

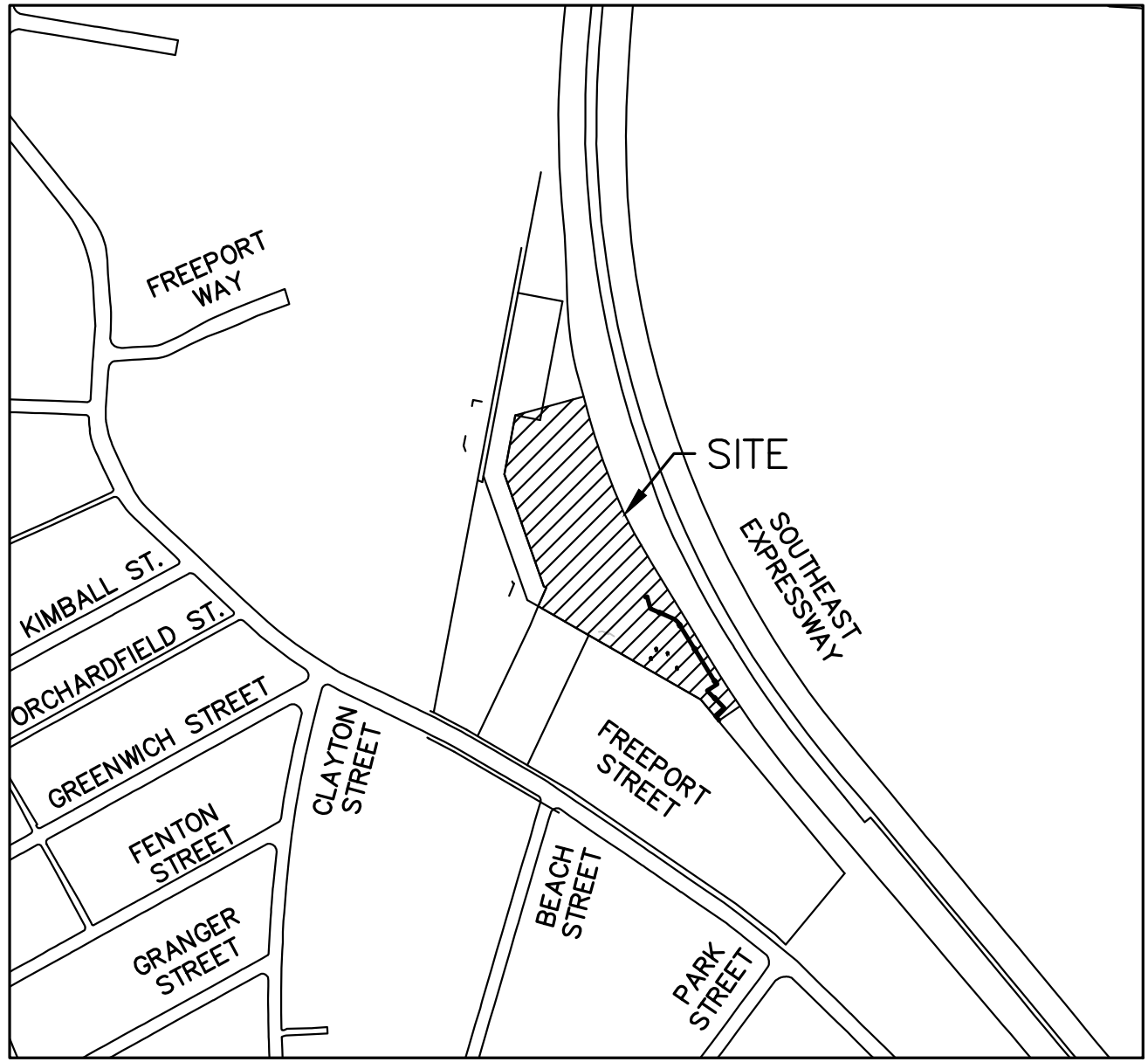
NOTICE OF INTENT DRAWINGS

256 FREEPORT STREET

DORCHESTER, MA.

SHEET INDEX

SHEET C0.01 COVER SHEET
 SHEET C1.00 SITE PREPARATION PLAN
 SHEET C2.00 LAYOUT AND MATERIALS PLAN
 SHEET C3.00 GRADING AND DRAINAGE PLAN
 SHEET C4.00 DETAIL SHEET
 SHEET C4.01 DETAIL SHEET



LOCUS MAP
1" = 250'

PARCEL INFORMATION

PARCEL ID 1600008002



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 Chelmsford, MA 01824
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IBEW LOCAL 103
 256 FREEPORT STREET
 DORCHESTER, MA 02122

**256 FREEPORT STREET
 BOSTON, MA**

REVISIONS:

NO	BY	DATE	DESCRIPTION
1		04/27/22	REV 1



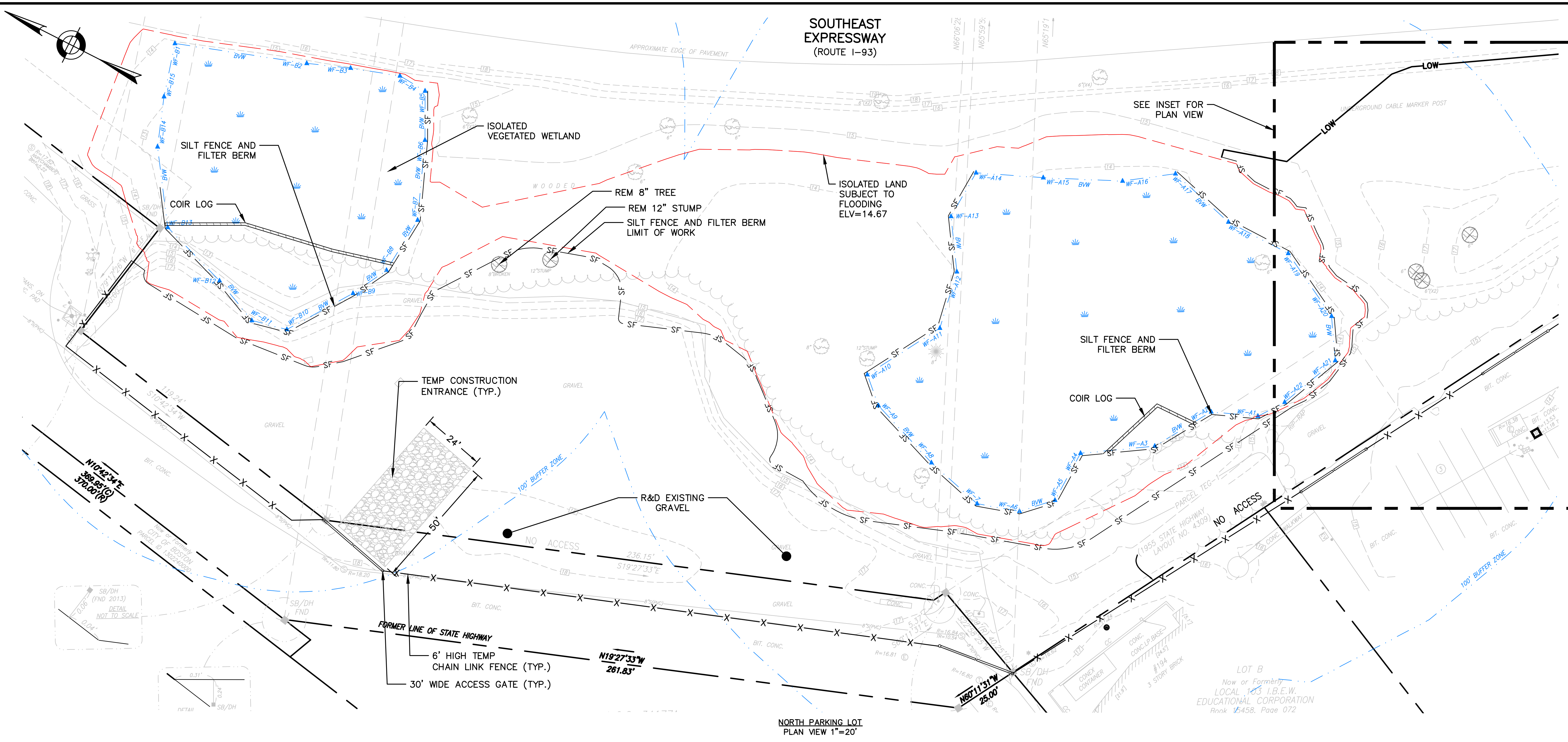
Richard E. Latin

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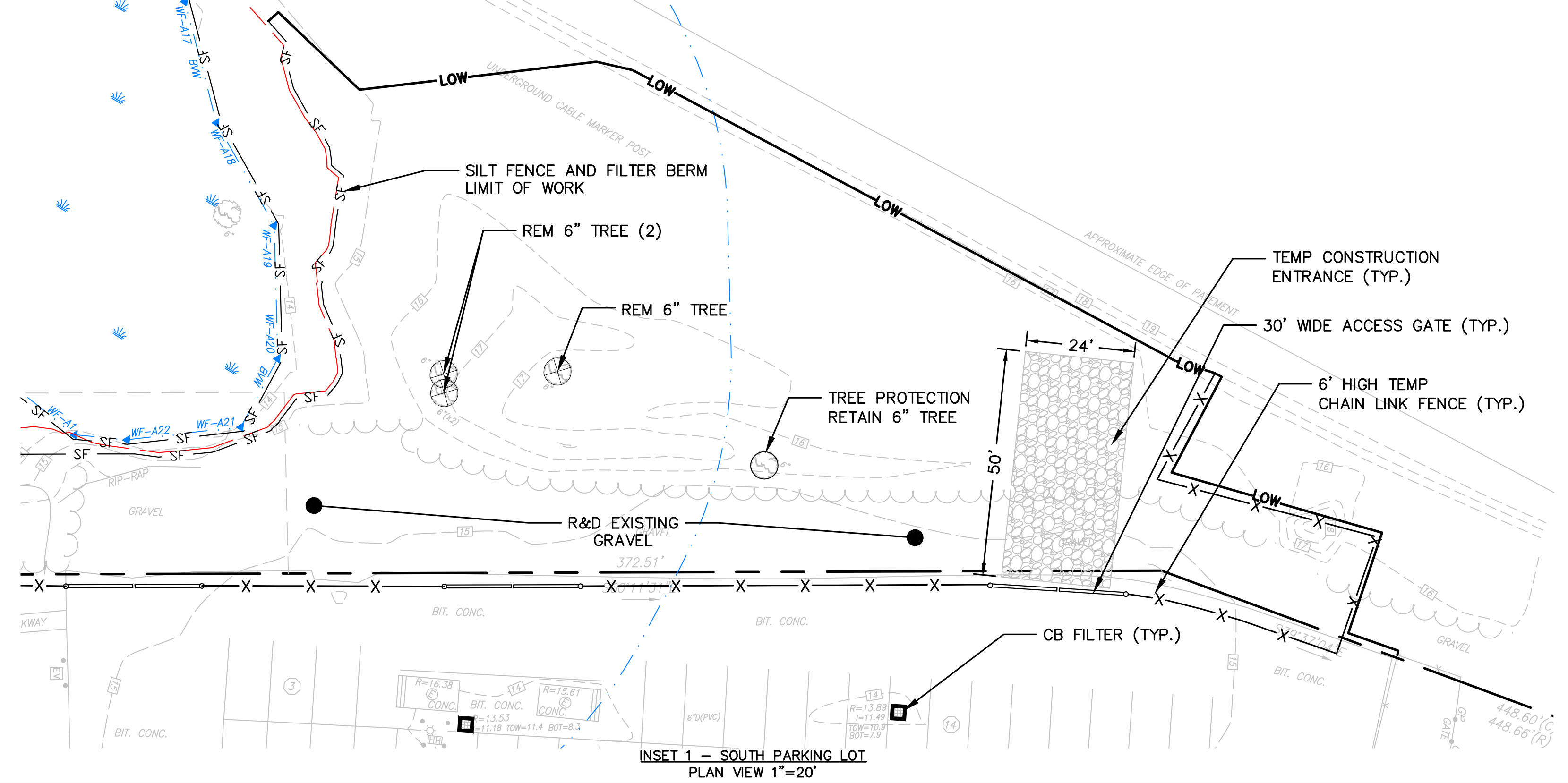
COVER SHEET

DATE:	03/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

C0.01

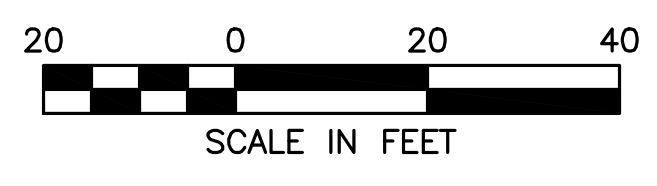


- NOTES:**
1. EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED AND UPGRADED AS NECESSARY DURING CONSTRUCTION BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND INSTALL ADDITIONAL CONTROL MEASURES AS NEEDED DURING CONSTRUCTION.
 2. STABILIZATION OF ALL RE-GRADED AND SOIL STOCKPILE AREAS MUST BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
 3. SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL DEVICES MUST BE PROPERLY REMOVED AND DISPOSED. ALL DAMAGED CONTROLS MUST BE REMOVED AND REPLACED.
 4. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THIS INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER CITY AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING WIND EROSION AND DUST THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL MAY INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND STREET SWEEPING ADJACENT ROADWAYS.
 6. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN 21 DAYS AFTER LAND DISTURBANCE ACTIVITIES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZED SOILS WITHIN 14 DAYS OF THE LAST DISTURBANCE. IF A DISTURBED AREA WILL BE EXPOSED FOR GREATER THAN ONE YEAR, PERMANENT GRASSES OR OTHER APPROVED COVER MUST BE INSTALLED.
 7. THE CONTRACTOR MUST KEEP ON-SITE AT ALL TIMES ADDITIONAL COMPOST FILTER TUBES AND/OR SILT FENCE FOR THE INSTALLATION AT THE DIRECTION OF THE ENGINEER OR CONSERVATION COMMISSION TO MITIGATE ANY EMERGENCY CONDITION.
 8. THE EROSION AND SEDIMENT CONTROLS AS SHOWN MAY NOT BE PRACTICAL DURING ALL STAGES OF CONSTRUCTION. EARTHWORK ACTIVITY ON-SITE MUST BE DONE IN A MANNER SUCH THAT RUNOFF IS DIRECTED TO A SEDIMENT CONTROL DEVICE OR INFILTRATED TO THE GROUND.
 9. DEMOLITION AND CONSTRUCTION DEBRIS MUST BE PROPERLY CONTAINED AND DISPOSED OF.
 10. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.



LEGEND

ABANDON	ABAN
REMOVE AND DISPOSE	R&D
REMOVE AND STOCKPILE	R&S
CATCH BASIN FILTER	
CONSTRUCTION ENTRANCE	
CONSTRUCTION FENCE	
REMOVE TREE	
TREE PROTECTION	
LIMIT OF WORK	LOW
SILT FENCE	



SOUTHEAST EXPRESSWAY (ROUTE 1-93)

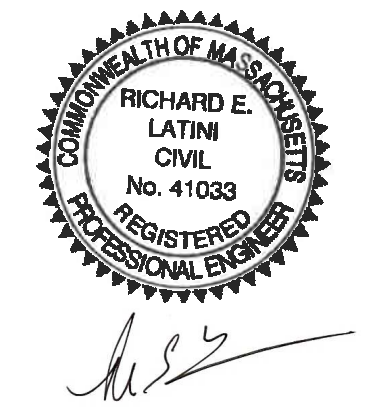
HOWARD STEIN HUDSON
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PREPARED FOR:
 IBEW LOCAL 103
 256 FREEPORT STREET
 DORCHESTER, MA 02122

**256 FREEPORT STREET
 BOSTON, MA**

REVISIONS:

NO	BY	DATE	DESCRIPTION
1		04/27/22	REV 1

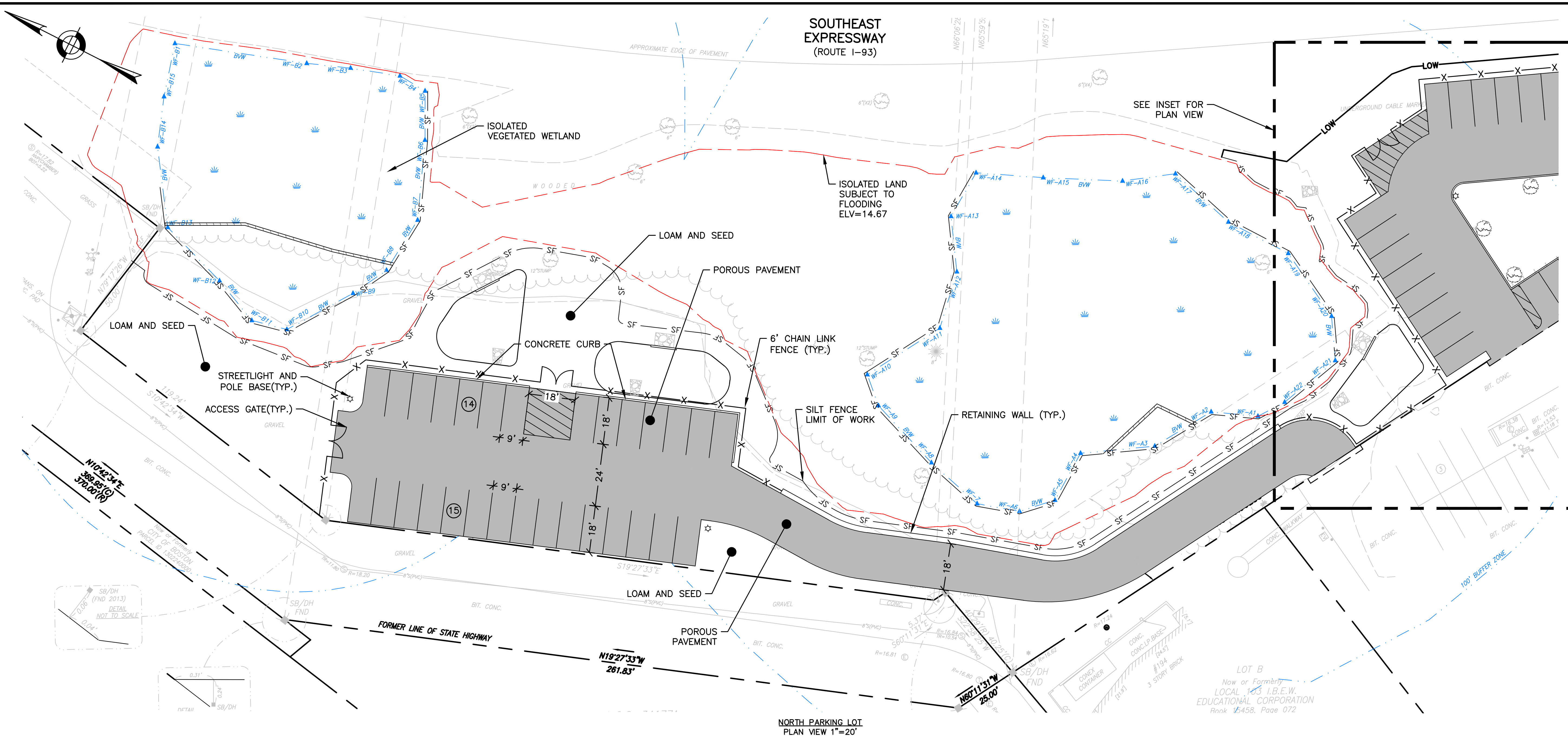


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SITE PREPARATION PLAN

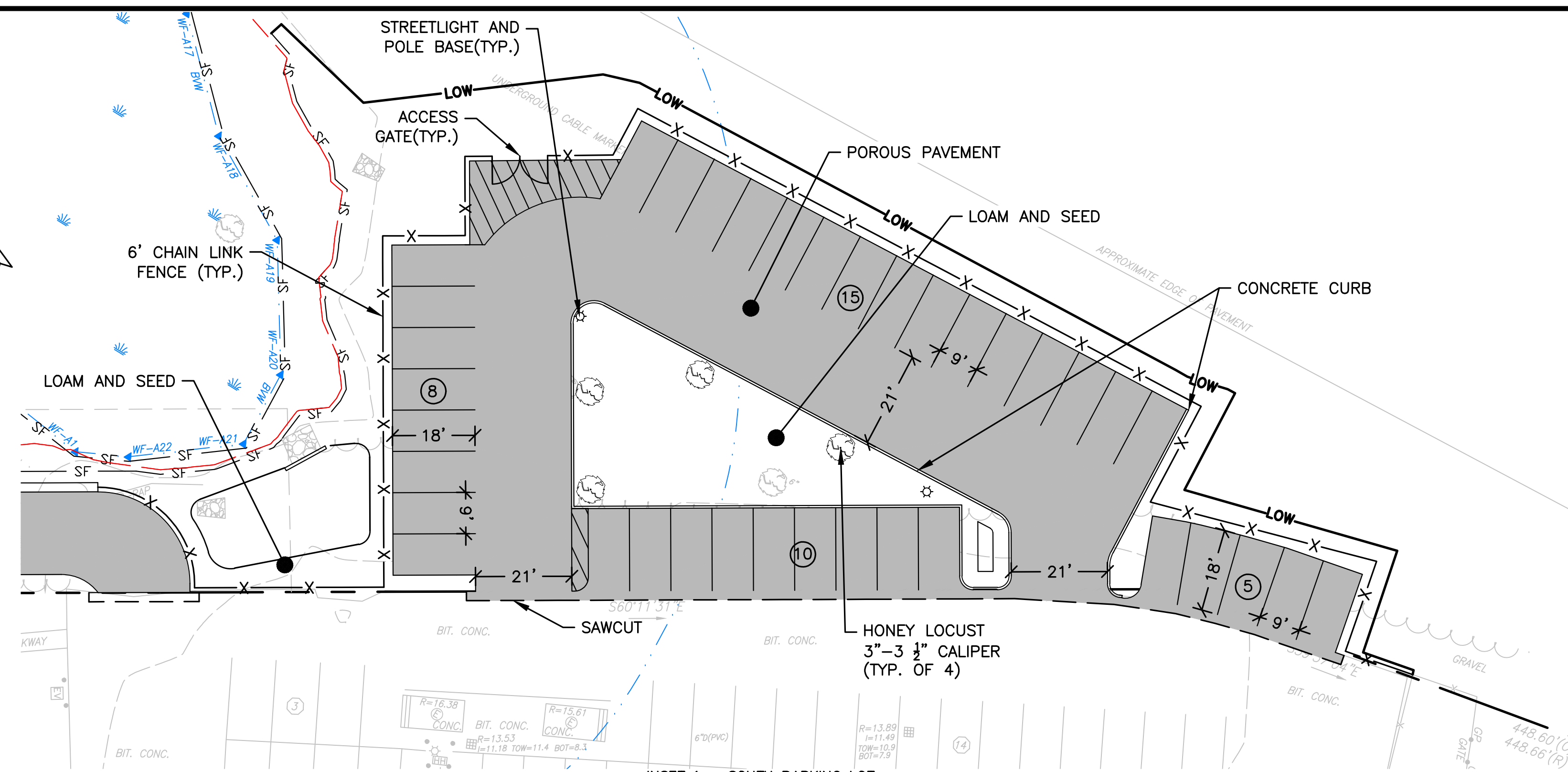
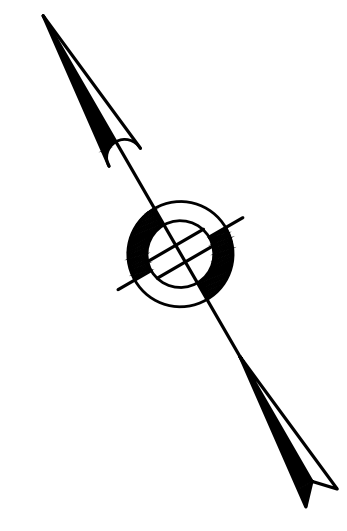
DATE:	03/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

C1.00



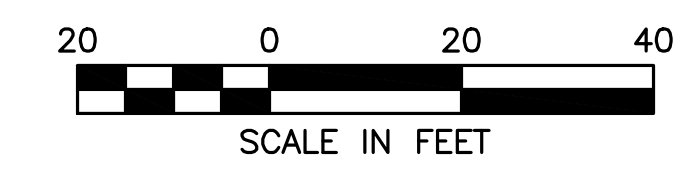
NORTH PARKING LOT
PLAN VIEW 1"=20'

LEGEND	
	PROPERTY LINE
	CONCRETE CURB
	SAWCUT
	6' CHAIN LINK FENCE
	POROUS PAVEMENT
	LIMIT OF WORK
	SILT FENCE



INSET 1 - SOUTH PARKING LOT
PLAN VIEW 1"=20'

NOTES:
1. APPROXIMATELY 67 NEW PARKING SPACES

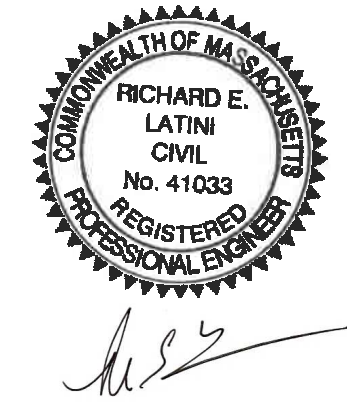


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LAYOUT AND
MATERIALS PLAN

DATE:	03/25/22
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DESIGNED BY:	RJM
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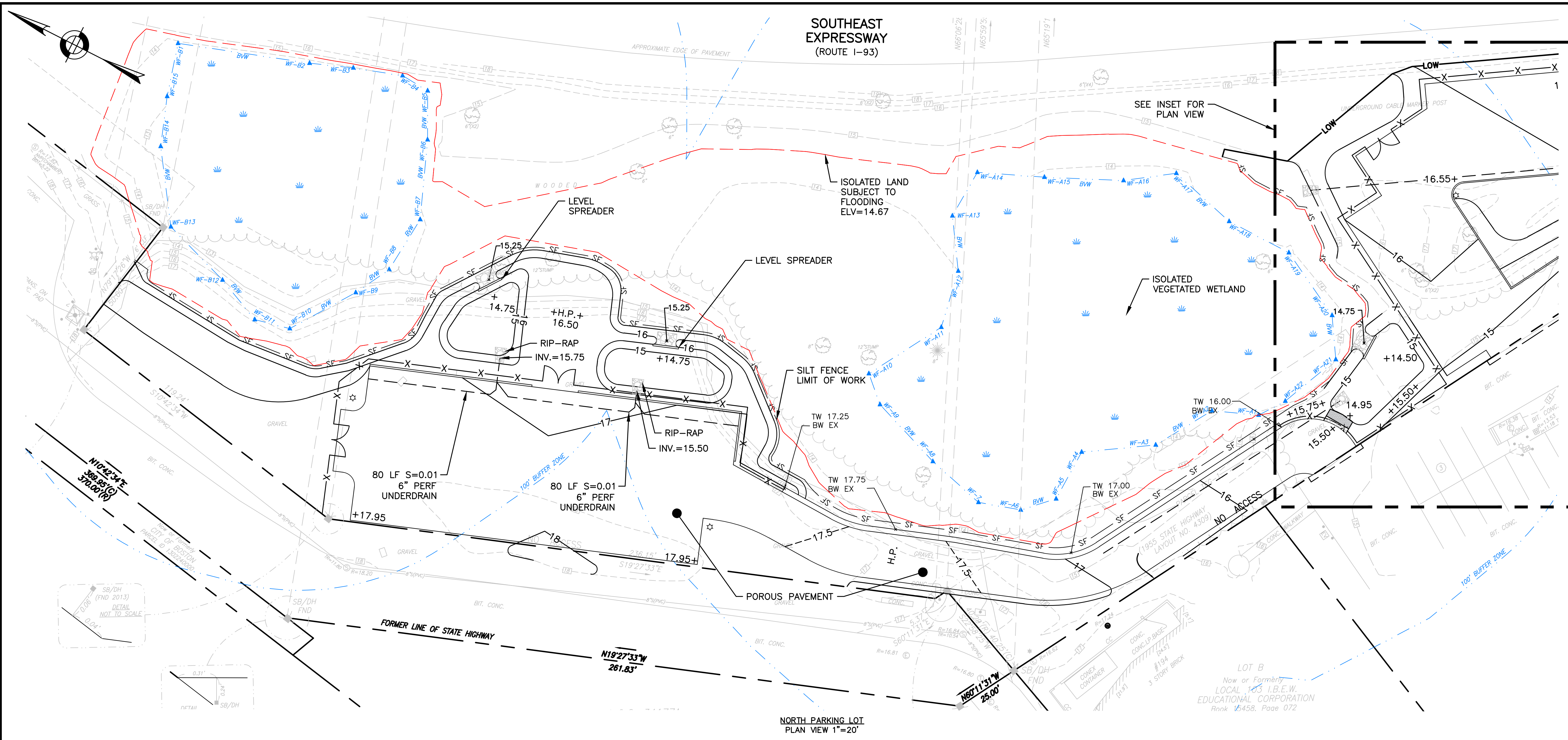
C2.00

SOUTHEAST EXPRESSWAY
(ROUTE 1-93)

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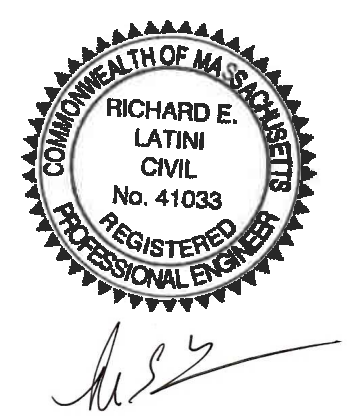
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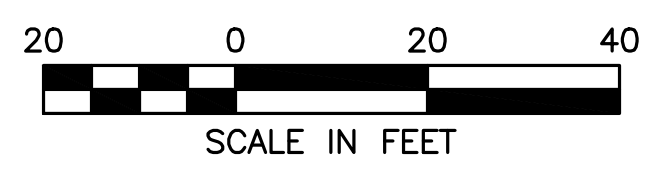
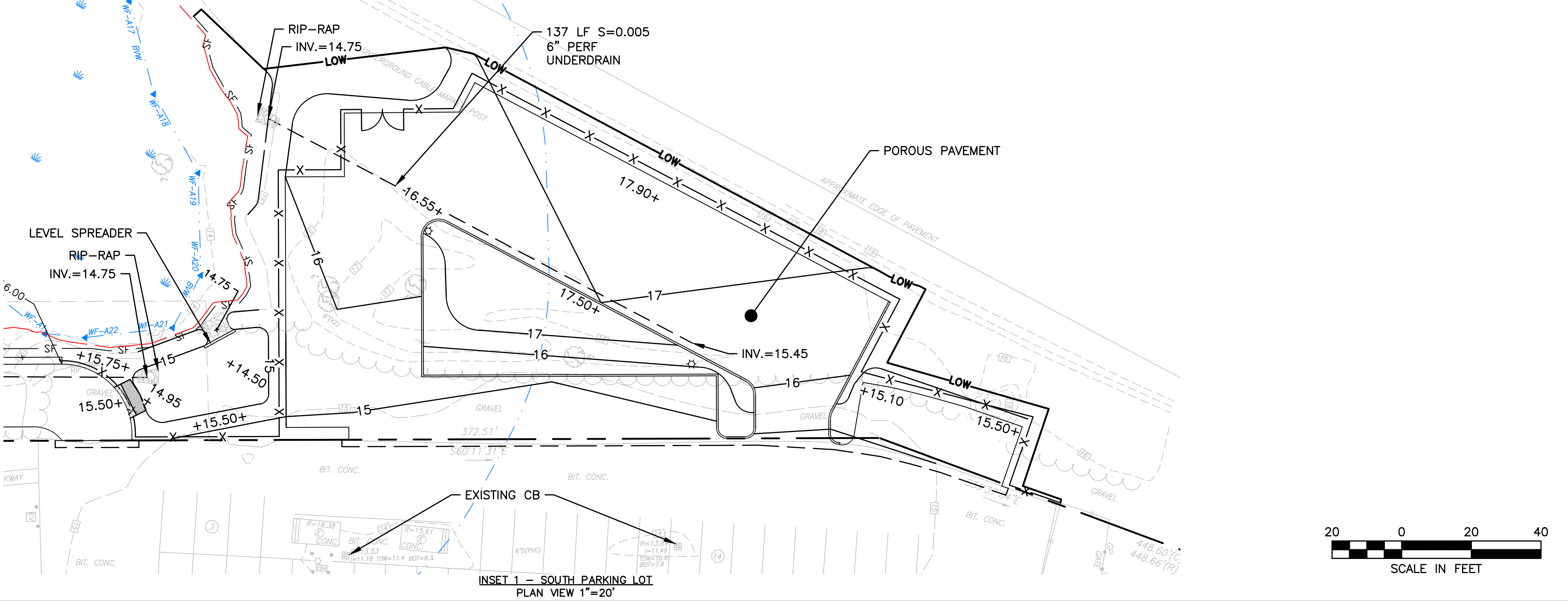
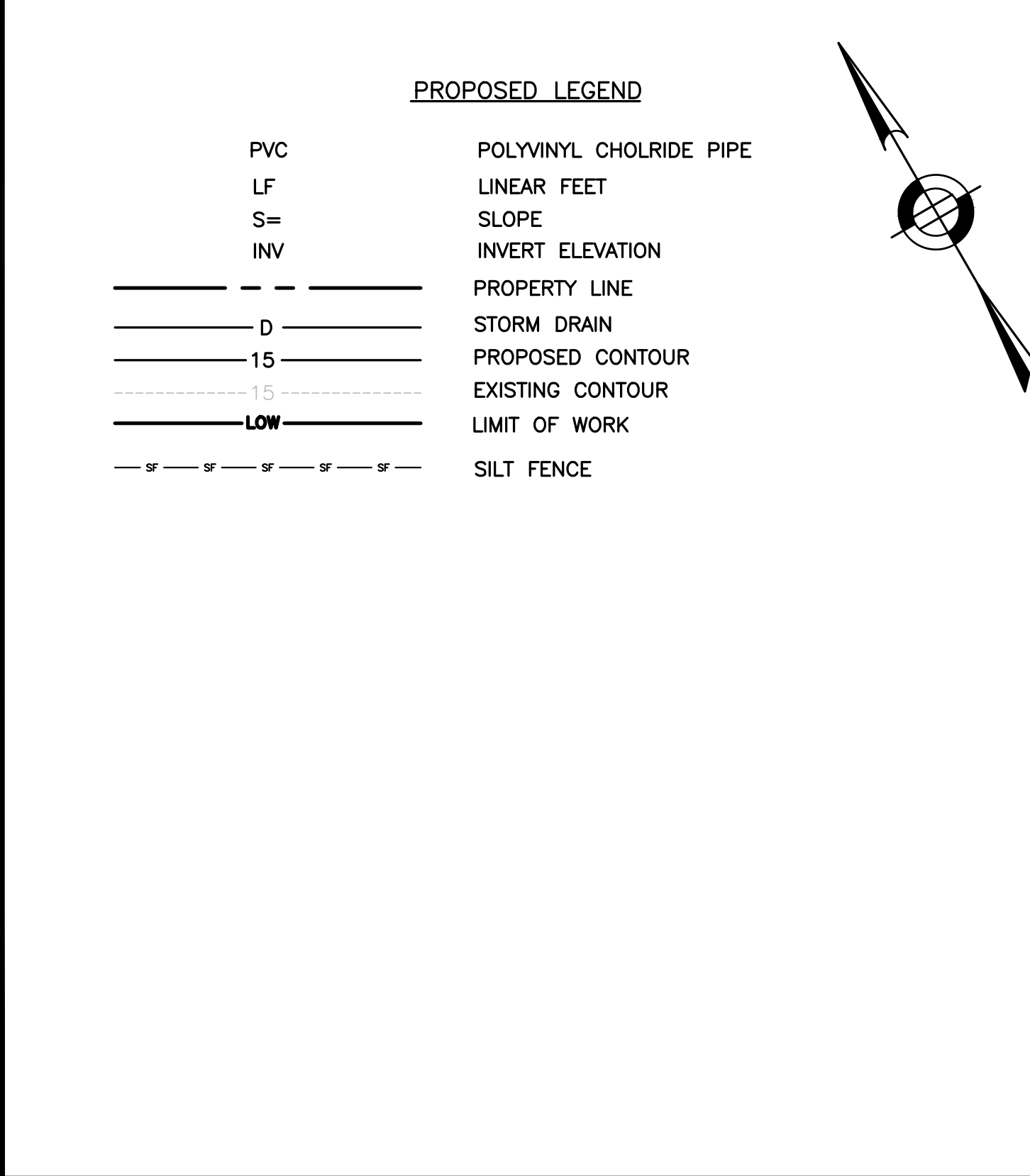


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NOT FOR CONSTRUCTION

GRADING AND
DRAINAGE PLAN

DATE: 03/25/22
PROJECT NUMBER: 19059
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DRAWN BY: RJM
CHECKED BY: JD

C3.00





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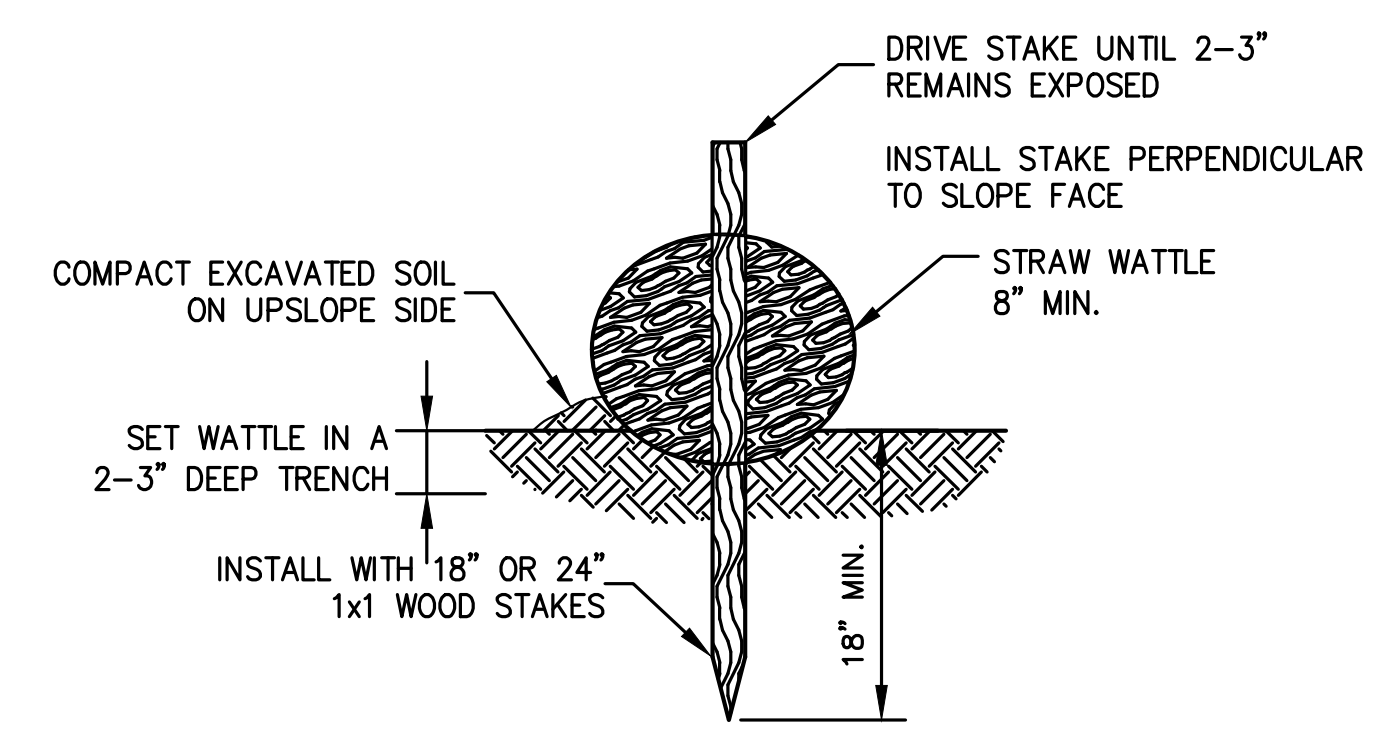


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SITE DETAILS 1

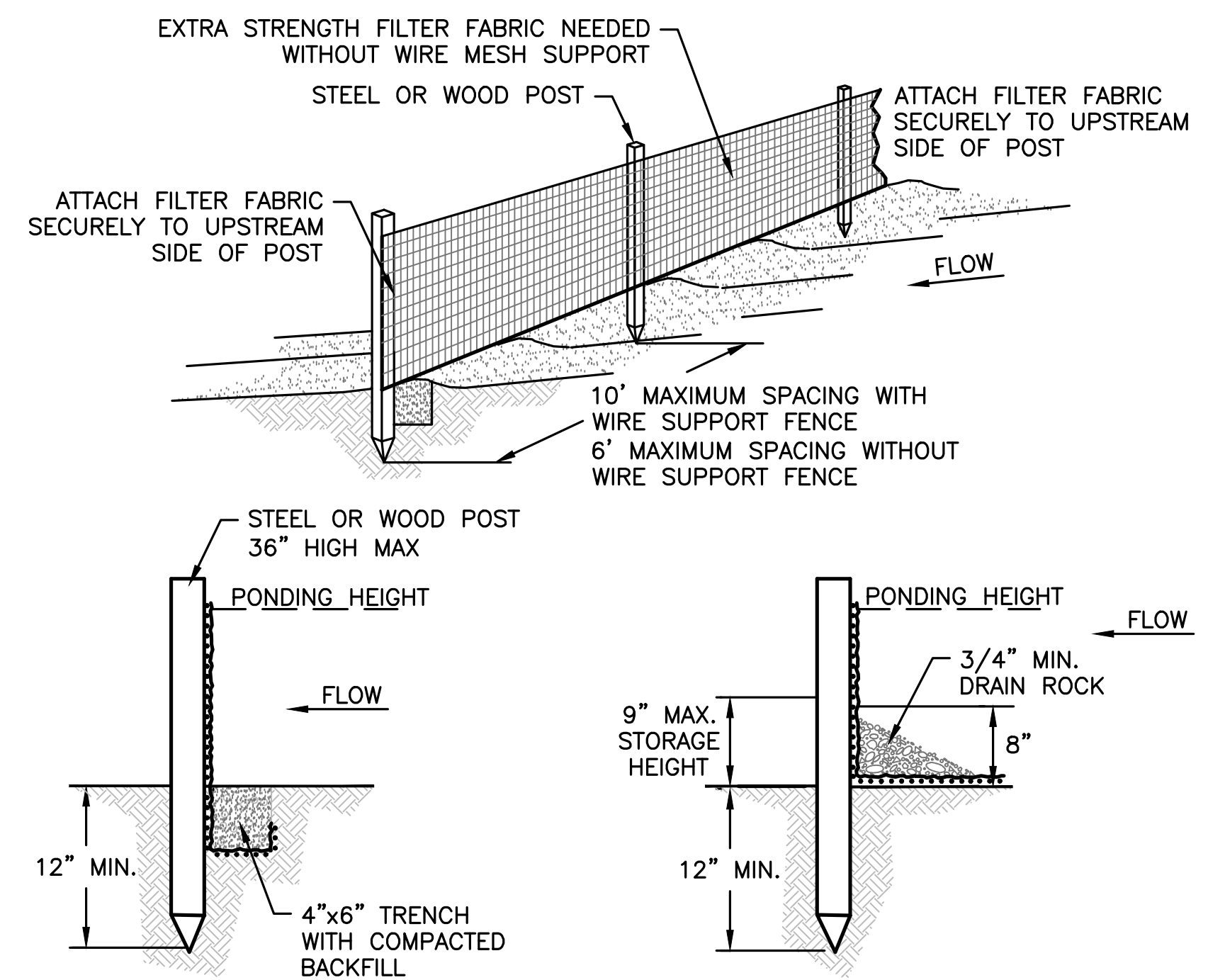
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PROJECT NUMBER:	19059
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DRAWN BY:	RJM
CHECKED BY:	JD

C4.00



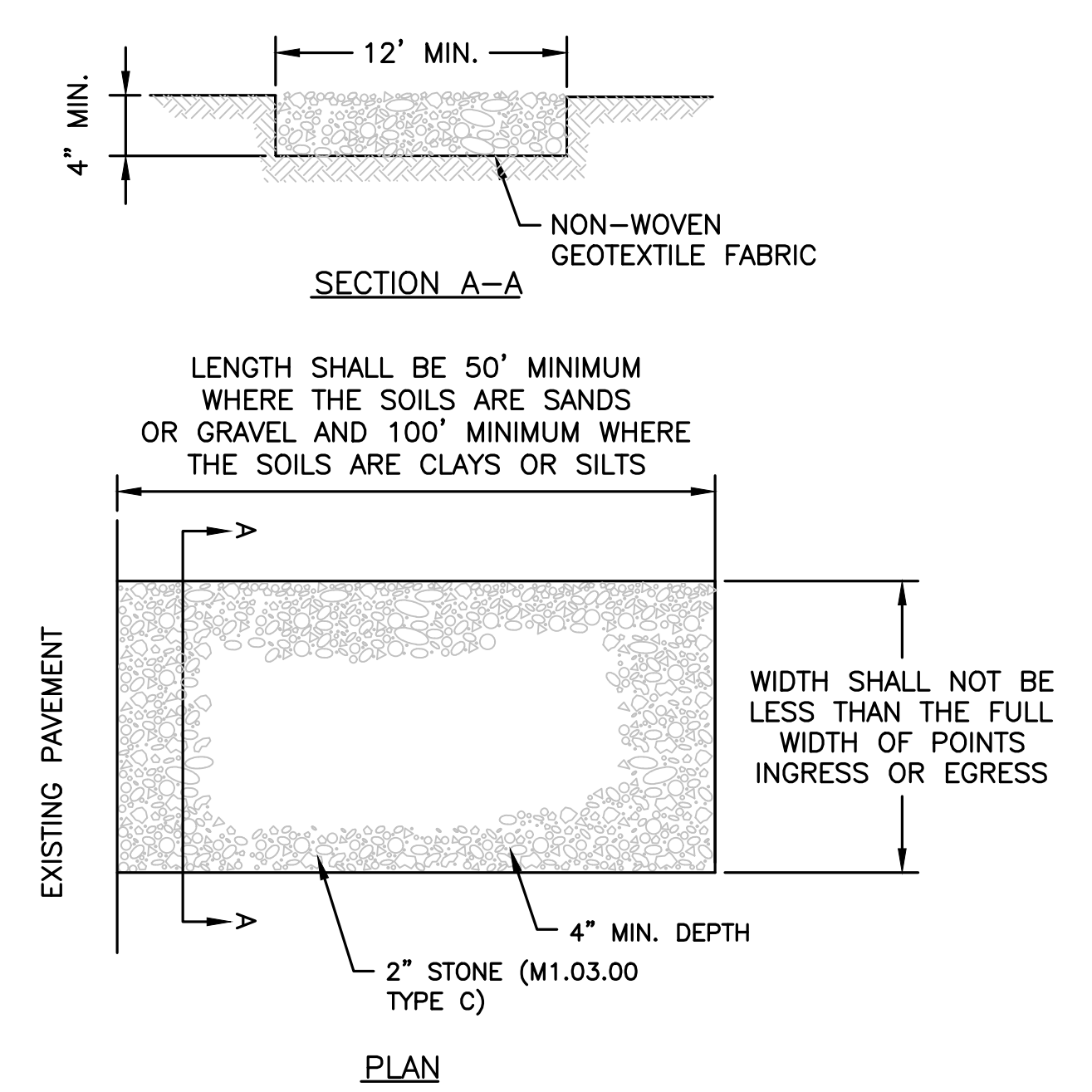
- NOTES:
- BEGIN AT THE LOCATION WHERE THE WATTLE IS TO BE INSTALLED BY EXCAVATING A 2-3" (5-7.5 CM) DEEP X 9" (22.9 CM) WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHOULD BE PLACED UP-SLOPE FROM THE ANCHOR TRENCH.
 - PLACE THE WATTLE IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE WATTLE ON THE UPHILL SIDE. ADJACENT WATTLES SHOULD TIGHTLY ABUT.
 - SECURE THE WATTLE WITH 18-24" (45.7-61 CM) STAKES EVERY 3-4' (0.9 - 1.2 M) AND WITH A STAKE ON EACH END. (STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE LEAVING AT LEAST 2-3" (5-7.5 CM) OF STAKE EXTENDING ABOVE THE WATTLE. STAKES SHOULD BE DRIVEN PERPENDICULAR TO SLOPE FACE.

FILTER BERM
 NOT TO SCALE



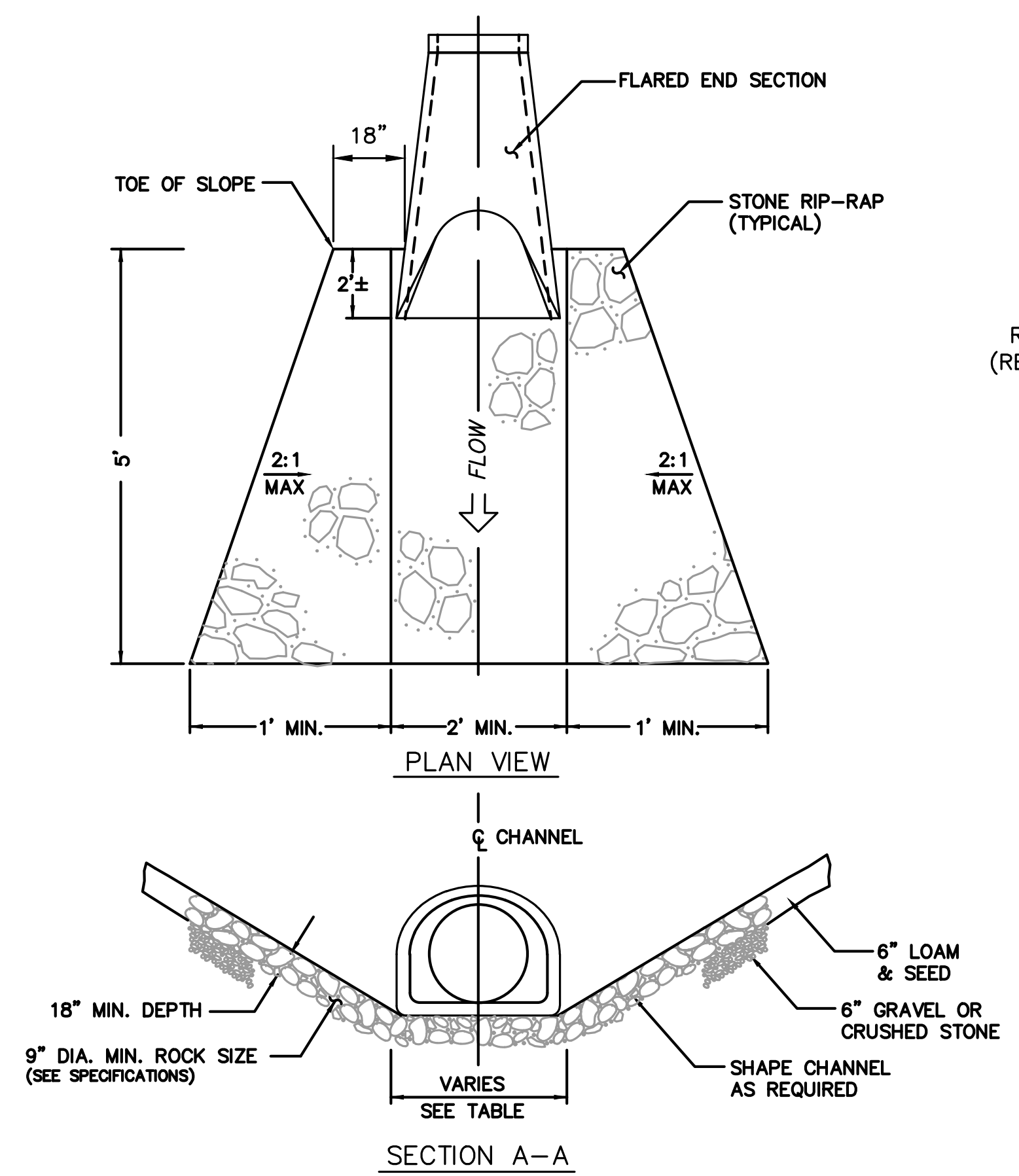
- NOTES:
- EROSION CONTROL BARRIER (HAY BALES, SILT FENCE OR EROSION STOCK) SHALL BE PLACED AROUND ALL MATERIAL STOCKPILE AREAS AND MAINTAINED AT STAGING AREAS TO ASSURE NO SILTATION ONTO PUBLIC OR PRIVATE WAYS OR PROPERTY.

EROSION CONTROL BARRIER
 NOT TO SCALE

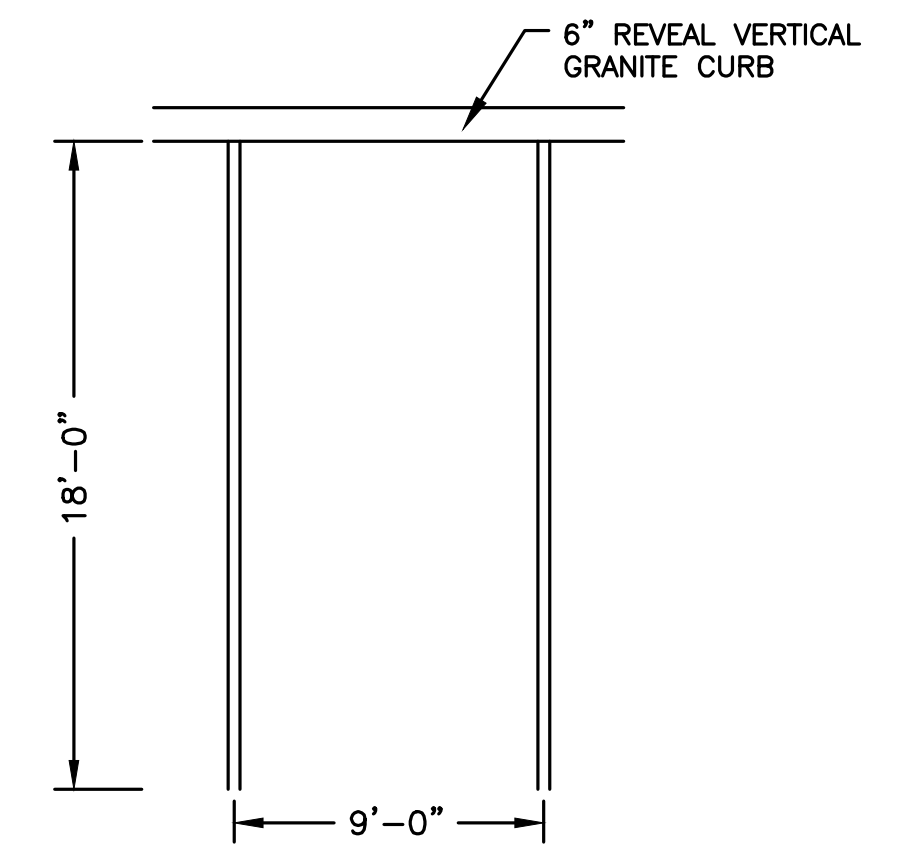


- NOTES:
- INSTALLATION: THE AREA OF THE ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE GRAVEL SHALL BE PLACED TO THE SPECIFIED DIMENSIONS NOTED ABOVE.
 - MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENTS ONTO PUBLIC RIGHT-OF-WAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE, OR ADDITIONAL LENGTH, AS CONDITIONS DEMAND, AND REPAIR, AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
 - LOCATION: SEE C1.0 FOR LOCATION OF CONSTRUCTION ENTRANCES.

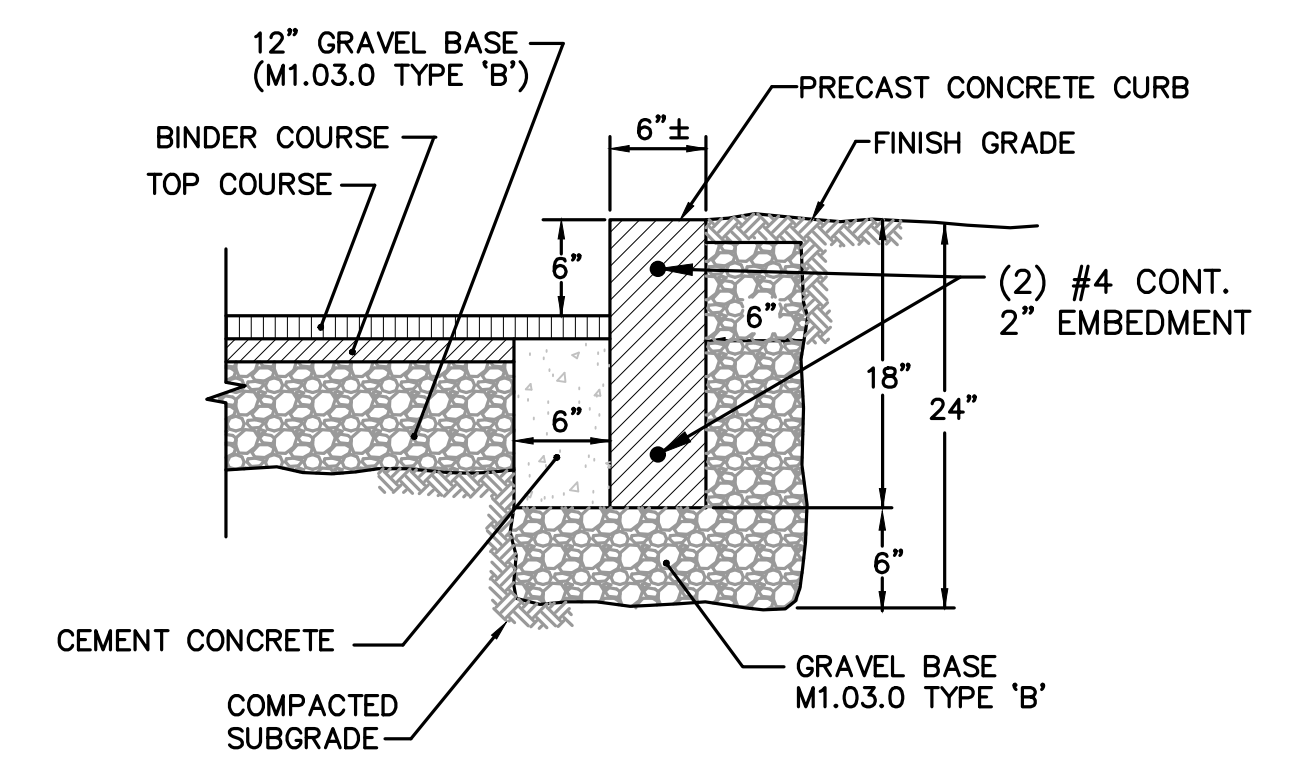
TEMP CONSTRUCTION ENTRANCE
 NOT TO SCALE



OUTLET EROSION PROTECTION
 NOT TO SCALE

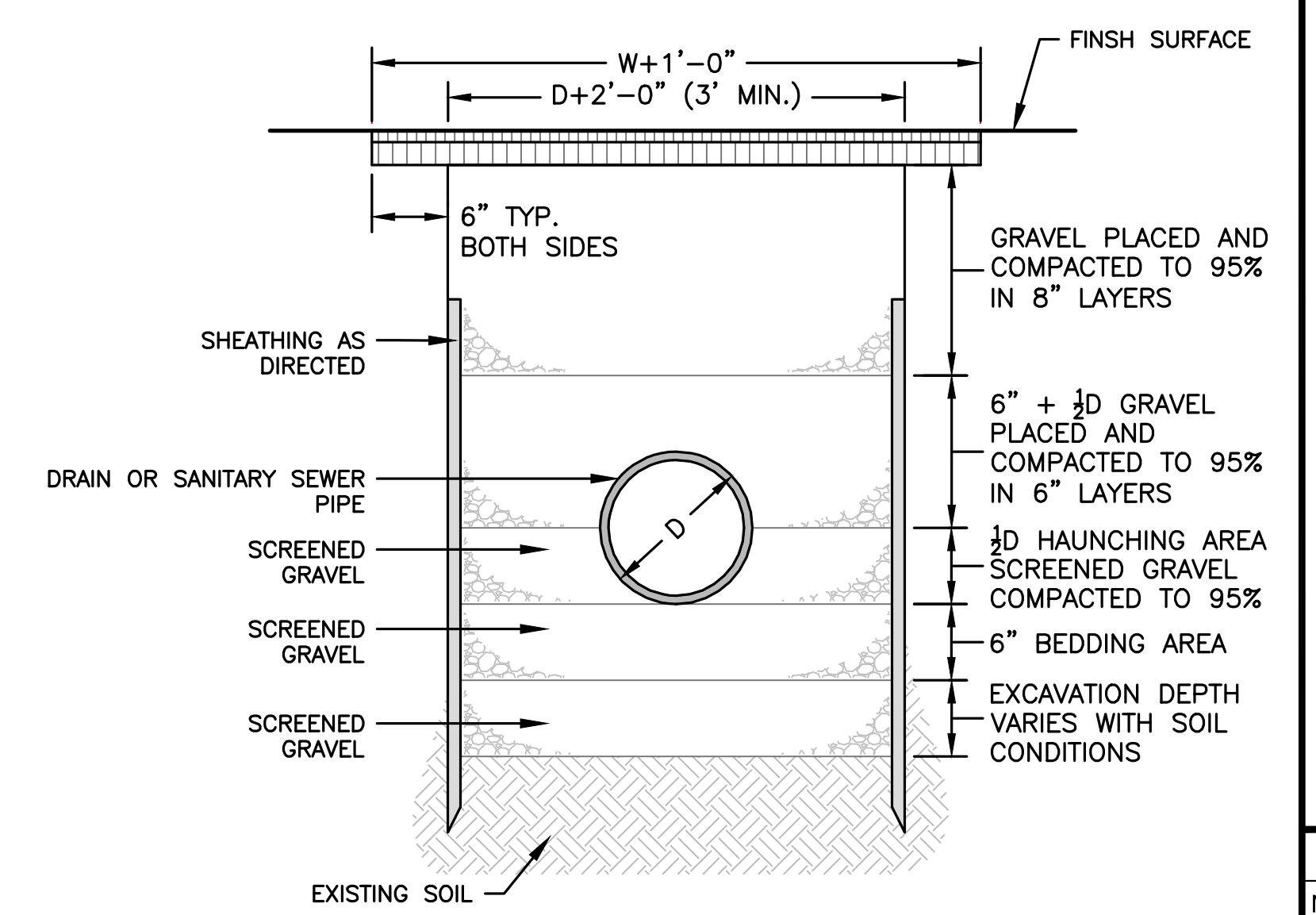


TYPICAL PARKING SPACE
 NOT TO SCALE

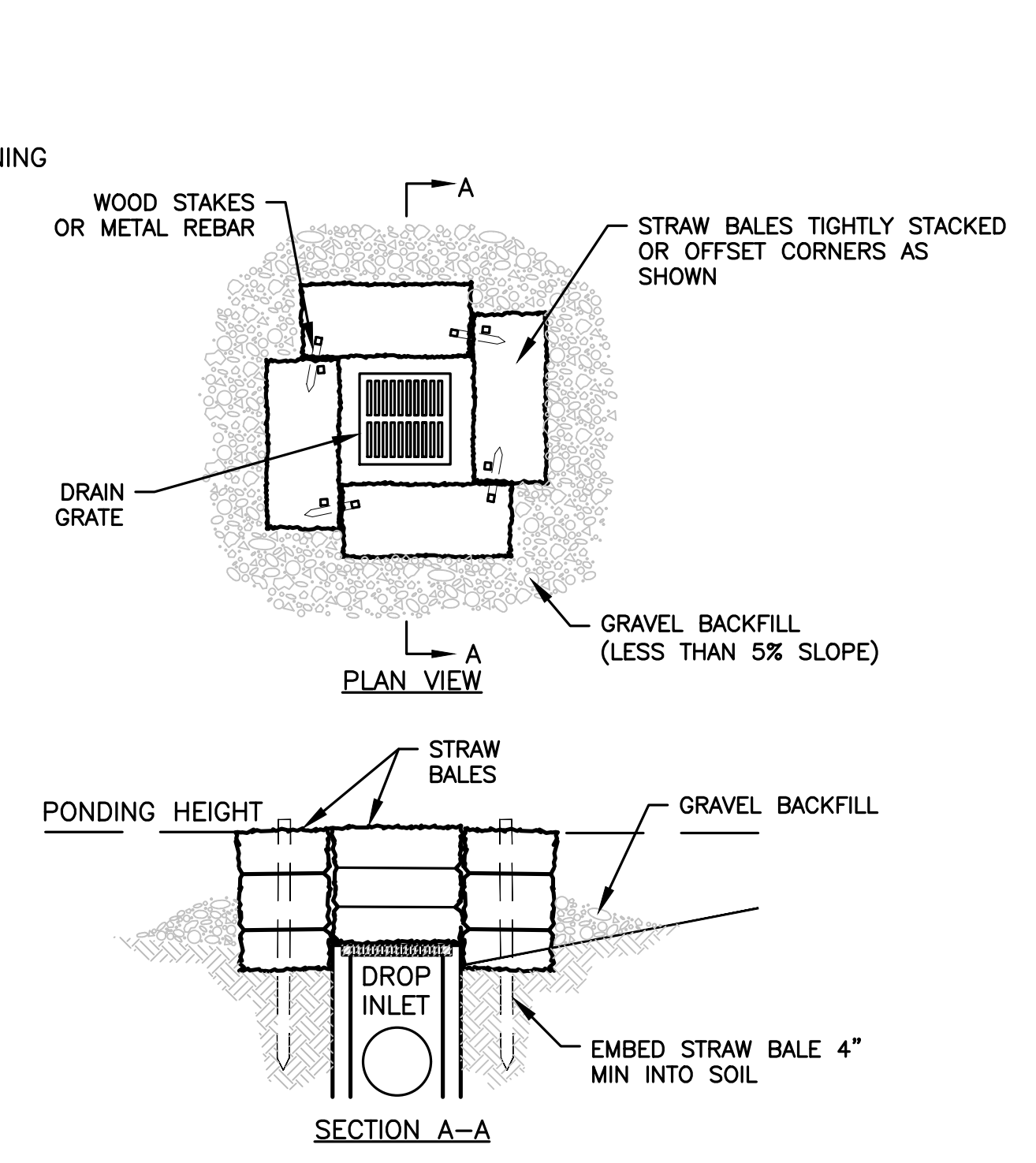
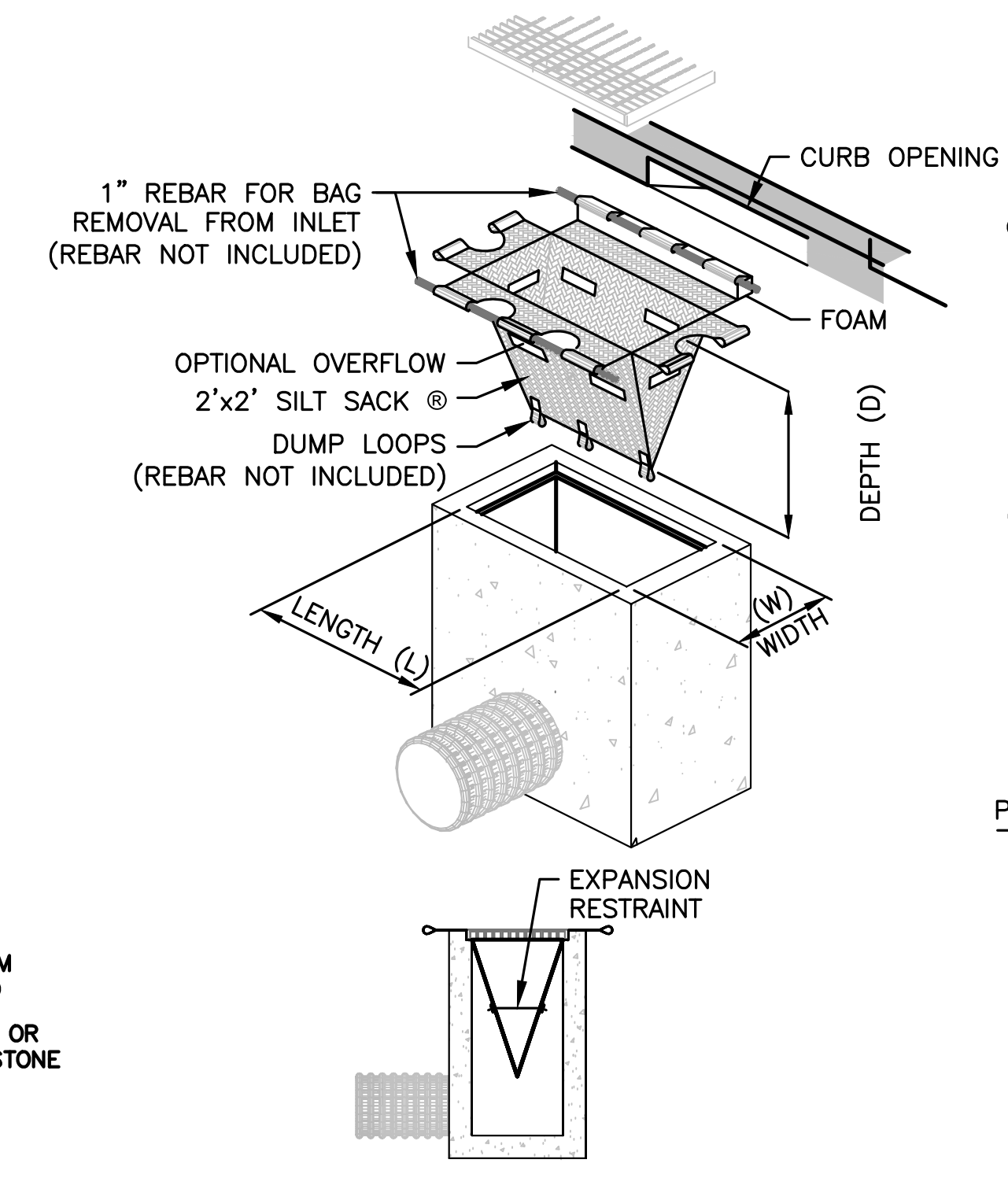


NOTE:
 CURBS SHALL BE BACKED UP BY CONCRETE ANCHOR AT ALL JOINTS WHERE NOT ADJACENT TO A SIDEWALK OR OTHER STRUCTURE.

PRECAST CONCRETE CURB
 NOT TO SCALE



TRENCH DETAIL - DRAIN & SANITARY SEWER
 NOT TO SCALE



STRAW BALE & GRAVEL INLET SEDIMENT BARRIER

TEMPORARY INLET PROTECTION
 NOT TO SCALE



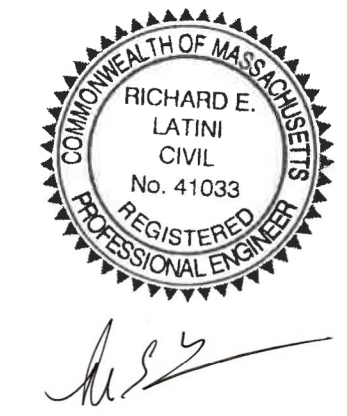
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PREPARED FOR:

256 FREEPORT STREET
 BOSTON, MA

REVISIONS:

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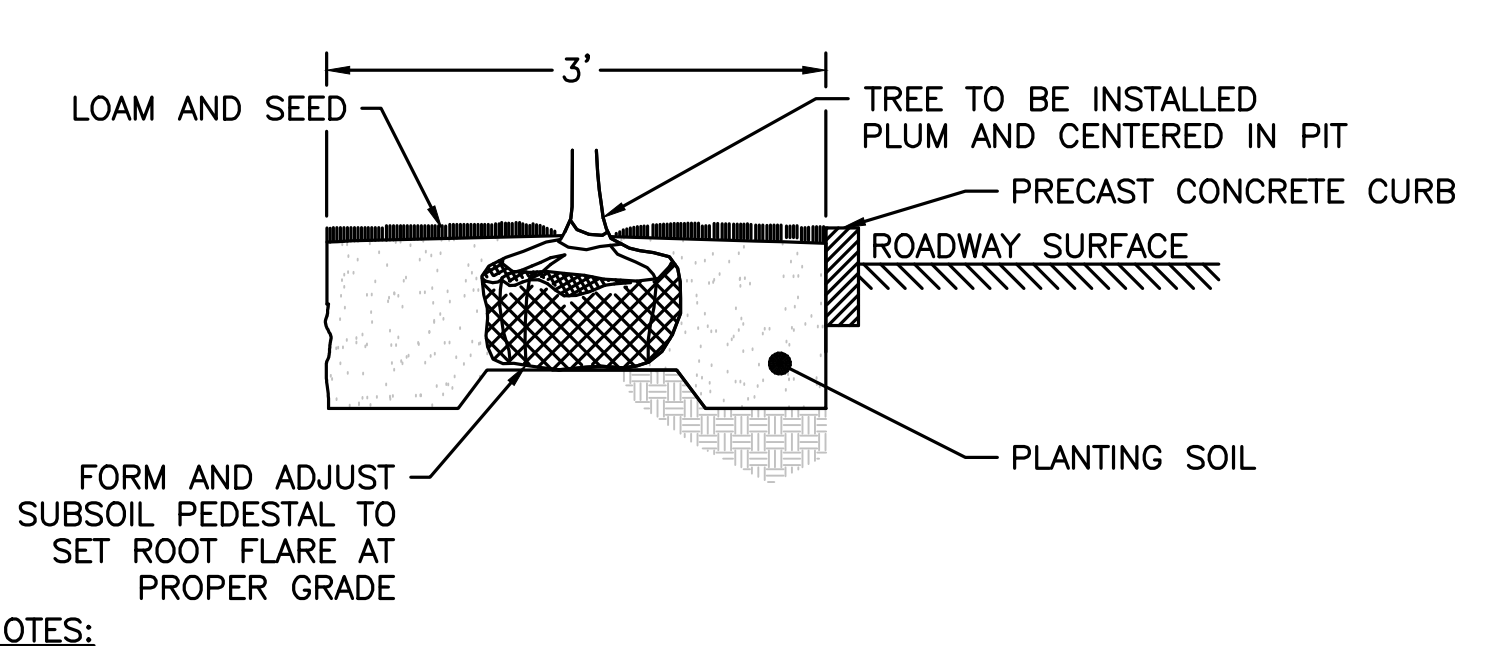
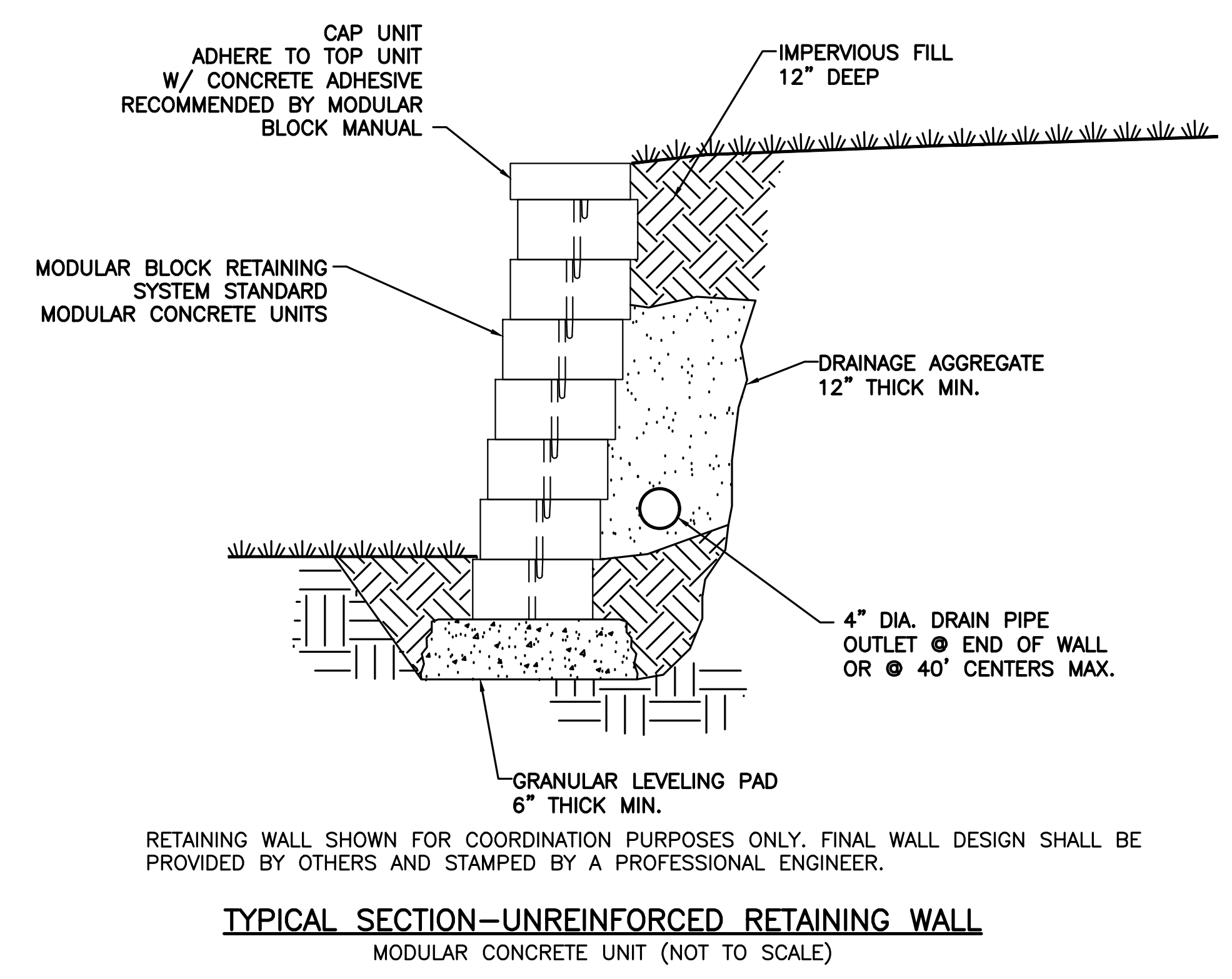
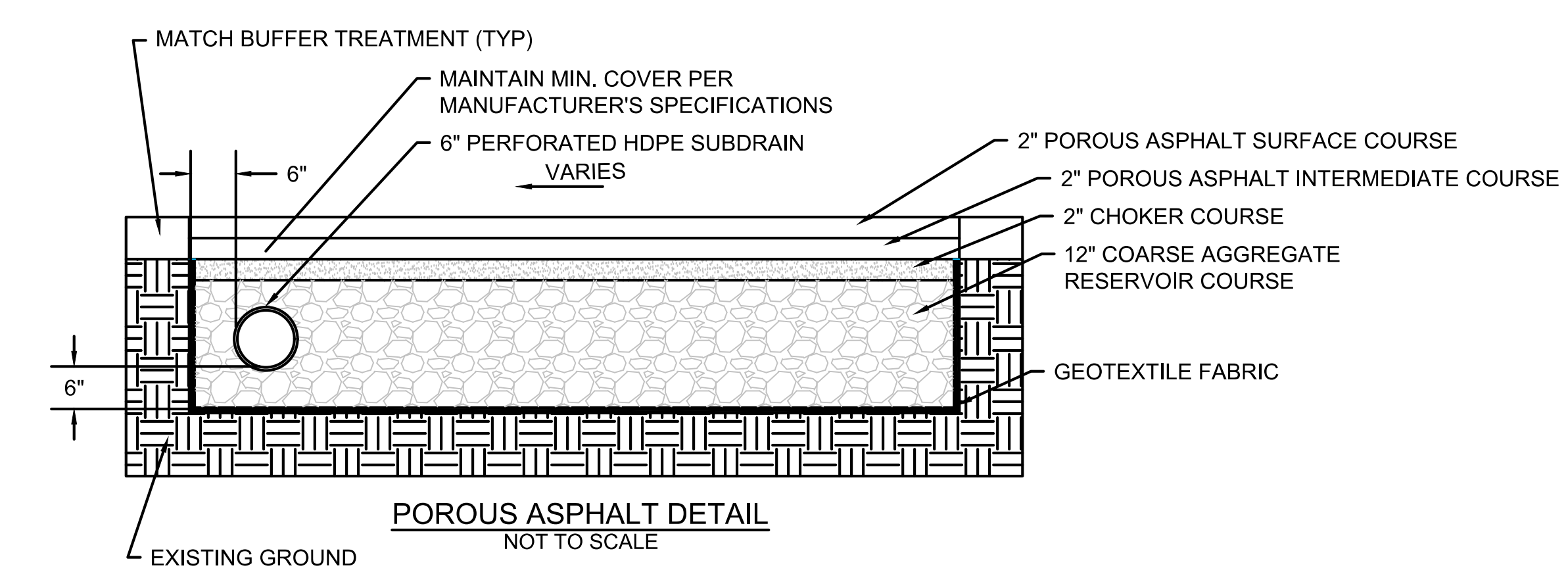
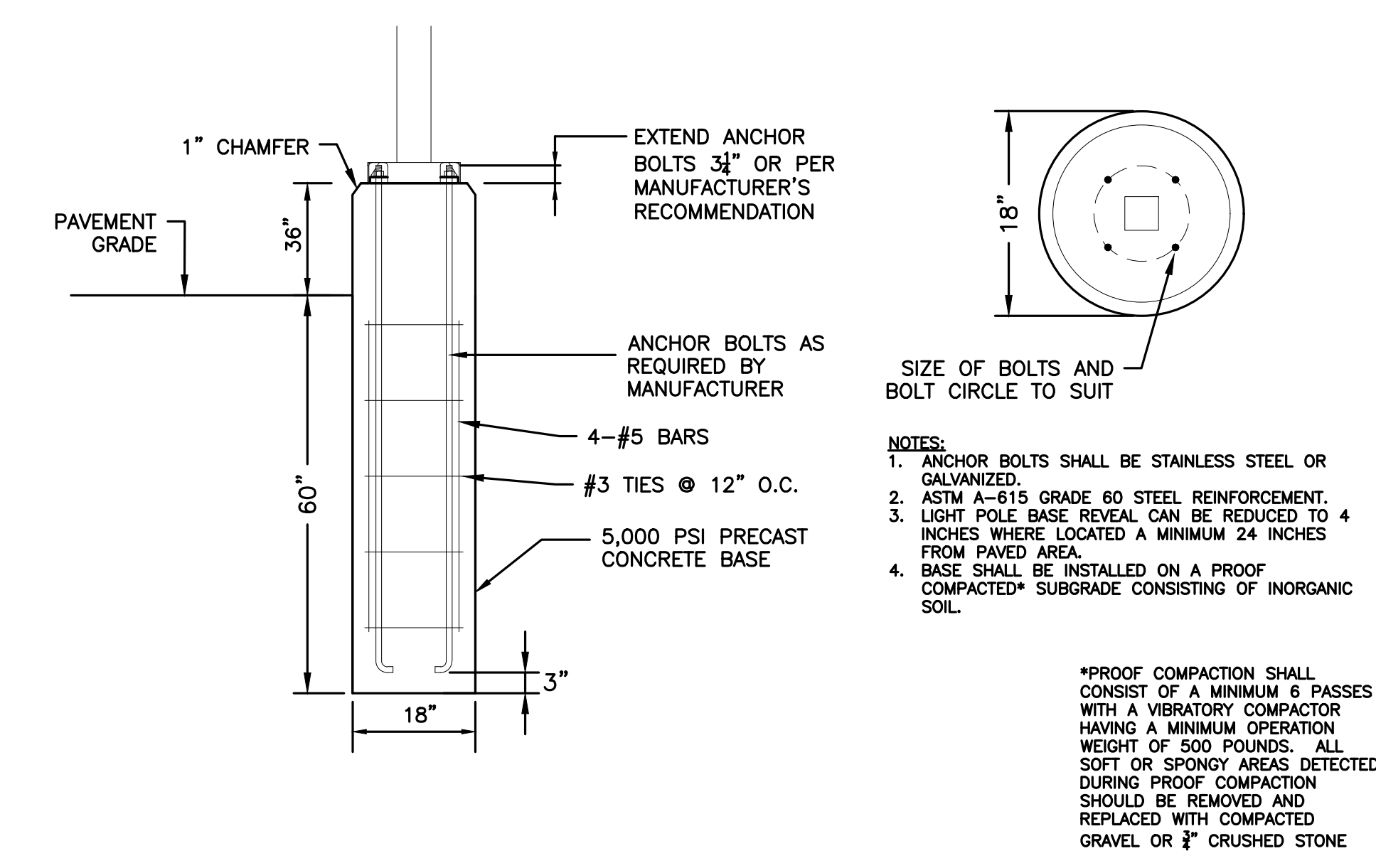


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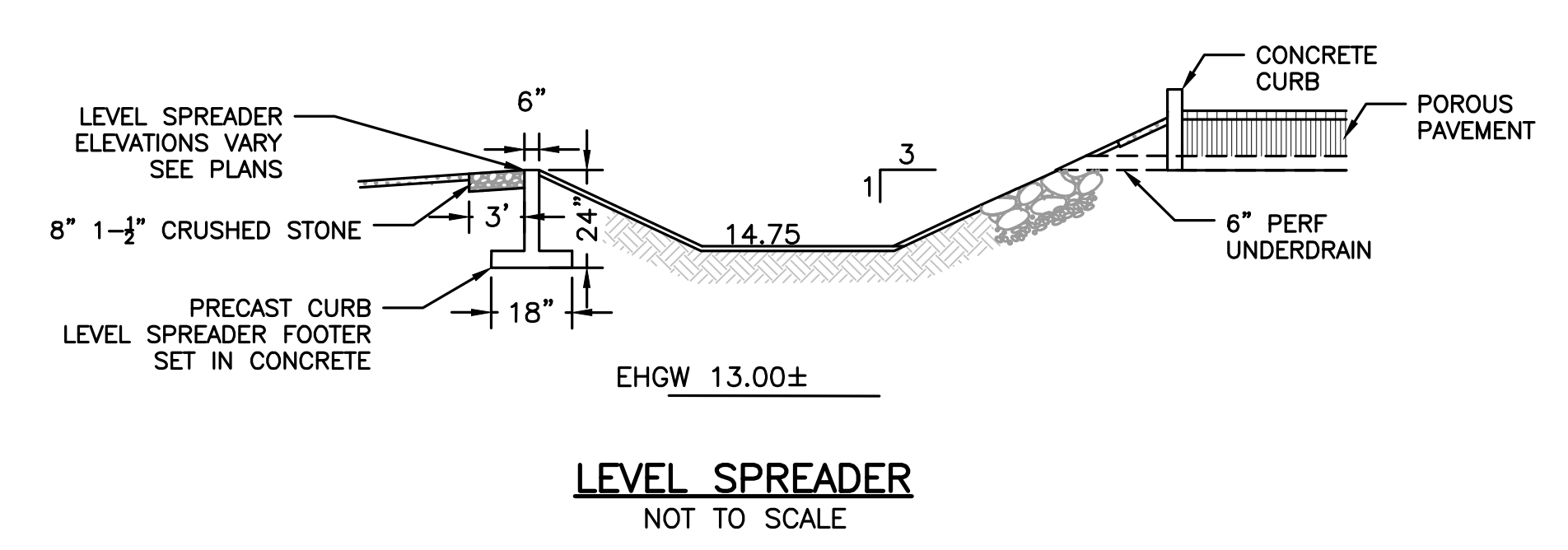
SITE DETAILS 2

DATE:	04/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

C4.01



TREE - HONEY LOCUST
 NOT TO SCALE





HOWARD STEIN HUDSON

Engineers + Planners

OPERATION & MAINTENANCE PLAN

256 Freeport Street

Boston, Massachusetts



Prepared for:

IBEW Local 103
256 Freeport Street
Dorchester, MA 02122

Prepared by

Howard Stein Hudson
11 Beacon Street, Suite 1010
Boston, MA 02108
617-482-7080

April 25, 2022



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Project Narrative

1.0 Introduction

This Stormwater Management System Operation & Maintenance Plan has been prepared by Howard Stein Hudson (HSH) on behalf of the International Brotherhood of Electrical Workers (IBEW) LOCAL 103 (the "Applicant") for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the proposed parking lot at 253 Freeport Street, Boston MA. The stormwater BMPs include porous pavements and level spreaders.

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10).

2.0 Purpose

This Operation & Maintenance Plan (O&M Plan) is intended to provide a mechanism for the consistent inspection and maintenance of BMPs to be installed on-site. Included in this O&M Plan is a description of each BMP type, the location of individual BMPs, an inspection schedule for each stormwater system and forms to be utilized to document the inspection and maintenance of each BMP. Snow storage areas have been identified and are shown on the plan entitled "Snow Storage Plan". Once the designated snow storage areas have reached capacity, excess snow will be mechanically removed. This O&M Plan is intended for use by IBEW Local 103 maintenance personnel.

The Facilities Manager will be responsible for the operation and maintenance of the stormwater management facilities and associated stormwater management features.

Bob Bonanno:
Facilities Manager
IBEW LOCAL 103
256 Freeport Street,
Dorchester MA 02122
Phone: (617) 477-1696
Cell: (617) 840-3367



3.0 Descriptions and Locations of Stormwater BMPs

The following post-construction stormwater best management practices (BMPs) have been designed for the IBEW new porous pavement parking lots to assure its continued performance. A map showing the location of systems and facilities associated with the stormwater management system is provided in Attachment A.

3.1 POROUS PAVEMENT

There are two porous pavement areas design for the new parking lot. Porous pavement is a paved surface with a higher than normal percentage of air voids to allow water to pass through it and infiltrate into the subsoil. This porous surface replaces traditional pavement, allowing parking lot, driveway, and roadway runoff to infiltrate directly into the soil and receive water quality treatment. All permeable paving systems consist of a durable, load-bearing, pervious surface overlying a stone bed that stores rainwater before it infiltrates into the underlying soil.

Porous pavement performs well in cold climates. Porous pavement can reduce meltwater runoff and avoid excessive water on the road during the snowmelt period.

3.2 LEVEL SPREADER

There are three level spreaders are designed on-site. These structures are designed to receive concentrated flow from channels, outlet structures, or other conveyance structures, and converts it to sheet flow where it can disperse uniformly across a stable slope as a permanent structure to reduce runoff velocities, reduce erosion and gulying in the channel and allow sediments to settle out.

4.0 Inspection Frequency, Inspection Safety and Maintenance Safety

4.1 INSPECTION FREQUENCY

A complete and thorough inspection of the system shall be performed once a month during the first six (6) months and then on a semi-annual basin (spring and fall) using the Inspection and Maintenance Forms provided in Attachment B. A qualified member of the Facilities Manager team shall complete an Inspection and Maintenance Form for each BMP at each visit. See Section 5 for a description of maintenance procedures.

4.2 INSPECTION SAFETY

The inspector performing the inspections of the drainage structures shall have the proper safety equipment (heavy duty gloves, steel-toed boots, hard hat, first aid kits, etc.) and appropriate training before conducting inspections. If the inspection of the drainage structure reveals any safety problems



the site activities may need to be modified to reduce or eliminate the safety risk. The inspector shall be aware of the following safety precautions when conducting drainage structure inspections:

- Never enter a confined space unless you have proper Occupational Health and Safety Administration (OSHA) training. Do not enter any confined space until the atmosphere has been checked and proper safety equipment is worn or erected.
- Avoid entering pipes or conduits without another individual present. If the structural strength of a pipe or conduit is questionable, do not enter the pipe or conduit.
- Check the ventilation in the drainage structures before using any ignitable materials. Some drainage structures may be sealed or have poor ventilation, posing a safety risk to the inspector if the vapor comes in contact with an open flame. Also, be sure to allow the drainage structures to vent for a period of time if a peculiar odor is present.
- Check the ventilation in the drainage structures before using any ignitable materials. Some drainage structures may be sealed or have poor ventilation, posing a safety risk to the inspector if the vapor comes in contact with an open flame. Also, be sure to allow the drainage structures to vent for a period of time if a peculiar odor is present.
- Check the ventilation in the drainage structures before using any ignitable materials. Some drainage structures may be sealed or have poor ventilation, posing a safety risk to the inspector if the vapor comes in contact with an open flame. Also, be sure to allow the drainage structures to vent for a period of time if a peculiar odor is present.
- Check the water depth of the system before taking a step in the water. The water may be deeper than it seems or there may be steep slopes below the water line.
- Be aware that nails, broken glass, or other sharp debris may be in the storm water system and can cause injury. Wearing the proper safety clothing will reduce the safety risk associated with these objects.

4.2 MAINTENANCE SAFETY

All maintenance work shall be done in compliance with OSHA regulations. Maintenance personnel will have the proper safety equipment (heavy duty gloves, steel-toed boots, hard hat, first aid kits, etc.) and training before performing any maintenance on the drainage structures. Maintenance personnel shall be aware of the following safety precautions when performing maintenance on the drainage structures:

- Operate equipment safely and in accordance with the manufacturer's specifications. Equipment operators must remain aware of site personnel at all times to avoid causing injury to others.
- Contact Dig Safe System Inc. at 1-888-DIG-SAFE seventy-two (72) hours before excavating a site. Underground utility wires and pipes may be present. Cover or clearly mark excavated



areas that cannot be filled in at the end of the day to alert site employees of the potential risk. Also, be aware of overhead electrical wires that could come in contact with maintenance equipment.

- Contact Dig Safe System Inc. at 1-888-DIG-SAFE seventy-two (72) hours before excavating a site. Underground utility wires and pipes may be present. Cover or clearly mark excavated areas that cannot be filled in at the end of the day to alert site employees of the potential risk. Also, be aware of overhead electrical wires that could come in contact with maintenance equipment.
- Wear gloves if any mechanical parts or structural components are going to be handled. Wearing gloves not only reduces the risk of getting cuts and abrasions, but also reduces the exposure of pollutants to the skin.

5.0 Inspection and Maintenance Procedures

The Facilities Manager is responsible for the inspection and maintenance of the stormwater system components. The following list of inspections and maintenance shall be performed on the required schedule. All sediment, debris, and hydrocarbons that are removed during the maintenance of the stormwater system components should be properly handled and disposed.

5.1 POROUS PAVEMENT

- a. Inspect annually for deterioration or spalling of the pavement.(January, April, July, October)
- b. No winter sanding shall be conducted on the porous surface as it would lead to clogging of the surface.
- c. The pavement should be vacuum swept monthly.

5.2 LEVEL SPREADER

- a. Inspect and remove trash monthly
- b. Clean 2 times per year, removing and replacing dead vegetation, weeds etc.

6.0 Record Keeping

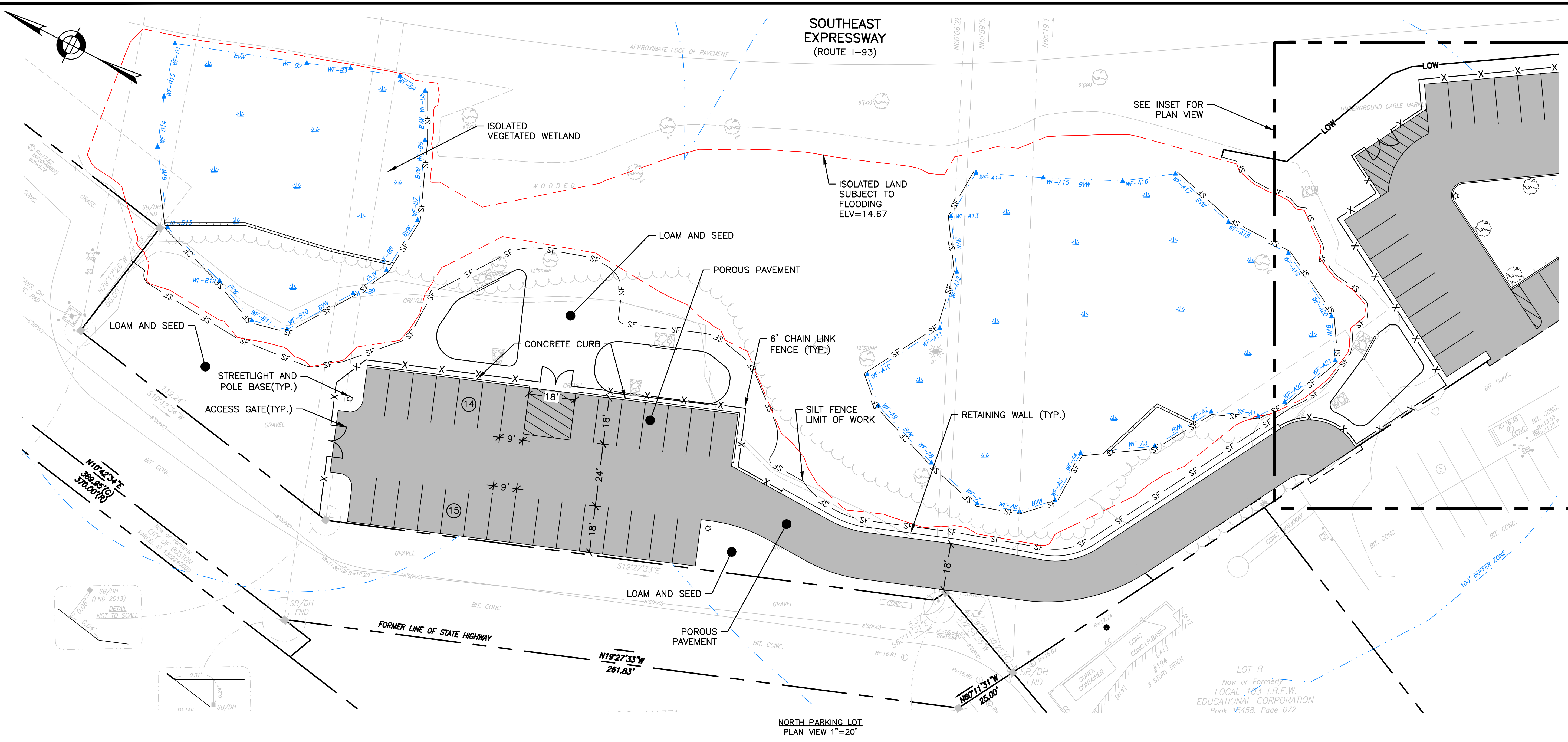
An “Inspection and Maintenance Form” shall be filled out each time inspectional or maintenance work is performed. A binder shall be kept by the Facility Manager that contains all of the completed inspection forms and/or photographs and related material. A review of all Operation and Maintenance actions should take place annually to ensure that these Stormwater BMPs are being



taken care of in the manner illustrated in this Operation & Maintenance Plan. Additionally, all operation and maintenance records shall be retained for at least ten (10) years and be provided to the Conservation Commission upon request.



Attachment A: System Location Map



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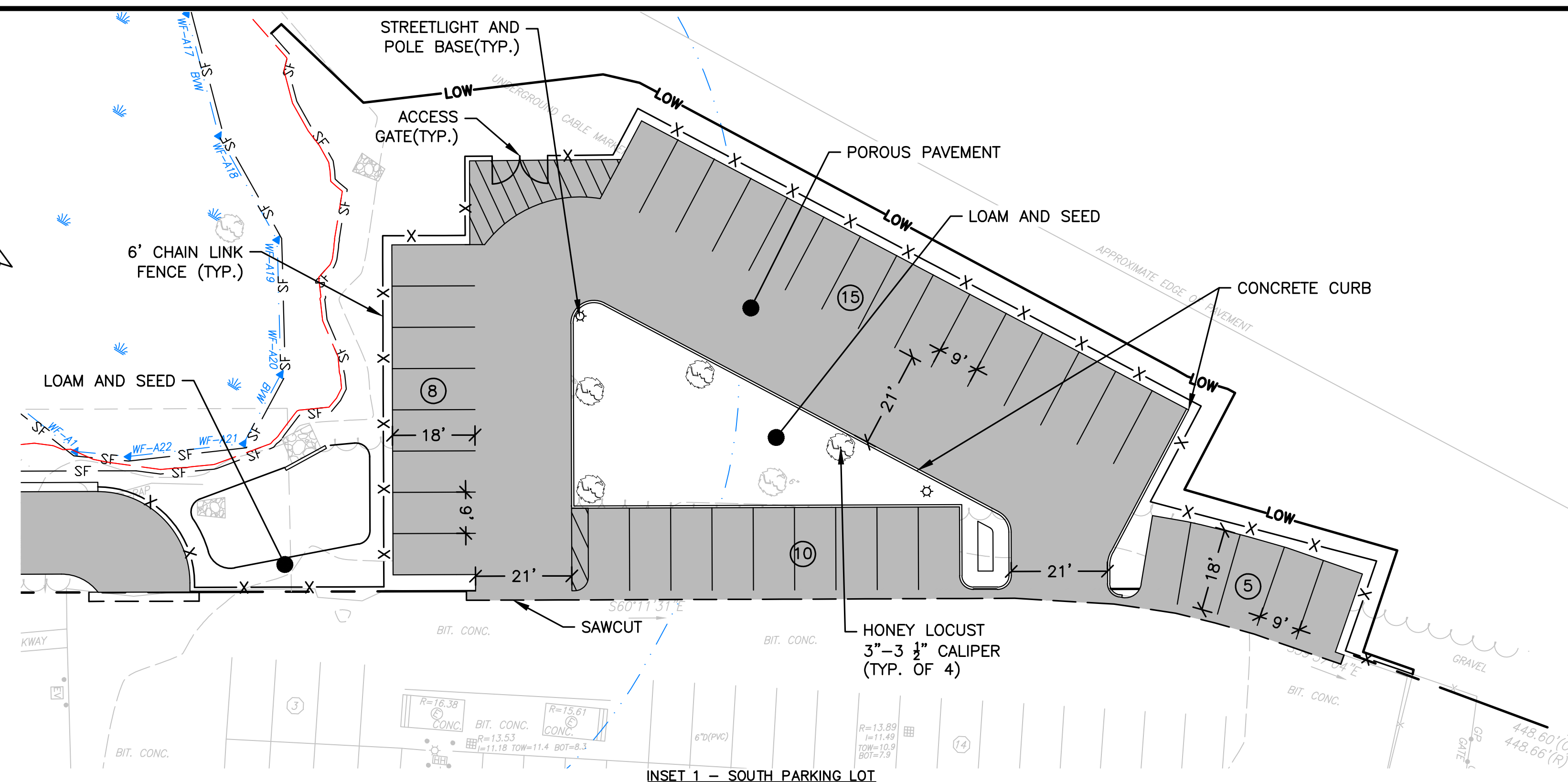
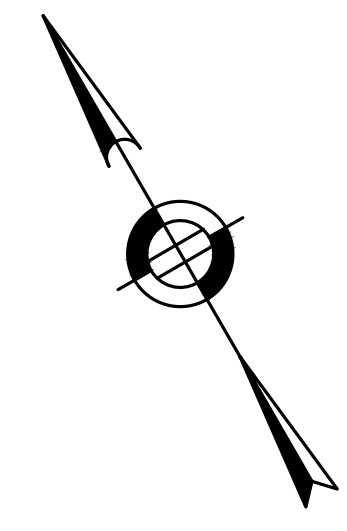
256 FREEPORT STREET
 BOSTON, MA

REVISIONS:

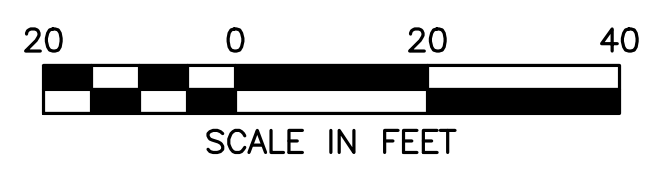
NO	BY	DATE	DESCRIPTION
1		04/27/22	REV 1

LEGEND

	PROPERTY LINE
	CONCRETE CURB
	SAWCUT
	6' CHAIN LINK FENCE
	POROUS PAVEMENT
	LIMIT OF WORK
	SILT FENCE



NOTES:
 1. APPROXIMATELY 67 NEW PARKING SPACES



PERMIT SET
 NOT FOR CONSTRUCTION

LAYOUT AND
 MATERIALS PLAN

DATE:	03/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

C2.00



Attachment B: Inspection and Maintenance Forms

**INSPECTION AND MAINTENANCE FORM
STORMWATER BEST MANAGEMENT PRACTICES (BMPs)**

Drainage System: Level Spreader Date: _____ Time: _____

Weather/Temp.: _____ Inspector(s): _____

Date of Last Precipitation: _____ Precipitation Amount: _____ Inches

Precipitation Type: _____ Location On-Site: _____

Scoring Breakdown:

N/A = Not Applicable	1 = Monitor (potential for future problems exist)
N/I = Not Investigated	2 = Routine Maintenance Required
0 = Not a problem	3 = Immediate Repair Necessary

1. Grass on Surface

Overall Condition	N/A	N/I	0	1	2	3	
Displacement/Erosion	N/A	N/I	0	1	2	3	
Sediment accumulation >1"	No	Yes	0	1	2	3	Amount: _____ in. *

5. Outlet

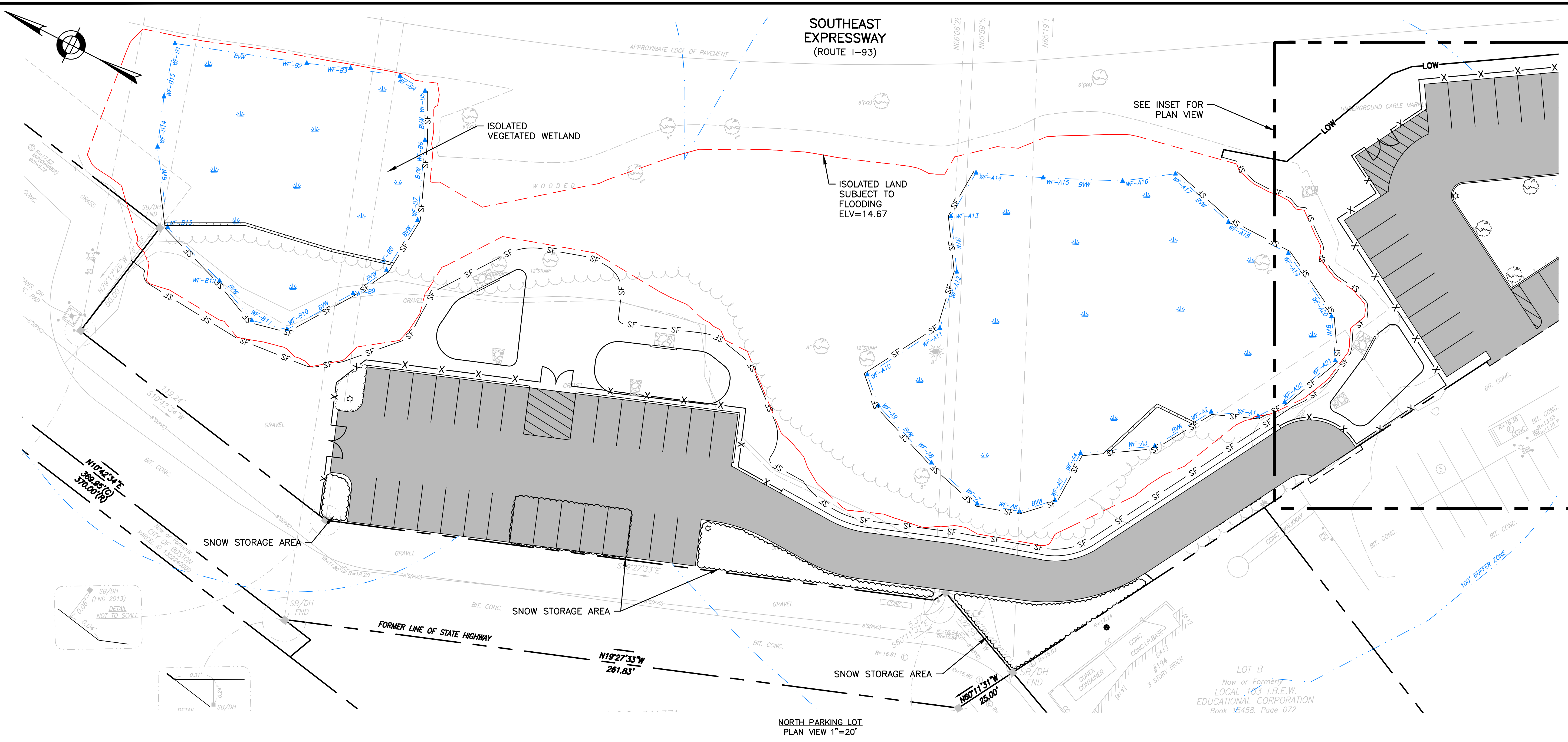
Broken	N/A	N/I	0	1	2	3
Clogged	N/A	N/I	0	1	2	3
Submerged Outlet Pipe	N/A	N/I	0	1	2	3

Overall Condition

Inspector's Summary:



Attachment C: Snow Storage Plan



HOWARD STEIN HUDSON
 11 Beacon Street, Suite 1010
 Boston, MA 02108
 www.hshassoc.com

PREPARED FOR:
 IBEW LOCAL 103
 256 FREEPORT STREET
 DORCHESTER, MA 02122

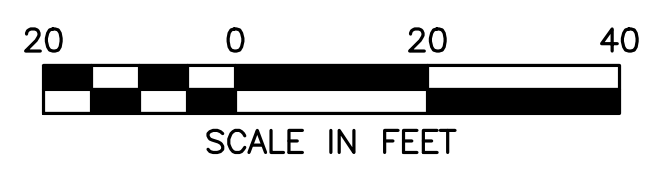
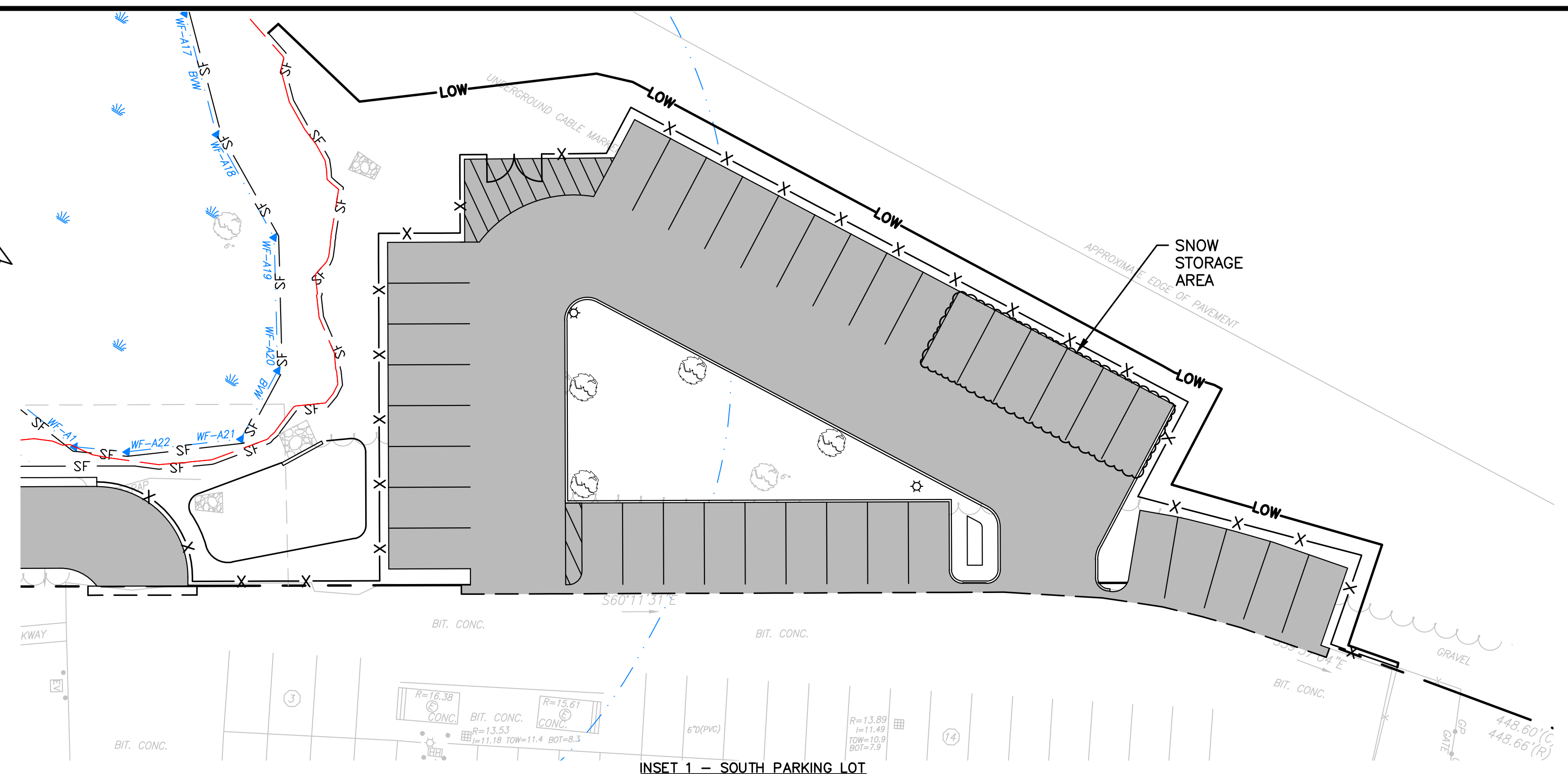
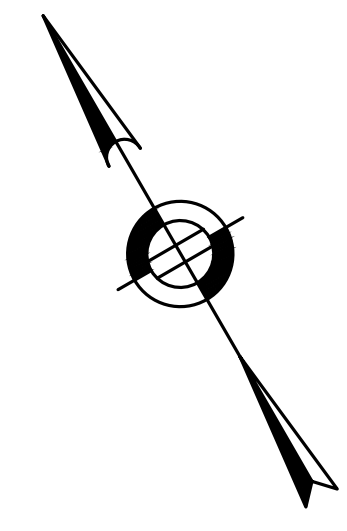
**256 FREEPORT STREET
 BOSTON, MA**

REVISIONS:

NO	BY	DATE	DESCRIPTION

LEGEND

	PROPERTY LINE
	CONCRETE CURB
	SAWCUT
	6' CHAIN LINK FENCE
	POROUS PAVEMENT
	LIMIT OF WORK
	SILT FENCE
	SNOW STORAGE



PERMIT SET
 NOT FOR CONSTRUCTION

SNOW STORAGE PLAN

DATE:	04/26/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

FIGURE 1



HOWARD STEIN HUDSON

Engineers + Planners

STORMWATER MANAGEMENT REPORT

256 Freeport Street Boston, Massachusetts



Prepared for:

IBEW Local 103
256 Freeport Street
Dorchester, MA 02122

Prepared by

Howard Stein Hudson
11 Beacon Street, Suite 1010
Boston, MA 02108
617-482-7080

April 27, 2022



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Appendix D: Water Quality Calculations

Appendix E: Operation and Maintenance Plan (Under Separate Cover)

Appendix F: Checklist for Stormwater Report

Appendix G: Illicit Discharge Compliance Statement

Appendix H: Proposed Plans (under Separate Cover)



Introduction

This Stormwater Management Report describes the existing drainage conditions and proposed stormwater best management practices (BMPs) designed to treat and control runoff for the proposed new parking at 256 Freeport Street in Boston, MA.

The Project proposes the construction of two parking lots that provide parking for 67 vehicles. Construction will include porous pavement, one retaining wall, trees, fencing and lighting.

The approach to stormwater management for this project is to balance the needs of the project while preserving the integrity of the groundwater aquifer and the existing isolated vegetated wetlands. The proposed stormwater management system incorporates Best Management Practices (BMPs), as described in the Department of Environmental Protection Stormwater Management Policy Handbook. Stormwater BMPs include porous pavement and level spreaders to help reduce pollutant concentrations in the stormwater runoff. The Project will result in an decrease in impervious area of approximately 5,968 ft².

Pre and post-construction hydrology was analyzed with HydroCAD v 10.0, model using TR-20 methodology. The rainfall data was obtained from the Cornell University Atlas of Precipitation Extremes for Northeastern United States & Southeastern Canada. The pre- and post-development peak discharge rates have been analyze and are included in Table 1. The project will result in a slight increase in peak discharge rates, but overall provides an improvement over existing conditions. Soils at the site are mapped as Natural Resource Conservation Service (NRCS) Hydrologic Soil Group C. The NRCS soil maps are included in Appendix A.

Hydrology

Pre-Construction Hydrology

The hydrology calculations analyze three design points. Most existing stormwater runoff overland flows northerly toward on-site isolated vegetated wetlands, DP1 and DP2. A portion of the existing site overland flows southwest toward an existing catch basin, DP3. These subcatchment areas are shown on the plan entitled “Existing Hydrology” provided in Appendix B.



Post-Construction Hydrology

The proposed stormwater management system was designed to maintain peak flows and volumes contributing to the individual existing Isolated Vegetated Wetlands. Pre and Post construction peak flows and volumes are in Table 1. The proposed subcatchment areas are shown on the plan entitled “Proposed Hydrology” provided in Appendix C.

DESIGN POINT 1 – NORTH ISOLATED VEGETATED WETLAND

Runoff from subcatchment PR 5 is captured by porous pavement and will either infiltrate to groundwater or discharge to DP1 via a porous pavement underdrain and level spreader. Runoff within subcatchment PR8 will continue to flow overland to the existing isolated vegetated wetlands. DP1 will have a slight decrease in peak flows for the 2, 10, and 100-year storms. DP1 stormwater volumes slightly decrease for the 2-year storm and there’s a de minimis increase for the 10 and 100-year storms.

DESIGN POINT 2 – SOUTH ISOLATED VEGETATED WETLAND

Runoff within subcatchment PR1 will continue to flow overland to the existing isolated vegetated wetlands DP2. Runoff from subcatchments PR3, PR4 and PR7 is captured by porous pavement and will either infiltrate to groundwater or discharge to DP2 via an underdrain. DP2 will have a slight decrease in peak flows for the 2, 10, and 100-year storms. DP2 stormwater volumes slightly decrease for the 2 and 10-year storms and there’s a slight increase for the 100-year storm.

DESIGN POINT 3 – EXISTING CATCH BASIN

PR6 overland flows southwest toward an existing catch basin, DP3. PR 2 is captured by porous pavement and will either infiltrate or discharge to DP3 via sheet flow. DP2 will have a decrease in peak flows and volumes for the 2, 10, and 100-year storms.

Stormwater Management Standards

STANDARD 1: NO NEW UNTREATED DISCHARGES

The Massachusetts Stormwater Handbook requires that the project demonstrates that there are no new untreated discharges and that new discharges will not cause erosion or scour to downstream wetlands.

A majority of runoff from the paved areas will be filtered through porous pavement. Other areas disturbed by construction will be stabilized with vegetation and is not expected to cause erosion or scouring downstream.



STANDARD 2: POST-DEVELOPMENT PEAK DISCHARGE RATES NOT TO EXCEED PRE-DEVELOPMENT PEAK DISCHARGE RATES

The project meets Standard 2 for the 2, 10 and 100 year storms. Peak discharge rates and volumes are provided in Table 1. Hydrology calculations are provided in Appendices B and C.

Table 1. Pre- Vs Post-Development Peak Discharge Rates and Volumes

Design Point	Pre-Development Rate (cfs)	Pre-Development Volume(cf)	Post-Development Rate (cfs)	Post-Development Volume(cf)
2-Year Storm Event				
DP #1: Isolated Vegetated Wetland	0.73	2,901	0.61	2,874
DP #2: Isolated Vegetated Wetland	1.42	5,837	1.42	4,792
DP #3: Existing Catch Basin	0.98	3,485	0.57	1,742
2-Year Storm Event Total	3.13	12,221	2.60	9,408
10-Year Storm Event				
DP #1: Isolated Vegetated Wetland	1.70	6,273	1.36	6,360
DP #2: Isolated Vegetated Wetland	3.33	12,589	3.15	11,935
DP #3: Existing Catch Basin	1.72	6,229	0.92	2,918
10-Year Storm Event Total	6.75	25,091	5.43	21,213
100-Year Storm Event				
DP #1: Isolated Vegetated Wetland	4.30	15,725	3.37	15,812
DP #2: Isolated Vegetated Wetland	8.44	31,668	7.79	32,321
DP #3: Existing Catch Basin	3.51	13,199	1.75	7,361
100-Year Storm Event Total	16.25	60,592	12.91	55,494

STANDARD 3: MINIMIZE OR ELIMINATE LOSS OF ANNUAL RECHARGE TO GROUNDWATER

It is anticipated that the stormwater management system will increase the annual recharge to the groundwater over existing conditions. Recharge is provided by porous pavement. The recharge volumes calculations are provided in Appendix D.

STANDARD 4: STORMWATER MANAGEMENT SYSTEM TO REMOVE 80% OF AVERAGE ANNUAL LOAD OF TOTAL SUSPENDED SOLIDS (TSS)

The stormwater management system removes 80% of the average annual total suspended solids (TSS) for the overall project by utilizing infiltration basins and porous pavement. TSS Removal Calculations were computed using the MassDEP TSS Removal Calculation Worksheet. Calculations and the project's Water Quality Data Form are provided in Appendix D.



STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

Standard 5 does not apply to the project. There are no land uses with higher potential pollutant loads within the project area.

STANDARD 6: STORMWATER DISCHARGES TO CRITICAL AREAS

This standard is not applicable. The stormwater discharges are not located within or near a critical area.

STANDARD 7: REDEVELOPMENT PROJECTS

The project lies within a previously developed area and will improve existing conditions.

STANDARD 8: PLAN TO CONTROL CONSTRUCTION-RELATED IMPACTS

The project will install erosion and sediment controls prior to any major earthwork activity.

STANDARD 9: LONG-TERM OPERATION AND MAINTENANCE PLAN

A long-term Operations and Maintenance Plan has been provided in Appendix E.

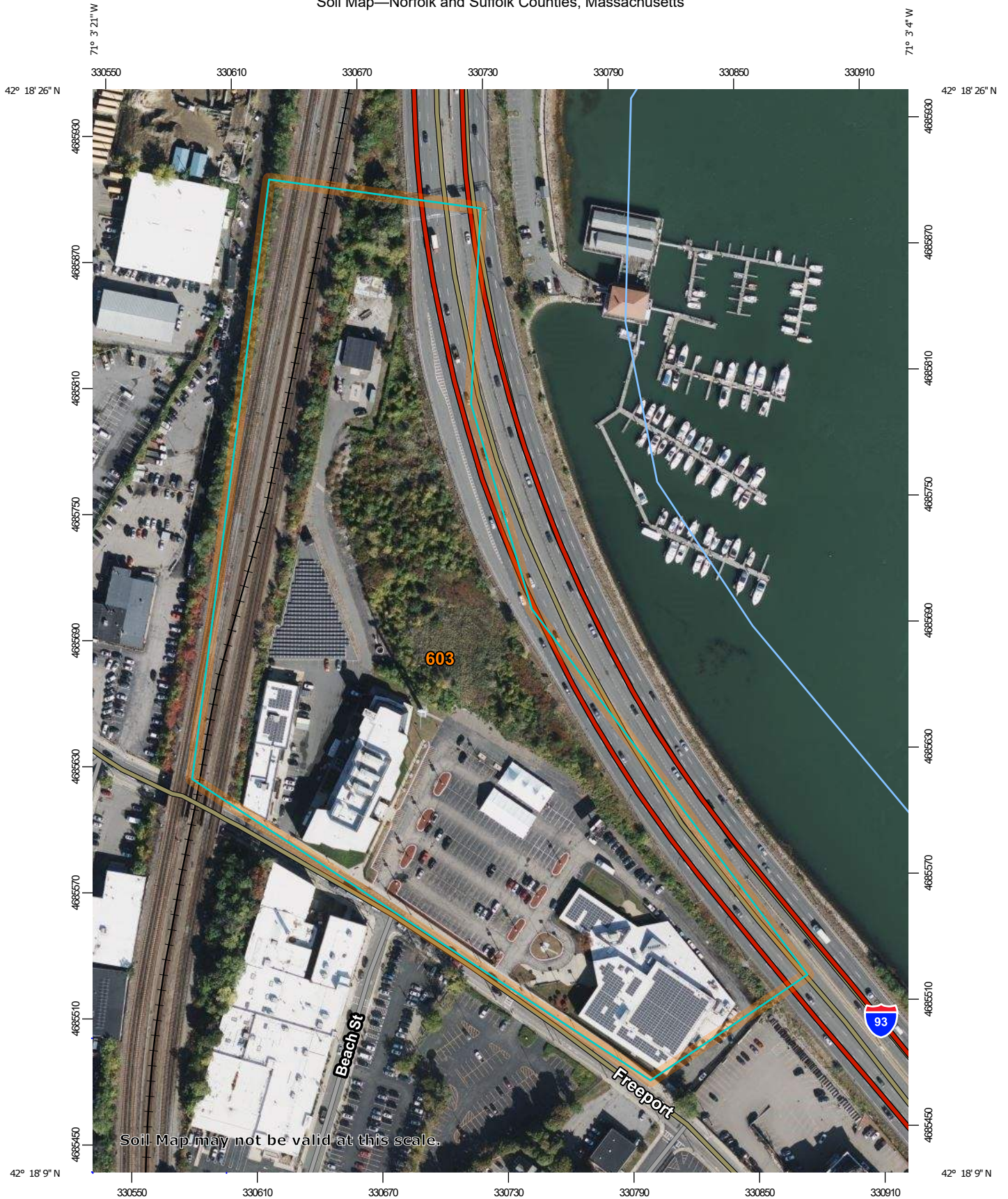
STANDARD 10: NO ILLICIT DISCHARGES

No illicit discharges shall be made. See Appendix G for the illicit discharge compliance statement.

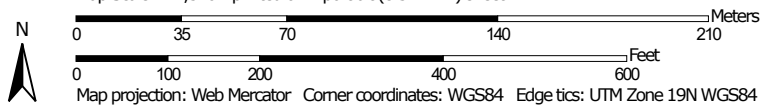


Appendix A: Soil Information

Soil Map—Norfolk and Suffolk Counties, Massachusetts



Map Scale: 1:2,510 if printed on A portrait (8.5" x 11") sheet.





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 17, Sep 3, 2021

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

Date(s) aerial images were photographed: Aug 13, 2020—Oct 18, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
603	Urban land, wet substratum, 0 to 3 percent slopes	14.9	100.0%
Totals for Area of Interest		14.9	100.0%



Appendix B: Pre-Construction Hydrology

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.054 degrees West
Latitude	42.305 degrees North
Elevation	0 feet
Date/Time	Mon, 19 Apr 2021 10:32:15 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.54	0.70	0.88	1.11	1yr	0.76	1.05	1.29	1.65	2.11	2.72	3.01	1yr	2.41	2.89	3.33	3.99	4.70	1yr
2yr	0.36	0.55	0.68	0.90	1.13	1.42	2yr	0.97	1.30	1.64	2.07	2.59	3.26	3.63	2yr	2.89	3.49	4.00	4.74	5.38	2yr
5yr	0.43	0.66	0.83	1.11	1.42	1.81	5yr	1.23	1.64	2.10	2.64	3.29	4.11	4.60	5yr	3.64	4.43	5.05	6.01	6.72	5yr
10yr	0.48	0.76	0.96	1.30	1.69	2.17	10yr	1.46	1.95	2.52	3.17	3.95	4.90	5.52	10yr	4.34	5.30	6.04	7.18	7.96	10yr
25yr	0.58	0.92	1.17	1.61	2.13	2.75	25yr	1.84	2.45	3.21	4.04	5.01	6.19	7.01	25yr	5.48	6.74	7.65	9.10	9.95	25yr
50yr	0.65	1.05	1.35	1.89	2.55	3.32	50yr	2.20	2.92	3.88	4.87	6.02	7.38	8.40	50yr	6.53	8.08	9.15	10.89	11.79	50yr
100yr	0.75	1.22	1.57	2.23	3.04	3.98	100yr	2.62	3.48	4.67	5.85	7.22	8.81	10.08	100yr	7.80	9.70	10.95	13.04	13.98	100yr
200yr	0.87	1.41	1.83	2.63	3.63	4.79	200yr	3.14	4.14	5.62	7.04	8.66	10.52	12.11	200yr	9.31	11.64	13.10	15.62	16.59	200yr
500yr	1.06	1.74	2.27	3.29	4.61	6.10	500yr	3.98	5.22	7.17	8.97	11.01	13.31	15.43	500yr	11.78	14.83	16.63	19.84	20.80	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.47	0.63	0.77	0.88	1yr	0.67	0.86	1.12	1.42	1.82	2.53	2.64	1yr	2.24	2.54	2.91	3.43	4.39	1yr
2yr	0.34	0.52	0.64	0.87	1.07	1.28	2yr	0.93	1.25	1.47	1.95	2.54	3.18	3.52	2yr	2.81	3.38	3.87	4.61	5.24	2yr
5yr	0.39	0.61	0.75	1.03	1.32	1.54	5yr	1.14	1.50	1.75	2.29	2.94	3.82	4.25	5yr	3.38	4.09	4.69	5.60	6.29	5yr
10yr	0.44	0.68	0.84	1.17	1.51	1.77	10yr	1.31	1.73	2.00	2.57	3.30	4.40	4.90	10yr	3.90	4.71	5.42	6.47	7.19	10yr



HOWARD STEIN HUDSON
 11 Beacon Street, Suite 1010
 Boston, MA 02108
 www.hshassoc.com

PREPARED FOR:

256 FREEPORT STREET
 BOSTON, MA

REVISIONS:

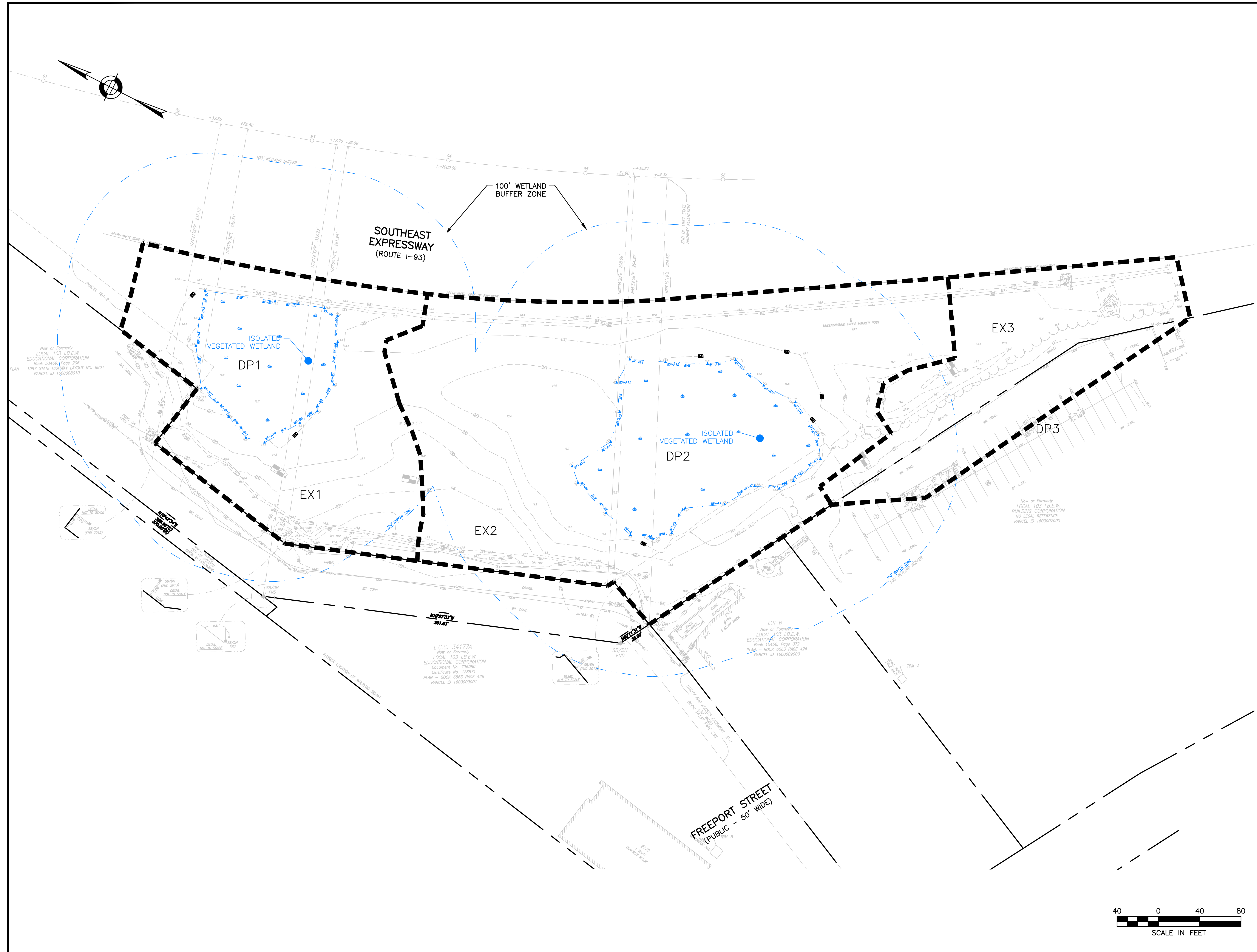
NO	BY	DATE	DESCRIPTION

NOT FOR CONSTRUCTION

EXISTING
 HYDROLOGY

DATE:	4/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

FIG 1

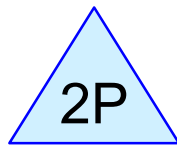




Wetlands



EX1



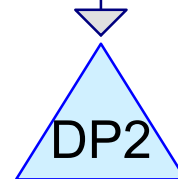
Wetlands



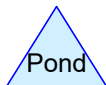
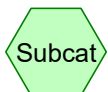
EX2



To off Site Drainage
PRE



IBEW DR S-M



Routing Diagram for Existing Hydrology

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Existing Hydrology

Prepared by {enter your company name here}

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	Type III 24-hr		Default	24.00	1	3.26	2
2	10 yr	Type III 24-hr		Default	24.00	1	4.90	2
3	100 yr	Type III 24-hr		Default	24.00	1	8.81	2
4	Custom	Type III 24-hr		Default	24.00	1	6.70	2

Existing Hydrology

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.128	96	Gravel surface, HSG C (EX3)
0.157	98	Paved parking, HSG C (EX3)
2.589	73	Woods, Fair, HSG C (EX1, EX2, EX3)
2.874	75	TOTAL AREA

Existing Hydrology

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Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.874	HSG C	EX1, EX2, EX3
0.000	HSG D	
0.000	Other	
2.874		TOTAL AREA

Existing Hydrology

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Page 5

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.128	0.000	0.000	0.128	Gravel surface	EX3
0.000	0.000	0.157	0.000	0.000	0.157	Paved parking	EX3
0.000	0.000	2.589	0.000	0.000	2.589	Woods, Fair	EX1, EX2, EX3
0.000	0.000	2.874	0.000	0.000	2.874	TOTAL AREA	

Existing Hydrology

Type III 24-hr 2 yr Rainfall=3.26"

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Page 6

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1

Runoff Area=34,184 sf 0.00% Impervious Runoff Depth>1.02"
Flow Length=135' Tc=10.7 min CN=73 Runoff=0.75 cfs 0.067 af

SubcatchmentEX2: EX2

Runoff Area=68,776 sf 0.00% Impervious Runoff Depth>1.02"
Flow Length=173' Tc=11.6 min CN=73 Runoff=1.46 cfs 0.134 af

SubcatchmentEX3: To off Site Drainage

Runoff Area=22,250 sf 30.83% Impervious Runoff Depth>1.88"
Flow Length=85' Tc=10.0 min CN=86 Runoff=0.98 cfs 0.080 af

Pond 2P: Wetlands

Peak Elev=13.96' Storage=5,835 cf Inflow=1.46 cfs 0.134 af
Outflow=0.00 cfs 0.000 af

Pond DP1: Wetlands

Peak Elev=13.86' Storage=2,901 cf Inflow=0.75 cfs 0.067 af
Outflow=0.00 cfs 0.000 af

Pond DP2: IBEW DR S-M

Inflow=0.98 cfs 0.080 af
Primary=0.98 cfs 0.080 af

Total Runoff Area = 2.874 ac Runoff Volume = 0.281 af Average Runoff Depth = 1.17"
94.52% Pervious = 2.717 ac 5.48% Impervious = 0.157 ac

Existing Hydrology

Prepared by {enter your company name here}

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Type III 24-hr 2 yr Rainfall=3.26"

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Page 7

Summary for Subcatchment EX1: EX1

Runoff = 0.75 cfs @ 12.16 hrs, Volume= 0.067 af, Depth> 1.02"

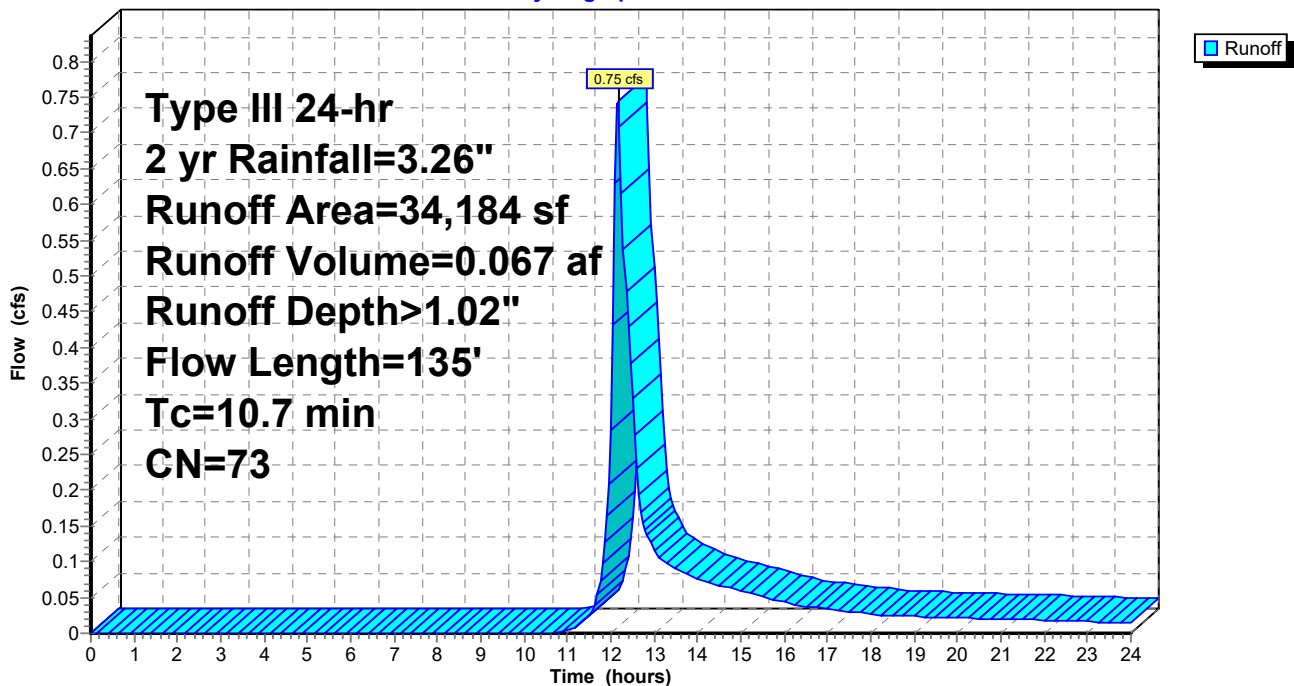
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
34,184	73	Woods, Fair, HSG C
34,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow Grass: Bermuda n= 0.410 P2= 3.26"
8.5	40	0.0333	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
1.2	85	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.7	135	Total			

Subcatchment EX1: EX1

Hydrograph



Existing Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment EX2: EX2

Runoff = 1.46 cfs @ 12.17 hrs, Volume= 0.134 af, Depth> 1.02"

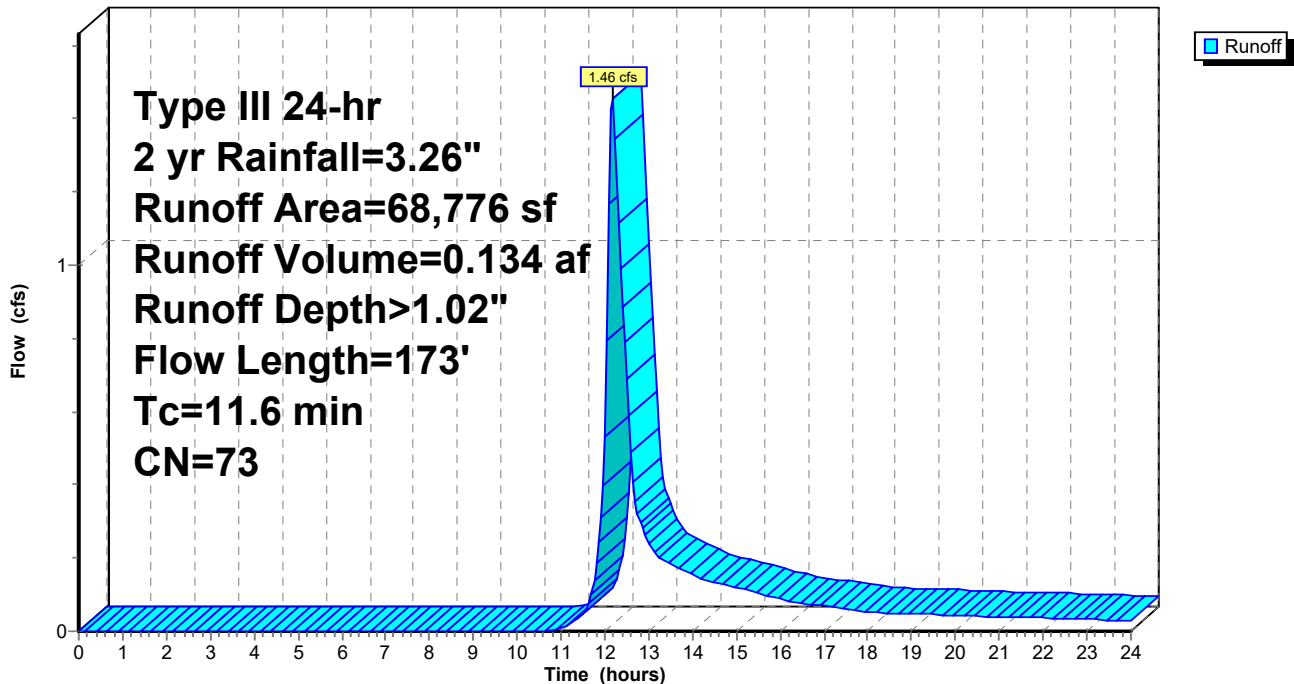
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
68,776	73	Woods, Fair, HSG C
68,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow
					Grass: Bermuda n= 0.410 P2= 3.26"
8.9	40	0.0300	0.08		Sheet Flow,
					Grass: Bermuda n= 0.410 P2= 3.26"
1.7	123	0.0300	1.21		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.6	173	Total			

Subcatchment EX2: EX2

Hydrograph



Existing Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment EX3: To off Site Drainage PRE

Runoff = 0.98 cfs @ 12.14 hrs, Volume= 0.080 af, Depth> 1.88"

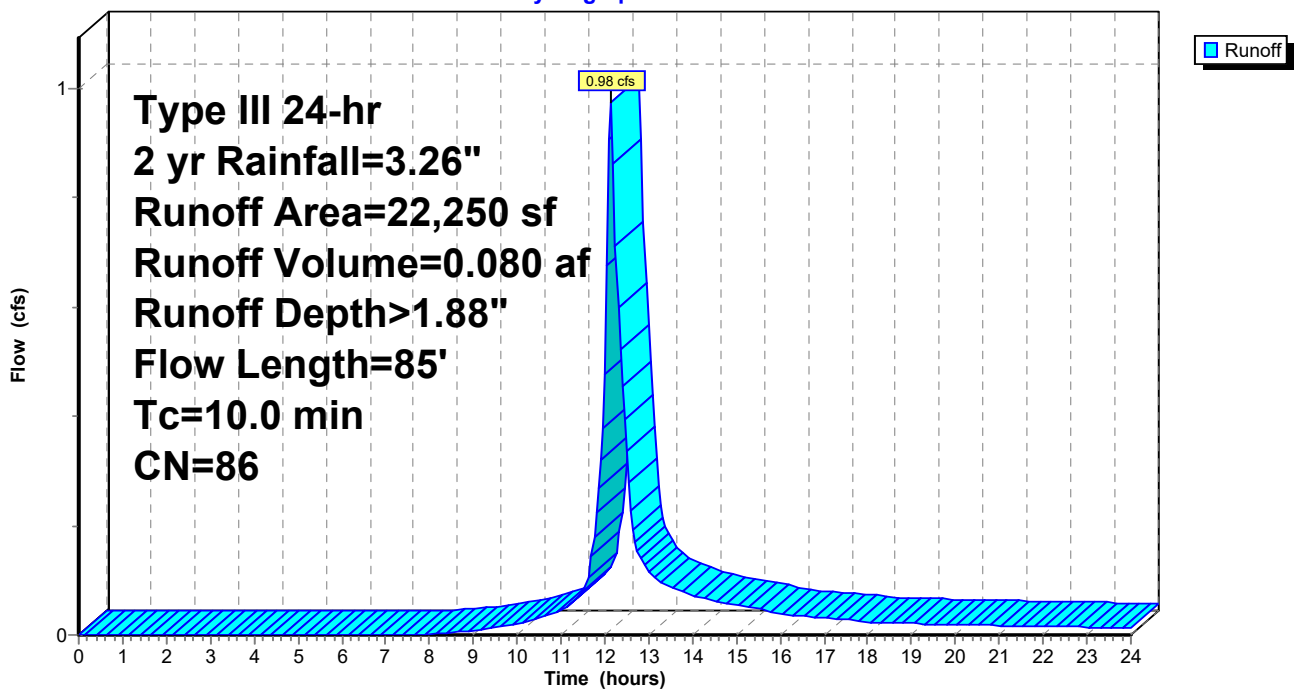
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
6,860	98	Paved parking, HSG C
5,555	96	Gravel surface, HSG C
9,835	73	Woods, Fair, HSG C
22,250	86	Weighted Average
15,390		69.17% Pervious Area
6,860		30.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.3300	0.13		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
9.2	45	0.0350	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
0.2	35	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	85	Total			

Subcatchment EX3: To off Site Drainage PRE

Hydrograph



Existing Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Pond 2P: Wetlands

Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth > 1.02" for 2 yr event
 Inflow = 1.46 cfs @ 12.17 hrs, Volume= 0.134 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 13.96' @ 24.00 hrs Surf.Area= 31,611 sf Storage= 5,835 cf

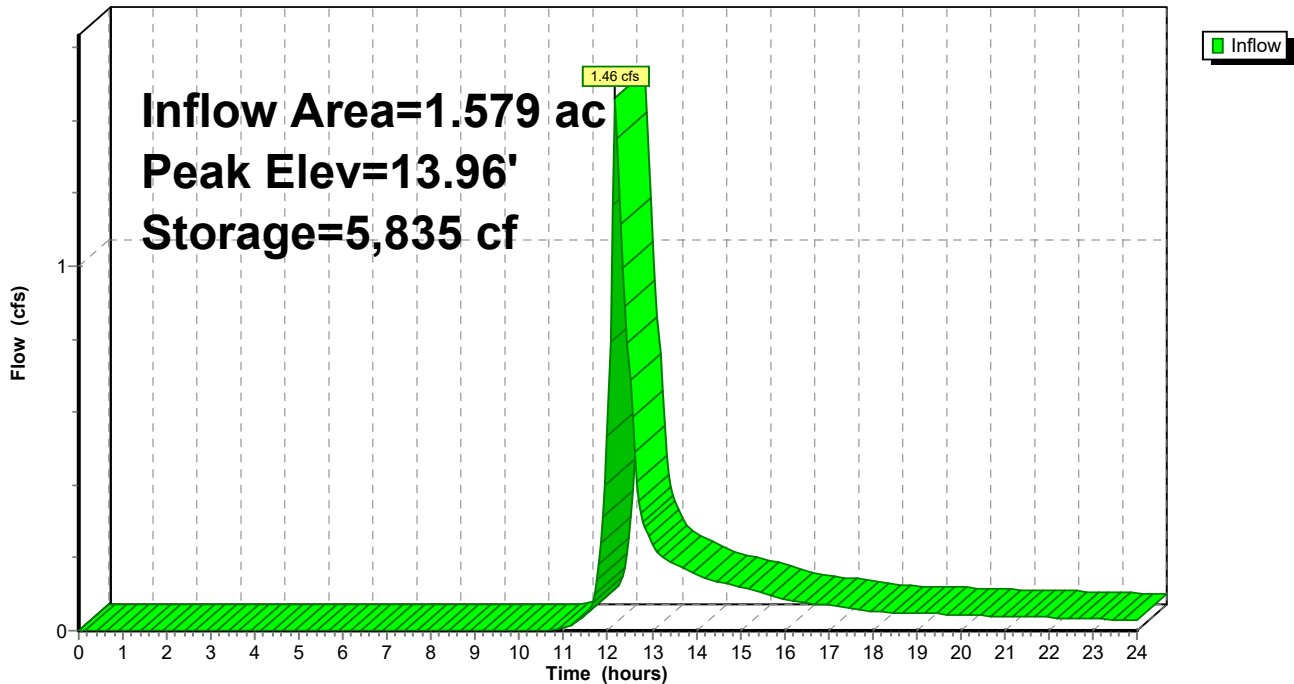
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond 2P: Wetlands

Hydrograph



Existing Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Pond DP1: Wetlands

Inflow Area = 0.785 ac, 0.00% Impervious, Inflow Depth > 1.02" for 2 yr event
 Inflow = 0.75 cfs @ 12.16 hrs, Volume= 0.067 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 13.86' @ 24.00 hrs Surf.Area= 27,827 sf Storage= 2,901 cf

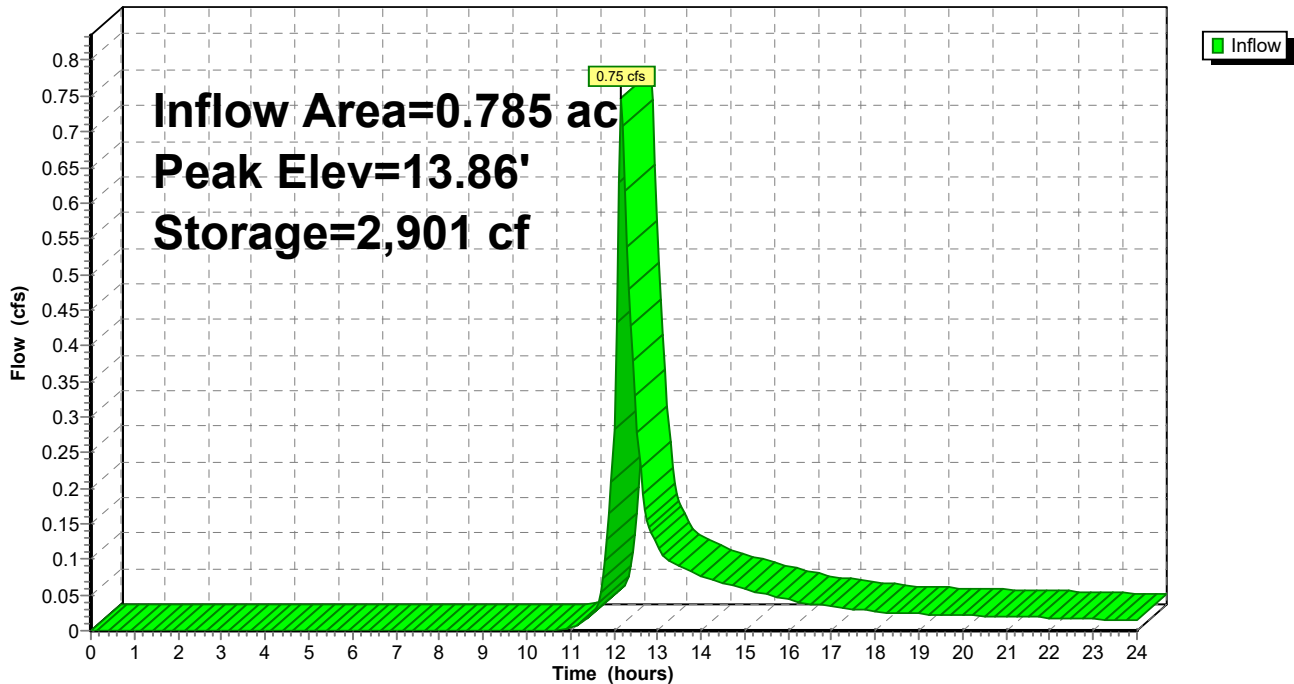
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond DP1: Wetlands

Hydrograph



Existing Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Pond DP2: IBEW DR S-M

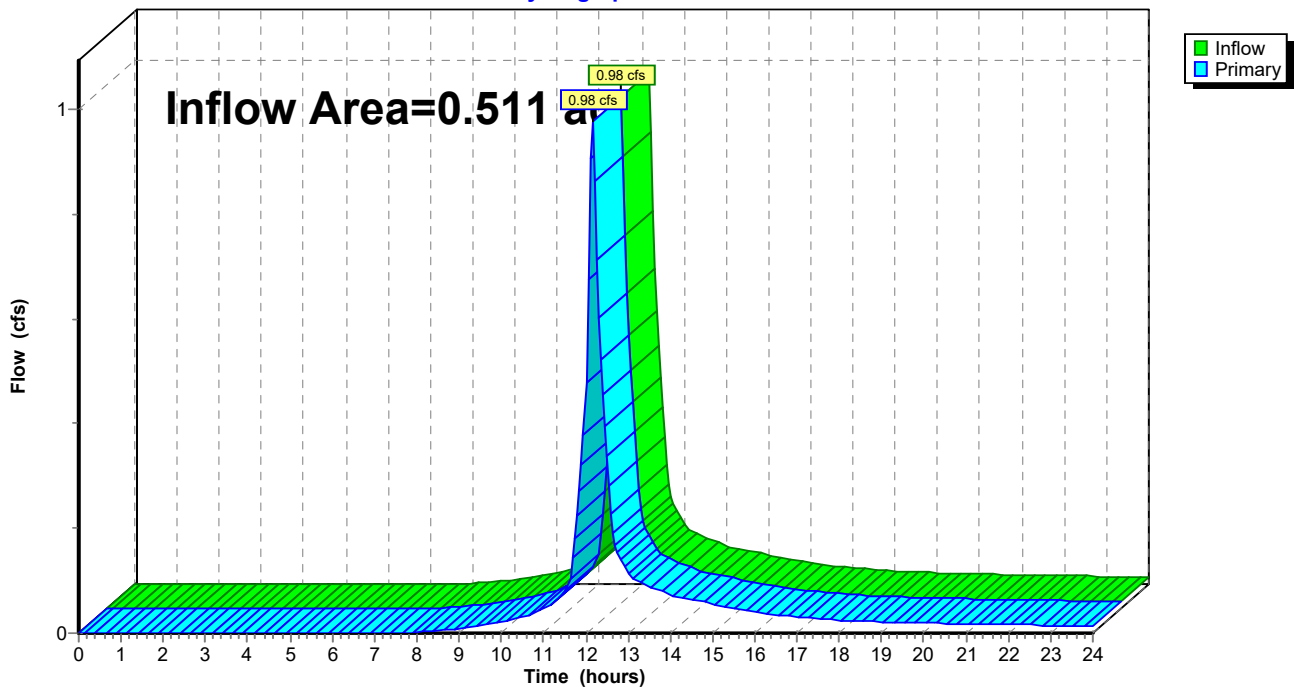
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.511 ac, 30.83% Impervious, Inflow Depth > 1.88" for 2 yr event
Inflow = 0.98 cfs @ 12.14 hrs, Volume= 0.080 af
Primary = 0.98 cfs @ 12.14 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: IBEW DR S-M

Hydrograph



Existing Hydrology

Type III 24-hr 10 yr Rainfall=4.90"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1

Runoff Area=34,184 sf 0.00% Impervious Runoff Depth>2.20"
Flow Length=135' Tc=10.7 min CN=73 Runoff=1.70 cfs 0.144 af

SubcatchmentEX2: EX2

Runoff Area=68,776 sf 0.00% Impervious Runoff Depth>2.20"
Flow Length=173' Tc=11.6 min CN=73 Runoff=3.33 cfs 0.289 af

SubcatchmentEX3: To off Site Drainage

Runoff Area=22,250 sf 30.83% Impervious Runoff Depth>3.37"
Flow Length=85' Tc=10.0 min CN=86 Runoff=1.72 cfs 0.143 af

Pond 2P: Wetlands

Peak Elev=14.16' Storage=12,588 cf Inflow=3.33 cfs 0.289 af
Outflow=0.00 cfs 0.000 af

Pond DP1: Wetlands

Peak Elev=13.98' Storage=6,258 cf Inflow=1.70 cfs 0.144 af
Outflow=0.00 cfs 0.000 af

Pond DP2: IBEW DR S-M

Inflow=1.72 cfs 0.143 af
Primary=1.72 cfs 0.143 af

Total Runoff Area = 2.874 ac Runoff Volume = 0.576 af Average Runoff Depth = 2.41"
94.52% Pervious = 2.717 ac 5.48% Impervious = 0.157 ac

Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment EX1: EX1

Runoff = 1.70 cfs @ 12.16 hrs, Volume= 0.144 af, Depth> 2.20"

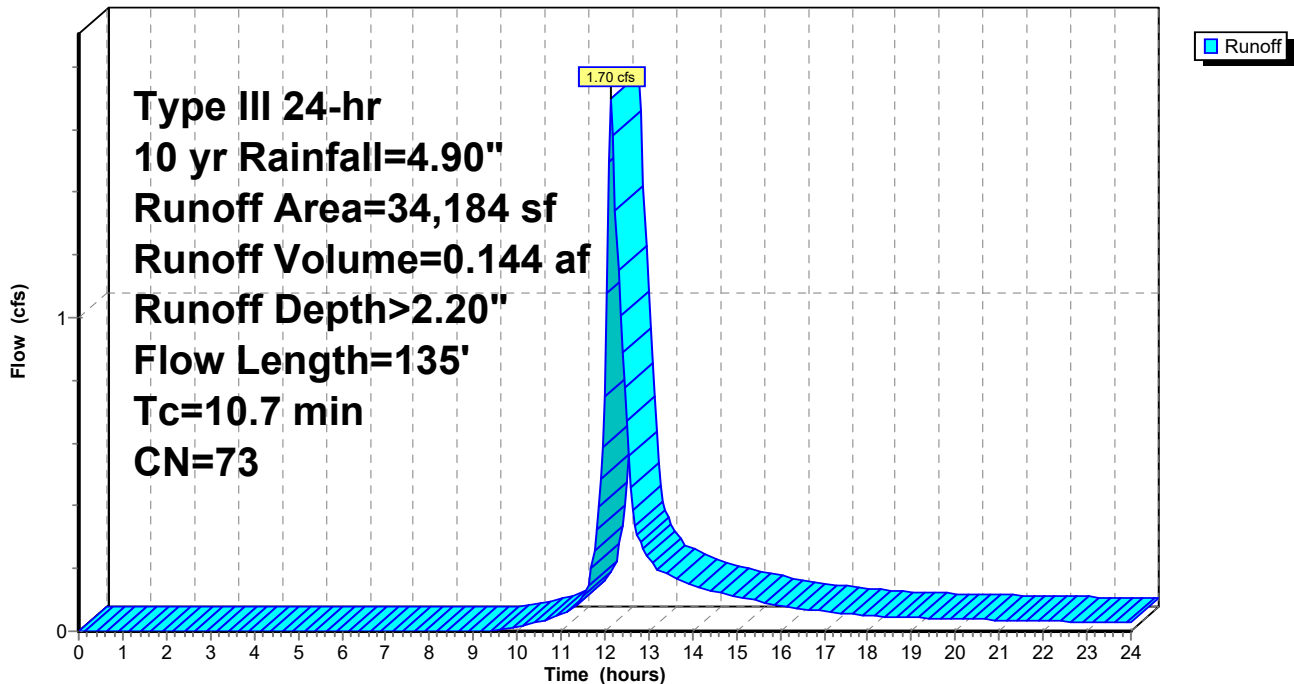
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
34,184	73	Woods, Fair, HSG C
34,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow
					Grass: Bermuda n= 0.410 P2= 3.26"
8.5	40	0.0333	0.08		Sheet Flow,
					Grass: Bermuda n= 0.410 P2= 3.26"
1.2	85	0.0300	1.21		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
10.7	135	Total			

Subcatchment EX1: EX1

Hydrograph



Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment EX2: EX2

Runoff = 3.33 cfs @ 12.17 hrs, Volume= 0.289 af, Depth> 2.20"

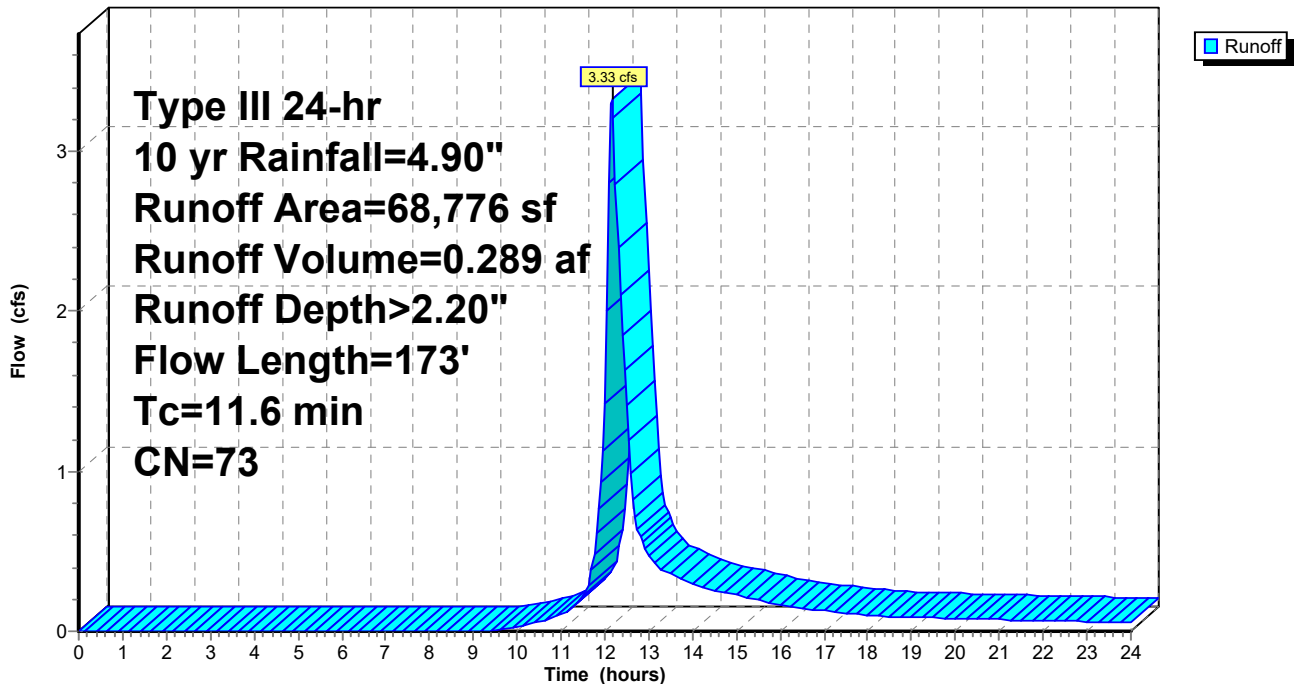
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
68,776	73	Woods, Fair, HSG C
68,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow
					Grass: Bermuda n= 0.410 P2= 3.26"
8.9	40	0.0300	0.08		Sheet Flow,
					Grass: Bermuda n= 0.410 P2= 3.26"
1.7	123	0.0300	1.21		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.6	173	Total			

Subcatchment EX2: EX2

Hydrograph



Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment EX3: To off Site Drainage PRE

Runoff = 1.72 cfs @ 12.14 hrs, Volume= 0.143 af, Depth> 3.37"

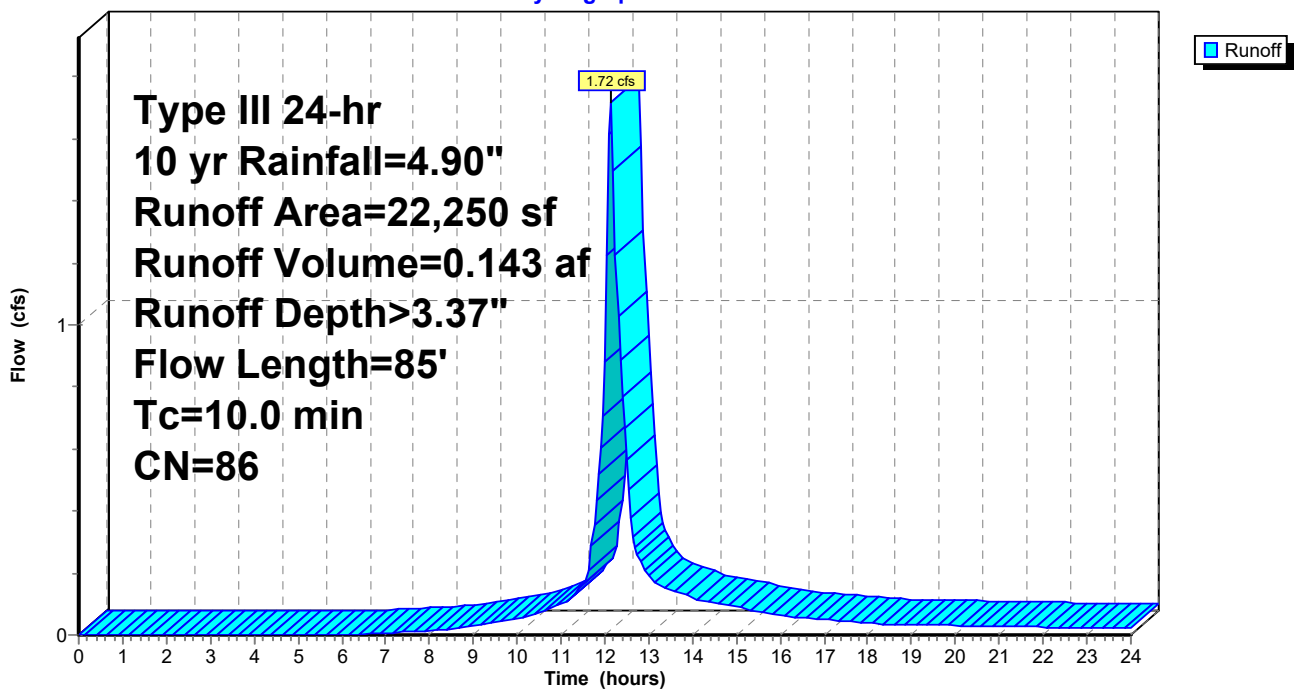
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
6,860	98	Paved parking, HSG C
5,555	96	Gravel surface, HSG C
9,835	73	Woods, Fair, HSG C
22,250	86	Weighted Average
15,390		69.17% Pervious Area
6,860		30.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.3300	0.13		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
9.2	45	0.0350	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
0.2	35	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	85	Total			

Subcatchment EX3: To off Site Drainage PRE

Hydrograph



Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Pond 2P: Wetlands

Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth > 2.20" for 10 yr event
 Inflow = 3.33 cfs @ 12.17 hrs, Volume= 0.289 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 14.16' @ 24.00 hrs Surf.Area= 36,267 sf Storage= 12,588 cf

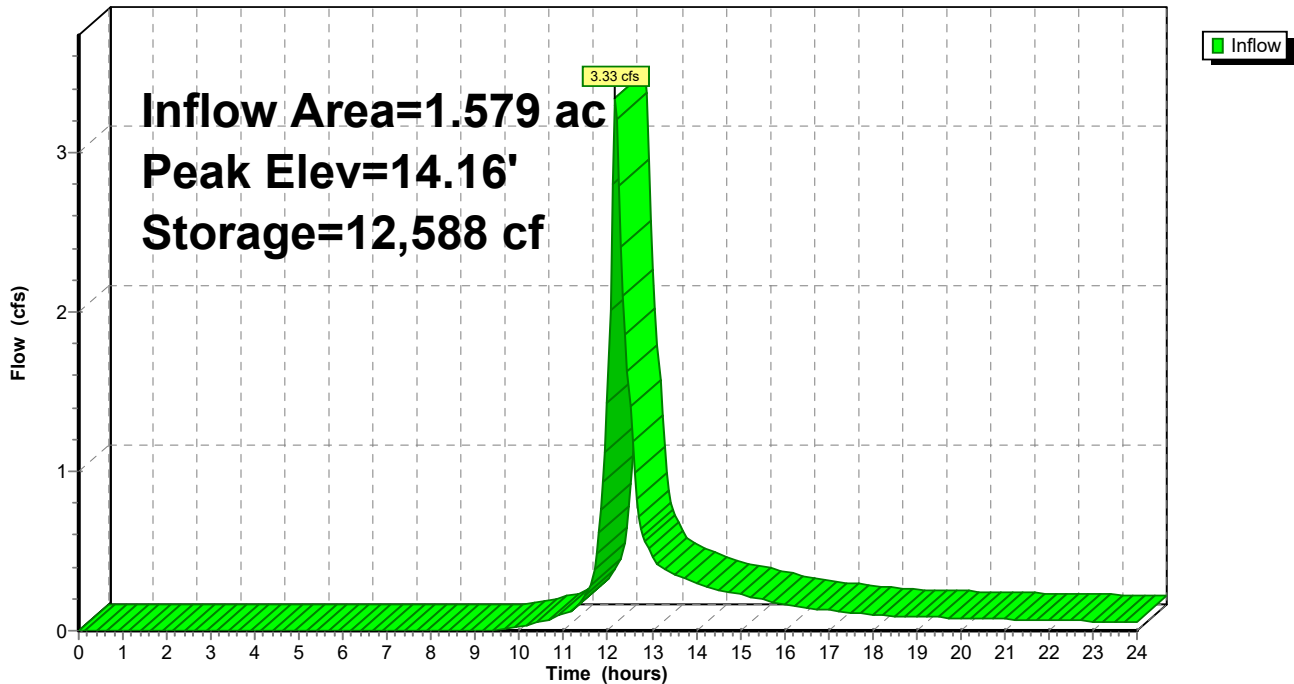
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond 2P: Wetlands

Hydrograph



Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Pond DP1: Wetlands

Inflow Area = 0.785 ac, 0.00% Impervious, Inflow Depth > 2.20" for 10 yr event
 Inflow = 1.70 cfs @ 12.16 hrs, Volume= 0.144 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 13.98' @ 24.00 hrs Surf.Area= 32,120 sf Storage= 6,258 cf

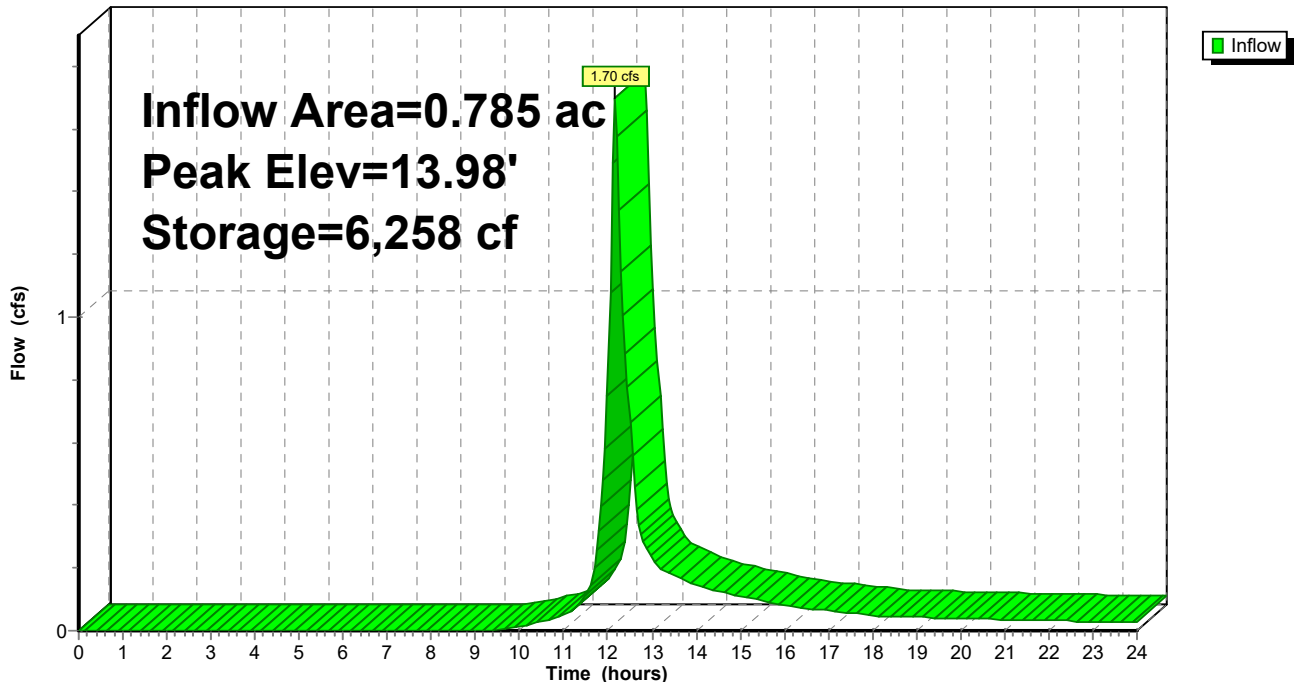
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond DP1: Wetlands

Hydrograph



Existing Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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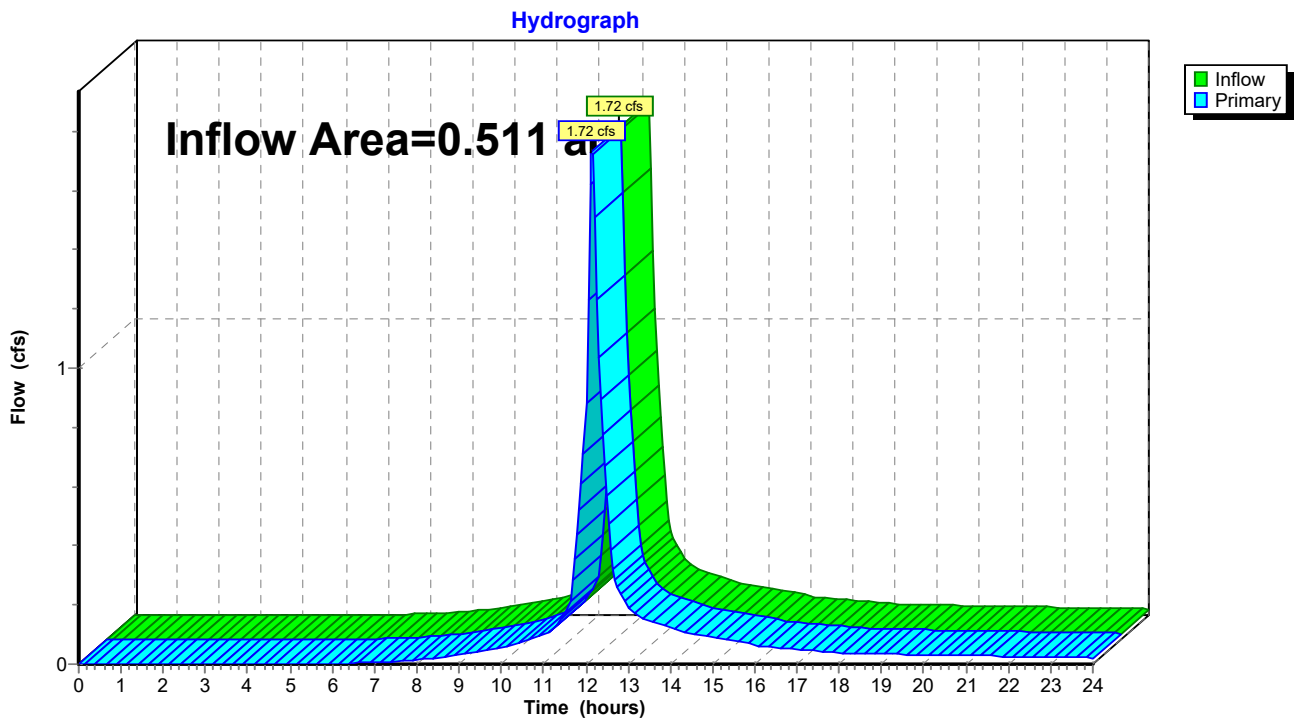
Summary for Pond DP2: IBEW DR S-M

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.511 ac, 30.83% Impervious, Inflow Depth > 3.37" for 10 yr event
Inflow = 1.72 cfs @ 12.14 hrs, Volume= 0.143 af
Primary = 1.72 cfs @ 12.14 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: IBEW DR S-M



Existing Hydrology

Type III 24-hr 100 yr Rainfall=8.81"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1

Runoff Area=34,184 sf 0.00% Impervious Runoff Depth>5.52"
Flow Length=135' Tc=10.7 min CN=73 Runoff=4.30 cfs 0.361 af

SubcatchmentEX2: EX2

Runoff Area=68,776 sf 0.00% Impervious Runoff Depth>5.52"
Flow Length=173' Tc=11.6 min CN=73 Runoff=8.44 cfs 0.727 af

SubcatchmentEX3: To off Site Drainage

Runoff Area=22,250 sf 30.83% Impervious Runoff Depth>7.11"
Flow Length=85' Tc=10.0 min CN=86 Runoff=3.51 cfs 0.303 af

Pond 2P: Wetlands

Peak Elev=14.62' Storage=31,647 cf Inflow=8.44 cfs 0.727 af
Outflow=0.00 cfs 0.000 af

Pond DP1: Wetlands

Peak Elev=14.24' Storage=15,732 cf Inflow=4.30 cfs 0.361 af
Outflow=0.00 cfs 0.000 af

Pond DP2: IBEW DR S-M

Inflow=3.51 cfs 0.303 af
Primary=3.51 cfs 0.303 af

Total Runoff Area = 2.874 ac Runoff Volume = 1.391 af Average Runoff Depth = 5.81"
94.52% Pervious = 2.717 ac 5.48% Impervious = 0.157 ac

Existing Hydrology

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Subcatchment EX1: EX1

Runoff = 4.30 cfs @ 12.15 hrs, Volume= 0.361 af, Depth> 5.52"

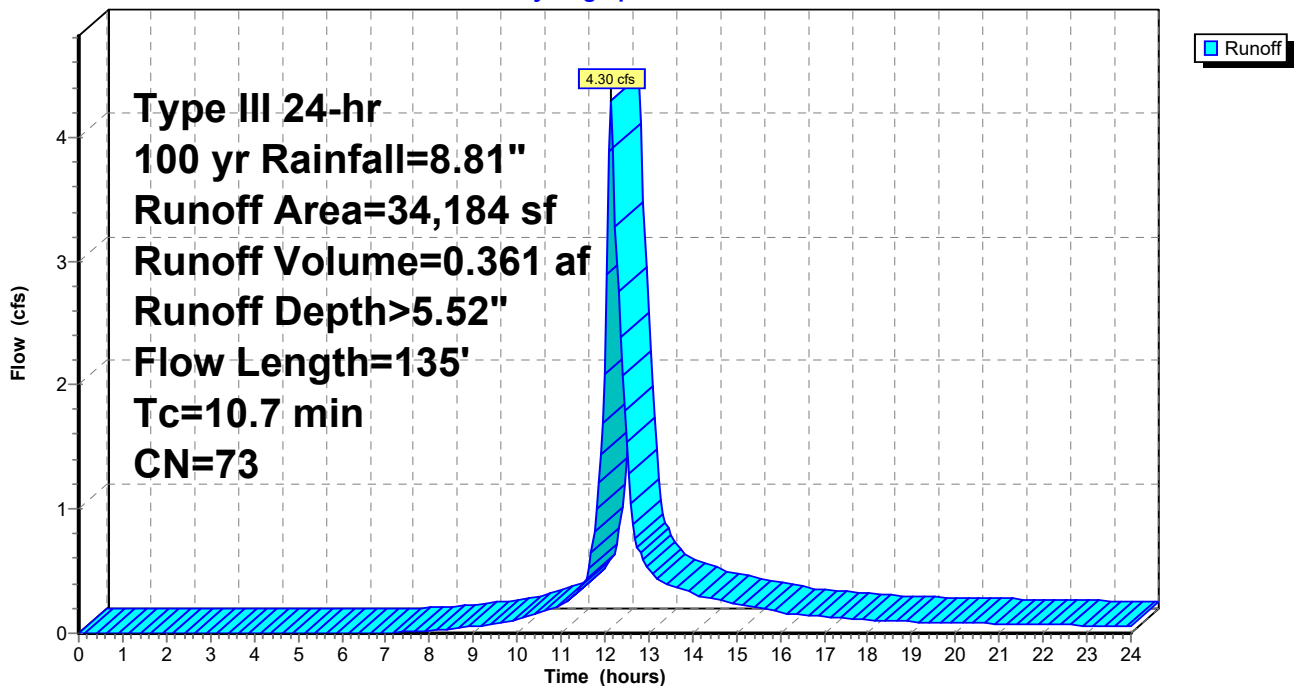
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
34,184	73	Woods, Fair, HSG C
34,184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow Grass: Bermuda n= 0.410 P2= 3.26"
8.5	40	0.0333	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
1.2	85	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.7	135	Total			

Subcatchment EX1: EX1

Hydrograph



Existing Hydrology

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Subcatchment EX2: EX2

Runoff = 8.44 cfs @ 12.16 hrs, Volume= 0.727 af, Depth> 5.52"

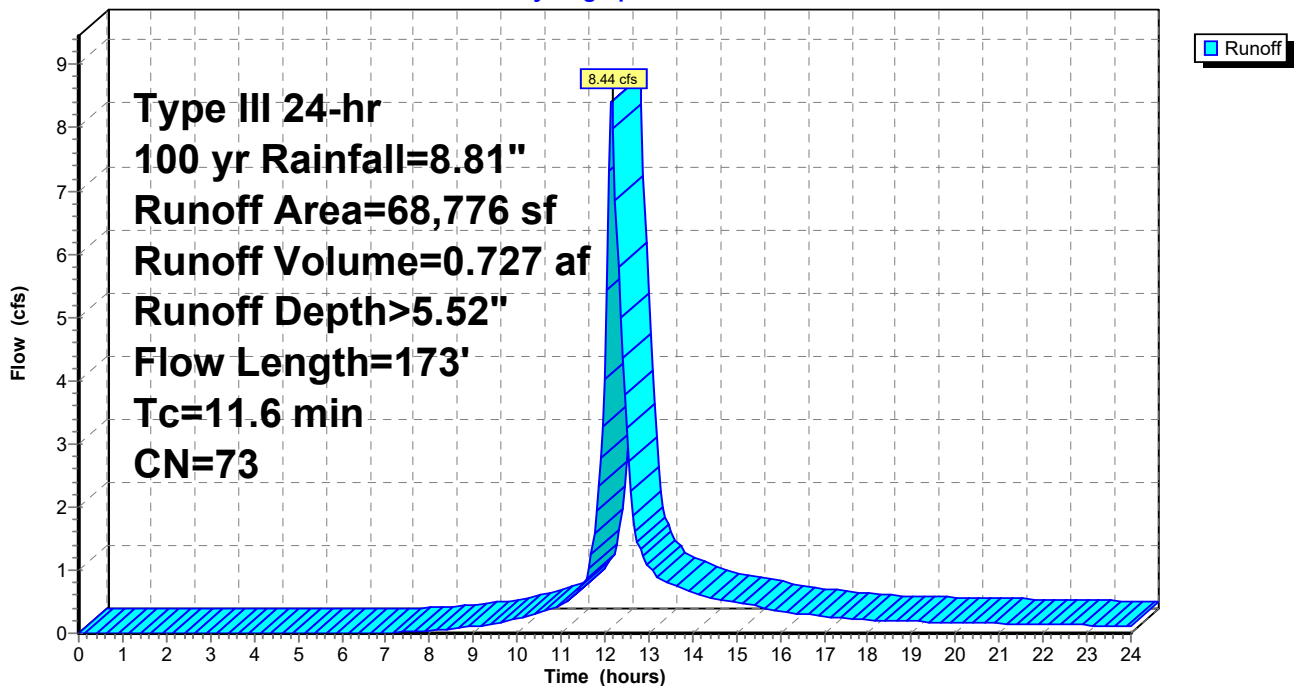
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
68,776	73	Woods, Fair, HSG C
68,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.4000	0.16		Sheet Flow, Sheet Flow
					Grass: Bermuda n= 0.410 P2= 3.26"
8.9	40	0.0300	0.08		Sheet Flow,
					Grass: Bermuda n= 0.410 P2= 3.26"
1.7	123	0.0300	1.21		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.6	173	Total			

Subcatchment EX2: EX2

Hydrograph



Existing Hydrology

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Subcatchment EX3: To off Site Drainage PRE

Runoff = 3.51 cfs @ 12.14 hrs, Volume= 0.303 af, Depth> 7.11"

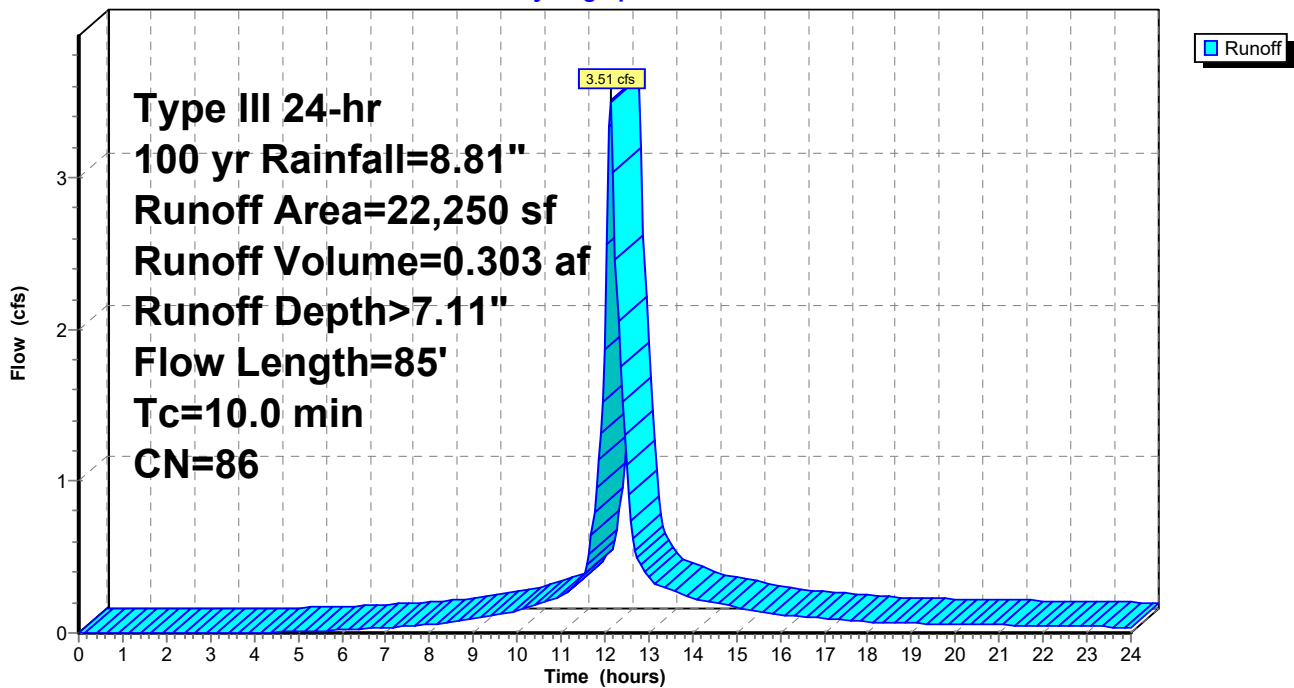
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
6,860	98	Paved parking, HSG C
5,555	96	Gravel surface, HSG C
9,835	73	Woods, Fair, HSG C
22,250	86	Weighted Average
15,390		69.17% Pervious Area
6,860		30.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.3300	0.13		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
9.2	45	0.0350	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"
0.2	35	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	85	Total			

Subcatchment EX3: To off Site Drainage PRE

Hydrograph



Existing Hydrology

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Pond 2P: Wetlands

Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth > 5.52" for 100 yr event
Inflow = 8.44 cfs @ 12.16 hrs, Volume= 0.727 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.62' @ 24.00 hrs Surf.Area= 45,604 sf Storage= 31,647 cf

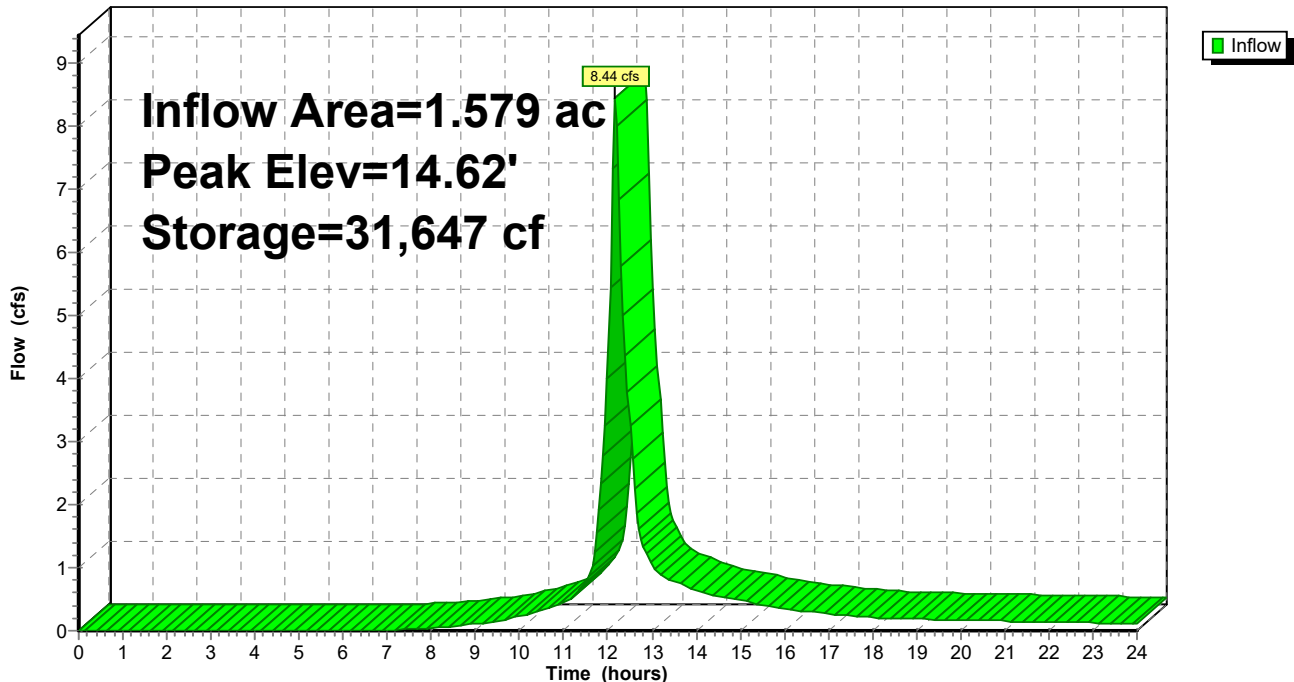
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond 2P: Wetlands

Hydrograph



Existing Hydrology

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Pond DP1: Wetlands

Inflow Area = 0.785 ac, 0.00% Impervious, Inflow Depth > 5.52" for 100 yr event
 Inflow = 4.30 cfs @ 12.15 hrs, Volume= 0.361 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 14.24' @ 24.00 hrs Surf.Area= 37,966 sf Storage= 15,732 cf

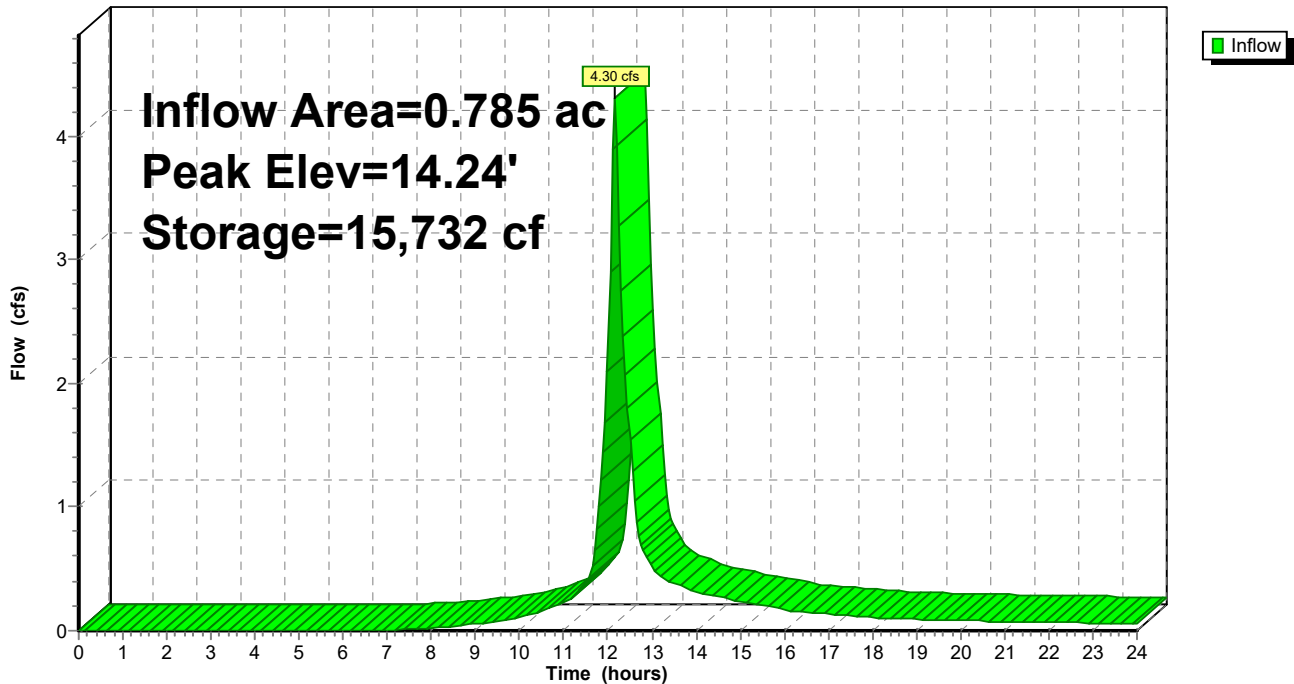
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	50,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.75	23,495	0	0
14.00	33,076	7,071	7,071
15.00	53,131	43,104	50,175

Pond DP1: Wetlands

Hydrograph



Existing Hydrology

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Summary for Pond DP2: IBEW DR S-M

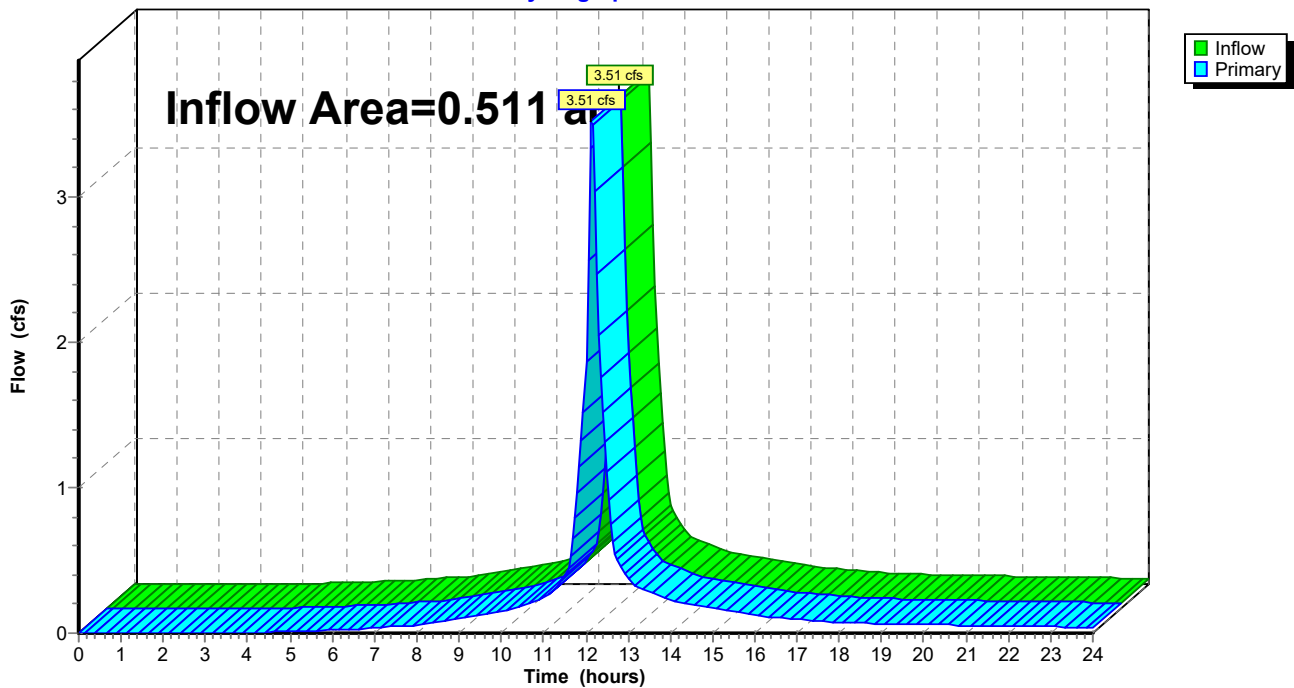
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.511 ac, 30.83% Impervious, Inflow Depth > 7.11" for 100 yr event
Inflow = 3.51 cfs @ 12.14 hrs, Volume= 0.303 af
Primary = 3.51 cfs @ 12.14 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: IBEW DR S-M

Hydrograph





Appendix C: Post-Construction Hydrology



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 11 Beacon Street, Suite 1010
 Boston, MA 02108
 www.hshassoc.com

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**256 FREEPORT STREET
 BOSTON, MA**

REVISIONS:

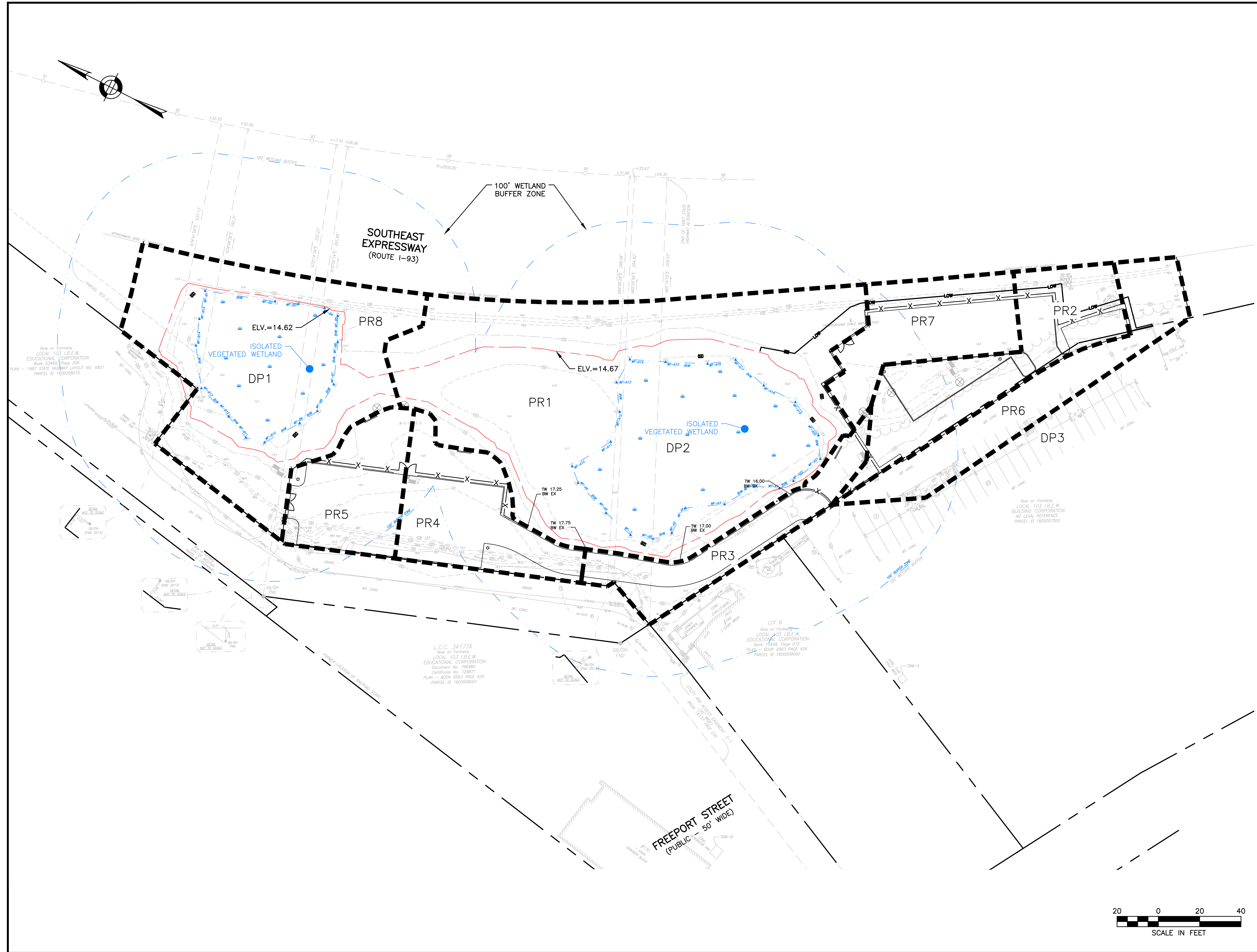
NO	BY	DATE	DESCRIPTION

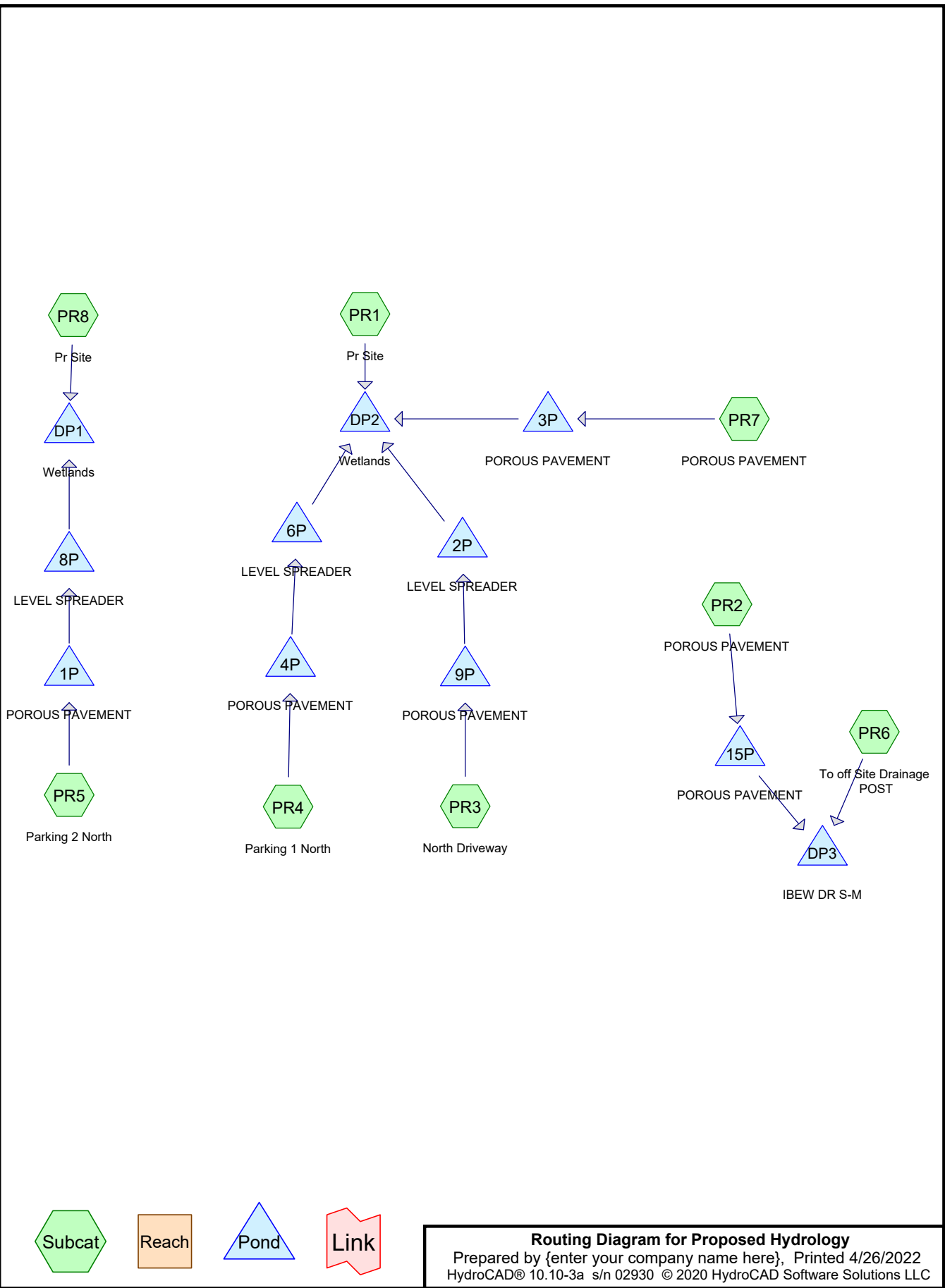
NOT FOR CONSTRUCTION

**PROPOSED
 HYDROLOGY**

DATE:	4/25/22
PROJECT NUMBER:	19059
DESIGNED BY:	RJM
DRAWN BY:	RJM
CHECKED BY:	JD

FIG 2





PR8

Pr Site

DP1

Wetlands

8P

LEVEL SPREADER

1P

POROUS PAVEMENT

PR5

Parking 2 North

PR1

Pr Site

DP2

Wetlands

6P

LEVEL SPREADER

4P

POROUS PAVEMENT

PR4

Parking 1 North

3P

POROUS PAVEMENT

2P

LEVEL SPREADER

9P

POROUS PAVEMENT

PR3

North Driveway

PR7

POROUS PAVEMENT

PR2

POROUS PAVEMENT

15P

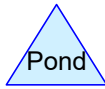
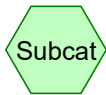
POROUS PAVEMENT

PR6

To off Site Drainage POST

DP3

IBEW DR S-M



Routing Diagram for Proposed Hydrology

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Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	Type III 24-hr		Default	24.00	1	3.26	2
2	10 yr	Type III 24-hr		Default	24.00	1	4.90	2
3	100 yr	Type III 24-hr		Default	24.00	1	8.81	2
4	Custom	Type III 24-hr		Default	24.00	1	6.70	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.169	74	>75% Grass cover, Good, HSG C (PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8)
0.705	98	Paved parking, HSG C (PR2, PR3, PR4, PR5, PR6, PR7)
2.874	80	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.874	HSG C	PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8
0.000	HSG D	
0.000	Other	
2.874		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.169	0.000	0.000	2.169	>75% Grass cover, Good	PR1, PR2, PR3, PR4, PR5, PR6, PR7, PR8
0.000	0.000	0.705	0.000	0.000	0.705	Paved parking	PR2, PR3, PR4, PR5, PR6, PR7
0.000	0.000	2.874	0.000	0.000	2.874	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	16.00	15.25	80.0	0.0094	0.010	6.0	0.0	0.0
2	3P	15.45	14.75	137.0	0.0051	0.013	6.0	0.0	0.0
3	4P	16.40	15.50	80.0	0.0112	0.010	6.0	0.0	0.0
4	9P	16.00	14.75	108.0	0.0116	0.010	6.0	0.0	0.0
5	15P	15.45	14.75	137.0	0.0051	0.010	6.0	0.0	0.0

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Type III 24-hr 2 yr Rainfall=3.26"

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Page 7

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR1: Pr Site	Runoff Area=49,602 sf 0.00% Impervious Runoff Depth=1.08" Tc=5.0 min CN=74 Runoff=1.42 cfs 0.102 af
SubcatchmentPR2: POROUS PAVEMENT	Runoff Area=10,879 sf 39.68% Impervious Runoff Depth>1.64" Tc=480.0 min CN=84 Runoff=0.05 cfs 0.034 af
SubcatchmentPR3: North Driveway	Runoff Area=6,564 sf 50.94% Impervious Runoff Depth>1.79" Tc=480.0 min CN=86 Runoff=0.03 cfs 0.023 af
SubcatchmentPR4: Parking 1 North	Runoff Area=8,250 sf 65.64% Impervious Runoff Depth>2.12" Tc=480.0 min CN=90 Runoff=0.05 cfs 0.033 af
SubcatchmentPR5: Parking 2 North	Runoff Area=7,185 sf 63.26% Impervious Runoff Depth>2.04" Tc=480.0 min CN=89 Runoff=0.04 cfs 0.028 af
SubcatchmentPR6: To off Site Drainage	Runoff Area=8,722 sf 74.16% Impervious Runoff Depth=2.41" Tc=5.0 min CN=92 Runoff=0.57 cfs 0.040 af
SubcatchmentPR7: POROUS PAVEMENT	Runoff Area=8,043 sf 82.33% Impervious Runoff Depth>2.49" Tc=480.0 min CN=94 Runoff=0.05 cfs 0.038 af
SubcatchmentPR8: Pr Site	Runoff Area=25,943 sf 0.00% Impervious Runoff Depth=1.08" Flow Length=50' Slope=0.0300 '/' Tc=10.6 min CN=74 Runoff=0.61 cfs 0.053 af
Pond 1P: POROUS PAVEMENT	Peak Elev=16.11' Storage=590 cf Inflow=0.04 cfs 0.028 af Discarded=0.00 cfs 0.000 af Primary=0.03 cfs 0.016 af Outflow=0.03 cfs 0.016 af
Pond 2P: LEVEL SPREADER	Peak Elev=14.76' Storage=209 cf Inflow=0.03 cfs 0.016 af Discarded=0.00 cfs 0.003 af Primary=0.02 cfs 0.008 af Outflow=0.03 cfs 0.011 af
Pond 3P: POROUS PAVEMENT	Peak Elev=15.31' Storage=419 cf Inflow=0.05 cfs 0.038 af Discarded=0.03 cfs 0.036 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.036 af
Pond 4P: POROUS PAVEMENT	Peak Elev=16.48' Storage=1,100 cf Inflow=0.05 cfs 0.033 af Discarded=0.00 cfs 0.000 af Primary=0.02 cfs 0.009 af Outflow=0.02 cfs 0.009 af
Pond 6P: LEVEL SPREADER	Peak Elev=15.25' Storage=266 cf Inflow=0.02 cfs 0.009 af Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af
Pond 8P: LEVEL SPREADER	Peak Elev=15.26' Storage=152 cf Inflow=0.03 cfs 0.016 af Outflow=0.03 cfs 0.013 af
Pond 9P: POROUS PAVEMENT	Peak Elev=16.10' Storage=354 cf Inflow=0.03 cfs 0.023 af Discarded=0.00 cfs 0.000 af Primary=0.03 cfs 0.016 af Outflow=0.03 cfs 0.016 af
Pond 15P: POROUS PAVEMENT	Peak Elev=14.96' Storage=29 cf Inflow=0.05 cfs 0.034 af Discarded=0.04 cfs 0.034 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.034 af

Proposed Hydrology

Type III 24-hr 2 yr Rainfall=3.26"

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Pond DP1: Wetlands

Inflow=0.61 cfs 0.066 af
Primary=0.61 cfs 0.066 af

Pond DP2: Wetlands

Inflow=1.42 cfs 0.110 af
Primary=1.42 cfs 0.110 af

Pond DP3: IBEW DR S-M

Inflow=0.57 cfs 0.040 af
Primary=0.57 cfs 0.040 af

Total Runoff Area = 2.874 ac Runoff Volume = 0.352 af Average Runoff Depth = 1.47"
75.47% Pervious = 2.169 ac 24.53% Impervious = 0.705 ac

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR1: Pr Site

Runoff = 1.42 cfs @ 12.08 hrs, Volume= 0.102 af, Depth= 1.08"

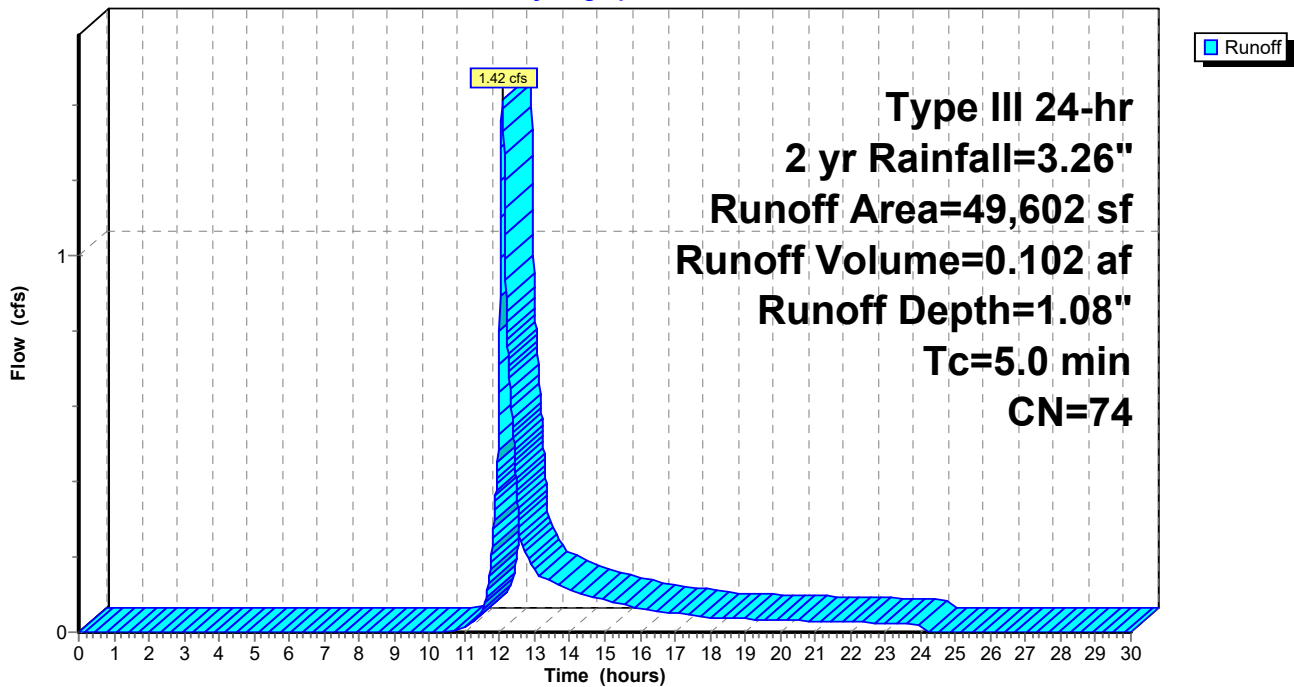
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
49,602	74	>75% Grass cover, Good, HSG C
49,602		100.00% Pervious Area

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

Subcatchment PR1: Pr Site

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR2: POROUS PAVEMENT

Runoff = 0.05 cfs @ 18.67 hrs, Volume= 0.034 af, Depth> 1.64"

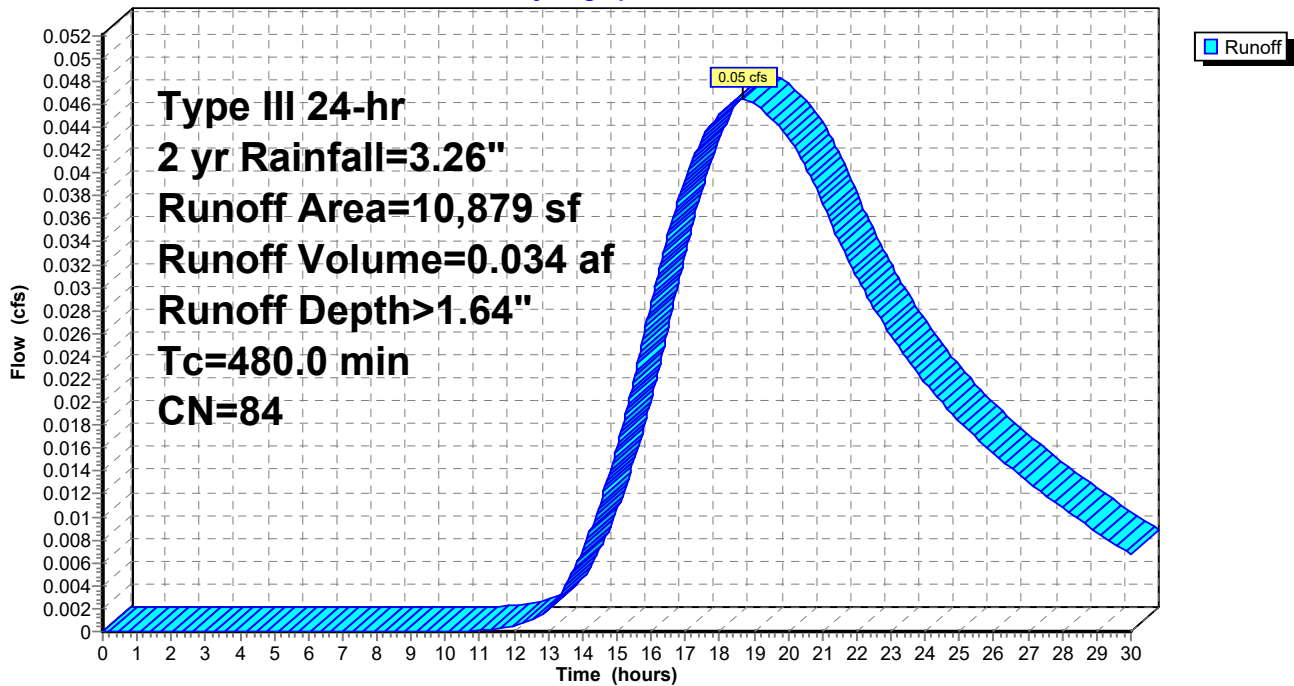
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
4,317	98	Paved parking, HSG C
6,562	74	>75% Grass cover, Good, HSG C
10,879	84	Weighted Average
6,562		60.32% Pervious Area
4,317		39.68% Impervious Area

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

Subcatchment PR2: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR3: North Driveway

Runoff = 0.03 cfs @ 18.67 hrs, Volume= 0.023 af, Depth> 1.79"

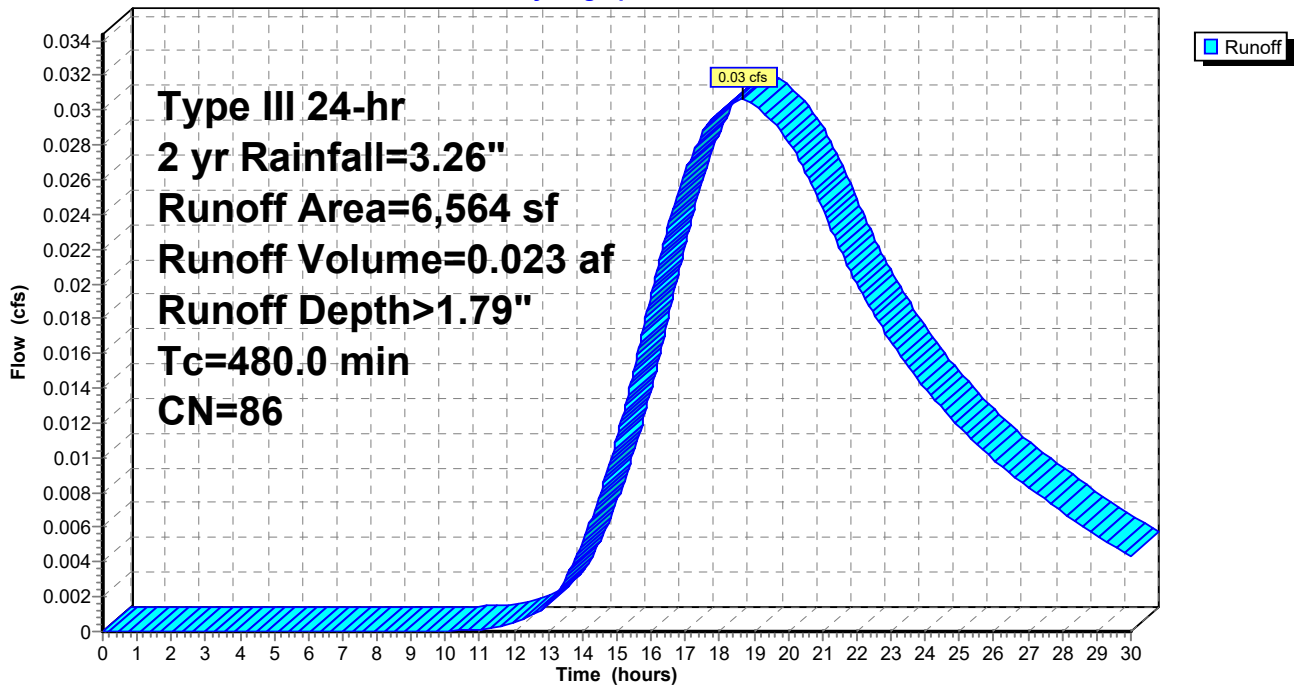
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG C
3,220	74	>75% Grass cover, Good, HSG C
6,564	86	Weighted Average
3,220		49.06% Pervious Area
3,344		50.94% Impervious Area

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

Subcatchment PR3: North Driveway

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR4: Parking 1 North

Runoff = 0.05 cfs @ 18.66 hrs, Volume= 0.033 af, Depth> 2.12"

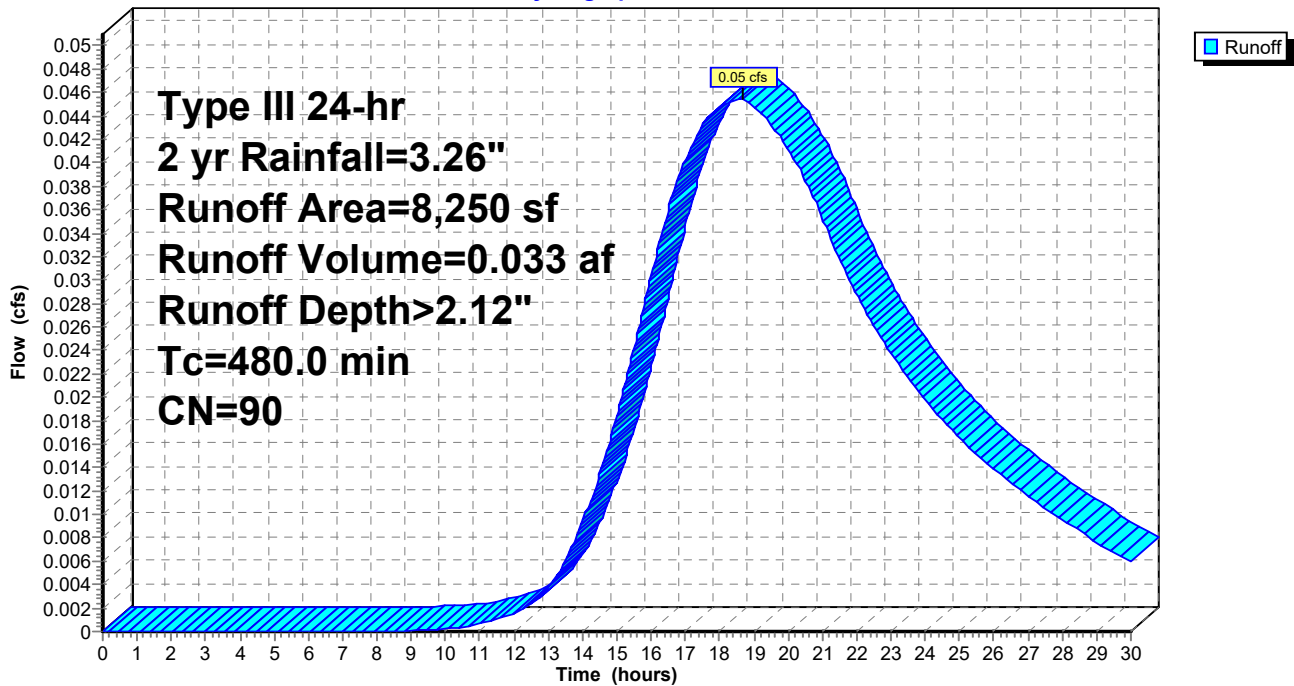
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
5,415	98	Paved parking, HSG C
2,835	74	>75% Grass cover, Good, HSG C
8,250	90	Weighted Average
2,835		34.36% Pervious Area
5,415		65.64% Impervious Area

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

Subcatchment PR4: Parking 1 North

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR5: Parking 2 North

Runoff = 0.04 cfs @ 18.66 hrs, Volume= 0.028 af, Depth> 2.04"

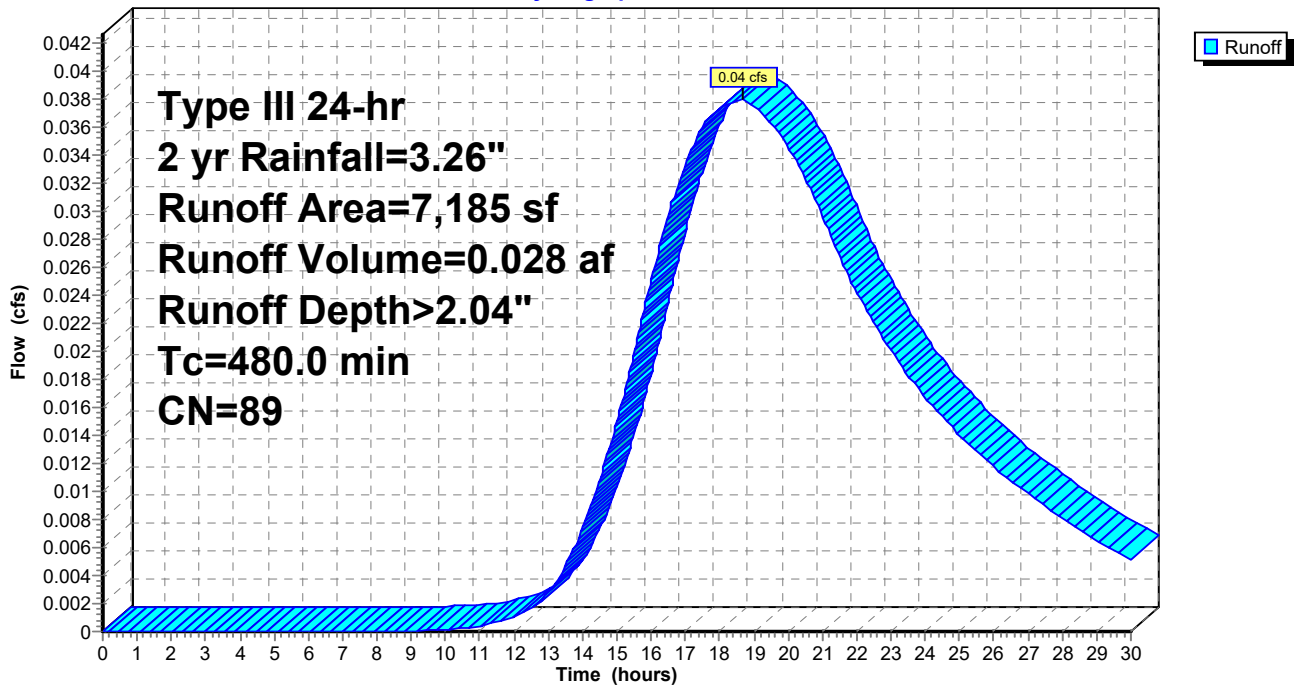
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
4,545	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
7,185	89	Weighted Average
2,640		36.74% Pervious Area
4,545		63.26% Impervious Area

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

Subcatchment PR5: Parking 2 North

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR6: To off Site Drainage POST

Runoff = 0.57 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.41"

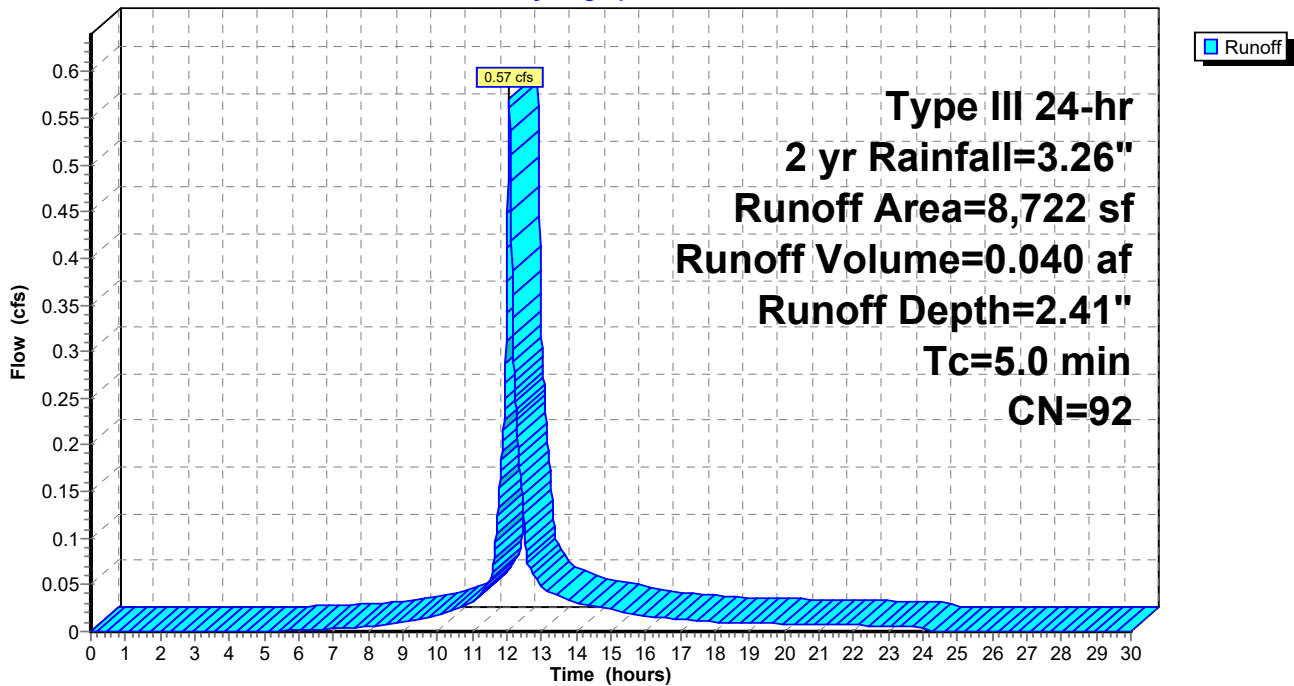
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
6,468	98	Paved parking, HSG C
2,254	74	>75% Grass cover, Good, HSG C
8,722	92	Weighted Average
2,254		25.84% Pervious Area
6,468		74.16% Impervious Area

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

Subcatchment PR6: To off Site Drainage POST

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR7: POROUS PAVEMENT

Runoff = 0.05 cfs @ 18.66 hrs, Volume= 0.038 af, Depth> 2.49"

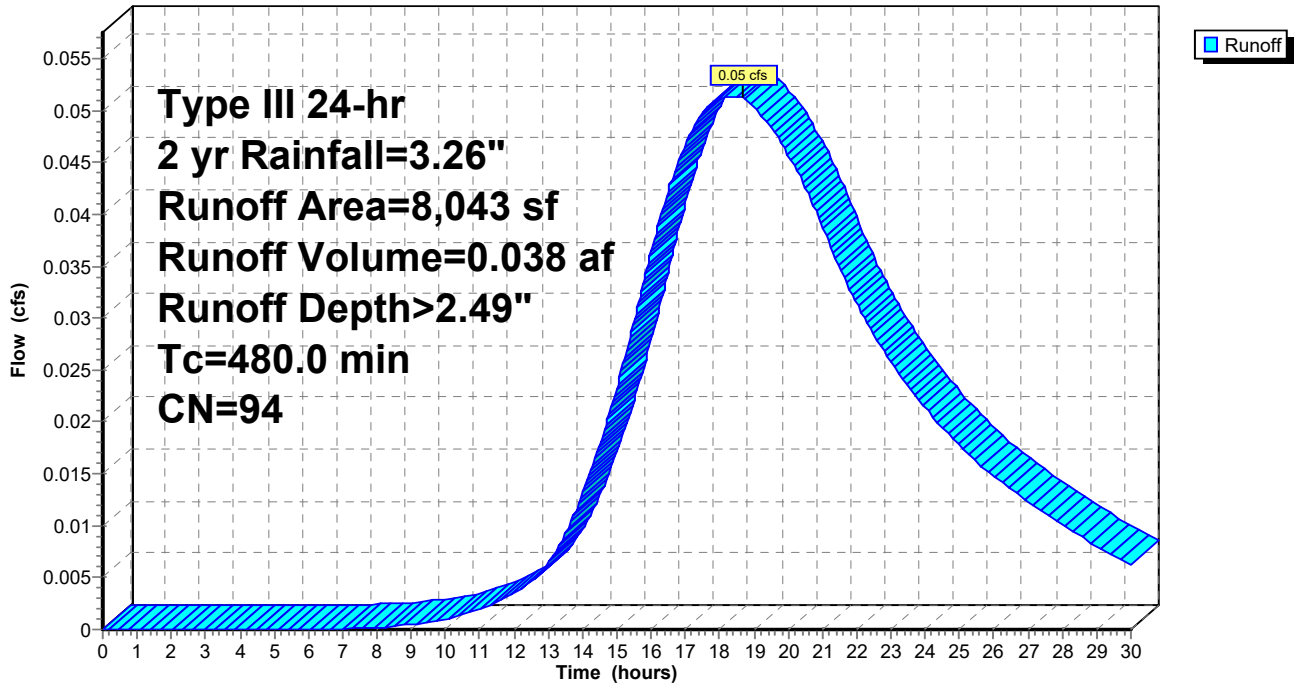
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
6,622	98	Paved parking, HSG C
1,421	74	>75% Grass cover, Good, HSG C
8,043	94	Weighted Average
1,421		17.67% Pervious Area
6,622		82.33% Impervious Area

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

Subcatchment PR7: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Subcatchment PR8: Pr Site

Runoff = 0.61 cfs @ 12.16 hrs, Volume= 0.053 af, Depth= 1.08"

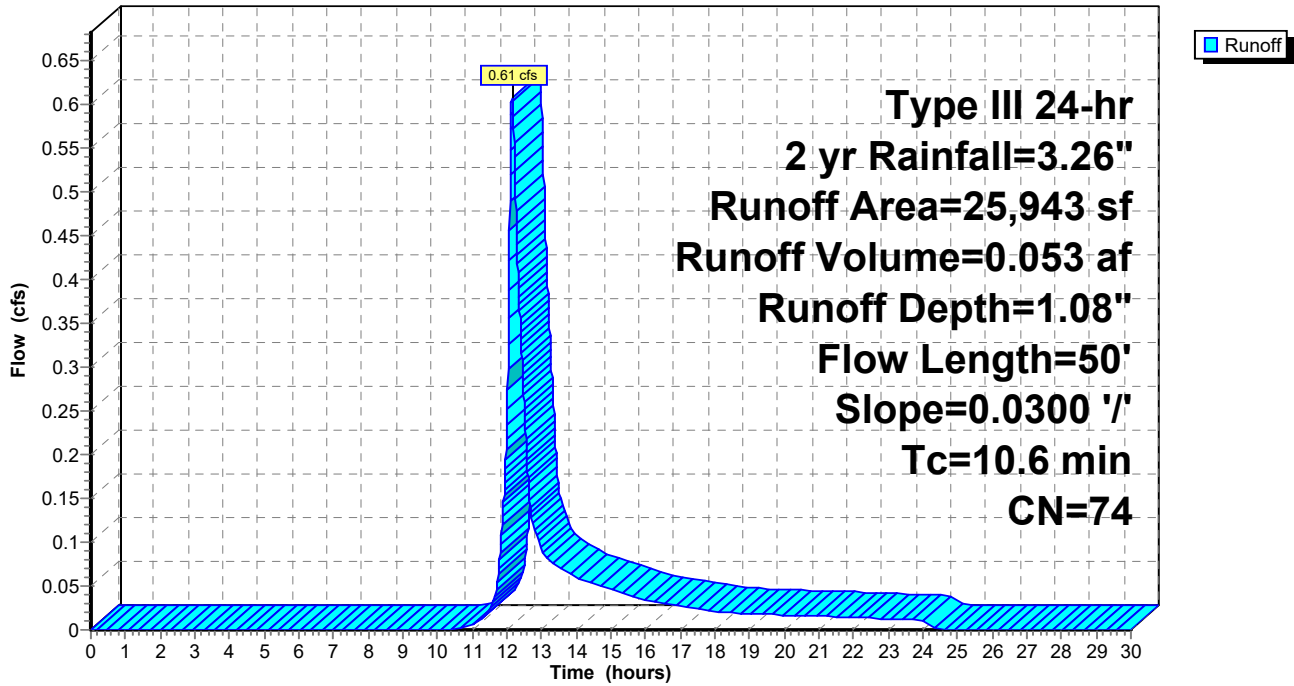
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.26"

Area (sf)	CN	Description
25,943	74	>75% Grass cover, Good, HSG C
25,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"

Subcatchment PR8: Pr Site

Hydrograph



Proposed Hydrology

Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Pond 1P: POROUS PAVEMENT

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 2.04" for 2 yr event
 Inflow = 0.04 cfs @ 18.66 hrs, Volume= 0.028 af
 Outflow = 0.03 cfs @ 20.90 hrs, Volume= 0.016 af, Atten= 21%, Lag= 134.4 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.03 cfs @ 20.90 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.11' @ 20.90 hrs Surf.Area= 4,500 sf Storage= 590 cf

Plug-Flow detention time= 347.0 min calculated for 0.016 af (58% of inflow)
 Center-of-Mass det. time= 187.5 min (1,405.0 - 1,217.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 15.25' S= 0.0094 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 20.90 hrs HW=16.11' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.03 cfs @ 0.98 fps)

Proposed Hydrology

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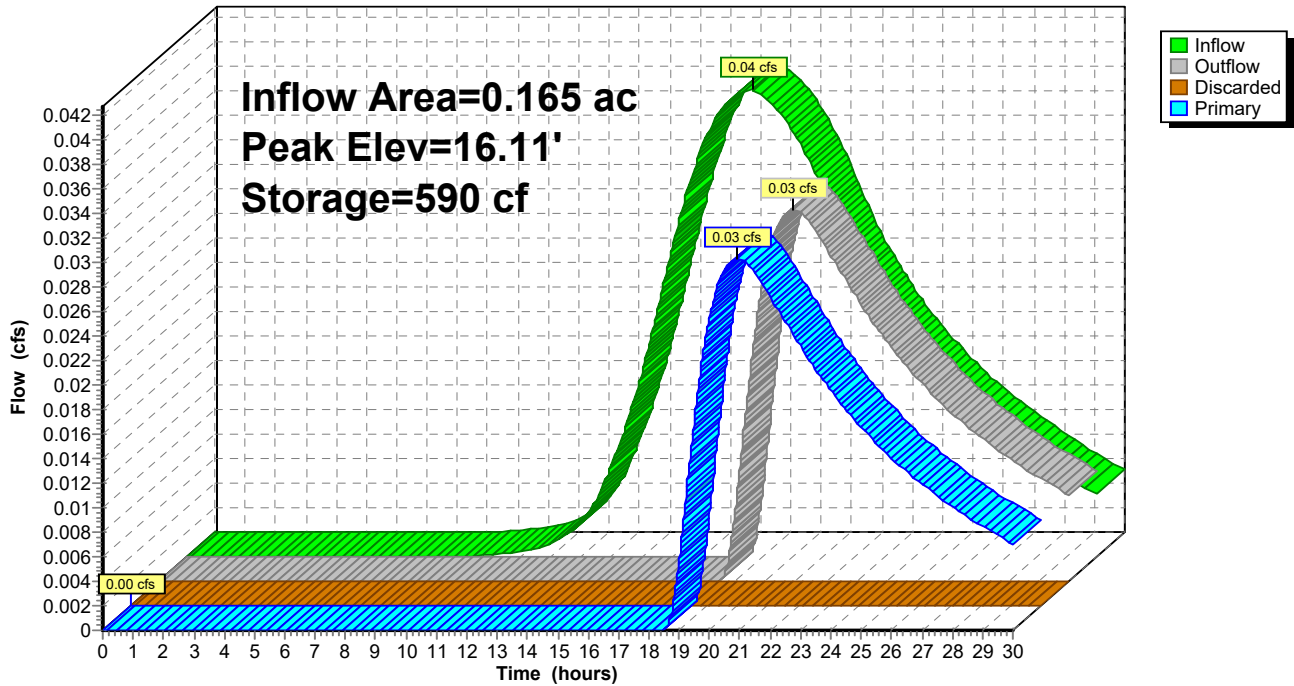
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Pond 1P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Summary for Pond 2P: LEVEL SPREADER

[79] Warning: Submerged Pond 9P Primary device # 1 OUTLET by 0.01'

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 1.25" for 2 yr event
 Inflow = 0.03 cfs @ 20.02 hrs, Volume= 0.016 af
 Outflow = 0.03 cfs @ 21.01 hrs, Volume= 0.011 af, Atten= 7%, Lag= 59.5 min
 Discarded = 0.00 cfs @ 21.01 hrs, Volume= 0.003 af
 Primary = 0.02 cfs @ 21.01 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.76' @ 21.01 hrs Surf.Area= 325 sf Storage= 209 cf

Plug-Flow detention time= 182.0 min calculated for 0.011 af (70% of inflow)
 Center-of-Mass det. time= 81.1 min (1,445.2 - 1,364.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	14.00'	294 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
14.00	230	0	0	230	
14.75	323	206	206	333	
15.00	375	87	294	387	

Device	Routing	Invert	Outlet Devices				
#1	Primary	14.75'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
			Head (feet) 0.20 0.40 0.60 0.80 1.00				
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				
#2	Discarded	14.00'	0.270 in/hr Exfiltration over Wetted area				
			Conductivity to Groundwater Elevation = 13.00'				

Discarded OutFlow Max=0.00 cfs @ 21.01 hrs HW=14.76' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.02 cfs @ 21.01 hrs HW=14.76' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 0.02 cfs @ 0.25 fps)

Proposed Hydrology

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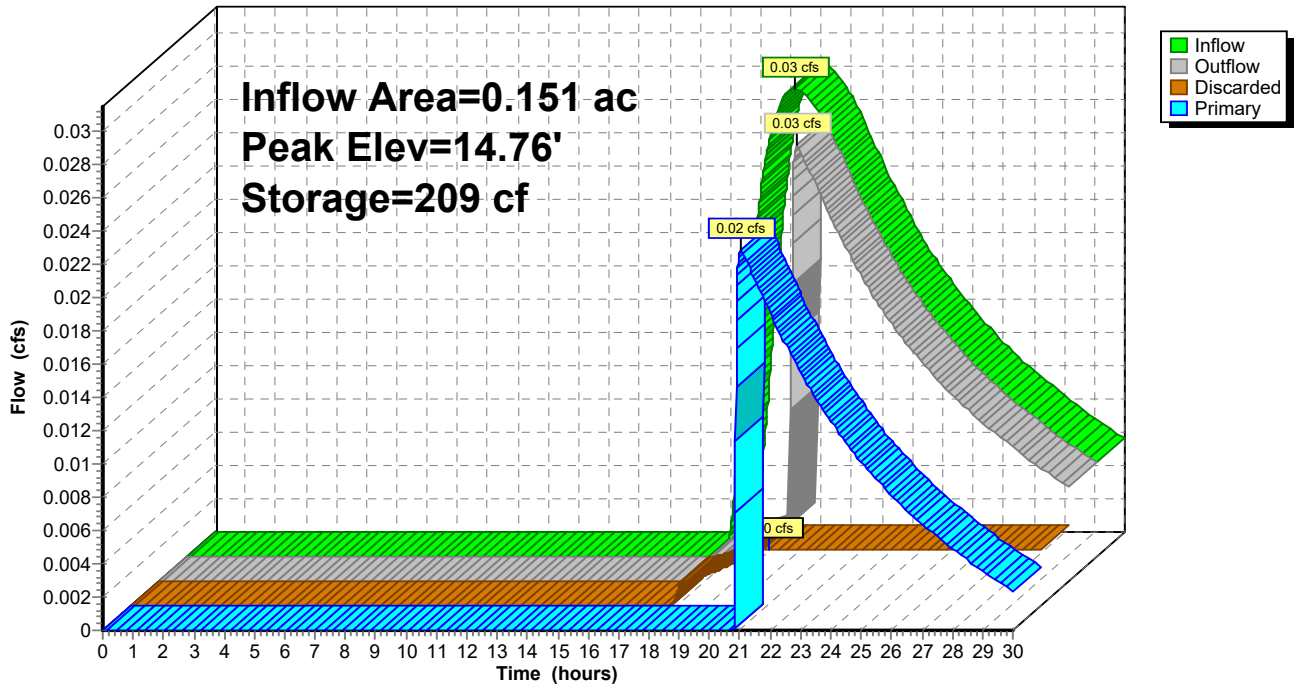
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Pond 2P: LEVEL SPREADER

Hydrograph



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Summary for Pond 3P: POROUS PAVEMENT

Inflow Area = 0.185 ac, 82.33% Impervious, Inflow Depth > 2.49" for 2 yr event
 Inflow = 0.05 cfs @ 18.66 hrs, Volume= 0.038 af
 Outflow = 0.03 cfs @ 22.46 hrs, Volume= 0.036 af, Atten= 44%, Lag= 227.9 min
 Discarded = 0.03 cfs @ 22.46 hrs, Volume= 0.036 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.31' @ 22.46 hrs Surf.Area= 3,872 sf Storage= 419 cf

Plug-Flow detention time= 144.6 min calculated for 0.036 af (95% of inflow)
 Center-of-Mass det. time= 115.7 min (1,311.9 - 1,196.2)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	1,220 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,066 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	3,872	0	0
16.00	3,872	4,066	4,066

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.03 cfs @ 22.46 hrs HW=15.31' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.95' (Free Discharge)
 ↑**1=Culvert** (Controls 0.00 cfs)

Proposed Hydrology

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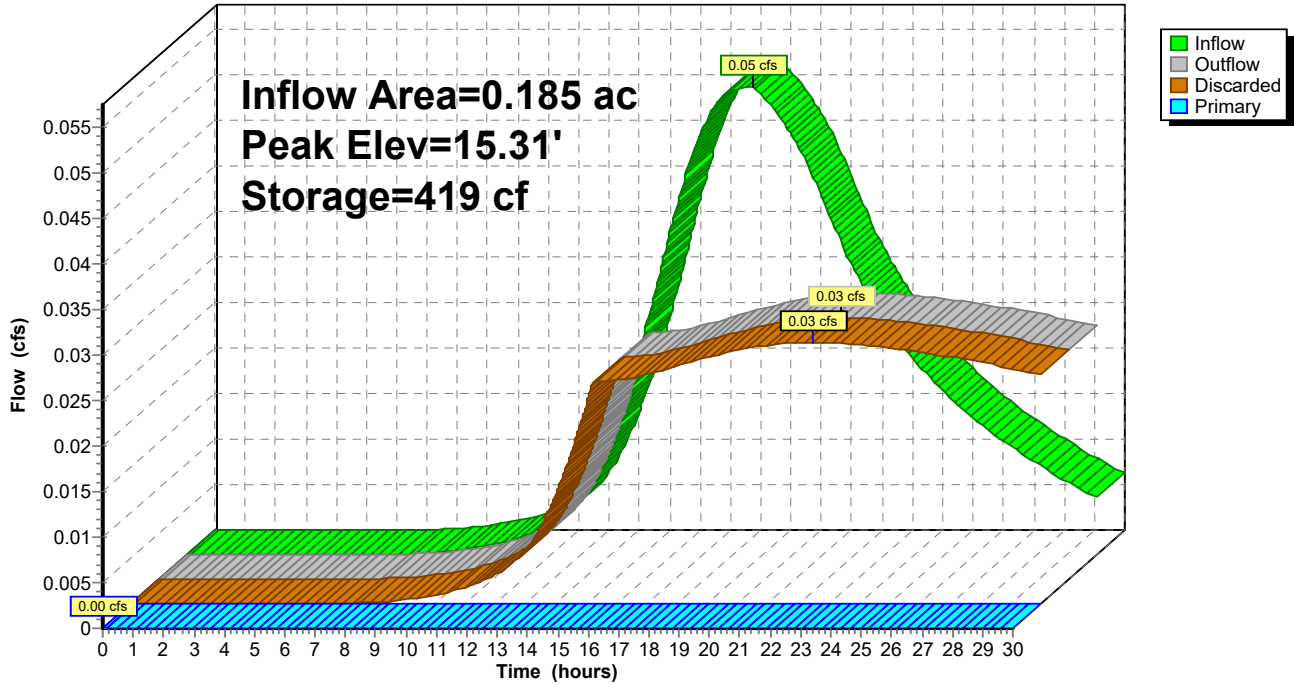
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Pond 3P: POROUS PAVEMENT

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.26"

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Summary for Pond 4P: POROUS PAVEMENT

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 2.12" for 2 yr event
 Inflow = 0.05 cfs @ 18.66 hrs, Volume= 0.033 af
 Outflow = 0.02 cfs @ 24.11 hrs, Volume= 0.009 af, Atten= 57%, Lag= 326.6 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.02 cfs @ 24.11 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.48' @ 24.11 hrs Surf.Area= 4,500 sf Storage= 1,100 cf

Plug-Flow detention time= 586.9 min calculated for 0.009 af (27% of inflow)
 Center-of-Mass det. time= 329.2 min (1,543.1 - 1,213.9)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.40'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.40' / 15.50' S= 0.0112 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.02 cfs @ 24.11 hrs HW=16.48' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.02 cfs @ 0.88 fps)

Proposed Hydrology

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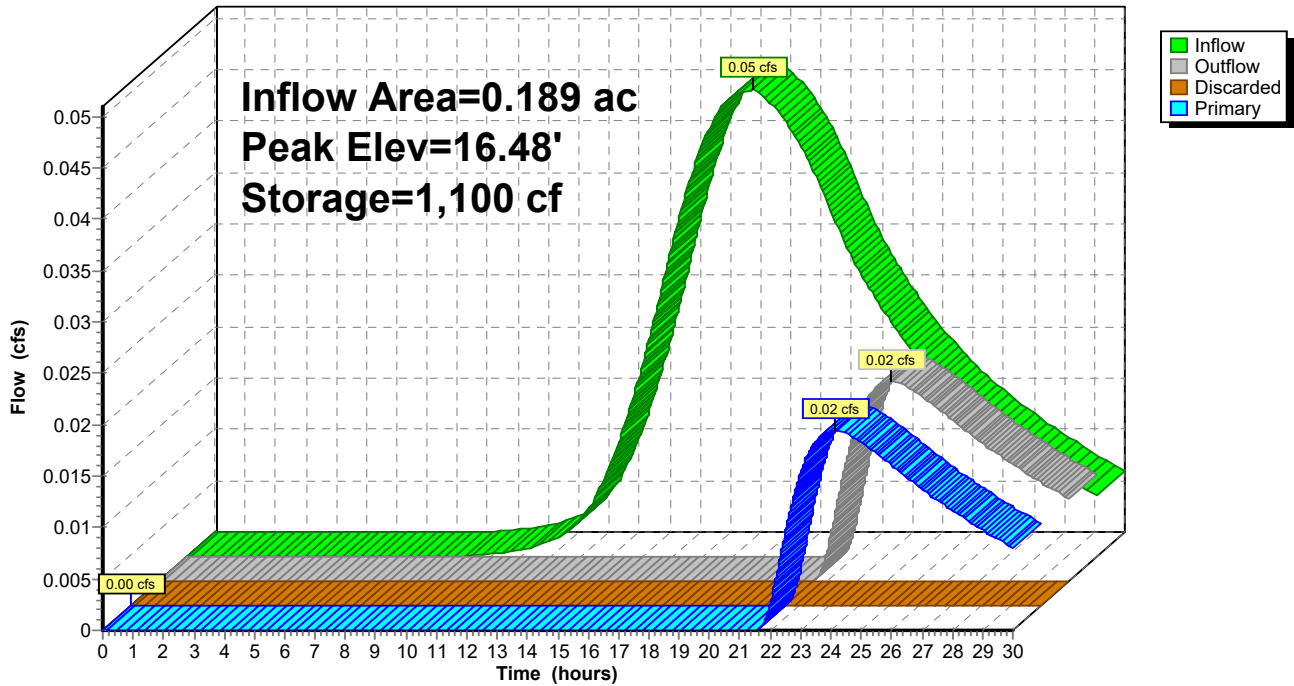
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Pond 4P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Summary for Pond 6P: LEVEL SPREADER

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 0.58" for 2 yr event
 Inflow = 0.02 cfs @ 24.11 hrs, Volume= 0.009 af
 Outflow = 0.01 cfs @ 29.14 hrs, Volume= 0.003 af, Atten= 51%, Lag= 302.2 min
 Discarded = 0.01 cfs @ 29.14 hrs, Volume= 0.003 af
 Primary = 0.00 cfs @ 29.14 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.25' @ 29.14 hrs Surf.Area= 686 sf Storage= 266 cf

Plug-Flow detention time= 203.5 min calculated for 0.003 af (34% of inflow)
 Center-of-Mass det. time= 68.7 min (1,611.8 - 1,543.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	14.75'	879 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
14.75	250	0	0	250	
15.00	604	104	104	604	
16.00	960	775	879	974	

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	0.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 13.00'
#2	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 29.14 hrs HW=15.25' (Free Discharge)
 ↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 29.14 hrs HW=15.25' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.10 fps)

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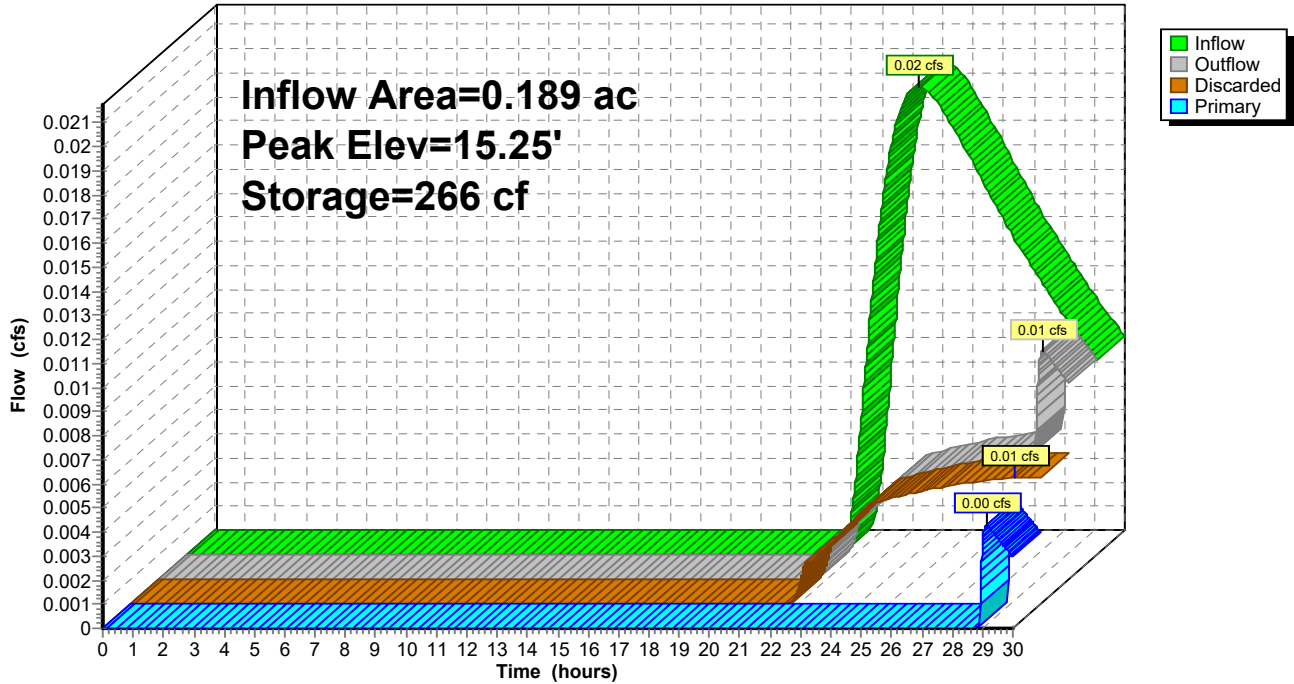
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Pond 6P: LEVEL SPREADER

Hydrograph



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Summary for Pond 8P: LEVEL SPREADER

[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.01'

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 1.18" for 2 yr event
 Inflow = 0.03 cfs @ 20.90 hrs, Volume= 0.016 af
 Outflow = 0.03 cfs @ 21.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 11.4 min
 Primary = 0.03 cfs @ 21.09 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.26' @ 21.09 hrs Surf.Area= 624 sf Storage= 152 cf

Plug-Flow detention time= 124.0 min calculated for 0.013 af (79% of inflow)
 Center-of-Mass det. time= 55.2 min (1,460.2 - 1,405.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	15.00'	709 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
15.00	542	0	0	542	
16.00	890	709	709	903	

Device	Routing	Invert	Outlet Devices				
#1	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
			Head (feet) 0.20 0.40 0.60 0.80 1.00				
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=0.03 cfs @ 21.09 hrs HW=15.26' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.03 cfs @ 0.29 fps)

Proposed Hydrology

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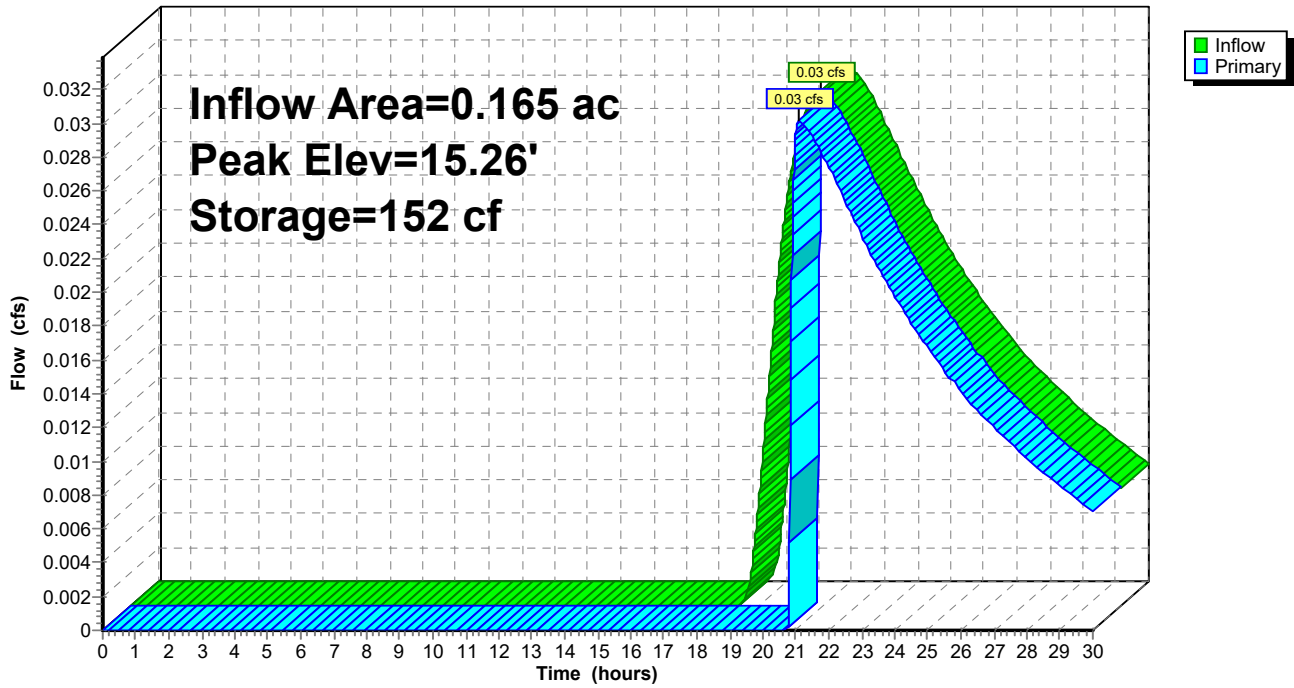
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Pond 8P: LEVEL SPREADER

Hydrograph



Proposed Hydrology

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Summary for Pond 9P: POROUS PAVEMENT

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 1.79" for 2 yr event
 Inflow = 0.03 cfs @ 18.67 hrs, Volume= 0.023 af
 Outflow = 0.03 cfs @ 20.02 hrs, Volume= 0.016 af, Atten= 8%, Lag= 81.3 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.03 cfs @ 20.02 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.10' @ 20.02 hrs Surf.Area= 3,344 sf Storage= 354 cf

Plug-Flow detention time= 258.9 min calculated for 0.016 af (70% of inflow)
 Center-of-Mass det. time= 136.8 min (1,364.1 - 1,227.3)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	1,003 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 3,344 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	3,344	0	0
16.75	3,344	3,344	3,344

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 108.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 14.75' S= 0.0116 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.75'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 20.02 hrs HW=16.10' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.03 cfs @ 0.96 fps)

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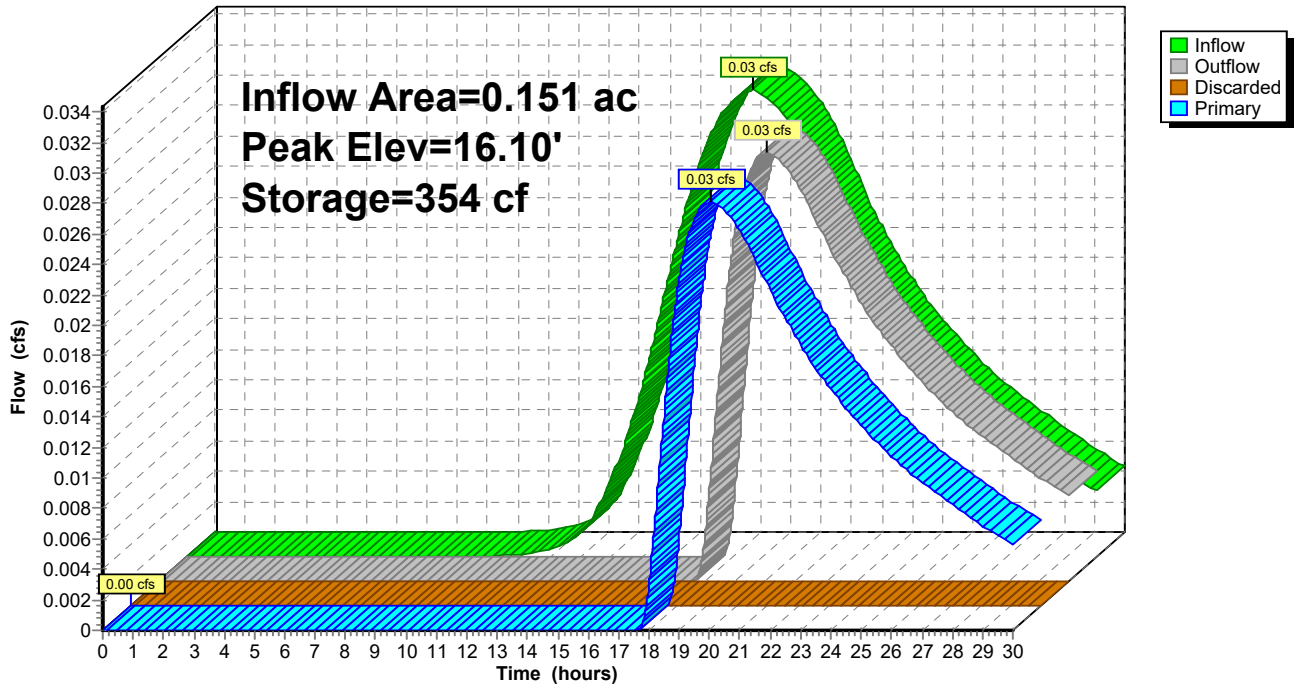
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Pond 9P: POROUS PAVEMENT

Hydrograph



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Summary for Pond 15P: POROUS PAVEMENT

Inflow Area = 0.250 ac, 39.68% Impervious, Inflow Depth > 1.64" for 2 yr event
 Inflow = 0.05 cfs @ 18.67 hrs, Volume= 0.034 af
 Outflow = 0.04 cfs @ 19.64 hrs, Volume= 0.034 af, Atten= 4%, Lag= 58.1 min
 Discarded = 0.04 cfs @ 19.64 hrs, Volume= 0.034 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.96' @ 19.64 hrs Surf.Area= 7,067 sf Storage= 29 cf

Plug-Flow detention time= 8.5 min calculated for 0.034 af (100% of inflow)
 Center-of-Mass det. time= 7.2 min (1,240.4 - 1,233.2)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	2,120 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,067 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	7,067	0	0
15.95	7,067	7,067	7,067

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.04 cfs @ 19.64 hrs HW=14.96' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.95' (Free Discharge)
 ↑**1=Culvert** (Controls 0.00 cfs)

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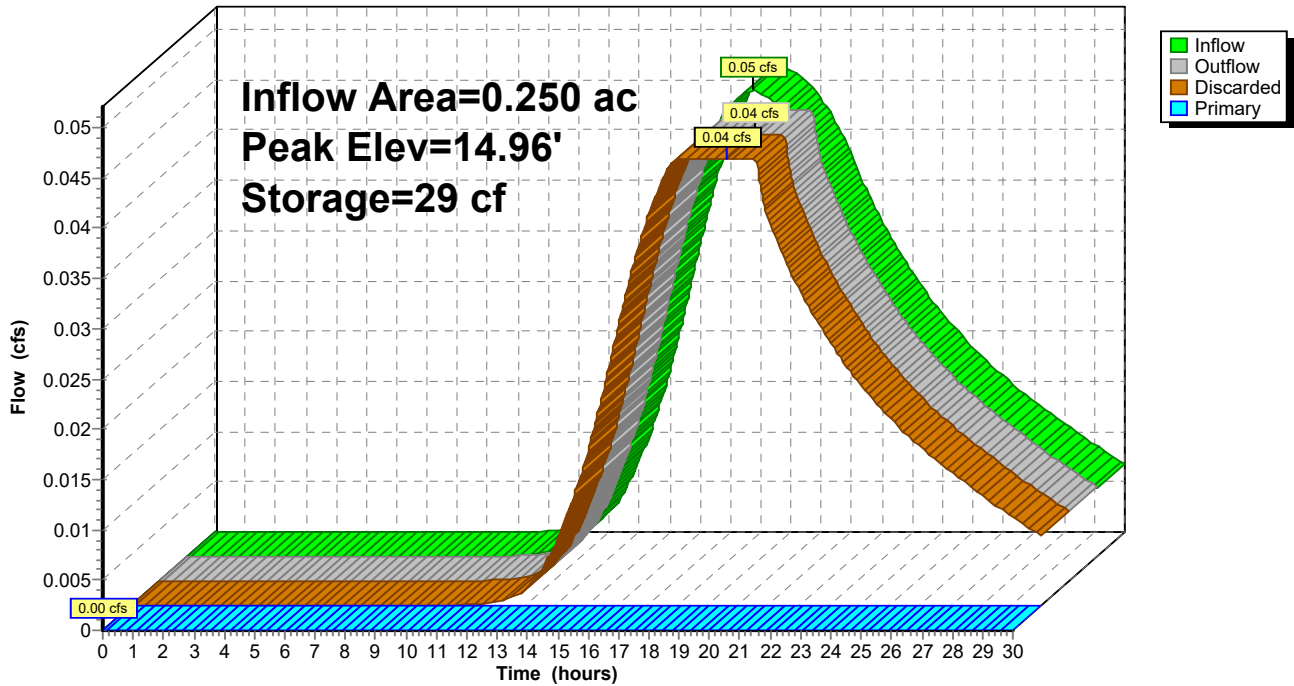
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Pond 15P: POROUS PAVEMENT

Hydrograph



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Summary for Pond DP1: Wetlands

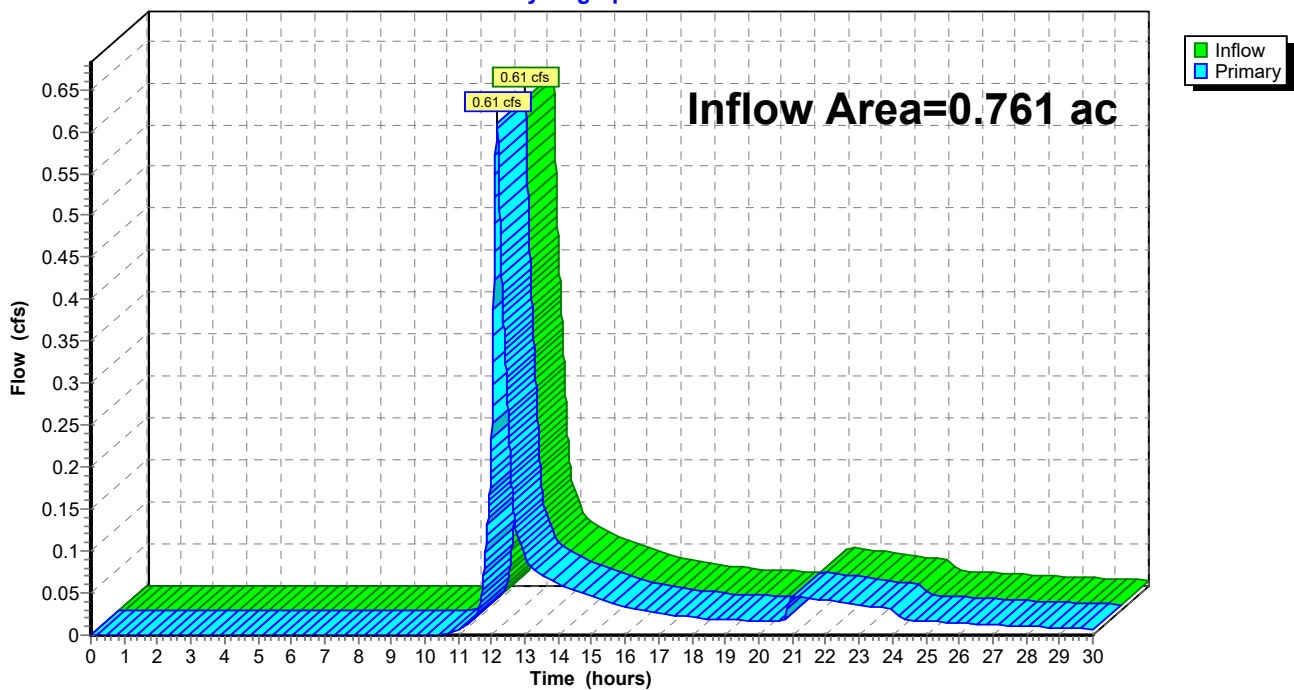
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.761 ac, 13.72% Impervious, Inflow Depth > 1.05" for 2 yr event
Inflow = 0.61 cfs @ 12.16 hrs, Volume= 0.066 af
Primary = 0.61 cfs @ 12.16 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP1: Wetlands

Hydrograph



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Summary for Pond DP2: Wetlands

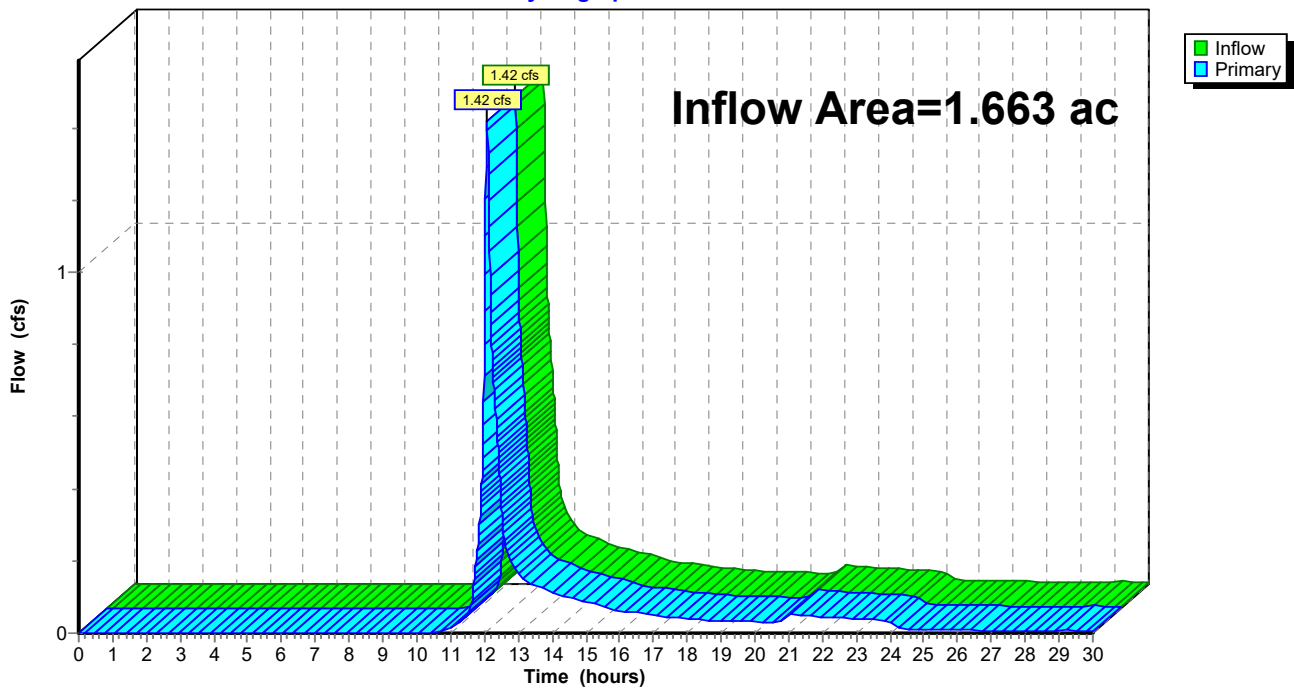
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.663 ac, 21.23% Impervious, Inflow Depth > 0.80" for 2 yr event
Inflow = 1.42 cfs @ 12.08 hrs, Volume= 0.110 af
Primary = 1.42 cfs @ 12.08 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP2: Wetlands

Hydrograph



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Summary for Pond DP3: IBEW DR S-M

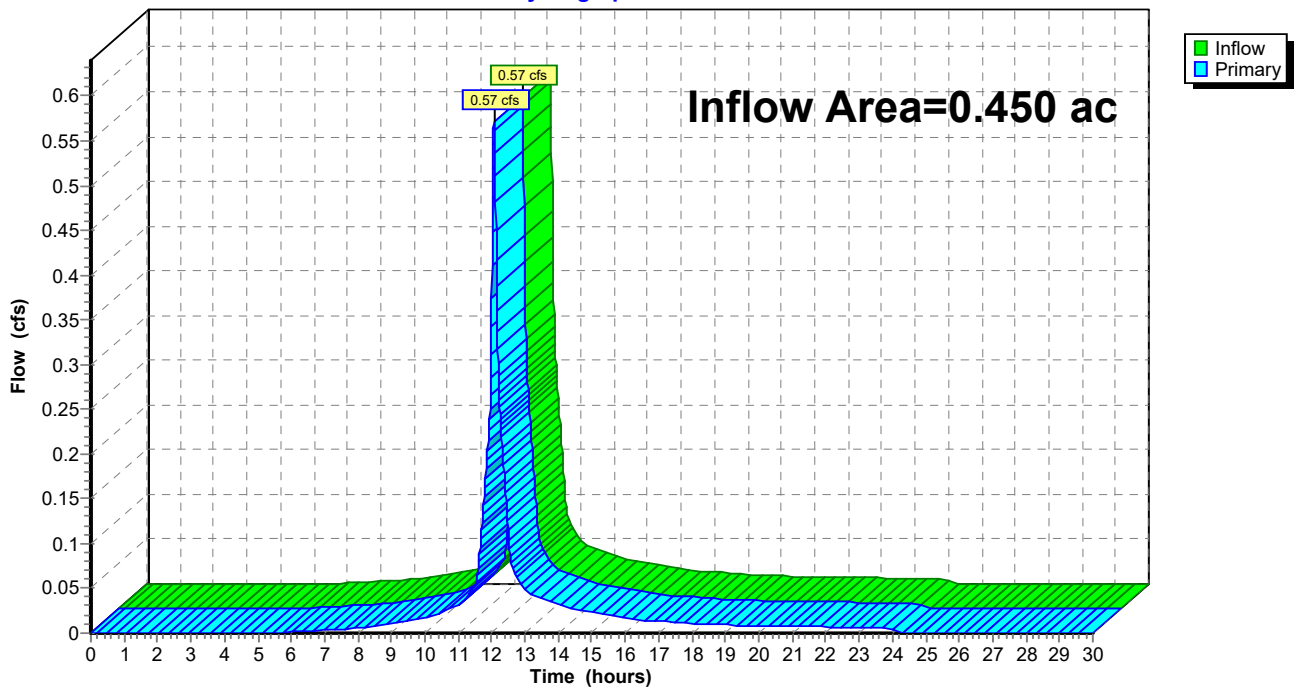
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.450 ac, 55.02% Impervious, Inflow Depth = 1.07" for 2 yr event
Inflow = 0.57 cfs @ 12.07 hrs, Volume= 0.040 af
Primary = 0.57 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP3: IBEW DR S-M

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.90"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR1: Pr Site	Runoff Area=49,602 sf 0.00% Impervious Runoff Depth=2.28" Tc=5.0 min CN=74 Runoff=3.15 cfs 0.217 af
SubcatchmentPR2: POROUS PAVEMENT	Runoff Area=10,879 sf 39.68% Impervious Runoff Depth>3.03" Tc=480.0 min CN=84 Runoff=0.09 cfs 0.063 af
SubcatchmentPR3: North Driveway	Runoff Area=6,564 sf 50.94% Impervious Runoff Depth>3.22" Tc=480.0 min CN=86 Runoff=0.05 cfs 0.040 af
SubcatchmentPR4: Parking 1 North	Runoff Area=8,250 sf 65.64% Impervious Runoff Depth>3.62" Tc=480.0 min CN=90 Runoff=0.08 cfs 0.057 af
SubcatchmentPR5: Parking 2 North	Runoff Area=7,185 sf 63.26% Impervious Runoff Depth>3.52" Tc=480.0 min CN=89 Runoff=0.07 cfs 0.048 af
SubcatchmentPR6: To off Site Drainage	Runoff Area=8,722 sf 74.16% Impervious Runoff Depth=3.99" Tc=5.0 min CN=92 Runoff=0.92 cfs 0.067 af
SubcatchmentPR7: POROUS PAVEMENT	Runoff Area=8,043 sf 82.33% Impervious Runoff Depth>4.04" Tc=480.0 min CN=94 Runoff=0.08 cfs 0.062 af
SubcatchmentPR8: Pr Site	Runoff Area=25,943 sf 0.00% Impervious Runoff Depth=2.28" Flow Length=50' Slope=0.0300 '/' Tc=10.6 min CN=74 Runoff=1.36 cfs 0.113 af
Pond 1P: POROUS PAVEMENT	Peak Elev=16.16' Storage=656 cf Inflow=0.07 cfs 0.048 af Discarded=0.00 cfs 0.000 af Primary=0.06 cfs 0.036 af Outflow=0.06 cfs 0.036 af
Pond 2P: LEVEL SPREADER	Peak Elev=14.76' Storage=211 cf Inflow=0.05 cfs 0.033 af Discarded=0.00 cfs 0.004 af Primary=0.05 cfs 0.025 af Outflow=0.05 cfs 0.029 af
Pond 3P: POROUS PAVEMENT	Peak Elev=15.58' Storage=737 cf Inflow=0.08 cfs 0.062 af Discarded=0.03 cfs 0.042 af Primary=0.04 cfs 0.011 af Outflow=0.07 cfs 0.053 af
Pond 4P: POROUS PAVEMENT	Peak Elev=16.56' Storage=1,200 cf Inflow=0.08 cfs 0.057 af Discarded=0.00 cfs 0.000 af Primary=0.06 cfs 0.032 af Outflow=0.06 cfs 0.032 af
Pond 6P: LEVEL SPREADER	Peak Elev=15.27' Storage=276 cf Inflow=0.06 cfs 0.032 af Discarded=0.01 cfs 0.005 af Primary=0.06 cfs 0.022 af Outflow=0.06 cfs 0.026 af
Pond 8P: LEVEL SPREADER	Peak Elev=15.27' Storage=156 cf Inflow=0.06 cfs 0.036 af Outflow=0.06 cfs 0.033 af
Pond 9P: POROUS PAVEMENT	Peak Elev=16.14' Storage=396 cf Inflow=0.05 cfs 0.040 af Discarded=0.00 cfs 0.000 af Primary=0.05 cfs 0.033 af Outflow=0.05 cfs 0.033 af
Pond 15P: POROUS PAVEMENT	Peak Elev=15.24' Storage=610 cf Inflow=0.09 cfs 0.063 af Discarded=0.05 cfs 0.062 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.062 af

Proposed Hydrology

Type III 24-hr 10 yr Rainfall=4.90"

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Pond DP1: Wetlands

Inflow=1.36 cfs 0.146 af
Primary=1.36 cfs 0.146 af

Pond DP2: Wetlands

Inflow=3.15 cfs 0.274 af
Primary=3.15 cfs 0.274 af

Pond DP3: IBEW DR S-M

Inflow=0.92 cfs 0.067 af
Primary=0.92 cfs 0.067 af

Total Runoff Area = 2.874 ac Runoff Volume = 0.668 af Average Runoff Depth = 2.79"
75.47% Pervious = 2.169 ac 24.53% Impervious = 0.705 ac

Proposed Hydrology

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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment PR1: Pr Site

Runoff = 3.15 cfs @ 12.08 hrs, Volume= 0.217 af, Depth= 2.28"

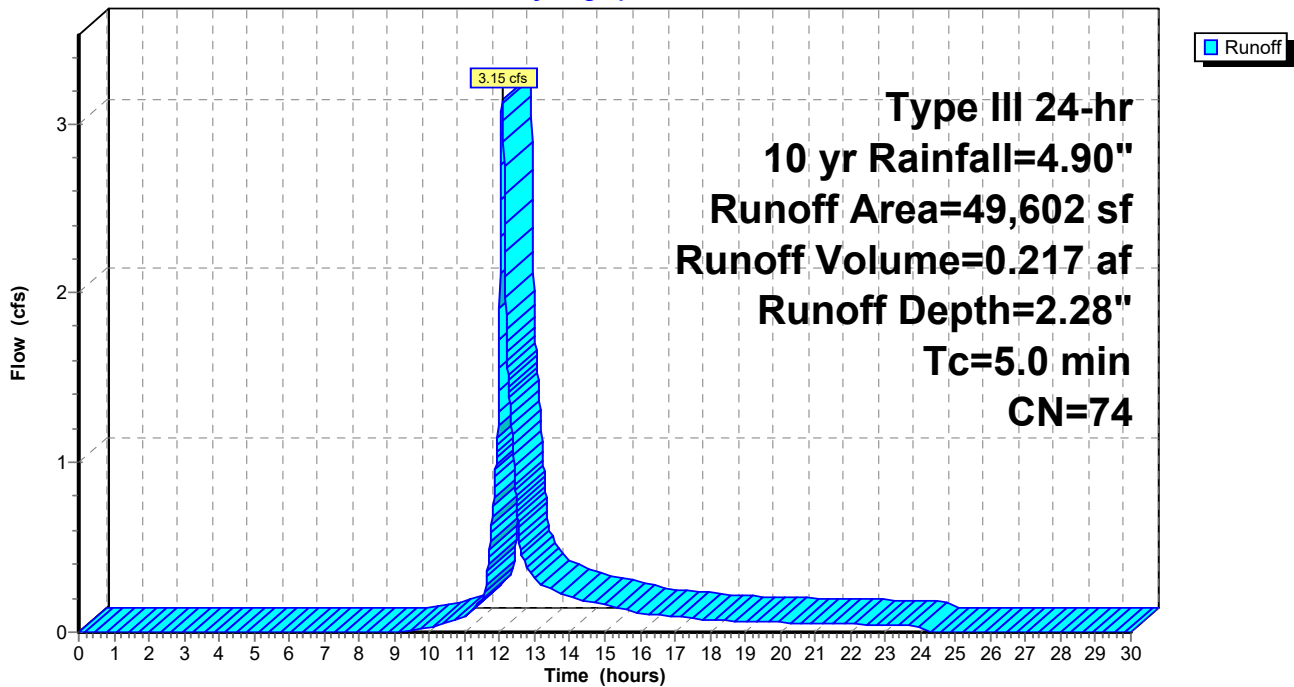
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
49,602	74	>75% Grass cover, Good, HSG C
49,602		100.00% Pervious Area

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

Subcatchment PR1: Pr Site

Hydrograph



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Summary for Subcatchment PR2: POROUS PAVEMENT

Runoff = 0.09 cfs @ 18.66 hrs, Volume= 0.063 af, Depth> 3.03"

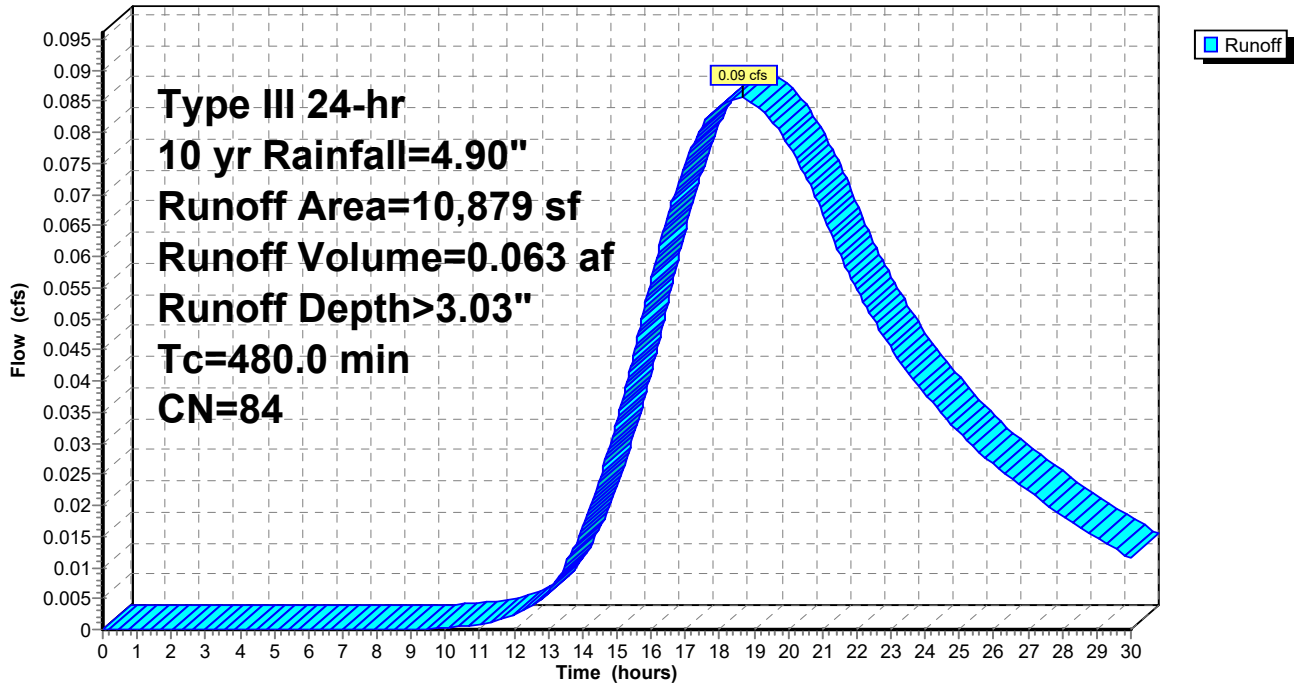
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
4,317	98	Paved parking, HSG C
6,562	74	>75% Grass cover, Good, HSG C
10,879	84	Weighted Average
6,562		60.32% Pervious Area
4,317		39.68% Impervious Area

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

Subcatchment PR2: POROUS PAVEMENT

Hydrograph



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Summary for Subcatchment PR3: North Driveway

Runoff = 0.05 cfs @ 18.66 hrs, Volume= 0.040 af, Depth> 3.22"

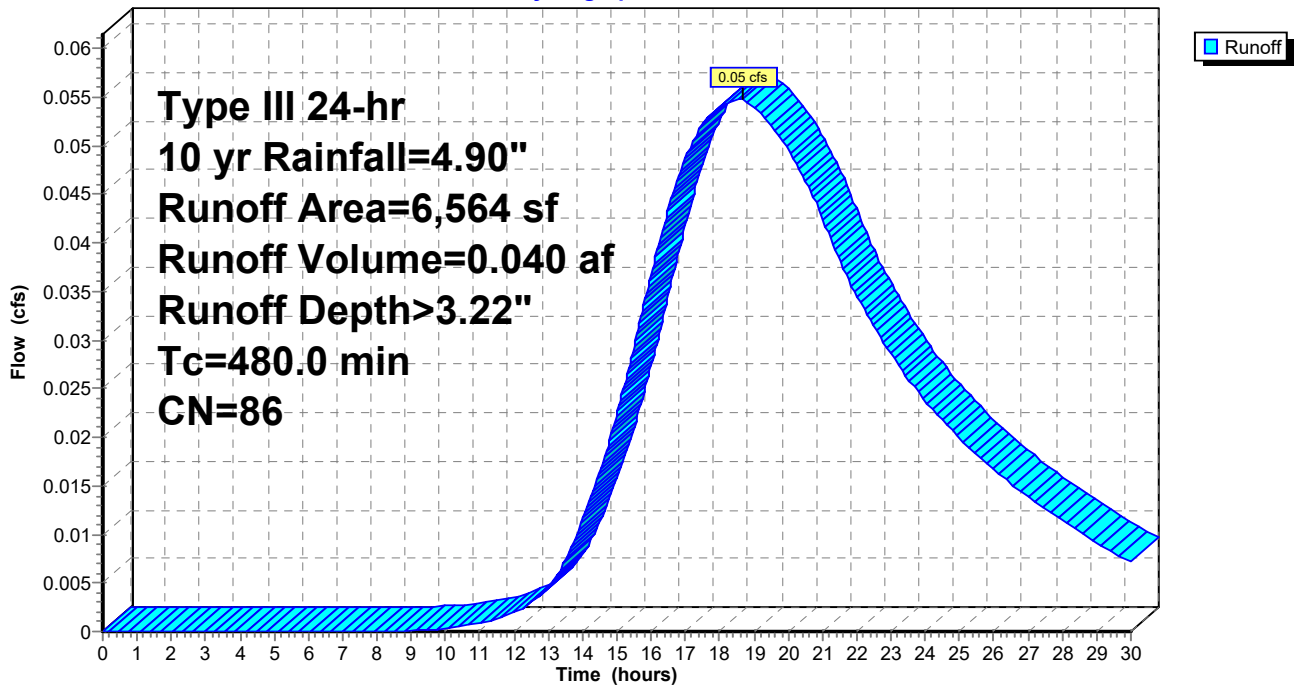
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG C
3,220	74	>75% Grass cover, Good, HSG C
6,564	86	Weighted Average
3,220		49.06% Pervious Area
3,344		50.94% Impervious Area

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

Subcatchment PR3: North Driveway

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment PR4: Parking 1 North

Runoff = 0.08 cfs @ 18.66 hrs, Volume= 0.057 af, Depth> 3.62"

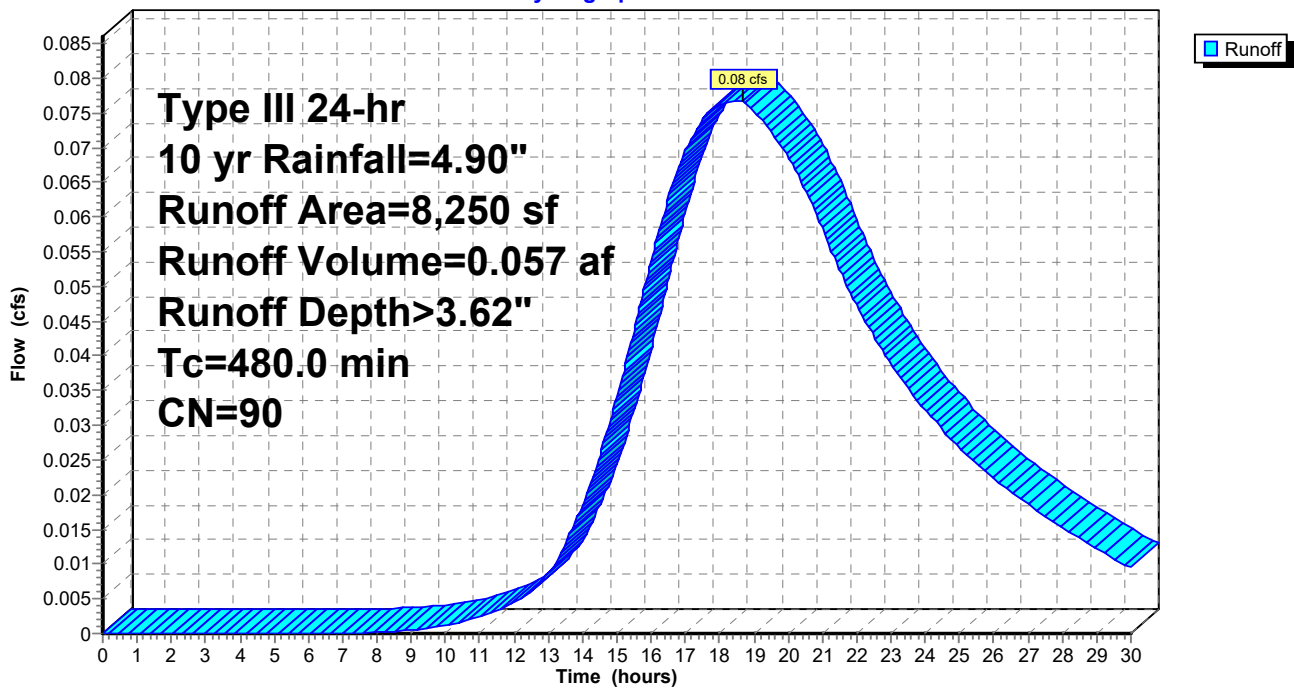
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
5,415	98	Paved parking, HSG C
2,835	74	>75% Grass cover, Good, HSG C
8,250	90	Weighted Average
2,835		34.36% Pervious Area
5,415		65.64% Impervious Area

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

Subcatchment PR4: Parking 1 North

Hydrograph



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Summary for Subcatchment PR5: Parking 2 North

Runoff = 0.07 cfs @ 18.66 hrs, Volume= 0.048 af, Depth> 3.52"

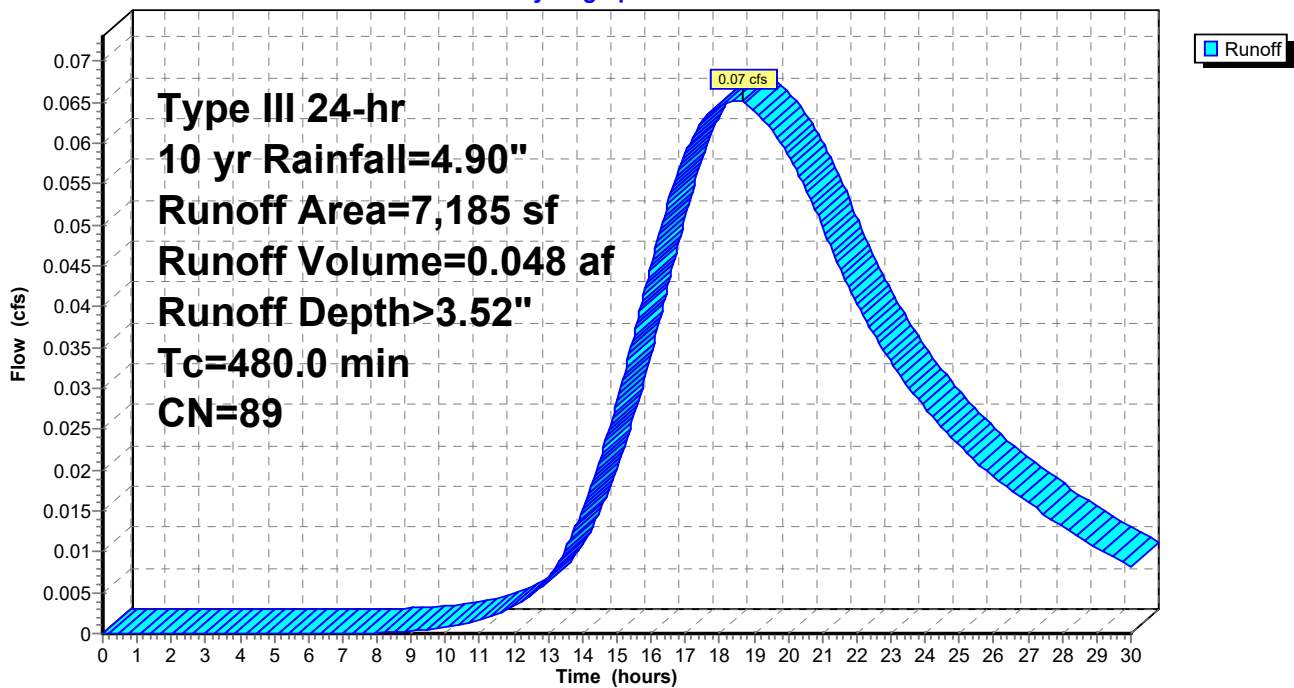
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
4,545	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
7,185	89	Weighted Average
2,640		36.74% Pervious Area
4,545		63.26% Impervious Area

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

Subcatchment PR5: Parking 2 North

Hydrograph



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Summary for Subcatchment PR6: To off Site Drainage POST

Runoff = 0.92 cfs @ 12.07 hrs, Volume= 0.067 af, Depth= 3.99"

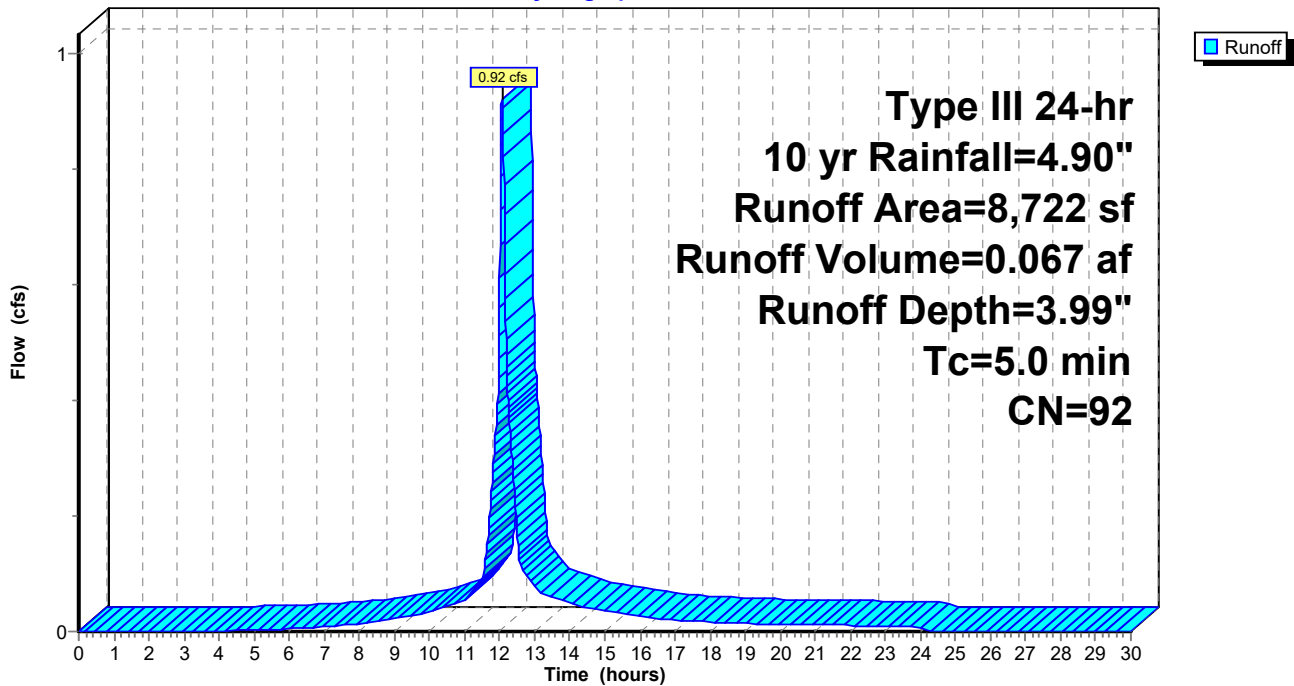
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
6,468	98	Paved parking, HSG C
2,254	74	>75% Grass cover, Good, HSG C
8,722	92	Weighted Average
2,254		25.84% Pervious Area
6,468		74.16% Impervious Area

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

Subcatchment PR6: To off Site Drainage POST

Hydrograph



Proposed Hydrology

Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment PR7: POROUS PAVEMENT

Runoff = 0.08 cfs @ 18.14 hrs, Volume= 0.062 af, Depth> 4.04"

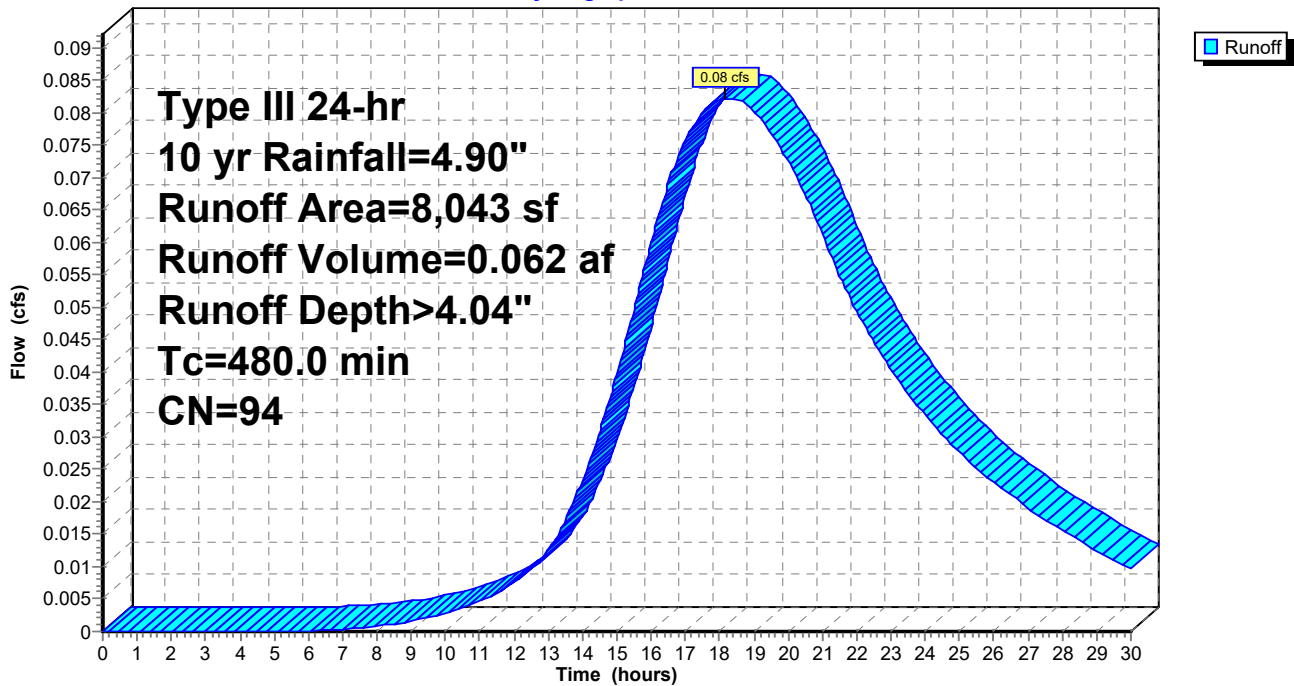
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
6,622	98	Paved parking, HSG C
1,421	74	>75% Grass cover, Good, HSG C
8,043	94	Weighted Average
1,421		17.67% Pervious Area
6,622		82.33% Impervious Area

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

Subcatchment PR7: POROUS PAVEMENT

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Subcatchment PR8: Pr Site

Runoff = 1.36 cfs @ 12.15 hrs, Volume= 0.113 af, Depth= 2.28"

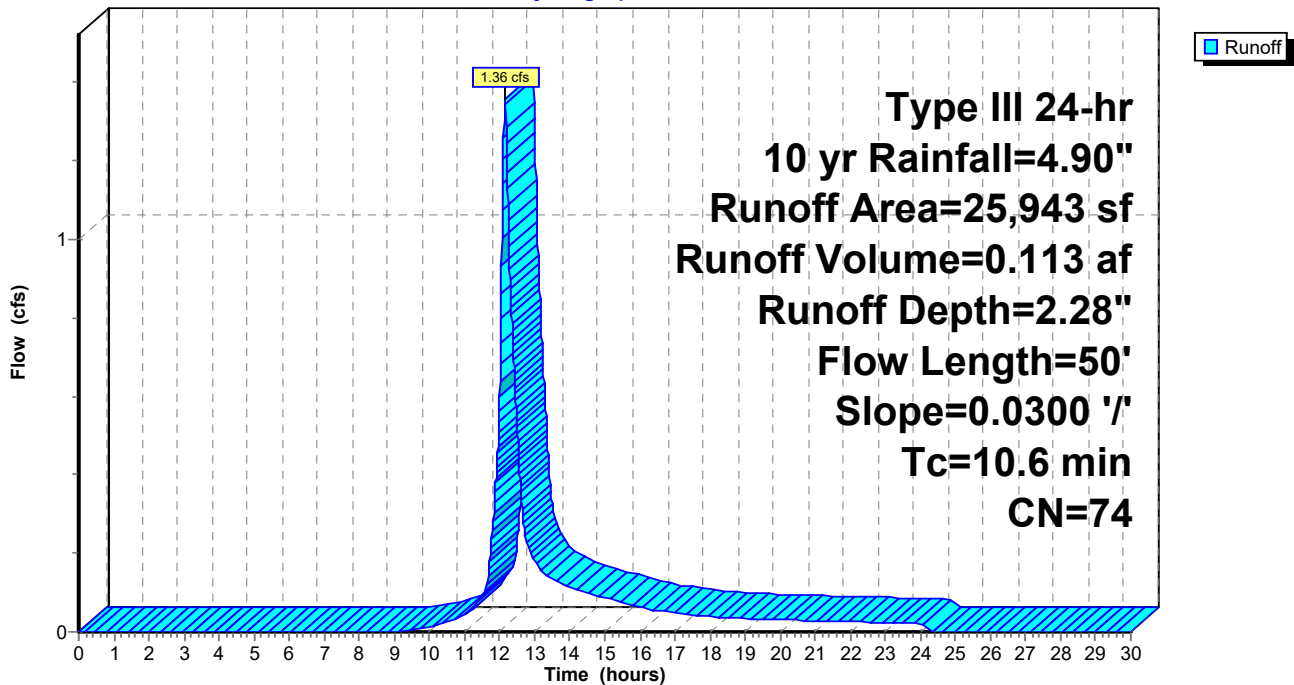
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.90"

Area (sf)	CN	Description
25,943	74	>75% Grass cover, Good, HSG C
25,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"

Subcatchment PR8: Pr Site

Hydrograph



Proposed Hydrology

Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Pond 1P: POROUS PAVEMENT

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 3.52" for 10 yr event
 Inflow = 0.07 cfs @ 18.66 hrs, Volume= 0.048 af
 Outflow = 0.06 cfs @ 19.36 hrs, Volume= 0.036 af, Atten= 4%, Lag= 42.4 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.06 cfs @ 19.36 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.16' @ 19.36 hrs Surf.Area= 4,500 sf Storage= 656 cf

Plug-Flow detention time= 230.0 min calculated for 0.036 af (75% of inflow)
 Center-of-Mass det. time= 122.6 min (1,326.6 - 1,204.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 15.25' S= 0.0094 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 19.36 hrs HW=16.16' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.06 cfs @ 1.19 fps)

Proposed Hydrology

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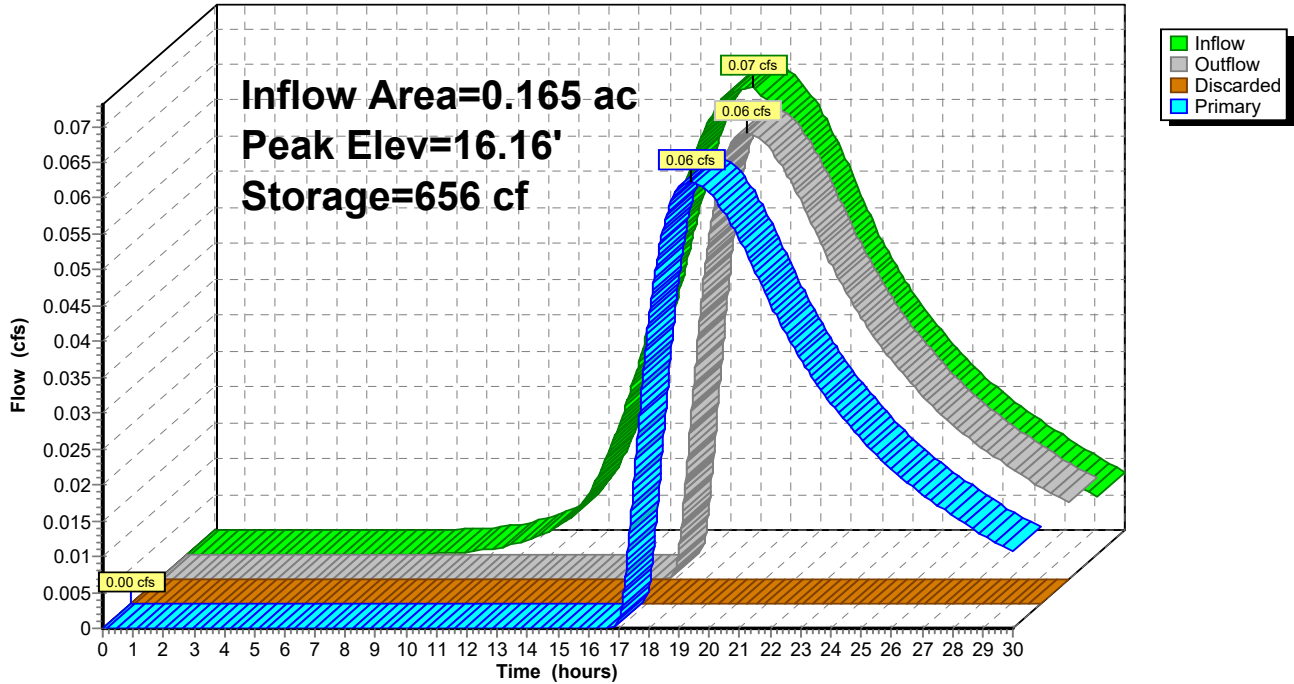
Type III 24-hr 10 yr Rainfall=4.90"

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Pond 1P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Pond 2P: LEVEL SPREADER

[79] Warning: Submerged Pond 9P Primary device # 1 OUTLET by 0.01'

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 2.66" for 10 yr event
 Inflow = 0.05 cfs @ 18.95 hrs, Volume= 0.033 af
 Outflow = 0.05 cfs @ 18.97 hrs, Volume= 0.029 af, Atten= 0%, Lag= 1.1 min
 Discarded = 0.00 cfs @ 18.97 hrs, Volume= 0.004 af
 Primary = 0.05 cfs @ 18.97 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.76' @ 18.97 hrs Surf.Area= 326 sf Storage= 211 cf

Plug-Flow detention time= 100.8 min calculated for 0.029 af (86% of inflow)
 Center-of-Mass det. time= 41.7 min (1,344.0 - 1,302.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.00'	294 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
14.00	230	0	0	230
14.75	323	206	206	333
15.00	375	87	294	387

Device	Routing	Invert	Outlet Devices
#1	Primary	14.75'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	14.00'	0.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 18.97 hrs HW=14.76' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.05 cfs @ 18.97 hrs HW=14.76' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 0.05 cfs @ 0.34 fps)

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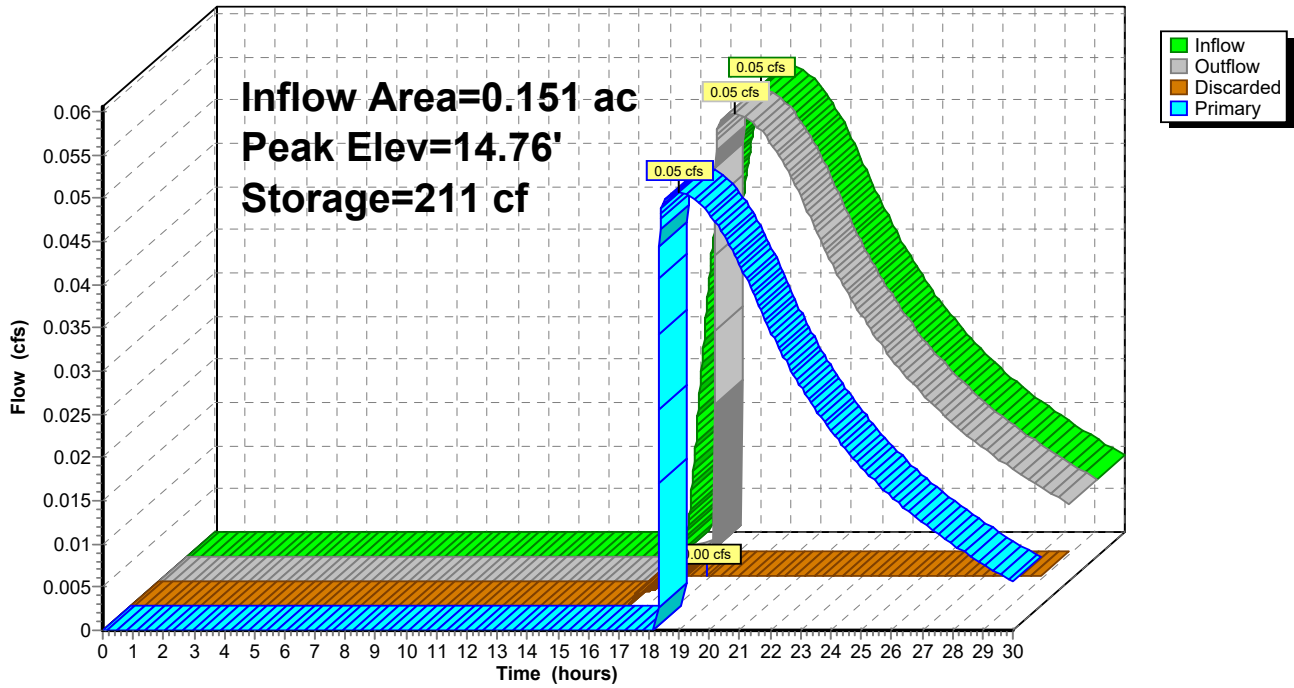
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Pond 2P: LEVEL SPREADER

Hydrograph



Proposed Hydrology

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Summary for Pond 3P: POROUS PAVEMENT

Inflow Area = 0.185 ac, 82.33% Impervious, Inflow Depth > 4.04" for 10 yr event
 Inflow = 0.08 cfs @ 18.14 hrs, Volume= 0.062 af
 Outflow = 0.07 cfs @ 20.47 hrs, Volume= 0.053 af, Atten= 18%, Lag= 139.6 min
 Discarded = 0.03 cfs @ 20.47 hrs, Volume= 0.042 af
 Primary = 0.04 cfs @ 20.47 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.58' @ 20.47 hrs Surf.Area= 3,872 sf Storage= 737 cf

Plug-Flow detention time= 175.1 min calculated for 0.053 af (85% of inflow)
 Center-of-Mass det. time= 103.0 min (1,287.7 - 1,184.7)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	1,220 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,066 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	3,872	0	0
16.00	3,872	4,066	4,066

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.03 cfs @ 20.47 hrs HW=15.58' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.04 cfs @ 20.47 hrs HW=15.58' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.04 cfs @ 1.25 fps)

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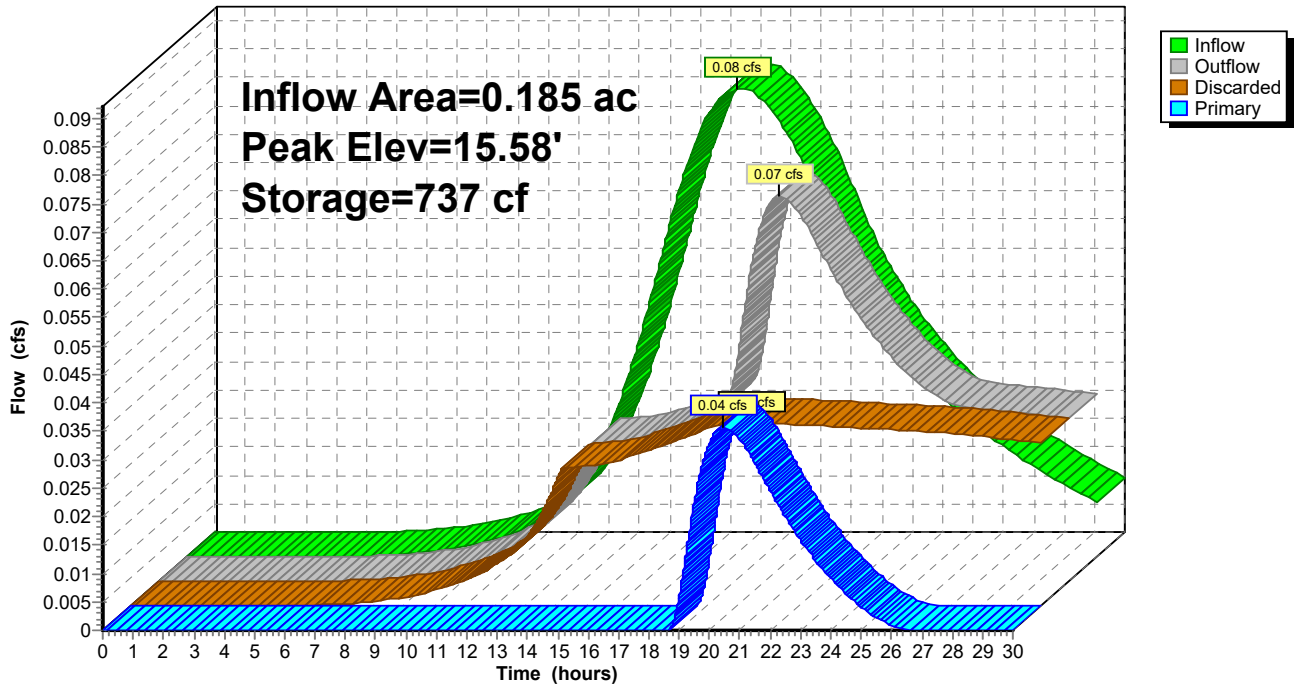
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Pond 3P: POROUS PAVEMENT

Hydrograph



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Summary for Pond 4P: POROUS PAVEMENT

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 3.62" for 10 yr event
Inflow = 0.08 cfs @ 18.66 hrs, Volume= 0.057 af
Outflow = 0.06 cfs @ 20.45 hrs, Volume= 0.032 af, Atten= 16%, Lag= 107.5 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.06 cfs @ 20.45 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 16.56' @ 20.45 hrs Surf.Area= 4,500 sf Storage= 1,200 cf

Plug-Flow detention time= 352.6 min calculated for 0.032 af (57% of inflow)
Center-of-Mass det. time= 187.4 min (1,388.0 - 1,200.7)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.40'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.40' / 15.50' S= 0.0112 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 20.45 hrs HW=16.56' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.06 cfs @ 1.20 fps)

Proposed Hydrology

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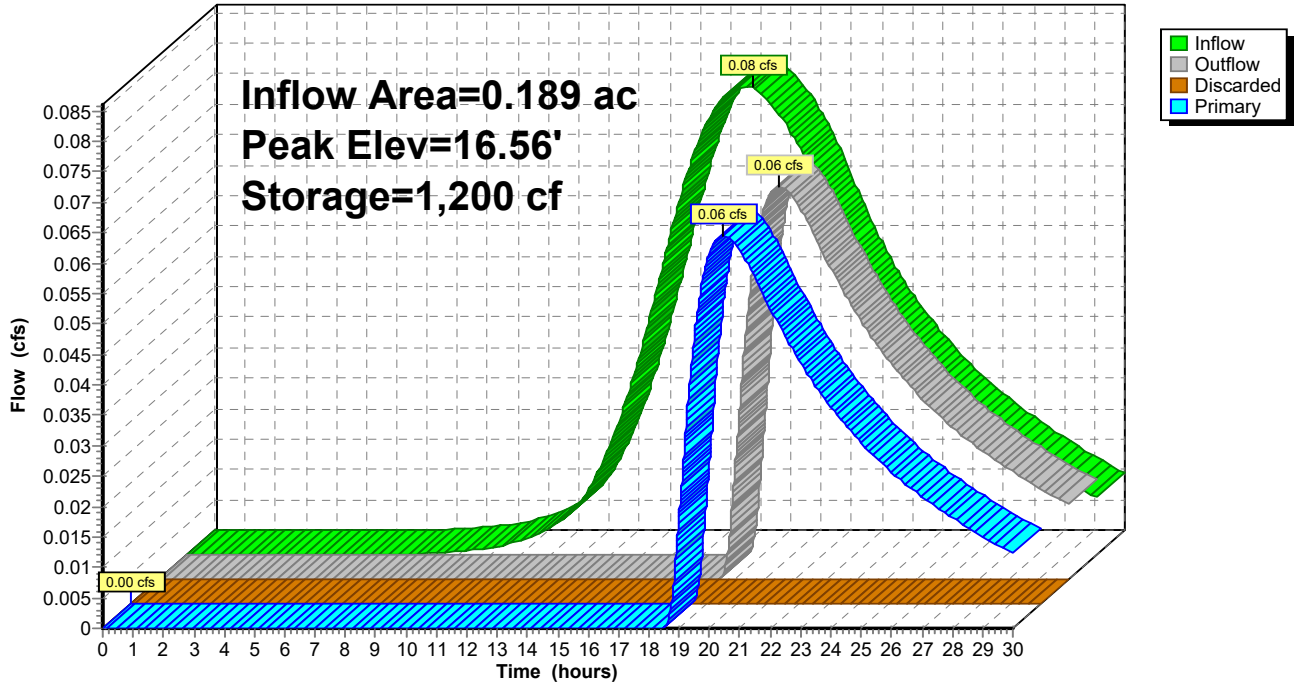
Type III 24-hr 10 yr Rainfall=4.90"

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Pond 4P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Summary for Pond 6P: LEVEL SPREADER

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 2.05" for 10 yr event
 Inflow = 0.06 cfs @ 20.45 hrs, Volume= 0.032 af
 Outflow = 0.06 cfs @ 20.73 hrs, Volume= 0.026 af, Atten= 1%, Lag= 16.8 min
 Discarded = 0.01 cfs @ 20.73 hrs, Volume= 0.005 af
 Primary = 0.06 cfs @ 20.73 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.27' @ 20.73 hrs Surf.Area= 691 sf Storage= 276 cf

Plug-Flow detention time= 112.7 min calculated for 0.026 af (81% of inflow)
 Center-of-Mass det. time= 48.3 min (1,436.3 - 1,388.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.75'	879 cf	Custom Stage Data (Conic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet) Wet.Area (sq-ft)
14.75	250	0	0 250
15.00	604	104	104 604
16.00	960	775	879 974

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.75'	0.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 13.00'
#2	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 20.73 hrs HW=15.27' (Free Discharge)
 ↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.06 cfs @ 20.73 hrs HW=15.27' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.06 cfs @ 0.35 fps)

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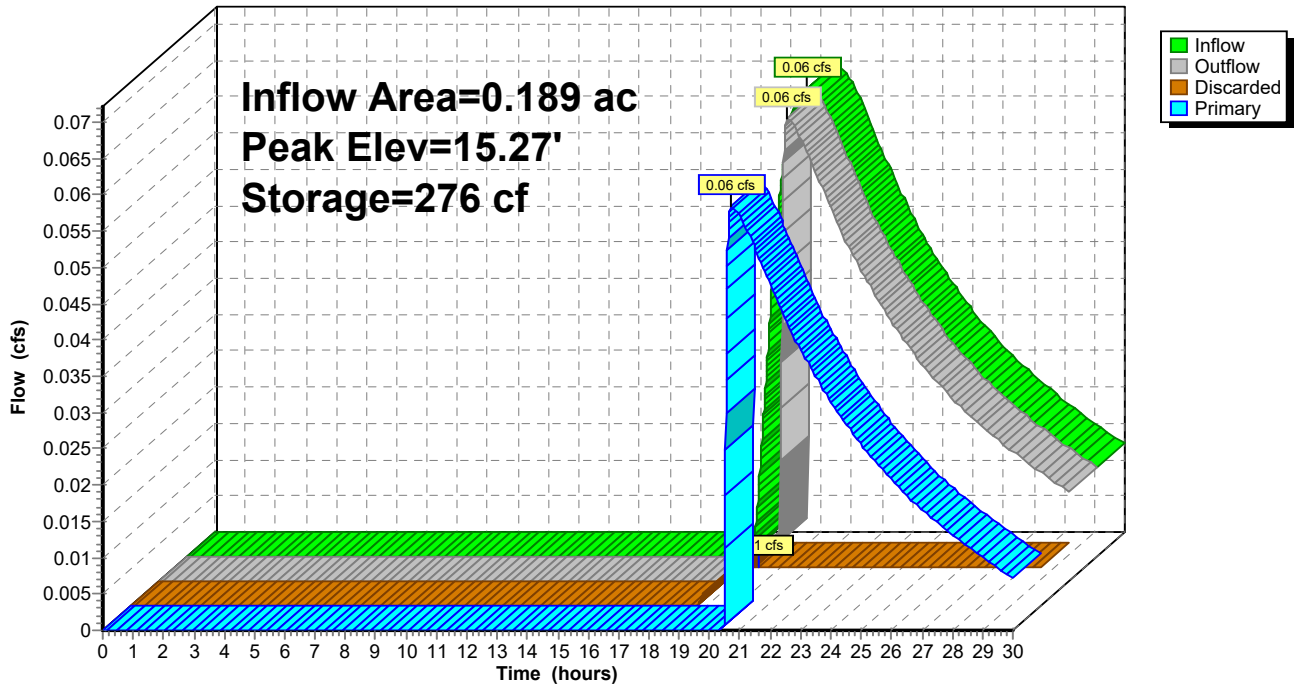
Type III 24-hr 10 yr Rainfall=4.90"

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Pond 6P: LEVEL SPREADER

Hydrograph



Proposed Hydrology

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Summary for Pond 8P: LEVEL SPREADER

[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.02'

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 2.63" for 10 yr event
 Inflow = 0.06 cfs @ 19.36 hrs, Volume= 0.036 af
 Outflow = 0.06 cfs @ 19.40 hrs, Volume= 0.033 af, Atten= 0%, Lag= 2.1 min
 Primary = 0.06 cfs @ 19.40 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.27' @ 19.40 hrs Surf.Area= 626 sf Storage= 156 cf

Plug-Flow detention time= 67.1 min calculated for 0.033 af (91% of inflow)
 Center-of-Mass det. time= 27.9 min (1,354.5 - 1,326.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	15.00'	709 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
15.00	542	0	0	542	
16.00	890	709	709	903	

Device	Routing	Invert	Outlet Devices				
#1	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
			Head (feet) 0.20 0.40 0.60 0.80 1.00				
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=0.06 cfs @ 19.40 hrs HW=15.27' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.06 cfs @ 0.36 fps)

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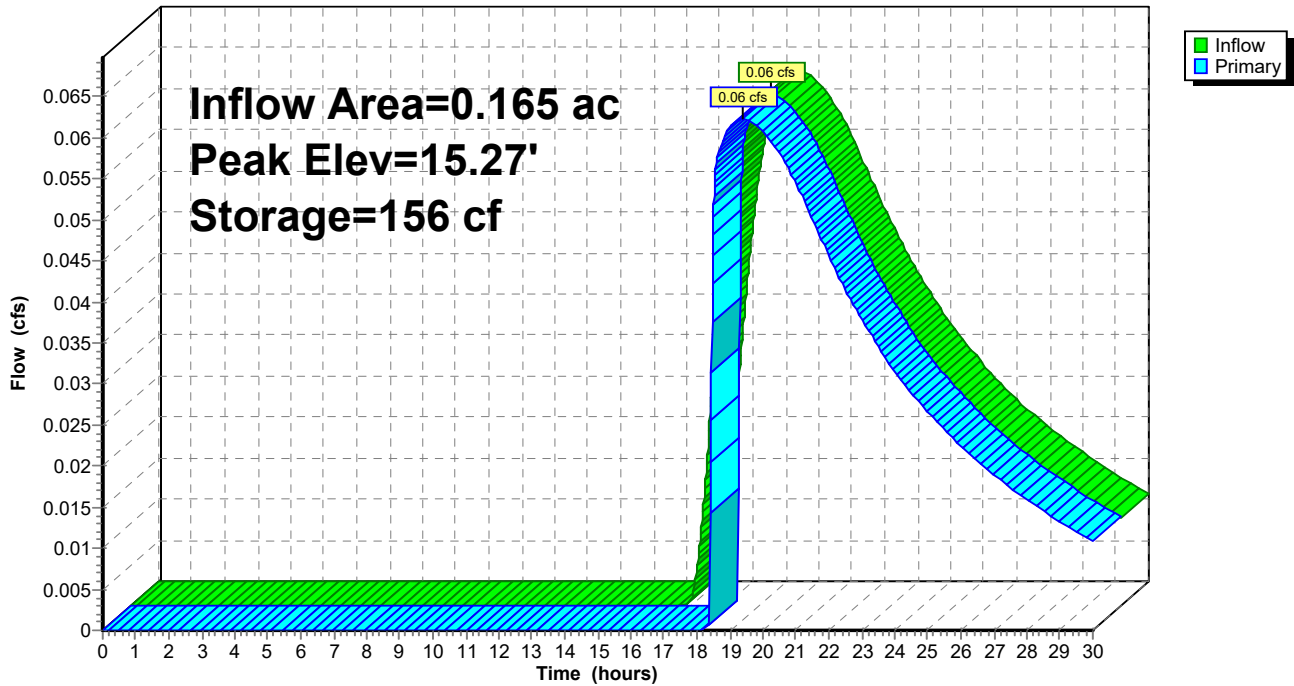
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Pond 8P: LEVEL SPREADER

Hydrograph



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Summary for Pond 9P: POROUS PAVEMENT

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 3.22" for 10 yr event
 Inflow = 0.05 cfs @ 18.66 hrs, Volume= 0.040 af
 Outflow = 0.05 cfs @ 18.95 hrs, Volume= 0.033 af, Atten= 1%, Lag= 17.5 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.05 cfs @ 18.95 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.14' @ 18.95 hrs Surf.Area= 3,344 sf Storage= 396 cf

Plug-Flow detention time= 168.7 min calculated for 0.033 af (83% of inflow)
 Center-of-Mass det. time= 89.3 min (1,302.3 - 1,213.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	1,003 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 3,344 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	3,344	0	0
16.75	3,344	3,344	3,344

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 108.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 14.75' S= 0.0116 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.75'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.05 cfs @ 18.95 hrs HW=16.14' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.05 cfs @ 1.14 fps)

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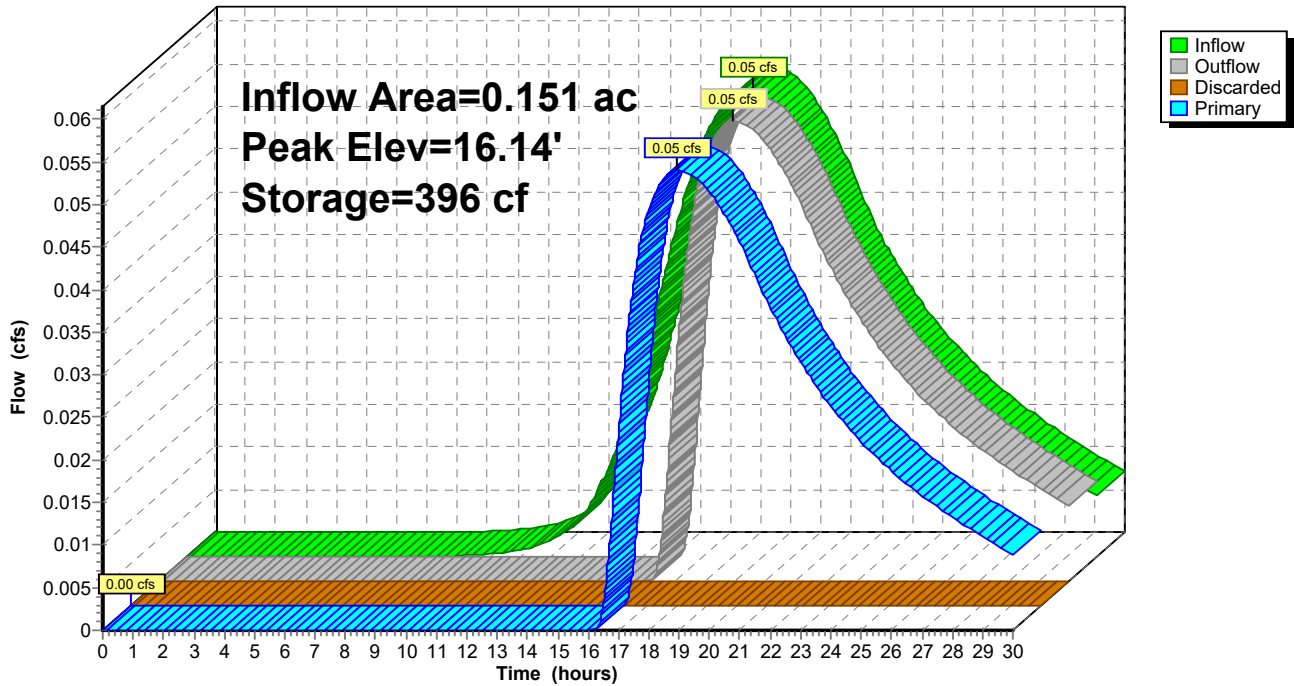
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Pond 9P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Summary for Pond 15P: POROUS PAVEMENT

Inflow Area = 0.250 ac, 39.68% Impervious, Inflow Depth > 3.03" for 10 yr event
 Inflow = 0.09 cfs @ 18.66 hrs, Volume= 0.063 af
 Outflow = 0.05 cfs @ 22.40 hrs, Volume= 0.062 af, Atten= 41%, Lag= 224.3 min
 Discarded = 0.05 cfs @ 22.40 hrs, Volume= 0.062 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.24' @ 22.40 hrs Surf.Area= 7,067 sf Storage= 610 cf

Plug-Flow detention time= 118.6 min calculated for 0.062 af (99% of inflow)
 Center-of-Mass det. time= 111.2 min (1,329.5 - 1,218.4)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	2,120 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,067 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	7,067	0	0
15.95	7,067	7,067	7,067

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.05 cfs @ 22.40 hrs HW=15.24' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.95' (Free Discharge)
 ↑**1=Culvert** (Controls 0.00 cfs)

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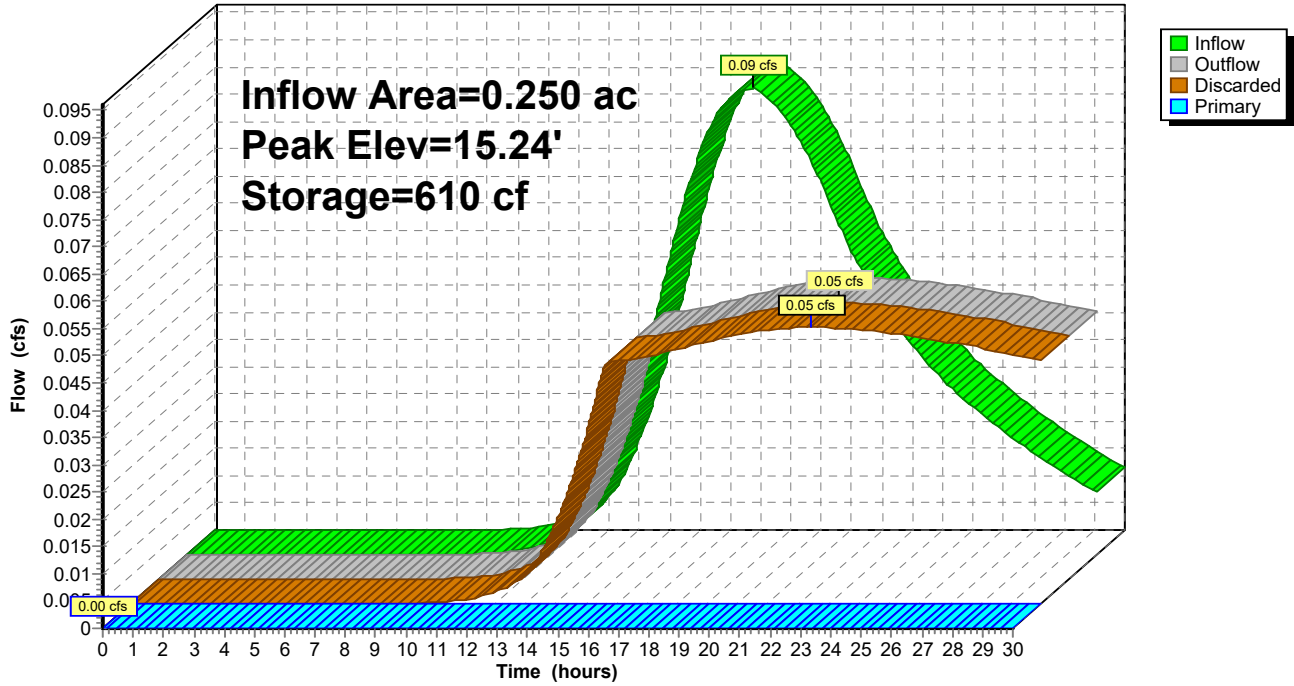
Type III 24-hr 10 yr Rainfall=4.90"

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Pond 15P: POROUS PAVEMENT

Hydrograph



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Summary for Pond DP1: Wetlands

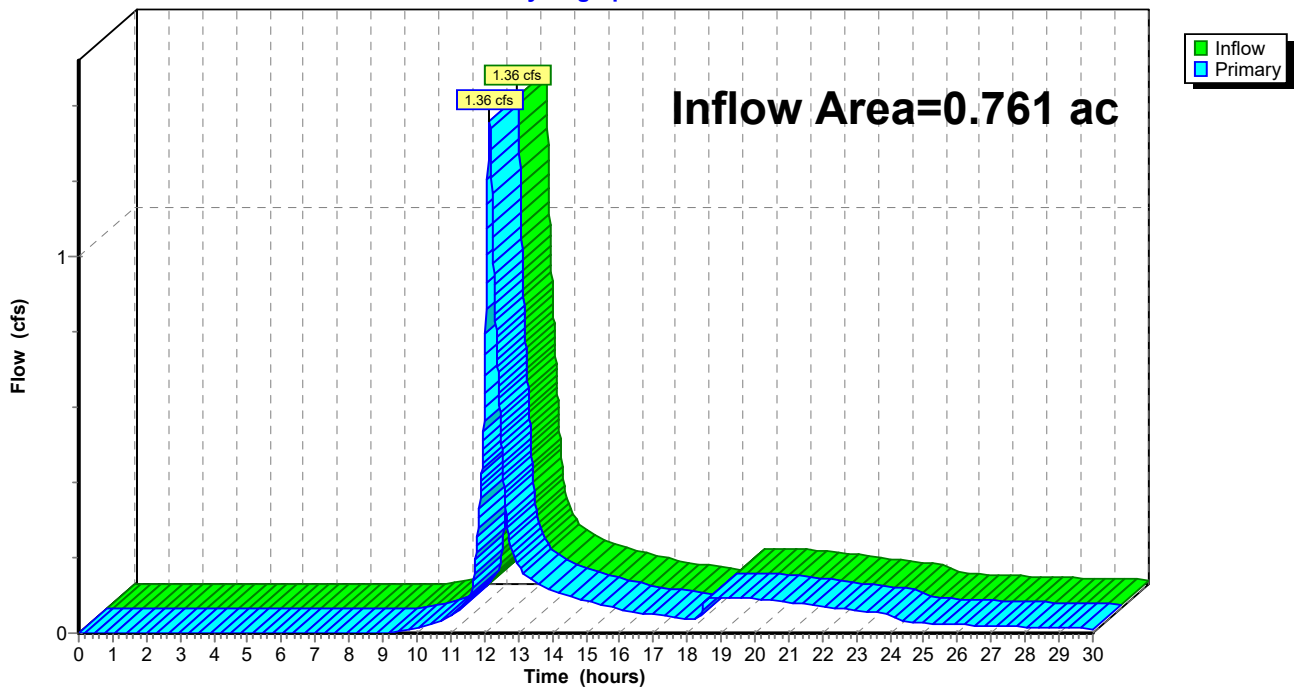
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.761 ac, 13.72% Impervious, Inflow Depth > 2.31" for 10 yr event
Inflow = 1.36 cfs @ 12.15 hrs, Volume= 0.146 af
Primary = 1.36 cfs @ 12.15 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP1: Wetlands

Hydrograph



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Summary for Pond DP2: Wetlands

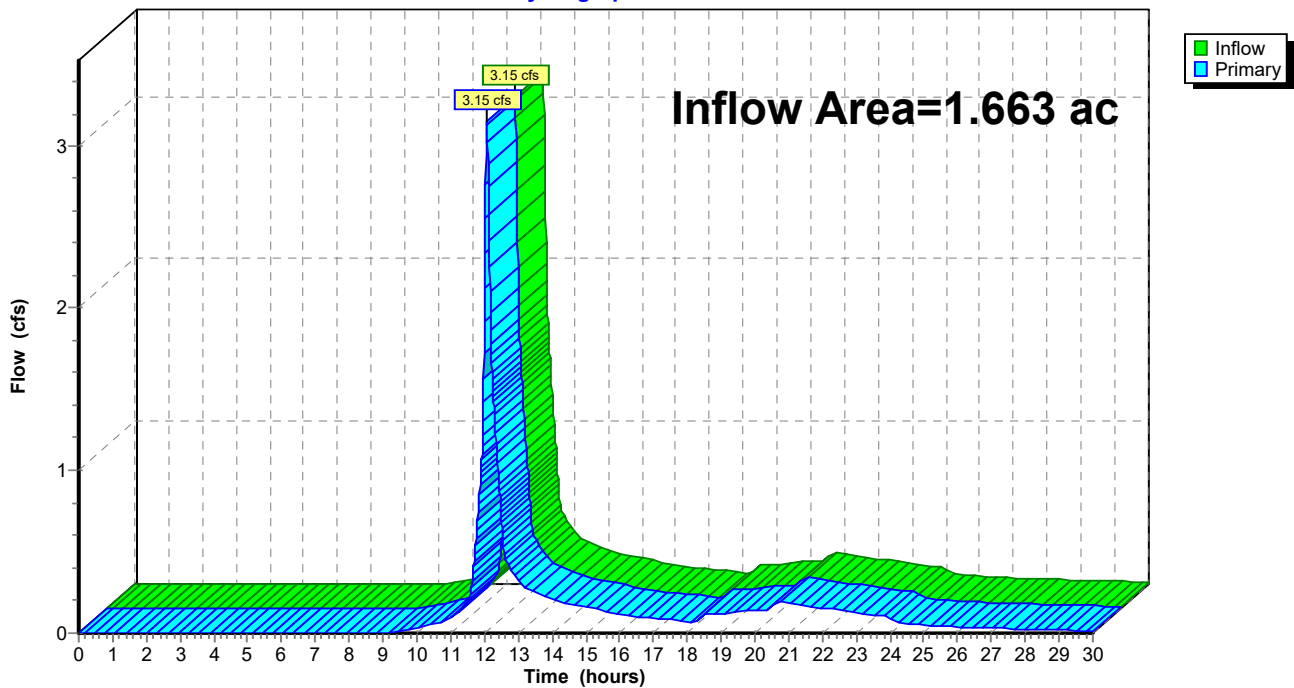
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.663 ac, 21.23% Impervious, Inflow Depth > 1.98" for 10 yr event
Inflow = 3.15 cfs @ 12.08 hrs, Volume= 0.274 af
Primary = 3.15 cfs @ 12.08 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP2: Wetlands

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.90"

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Summary for Pond DP3: IBEW DR S-M

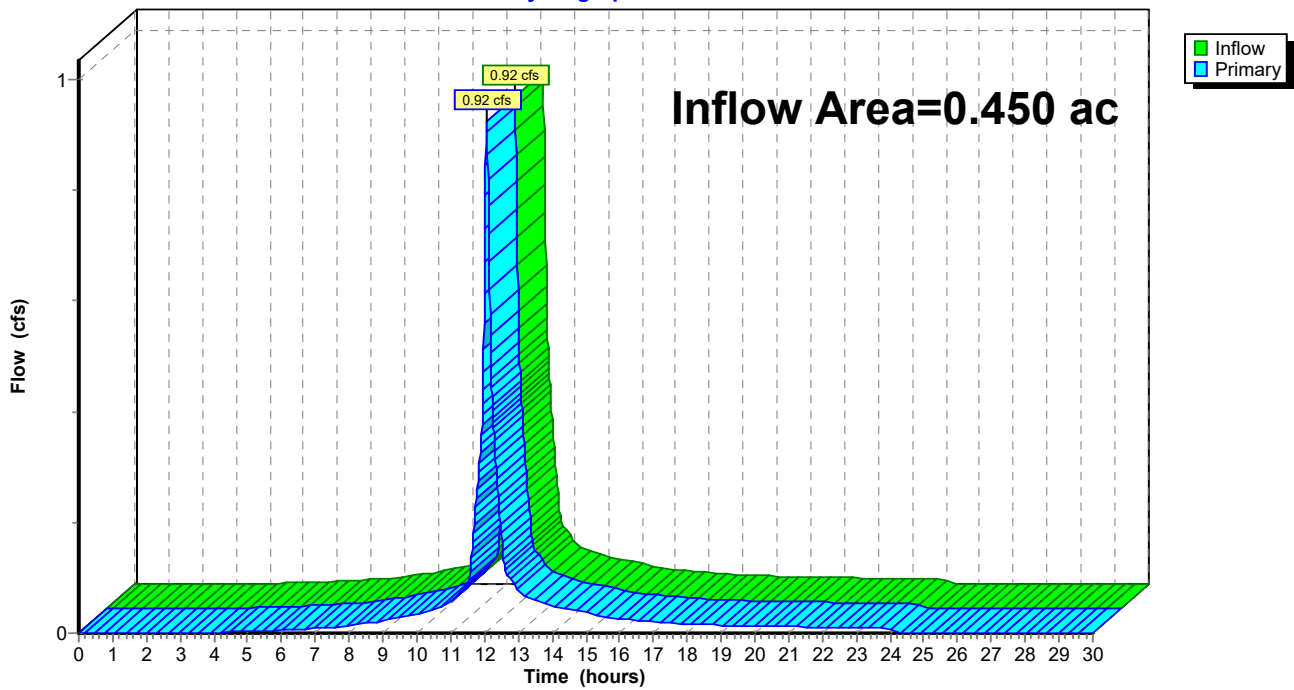
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.450 ac, 55.02% Impervious, Inflow Depth = 1.78" for 10 yr event
Inflow = 0.92 cfs @ 12.07 hrs, Volume= 0.067 af
Primary = 0.92 cfs @ 12.07 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP3: IBEW DR S-M

Hydrograph



Proposed Hydrology

Type III 24-hr 100 yr Rainfall=8.81"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR1: Pr Site	Runoff Area=49,602 sf 0.00% Impervious Runoff Depth=5.66" Tc=5.0 min CN=74 Runoff=7.79 cfs 0.537 af
SubcatchmentPR2: POROUS PAVEMENT	Runoff Area=10,879 sf 39.68% Impervious Runoff Depth>6.58" Tc=480.0 min CN=84 Runoff=0.18 cfs 0.137 af
SubcatchmentPR3: North Driveway	Runoff Area=6,564 sf 50.94% Impervious Runoff Depth>6.82" Tc=480.0 min CN=86 Runoff=0.11 cfs 0.086 af
SubcatchmentPR4: Parking 1 North	Runoff Area=8,250 sf 65.64% Impervious Runoff Depth>7.30" Tc=480.0 min CN=90 Runoff=0.15 cfs 0.115 af
SubcatchmentPR5: Parking 2 North	Runoff Area=7,185 sf 63.26% Impervious Runoff Depth>7.18" Tc=480.0 min CN=89 Runoff=0.13 cfs 0.099 af
SubcatchmentPR6: To off Site Drainage	Runoff Area=8,722 sf 74.16% Impervious Runoff Depth=7.85" Tc=5.0 min CN=92 Runoff=1.75 cfs 0.131 af
SubcatchmentPR7: POROUS PAVEMENT	Runoff Area=8,043 sf 82.33% Impervious Runoff Depth>7.78" Tc=480.0 min CN=94 Runoff=0.16 cfs 0.120 af
SubcatchmentPR8: Pr Site	Runoff Area=25,943 sf 0.00% Impervious Runoff Depth=5.66" Flow Length=50' Slope=0.0300 '/' Tc=10.6 min CN=74 Runoff=3.37 cfs 0.281 af
Pond 1P: POROUS PAVEMENT	Peak Elev=16.23' Storage=760 cf Inflow=0.13 cfs 0.099 af Discarded=0.00 cfs 0.000 af Primary=0.13 cfs 0.086 af Outflow=0.13 cfs 0.086 af
Pond 2P: LEVEL SPREADER	Peak Elev=14.77' Storage=214 cf Inflow=0.11 cfs 0.078 af Discarded=0.00 cfs 0.004 af Primary=0.11 cfs 0.069 af Outflow=0.11 cfs 0.073 af
Pond 3P: POROUS PAVEMENT	Peak Elev=15.70' Storage=874 cf Inflow=0.16 cfs 0.120 af Discarded=0.03 cfs 0.049 af Primary=0.12 cfs 0.058 af Outflow=0.15 cfs 0.106 af
Pond 4P: POROUS PAVEMENT	Peak Elev=16.65' Storage=1,327 cf Inflow=0.15 cfs 0.115 af Discarded=0.00 cfs 0.000 af Primary=0.15 cfs 0.090 af Outflow=0.15 cfs 0.090 af
Pond 6P: LEVEL SPREADER	Peak Elev=15.28' Storage=285 cf Inflow=0.15 cfs 0.090 af Discarded=0.01 cfs 0.006 af Primary=0.15 cfs 0.078 af Outflow=0.15 cfs 0.084 af
Pond 8P: LEVEL SPREADER	Peak Elev=15.28' Storage=163 cf Inflow=0.13 cfs 0.086 af Outflow=0.13 cfs 0.082 af
Pond 9P: POROUS PAVEMENT	Peak Elev=16.22' Storage=468 cf Inflow=0.11 cfs 0.086 af Discarded=0.00 cfs 0.000 af Primary=0.11 cfs 0.078 af Outflow=0.11 cfs 0.078 af
Pond 15P: POROUS PAVEMENT	Peak Elev=15.66' Storage=1,496 cf Inflow=0.18 cfs 0.137 af Discarded=0.06 cfs 0.078 af Primary=0.10 cfs 0.038 af Outflow=0.16 cfs 0.116 af

Proposed Hydrology

Type III 24-hr 100 yr Rainfall=8.81"

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Pond DP1: Wetlands

Inflow=3.37 cfs 0.363 af
Primary=3.37 cfs 0.363 af

Pond DP2: Wetlands

Inflow=7.79 cfs 0.742 af
Primary=7.79 cfs 0.742 af

Pond DP3: IBEW DR S-M

Inflow=1.75 cfs 0.169 af
Primary=1.75 cfs 0.169 af

Total Runoff Area = 2.874 ac Runoff Volume = 1.504 af Average Runoff Depth = 6.28"
75.47% Pervious = 2.169 ac 24.53% Impervious = 0.705 ac

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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Subcatchment PR1: Pr Site

Runoff = 7.79 cfs @ 12.07 hrs, Volume= 0.537 af, Depth= 5.66"

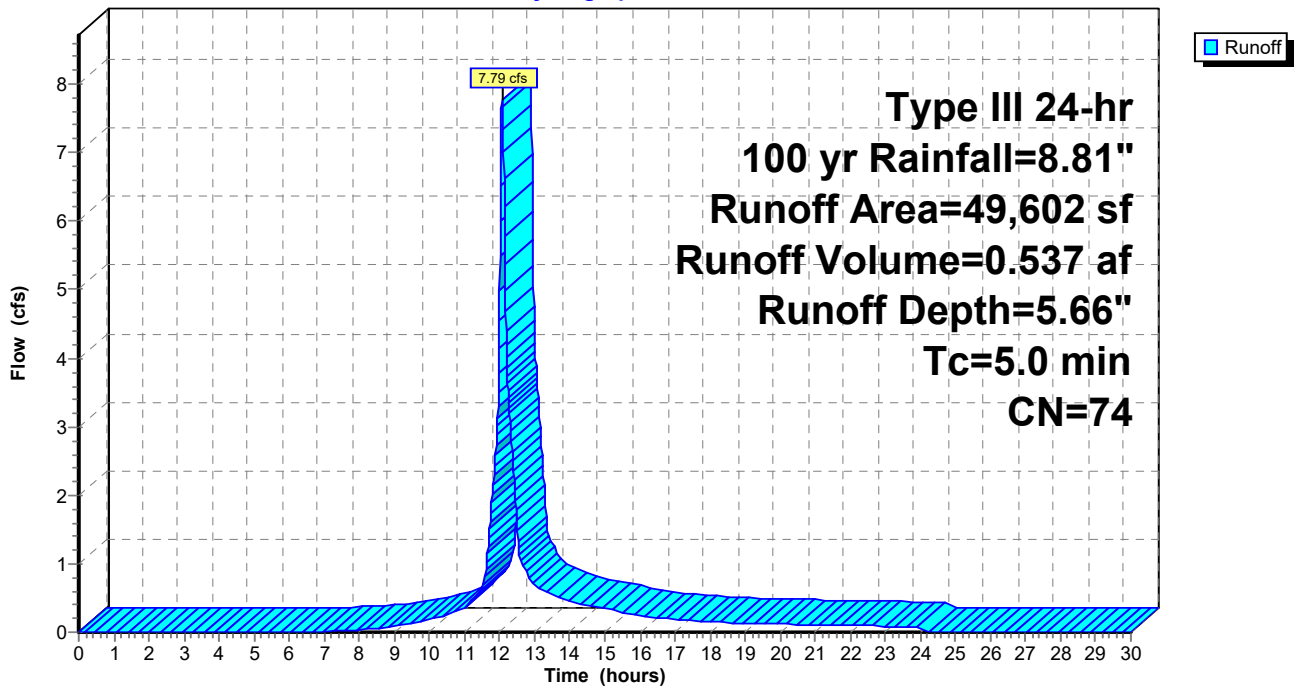
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
49,602	74	>75% Grass cover, Good, HSG C
49,602		100.00% Pervious Area

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

Subcatchment PR1: Pr Site

Hydrograph



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Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Subcatchment PR2: POROUS PAVEMENT

Runoff = 0.18 cfs @ 18.66 hrs, Volume= 0.137 af, Depth> 6.58"

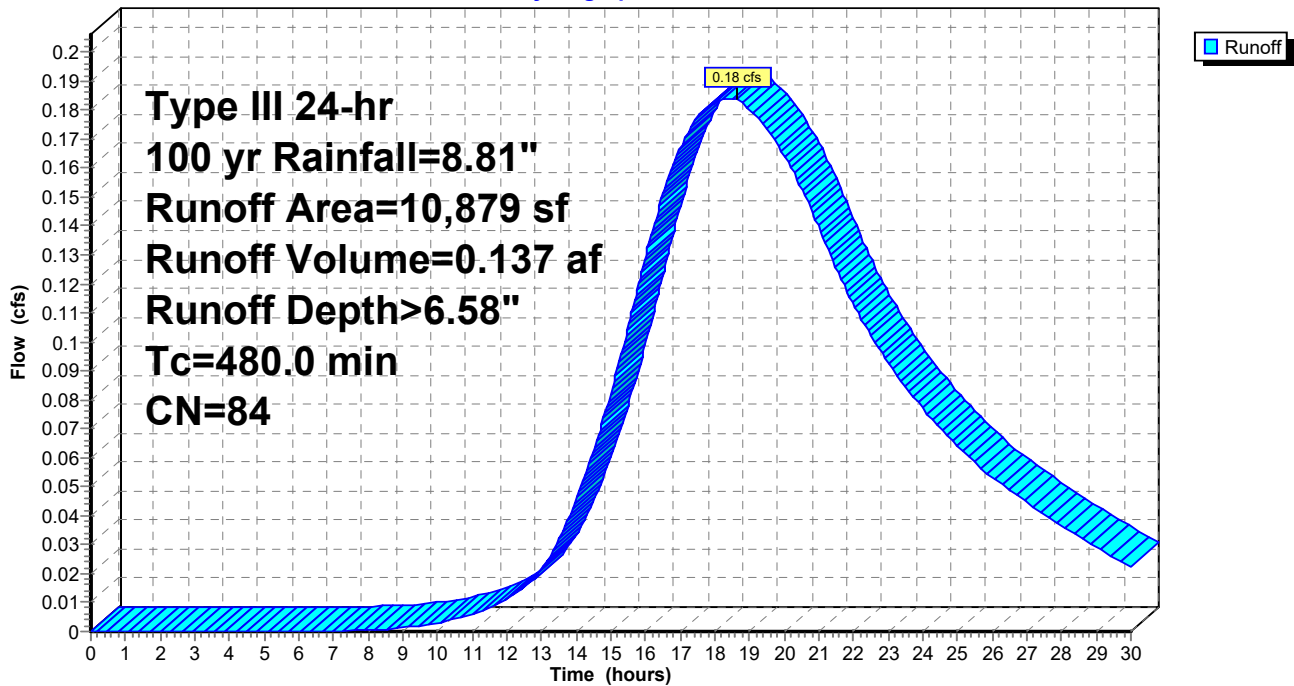
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
4,317	98	Paved parking, HSG C
6,562	74	>75% Grass cover, Good, HSG C
10,879	84	Weighted Average
6,562		60.32% Pervious Area
4,317		39.68% Impervious Area

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

Subcatchment PR2: POROUS PAVEMENT

Hydrograph



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Summary for Subcatchment PR3: North Driveway

Runoff = 0.11 cfs @ 18.66 hrs, Volume= 0.086 af, Depth> 6.82"

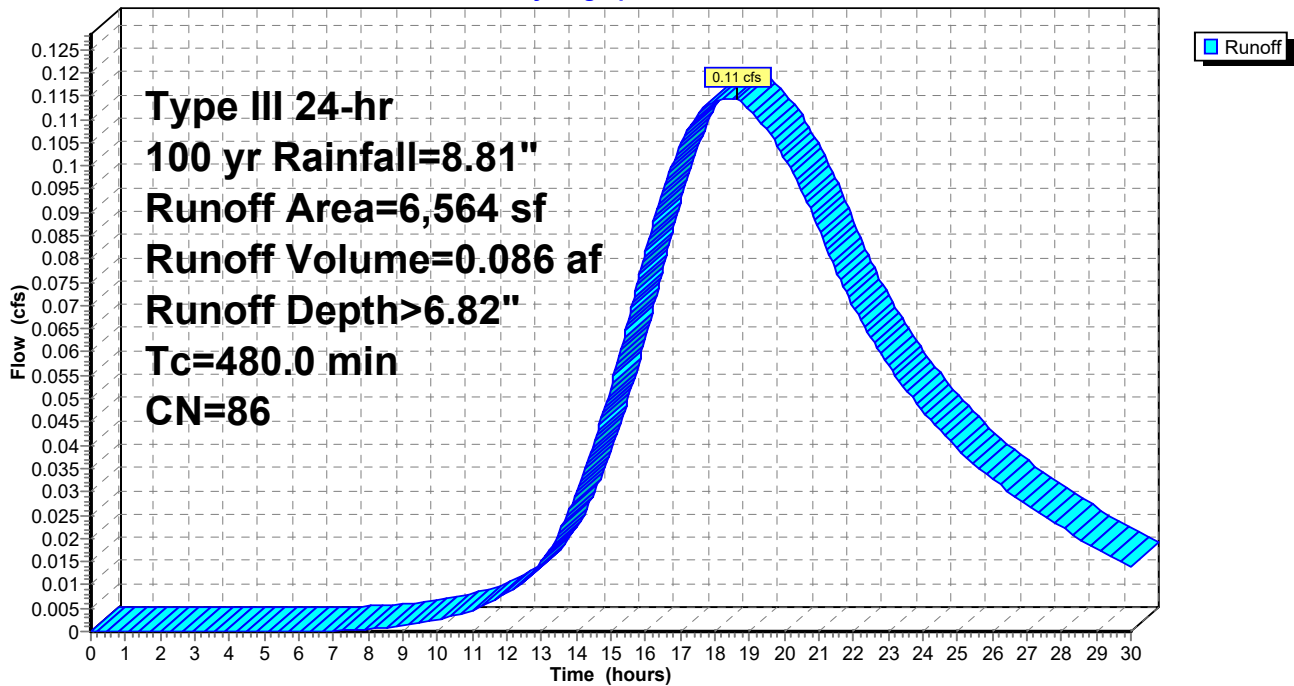
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG C
3,220	74	>75% Grass cover, Good, HSG C
6,564	86	Weighted Average
3,220		49.06% Pervious Area
3,344		50.94% Impervious Area

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

Subcatchment PR3: North Driveway

Hydrograph



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Summary for Subcatchment PR4: Parking 1 North

Runoff = 0.15 cfs @ 18.14 hrs, Volume= 0.115 af, Depth> 7.30"

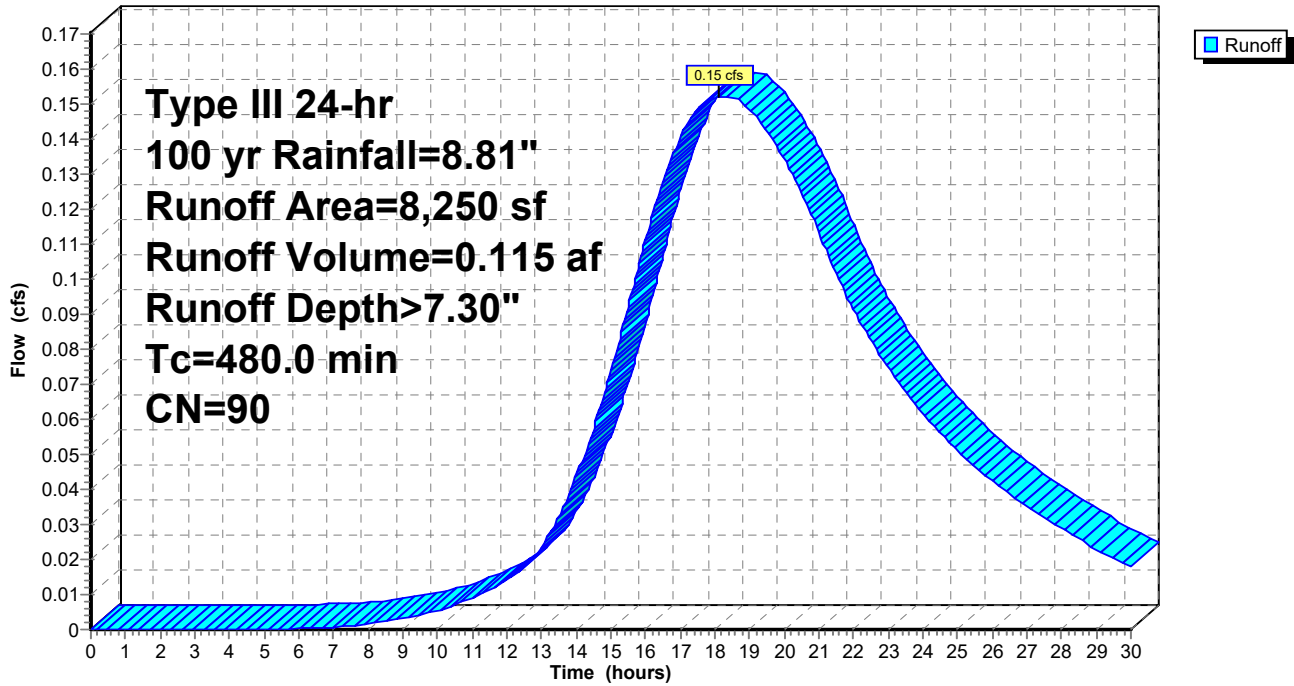
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
5,415	98	Paved parking, HSG C
2,835	74	>75% Grass cover, Good, HSG C
8,250	90	Weighted Average
2,835		34.36% Pervious Area
5,415		65.64% Impervious Area

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

Subcatchment PR4: Parking 1 North

Hydrograph



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Summary for Subcatchment PR5: Parking 2 North

Runoff = 0.13 cfs @ 18.14 hrs, Volume= 0.099 af, Depth> 7.18"

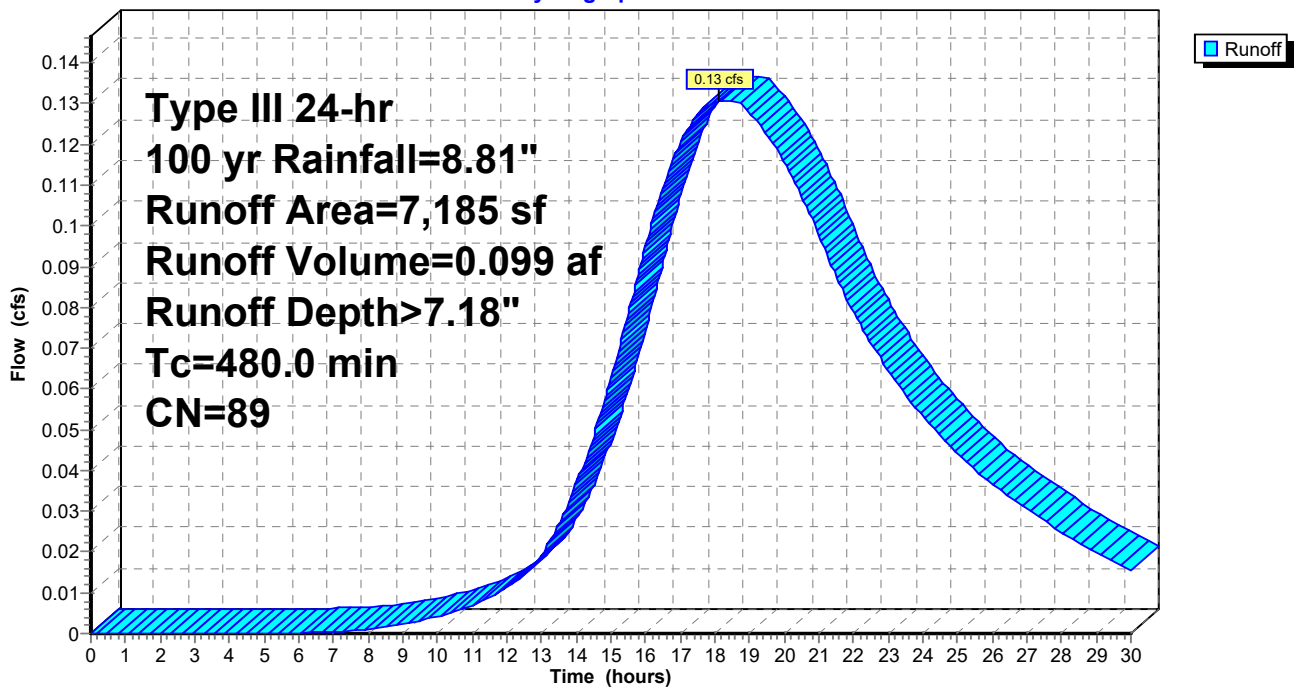
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
4,545	98	Paved parking, HSG C
2,640	74	>75% Grass cover, Good, HSG C
7,185	89	Weighted Average
2,640		36.74% Pervious Area
4,545		63.26% Impervious Area

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

Subcatchment PR5: Parking 2 North

Hydrograph



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Summary for Subcatchment PR6: To off Site Drainage POST

Runoff = 1.75 cfs @ 12.07 hrs, Volume= 0.131 af, Depth= 7.85"

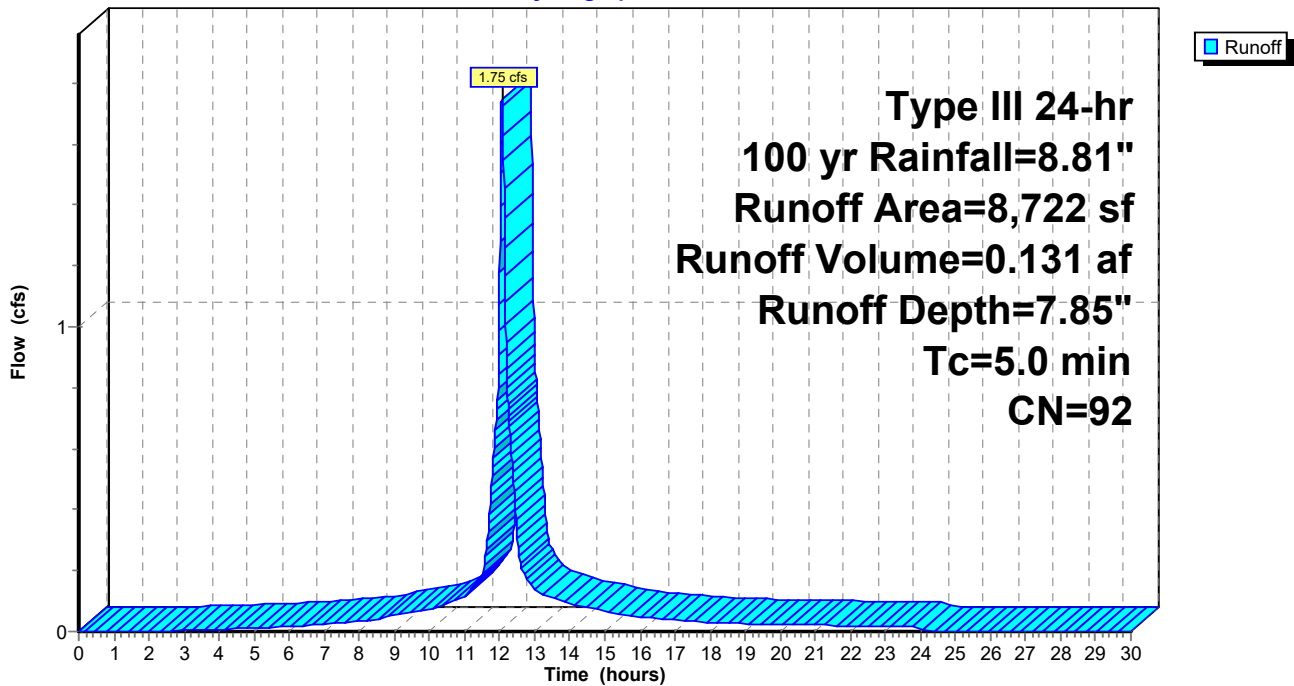
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
6,468	98	Paved parking, HSG C
2,254	74	>75% Grass cover, Good, HSG C
8,722	92	Weighted Average
2,254		25.84% Pervious Area
6,468		74.16% Impervious Area

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

Subcatchment PR6: To off Site Drainage POST

Hydrograph



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Summary for Subcatchment PR7: POROUS PAVEMENT

Runoff = 0.16 cfs @ 18.14 hrs, Volume= 0.120 af, Depth> 7.78"

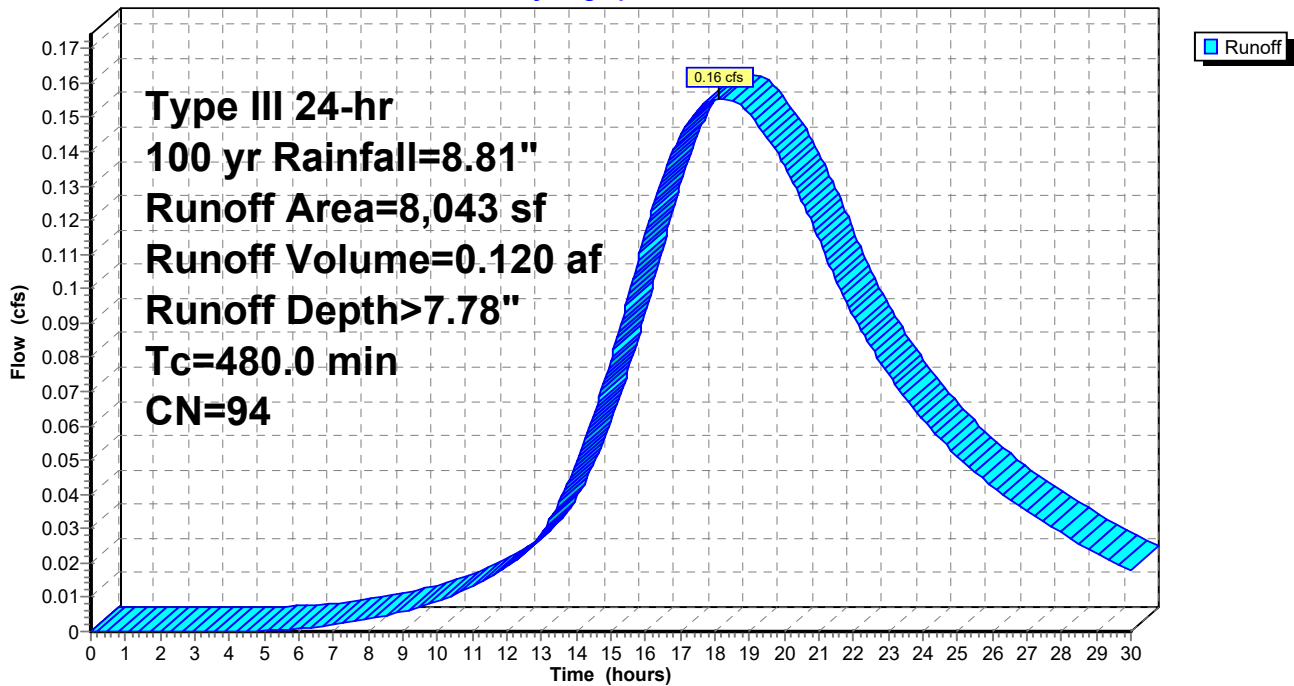
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
6,622	98	Paved parking, HSG C
1,421	74	>75% Grass cover, Good, HSG C
8,043	94	Weighted Average
1,421		17.67% Pervious Area
6,622		82.33% Impervious Area

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

Subcatchment PR7: POROUS PAVEMENT

Hydrograph



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Summary for Subcatchment PR8: Pr Site

Runoff = 3.37 cfs @ 12.14 hrs, Volume= 0.281 af, Depth= 5.66"

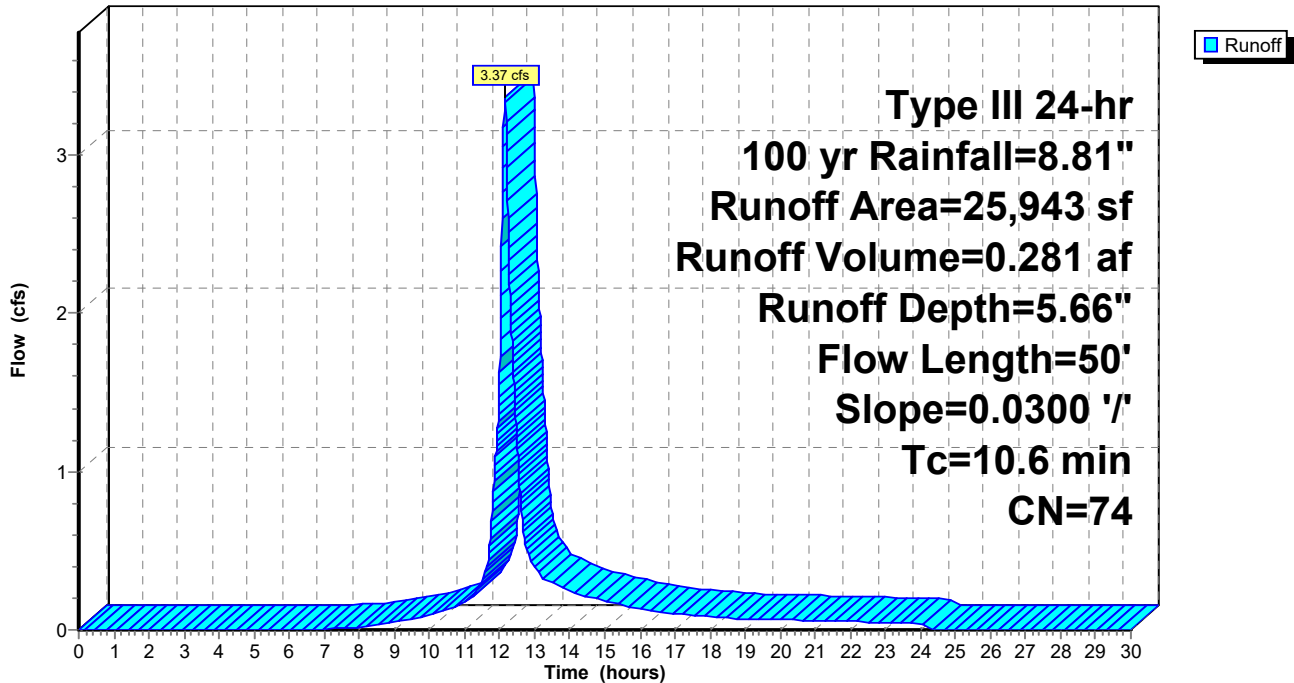
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=8.81"

Area (sf)	CN	Description
25,943	74	>75% Grass cover, Good, HSG C
25,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		Sheet Flow, Grass: Bermuda n= 0.410 P2= 3.26"

Subcatchment PR8: Pr Site

Hydrograph



Proposed Hydrology

Type III 24-hr 100 yr Rainfall=8.81"

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Summary for Pond 1P: POROUS PAVEMENT

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 7.18" for 100 yr event
 Inflow = 0.13 cfs @ 18.14 hrs, Volume= 0.099 af
 Outflow = 0.13 cfs @ 18.73 hrs, Volume= 0.086 af, Atten= 1%, Lag= 35.1 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.13 cfs @ 18.73 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.23' @ 18.73 hrs Surf.Area= 4,500 sf Storage= 760 cf

Plug-Flow detention time= 141.4 min calculated for 0.086 af (87% of inflow)
 Center-of-Mass det. time= 77.7 min (1,264.4 - 1,186.7)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 15.25' S= 0.0094 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.13 cfs @ 18.73 hrs HW=16.23' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.13 cfs @ 1.45 fps)

Proposed Hydrology

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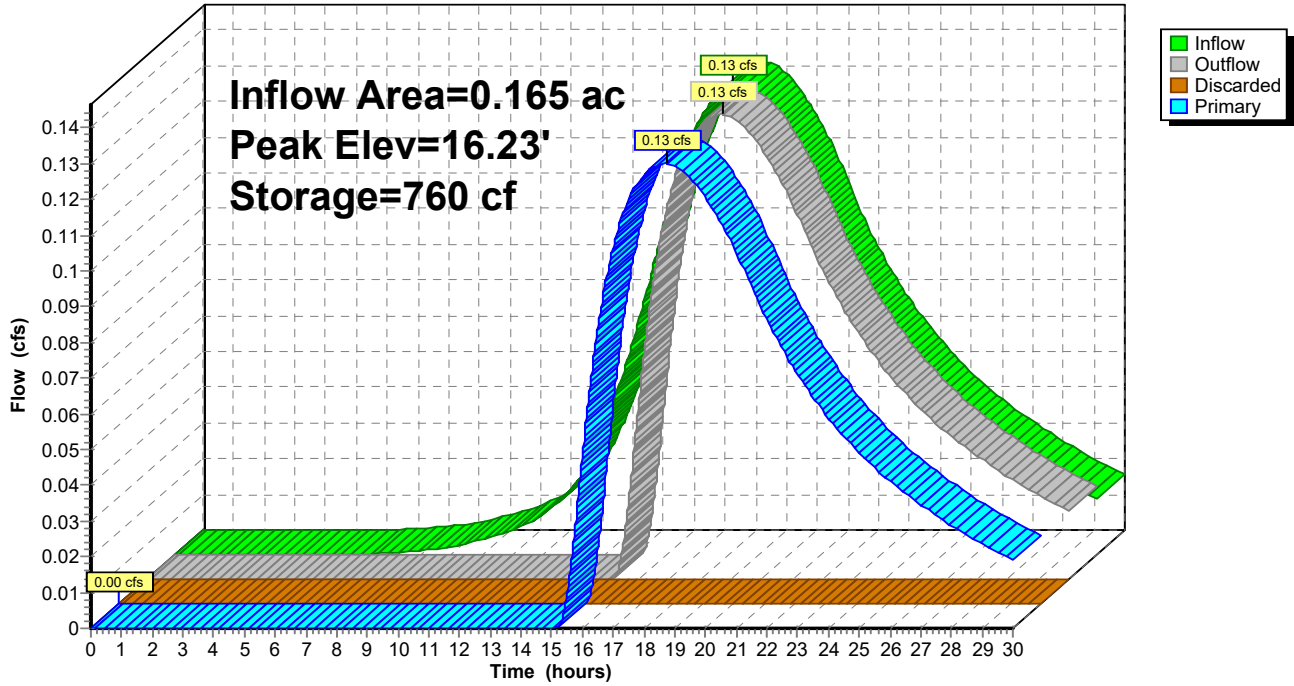
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Pond 1P: POROUS PAVEMENT

Hydrograph



Proposed Hydrology

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Summary for Pond 2P: LEVEL SPREADER

[79] Warning: Submerged Pond 9P Primary device # 1 OUTLET by 0.02'

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 6.22" for 100 yr event
 Inflow = 0.11 cfs @ 18.71 hrs, Volume= 0.078 af
 Outflow = 0.11 cfs @ 18.72 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.8 min
 Discarded = 0.00 cfs @ 18.72 hrs, Volume= 0.004 af
 Primary = 0.11 cfs @ 18.72 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.77' @ 18.72 hrs Surf.Area= 328 sf Storage= 214 cf

Plug-Flow detention time= 50.8 min calculated for 0.073 af (94% of inflow)
 Center-of-Mass det. time= 20.6 min (1,271.5 - 1,250.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	14.00'	294 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
14.00	230	0	0	230	
14.75	323	206	206	333	
15.00	375	87	294	387	

Device	Routing	Invert	Outlet Devices				
#1	Primary	14.75'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
			Head (feet) 0.20 0.40 0.60 0.80 1.00				
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				
#2	Discarded	14.00'	0.270 in/hr Exfiltration over Wetted area				
			Conductivity to Groundwater Elevation = 13.00'				

Discarded OutFlow Max=0.00 cfs @ 18.72 hrs HW=14.77' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.11 cfs @ 18.72 hrs HW=14.77' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 0.11 cfs @ 0.44 fps)

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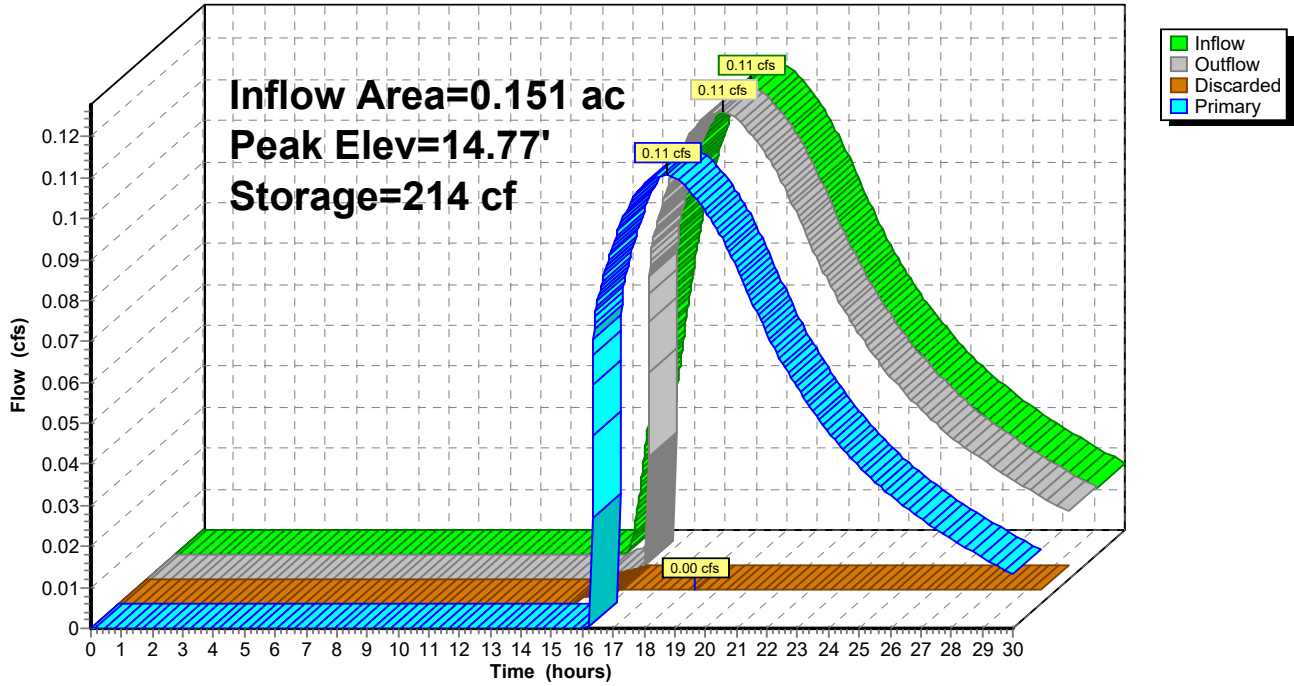
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Pond 2P: LEVEL SPREADER

Hydrograph



Proposed Hydrology

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Summary for Pond 3P: POROUS PAVEMENT

Inflow Area = 0.185 ac, 82.33% Impervious, Inflow Depth > 7.78" for 100 yr event
 Inflow = 0.16 cfs @ 18.14 hrs, Volume= 0.120 af
 Outflow = 0.15 cfs @ 18.73 hrs, Volume= 0.106 af, Atten= 1%, Lag= 35.8 min
 Discarded = 0.03 cfs @ 18.73 hrs, Volume= 0.049 af
 Primary = 0.12 cfs @ 18.73 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.70' @ 18.73 hrs Surf.Area= 3,872 sf Storage= 874 cf

Plug-Flow detention time= 119.5 min calculated for 0.106 af (89% of inflow)
 Center-of-Mass det. time= 62.9 min (1,233.5 - 1,170.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	1,220 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,066 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	3,872	0	0
16.00	3,872	4,066	4,066

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.03 cfs @ 18.73 hrs HW=15.70' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.12 cfs @ 18.73 hrs HW=15.70' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.12 cfs @ 1.77 fps)

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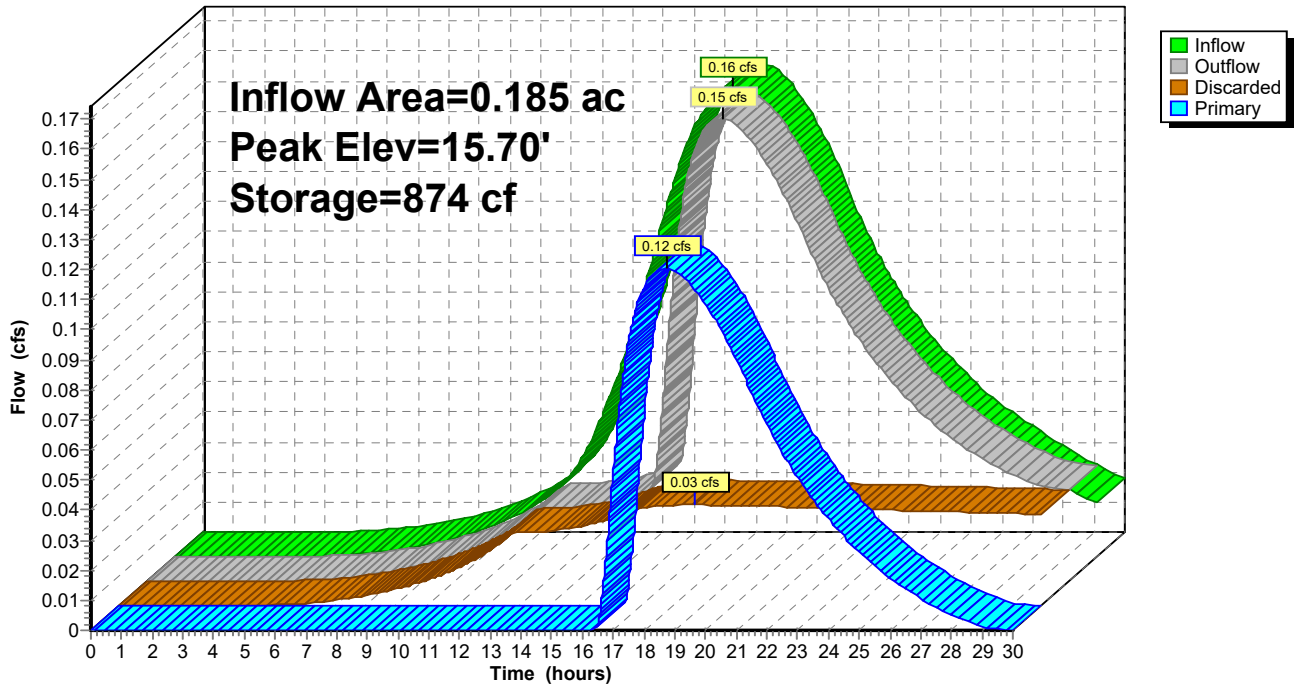
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Pond 3P: POROUS PAVEMENT

Hydrograph



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Summary for Pond 4P: POROUS PAVEMENT

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 7.30" for 100 yr event
 Inflow = 0.15 cfs @ 18.14 hrs, Volume= 0.115 af
 Outflow = 0.15 cfs @ 18.76 hrs, Volume= 0.090 af, Atten= 1%, Lag= 37.3 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.15 cfs @ 18.76 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.65' @ 18.76 hrs Surf.Area= 4,500 sf Storage= 1,327 cf

Plug-Flow detention time= 207.0 min calculated for 0.090 af (78% of inflow)
 Center-of-Mass det. time= 108.3 min (1,292.2 - 1,183.8)

Volume	Invert	Avail.Storage	Storage Description
#1	15.67'	1,350 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 4,500 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.67	4,500	0	0
16.67	4,500	4,500	4,500

Device	Routing	Invert	Outlet Devices
#1	Primary	16.40'	6.0" Round Culvert L= 80.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.40' / 15.50' S= 0.0112 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.67'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.67' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 18.76 hrs HW=16.65' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.15 cfs @ 1.51 fps)

Proposed Hydrology

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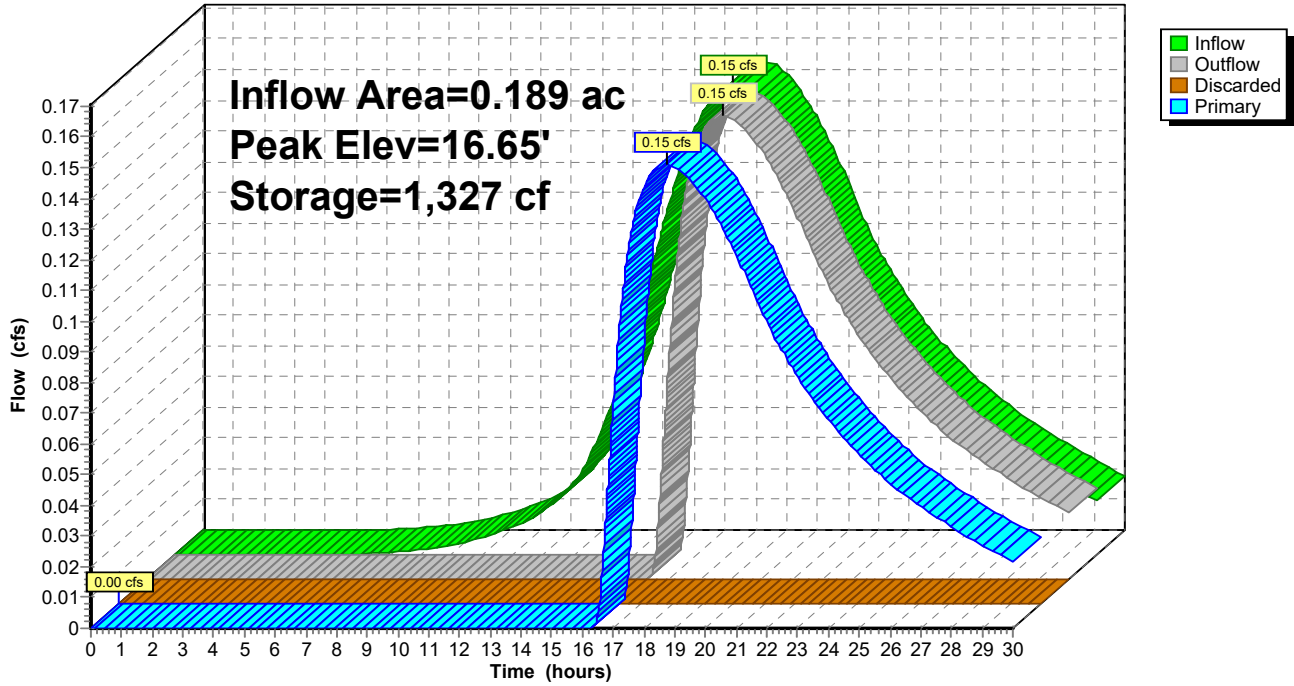
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Pond 4P: POROUS PAVEMENT

Hydrograph



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Summary for Pond 6P: LEVEL SPREADER

Inflow Area = 0.189 ac, 65.64% Impervious, Inflow Depth > 5.69" for 100 yr event
 Inflow = 0.15 cfs @ 18.76 hrs, Volume= 0.090 af
 Outflow = 0.15 cfs @ 18.79 hrs, Volume= 0.084 af, Atten= 0%, Lag= 1.6 min
 Discarded = 0.01 cfs @ 18.79 hrs, Volume= 0.006 af
 Primary = 0.15 cfs @ 18.79 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.28' @ 18.79 hrs Surf.Area= 695 sf Storage= 285 cf

Plug-Flow detention time= 52.2 min calculated for 0.084 af (93% of inflow)
 Center-of-Mass det. time= 21.0 min (1,313.1 - 1,292.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	14.75'	879 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
14.75	250	0	0	250	
15.00	604	104	104	604	
16.00	960	775	879	974	

Device	Routing	Invert	Outlet Devices				
#1	Discarded	14.75'	0.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 13.00'				
#2	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Discarded OutFlow Max=0.01 cfs @ 18.79 hrs HW=15.28' (Free Discharge)
 ↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.14 cfs @ 18.79 hrs HW=15.28' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.48 fps)

Proposed Hydrology

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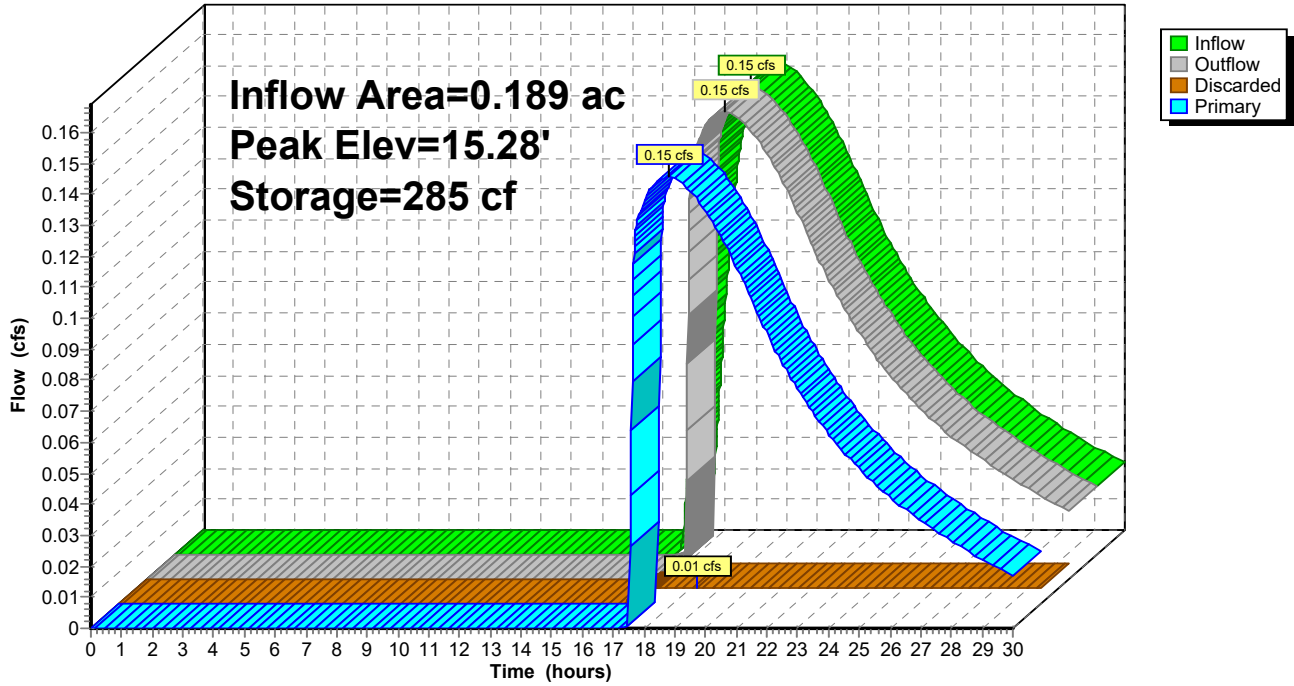
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Pond 6P: LEVEL SPREADER

Hydrograph



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Summary for Pond 8P: LEVEL SPREADER

[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.03'

Inflow Area = 0.165 ac, 63.26% Impervious, Inflow Depth > 6.24" for 100 yr event
 Inflow = 0.13 cfs @ 18.73 hrs, Volume= 0.086 af
 Outflow = 0.13 cfs @ 18.76 hrs, Volume= 0.082 af, Atten= 0%, Lag= 1.6 min
 Primary = 0.13 cfs @ 18.76 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.28' @ 18.76 hrs Surf.Area= 630 sf Storage= 163 cf

Plug-Flow detention time= 34.0 min calculated for 0.082 af (96% of inflow)
 Center-of-Mass det. time= 14.1 min (1,278.5 - 1,264.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	15.00'	709 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
15.00	542	0	0	542	
16.00	890	709	709	903	

Device	Routing	Invert	Outlet Devices				
#1	Primary	15.25'	10.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
			Head (feet) 0.20 0.40 0.60 0.80 1.00				
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=0.13 cfs @ 18.76 hrs HW=15.28' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.13 cfs @ 0.47 fps)

Proposed Hydrology

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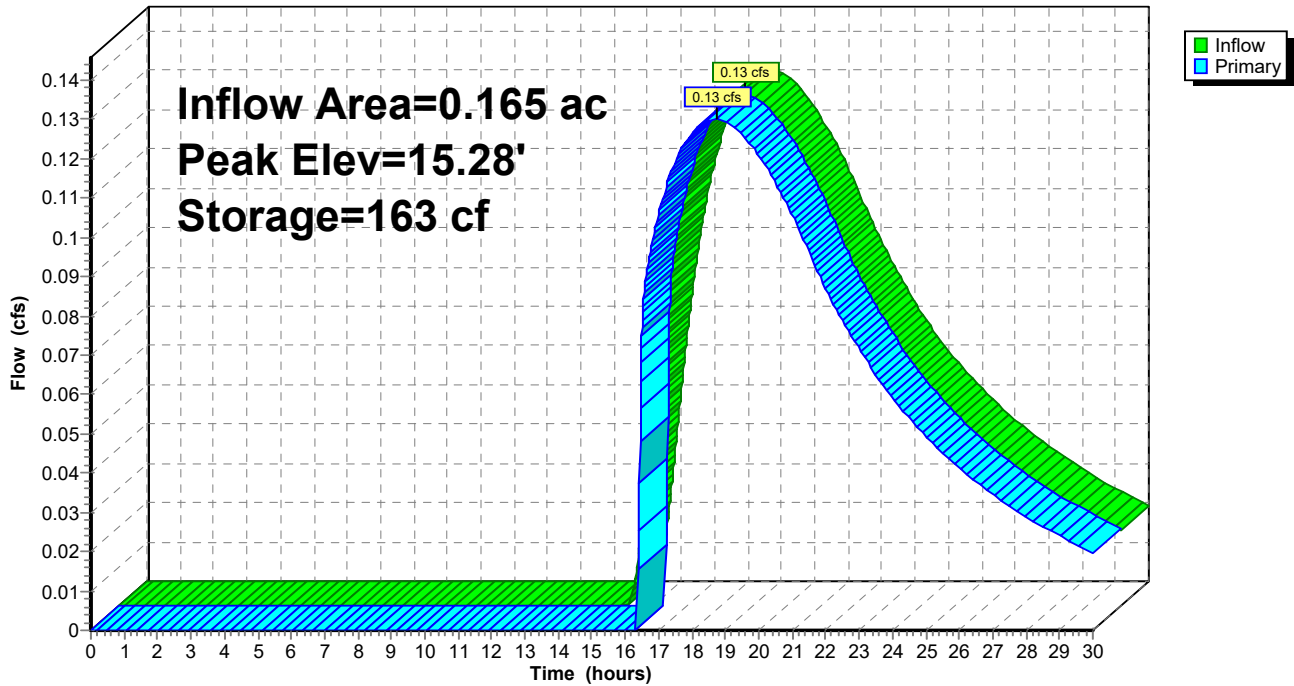
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Pond 8P: LEVEL SPREADER

Hydrograph



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Summary for Pond 9P: POROUS PAVEMENT

Inflow Area = 0.151 ac, 50.94% Impervious, Inflow Depth > 6.82" for 100 yr event
 Inflow = 0.11 cfs @ 18.66 hrs, Volume= 0.086 af
 Outflow = 0.11 cfs @ 18.71 hrs, Volume= 0.078 af, Atten= 0%, Lag= 3.3 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.11 cfs @ 18.71 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.22' @ 18.71 hrs Surf.Area= 3,344 sf Storage= 468 cf

Plug-Flow detention time= 101.6 min calculated for 0.078 af (91% of inflow)
 Center-of-Mass det. time= 56.4 min (1,250.9 - 1,194.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	1,003 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 3,344 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	3,344	0	0
16.75	3,344	3,344	3,344

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	6.0" Round Culvert L= 108.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 16.00' / 14.75' S= 0.0116 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	15.75'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.11 cfs @ 18.71 hrs HW=16.22' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.40 fps)

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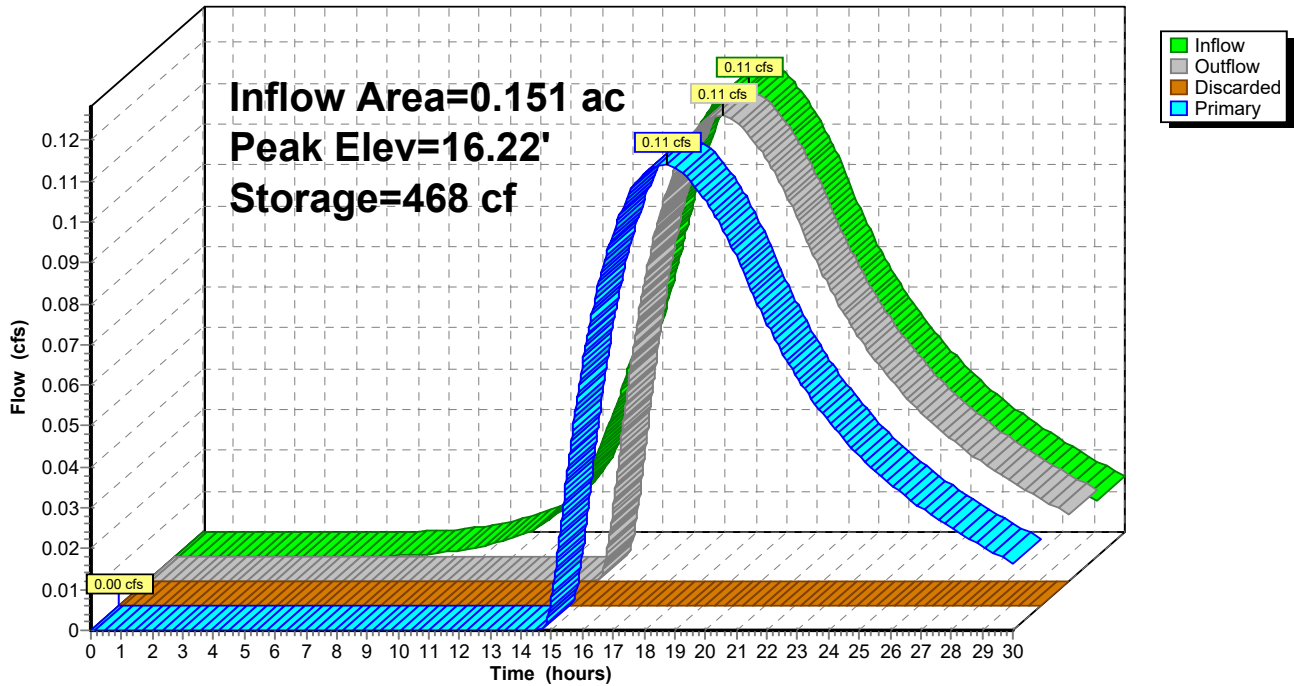
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Pond 9P: POROUS PAVEMENT

Hydrograph



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Summary for Pond 15P: POROUS PAVEMENT

Inflow Area = 0.250 ac, 39.68% Impervious, Inflow Depth > 6.58" for 100 yr event
 Inflow = 0.18 cfs @ 18.66 hrs, Volume= 0.137 af
 Outflow = 0.16 cfs @ 20.03 hrs, Volume= 0.116 af, Atten= 11%, Lag= 82.6 min
 Discarded = 0.06 cfs @ 20.03 hrs, Volume= 0.078 af
 Primary = 0.10 cfs @ 20.03 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.66' @ 20.03 hrs Surf.Area= 7,067 sf Storage= 1,496 cf

Plug-Flow detention time= 163.6 min calculated for 0.116 af (85% of inflow)
 Center-of-Mass det. time= 92.4 min (1,291.6 - 1,199.2)

Volume	Invert	Avail.Storage	Storage Description
#1	14.95'	2,120 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,067 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.95	7,067	0	0
15.95	7,067	7,067	7,067

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	6.0" Round Culvert L= 137.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.45' / 14.75' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	14.95'	0.270 in/hr Exfiltration over Surface area below 15.45' Conductivity to Groundwater Elevation = 13.00'

Discarded OutFlow Max=0.06 cfs @ 20.03 hrs HW=15.66' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.10 cfs @ 20.03 hrs HW=15.66' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.10 cfs @ 2.01 fps)

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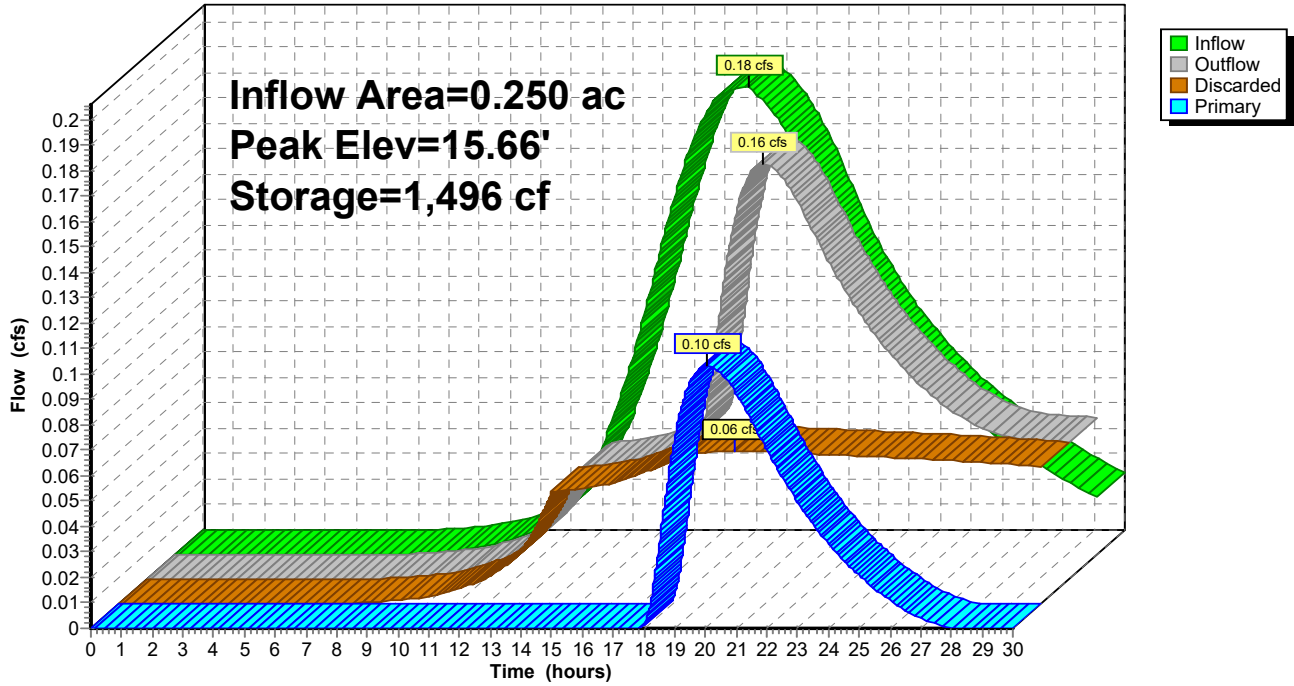
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Pond 15P: POROUS PAVEMENT

Hydrograph



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Summary for Pond DP1: Wetlands

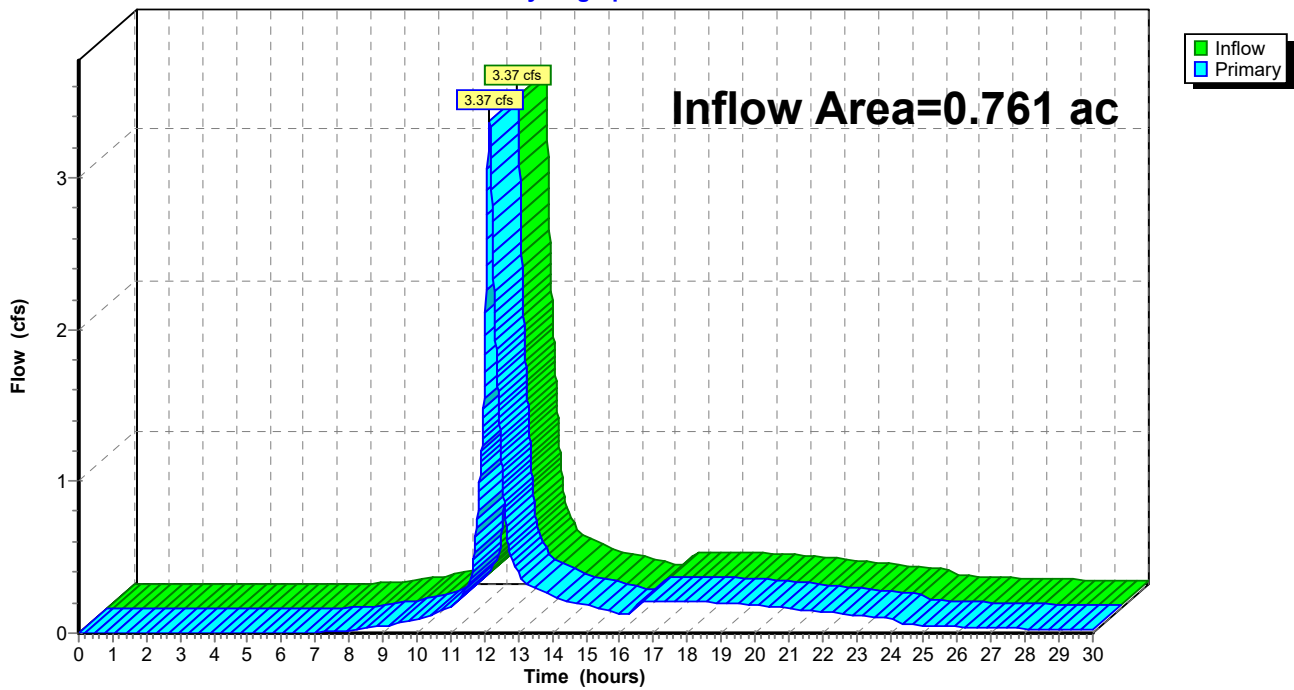
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.761 ac, 13.72% Impervious, Inflow Depth > 5.73" for 100 yr event
Inflow = 3.37 cfs @ 12.14 hrs, Volume= 0.363 af
Primary = 3.37 cfs @ 12.14 hrs, Volume= 0.363 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP1: Wetlands

Hydrograph



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Summary for Pond DP2: Wetlands

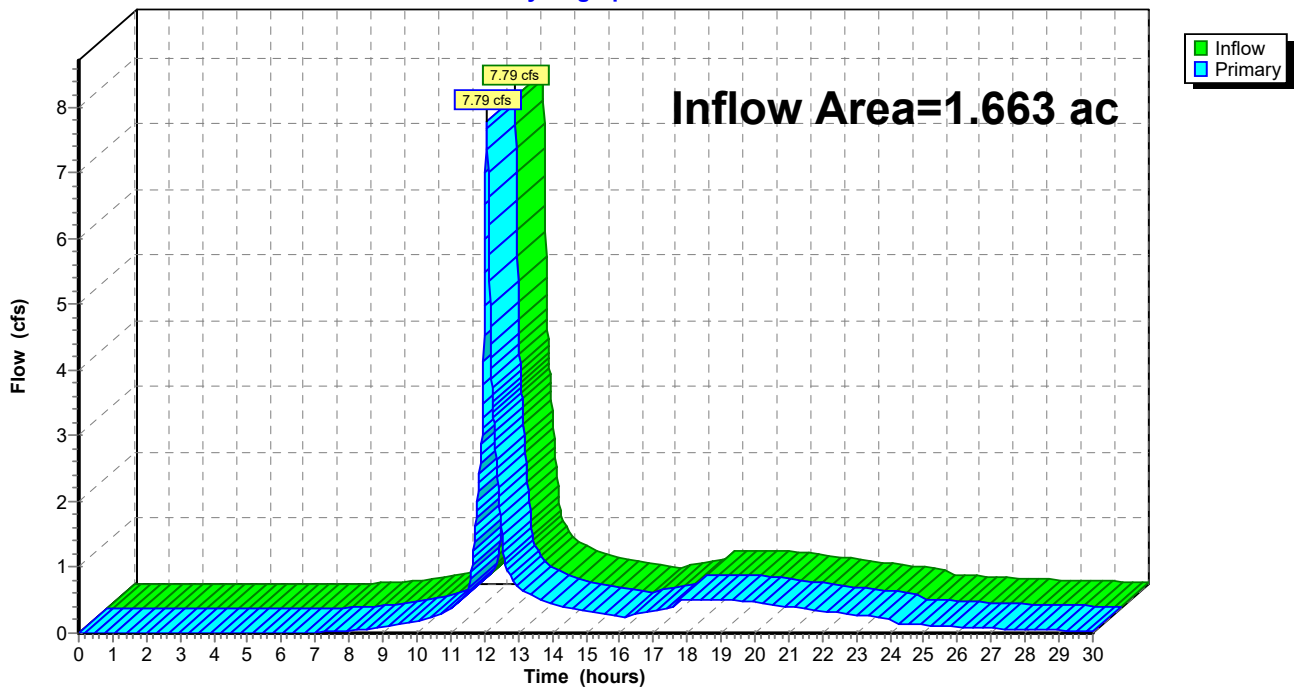
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.663 ac, 21.23% Impervious, Inflow Depth > 5.35" for 100 yr event
Inflow = 7.79 cfs @ 12.07 hrs, Volume= 0.742 af
Primary = 7.79 cfs @ 12.07 hrs, Volume= 0.742 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP2: Wetlands

Hydrograph



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Summary for Pond DP3: IBEW DR S-M

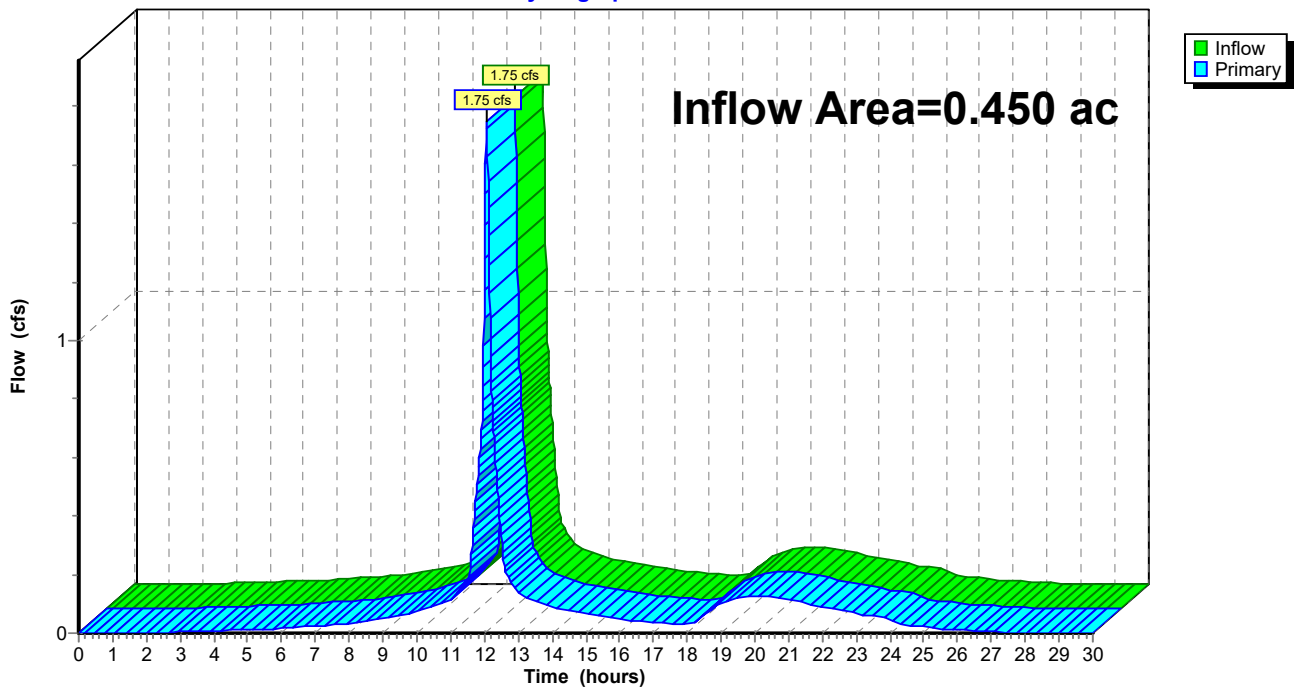
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.450 ac, 55.02% Impervious, Inflow Depth = 4.51" for 100 yr event
Inflow = 1.75 cfs @ 12.07 hrs, Volume= 0.169 af
Primary = 1.75 cfs @ 12.07 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP3: IBEW DR S-M

Hydrograph





Appendix D: Water Quality Calculations

Table 1 Required Recharge Volume

Turnpike Road

As shown in Vol 3. Chapter 1 Page 15 of the Massachusetts Stormwater Handbook

Required Recharge Volume determined by the following equation:

$$R_v = F \times A_{imp} \quad \text{where:}$$

R_v Required Recharge Volume

F Target Depth Factor

A_{imp} Impervious Area

Given:

NRCS Hydrologic Soil Type - C

Target Depth Factor = 0.25 inch

Subcatchment	A_{imp}	A_{imp}	F	R_v	R_v
	ft. ²	acre	inch	acre-ft	ft. ³
PR2	7,067	0.16	0.25	0.0034	147
PR3	3,344	0.08	0.25	0.0016	70
PR4 and PR5	9,960	0.23	0.25	0.0048	208
PR7	3,872	0.09	0.25	0.0019	81
TOTAL	24,243				

Table 1

Table 2 Simple Dynamic Method for Recharge

Turnpike Road

As shown in Vol 3. Chapter 1 Page 19 of the Massachusetts Stormwater Handbook

Using the following equations

$$A = R_v / (D + KT)$$

$$V = A \times D$$

where

- R_v Required Recharge Volume
- A Minimum Req'd surface area of the bottom of the infiltration structure
- V Storage Volume
- D depth of the infiltration facility
- K Rawls rate for saturated hydraulic conductivity
- T allowable drawdown

Use

$k =$ 0.27 in/hr C-Soils

T 2 hours

P5

Subcatchment	R_v	D	A	$V_{Required}$	BMP	$V_{provided}$	$V_{provided} > V_{req}$
	ft. ³	ft	ft. ²	ft. ³		ft. ³	Yes/No
PR2	147	1.00	140.89	140.89	Porous Pavement	1,060	Yes
PR3	70	1.00	66.67	66.67	Porous Pavement	502	Yes
PR4 and PR5	208	1.00	198.56	198.56	Porous Pavement	1,350	Yes
PR7	81	1.00	77.19	77.19	Porous Pavement	581	Yes

Table 2

Table 3 Drawdown
Turnpike Road

Using the following equations

$$\text{Time}_{\text{drawdown}} = R_v / (K * \text{Bottom Area})$$

As shown in Vol 3. Chapter 1 Page 25 of the Massachusetts Stormwater Handbook

$\text{Time}_{\text{drawdown}}$ Drawdown time for Infiltration BMP, must be < 72 hours

R_v Required Recharge Volume

Bottom area Bottom Area of Recharge Structure

K Rawls rate for saturated hydraulic conductivity

k= 0.27 in/hr C -Soils

Subcatchment	R_v	Bottom Area	$\text{Time}_{\text{drawdown}}$	$\text{Time}_{\text{drawdown}} < 72 \text{ hours}$
	ft. ³	ft. ²	hours	Yes/No
PR2	147	7067	0.93	Yes
PR3	70	3344	0.93	Yes
PR4 and PR5	208	9000	1.02	Yes
PR7	81	3872	0.93	Yes

Table 3

Table 4 Water Quality Volume

Turnpike Road

As shown in Vol 3. Chapter 1 Page 32 of the Massachusetts Stormwater Handbook

$$V_{WQ} = (D_{WQ}/12 \text{ in/ft}) * (A_{imp} * 43,560 \text{ ft.}^2/\text{acre})$$

where

V_{WQ} Water Quality Volume

D_{WQ} Water Quality Depth

A_{imp} Impervious Area

D_{WQ} 0.5 in

Subcatchment	A_{imp} ft. ²	A_{imp} acre	V_{WQ} ft. ³	$V_{provided}$ [*] ft. ³	$V_{provided} > V_{req}$ Yes/No
PR2	7,067	0.16	294.46	1,060	Yes
PR3	3,344	0.08	139.33	502	Yes
PR4 and PR5	9,960	0.23	415.00	1,350	Yes
PR7	3,872	0.09	161.33	581	Yes

*Volume taken from HydroCAD model

Table 4

TSS Removal Worksheet

As shown in Vol 3. Chapter 1 Page 34 of the Massachusetts Stormwater Handbook

Treatment Train 1				
A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Porous Pavement	80%	1.00	0.80	0.20
Total TSS Removal =			0.80	

Table 5



Appendix E: Operation and Maintenance Plan (Under Separate Cover)

256 Freeport Street Stormwater Management System

Operation and Maintenance Plan (O&M)

March 2022

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution of rainwater associated with the 256 Freeport Street project in Dorchester, MA.

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10).

Responsible Party

IBEW Local 103
256 Freeport Street
Dorchester, MA 02122

The stormwater management system will be maintained properly to assure its continued performance, as follows.

1. Level Spreader
 - Inspect every 6 months and after every major storm event
 - Remove any debris that may clog system.
 - Remove sediment if depth reaches 3 inches.
 - Removal of dead vegetation and leaves

3. Drain Outlets
 - Inspect every 6 months and after every major storm event
 - Remove any debris that may clog system.
 - Remove sediment if depth reaches 3 inches.
 - Removal of dead vegetation and leaves

4. Porous Pavement
 - Inspect every 6 months and after every major storm event
 - Remove any debris that may clog system.

Maintenance of these components will be conducted in accordance with the Mass DEP Stormwater Policy Manual as noted in the attached Operation and Maintenance table

summarizing the pertinent inspection and maintenance activities. The Mass DEP Stormwater Policy Manual is available at the following web-site:

<http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html>

Practices for Long Term Pollution Prevention

Litter Pick-up

The Owner will conduct litter pick-up from the stormwater management facilities in conjunction with routine maintenance activities.

Routine Inspection and Maintenance of Stormwater BMPs

The Owner will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above.

Maintenance of Landscaped Areas

The Owner shall minimize use of fertilizers, herbicides, and pesticides for the maintenance of facilities covered by this plan.

Prohibition of Illicit Discharges

The DEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Discharges from the following activities are not considered illicit discharges:

firefighting	foundation drains
water line flushing	footing drains
landscape irrigation	individual resident car washing
uncontaminated groundwater	flows from riparian habitats and wetlands
potable water sources	dechlorinated water from swimming pools
water used to clean residential buildings	water used for street washing
without detergents	air conditioning condensation

There are no known or proposed illicit connections associated with this project.



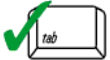
Appendix F: Checklist for Stormwater Report



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 8²
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

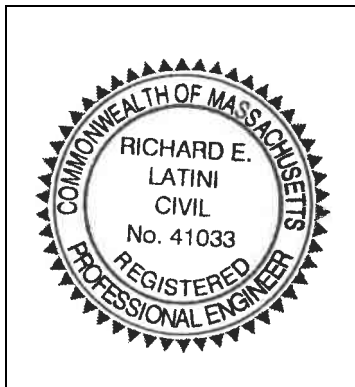
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

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

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

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

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

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

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

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

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

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

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.



Appendix G: Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

To the best of my knowledge, belief and information the stormwater management system servicing the 256 Freeport Street project in Boston, MA will not receive illicit discharges, including wastewater discharges or stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, or hazardous substances.

There are no known or proposed illicit connections associated with this project. If a potential illicit discharge to the facilities covered by this plan is detected (e.g. dry weather flows at any pipe outlet, evidence of contamination of surface water discharge by non-stormwater sources), the Boston Department of Public Works shall be notified for assistance in determining the nature and source of the discharge.

The stormwater management and conveyance systems are shown on the plans entitled "Grading and Drainage Plan" prepared by Howard Stein Hudson and include with the Notice of Intent submittal.

Signature: _____

Luis J. Anterelles



Appendix H: Proposed Plans (under Separate Cover)



April 25th, 2022

Boston Conservation Commission
City Hall Plaza, Room 709
Boston, MA 02201

Re: IBEW LOCAL 103 Wetland and Buffer Restoration Plan Updates

Dear Commissioners:

Howard Stein Hudson (HSH) is providing this letter update to address comments provided by Conservation Commission Staff in relation to the wetland restoration at the IBEW 103 SITE LOCATED AT 256 Freeport Street, Boston, MA. Also attached is an updated wetland impacts plan and the wetland restoration plan.

Comment No.1: *Table 1-1 details the calculated impacts to the wetland resources but only quantifies the amount of fill placed within the ILSF. Having been to the site, a substantial amount of fill has also been placed within the IVW and Buff Zone. Why has that not been quantified?*

Response: HSH has quantified the fill within the IVW & the 100-Foot Buffer Zone. An updated table is provided below. An updated wetland impact plan is also attached.

AREA	SQUARE FEET	CUT (CY)	FILL (CY)
ISOLATED VEGATED WETLAND	1,924	-	10
ISOLATED LAND SUBJECT TO FLOODING	4,929	14	108
100FT WETLAND BUFFER	24,611	311	601

Table 1-1 Resource Area Impacts (Revised 4.25.2022)

Comment No.2: *The plan itself seems to question the overall survivability of the restoration plantings, especially with the strong presence of invasive species. Why does the plan not include treatment of the invasive species and or restoration of these areas as well?*

Response: Implementing an invasive plant removal plan across the entire site is a massive undertaking and out of the scope of the enforcement order. In the plan we state that the restoration areas will be monitored for invasives and a treatment will be prepared at that time.



Comment No.3: *Staff feels that this plan is a good first draft but has noted several components that are missing but overall critical to the success of a restoration effort, A clear understanding of what the overall goals and what the intended end point of the restoration plan is critical in assessing the success of the plan and whether the Resource Area Values have been restored.*

Response: The goal of the plan is to restore the pre-existing topography and flood storage capacity of the resource area, and to provide an enhanced and more diverse vegetative community than what existed prior to the unpermitted alteration.

Comment No.4: *Since we are already in April, a detailed timeline of the fill removal and planting process is necessary to ensure that activities are occurring in the correct sequence and during the correct time of year.*

Response: The removal of fill will begin in June, 2022. Once the fill is removed the area will be prepared for the seed mixes to be placed. The PWS will inspect for invasive species as outlined in the Wetland and Buffer Restoration Plan prepared by Lucas Environmental, LLC dated March 15, 2022. The erosion control measures, and the disturbed areas will be inspected in accordance with the Stormwater Pollution Prevention Plan. It is anticipated that the trees and shrubs will be planted at the appropriate time in late summer/early fall, depending on weather conditions. Plantings will commence under the supervision of the PWS.

Comment No.5: *Additional detail on how the fill will be removed and with what equipment, how the predisturbance substrate will be identified, and what process is in place should the predisturbance substrate not be differentiated from the fill.*

Response: Once the erosion controls are in place and the supervising Professional Wetland Scientist (PWS) is on site the contractor shall use a mid-sized excavator to remove the fill material. The excavator will be positioned outside of the wetland resource areas at all times and will be able to reach all of the filled areas. The fill material will be paced within a 10-wheeler dump truck and removed to the predetermined storage area within the existing parking lot, outside of the wetland resource buffer areas.

The fill material placed with the resource areas consist of roughly graded crushed rock and stone which is fairly easy to identify. The underlining material on the site is the original soil material. Once the PWS visually identifies the underlying native material the use of hand tools will begin to remove the last of the fill material.

Comment No.6: *Additional detail on what will happen to the fill, how it will be managed once removed, where it will be stockpiled and/or disposed of, etc.*



Response: The fill material removed from the resource areas will be stockpiled with the existing parking lot with the appropriate erosion controls (Haybales) in place outside of the wetland buffer areas. Suitable fill will be reused in the construction of the new parking areas. The remainder of the fill material will be trucked off site and disposed of according to State Regulations.

Comment No.6: Additional information on how the plantings will be maintained after planting (including irrigation, weeding, etc.).

Response: The PWS will inspect the planting area at the end of the 2022 growing season for invasive species to determine the presence/extent of invasive/opportunistic species within the planting area. If invasive/opportunistic species are found, a control plan including measures for removal will be developed and submitted to the Conservation Commission for review and approval prior to implementation. The control plan will provide for long-term maintenance activities within the restoration areas and Buffer.

The contractor will be required to maintain adequate moisture for the first growing season following planting to support the plantings (>75% survival is required). Irrigation practices will be likely be necessary for the mitigation areas following planting and seeding.

Once the fill is removed from the impacted areas the seed mixes can be placed. These areas would be irrigated twice a week by the contractor or as needed depending on weather conditions. The shrubs and tree planting will be installed in cooler conditions in early fall and will be watered weekly. The watering schedule is subject to change based on weather conditions.

If you have any questions, please do not hesitate to contact me at 617-797-9190 or jdowning@hshassoc.com.

Sincerely,

James Downing
Manager of Civil Engineering



HOWARD STEIN HUDSON
 11 Beacon Street, Suite 1010
 Boston, MA 02108
 www.hshassoc.com

PREPARED FOR:

256 FREEPORT STREET
 BOSTON, MA

REVISIONS:

NO	BY	DATE	DESCRIPTION

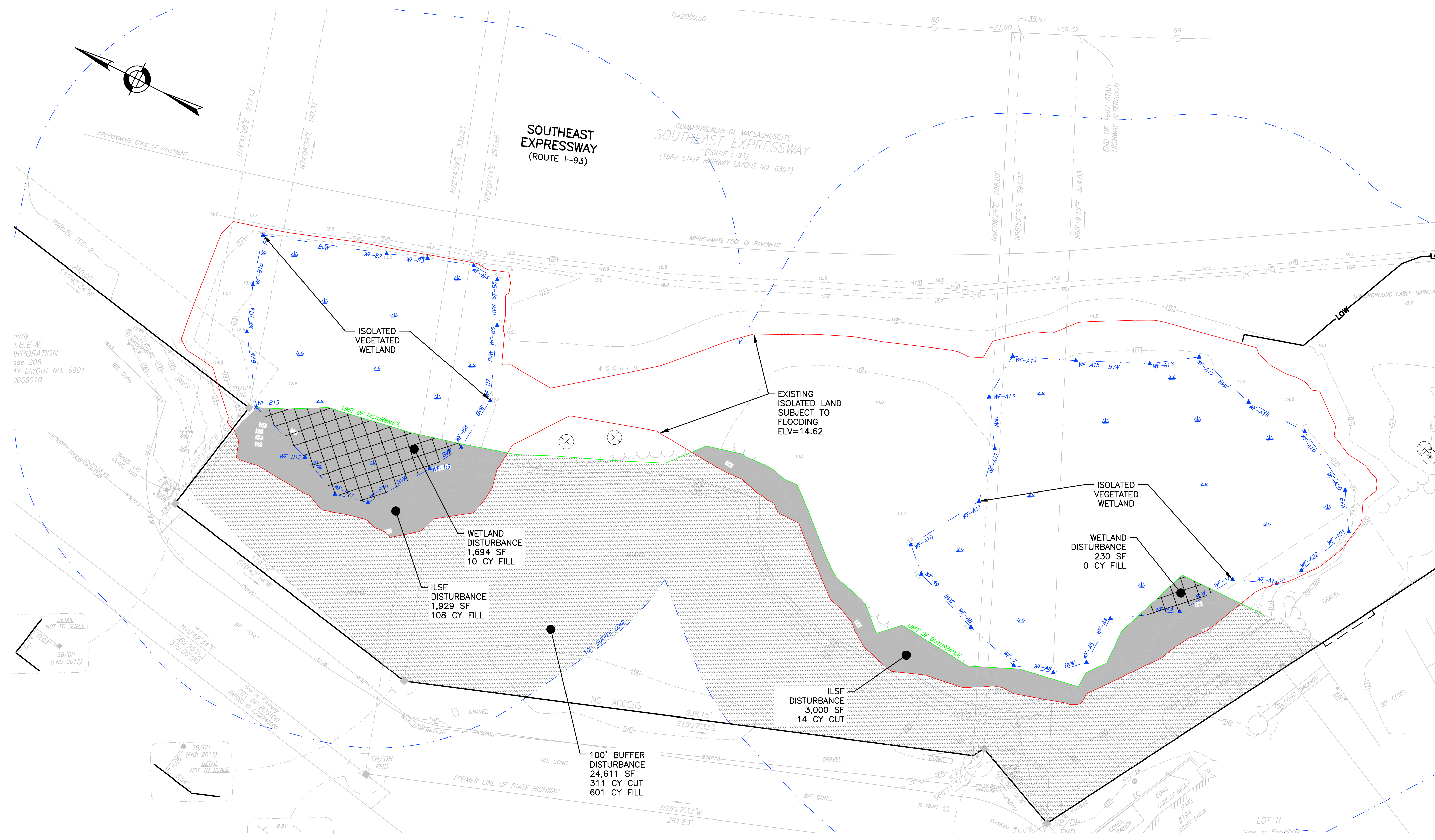


PERMIT SET
 NOT FOR CONSTRUCTION

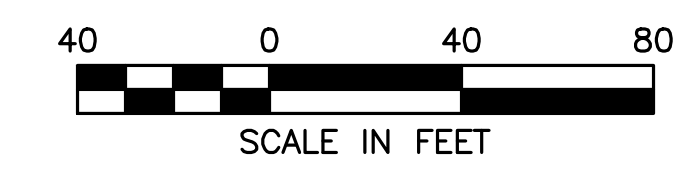
WETLAND IMPACT PLAN

DATE: 04/26/22
 PROJECT NUMBER: 19059
 DESIGNED BY: RJM
 DRAWN BY: RJM
 CHECKED BY: JD

FIG-1



DISTURBANCE QUANTITIES				
AREA	SQUARE FEET	CUT (CUBIC YDS)	FILL (CUBIC YDS)	
ISOLATED VEGETATED WETLAND	1,924	-	10	
ISOLATED LAND SUBJECT TO FLOODING	4,929	14	108	
100' WETLAND BUFFER	24,611	311	601	





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PREPARED FOR:

**256 FREEPORT STREET
 BOSTON, MA**

REVISIONS:

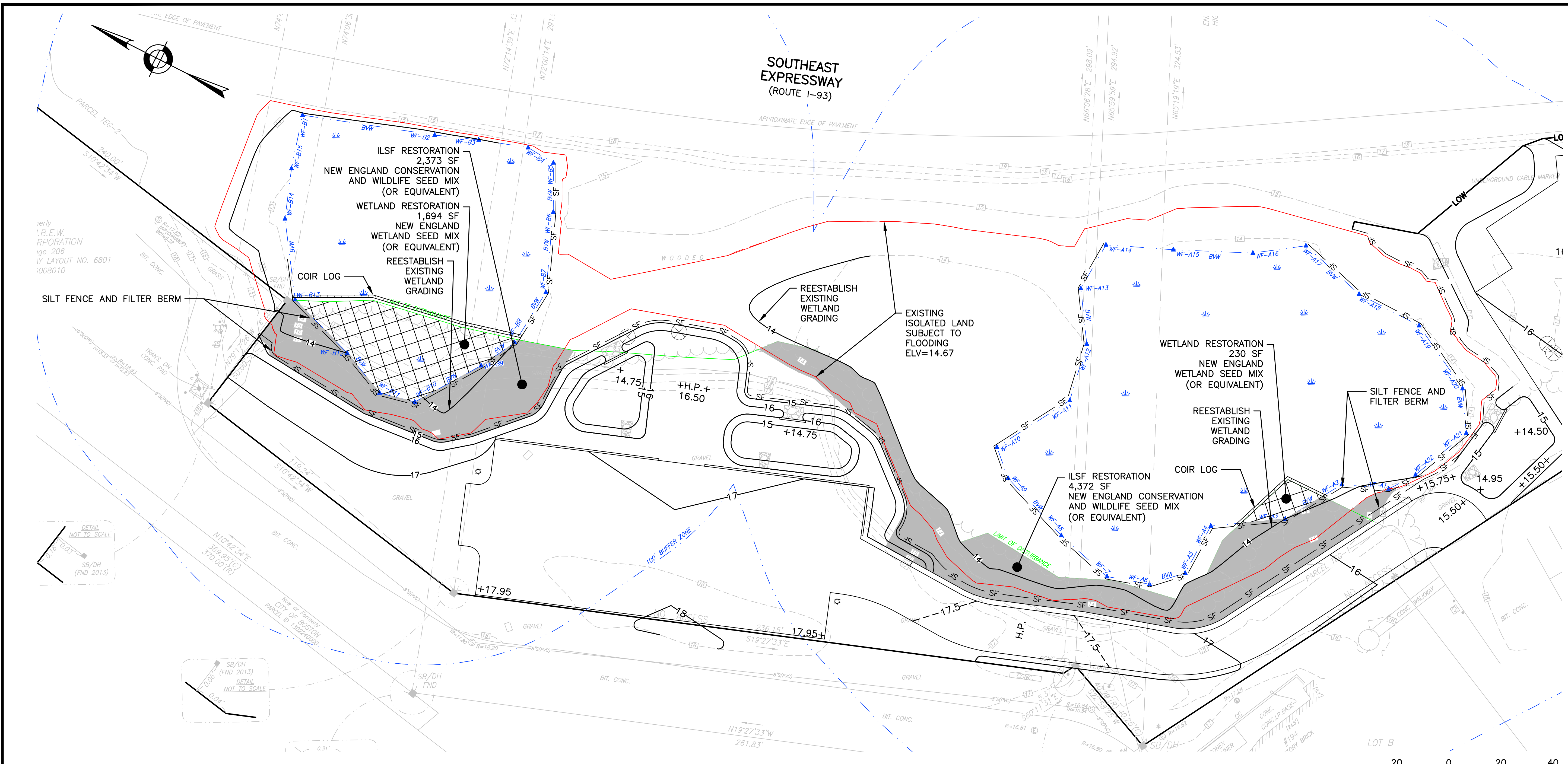
NO	BY	DATE	DESCRIPTION



PERMIT SET
 NOT FOR CONSTRUCTION

**WETLAND AND
 BUFFER
 RESTORATION PLAN**

DATE: 04/25/22
 PROJECT NUMBER: 19059
 DESIGNED BY: RJM
 DRAWN BY: RJM
 CHECKED BY: JD



- SEE WETLAND AND BUFFER ZONE RESTORATION REPORT PREPARED BY LUCAS ENVIRONMENTAL, LLC FOR DETAILED INFORMATION ABOUT THIS PLANTING PLAN.
- PROPOSED PARKING AND DRAINAGE IMPROVEMENTS SUBMITTED UNDER SEPARATE NOTICE OF INTENT.
- DURING CONSTRUCTION, PROTECT ALL EXISTING SITE FEATURES, STRUCTURES AND UTILITIES.
- PLANTS SHALL BE TRUE TO SPECIES AND VARIETY SPECIFIED AND NURSERY GROWN IN ACCORDANCE WITH THE AMERICAN STANDARD FOR NURSERY STOCK UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT. SUBSTITUTIONS WILL BE PERMITTED ONLY IF APPROVED BY THE WETLAND SCIENTIST.
- WETLAND SCIENTIST APPROVAL IS REQUIRED BEFORE PLANT MATERIAL IS PLANTED.
- ALL EXPOSED BURLAP, WIRE BASKETS AND OTHER MATERIALS ATTACHED TO PLANTS SHALL BE REMOVED PRIOR TO PLANTING. CARE SHALL BE TAKEN NOT TO DISTURB THE ROOT BALL OF PLANTS.
- THOROUGHLY WATER ALL PLANTS IMMEDIATELY AFTER PLANTING.
- LOAM USED SHALL BE UNIFORM IN COMPOSITION, FREE FROM SUBSOIL, STONES LARGER THAN 1", NOXIOUS SEEDS AND SUITABLE FOR THE SUPPORT OF VEGETATIVE GROWTH. THE pH VALUE SHALL BE BETWEEN 5.5 AND 6.5.
- MULCH IN TREE AND SHRUB BEDS SHALL BE NATURAL, NATIVE HEMLOCK MULCH FREE OF GROWTH OR GERMINATION INHIBITING INGREDIENTS.
- LOCATIONS FOR PLANTS AND/OR OUTLINE OF AREAS TO BE PLANTED ARE TO BE STAKED OUT AT THE SITE FOR APPROVAL BY THE WETLAND SCIENTIST.

RESTORATION AREA	SQUARE FEET
ISOLATED VEGETATED WETLAND	1,924
ISOLATED LAND SUBJECT TO FLOODING AND BUFFER ZONE	6,745

**TABLE 1
 ISOLATED VEGETATED WETLAND RESTORATION PLAN PLANTING SCHEDULE***

Common Name	Latin Name	Indicator Status	Size	Quantity
Trees				
Green Ash	<i>Fraxinus pensylvanica</i>	FACW	4-6'	10
Pin Oak	<i>Quercus palustris</i>	FACW	4-6'	6
Red Maple	<i>Acer rubrum</i>	FAC	4-6'	6
Total				22
Shrubs				
Speckled Alder	<i>Alnus rugosa</i>	FACW	2-3'	12
Elderberry	<i>Sambucus canadensis</i>	FACW	2-3'	12
Silky Dogwood	<i>Cornus amomum</i>	FACW	2-3'	12
Pussy Willow	<i>Salix discolor</i>	FACW	2-3'	12
Total				48
Ground Cover				
New England Wetland Seed Mix (or equivalent)		Varies	1 lb./2,500 s.f.	1 lb.

**TABLE 2
 ILSF AND BUFFER ZONE RESTORATION PLAN PLANTING SCHEDULE**

Common Name	Latin Name	Size	Quantity
Trees			
Hackberry	<i>Celtis occidentalis</i>	4-6'	6
Red Cedar	<i>Juniperus virginiana</i>	4-6'	10
Chokecherry	<i>Prunus virginiana</i>	4-6'	10
Pin Oak	<i>Quercus palustris</i>	4-6'	8
Gray Birch	<i>Betula populifolia</i>	4-6'	6
Total			40
Shrubs			
Black Chokeberry	<i>Aronia melanocarpa</i>	2-3'	25
Bayberry	<i>Myrica pensylvanica</i>	2-3'	25
Virginia Rose	<i>Rosa virginiana</i>	2-3'	10
Alternate-leaved Dogwood	<i>Cornus alterniflora</i>	2-3'	15
Serviceberry	<i>Amelanchier canadensis</i>	2-3'	25
Total			100
Ground Cover			
New England Conservation/Wildlife Mix, or equivalent		1 lb./7,500 sq. ft.	1.5

**TABLE 3
 NEW ENGLAND CONSERVATION/WILDLIFE MIX**

Latin Name	Species	Indicator Status
<i>Elymus virginicus</i>	Virginia Wild Rye	FACW-
<i>Schizachyrium scoparium</i>	Little Bluestem	FACU
<i>Andropogon gerardii</i>	Big Bluestem	FAC
<i>Festuca rubra</i>	Creeping Red Fescue	FACU
<i>Panicum virginatum</i>	Switch Grass	FAC
<i>Chamaecrista fasciculata</i>	Partridge Pea	FACU
<i>Panicum clandestinum</i>	Deer Tongue	FAC+
<i>Sorghastrum nutans</i>	Indian Grass	UPL
<i>Asclepias syriaca</i>	Common Milkweed	FACU-
<i>Helianthus scaberrimus</i>	Ox Eye Sunflower	UPL
<i>Eupatorium purpureum</i>	Purple Joe Pye Weed	FAC
<i>Euthamia graminifolia</i>	Grass Leaved Goldenrod	FAC
<i>Verbena hastata</i>	Blue Vervain	FACW
<i>Zizia aurea</i>	Golden Alexanders	FAC
<i>Aster umbellatus</i>	Flat Topped/Umbrella Aster	FACW
<i>Solidago juncea</i>	Early Goldenrod	NI

**TABLE 4
 NEW ENGLAND WETMIX (WETLAND SEED MIX)**

Species	Latin Name	Indicator Status
Fox Sedge	<i>Carex vulpinoidea</i>	OBL
Blunt Broom Sedge	<i>Carex scoparia</i>	FACW
Lurid Sedge	<i>Carex lurida</i>	OBL
Hop Sedge	<i>Carex lupulina</i>	OBL
Fowl Bluegrass	<i>Poa palustris</i>	FACW
Beggar Ticks	<i>Bidens frondosa</i>	FACW
Green Bulrush	<i>Scirpus atrovirens</i>	OBL
Swamp Milkweed	<i>Asclepias incarnata</i>	OBL
Fringed Sedge	<i>Carex crinita</i>	OBL
Soft Rush	<i>Juncus effusus</i>	FACW!
Starved/Calico Aster	<i>(Symphyotrichum lateriflorum)</i>	FACW
Blue Flag	<i>Iris versicolor</i>	OBL
American Mannagrass	<i>Glyceria grandis</i>	OBL
Square Stemed Monkey Flower	<i>Mimulus ringens</i>	OBL
Spotted Joe Pye Weed	<i>Eupatorium maculatum</i>	OBL