Storm Water Report

For

"Cutler Place"
6 Cutler Street
Medway, Massachusetts

Prepared for and
Owned by: Cutler Place LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Operation & Maintenance
Responsibility: Cutler Place LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Prepared By: Ronald Tiberi P.E.
9 Massachusetts Ave
Natick, MA 01760
508-361-5077

November 13, 2021
Rev- 12/26/21

SECTION 1 - Project Title

Applicant: Cutler Place LLC
6 Cutler Street
Medway MA 02053

Project Name: Cutler Place
Project Address: 6 Cutler Street, Medway MA
Engineer: Ronald Tiberi P.E.
9 Massachusetts Ave
Natick MA 01760
Date: 11-13-21

SECTION 2 - Project Introduction & Description:

6 Cutler St currently consists of a 4,800 square foot building which was, most recently, the Medway American Legion which sit on a 30903sf lot. We are proposing a renovation of the existing building which will accommodate 3 dwelling units and a 50'x30', 3,000 square foot addition which will accommodate 2 additional dwelling units. The addition will be adjacent and connected to the existing structure, it does not stand alone.

The lot slopes back to front and is almost completely paved, with some small trees, and little brush along the perimeter.

The proposed roof surface runoff will be directed to surface. The driveway/parking areas runoff will be sheet flowed toward the front rain garden for treatment prior to infiltration underneath provided by stone bedding for infiltration into the ground. The majority of the surface runoff will be directed through the garden in the front of the property.

Based on the subsurface exploration and the soil evaluation conducted by Certified Soils Evaluator SE 2688 Lawrence Green on Nov. 11, 2021, soil conditions vary from sand to Sandy loams for the recharge target depth hydrological soil is soil type A (see soil evaluator's testpit logs attached). The infiltration rates used for this material range from 8.27 inches/hour.

SECTION 3 – Stormwater checklist:

See attached.

SECTION 4 – LID Measures & Drainage Summary:

The improvements include redevelopment of the existing structure, constructing a 50x30 addition for 5-unit townhouses comprised of single structure with parking, driveway/parking and open landscaped areas. A landscape area containing trees and shrubs is proposed along the open areas and property boundaries of the proposed lawn.

Erosion control barriers are proposed to protect boundaries and abutting properties during construction. (See Plan sheet S-4). The area drainage catchments A, B, & C comprise some 33903-sf representing the entire lot. The predominate area A drains directly toward the front of the parcel with a small areas B & C which currently drains off the property towards the abutters on the westerly side of the parcel. See Figure 1 of existing catchment areas. The proposed areas will be predominately directed to the driveway and the proposed rain garden structure at the front of the property. Overall drainage patterns will remain unchanged and with the pavement reductions, along with proposed lawn surfaces, volumes of the runoff after development will remain essentially unchanged and/or reduced to maximum extent practicable. See Figure 1 of proposed catchment areas.

The Natural Resources Conservation Service (NRCS) has the site designated with varying soils which are predominately in the Hydrologic A Soil Group. Field results are designated as a sandy loam and sands at recharge depths. See attached soils report in appendices.

A subsurface exploration program was conducted, soil evaluations were conducted Lawrence Green, SE#2688- Soil evaluator. The logs for this program are attached. Test Pits identified the areas as Sandy Loam to Sand, Hydrologic A Soil Group. The existing site drainage predominately flows from North to South draining to the front of the property.

Watershed modeling was conducted using HydroCAD 10-24 software that combines SCS runoff methodology with standard hydraulic calculations. See attached computations with diagram and corresponding drainage area figures. Table 1 Summaries existing rate (cfs) and water volumes {acre-feet (af)} per design point.

TABLE 1 EXISTING CONDITIONS (ET)

Catchment	2yr (cfs)	2yr (af)	10yr (cfs)	10yr (af)	25yr (cfs)	25yr (af)	50yr (cfs)	50yr (af)	100yr (cfs)	100yr (af)
A	0.99	0.068	1.68	0.117	2.05	0.144	2.32	0.164	2.60	0.184
B	0.08	0.008	0.15	0.015	0.20	0.020	0.23	0.023	0.26	0.026
C	0.54	0.038	0.85	0.061	1.02	0.074	1.14	0.084	1.26	0.093
ET (total)	1.61	0.114	2.68	0.193	3.27	0.238	3.69	0.271	4.12	0.303

Post-Development Conditions-

The post-development conditions are defined by the areas altered by the proposed plan. The proposed conditions have been designed to meet the Massachusetts Department of Environmental Protection (MassDEP) Wetland and Stormwater requirements of TSS and Phosphorous removal.

The stormwater management system has been designed that post-development rates to match or decrease peak pre-development runoff rates for the entire site, for storm events. Computations provided are for the 2, 10, 25, 50 and 100-year, 24-hour storm events. Design Storm Rainfall at the following: 2-Year - 3.2 inches; 10-Year - 4.7 inches; 25-Year- 5.5 inches; 50-Year- 6.1 inches; 100-Year-6.7 inches.

The area drainage catchments of some 33903 sf represent the entire lot area. The Impacted area of construction shall consist of some 30000 sf. This majority of the area A will be directed to Rain Garden/infiltration area in the front of the property.

Small portions at the westerly ends of the property still to runoff site as existing with a much-reduced rate, see table 2. Overall drainage patterns will remain unchanged and with the pavement reductions, garden infiltration system, along with proposed lawn surface, volumes of the runoff after development will remain essentially unchanged and/or reduced. See Figure 1 for the re-aligned drainage catchments, and Table 2 to for the associated proposed runoff rates.

TABLE 2 PROPOSED CONDITIONS

Catchment	2yr (cfs)	2yr (af)	10yr (cfs)	10yr (af)	25yr (cfs)	25yr (af)	50yr (cfs)	50yr (af)	100yr (cfs)	100yr (af)
A	0.0	0.000	0.0	0.000	0.0	0.000	0.00	0.000	0.00	0.00
B	0.03	0.004	0.10	0.010	0.14	0.014	0.17	0.017	0.20	0.02
C	0.01	0.002	0.09	0.008	0.15	0.012	0.20	0.015	0.25	0.02
PT(total)	0.04	.006	0.19	0.018	0.29	0.026	0.37	0.032	0.45	0.04

The areas are compensated for changes in flow rates and overall impacted from development has no adverse drainage effect from the property as demonstrated in the attached Hydrocad reports.

SECTION 5 – Stormwater Standards:

Standard 1: No New Untreated Discharges

There will be no untreated discharges. Existing overland flow is on essentially bare ground. The proposed conditioned will be on a vegetated surface with native growth grass/plant. The sheet flow discharge energy from the road/parking areas will be dissipated by a rain garden and crested weir.

Standard 2: Peak Rate Attenuation

Rain Garden leaching systems (Sub-catchments A) with an 8.27 in per hour soils infiltration rate the parking area basin can accommodate the majority runoff for a 2, 10, 25, 50 and 100 year 24-hour storm events (See calculations attached). Site total combined area summary comparison are shown in Table 3.

TABLE 3 SITE PRE/POST RUNOFF SUMMARY

Post Analysis Point		**2 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
PT (CFS)		0.04	0.19	0.29	0.37	0.45
PT (A-F)		0.006	0.018	0.026	0.032	0.04
Pre-Analysis Point		**2 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
ET (CFS)		1.67	2.68	3.27	3.69	4.12
ET (A-F)		0.114	0.193	0.238	0.271	0.303

NET % Change		**2 Year**	**10 Year**	**25 Year**	**50 Year**	**100 Year**
ET-PT (CFS)		-97%	-93%	-91%	-89%	-98%
ET-PT (A-F)		-95%	-90%	-91%	-88%	-87%

Site areas to the westerly border catchments B and C flow comparisons also exhibit reductions.

Standard 3: Stormwater Recharge

Based on the soil explorations, percolation tests, and observations at the site of nearly bare ground the hydrological soil is soil type A.

The required recharge volume calculation is provided in the drainage calculations. The static method was used for sizing the infiltration.

_ STANDARD #3: The pre-development annual recharge for the site has been approximated in the post-developed condition, and as illustrated below will more than satisfy the minimum requirements. The Recharge Volume is based on the Static Method per the MassDEP Stormwater Management Standards, Volume 3, Chapter 1.
For purposes of the analysis and demonstrate compliance with Standard #3, the recharge volume calculation assumes the site is a Hydrologic Soil Group "A" (HSG-A). The BMP requires 0.6 inches over the impervious surface for a class A soil to be recharged

Impervious Area = 10800 square feet

Recharge Volume (Rv) = (F) x (Impervious Area)
Where:

Rv = Required Recharge Volume, expressed in cubic feet
F = Target Depth Factor associated with each Hydrologic Soil Group
Impervious Area = proposed pavement, rooftops in square feet

Recharge Volume (Rv) = (F) x (Impervious Area)
= (0.60 inches)*(1/12 inches/ft)* (10800 square feet)
= (0.05 feet)*(10800 square feet)
= 540 ft3

Recharge Provided Storage Garden Areas total storage = 1678 ft3
1678 > 540 ft3 Required

TIME TO DRAIN

Time(drawdown)= [Rv/(K x Bottom Area)]

A1- Rv=540cf
K=8.27 in/hr
Bottom Area= 945

Time to Drain = 540/[(8.27in/hr/12"/ft)x 945]= 0.8 Hours

Standard 4: Water Quality

_ STANDARD #4: The proposed stormwater management system has been designed so that for each drainage area and outfall the 90% TSS removal standard has been met.

Water Quality Volume (VWQ) = (DWQ/12 inches/foot)*(AIMP * 10800 s.f./acre)
VWQ = Required Water Quality Volume in cubic feet

DWQ = Water Quality Depth
X_ one inch for discharges within a Zone II or Interim Wellhead Protection Area, to or near another critical area, runoff from a land use with higher potential pollutant loading (LUHPPL), or exfiltration to soils with infiltration rate greater than 2.4 inches/hour.
_ ½-inch for discharges to other areas.

AIMP = Impervious Area (in acres)

= (1.0 inches)*(1/12 inches/ft)* (0.25)
= (0.083 feet)*(0.25 Acre)
= 0.021 ft3

See the attached TSS removal work sheets.
See attached Total Phosphorus removal sheets

Stormwater pretreatment is handled by rain garden, which removes the required 90% TSS.

The BMPs are sized for the 1-inch water quality volume. The basins were designed to treat the WQV attributed as shown in Standard 3 of this report.

A standalone spill prevention plan and operation and maintenance plan have been developed and attached to this document to further prevent any water quality degradation.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)
This development is not a Land Use with Higher Potential Pollutant Loads.

Standard 6: Critical Areas

No Critical areas are to be adversely impacted.

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

The site is a is required to meet these standards to the maximum extent practicable, all standards are met.

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

The applicant will use filter sock erosion controls. Silt sacks will be used in Catch basins within 100 of construction limits. Project limits, lay down and staging areas are noted on the erosion control plan and coincide with erosion control systems. An erosion control plan has been developed as part of the town of Medway Article 32 bylaw and appended to this submittal.

The Applicant: Cutler Place LLC, 6 Cutler Street, Medway MA 02053, will be ultimately responsible for compliance, until a Condominium Association is established.

A filter sock will be placed along the downstream boundary of the disturbed material. The barrier will be installed at onset of construction and will be removed on the establishment of the vegetation. See the plans for the landscaping planning and the site development, as well as attached pollution prevention plans. The project's resident inspector will be responsible for monitoring the controls.

This project site does not disturb more than one acre area not initiating an NPDES permit requirement. Stormwater Pollution Prevention Plan has been prepared and included as Attachment D.

Standard 9: Operation and Maintenance Plan

A Long-Term Operation and Maintenance (O&M) Plan has been developed for the proposed stormwater management system as a separate document attached.

Standard 10: Prohibition of Illicit Discharges

There are no expected illicit discharges to the stormwater management system from applicants use of its property. The applicant will submit the Illicit Discharge Compliance Statement prior to the discharge of stormwater runoff to the post-construction stormwater best management practices and prior to the issuance of a Certificate of Compliance.

Pollution Prevention Plan Certification

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

Signed: _____Date: _____

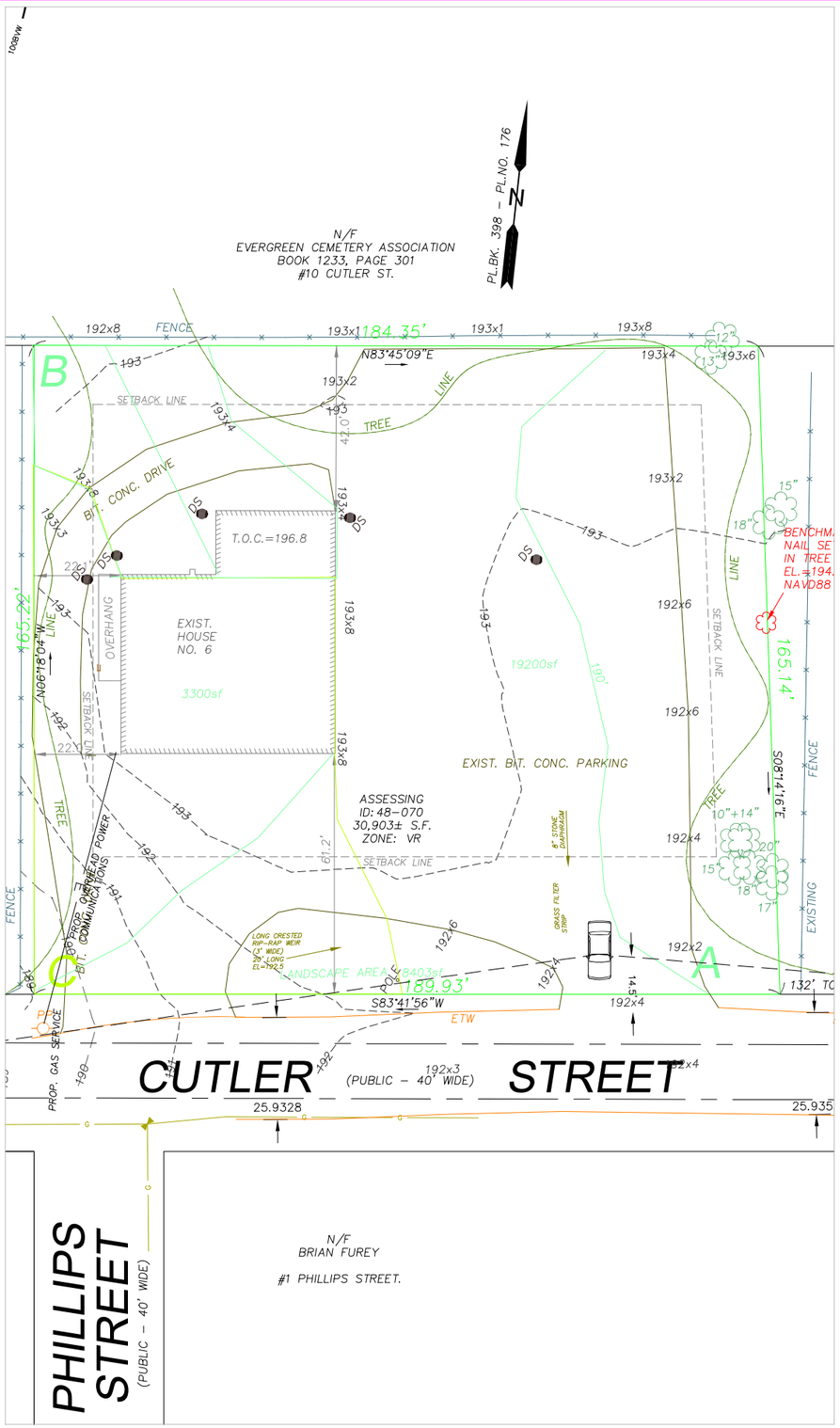
ATTACHMENTS

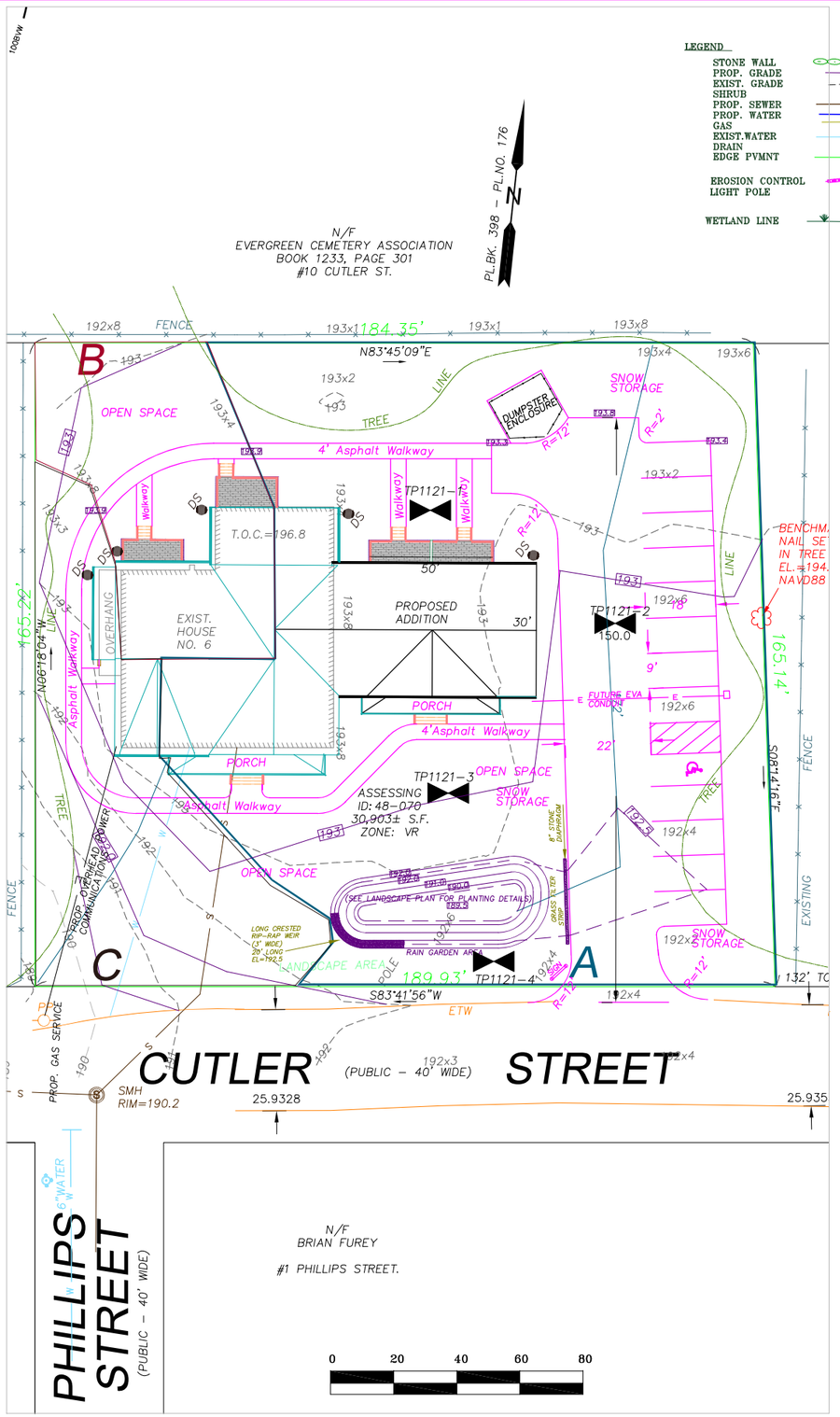
Figure 1 Existing & Proposed Drainage Catchments

stormwater Checklist
HydroCad Analysis

Soils Report
Soil Testing Reports
TSS Removal Calculation Sheet
Phosphorous Removal Sheets
O&M PLAN
SPILL PREVENTION PLAN

FIGURES





GENERAL SITE NOTES

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORKSCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS, RELATIVE TO THE SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.

2. ALL WORK SHALL CONFORM TO LOCAL, COMMONWEALTH OF MASSACHUSETTS, AND OSHA STANDARDS AND GUIDELINES.

3. LOCATION OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE CONFIRMED INDEPENDENTLY WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. ALL UTILITY SERVICE CONNECTION POINTS SHALL BE CONFIRMED INDEPENDENTLY BY THE CONTRACTOR IN THE FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

4. ALL UTILITY LOCATIONS ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE CONDUITS, PRODUCT PIPING, ETC. PRIOR TO COMMENCEMENT OF EXCAVATION OF ANY TYPE.

5. ALL EXCAVATED UNSUITABLE MATERIAL MUST BE TRANSPORTED TO AN APPROVED DISPOSAL LOCATION.

6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY "DIG SAFE" (1-888-344-7233) 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY THE LOCAL DEPARTMENT OF PUBLIC WORKS TO MARK OUT THEIR UTILITIES.

7. THE LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR SITE CLEARING.

8. ALL CONCRETE AND BITUMINOUS PATCH AREAS TO MATCH EXISTING GRADES.

9. SOLID WASTE TO BE DISPOSED OF BY CONTRACTOR IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

10. CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION TO BE PERFORMED IN ACCORDANCE WITH CURRENT STANDARDS, AS WELL AS ADDITIONAL PROVISIONS TO ASSURE STABILITY OF CONTIGUOUS STRUCTURES.

11. IN CASE OF DISCREPANCIES BETWEEN PLANS, THE SITE PLAN WILL SUPERCEDE IN ALL CASES. NOTIFY ENGINEER OF RECORD OF ANY CONFLICTS.

DIG SAFE NOTE:

UTILITIES ARE PLOTTED FROM FIELD LOCATION AND ANY RECORD INFORMATION AVAILABLE, AND SHOULD BE CONSIDERED APPROXIMATE. OTHER UTILITIES MAY EXIST WHICH ARE NOT EVIDENT OR FOR WHICH RECORD INFORMATION WAS NOT AVAILABLE. CONTRACTORS (IN ACCORDANCE WITH MASS.G.L. CHAPTER 82 SECTION 40 AS AMENDED) MUST CONTACT ALL UTILITY COMPANIES BEFORE EXCAVATING AND DRILLING. ALSO, CALL "DIG-SAFE" AT 1(888)344-7233 1(888)DIG-SAFE.

THE OFFSETS AS SHOWN ON THIS PLAN ARE NOT TO BE USED FOR THE ESTABLISHMENT OF PROPERTY LINES OR FOR THE ESTABLISHMENT OF ANY PROPOSED CONSTRUCTION UNLESS SAID CONSTRUCTION IS SHOWN HEREON.

THIS PLAN WAS PREPARED FOR THE EXCLUSIVE USE AND PURPOSE FOR THE PARTY STATED HEREON AND SHALL NOT BE USED BY ANY THIRD PARTY WITHOUT THE EXPRESSED WRITTEN PERMISSION OF RONALD TIBERI P.E.

CONSTRUCTION ON THIS LAND IS SUBJECT TO ANY EASEMENTS, RIGHTS-OF-WAY, RESTRICTIONS, RESERVATIONS, OR OTHER LIMITATIONS WHICH MAY BE REVEALED BY AN EXAMINATION OF THE TITLE.

APPROVED BY PLANNING BOARD

DATE: _____

REVISIONS

No.	DATE	DESCRIPTION
1.	12-27-21	REVISED GARDEN AND DRAINAGE AREAS

DRAINAGE AREAS

IN
MEDWAY, MASSACHUSETTS

CUTLER PLACE
6 CUTLER STREET

PREPARED FOR:
CUTLER PLACE LLC
6 CUTLER STREET
MEDWAY MA 02053

PREPARED By:
RONALD TIBERI P.E.
9 MASSACHUSETTS AVE.
NATICK MA 01760

DRAWING SCALE: 1 inch = 20 feet

PROJECT NUMBER: 7155

DATE: NOV 1. 2021

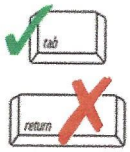
FIG 1

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

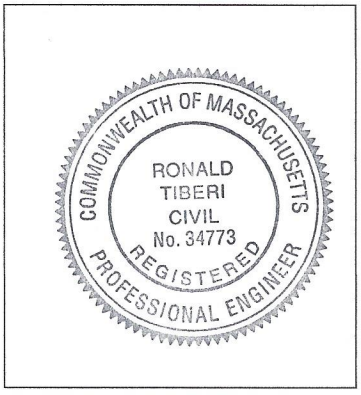
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



11/14/21

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

☒ The ½" or 1" Water Quality Volume or

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

- ☐ Limited Project
- ☒ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

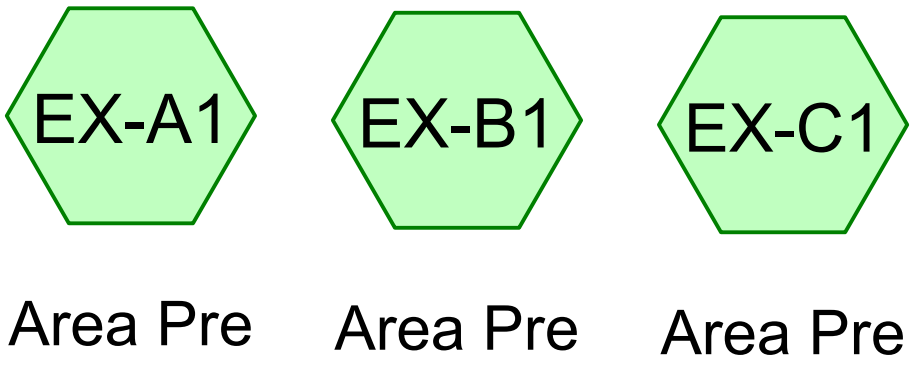
Standard 10: Prohibition of Illicit Discharges

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

☐ An Illicit Discharge Compliance Statement is attached;

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

HYDROCAD



Subcat Reach Pond Link

Routing Diagram for drainage#2
Prepared by Hewlett-Packard Company, Printed 12/26/2021

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.20	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.70	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.50	2
4	50-Year	Type III 24-hr		Default	24.00	1	6.10	2
5	100-Year	Type III 24-hr		Default	24.00	1	6.70	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,168	49	50-75% Grass cover, Fair, HSG A (EX-A1)
3,775	68	<50% Grass cover, Poor, HSG A (EX-B1, EX-C1)
19,205	98	Paved parking, HSG A (EX-A1, EX-B1, EX-C1)
3,155	98	Roofs, HSG A (EX-B1, EX-C1)

Summary for Subcatchment EX-A1: Area Pre

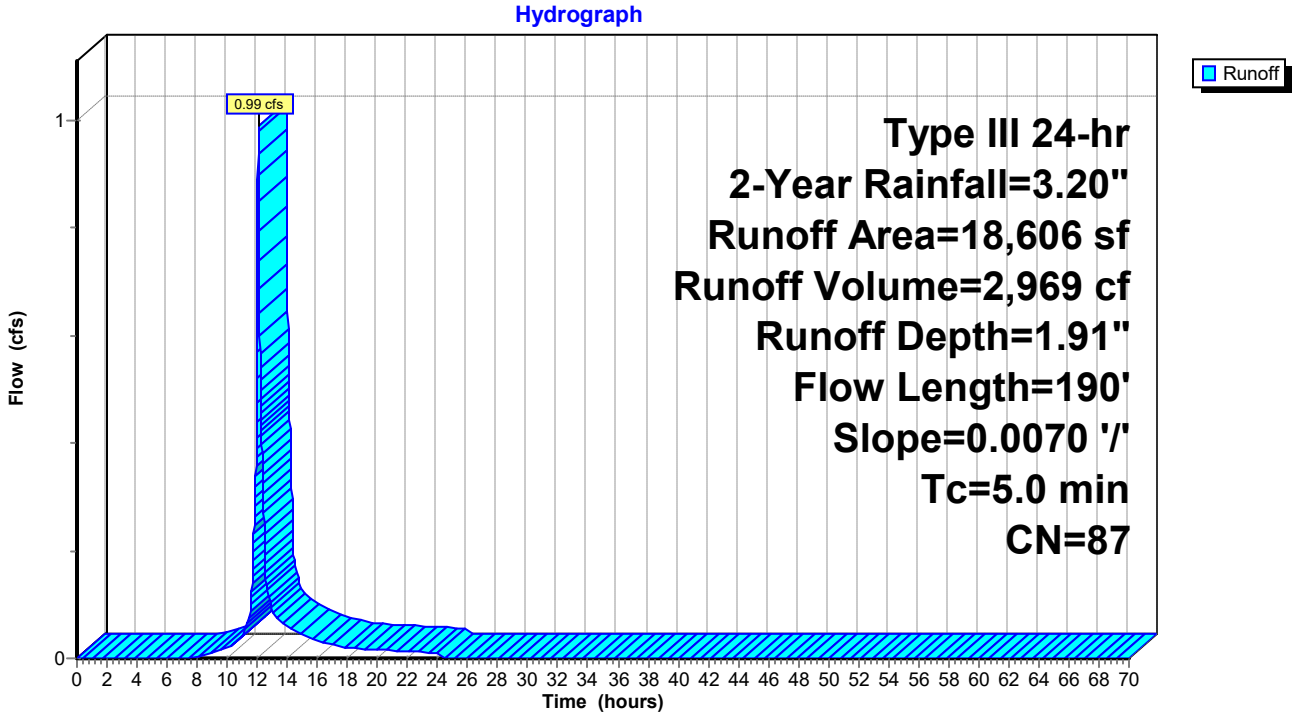
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 2,969 cf, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
14,438	98	Paved parking, HSG A
4,168	49	50-75% Grass cover, Fair, HSG A
18,606	87	Weighted Average
4,168		22.40% Pervious Area
14,438		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	190	0.0070	1.19		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
2.7	190	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-A1: Area Pre



Summary for Subcatchment EX-B1: Area Pre

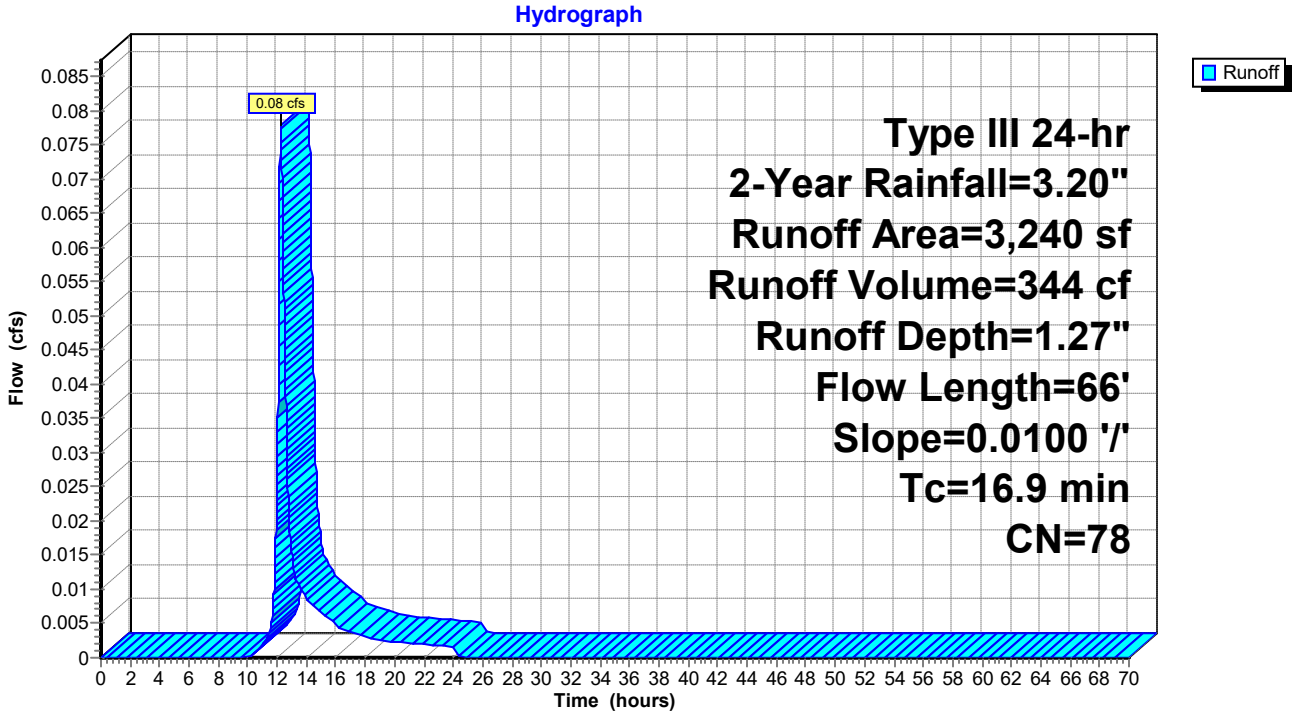
Runoff = 0.08 cfs @ 12.24 hrs, Volume= 344 cf, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
525	98	Roofs, HSG A
572	98	Paved parking, HSG A
2,143	68	<50% Grass cover, Poor, HSG A
3,240	78	Weighted Average
2,143		66.14% Pervious Area
1,097		33.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment EX-B1: Area Pre



Summary for Subcatchment EX-C1: Area Pre

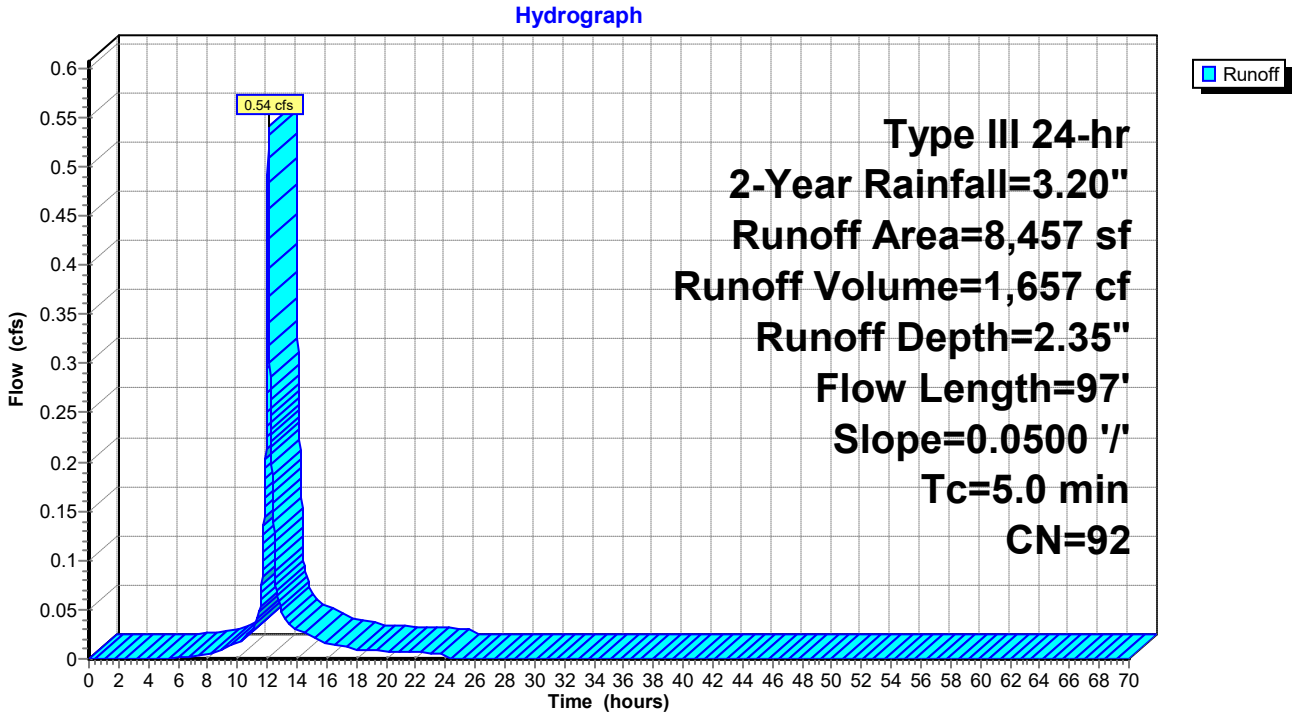
Runoff = 0.54 cfs @ 12.07 hrs, Volume= 1,657 cf, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
2,630	98	Roofs, HSG A
4,195	98	Paved parking, HSG A
1,632	68	<50% Grass cover, Poor, HSG A
8,457	92	Weighted Average
1,632		19.30% Pervious Area
6,825		80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-C1: Area Pre



Summary for Subcatchment EX-A1: Area Pre

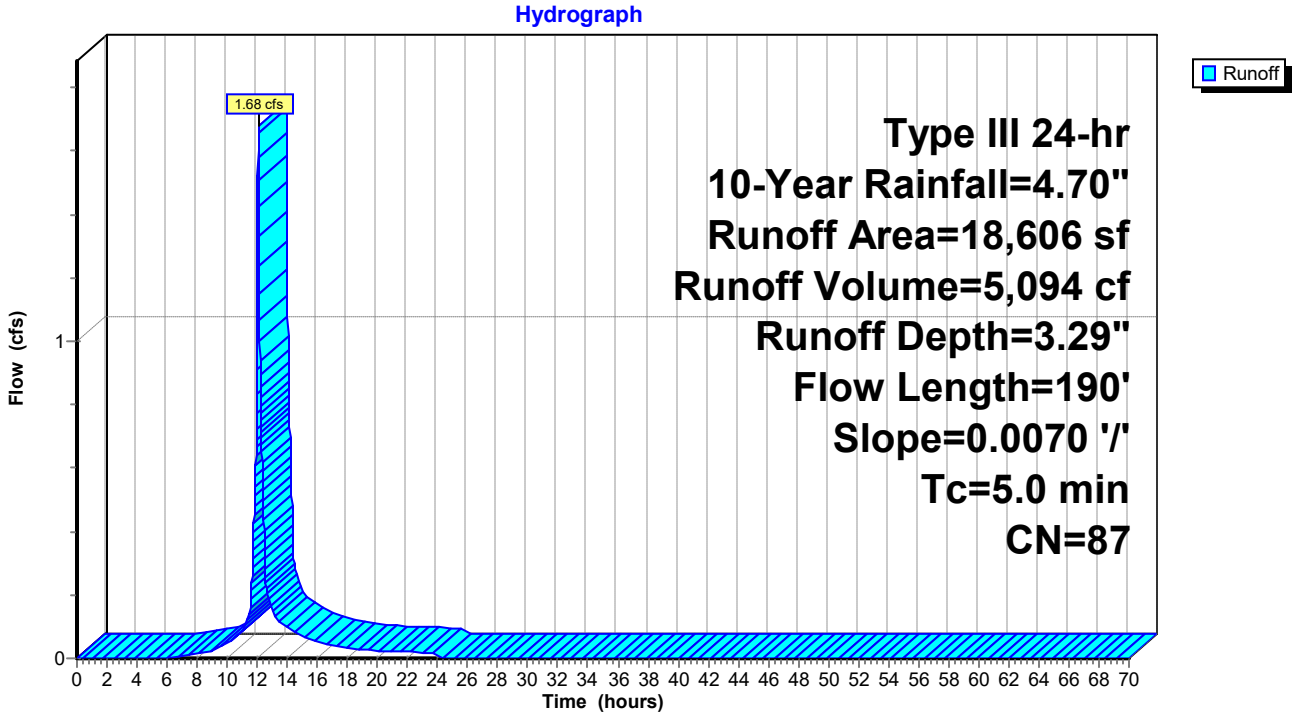
Runoff = 1.68 cfs @ 12.07 hrs, Volume= 5,094 cf, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
14,438	98	Paved parking, HSG A
4,168	49	50-75% Grass cover, Fair, HSG A
18,606	87	Weighted Average
4,168		22.40% Pervious Area
14,438		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	190	0.0070	1.19		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
2.7	190	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-A1: Area Pre



Summary for Subcatchment EX-B1: Area Pre

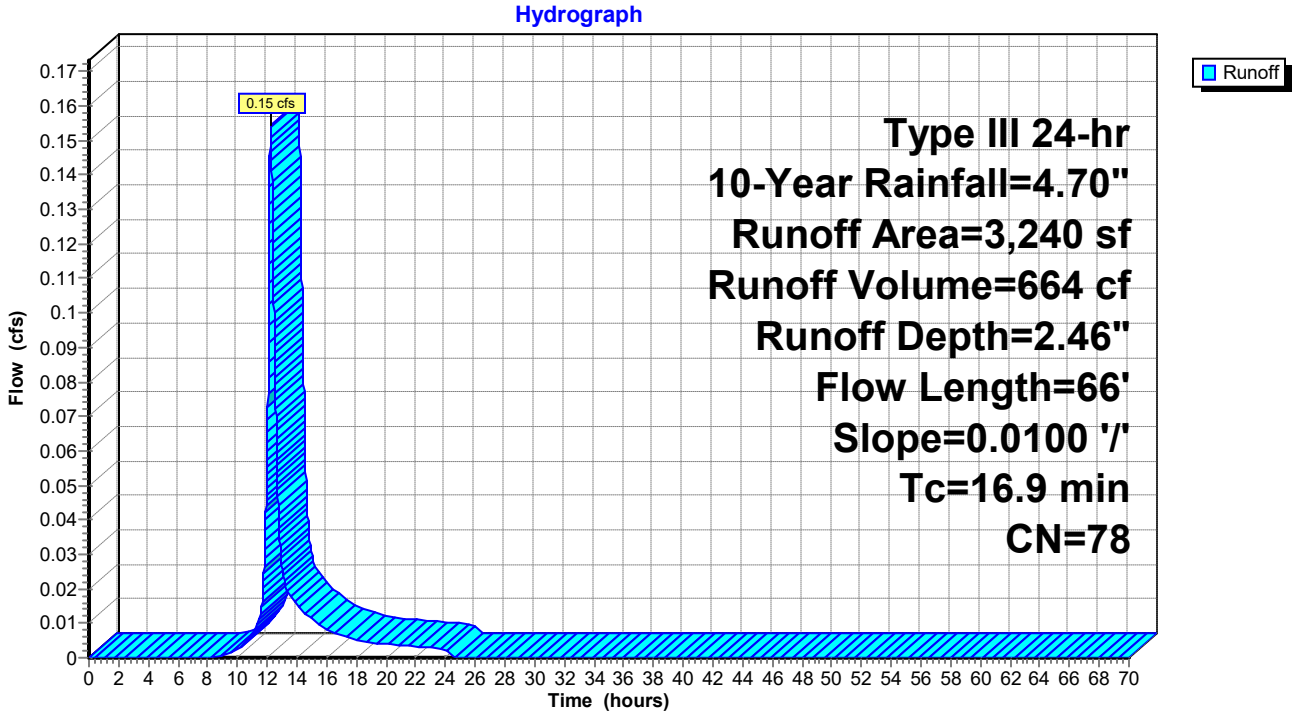
Runoff = 0.15 cfs @ 12.23 hrs, Volume= 664 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
525	98	Roofs, HSG A
572	98	Paved parking, HSG A
2,143	68	<50% Grass cover, Poor, HSG A
3,240	78	Weighted Average
2,143		66.14% Pervious Area
1,097		33.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment EX-B1: Area Pre



Summary for Subcatchment EX-C1: Area Pre

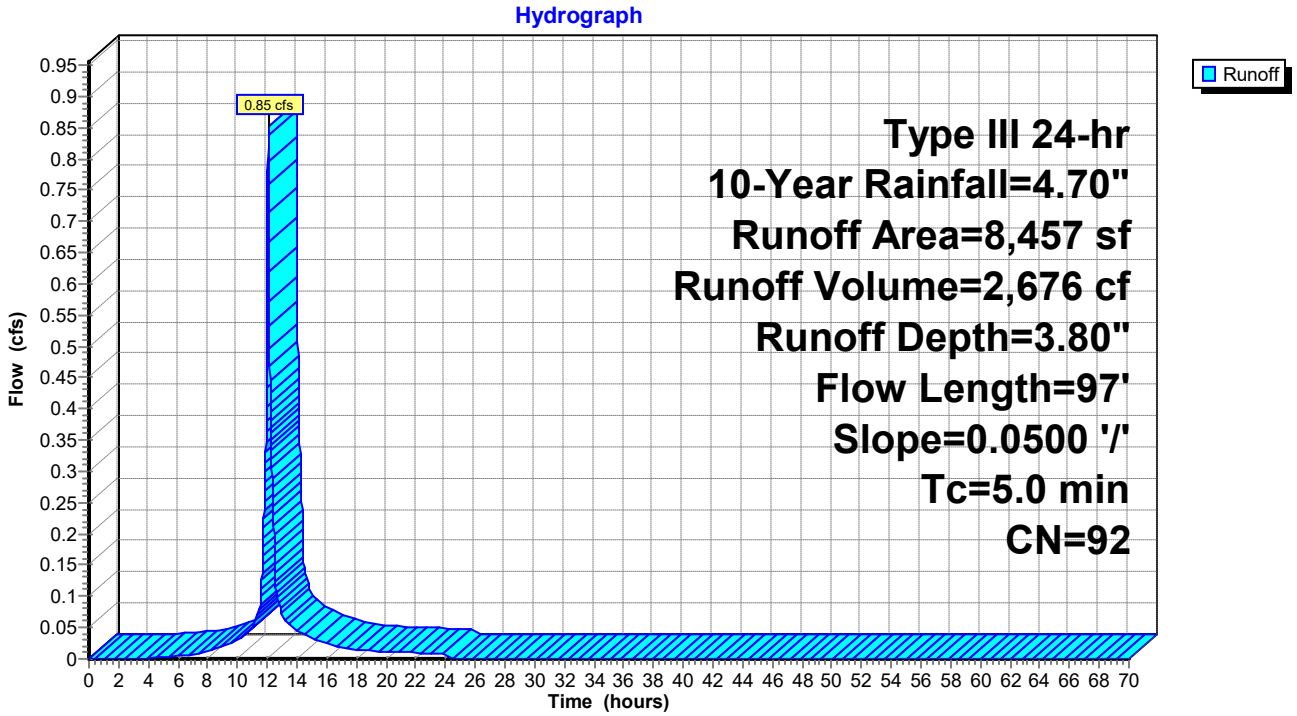
Runoff = 0.85 cfs @ 12.07 hrs, Volume= 2,676 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
2,630	98	Roofs, HSG A
4,195	98	Paved parking, HSG A
1,632	68	<50% Grass cover, Poor, HSG A
8,457	92	Weighted Average
1,632		19.30% Pervious Area
6,825		80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-C1: Area Pre



Summary for Subcatchment EX-A1: Area Pre

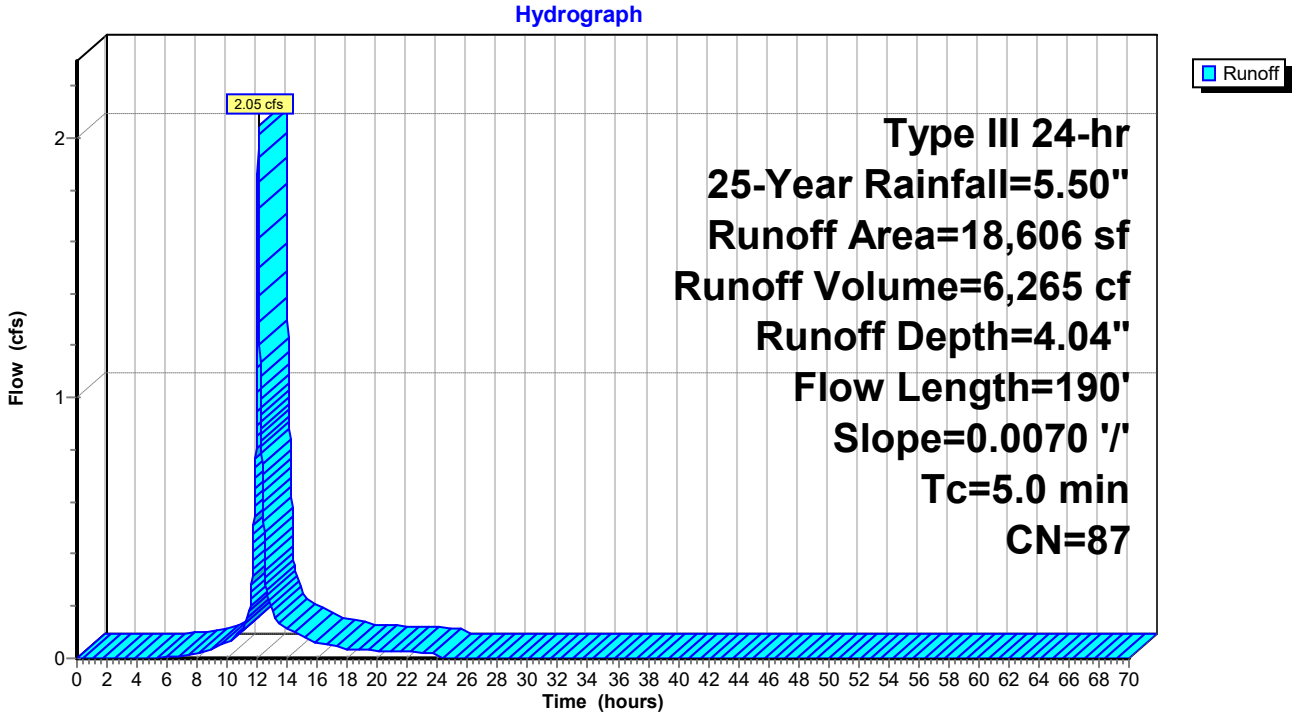
Runoff = 2.05 cfs @ 12.07 hrs, Volume= 6,265 cf, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
14,438	98	Paved parking, HSG A
4,168	49	50-75% Grass cover, Fair, HSG A
18,606	87	Weighted Average
4,168		22.40% Pervious Area
14,438		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	190	0.0070	1.19		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
2.7	190	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-A1: Area Pre



Summary for Subcatchment EX-B1: Area Pre

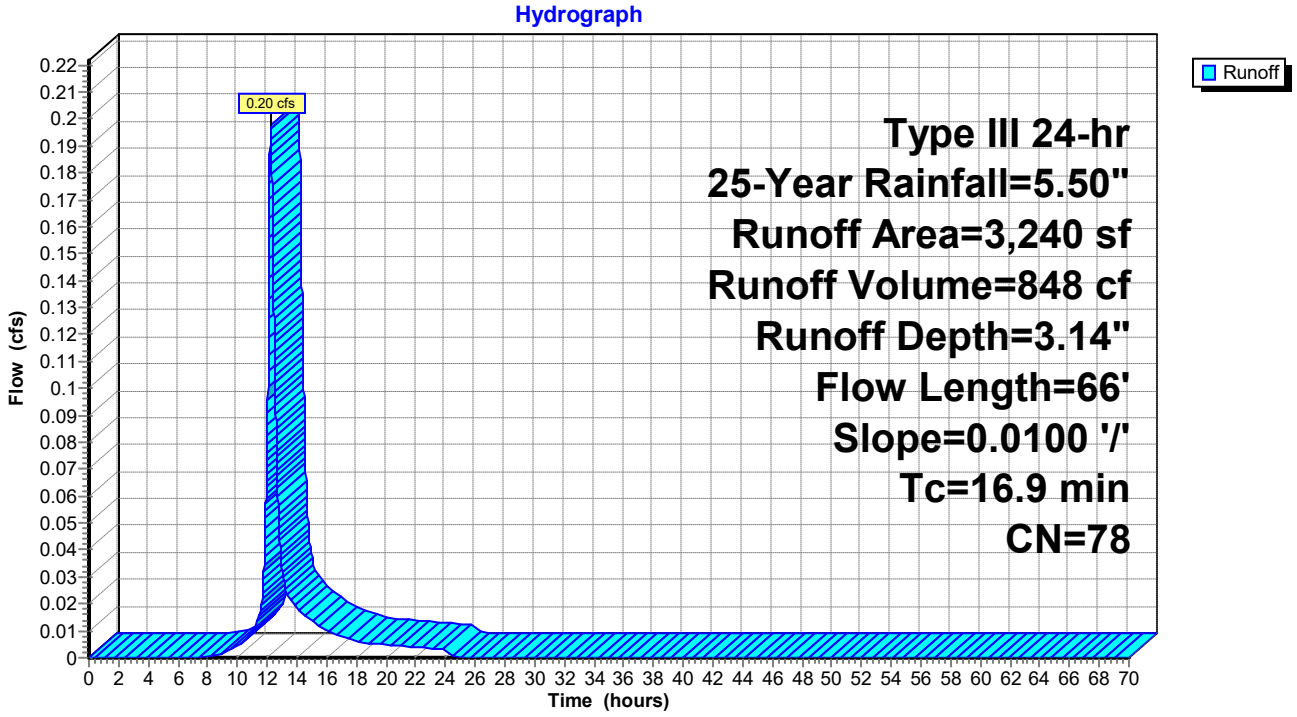
Runoff = 0.20 cfs @ 12.23 hrs, Volume= 848 cf, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
525	98	Roofs, HSG A
572	98	Paved parking, HSG A
2,143	68	<50% Grass cover, Poor, HSG A
3,240	78	Weighted Average
2,143		66.14% Pervious Area
1,097		33.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment EX-B1: Area Pre



Summary for Subcatchment EX-C1: Area Pre

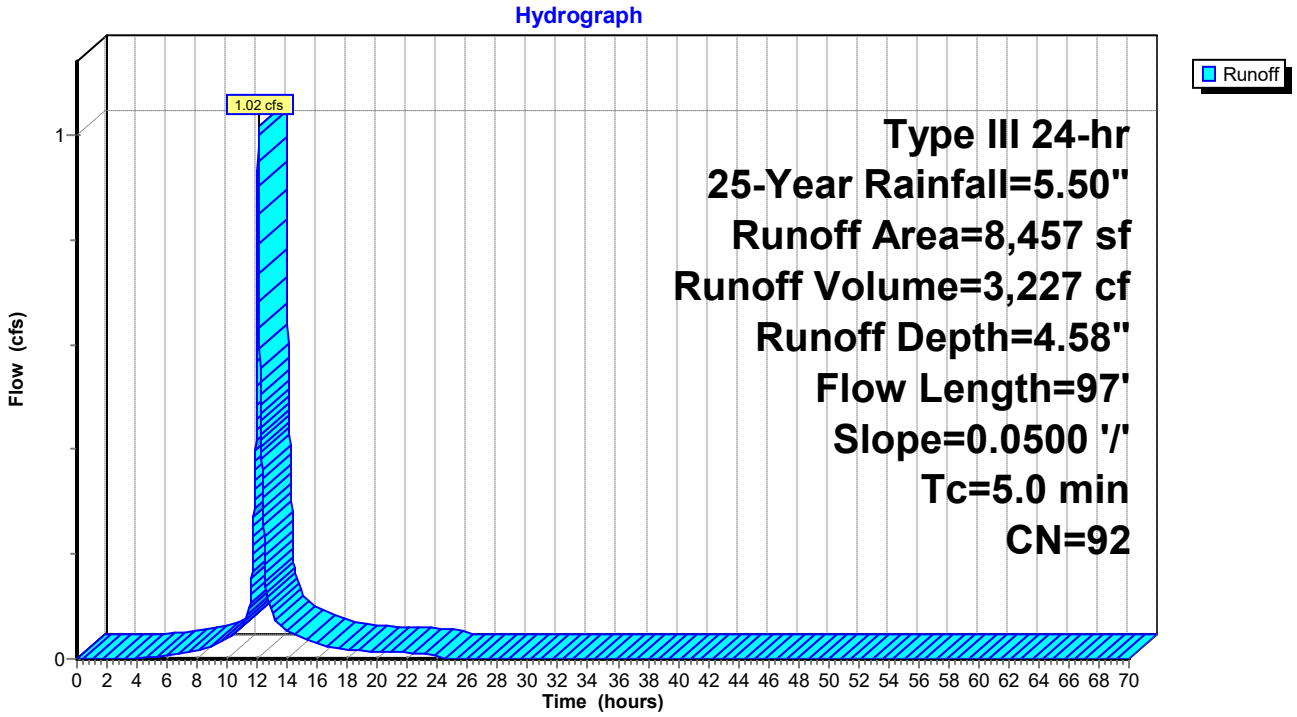
Runoff = 1.02 cfs @ 12.07 hrs, Volume= 3,227 cf, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
2,630	98	Roofs, HSG A
4,195	98	Paved parking, HSG A
1,632	68	<50% Grass cover, Poor, HSG A
8,457	92	Weighted Average
1,632		19.30% Pervious Area
6,825		80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-C1: Area Pre



Summary for Subcatchment EX-A1: Area Pre

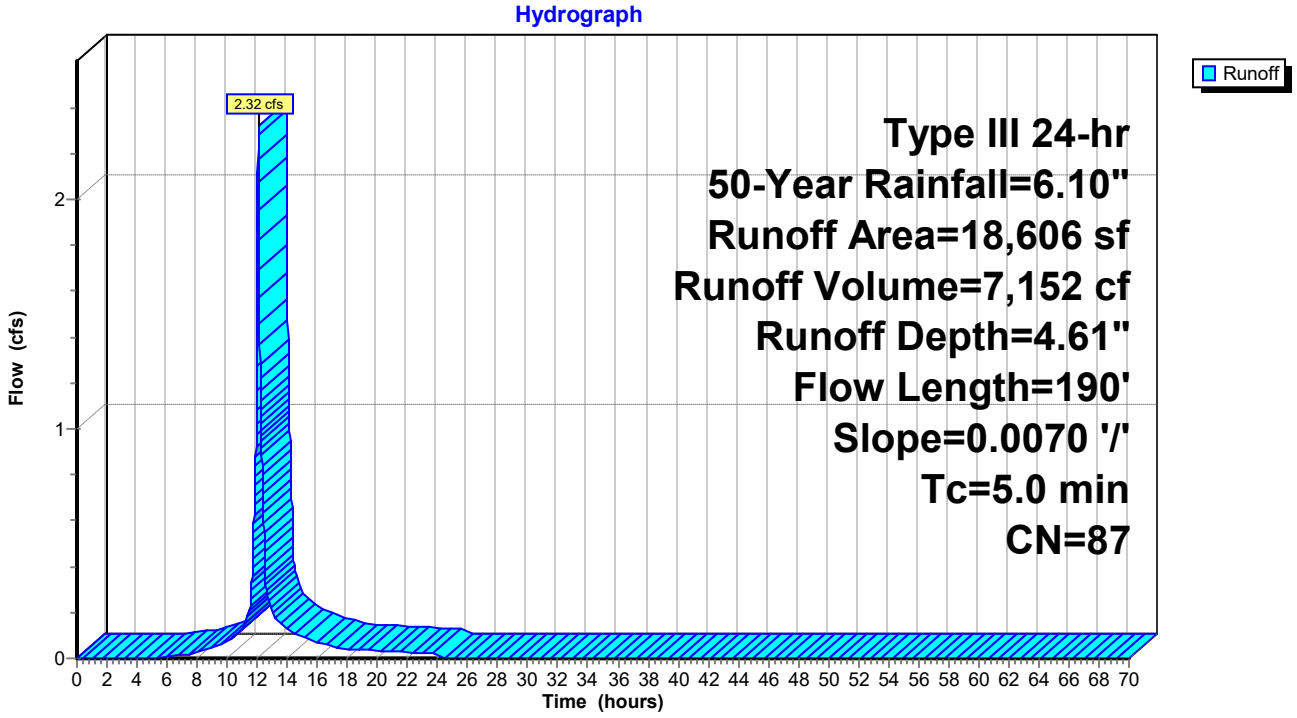
Runoff = 2.32 cfs @ 12.07 hrs, Volume= 7,152 cf, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
14,438	98	Paved parking, HSG A
4,168	49	50-75% Grass cover, Fair, HSG A
18,606	87	Weighted Average
4,168		22.40% Pervious Area
14,438		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	190	0.0070	1.19		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
2.7	190	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-A1: Area Pre



Summary for Subcatchment EX-B1: Area Pre

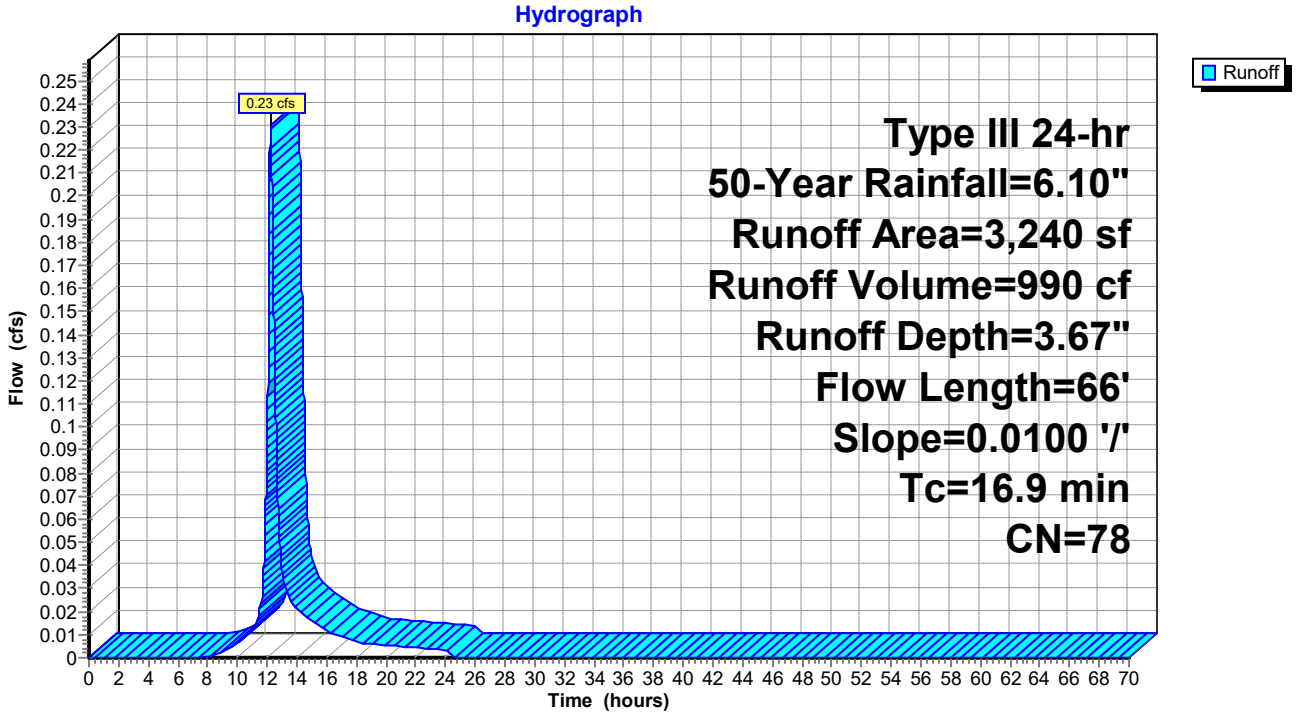
Runoff = 0.23 cfs @ 12.23 hrs, Volume= 990 cf, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
525	98	Roofs, HSG A
572	98	Paved parking, HSG A
2,143	68	<50% Grass cover, Poor, HSG A
3,240	78	Weighted Average
2,143		66.14% Pervious Area
1,097		33.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment EX-B1: Area Pre



Summary for Subcatchment EX-C1: Area Pre

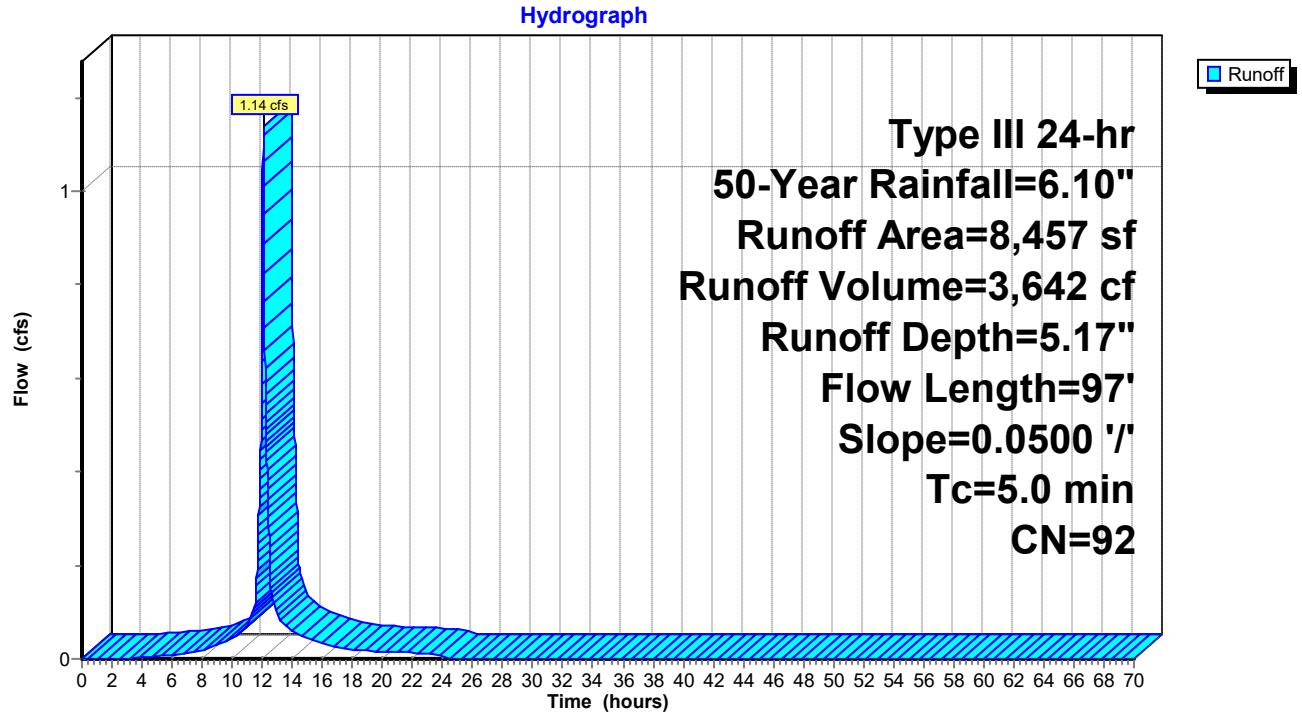
Runoff = 1.14 cfs @ 12.07 hrs, Volume= 3,642 cf, Depth= 5.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
2,630	98	Roofs, HSG A
4,195	98	Paved parking, HSG A
1,632	68	<50% Grass cover, Poor, HSG A
8,457	92	Weighted Average
1,632		19.30% Pervious Area
6,825		80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-C1: Area Pre



Summary for Subcatchment EX-A1: Area Pre

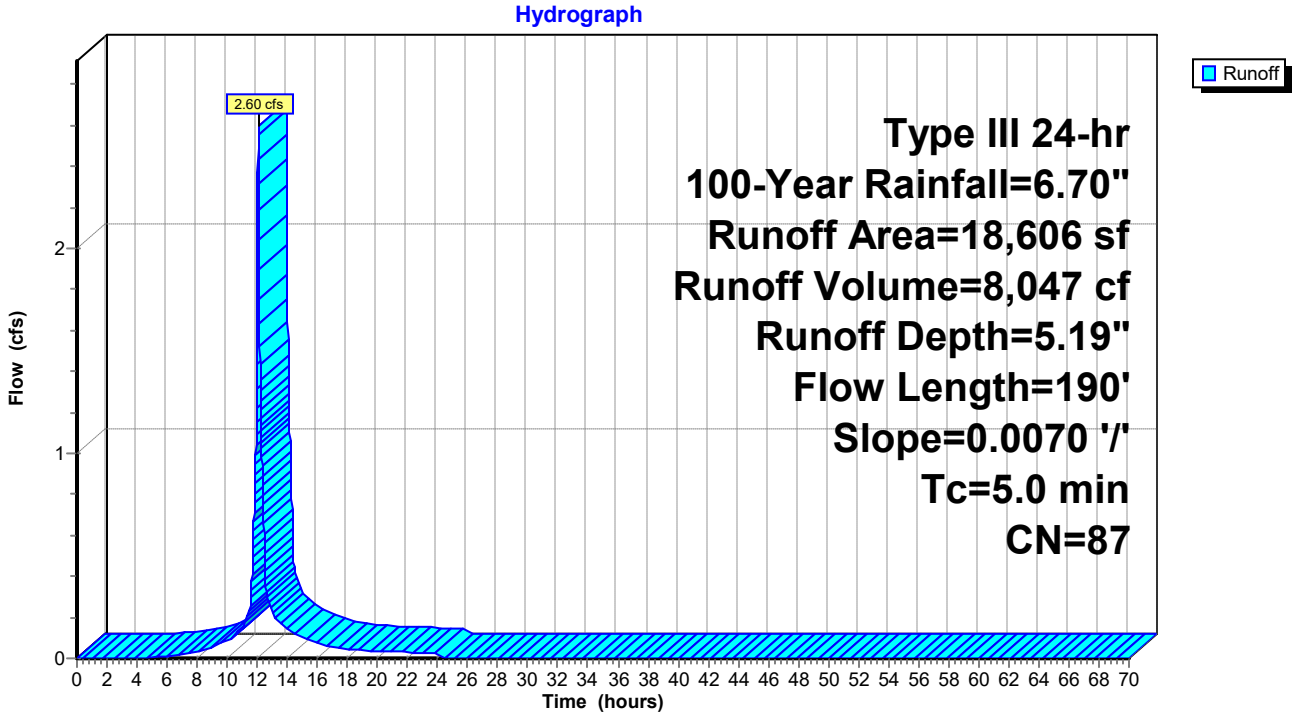
Runoff = 2.60 cfs @ 12.07 hrs, Volume= 8,047 cf, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
14,438	98	Paved parking, HSG A
4,168	49	50-75% Grass cover, Fair, HSG A
18,606	87	Weighted Average
4,168		22.40% Pervious Area
14,438		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	190	0.0070	1.19		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
2.7	190	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-A1: Area Pre



Summary for Subcatchment EX-B1: Area Pre

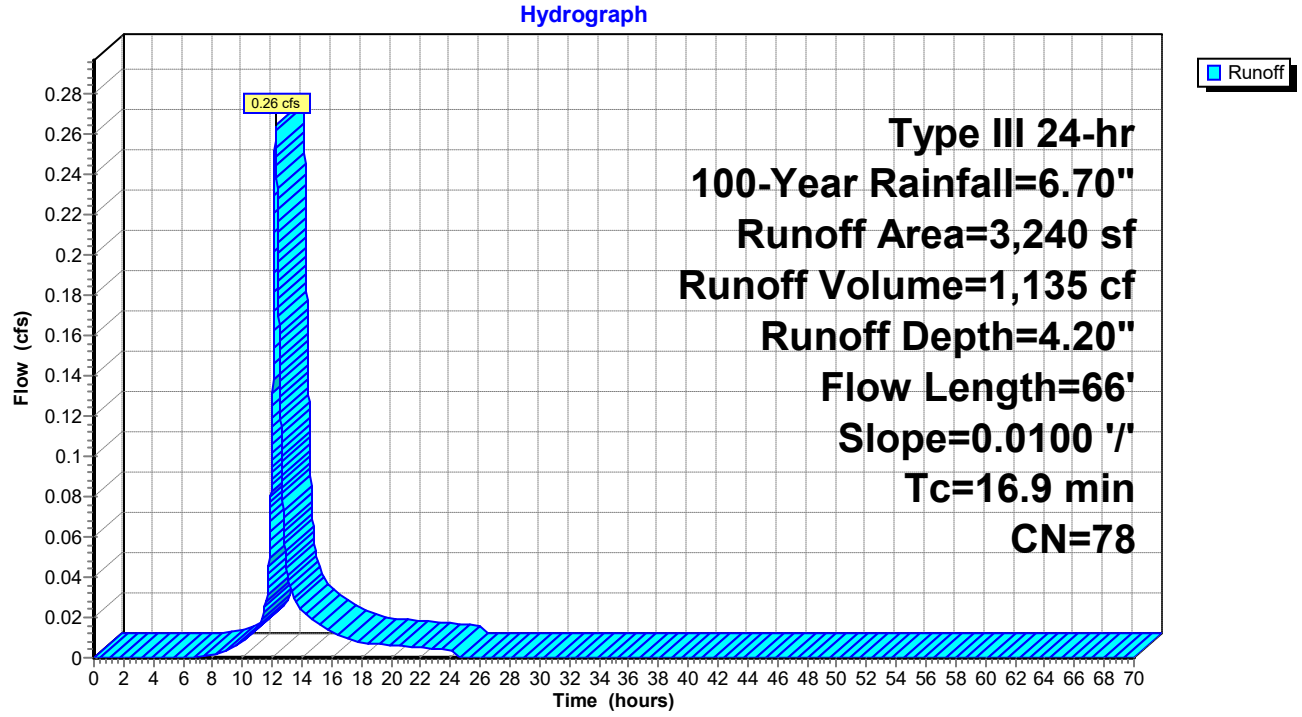
Runoff = 0.26 cfs @ 12.23 hrs, Volume= 1,135 cf, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
525	98	Roofs, HSG A
572	98	Paved parking, HSG A
2,143	68	<50% Grass cover, Poor, HSG A
3,240	78	Weighted Average
2,143		66.14% Pervious Area
1,097		33.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment EX-B1: Area Pre



Summary for Subcatchment EX-C1: Area Pre

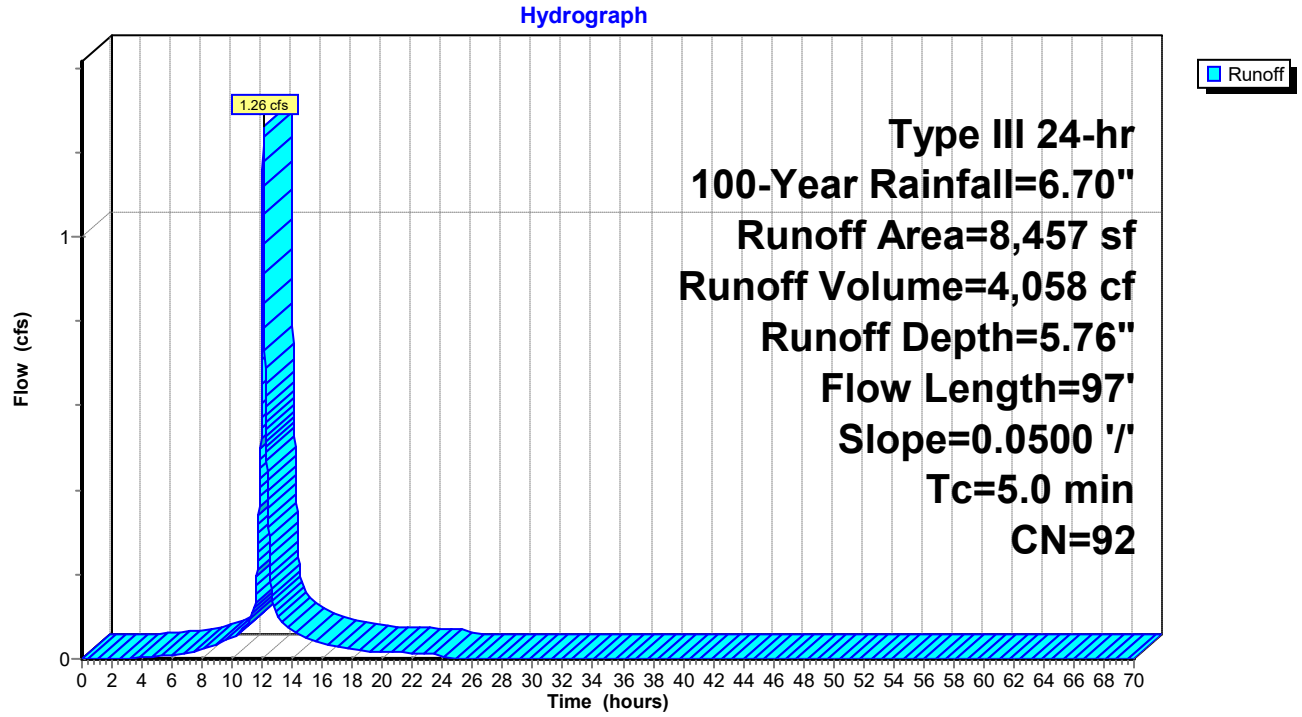
Runoff = 1.26 cfs @ 12.07 hrs, Volume= 4,058 cf, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
2,630	98	Roofs, HSG A
4,195	98	Paved parking, HSG A
1,632	68	<50% Grass cover, Poor, HSG A
8,457	92	Weighted Average
1,632		19.30% Pervious Area
6,825		80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EX-C1: Area Pre



drainage#2
Prepared by Hewlett-Packard Company

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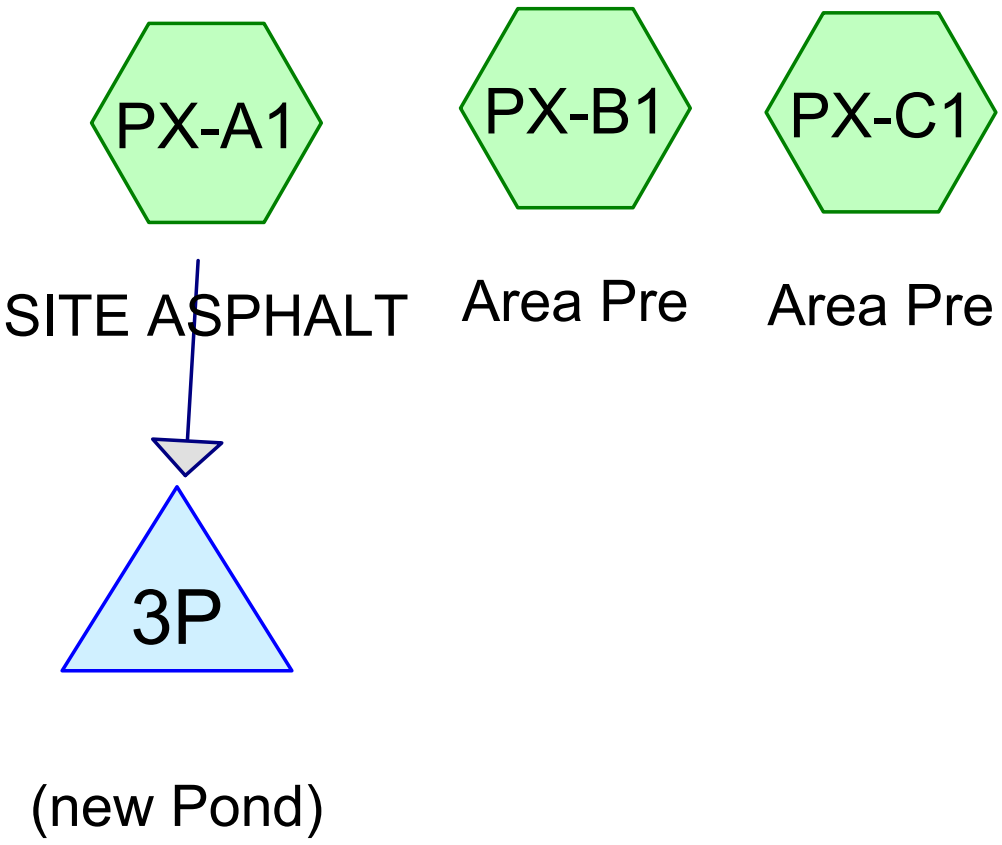


Subcat Reach Pond Link

Routing Diagram for drainage#2
Prepared by Hewlett-Packard Company, Printed 12/26/2021

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.20	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.70	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.50	2
4	50-Year	Type III 24-hr		Default	24.00	1	6.10	2
5	100-Year	Type III 24-hr		Default	24.00	1	6.70	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
18,139	39	>75% Grass cover, Good, HSG A (PX-A1, PX-B1, PX-C1)
6,329	98	Paved parking, HSG A (PX-A1, PX-B1, PX-C1)
1,823	98	Roofs, HSG A (PX-B1, PX-C1)
3,870	98	Unconnected roofs, HSG A (PX-A1)
918	98	WALKS (PX-A1)
431	98	WALKWAYS, HSG A (PX-C1)

Summary for Pond 3P: (new Pond)

Inflow Area = 22,771 sf, 45.67% Impervious, Inflow Depth = 0.64" for 2-Year event
Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,220 cf
Outflow = 0.19 cfs @ 12.27 hrs, Volume= 1,220 cf, Atten= 42%, Lag= 10.9 min
Discarded = 0.19 cfs @ 12.27 hrs, Volume= 1,220 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 188.73' @ 12.27 hrs Surf.Area= 945 sf Storage= 66 cf

Plug-Flow detention time= 1.4 min calculated for 1,220 cf (100% of inflow)
Center-of-Mass det. time= 1.4 min (891.6 - 890.2)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	697 cf	**Custom Stage Data (Conic)** Listed below 3,780 cf Overall - 1,456 cf Embedded = 2,325 cf x 30.0% Voids
#2	189.50'	1,456 cf	**Custom Stage Data (Prismatic)** Listed below Inside #1
		2,153 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	945	0	0	945
189.50	945	945	945	1,054
190.50	945	945	1,890	1,163
191.50	945	945	2,835	1,272
192.50	945	945	3,780	1,381

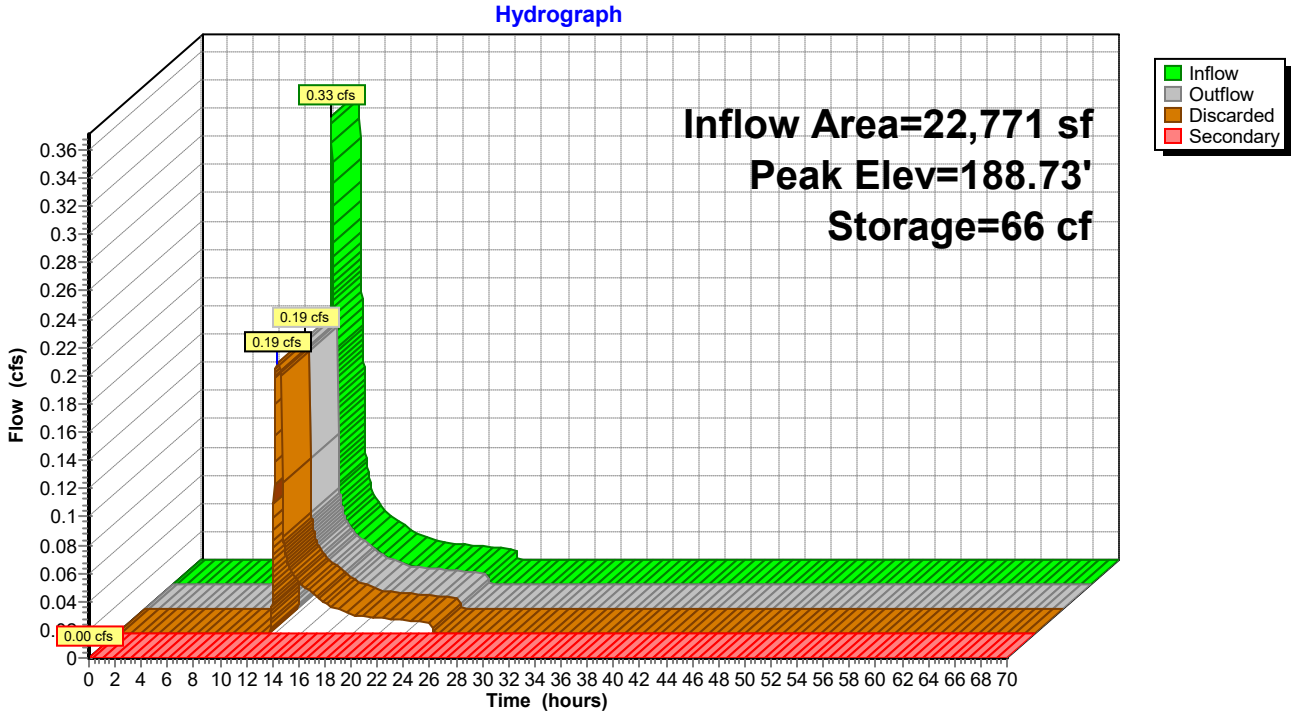
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.50	276	0	0
190.50	371	324	324
191.50	474	423	746
192.50	945	710	1,456

Device	Routing	Invert	Outlet Devices
#1	Discarded	188.50'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00' Phase-In= 0.01'
#2	Secondary	192.15'	**20.0' long + 1.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

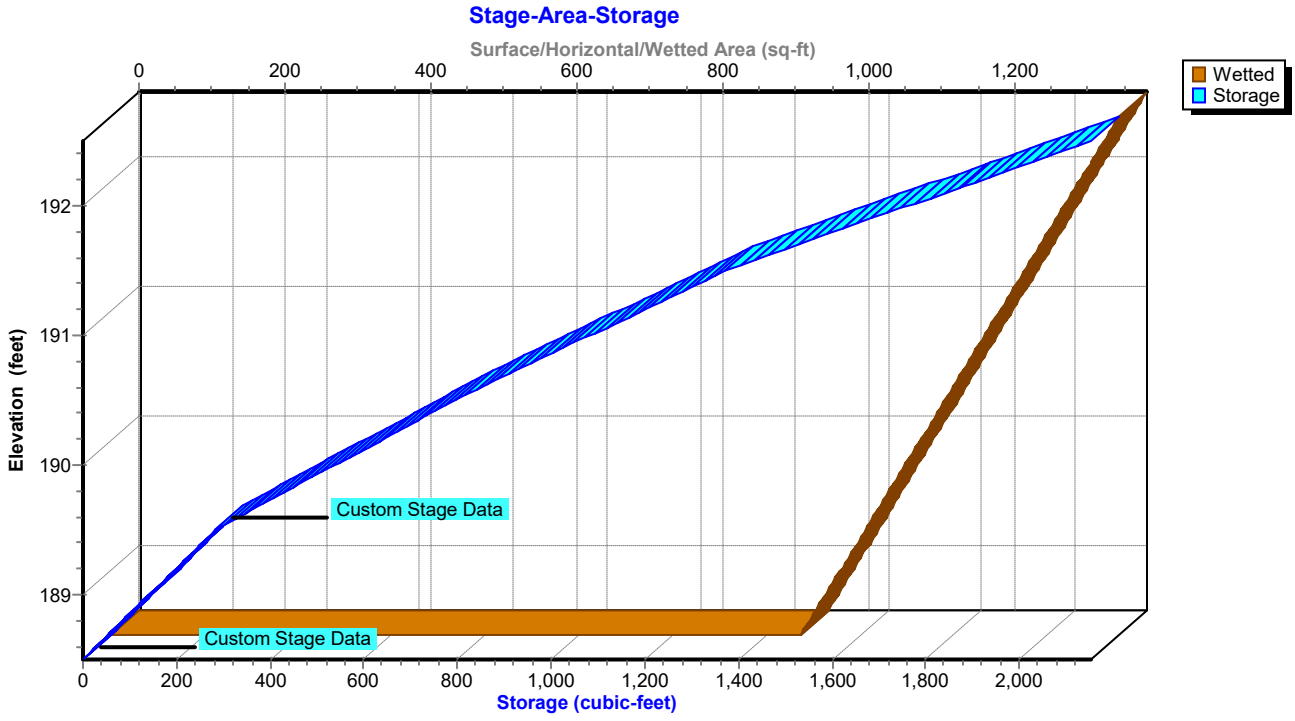
Discarded OutFlow Max=0.19 cfs @ 12.27 hrs HW=188.73' (Free Discharge)
↑**1=Exfiltration** (Controls 0.19 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Pond 3P: (new Pond)



Summary for Subcatchment PX-A1: SITE ASPHALT

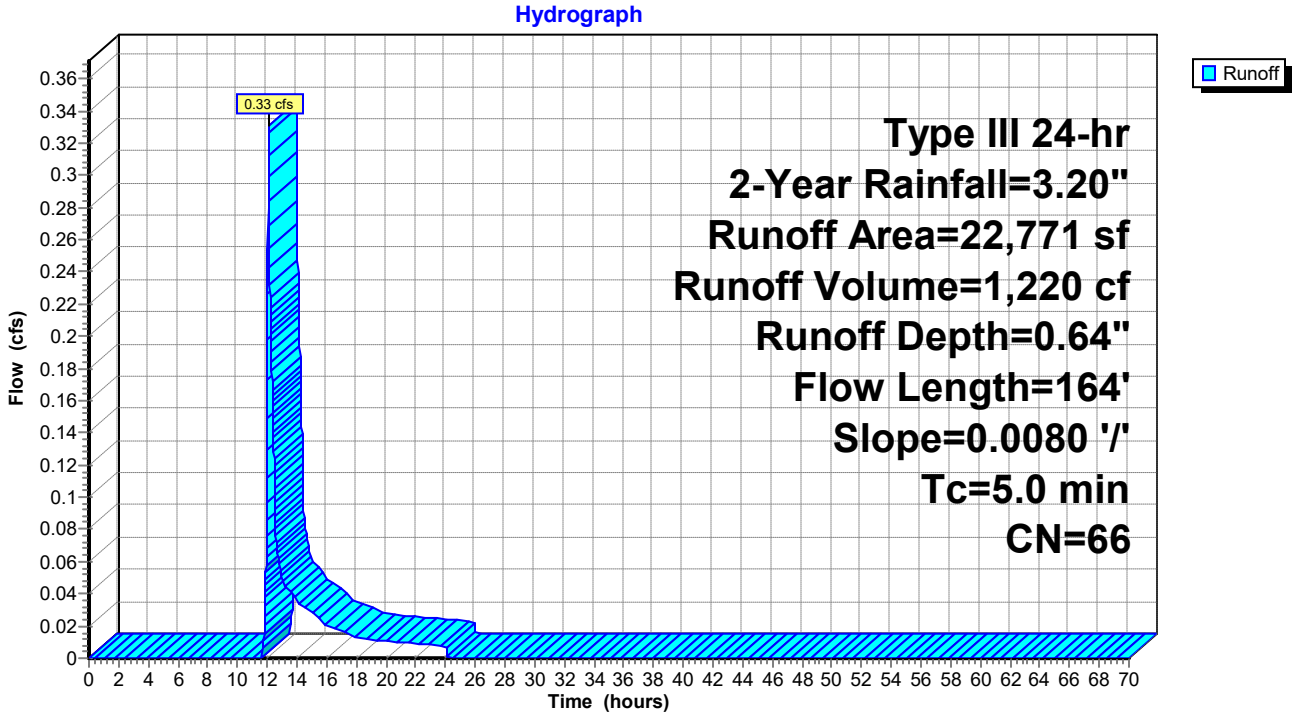
Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,220 cf, Depth= 0.64"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

	Area (sf)	CN	Description
	12,372	39	>75% Grass cover, Good, HSG A
	5,611	98	Paved parking, HSG A
*	918	98	WALKS
	3,870	98	Unconnected roofs, HSG A
	22,771	66	Weighted Average
	12,372		54.33% Pervious Area
	10,399		45.67% Impervious Area
	3,870		37.22% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0080	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
2.2	164	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-A1: SITE ASPHALT



Summary for Subcatchment PX-B1: Area Pre

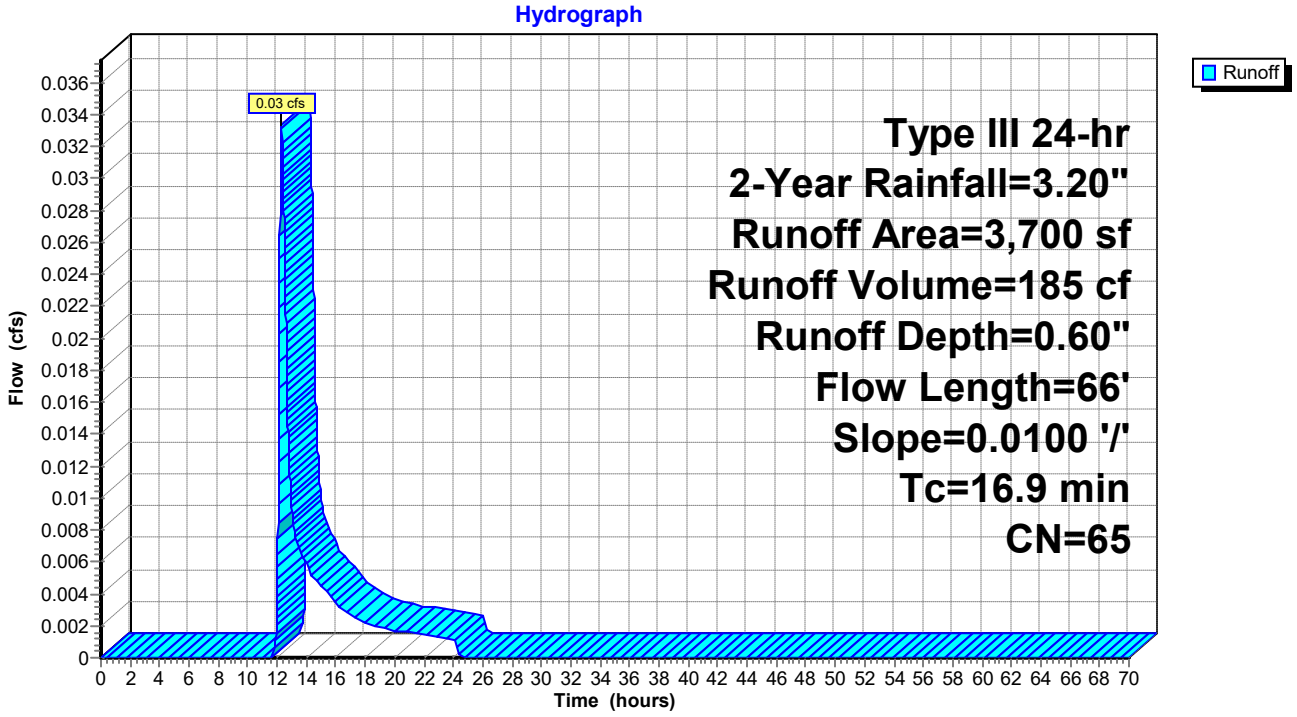
Runoff = 0.03 cfs @ 12.29 hrs, Volume= 185 cf, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
1,386	98	Roofs, HSG A
256	98	Paved parking, HSG A
2,058	39	>75% Grass cover, Good, HSG A
3,700	65	Weighted Average
2,058		55.62% Pervious Area
1,642		44.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment PX-B1: Area Pre



Summary for Subcatchment PX-C1: Area Pre

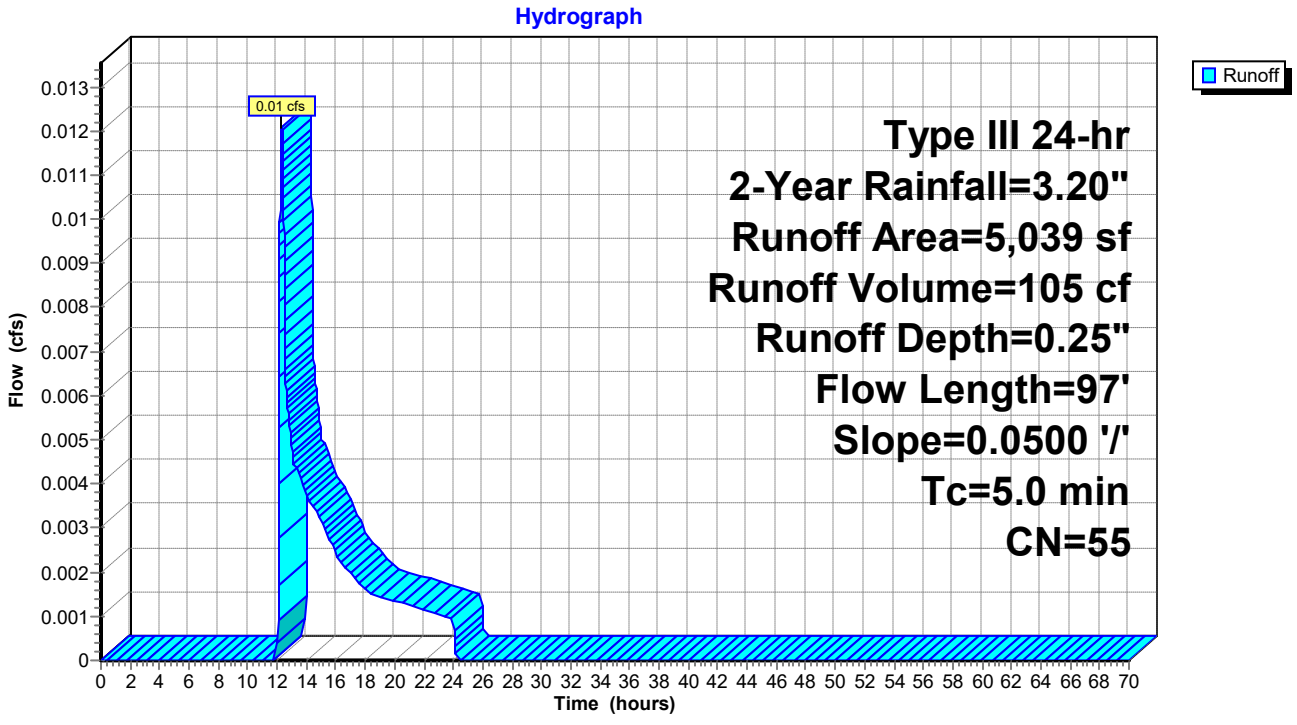
Runoff = 0.01 cfs @ 12.32 hrs, Volume= 105 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

	Area (sf)	CN	Description
	437	98	Roofs, HSG A
	462	98	Paved parking, HSG A
	3,709	39	>75% Grass cover, Good, HSG A
*	431	98	WALKWAYS, HSG A
	5,039	55	Weighted Average
	3,709		73.61% Pervious Area
	1,330		26.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-C1: Area Pre



Summary for Pond 3P: (new Pond)

Inflow Area = 22,771 sf, 45.67% Impervious, Inflow Depth = 1.53" for 10-Year event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 2,897 cf
Outflow = 0.25 cfs @ 12.49 hrs, Volume= 2,897 cf, Atten= 73%, Lag= 24.2 min
Discarded = 0.25 cfs @ 12.49 hrs, Volume= 2,897 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 190.10' @ 12.49 hrs Surf.Area= 945 sf Storage= 589 cf

Plug-Flow detention time= 13.7 min calculated for 2,896 cf (100% of inflow)
Center-of-Mass det. time= 13.7 min (874.7 - 861.0)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	697 cf	**Custom Stage Data (Conic)** Listed below 3,780 cf Overall - 1,456 cf Embedded = 2,325 cf x 30.0% Voids
#2	189.50'	1,456 cf	**Custom Stage Data (Prismatic)** Listed below Inside #1
		2,153 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	945	0	0	945
189.50	945	945	945	1,054
190.50	945	945	1,890	1,163
191.50	945	945	2,835	1,272
192.50	945	945	3,780	1,381

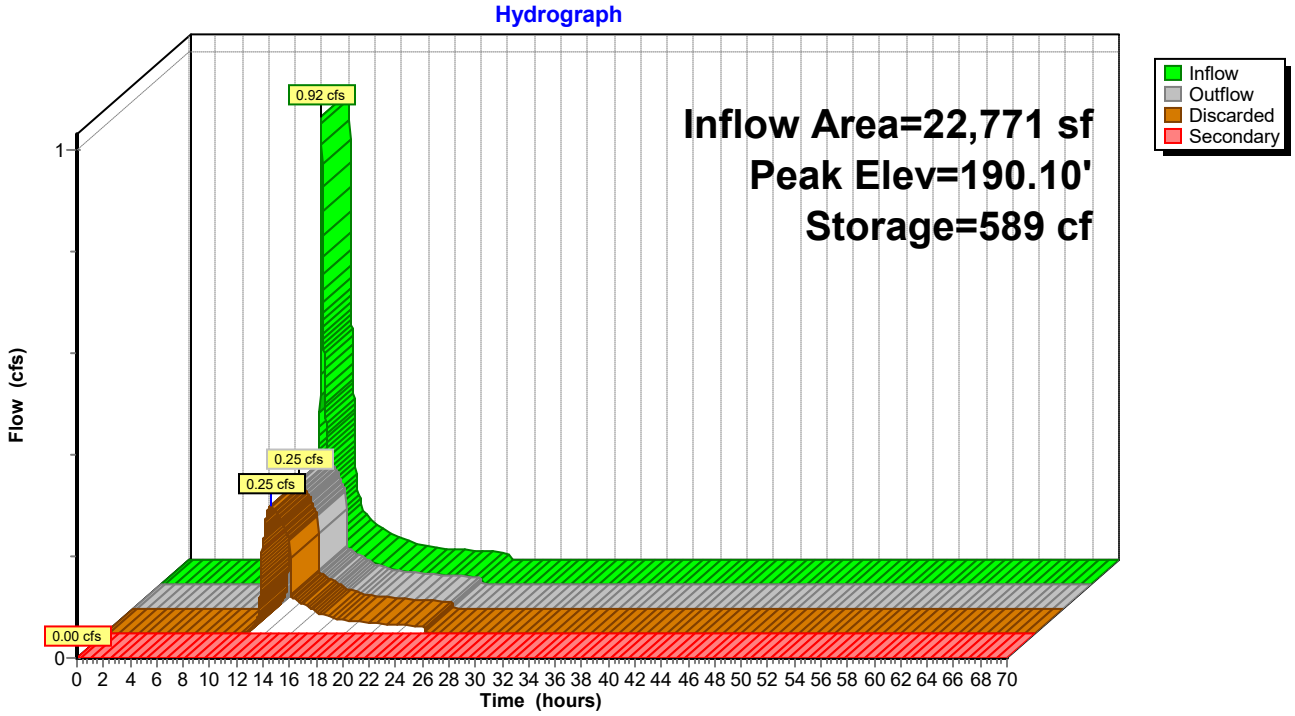
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.50	276	0	0
190.50	371	324	324
191.50	474	423	746
192.50	945	710	1,456

Device	Routing	Invert	Outlet Devices
#1	Discarded	188.50'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00' Phase-In= 0.01'
#2	Secondary	192.15'	**20.0' long + 1.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

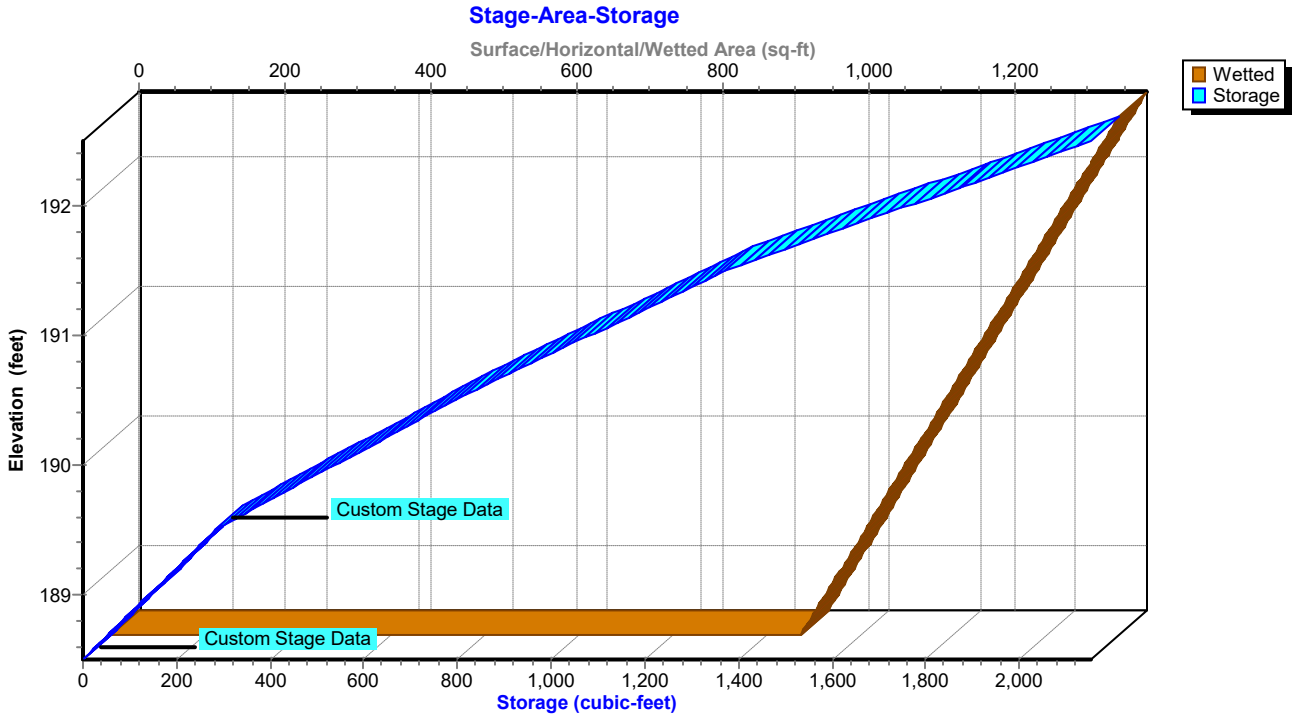
Discarded OutFlow Max=0.25 cfs @ 12.49 hrs HW=190.10' (Free Discharge)
↑**1=Exfiltration** (Controls 0.25 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Pond 3P: (new Pond)



Summary for Subcatchment PX-A1: SITE ASPHALT

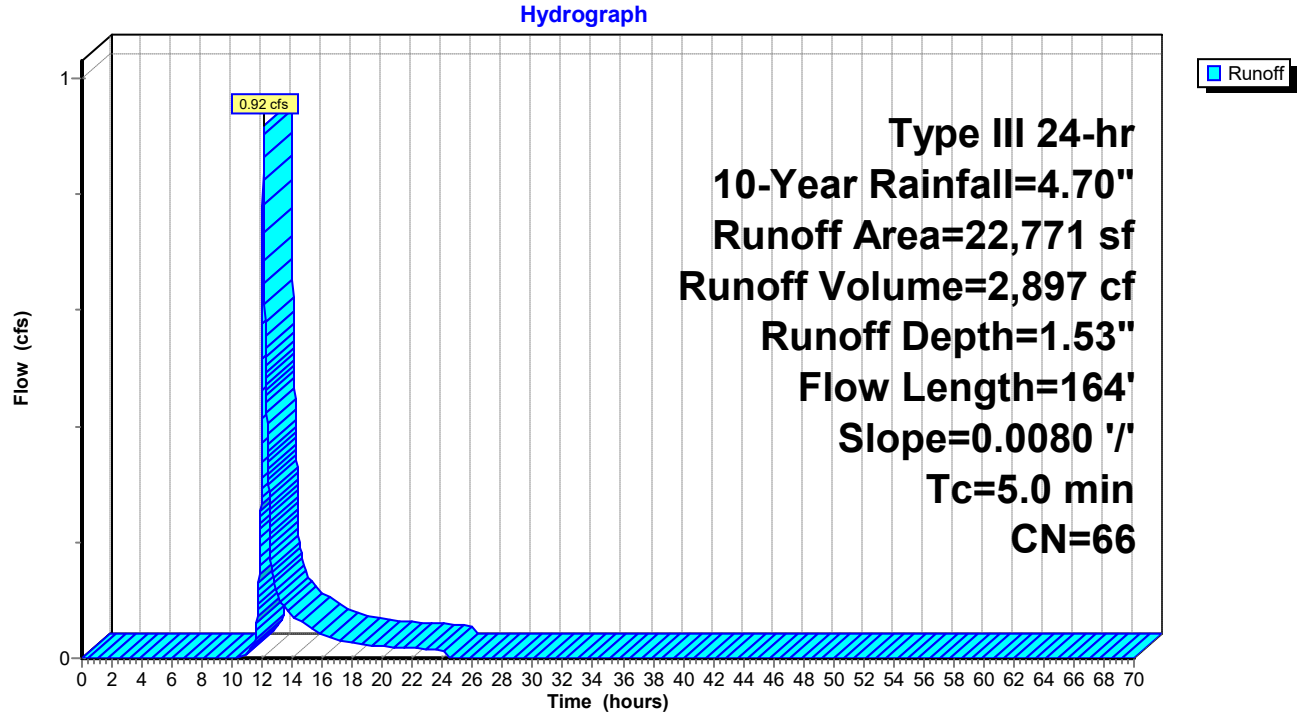
Runoff = 0.92 cfs @ 12.08 hrs, Volume= 2,897 cf, Depth= 1.53"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
	12,372	39	>75% Grass cover, Good, HSG A
	5,611	98	Paved parking, HSG A
*	918	98	WALKS
	3,870	98	Unconnected roofs, HSG A
	22,771	66	Weighted Average
	12,372		54.33% Pervious Area
	10,399		45.67% Impervious Area
	3,870		37.22% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0080	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
2.2	164	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-A1: SITE ASPHALT



Summary for Subcatchment PX-B1: Area Pre

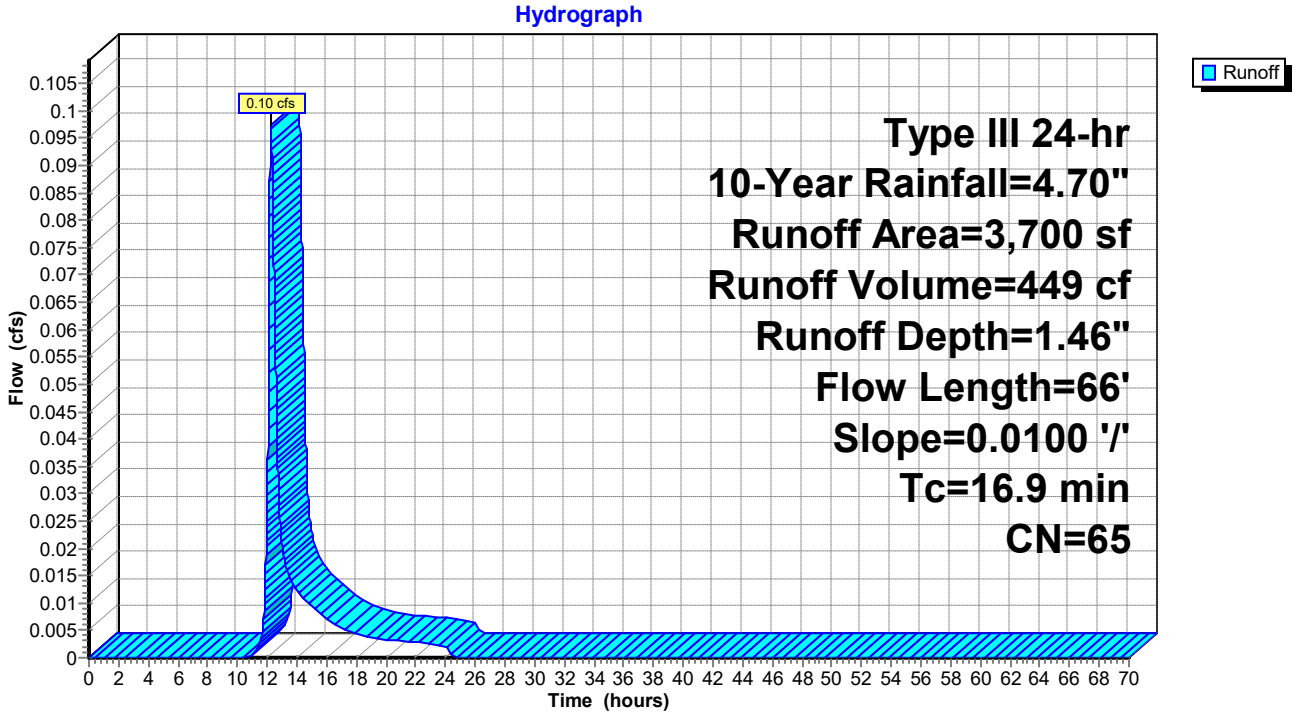
Runoff = 0.10 cfs @ 12.26 hrs, Volume= 449 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
1,386	98	Roofs, HSG A
256	98	Paved parking, HSG A
2,058	39	>75% Grass cover, Good, HSG A
3,700	65	Weighted Average
2,058		55.62% Pervious Area
1,642		44.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment PX-B1: Area Pre



Summary for Subcatchment PX-C1: Area Pre

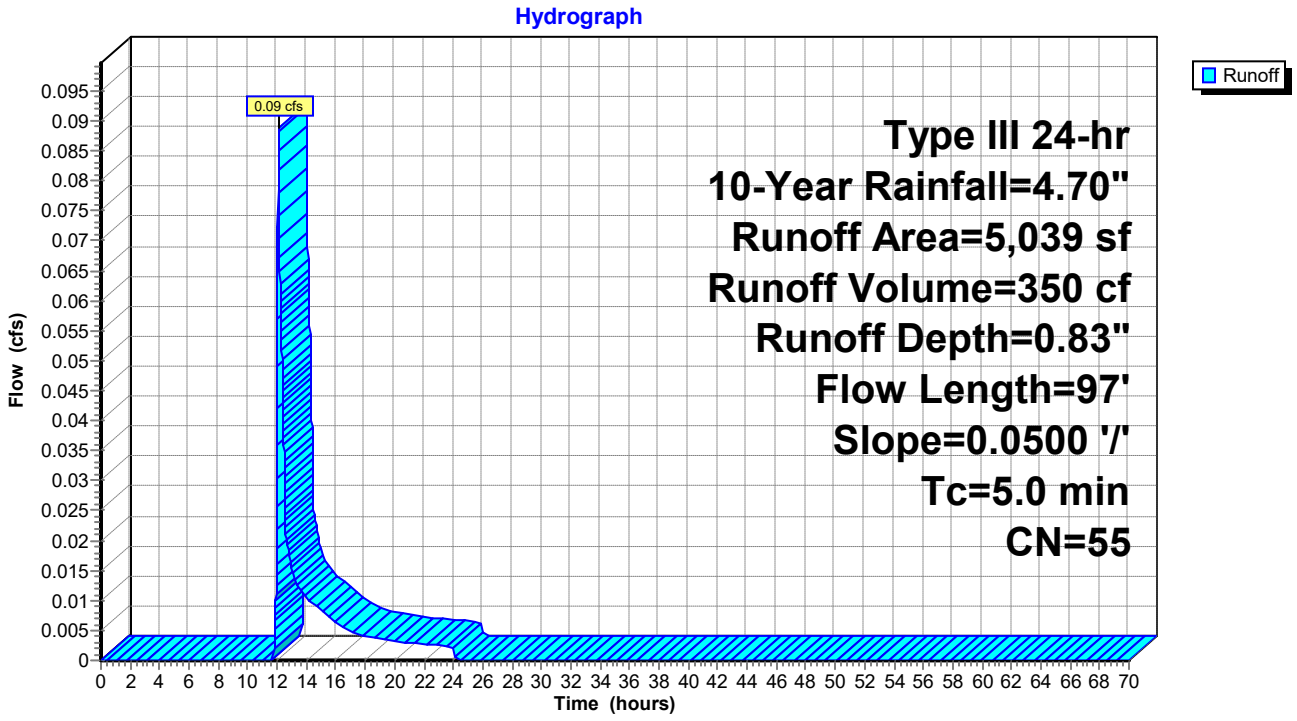
Runoff = 0.09 cfs @ 12.10 hrs, Volume= 350 cf, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
	437	98	Roofs, HSG A
	462	98	Paved parking, HSG A
	3,709	39	>75% Grass cover, Good, HSG A
*	431	98	WALKWAYS, HSG A
	5,039	55	Weighted Average
	3,709		73.61% Pervious Area
	1,330		26.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-C1: Area Pre



Summary for Pond 3P: (new Pond)

Inflow Area = 22,771 sf, 45.67% Impervious, Inflow Depth = 2.08" for 25-Year event
Inflow = 1.28 cfs @ 12.08 hrs, Volume= 3,940 cf
Outflow = 0.29 cfs @ 12.52 hrs, Volume= 3,940 cf, Atten= 78%, Lag= 26.4 min
Discarded = 0.29 cfs @ 12.52 hrs, Volume= 3,940 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 190.84' @ 12.52 hrs Surf.Area= 945 sf Storage= 988 cf

Plug-Flow detention time= 23.4 min calculated for 3,940 cf (100% of inflow)
Center-of-Mass det. time= 23.4 min (875.0 - 851.6)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	697 cf	**Custom Stage Data (Conic)** Listed below 3,780 cf Overall - 1,456 cf Embedded = 2,325 cf x 30.0% Voids
#2	189.50'	1,456 cf	**Custom Stage Data (Prismatic)** Listed below Inside #1
		2,153 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	945	0	0	945
189.50	945	945	945	1,054
190.50	945	945	1,890	1,163
191.50	945	945	2,835	1,272
192.50	945	945	3,780	1,381

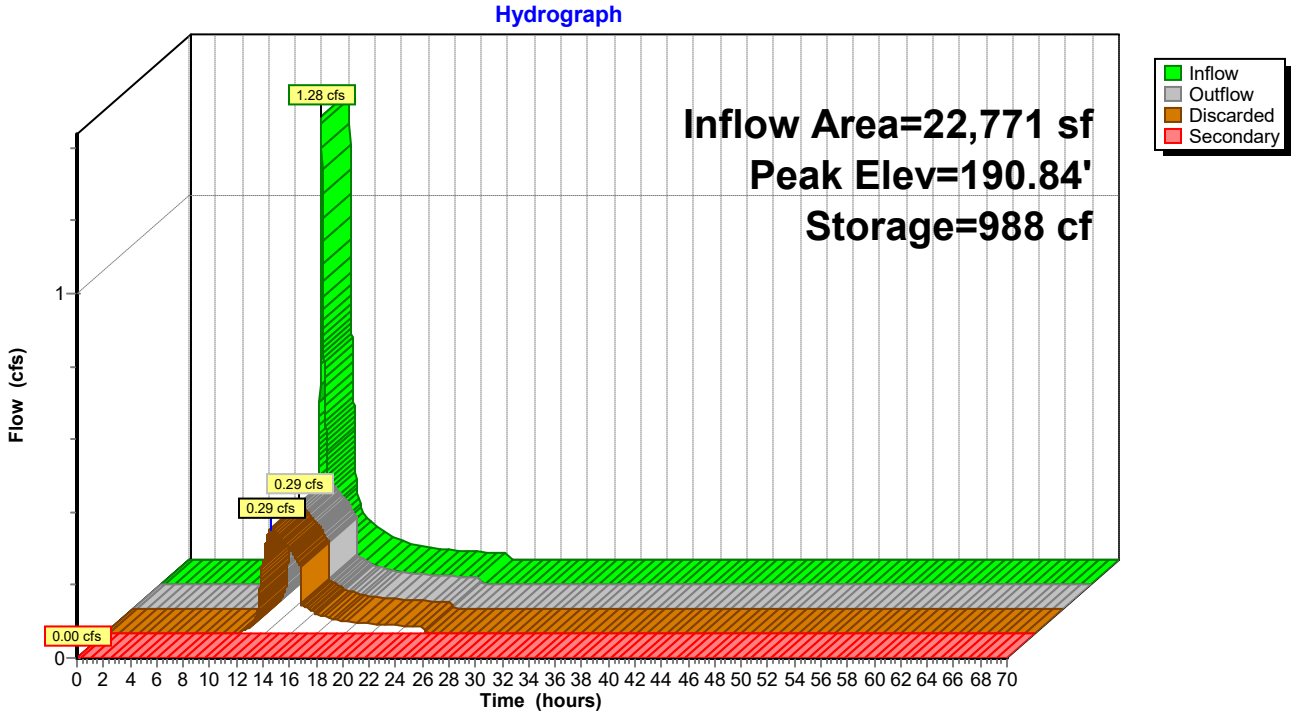
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.50	276	0	0
190.50	371	324	324
191.50	474	423	746
192.50	945	710	1,456

Device	Routing	Invert	Outlet Devices
#1	Discarded	188.50'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00' Phase-In= 0.01'
#2	Secondary	192.15'	**20.0' long + 1.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

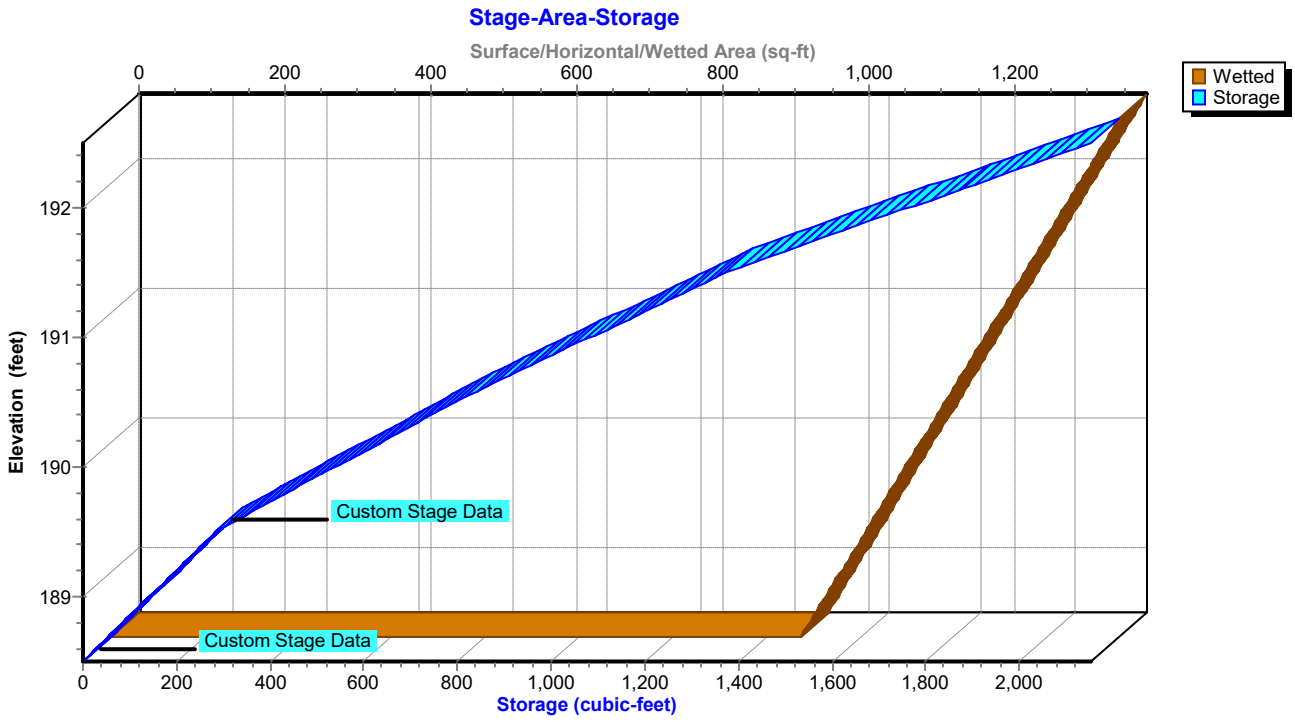
Discarded OutFlow Max=0.29 cfs @ 12.52 hrs HW=190.84' (Free Discharge)
↑**1=Exfiltration** (Controls 0.29 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Pond 3P: (new Pond)



Summary for Subcatchment PX-A1: SITE ASPHALT

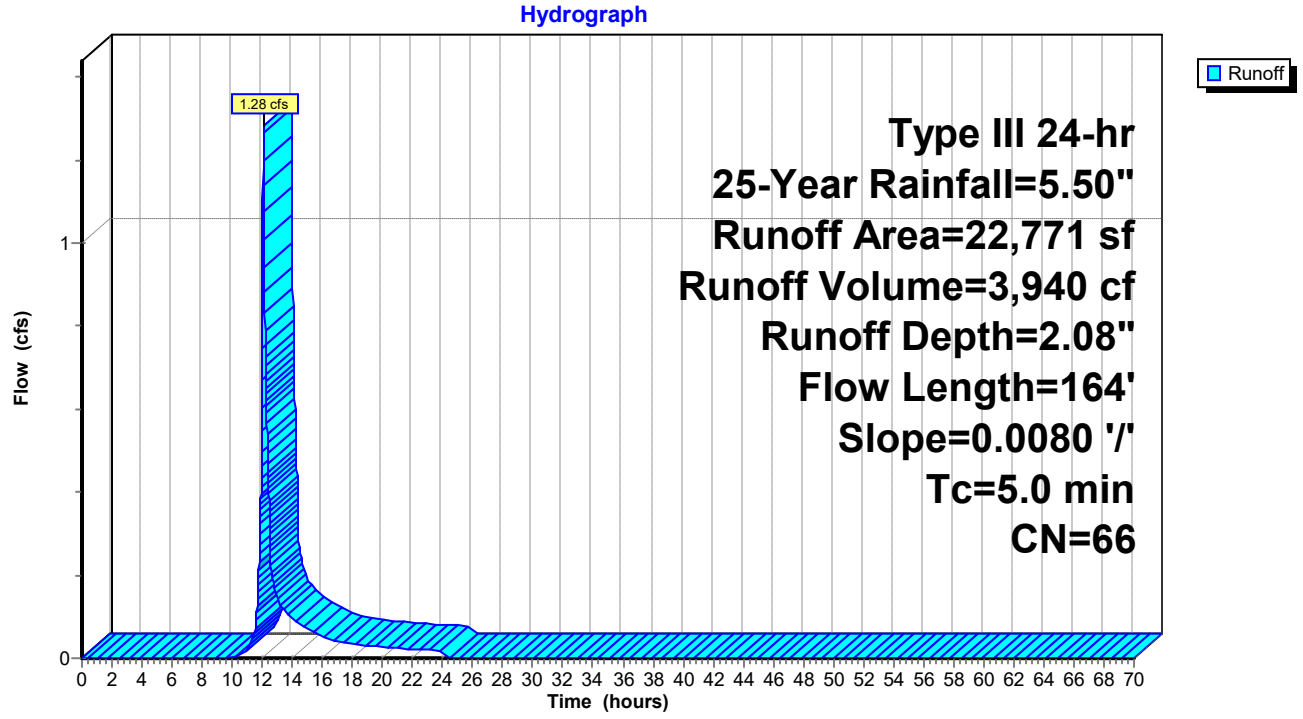
Runoff = 1.28 cfs @ 12.08 hrs, Volume= 3,940 cf, Depth= 2.08"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	12,372	39	>75% Grass cover, Good, HSG A
	5,611	98	Paved parking, HSG A
*	918	98	WALKS
	3,870	98	Unconnected roofs, HSG A
	22,771	66	Weighted Average
	12,372		54.33% Pervious Area
	10,399		45.67% Impervious Area
	3,870		37.22% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0080	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
2.2	164	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-A1: SITE ASPHALT



Summary for Subcatchment PX-B1: Area Pre

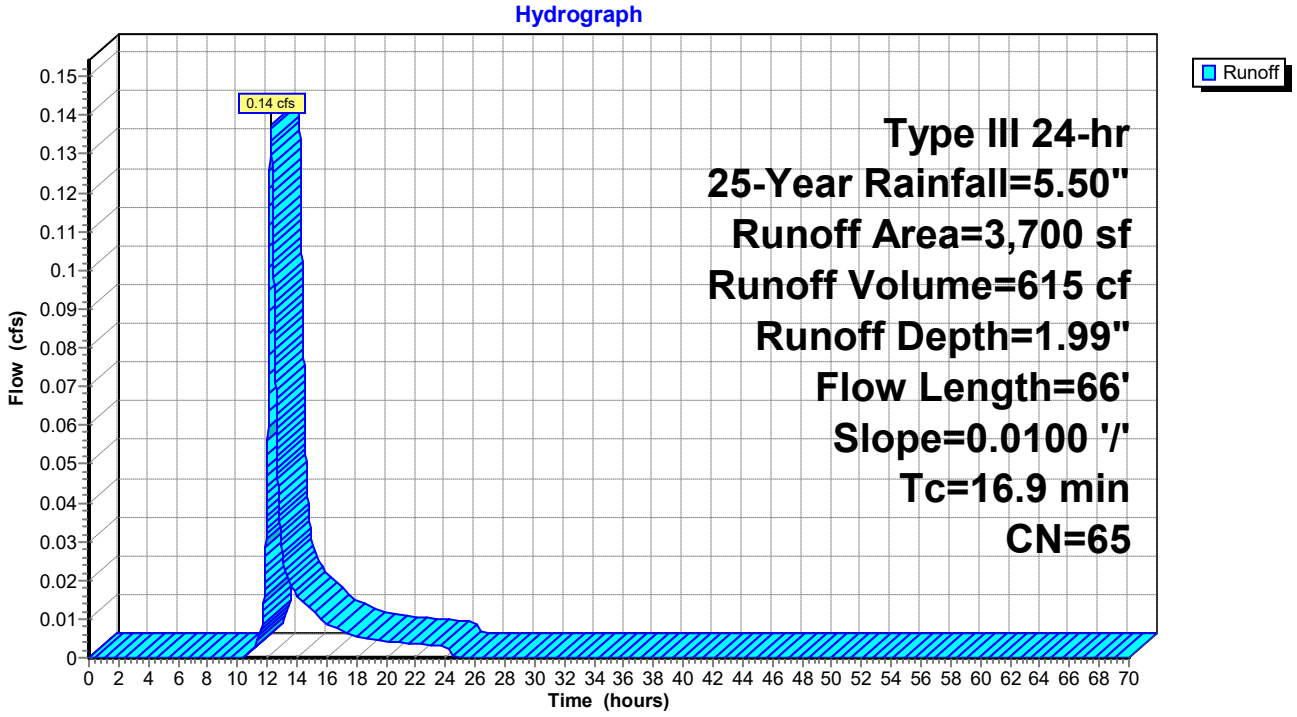
Runoff = 0.14 cfs @ 12.25 hrs, Volume= 615 cf, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
1,386	98	Roofs, HSG A
256	98	Paved parking, HSG A
2,058	39	>75% Grass cover, Good, HSG A
3,700	65	Weighted Average
2,058		55.62% Pervious Area
1,642		44.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment PX-B1: Area Pre



Summary for Subcatchment PX-C1: Area Pre

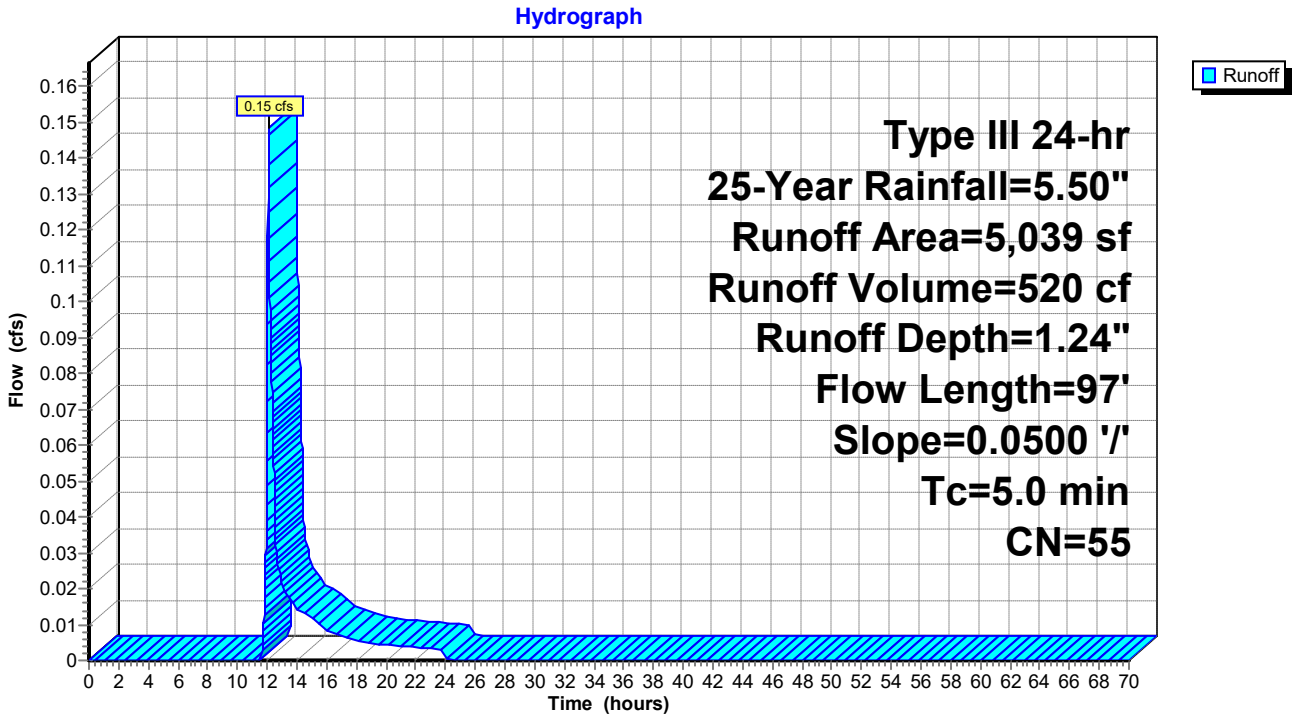
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 520 cf, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	437	98	Roofs, HSG A
	462	98	Paved parking, HSG A
	3,709	39	>75% Grass cover, Good, HSG A
*	431	98	WALKWAYS, HSG A
	5,039	55	Weighted Average
	3,709		73.61% Pervious Area
	1,330		26.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-C1: Area Pre



Summary for Pond 3P: (new Pond)

Inflow Area = 22,771 sf, 45.67% Impervious, Inflow Depth = 2.51" for 50-Year event
Inflow = 1.57 cfs @ 12.08 hrs, Volume= 4,772 cf
Outflow = 0.31 cfs @ 12.53 hrs, Volume= 4,772 cf, Atten= 80%, Lag= 27.4 min
Discarded = 0.31 cfs @ 12.53 hrs, Volume= 4,772 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 191.41' @ 12.53 hrs Surf.Area= 945 sf Storage= 1,321 cf

Plug-Flow detention time= 31.1 min calculated for 4,771 cf (100% of inflow)
Center-of-Mass det. time= 31.1 min (877.0 - 845.9)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	697 cf	**Custom Stage Data (Conic)** Listed below 3,780 cf Overall - 1,456 cf Embedded = 2,325 cf x 30.0% Voids
#2	189.50'	1,456 cf	**Custom Stage Data (Prismatic)** Listed below Inside #1
		2,153 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	945	0	0	945
189.50	945	945	945	1,054
190.50	945	945	1,890	1,163
191.50	945	945	2,835	1,272
192.50	945	945	3,780	1,381

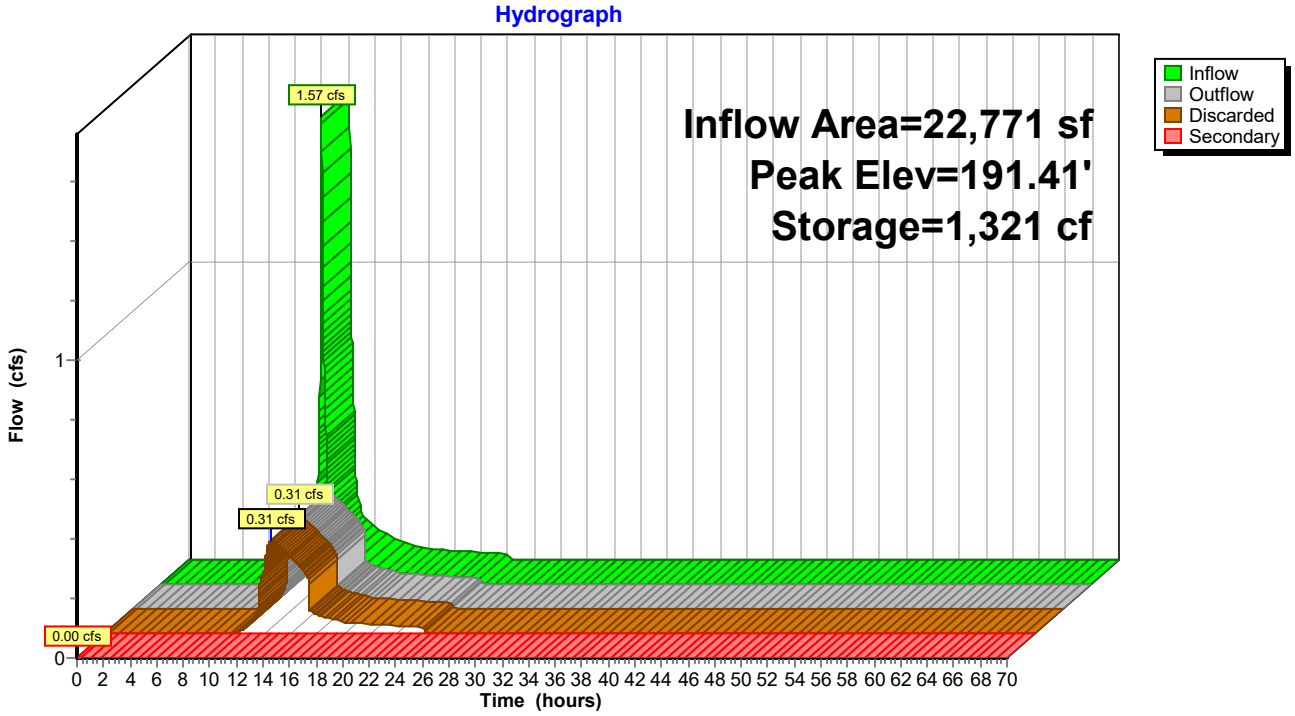
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.50	276	0	0
190.50	371	324	324
191.50	474	423	746
192.50	945	710	1,456

Device	Routing	Invert	Outlet Devices
#1	Discarded	188.50'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00' Phase-In= 0.01'
#2	Secondary	192.15'	**20.0' long + 1.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

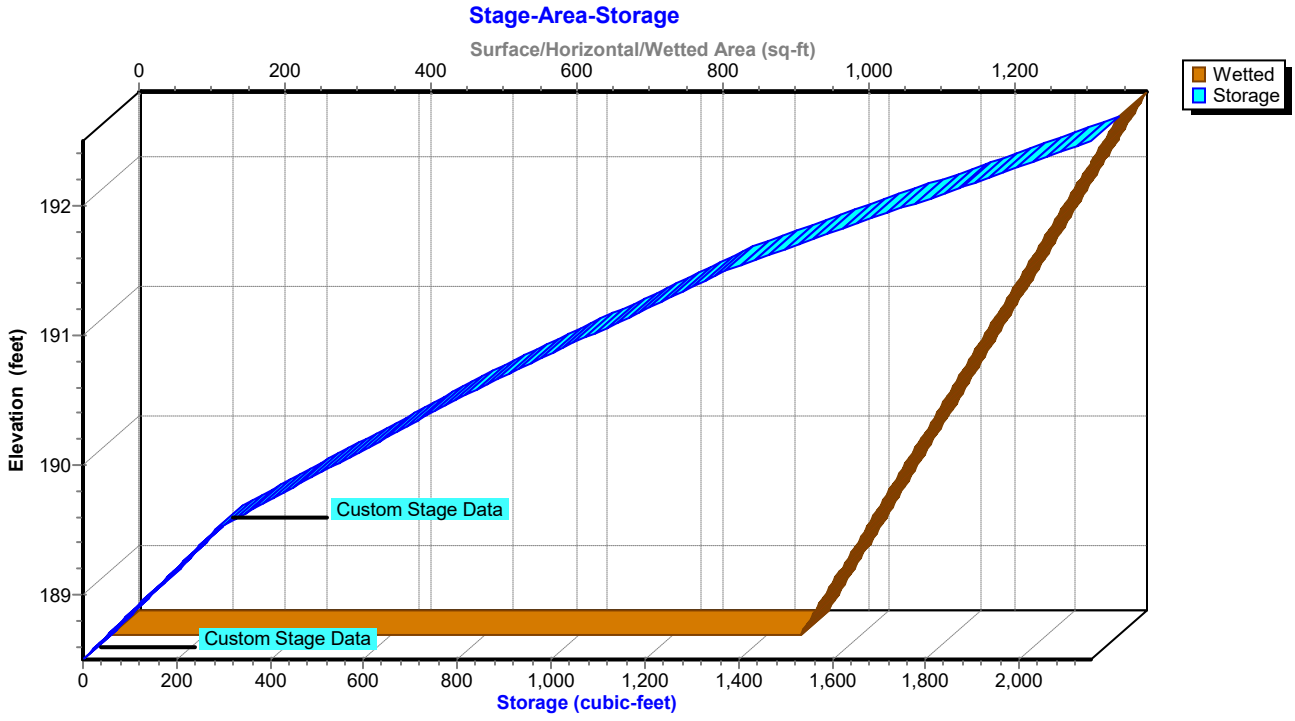
Discarded OutFlow Max=0.31 cfs @ 12.53 hrs HW=191.41' (Free Discharge)
↑**1=Exfiltration** (Controls 0.31 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Pond 3P: (new Pond)



Summary for Subcatchment PX-A1: SITE ASPHALT

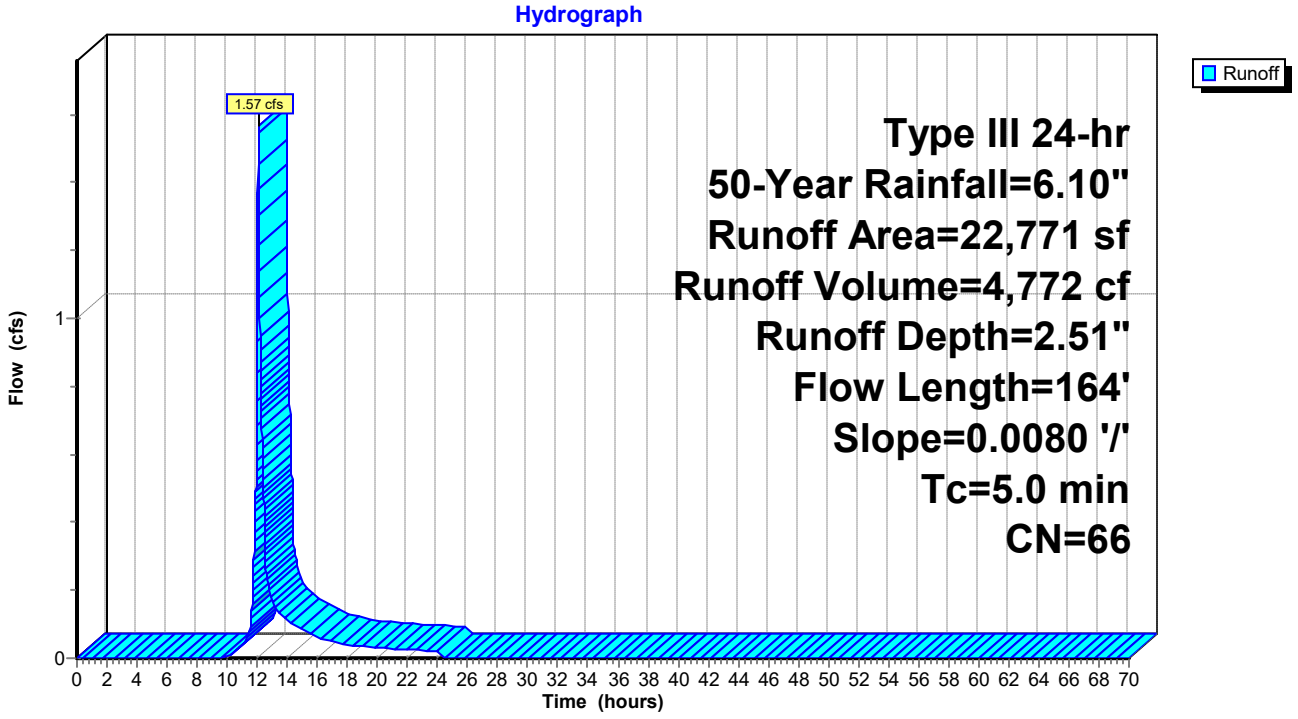
Runoff = 1.57 cfs @ 12.08 hrs, Volume= 4,772 cf, Depth= 2.51"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

	Area (sf)	CN	Description
	12,372	39	>75% Grass cover, Good, HSG A
	5,611	98	Paved parking, HSG A
*	918	98	WALKS
	3,870	98	Unconnected roofs, HSG A
	22,771	66	Weighted Average
	12,372		54.33% Pervious Area
	10,399		45.67% Impervious Area
	3,870		37.22% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0080	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
2.2	164	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-A1: SITE ASPHALT



Summary for Subcatchment PX-B1: Area Pre

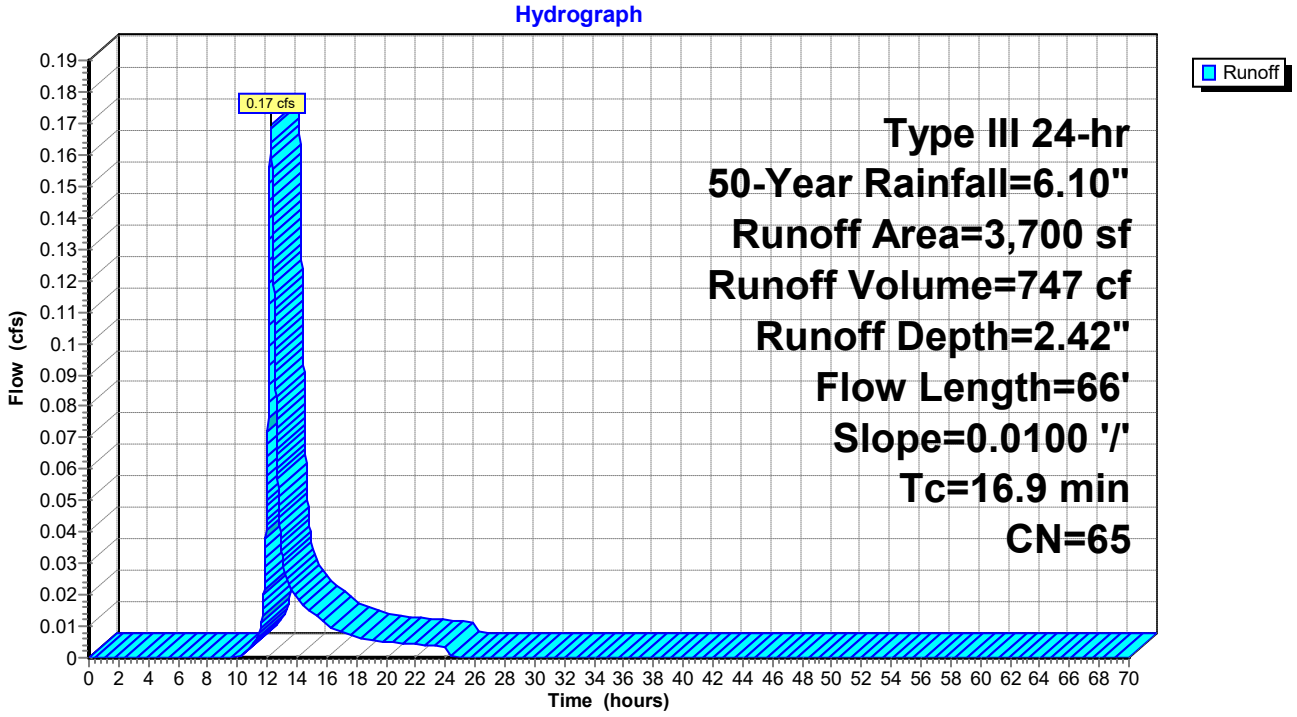
Runoff = 0.17 cfs @ 12.24 hrs, Volume= 747 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
1,386	98	Roofs, HSG A
256	98	Paved parking, HSG A
2,058	39	>75% Grass cover, Good, HSG A
3,700	65	Weighted Average
2,058		55.62% Pervious Area
1,642		44.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment PX-B1: Area Pre



Summary for Subcatchment PX-C1: Area Pre

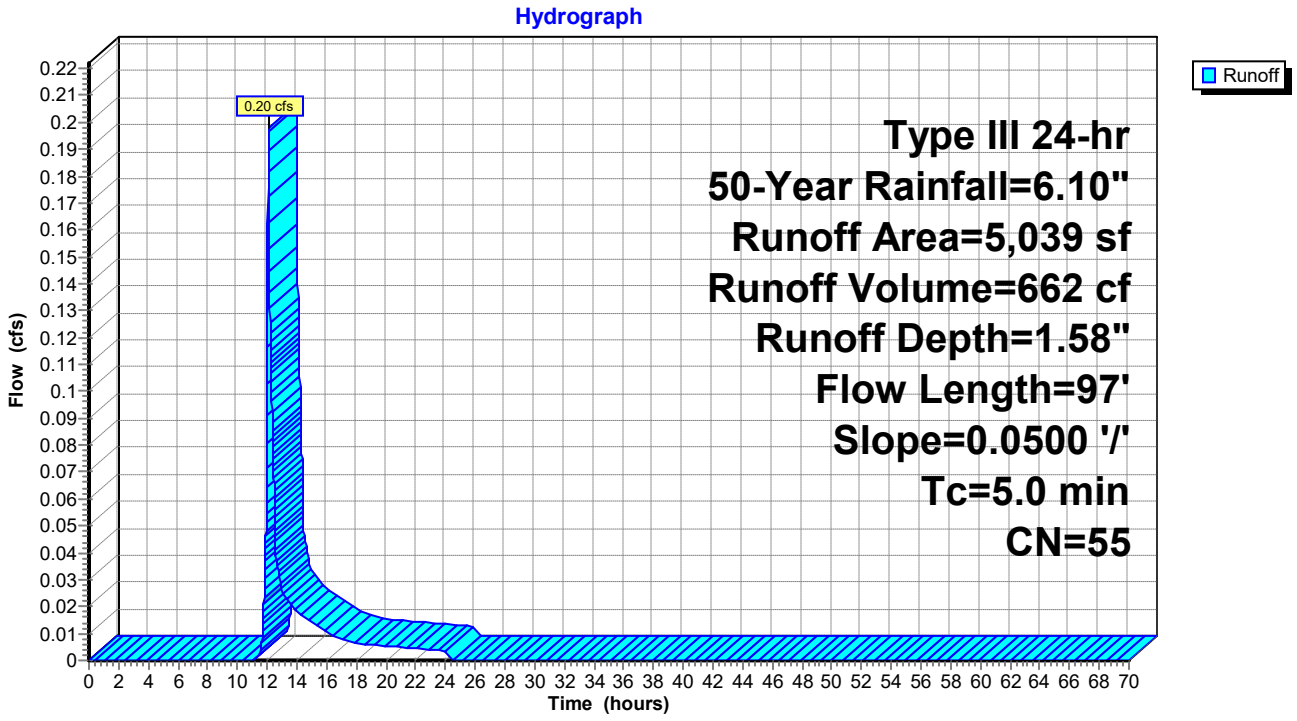
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 662 cf, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

	Area (sf)	CN	Description
	437	98	Roofs, HSG A
	462	98	Paved parking, HSG A
	3,709	39	>75% Grass cover, Good, HSG A
*	431	98	WALKWAYS, HSG A
	5,039	55	Weighted Average
	3,709		73.61% Pervious Area
	1,330		26.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-C1: Area Pre



Summary for Pond 3P: (new Pond)

Inflow Area = 22,771 sf, 45.67% Impervious, Inflow Depth = 2.97" for 100-Year event
Inflow = 1.87 cfs @ 12.08 hrs, Volume= 5,637 cf
Outflow = 0.34 cfs @ 12.55 hrs, Volume= 5,637 cf, Atten= 82%, Lag= 28.4 min
Discarded = 0.34 cfs @ 12.55 hrs, Volume= 5,637 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 191.89' @ 12.55 hrs Surf.Area= 945 sf Storage= 1,678 cf

Plug-Flow detention time= 38.9 min calculated for 5,636 cf (100% of inflow)
Center-of-Mass det. time= 38.9 min (879.9 - 841.0)

Volume	Invert	Avail.Storage	Storage Description
#1	188.50'	697 cf	**Custom Stage Data (Conic)** Listed below 3,780 cf Overall - 1,456 cf Embedded = 2,325 cf x 30.0% Voids
#2	189.50'	1,456 cf	**Custom Stage Data (Prismatic)** Listed below Inside #1
		2,153 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
188.50	945	0	0	945
189.50	945	945	945	1,054
190.50	945	945	1,890	1,163
191.50	945	945	2,835	1,272
192.50	945	945	3,780	1,381

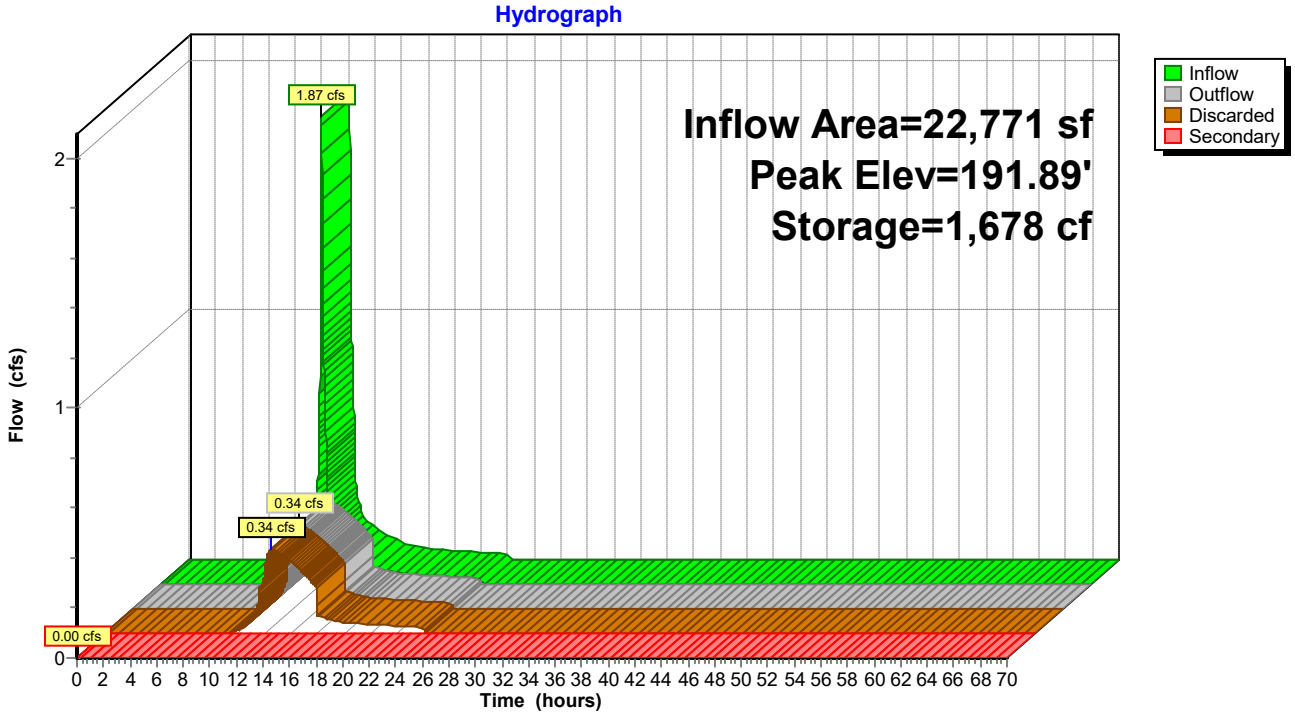
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.50	276	0	0
190.50	371	324	324
191.50	474	423	746
192.50	945	710	1,456

Device	Routing	Invert	Outlet Devices
#1	Discarded	188.50'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00' Phase-In= 0.01'
#2	Secondary	192.15'	**20.0' long + 1.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

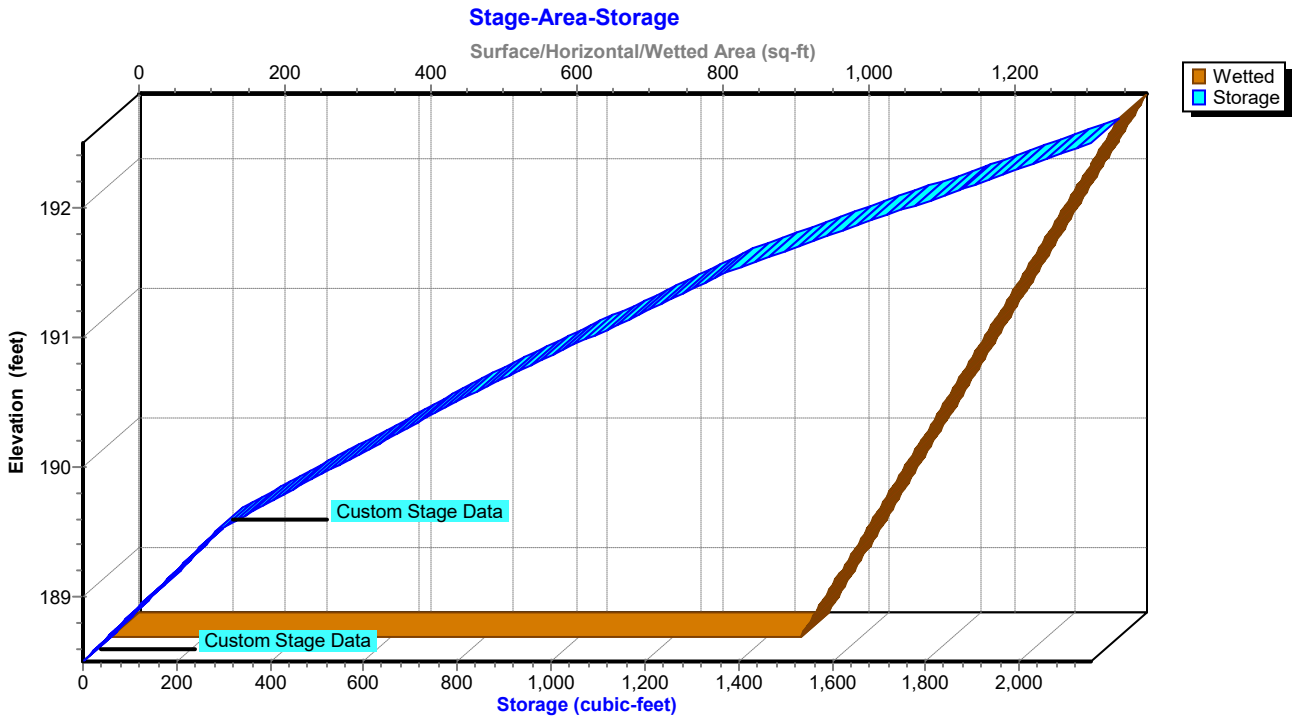
Discarded OutFlow Max=0.34 cfs @ 12.55 hrs HW=191.89' (Free Discharge)
↑**1=Exfiltration** (Controls 0.34 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=188.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Pond 3P: (new Pond)



Summary for Subcatchment PX-A1: SITE ASPHALT

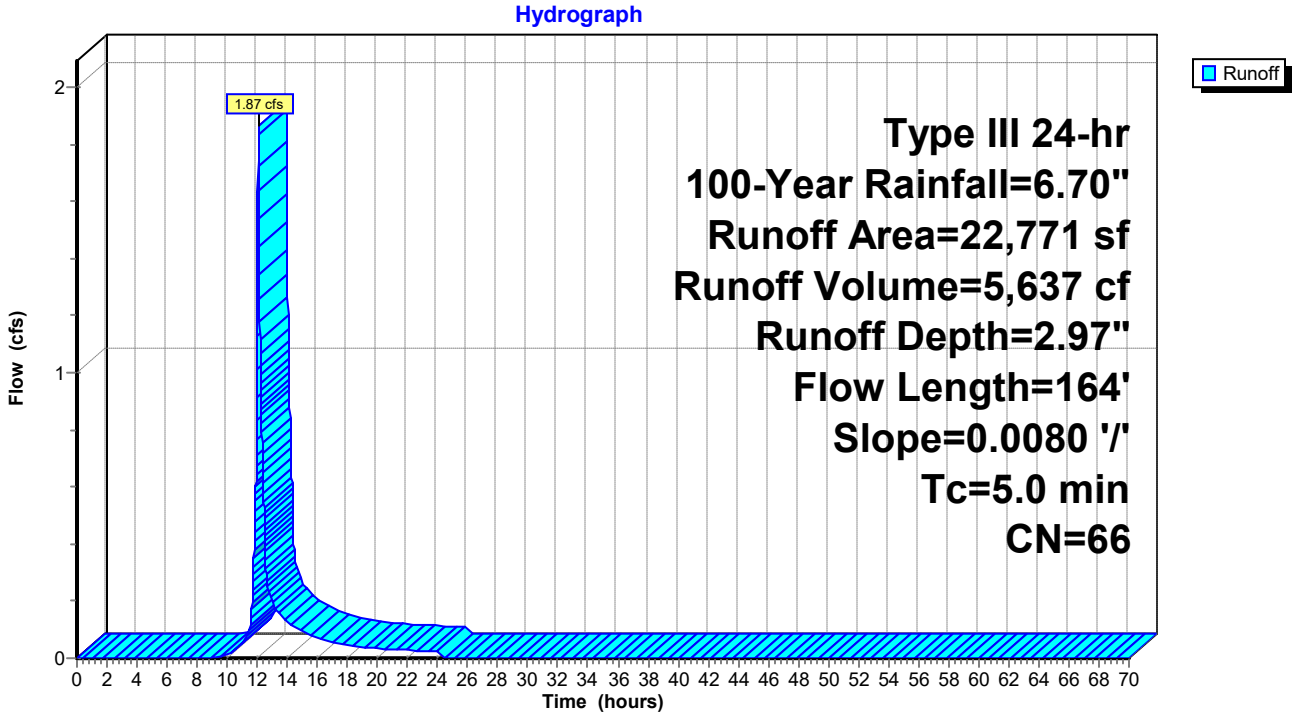
Runoff = 1.87 cfs @ 12.08 hrs, Volume= 5,637 cf, Depth= 2.97"
Routed to Pond 3P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

	Area (sf)	CN	Description
	12,372	39	>75% Grass cover, Good, HSG A
	5,611	98	Paved parking, HSG A
*	918	98	WALKS
	3,870	98	Unconnected roofs, HSG A
	22,771	66	Weighted Average
	12,372		54.33% Pervious Area
	10,399		45.67% Impervious Area
	3,870		37.22% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	164	0.0080	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
2.2	164	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-A1: SITE ASPHALT



Summary for Subcatchment PX-B1: Area Pre

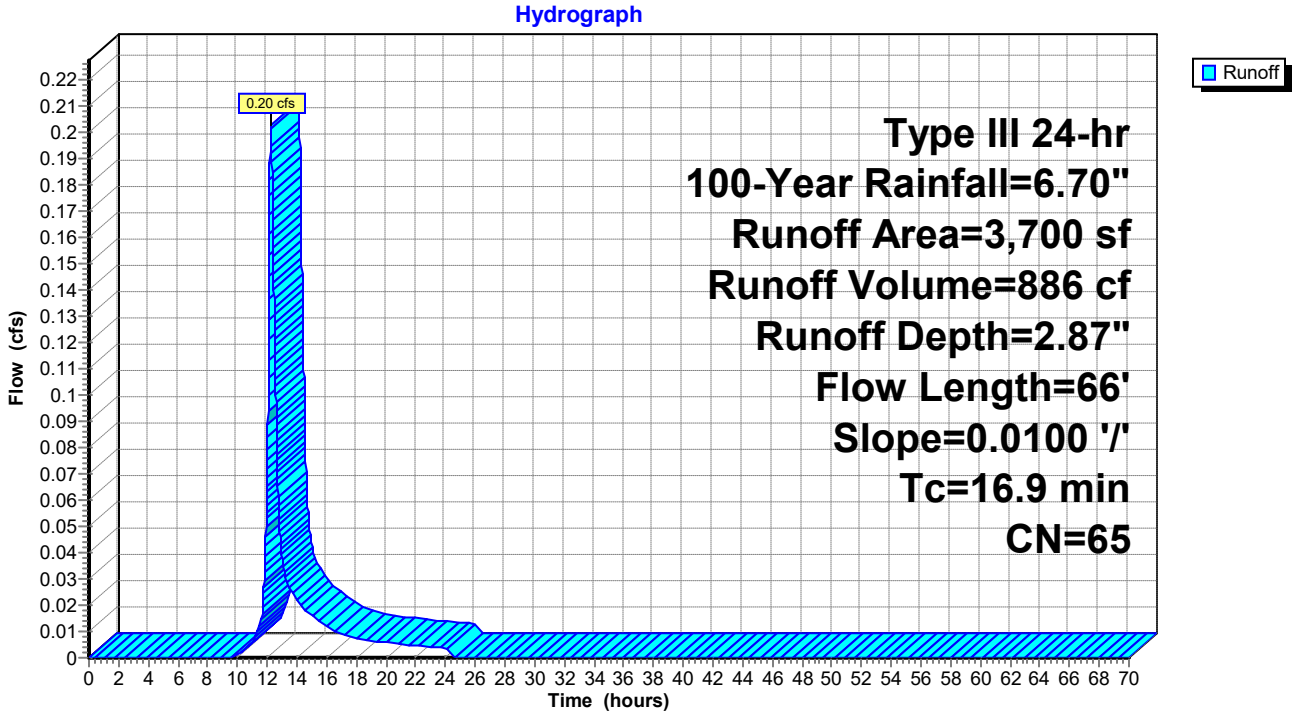
Runoff = 0.20 cfs @ 12.24 hrs, Volume= 886 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
1,386	98	Roofs, HSG A
256	98	Paved parking, HSG A
2,058	39	>75% Grass cover, Good, HSG A
3,700	65	Weighted Average
2,058		55.62% Pervious Area
1,642		44.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	23	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 4.30"
0.3	14	0.0100	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.30"
9.1	29	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.30"
16.9	66	Total			

Subcatchment PX-B1: Area Pre



Summary for Subcatchment PX-C1: Area Pre

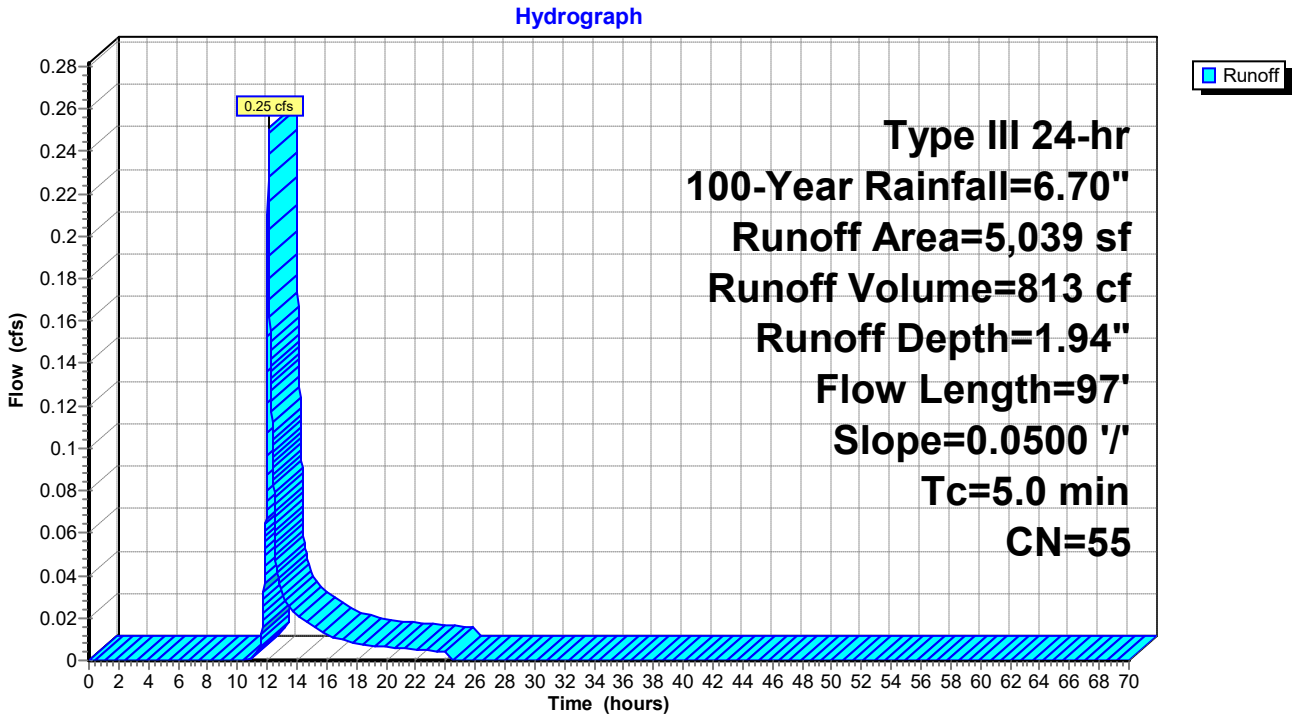
Runoff = 0.25 cfs @ 12.08 hrs, Volume= 813 cf, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-70.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

	Area (sf)	CN	Description
	437	98	Roofs, HSG A
	462	98	Paved parking, HSG A
	3,709	39	>75% Grass cover, Good, HSG A
*	431	98	WALKWAYS, HSG A
	5,039	55	Weighted Average
	3,709		73.61% Pervious Area
	1,330		26.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	97	0.0500	2.29		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 4.30"
0.7	97	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PX-C1: Area Pre



drainage#2
Prepared by Hewlett-Packard Company

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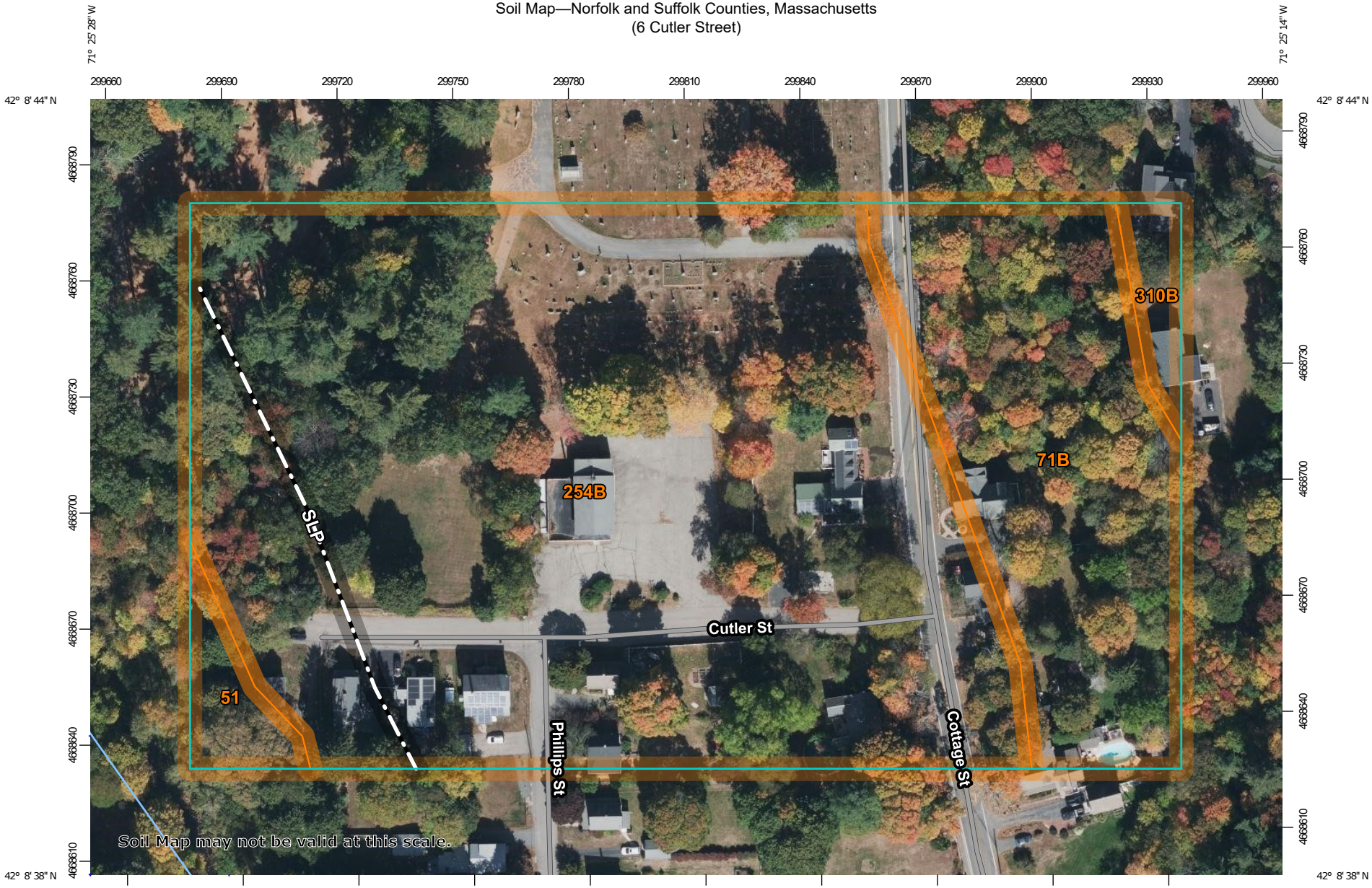
SOILS REPORTS

Soil Map—Norfolk and Suffolk Counties, Massachusetts
(6 Cutler Street)



Map Scale: 1:1,410 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 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 31, 2020—Oct 22, 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
51	Swansea muck, 0 to 1 percent slopes	0.2	2.3%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	2.0	21.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	7.0	74.8%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	0.2	1.8%
Totals for Area of Interest		**9.3**	**100.0%**

Norfolk and Suffolk Counties, Massachusetts

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

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

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

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

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, crest, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Sudbury

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

Windsor

Percent of map unit: 3 percent
Landform: Outwash terraces, dunes, deltas, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, moraines, stream terraces, eskers, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TOWN OF MEDWAY
Owner Name

155 VILLAGE STREET
Street Address

48-70
Map/Lot #

MEDWAY
City

MA
State

02053
Zip Code

6 CUTLER STREET

B. Site Information

1. (Check one) ☐ New Construction ☑ Upgrade ☐ Repair

2. Soil Survey Available? ☐ Yes ☐ No If yes: NRCS SOIL SURVEY
Source

Soil Map Unit

MERRIMAC FINE SANDY LOAM
Soil Name

Soil Limitations

COARSE SAND
Soil Parent material

OUTWASH PLAIN
Landform

3. Surficial Geological Report Available? ☑ Yes ☐ No If yes:
Year Published/Source

Map Unit

QUINCY GRANITE
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☑ No

5. Within a velocity zone? ☐ Yes ☑ No

6. Within a Mapped Wetland Area? ☐ Yes ☑ No If yes, MassGIS Wetland Data Layer:
Wetland Type

7. Current Water Resource Conditions (USGS):
Month/Day/ Year

Range: ☐ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 11ZL-01 (Hole #) | 11/11/21 (Date) | AM (Time) | SUNNY 30'S (Weather) | 42.144 (Latitude) | -71.422 (Longitude:)

1. Land Use: FORMER SCHOOL (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

Description of Location: ADJACENT & WITHIN THE EXISTING PARKING LOT

2. Soil Parent Material: COARSE SAND | OUTWASH PLAIN (Landform) | SIDE SLOPE (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body _____ feet | Drainage Way _____ feet | Wetlands _____ feet | Property Line _____ feet | Drinking Water Well _____ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☑ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☑ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-5	PLOWE										
5-25	FILL										
25-40	Bw	SANDY LOAM	10YR 5/6								
40-118	C	COARSE SAND	2.5Y 6/3						SINGLE GRAIN		

Additional Notes:
NO REDOX, NO GROUNDWATER, NO SEEPAGE, NO STONES

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 11 21-02 (Hole #) | 11/11/21 (Date) | AM (Time) | SUNNY 30's (Weather) | 42.144 (Latitude) | -71.422 (Longitude:)

1. Land Use: FORMER SCHOOL (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

   Description of Location: ADJACENT / WITHIN EXISTING PARKING LOT OUTWASH

2. Soil Parent Material: COARSE SAND | PLAIN (Landform) | SIDE SLOPE (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body _____ feet | Drainage Way _____ feet | Wetlands _____ feet
   Property Line _____ feet | Drinking Water Well _____ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☑ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☑ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0"-4"	PEAT										
4"-16"	FILL										
16"-42"	B/C	SANDY LOAM	10YR 5/6								
42-96	C	COARSE SAND	2.5Y 6/3						SINGLE GRAIN		

Additional Notes:
NO REDOX, NO GROUNDWATER, NO SEEPAGE, NO STONES

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 11-21-03 (Hole #) | 11-11-21 (Date) | AM (Time) | SUNNY 30'S (Weather) | 42.144 (Latitude) | -71.422 (Longitude)

1. Land Use: FORMER SCHOOL (e.g., woodland, agricultural field, vacant lot, etc.) | N/A (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

Description of Location: ADJACENT & WITHIN EXISTING PARKING LOT OUTLINED

2. Soil Parent Material: COARSE SAND | PLAIN (Landform) | SIDE SLOPE (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body _____ feet | Drainage Way _____ feet | Wetlands _____ feet | Property Line _____ feet | Drinking Water Well _____ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☑ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☑ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0"-5"	FILL										
5"-16"	FILL										
16"-45"	BW	SANDY LOAM	10YR 5/6								
45"-92"	C	COARSE SAND	2.5Y 6/3						SINGLE GRAIN		

Additional Notes:
NO REDOX, NO SEEPAGE, NO GROUNDWATER, NO STONES

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1121-04 (Hole #) 11-11-21 (Date) AM (Time) SUNNY 30's (Weather) 42.144 (Latitude) -71.422 (Longitude:)

1. Land Use: FORMER SCHOOL (e.g., woodland, agricultural field, vacant lot, etc.) N/A (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 2-5% (Slope (%))

   Description of Location: ADJACENT TO PARKING AREA OUTWASH

2. Soil Parent Material: COARSE SAND Landform: PLAIN Position on Landscape (SU, SH, BS, FS, TS): SIDESLOPE

3. Distances from: Open Water Body _____ feet; Drainage Way _____ feet; Wetlands _____ feet; Property Line _____ feet; Drinking Water Well _____ feet; Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☑ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☑ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12"	Ap	SANDY LOAM	10YR 3/3								
12-27"	Bw	"	10YR 4/6								
27-91"	C	COARSE SAND	2.5Y 5/3						SINGLE GRAIN		

Additional Notes:
NO REDOX, NO SEEPAGE, NO GROUNDWATER, NO STONES

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole #_____	Obs. Hole #_____
☐ Depth observed standing water in observation hole	_____ inches	_____ inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☐ Depth to soil redoximorphic features (mottles)	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☑ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: VARIABLE inches Lower boundary: _____ inches

c. If no, at what depth was impervious material observed? Upper boundary: VARIABLE inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of MEDWAY

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

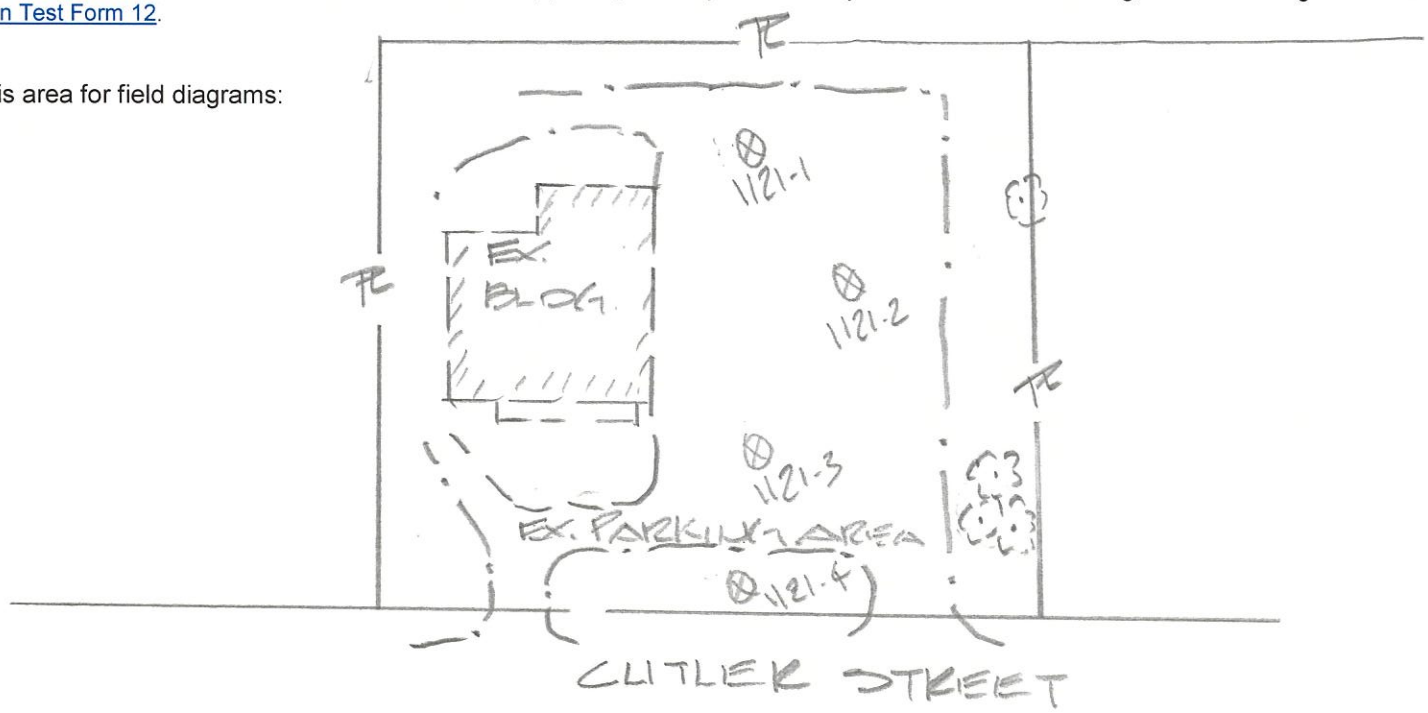
Signature of Soil Evaluator — 11-11-2021 Date

LAWRENCE C. GREENE #2688
Typed or Printed Name of Soil Evaluator / License # — 6-30-2022 Expiration Date of License

Name of Approving Authority Witness — Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:



REMOVAL COMPS

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Cutler Street

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Street Sweeping - 2%	0.02	1.00	0.02	0.98
Rain Garden	0.90	0.98	0.88	0.10
Subsurface Infiltration Structure	0.80	0.10	0.08	0.02
	0.00	0.02	0.00	0.02
	0.00	0.02	0.00	0.02

Total TSS Removal = 98%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Cutler Street

Prepared By: Ron T

Date: 12/20/2021

*Equals remaining load from previous BMP (E) which enters the BMP

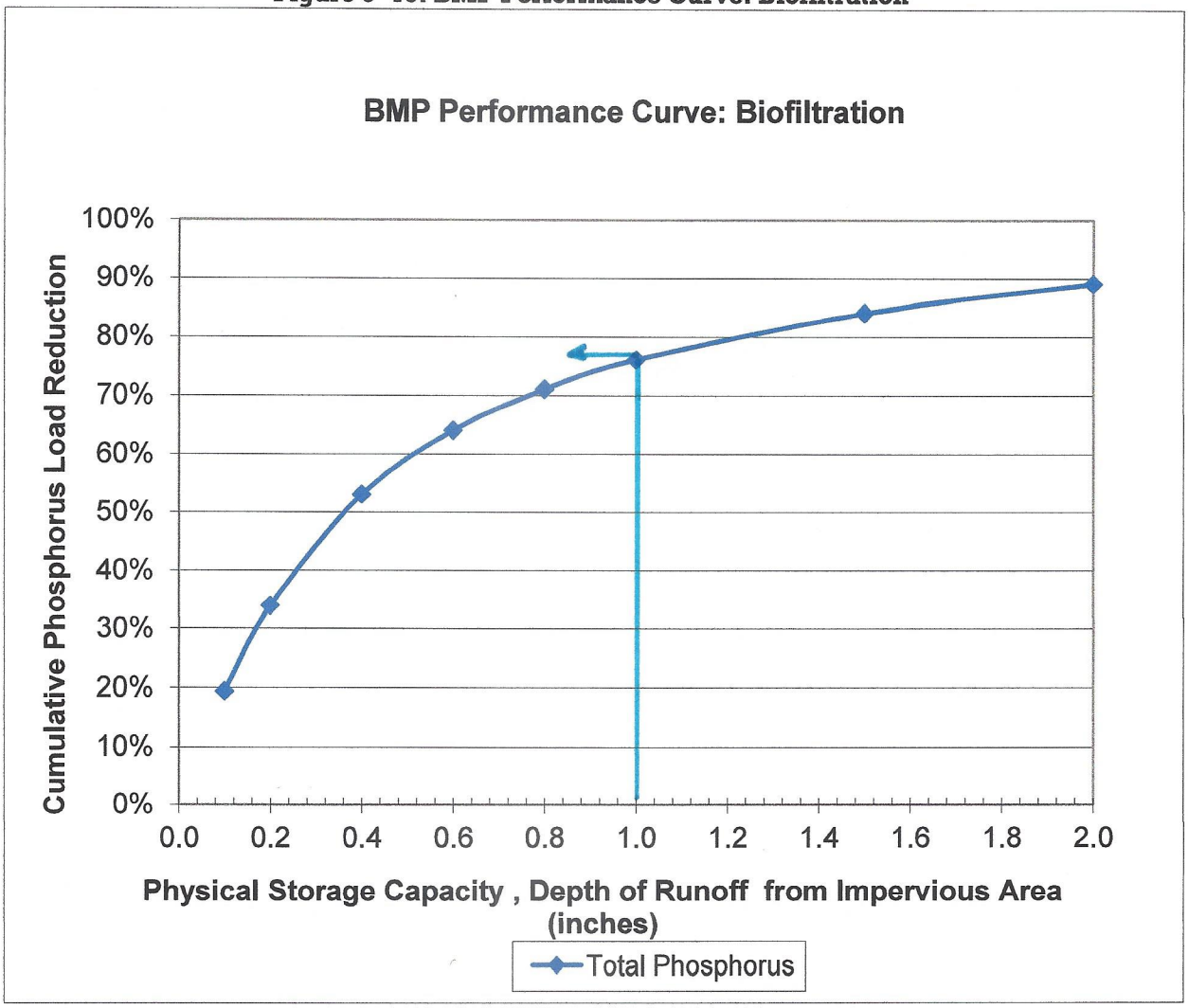
Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

Table 3- 16: Biofiltration BMP Performance Table

Biofiltration BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	34%	53%	64%	71%	76%	84%	89%

Figure 3- 13: BMP Performance Curve: Biofiltration



Stormwater Operations and Maintenance Plan

For

"Cutler Place"
6 Cutler Street
Medway, Massachusetts

Prepared for and
Owned by: Cutler Place LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Operation & Maintenance
Responsibility: Cutler Place LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Anthony Varrichione
Signature (Owner)

Prepared By: Ronald Tiberi P.E.
9 Massachusetts Ave
Natick, MA 01760
508-361-5077

Revised -December 26, 2021

Introduction

All measures both temporary and permanent taken shall be coordinated with all the approved documents for the project including but not limited to the Erosion Control Site Plan (sheet S-4), the Spill prevention plan, the approve Order of Conditions and the Town of Medway regulations.

Temporary Stormwater Measures

Temporary stormwater measures are the structural or non-structural practices employed to reduce or eliminate stormwater degradation and site erosion during construction. The placement, monitoring and successful operations of temporary measures shall be the Owner's responsibility with authority assigned to the construction manager, general contractor or site contractor, as applicable.

The temporary stormwater measures are as follows:

- Stabilized Construction Entrance
- Crushed Stone Check Dams
- Staked Erosion Control Barriers
- Silt Sack
- Material Stockpiles with Containment Barrier and/or Mulch Covering
- Temporary Stormwater Settling Basins
- Concrete Washout basins

Please also refer to the project specific BMP reference documents contained in the project stormwater report, permit documents and SWPPP.

Permanent Stormwater Measures

Permanent stormwater measures are the structural or non-structural practices employed to reduce or eliminate stormwater degradation and site erosion following completion of construction, site stabilization and property occupancy. The placement, monitoring and successful operations of temporary measures shall be the Property Manager's responsibility. A third party stormwater agent may be contracted by the property manager for certain operation and maintenance responsibilities. All such contractual arrangements will be added to the final Stormwater Operations and Maintenance Plan with business registrations, certifications and insurances as applicable.

The proposed stormwater measures are as follows:

- Bituminous Pavement (Access Drives and Parking) (30-yr replacement schedule)
- Rain Garden & Vegetation Filter Strips and Landscape Plantings (Lawns and Gardens) (service and replacement on an on-going basis)

Please also refer to the project specific BMP reference documents contained in the project

stormwater report, permit documents and SWPPP.

Material and Equipment Storage

Material and equipment storage will vary according to the project phase. During construction, all material and equipment will be stored in an organized staging area. In addition, the operations and maintenance of the temporary storage area will be as described in the SWPPP. Additionally, the project SPPP addresses typical temporary operations such as material stabilization techniques, equipment fueling, debris collection, storage and disposal. In general, the Owner is responsible with typical assignment and agency granted to the construction manager, general contractor or site contractor for all temporary material and equipment storage, in accordance with usual and customary construction means and methods.
At no time will equipment maintenance or long-term fuel storage be permitted on site. All equipment maintenance will be performed off site. Re-fuelers are permitted on site, but must operate within the temporary storage area.

Preventative landscaping and grounds control

Permanent Seeding & Lawn care – Permanent Seeding should be done immediately after the final design grades are achieved. Native species of grass should be used to establish perennial vegetative cover on disturbed areas. The revegetation should be completed early enough in the fall so that a good cover is established before cold weather inhibits growth until the spring. A good cover typically represents vegetation covering 75 percent or more of the ground surface.
Permanent Seeding Seedbed Preparation
g) In infertile or coarse-textured subsoil, it is recommended to spread topsoil over the finished slope at a minimum 2 to 6-inch depth and roll it to provide a firm seedbed. The topsoil must have a sandy loam to silt loam texture with 15% to 20% organic content. If construction fill operations have left soil exposed with a loose, rough, or irregular surface, smooth with blade and roll.
a) Loosen the soil to a depth of 3-5 inches with suitable agricultural or construction equipment.
b) Areas not to receive topsoil shall be treated to firm the seedbed after incorporation of the lime and fertilizer so that it is depressed no more than ½ - 1 inch beneath foot traffic.
Areas to receive topsoil shall not be firmed until after topsoil, lime and fertilizer is applied and incorporated, at which time it shall be treated to firm the seedbed as described above.
Permanent Seeding Grass Selection/Application
a) Select an appropriate cool or warm season grass based on site conditions and seeding date. Apply the seed uniformly by hydroseeding, broadcasting, or by hand. Uniform seed distribution is essential. On steep slopes, hydroseeding may be the most effective seeding method. Surface roughening is particularly important when preparing slopes for hydroseeding.
b) Lime and fertilize.
c) Mulch the seedings with straw applied at the rate of ½ tons per acre. Anchor the mulch with erosion control netting or fabric on sloping areas. Amoco supergrow or equivalent should be utilized.

Permanent Seeding Inspection/Maintenance

a) Frequently inspect seeded areas for failure and make necessary repairs and reseed immediately. Conduct or follow-up survey after one year and replace failed grasses where necessary.
b) If vegetative cover is inadequate to prevent rill erosion, overseed and fertilize in accordance with soil test results.
c) If a stand has less than 40% cover, reevaluate choice of grass seed and quantities of lime and fertilizer. Re-establish the stand following seedbed preparation and seeding recommendations, omitting lime and fertilizer in the absence of soil test results. If the season prevents re-sowing, mulch or jute netting is an effective temporary cover.
d) Seeded areas should be fertilized during the second growing season. Lime and fertilize thereafter at periodic intervals, as needed.

Fertilizers/Detergents:

Fertilizers and detergents contain nutrients such as phosphorous and nitrogen which can contribute to water pollution. The following practices should be utilized to reduce the risks of using fertilizer/detergent products.

1) Limit the application of fertilizers to the minimum area and the minimum recommended amounts.
2) Reduce the exposure of nutrients to storm water runoff by working the fertilizer deep into the soil (depth of 4 to 6 inches) instead of letting it remain on the surface.
3) Apply fertilizer more frequently, but at lower application rates.
4) Hydro-seeding where lime and fertilizers are applied to the ground surface in one application should be limited where possible.
5) Limit the use of detergents onsite; wash water containing detergents should not be discharged in the storm water system.
6) Apply fertilizer and use detergents only in the recommended manner and only in recommended amounts.

Snow Operations Management

The proper management of snow and snow melt, in terms of snow removal and storage, use of deicing compounds, and other practices will prevent or minimize the major runoff and pollutant loading impacts. The following practices should be employed to avoid pollution impacts from snow.
1) Use of De-icing Compounds
a) The Town of Medway may agree to the use of certain chemicals for de-icing. Alternative de-icing compounds such as calcium chloride ($CaCl_2$) and calcium magnesium acetate (CMA) are possibilities.
b) Use a sand only for deicing road treatment.
c) There are no stockpiles of salt and sand stored or proposed on this site for de-icing.
2) Snow Removal and Storage: Place plowed snow in designated pervious areas where it can slowly infiltrate. This can be accomplished at the edge of the parking area surface.
3) Blow snow from paved areas to grass or pervious areas.
4) Utilize pavement sweeping and catch basin cleaning as a minimum bi-annual in the early spring (after winter storms),and mid-fall (after the leaf drop). The disposal of street sweepings shall

comply with DEP/BWP Final Policy #94-092.
The preceding does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated.

Stormwater Systems

The temporary stormwater systems are documented within the project SWPPP. The Owner is responsible with typical authority granted to the construction manager, general contractor or site contractor.
The permanent stormwater systems are designed to enhance recharge to groundwater on a sitewide basis. In general, all the clean roof runoff will be collected, stored and infiltrated through underground chamber systems designed to replicate the naturally-occurring site-wide recharge characteristics of the locus. The associated site access and parking areas are conventional bituminous pavement with edging to direct surface flow into rain garden. There are hydrodynamic structural units to collect and treat surface flows prior to recharge in underground storage systems. Collectively, the stormwater design will meet or exceed local, state and federal standards as designed when operated, monitored and maintained properly.
Please also refer to the project specific BMP reference documents contained in the stormwater report, permit documents and SWPPP.

Stormwater Operations and Maintenance

The combined stormwater systems operations and maintenance can be performed by the Sampson Pond LLC property manager or their assigned agent. Nonetheless, due to proprietary product knowledge, training and specialty maintenance equipment required, it is recommended that the property manager secure and maintain a long term third party contract with an industry specific trained and licensed professional capable of operating, inspecting and maintaining Rain Garden systems.

The following activities should be carried out on an on-going basis to maintain good site operations:

• Site Maintenance: The site and all components are to be kept in a neat, orderly and clean fashion. Routine upkeep shall be performed by either the Owner's representatives, Property Management Staff and/or their assignees. Typical site maintenance activities shall include responsible construction practices, careful employment of temporary erosion control methods, street sweeping, landscape management and grounds maintenance.

• Trash Disposal: All common household waste materials shall be collected and stored in securely fastened metal dumpsters within secured enclosures and maintained on site by a refuse collection vendor. The dumpster will be emptied regularly, and not be over-filled. All residents and property management personnel will be instructed on proper onsite waste disposal practices. In addition to on-site signage, all residents will receive specific onsite disposal services, including recycling if applicable within their lease agreement documentation.

• Spill Control & Containment: Good housekeeping and spill control practices will minimize stormwater contamination from petroleum products, paints and cleaning products. All resident vehicles will be routinely monitored for leaks. Written notices will be distributed as required by property management staff. Habitual offenders will be removed from the site with parking privileges revokes, if necessary. Emergency spill kits will be available on site to be operated and deployed by trained property management staff.
No hazardous or dangerous material or chemical storage will be permitted on premises in any quantity by either property management representatives, tenants or residents. Only common, over-the-counter household cleaning products within acceptable consumable legal limits will be permitted on site. Any and all such consumable products may be routinely disposed of within the onsite refuse receptacles, in accordance with state and federal laws.

Management, Training and Certification

The Owner is responsible to ensure that their assigned construction manager, general contractor or site contractor utilizes qualified and competent personnel who have been trained and are certified in the site specific temporary stormwater systems management. All temporary stormwater systems training and certifications must be documented to remain on file or within the SWPPP documentation.

The Cutler Place permanent stormwater systems are to be monitored, operated and maintained by trained individuals, certified in stormwater management practices. Either the property management staff may become trained and certified or utilize a professional contractor with the appropriate training and certifications capable of responsibly ensuring stormwater systems operations and maintenance compliance.
Both the Owner and property manager shall maintain responsible and current records of all stormwater management training and certifications, as are required and performed within the SWPPP. Please also refer to the project BMP reference documents and sample report forms contained in the stormwater report, permit documents and SWPPP.

Observation/Corrective Logs

The Owner is responsible to ensure their assigned construction manager, general contractor or site contractor routinely completes stormwater observation logs in compliance with the SWPPP.

The Property Manager and/or their stormwater consultant(s) are responsible to complete stormwater observation logs in compliance with state and local stormwater compliance regulations, in addition to the suggested manufacturer specifications.
Please also refer to the project specific sample report forms contained in the project stormwater report, permit documents and SWPPP as required.

When required and as necessary, corrective action shall be prepared and logged. The purpose and intent of corrective actions logged are to document a stormwater occurrence that required additional, amended or revised stormwater measures than the approved or permitted devices in operation. Both temporary and permanent stormwater measures may require corrective action. The documentation and corrective action reporting shall be the Owner’s or Property Manager’s responsibility.

Please also refer to the sample report forms contained in the project stormwater report, permit documents and SWPPP as required.

BMP's

Both temporary and permanent BMP inspection, operation and maintenance is critical to the health and success of stormwater system sustainability. Usual and customary BMP literature is included in the project stormwater report permit documents and SWPPP. However these representative BMP's shall be considered the minimum requirement, providing practical stormwater operation and maintenance guidance. Additional BMP's may be required, depending on actual site conditions to augment or replace current BMP's The use, replacement or amendment of onsite BMP's, whether temporary or permanent will be determined by either the local or state stormwater official or the project engineer of record.

Operation

Once the infiltration facilities have been constructed and the site has been permanently stabilized and put into action, the operation of the drainage works will be routine.

Maintenance

The storm water drainage system complies with the Best Management Practices (BMP) standards of the Massachusetts Department of Environmental Protection, as described in *Storm Water Management Policy*. In order to keep the drainage system operating under those standards, maintenance of the various components is required by the facilities operator, facility owner, or his service contractor. These items include but not limited to the following:

A) Annual pavement sweeping before April 30th.
B) Minimum bi-annual cleaning of the rain garden at the end of foliage and snow removal seasons, and approved disposal of the recovered materials.
C) Bi-annual inspection of the drainage works may require remedial action. Any extensive damage repair for weather and non-weather related activities should be made immediately. Chronological Records of the repairs shall be kept in a file on-site. Records shall be kept for a period of at least 7-years.
D) Record keeping of the maintenance, checking and monitoring of the system shall be maintained by the owner. Service contractors shall provide the owner with receipt showing a clear description of their site visit; and, findings shall be clearly and legibly printed and dated on the receipt.
E) A copy of the service contractor's manifest record shall be provided to the owner and/or operator of the system.

DETAILED BMP REQUIREMENTS

Stormwater Infiltration/Rain Garden:

1.Stormwater basins shall be inspected at least twice per year to insure proper operation (during a storm event).

2.Inspections shall include ensuring that inlet, outlet, and splash pad rip-rap aprons are in good condition and that that interior wall systems are in good condition. Deficiencies shall be remedied immediately.

3.Inspections shall include an observation of the accumulation of sediment in the basin. Pretreatment BMPs are intended to capture and contain coarse sediments.

4.Inspections shall include ensuring that outlet structures are unobstructed and free-flowing per the Site Plan design specifications.

5.Inspections shall include ensuring that all berms are fully stabilized, structurally sound and not eroded. Deficiencies shall be remedied immediately.

6.Stormwater basins should be mowed and all clippings and debris removed at least twice per year. Debris shall be removed at more frequent intervals if warranted by extreme weather events. If wetland vegetation grows at the bottom of the stormwater basin, it shall only be mowed once per year at the beginning of the winter season.

7.Sediment should be removed at least once every 5 years or when 2-inches of sediment accumulates anywhere in the basin and disposed of off-site in accordance with all applicable local, state, and federal regulations. Two sedimentation markers shall be installed in the basin by a Registered Land Surveyors with a clear marking of the 2-inch accumulation line. It is recommended that stone bounds be installed with chiseled marks indicating the limit of accumulation, although other similarly permanent marking methods may be utilized.

Underground Infiltration Field:

1.Perform all pretreatment BMP maintenance, structural and non-structural, as required herein.

2.Inspect the infiltration field at least twice per year, approximately 2-4 days after a rainfall event to ensure that water is not still in the field (as it should have infiltrated into underlying soils by then). Should the infiltration field fail to infiltrate water sufficiently, the field system shall be excavated and replaced in accordance with the original design.

3. Basins should be mowed and all clippings and debris removed at least twice per year. Evasive shrubs or plants shall be removed to mitigate root intrusion. Observation ports shall be kept clear and accessible.

Stormwater BMP Inspection and Maintenance Log

Facility Name Cutler Place	
Address 6 Cutler Street	
Begin Date	End Date
Date of Last Rainfall/Rainfall Amount	

Date Inspected	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken (Dated)
	1	Slope edges				
	1	Rain Garden				

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality and start a new log at that time.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and date completed and need for follow-up.

Storm Water Pollution Prevention Plan

For

“Cutler Street”
6 Cutler Street
Medway, Massachusetts

Prepared for and
Owned by: Cutler Street LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Operation & Maintenance
Responsibility: Cutler Street LLC
6 Cutler Street
Medway MA 02053 or its successor in title (the "Owner")

Prepared By: Ronald Tiberi P.E.
9 Massachusetts Ave
Natick, MA 01760
508-361-5077

November 14, 2021

Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan was developed in accordance with the following:
1) Town of Medway Regulations
2) Massachusetts Erosion and Sediment Control Guidelines For Urban and Suburban Areas (March 1997)
3) The Massachusetts Department of Environmental Protection's *Storm Water Policy* (February, 2008)
4) The United States Environmental Protection Agency's Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices.

Erosion and Sedimentation Control Plan

This stormwater pollution prevention plan (SWPPP) document and permit includes an operation and maintenance plan (O&M Plan) that is found herein along with a "Erosion Control Site Plan" Sheet E-1 . The SWPPP Permit will be attached to this document when issued. The site owner and contractor in responsible charge are required affix their signature and date in the appropriate section that is also found in the rear section.
Erosion and sedimentation will be controlled at the site by utilizing structural practices, stabilization practices, site maintenance and dust control. Site erosion and sedimentation inspection forms are included as part of the site erosion control plan and shall be implemented and executed during the site construction phase. It is important to stabilize the site as soon as possible with a temporary vegetative cover for soil stabilization to maximize the effectiveness of the temporary erosion controls. Before construction a erosion control barrier (ECB) device shall be placed at the downgradient edges of all land disturbing activities of the work site.

Site Construction:

Cutler Place, LLC intends to develop the site at 6 Cutler Street, west of the intersection of Cutler Street and Cottage Street. The site work will disturb approximately 0.71 acres of land. FilterMitt/Socks as erosion control barrier (ECB) will be placed and maintained at the lowest elevation in the rear of the property toward which storm drainage runoff flows.
Before work commences on the site including placement of any fill, the downgradient perimeter of the work area shall be protected with a new row of ECB staked into the ground as detailed on Sheet S-4. Low spots that receive most of the drainage runoff shall be enhanced with a double row of ECB.

A site access gravel stone pad will be installed at the site entrance beginning at the edge of Evergreen Street to control the mud and dirt from being carried from the lot onto the public way.
The disturbed soil areas in the front part of the site shall be immediately finish graded and be stabilized with a perennial grass as soon as practical. A temporary Rye Grass shall be supplanted with the perennial grass for fast germination and establishment of a vegetative cover. Stockpiled soil material will be surrounded at the base with a woven filter fence barrier to control the migration of sediment from the piles.

The basin near wetlands shall be constructed in conjunction with the grading and filling of the Site as part of the initial phase and operations for drainage control. Before the basin is allowed to receive any site stormwater flows, the drainage collection system shall be installed and made

operational. Also, the subsurface infiltration systems shall be constructed and bulkheaded off until the disturbed surfaces are stabilized.

Structural Practices:

1) **Filter sock Controls** – A barrier will be constructed along downgradient slopes abutting the proposed parking lot, building footprints, edge of grading, and stockpile areas. The ECB shall be placed upland of the anchor stake. This control will be installed prior to major soil disturbance in the drainage area.

A.
All Certified Phase II Stormwater Products Microbial FilterMitt TM installations shall be done by a Phase II Stormwater Products Certified Professional.
B.
If installation is not done by a Certified Phase II Stormwater Products Certified Professional, than the installation of the project may not comply with the design specifications and performance standards; the project will be declined.
C.
A Certified Phase II Stormwater Products Microbial FilterMitt TM can be constructed on site or delivered prefilled: minimal onsite labor time.
D.
Can be tailored to site requirements; individual units can be made in lengths from 1-100 linear feet.
E.
When the Certified Phase II Stormwater Products Microbial FilterMitt TM is properly installed, water will not be able to bypass around the ends.
F.
Because the Certified Phase II Stormwater Products Microbial FilterMitt TM conforms to the grade, there is no need to re-grade with heavy equipment which causes soil disturbance and creates conditions for more erosion.
G.
The movement of heavy equipment compacts the soil which increases flowrate and damages soil structure making it more difficult to establish seed germination.
H.
Staking with hardwood stakes at maximum 10 foot intervals ensures stability against water flow for slopes 2:1 and greater. Ends of individual Certified Phase II Stormwater Products Microbial FilterMitt TM are overlapped and staked to ensure integrity on slopes 2:1 or greater
End stakes should be placed no more than one foot from terminal ends on slopes 2:1 or greater.
I.
Protective fencing is recommended to protect structures from construction disturbance, or vehicle and foot traffic. Fence should be placed in front of the Certified Phase II Stormwater Products Microbial FilterMitt TM.

<u>Erosion Control Barrier Inspection/Maintenance</u>

a) Erosion Control barriers should be inspected immediately after each runoff-producing rainfall and at least daily during prolonged rainfall.

b) Close attention should be paid to the repair of damaged bales, erosion beneath bales, and flow around the ends of the bales.
c) Necessary repairs to barriers or replacement of bales shall be completed promptly.
d) Sediment deposits should be checked after each runoff-producing rainfall and should be removed when the level of deposition reaches approximately one-half the height of the barrier.
e) Any sediment deposits remaining in place after the Erosion Control barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

2) **Construction Entrances** – A stabilized construction entrance shall be placed at the site entrance before construction begins on the project to keep mud and sediment from being tracked off the construction site by vehicles leaving the site. (See Details)

Construction Entrance Design/Construction Requirements

a) Remove all vegetation and other objectionable material from the subbase area. Grade and crown foundation for positive drainage.
b) Stone for a stabilized construction entrance shall be 1 to 3-inch stone placed on a stable foundation.
c) Pad dimensions: The minimum length of the gravel pad should be 30 feet. The pad should extend the full width of the access road, a 10 foot minimum width, or wide enough so that the largest construction vehicle will not extend outside the pad; whichever is greater. If significant traffic is expected at the entrance, then the stabilized construction entrance should be wide enough to fit two vehicles abreast.
d) A geotextile filter fabric shall be placed between the stone fill and the earth surface below the pad to reduce the migration of soil particles from the underlying soil into the stone and vice versa. The filter fabric should be Amoco woven polypropylene 1198 or equivalent.
e) Washing: If the site conditions are such that the majority of mud is not removed from the vehicle tires by the gravel pad, then the tires should be washed before the vehicle enters the road or street. The wash area should be a level area with 3-inch washed stone minimum, or a commercial rack.
f) Wash water should be directed into a sediment trap, a vegetated filter strip, or other approved sediment trapping device. Sediment shall be prevented from entering any watercourses.
g) A sediment fence/hay bale barrier should be installed down-gradient from the construction entrance in order to contain any sediment-laden runoff from the entrance.

<u>Construction Entrance Inspection/Maintenance</u>
a) The entrance should be maintained in a condition that will prevent tracking or flowing of sediment onto the public ways. This may require periodic topdressing with additional stone.
b) Inspect entrance/exit pad and sediment disposal area weekly and after heavy rains or heavy use.
c) Remove mud and sediment tracked or washed onto public road immediately.
d) Once mud and soil particles clog the voids in the gravel and the effectiveness of the gravel pad is no longer satisfactory, the pad must be top-dressed with new stone. Complete replacement of the pad may be necessary if the stone voids become clogged.
e) If washing facilities are used, the sediment traps should be cleaned out as often as

necessary to assure that adequate trapping efficiency and storage volume is available.
f) Reshape pad as needed for drainage and runoff control.
g) Repair any broken road pavement on the Street immediately.
h) All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization is achieved or after the temporary practices are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil areas resulting from removal shall be permanently stabilized.

3) **Construction Road Stabilization** – The stabilized construction road(s) will provide a means for construction vehicles to move around the site without causing significant erosion. The road stabilization will significantly speed up on-site work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather. The construction road(s) will be stabilized at the beginning of construction and maintained throughout construction. The stabilized construction road will not be located in a cut or fill area until after grading has been performed. Some of the stone used will remain in place for use as part of the final base course of the road. Permanent roads and parking areas will be paved as soon as practicable.

Construction Road Stabilization Design/Construction Requirements
a) A 6-inch course of 2 to 4-inch crushed rock, gravel base, or crushed surfacing base course should be applied immediately after grading or the completion of utility installation within the right-of-way. A 4-inch course of asphalt-treated base may be used in lieu of the crushed rock.
b) Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slopes should not exceed 15 percent. Roadways should be carefully graded to drain to the edge of the road, enabling storm water to travel the shortest route. Provide drainage swales on each side of the roadway in the case of a crowned section, or one side in the case of a superelevated section.
c) Drain inlets should be protected to prevent sediment-laden runoff from entering the structures.
d) Areas adjacent to culvert crossings and steep slopes should be seeded and mulched.
e) Dust control should be used when necessary.
Construction Road Stabilization Inspection/Maintenance
a) Inspect stabilized areas regularly, especially after large storm events. Add 2 to 4-inch crushed rock if necessary and re-stabilize any areas found to be eroding.
b) All temporary erosion and sediment control measures should be removed with 30 days after final site stabilization is achieved or after the temporary practices are no longer needed.
c) Trapped sediment should be removed or stabilized on site. Disturbed soil areas resulting from removal should be permanently stabilized.

4) **Inlet Protection** – Inlet Protection will be utilized around catch basin grates. The inlet protection will allow the storm drain inlets not tributary to infiltraton facilites to be used before final stabilization. Siltsack or equivalent will be utilized for the inlet protection. Siltsack is manufactured by ACF Environmental at 1-800-437-6746. Regular flow siltsack will be utilized, and if it does not allow enough storm water flow, hi-flow siltsack will be utilized.
Silt Sack (or equivalent) Inlet Protection Inspection/Maintenance Requirements
a) All trapping devices and the structures they protect should be inspected after every rain

storm and repairs made as necessary.
b) Sediment should be removed from the trapping devices after the sediment has reached a maximum depth of one-half the depth of the trap.
c) Sediment should be disposed of in a suitable area and protected from erosion by either structural or vegetative means.
d) After emptying, if the siltsack is ripped or torn in any way, it must be replaced.
e) Temporary traps should be removed and the area repaired as soon as the contributing drainage area to the inlet has been completely stabilized.

5) **Surface Roughening** – Roughening surface slopes is a temporary measure that will improve the success of vegetative stabilization, encourage water infiltration and decreases runoff velocity. The grooved slopes create irregularities in the soil surface to catch rainwater and retain lime, fertilizer, and seed. The soil surface is roughened by the creation of horizontal grooves or slight depressions (1 - 3" deep and 6 – 15" apart) parallel to the slope contour. Roughening can be used with both seeding and planting and temporary mulching to stabilize an area.
Surface Roughening Design/Construction Requirements
a) Roughening should be done as soon as possible after the vegetation has been removed from the slope and grading activities have ceased.
b) Roughening methods include stair-step grading, grooving, and tracking.
c) Graded areas with slopes greater than 3:1 but less than 2:1 should be roughened before seeding. Graded areas steeper than 2:1 should be stair-stepped with benches.
d) Areas which will be mowed (these areas should have slopes less steep than 3:1) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour. These areas need to be smoothed.
e) It is important to avoid excessive compacting of the soil surface when scarifying. Tracking with bulldozer treads is preferable to not roughening at all, but is not as effective as other forms of roughening because the soil compaction inhibits vegetation growth and causes higher runoff speed.

<u>Surface Roughening Inspection/Maintenance</u>
a) Surface roughened areas should be seeded as quickly as possible.
b) Regular inspections should be made. If rills appear, they should be regraded and reseeded immediately.

Stabilization Practices:

As required by the EPA, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased, with the following exceptions.
1) Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
2) Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of the site by the 14th day after construction where activity had temporarily ceased.

Lawn area Naturalization Methods – See Landscaping plan notes Sheet L-1, Scapping to be performed by hand.

1) **Temporary Seeding** – Temporary seeding will allow a short-term vegetative cover on disturbed site areas that may be in danger of erosion. Temporary seeding will be completed on stock piles and disturbed portions of the site where construction activity will have temporarily ceased for at least 21 days. The temporary seedings should stabilize cleared and unvegetated areas that are not expected to be final graded for several weeks or months.

Temporary Seeding and Planting Procedures

a) Planting should preferably be completed between April 1st and June 30th, and September 1st through September 31st. If Planting is undertaken in the months of July and August, irrigation may be required. If planting is undertaken between October 1st and March 31st, mulching should be applied immediately after planting. If seeding is completed during the summer months, irrigation of some sort will probably be necessary.
b) Before seeding, install structural practice controls. Utilize Amoco supergrow or equivalent.
c) The seedbed should be firm with a fairly fine surface. Perform all cultural operations across or at right angles to the slope. A minimum of 2 to 4-inches of tilled topsoil is required. The topsoil should have a sandy loam to silt loam texture with 15% to 20% organic content.
d) Apply uniformly 2 tons of ground limestone per acre (100 lbs. Per 1,000 sq.ft.) or according to soil tests. Apply uniformly 10-10-10 analysis fertilizer at the rate of 400 lbs. per acre (14 lbs. per 1,000 sq.ft.) or as indicated by soil tests. Forty percent of the nitrogen should be in organic form. Work in lime and fertilizer to a depth of 4-inches using suitable equipment.
e) Select the appropriate seed species for temporary cover from the following table.

Species	Seeding Rate (lbs/1,000 sq.ft.)	Seeding Rate (lbs/acre)	Recommended Seeding Dates	Seed Cover required
Annual Ryegrass	1	40	April 1st to June 1st August 15th to Sept. 15th	¼ inch
Foxtail Millet	0.7	30	May 1st to June 30	1/2 to 3/4 inch
Oats	2	80	April 1st to July 1st August 15th to Sept. 15th	1 to 1-½ inch
Winter rye	3	120	August 15th to Oct. 15th	1 to 1-½ inch

Apply the seed uniformly by hydroseeding, broadcasting, or by hand.
f) Use effective mulch, such as clean grain straw; tacked and/or tied with netting to protect the seedbed and encourage plant growth.
Temporary Seeding Inspection/Maintenance
a) Inspect within 6 weeks of planting to see if stands are adequate. Check for damage within 24 hours of the end to a heavy rainfall, defined as a 2-year storm event (i.e., 3.2 inches of rainfall within a twenty-four hour period). Stands should be uniform and dense. Fertilize,

reseed, and mulch damaged and sparse areas immediately. Tack or tie down mulch as necessary.
b) Seeds should be supplied with adequate moisture. Furnish water as needed, especially during periods of abnormally hot or dry weather. Water application rates should be controlled to prevent runoff.

2) **Mulching and Netting** – Mulching will provide immediate protection to exposed soils during the period of short construction delays, or over winter months through the application of plant residues, or other suitable materials, to exposed soil areas. In areas which have been seeded either for temporary or permanent cover, mulching should immediately follow seeding. On steep slopes, mulch must be supplemented with netting. The preferred mulching material is straw.

Mulch (Hay or Straw) Materials and Installation

a) Straw has been found to be one of the most effective organic mulch materials. The specifications for straw are described below, but other material may be appropriate. The straw should be air-dried; free of undesirable seeds & coarse materials. The application rate per 1,000 sq.ft. is 90-100 lbs. (2-3 bales) and the application rate per acre is 2 tons (100-120 bales). The application should cover about 90% of the surface. The use of straw mulch is appropriate where mulch is maintained for more than three months. Straw mulch is subject to wind blowing unless anchored, but is the most commonly used mulching material, and has the best microenvironment for germinating seeds.

Mulch Maintenance

a) Inspect after rainstorms to check for movement of mulch or erosion. If washout, breakage, or erosion occurs, repair surface, reseed, re-mulch, and install new netting.
b) Straw or grass mulches that blow or wash away should be repaired promptly.
c) If plastic netting is used to anchor mulch, care should be taken during initial mowings to keep the mower height high. Otherwise, the netting can wrap up on the mower blade shafts. After a period of time, the netting should degrade and become part of the root matrix.
d) Continue inspections until vegetation is well established.

3) **Geotextiles** - Geotextiles such as jute netting will be used in combination with other practices such as mulching to stabilize slopes.
The following geotextile materials or equivalent are to be utilized for structural and nonstructural controls as shown in the following table.

Practice	Manufacturer	Product	Remarks
Sediment Fence	Amoco	**Woven polypropylene 1198 or equivalent**	**0.425 mm opening**
Construction Entrance	**Amoco**	**Woven polypropylene 2002 or equivalent**	**0.300 mm opening**

Outlet Protection	**Amoco**	**Nonwoven polypropylene 4551 or equivalent**	**0.150 mm opening**
Erosion Control (slope stability)	**Amoco**	**Supergrow or equivalent**	**Erosion control revegetation mix, open polypropylene fiber on degradable polypropylene net scrim**

Amoco may be reached at (800) 445-7732

Geotextile Installation

a) Netting and matting require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material.

Geotextile Inspection/Maintenance

a) In the field, regular inspections should be made to check for cracks, tears, or breaches in the fabric. The appropriate repairs should be made.

4) **Land Grading** – Grading on fill slopes, cut slopes, and stockpile areas will be undertaken only with full siltation controls in place.

Land Grading Design/Construction Requirements

a) Areas to be graded should be cleared and grubbed of all timber, logs, brush, rubbish, and vegetated matter that will interfere with the grading operation. Topsoil should be stripped and stockpiled for use on disturbed areas for establishment of vegetation. Cut slopes to be topsoiled should be thoroughly scarified to a minimum depth of 3-inches prior to placement of topsoil.
b) Fill materials should be generally free of brush, rubbish, rocks, and stumps. Frozen materials or soft and easily compressible materials should not be used in fills intended to support buildings, parking lots, roads, conduits, or other structures. Documentation and specifications of fill material shall be approved prior to shipping by the Town of Medway or its representatives.
c) Earth fill intended to support structural measures should be compacted to a minimum of 90 percent of Standard Proctor Test density with proper moisture control, or as otherwise specified by the engineer responsible for the design. Compaction of other fills should be to the density required to control sloughing, erosion or excessive moisture content. Maximum thickness of fill layers prior to compaction should not exceed 9 inches.
d) The uppermost one foot of fill slopes should be compacted to at least 85 percent of the maximum unit weight (based on the modified AASHTO compaction test). This is usually accomplished by running heavy equipment over the fill.
e) All disturbed areas should be free draining, left with a neat and finished appearance, and should be protected from erosion.

Land Grading Stabilization Inspection/Maintenance

a) All slopes should be checked periodically to see that vegetation is in good condition. Any rills or damage from erosion and animal burrowing should be repaired immediately to avoid further damage.

b) If seeps develop on the slopes, the area should be evaluated to determine if the seep will cause an unstable condition. Subsurface drains or a gravel mulch may be required to solve seep problems. However, no seeps are anticipated.

c) Areas requiring revegetation should be repaired immediately. Slopes should be limed and fertilized as necessary to keep vegetation healthy. Control undesirable vegetation such as weeds and woody growth to avoid bank stability problems in the future.

5) **Topsoil** – Topsoil should help support vegetation on all disturbed areas throughout the site during the seeding process. The soil texture of the topsoil to be used will be a sandy loam to a silt loam texture with 15% to 20% organic content.

Topsoil Placement

a) Topsoil should not be placed on frozen or muddy subsoils, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed seeding.

b) Do not place topsoil on slopes steeper than 2:1.

c) If topsoil and subsoils are not properly bonded, water will not infiltrate evenly into the soil profile and it will be difficult to establish vegetation. Topsoil should be worked into the subsoil layer below for a depth of at least 6 inches.

6) **Preserving Natural Vegetation** – The trees to be saved will be clearly flagged or marked with a bright colored ribbon. Snow fencing will be set at the drip/spread line of the trees and shrubs to be protected. Machinery will be kept away from tree roots.

7) **Permanent Seeding** – Permanent Seeding should be done immediately after the final design grades are achieved. Native species of grass should be used to establish perennial vegetative cover on disturbed areas. The revegetation should be completed early enough in the fall so that a good cover is established before cold weather inhibits growth until the spring. A good cover typically represents vegetation covering 75 percent or more of the ground surface.

Permanent Seeding Seedbed Preparation

g) In infertile or coarse-textured subsoil, it is recommended to spread topsoil over the finished slope at a minimum 2 to 6-inch depth and roll it to provide a firm seedbed. The topsoil must have a sandy loam to silt loam texture with 15% to 20% organic content. If construction fill operations have left soil exposed with a loose, rough, or irregular surface, smooth with blade and roll.

a) Loosen the soil to a depth of 3-5 inches with suitable agricultural or construction equipment.

b) Areas not to receive topsoil shall be treated to firm the seedbed after incorporation of the lime and fertilizer so that it is depressed no more than ½ - 1 inch beneath foot traffic.

Areas to receive topsoil shall not be firmed until after topsoil, lime and fertilizer is applied and incorporated, at which time it shall be treated to firm the seedbed as described above.

Permanent Seeding Grass Selection/Application

a) Select an appropriate cool or warm season grass based on site conditions and seeding date. Apply the seed uniformly by hydroseeding, broadcasting, or by hand. Uniform seed

distribution is essential. On steep slopes, hydroseeding may be the most effective seeding method. Surface roughening is particularly important when preparing slopes for hydroseeding.
b) Lime and fertilize.
c) Mulch the seedings with straw applied at the rate of ½ tons per acre. Anchor the mulch with erosion control netting or fabric on sloping areas. Amoco supergrow or equivalent should be utilized.

Fertilizers:

Fertilizers contain nutrients such as phosphorous and nitrogen which can contribute to water pollution. The following practices should be utilized to reduce the risks of using fertilizer/detergent products.

1) Limit the application of fertilizers to the minimum area and the minimum recommended amounts.
2) Reduce the exposure of nutrients to storm water runoff by working the fertilizer deep into the soil (depth of 4 to 6 inches) instead of letting it remain on the surface.
3) Apply fertilizer more frequently, but at lower application rates.
4) Hydro-seeding where lime and fertilizers are applied to the ground surface in one application should be limited where possible.
5) Limit the use of detergents onsite; wash water containing detergents should not be discharged in the storm water system.
6) Apply fertilizer and use detergents only in the recommended manner and only in recommended amounts.

Permanent Seeding Inspection/Maintenance
a) Frequently inspect seeded areas for failure and make necessary repairs and reseed immediately. Conduct or follow-up survey after one year and replace failed grasses where necessary.
b) If vegetative cover is inadequate to prevent rill erosion, overseed and fertilize in accordance with soil test results.
c) If a stand has less than 40% cover, reevaluate choice of grass seed and quantities of lime and fertilizer. Re-establish the stand following seedbed preparation and seeding recommendations, omitting lime and fertilizer in the absence of soil test results. If the season prevents re-sowing, mulch or jute netting is an effective temporary cover.
d) Seeded areas should be fertilized during the second growing season. Lime and fertilize thereafter at periodic intervals, as needed.

Dust Control:

Dust control will be utilized during the site construction phase. The following are methods of Dust Control that may be used on-site.
Vegetative Cover – The most practical method for disturbed areas not subject to traffic.
Calcium Chloride – Calcium chloride may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage.

Sprinkling – The site may be sprinkled with water until the surface is wet. Sprinkling will be effective for dust control on haul roads and other traffic routes.
Stone – Stone will be used to stabilize construction roads; will also be effective for dust control.

Non-Stormwater Discharges:

During construction activities at the site, water from the site will be suitable for discharge to the detention areas and/or temporary sediment basin areas. Non-stormwater discharges will be directed to recharge groundwater as follows:
Uncontaminated groundwater from de-watering excavations will be conserved for recharge.
The construction de-watering and all non-stormwater discharges will be directed into a storm drain inlet equipped with a siltsack (or equivalent) inlet protection or a sediment trap.
The developer and site general contractor will comply with the E.P.A.'s Final General Permit for Construction Dewatering Discharges, (N.P.D.E.S., Section 402 and 40 C.F.R. 122.26(b) (14) (x), if required.

Stockpiling Material:

Stockpiled Material
1) Sediment Fence Barrier erosion control measures shall be placed surrounding the stockpile until it is removed from the site.
2) As needed, the stockpiled topsoil and subsoil may be used by re-distributing it around the site.

Solid Waste Disposal:

There should be no construction waste material on the site. No structures will be installed. The waste container in the upper site will be used for any trash. No trash is expected to be generated on the work site. If any trash or waste is found, it shall be handled and orderly disposed of in the current developed portion of the site.

Material Management Plan

An inventory will be kept of the material on site. There will be neat and orderly storage of hazardous materials. Regular garbage, rubbish, construction waste, and sanitary waste disposal will be employed. There will be prompt cleanup of any spills, either liquid or dry materials. The following practices will be used to avoid problems associated with the disposal of hazardous materials.
1) Check with local waste management authorities to determine what the requirements are for disposing of hazardous materials.
2) Use the entire product before disposing of the container.
3) Do not remove the original product label from the container, since it contains important information.
4) If surplus products must be disposed, do not mix products together unless specifically recommended by the manufacturer.
5) The correct method of disposal of hazardous materials varies with the product used. Follow the manufacturer's recommended method, which is often found on the label.
Hazardous Products: Hazardous Products may include but are not limited to paints, acids

for cleaning masonry surfaces, cleaning solvents, and concrete curing compounds and additives. The following practices will help to avoid pollution of storm water by these products.
1) Have equipment to contain and clean up spills of hazardous materials in the areas where these materials are stored or used.
2) Contain and clean up spills immediately after they occur.
3) Keep materials in a dry covered area.
Pesticides: Pesticides may include but are not limited to insecticides, rodenticides, and herbicides. The following practices should be utilized to reduce the risks of using pesticides.
1) Handle the materials as infrequently as possible.
2) Observe all applicable Federal, State, and local regulations when using, handling, or disposing of these materials.
Petroleum Products: Oil, gasoline, lubricants, and asphalt substances such as paving materials are considered petroleum products. Petroleum products will most likely be used in areas where road construction of some type is occurring and at vehicle storage areas or areas of onsite fueling or equipment maintenance. The following practices should be utilized to reduce the pollution risks from using petroleum products.
1) Have equipment to contain and clean up petroleum spills in fuel storage areas or on board maintenance and fueling vehicles.
2) Where possible, store petroleum products and fuel vehicles in covered areas and construct dikes to contain any spills.
3) Contain and clean up petroleum spills immediately.
4) Preventive maintenance for onsite equipment should be done to prevent leakage. This may include checking for and fixing gas or oil leaks in construction vehicles on a regular basis.
5) Proper application of asphalt substances (see manufacturers' instructions) will also reduce the risk of a spill.

Fertilizers/Detergents:

Fertilizers and detergents contain nutrients such as phosphorous
and nitrogen which can contribute to water pollution. The following practices should be utilized to reduce the risks of using fertilizer/detergent products.

1) Limit the application of fertilizers to the minimum area and the minimum recommended amounts.
2) Reduce the exposure of nutrients to storm water runoff by working the fertilizer deep into the soil (depth of 4 to 6 inches) instead of letting it remain on the surface.
3) Apply fertilizer more frequently, but at lower application rates.
4) Hydro-seeding where lime and fertilizers are applied to the ground surface in one application should be limited where possible.
5) Limit the use of detergents onsite; wash water containing detergents should not be discharged in the storm water system.
6) Apply fertilizer and use detergents only in the recommended manner and only in recommended amounts.

Spills: The site owner/supervisor will create and adopt a spill control plan that includes

measures to stop the source of the spill, contain the spill, clean up the spill, dispose of materials contaminated by the spill, and identify and train personnel responsible for spill prevention and control. The following measures will be appropriate for a spill prevention and response plan.

1) Store and handle materials to prevent spills.
a) Tightly seal containers.
b) Make sure all containers are clearly labeled.
c) Stack containers neatly and securely.
2) Reduce storm water contact if there is a spill.
a) Have cleanup procedures clearly posted.
b) Have cleanup materials readily available.
c) Contain any liquid.
d) Stop the source of the spill.
e) Cover spill with absorbent materials such as kitty litter or sawdust.
3) Dispose of contaminated materials according to manufacturer's instructions or according to state or local requirements.
4) Identify personnel responsible for responding to a spill of toxic or hazardous materials.
a) Provide personnel spill response training.
b) Post names of spill response personnel.
c) Keep the spill area well ventilated.
d) If necessary, use a private firm that specializes in spill cleanup.
5) Spills that exceed Reportable Quantity (RQ) levels must be reported and documented.

Temporary Sanitary Waste Disposal:

Temporary sanitary waste facilities shall be provided in an easily accessible location on the site for all construction personnel and shall maintained according to the vendor's required maintenance schedule.

Snow Management Plan:

The proper management of snow and snow melt, in terms of snow removal and storage, use of deicing compounds, and other practices will prevent or minimize the major runoff and pollutant loading impacts. The following practices should be employed to avoid pollution impacts from snow.
1) Use of De-icing Compounds
a) The Town of Medway may agree to the use of certain chemicals for de-icing. Alternative de-icing compounds such as calcium chloride ($CaCl_2$) and calcium magnesium acetate (CMA) are possibilities.
b) Use a sand only for road deicing.
c) There are no stockpiles of salt and sand stored or proposed on this site for de-icing.
2) Snow Removal and Storage: Place plowed snow in pervious areas where it can slowly infiltrate. This can be accomplished at the edge of the parking area surface.
3) Blow snow from paved areas to grass or pervious areas.
4) Utilize pavement sweeping and catch basin cleaning as a minimum bi-annual in the early spring (after winter storms), and mid-fall (after the leaf drop). The disposal of street sweepings shall comply with DEP/BWP Final Policy #94-092.

The preceding does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated.

Inspection/Maintenance:

Operator personnel must inspect the construction site at least once every 14 calendar days and within 24 hours of a storm event of 1/4-inch or greater. Refer to the Inspection/ Maintenance Requirements presented earlier in the “Structural and Stabilization Practices.” The inspector should look for three primary things when inspecting erosion and sediment controls.
1) Whether or not the measure was installed /performed correctly.
2) Whether or not there has been damage to the measure since it was installed or performed.
3) Required action to be completed to correct any problems with the measure.
The inspector should prepare a report documenting the findings. The inspector should request the required maintenance or repair for the pollution prevention measures when the inspector finds that it is necessary for the measure to be effective. If the Storm Water Pollution Prevention Plan should be changed to allow for unexpected conditions, the inspector should request the changes. The inspector should notify the appropriate person to make the changes.

LOG FORM

Construction Stormwater BMP Inspection, Maintenance, Corrective Action Log

Facility Name Cutler Place	
Address 6 Cutler Street	
Begin Date	End Date
Date of Last Rainfall/Rainfall Amount	

Inspection Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken (Dated)
	Erosion Control Barriers					
	Construction Entrance					
	Stockpiles Barriers					
	Slope Stability					
	conditions					

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality and start a new log at that time. To be completed at least once every 7 calendar days and within 24 hours of a storm event of 1 inch or greater.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done with date completed and need for follow-up.