STORMWATER MANAGEMENT REPORT

STORMWATER REPORT

SINGLE FAMILY HOME REDEVELOPMENT
4 DEL PRETE DRIVE
HINGHAM, MA 02043

Prepared For:

4 DEL PRETE REALTY TRUST
4 DEL PRETE DRIVE
HINGHAM, MA 02043

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
2 CORPORATION WAY, SUITE 160
PEABODY, MA 01960

CEC Project 356-812

FEBRUARY 2026

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1.0 PROJECT NARRATIVE

1.1 INTRODUCTION

On behalf of 4 Del Prete Realty Trust (the "Applicant"), Civil & Environmental Consultants, Inc. (CEC) has prepared this stormwater report and analysis to demonstrate compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards and the Town of Hingham Design and Performance Standards.

The Applicant proposes the construction of a 2,420 square foot, 2.5 story single-family home at 4 Del Prete Drive, in Hingham, Massachusetts, identified as Assessor's Parcel 70-0-71 (the "Site"). The project also proposes an inground pool, a bituminous asphalt driveway, stormwater drainage improvements, landscape improvements, and associated infrastructure (the "Project"). The Site will be serviced by existing electrical, gas, sewer, and water utilities onsite. The property is located with the Residential A Zoning District.

This Stormwater Management Report describes the proposed design as depicted on the Minor Site Plan Development Set prepared by CEC, dated February 2026, provided under separate cover.

1.2 EXISTING CONDITIONS

1.2.1 Overall Site

The Site is located at 4 Del Prete Drive, in Hingham, Massachusetts, bounded by Del Prete Drive to the north, and single-family residential dwellings to the west, south, and east. The Site contains 0.24± acres of land comprised of an existing 2.5-story residential dwelling along with an associated bituminous asphalt driveway, paved walkways and grassed areas. According to publicly available mapping data, there are no wetlands or other resource areas mapped onsite or within one-hundred (100) feet of the Site. There is a mapped wetland located on Del Prete Drive, however, it is located greater than 100 feet from the Site, as demonstrated by the Site Context Plan in the Site Plan Set in Appendix D of this report. Refer to Figure 1 for a Site Location Map and Figure 2 for an Aerial Site Plan for additional information pertaining to the existing Site.

Existing topography onsite ranges from a high point elevation of approximately 68 feet (NAVD 88) along the northeastern corner of the Site and a low point elevation of approximately 63 feet along the southwestern corner of the Site, adjacent to the western property line. Refer to the Existing Conditions Plan included in the Site Plan Set in Appendix D of this report for additional detail.

Stormwater runoff from the existing Site, flows overland, unattenuated predominantly to the southwestern corner of Site, identified as Design Point A (DP-A) in the pre-development stormwater calculations. The runoff from the remaining portions of Site flow to the municipal stormwater system located in Del Prete Drive, identified as Design Point B (DP-B) in the pre-development stormwater calculations. A small portion of the runoff from the Site flows to the eastern residential abutter identified as Design Point C (DP-C) in the pre-development stormwater calculations.

1.2.2 Geotechnical Conditions

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey the Site is classified as Chatfield-Rock outcrop, Canton complex (8-15% slopes), very stony, with a Hydrologic Soils Group designation of HSG B. Refer to Appendix B, of this report, for the NRCS Soil Information. Soil testing was performed onsite which confirmed the HSG B soils, see the "Geotechnical Investigation and Summary", located in Appendix B of this report, prepared by Aardvark Geotechnical Engineering & Testing, Inc, for boring locations and soils analysis. An infiltration rate of 1.02 in/hr was utilized based on the Rawl's Rate for Sandy Loam, which is consistent with the Massachusetts Stormwater Handbook requirements. Should the soil types observed during construction vary significantly from those used to design the subsurface infiltration system, CEC will reevaluate the design of the subsurface infiltration system accordingly.

1.2.3 Flood Zone

The Site is located within Zone X (unmapped) as shown on the Federal Emergency Agency (FEMA) Flood Insurance Rate Map (FIRM) for the town of Hingham, Map #25023C0082K, effective July 3, 2024. Refer to Figure 3 for the FIRMette Map.

1.3 PROPOSED PROJECT

The Applicant proposes the demolition of the existing single-family dwelling and associated paved driveway and walkways to support the construction of a new 2.5 story single-family home with a 2,420 square foot building footprint. The project also proposes an inground pool, a bituminous asphalt driveway, stormwater drainage improvements, landscape improvements, and associated infrastructure with proposed utilities connecting to existing services onsite.

The existing onsite drainage pattern will be maintained to the extent practicable with runoff from the roof being routed to the proposed subsurface infiltration system and infiltration trench to attenuate peak rates, provide recharge, and mitigate the increase in impervious area from existing to proposed condition.

The proposed stormwater design mitigates and reduces peak runoff rates from pre-development conditions to post-development conditions for the 2-, 10-, 25- and 100-year storms. Refer to the HydroCAD Drainage Analysis in Appendix C of this report.

2.0 STORMWATER MANAGEMENT SYSTEMS

2.1 DESCRIPTION OF RUNOFF CONTROLS

The stormwater management improvements consist of components designed to manage runoff from the Site. These components attenuate peak runoff discharge rates, minimize erosion, provide groundwater recharge and minimize impacts to offsite areas.

The stormwater management system utilizes Best Management Practices to recharge groundwater in accordance with the Massachusetts Stormwater Management Standards. The proposed stormwater management system will use the following specific control measures:

- Subsurface Infiltration Structures: A portion of clean stormwater runoff from the proposed roof area will be conveyed to subsurface stormwater infiltration chambers (Cultec Recharger 280HD), while the remainder of the building roof will be routed to the proposed infiltration trench. The subsurface infiltration chambers are located in the front yard beneath predominantly grassed area and is sized and designed to control peak rates of stormwater runoff. The proposed runoff controls are detailed in the Site Plan Set provided in Appendix D of this report. The proposed subsurface infiltration chamber system has been sized for design storm events up to and including the 100-year storm event with runoff exfiltrating into the existing soils, thus providing groundwater recharge.
- Infiltration Trench: A portion of clean stormwater runoff from the proposed roof area will be conveyed to the infiltration trench located around a majority of the building perimeter and is designed to provide storage and recharge, to attenuate peak runoff rates for tributary drainage area.

The use of the subsurface infiltration chamber system and the infiltration trenches for attenuation and treatment of stormwater is accepted as good standard practice, and is in done so in accordance with sound professional standards. Refer to Appendix C, of this report, for supporting information.

2.2 CONSTRUCTION SEQUENCE PLAN

The purpose of the Construction Sequence Plan is to develop a working schedule for the implementation of the proposed stormwater improvements. Prior to initiating work, the appropriate erosion and sedimentation control barriers will be installed along the limit of work. After the appropriate permits are obtained, and the installation of the erosion and sedimentation control barriers are confirmed by the applicable agencies, the construction project will commence in the following sequence:

1. Install necessary erosion and sedimentation control barriers as shown on the design drawings.
2. Perform demolition of existing building and paved areas, remove select trees identified, and cut, cap, and remove existing utility services as shown on the design drawings in Appendix D of this report.
3. Perform excavation for building foundation areas, subsurface infiltration chamber system and utilities.
4. Install proposed utilities and stormwater infrastructure.
5. Place clean fill materials.
6. Construct building.
7. Install bituminous asphalt driveway.
8. Install proposed final landscaping.
9. Remove existing erosion and sedimentation control measures.

All construction water will be collected and treated in accordance with the Erosion and Sediment Control Plan included on the Site Plan set in Appendix D of this report.

3.0 STORMWATER ANALYSIS

3.1 METHOD OF ANALYSIS

A hydrologic analysis has been performed for the Site comparing existing conditions and post-development conditions using a software program developed by HydroCAD. This program analyzes site hydrology by the graphic peak discharge method documented in Technical Release No. 20 and Technical Release No. 55 published by the United States Department of Agriculture (USDA) Soil Conservation Service.

The following variables were developed for the contributing watersheds (drainage areas) in order to complete the analysis:

- **Rainfall Depth:** A hydrologic analysis was performed for the 24-hour 2-year, 10-year, 25-year, and 100-year, Type III storm events (3.43, 5.06, 6.08, and 7.65 inches respectively) for each drainage area. The rainfall depths for the study area were obtained from NOAA Atlas 14 Volume 10 based on the Site Location.

- **Runoff Curve Number (RCN):** The RCN is a hydrologic characteristic that contributes to the peak rate of runoff and volume from a given storm event. It is dependent upon soil conditions and land use. Generally, higher curve numbers are associated with less pervious soils and, hence, greater amounts of runoff. As previously noted, based on the review of the NRCS Web Soil Survey, an assumed Hydrologic Soil Group (HSG) B was used in determining RCNs.

- **Time of Concentration (Tc):** The Tc is defined as the time it takes runoff to travel from the hydraulically most distant part of the watershed to the downstream point of interest. This parameter is dependent on the characteristics of the ground surface and condition of the travel path. Times of concentration were calculated for the various drainage areas using the HydroCAD program, with a minimum Tc of six (6) minutes used in accordance with the protocol outlined in Technical Release No. 55.

3.2 DRAINAGE AREAS

To perform the analysis, the contributing drainage areas for pre-development, existing, and post-development conditions were delineated. The delineation of the drainage areas was determined by the topography depicted on the Existing Conditions Plan. Descriptions of the existing condition and proposed condition drainage areas are as follows:

- **Existing Condition:** The existing Site has been divided into three (3) existing drainage areas that ultimately drain to three (3) separate design points: the western residential abutter (Design Point A), the municipal stormwater system located in Del Prete Drive (Design Point B), and the eastern residential abutter (Design Point C).
  - **A1-EX:** Comprised of roof area, paved areas, and grassed area that flows overland to DP-A.
  - **B1-EX**: Comprised of roof area, paved areas, and grassed area that flows overland to DP-B.
  - **C1-EX**: Comprised entirely of grassed area that flows overland to DP-C.

Refer to Figure HYD-PRE for the pre-development conditions drainage areas. A summary of pre-development conditions drainage areas is listed below:

Table 3-1: Pre-Development Conditions

PRE-DEVELOPMENT CONDITIONS				
Drainage Area	**Design Point**	**Area (s.f.)**	**Curve Number**	**Time of Concentration (minutes)**
A1-EX	DP-A	6,711	73	6.0
B1-EX	DP-B	2,398	80	6.0
C1-EX	DP-C	1,375	61	6.0

- **Proposed Conditions:** The proposed Project has been divided into five (5) drainage areas in the proposed condition that ultimately drain to three (3) separate design points: the western residential abutter (Design Point A), the municipal stormwater system in Del Prete Drive (Design Point B), and the eastern residential abutter (Design Point C).
  - **A1-PR:** Comprised of patio roof area, paved areas, gravel area, pool area modeled as impervious, grassed area, and wooded landscape area that flows overland to DP-A.
  - **A2-PR:** Comprised of roof area that drains via downspouts to infiltration trenches (Pond P1) that ultimately flows to DP-A.
  - **B1-PR:** Comprised of paved area and grassed area that flows overland to DP-B.
  - **B2-PR:** Comprised of roof area that drains via downspouts and roof drains to the proposed subsurface infiltration chamber system (Pond P2) that flows to DP-B.
  - **C1-PR:** Comprised of grassed and wooded landscape area that flows overland to DP-C.

Refer to Figure HYD-POST for the proposed conditions drainage areas. A summary of the proposed conditions drainage areas is listed below:

Table 3-2: Post-Development Conditions

POST-DEVELOPMENT CONDITIONS				
Drainage Area	**Design Point**	**Area (s.f.)**	**Curve Number**	**Time of Concentration (minutes)**
A1-PR	DP-A	4,392	66	6.0
A2-PR		1,571	98	6.0
B1-PR	DP-B	2,136	76	6.0
B2-PR		1,014	98	6.0
C1-PR	DP-C	1,371	59	6.0

3.3 RESULTS OF ANALYSIS

A stormwater analysis was performed for the 24-hour 2-year, 10-year, 25-year, and 100-year storm events to determine that there will be no increase in the peak stormwater runoff rates of discharge off-site after the proposed construction is complete and the stormwater management devices are in place per the design plans. Detailed calculations are attached in Appendix A of this report. Compliance for existing and post-development conditions was evaluated at each design point. A summary of the peak stormwater runoff is provided below.

As shown below in Table 3.3, post-development runoff rates from the Site to all of the design points do not exceed existing runoff rates. Supporting calculations are provided in Appendix C of this report.

Table 3-3: Project Stormwater Runoff Rates

PEAK RUNOFF RATES (cfs)								
	2-Year		10-Year		25-Year		100-Year	
Design Point	*Ex.*	Prop.	*Ex.*	Prop.	*Ex.*	Prop.	*Ex.*	Prop.
DP-A	*0.21*	0.18	*0.43*	0.35	*0.59*	0.47	*0.83*	0.67
DP-B	*0.10*	0.08	*0.19*	0.15	*0.25*	0.20	*0.34*	0.28
DP-C	*0.02*	0.01	*0.05*	0.05	*0.08*	0.07	*0.12*	0.12

4.0 STORMWATER CONTROL SYSTEM DESIGN CRITERIA

4.1 MASSDEP STORMWATER MANAGEMENT POLICY

Stormwater discharge from the proposed Project is subject to the Massachusetts DEP Stormwater Management Policy (the Policy). The Policy is designed "to protect the wetlands and waters of the Commonwealth from adverse impacts of storm water runoff." To accomplish this goal, the Policy establishes ten (10) performance standards to control stormwater quantity and quality. These standards establish the level of required controls that can be achieved with site planning, structural and non-structural controls, and other best management practices (BMPs). The Stormwater Checklist is provided in Appendix C of this report. Stormwater modeling methodology is discussed in detail in Section 3.0 of this report. Results of the stormwater modeling of the existing and proposed conditions are provided as Appendix E of this report.

4.1.1 Stormwater Management Standards

The following section documents compliance with the MassDEP Stormwater Management Standards.

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

No new stormwater conveyances are proposed to discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

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

The post-development peak discharge rates of runoff do not exceed pre-development rates for the 2-, 10-, 25- and 100-year storm events. Stormwater modeling methodology is discussed in detail in Section 3.0 of this report. The model output is provided in the HydroCAD Drainage Analysis, in Appendix C of this report. Summaries of the model results are provided above in Table 3-3.

Standard 3
Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site

should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.

The project is designed to comply with this requirement. In accordance with the stormwater standards, 0.35-inches of recharge must be provided for the increase in impervious areas onsite for HSG B soils. The proposed project results in 790 square feet of new impervious area, requiring 37 cubic feet (CF) of groundwater recharge. The proposed subsurface infiltration system and infiltration trench will provide approximately 433 CF of recharge, well in excess of the regulatory requirement.

A Saturated Hydraulic Conductivity rate of 1.02 in/hour was utilized to model exfiltration and to document compliance for drawdown of the stormwater in less than 72 hours. This exfiltration rate was taken from the Rawls Rates table for Sandy Loam. Supporting calculations are provided in Appendix C of this report.

Standard 4

For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:

A. Suitable nonstructural practices for source control and pollution prevention are implemented;
B. Stormwater management best practices (BMPs) are sized to capture the prescribed runoff volume; and
C. Stormwater management BMPs are maintained as designed.

The proposed project includes a subsurface infiltration chamber system and an infiltration trench to recharge runoff from the roof area, and while both BMPs provide TSS treatment, roof runoff is considered “clean” and does not require water quality treatment.

A comprehensive Operations and Maintenance Plan (O&M) has been developed and is included in Appendix A of this report.

Standard 5

Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs. The use of infiltration practices without pre-treatment is prohibited.

The proposed project is not considered a land use with higher potential pollutant loads, therefore this standard is not applicable to this Project.

Standard 6

Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resources Waters (ORWs), shellfish beds, bathing beaches, cold water fisheries, and recharge areas for public water supplies.

Upon review of publicly available mapping at the time of this report, the proposed project does not discharge to known critical areas.

Standard 7

Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. Where it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

Although this Project is a redevelopment of an existing residential property, the proposed project, according to the MassDEP Stormwater Regulations, does not qualify as a redevelopment due to the increase in impervious area as a result of the Project.

Standard 8

Erosion and sediment controls must be implemented to prevent impacts during construction, or land disturbance activities.

Erosion and sediment controls are integral to the project improvements. The Erosion and Sedimentation Control Plan includes compost silt socks, which will be installed around the proposed work area, along the perimeter of the property. Prior to, and during construction, the Site's Erosion and Sedimentation Control Plan will be followed. These measures will be utilized throughout construction to prevent erosion, control sediments, and stabilize exposed soils.

Standard 9

All stormwater management systems must have an operations and maintenance plan to ensure that systems function as designed.

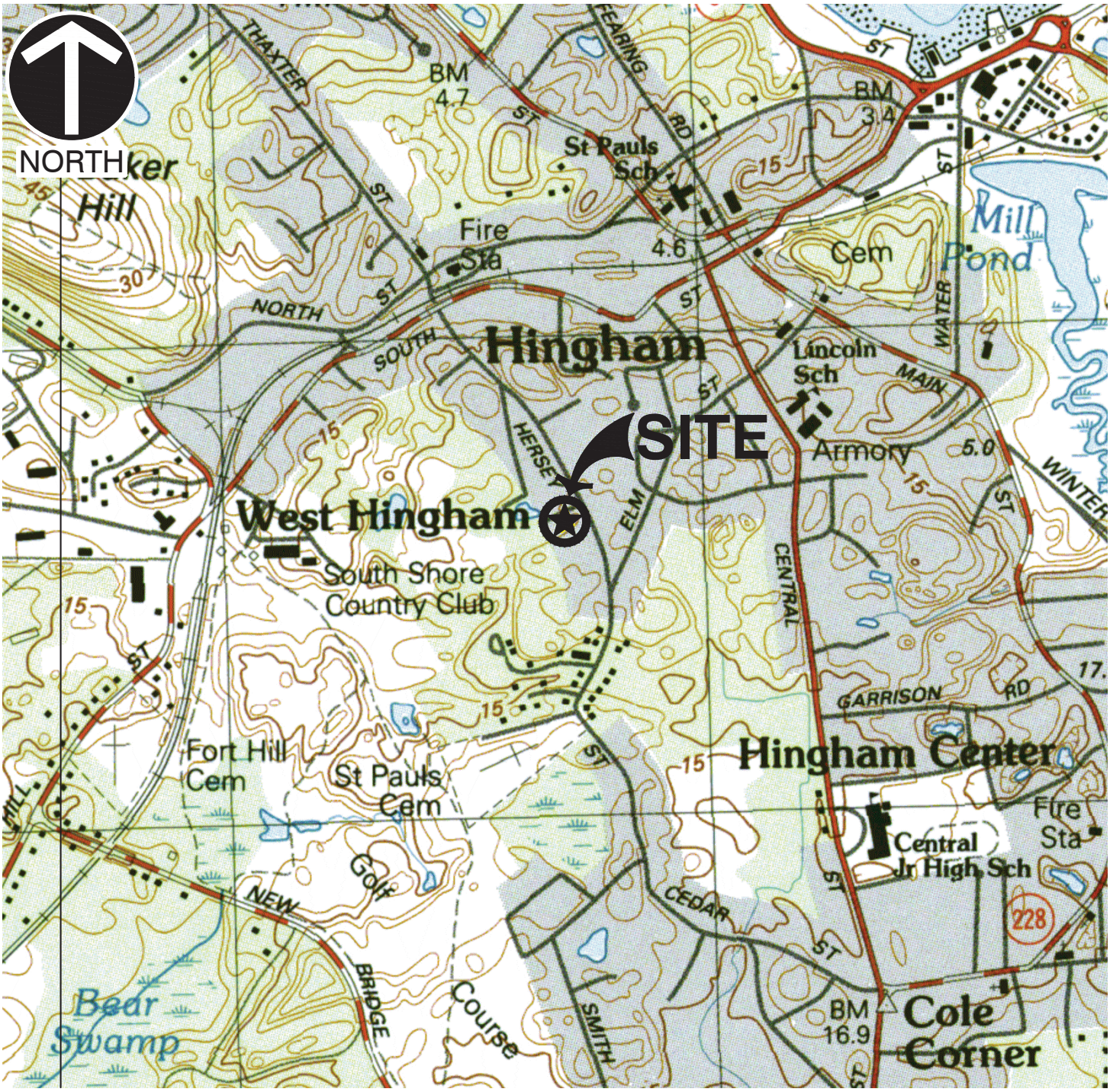
A comprehensive Operations and Maintenance Plan (O&M) has been developed. The Manufacturer's O&M Procedures for the water quality unit and stormwater chambers are included in the O&M Plan for reference. Refer to Appendix A of this report.

Standard 10

All illicit discharges to the stormwater management system are prohibited.

There are no known illicit discharges at the Site. If found, any illicit discharges will be eliminated, and the project will not be constructed with any illicit connections. Refer to the Illicit Discharge Statement in Appendix C of this report.

FIGURES



SCALE IN FEET

0 1,000 2,000

REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, Q249882, Q249886, Q253882, AND Q253886 QUADRANGLES, MASSACHUSETTS.

ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE IN THE STATE OF NORTH CAROLINA WILL BE PROVIDED BY CEC SURVEYING AND LANDSCAPE ARCHITECTS OF NC, PLLC. SERVICES IN PUERTO RICO WILL BE PROVIDED BY CEC ENGINEERS & CONSULTANTS, LLC. LANDSCAPE ARCHITECTURE SERVICES IN THE STATE OF OHIO WILL BE PROVIDED BY CEC LANDSCAPE ARCHITECTS, LLC.

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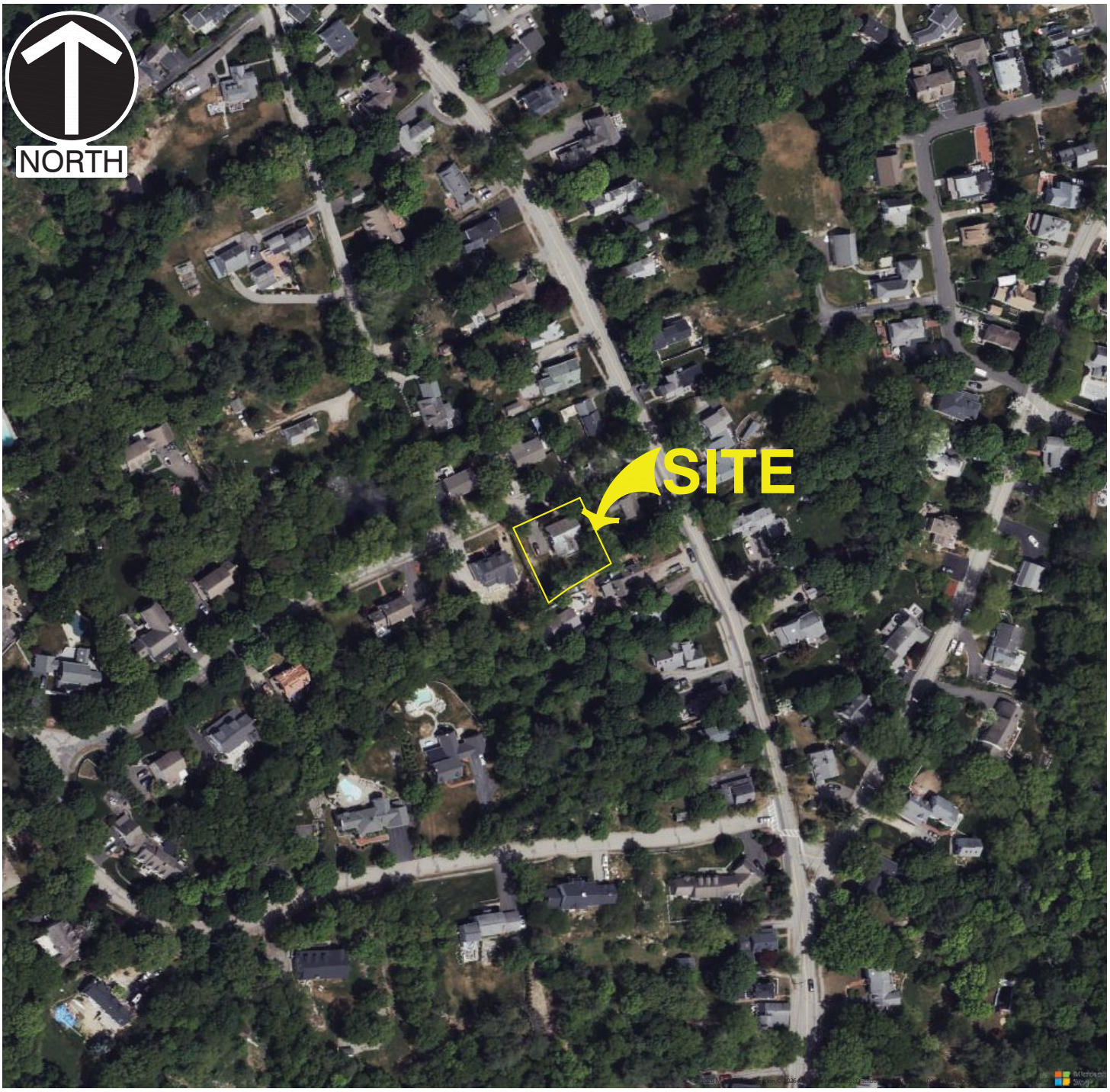
HINGHAM, MASSACHUSETTS

SITE LOCATION MAP

DRAWN BY:	AMB	CHECKED BY:	DSK	APPROVED BY:	MKB	FIGURE NO.:
DATE:	JANUARY 2026	DWG SCALE:	1"=1,000'	PROJECT NO:	356-812	1

P:\350-000\356-812\-CADD\Dwg\SP01\356812-SP01-Site Figures.dwg{FIGURE 1} LS:(1/30/2026 - abucco) - LP: 1/30/2026 3:11 PM



SCALE IN FEET

0 200 400

REFERENCE

1. AERIAL PHOTOGRAPHY BY EARTHSTAR GEOGRAPHICS SIO, PROVIDED BY AUTODESK, ACCESSED 01/30/2026, DATED 2026.

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AERIAL SITE PLAN

DRAWN BY:	AMB	CHECKED BY:	DSK	APPROVED BY:	MKB	FIGURE NO.:	2
DATE:	JANUARY 2026	DWG SCALE:	1"=200'	PROJECT NO:	356-812		

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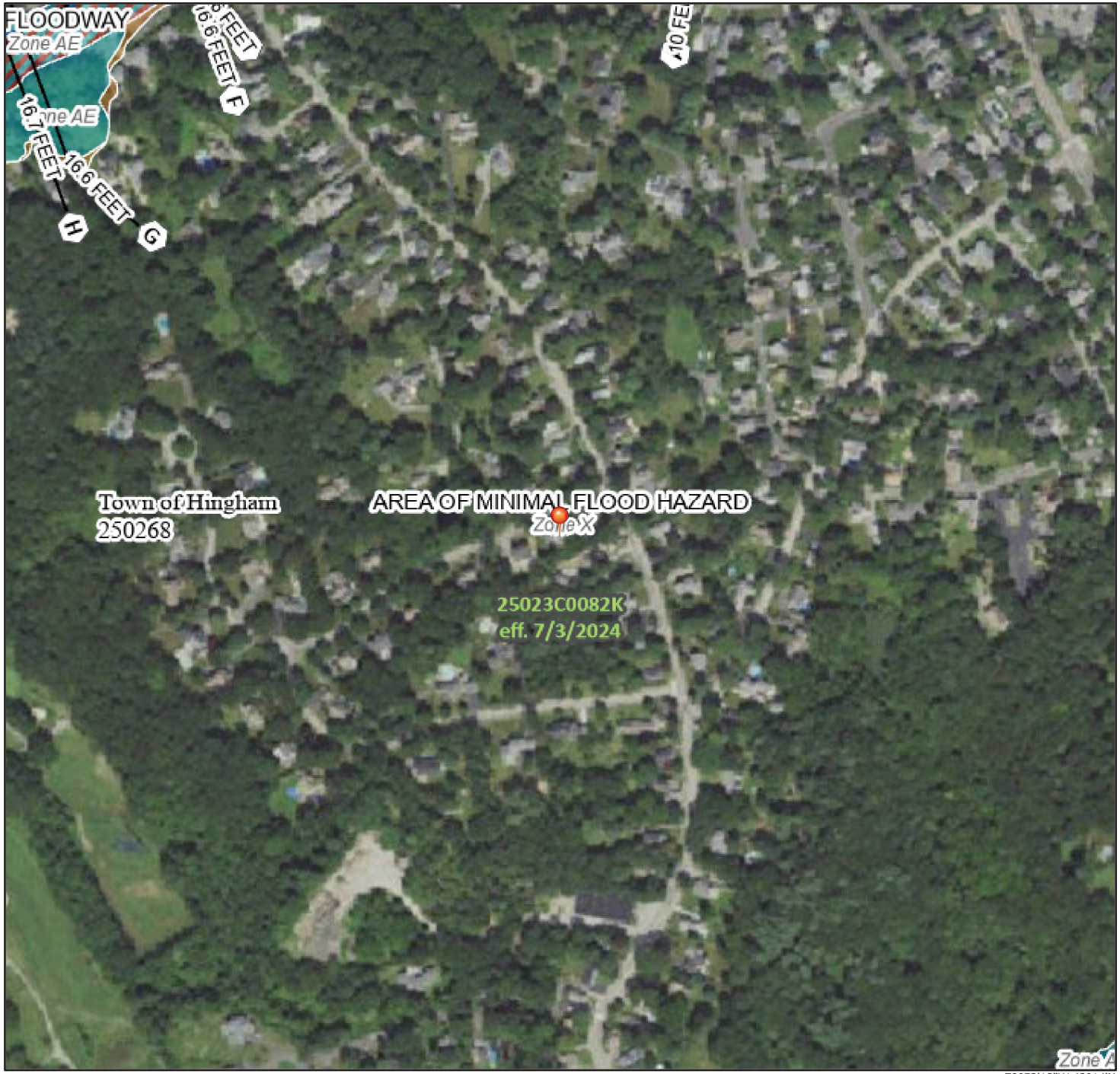
National Flood Hazard Layer FIRMette

FEMA

70°53'56"W 42°14'27"N



70°53'18"W 42°14'N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/30/2026 at 4:07 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

LEGEND

- DESIGN POINT (A)
- SUBCATCHMENT AREA (A1)
- POND/DETENTION AREA (P1)
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION PATH
- VEGETATED AREA
- WOODED AREA
- PAVED AREA
- GRAVEL AREA
- ROOF AREA

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DRAINAGE AREA MAP
EXISTING CONDITIONS

DRAWN BY:	MKB	CHECKED BY:	DSK	APPROVED BY:	MKB	FIGURE NO.:
DATE:	JANUARY 2026	DWG SCALE:	1"=20'	PROJECT NO:	356-812	HYD-EX

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DRAINAGE AREA MAP
PROPOSED CONDITIONS

DRAWN BY:	MKB	CHECKED BY:	DSK	APPROVED BY:	MKB	FIGURE NO.:
DATE:	JANUARY 2026	DWG SCALE:	1"=20'	PROJECT NO:	356-812	HYD-PR

APPENDIX A
STORMWATER MANAGEMENT
OPERATION & MAINTENANCE PLAN

STORMWATER MANAGEMENT
OPERATIONS AND MAINTENANCE (O&M) PLAN

SINGLE FAMILY HOME REDEVELOPMENT
4 DEL PRETE DRIVE
HINGHAM, MA 02043

Prepared For:

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RAYNHAM, MASSACHUSETTS 02767

CEC PROJECT 356-812

FEBRUARY 2026

OPERATIONS AND MAINTENANCE (O&M) PLAN

GENERAL

Stormwater management systems with multiple components, such as the one proposed for this Project, assures the cleanest possible discharges of stormwater to the environment. However, these systems must be routinely maintained to keep them in good working order. This plan identifies potential sources of pollution that may affect the quality of stormwater discharges and describes the implementation of Long-Term Pollution Prevention practices to reduce potential pollutants in stormwater discharges. The party identified below will be responsible for the operation and maintenance of the stormwater management system and Site. Schedules and procedures for inspection and maintenance of the existing and proposed stormwater management system components are provided in the following sections.

Responsible Party for Plan Compliance:
4 Del Prete Realty Trust
4 Del Prete Drive
Hingham, MA 02043

Upon a transfer of ownership, the future owner shall assume the responsibilities for compliance with this O&M Plan.

Emergency Contact Information:
Stephen Niosi, Jr.
(781) 726-2573

Estimated O&M Budget

It is estimated that an annual budget of $2,500 should be allocated to performing routine inspections and maintenance identified in this O&M Plan.

LOCATION OF OPERATIONS AND MAINTENANCE PLAN

Copies of the O&M Plan are kept on file at the subject property of 4 Del Prete Drive, Hingham, MA.

RECORDKEEPING

Records of inspections and maintenance shall be up to date and available for review and inspection, if requested by Town officials.

STORMWATER BEST MANAGEMENT PRACTICES (BMP) PLAN

ROUTINE INSPECTIONS

Inspections of the stormwater management system as a whole, and of the individual components of the system, will be carried out on a routine basis in accordance with the schedule identified below. Components to be inspected include the extents noted below. Each component will be inspected for standing water, sediment buildup, presence of oil, color, and structural damage. The results of each inspection will be entered into an inspection log. Refer to Attachment 1 Operations & Maintenance Log for the inspection log form.

MAINTENANCE PLAN

The Responsible Party will incorporate a routine maintenance program to assure proper operation of the stormwater management system. Maintenance will be performed based on the results of inspections in accordance with the schedules identified in Attachment 1. The program will include the following maintenance activities:

Subsurface Infiltration Chamber System

- See the attached Manufacturer's instructions on operation and maintenance requirements and methodology.
- Perform routine inspections on a monthly basis for the first three months after installation. Then, at a minimum, the treatment structure is to be inspected twice annually and the infiltrating structure is to be inspected annually.
- The subsurface infiltration chamber system will be inspected twice during for the first year and annually thereafter by removing the manhole/access port covers and determining the thickness of sediment that has accumulated.
- If sediment is more than two inches deep, it must be suspended via flushing with clean water and removed using a vactor truck.
- Emergency overflow pipes will be examined at least once each year and verified that no blockage has occurred.

Infiltration Trench

- Inspect and clean at least twice per year, typically in the spring and the fall.
- Inspect for washouts and repair if necessary.
- Remove vegetation and debris.

Roof Drain Leaders

- Perform routine roof drain and gutter inspections twice per year, typically in the spring and fall.
- Inspect for blockage and remove debris if required.
- Keep roof, roof drains and gutters clean and free of debris.
- Keep roof drainage systems clear.
- Keep roof access limited to authorized personnel.

Stormwater Outfall

- Inspect after the first several rainfall events and after any major storm events within the first year. After the first year, inspect regularly on an annual basis.
- Inspect for washouts and repair if necessary.
- Remove any sediment, trash, debris, leaves and grass clippings from blocking the outfall.
- Remove any tree seedlings before they become firmly established.

Vegetated Areas

- Inspect twice per year, typically in the spring and fall.
- Remove sediment, debris, and invasive vegetation.

LONG TERM POLLUTION PREVENTION MAINTENANCE

The Responsible Party will incorporate a routine maintenance program to ensure the continued effectiveness of the structural water quality controls. Maintenance will be performed based on the results of inspections in accordance with the schedules identified below. The program will include the following maintenance activities:

Maintenance of Pavement Systems

Regular maintenance of pavement surfaces will prevent pollutants such as oil and grease, trash, and sediments from entering the stormwater management system. The following practices should be performed:

- Sweep asphalt pavement areas a minimum of twice per year, typically between March and November and dispose of removed material.

Maintenance of Vegetated Areas

Proper maintenance of vegetated areas can prevent the pollution of stormwater runoff by controlling the source of pollutants such as suspended sediments, excess nutrients, and chemicals from landscape care products. Practices that should be followed under the regular maintenance of the vegetated landscape include:

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas: install appropriate erosion control measures when native soil is exposed, or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- Grass vegetation should not be cut to a height less than four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow-release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas but should not be applied on a regular basis unless necessary.

ATTACHMENT 1

STORMWATER OPERATIONS &MAINTENANCE LOG

Stormwater Operations and Maintenance Log

Project Name: Single Family Home Redevelopment
Project Location: 4 Del Prete Drive, Hingham, MA
Project Number: 356-812

Date: 2/4/2026
Prepared By: AMB
Approved By: MKB

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning or Repair Needed (List Items if Required)	Date of Cleaning or Repair	Performed by
Subsurface Infiltration Chamber System	Inspect monthly for the first three months. Then, at a minimum, the treatment structure is to be inspected twice annually, typically in the spring and the fall, and the infiltrating structure is to be inspected annually as required by the manufacturer.			Remove sediment once per year or when buildup exceeds two (2) inches in depth.			
Infiltration Trench	Inspect twice per year, typically in the spring and fall.			Remove vegetation and debris. Inspect for washouts and repair if necessary.			
Roof Drain Leaders	Inspect twice per year, typically in the spring and fall.			Inspect for blockage and remove debris if required.			
Stormwater Outfall	Inspect after the first several rainfall events and after any major storm events within the first year. After the first year, inspect regularly on an annual basis, typically in the spring.			Remove any sediment, trash, debris, leaves and grass clippings. Remove any tree seedlings before they become firmly established. Note and repair any erosion or low spots in the level spreader.			
Vegetated Areas	Inspect twice per year, typically in the spring and fall.			Perform maintenance on a regular basis during the growing season. Mow grassed areas on a regular basis to maintain growth. Plant alternative mixture of grass species in the event of unsuccessful establishment. Grass vegetation should not be cut to a height less than four inches. Maintain planted areas adjacent to pavement to prevent soil washout and immediately clean any soil deposited on pavement. Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming. Remove trash, sediment debris and invasive vegetation.			

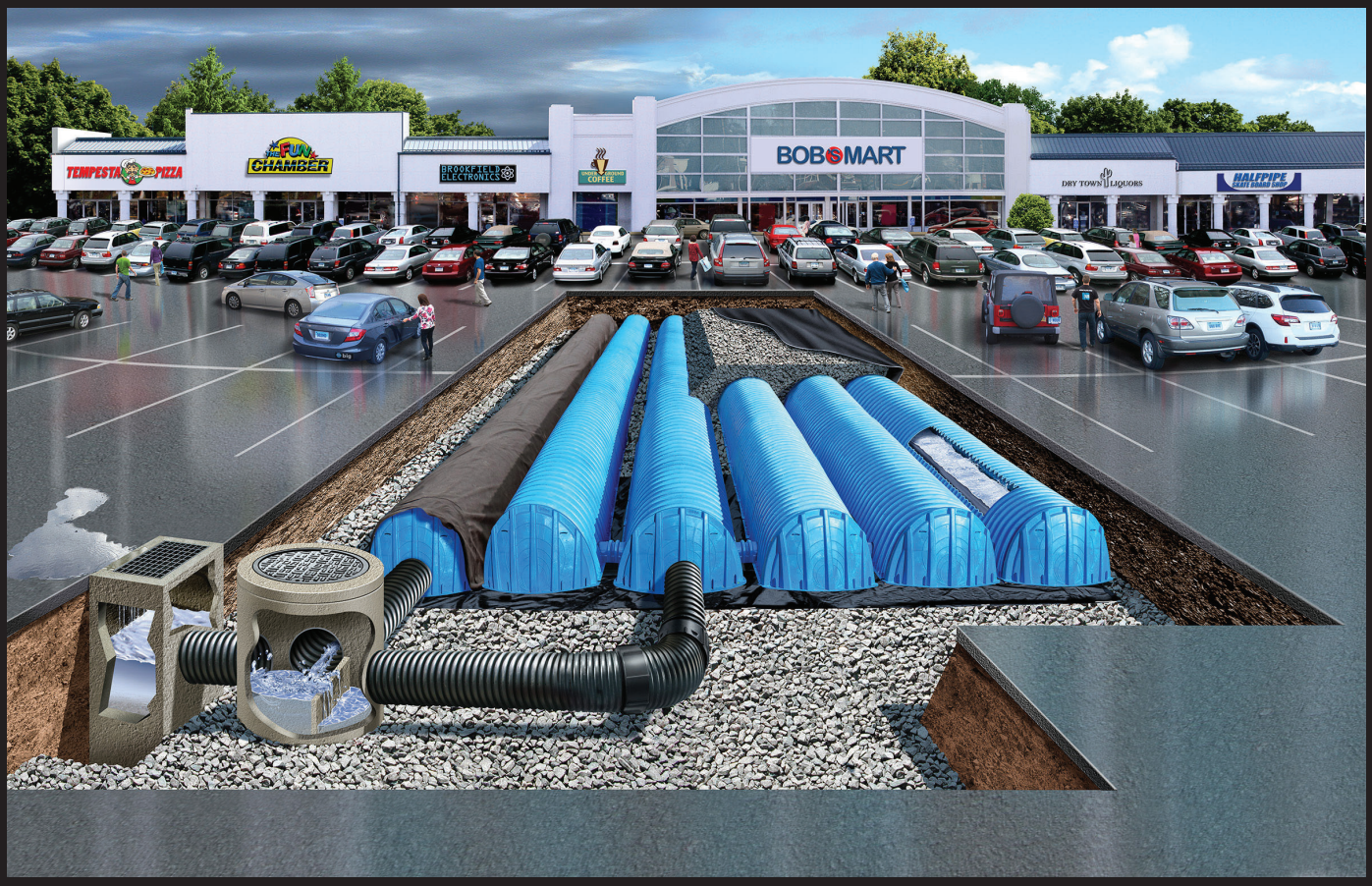
Stormwater Supervisor Contact Information:_____

ATTACHMENT 2

MANUFACTURER'S OPERATIONS & MAINTENANCE PROCEDURES

CONTACTOR® & RECHARGER®

STORMWATER MANAGEMENT SOLUTIONS



OPERATION & MAINTENANCE GUIDELINES

FOR CULTEC STORMWATER MANAGEMENT SYSTEMS

CULTEC®

Published by
CULTEC
P.O. Box 280
878 Federal Road
Brookfield, Connecticut 06804 USA
www.cultec.com

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Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at CT-CustomerService@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail CT-Tech@cultec.com.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CLT057 11-23
November 2023

These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pretreatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC at 1-800-428-5832.

CULTEC
878 Federal Road • P.O. Box 280 • Brookfield, CT 06804 USA
P: (203) 775-4416 • Toll Free: 1(800) 4-CULTEC • www.cultec.com

RETENTION • DETENTION • INFILTRATION • WATER QUALITY

APPENDIX B

GEOTECHNICAL INFORMATION

United States Department of Agriculture

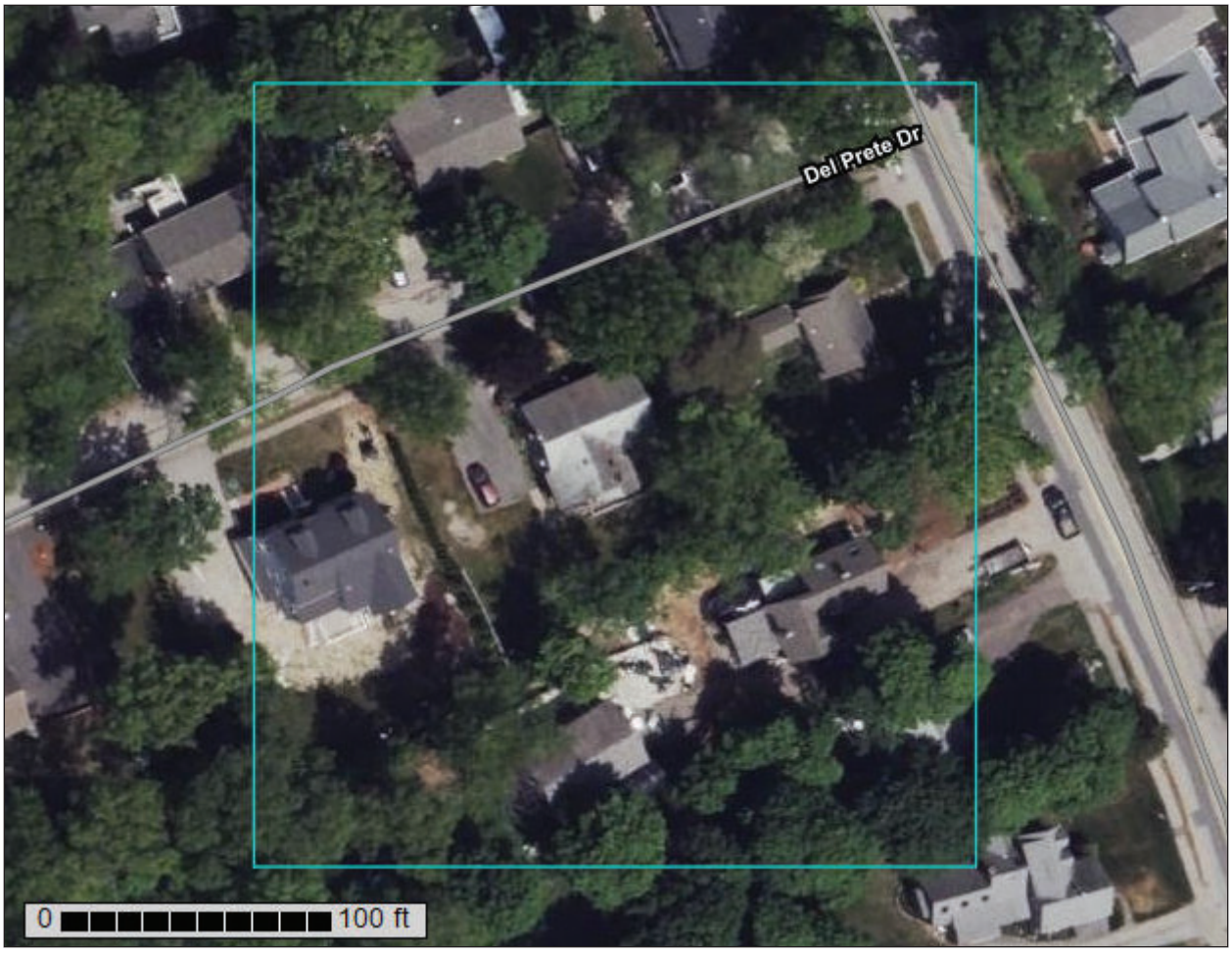
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Plymouth County, Massachusetts

4 Del Prete Drive, Hingham, MA



January 29, 2026

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:629 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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 1:12,000.

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: Plymouth County, Massachusetts
Survey Area Data: Version 18, Sep 5, 2025

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
111C	Chatfield-Rock outcrop-Canton complex, 8 to 15 percent slopes, very stony	1.8	100.0%
Totals for Area of Interest		**1.8**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Plymouth County, Massachusetts

111C—Chatfield-Rock outcrop-Canton complex, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w82v
Landscape: Glaciated uplands
Elevation: 0 to 230 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 40 percent
Rock outcrop: 25 percent
Canton, very stony, and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landscape: Glaciated uplands
Landform: Bedrock-controlled ridges, Bedrock-controlled hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landscape: Glaciated uplands
Landform: Bedrock-controlled ridges, Bedrock-controlled hills
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landscape: Glaciated uplands
Landform: Ridges, Moraines, Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 10 percent
Landscape: Glaciated uplands
Landform: Ground moraines, Moraines, Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Hollis, very stony

Percent of map unit: 5 percent
Landscape: Glaciated uplands
Landform: Bedrock-controlled ridges, Bedrock-controlled hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

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RE: Geotechnical Investigation and Summary
4 Del Prete Dr.
Hingham, MA 02043

AARDVARK GEOTECHNICAL ENGINEERING & TESTING, INC.
Certified DBE

App B A

July 28, 2025 **Ref. File 25016**

Dear Client,

The purpose of this report, as agreed, is to present the results, observations, and professional geotechnical engineering recommendations and conclusions from a subsurface investigation program which was completed on July 25th, 2025, at the above referenced site.

This soil boring program, as requested, is intended to address the structural implications of the subsurface materials conditions relative to the proposed 4 Del Prete Drive project. The field data was utilized to draw the engineering conclusions and to formulate the professional recommendations presented later in this document.

The site consists of a single-family home measuring approximately 1,550 square feet, located in a residential neighborhood. Del Prete Drive lies to the north, with houses surrounding the property. A small pond is located approximately 200’ to the northwest of the site. The backyard had recently been excavated for pipe and utility work. The client intends to construct or redevelop the residence. At the time of the site visit, only the aforementioned construction activities had begun.

On the date mentioned above, Aardvark Geotechnical Engineering & Testing visited the site and performed a limited subsurface boring investigation consisting of five (5) soil borings (B-1 through B-5), at the aforementioned site location.

It should also be noted that our boring evaluations reflected the values shown on the original site plan, regardless of the ongoing site operations and possible minor changes in contour/grade.

The borings were advanced using penetration by a Geoprobe 7822DT. Standard penetration resistance, at standard or continuous increments, was measured using a 24-inch long 2-inch O.D. split spoon sampler driven by an automatic, pneumatic hammer delivering a force equal to 140 pounds falling 30 inches. The field values, commonly referred to as “blow counts,” are listed on the individual soil boring logs, which are attached. The recovered soil samples, visually classified in the field, were recorded and stored in the event that further review is requested. The boring locations shown in Figure 1, the Boring Location Plans, were adjusted by our field engineers during the drilling to provide a cross section of the subsurface soils underlying the site.

Borings B-1 through B-5 were placed around the existing building. B-2 was sampled continuously to give a more in depth cross section of the subsurface conditions. Borings B-1 and B-5 were located at the same elevation as the adjacent street and were designated as 0' elevation.

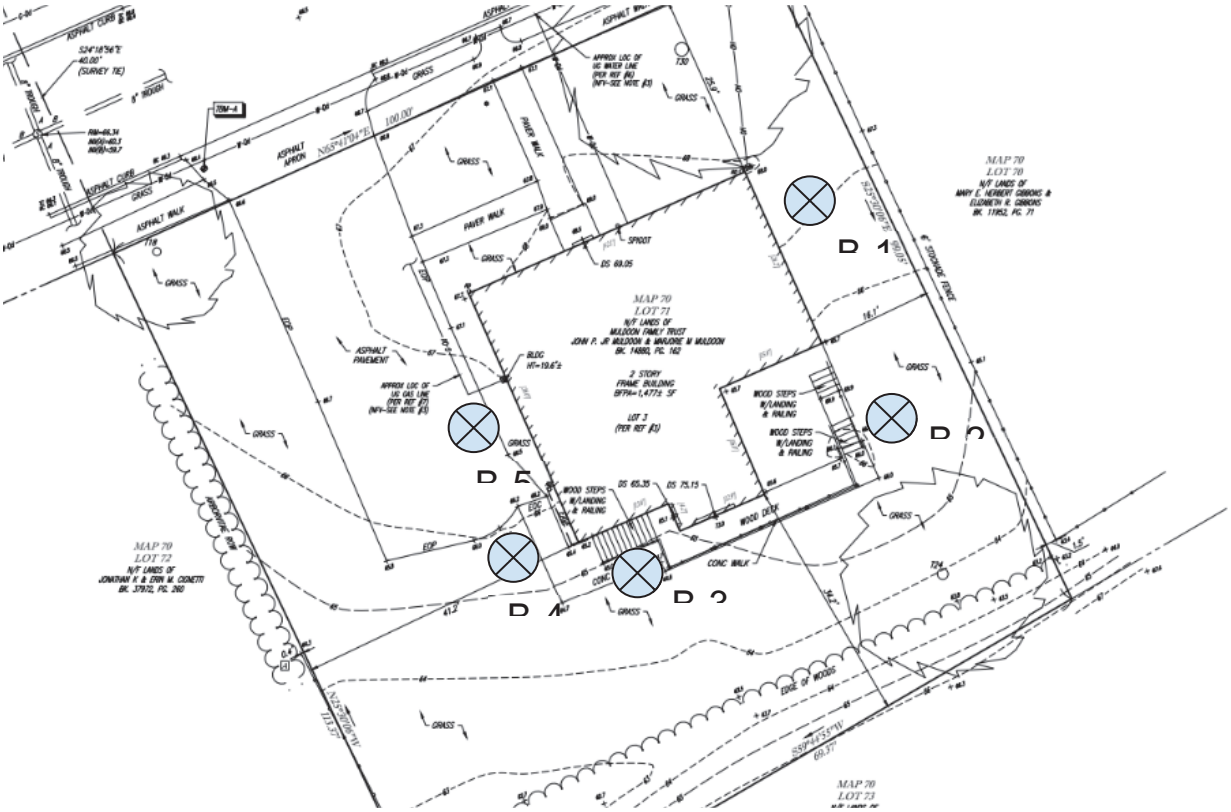


Figure 1: Boring Location Plan

B-1, located in the northeast of the site, at existing grade, shows 5'± of black to tan, damp, medium dense silty sand trace gravel with topsoil. Overlying 4'± of tan to brown, wet, dense silty sand trace gravel. Underneath lies 1"± of greyish tan, wet, very dense silty sand and gravel, until termination at 10'± depth due to potential bedrock or ledge. Evidence of the static groundwater table was observed at 5'± depth. Evidence of the undisturbed native soil was observed at 5'± depth.

B-2, located in the east of the site, at 2'± below existing grade, shows 1'± of brown, damp, very loose topsoil trace gravel, followed by 4'± of brown, damp, loose to medium dense silty sand trace gravel. Then, 5'± of tan to orange to gray, wet, medium dense silty sand trace gravel. Underneath lies 5'± of tan, wet, medium dense to very dense, silty sand with some gravel. Below lies 2"± of tan to gray, very dense, silty sand and gravel, until termination at 15' 2"± depth due to potential bedrock or ledge. Evidence of the static groundwater table was observed at 5'± depth. Evidence of the undisturbed native soil was observed at 5'± depth.

B-3, located in the south of the site, 2'± below existing grade, shows 1'± of brown, damp, very loose topsoil trace gravel. Over 8'± of brown, damp to wet, medium dense silty sand trace gravel. Underneath lies 1'± of brown, wet, very dense, silty sand and gravel until termination at 9' 10"± depth due to potential bedrock or ledge. Evidence of the static groundwater table was observed at 5'± depth. Evidence of the undisturbed native soil observed at 2'± depth.

B-4, located in the southwest of the site, 1'± below existing grade, shows 1'± of brown, damp, medium dense topsoil trace gravel followed by 4'± of brown to orange, damp, medium dense silty sand trace gravel. Then, 4'± of brown, wet, medium dense, silty sand and some gravel. Underneath this lies 6"± of brown, wet, very dense, silty sand and gravel until termination at 9'6"± depth due to potential bedrock or ledge. Evidence of the static groundwater table was observed at 5'± depth. Evidence of the undisturbed native soil was observed at 2'± depth.

B-5, located in the west of the site, at existing grade, shows 1'± of brown, damp, medium dense topsoil trace gravel followed by 4'± of brown to orange, damp, medium dense silty sand trace gravel. Then, 3'± of brown, wet, medium dense, silty sand with some gravel. Below this is 8"± of tan to brown, wet, very dense, silty sand and gravel until termination at 8' 8"'± depth due to potential bedrock or ledge. Evidence of the static groundwater table was observed at 5'± depth. Evidence of the undisturbed native soil was observed at 5'± depth.

Table 1: Summary of Borings

Depth	**B – 1 E**	**B-2 SW**	**B-3 W**	**B-4 Center**	**B-5 E**
Existing Grade	EG	2'± BEG	2'± BEG	1'± BEG	EG
0' - 5'	Black to tan, damp, medium dense topsoil silty sand trace gravel	1'± Brown, damp, very loose topsoil trace gravel 4'± Brown, damp, loose to medium dense silty sand trace gravel	1'± Brown, damp, very loose topsoil trace gravel 4'± Brown, damp, medium dense silty sand trace gravel	1'± Brown, damp, medium dense topsoil trace gravel 4'± Brown to orange, damp, medium dense silty sand trace gravel	1'± Brown, damp, medium dense topsoil trace gravel 4'± Brown to orange, damp, medium dense silty sand trace gravel
5' - 10'	Tan to brown, wet, dense silty sand trace gravel 1'± Greyish tan, wet, very dense silty sand and gravel	Grey, wet, medium dense silty sand trace gravel	4'± Brown, wet, medium dense, silty sand trace gravel 1'± Brown, wet, very dense silty sand and gravel	4'± Brown, wet, medium dense, silty sand some gravel 6"± Brown, wet, very dense, silty sand and gravel	3'± Brown, wet, medium dense, silty sand some gravel 1'8"± Tan to brown, wet very dense, silty sand and gravel
10' - 15'	-	Tan, wet, medium dense to very dense, silty sand some gravel	-	-	-
Termination	10'±	15'2"±	9'10"±	9'6"±	8'8"±
Static Groundwater Table Depth	5'±	5'± 7'± BEG	5'± 7'± BEG	5'± 6'± BEG	5'±

Native Soil Depth	5'±	5'± or 7'± BEG	2'± or 4'± BEG	2'± or 3'± BEG	5'±

It appears the native soil, medium dense silty sand, is at an approximately 3-7'± below existing grade depth. An Aardvark engineer should be onsite during excavation to confirm that the native soil has been reached and if the onsite soil is suitable for reuse.

Evidence of the static water table was encountered at 5-7'± below existing grade depth. Other excavation in the area can impact the water table. It should be noted that the groundwater table fluctuates throughout the year, due to precipitation, season, and other factors. As such, it is possible that, taken under different conditions, levels may vary from those presented in this report.

It is our recommendation that the contractor shall excavate until undisturbed native soil (medium dense silty sand) is reached, prior to backfilling with approved material, which is detailed further in this report.

Laboratory gradation analyses were completed, per ASTM D-422 methods, on two (2) soil samples recovered from the site at different depths. B-2, S-4 at 7'-9' which was visually classified a medium dense silty sand trace gravel and B-5, S-2 at 5'-7' which was visually classified a medium dense silty sand with some gravel. The gradation results (copies attached) classified the soils as SM: Silty sand. These grain size distributions would fall within Class #9 of State Building Code (SBC) Table 1806.2a material classification and were applied in determining the maximum allowable soil bearing capacity presented later in this report.

The Chapter 20 of ASCE 7 applies site classes "A/B/C/D/E/F" based on either shear wave velocity (V_S) or boring standard penetration numbers (SPN's or "blow counts") for soil below the proposed footing elevation. Our evaluation, based on the consistent blows/foot correlated to site class "D". However, the subsurface soils were not considered to be susceptible to liquefaction (rapid settlement via vibration), according to SBC 1806.4, due to their measured high relative density and not being classified as "clean sands".

Judging from the blow counts and soil type(s), it is our professional opinion that, in accordance with SBC section 1806.2, the maximum allowable net soil bearing capacity of the medium dense sand (Class #9), at native soil depth, could be up to 2.0 TSF (4000 psf). However, we recommend that the actual design soil bearing capacity not exceed a conservative value of 1.0 TSF (2000 psf).

Further, it should be noted that the soil bearing capacity is based on a minimum footing width of 3' and must be reduced proportionately for narrower footings. As the soils were found to be at least medium dense, it is our professional opinion that long-term settlement should not exceed 3/8" with insignificant differential settlement.

We recommended that the static lateral earth pressure (at rest = K_o) for any restrained walls, which will effectively serve as retaining walls with greater than 4' exposed, should be calculated using

an equivalent fluid pressure of 60 pcf (pounds per cubic foot). This value is based on the backfill consisting of granular (less than 10% passing #200 sieve) soils, being compacted to greater than 95%. It is calculated as K_o = 1-sin Ø where Ø is the soil shear angle (assumed to be 30º± for "granular" sand/gravel with a unit weight of 120± pcf). Thus the at rest (no wall movement) soil "fluid" pressure is K_o x soil unit weight = 0.5± x 120± pcf = 60 pcf.

The static lateral earth pressure (outward wall movement allowed "active" pressure = K_a) for "unrestrained" retaining walls, is calculated as $K_a = \tan^2 (45º - \text{Ø}/2)$ where Ø is the soil shear angle (assumed 30º± for granular soil). Thus the "active" soil pressure is K_a x soil unit weight (0.33± x 120± pcf) yields an active equivalent fluid pressure of 40 pcf. Additional pressure(s) exerted from surcharge loads (acting within 1.5 times the wall height) should be considered as a uniform pressure equal to 0.5*q*, where *q* (psf) is the surcharge load. Further, granular backfill, should have less than 10% silt (%<#200 sieve) and be compacted to greater than 95%. Also, for cast-in-place concrete footings bearing, on native soil or compacted structural fill, we recommend a design "sliding friction" coefficient of 0.40.

Unsuitable materials, including surficial topsoil, subsoil, boulders, and organics should be stripped down to the underlying native material prior to commencing construction. The unsuitable materials should be removed to a distance of at least 5' beyond the structures. Also, the contractor should proof roll the exposed subgrade, under the supervision of an experienced Aardvark geotechnical engineer, and any observed weak/soft spots should be excavated and replaced with compacted **Gravel Base or up to 1' of no more than 1½" crushed stone.**

The soil may require some protection during construction to maintain their suitable density and stability. It is recommended that the contractor will over-excavate locations and prepare 1' of 1½" traprock. The purpose of the stone layer is to maintain subgrade stability and provide temporary drainage during construction. This stone layer should be placed after removing any soft/wet soils then tamped/seated by ramming with the excavator bucket. We recommend that an Aardvark engineer be onsite for geotechnical guidance during the determination and confirmation of subgrade suitability.

The following soil gradation specifications are suggested for Granular Fill and Gravel Base, and **Dense Graded crushed stone materials** are recommended:

Sieve Size	Granular Fill	Gravel Base	**Dense Grade**
6"	100	100	100
3"	95-100	100	100
½"	60-95	50-85	50-80
#4	50-80	40-75	30-55

#10	30-70	30-60	N/A
#40	10-70	10-35	10-25
#100	0-25	0-15	N/A
#200	0-10	0-8	3-10

All backfill soils shall be free from snow, ice, roots, topsoil, and/or other deleterious materials.

All backfill within the additional footing "zone of influence" (1:1 slope from the outside face of the footing) should consist of Gravel Base. Backfill outside/beyond the structural zone of influence could consist of Granular Fill or possibly onsite "cut" soils (weather permitting) if approved in writing first by our firm. The recommended compaction based on the percentage of the soil's maximum dry density, according to ASTM D-1557 methods, is specified below:

General Backfill Areas	Minimum Compaction
Beneath Footings and for Pavement Gravel Base	95%
Below Pavement Base Course Material	92%
Beneath Landscaped Areas	90%

It is recommended that all backfill be compacted to a minimum of 95% of the soil's maximum dry density. Also, any controlled fill should be approved by Aardvark in writing or meet the MSH&B gravel borrow (sec. M1.03.0) specifications and be prepared in compacted lifts not exceeding 1'. Further, any controlled fill operations should be reviewed (and tested) by *Aardvark* to confirm the required 95% compaction.

The existing silty sand appears suitable to remain as subgrade material beneath pavements. We typically recommend a minimum 1' layer of Gravel Base, topped by 4" of Dense Graded, directly beneath the pavement, for "light duty" traffic conditions. Our typically recommended pavement material cross sections are summarized in the Table below:

Pavement Courses	Heavy Duty Traffic	Light Duty Traffic
Bituminous Top Mix MHD M3.11.03 Table A	1 ½"	1"
Bituminous Binder Mix M3.11.03 Table A	2 ½ "	2"
Dense Graded Crushed Stone MHD M2.01.7	6"	4"
Gravel Borrow Subbase MHD M1.03.0	16"	12"

We do recommend that any soil bearing surface be proof-rolled in order to verify the soil stability and achieve the State Code required minimum 95% degree of compaction. Further, should the construction excavation/progress reveal subsurface soil conditions that vary from those presented herein, our firm should be immediately contacted for additional geotechnical engineering review.

We suggest that field compaction tests be completed, on any prepared footing areas, to ensure that the above geotechnical guidelines have been achieved. In addition, *Aardvark* would be pleased to provide the field concrete testing services (typically required by the foundation design engineer).

We recommend that Aardvark Geotechnical Engineering & Testing, Inc. be retained to monitor aspects of the footing construction operations which are listed below:

- Monitor the initial site work and confirm that the type(s) of subgrade soil is adequate.
- Review the proposed bearing surfaces to confirm that they have been properly prepared, and that they are satisfactory for the recommended bearing pressures.
- Observe the placement and compaction of structural fill within the building areas.
- Observe the placement and compaction of fill within the proposed pavement areas.
- Check the suitability, via project specifications, of soils for use as backfill.
- Concrete testing required by the State Building Code

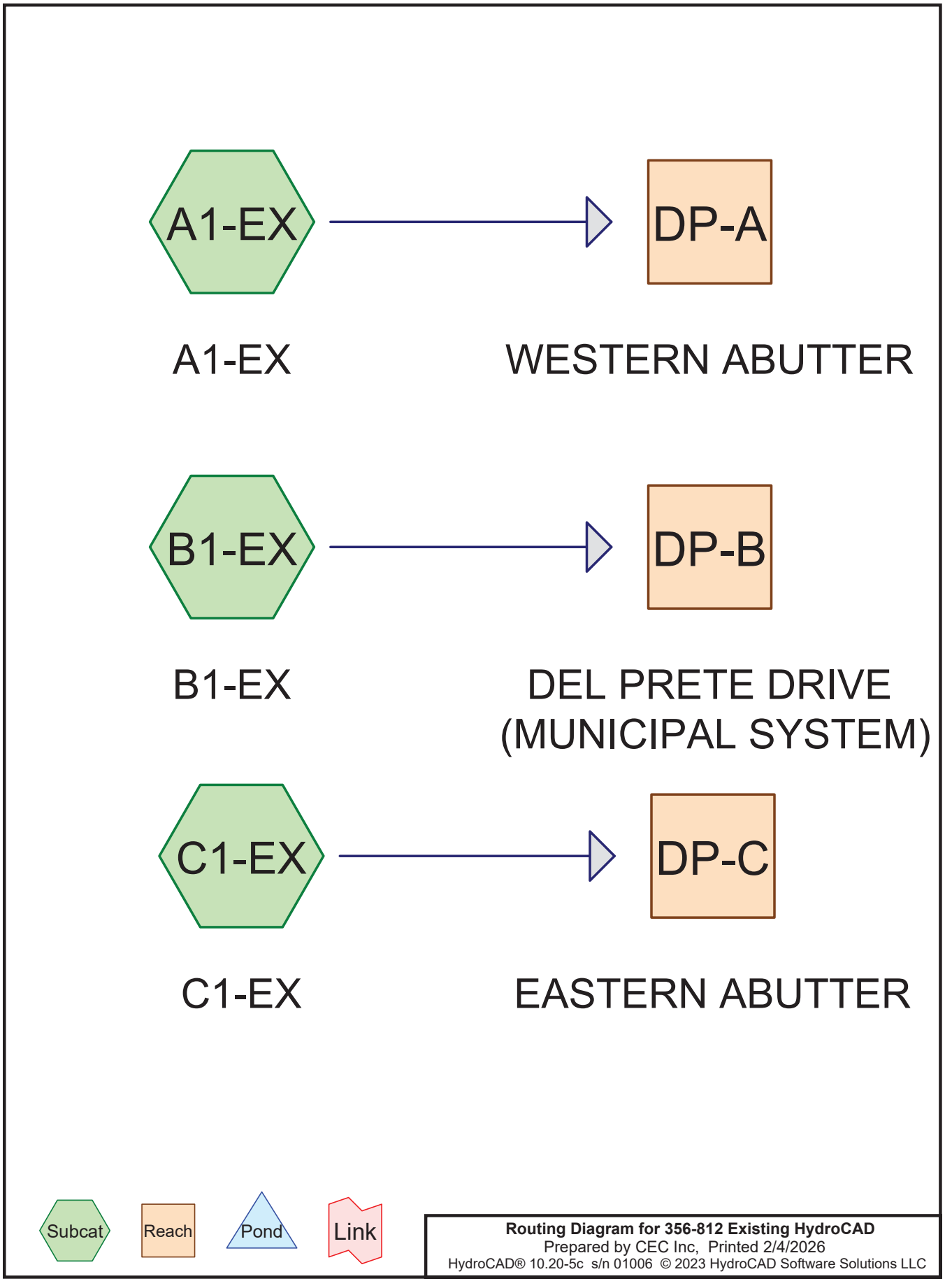
In summary, the observed native soils appear to be at least medium dense silty sand at an approximate 3-7'± below existing grade depth or 2-5'± below boring depth. Provided the contractor adheres to the geotechnical engineering recommendations contained in this report, these soils can be prepared properly for structural support. **As noted prior, this report only holds true and valid if all aspects contained herein are kept in practice.** Should you have any questions, or wish to discuss the reported conditions, engineering recommendations, and geotechnical considerations contained herein and attached, please do not hesitate to contact our Medford office at 978-650-2990.

Very truly yours,

Mark St Fleur, PE
Director of Engineering Services

APPENDIX C

SUPPORTING CALCULATIONS


A1-EX
DP-A
A1-EX
WESTERN ABUTTER
B1-EX
DP-B
B1-EX
DEL PRETE DRIVE
(MUNICIPAL SYSTEM)
C1-EX
DP-C
C1-EX
EASTERN ABUTTER
Subcat
Reach
Pond
Link
Routing Diagram for 356-812 Existing HydroCAD
Prepared by CEC Inc, Printed 2/4/2026
HydroCAD® 10.20-5c s/n 01006 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA10 24-hr	D	Default	24.00	1	3.43	2
2	10-Year	NOAA10 24-hr	D	Default	24.00	1	5.06	2
3	25-Year	NOAA10 24-hr	D	Default	24.00	1	6.08	2
4	100-Year	NOAA10 24-hr	D	Default	24.00	1	7.65	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
7,035	61	>75% Grass cover, Good, HSG B (A1-EX, B1-EX, C1-EX)
1,486	98	Roofs, HSG B (A1-EX, B1-EX)
1,963	98	Unconnected pavement, HSG B (A1-EX, B1-EX)
10,484	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
10,484	HSG B	A1-EX, B1-EX, C1-EX
0	HSG C	
0	HSG D	
0	Other	
10,484		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	7,035	0	0	0	7,035	>75% Grass cover, Good	
0	1,486	0	0	0	1,486	Roofs	
0	1,963	0	0	0	1,963	Unconnected pavement	
0	**10,484**	**0**	**0**	**0**	**10,484**	**TOTAL AREA**	

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS2-Rain.txt" for 446 MA Hingham Plymouth Co

Summary for Subcatchment A1-EX: A1-EX

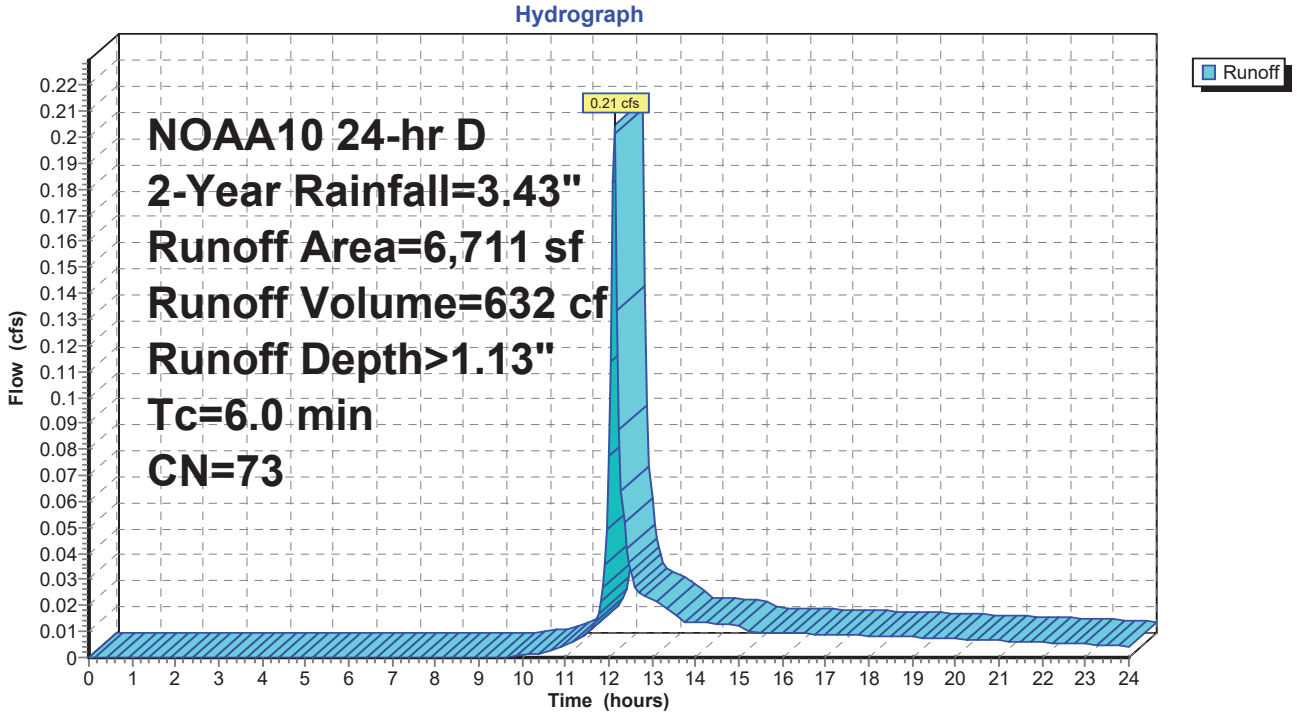
Runoff = 0.21 cfs @ 12.14 hrs, Volume= 632 cf, Depth> 1.13"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
4,463	61	>75% Grass cover, Good, HSG B
1,505	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
6,711	73	Weighted Average
4,463		66.50% Pervious Area
2,248		33.50% Impervious Area
1,505		66.95% Unconnected

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

Subcatchment A1-EX: A1-EX



Summary for Subcatchment B1-EX: B1-EX

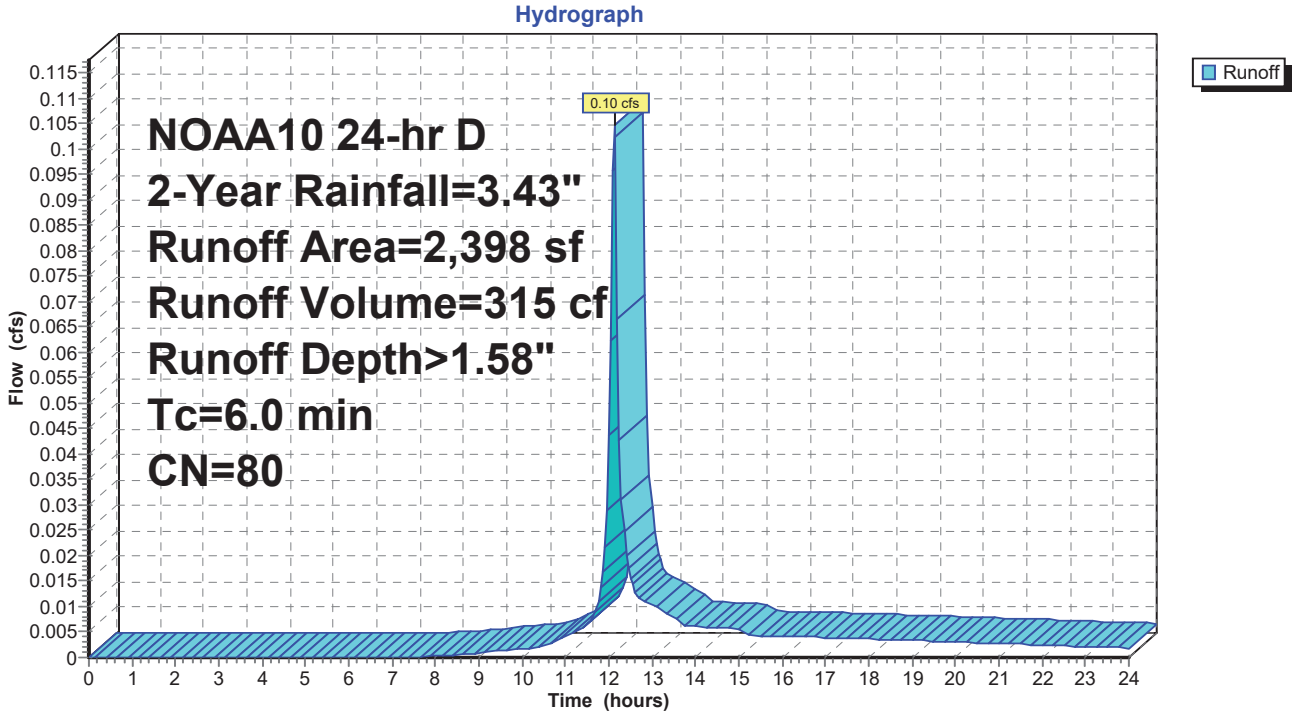
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 315 cf, Depth> 1.58"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,197	61	>75% Grass cover, Good, HSG B
458	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
2,398	80	Weighted Average
1,197		49.92% Pervious Area
1,201		50.08% Impervious Area
458		38.13% Unconnected

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

Subcatchment B1-EX: B1-EX



Summary for Subcatchment C1-EX: C1-EX

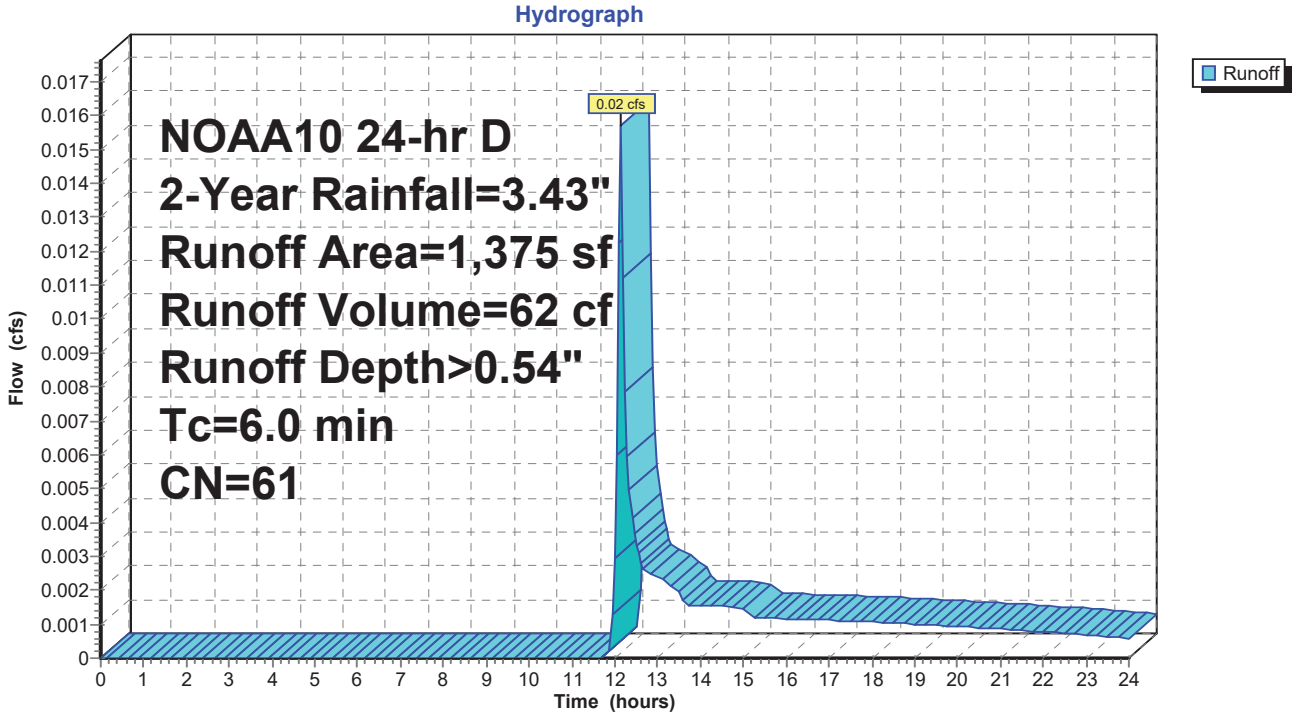
Runoff = 0.02 cfs @ 12.15 hrs, Volume= 62 cf, Depth> 0.54"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,375	61	>75% Grass cover, Good, HSG B
1,375		100.00% Pervious Area

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

Subcatchment C1-EX: C1-EX

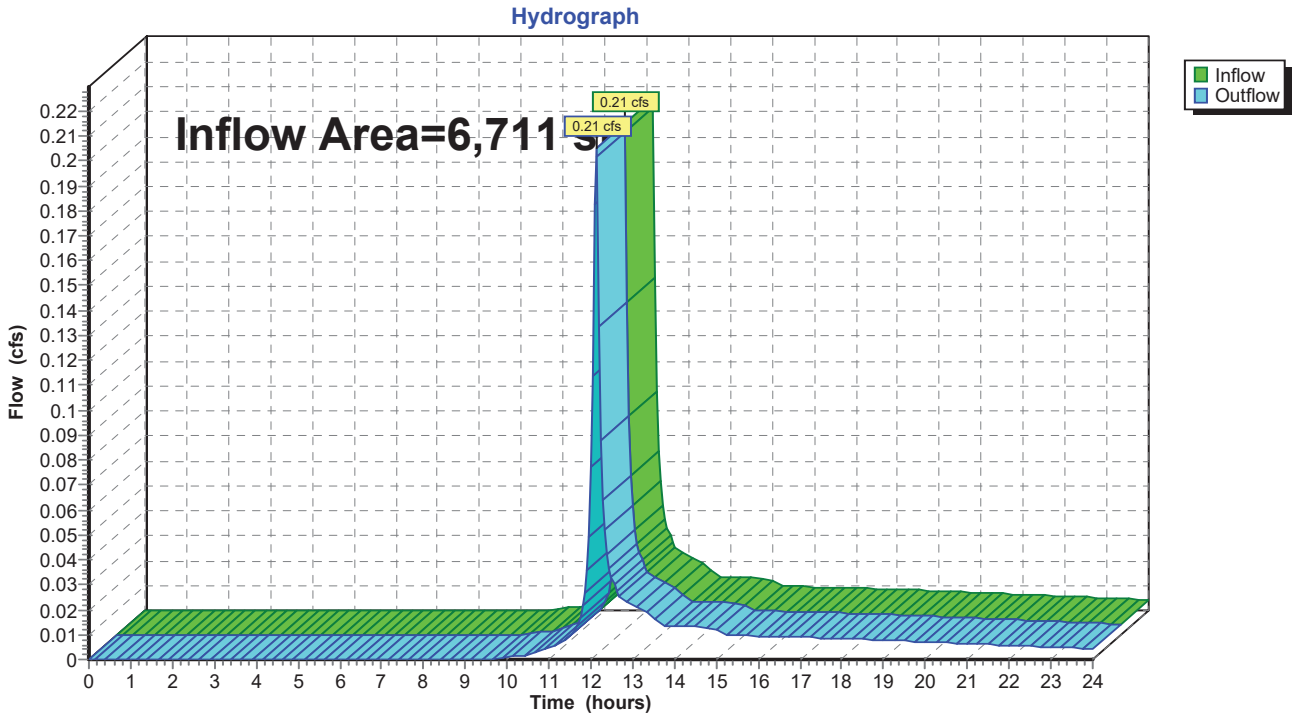


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 6,711 sf, 33.50% Impervious, Inflow Depth > 1.13" for 2-Year event
Inflow = 0.21 cfs @ 12.14 hrs, Volume= 632 cf
Outflow = 0.21 cfs @ 12.14 hrs, Volume= 632 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

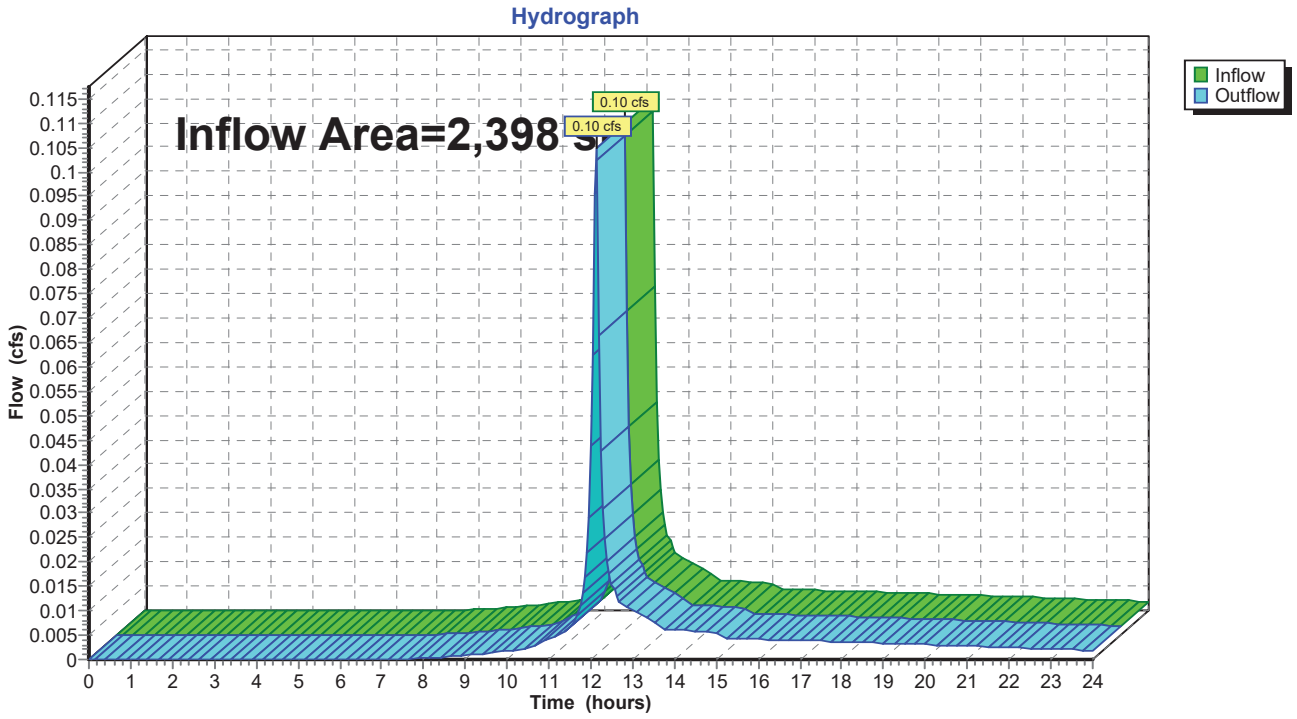


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 2,398 sf, 50.08% Impervious, Inflow Depth > 1.58" for 2-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 315 cf
Outflow = 0.10 cfs @ 12.13 hrs, Volume= 315 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

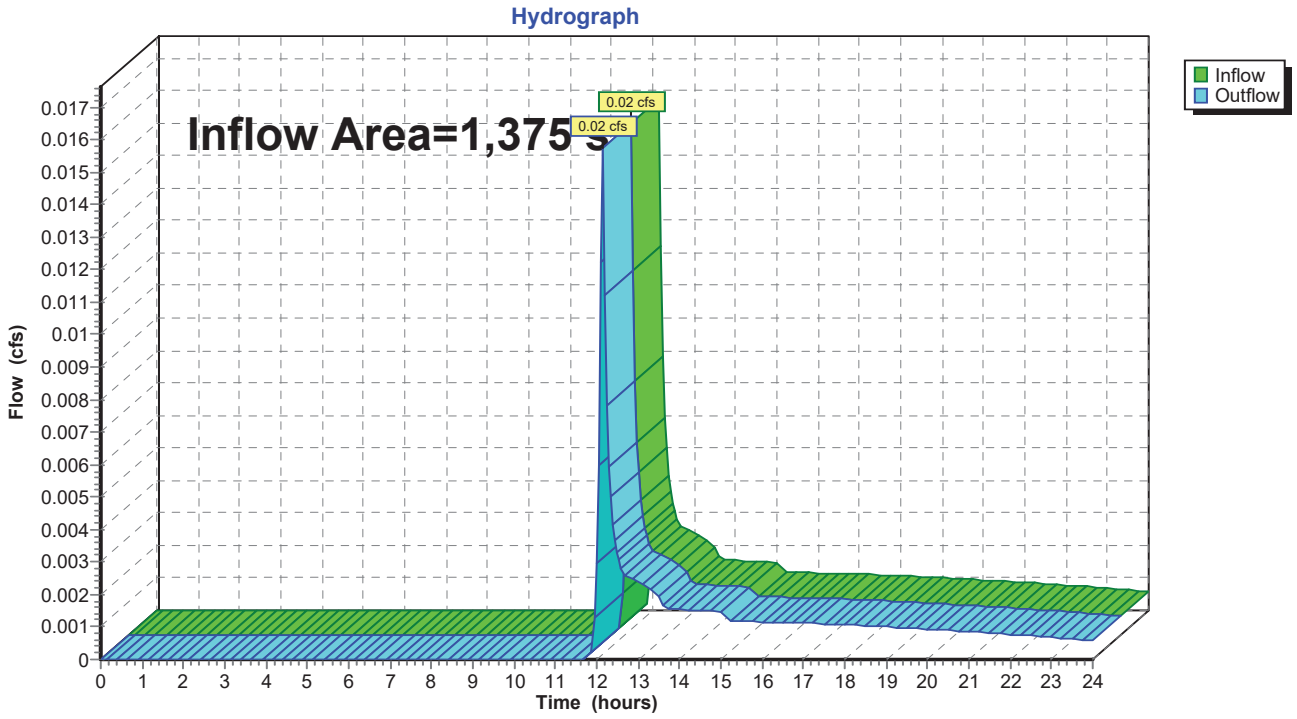


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,375 sf, 0.00% Impervious, Inflow Depth > 0.54" for 2-Year event
Inflow = 0.02 cfs @ 12.15 hrs, Volume= 62 cf
Outflow = 0.02 cfs @ 12.15 hrs, Volume= 62 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Subcatchment A1-EX: A1-EX

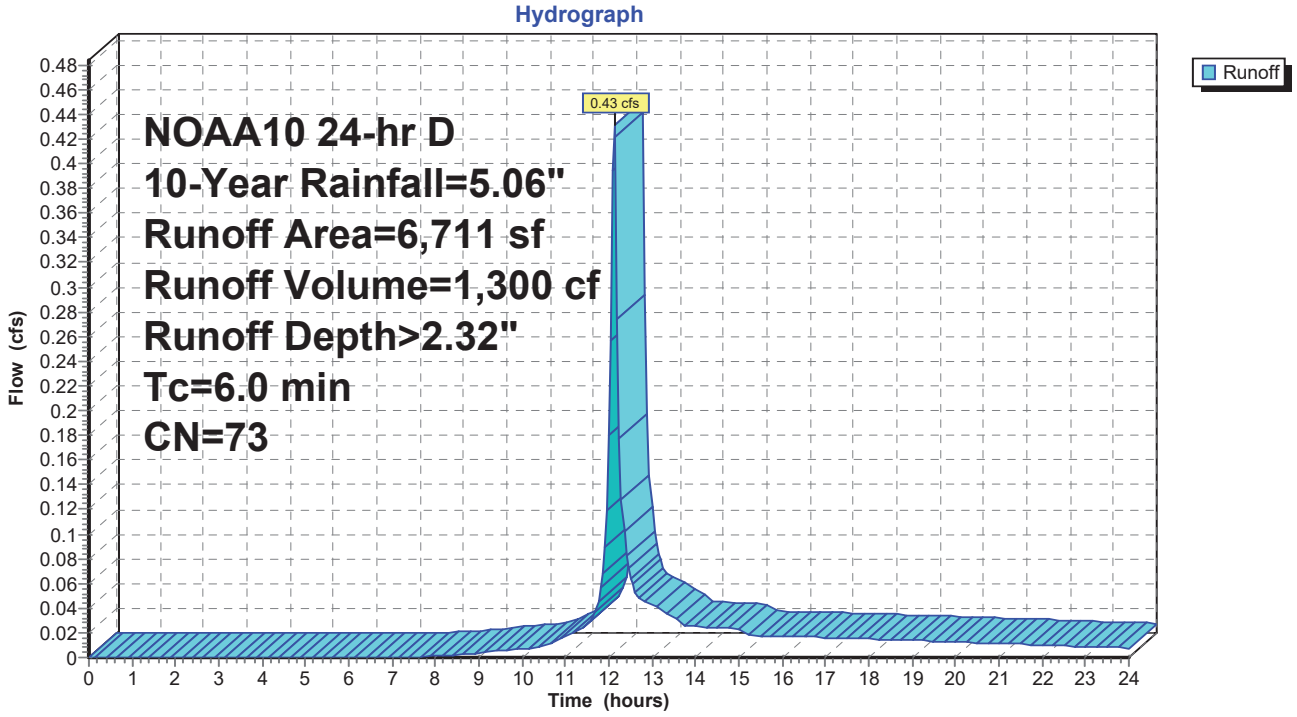
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,300 cf, Depth> 2.32"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
4,463	61	>75% Grass cover, Good, HSG B
1,505	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
6,711	73	Weighted Average
4,463		66.50% Pervious Area
2,248		33.50% Impervious Area
1,505		66.95% Unconnected

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

Subcatchment A1-EX: A1-EX



Summary for Subcatchment B1-EX: B1-EX

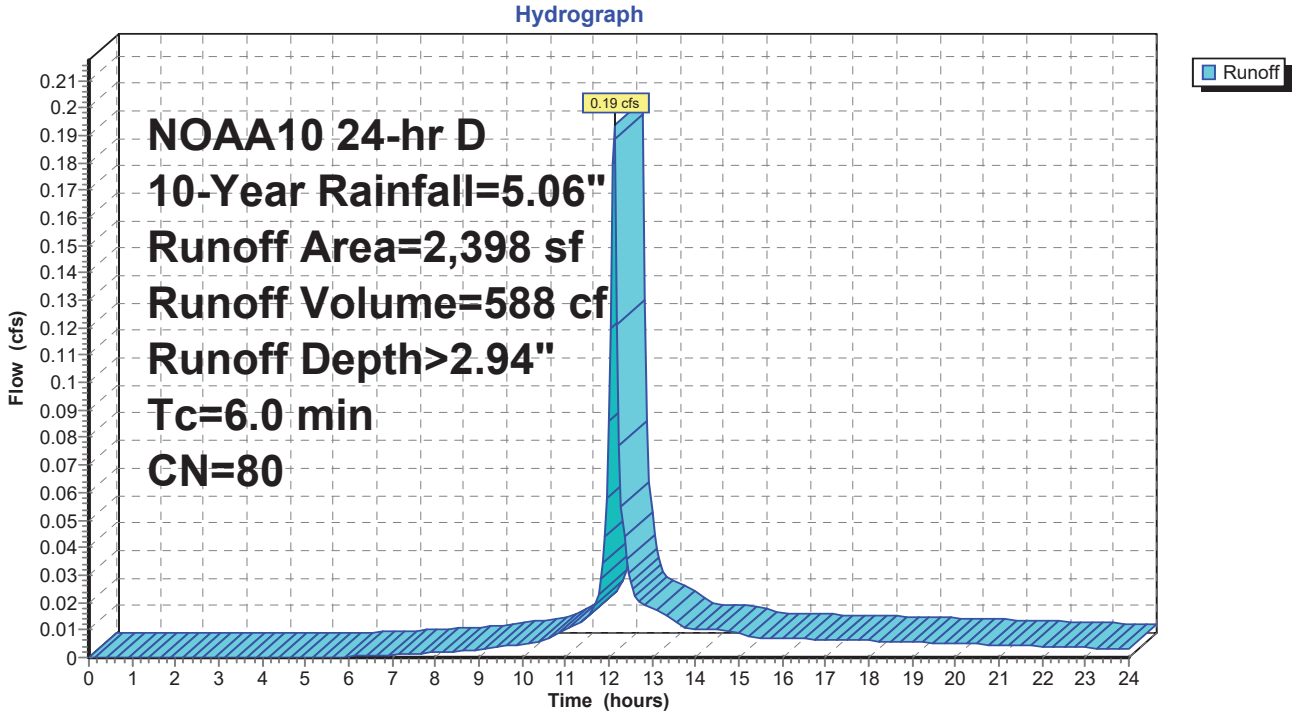
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 588 cf, Depth> 2.94"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
1,197	61	>75% Grass cover, Good, HSG B
458	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
2,398	80	Weighted Average
1,197		49.92% Pervious Area
1,201		50.08% Impervious Area
458		38.13% Unconnected

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

Subcatchment B1-EX: B1-EX



Summary for Subcatchment C1-EX: C1-EX

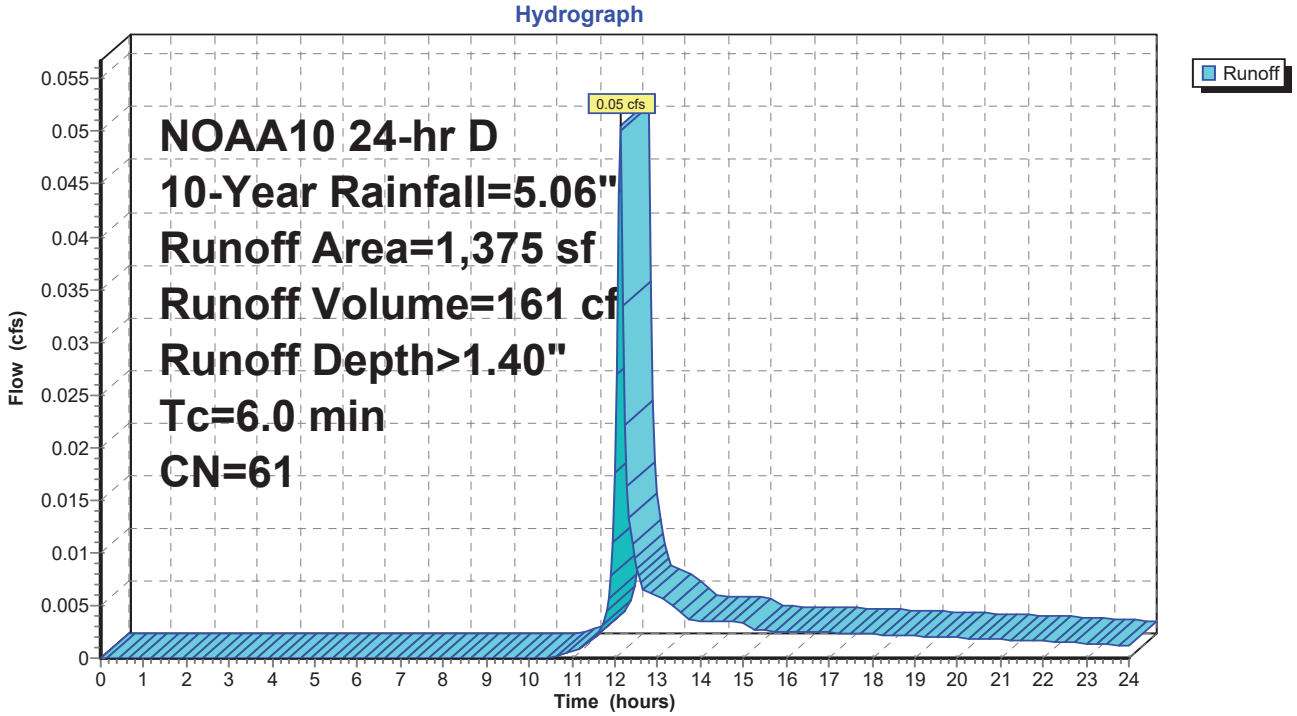
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 161 cf, Depth> 1.40"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
1,375	61	>75% Grass cover, Good, HSG B
1,375		100.00% Pervious Area

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

Subcatchment C1-EX: C1-EX

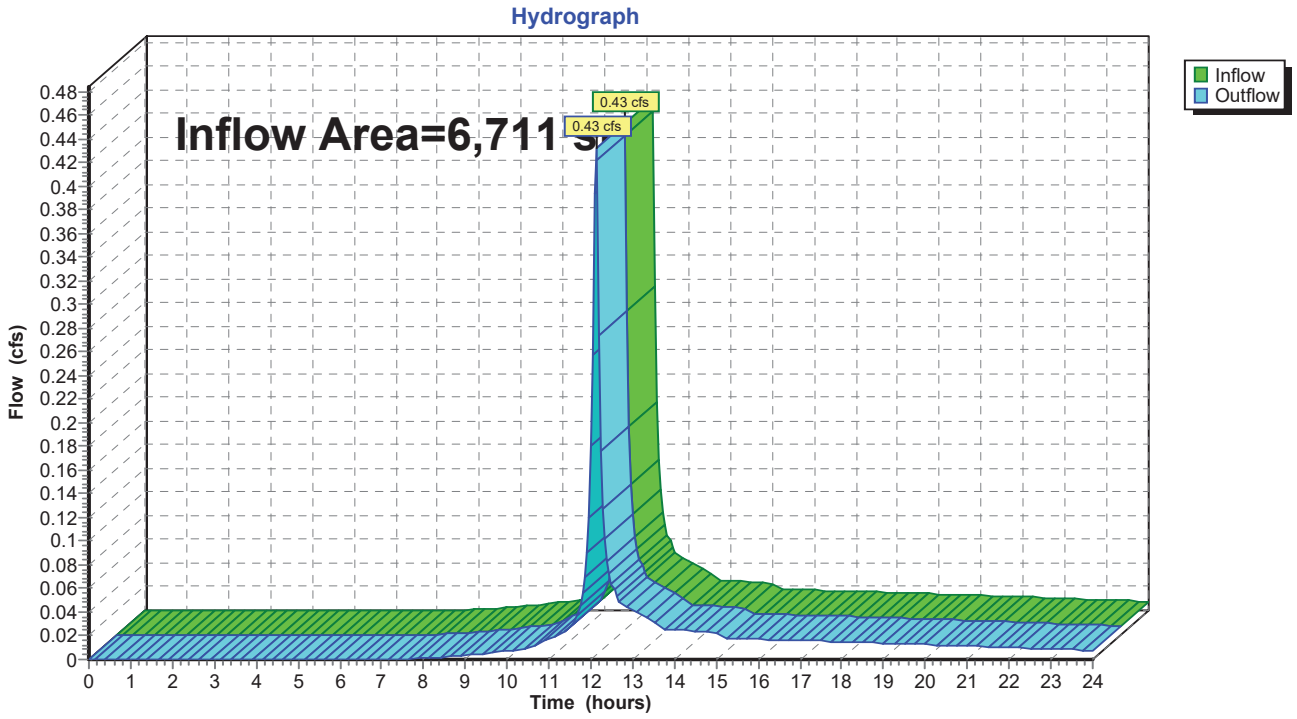


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 6,711 sf, 33.50% Impervious, Inflow Depth > 2.32" for 10-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 1,300 cf
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 1,300 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

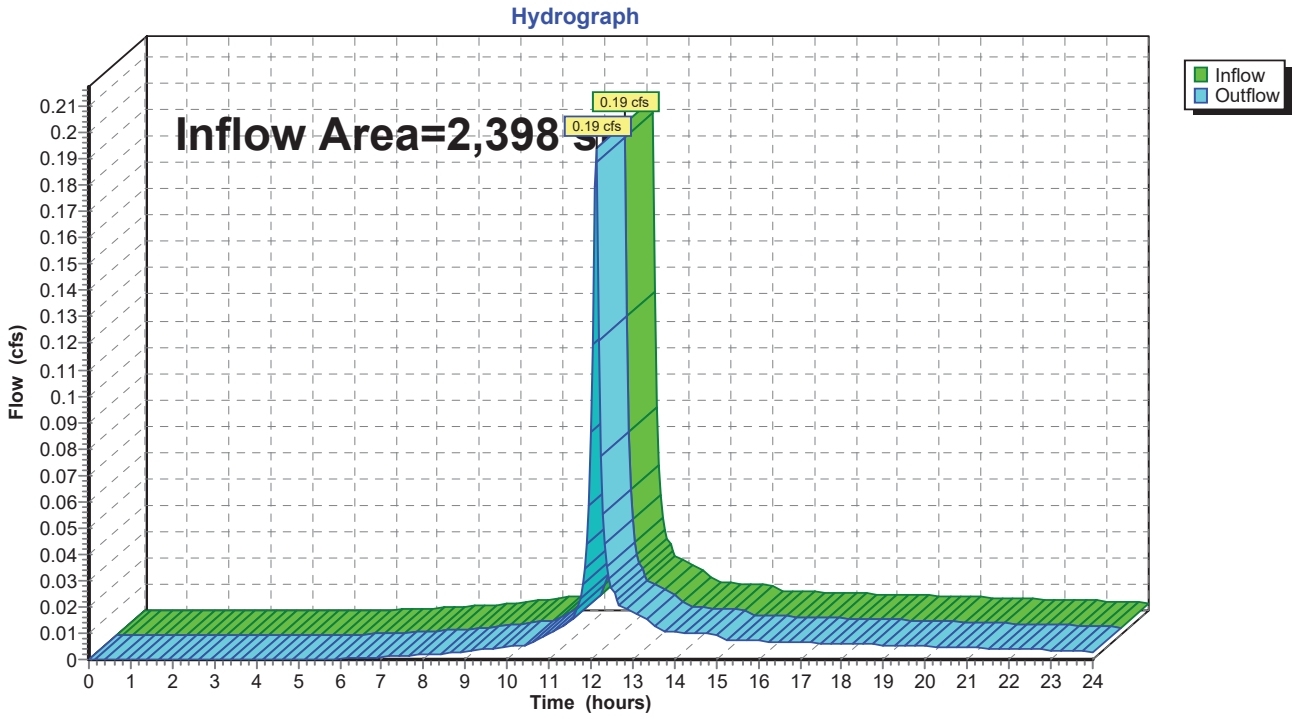


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 2,398 sf, 50.08% Impervious, Inflow Depth > 2.94" for 10-Year event
Inflow = 0.19 cfs @ 12.13 hrs, Volume= 588 cf
Outflow = 0.19 cfs @ 12.13 hrs, Volume= 588 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

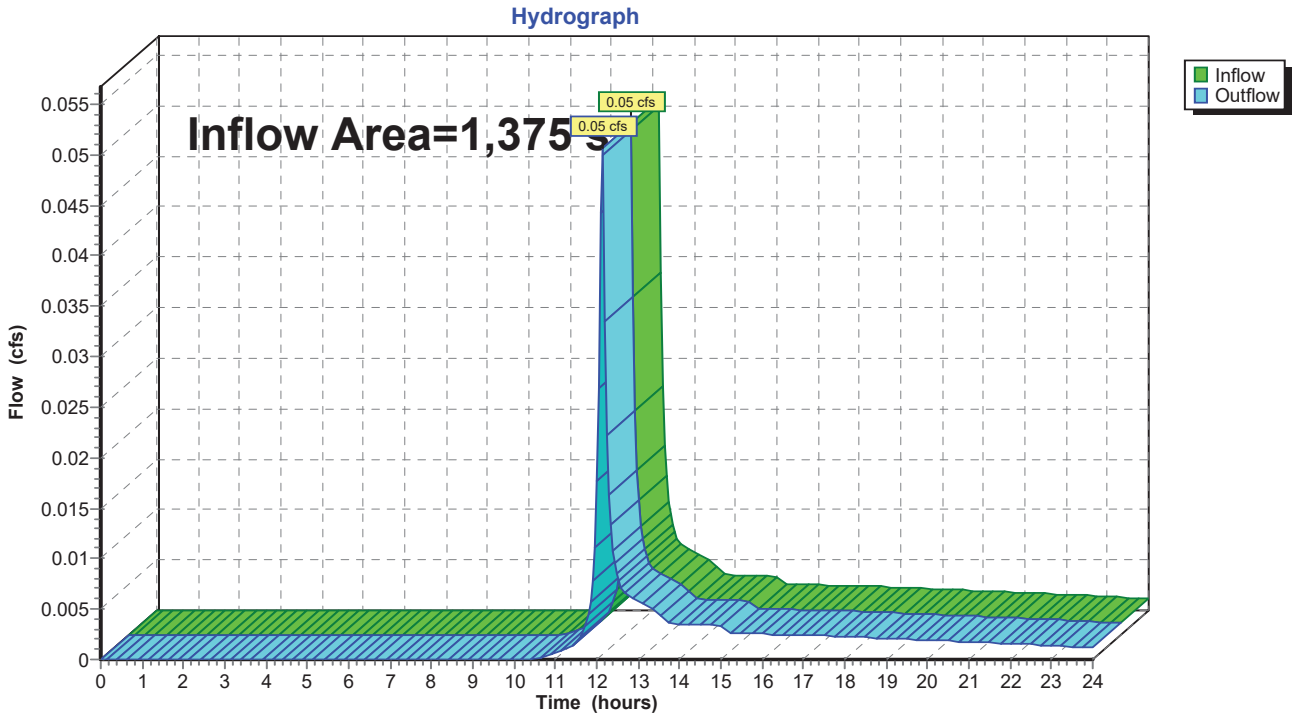


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,375 sf, 0.00% Impervious, Inflow Depth > 1.40" for 10-Year event
Inflow = 0.05 cfs @ 12.14 hrs, Volume= 161 cf
Outflow = 0.05 cfs @ 12.14 hrs, Volume= 161 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Subcatchment A1-EX: A1-EX

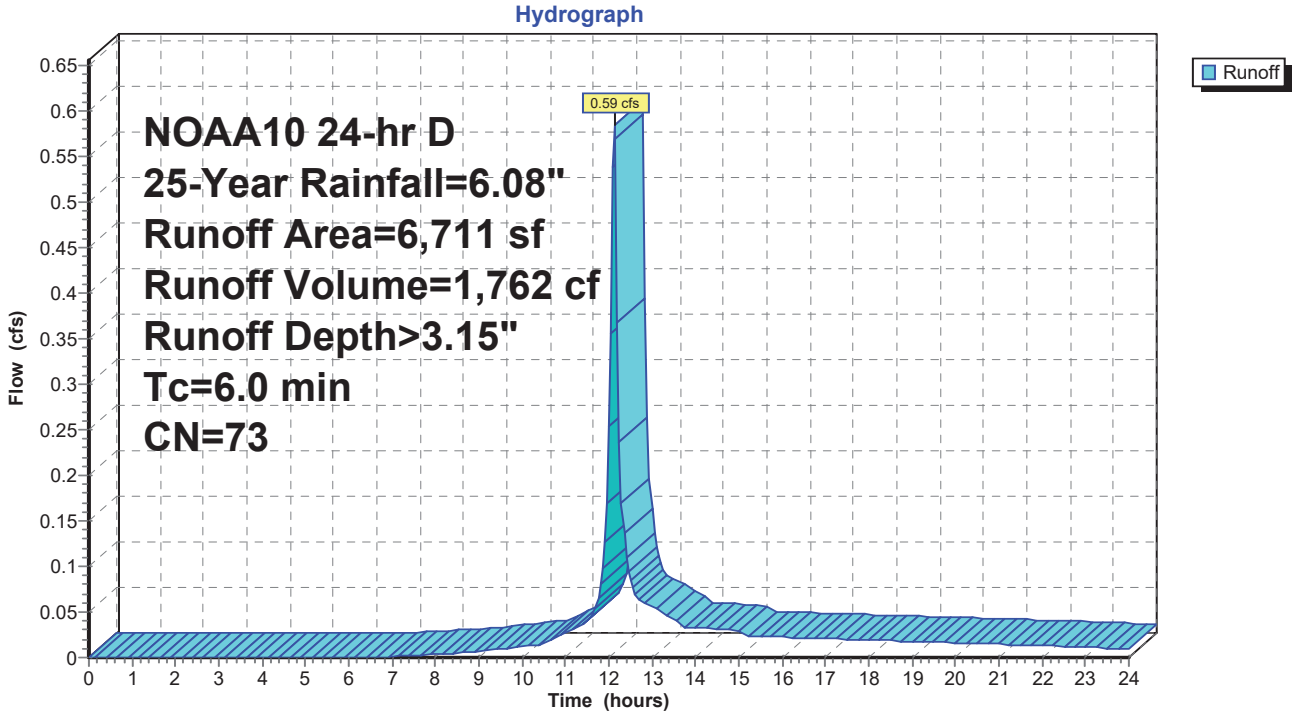
Runoff = 0.59 cfs @ 12.13 hrs, Volume= 1,762 cf, Depth> 3.15"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
4,463	61	>75% Grass cover, Good, HSG B
1,505	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
6,711	73	Weighted Average
4,463		66.50% Pervious Area
2,248		33.50% Impervious Area
1,505		66.95% Unconnected

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

Subcatchment A1-EX: A1-EX



Summary for Subcatchment B1-EX: B1-EX

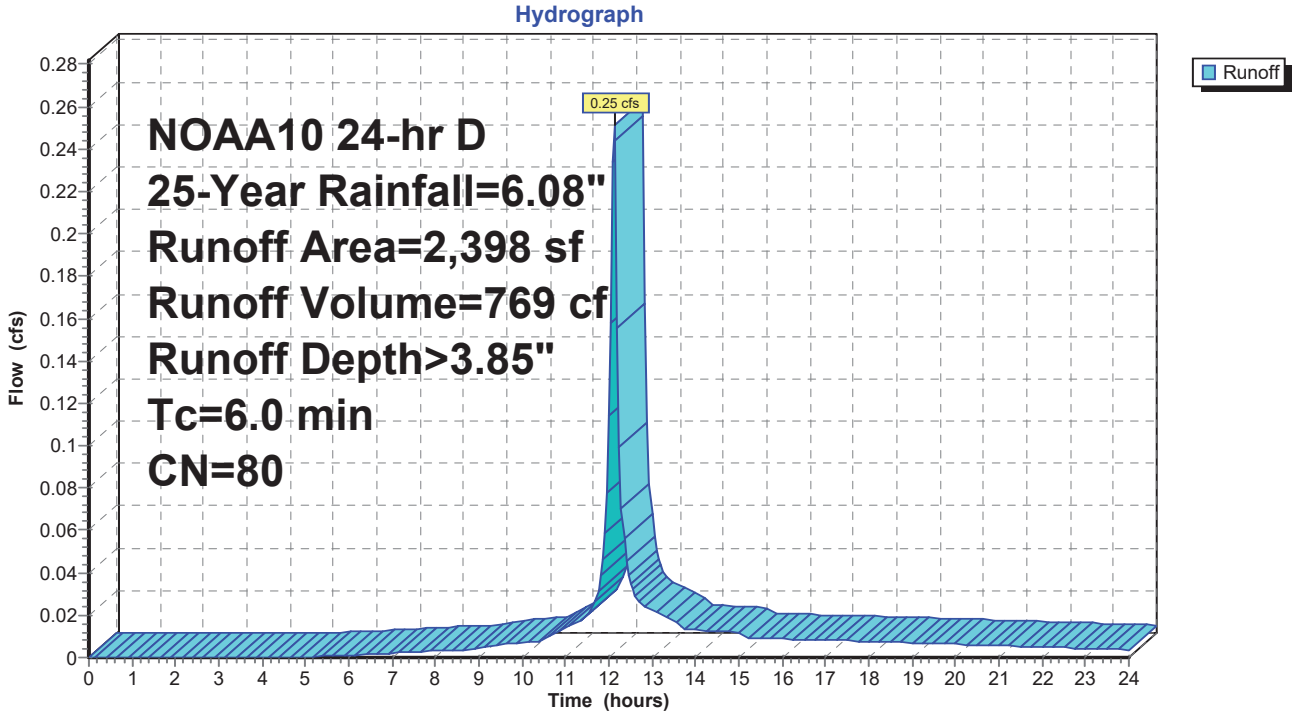
Runoff = 0.25 cfs @ 12.13 hrs, Volume= 769 cf, Depth> 3.85"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
1,197	61	>75% Grass cover, Good, HSG B
458	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
2,398	80	Weighted Average
1,197		49.92% Pervious Area
1,201		50.08% Impervious Area
458		38.13% Unconnected

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

Subcatchment B1-EX: B1-EX



Summary for Subcatchment C1-EX: C1-EX

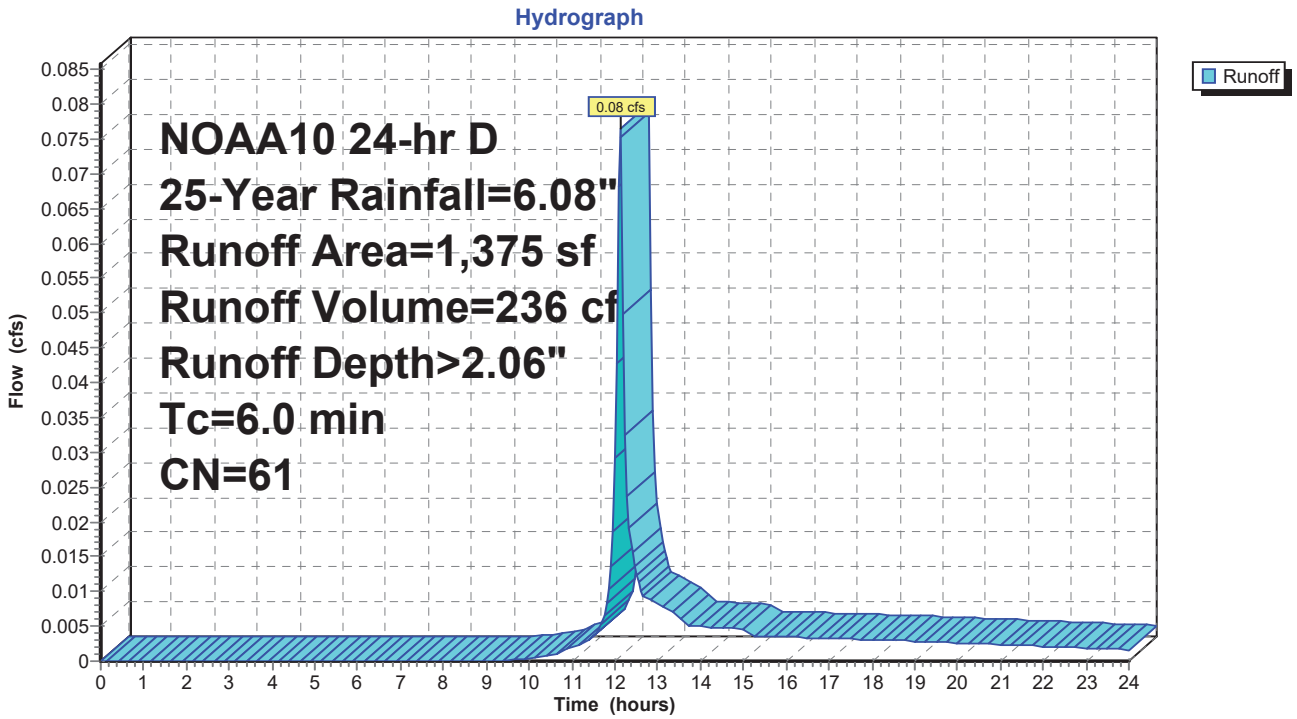
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 236 cf, Depth> 2.06"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
1,375	61	>75% Grass cover, Good, HSG B
1,375		100.00% Pervious Area

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

Subcatchment C1-EX: C1-EX

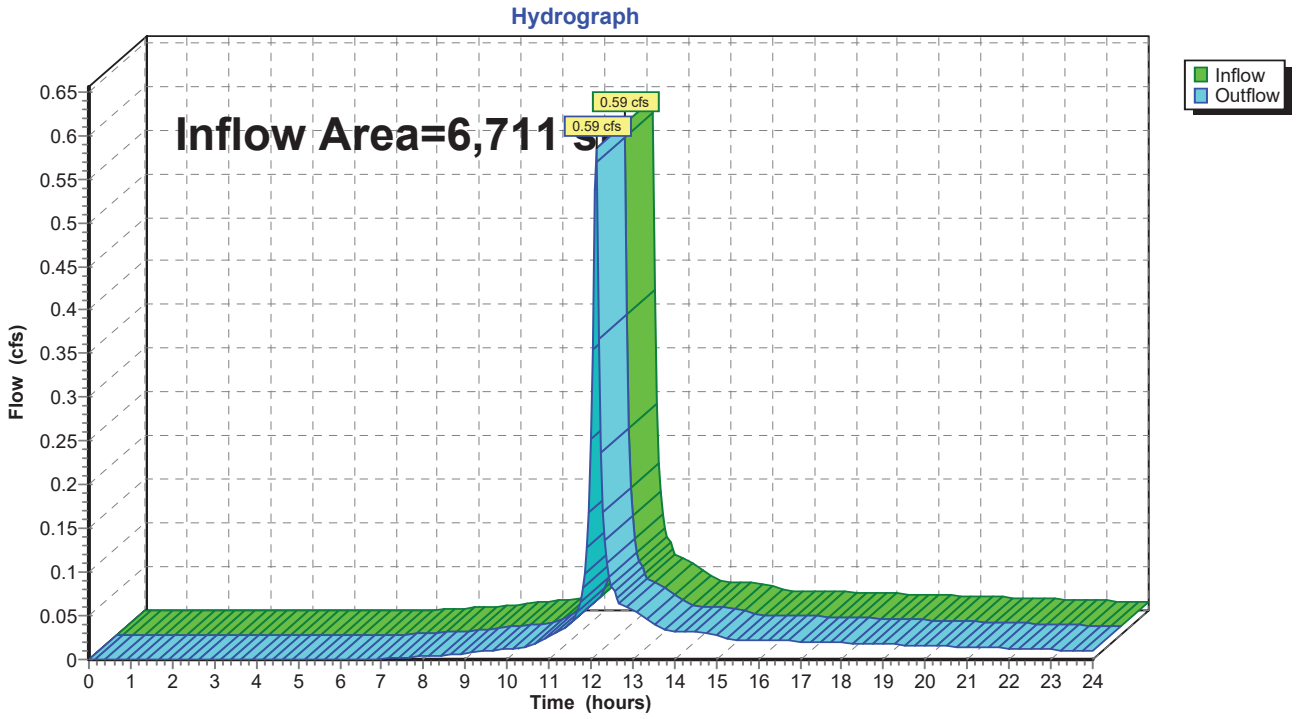


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 6,711 sf, 33.50% Impervious, Inflow Depth > 3.15" for 25-Year event
Inflow = 0.59 cfs @ 12.13 hrs, Volume= 1,762 cf
Outflow = 0.59 cfs @ 12.13 hrs, Volume= 1,762 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

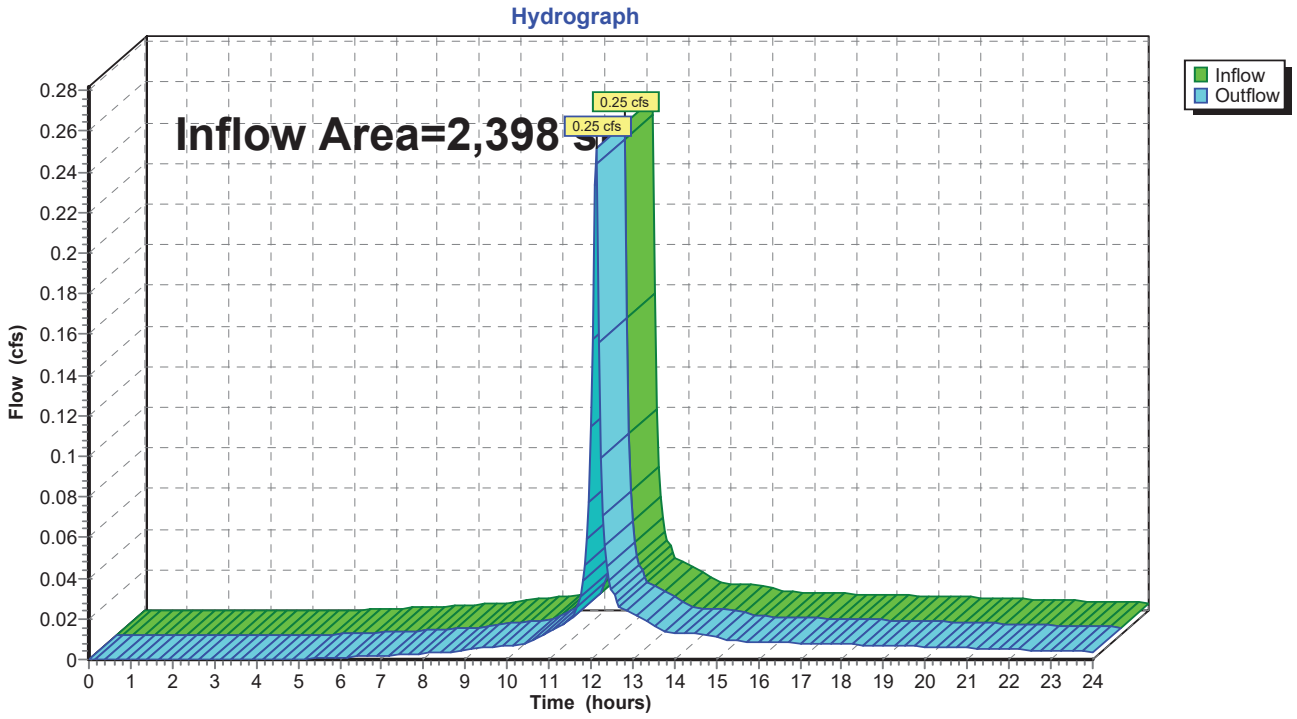


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 2,398 sf, 50.08% Impervious, Inflow Depth > 3.85" for 25-Year event
Inflow = 0.25 cfs @ 12.13 hrs, Volume= 769 cf
Outflow = 0.25 cfs @ 12.13 hrs, Volume= 769 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

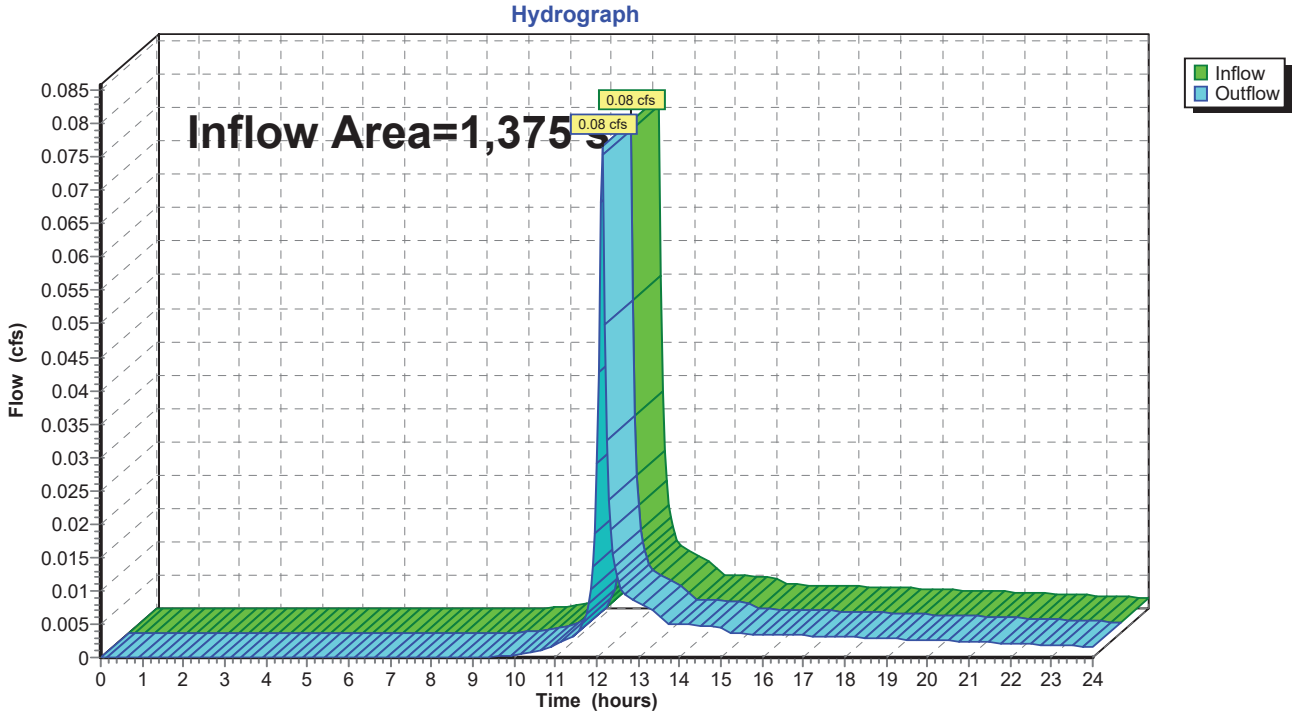


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,375 sf, 0.00% Impervious, Inflow Depth > 2.06" for 25-Year event
Inflow = 0.08 cfs @ 12.14 hrs, Volume= 236 cf
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 236 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Subcatchment A1-EX: A1-EX

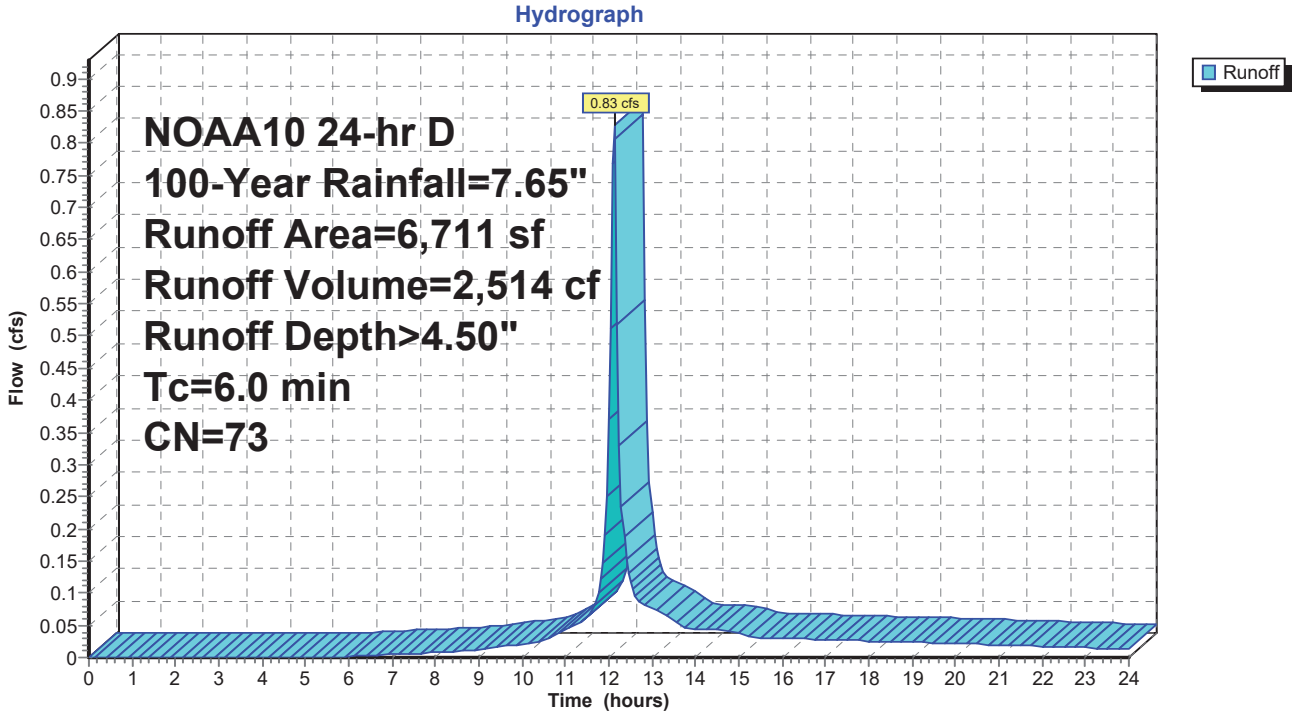
Runoff = 0.83 cfs @ 12.13 hrs, Volume= 2,514 cf, Depth> 4.50"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
4,463	61	>75% Grass cover, Good, HSG B
1,505	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
6,711	73	Weighted Average
4,463		66.50% Pervious Area
2,248		33.50% Impervious Area
1,505		66.95% Unconnected

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

Subcatchment A1-EX: A1-EX



Summary for Subcatchment B1-EX: B1-EX

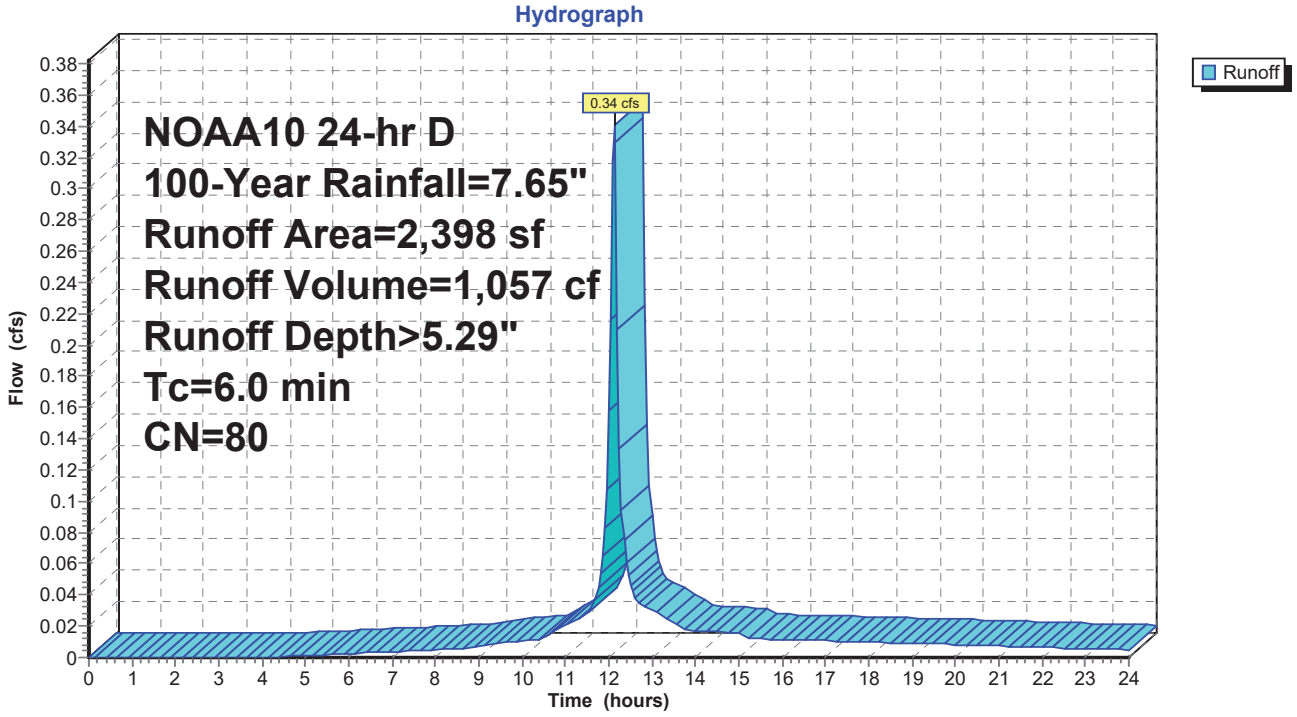
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 1,057 cf, Depth> 5.29"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
1,197	61	>75% Grass cover, Good, HSG B
458	98	Unconnected pavement, HSG B
743	98	Roofs, HSG B
2,398	80	Weighted Average
1,197		49.92% Pervious Area
1,201		50.08% Impervious Area
458		38.13% Unconnected

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

Subcatchment B1-EX: B1-EX



Summary for Subcatchment C1-EX: C1-EX

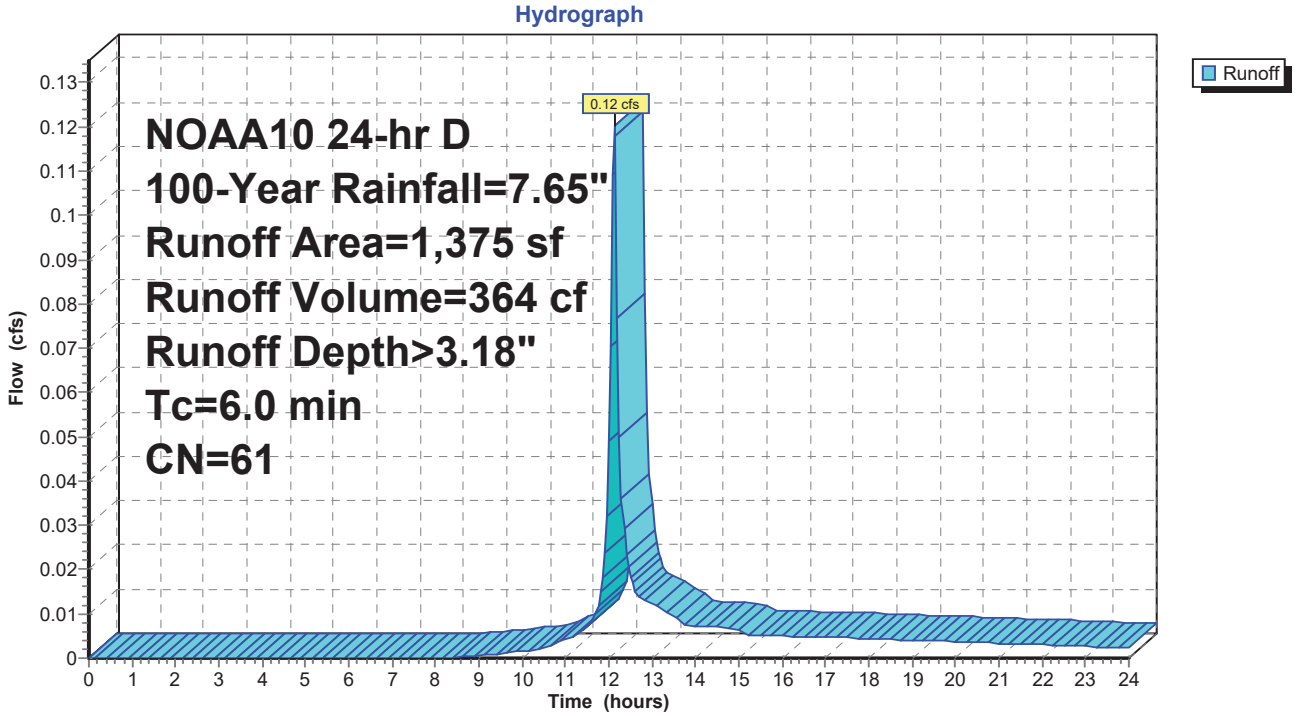
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 364 cf, Depth> 3.18"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
1,375	61	>75% Grass cover, Good, HSG B
1,375		100.00% Pervious Area

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

Subcatchment C1-EX: C1-EX

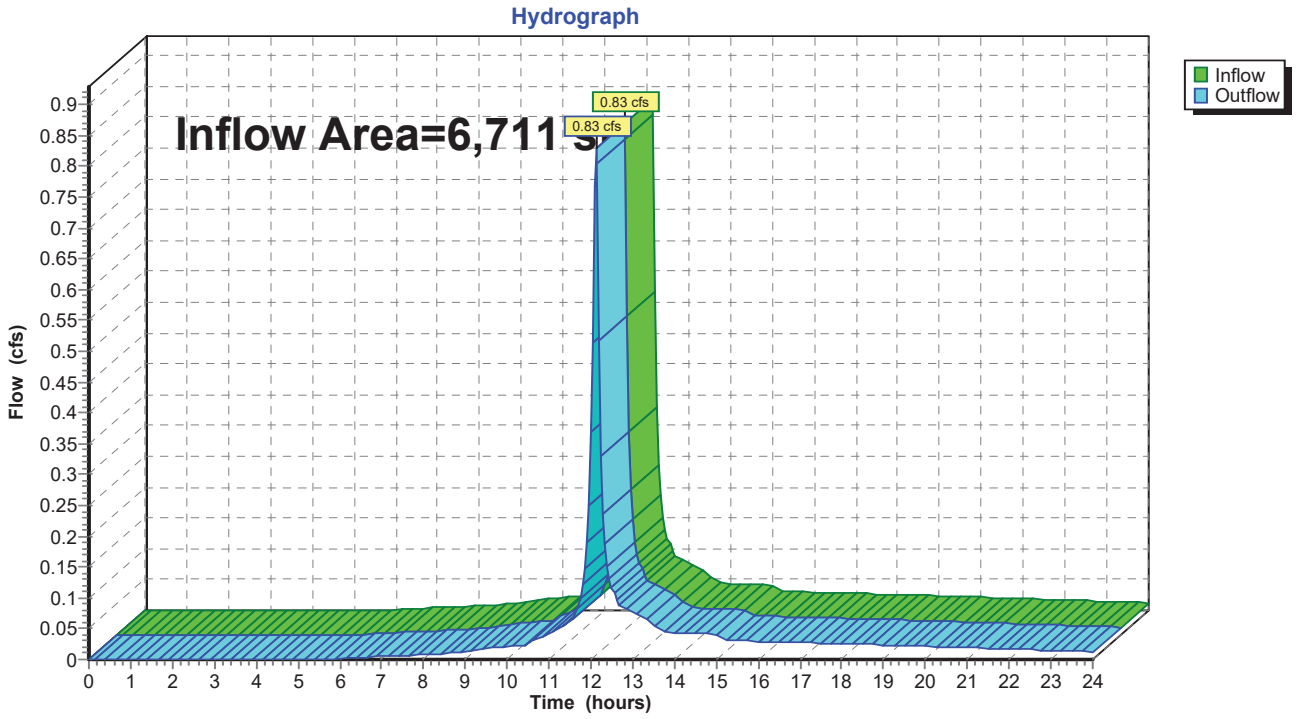


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 6,711 sf, 33.50% Impervious, Inflow Depth > 4.50" for 100-Year event
Inflow = 0.83 cfs @ 12.13 hrs, Volume= 2,514 cf
Outflow = 0.83 cfs @ 12.13 hrs, Volume= 2,514 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

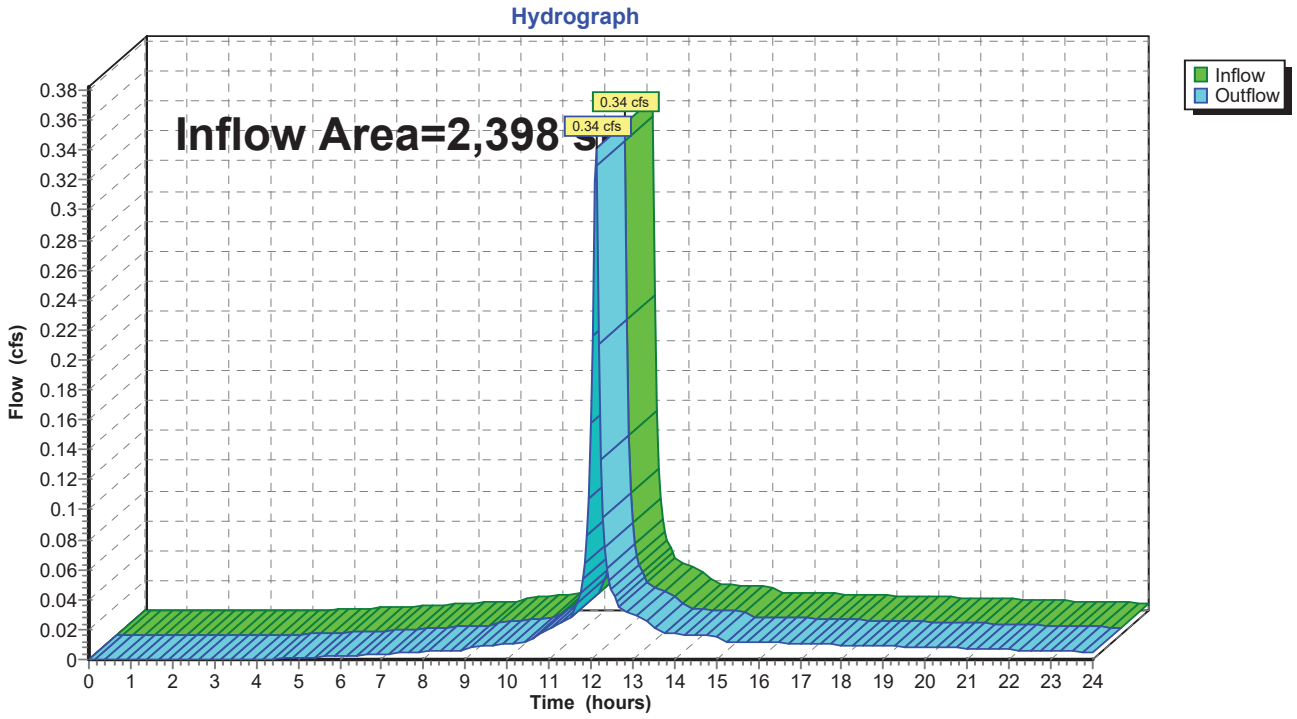


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 2,398 sf, 50.08% Impervious, Inflow Depth > 5.29" for 100-Year event
Inflow = 0.34 cfs @ 12.13 hrs, Volume= 1,057 cf
Outflow = 0.34 cfs @ 12.13 hrs, Volume= 1,057 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

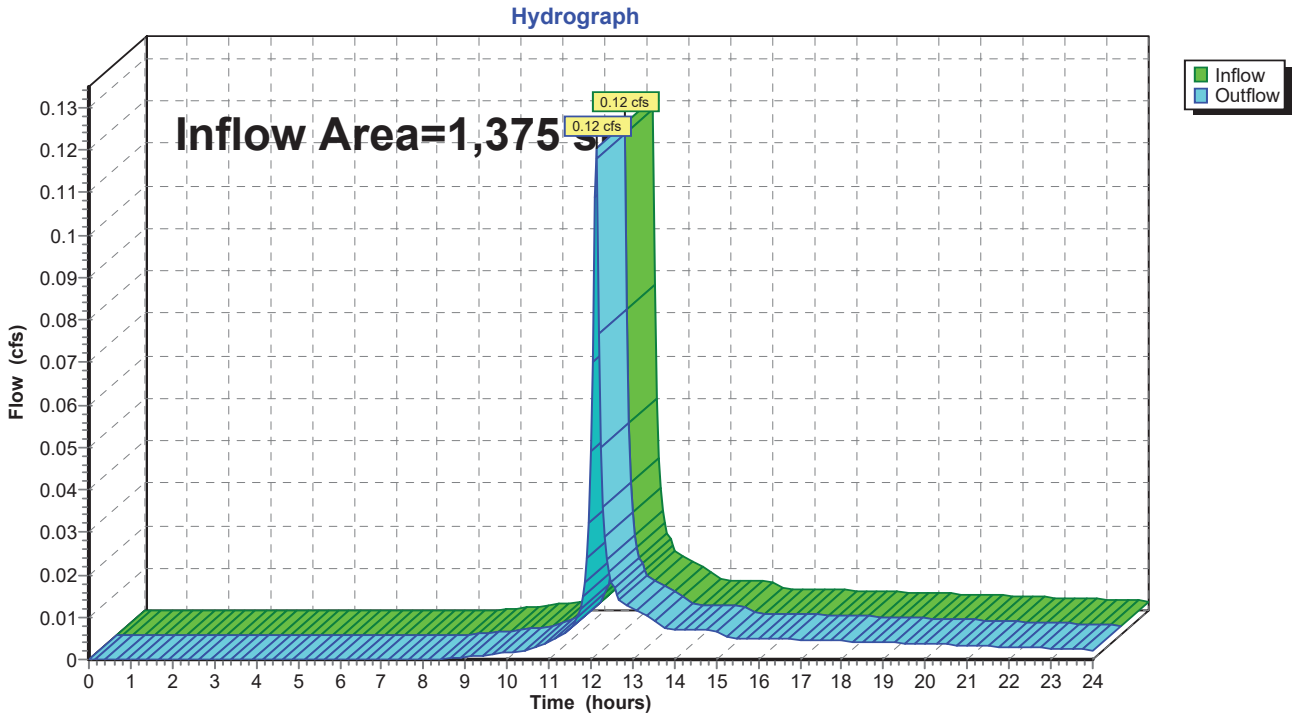


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,375 sf, 0.00% Impervious, Inflow Depth > 3.18" for 100-Year event
Inflow = 0.12 cfs @ 12.13 hrs, Volume= 364 cf
Outflow = 0.12 cfs @ 12.13 hrs, Volume= 364 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Events for Subcatchment A1-EX: A1-EX

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.21	632	1.13
10-Year	5.06	0.43	1,300	2.32
25-Year	6.08	0.59	1,762	3.15
100-Year	**7.65**	**0.83**	**2,514**	**4.50**

Events for Subcatchment B1-EX: B1-EX

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.10	315	1.58
10-Year	5.06	0.19	588	2.94
25-Year	6.08	0.25	769	3.85
100-Year	**7.65**	**0.34**	**1,057**	**5.29**

Events for Subcatchment C1-EX: C1-EX

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.02	62	0.54
10-Year	5.06	0.05	161	1.40
25-Year	6.08	0.08	236	2.06
100-Year	**7.65**	**0.12**	**364**	**3.18**

Events for Reach DP-A: WESTERN ABUTTER

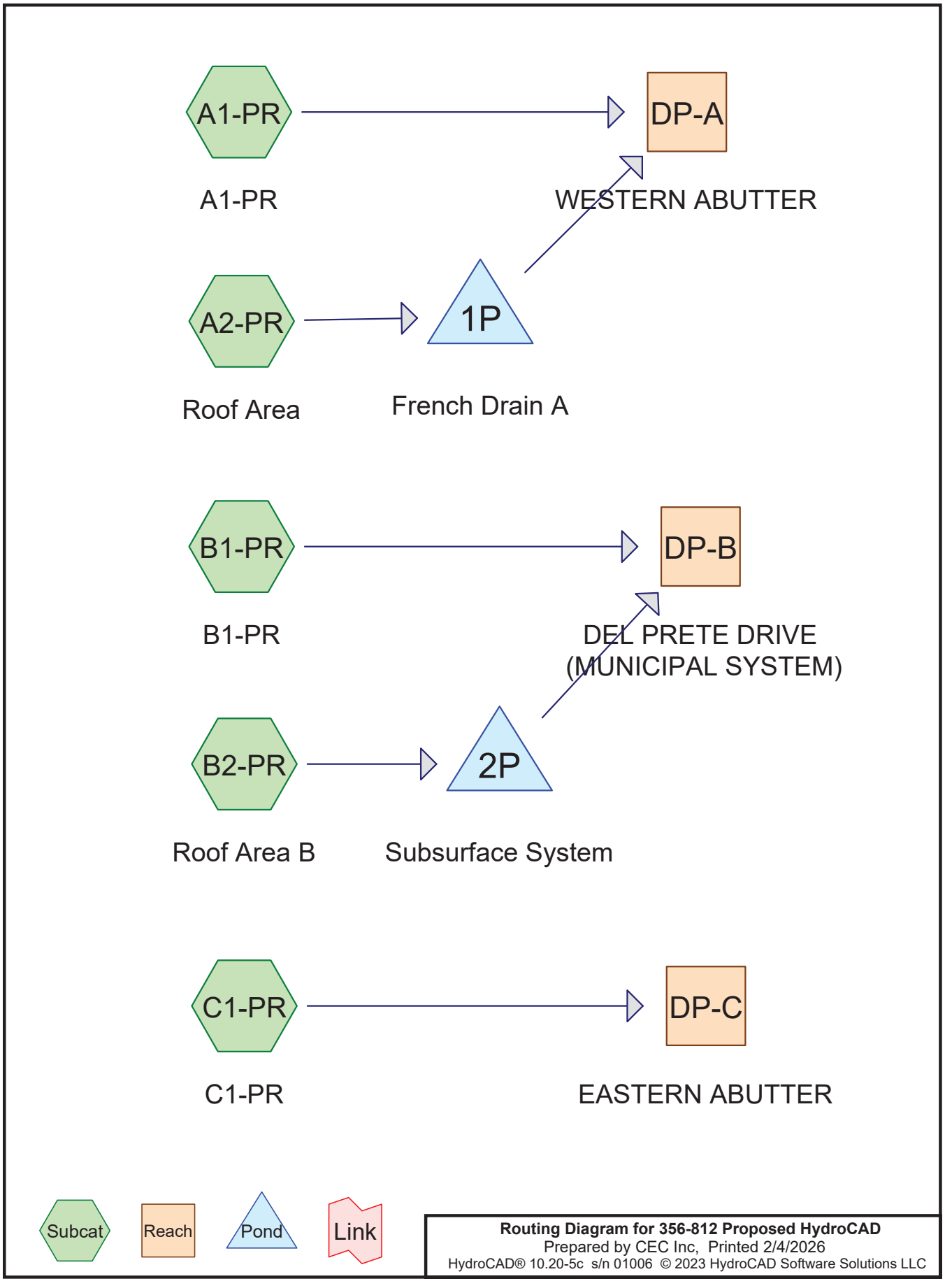
Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.21	0.21	**0.00**	**0**
10-Year	0.43	0.43	0.00	0
25-Year	0.59	0.59	0.00	0
100-Year	**0.83**	**0.83**	0.00	0

Events for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.10	0.10	**0.00**	**0**
10-Year	0.19	0.19	0.00	0
25-Year	0.25	0.25	0.00	0
100-Year	**0.34**	**0.34**	0.00	0

Events for Reach DP-C: EASTERN ABUTTER

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.02	0.02	**0.00**	**0**
10-Year	0.05	0.05	0.00	0
25-Year	0.08	0.08	0.00	0
100-Year	**0.12**	**0.12**	0.00	0



Routing Diagram for 356-812 Proposed HydroCAD
Prepared by CEC Inc, Printed 2/4/2026
HydroCAD® 10.20-5c s/n 01006 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA10 24-hr	D	Default	24.00	1	3.43	2
2	10-Year	NOAA10 24-hr	D	Default	24.00	1	5.06	2
3	25-Year	NOAA10 24-hr	D	Default	24.00	1	6.08	2
4	100-Year	NOAA10 24-hr	D	Default	24.00	1	7.65	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,890	61	>75% Grass cover, Good, HSG B (A1-PR, B1-PR, C1-PR)
166	96	Gravel surface, HSG B (A2-PR)
2,419	98	Roofs, HSG B (A2-PR, B2-PR)
1,385	98	Unconnected pavement, HSG B (A1-PR, B1-PR)
269	98	Unconnected roofs, HSG B (A1-PR, C1-PR)
1,355	55	Woods, Good, HSG B (A1-PR, C1-PR)
10,484	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
10,484	HSG B	A1-PR, A2-PR, B1-PR, B2-PR, C1-PR
0	HSG C	
0	HSG D	
0	Other	
10,484		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	4,890	0	0	0	4,890	>75% Grass cover, Good	
0	166	0	0	0	166	Gravel surface	
0	2,419	0	0	0	2,419	Roofs	
0	1,385	0	0	0	1,385	Unconnected pavement	
0	269	0	0	0	269	Unconnected roofs	
0	1,355	0	0	0	1,355	Woods, Good	
0	**10,484**	**0**	**0**	**0**	**10,484**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	65.50	63.50	24.0	0.0833	0.013	0.0	8.0	0.0	

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS2-Rain.txt" for 446 MA Hingham Plymouth Co

Summary for Subcatchment A1-PR: A1-PR

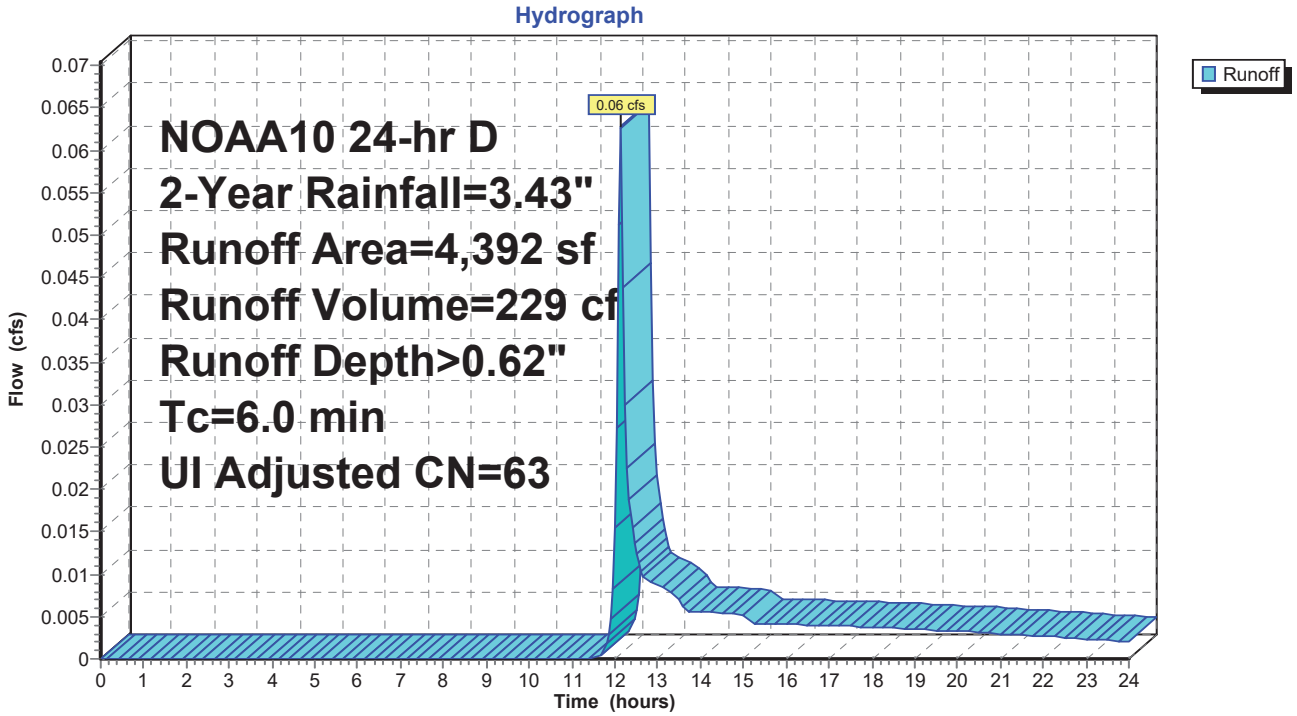
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 229 cf, Depth> 0.62"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Adj	Description
2,639	61		>75% Grass cover, Good, HSG B
515	98		Unconnected pavement, HSG B
1,009	55		Woods, Good, HSG B
229	98		Unconnected roofs, HSG B
4,392	66	63	Weighted Average, UI Adjusted
3,648			83.06% Pervious Area
744			16.94% Impervious Area
744			100.00% Unconnected

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

Subcatchment A1-PR: A1-PR



Summary for Subcatchment A2-PR: Roof Area

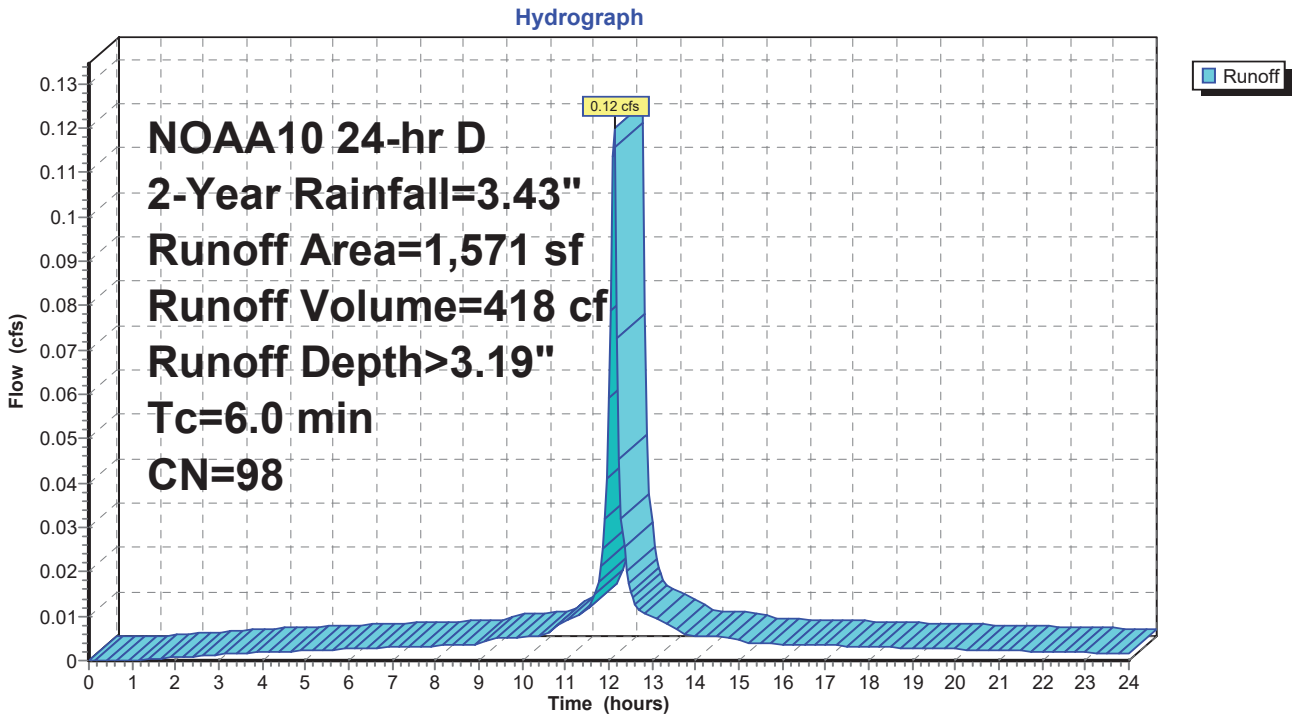
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 418 cf, Depth> 3.19"
Routed to Pond 1P : French Drain A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,405	98	Roofs, HSG B
166	96	Gravel surface, HSG B
1,571	98	Weighted Average
166		10.57% Pervious Area
1,405		89.43% Impervious Area

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

Subcatchment A2-PR: Roof Area



Summary for Subcatchment B1-PR: B1-PR

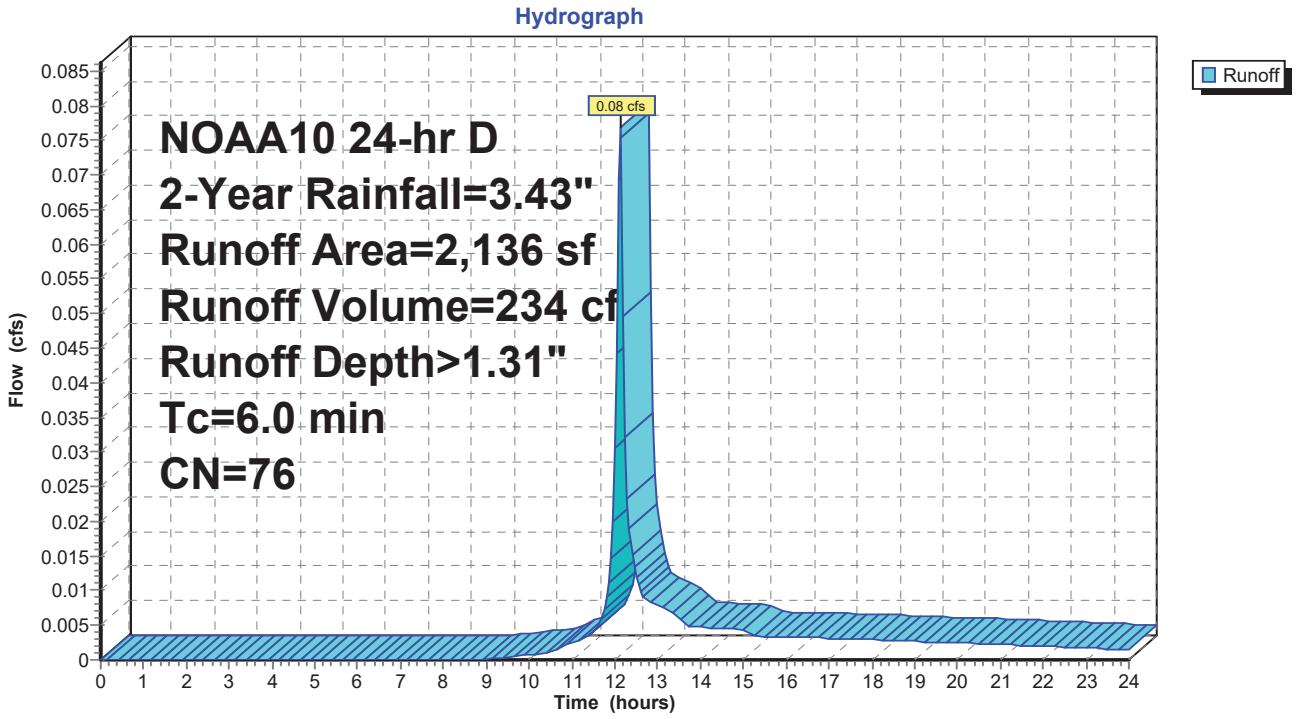
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 234 cf, Depth> 1.31"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,266	61	>75% Grass cover, Good, HSG B
870	98	Unconnected pavement, HSG B
2,136	76	Weighted Average
1,266		59.27% Pervious Area
870		40.73% Impervious Area
870		100.00% Unconnected

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

Subcatchment B1-PR: B1-PR



Summary for Subcatchment B2-PR: Roof Area B

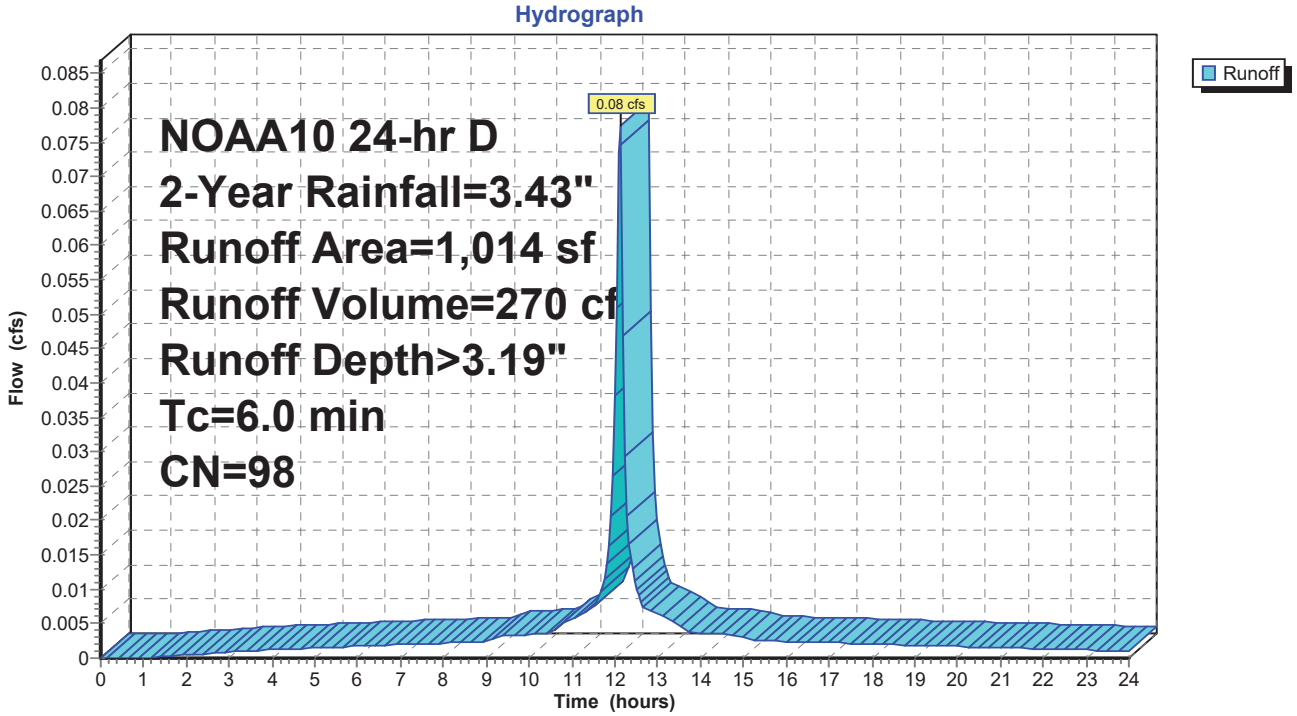
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 270 cf, Depth> 3.19"
Routed to Pond 2P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,014	98	Roofs, HSG B
1,014		100.00% Impervious Area

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

Subcatchment B2-PR: Roof Area B



Summary for Subcatchment C1-PR: C1-PR

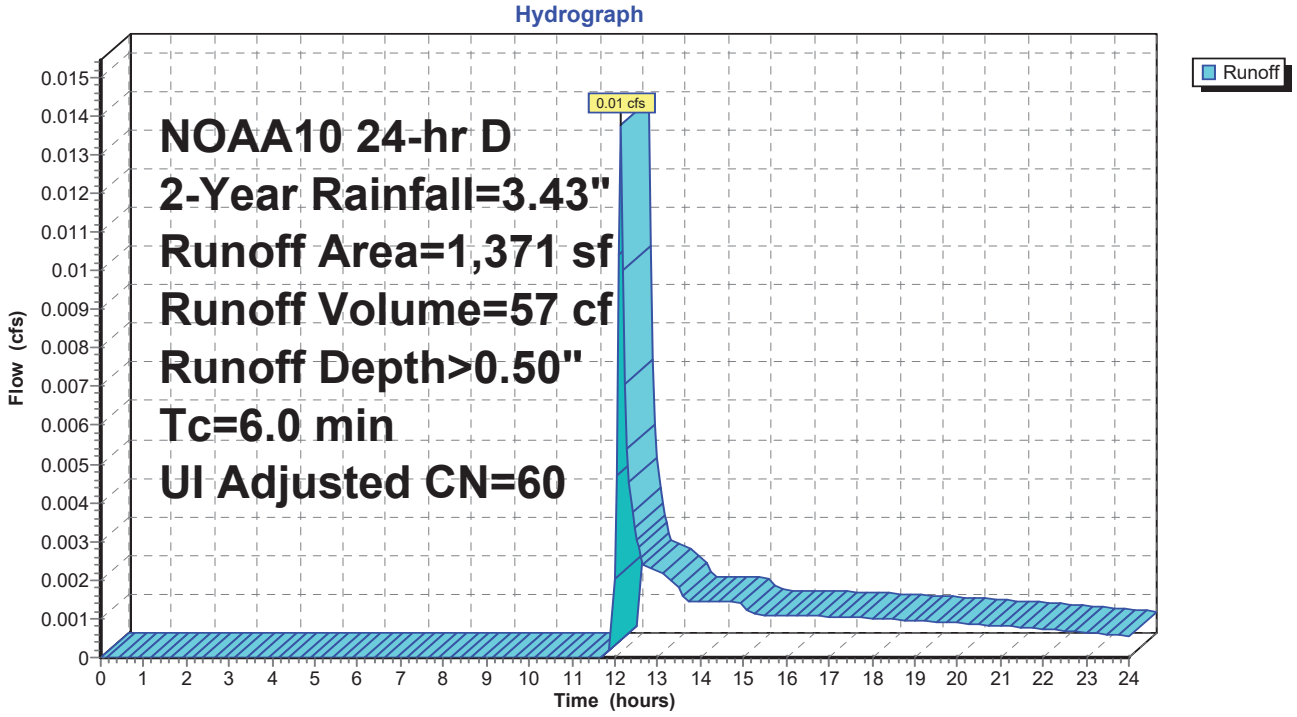
Runoff = 0.01 cfs @ 12.15 hrs, Volume= 57 cf, Depth> 0.50"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.43"

Area (sf)	CN	Adj	Description
985	61		>75% Grass cover, Good, HSG B
346	55		Woods, Good, HSG B
40	98		Unconnected roofs, HSG B
1,371	61	60	Weighted Average, UI Adjusted
1,331			97.08% Pervious Area
40			2.92% Impervious Area
40			100.00% Unconnected

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

Subcatchment C1-PR: C1-PR

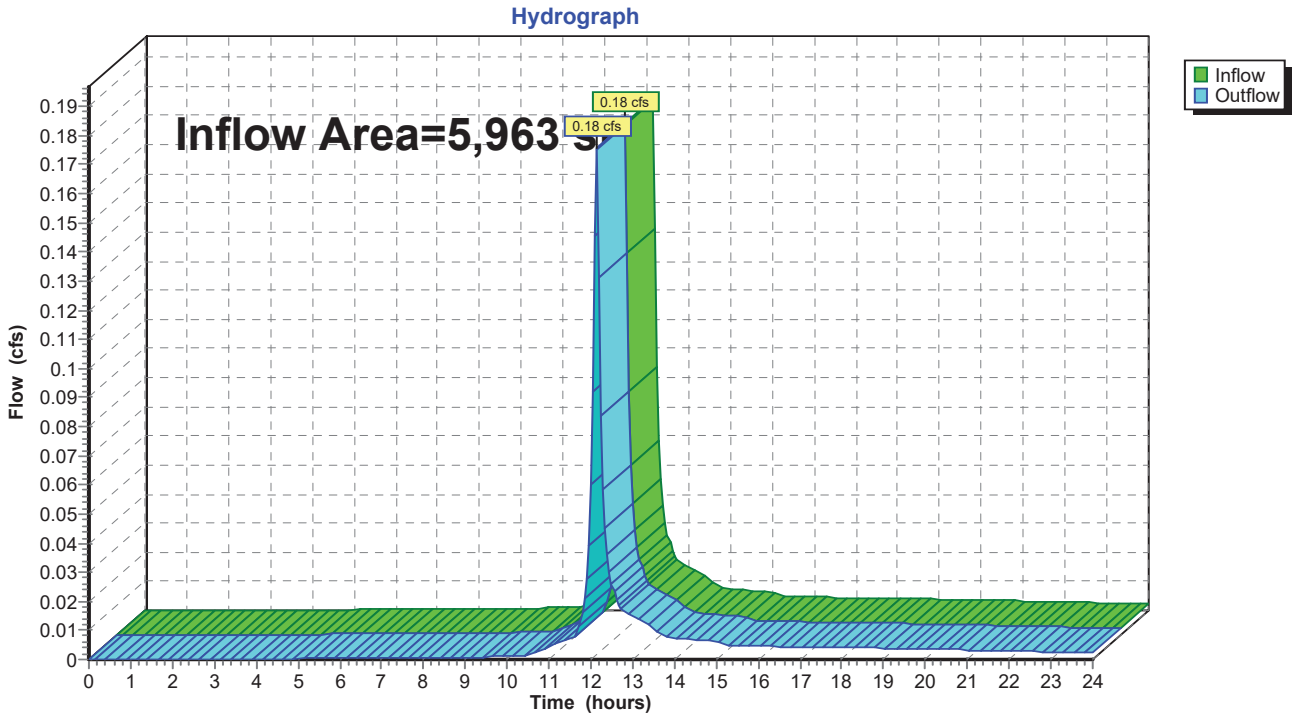


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 5,963 sf, 36.04% Impervious, Inflow Depth > 0.87" for 2-Year event
Inflow = 0.18 cfs @ 12.15 hrs, Volume= 430 cf
Outflow = 0.18 cfs @ 12.15 hrs, Volume= 430 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

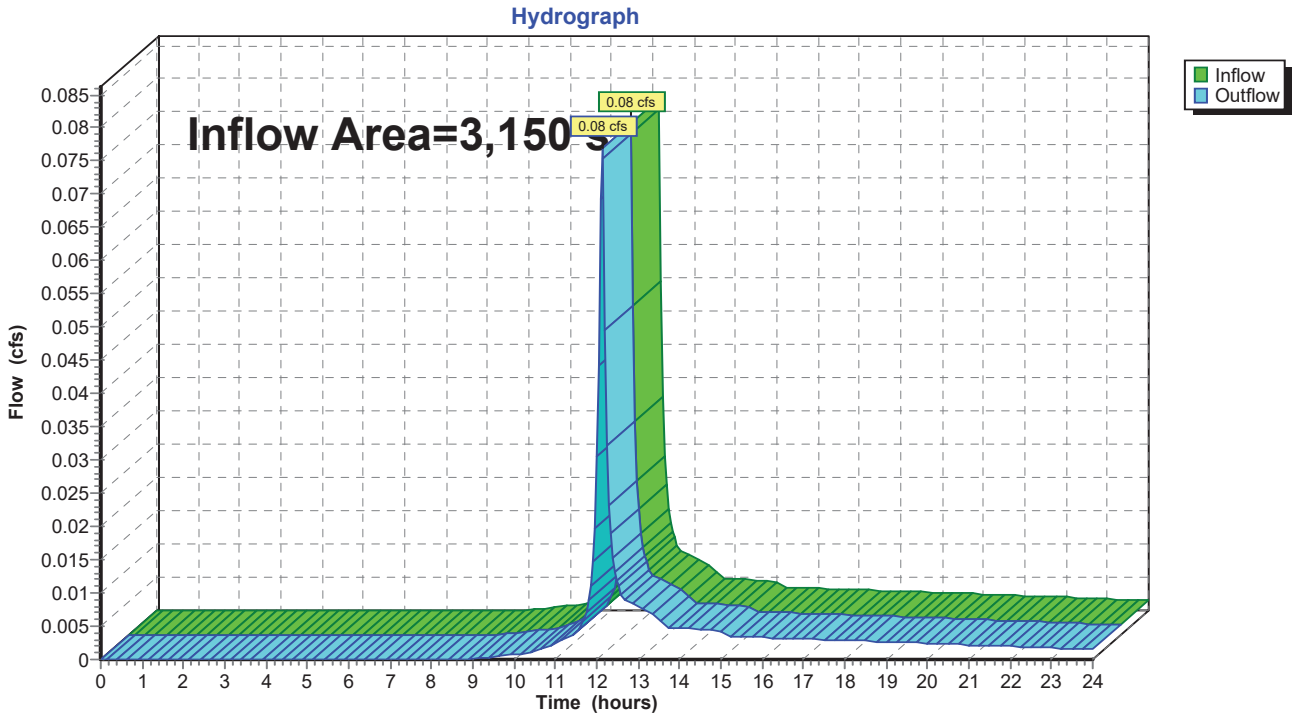


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 3,150 sf, 59.81% Impervious, Inflow Depth > 0.89" for 2-Year event
Inflow = 0.08 cfs @ 12.13 hrs, Volume= 234 cf
Outflow = 0.08 cfs @ 12.13 hrs, Volume= 234 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

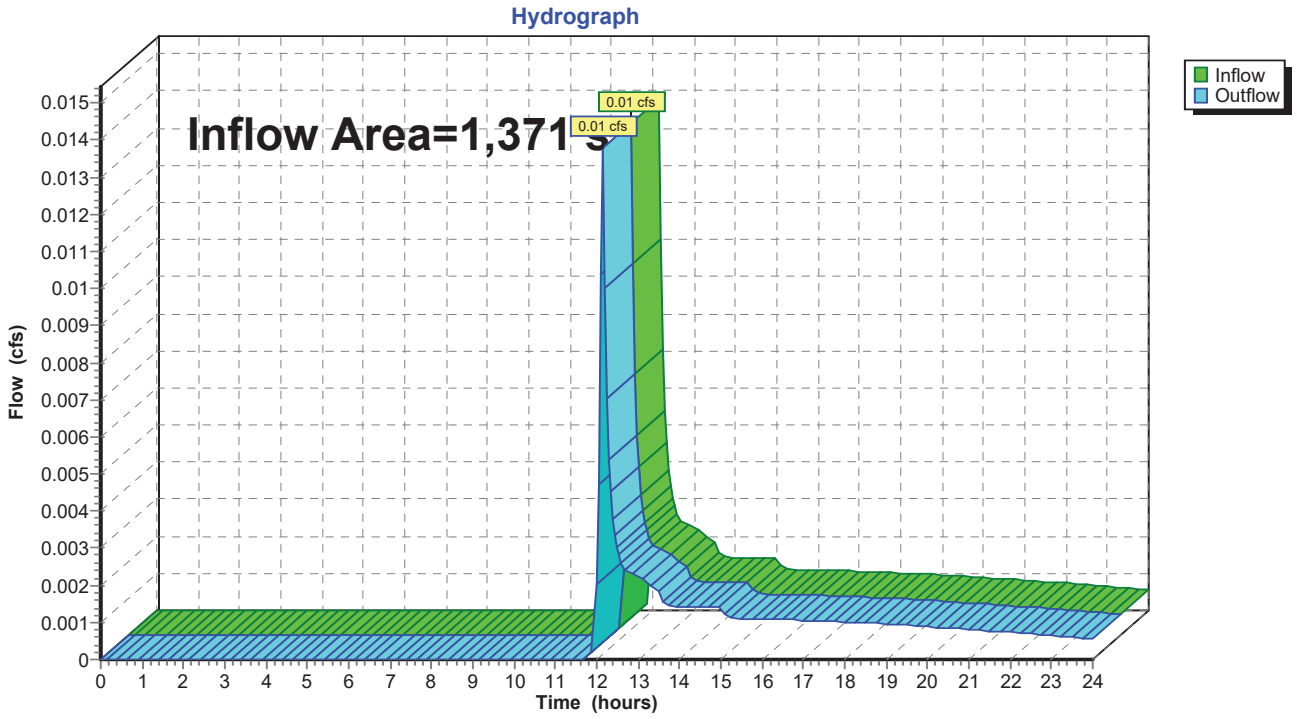


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,371 sf, 2.92% Impervious, Inflow Depth > 0.50" for 2-Year event
Inflow = 0.01 cfs @ 12.15 hrs, Volume= 57 cf
Outflow = 0.01 cfs @ 12.15 hrs, Volume= 57 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Pond 1P: French Drain A

Inflow Area = 1,571 sf, 89.43% Impervious, Inflow Depth > 3.19" for 2-Year event
Inflow = 0.12 cfs @ 12.13 hrs, Volume= 418 cf
Outflow = 0.12 cfs @ 12.15 hrs, Volume= 418 cf, Atten= 3%, Lag= 1.1 min
Discarded = 0.00 cfs @ 9.25 hrs, Volume= 216 cf
Primary = 0.11 cfs @ 12.15 hrs, Volume= 202 cf
Routed to Reach DP-A : WESTERN ABUTTER

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.71' @ 12.15 hrs Surf.Area= 168 sf Storage= 14 cf

Plug-Flow detention time= 3.8 min calculated for 417 cf (100% of inflow)
Center-of-Mass det. time= 3.3 min (761.6 - 758.4)

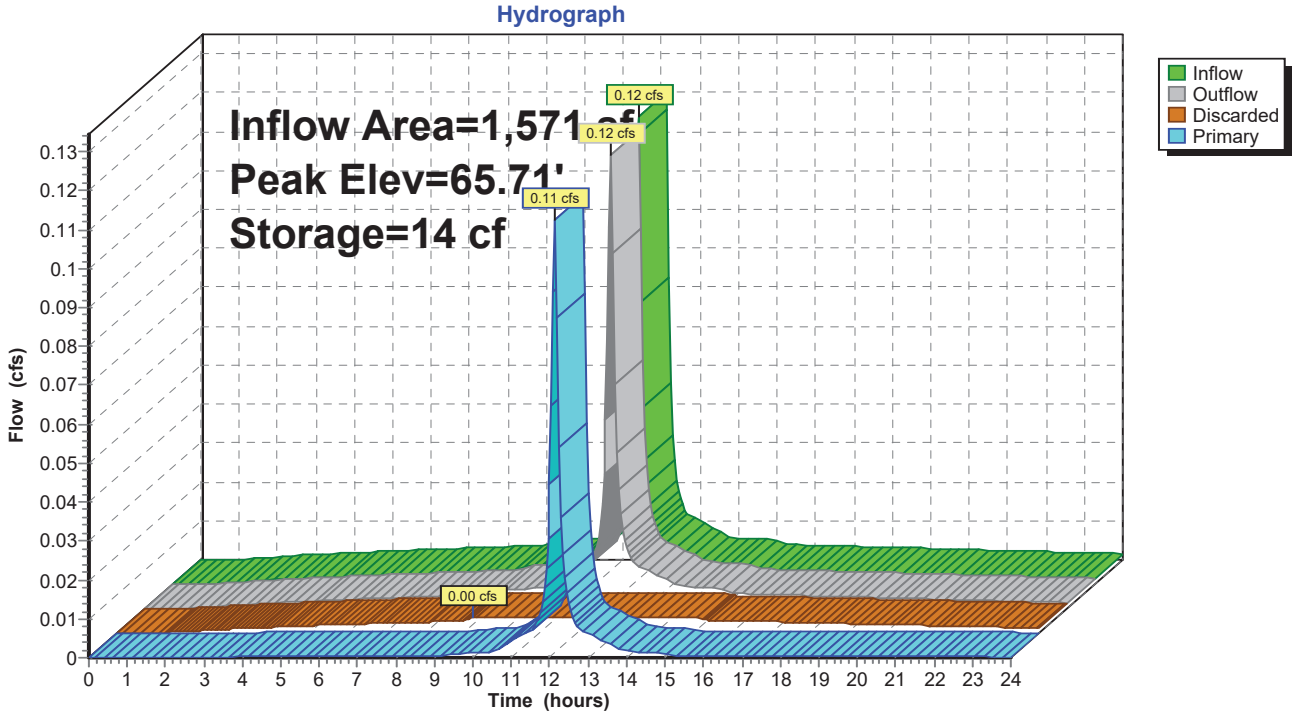
Volume	Invert	Avail.Storage	Storage Description
#1	65.50'	101 cf	**1.50'W x 112.00'L x 1.50'H French Drain** 252 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	65.50'	**8.0" Round Culvert** L= 24.0' Ke= 1.000 Inlet / Outlet Invert= 65.50' / 63.50' S= 0.0833 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Discarded	65.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 9.25 hrs HW=65.52' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.11 cfs @ 12.15 hrs HW=65.71' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.11 cfs @ 1.17 fps)

Pond 1P: French Drain A



Summary for Pond 2P: Subsurface System

Inflow Area = 1,014 sf,100.00% Impervious, Inflow Depth > 3.19" for 2-Year event
Inflow = 0.08 cfs @ 12.13 hrs, Volume= 270 cf
Outflow = 0.00 cfs @ 10.75 hrs, Volume= 256 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.00 cfs @ 10.75 hrs, Volume= 256 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 64.59' @ 13.61 hrs Surf.Area= 174 sf Storage= 93 cf

Plug-Flow detention time= 179.9 min calculated for 255 cf (95% of inflow)
Center-of-Mass det. time= 147.5 min (905.9 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.66'	151 cf	**10.25'W x 17.00'L x 3.21'H Field A** 559 cf Overall - 182 cf Embedded = 377 cf x 40.0% Voids
#2A	64.16'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		333 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.66'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 10.75 hrs HW=63.69' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Pond 2P: Subsurface System - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 5.0" Spacing = 52.0" C-C Row Spacing

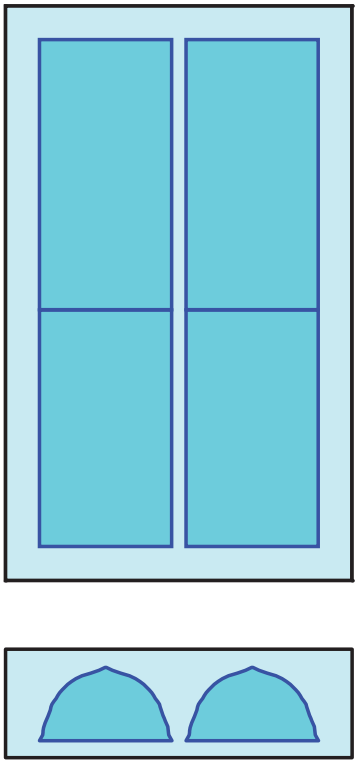
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +12.0" End Stone x 2 = 17.00' Base Length
2 Rows x 47.0" Wide + 5.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

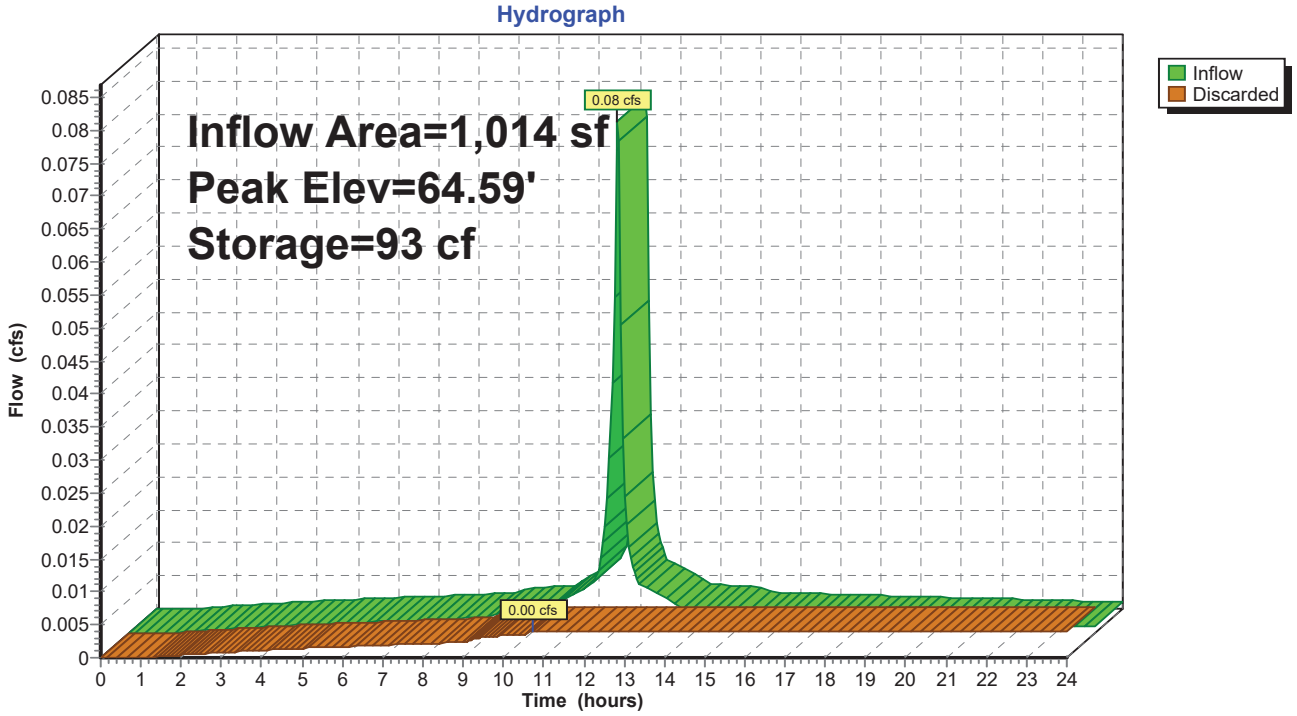
559.1 cf Field - 182.2 cf Chambers = 376.9 cf Stone x 40.0% Voids = 150.8 cf Stone Storage

Chamber Storage + Stone Storage = 332.9 cf = 0.008 af
Overall Storage Efficiency = 59.5%
Overall System Size = 17.00' x 10.25' x 3.21'

4 Chambers
20.7 cy Field
14.0 cy Stone



Pond 2P: Subsurface System



Summary for Subcatchment A1-PR: A1-PR

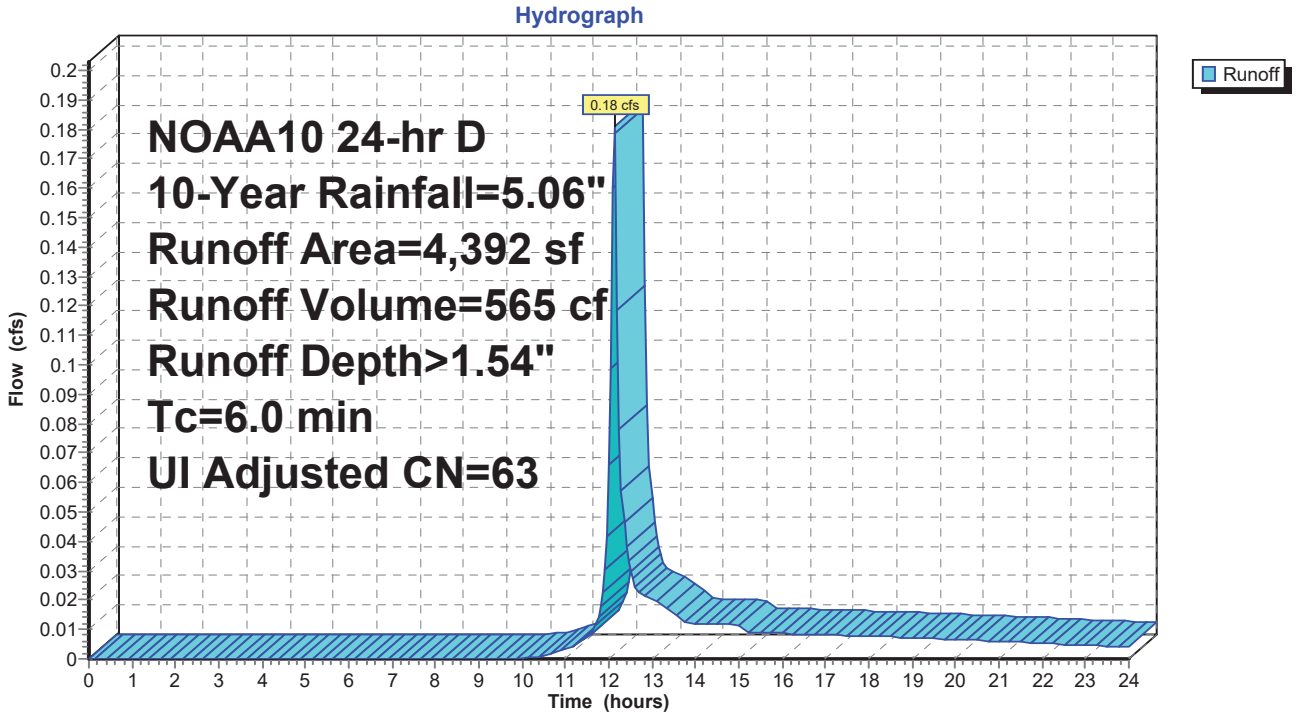
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 565 cf, Depth> 1.54"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Adj	Description
2,639	61		>75% Grass cover, Good, HSG B
515	98		Unconnected pavement, HSG B
1,009	55		Woods, Good, HSG B
229	98		Unconnected roofs, HSG B
4,392	66	63	Weighted Average, UI Adjusted
3,648			83.06% Pervious Area
744			16.94% Impervious Area
744			100.00% Unconnected

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

Subcatchment A1-PR: A1-PR



Summary for Subcatchment A2-PR: Roof Area

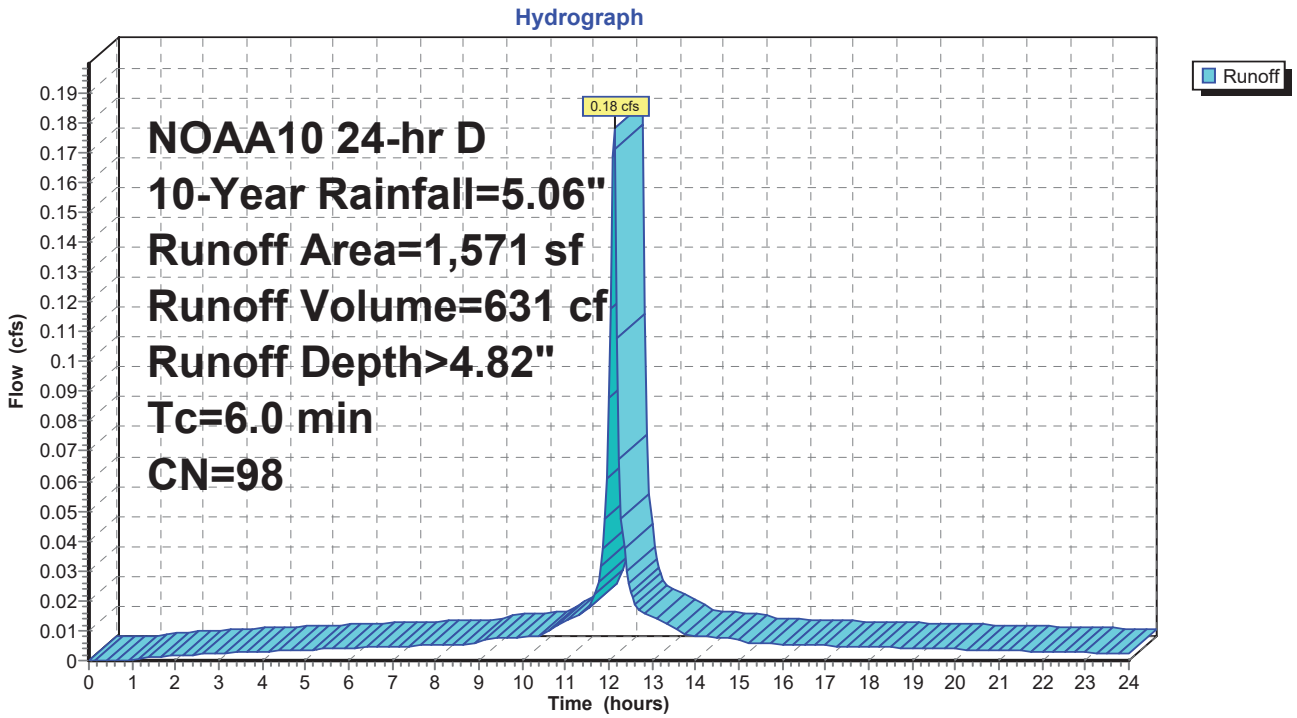
Runoff = 0.18 cfs @ 12.13 hrs, Volume= 631 cf, Depth> 4.82"
Routed to Pond 1P : French Drain A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
1,405	98	Roofs, HSG B
166	96	Gravel surface, HSG B
1,571	98	Weighted Average
166		10.57% Pervious Area
1,405		89.43% Impervious Area

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

Subcatchment A2-PR: Roof Area



Summary for Subcatchment B1-PR: B1-PR

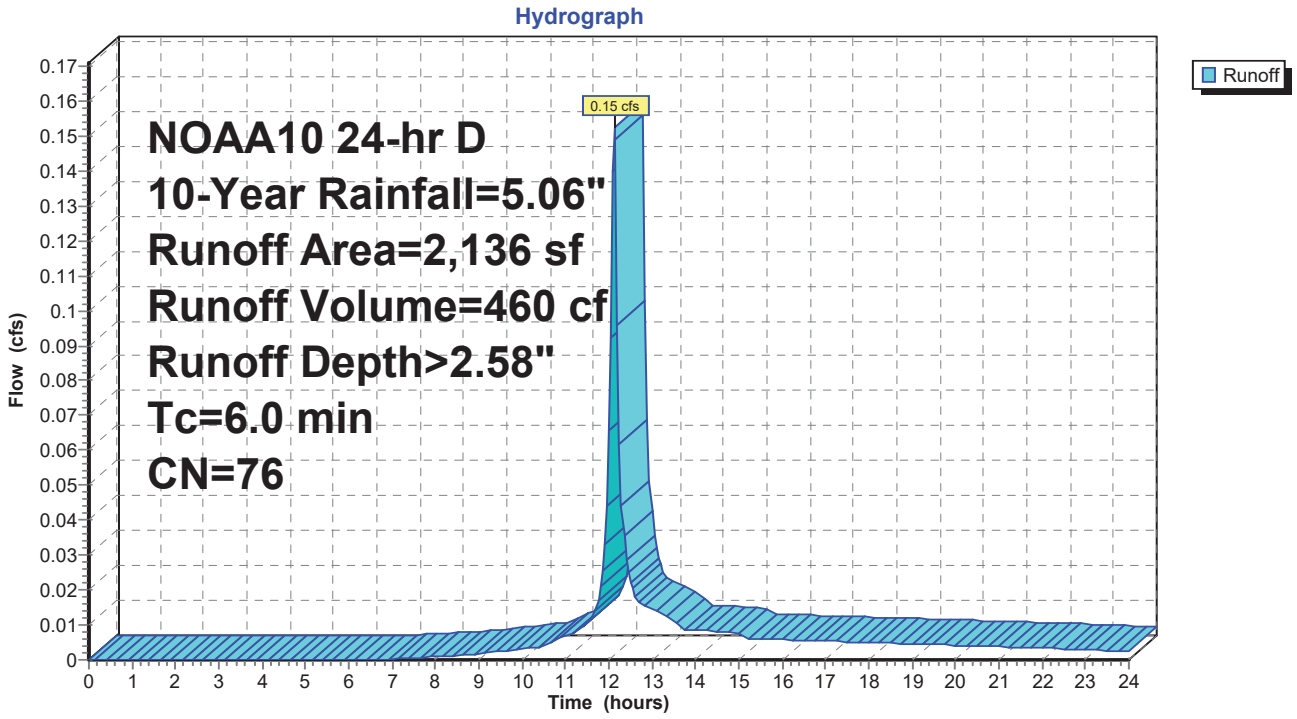
Runoff = 0.15 cfs @ 12.13 hrs, Volume= 460 cf, Depth> 2.58"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
1,266	61	>75% Grass cover, Good, HSG B
870	98	Unconnected pavement, HSG B
2,136	76	Weighted Average
1,266		59.27% Pervious Area
870		40.73% Impervious Area
870		100.00% Unconnected

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

Subcatchment B1-PR: B1-PR



Summary for Subcatchment B2-PR: Roof Area B

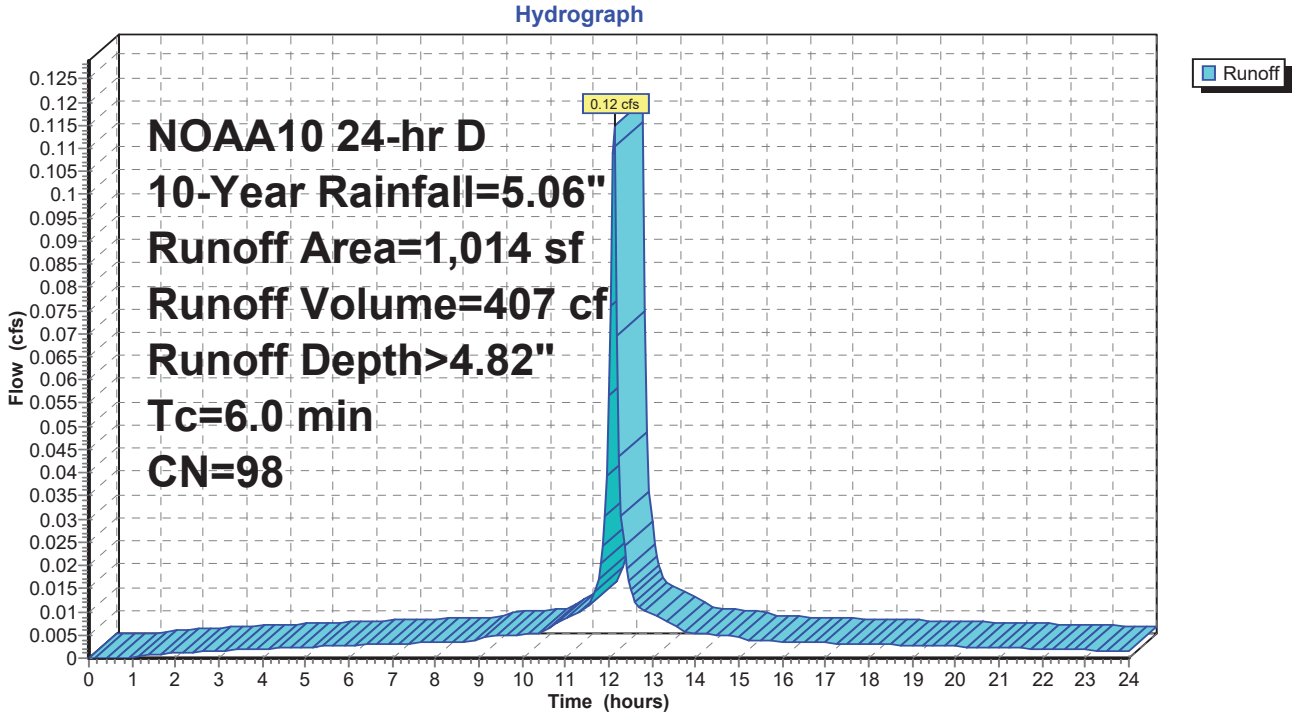
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 407 cf, Depth> 4.82"
Routed to Pond 2P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Description
1,014	98	Roofs, HSG B
1,014		100.00% Impervious Area

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

Subcatchment B2-PR: Roof Area B



Summary for Subcatchment C1-PR: C1-PR

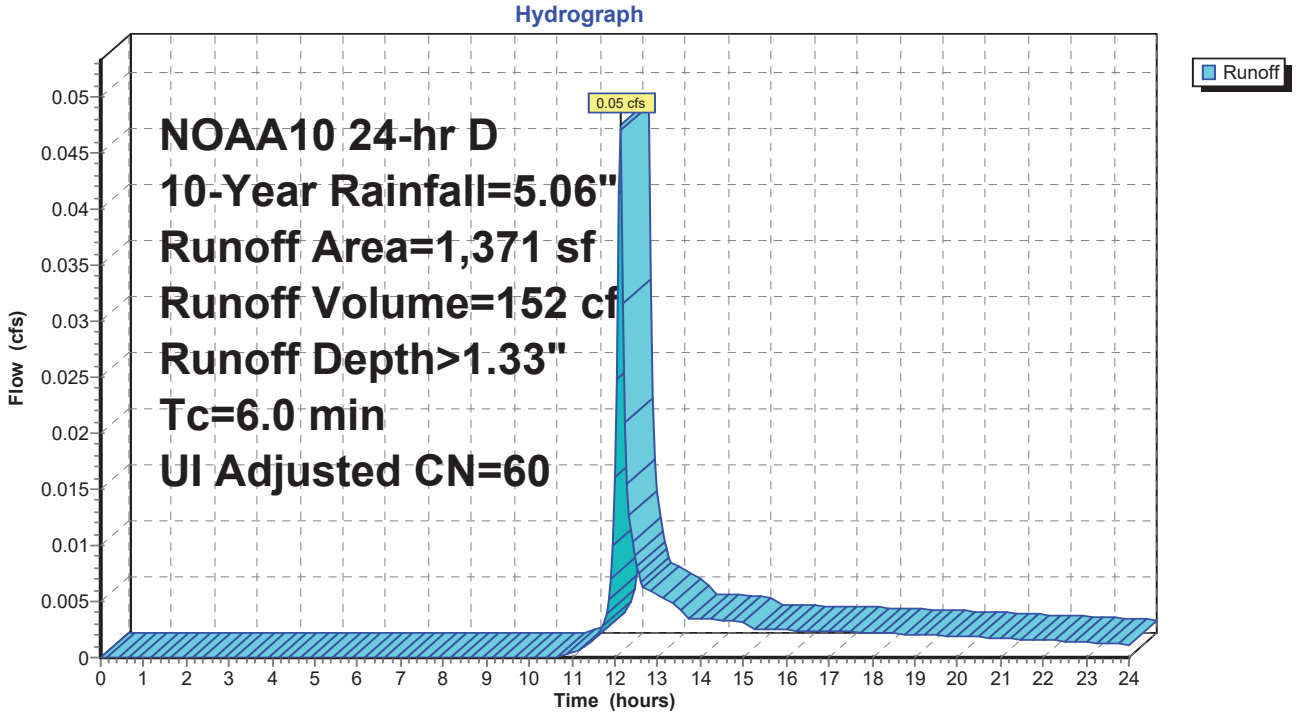
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 152 cf, Depth> 1.33"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.06"

Area (sf)	CN	Adj	Description
985	61		>75% Grass cover, Good, HSG B
346	55		Woods, Good, HSG B
40	98		Unconnected roofs, HSG B
1,371	61	60	Weighted Average, UI Adjusted
1,331			97.08% Pervious Area
40			2.92% Impervious Area
40			100.00% Unconnected

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

Subcatchment C1-PR: C1-PR

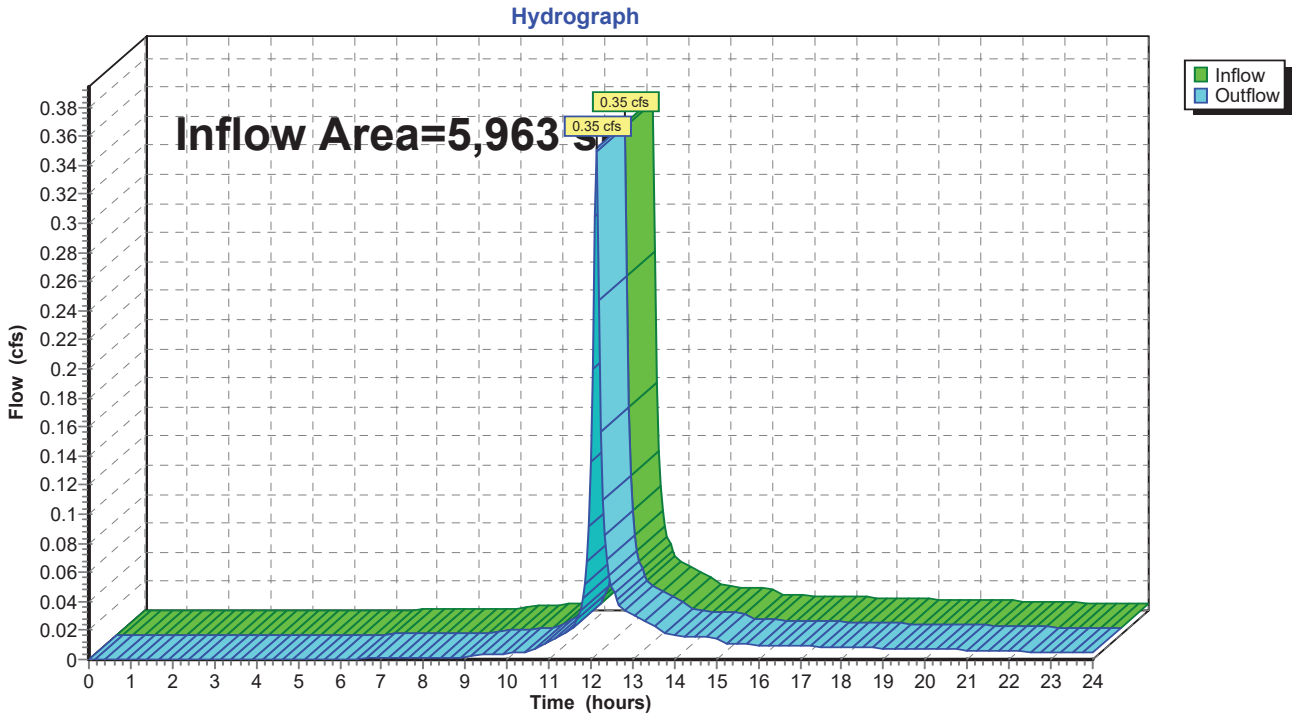


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 5,963 sf, 36.04% Impervious, Inflow Depth > 1.85" for 10-Year event
Inflow = 0.35 cfs @ 12.14 hrs, Volume= 919 cf
Outflow = 0.35 cfs @ 12.14 hrs, Volume= 919 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

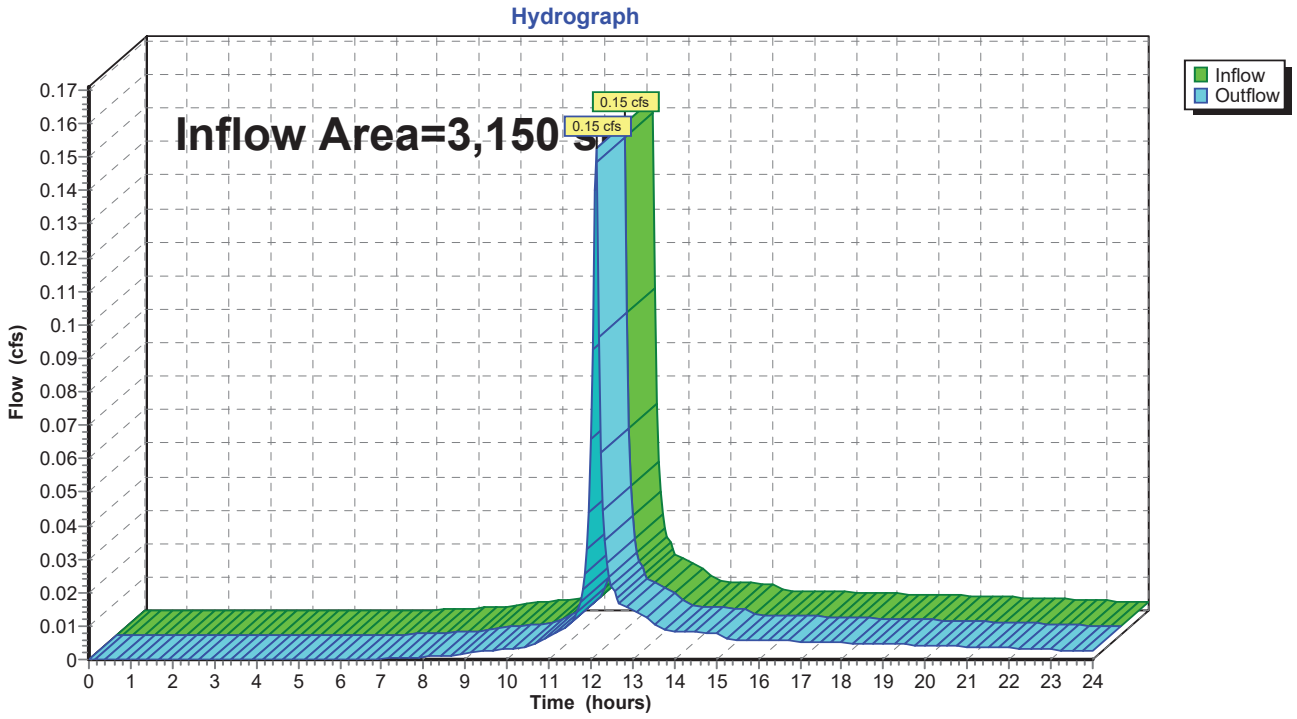


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 3,150 sf, 59.81% Impervious, Inflow Depth > 1.75" for 10-Year event
Inflow = 0.15 cfs @ 12.13 hrs, Volume= 460 cf
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 460 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

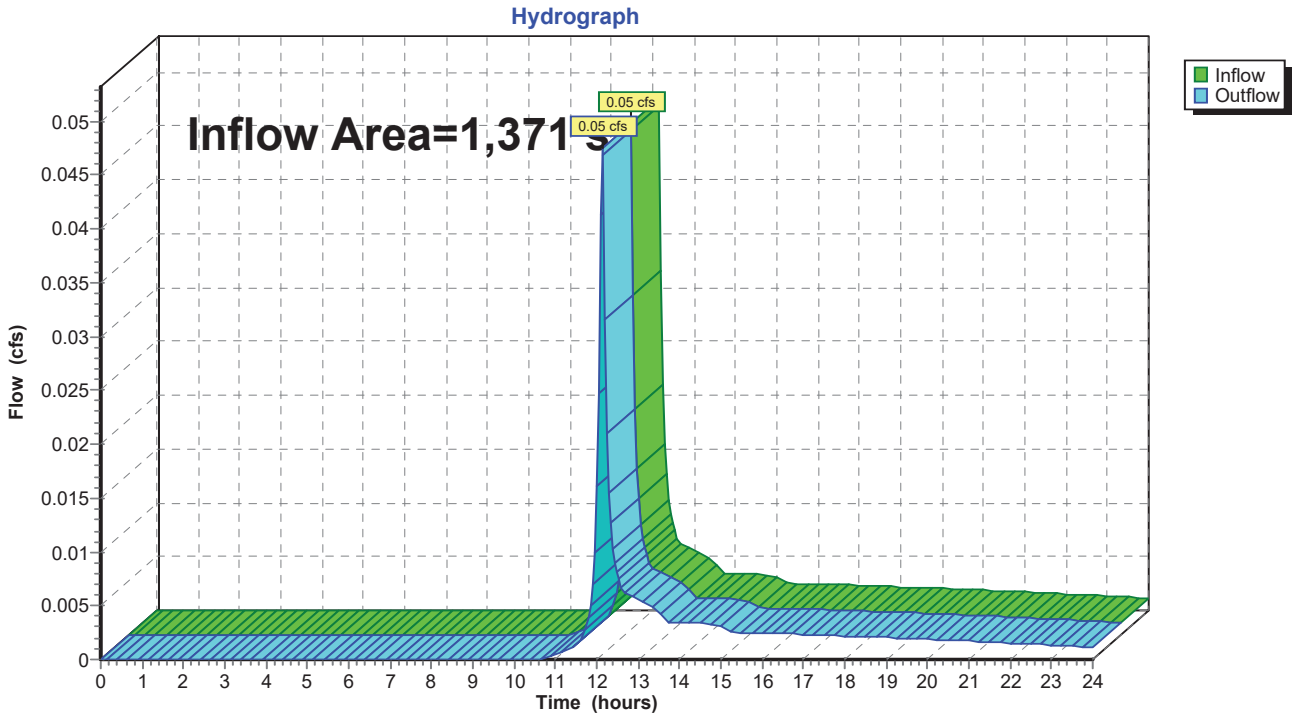


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,371 sf, 2.92% Impervious, Inflow Depth > 1.33" for 10-Year event
Inflow = 0.05 cfs @ 12.14 hrs, Volume= 152 cf
Outflow = 0.05 cfs @ 12.14 hrs, Volume= 152 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Pond 1P: French Drain A

Inflow Area = 1,571 sf, 89.43% Impervious, Inflow Depth > 4.82" for 10-Year event
Inflow = 0.18 cfs @ 12.13 hrs, Volume= 631 cf
Outflow = 0.17 cfs @ 12.14 hrs, Volume= 630 cf, Atten= 2%, Lag= 1.0 min
Discarded = 0.00 cfs @ 6.85 hrs, Volume= 277 cf
Primary = 0.17 cfs @ 12.14 hrs, Volume= 354 cf
Routed to Reach DP-A : WESTERN ABUTTER

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.77' @ 12.14 hrs Surf.Area= 168 sf Storage= 18 cf

Plug-Flow detention time= 3.8 min calculated for 629 cf (100% of inflow)
Center-of-Mass det. time= 3.3 min (753.1 - 749.8)

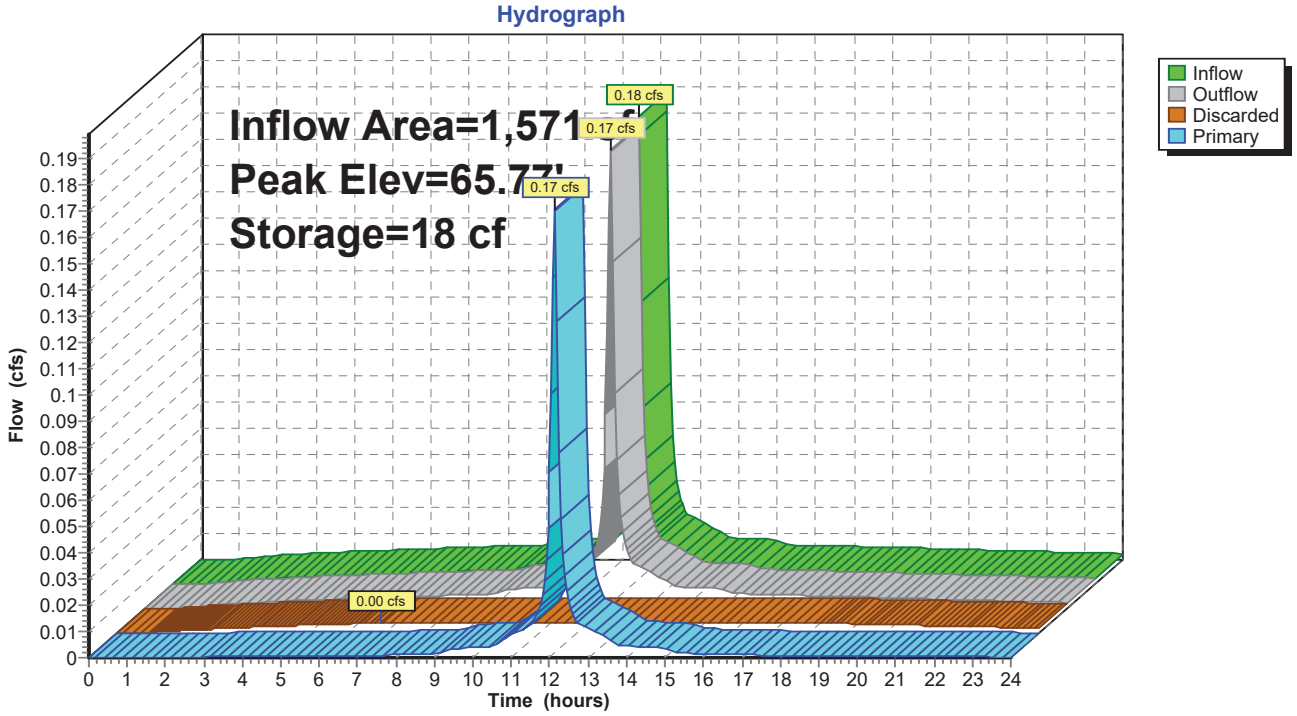
Volume	Invert	Avail.Storage	Storage Description
#1	65.50'	101 cf	**1.50'W x 112.00'L x 1.50'H French Drain** 252 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	65.50'	**8.0" Round Culvert** L= 24.0' Ke= 1.000 Inlet / Outlet Invert= 65.50' / 63.50' S= 0.0833 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Discarded	65.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 6.85 hrs HW=65.52' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.17 cfs @ 12.14 hrs HW=65.76' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.17 cfs @ 1.31 fps)

Pond 1P: French Drain A



Summary for Pond 2P: Subsurface System

Inflow Area = 1,014 sf,100.00% Impervious, Inflow Depth > 4.82" for 10-Year event
Inflow = 0.12 cfs @ 12.13 hrs, Volume= 407 cf
Outflow = 0.00 cfs @ 9.20 hrs, Volume= 286 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.00 cfs @ 9.20 hrs, Volume= 286 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.17' @ 15.11 hrs Surf.Area= 174 sf Storage= 170 cf

Plug-Flow detention time= 225.1 min calculated for 285 cf (70% of inflow)
Center-of-Mass det. time= 100.9 min (850.7 - 749.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.66'	151 cf	**10.25'W x 17.00'L x 3.21'H Field A** 559 cf Overall - 182 cf Embedded = 377 cf x 40.0% Voids
#2A	64.16'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		333 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.66'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 9.20 hrs HW=63.69' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Pond 2P: Subsurface System - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 5.0" Spacing = 52.0" C-C Row Spacing

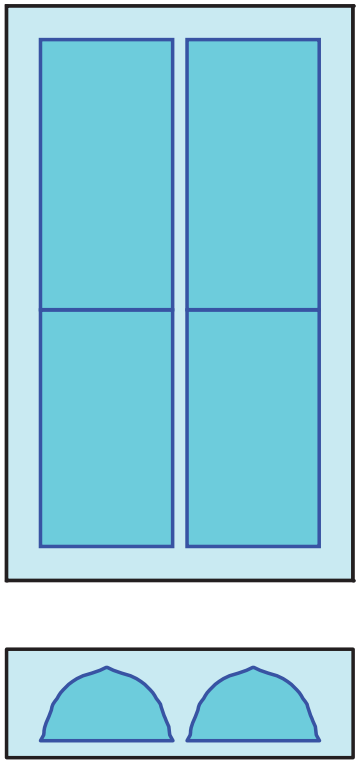
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +12.0" End Stone x 2 = 17.00' Base Length
2 Rows x 47.0" Wide + 5.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

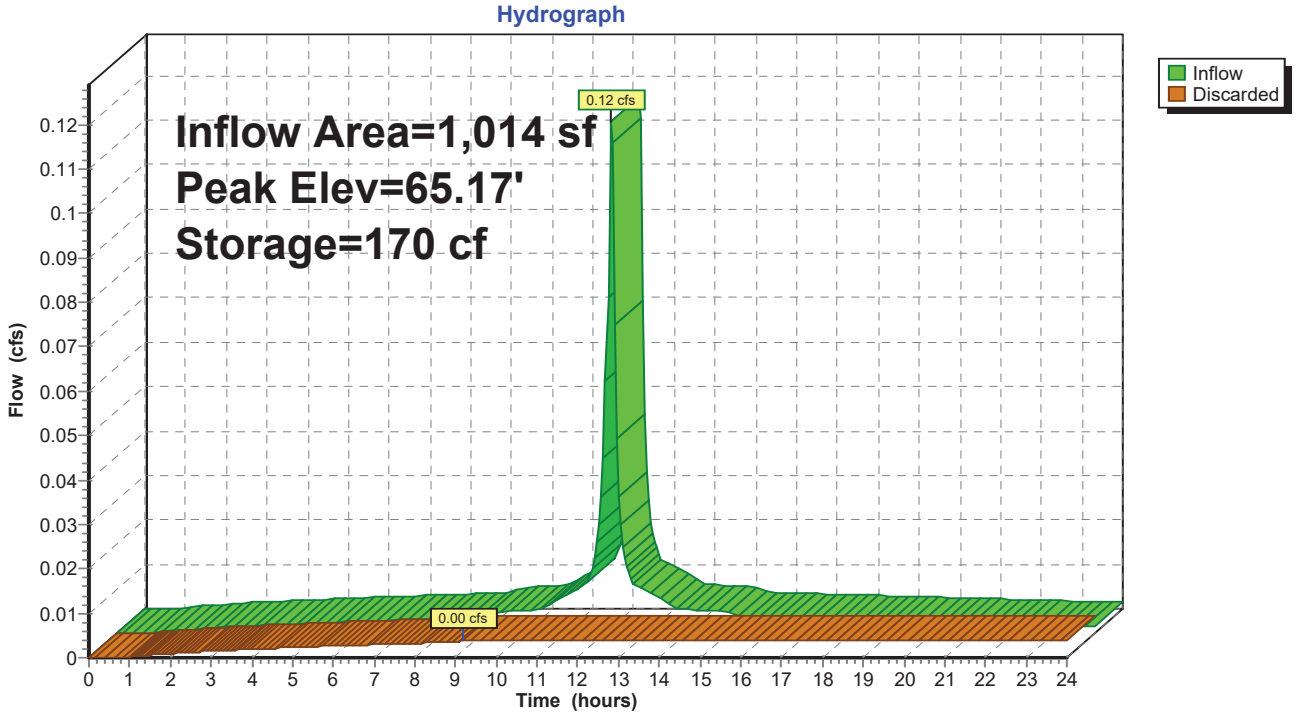
559.1 cf Field - 182.2 cf Chambers = 376.9 cf Stone x 40.0% Voids = 150.8 cf Stone Storage

Chamber Storage + Stone Storage = 332.9 cf = 0.008 af
Overall Storage Efficiency = 59.5%
Overall System Size = 17.00' x 10.25' x 3.21'

4 Chambers
20.7 cy Field
14.0 cy Stone



Pond 2P: Subsurface System



Summary for Subcatchment A1-PR: A1-PR

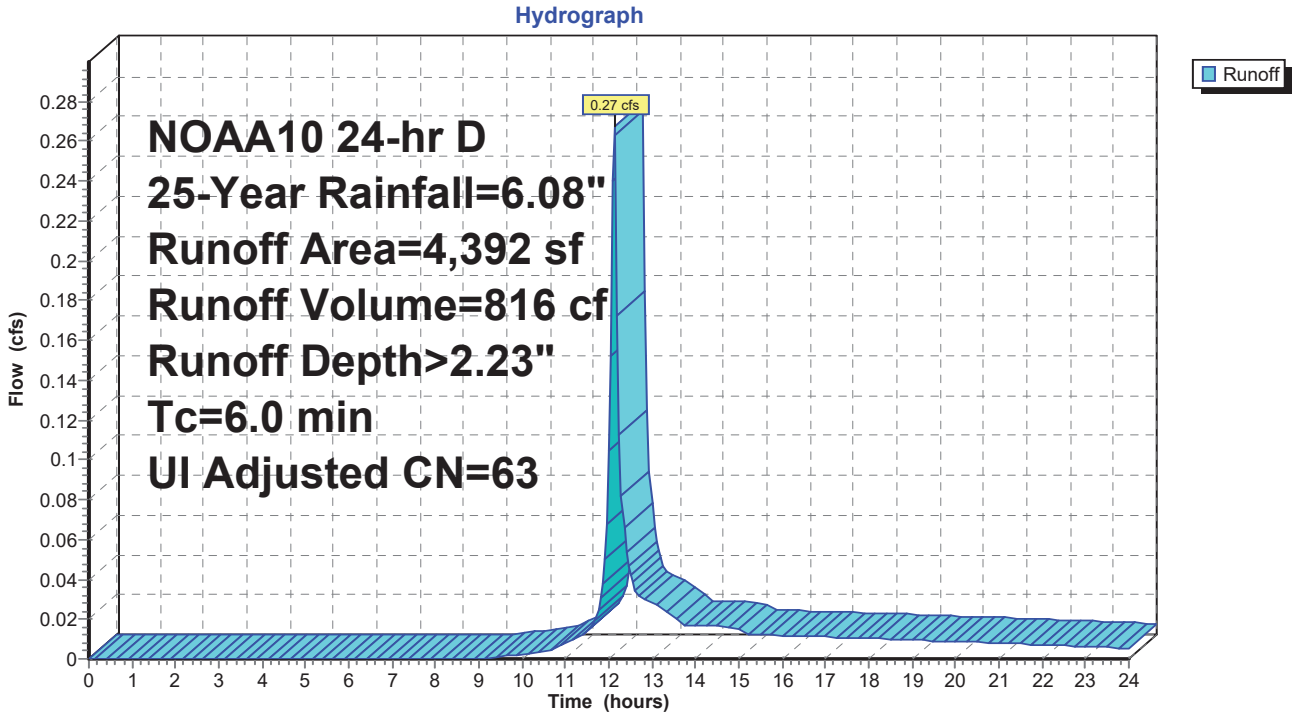
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 816 cf, Depth> 2.23"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Adj	Description
2,639	61		>75% Grass cover, Good, HSG B
515	98		Unconnected pavement, HSG B
1,009	55		Woods, Good, HSG B
229	98		Unconnected roofs, HSG B
4,392	66	63	Weighted Average, UI Adjusted
3,648			83.06% Pervious Area
744			16.94% Impervious Area
744			100.00% Unconnected

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

Subcatchment A1-PR: A1-PR



Summary for Subcatchment A2-PR: Roof Area

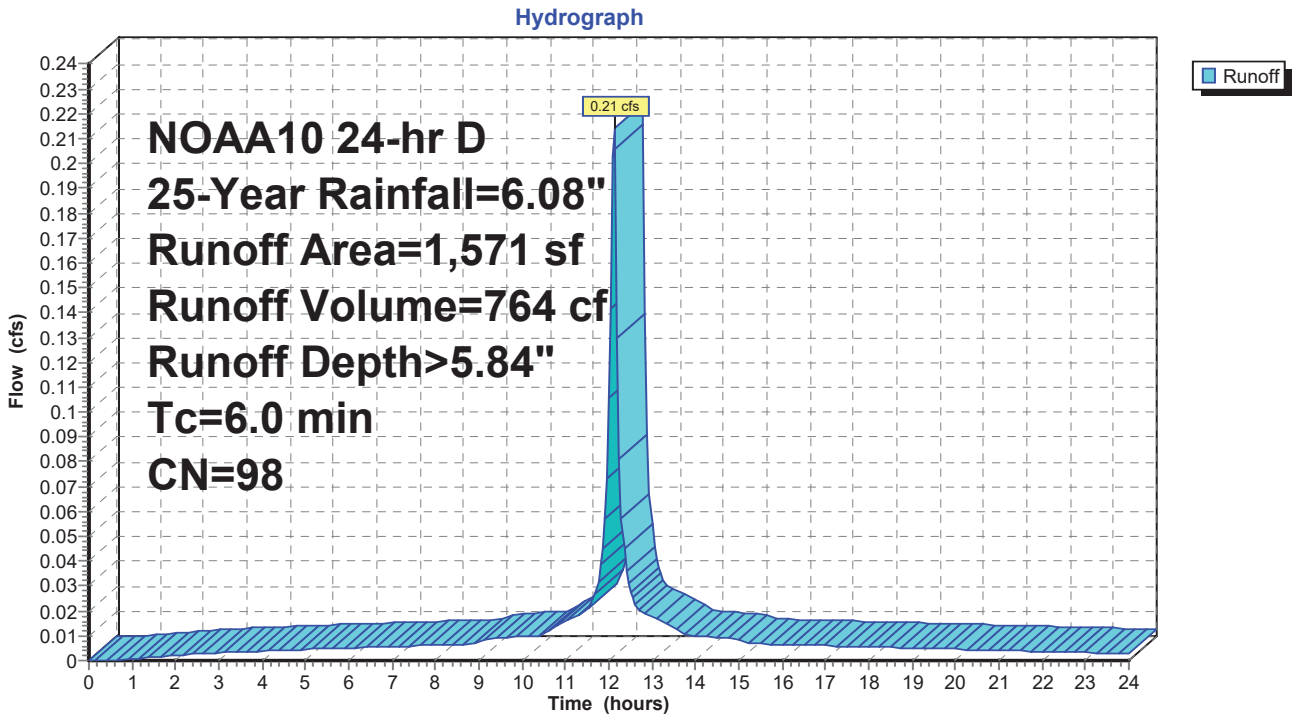
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 764 cf, Depth> 5.84"
Routed to Pond 1P : French Drain A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
1,405	98	Roofs, HSG B
166	96	Gravel surface, HSG B
1,571	98	Weighted Average
166		10.57% Pervious Area
1,405		89.43% Impervious Area

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

Subcatchment A2-PR: Roof Area



Summary for Subcatchment B1-PR: B1-PR

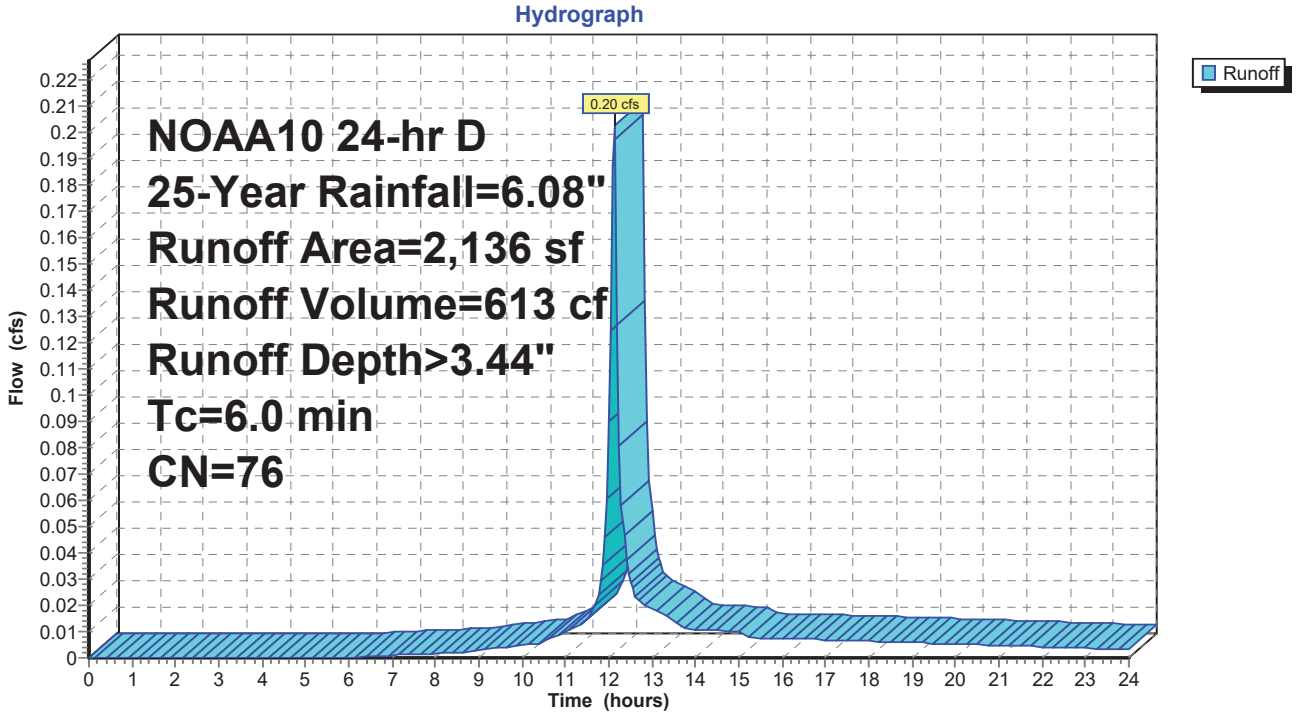
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 613 cf, Depth> 3.44"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
1,266	61	>75% Grass cover, Good, HSG B
870	98	Unconnected pavement, HSG B
2,136	76	Weighted Average
1,266		59.27% Pervious Area
870		40.73% Impervious Area
870		100.00% Unconnected

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

Subcatchment B1-PR: B1-PR



Summary for Subcatchment B2-PR: Roof Area B

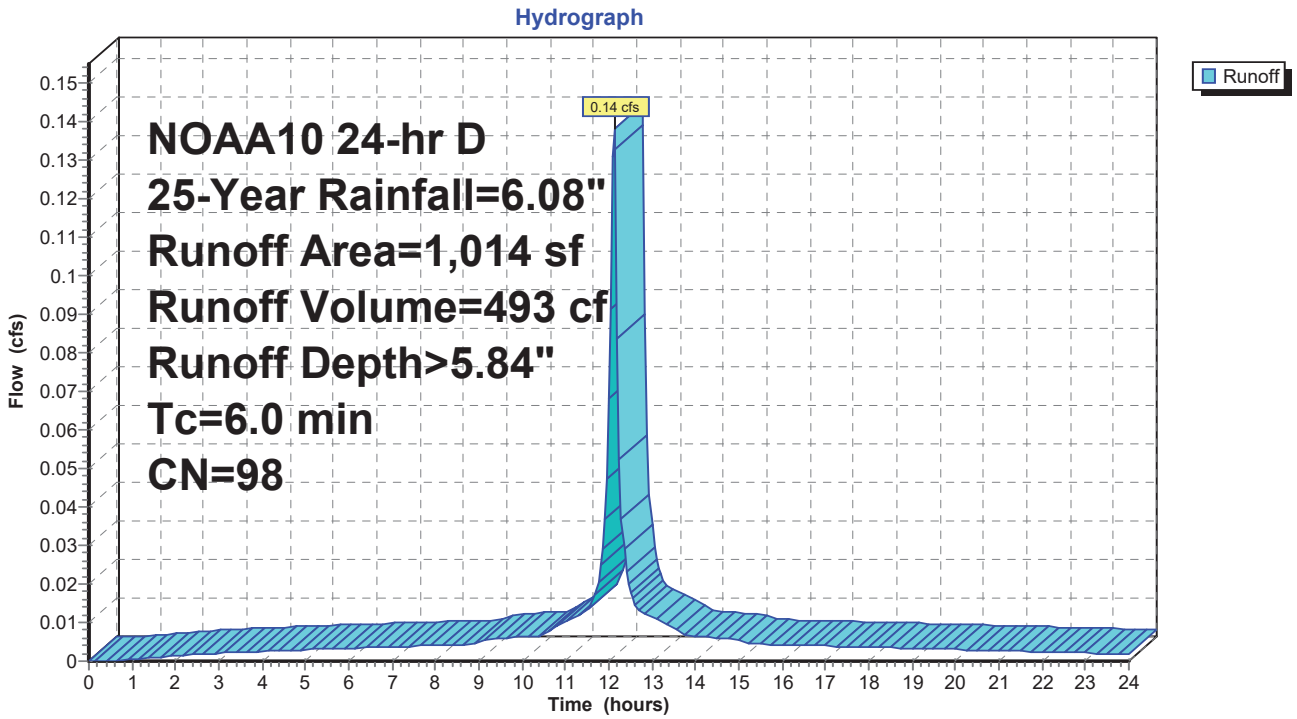
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 493 cf, Depth> 5.84"
Routed to Pond 2P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Description
1,014	98	Roofs, HSG B
1,014		100.00% Impervious Area

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

Subcatchment B2-PR: Roof Area B



Summary for Subcatchment C1-PR: C1-PR

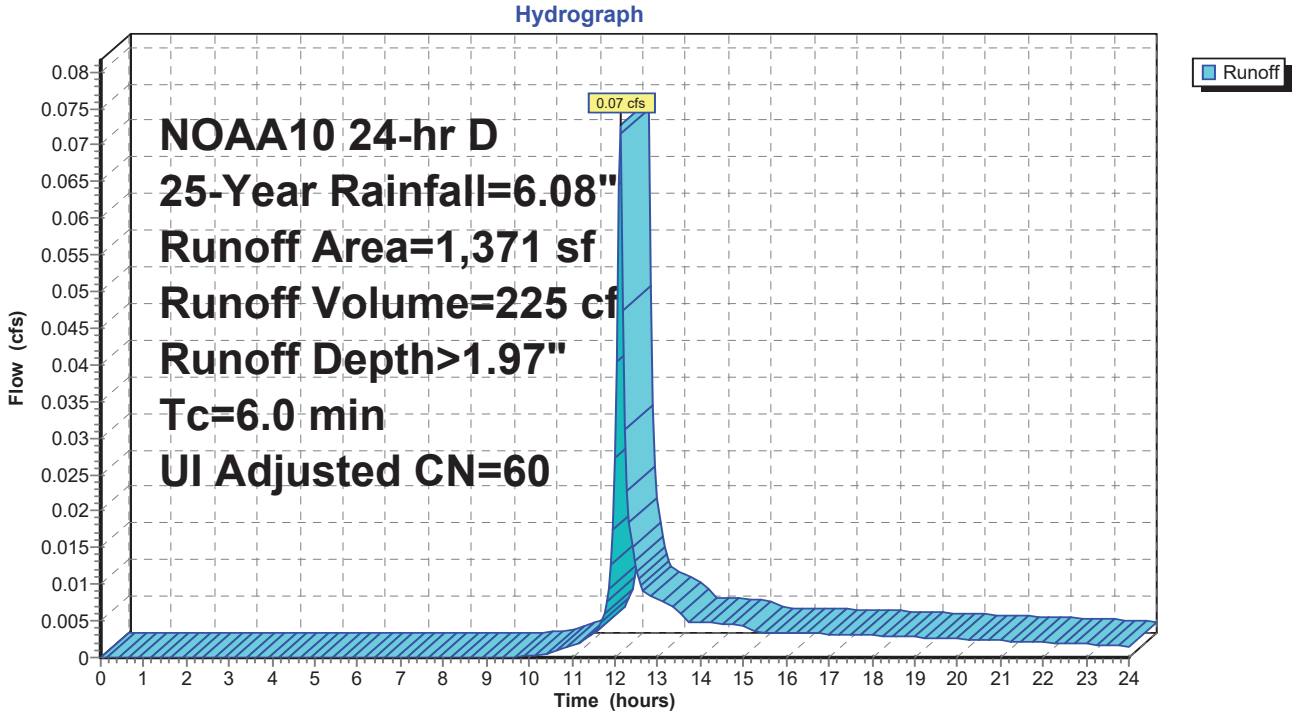
Runoff = 0.07 cfs @ 12.14 hrs, Volume= 225 cf, Depth> 1.97"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.08"

Area (sf)	CN	Adj	Description
985	61		>75% Grass cover, Good, HSG B
346	55		Woods, Good, HSG B
40	98		Unconnected roofs, HSG B
1,371	61	60	Weighted Average, UI Adjusted
1,331			97.08% Pervious Area
40			2.92% Impervious Area
40			100.00% Unconnected

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

Subcatchment C1-PR: C1-PR

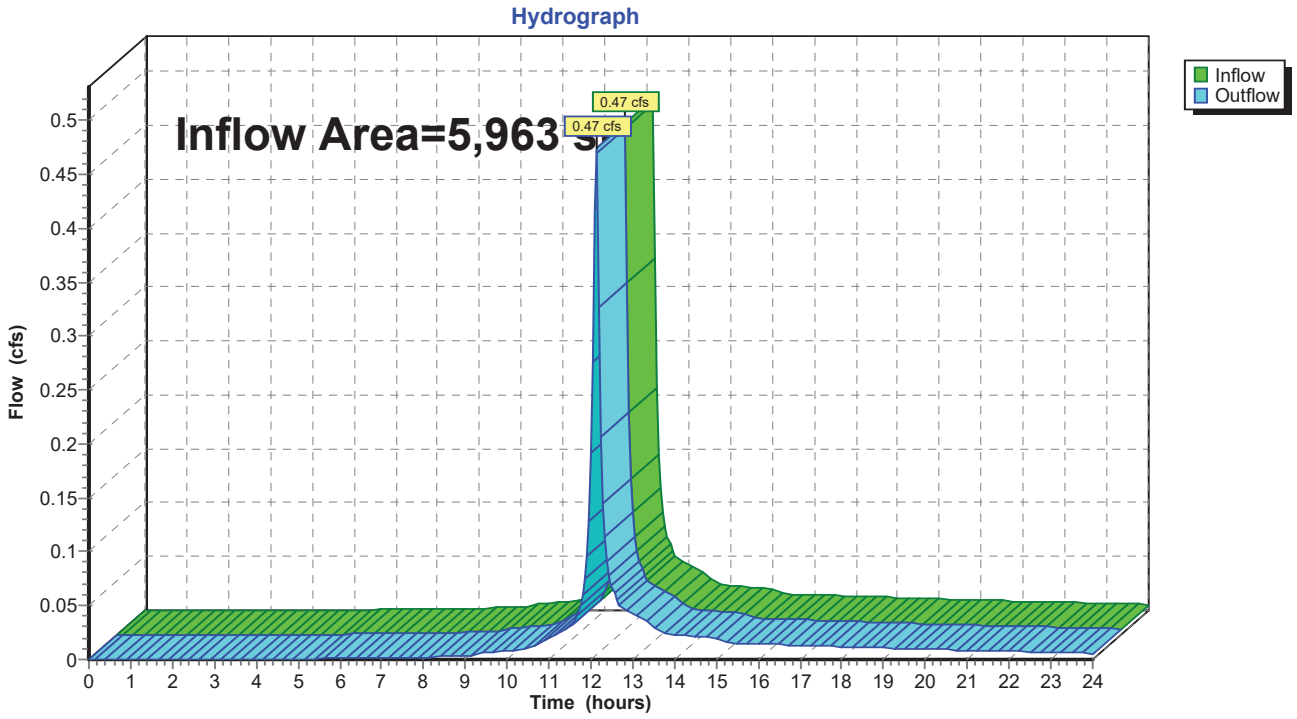


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 5,963 sf, 36.04% Impervious, Inflow Depth > 2.58" for 25-Year event
Inflow = 0.47 cfs @ 12.14 hrs, Volume= 1,282 cf
Outflow = 0.47 cfs @ 12.14 hrs, Volume= 1,282 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

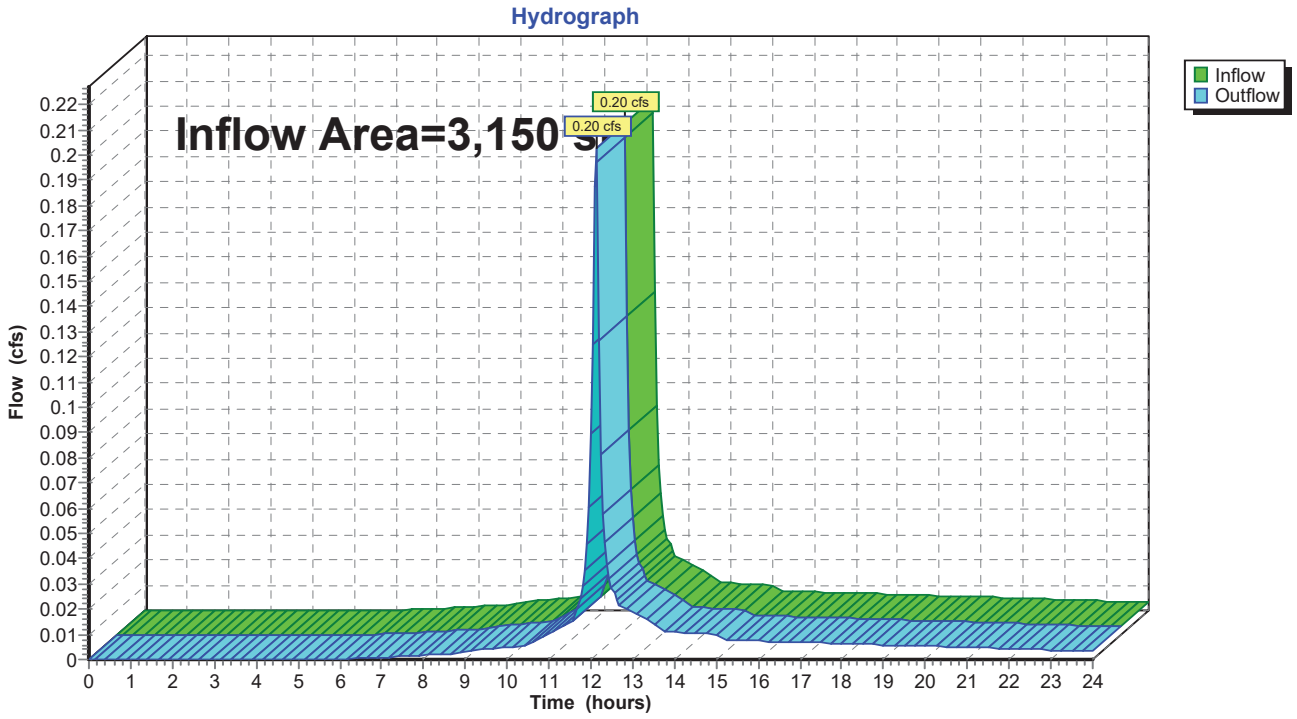


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 3,150 sf, 59.81% Impervious, Inflow Depth > 2.34" for 25-Year event
Inflow = 0.20 cfs @ 12.13 hrs, Volume= 613 cf
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 613 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

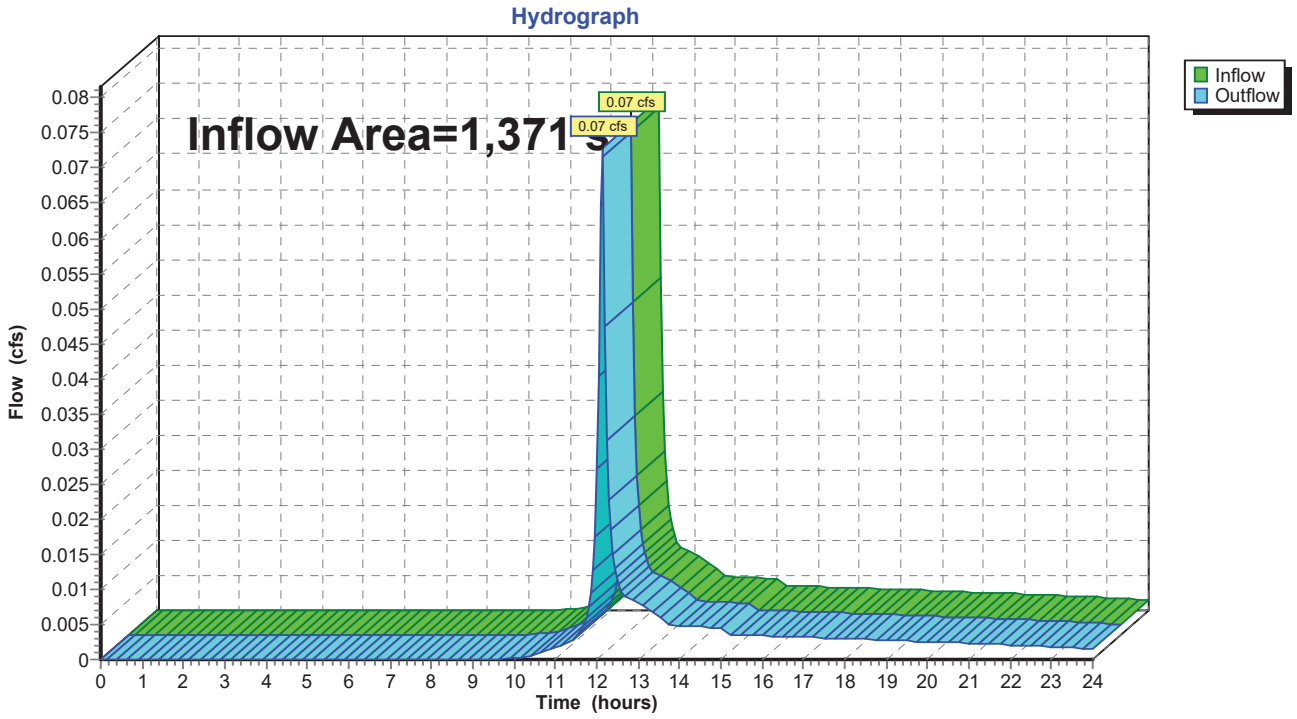


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,371 sf, 2.92% Impervious, Inflow Depth > 1.97" for 25-Year event
Inflow = 0.07 cfs @ 12.14 hrs, Volume= 225 cf
Outflow = 0.07 cfs @ 12.14 hrs, Volume= 225 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Pond 1P: French Drain A

Inflow Area = 1,571 sf, 89.43% Impervious, Inflow Depth > 5.84" for 25-Year event
Inflow = 0.21 cfs @ 12.13 hrs, Volume= 764 cf
Outflow = 0.21 cfs @ 12.14 hrs, Volume= 764 cf, Atten= 2%, Lag= 1.0 min
Discarded = 0.00 cfs @ 5.10 hrs, Volume= 297 cf
Primary = 0.21 cfs @ 12.14 hrs, Volume= 466 cf
Routed to Reach DP-A : WESTERN ABUTTER

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.80' @ 12.14 hrs Surf.Area= 168 sf Storage= 20 cf

Plug-Flow detention time= 3.9 min calculated for 764 cf (100% of inflow)
Center-of-Mass det. time= 3.3 min (749.8 - 746.4)

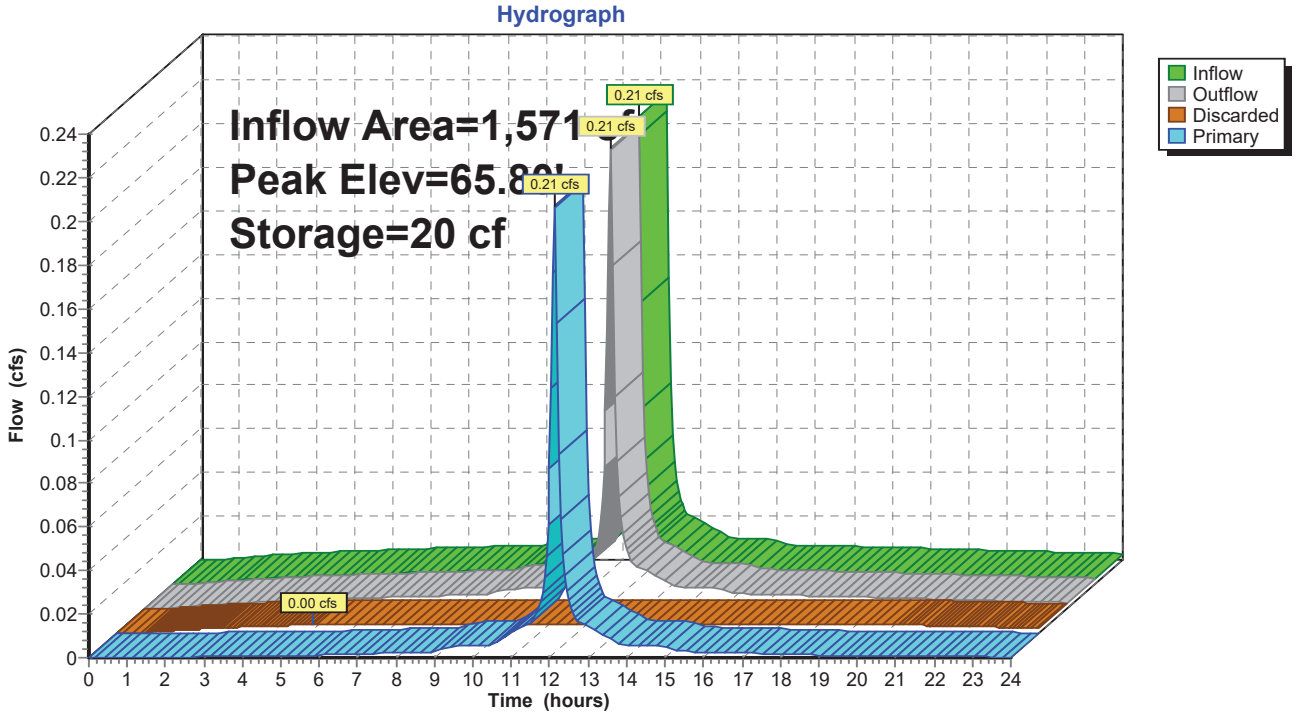
Volume	Invert	Avail.Storage	Storage Description
#1	65.50'	101 cf	**1.50'W x 112.00'L x 1.50'H French Drain** 252 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	65.50'	**8.0" Round Culvert** L= 24.0' Ke= 1.000 Inlet / Outlet Invert= 65.50' / 63.50' S= 0.0833 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Discarded	65.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 5.10 hrs HW=65.52' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.20 cfs @ 12.14 hrs HW=65.79' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.20 cfs @ 1.38 fps)

Pond 1P: French Drain A



Summary for Pond 2P: Subsurface System

Inflow Area = 1,014 sf,100.00% Impervious, Inflow Depth > 5.84" for 25-Year event
Inflow = 0.14 cfs @ 12.13 hrs, Volume= 493 cf
Outflow = 0.00 cfs @ 8.35 hrs, Volume= 301 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.00 cfs @ 8.35 hrs, Volume= 301 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.61' @ 16.41 hrs Surf.Area= 174 sf Storage= 224 cf

Plug-Flow detention time= 222.8 min calculated for 301 cf (61% of inflow)
Center-of-Mass det. time= 77.1 min (823.6 - 746.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.66'	151 cf	**10.25'W x 17.00'L x 3.21'H Field A** 559 cf Overall - 182 cf Embedded = 377 cf x 40.0% Voids
#2A	64.16'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		333 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.66'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 8.35 hrs HW=63.69' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Pond 2P: Subsurface System - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 5.0" Spacing = 52.0" C-C Row Spacing

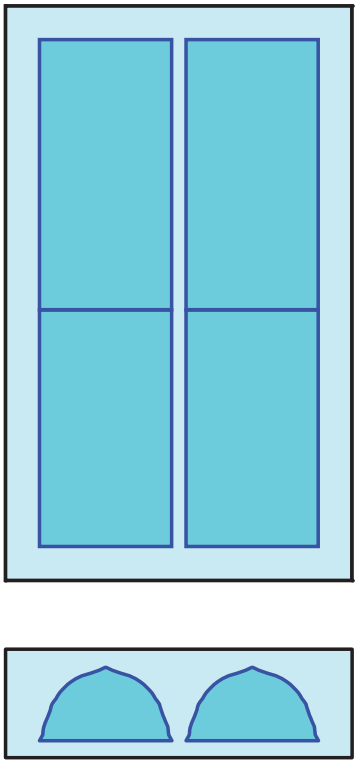
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +12.0" End Stone x 2 = 17.00' Base Length
2 Rows x 47.0" Wide + 5.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

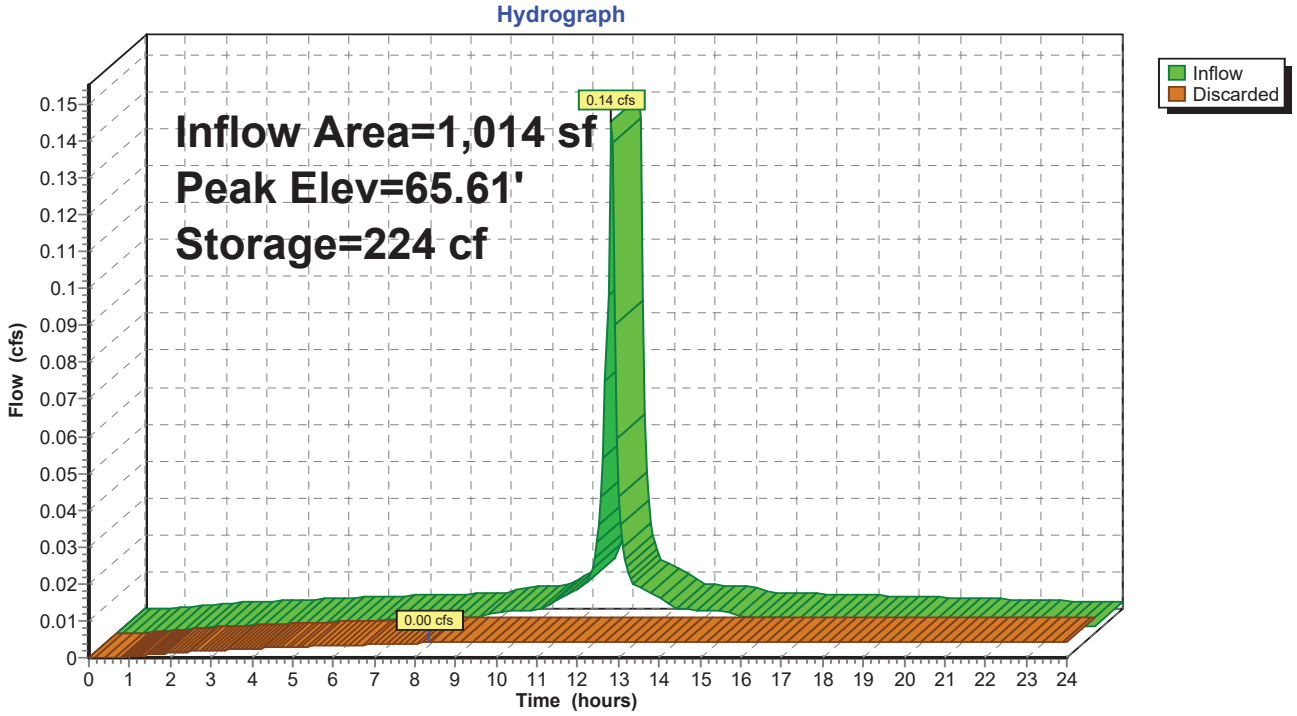
559.1 cf Field - 182.2 cf Chambers = 376.9 cf Stone x 40.0% Voids = 150.8 cf Stone Storage

Chamber Storage + Stone Storage = 332.9 cf = 0.008 af
Overall Storage Efficiency = 59.5%
Overall System Size = 17.00' x 10.25' x 3.21'

4 Chambers
20.7 cy Field
14.0 cy Stone



Pond 2P: Subsurface System



Summary for Subcatchment A1-PR: A1-PR

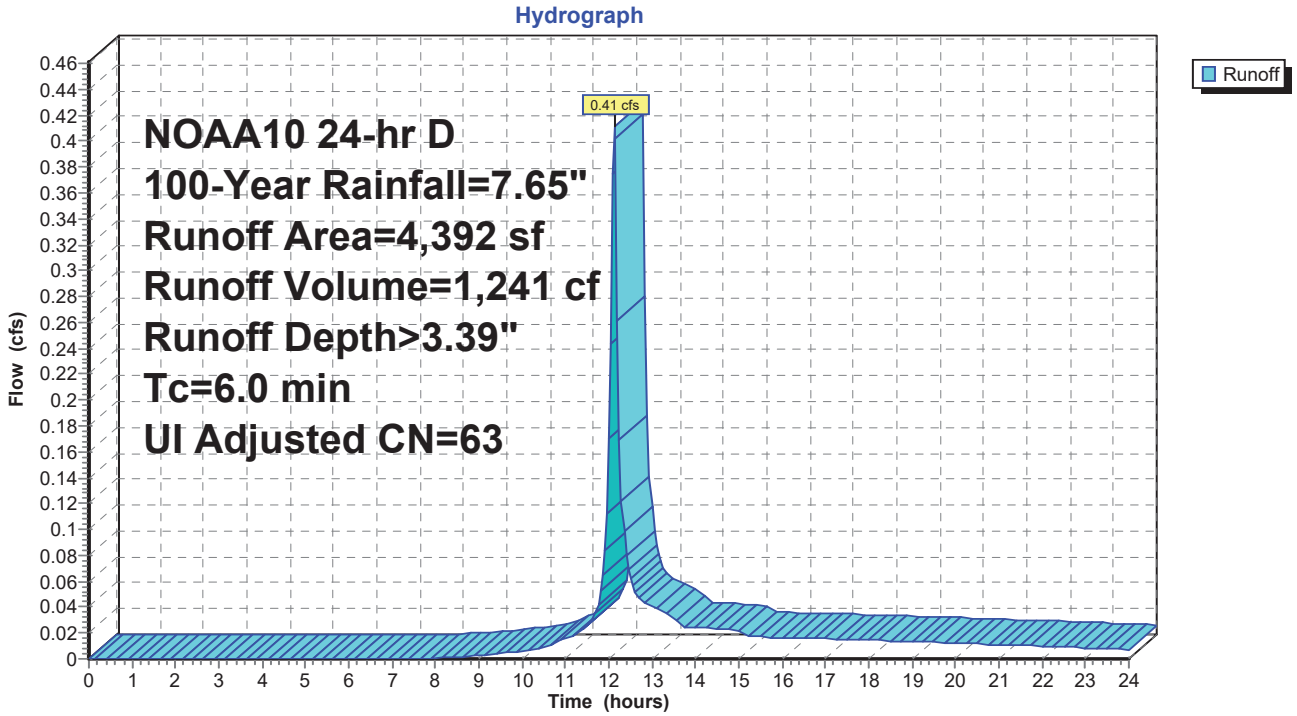
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 1,241 cf, Depth> 3.39"
Routed to Reach DP-A : WESTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Adj	Description
2,639	61		>75% Grass cover, Good, HSG B
515	98		Unconnected pavement, HSG B
1,009	55		Woods, Good, HSG B
229	98		Unconnected roofs, HSG B
4,392	66	63	Weighted Average, UI Adjusted
3,648			83.06% Pervious Area
744			16.94% Impervious Area
744			100.00% Unconnected

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

Subcatchment A1-PR: A1-PR



Summary for Subcatchment A2-PR: Roof Area

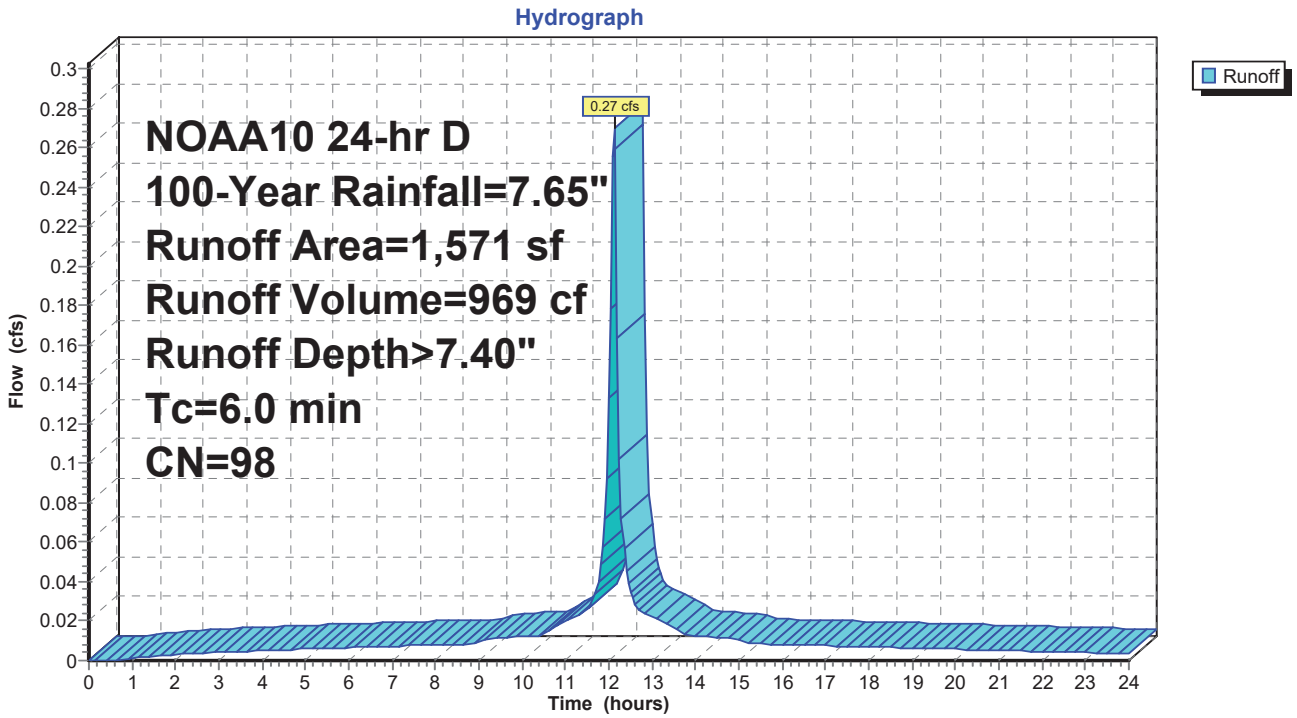
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 969 cf, Depth> 7.40"
Routed to Pond 1P : French Drain A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
1,405	98	Roofs, HSG B
166	96	Gravel surface, HSG B
1,571	98	Weighted Average
166		10.57% Pervious Area
1,405		89.43% Impervious Area

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

Subcatchment A2-PR: Roof Area



Summary for Subcatchment B1-PR: B1-PR

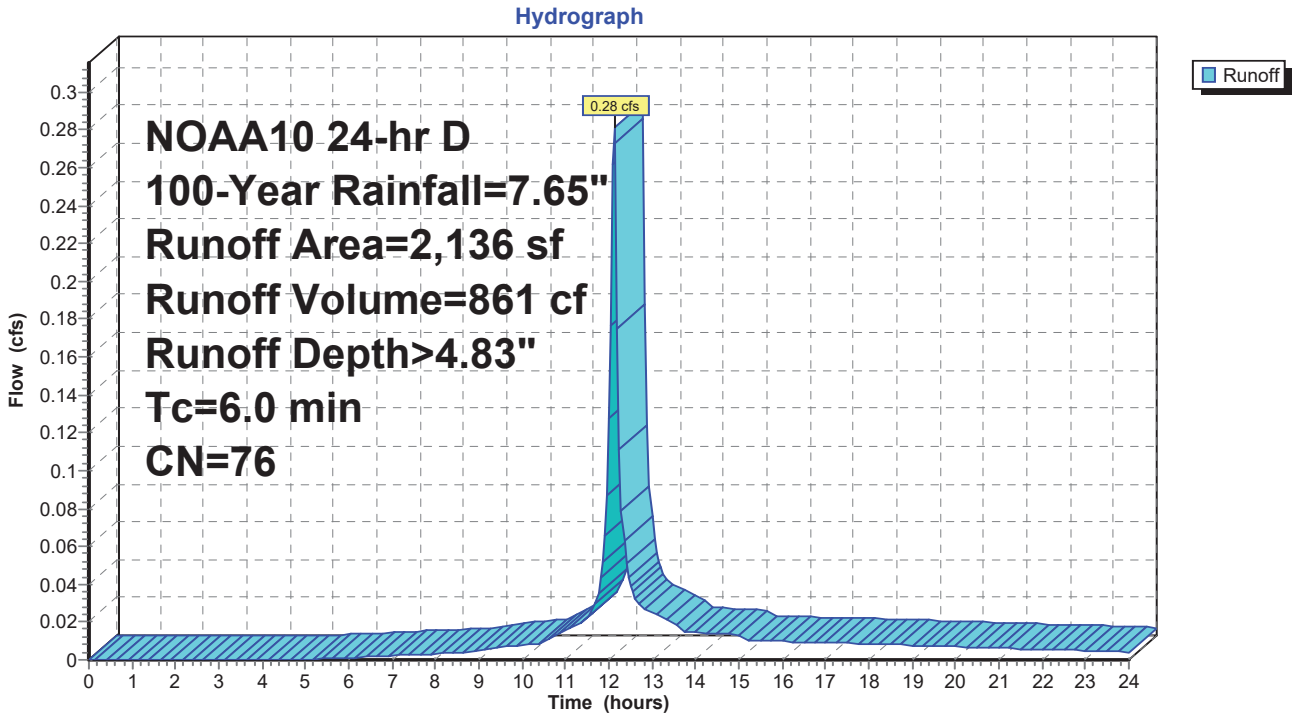
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 861 cf, Depth> 4.83"
Routed to Reach DP-B : DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
1,266	61	>75% Grass cover, Good, HSG B
870	98	Unconnected pavement, HSG B
2,136	76	Weighted Average
1,266		59.27% Pervious Area
870		40.73% Impervious Area
870		100.00% Unconnected

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

Subcatchment B1-PR: B1-PR



Summary for Subcatchment B2-PR: Roof Area B

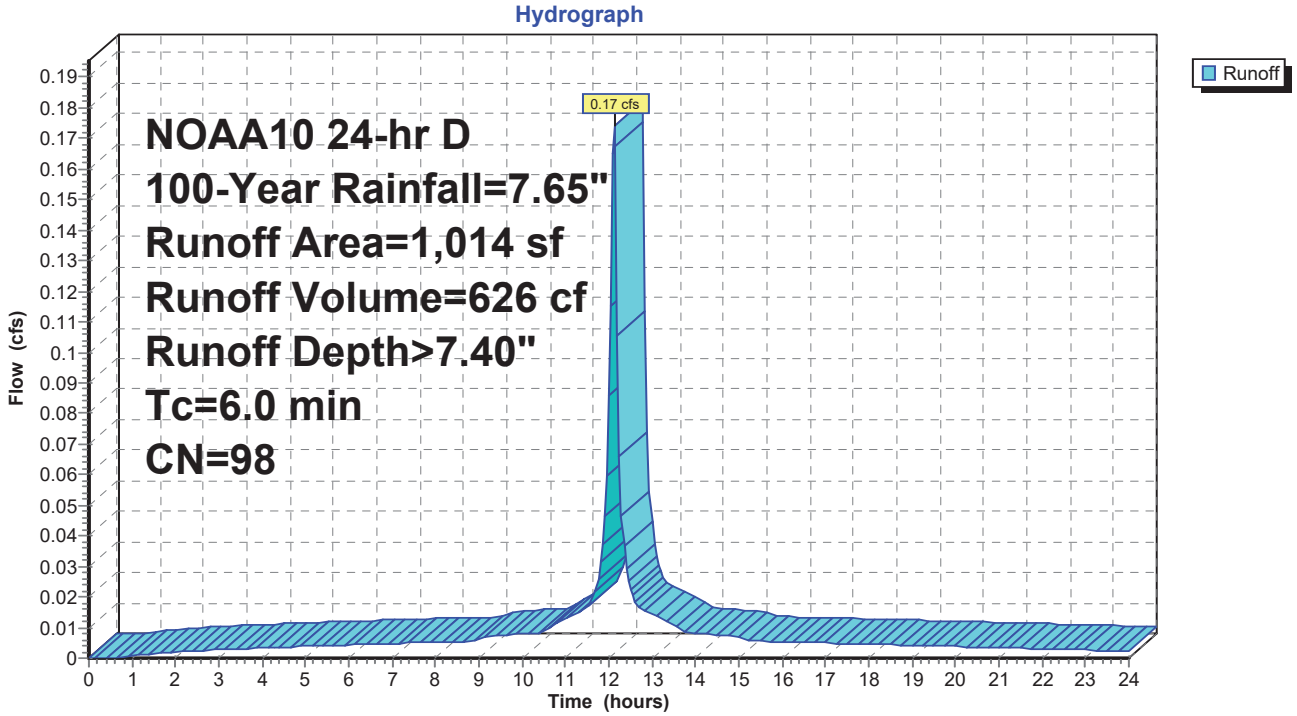
Runoff = 0.17 cfs @ 12.13 hrs, Volume= 626 cf, Depth> 7.40"
Routed to Pond 2P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Description
1,014	98	Roofs, HSG B
1,014		100.00% Impervious Area

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

Subcatchment B2-PR: Roof Area B



Summary for Subcatchment C1-PR: C1-PR

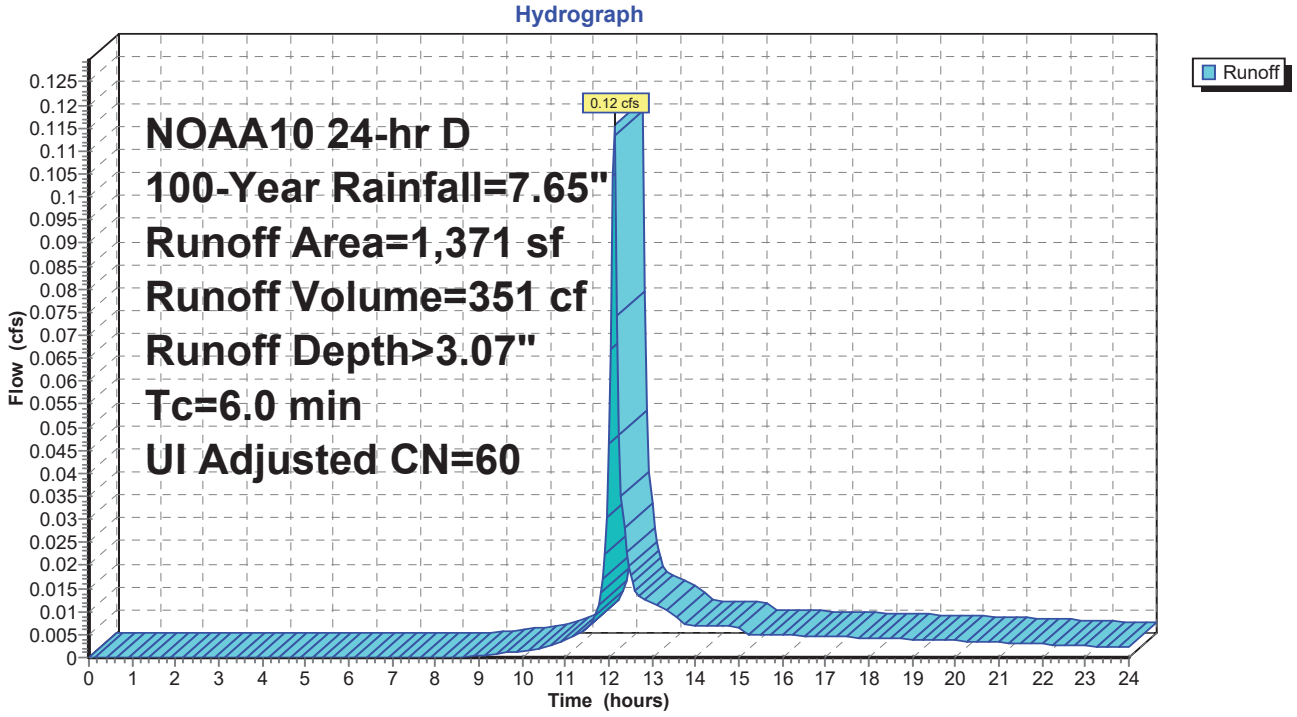
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 351 cf, Depth> 3.07"
Routed to Reach DP-C : EASTERN ABUTTER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=7.65"

Area (sf)	CN	Adj	Description
985	61		>75% Grass cover, Good, HSG B
346	55		Woods, Good, HSG B
40	98		Unconnected roofs, HSG B
1,371	61	60	Weighted Average, UI Adjusted
1,331			97.08% Pervious Area
40			2.92% Impervious Area
40			100.00% Unconnected

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

Subcatchment C1-PR: C1-PR

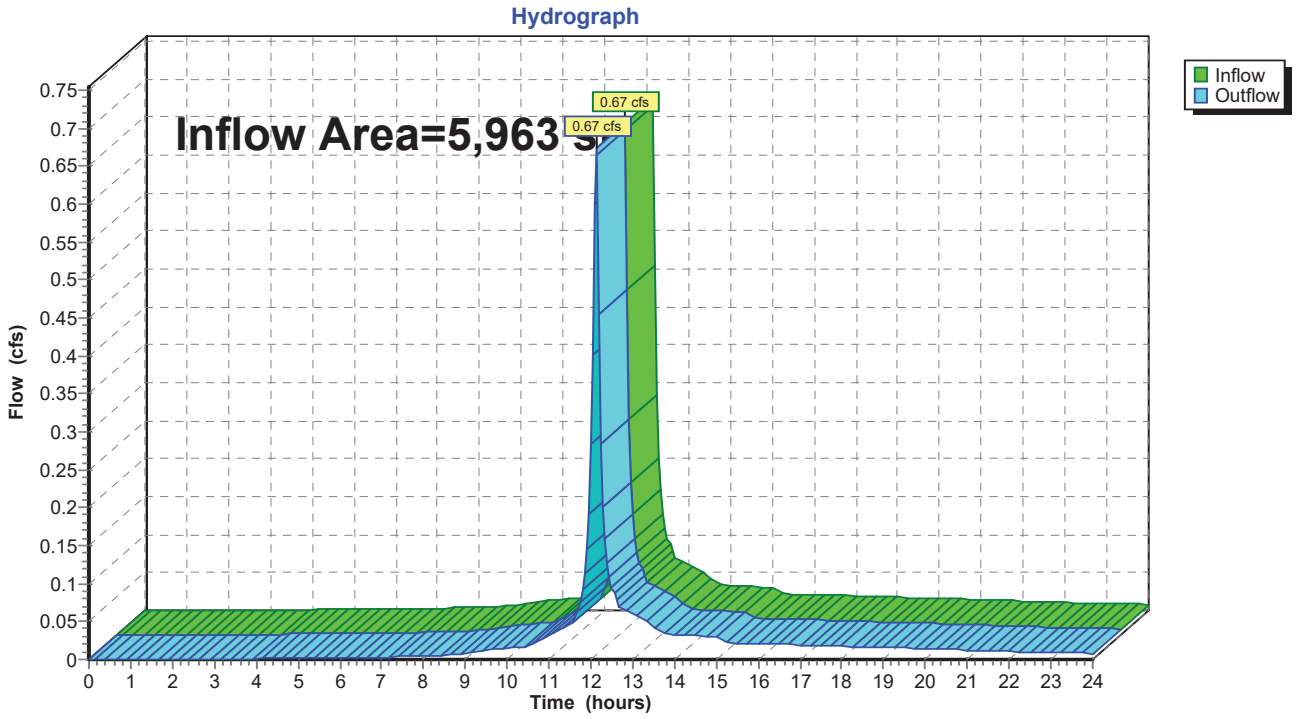


Summary for Reach DP-A: WESTERN ABUTTER

Inflow Area = 5,963 sf, 36.04% Impervious, Inflow Depth > 3.81" for 100-Year event
Inflow = 0.67 cfs @ 12.14 hrs, Volume= 1,894 cf
Outflow = 0.67 cfs @ 12.14 hrs, Volume= 1,894 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-A: WESTERN ABUTTER

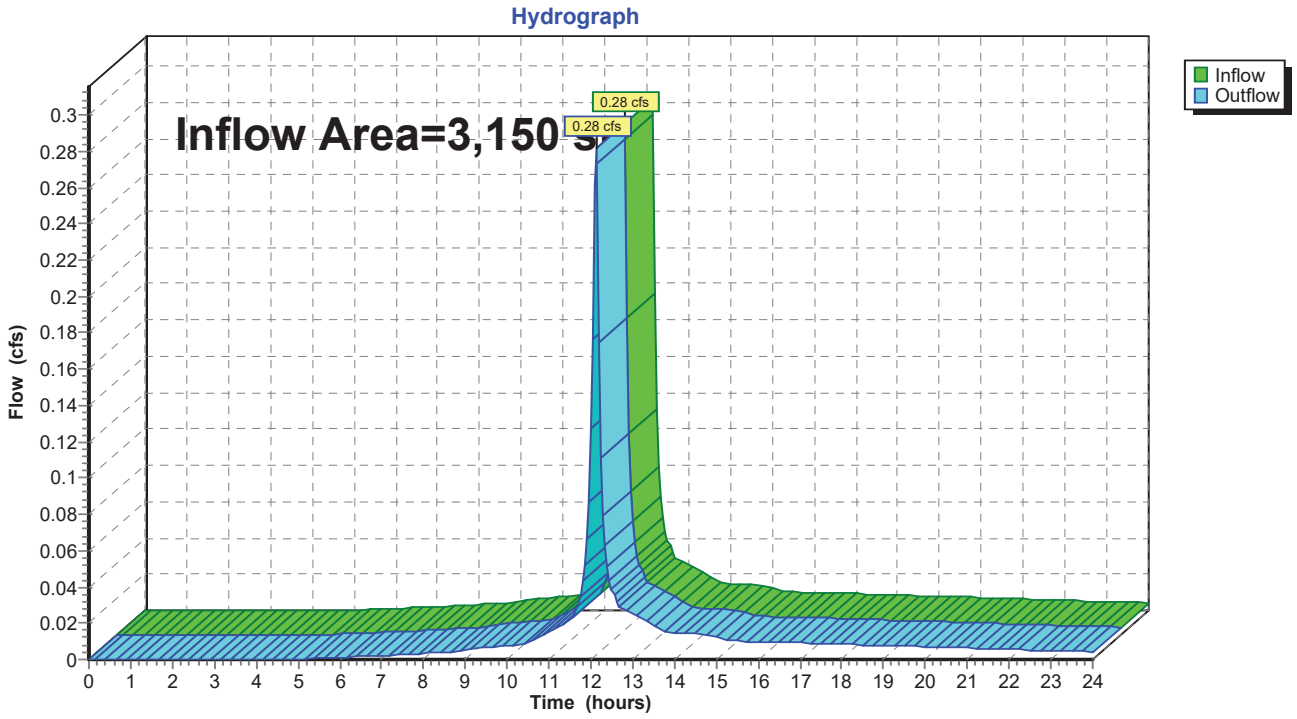


Summary for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Inflow Area = 3,150 sf, 59.81% Impervious, Inflow Depth > 3.28" for 100-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 861 cf
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 861 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

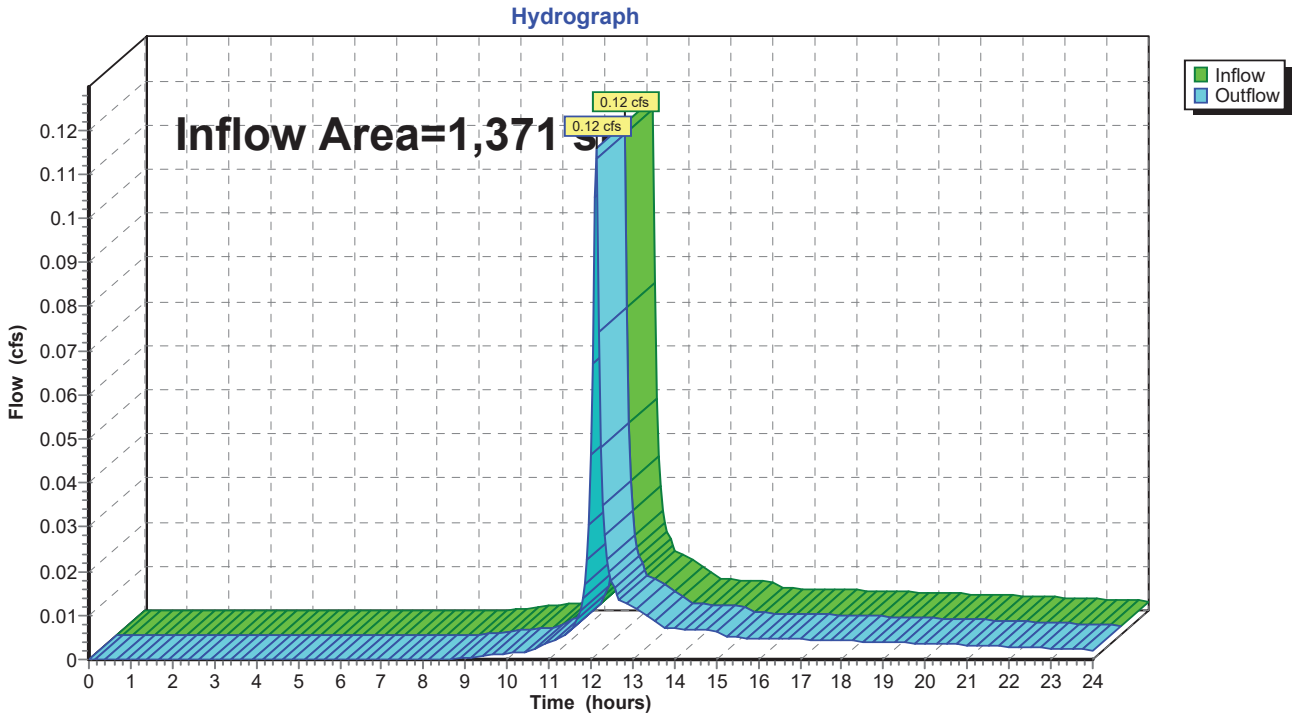


Summary for Reach DP-C: EASTERN ABUTTER

Inflow Area = 1,371 sf, 2.92% Impervious, Inflow Depth > 3.07" for 100-Year event
Inflow = 0.12 cfs @ 12.13 hrs, Volume= 351 cf
Outflow = 0.12 cfs @ 12.13 hrs, Volume= 351 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-C: EASTERN ABUTTER



Summary for Pond 1P: French Drain A

Inflow Area = 1,571 sf, 89.43% Impervious, Inflow Depth > 7.40" for 100-Year event
Inflow = 0.27 cfs @ 12.13 hrs, Volume= 969 cf
Outflow = 0.27 cfs @ 12.14 hrs, Volume= 969 cf, Atten= 1%, Lag= 0.9 min
Discarded = 0.00 cfs @ 3.40 hrs, Volume= 316 cf
Primary = 0.26 cfs @ 12.14 hrs, Volume= 653 cf
Routed to Reach DP-A : WESTERN ABUTTER

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 65.84' @ 12.14 hrs Surf.Area= 168 sf Storage= 23 cf

Plug-Flow detention time= 3.9 min calculated for 969 cf (100% of inflow)
Center-of-Mass det. time= 3.3 min (746.1 - 742.8)

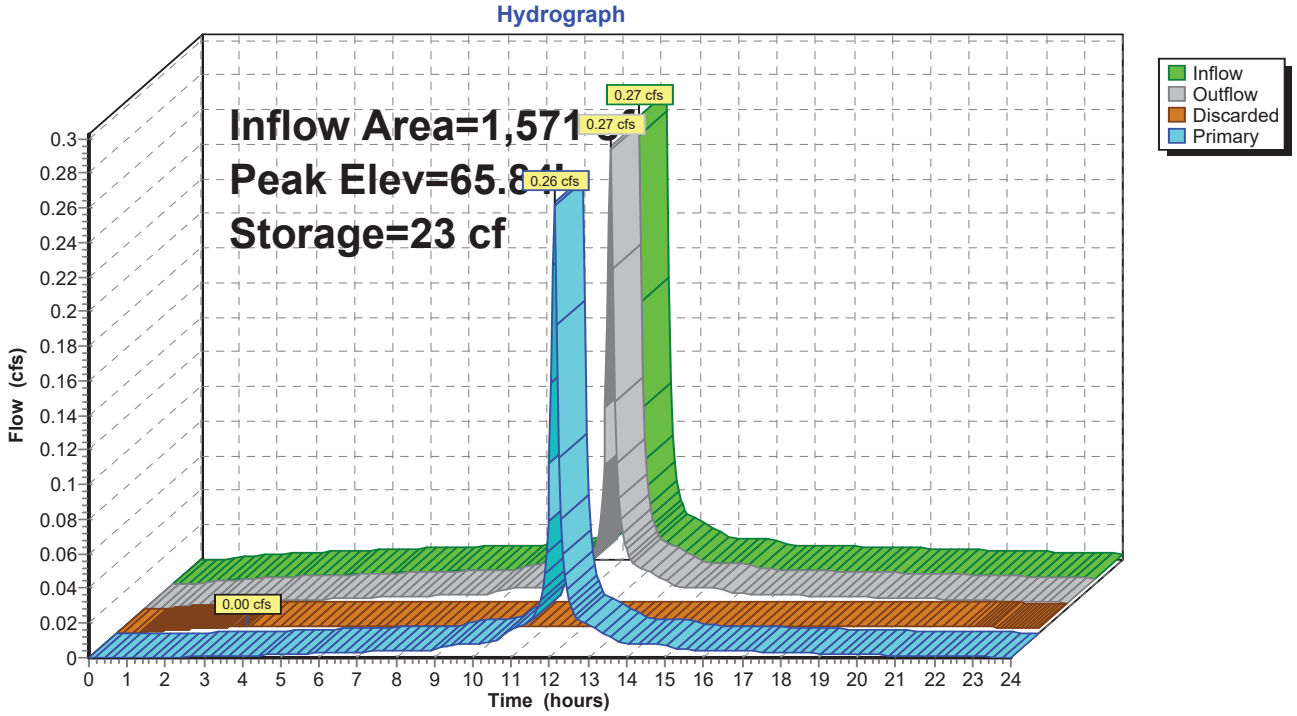
Volume	Invert	Avail.Storage	Storage Description
#1	65.50'	101 cf	**1.50'W x 112.00'L x 1.50'H French Drain** 252 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	65.50'	**8.0" Round Culvert** L= 24.0' Ke= 1.000 Inlet / Outlet Invert= 65.50' / 63.50' S= 0.0833 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Discarded	65.50'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 3.40 hrs HW=65.52' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.26 cfs @ 12.14 hrs HW=65.83' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.26 cfs @ 1.47 fps)

Pond 1P: French Drain A



Summary for Pond 2P: Subsurface System

Inflow Area = 1,014 sf,100.00% Impervious, Inflow Depth > 7.40" for 100-Year event
Inflow = 0.17 cfs @ 12.13 hrs, Volume= 626 cf
Outflow = 0.00 cfs @ 5.75 hrs, Volume= 318 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.75 hrs, Volume= 318 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 66.75' @ 19.11 hrs Surf.Area= 174 sf Storage= 325 cf

Plug-Flow detention time= 226.1 min calculated for 317 cf (51% of inflow)
Center-of-Mass det. time= 51.5 min (794.2 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.66'	151 cf	**10.25'W x 17.00'L x 3.21'H Field A** 559 cf Overall - 182 cf Embedded = 377 cf x 40.0% Voids
#2A	64.16'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		333 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.66'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 5.75 hrs HW=63.69' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Pond 2P: Subsurface System - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 5.0" Spacing = 52.0" C-C Row Spacing

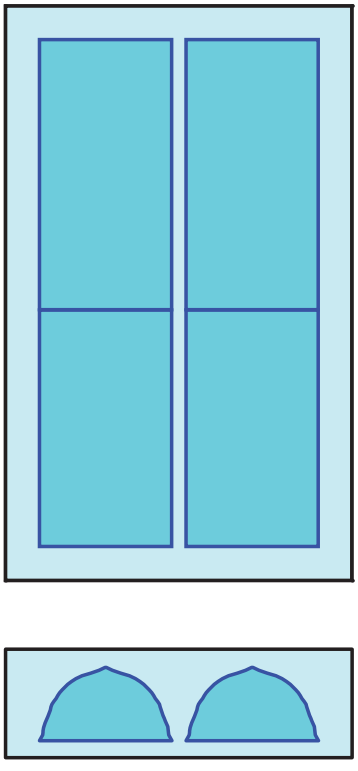
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +12.0" End Stone x 2 = 17.00' Base Length
2 Rows x 47.0" Wide + 5.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

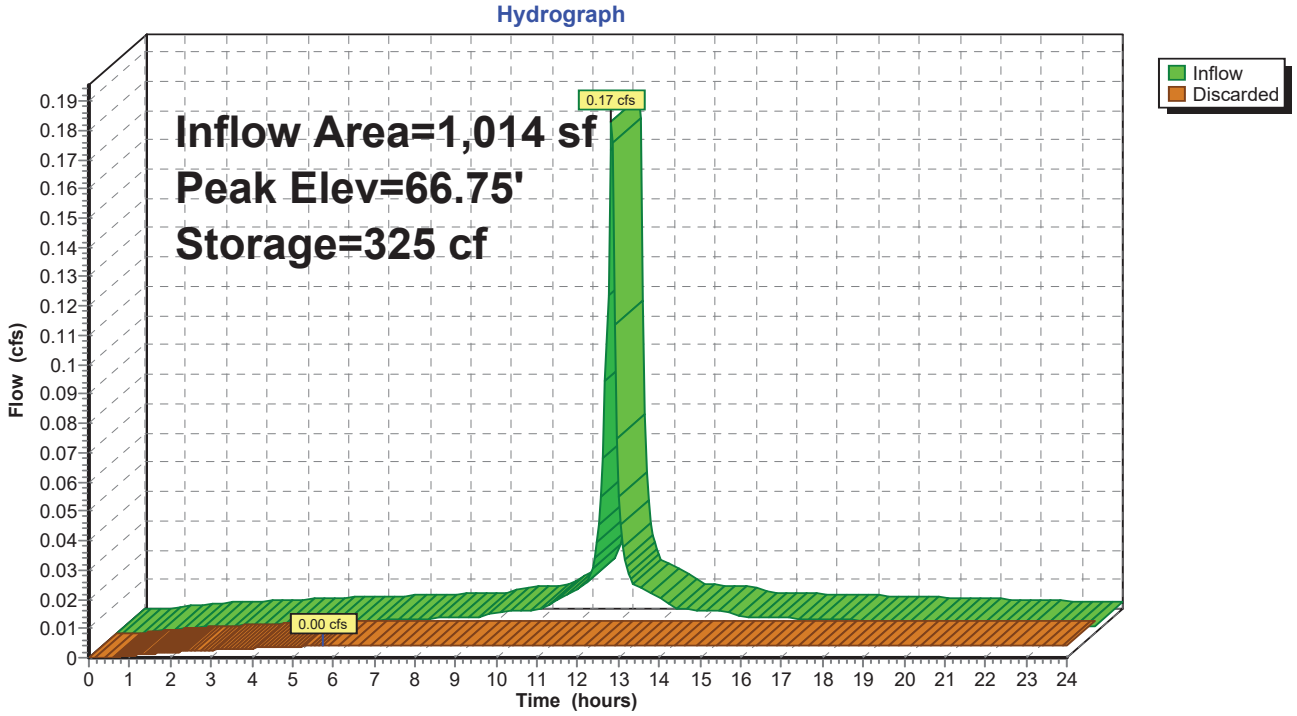
559.1 cf Field - 182.2 cf Chambers = 376.9 cf Stone x 40.0% Voids = 150.8 cf Stone Storage

Chamber Storage + Stone Storage = 332.9 cf = 0.008 af
Overall Storage Efficiency = 59.5%
Overall System Size = 17.00' x 10.25' x 3.21'

4 Chambers
20.7 cy Field
14.0 cy Stone



Pond 2P: Subsurface System



Events for Subcatchment A1-PR: A1-PR

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.06	229	0.62
10-Year	5.06	0.18	565	1.54
25-Year	6.08	0.27	816	2.23
100-Year	**7.65**	**0.41**	**1,241**	**3.39**

Events for Subcatchment A2-PR: Roof Area

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.12	418	3.19
10-Year	5.06	0.18	631	4.82
25-Year	6.08	0.21	764	5.84
100-Year	**7.65**	**0.27**	**969**	**7.40**

Events for Subcatchment B1-PR: B1-PR

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.08	234	1.31
10-Year	5.06	0.15	460	2.58
25-Year	6.08	0.20	613	3.44
100-Year	**7.65**	**0.28**	**861**	**4.83**

Events for Subcatchment B2-PR: Roof Area B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.08	270	3.19
10-Year	5.06	0.12	407	4.82
25-Year	6.08	0.14	493	5.84
100-Year	**7.65**	**0.17**	**626**	**7.40**

Events for Subcatchment C1-PR: C1-PR

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.43	0.01	57	0.50
10-Year	5.06	0.05	152	1.33
25-Year	6.08	0.07	225	1.97
100-Year	**7.65**	**0.12**	**351**	**3.07**

Events for Reach DP-A: WESTERN ABUTTER

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.18	0.18	**0.00**	**0**
10-Year	0.35	0.35	0.00	0
25-Year	0.47	0.47	0.00	0
100-Year	**0.67**	**0.67**	0.00	0

Events for Reach DP-B: DEL PRETE DRIVE (MUNICIPAL SYSTEM)

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.08	0.08	**0.00**	**0**
10-Year	0.15	0.15	0.00	0
25-Year	0.20	0.20	0.00	0
100-Year	**0.28**	**0.28**	0.00	0

Events for Reach DP-C: EASTERN ABUTTER

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.01	0.01	**0.00**	**0**
10-Year	0.05	0.05	0.00	0
25-Year	0.07	0.07	0.00	0
100-Year	**0.12**	**0.12**	0.00	0

Events for Pond 1P: French Drain A

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.12	0.12	**0.00**	0.11	65.71	14
10-Year	0.18	0.17	0.00	0.17	65.77	18
25-Year	0.21	0.21	0.00	0.21	65.80	20
100-Year	**0.27**	**0.27**	0.00	**0.26**	**65.84**	**23**

Events for Pond 2P: Subsurface System

Event	Inflow (cfs)	Discarded (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.08	**0.00**	64.59	93
10-Year	0.12	0.00	65.17	170
25-Year	0.14	0.00	65.61	224
100-Year	**0.17**	0.00	**66.75**	**325**

Groundwater Recharge Calculations

App C

Project Name: Single Family Home Redevelopment
Project Location: Hingham, MA
Project Number: 356-812

Date: 2/4/2026
Calculated By: MKB
Checked By: DSK

OVERALL SITE RECHARGE

Existing Conditions Impervious Area

Hydraulic Soil Group	Area (sq ft)	Area (acres)	Recharge Depth (in)	Volume (cu ft)
A	0	0.00	0.60	0
B	3,449	0.08	0.35	101
C	0	0.00	0.25	0
D	0	0.00	0.10	0
TOTAL	**3,449**	**0.08**		**101**

Proposed Conditions Impervious Area

Hydraulic Soil Group	Area (sq ft)	Area (acres)	Recharge Depth (in)	Volume (cu ft)
A	0	0.00	0.60	0
B	4,239	0.10	0.35	124
C	0	0.00	0.25	0
D	0	0.00	0.10	0
TOTAL	**4,239**	**0.10**		**124**

Net Required Recharge Volume: 23 cu ft

Capture Area Adjustment

* Impervious Area to Recharge Facility: 0.06 ac
Total Site Impervious Area: 0.10 ac
** Impervious Ratio: 1.62

* (entire roof area)

** (Total Site Impervious / Impervious Area to Recharge Facility)

Adjusted Required Recharge Volume: 37 cu ft

Provided Recharge

Provided Recharge Volume:	**433 cf**
	0.010 ac ft

Water Quality Volume Provided by Infiltration Trench P1	101	sq ft
Water Quality Volume Provided by Subsurface Infiltration System P2	332	sq ft

Groundwater Recharge Calculations

Project Name:	Single Family Home Redevelopment	Date:	2/4/2026
Project Location:	Hingham, MA	Calculated By:	MKB
Project Number:	356-812	Checked By:	DSK

Stormwater BMP: Subcatchment B2-PR Description: Cultec R-280HD (2P)

Provided Recharge Volume

Bottom of Stone: 63.66 ft

Exfiltration is the only outlet

*** Recharge Provided: 332 cu ft *** (See attached HydroCAD output)

Total Provided 332 cu ft

72-hour Drawdown Calculation

Provided Recharge Volume:	332	cu ft	
Saturated Hydraulic Conductivity:	1.02	in / hr	(Rawls Rate for HSG B was used)
Bottom Area:	174	sq ft	
Drawdown Time:	**22.4**	**hours**	

ILLICIT DISCHARGE COMPLIANCE STATEMENT

I VERIFY THAT NO ILLICIT DISCHARGES EXIST FROM THE PROPOSED SINGLE FAMILY HOME REDEVELOPMENT AT 4 DEL PRETE DRIVE, HINGHAM, MASSACHUSETTS. THROUGH THE IMPLEMENTATION OF THE *CONSTRUCTION PERIOD POLLUTION PREVENTION AND SEDIMENTATION AND EROSION CONTROL PLAN* AS WELL AS THE *OPERATION AND MAINTENANCE PLAN*, MEASURES ARE SET FORTH TO PREVENT ILLICIT DISCHARGES FROM ENTERING THE STORMWATER MANAGEMENT DRAINAGE SYSTEM.

	MEGHAN BRUCKMAN	02-06-2026
SIGNATURE	**PRINT NAME**	**DATE**

PROJECT MANAGER	Civil and Environmental Consultants, Inc.
TITLE	**COMPANY**

SIGNATURE	**PRINT NAME**	**DATE**

TITLE	**COMPANY**

NOTE: THIS CERTIFICATION MUST BE SIGNED BEFORE STORMWATER IS CONVEYED TO THE PROPOSED STORMWATER DRAINAGE SYSTEM IN ACCORDANCE WITH STANDARD 10 OF THE MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS.

APPENDIX D

SITE PLAN SET

(UNDER SEPARATE COVER)