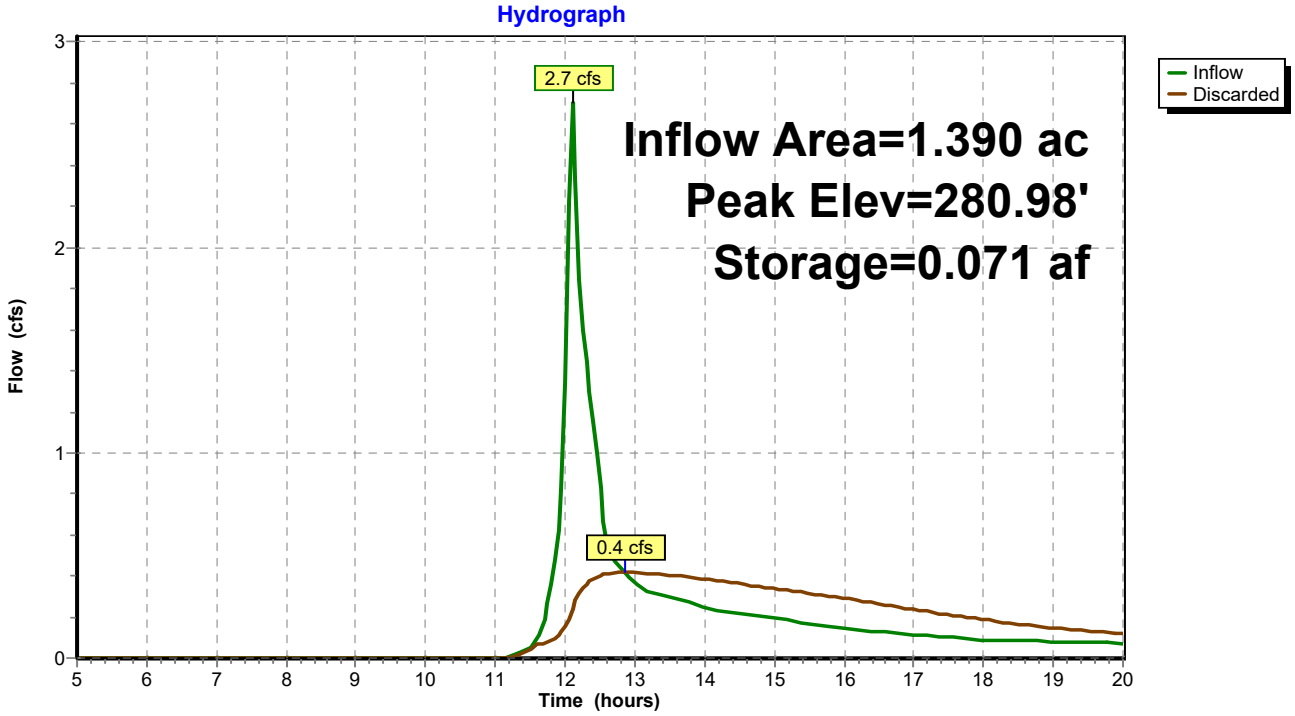
Volume	Invert	Avail.Storage	Storage Description
#1	278.00'	0.124 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
278.00	0.008	124.0	0.000	0.000	0.008
280.00	0.030	178.0	0.036	0.036	0.039
282.00	0.060	237.0	0.088	0.124	0.084

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.00'

Discarded OutFlow Max=0.4 cfs @ 12.86 hrs HW=280.98' (Free Discharge)
1=Exfiltration (Controls 0.4 cfs)

Pond 7P: Infilltration Pond #1



Summary for Pond 8P: Infilltration Pond #2

Inflow Area = 1.370 ac, 37.96% Impervious, Inflow Depth > 2.28" for 100-Year event
Inflow = 3.8 cfs @ 12.10 hrs, Volume= 0.261 af
Outflow = 0.1 cfs @ 16.66 hrs, Volume= 0.096 af, Atten= 96%, Lag= 273.4 min
Discarded = 0.1 cfs @ 16.66 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 274.52' @ 16.66 hrs Surf.Area= 0.089 ac Storage= 0.175 af

Plug-Flow detention time= 234.0 min calculated for 0.096 af (37% of inflow)
Center-of-Mass det. time= 140.7 min (952.7 - 812.0)

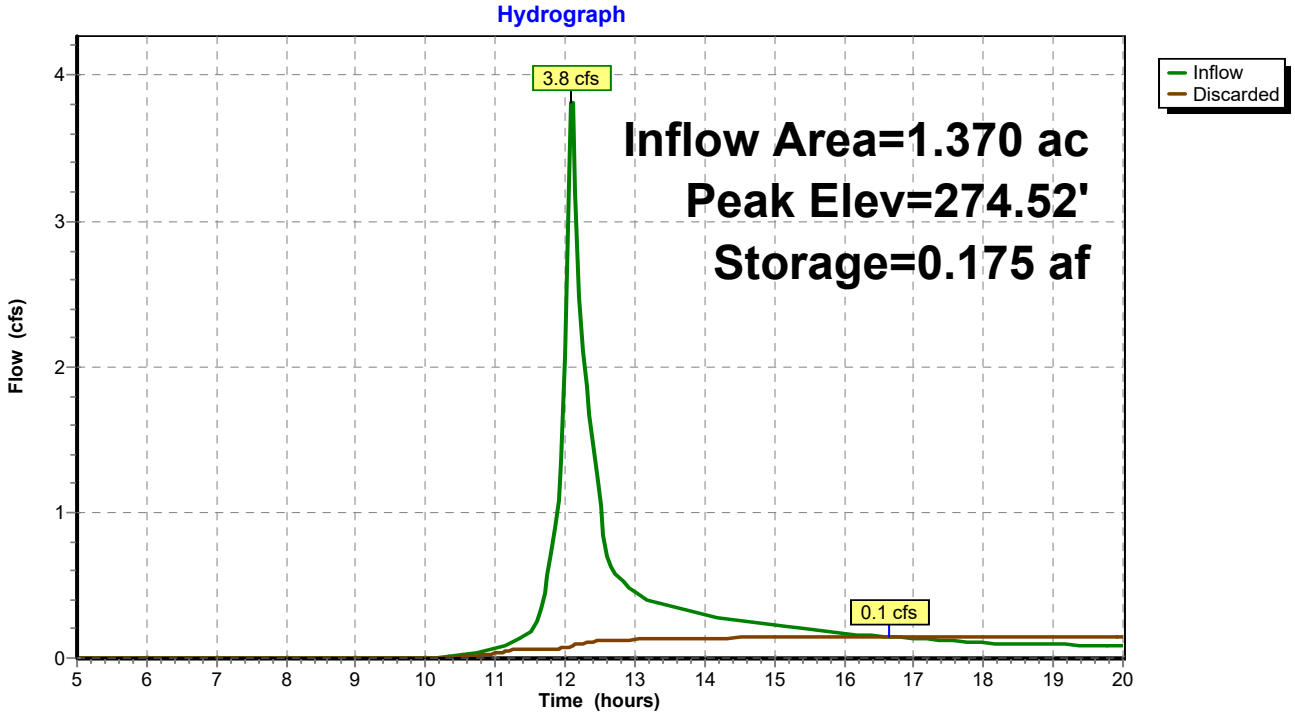
Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	0.328 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
272.00	0.052	184.0	0.000	0.000	0.052
274.00	0.080	226.0	0.131	0.131	0.085
276.00	0.118	275.0	0.197	0.328	0.131

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 268.75'

Discarded OutFlow Max=0.1 cfs @ 16.66 hrs HW=274.52' (Free Discharge)
↑**1=Exfiltration** (Controls 0.1 cfs)

Pond 8P: Infilltration Pond #2



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APPENDIX B – STORM WATER WORKSHEETS

Required Recharge Volume and Drawdown Worksheet
TSS Removal Worksheet
Stormceptor Documentation
Checklist for Stormwater Report
Ground Water Mounding Summary Worksheet

Required Recharge Volume Worksheet

PROJECT LOCATION: **Ridge Road Foxborough, MA**
DATE: 5-Jan-23
PROJECT NUMBER: 23-0138

Subarea PA

SCS Soil Type Hydrologic Group	*Target Depth Factor (in)*	*Total Impervious Area (ac)*	*Required Volume to Recharge (ac-ft)*
HSG A - Pavement & Roofs	0.60	0.340	0.0170
		TOTAL:	**0.0170**
		SITE TOTAL Rv:	**0.0170**

Subsurface Basin

Volume Recharged	
Volume of pond between bottom and outlet (el=281.40)	0.091 ac-ft

Drawdown Within 72 hours	
Soil Type:	Sand
RAWLS Rate (in/hr):	8.27
Infiltration Area (sf):	356
Drawdown Time (hours):	3.0

Required Recharge Volume Worksheet

PROJECT LOCATION: **Ridge Road Foxborough, MA**
DATE: 5-Jan-23
PROJECT NUMBER: 23-0138

Subarea PB

SCS Soil Type Hydrologic Group	*Target Depth Factor (in)*	*Total Impervious Area (ac)*	*Required Volume to Recharge (ac-ft)*
HSG A - Pavement & Roofs	0.60	0.400	0.0200
		TOTAL:	**0.0200**

SITE TOTAL Rv: **0.0200**

Subsurface Basin

Volume Recharged	
Volume of pond between bottom and outlet (el=275.00)	0.220 ac-ft

Drawdown Within 72 hours	
Soil Type:	Sandy Loam
RAWLS Rate (in/hr):	1.02
Infiltration Area (sf):	2,260
Drawdown Time (hours):	4.5

PROJECT LOCATION: Ridge Road Foxborough, MA
DATE: 5-Jan-24
PROJECT NUMBER: 23-0138

TSS Removal

Basin #1

Impervious Area =	0.340 acres			
Runoff depth to be treated =	1.00 inches			
Runoff volume to be treated =	0.0283 ac-ft			
BMP	*TSS Removal Rate*	*Starting TSS Load*	*Amount Removed*	*Remaining Load*
Deep sump CB	0.25	1.00	0.25	0.75
Stormceptor	0.8	0.75	0.60	0.15
Infiltration Basin	0.8	0.15	0.12	0.03
TOTAL TSS REMOVED =				**97 %**

Basin #2

Impervious Area =	0.400 acres			
Runoff depth to be treated =	1.00 inches			
Runoff volume to be treated =	0.0333 ac-ft			
BMP	*TSS Removal Rate*	*Starting TSS Load*	*Amount Removed*	*Remaining Load*
Deep sump CB	0.25	1.00	0.25	0.75
Stormceptor	0.8	0.75	0.60	0.15
Infiltration Basin	0.8	0.15	0.12	0.03
TOTAL TSS REMOVED =				**97 %**

Convert Required WQV to Discharge Rate for
Proprietary Stormwater Treatment Structures

PROJECT LOCATION:	Ridge Road
DATE:	01/05/23
PROJECT NUMBER:	23-0138

Structure Location:	DMH #1 - Subarea PA		
Within or Near a Critical Area:	Yes		
WQV:	1.0	inch	
Impervious Area =	0.000531	square miles	
Runoff Curve Number - CN =	98		
Time of Concentration - Tc =	6.0	min	
Unit Peak Discharge - qu =	774	csm/inch	see Table in Figure 4
Computed Flow Rate (1.0" of Runoff) $Q_{1.0}$ =	0.41	cfs	**STC 900** can accept 0.89 cfs

Structure Location:	DMH #2 - Subarea PB		
Within or Near a Critical Area:	Yes		
WQV:	1.0	inch	
Impervious Area =	0.000625	square miles	
Runoff Curve Number - CN =	98		
Time of Concentration - Tc =	7.0	min	
Unit Peak Discharge - qu =	755	csm/inch	see Table in Figure 4
Computed Flow Rate (1.0" of Runoff) $Q_{1.0}$ =	0.47	cfs	**STC 900** can accept 0.89 cfs

Reference: MassDEP Standard Method to Convert Required Water Quality Volume to Discharge Rate for Sizing Flow Based Manufatured Proprietary Stormwater Treatment Practices dated September 10, 2013

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Blaisdell House, UMass
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Massachusetts Stormwater Evaluation Project

(413) 545-5532
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www.mastep.net

MASTEP Technology Review

Technology Name: Stormceptor

Studies Reviewed: Final NJCAT Technology Verification Stormceptor STC900 September 2004; Coventry University Study, 1996; Technology Assessment, University of Massachusetts, 1997; SeaTac Stormceptor Performance report 2001; SWAMP report Ontario 2004; Phoenix Group Edmonton report 1995; Stormceptor 1200 Field Evaluation report 2004; Applied Hydrology Associates Denver report 2003; Rinker Materials Como Park St. Paul MN report 2002; VA DOT / UVA "Testing of Ultra-Urban Stormwater Best Management Practices" report 2001.
Hydrodynamic Separator Sediment Retention Testing, Mohseni, 2010.

Date: September 17, 2013

Reviewer: Jerry Schoen

Rating: 2

Brief rationale for rating: This rating is primarily based on the 2005 NJCAT Technology Verification study. In general, this was a well-conducted test, which in large part followed NJDEP test guidelines for laboratory studies, which MASTEP considers as the laboratory equivalent of TARP field protocols. Issues of concern: the study measured suspended sediment concentration (SSC) rather than total suspended solids (TSS). Although SSC is considered by many scientists to be the preferred method, it is at odds with Massachusetts stormwater regulations, which are based on TSS treatment. Comparing SSC and TSS results is considered an inexact science. The test was conducted with higher influent sediment concentrations than is preferred, but results were fairly consistent across all ranges studied. The particle size distribution also appears to be slightly higher than the target test range. There are additional field studies that in general support the results obtained in this laboratory studies. These studies do not satisfy TARP protocols, but they do not contradict results obtained in the NJCAT study.

TARP Requirements Not Met*:

- Measurements in TSS.
- Influent sediment concentration is 100 – 300 mg/l: actual was 153-460.
- No documentation of a Quality Assurance Project Plan
- Third party studies are preferred. This was conducted by Stormceptor personnel, with sample analyses conducted by an external laboratory.

Other Comments:
* The 2010 Mohseni study evaluates the susceptibility of the Stormceptor to scouring, or washout of collected sediments. Report concluded that the unit does not scour at high flows as long as sediment depth does not exceed maintenance level.

* Criteria also based on NJDEP laboratory testing guidelines.

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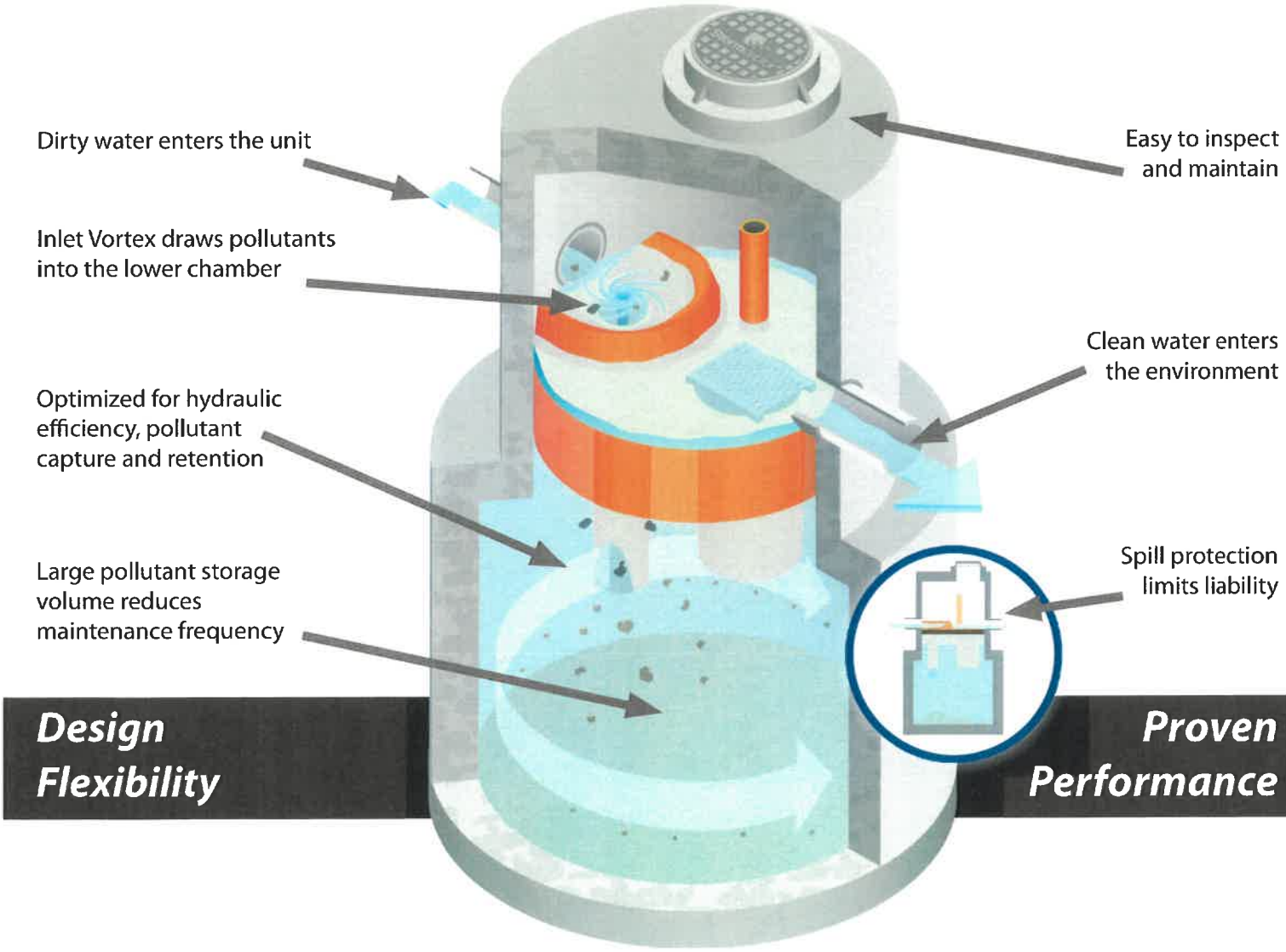

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Stormceptor® STC

Stormceptor® is an underground stormwater quality treatment device that is unparalleled in its effectiveness for pollutant capture and retention. With thousands of systems operating worldwide, Stormceptor delivers protection every day in every storm.

With patented technology, optimal treatment occurs by allowing free oil to rise and sediment to settle. The Stormceptor design prohibits scour and release of previously captured pollutants, ensuring superior treatment and protection during even the most extreme storm events.

Stormceptor is very easy to design and provides flexibility under varying site constraints such as tight right-of-ways, zero lot lines and retrofit projects. Design flexibility allows for a cost-effective approach to stormwater treatment. Stormceptor has proven performance backed by the longest record of lab and field verification in the industry.

Tested Performance

- Fine particle capture
- Prevents scour or release
- 95%+ Oil removal

Massachusetts – Water Quality (Q) Flow Rate

Stormceptor STC Model	Inside Diameter	Typical Depth Below Inlet Pipe Invert [1]	Water Quality Flow Rate Q [2]	Peak Conveyance Flow Rate [3]	Hydrocarbon Capacity [4]	Maximum Sediment Capacity [4]
	(ft)	(in)	(cfs)	(cfs)	(Gallons)	(ft^3)
STC 450i	4	68	0.40	5.5	86	46
STC 900	6	63	0.89	22	251	89
STC 2400	8	104	1.58	22	840	205
STC 4800	10	140	2.47	22	909	543
STC 7200	12	148	3.56	22	1,059	839
STC 11000	2 x 10	142	4.94	48	2,792	1,086
STC 16000	2 x 12	148	7.12	48	3,055	1,677

[1] Depth Below Pipe Inlet Invert to the Bottom of Base Slab, and Maximum Sediment Capacity can vary to accommodate specific site designs and pollutant loads. Depths can vary to accommodate special designs or site conditions. Contact your local representative for assistance.
[2] Water Quality Flow Rate (Q) is based on 80% annual average TSS removal of the OK110 particle size distribution.
[3] Peak Conveyance Flow Rate is based upon ideal velocity of 3 feet per second and outlet pipe diameters of 18-inch, 36-inch, and 54-inch diameters.
[4] Hydrocarbon & Sediment capacities can be modified to accommodate specific site design requirements, contact your local representative for assistance.

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Phone: (413) 562-3647
11-22-13-R13-802 MDEP

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.

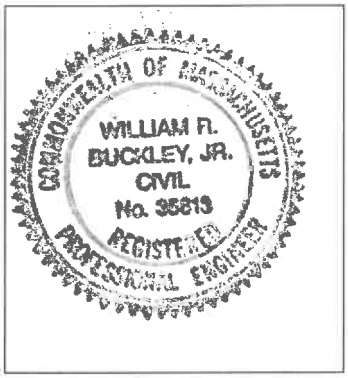
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



11/7/2020
Signature and Date

Checklist

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

- [x] 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:

- [x] No disturbance to any Wetland Resource Areas
- [ ] Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- [ ] Reduced Impervious Area (Redevelopment Only)
- [ ] Minimizing disturbance to existing trees and shrubs
- [ ] LID Site Design Credit Requested:
  - [ ] Credit 1
  - [ ] Credit 2
  - [ ] Credit 3
- [ ] Use of "country drainage" versus curb and gutter conveyance and pipe
- [ ] Bioretention Cells (includes Rain Gardens)
- [ ] Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- [ ] Treebox Filter
- [ ] Water Quality Swale
- [ ] Grass Channel
- [ ] Green Roof
- [ ] Other (describe): _____

Standard 1: No New Untreated Discharges

- [x] No new untreated discharges
- [x] 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)

- [x] 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.

- [x] A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- [x] 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:
  - [x] is within the Zone II or Interim Wellhead Protection Area
  - [ ] is near or to other critical areas
  - [x] 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.
- [x] 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)

- [x] The BMP is sized (and calculations provided) based on:
  - [x] 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.
- [x] 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.
- [x] 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.

PROJECT LOCATION:	**Ridge Road**
DATE:	5-Jan-24
PROJECT NUMBER:	23-0138

Basin 2

Aquifer Properties:

Hydraulic Conductivity (K-ft/day):	2.04	RAWLS rate for SAND
Specific Yield (Sy):	0.22	Coarse Sand (USGS Water Supply Paper 1662-D)
Initial Saturated Thickness (ft):	10	Town of Foxborough Ground Water Protection Study- April 1989

Recharge Area Properties:

Required Recharge Volume (Rv-ft3):	872	See Required Recharge Volume Worksheet
Elevation of Estimated High Groundwater (ft):	268.75	
Bottom of Recharge System (ft):	272.00	Bottom basin el-272.0'
Bottom Area (ft2):	2,260	Bottom basin el-272.0'

Application Rate Calculation:

$$\frac{\text{Rv (ft3)}}{\text{Bottom Area (ft2)}} * \frac{\text{24 hrs/day}}{\text{(DEP stan}} =$$

$$\frac{872}{2{,}260} * \frac{24}{2} = 4.6 \text{ ft/day}$$

Length of Time to Generate Rv (days):	0.0833	assume Rv generated during a 2 hour period - see DEP Stormwater Handbook, Vol.3, Ch.1, p.20

Groundwater Mounding Solution by Hantush (1967)

Maximum Water Table Rise in Center of Recharge Area (ft)	1.74	See output run using AQTESOLV V4.50.002
Depth From Top of Mound to Bottom of Recharge Area (ft):	1.51	Mound does not breach bottom of system

Transient Water-Table Rise Beneath a Rectangular Recharge Area
Groundwater Mounding Solution by Hantush (1967)

Aquifer Properties:
Hydraulic conductivity, K = 2.04 ft/day
Specific yield, Sy = 0.22
Initial saturated thickness, h(0) = 10 ft

Recharge Area Properties:
Recharge rate, w = 4.6 ft/day
Simulation time, t = 1 day
Time when recharge stops, t(0) = 0.0833 day
X coordinate at center of recharge area, X = 0 ft
Y coordinate at center of recharge area, Y = 0 ft
Length in x direction, l = 50 ft
Length in y direction, a = 45.2 ft

Water-Table Rise at Center of Recharge Area:

t (day)	h (ft)
0.1	1.74173
0.2	1.74151
0.3	1.73743
0.4	1.72209
0.5	1.69326
0.6	1.65369
0.7	1.60725
0.8	1.55721
0.9	1.50588
1	1.4548

Note: recovery begins after 0.0833 day.

APPENDIX C - OPERATION AND MAINTENANCE PLAN FOR STORM WATER BMPS

Construction Period O & M Plan
Post-Construction O & M Plan

CONSTRUCTION PERIOD MAINTENANCE PLAN
FOR STORMWATER BMPs
Ridge Road Foxborough, MA

References:

- Definitive Plan of Land Ridge Road Foxborough, MA dated January 5, 2024
- Storm Water Management Report "Ridge Road Foxborough, MA" dated January, 2024

Operation and Maintenance

Item 1: During construction, **weekly** inspection of the crushed stone construction entrance pad and erosion control systems shall be conducted by a qualified staff member of the responsible party or an independent sediment and erosion control expert hired by the responsible party. Any displaced barriers shall be restored or repaired immediately.

Item 2: The catch basins within the project site shall be set to base course grade so that they are functional throughout the project. They shall be inspected **before** and **after** rain storms, if they are filled with sediment to half of their depth, they shall be cleaned out with an orange peel bucket or some other means. Silt sacks shall be installed inside the catch basins to ensure that siltation does not enter the catch basin. The infiltration system and catch basins shall be inspected three times a year: once after leaf fall, once before the arrival of hurricane season, the third in the early or mid-spring after the snow melt and road sweeping. Any debris should be cleaned out. The roadways shall be swept as necessary, but no less than twice a year: once before hurricane season, the once in the spring after snow melt.

Item 3: Stormcepters shall be installed where indicated.

Item 4: During construction every effort will be made to ensure that silt does not enter the infiltration basin. Additional silt socks shall be used as necessary. If silt does enter the basin, then clean out the bottom of the basin. Do not install the bottom material in the basin until the entire site has been stabilized.

Item 5: During construction, the stone pads at the entrances to the project shall be inspected **weekly** and replenished if siltation is impeding the cleaning of truck tires. Any materials tracked into the roadway shall be swept up within a day.

LONG TERM OPERATION AND MAINTENANCE PLAN
FOR STORMWATER BMPs
Ridge Road Foxborough, MA

	During Construction	**Post-construction**
BMP Owner:	**Owner**	**Town of Foxborough**
Party of Plan Responsibility:	**Owner**	**Town of Foxborough**

References:

- Definitive Plan of Land Ridge Road Foxborough, MA dated January 5, 2024
- Storm Water Management Report "Ridge Road Foxborough, MA" dated January, 2024

Operation and Maintenance

Catch Basins: The catch basins shall be inspected three times a year: once after leaf fall, once before the arrival of hurricane season, the third in the early or mid-spring after the snow melt and road sweeping. Any debris in catch basins shall be cleaned out. If there is less than 2' of space below the outlet and the top of the silt then the structure shall be cleaned out.

Roadways: The roadways will be swept twice a year: once before hurricane season, the other in the spring after snow melt.

Infiltration Basins: Once the infiltration system is in use, inspect it after every major storm (3.2 inches in 24 hours) for the first few months to ensure it is functioning properly and if necessary, take corrective action. Note how long water remains standing in the basin after a storm; standing water within the basin 48 to 72 hours after a storm indicates that there is an issue. If the ponding is due to clogging, immediately address the reasons for the clogging (such as upland sediment erosion). If necessary, aerate the bottom or replace the top 6" with the same mixture used to create the basin. Thereafter, inspect the infiltration basin at least twice per year to ensure that it is dry. During the inspection mowing the basin is appropriate.

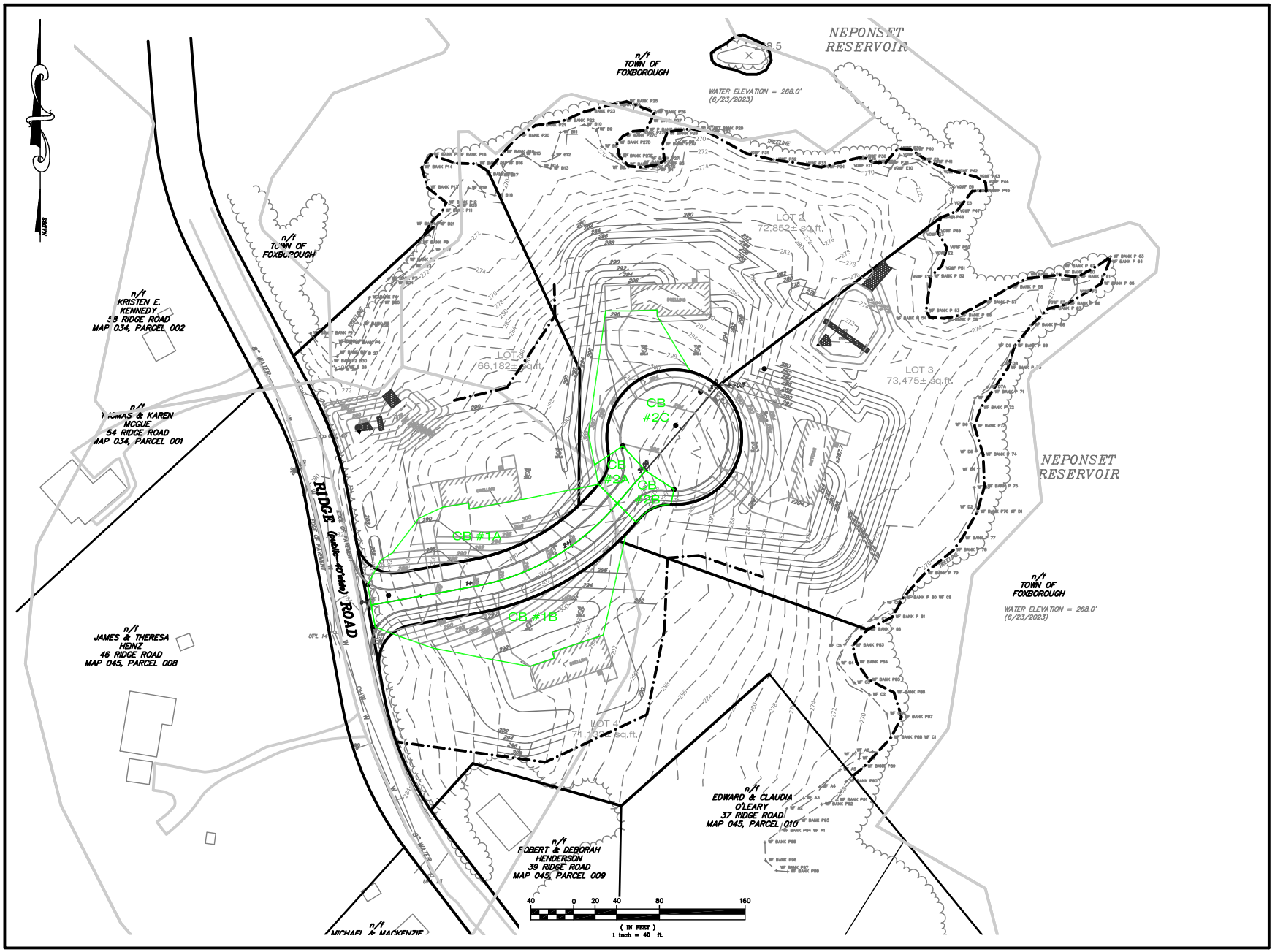
Contech Stormceptors: Inspect Stormceptor structure in accordance with the latest manufacturer's maintenance manual, which can be found at Contech Engineered Solutions Technical Guides (conteches.com)

Estimated Operations and Maintenance Budget

The following is an estimate of the O&M Budget, post construction.
Inspections (3 times per year): $420
Mowing (2 times per year): $100
Cleaning catch basins (yearly): $1,000

APPENDIX D - Closed Drainage System Worksheet

Upstream Node	Downstream Node	Length (ft)	Section Size	Constructed Slope (ft/ft)	Full Capacity (cfs)	Upstream Inlet Rational Flow (cfs)	Total Flow (cfs)	Average Velocity (ft/s)	Upstream Ground Elevation (ft)	Upstream Invert Elevation (ft)	Upstream Structure Hydraulic Grade (ft)	Downstream Ground Elevation (ft)	Downstream Invert Elevation (ft)	Downstream Structure Hydraulic Grade (ft)
DMH #3	FES #2	55	12 inch	0.03	6.17	N/A	1.01	5.79	283.00	274.65	275.07	276.00	273.00	273.00
DMH #1	FES #1	151	12 inch	0.01	3.56	N/A	1.61	4.42	284.60	279.71	280.25	282.00	278.20	278.20
CB#1A	DMH #1	18	12 inch	0.01	3.56	0.75	0.75	3.59	283.70	279.70	280.31	284.60	279.52	280.32
CB#1B	DMH #1	26	12 inch	0.01	3.56	0.87	0.87	3.74	284.40	279.78	280.32	284.60	279.52	280.32
DMH #2	DMH #3	94	12 inch	0.07	9.43	N/A	1.01	7.84	294.80	287.58	288.00	283.00	281.00	275.10
CB #2A	DMH #2	48	12 inch	0.02	5.04	0.07	0.07	2.28	296.00	288.54	288.65	294.80	287.58	288.03
CB #2C	DMH #2	36	12 inch	0.02	5.04	0.89	0.89	4.83	293.20	288.30	288.69	294.80	287.58	288.03
CB #2B	DMH #2	55	12 inch	0.02	5.04	0.07	0.07	2.28	296.00	288.68	288.79	294.80	287.58	288.03



PROJECT:

Ridge Road
Foxborough, MA
02035

OWNER:

FED CAP, Inc.
P.O. Box 669
Foxborough, MA
02035

Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors
FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

REFERENCES:

STAMP

DRAWING TITLE

Catch Basin Subareas

SCALE: 1" = 40'

JAN. 5, 2024	SHEET NUMBER
23-0138D	CB

APPENDIX E - DRAFT STORMWATER POLLUTION PREVENTION PLAN

Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

Ridge Road
Foxborough, MA
Telephone: TBD

SWPPP Prepared For:

FED CAP, Inc.
P.O. Box 669
Foxborough, MA 02035
508.326.0172

SWPPP Prepared By:

Bay Colony Group, Inc.
4 School Street
Foxborough, MA 02035
508.543.3939
508.543.8866 fax

SWPPP Preparation Date:

January, 2024

Estimated Project Dates:

Project Start Date: TBD
Project Completion Date: TBD

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

A. FED CAP, Inc.
P.O. Box 669
Foxborough, MA 02035
508.326.0172

General Contractor

Subcontractor(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one operator at site):

[Repeat as necessary.]

Emergency 24-Hour Contact:

A. Insert name address, telephone number

1.2 Stormwater Team

Insert Role or Responsibility: **Project Manager**
Insert Position: **Project Manager**
Insert Name: **Name**
Insert Telephone Number: **number**
Insert Email: **email**

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:

Insert Email:

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:
Insert Email:

[Repeat as necessary.]

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 *Project/Site Information*

Project Name and Address

Project/Site Name: **Ridge Road**
Project Street/Location: **Ridge Road**
City: **Foxborough**
State: **MA**
ZIP Code: **02035**
County or Similar Subdivision: **Norfolk**

Project Latitude/Longitude

(Use **one** of three possible formats, and specify method)

Latitude:
1. **42 ° 04 ' 54.8" N** (degrees, minutes, seconds)
2. _ _ ° _ _ . _ _ ' N (degrees, minutes, decimal)
3. _ _ . _ _ _ _ ° N (decimal)

Longitude:
1. **71 ° 14 ' 30.0" W** (degrees, minutes, seconds)
2. _ _ ° _ _ . _ _ ' W (degrees, minutes, decimal)
3. _ _ . _ _ _ _ ° W (decimal)

Method for determining latitude/longitude:
☐ USGS topographic map (specify scale: _____) ☐ EPA Web site ☒ GPS
☐ Other (please specify):

Horizontal Reference Datum:
☐ NAD 27 ☒ NAD 83 or WGS 84 ☐ Unknown

If you used a U.S.G.S topographic map, what was the scale? _____

Additional Project Information

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: **N/A**

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services: **N/A**

Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the 2012 CGP? ☐ Yes ☒ No

2.2 *Discharge Information*

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☒ No

Are there any surface waters that are located within 50 feet of your construction disturbances?
☒ Yes ☐ No

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
1. Neponset Reservoir
2.
3.
4.
5.
6.

Table 2 – Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 1 above)

	Is this surface water listed as "impaired"?	If you answered yes, then answer the following:			
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutant(s) for which there is a TMDL
1.	☒ YES ☐ NO	**Introduction of Non-Native Organisms**	☐ YES ☒ NO		
2.	☐ YES ☐ NO		☐ YES ☐ NO		
3.	☐ YES ☐ NO		☐ YES ☐ NO		
4.	☐ YES ☐ NO		☐ YES ☐ NO		
5.	☐ YES ☐ NO		☐ YES ☐ NO		
6.	☐ YES ☐ NO		☐ YES ☐ NO		

[Include additional rows as necessary.]

Describe the method(s) you used to determine whether or not your project/site discharges to an impaired water: Review of the MassDEP 2022 Integrated List of Waters.

Table 3 – Tier 2, 2.5, or 3 Waters (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water? (see Appendix F)	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
1.	☐ YES ☐ NO	INSERT "Tier 2", "Tier 2.5", or "Tier 3"
2.	☐ YES ☐ NO	INSERT "Tier 2", "Tier 2.5", or "Tier 3"
3.	☐ YES ☐ NO	INSERT "Tier 2", "Tier 2.5", or "Tier 3"
4.	☐ YES ☐ NO	INSERT "Tier 2", "Tier 2.5", or "Tier 3"

5.	☐ YES ☐ NO	INSERT "Tier 2", "Tier 2.5", or "Tier 3"

2.3 *Nature of the Construction Activity*

General Description of Project

Provide a general description of the construction project:

Construction of a 389+/- lf of roadway and 4 single family homes with associated utilities, septic system and storm water systems.

Size of Construction Project

What is the size of the property (in acres), the total area expected to be disturbed by the construction activities (in acres), and the maximum area expected to be disturbed at any one time?

INSERT SIZE OF PROPERTY – 7.13+/- acres

INSERT TOTAL AREA OF CONSTRUCTION DISTURBANCES – 4.83+/- acres

INSERT MAXIMUM AREA TO BE DISTURBED AT ANY ONE TIME – 4.83+/- acres

[Repeat as necessary for individual project phases.][3]

Construction Support Activities (only provide if applicable)[3]

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)

INSERT DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITY

INSERT CONTACT INFORMATION FOR CONSTRUCTION SUPPORT ACTIVITY (Name, Telephone No., Email Address)

INSERT LOCATION INFORMATION FOR CONSTRUCTION SUPPORT ACTIVITY (Address and/or Latitude/Longitude)

[Repeat as necessary.]

2.4 *Sequence and Estimated Dates of Construction Activities*

Phase I

Clearing of building site and storm water basins, installation of erosion controls, and grubbing of roadway, house locations and storm water basin areas.

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED

Phase II

Bring site to subbase elevation. Construction of storm water basins. Installation of drainage and water services within site.

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED

Phase III

Installation of base course of roadway. Start construction of homes.

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED

Phase IV

Construct finished course of pavement. Complete landscaping of disturbed areas. Remove storm water erosion controls.

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED
-

[Repeat as needed.]

2.5 *Allowable Non-Stormwater Discharges*

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	Likely to be Present at Your Site?
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☐ YES ☒ NO
Landscape irrigation	☒ YES ☐ NO
Waters used to wash vehicles and equipment	☐ YES ☒ NO
Water used to control dust	☒ YES ☐ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
Routine external building wash down	☐ YES ☒ NO
Pavement wash waters	☐ YES ☒ NO
Uncontaminated air conditioning or compressor condensate	☒ YES ☐ NO

Uncontaminated, non-turbid discharges of ground water or spring water	☐ YES ☒ NO
Foundation or footing drains	☐ YES ☒ NO
Construction dewatering water	☒ YES ☐ NO

(Note: You are reminded of the requirement to identify the likely locations of these allowable non-stormwater discharges on your site map. See Section 2.6, below, of the SWPPP Template.)

2.6 *Site Maps*

See Definitive Plan of Land Ridge Road Foxborough, MA by Bay Colony Group, Inc.

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Under which criterion listed in Appendix D are you eligible for coverage under this permit?

☒A ☐B ☐C ☐D ☐E ☐F

For reference purposes, the eligibility criteria listed in Appendix D are as follows:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of this permit.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Supporting Documentation

Provide documentation for the applicable eligibility criterion you select in Appendix D, as follows:

For criterion A, indicate the basis for your determination that no federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the permit). Check the applicable source of information you relied upon:

- ☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service. INSERT DATE OF COMMUNICATION AND WHO YOU SPOKE WITH
- ☒ Publicly available species list. MASSMAPPER Website – NHESP Tabs
- ☐ Other source: INSERT SPECIFIC SOURCE

For criterion B, provide the Tracking Number from the other operator's notification of permit authorization: INSERT AUTHORIZATION TRACKING NUMBER FROM OTHER OPERATOR'S NOTIFICATION LETTER/EMAIL

Provide a brief summary of the basis used by the other operator for selecting criterion A, B, C, D, E, or F: INSERT TEXT HERE

For criterion C, provide the following information:

- INSERT LIST OF FEDERALLY-LISTED SPECIES OR FEDERALLY-DESIGNATED CRITICAL HABITAT LOCATED IN YOUR ACTION AREA
- INSERT DISTANCE BETWEEN YOUR SITE AND THE LISTED SPECIES OR CRITICAL HABITAT (in miles)

Also, provide a brief summary of the basis used for determining that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat: INSERT TEXT HERE

For criterion D, E, or F, attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service concluding consultation or coordination activities. INSERT COPIES OF LETTERS OR OTHER COMMUNICATIONS HERE

3.2 Historic Preservation

Appendix E, Step 1

Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

- ☐ Dike
- ☐ Berm
- ☒ Catch Basin
- ☒ Pond
- ☐ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
- ☒ Culvert
- ☒ Other type of ground-disturbing stormwater control: Roof recharge

(Note: If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

Appendix E, Step 2

If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties? ☐ YES ☒ NO

- If yes, no further documentation is required for Section 3.2 of the Template.
- If no, proceed to Appendix E, Step 3.

Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? ☒ YES ☐ NO

If yes, provide documentation of the basis for your determination. **Reference to the Massachusetts Cultural Resources Information System shows no historical areas, buildings, burial grounds, objects or structures on or near the site.**

If no, proceed to Appendix E, Step 4.

Appendix E, Step 4

If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other tribal representative (whichever applies) respond to you within 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? ☐ YES ☐ NO

If no, no further documentation is required for Section 3.2 of the Template.

If yes, describe the nature of their response:

- ☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions. INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE APPLICABLE SHPO, THPO, OR OTHER TRIBAL REPRESENTATIVE

- ☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls. INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE APPLICABLE SHPO, THPO, OR OTHER TRIBAL REPRESENTATIVE

- ☐ Other: INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE APPLICABLE SHPO, THPO, OR OTHER TRIBAL REPRESENTATIVE

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

- ☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

- ☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow

- ☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If yes, INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE STATE AGENCY OR EPA REGIONAL OFFICE - **no correspondence undertaken. Project is permitted under the MassDEP Stormwater Regulations which are enforced by the local Planning Board. A Notice of Intent will be filed and an Order of Conditions issued before the project can proceed.**

SECTION 4: EROSION AND SEDIMENT CONTROLS

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

(Note: If no, no further documentation is required for the SWPPP Template.)

Check the compliance alternative that you have chosen:

☐ I will provide and maintain a 50-foot undisturbed natural buffer.

(Note (1): You must show the 50-foot boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

☐ I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

(Note (1): You must show the boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

- INSERT WIDTH OF NATURAL BUFFER TO BE RETAINED
- INSERT EITHER ONE OF THE FOLLOWING:

  (1) THE ESTIMATED SEDIMENT REMOVAL FROM A 50-FOOT BUFFER USING APPLICABLE TABLES IN APP. G, ATTACHMENT 1. INCLUDE INFORMATION ABOUT THE BUFFER VEGETATION AND SOIL TYPE THAT PREDOMINATE AT YOUR SITE

  OR

  (2) IF YOU CONDUCTED A SITE-SPECIFIC CALCULATION FOR THE ESTIMATED SEDIMENT REMOVAL OF A 50-FOOT BUFFER, PROVIDE THE SPECIFIC REMOVAL EFFICIENCY, AND INFORMATION YOU RELIED UPON TO MAKE YOUR SITE-SPECIFIC CALCULATION.
- INSERT DESCRIPTION OF ADDITIONAL EROSION AND SEDIMENT CONTROLS TO BE USED IN COMBINATION WITH NATURAL BUFFER AREA
- INSERT THE FOLLOWING INFORMATION:
  - (1) SPECIFY THE MODEL OR OTHER TOOL USED TO ESTIMATE SEDIMENT LOAD REDUCTIONS FROM THE COMBINATION OF THE BUFFER AREA AND ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE, AND
  - (2) INCLUDE THE RESULTS OF CALCULATIONS SHOWING THAT THE COMBINATION OF YOUR BUFFER AREA AND THE ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE WILL MEET OR EXCEED THE SEDIMENT REMOVAL EFFICIENCY OF A 50-FOOT BUFFER

☐ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- DESCRIPTION OF WHY IT IS NOT FEASIBLE
- INSERT EITHER ONE OF THE FOLLOWING:

  (1) THE ESTIMATED SEDIMENT REMOVAL FROM A 50-FOOT BUFFER USING APPLICABLE TABLES IN APP. G, ATTACHMENT 1. INCLUDE INFORMATION ABOUT THE BUFFER VEGETATION AND SOIL TYPE THAT PREDOMINATE AT YOUR SITE

  OR

  (2) IF YOU CONDUCTED A SITE-SPECIFIC CALCULATION FOR THE ESTIMATED SEDIMENT REMOVAL OF A 50-FOOT BUFFER, PROVIDE THE SPECIFIC REMOVAL EFFICIENCY, AND INFORMATION YOU RELIED UPON TO MAKE YOUR SITE-SPECIFIC CALCULATION.
- INSERT DESCRIPTION OF ADDITIONAL EROSION AND SEDIMENT CONTROLS TO BE USED IN COMBINATION WITH NATURAL BUFFER AREA
- INSERT THE FOLLOWING INFORMATION:
  - (1) SPECIFY THE MODEL OR OTHER TOOL USED TO ESTIMATE SEDIMENT LOAD REDUCTIONS FROM THE EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE, AND
  - (2) INCLUDE THE RESULTS OF CALCULATIONS SHOWING THAT THE ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE WILL MEET OR EXCEED THE SEDIMENT REMOVAL EFFICIENCY OF A 50-FOOT BUFFER

☒ I qualify for one of the exceptions in Part 2.1.2.1.e. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

Buffer Exceptions

Which of the following exceptions to the buffer requirements applies to your site?

☐ There is no discharge of stormwater to the surface water that is located 50 feet from my construction disturbances.

(Note: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

☐ No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.

(Note (1): If this exception applies, no further documentation is required for Section 4.1 of the Template.)

(Note (2): Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you must still comply with the one of the CGP Part 2.1.2.1.a compliance alternatives.)

☐ For a "linear project" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible for me to meet any of the CGP Part 2.1.2.1.a compliance alternatives. INCLUDE DOCUMENTATION HERE OF THE FOLLOWING: (1) WHY IT IS INFEASIBLE FOR YOU TO MEET ONE OF THE BUFFER COMPLIANCE ALTERNATIVES, AND (2) BUFFER WIDTH RETAINED AND/OR SUPPLEMENTAL EROSION AND SEDIMENT CONTROLS TO TREAT DISCHARGES TO THE SURFACE WATER

☒ The project qualifies as "small residential lot" construction (defined in Part 2.1.2.1.e.iv and in Appendix A).

For Alternative 1 (see Appendix G, Part G.2.3.2.a):

- INSERT WIDTH OF NATURAL BUFFER TO BE RETAINED: 35'
- Double Perimeter Controls for buffer zone between 50' – 30'
- Double perimeter controls show on site plan in areas less than 50'

For Alternative 2 (see Appendix G, Part G.2.3.2.b):

- INSERT (1) THE ASSIGNED RISK LEVEL BASED ON APPLICABLE TABLE IN APP. G, PART G.2.3.2.b, AND (2) THE PREDOMINANT SOIL TYPE AND AVERAGE SLOPE AT YOUR SITE
- INSERT APPLICABLE REQUIREMENTS BASED ON APP. G, TABLE G-7
- INSERT DESCRIPTION OF HOW YOU WILL COMPLY WITH THESE REQUIREMENTS

☐ Buffer disturbances are authorized under a CWA Section 404 permit. INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

(Note (1): If this exception applies, no further documentation is required for Section 4.1 of the Template.)

(Note (2): This exception only applies to the limits of disturbance authorized under the Section 404 permit, and does not apply to any upland portion of the construction project.)

☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail). INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

(Note (1): If this exception applies, no further documentation is required for Section 4.1 of the Template.)

4.2 Perimeter Controls

General

- **The downgradient perimeter of the site where sediment could be expected to migrate off site will contain a silt sock barrier that will to capture siltation and runoff.**

Specific Perimeter Controls

Perimeter Control # 1

Perimeter Control Description

- **Silt sock barrier**
- **See SWPP Plan – Site Plan**

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Weekly inspection and removal of sediment once it reaches at least ½ way up the barrier.**

[Repeat as needed for individual perimeter controls.]

4.3 Sediment Track-Out

General

- **Rip rap stabilized construction entrance.**

Specific Track-Out Controls

Track-Out Control # 1

Track-Out Control Description

- **Rip rap stabilized construction entrances at points where they meet existing Ridge Road pavement**
- **See SWPP Plan – Site Plan**

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Monitor and maintain the Stabilized Construction Entrance shown on the SWPPP Plan to ensure that it is cleaned and functioning correctly to prevent tracking of sediment by construction that exit the Site.**
- **Where sediment has been tracked-out from the site onto the surface of off-site streets, other paved areas, and sidewalks, you must remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Hosing or sweeping tracked-out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.") is prohibited.**

[Repeat as needed for individual track-out controls.]

4.4 Stockpiled Sediment or Soil

General

- **Stockpiled Material will be encircled with a silt sock barrier**

Specific Stockpile Controls

Stockpile Control # 1

Stockpiled Sediment/Soil Control Description

- **Silt sock will be placed around the perimeter of the stockpiled material.**
- **See SWPP Plan – Site Plan**

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Inspect barriers weekly or after a rain storm and remove sediment if it has reached ½ way up the barrier.**

[Repeat as needed for individual stockpile controls.]

4.5 Minimize Dust

General

- **A water truck will be used for dust control.**

Specific Dust Controls

Dust Control # 1
Dust Control Description

- **A water truck will be used for dust control.**

Installation

- **n/a**

Maintenance Requirements

- **n/a**

[Repeat as needed for individual dust controls.]

4.6 Minimize the Disturbance of Steep Slopes

General

- **Erosion control will be used to minimize siltation from slopes to be disturbed.**

Specific Steep Slope Controls

Steep Slope Control # 1
Steep Slope Control Description

- INSERT DESCRIPTION OF STEEP SLOPE CONTROL TO BE INSTALLED
- INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- INSERT MAINTENANCE REQUIREMENTS FOR THE STEEP SLOPE CONTROL

[Repeat as needed for individual steep slope controls.]

4.7 Topsoil

General

- **The existing topsoil will stripped and stockpiled on the site and reused in areas of the site where it is appropriate: lawns, road side slopes, storm water basin slopes, etc. The remainder will be removed from the site to locations TBD.**

Specific Topsoil Controls

Topsoil Control # 1
Topsoil Control Description
- **Topsoil will be stripped and stockpiled on the site and handled in accordance with the specifications of other stockpiles**
- **See Section 4.4**
- **See SWPP Plan – Appendix A**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- **Same as Section 4.4**

[Repeat as needed for individual topsoil controls.]

4.8 Soil Compaction

General
- **Areas of landscaping will be handled in accordance with local landscaping practice. Storm water basin construction will be handled in accordance with the guidance in the MA DEP Stormwater standards.**

Specific Soil Compaction Controls

Soil Compaction Control # 1
Soil Compaction Control Description
- **Storm water basin construction will be in accordance with MA DEP Stormwater standards.**
- **See definitive plans – Appendix A**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- **Storm water basins will be cleaned on an annual basis, or more if necessary.**
-

[Repeat as needed for individual soil compaction controls.]

4.9 Storm Drain Inlets

General
- **Storm drain inlets will be protected through the use of silt socks within drainage swales. Catch basins will protected by silt socks around the grates or with silt sacks inserted in the structure.**

Specific Storm Drain Inlet Controls

Storm Drain Inlet Control # 1
Storm Drain Inlet Control Description

- **Silt socks**
- **See SWPP Plan – Appendix A**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- **Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.**

Storm Drain Inlet Control # 2
Storm Drain Inlet Control Description
- **Silt socks around grates or silt sacks in catch basins**
- **See SWPP Plan – Appendix A**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- **Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.**

[Repeat as needed for individual storm drain inlet controls.]

4.10 Constructed Stormwater Conveyance Channels

General
- **Rip rap devices will be used at all outlets.**

Specific Conveyance Channel Controls

Stormwater Conveyance Channel Control # 1
Stormwater Conveyance Channel Control Description
- **Rip rap outlet to drain outlet pipes**
- **See Site Plan**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Rip rap shall be inspected weekly and after every rainstorm. If erosion is taking place the stone shall be replenished.**

[Repeat as needed for individual stormwater conveyance channel controls.]

4.11 Sediment Basins

General

- **The storm water basin will not be used as sediment basin during construction. Sediment basins will be constructed as necessary to control sediment close to the source and to prevent it from exiting site or going into the storm water basin.**

Specific Sediment Basin Controls

Sediment Basin Control # 1
Sediment Basin Control Description

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Sediment basins will be inspected weekly and after every rain event greater than 0.5". Once the sediment in the forebay reaches 1/2 of depth the sediment will be removed.**
- **Once construction has stopped and the site is fully stabilized the basin will be revegetated as necessary to bring it into compliance with the definitive plans.**

  (Note: At a minimum, you must comply with following requirement in CGP Part 2.1.3.2.b: "Keep in effective operating condition and remove accumulated sediment to maintain at least ½ of the design capacity of the sediment basin at all times.")

[Repeat as needed for individual sediment basin controls.]

4.12 Chemical Treatment

Soil Types
List all the soil types (including soil types expected to be found in fill material) that are expected to be exposed during construction and that will be discharged to locations where chemicals will be applied:
None anticipated

Treatment Chemicals
List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics: INSERT TEXT HERE

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage: INSERT TEXT HERE

Provide information from any applicable Material Safety Data Sheets (MSDS): INSERT TEXT HERE

Describe how each of the chemicals will stored: INSERT TEXT HERE

Include references to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems: INSERT TEXT HERE

Special Controls for Cationic Treatment Chemicals (if applicable)
If you have been authorized by your applicable Regional Office to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures you are required to implement to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards: INSERT (1) ANY LETTERS OR OTHER DOCUMENTS SENT FROM THE EPA REGIONAL OFFICE CONCERNING YOUR USE OF CATIONIC TREATMENT CHEMICALS, AND (2) DESCRIPTION OF ANY SPECIFIC CONTROLS YOU ARE REQUIRED TO IMPLEMENT

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems
Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals: INSERT TEXT HERE

Training
Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals: INSERT TEXT HERE

4.13 Dewatering Practices

General

- **Dewatering is not expected to be necessary**

Specific Dewatering Practices

Dewatering Practice # 1
Dewatering Practice Description:

- **Installation of a sump pipe with trash pump in the area of the excavation**
- **Discharge will take place in a sediment basin, which will allow the water to infiltrate into the ground away from the wetlands.**

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Create a stone sump if necessary to ameliorate velocity and to encourage infiltration. If necessary, use silt socks or hay bales to contain.**

[Repeat as needed for individual dewatering practices.]

4.14 Other Stormwater Controls

General

- INSERT GENERAL DESCRIPTION OF THE PROBLEM THIS CONTROL IS DESIGNED TO ADDRESS

Specific Stormwater Control Practices

Stormwater Control Practice # 1
Description
- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE STORMWATER CONTROL PRACTICE

[Repeat as needed.]

4.15 Site Stabilization

Site Stabilization Practice (only use this if you are not located in an arid, semi-arid, or drought-stricken area)
☒ *Vegetative* ☐ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

Description of Practice
- **Temporary stabilization of disturbed areas.**
- **No later than 14 days after initiation of soil stabilization measures the portion of the site in question will be planted with temporary cover using either standard seeding or hydroseeding.**
- **Seed mixture shall be based on the Massachusetts Conservation Guide Vol. II – Vegetated Practices in Site Development Table 1 – Seedings for Temporary Cover and is dependent on the time of year and the weather conditions.**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION
- INSERT APPROXIMATE COMPLETION DATE CONSISTENT WITH CGP PART 2.2.1.2

Maintenance Requirements
Seeded areas should be refertilized with ½ of the establishment amount in the second growing season and subsequently as needed.

[Repeat as needed for additional stabilization practices.]

Site Stabilization Practice (only use this if you are located in an arid, semi-arid, or drought-stricken area)
☒ *Vegetative* ☐ *Non-Vegetative*
☐ *Temporary* ☒ *Permanent*

Description of Practice
- **Permanent stabilization of disturbed areas.**
- **Final stabilization in areas to be vegetated will be done in accordance Section 2.2.2 of the general permit.**
- **Seed mixture shall be based on the Massachusetts Conservation Guide Vol. II – Vegetated Practices in Site Development Table 2 – Seed Mixtures for Permanent Cover and is dependent on the time of year and the weather conditions.**
-

Installation
- FOR VEGETATIVE STABILIZATION IN ARID OR SEMI-ARID AREAS, INDICATE THE BEGINNING AND ENDING DATES OF THE SEASONALLY DRY PERIOD AND DESCRIBE YOUR SITE CONDITIONS
- INSERT APPROXIMATE DATE OF INSTALLATION
- INSERT APPROXIMATE COMPLETION DATE CONSISTENT WITH CGP PART 2.2.1.3

Maintenance Requirements
Seeded areas should be refertilized with ½ of the establishment amount in the second growing season and subsequently as needed.

[Repeat as needed for additional stabilization practices.]

Site Stabilization Practice (only use this if uncontrollable circumstances have delayed the initiation or completion of stabilization)

(Note: You will not be able to include this information in your initial SWPPP. If you are affected by circumstances such as those described in CGP Part 2.2.1.3.b, you will need to modify your SWPPP to include this information.)

☐ *Vegetative* ☐ *Non-Vegetative*
☐ *Temporary* ☐ *Permanent*

Justification

- INSERT DESCRIPTION OF CIRCUMSTANCES THAT PREVENT YOU FROM MEETING THE DEADLINES REQUIRED IN CGP PARTS 2.2.1.1 AND/OR 2.2.1.2 AND THE SCHEDULE YOU WILL FOLLOW FOR INITIATING AND COMPLETING STABILIZATION

Description of Practice

- INSERT DESCRIPTION OF STABILIZATION PRACTICE TO BE INSTALLED
- NOTE HOW DESIGN WILL MEET REQUIREMENTS OF PART 2.2.2.1 OR 2.2.2.2, WHICHEVER APPLIES
- INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT DATES OF INITIATION AND COMPLETION OF NON-VEGETATIVE STABILIZATION CONTROLS (must be completed within 14 days of the cessation of construction)

Maintenance Requirements

INSERT MAINTENANCE REQUIREMENTS FOR THE STABILIZATION PRACTICE

[Repeat as needed for additional stabilization practices.]

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)	**Location on Site** (or reference SWPPP site map where this is shown)
Fueling of vehicles	Gasoline or diesel	Only on paved surfaces, to include existing Ridge Road

[Include additional rows as necessary.]

5.2 Spill Prevention and Response

Any spills of petroleum products will be cleaned using available sorbent material, to include sand, gravel, earth, or other dry clean up measures. If the spill is so large that it enters a catch basin then ensure that the basin is properly emptied so that the materials do not exit the structure. If necessary, contact the Foxboro Fire Department at 911 and direct them to the project site.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

- **Fueling will only take place on pavement where spills can be readily cleaned-up. Ensure that adequate absorbent, spill clean-up materials are available on the site. If necessary, drip pans will be used under vehicles that leak. Those vehicles shall be removed from the site and repaired before being allowed to return. No storage of fuels or lubricants will take place on site. No maintenance will take place on site.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description

- **Fueling will only take place on pavement and adequate absorbent, spill clean-up materials will be available on site.**

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- **Ensure that adequate materials are maintained on site.**

[Repeat as needed.]

5.4 Washing of Equipment and Vehicles

General

- **No washing of equipment or vehicles will be done on site.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description

- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

5.5.1 Building Products

(Note: Examples include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures.)

General
- **Building products not designed to come in contact with rain will be stored under cover.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- **Building products not designed to come in contact with rain will be stored under cover.**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

General
- **Shall not be stored on site. Application shall be done at a rate and in amounts consistent with the manufacturer's specifications.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- **Application shall be done at a rate and in amounts consistent with the manufacturer's specifications.**
- **See manufacturer's specifications**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

- **No fuels or petroleum products will be stored on site.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description

- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.)

General

- INSERT GENERAL DESCRIPTION OF HOW YOU WILL COMPLY WITH CGP PART 2.3.3.3.d

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description

- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.5.5 Construction and Domestic Waste

(Note: Examples include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, and other trash or building materials.)

General

- **Dumpsters will be used for waste from individual home construction.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- **Dumpsters will be used for materials waste for home construction. The location of the dumpsters will be determined on a case by case basis as the home is built.**
-

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- **Remove from site when full.**

[Repeat as needed.]

5.5.6 Sanitary Waste

General
- **Porta-johns will be used on the site for human waste.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- **Porta-johns will be used on the site as necessary. The number of porta-johns will be based on the worker population. Typically, one will be sufficient.**

Installation
- **They will be used on the site from the start to the end of construction.**

Maintenance Requirements
- **Typical maintenance will involve pumping and cleaning once per week depending on the population size.**

[Repeat as needed.]

5.6 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

General
- **Direct all washwater into leak proof containers designed so that no overflows can occur. Do not dump liquid wastes in storm sewers. Remove and dispose of hardened concrete in accordance with other solid wastes generated on site.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

5.7 Fertilizers

General
- **Shall not be stored on site. Application shall be done at a rate and in amounts consistent with the manufacturer's specifications.**

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- **Application shall be done at a rate and in amounts consistent with the manufacturer's specifications.**

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed for individual fertilizer practices.]

5.8 Other Pollution Prevention Practices

General
- INSERT GENERAL DESCRIPTION OF THE PROBLEM THIS CONTROL IS DESIGNED TO ADDRESS

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1
Description
- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation
- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements
- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

SECTION 6: INSPECTION AND CORRECTIVE ACTION

6.1 *Inspection Personnel and Procedures*

Personnel Responsible for Inspections

INSERT NAMES OF PERSONNEL OR TYPES OF PERSONNEL WHO WILL BE CONDUCTING SITE INSPECTIONS HERE

Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Schedule

Specific Inspection Frequency

Inspections will take place once every 7 days or more often if a rain event greater then 0.25" has occurred.

Rain Gauge Location (if applicable)

SPECIFY LOCATION(S) OF RAIN GAUGE TO BE USED FOR DETERMINING WHETHER A RAIN EVENT OF 0.25 INCHES OR GREATER HAS OCCURRED (only applies to inspections conducted for Part 4.1.2.2, 4.1.3, or 4.1.4.2)

Reductions in Inspection Frequency (if applicable)

- For the reduction in inspections resulting from stabilization: SPECIFY (1) LOCATIONS WHERE STABILIZATION STEPS HAVE BEEN COMPLETED AND (2) DATE THAT THEY WERE COMPLETED (Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.1.4.1), you will need to modify your SWPPP to include this information.)
- For the reduction in inspections in arid, semi-arid, or drought-stricken areas: INSERT BEGINNING AND ENDING DATES OF THE SEASONALLY-DEFINED ARID PERIOD FOR YOUR AREA OR THE VALID PERIOD OF DROUGHT
- For reduction in inspections due to frozen conditions: INSERT BEGINNING AND ENDING DATES OF FROZEN CONDITIONS ON YOUR SITE

Inspection Report Forms

See Appendix D

6.2 Corrective Action

Personnel Responsible for Corrective Actions

INSERT NAMES OF PERSONNEL OR TYPES OF PERSONNEL RESPONSIBLE FOR CORRECTIVE ACTIONS

Corrective Action Forms

See Appendix E

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):

Insert Company or Organization Name:
Insert Name:
Insert Position:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:

SECTION 7: TRAINING

Table 7-1: Documentation for Completion of Training

Name	Date Training Completed
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
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INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE

SECTION 8: CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

[Repeat as needed for multiple construction operators at the site.]

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2023 CGP

Appendix C – NOI and EPA Authorization Email

Appendix D – Inspection Forms
- ***Stormwater Construction Site Inspection Report***
- ***Checklist for Catch Basin***
- ***Checklist for Cascade Separator***
- ***Checklist for Infiltration Basin***

Appendix E – Corrective Action Form

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Log

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Historic Preservation Documentation

Appendix A – Site Maps

INSERT SITE MAPS CONSISTENT WITH TEMPLATE SECTION 2.6

Appendix B – Copy of 2023 CGP

INSERT COPY OF 2023 CGP

Appendix C – Copy of NOI and EPA Authorization email

INSERT COPY OF NOI AND EPA'S AUTHORIZATION EMAIL PROVIDING COVERAGE UNDER THE CGP

Appendix D – Copy of Inspection Form

INSERT COPY OF ANY INSPECTION FORMS YOU WILL USE TO PREPARE INSPECTION REPORTS

Appendix E – Copy of Corrective Action Form

INSERT COPY OF CORRECTIVE ACTION FORMS YOU WILL USE

Appendix F –SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix G – *Sample* Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix H –Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**

Appendix I –SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ **Sediment and Erosion Controls**
- ❑ **Stabilization Controls**
- ❑ **Pollution Prevention Measures**
- ❑ **Emergency Procedures**
- ❑ **Inspections/Corrective Actions**

Specific Training Objective: _____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

Appendix J –Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Appendix K – Endangered Species Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.1

Appendix L – Historic Properties Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.2

APPENDIX F: SOILS DATA

Soil Evaluation Forms
Grain Size Analysis & USDA Soil Textural Classification
NRCS Soil Resource Report

No. 23-0138 Date: December 6, 2023

Commonwealth of Massachusetts

Foxborough , Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed By: Richard Leslie Date: December 6, 2023

Witnessed By: Kevin Duquette

Location Address or Lot #:	Owner's Name, Address, and , Telephone #:
Ridge Road, Lot #1 Foxborough, MA 02035 New Construction: ☑ Repair ☐	FED CAP, Inc. P.O.Box 669 Foxborough, MA 02035 508.326.0172

Office Review

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Hinckley LS

Drainage Class A Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Coarse Deposits

Landform Glacial Outwash Plain

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month October, 2023

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed: _____

Location Address or Lot No. Ridge Road, Lot #1

On-site Review

Deep Hole Number: 3 Date: 12/6/2023 Time: 0900 Weather: 32°/Snow /Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 10"	A	SL	10YR3/1		
10" - 32"	B	SL	10YR5/6		
32" - 180"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 180"

Location Address or Lot No. Ridge Road, Lot #1

On-site Review

Deep Hole Number: 4 Date: 12/6/2023 Time: 0930 Weather: 32°/Snow/Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/1		
8" - 32"	B	SL	10YR5/6		
32" - 180"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 180"

Location Address or Lot No. Ridge Road, Lot #1

Commonwealth of Massachusetts

Foxborough , Massachusetts

Percolation Test*		
Date: December 6, 2023	Time: 1058	
Observation Hole #	3	
Depth of Perc	36"	
Start Pre-soak	1058	
End Pre-soak	24 Gals @ 1107	
Time at 12"		
Time at 9"		
Time at 6"		
Time (9" – 6")		
Rate Min./Inch	2	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☑ Site Failed ☐

Performed By: Richard Leslie

Witnessed By: Kevin Duquette

Comments:

No. 23-0138 Date: December 6, 2023

Commonwealth of Massachusetts

Foxborough , Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed By: Richard Leslie Date: December 6, 2023

Witnessed By: Kevin Duquette

Location Address or Lot #:	Owner's Name, Address, and , Telephone #:
Ridge Road, Lot #2 Foxborough, MA 02035 New Construction: ☑ Repair ☐	FED CAP, Inc. P.O.Box 669 Foxborough, MA 02035 508.326.0172

Office Review

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Hinckley LS

Drainage Class A Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Coarse Deposits

Landform Glacial Outwash Plain

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit)

Wetlands Conservancy Program Map (map unit)

Current Water Resource Conditions (USGS): Month October, 2023

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed:

Location Address or Lot No. Ridge Road, Lot #2

On-site Review

Deep Hole Number: 5 Date: 12/6/2023 Time: 1000 Weather: 32°/Snow /Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/1		
8" - 28"	B	SL	10YR5/6		
28" - 180"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 180"

Location Address or Lot No. Ridge Road, Lot #2

On-site Review

Deep Hole Number: 6 Date: 12/6/2023 Time: 1030 Weather: 32°/Snow/Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/2		
8" - 26"	B	SL	10YR5/6		
26" - 180"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 180"

Location Address or Lot No. Ridge Road, Lot #2

Commonwealth of Massachusetts

Foxborough , Massachusetts

Percolation Test*		
Date: December 6, 2023	Time: 1111	
Observation Hole #	5	
Depth of Perc	40"	
Start Pre-soak	1111	
End Pre-soak	24 Gals @ 1119	
Time at 12"		
Time at 9"		
Time at 6"		
Time (9" – 6")		
Rate Min./Inch	2	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☑ Site Failed ☐

Performed By: Richard Leslie

Witnessed By: Kevin Duquette

Comments:

No. 23-0138 Date: December 6, 2023

Commonwealth of Massachusetts

Foxborough , Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed By: Richard Leslie Date: December 6, 2023

Witnessed By: Kevin Duquette

Location Address or Lot #:	Owner's Name, Address, and , Telephone #:
Ridge Road, Lot #3 Foxborough, MA 02035 New Construction: ☑ Repair ☐	FED CAP, Inc. P.O.Box 669 Foxborough, MA 02035 508.326.0172

Office Review

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Hinckley LS

Drainage Class A Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Coarse Deposits

Landform Glacial Outwash Plain

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month October, 2023

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed: _____

Location Address or Lot No. Ridge Road, Lot #3

On-site Review

Deep Hole Number: 7 Date: 12/6/2023 Time: 1100 Weather: 32°/Snow /Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 6"	A	SL	10YR3/2		
6" - 25"	B	SL	10YR5/6		
25" - 156"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 156"

Location Address or Lot No. Ridge Road, Lot #3

On-site Review

Deep Hole Number: 8 Date: 12/6/2023 Time: 1130 Weather: 32°/Snow/Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 6"	A	SL	10YR3/2		
6" - 28"	B	SL	10YR5/6		
28" - 168"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 168"

Location Address or Lot No. Ridge Road, Lot #3

Commonwealth of Massachusetts

Foxborough , Massachusetts

Percolation Test*		
Date: December 6, 2023	Time: 1119	
Observation Hole #	7	
Depth of Perc	36"	
Start Pre-soak	1119	
End Pre-soak	24 Gals @ 1134	
Time at 12"		
Time at 9"		
Time at 6"		
Time (9" – 6")		
Rate Min./Inch	2	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☑ Site Failed ☐

Performed By: Richard Leslie

Witnessed By: Kevin Duquette

Comments:

No. 23-0138 Date: December 6, 2023

Commonwealth of Massachusetts

Foxborough , Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed By: Richard Leslie Date: December 6, 2023

Witnessed By: Kevin Duquette

Location Address or Lot #:	Owner's Name, Address, and , Telephone #:
Ridge Road, Lot #4 Foxborough, MA 02035 New Construction: ☑ Repair ☐	FED CAP, Inc. P.O.Box 669 Foxborough, MA 02035 508.326.0172

Office Review

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Hinckley LS

Drainage Class A Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Coarse Deposits

Landform Glacial Outwash Plain

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month October, 2023

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed: _____

Location Address or Lot No. Ridge Road, Lot #4

On-site Review

Deep Hole Number: 1 Date: 12/6/2023 Time: 0800 Weather: 32°/Snow /Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/1		
8" - 32"	B	SL	10YR5/6		
32" - 105"	C1	Sand	2.5Y5/4		Gravelly, Cobbly, Coarse, Few Stone
105" - 144"	C2	LS	2.5Y5/2		Gravelly, Angular Rock

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face:

Estimated Seasonal High Groundwater: 144"

Location Address or Lot No. Ridge Road, Lot #4

On-site Review

Deep Hole Number: 2 Date: 12/6/2023 Time: 0830 Weather: 32°/Snow/Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/1	108" 5YR4/6	
8" - 30"	B	SL	10YR5/6		
30" - 108"	C1	Sand	2.5Y5/4		Gravelly, Cobbly, Coarse, Few Stones
108" - 186"	C2	LS	2.5Y5/2		Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face: 108"

Estimated Seasonal High Groundwater: 108"

Location Address or Lot No. Ridge Road, Lot #4

Commonwealth of Massachusetts

Foxborough , Massachusetts

Percolation Test*		
Date: December 6, 2023	Time: 1045	
Observation Hole #	1	
Depth of Perc	48"	
Start Pre-soak	1045	
End Pre-soak	24 Gals @ 1055	
Time at 12"		
Time at 9"		
Time at 6"		
Time (9" – 6")		
Rate Min./Inch	2	

* Minimum of 1 percolation test must be performed in both the primary area AND reserve area.

Site Passed ☑ Site Failed ☐

Performed By: Richard Leslie

Witnessed By: Kevin Duquette

Comments:

No. 23-0138 Date: December 7, 2023

Commonwealth of Massachusetts

Foxborough , Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed By: Cameron Gray Date: December 7, 2023

Witnessed By: _____

Location Address or Lot #:	Owner's Name, Address, and , Telephone #:
Ridge Road, Drainage Foxborough, MA 02035 New Construction: ☑ Repair ☐	FED CAP, Inc. P.O.Box 669 Foxborough, MA 02035 508.326.0172

Office Review

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Hinckley LS

Drainage Class A Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Coarse Deposits

Landform Glacial Outwash Plain

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month October, 2023

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed: _____

Location Address or Lot No. Ridge Road, Drainage

On-site Review

Deep Hole Number: 10 Date: 12/7/2023 Time: 0730 Weather: 30°/Clear

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 8"	A	SL	10YR3/2		
8" - 24"	B	SL	10YR5/6		
24" - 64"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: 50" Weeping from Pit Face: 24"

Estimated Seasonal High Groundwater: 24"

Location Address or Lot No. Ridge Road, Drainage

On-site Review

Deep Hole Number: 11 Date: 12/7/2023 Time: 0800 Weather: 30°/Clear

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 5% Surface Stones Some

Vegetation Mixed Woods

Landform Glacial Outwash Plain

Position on landscape (sketch on back) See site plan

Distances from:

Open Water Body	>150'	Drainageway	>100'
Possible Wet Area	>100'	Property Line	25'+/-
Drinking Water Well	>100'	Other	

DEEP OBSERVATION HOLE LOG*

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0" - 12"	A	SL	10YR3/1		
12" - 32"	B	SL	10YR5/6		
32" - 112"	C	Sand	2.5Y5/4		Loose, Gravelly, Cobbly

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Glacial outwash Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face: 108"

Estimated Seasonal High Groundwater: 108"

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: DFR:0446516-90/1
Issue No: 1

Daily Field Report

Client: BAY COLONY GROUP
4 SCHOOL ST.
P.O. BOX 9136
FOXBORO, MA 02035

CC:

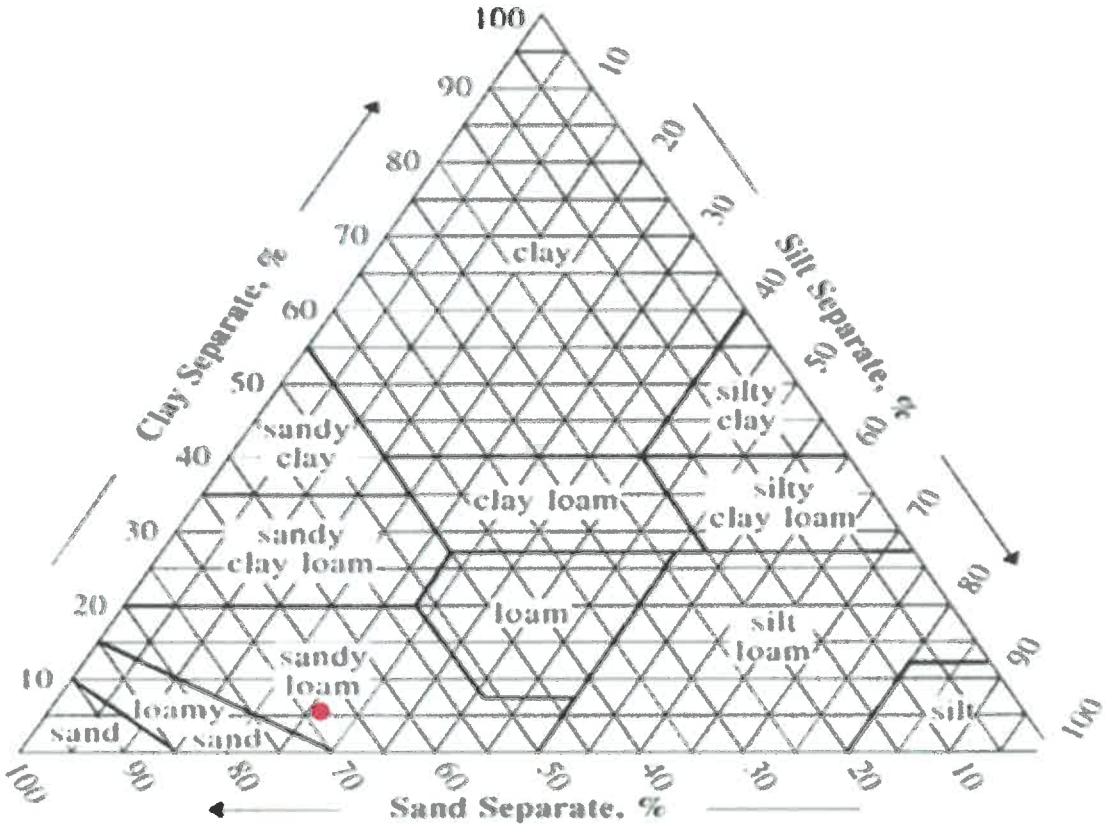
Project: BAY COLONY GROUP - LAB TESTIN
CANTON, MA

Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Date: 12/8/2023

PSI Representative:

Soil Texture Triangle



SOIL DATA					
Source	Sample No.	Percentages From Material Passing a #10 Sieve			Classification
		Sand	Silt	Clay	
Ridge Rd. - Foxborough, MA (TP #10 at 50")	S1	68.2	26.5	5.3	Sandy Loam

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: MAT:0446516-90-S1
Issue No: 1

Material Test Report

Client: BAY COLONY GROUP **CC:**
4 SCHOOL ST., P.O. BOX 9136
FOXBORO, MA 02035

Project: BAY COLONY GROUP - LAB TESTING
CANTON, MA

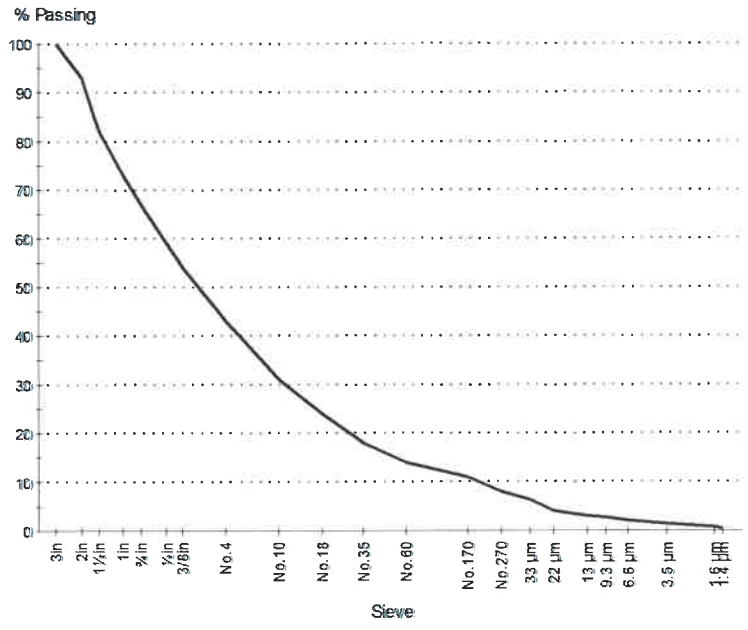
Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Sample Details

Sample ID:	0446516-90-S1
Client Sample ID:	
Date Sampled:	12/08/23
Sampled By:	Client
Specification:	Tex.Tri. Hydro. Coarse
Supplier:	
Source:	
Material:	
Sampling Method:	
General Location:	Ridge Road - Foxborough, MA
Location:	TP #10 at 50"
Lift:	

Sample Description:

Particle Size Distribution



COBBLES	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
(0.0%)	(32.8%)	(23.9%)	(11.9%)	(14.1%)	(7.7%)	(7.9%)	(1.7%)

Grading: ASTM D 422

Date Tested: 12/13/2023
Tested By: Gary Brooks

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	93	
1½in (37.5mm)	82	
1in (25.0mm)	73	
¾in (19.0mm)	67	
½in (12.5mm)	59	
3/8in (9.5mm)	54	
No.4 (4.75mm)	43	
No.10 (2.0mm)	31	
No.18 (1.0mm)	24	
No.35 (500µm)	18	
No.60 (250µm)	14	
No.170 (90µm)	11	
No.270 (53µm)	8	
33.0 µm	6.2	
22.0 µm	4.1	
13.0 µm	3.1	
9.3 µm	2.6	
6.6 µm	2.1	
3.5 µm	1.3	
1.6 µm	0.8	
1.4 µm	0.5	

D85: 40.5607 **D60:** 13.1717 **D50:** 7.3834
D30: 1.8114 **D15:** 0.2973 **D10:** 0.0754
Cu: 174.60 **Cc:** 3.30

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: MAT:0446516-90-S1
Issue No: 1

Material Test Report

Client: BAY COLONY GROUP **CC:**
4 SCHOOL ST., P.O. BOX 9136
FOXBORO, MA 02035

Project: BAY COLONY GROUP - LAB TESTING
CANTON, MA

Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Sample Details

Sample ID: 0446516-90-S1
Client Sample ID:
Date Sampled: 12/08/23
Sampled By: Client
Specification: Tex.Tri. Hydro. Coarse
Supplier:
Source:
Material:
Sampling Method:
General Location: Ridge Road - Foxborough, MA
Location: TP #10 at 50"
Lift:

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			

Comments

N/A

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: DFR:0446516-90/2
Issue No: 1

Daily Field Report

Client: BAY COLONY GROUP
4 SCHOOL ST.
P.O. BOX 9136
FOXBORO, MA 02035

CC:

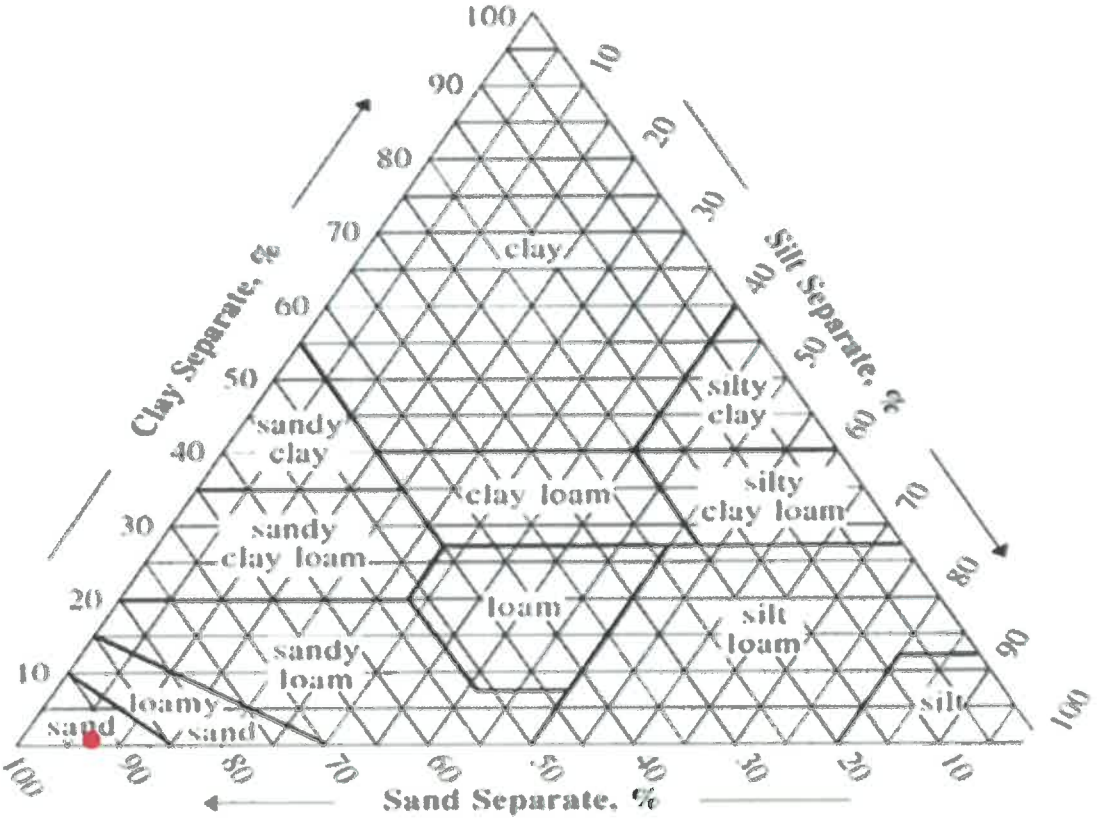
Project: BAY COLONY GROUP - LAB TESTIN
CANTON, MA

Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Date: 12/8/2023

PSI Representative:

Soil Texture Triangle



SOIL DATA					
Source	Sample No.	Percentages From Material Passing a #10 Sieve			Classification
		Sand	Silt	Clay	
Ridge Rd - Foxborough, MA (TP #11 at 60")	S2	92.3	7.1	0.6	Sand

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: MAT:0446516-90-S2
Issue No: 1

Material Test Report

Client: BAY COLONY GROUP **CC:**
4 SCHOOL ST., P.O. BOX 9136
FOXBORO, MA 02035

Project: BAY COLONY GROUP - LAB TESTING
CANTON, MA

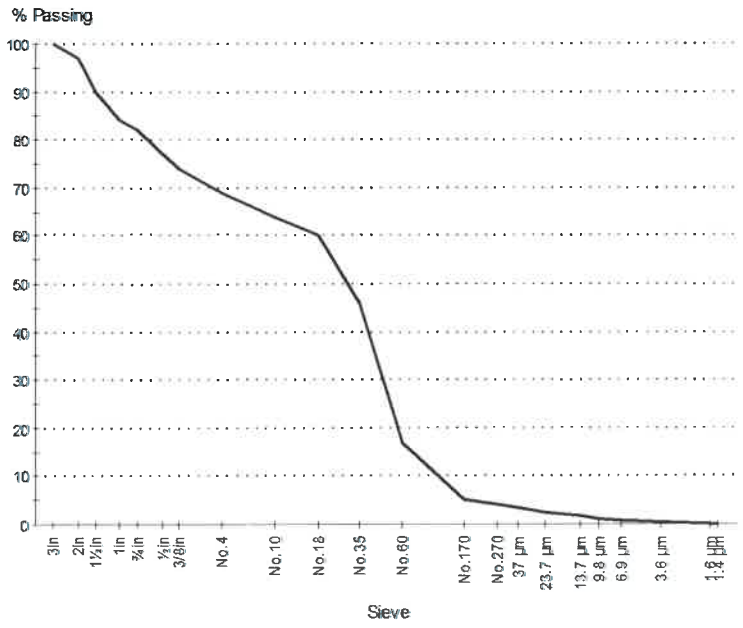
Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Sample Details

Sample ID:	0446516-90-S2
Client Sample ID:	
Date Sampled:	
Sampled By:	Client
Specification:	Tex.Tri. Hydro. Coarse
Supplier:	
Source:	
Material:	
Sampling Method:	
General Location:	Ridge Road - Foxborough, MA
Location:	TP #11 at 60"
Lift:	

Sample Description:

Particle Size Distribution



COBBLES	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
(0.0%)	(18.5%)	(12.6%)	(4.8%)	(27.1%)	(32.3%)	(4.4%)	(0.4%)

Grading: ASTM D 422

Date Tested: 12/13/2023
Tested By: Gary Brooks

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	97	
1½in (37.5mm)	90	
1in (25.0mm)	84	
¾in (19.0mm)	82	
½in (12.5mm)	77	
3/8in (9.5mm)	74	
No.4 (4.75mm)	69	
No.10 (2.0mm)	64	
No.18 (1.0mm)	60	
No.35 (500µm)	46	
No.60 (250µm)	17	
No.170 (90µm)	5	
No.270 (53µm)	4	
37.0 µm	3.4	
23.7 µm	2.3	
13.7 µm	1.7	
9.8 µm	1.1	
6.9 µm	0.6	
3.6 µm	0.3	
1.6 µm	0.0	
1.4 µm	0.0	

D85: 26.7478 **D60:** 1.0000 **D50:** 0.6095
D30: 0.3411 **D15:** 0.2109 **D10:** 0.1378
Cu: 7.26 **Cc:** 0.84

Professional Service Industries, Inc.
480 Neponset Street, Suite 9C
Canton, MA 02021

Phone: (781) 821-2355
Fax: (781) 821-6276

Report No: MAT:0446516-90-S2
Issue No: 1

Material Test Report

Client: BAY COLONY GROUP
4 SCHOOL ST., P.O. BOX 9136
FOXBORO, MA 02035

CC:

Project: BAY COLONY GROUP - LAB TESTING
CANTON, MA

Approved Signatory: Yannick Lastennet (Department Manager)
Date of Issue: 12/18/2023

Sample Details

Sample ID: 0446516-90-S2
Client Sample ID:
Date Sampled:
Sampled By: Client
Specification: Tex.Tri. Hydro. Coarse
Supplier:
Source:
Material:
Sampling Method:
General Location: Ridge Road - Foxborough, MA
Location: TP #11 at 60"
Lift:

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			

Comments

N/A

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 Norfolk and Suffolk Counties, Massachusetts

September 25, 2023

Preface

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

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

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

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

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

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

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Contents

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: 1:1,910 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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
1	Water	0.6	6.1%
245C	Hinckley loamy sand, 8 to 15 percent slopes	6.4	70.1%
253D	Hinckley loamy sand, 15 to 35 percent slopes	2.2	23.8%
Totals for Area of Interest		**9.1**	**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.

Norfolk and Suffolk Counties, Massachusetts

1—Water

Map Unit Setting

National map unit symbol: vkyp
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

245C—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, outwash terraces, moraines, eskers
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

253D—Hinckley loamy sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2svmd
Elevation: 0 to 860 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: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kame terraces, outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash plains, kame terraces, outwash terraces, moraines
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

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