Stormwater Report

for

Veterans Memorial Drive Extension Subdivision
Franklin, MA

Date: April 3, 2024

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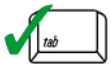
F-4598

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

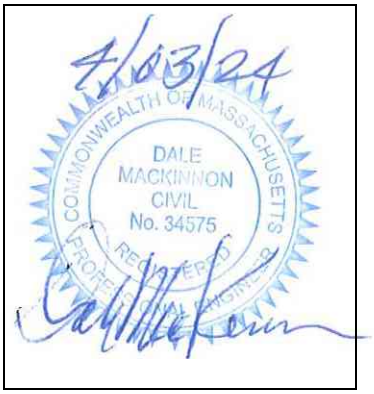
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

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

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Table of Contents

- Narrative
- Stormwater Design Parameters
- Massachusetts Stormwater Management Standards 1-10

Attachments

Pre and Post Watershed Development Condition

- Hydro CAD Calculations

  (Pre-Post Development Conditions 2, 10, 25, 100-Year Storm Events)
- Street Drain Calculations – Rational Method and Catchment Area Calculation
- NCRS Soil Survey
- Basin Drawdown Tabulation for (100-Yr)
- TSS Removal Calculations
- Contech worksheet

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NARRATIVE

This report was prepared on behalf of the applicant, Franklin Municipal Affordable Housing Trust Fund. The land to be subdivided and developed encompasses an area of 736,120 +/- sf. (16.90 +/-Ac.) owned and to be developed by the applicant. The property is bordered by a residential neighborhood to the north, Franklin High School to the east, Eaton Place to the southeast, condominiums/apartments to the south, and a solar farm associated with Tri-County High School to the west. The site is located within the Rural Residential II zoning district and has primary site access from Veterans Memorial Drive, and secondary access is possible from Irondequoit Road. Portions of the site contain bordering vegetated wetlands and their associated jurisdictional buffers, and the site is not located within the Franklin water resource district. The site is presently undeveloped. A 40B Development, "Franklin Ridge Senior Housing", is in the permitting phase for construction on Lot 1A by the developer JNJuhl and Assoc., LLC. Due to the interconnected nature of these two projects, the site and drainage design for Franklin Ridge is included within this project's stormwater report and site plans so that the full buildout of the site is more easily understood.

PROJECT DESCRIPTION

The Applicant is proposing to construct a town owned extension to Veterans Memorial Drive, approximately 1110' in length, starting from Eaton Place and extending northwest across the project parcel to connect to the existing stub of Irondequoit Road. The connection to Irondequoit Road is to be gated and for emergency use only. The new road is proposed to service the 40B "Franklin Ridge Senior Housing" residential development and two additional lots. Drainage infrastructure associated with the new development will also be constructed. The topography consists of slopes ranging from 0% to 25% grade.

DESCRIPTION OF EXISTING DRAINAGE

The pre-developed site drains principally from west to east, with portions of the site draining to the south. The pre-development drainage area is modeled as four hydrologic areas. These hydrologic areas are shown on the Pre-Development Watershed Plan attached to this report and are denoted as EX-1 through EX-4.

EX-1 contains approximately 136,828 square feet of contributing area, consisting primarily of woodland located in the southwest of the property. Runoff from this hydrologic area flows overland to the "GC-series" wetlands, where it is conveyed by a natural wooded swale to the southern abutting condominium property, AP-1.

EX-2 contains approximately 506,133 square feet of contributing area, consisting of woodland and rear yards of several lots fronting on Mucciarone Road (roof, lawn, and woodland). Runoff from this hydrologic area flows overland from west to northeast to the northeastern property line, where it is collected by an offsite natural swale and is conveyed to the Franklin High School property, AP-2.

EX-3 contains approximately 204,248 square feet of contributing area, consisting primarily of woodland located in the south and middle of the property. Runoff from this hydrologic area flows overland to the east, where it is captured by the existing drainage infrastructure on the Eaton Place site, AP-3.

EX-4 contains approximately 4,999 square feet of contributing area, consists primarily of grass and is located to the north, adjacent to the Irondequoit Rd stub. Runoff from this hydrologic area flows overland to the north, where it is captured by the existing drainage infrastructure within the roadway, AP-4.

discharging to the catch basins. Additionally, 0.94 acres of contributing area from the fields and existing house west of the project area drains to the wetlands located in the southwest corner of the project parcel.

DESCRIPTION OF PROPOSED DRAINAGE FACILITIES

Due to the interconnected nature of the sites, the drainage for the proposed roadway and for the 40B development were analyzed together within the HydroCAD model. The proposed drainage system to manage stormwater from the roadway construction and 40B development consists of Deep Sump Hooded Catch Basins, Sediment Forebays, Infiltration Basins, Subsurface Chamber Systems, and Detention Basins. Stormwater from sidewalks, driveways, and roadways are collected and conveyed by a conventional catch basin and drain manhole system to the sediment forebays, infiltration basins, chamber systems, and detention basins for treatment, detention, and infiltration. Stormwater from the roof of the proposed building is directed to the proposed detention basin or chambers prior to being conveyed to the forebays/infiltration basins for infiltration.

In the Post-Development condition, ten hydrologic areas were considered. These watershed areas consider the pavement, lawns, sidewalks, roofs, and drainage facilities proposed to be constructed. These hydrologic areas are shown on the Post-Development Watershed Plan attached to this report and are denoted as PR-1 through PR-10.

PR-1 contains approximately 133,315 square feet of contributing area and includes all land which drains directly to Infiltration Basin #1. Runoff is captured by catch basins and is conveyed to the East and then discharged to the sediment forebay and infiltration basin for treatment, detention, and infiltration.

PR-2 contains approximately 59,024 square feet of contributing area and includes all land which drains directly to Chamber System #1 & Infiltration Basin #2. Runoff is captured by catch basins and is conveyed to the East and then discharged to the chamber system, sediment forebay and infiltration basin for treatment, detention, and infiltration.

PR-3 contains approximately 82,428 square feet of contributing area and includes all land which drains directly to Chamber System #2 & Infiltration Basin #3. Runoff is captured by catch basins and is conveyed to the East and then discharged to the chamber system, sediment forebay and infiltration basin for treatment, detention, and infiltration.

PR-4 contains approximately 16,000 square feet of contributing area and includes all land which drains directly to Detention Basin #1, including the northern half of the roof of the proposed building. Runoff is conveyed to the East and then discharged to the detention basin for detention prior to being conveyed to Infiltration Basin #2.

PR-5 contains approximately 19,916 square feet of contributing area and includes all land which drains directly to Detention Basin #2. Runoff flows overland to the east directly to the basin detention prior to being conveyed to Infiltration Basin #2.

PR-6 contains approximately 12,492 square feet of contributing area and includes the southern half of the roof of the proposed building, discharging directly to Detention Basin #3. Runoff is conveyed to the East and then discharged to Infiltration Basin #3.

PR-7 contains approximately 49,112 square feet of contributing area and includes all land not captured by the proposed drainage improvements flowing directly to Eaton Place to the east. Runoff flows overland to the existing drainage infrastructure of Eaton Place.

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PR-8 contains approximately 137,043 square feet of contributing area and includes all land east of the proposed road not captured by the proposed drainage improvements, flowing to Franklin High School to the east. Runoff flows overland to the northeastern property line and the existing drainage infrastructure of Franklin High School.

PR-9 contains approximately 136,727 square feet of contributing area and drains southerly from the wetlands on the western portion of the site to the abutting residential condominiums.

PR-10 contains approximately 206,274 square feet of contributing area and includes all land west of the proposed roadway which is captured by proposed headwalls 1& 2. Runoff is conveyed under the proposed roadway by a conventional pipe and manhole system, where it is discharged overland to the northeastern property line and the existing drainage infrastructure of Franklin High School.

This report documents design compliance with the applicable sections of the Massachusetts Stormwater Management Standards 1-10.

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Stormwater Design Parameter:

The stormwater management system was designed to control the post-development rate of peak rainfall runoff from the site by keeping it below the post-development peak rate of rainfall runoff as stated as the objective in the Massachusetts Stormwater Handbook. The calculations were performed using the HydroCAD hydraulic program, developed by applied Microcomputer System. The HydroCAD software is based upon the Soil Conservation Service, "Technical Release 55 – Urban Hydrology for Small Watersheds" and is generally accepted industry methodology.

The analysis was performed for the 2-year, 10-year, 25-year, and 100-year 24-hour storm events.

The following data was required for input:

- Watershed Area: Areas of each watershed were calculated and expressed in square feet for these calculations.
- SCS Curve Number (Cn): Based on the cover type and hydrologic soil group, a weighted curve number (CN) was determined for each of the existing watersheds utilizing Table 2-2a- *Runoff Curve Numbers For Urban Areas* and *Worksheet 2, Runoff Curve Number and Runoff* from the Soil Conservation Service Technical Release 55 – Urban Hydrology for Small Watersheds.
- Time of Concentration, Tc (Minutes): The time of concentration for each watershed was determined by finding the time necessary for runoff to travel from the hydraulically most distant point in the watershed to the point of analysis. This was calculated by using a minimum time of 6 minutes for runoff to reach the most distant catch basin.
- SCS 24-Hour Storm Type: For the greater New England region, a Type III storm rainfall distribution is recommended for drainage calculations and was used for this project.
- Rainfall Precipitation: Rainfall precipitations used the Atlas-14 Volume 10, Version 3 rainfall estimates for the site, obtained from the NOAA Precipitation Frequency Data Server (PFDS) for the 2, 10, 25, and 100 year storm events and are as follows:

2-year storm event:	3.39 inches
10-year storm event:	5.25 inches
25-year storm event:	6.41 inches
100-year storm event:	8.19 inches

An on-site conventional storm drainage collection system is designed based on the "Rational Method" using Manning's equation to carry a minimum 25-year storm event and underground culverts to carry a minimum 50-year storm event through the site (See Pipe Sizing Attachments). The proposed drainage pipes will be Reinforced Concrete Pipe (RCP), unless otherwise noted on the plans.

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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.

All runoff from impervious areas will sheet flow across the pavement areas, accumulate into hooded catch basins, connect with drain pipe to a chamber system with separator row or sediment forebay, and discharge to the infiltration basins. No new untreated stormwater discharges are proposed.

Standard 2: Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates.

To meet Standard 2, the post-development peak discharge rate must be equal to or less than pre-development rates to prevent storm damage and downstream and offsite flooding from the 2-year and the 10-year 24-hour storm events.

Peak discharge rates volumes were calculated and evaluated at four analysis points. The point of evaluation is shown on the accompanying watershed plans.

In summary of the attached drainage analysis (HydroCAD), the peak discharge rates at the point of evaluation in cubic feet per second (cfs) are as follows;

	Run off		
Storm Events	Pre-dev. (cfs)[af]	Proposed (cfs)[af]	Change (cfs)[af]
Analysis Point 1 (AP-1)			
2-year	(1.74)[0.246]	(1.74)[0.246]	(-0.00)[-0.000]
10-year	(4.48)[0.582]	(4.47)[0.582]	(-0.01)[-0.000]
25-year	(6.38)[0.820]	(6.38)[0.820]	(-0.00)[-0.000]
100-year	(9.46)[1.211]	(9.46)[1.211]	(-0.00)[-0.000]

	Run off		
Storm Events	Pre-dev. (cfs)[af]	Proposed (cfs)[af]	Change (cfs)[af]
Analysis Point 2 (AP-2)			
2-year	(3.87)[0.718]	(3.59)[0.675]	(-0.28)[-0.043]
10-year	(11.53)[1.840]	(10.89)[1.816]	(-0.64)[-0.024]
25-year	(17.08)[2.661]	(16.52)[2.630]	(-0.56)[-0.031]
100-year	(26.22)[4.032]	(24.99)[3.969]	(-1.23)[-0.063]

	Run off		
Storm Events	Pre-dev. (cfs)[af]	Proposed (cfs)[af]	Change (cfs)[af]
Analysis Point 3 (AP-3)			
2-year	(1.84)[0.237]	(0.40)[0.140]	(-1.44)[-0.097]
10-year	(6.25)[0.652]	(2.14)[0.470]	(-4.11)[-0.182]
25-year	(9.53)[0.964]	(3.84)[0.802]	(-5.69)[-0.162]
100-year	(15.00)[1.492]	(14.28)[1.462]	(-0.72)[-0.030]

	Storm Events	Run off		
		Pre-dev. (cfs)[af]	Proposed (cfs)[af]	Change (cfs)[af]
Analysis Point 4 (AP-4)	2-year	(.09)[0.011]	(0.00)[0.000]	(-0.09)[-0.011]
	10-year	(0.20)[0.025]	(0.00)[0.000]	(-0.20)[-0.025]
	25-year	(0.28)[0.034]	(0.00)[0.000]	(-0.28)[-0.034]
	100-year	(0.32)[0.036]	(0.00)[0.000]	(-0.32)[-0.036]

Standard 3: Loss of annual recharge to ground water shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post- development site shall approximate the annual recharge from pre-development conditions based on soil type. This standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Soil Evaluation

Soil evaluation is broken down into two stages. Stage 1 identifies the underlying soils just beneath the surface that contribute to how much runoff is generated as stormwater falls and moves across the surface. Stage 2 evaluates the soils in direct contact with the proposed infiltration BMPs. The attachments section includes the NRCS Soil Survey used for Stage 1 while the site plan set includes the on-site soil textural analysis in the specific locations that infiltration is proposed. The information from the NRCS Soil Survey is included on the Pre and Post Development Watershed Plans.

Recharge Volume

Soils underlying the site are defined as map unit 300B Montauk fine sandy loam, 3 to 8 percent slopes, and map unit 422C Canton fine sandy loam, 8 to 15 percent slopes. We have estimated the soil as a mix of hydrologic group "B" for the westerly portion of the site and "C" for the easterly portion of the site of the site based on Web Soil Survey USDA/NRCS Soil Map. Test Pits throughout the site depicted the underlying soil C layer material to be a mix of loamy sand and sandy loam, with an area of Sand present near the entrance to the site. The infiltration design is based on a Type A Soil "1982 Rawls Rates" of 2.41 in/hr for the proposed roadway Infiltration Basin, and 1.02 in/hr for the proposed 40B Infiltration Basins. See Soil Data in Attachment Section.

Table 2: Basin #1 Required Recharge Volume Calculation

	Recharge	**Impervious**	**Volume**
Hydrologic Group	(in/sqft)	(sqft)	(cf)
A - *sand*	0.60	None	0
B - *loam*	0.35	40,554.4	1182.8 cf
C - *silty loam*	0.25	75,968.6	1582.7 cf
D - *clay*	0.10	None	0
Required Recharge Volume Total			**2,765.5 cf**

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Stormwater Basin Sizing

There are three ways of determining the recharge volume provided by a storm water basin (Static, Simple Dynamic, and Dynamic Field). The Static Method, used here, includes the volume of water that can be stored beneath the lowest outlet of the basin. This, the most conservative method of determining the recharge volume, doesn't account for any infiltration that takes place while the basin is filling with water and is less dependent on maintenance of the basin since the only way for the water below the lowest invert can leave the basin is though infiltration. The following table summarizes the recharge volume provided by the infiltration chambers. Detailed volume calculations for the basin are included in the attachments.

Table 3: Basin Recharge Volumes

	Recharge Volume
Basin 1 @ 323.75	3,637 cf
Basin 2 @ 358.20	3,579 cf
Basin 3 @ 358.90	6.269 cf
Total	13,485 cf

72-hour Drawdown

When using the conservative Static Method to determine infiltration volume provided, the Rawls Rate is used to represent the infiltration rate in place of a hydraulic conductivity rate. The specific rate chosen is based on the textural analysis of the in-site soil performed by a competent soil professional.

A Massachusetts Certified Soil Evaluator performed an evaluation of the soil at the proposed infiltration BMP. The soil textural analysis for the infiltration BMP is listed below with the associated Rawls Rate used in the HydroCAD calculations. Where textural analysis varied within any single BMP, the most restrictive textural evaluation and Rawls Rate were used. Soil logs of the in situ soil evaluation are included within the Site Plan set.

Table 4: Rawls Rate

	Most Restrictive Soil Texture	**Rawls Rate (in/hour)**
Infiltration Basin 1	Sand/Loamy Sand	2.41 in/hr
Infiltration Basins 2 & 3	Sandy Loam	1.02 in/hr

Drawdown time for the infiltration chamber systems is modeled by HydroCAD and included in the attachments. The following table summarizes the drawdown time for the basin to show it will drawdown within the 72-hour maximum.

Table 5: Basin Drawdown

	Time for Drawdown
Infiltration Basin 1	34 hours
Infiltration Basin 2	47 hours
Infiltration Basin 3	51 hours

Standard 4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when:

- ***a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;***
- ***b) Structural stormwater best management practices are sized to capture the required water quality volume as determined in accordance with the Massachusetts Stormwater Handbook; and***
- ***c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.***

The Water Quality Volume requiring 80% TSS removal, is calculated as follows:

The required water quality volume is based on 1.0" as the soil recharge rate is 2.41 in/hr, meeting the threshold rate of 2.4 in/hr or greater. The water quality volume equals 1.0 inches of runoff times the increased impervious area of the post-development site.

Basin #1 Required Water Quality Volume:

Existing Site Impervious Area	=	0 sf
Proposed Site Impervious Area	=	40,403 sf
Total Site Impervious Area Increase	=	40,403 sf
Impervious area to be treated	=	**40,403 sf**

Total volume to be treated:
1.0" x 1'/12" x 40,403 sf = 3,367.0 **cf Water Quality Volume Required**

Basin #1 Provided Water Quality Volume:

Infiltration Basin 1 Treatment volume:
(Storage below lowest invert @ 323.75) = 3,637 cf

Basin #2 Required Water Quality Volume:

Existing Site Impervious Area	=	0 sf
Proposed Site Impervious Area	=	42,689 sf
Total Site Impervious Area Increase	=	42,689 sf
Impervious area to be treated	=	**42,689 sf**

Total volume to be treated:
1.0" x 1'/12" x 42,689 sf = 3,557.4 **cf Water Quality Volume Required**

Basin #2 Provided Water Quality Volume:

Infiltration Basin 2 Treatment volume:
(Storage below lowest invert @ 358.20) = 3,579 cf

Basin #3 Required Water Quality Volume:

Existing Site Impervious Area = 0 sf
Proposed Site Impervious Area = 33,367 sf
Total Site Impervious Area Increase = 33,367 sf
Impervious area to be treated = **33,367 sf**

Total volume to be treated:
1.0" x 1'/12" x 33,367 sf = 2,780.6 **cf Water Quality Volume Required**

Basin #3 Provided Water Quality Volume:

Infiltration Basin 3 Treatment volume:
(Storage below lowest invert @ 358.90) = 14,210 cf

Forebay Sizing

All the stormwater from the impervious pavement is collected and discharged to the proposed sediment forebay which is sized to treat 0.1" of runoff from the 42,732.4-sf impervious area contributing to the basin. Detailed calculations for the sediment forebay are included in Appendix 5 / Stage-Area-Storage Calculations.

0.1"/12" per foot x 42,732.4 sf = 356.1 cf of storage required

Table 6: Sediment Forebay Sizing

	Impervious Area being Discharged	Required Volume	Provided Volume
Forebay 1 @ Inv.=324.0	40,403 cf	337 c.f.	1,856 c.f.
Forebay 2 @ Inv. = 359.0	42,689 cf	356 c.f.	2,060 c.f.
Forebay 3 @ Inv. = 358.0	33,367 cf	278 c.f.	2,025 c.f.

See TSS Removal Calculations in Attachment Section.

MS4 Bylaw Compliance:

Based on the Town of Franklin MS4 stormwater bylaw as specified in § 153-16 (B)(1)(a), new developments require the on-site stormwater management systems to be designed to retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area, and/or remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post construction impervious area on site and 60% of the average annual load of Total Phosphorous (TP) generated from the post construction impervious surface area on site..

The total impervious area, including roofs, is 116,459 square feet. The equivalent 1" of runoff from these surfaces is 9,705 cubic feet. The total storage provided below the lowest inverts out are as follows. See Appendix 5 – Stage -Area-Storage calculations.

Basin 1 @ Elev. 323.75 = 3,637 cf
Basin 2 @ Elev. 358.20 = 3,579 cf
Basin 3 @ Elev. 358.90 = 14,210 cf

Total Storage Volume Required = 9,705 cf
Total Storage Volume Provided = 21,426 cf

Standard 4: requires the development and implementation of suitable practices for source control and pollution prevention. These measures must be identified in a long-term pollution prevention plan.

The long-term pollution prevention plan is incorporated into the Operation and Maintenance Plan required by Standard 9.

Standard 5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

The proposed project is not a use with higher potential pollutant loads.

Standard 6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.

The subject property does not discharge stormwater within the Franklin Water Resource District. Due to the presence of soils with rapid recharge rates in the area of the infiltration basin, the Water Quality Volume is calculated using the required 1.0" rule, and 44% TSS removal is achieved prior to discharge to the infiltration basin. See Standard 4 for computations. The design utilizes stormwater BMPs designated as suitable for critical areas within the Massachusetts Stormwater Handbook. No metal roof is proposed.

Standard 7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable:

This project is not a redevelopment project and meets all applicable stormwater standards.

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Standard 8: A plan to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

During land disturbance and construction activities, project proponents must implement controls that prevent erosion, control sediment movement, and stabilize exposed soils to prevent pollutants from moving offsite or entering wetlands or waters. Land disturbance activities include demolition, construction, clearing, excavation, grading, filling, and reconstruction.

Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control.
EPA NPDES – Storm Water Pollution Prevention Plan (SWPPP)

A. Names of Persons or Entities Responsible for Plan Compliance

Franklin Municipal Affordable Housing Trust
c/o Bryan Taberner
355 East Central Street
Franklin, MA 02038
Tel: 508-553-4846

B. Construction Period Pollution Prevention Measures
   1. Inventory materials to be present on-site during construction.
   2. Train employees and subcontractors in prevention and clean up procedures.
   3. All materials stored on site will be stored in their appropriate containers and if possible, under a roof or covered.
   4. Follow manufacturer's recommendation for disposal of used containers.
   5. Store only enough product on site to do the job.
   6. On site equipment, fueling and maintenance measures:
      a. Inspect on-site vehicles and equipment daily for leaks.
      b. Conduct all vehicle and equipment maintenance and refueling in front of building, away from storm drains.
      c. Perform major repairs and maintenance off site.
      d. Use drip pans, drip cloths or absorbent pads when replacing spent fuels.
      e. Collect spent fuels and remove from site, per Local and State regulations.
      f. Maintain a clean construction entrance where truck traffic is frequent to reduce soil compaction constant sweeping is required and limit tracking of sediment into streets, sweeping street when silt is observed on street.
   7. Stockpile materials and maintain Erosion Control around the materials where it can easily be accessed. Maintain easy access to clean up materials to include brooms, mops, rags gloves, goggles, sand, sawdust, plastic and metal trash containers.
   8. Clean up spills.
      a. Never hose down "dirty" pavement or impermeable surfaces where fluids have spilled. Use dry clean up methods (sawdust, cat litter and/or rags and absorbent pads).
      b. Sweep up dry materials immediately. Never wash them away or bury them.
      c. Clean up spills on dirt areas by digging up and properly disposing of contaminated soil in a certified container and notify a certified hauler for removal.
      d. Report significant spills to the Fire Department.

9. It is the responsibility of the site superintendent or employees designated by the Applicant to inspect erosion control and repair as needed, also to inspect all on site vehicles for leaks and check all containers on site that may contain hazardous materials daily.

C. Construction Erosion and Sedimentation Control Plan.
See "Definitive Subdivision Plan of Land, Veterans Memorial Drive Extension, Franklin, Massachusetts" prepared by Guerriere & Halnon, Inc. Dated 03/15/24

D. Site Development Plans.
See "Definitive Subdivision Plan of Land, Veterans Memorial Drive Extension, Franklin, Massachusetts" prepared by Guerriere & Halnon, Inc. Dated 03/15/24

E. Construction Sequencing Plan

a. Record Order of Conditions - The site superintendent shall be aware of all the Conditions contained within the Order including inspection schedules
b. Install DEP File # Sign.
c. Prior to any work on the site including tree/brush clearing, the approved limit of clearing as well as the location of the proposed erosion control devices (such as silt fence/straw bales, etc.) must be staked on the ground under the direction of a Massachusetts registered Professional Land Surveyor.
d. Install silt fence/hay bales at locations
e. Strip off top and subsoil. Stockpile material to be reused away from the wetland, remove excess material from the site. Install and maintain erosion control barrier around stockpile.
f. Rough grade site, maintaining a temporary low area/sediment trap away from the wetland.
g. Construct drainage outfalls and stilling basin. Stabilize side slopes with loam, seed and mulch.
h. Install underground utilities; protect all open drainage structures with erosion/siltation control devices.
i. Install binder course of bituminous asphalt.
j. Install wearing course of asphalt, and striping (where required).
k. Maintain all erosion control devices until site is stabilized and a Certificate of Compliance is issued by the Conservation Commission.
l. The Contractor shall be responsible to schedule any required inspections of his/her work.

F. Construction Waste Management Plan

a. Dumpster for trash and bulk waste collection shall be provided separately for construction.
b. Recycle materials whenever possible (paper, plaster cardboard, metal cans). Separate containers for material are recommended.
c. Segregate and provide containers for disposal options for waste.
d. Do not bury waste and debris on site.
e. Certified haulers will be hired to remove the dumpster container waste as needed. Recycling products will also be removed off site weekly.
f. The sewer system is only for disposal of human waste, and substances permitted for disposal in the site sewer permit with the Town B.O.H.

G. Operation and Maintenance of Erosion and Sedimentation Controls

The operation and maintenance of sedimentation control shall be the responsibility of the contractor. The inspection and maintenance of the stormwater component shall be performed as noted below. The contractor shall have erosion control in place at all times. The contractor, based on future weather reports, shall prepare and inspect all erosion control devices; cleaning, repairing and upgrading is a priority so that the devices perform as per design. Inspect the site during rain events. Do not stay away from the site. At a minimum there should be inspection to assure the devices are not clogged or plugged, or that devices have not been destroyed or damaged during the rain event. After a storm event inspection is required to clean and repair any damage components. Immediate repair is required.

H. Inspection and Maintenance Schedules

1. Inspection must be conducted at least once every 7 days and within 24 hours of the end of a storm event 0.5 inches or greater.
2. Inspection frequency can be reduced to once a month if:
   a. The site is temporarily stabilized.
   b. Runoff is unlikely due to winter conditions when site is covered with snow or ice.
3. Inspections must be conducted by qualified personnel, "qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls and who possess the skills to assess the conditions and take measures to maintain and ensure proper operation, also to conclude if the erosion control methods selected are effective.
4. For each inspection, the inspection report must include: (See attached inspection and maintenance log)
   a. The inspection date.
   b. Names, titles of personnel making the inspection.
   c. Weather information for the period since the last inspection.
   d. Weather information at the time of the inspection.
   e. Locations of discharges of sediment from the site, if any.
   f. Locations of BMP's that need to be maintained.
   g. Locations where additional BMP's may be required.
   h. Corrective action required or any changes to the SWPPP that may be necessary.
5. The owner, or their representative, such as the contractor, shall inspect the following in-place work.

Inspection Schedule:

Erosion Control	Weekly
Catch Basins	Weekly
Temporary Sedimentation Traps/Basins	Weekly
Street Sweeping	Weekly

Please Note: Special inspections shall also be made after a significant rainfall event.

Maintenance Schedule

Erosion Control Devices Failure	Immediately
Catch Basins	Sump 1/4 full of sediment
Temporary Sedimentation Trap/Basin	As needed
Street Sweeping	14 days minimum and prior to any significant rain event.

Please Note: Special maintenance shall also be made after a significant rainfall event.

I. Inspection and Maintenance Log Form. (Log Form Follows)

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Standard 9: A Long –Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that storm water management systems function as designed.

The following shall serve as the (O&M) Plan required by Standard 9, as well as the Long-Term Pollution Prevention Plan required by Standard 4.

A. Names of Persons or Entities Responsible for Plan Compliance;

Franklin Municipal Affordable Housing Trust
c/o Bryan Taberner
355 East Central Street
Franklin, MA 02038
Tel: 508-553-4846

B. Stormwater Management System Owner

Franklin Municipal Affordable Housing Trust
c/o Bryan Taberner
355 East Central Street
Franklin, MA 02038
Tel: 508-553-4846

C. Good housekeeping practices

1. Maintain site, landscaping and vegetation.
2. Sweep and pick up litter on pavements and grounds.
3. Deliveries shall be monitored by owners or representative to ensure that if any spillage occurs, it shall be contained and cleaned up immediately.
4. Maintain pavement and curbing in good repair.

D. Requirements for routine inspections and maintenance of stormwater BMPs

1. Plans: The stormwater Operation and Maintenance Plan shall consist of all Plans, documents and all local state and federal approvals as required for the subject property.
2. Record Keeping:
    a. Maintain a log of all operation and maintenance activities for at least three years following construction, including inspections, repairs, replacement and disposal (for disposal, the log shall indicate the type of material and the disposal location).
    b. Make this log available to MassDEP and the Conservation Commission upon request; and
    c. Allow MassDEP and the Conservation Commission to inspect each BMP to determine whether the responsible party is implementing the Operation and Maintenance Plan.
3. Descriptions and Designs: The Best Management Practices (BMP) incorporated into the design include the following.
    a. Street Sweeping – Stipulated within the Construction Period Pollution Prevention Plan, the Long-Term Pollution Prevention Plan, and the Operation and Maintenance Plan. As the amount of TSS removal is discretionary, no credit was taken within the calculations for this BMP.
    b. Deep Sump Catch Basins with Hoods - Installed to promote TSS Removal of solids and control floatable pollutants. This BMP has a design rate of 25% TSS Removal.

c. Subsurface Detention Chambers – subsurface detention BMP provides the required groundwater recharge and has a design rate of 80% TSS Removal. Refer to TSS Removal Worksheet included in the Attachments.
d. Infiltration basin and Sediment Forebay - provided to promote the required 80% TSS Removal. Refer to TSS Removal Worksheet in Standard 4 for treatment train.
e. Safety Fencing - Provide 6-FT high chain link fence with lockable gates around detention basin for public safety.
f. Spill Containment Kit to contain and clean-up spills that could occur on site.

4. BMP Maintenance: After construction it is the responsibility of the owner to perform maintenance. The cleaning of the components of the stormwater management system shall generally be as follows:
   a. Roadway: The owner shall keep the roadway swept with a mechanical sweeper or hand swept semi-annually at a minimum.
   b. Catch Basins: Shall be cleaned by excavating, pumping or vacuuming four times per year and at the end of foliage and snow removal seasons. The sediment shall be disposed of off-site by the Owner. Inspect quarterly, remove silt when ¼ full.
   c. Sediment Forebay: Inspect monthly. Clean forebay 4 times per year.
   d. Subsurface Chambers: Inspect after 2 years of commission using the inspection port via a CCTV and inspect every year thereafter or as needed depending on rainfall and site conditions. Cleaning with high pressure water through culvert cleaning nozzle when sediment accumulation reaches a depth of 3 inches or more. A maintenance log shall be kept for all maintenance activities.
   e. Infiltration Basins: Preventative maintenance shall be performed at least twice per year. Inspection shall be performed after every major storm for the first three months and twice a year thereafter and when there are discharges through the high outlet orifice. Mowing of the buffer area, and bottom of basin; removal of trash and debris; removal of grass clippings and organic matter to be performed at least twice per year. Pretreatment devices shall be inspected every other month and a least twice a year and after every major storm event.

5. Access Provisions: All of the components of the storm water system shall be accessible by the Owner

E. Spill prevention and response plans

1. Inventory materials to be present on-site during construction.
2. Train employees and subcontractors in prevention and clean up procedures.
3. All materials stored on site will be stored in their appropriate containers under a roof.
4. Follow manufacturers recommendation for disposal of used containers.
5. Store only enough product on site to do the job.
6. On site equipment, fueling and maintenance measures:
   a. Inspect on-site vehicles and equipment daily for leaks.
   b. Conduct all vehicle and equipment maintenance and refueling in one location, away from storm drains.
   c. Perform major repairs and maintenance off site.
   d. Use drip pans, drip cloths or absorbent pads when replacing spent fuels.
   e. Collect spent fuels and remove from site.
7. Clean up spills.
   a. Spill Containment Kit to contain and clean-up spills that could occur on site

b. Never hose down "dirty" pavement or impermeable surfaces where fluids have spilled. Use dry clean up methods (sawdust, cat litter and/or rags and absorbent pads).
c. Sweep up dry materials immediately. Never wash them away or bury them.
d. Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
e. Report significant spills to the Fire Department, Conservation Commission and Board of Health.

F. Provisions for maintenance of lawns, gardens, and other landscaped areas

Use only organic fertilizer. Dispose of clippings outside of the 100-foot buffer zone to the adjacent wetland.

G. Requirements for storage and use of herbicides, and pesticides

The application of herbicides or pesticides will be done by professional certified contractor.

H. Provisions for operation and management of septic system

Site to be serviced by private on-site sewer.

I. Requirements for handling of pet waste

Pet waste should never be dumped or washed into the local storm drain system. Waste shall be picked up immediately and placed in bags and properly disposed of in the garbage to be collected and taken to a landfill.

J. Provisions for washing of vehicles

Washing of vehicles shall be done in an area away from sensitive areas and drainage inlets, so as to eliminate wash water from being directly discharged to the local storm drain system. Vehicles should be washed in areas where wash water can be held prior to discharging to the sanitary sewer system or in areas where infiltration precludes runoff to storm drains. Avoid using detergents whenever possible.

K. Provisions for solid waste management

1. Waste Management Plan
   a. Recycle materials whenever possible (paper, plaster cardboard, metal cans). Separate containers for material are recommended.
   b. Do not bury waste and debris on site.
   c. Certified haulers will be hired to remove the dumpster container waste as needed. Recycling products will also be removed off site weekly.

L. Snow disposal and plowing plans relative to Wetland Resource Areas

Snow storage is adequate around the site for large storm events. Storage of snow shall not be placed directly near areas adjacent to the proposed infiltration basin.

M. Winter Road Salt and/or Sand Use and Storage restrictions

No sand, salt, or chemicals for de-icing will be stored outside.

N. Street sweeping schedules

Sweeping, the act of cleaning pavement can be done by mechanical sweepers, vacuum sweeper or hand sweeper. The quantity of sand is a direct correlation with the treatment of ice and snow

and the types of chemicals and spreaders that are being used on site to manage snow. If a liquid de-icer such as calcium chloride is used as a pretreatment to new events the amount of sand is minimized. Sweeping for this site should be done semi-annually at a minimum. Collecting the particulate before it enters the catch basins is cheaper and more environmentally friendly than in a catch basin mixing with oils and greases in the surface water runoff in catch basins.

O. Provisions for prevention of illicit discharges to the stormwater management system

The discharge into the stormwater system is not being violated, see attachment for illicit discharges compliance.

P. Training the staff or personnel involved with implementing Long-Term Pollution Prevention Plan

The owner shall develop policies and procedures for containing the illicit spilling of oils, soda, beer, paper and litter. These wastes provide a degrading of the water quality. The placement of signs and trash barrels with lids around the site would contribute to a clean water quality site condition.

Q. List of Emergency contacts for implementing Long-Term Pollution Prevention Plan:

Franklin Municipal Affordable Housing Trust
c/o Bryan Taberner
355 East Central Street
Franklin, MA 02038
Tel: 508-553-4846

This shall be the contact until such time as the project is sold.

R. Estimated BMP Maintenance Costs

The following prices are estimates of the costs associated with maintenance of the proposed site BMPs. Costs provided are only estimates and may not reflect actual costs to perform the work. Actual costs may vary depending on company/personnel performing the work. Actual costs may increase over time.

BMP	Estimated Maintenance Cost
Pavement sweeping	$ 400 per year
Catch basin cleaning	$ 200 per catch basin per cleaning
Infiltration Basin	$ 200 per cleaning
Spill Containment Kit	$ 750 purchase price

Standard 10: All illicit discharges to the stormwater management system are prohibited.

Standard 10 prohibits illicit discharges to stormwater management systems. The stormwater management system is the system for conveying, treating, and infiltrating stormwater on site, including stormwater best management practices and any pipes intended to transport stormwater to the ground water, a surface water, or municipal separate storm sewer system. Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Notwithstanding the foregoing, an illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated ground water, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

Illicit Discharge Compliance Statement

It is the intent of the Applicant, Franklin Municipal Affordable Housing Trust c/o Bryan Taberner, 355 East Central Street, Franklin, MA 02038 to prevent illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease. There will be no connection to the storm water system to inadvertently direct other types of liquids, chemicals or solids into the storm drainage system. The Owner will also promote a clean Green Environment by mitigating spills onto pavements; oils, soda, chemicals, pet waste, debris and litter.

Respectfully Acknowledged,

_____

ATTACHMENTS

Pre- Post Drainage Plans

F4222

APPROVED DATE:

FRANKLIN PLANNING BOARD

BEING A MAJORITY

LEGAL NOTES

UTILITIES ARE PLOTTED AS A COMPILATION OF RECORD DOCUMENTS, MARKINGS AND OTHER OBSERVED EVIDENCE TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES AND SHOULD BE CONSIDERED APPROXIMATE. UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. ADDITIONAL UTILITIES, NOT EVIDENCED BY RECORD DOCUMENTS OR OBSERVED PHYSICAL EVIDENCE, MAY EXIST. CONTRACTORS (IN ACCORDANCE WITH MASS.G.L. CHAPTER 82 SECTION 40 AS AMENDED) MUST CONTACT ALL UTILITY COMPANIES BEFORE EXCAVATING AND DRILLING AND CALL DIGSAFE AT 1(888)DIG-SAFE{7233}.

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

OWNER/APPLICANT

FRANKLIN MUNICIPAL AFFORDABLE
HOUSING TRUST
355 EAST CENTRAL STREET
FRANKLIN, MA. 02038
MAP 259 PARCEL 007-002
BOOK 34282 PAGE 520

DEFINITIVE SUBDIVISION PLAN OF LAND
VETERANS MEMORIAL DRIVE EXTENSION
FRANKLIN MASSACHUSETTS

PRE-DEVELOPMENT DRAINAGE PLAN

MARCH 15, 2024

DATE	REVISION DESCRIPTION

GRAPHIC SCALE: 1"=60'

0 50 75 100 150 200 FEET
0 5 10 15 20 30 40 50 60 METERS

Guerriere & Halnon, Inc.
ENGINEERING & LAND SURVEYING
55 WEST CENTRAL ST. PH. (508) 528-3221
FRANKLIN, MA 02038 FX. (508) 528-7921
www.gandhengineering.com

SHEET 1 OF 2

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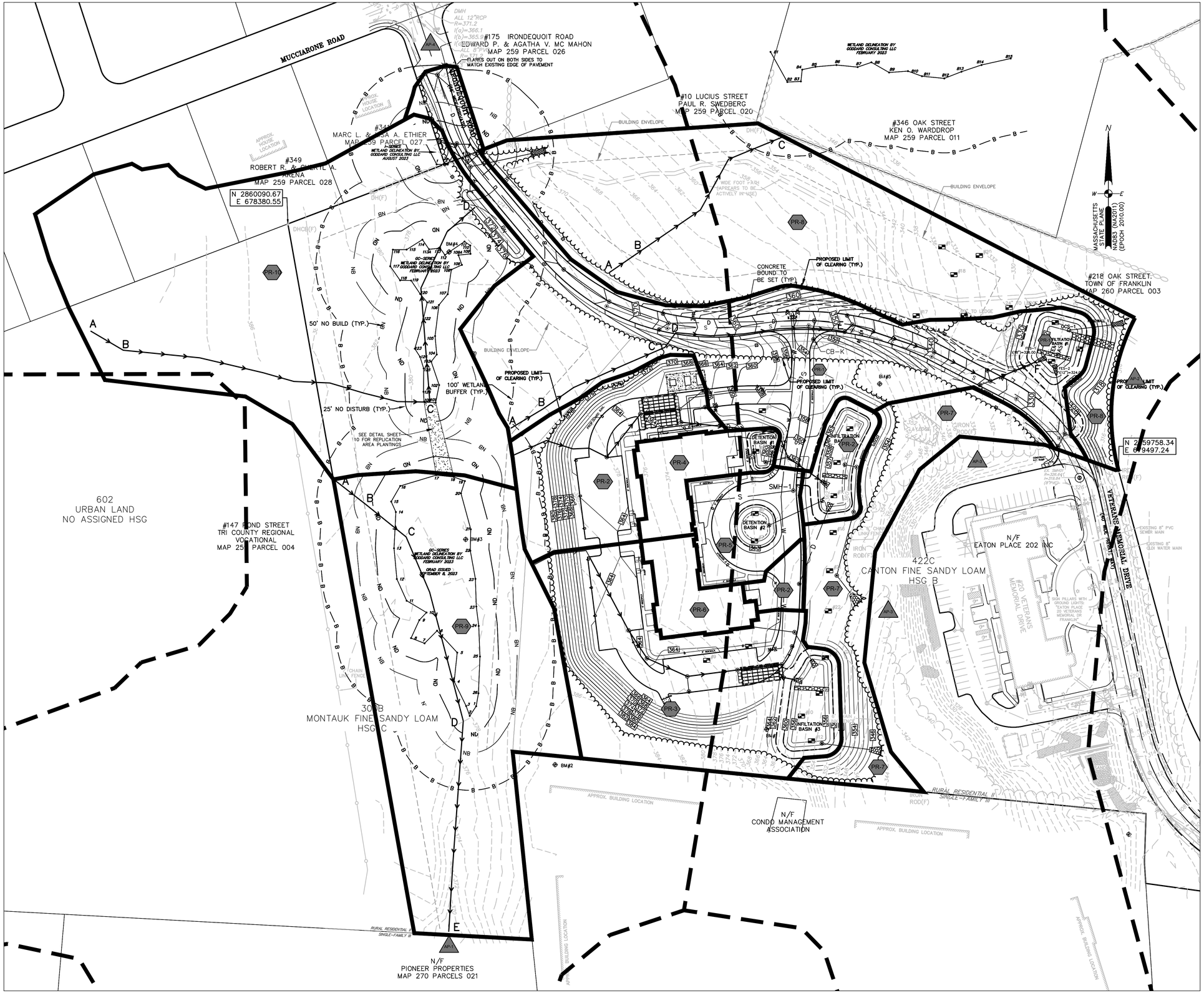

F4222

APPROVED DATE:

FRANKLIN PLANNING BOARD

BEING A MAJORITY

LEGAL NOTES

UTILITIES ARE PLOTTED AS A COMPILATION OF RECORD DOCUMENTS, MARKINGS AND OTHER OBSERVED EVIDENCE TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES AND SHOULD BE CONSIDERED APPROXIMATE. PRIOR TO EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. ADDITIONAL UTILITIES, NOT EVIDENCED BY RECORD DOCUMENTS OR OBSERVED PHYSICAL EVIDENCE MAY EXIST. CONTRACTORS (IN ACCORDANCE WITH MASS.G.L. CHAPTER 82 SECTION 40 AS AMENDED) MUST CONTACT ALL UTILITY COMPANIES BEFORE EXCAVATING AND DRILLING AND CALL DIGSAFE AT 1(888)DIG-SAFE(7233).

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

OWNER/APPLICANT

FRANKLIN MUNICIPAL AFFORDABLE HOUSING TRUST
355 EAST CENTRAL STREET
FRANKLIN, MA. 02038
MAP 259 PARCEL 007-002
BOOK 34282 PAGE 520

DEFINITIVE SUBDIVISION PLAN OF LAND
VETERANS MEMORIAL DRIVE EXTENSION
FRANKLIN MASSACHUSETTS

POST-DEVELOPMENT DRAINAGE PLAN

MARCH 15, 2024

DATE	REVISION DESCRIPTION

GRAPHIC SCALE: 1"=60'

0 50 75 100 150 200 FEET
0 5 10 15 20 30 40 50 60 METERS

Guerriere & Halnon, Inc.
ENGINEERING & LAND SURVEYING
55 WEST CENTRAL ST. PH. (508) 528-3221
FRANKLIN, MA 02038 FX. (508) 528-7921
www.gandhengineering.com

SHEET 2 OF 2 | F-4598

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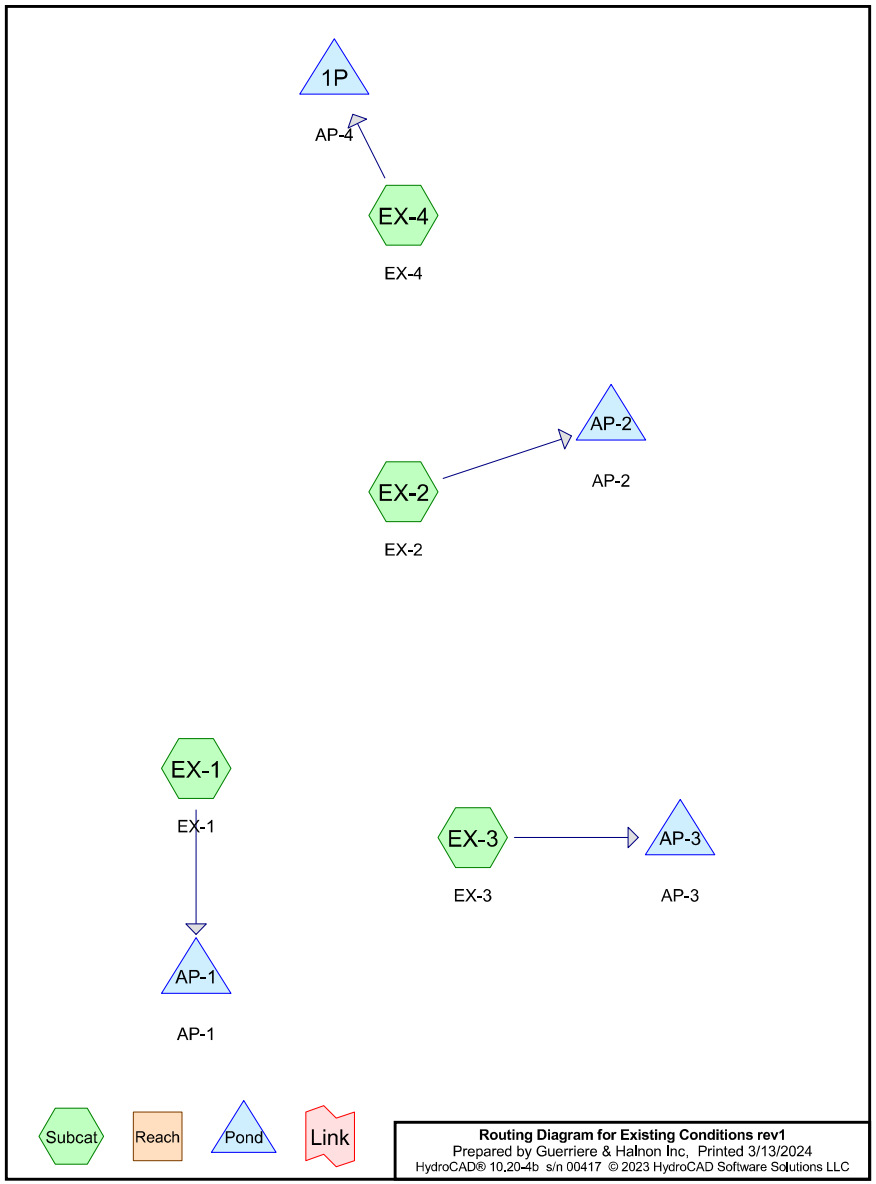
Hydro CAD Calculations



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	3.39	2
2	10-Year	NOAA10 24-hr	D	Default	24.00	1	5.25	2
3	25-Year	NOAA10 24-hr	D	Default	24.00	1	6.41	2
4	100-Year	NOAA10 24-hr	D	Default	24.00	1	8.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.221	80	1/2 acre lots, 25% imp, HSG C (EX-2)
0.115	74	>75% Grass cover, Good, HSG C (EX-4)
6.124	55	Woods, Good, HSG B (EX-2, EX-3)
12.104	70	Woods, Good, HSG C (EX-1, EX-2, EX-3)
19.564	**66**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
6.124	HSG B	EX-2, EX-3
13.440	HSG C	EX-1, EX-2, EX-3, EX-4
0.000	HSG D	
0.000	Other	
19.564		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.221	0.000	0.000	1.221	1/2 acre lots, 25% imp	EX-2
0.000	0.000	0.115	0.000	0.000	0.115	>75% Grass cover, Good	EX-4
0.000	6.124	12.104	0.000	0.000	18.228	Woods, Good	EX-1, EX-2, EX-3
0.000	**6.124**	**13.440**	**0.000**	**0.000**	**19.564**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: EX-1 Runoff Area=136,828 sf 0.00% Impervious Runoff Depth=0.94"
Flow Length=660' Tc=25.8 min CN=70 Runoff=1.74 cfs 0.246 af

Subcatchment EX-2: EX-2 Runoff Area=506,133 sf 2.63% Impervious Runoff Depth=0.74"
Flow Length=1,199' Tc=35.0 min CN=66 Runoff=3.87 cfs 0.718 af

Subcatchment EX-3: EX-3 Runoff Area=204,248 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=464' Tc=15.8 min CN=63 Runoff=1.84 cfs 0.237 af

Subcatchment EX-4: EX-4 Runoff Area=4,999 sf 0.00% Impervious Runoff Depth=1.16"
Flow Length=846' Tc=23.4 min CN=74 Runoff=0.09 cfs 0.011 af

Pond 1P: AP-4 Inflow=0.09 cfs 0.011 af
Primary=0.09 cfs 0.011 af

Pond AP-1: AP-1 Inflow=1.74 cfs 0.246 af
Primary=1.74 cfs 0.246 af

Pond AP-2: AP-2 Inflow=3.87 cfs 0.718 af
Primary=3.87 cfs 0.718 af

Pond AP-3: AP-3 Inflow=1.84 cfs 0.237 af
Primary=1.84 cfs 0.237 af

Total Runoff Area = 19.564 ac Runoff Volume = 1.212 af Average Runoff Depth = 0.74"
98.44% Pervious = 19.259 ac 1.56% Impervious = 0.305 ac

Summary for Subcatchment EX-1: EX-1

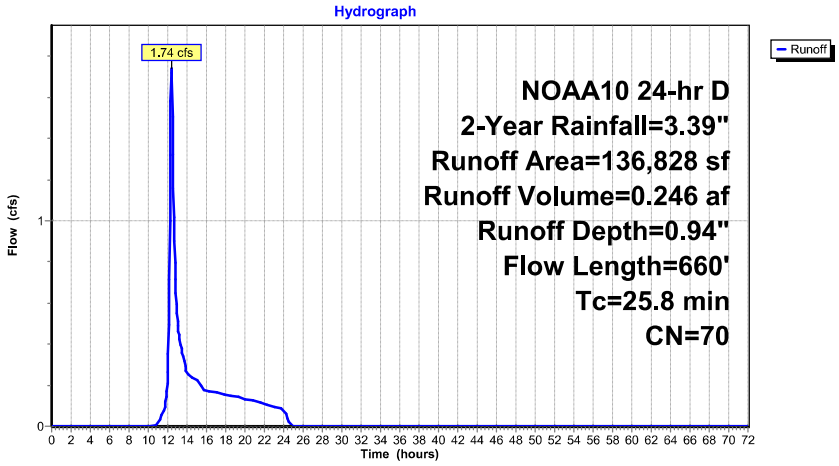
Runoff = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af, Depth= 0.94"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
136,828	70	Woods, Good, HSG C
136,828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment EX-1: EX-1



Summary for Subcatchment EX-2: EX-2

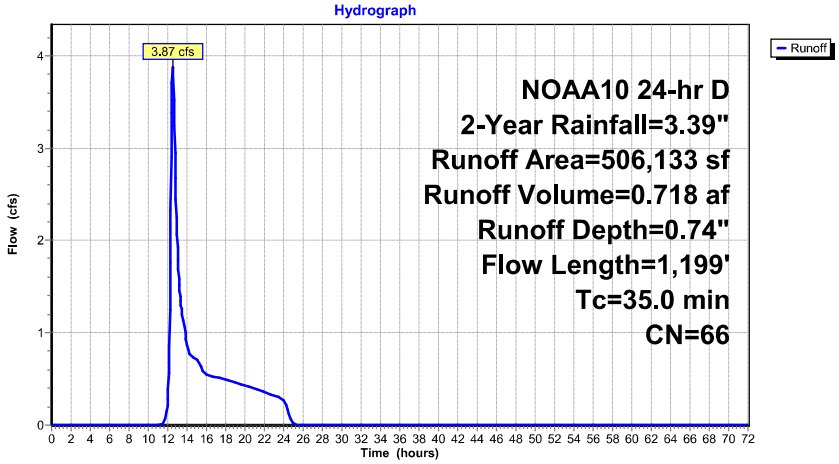
Runoff = 3.87 cfs @ 12.53 hrs, Volume= 0.718 af, Depth= 0.74"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
286,814	70	Woods, Good, HSG C
166,119	55	Woods, Good, HSG B
53,200	80	1/2 acre lots, 25% imp, HSG C
506,133	66	Weighted Average
492,833		97.37% Pervious Area
13,300		2.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.1	274	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.2	455	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
35.0	1,199	Total			

Subcatchment EX-2: EX-2



Summary for Subcatchment EX-3: EX-3

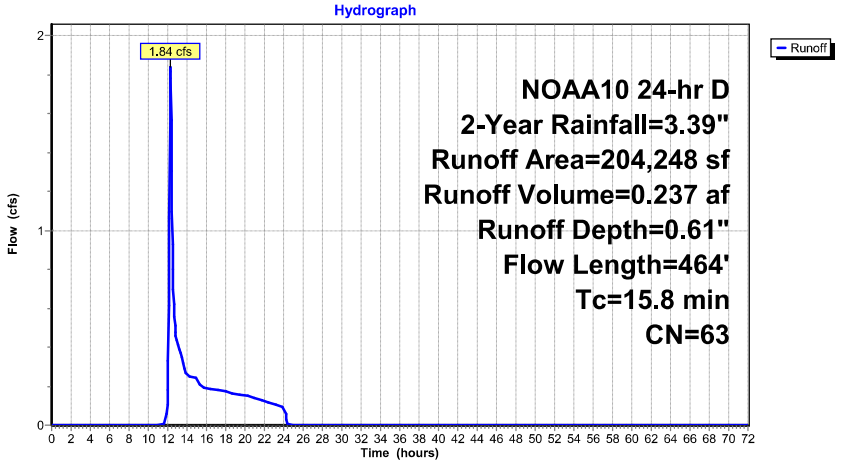
Runoff = 1.84 cfs @ 12.27 hrs, Volume= 0.237 af, Depth= 0.61"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
103,604	70	Woods, Good, HSG C
100,644	55	Woods, Good, HSG B
204,248	63	Weighted Average
204,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.7	35	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	214	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	165	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	464	Total			

Subcatchment EX-3: EX-3



Summary for Subcatchment EX-4: EX-4

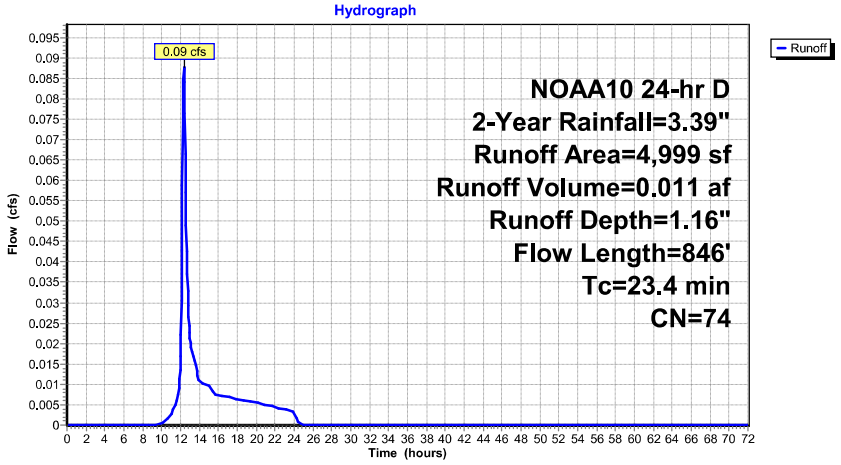
Runoff = 0.09 cfs @ 12.35 hrs, Volume= 0.011 af, Depth= 1.16"
Routed to Pond 1P : AP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
4,999	74	>75% Grass cover, Good, HSG C
4,999		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
2.2	96	0.0220	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	113	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	197	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	175	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3	215	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.4	846	Total			

Subcatchment EX-4: EX-4



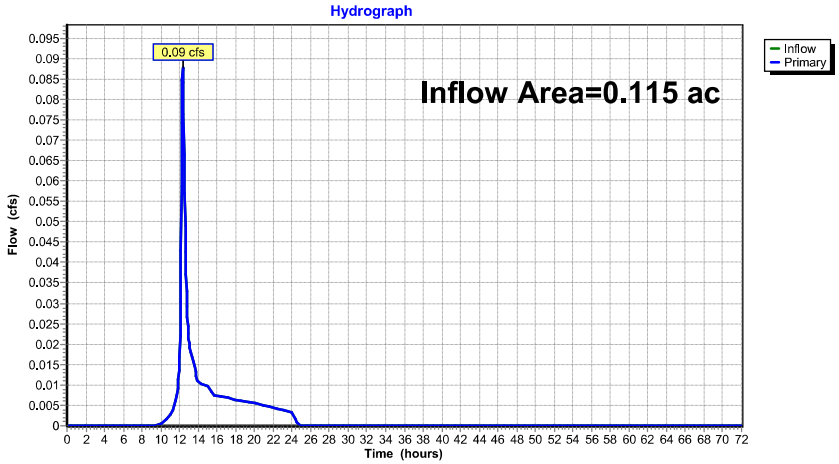
Summary for Pond 1P: AP-4

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

Inflow Area = 0.115 ac, 0.00% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 0.09 cfs @ 12.35 hrs, Volume= 0.011 af
Primary = 0.09 cfs @ 12.35 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond 1P: AP-4



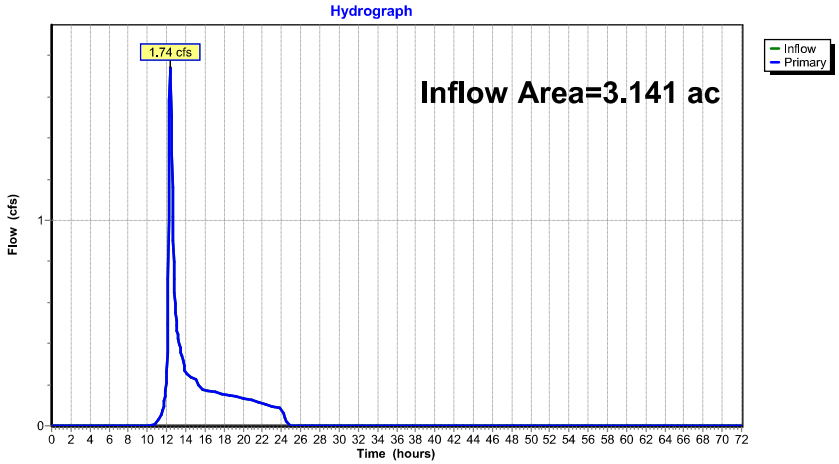
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.141 ac, 0.00% Impervious, Inflow Depth = 0.94" for 2-Year event
Inflow = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af
Primary = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



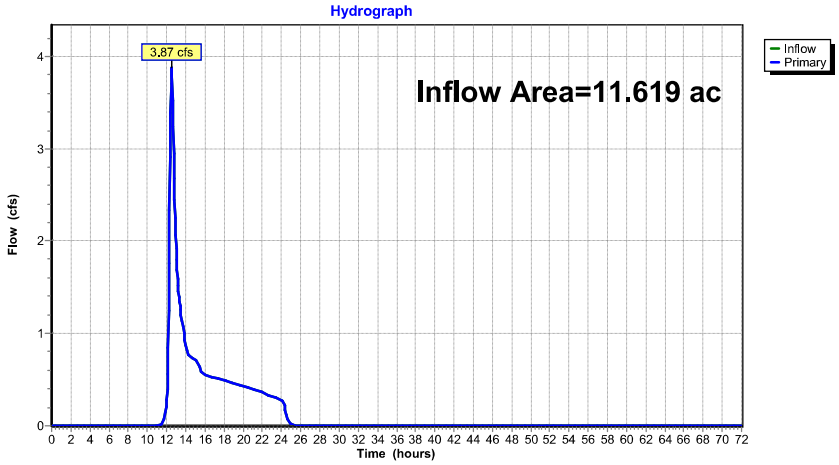
Summary for Pond AP-2: AP-2

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

Inflow Area = 11.619 ac, 2.63% Impervious, Inflow Depth = 0.74" for 2-Year event
Inflow = 3.87 cfs @ 12.53 hrs, Volume= 0.718 af
Primary = 3.87 cfs @ 12.53 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



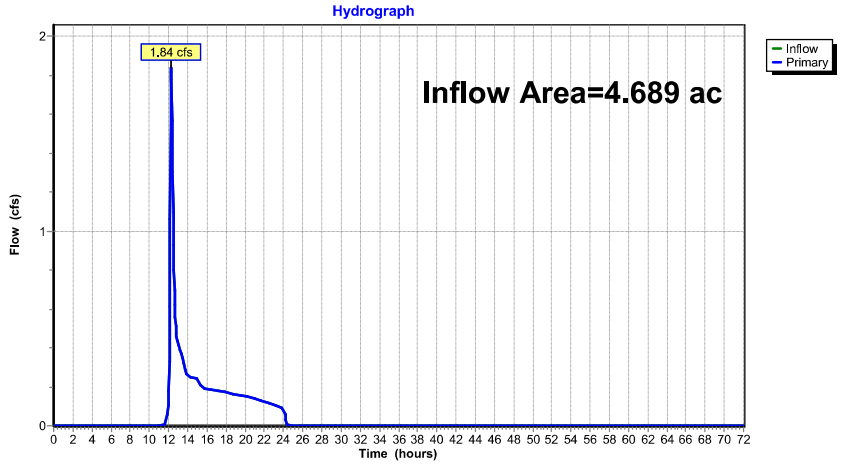
Summary for Pond AP-3: AP-3

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

Inflow Area = 4.689 ac, 0.00% Impervious, Inflow Depth = 0.61" for 2-Year event
Inflow = 1.84 cfs @ 12.27 hrs, Volume= 0.237 af
Primary = 1.84 cfs @ 12.27 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: EX-1 Runoff Area=136,828 sf 0.00% Impervious Runoff Depth=2.22"
Flow Length=660' Tc=25.8 min CN=70 Runoff=4.48 cfs 0.582 af

Subcatchment EX-2: EX-2 Runoff Area=506,133 sf 2.63% Impervious Runoff Depth=1.90"
Flow Length=1,199' Tc=35.0 min CN=66 Runoff=11.53 cfs 1.840 af

Subcatchment EX-3: EX-3 Runoff Area=204,248 sf 0.00% Impervious Runoff Depth=1.67"
Flow Length=464' Tc=15.8 min CN=63 Runoff=6.25 cfs 0.652 af

Subcatchment EX-4: EX-4 Runoff Area=4,999 sf 0.00% Impervious Runoff Depth=2.57"
Flow Length=846' Tc=23.4 min CN=74 Runoff=0.20 cfs 0.025 af

Pond 1P: AP-4 Inflow=0.20 cfs 0.025 af
Primary=0.20 cfs 0.025 af

Pond AP-1: AP-1 Inflow=4.48 cfs 0.582 af
Primary=4.48 cfs 0.582 af

Pond AP-2: AP-2 Inflow=11.53 cfs 1.840 af
Primary=11.53 cfs 1.840 af

Pond AP-3: AP-3 Inflow=6.25 cfs 0.652 af
Primary=6.25 cfs 0.652 af

Total Runoff Area = 19.564 ac Runoff Volume = 3.099 af Average Runoff Depth = 1.90"
98.44% Pervious = 19.259 ac 1.56% Impervious = 0.305 ac

Summary for Subcatchment EX-1: EX-1

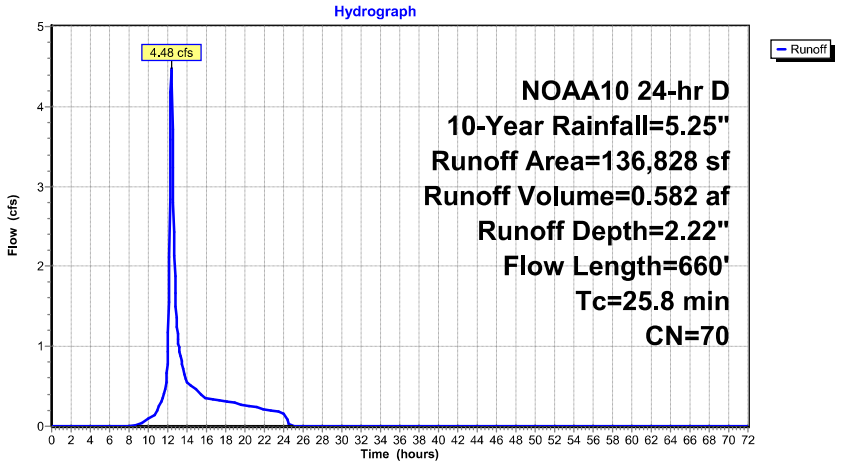
Runoff = 4.48 cfs @ 12.37 hrs, Volume= 0.582 af, Depth= 2.22"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
136,828	70	Woods, Good, HSG C
136,828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment EX-1: EX-1



Summary for Subcatchment EX-2: EX-2

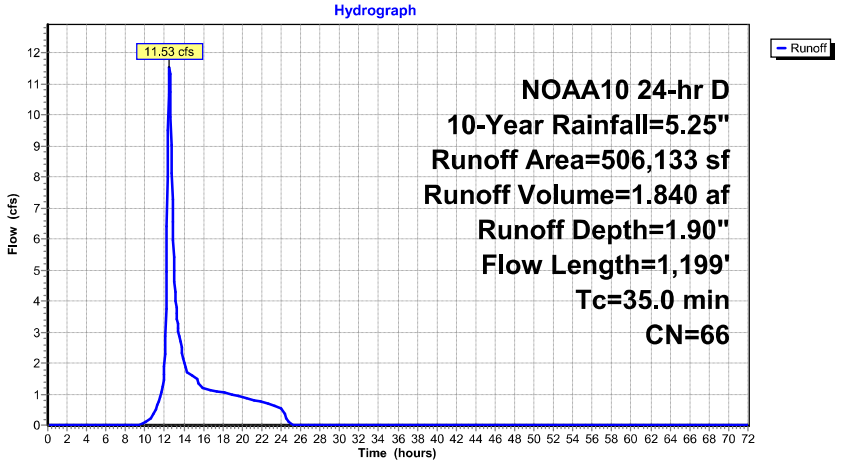
Runoff = 11.53 cfs @ 12.50 hrs, Volume= 1.840 af, Depth= 1.90"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
286,814	70	Woods, Good, HSG C
166,119	55	Woods, Good, HSG B
53,200	80	1/2 acre lots, 25% imp, HSG C
506,133	66	Weighted Average
492,833		97.37% Pervious Area
13,300		2.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.1	274	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.2	455	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
35.0	1,199	Total			

Subcatchment EX-2: EX-2



Summary for Subcatchment EX-3: EX-3

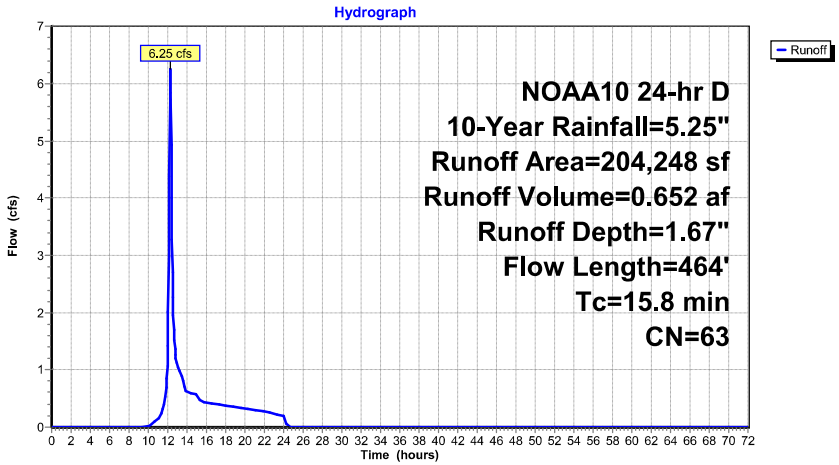
Runoff = 6.25 cfs @ 12.25 hrs, Volume= 0.652 af, Depth= 1.67"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
103,604	70	Woods, Good, HSG C
100,644	55	Woods, Good, HSG B
204,248	63	Weighted Average
204,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.7	35	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	214	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	165	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	464	Total			

Subcatchment EX-3: EX-3



Summary for Subcatchment EX-4: EX-4

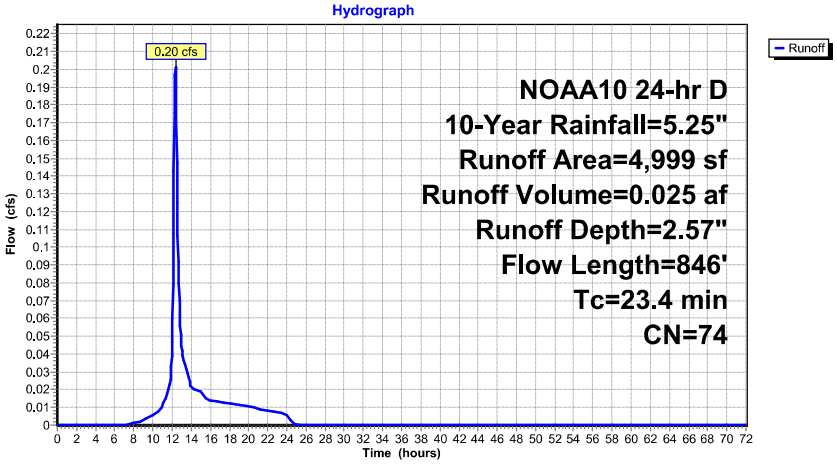
Runoff = 0.20 cfs @ 12.34 hrs, Volume= 0.025 af, Depth= 2.57"
Routed to Pond 1P : AP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
4,999	74	>75% Grass cover, Good, HSG C
4,999		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
2.2	96	0.0220	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	113	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	197	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	175	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3	215	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.4	846	Total			

Subcatchment EX-4: EX-4



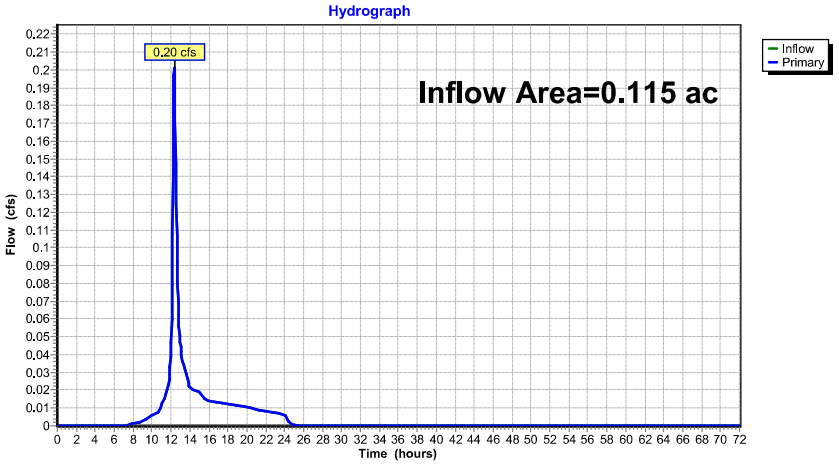
Summary for Pond 1P: AP-4

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

Inflow Area = 0.115 ac, 0.00% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 0.20 cfs @ 12.34 hrs, Volume= 0.025 af
Primary = 0.20 cfs @ 12.34 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond 1P: AP-4



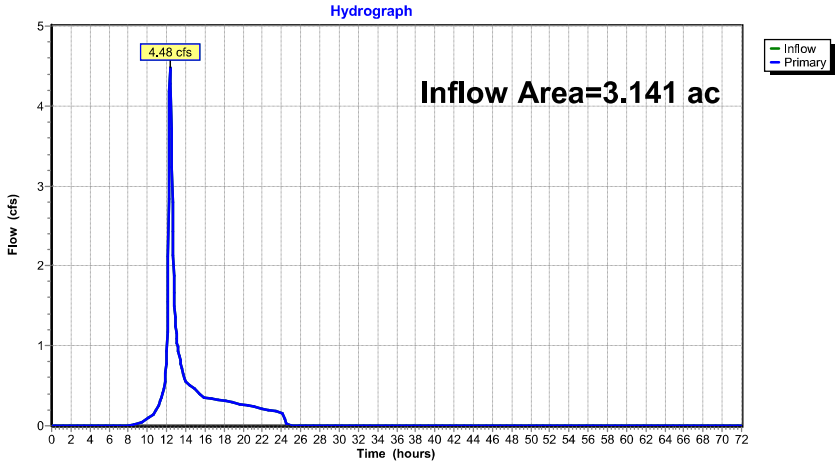
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.141 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10-Year event
Inflow = 4.48 cfs @ 12.37 hrs, Volume= 0.582 af
Primary = 4.48 cfs @ 12.37 hrs, Volume= 0.582 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



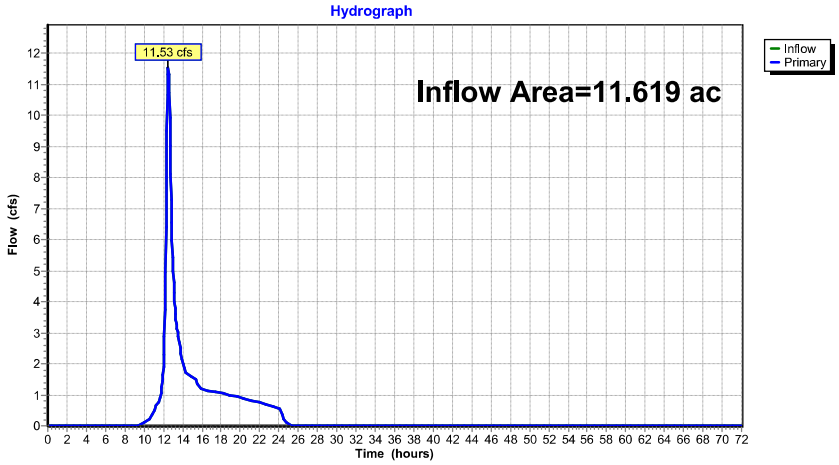
Summary for Pond AP-2: AP-2

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

Inflow Area = 11.619 ac, 2.63% Impervious, Inflow Depth = 1.90" for 10-Year event
Inflow = 11.53 cfs @ 12.50 hrs, Volume= 1.840 af
Primary = 11.53 cfs @ 12.50 hrs, Volume= 1.840 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



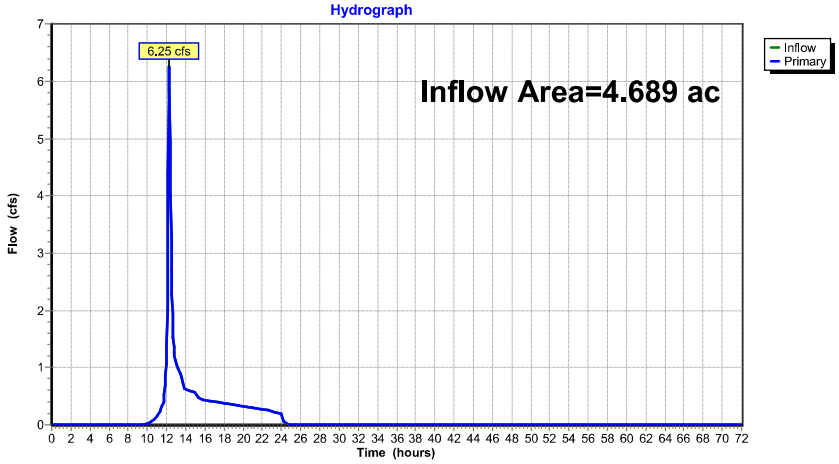
Summary for Pond AP-3: AP-3

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

Inflow Area = 4.689 ac, 0.00% Impervious, Inflow Depth = 1.67" for 10-Year event
Inflow = 6.25 cfs @ 12.25 hrs, Volume= 0.652 af
Primary = 6.25 cfs @ 12.25 hrs, Volume= 0.652 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: EX-1 Runoff Area=136,828 sf 0.00% Impervious Runoff Depth=3.13"
Flow Length=660' Tc=25.8 min CN=70 Runoff=6.38 cfs 0.820 af

Subcatchment EX-2: EX-2 Runoff Area=506,133 sf 2.63% Impervious Runoff Depth=2.75"
Flow Length=1,199' Tc=35.0 min CN=66 Runoff=17.08 cfs 2.661 af

Subcatchment EX-3: EX-3 Runoff Area=204,248 sf 0.00% Impervious Runoff Depth=2.47"
Flow Length=464' Tc=15.8 min CN=63 Runoff=9.53 cfs 0.964 af

Subcatchment EX-4: EX-4 Runoff Area=4,999 sf 0.00% Impervious Runoff Depth=3.53"
Flow Length=846' Tc=23.4 min CN=74 Runoff=0.28 cfs 0.034 af

Pond 1P: AP-4 Inflow=0.28 cfs 0.034 af
Primary=0.28 cfs 0.034 af

Pond AP-1: AP-1 Inflow=6.38 cfs 0.820 af
Primary=6.38 cfs 0.820 af

Pond AP-2: AP-2 Inflow=17.08 cfs 2.661 af
Primary=17.08 cfs 2.661 af

Pond AP-3: AP-3 Inflow=9.53 cfs 0.964 af
Primary=9.53 cfs 0.964 af

Total Runoff Area = 19.564 ac Runoff Volume = 4.479 af Average Runoff Depth = 2.75"
98.44% Pervious = 19.259 ac 1.56% Impervious = 0.305 ac

Summary for Subcatchment EX-1: EX-1

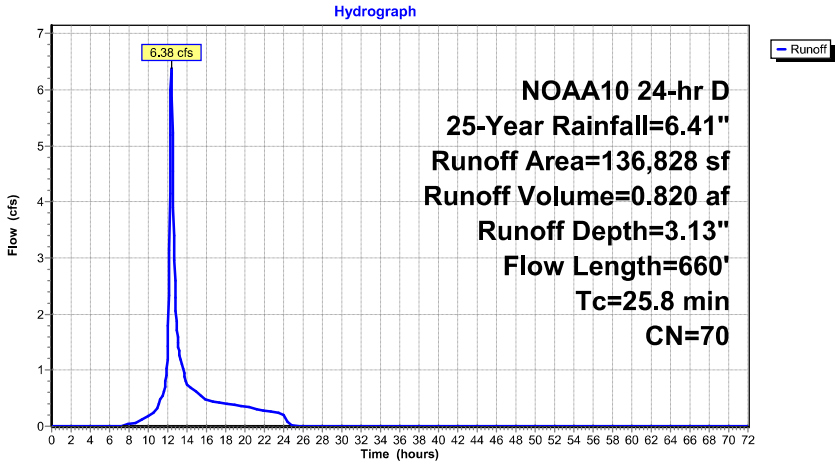
Runoff = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af, Depth= 3.13"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
136,828	70	Woods, Good, HSG C
136,828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment EX-1: EX-1



Summary for Subcatchment EX-2: EX-2

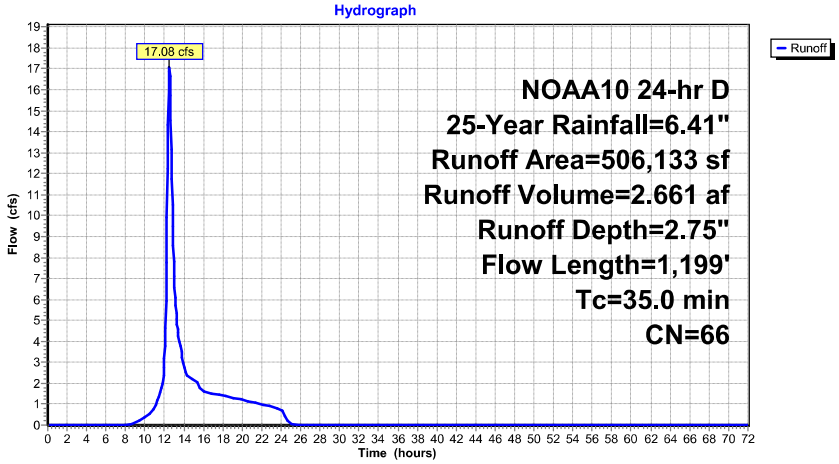
Runoff = 17.08 cfs @ 12.49 hrs, Volume= 2.661 af, Depth= 2.75"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
286,814	70	Woods, Good, HSG C
166,119	55	Woods, Good, HSG B
53,200	80	1/2 acre lots, 25% imp, HSG C
506,133	66	Weighted Average
492,833		97.37% Pervious Area
13,300		2.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.1	274	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.2	455	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
35.0	1,199	Total			

Subcatchment EX-2: EX-2



Summary for Subcatchment EX-3: EX-3

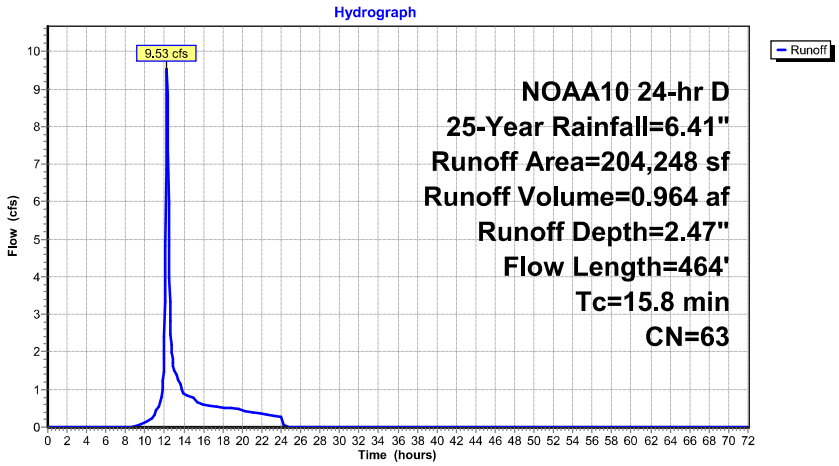
Runoff = 9.53 cfs @ 12.25 hrs, Volume= 0.964 af, Depth= 2.47"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
103,604	70	Woods, Good, HSG C
100,644	55	Woods, Good, HSG B
204,248	63	Weighted Average
204,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.7	35	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	214	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	165	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	464	Total			

Subcatchment EX-3: EX-3



Summary for Subcatchment EX-4: EX-4

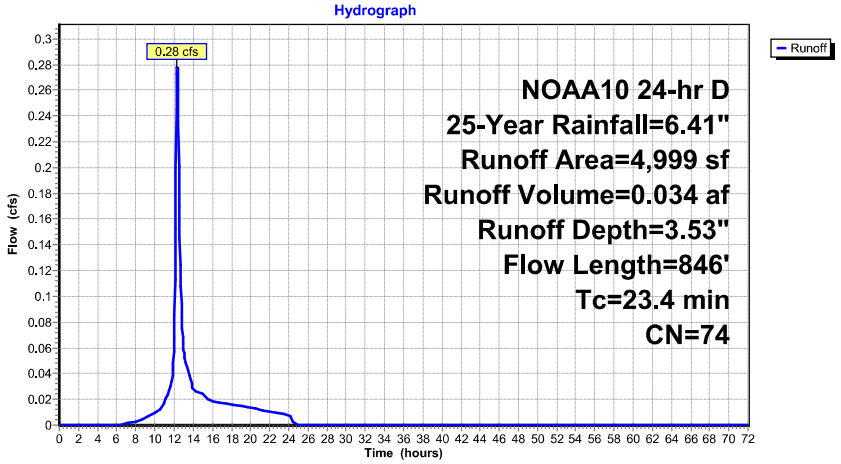
Runoff = 0.28 cfs @ 12.34 hrs, Volume= 0.034 af, Depth= 3.53"
Routed to Pond 1P : AP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
4,999	74	>75% Grass cover, Good, HSG C
4,999		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
2.2	96	0.0220	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	113	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	197	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	175	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3	215	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.4	846	Total			

Subcatchment EX-4: EX-4



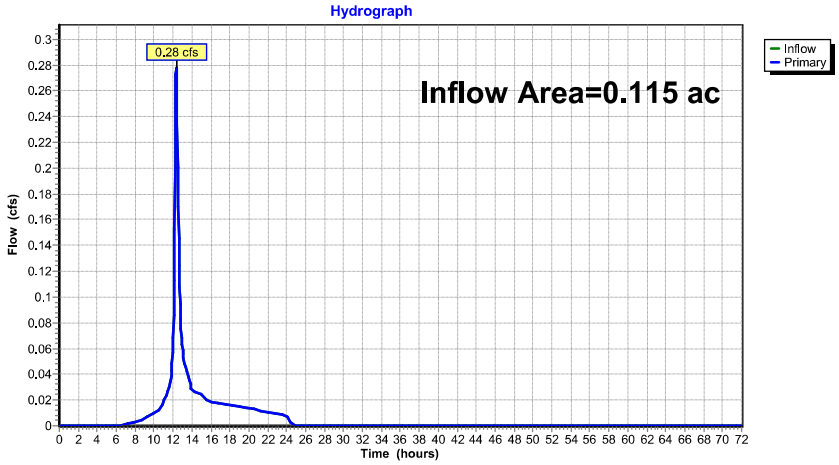
Summary for Pond 1P: AP-4

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

Inflow Area = 0.115 ac, 0.00% Impervious, Inflow Depth = 3.53" for 25-Year event
Inflow = 0.28 cfs @ 12.34 hrs, Volume= 0.034 af
Primary = 0.28 cfs @ 12.34 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond 1P: AP-4



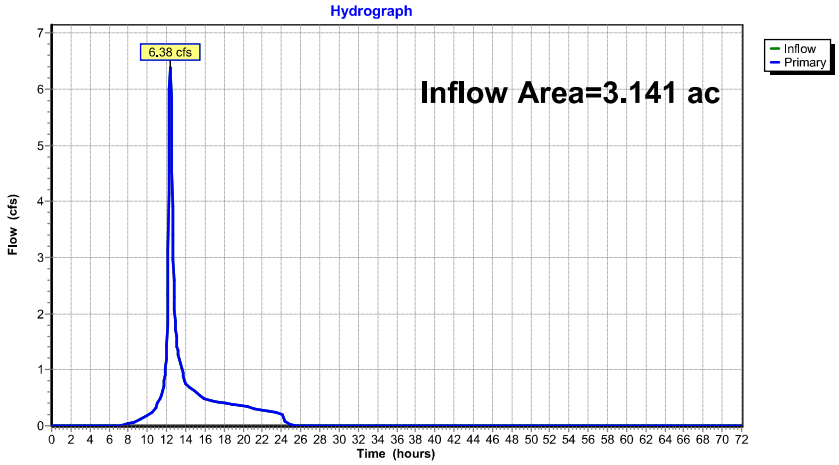
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.141 ac, 0.00% Impervious, Inflow Depth = 3.13" for 25-Year event
Inflow = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af
Primary = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



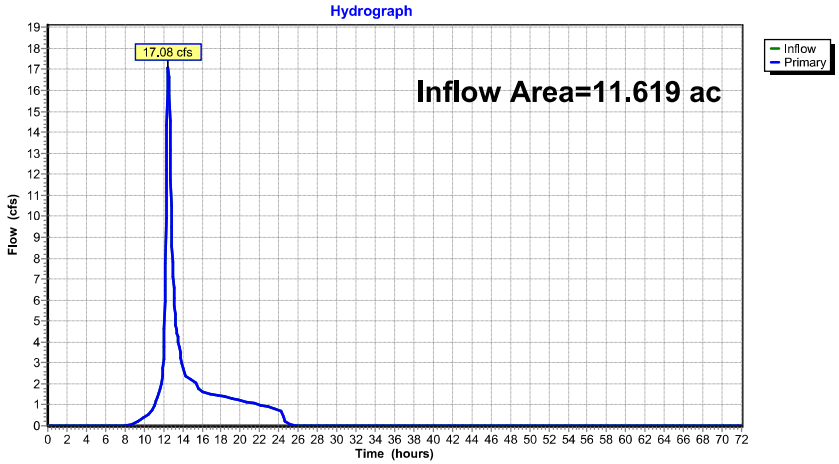
Summary for Pond AP-2: AP-2

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

Inflow Area = 11.619 ac, 2.63% Impervious, Inflow Depth = 2.75" for 25-Year event
Inflow = 17.08 cfs @ 12.49 hrs, Volume= 2.661 af
Primary = 17.08 cfs @ 12.49 hrs, Volume= 2.661 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



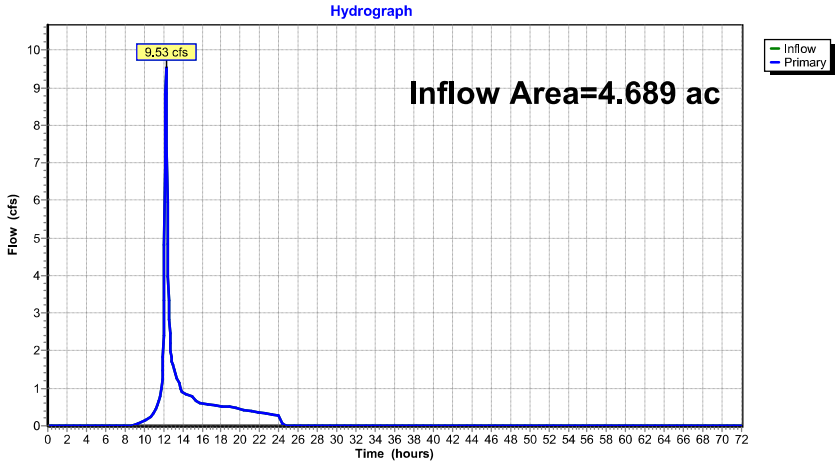
Summary for Pond AP-3: AP-3

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

Inflow Area = 4.689 ac, 0.00% Impervious, Inflow Depth = 2.47" for 25-Year event
Inflow = 9.53 cfs @ 12.25 hrs, Volume= 0.964 af
Primary = 9.53 cfs @ 12.25 hrs, Volume= 0.964 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: EX-1 Runoff Area=136,828 sf 0.00% Impervious Runoff Depth=4.63"
Flow Length=660' Tc=25.8 min CN=70 Runoff=9.46 cfs 1.211 af

Subcatchment EX-2: EX-2 Runoff Area=506,133 sf 2.63% Impervious Runoff Depth=4.16"
Flow Length=1,199' Tc=35.0 min CN=66 Runoff=26.22 cfs 4.032 af

Subcatchment EX-3: EX-3 Runoff Area=204,248 sf 0.00% Impervious Runoff Depth=3.82"
Flow Length=464' Tc=15.8 min CN=63 Runoff=15.00 cfs 1.492 af

Subcatchment EX-4: EX-4 Runoff Area=4,999 sf 0.00% Impervious Runoff Depth=5.10"
Flow Length=846' Tc=23.4 min CN=74 Runoff=0.40 cfs 0.049 af

Pond 1P: AP-4 Inflow=0.40 cfs 0.049 af
Primary=0.40 cfs 0.049 af

Pond AP-1: AP-1 Inflow=9.46 cfs 1.211 af
Primary=9.46 cfs 1.211 af

Pond AP-2: AP-2 Inflow=26.22 cfs 4.032 af
Primary=26.22 cfs 4.032 af

Pond AP-3: AP-3 Inflow=15.00 cfs 1.492 af
Primary=15.00 cfs 1.492 af

Total Runoff Area = 19.564 ac Runoff Volume = 6.784 af Average Runoff Depth = 4.16"
98.44% Pervious = 19.259 ac 1.56% Impervious = 0.305 ac

Summary for Subcatchment EX-1: EX-1

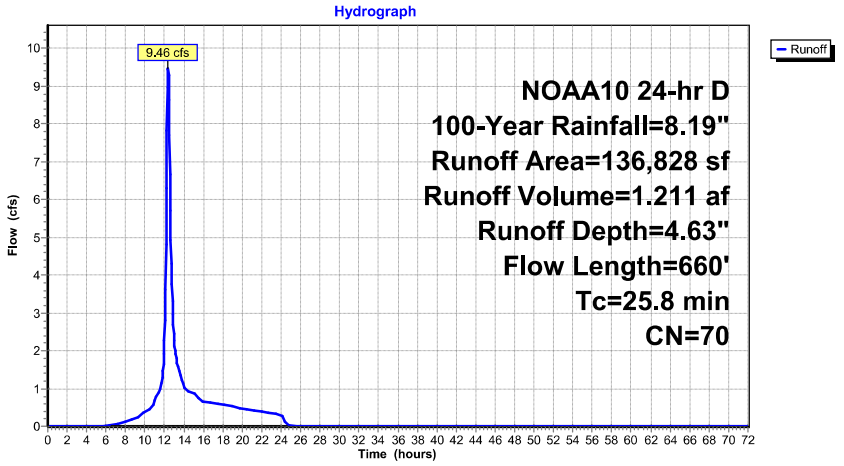
Runoff = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af, Depth= 4.63"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
136,828	70	Woods, Good, HSG C
136,828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment EX-1: EX-1



Summary for Subcatchment EX-2: EX-2

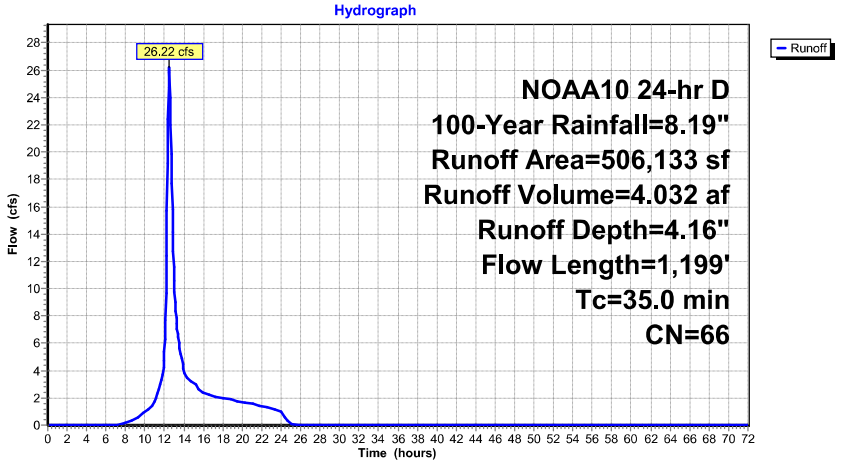
Runoff = 26.22 cfs @ 12.49 hrs, Volume= 4.032 af, Depth= 4.16"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
286,814	70	Woods, Good, HSG C
166,119	55	Woods, Good, HSG B
53,200	80	1/2 acre lots, 25% imp, HSG C
506,133	66	Weighted Average
492,833		97.37% Pervious Area
13,300		2.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.1	274	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.2	455	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
35.0	1,199	Total			

Subcatchment EX-2: EX-2



Summary for Subcatchment EX-3: EX-3

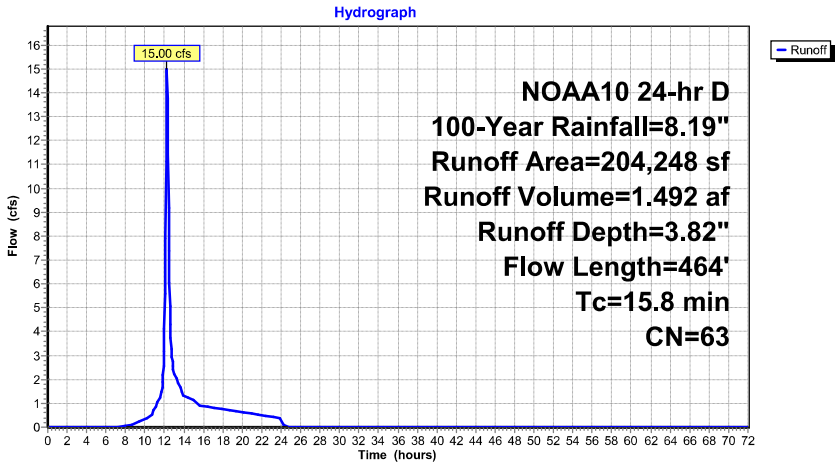
Runoff = 15.00 cfs @ 12.25 hrs, Volume= 1.492 af, Depth= 3.82"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
103,604	70	Woods, Good, HSG C
100,644	55	Woods, Good, HSG B
204,248	63	Weighted Average
204,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.7	35	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	214	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	165	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	464	Total			

Subcatchment EX-3: EX-3



Summary for Subcatchment EX-4: EX-4

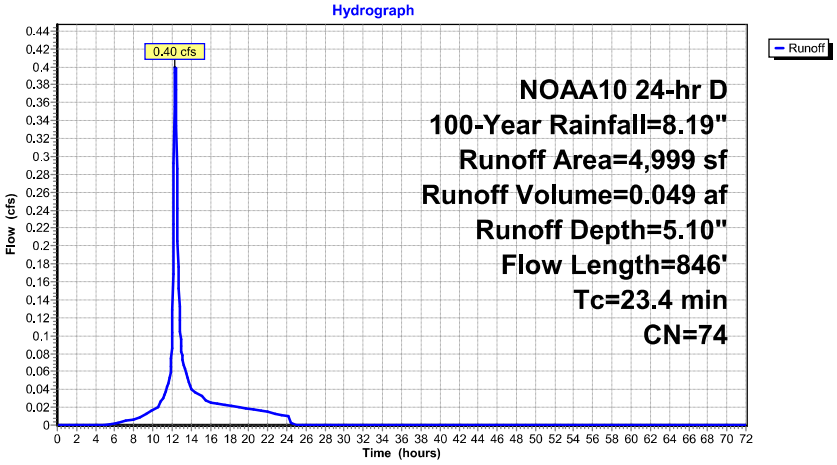
Runoff = 0.40 cfs @ 12.33 hrs, Volume= 0.049 af, Depth= 5.10"
Routed to Pond 1P : AP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
4,999	74	>75% Grass cover, Good, HSG C
4,999		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
2.2	96	0.0220	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	113	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	197	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	175	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3	215	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.4	846	Total			

Subcatchment EX-4: EX-4



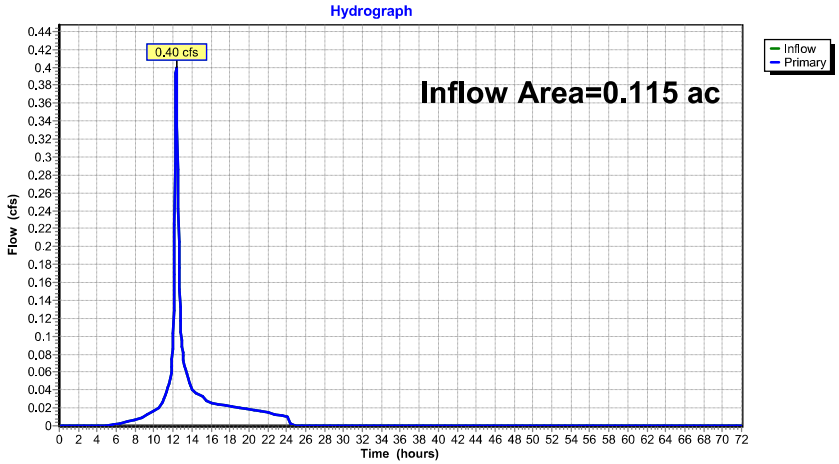
Summary for Pond 1P: AP-4

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

Inflow Area = 0.115 ac, 0.00% Impervious, Inflow Depth = 5.10" for 100-Year event
Inflow = 0.40 cfs @ 12.33 hrs, Volume= 0.049 af
Primary = 0.40 cfs @ 12.33 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond 1P: AP-4



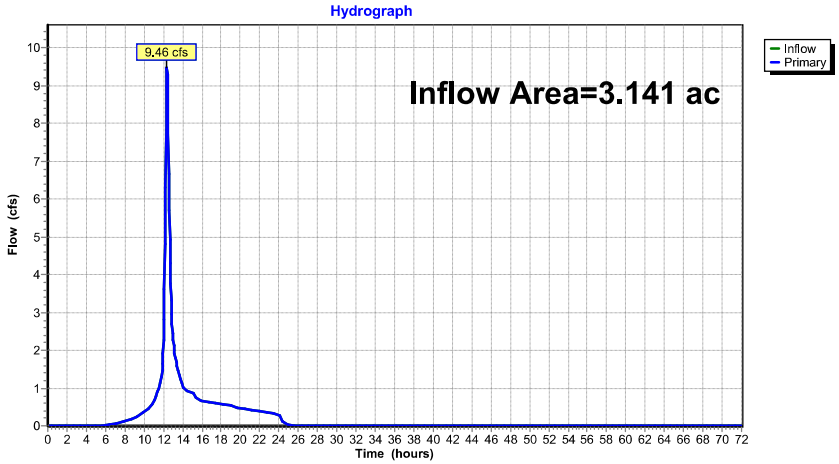
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.141 ac, 0.00% Impervious, Inflow Depth = 4.63" for 100-Year event
Inflow = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af
Primary = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



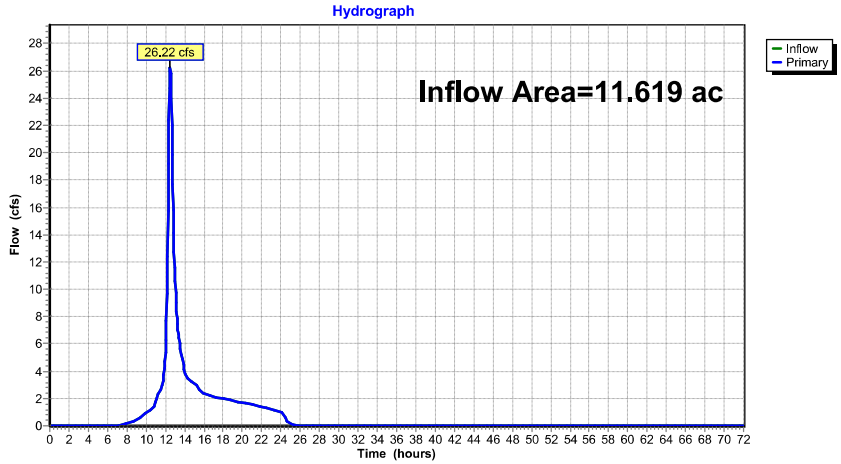
Summary for Pond AP-2: AP-2

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

Inflow Area = 11.619 ac, 2.63% Impervious, Inflow Depth = 4.16" for 100-Year event
Inflow = 26.22 cfs @ 12.49 hrs, Volume= 4.032 af
Primary = 26.22 cfs @ 12.49 hrs, Volume= 4.032 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



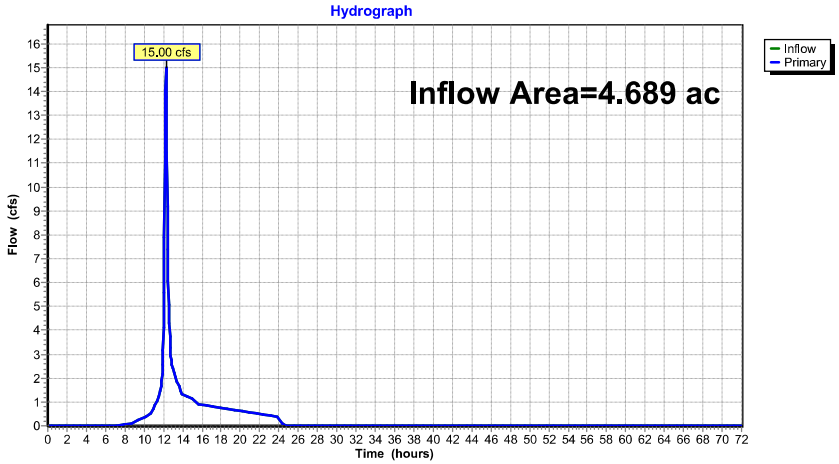
Summary for Pond AP-3: AP-3

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

Inflow Area = 4.689 ac, 0.00% Impervious, Inflow Depth = 3.82" for 100-Year event
Inflow = 15.00 cfs @ 12.25 hrs, Volume= 1.492 af
Primary = 15.00 cfs @ 12.25 hrs, Volume= 1.492 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Events for Subcatchment EX-1: EX-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.74	0.246	0.94
10-Year	5.25	4.48	0.582	2.22
25-Year	6.41	6.38	0.820	3.13
100-Year	**8.19**	**9.46**	**1.211**	**4.63**

Events for Subcatchment EX-2: EX-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	3.87	0.718	0.74
10-Year	5.25	11.53	1.840	1.90
25-Year	6.41	17.08	2.661	2.75
100-Year	**8.19**	**26.22**	**4.032**	**4.16**

Events for Subcatchment EX-3: EX-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.84	0.237	0.61
10-Year	5.25	6.25	0.652	1.67
25-Year	6.41	9.53	0.964	2.47
100-Year	**8.19**	**15.00**	**1.492**	**3.82**

Events for Subcatchment EX-4: EX-4

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	0.09	0.011	1.16
10-Year	5.25	0.20	0.025	2.57
25-Year	6.41	0.28	0.034	3.53
100-Year	**8.19**	**0.40**	**0.049**	**5.10**

Events for Pond 1P: AP-4

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	0.09	0.09	**0.00**	**0.000**
10-Year	0.20	0.20	0.00	0.000
25-Year	0.28	0.28	0.00	0.000
100-Year	**0.40**	**0.40**	0.00	0.000

Events for Pond AP-1: AP-1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	1.74	1.74	**0.00**	**0.000**
10-Year	4.48	4.48	0.00	0.000
25-Year	6.38	6.38	0.00	0.000
100-Year	**9.46**	**9.46**	0.00	0.000

Events for Pond AP-2: AP-2

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	3.87	3.87	**0.00**	**0.000**
10-Year	11.53	11.53	0.00	0.000
25-Year	17.08	17.08	0.00	0.000
100-Year	**26.22**	**26.22**	0.00	0.000

Events for Pond AP-3: AP-3

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	1.84	1.84	**0.00**	**0.000**
10-Year	6.25	6.25	0.00	0.000
25-Year	9.53	9.53	0.00	0.000
100-Year	**15.00**	**15.00**	0.00	0.000

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Existing Conditions rev1
Prepared by Guerriere & Halnon Inc
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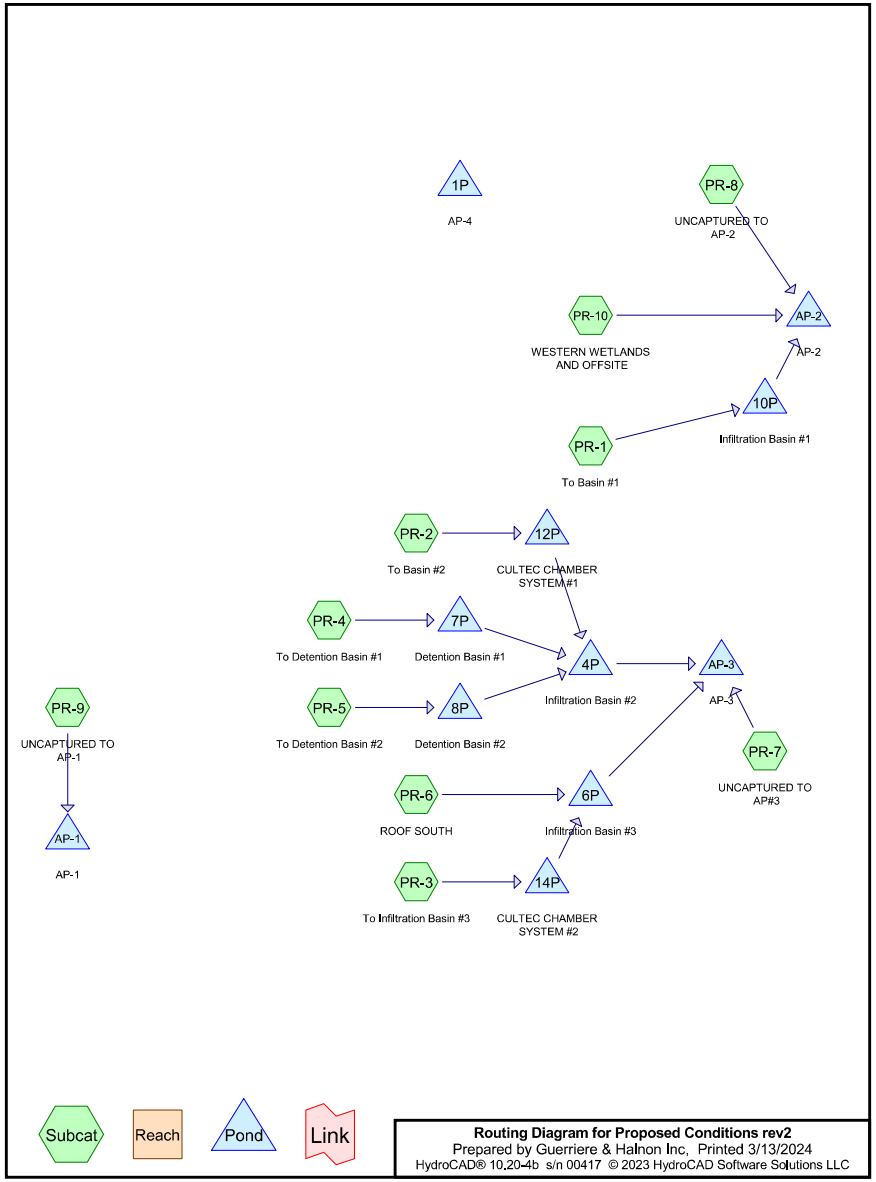


Rainfall Events Listing (selected events)

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	3.39	2
2	10-Year	NOAA10 24-hr	D	Default	24.00	1	5.25	2
3	25-Year	NOAA10 24-hr	D	Default	24.00	1	6.41	2
4	100-Year	NOAA10 24-hr	D	Default	24.00	1	8.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.238	80	1/2 acre lots, 25% imp, HSG C (PR-10)
0.002	0	>75% Grass cover, Good (PR-5)
2.273	61	>75% Grass cover, Good, HSG B (PR-1, PR-2, PR-3, PR-4, PR-5, PR-7, PR-8)
1.763	74	>75% Grass cover, Good, HSG C (PR-1, PR-10, PR-2, PR-3, PR-4, PR-5, PR-8, PR-9)
0.882	98	Paved parking, HSG B (PR-1, PR-2, PR-3, PR-4, PR-5, PR-7, PR-8)
1.188	98	Paved parking, HSG C (PR-1, PR-2, PR-3, PR-4, PR-5)
0.049	98	Roofs, HSG B (PR-2, PR-4, PR-6)
0.556	98	Roofs, HSG C (PR-4, PR-5, PR-6)
0.000	98	Unconnected pavement, HSG B (PR-3)
0.530	98	Water Surface, HSG B (PR-1, PR-2, PR-3, PR-4, PR-5)
0.000	98	Water Surface, HSG C (PR-5)
2.388	55	Woods, Good, HSG B (PR-1, PR-3, PR-7, PR-8)
8.697	70	Woods, Good, HSG C (PR-1, PR-10, PR-2, PR-3, PR-8, PR-9)
19.567	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
6.122	HSG B	PR-1, PR-2, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8
13.442	HSG C	PR-1, PR-10, PR-2, PR-3, PR-4, PR-5, PR-6, PR-8, PR-9
0.000	HSG D	
0.002	Other	PR-5
19.567		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.238	0.000	0.000	1.238	1/2 acre lots, 25% imp	PR-10
0.000	2.273	1.763	0.000	0.002	4.039	>75% Grass cover, Good	PR-1, PR-10, PR-2, PR-3, PR-4, PR-5, PR-7, PR-8, PR-9
0.000	0.882	1.188	0.000	0.000	2.070	Paved parking	PR-1, PR-2, PR-3, PR-4, PR-5, PR-7, PR-8
0.000	0.049	0.556	0.000	0.000	0.605	Roofs	PR-2, PR-4, PR-5, PR-6
0.000	0.000	0.000	0.000	0.000	0.000	Unconnected pavement	PR-3
0.000	0.530	0.000	0.000	0.000	0.530	Water Surface	PR-1, PR-2, PR-3, PR-4, PR-5
0.000	2.388	8.697	0.000	0.000	11.086	Woods, Good	PR-1, PR-10, PR-2, PR-3, PR-7, PR-8, PR-9
0.000	**6.122**	**13.442**	**0.000**	**0.002**	**19.567**	**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	PR-1	0.00	0.00	293.0	0.0610	0.013	0.0	12.0	0.0	
2	PR-2	0.00	0.00	336.0	0.0075	0.013	0.0	18.0	0.0	
3	4P	355.00	354.00	200.0	0.0050	0.013	0.0	12.0	0.0	
4	6P	354.00	346.00	68.3	0.1171	0.013	0.0	12.0	0.0	
5	7P	357.57	357.42	30.0	0.0050	0.013	0.0	12.0	0.0	
6	8P	359.18	358.75	86.0	0.0050	0.010	0.0	12.0	0.0	
7	10P	320.00	318.00	60.0	0.0333	0.013	0.0	18.0	0.0	
8	12P	359.60	358.94	131.1	0.0050	0.013	0.0	15.0	0.0	
9	14P	358.80	358.65	15.3	0.0098	0.013	0.0	18.0	0.0	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: To Basin #1 Runoff Area=133,315 sf 34.47% Impervious Runoff Depth=1.35"
Flow Length=819' Tc=17.4 min CN=77 Runoff=3.27 cfs 0.344 af

Subcatchment PR-10: WESTERN Runoff Area=206,274 sf 6.53% Impervious Runoff Depth=1.11"
Flow Length=756' Tc=29.2 min CN=73 Runoff=2.99 cfs 0.437 af

Subcatchment PR-2: To Basin #2 Runoff Area=59,024 sf 41.78% Impervious Runoff Depth=1.69"
Flow Length=472' Tc=14.3 min CN=82 Runoff=2.01 cfs 0.191 af

Subcatchment PR-3: To Infiltration Basin Runoff Area=82,428 sf 33.99% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=79 Runoff=3.37 cfs 0.234 af

Subcatchment PR-4: To Detention Basin #1 Runoff Area=16,000 sf 92.34% Impervious Runoff Depth=2.83"
Tc=6.0 min CN=95 Runoff=1.15 cfs 0.087 af

Subcatchment PR-5: To Detention Basin #2 Runoff Area=19,916 sf 68.53% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=88 Runoff=1.18 cfs 0.083 af

Subcatchment PR-6: ROOF SOUTH Runoff Area=12,492 sf 100.00% Impervious Runoff Depth=3.16"
Tc=6.0 min CN=98 Runoff=0.94 cfs 0.075 af

Subcatchment PR-7: UNCAPTURED TO Runoff Area=49,112 sf 0.09% Impervious Runoff Depth=0.41"
Flow Length=275' Tc=8.6 min CN=58 Runoff=0.29 cfs 0.039 af

Subcatchment PR-8: UNCAPTURED TO Runoff Area=137,043 sf 0.01% Impervious Runoff Depth=0.52"
Flow Length=301' Tc=11.3 min CN=61 Runoff=1.15 cfs 0.137 af

Subcatchment PR-9: UNCAPTURED TO Runoff Area=136,727 sf 0.00% Impervious Runoff Depth=0.94"
Flow Length=660' Tc=25.8 min CN=70 Runoff=1.74 cfs 0.246 af

Pond 1P: AP-4
Primary=0.00 cfs 0.000 af

Pond 4P: Infiltration Basin #2 Peak Elev=358.37' Storage=4,204 cf Inflow=1.60 cfs 0.348 af
Discarded=0.13 cfs 0.247 af Primary=0.35 cfs 0.101 af Outflow=0.48 cfs 0.348 af

Pond 6P: Infiltration Basin #3 Peak Elev=357.15' Storage=4,796 cf Inflow=3.82 cfs 0.303 af
Discarded=0.15 cfs 0.303 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.303 af

Pond 7P: Detention Basin #1 Peak Elev=361.90' Storage=900 cf Inflow=1.15 cfs 0.087 af
Outflow=0.95 cfs 0.087 af

Pond 8P: Detention Basin #2 Peak Elev=360.51' Storage=1,728 cf Inflow=1.18 cfs 0.083 af
Outflow=0.07 cfs 0.079 af

Pond 10P: Infiltration Basin #1 Peak Elev=324.20' Storage=4,826 cf Inflow=3.27 cfs 0.344 af
Discarded=0.16 cfs 0.243 af Primary=0.56 cfs 0.101 af Outflow=0.72 cfs 0.344 af

Pond 12P: CULTEC CHAMBER SYSTEM #1 Peak Elev=360.70' Storage=2,095 cf Inflow=2.01 cfs 0.191 af
Outflow=0.87 cfs 0.182 af

Pond 14P: CULTEC CHAMBER SYSTEM #2 Peak Elev=361.31' Storage=0.055 af Inflow=3.37 cfs 0.234 af
Outflow=2.88 cfs 0.228 af

Pond AP-1: AP-1 Inflow=1.74 cfs 0.246 af
Primary=1.74 cfs 0.246 af

Pond AP-2: AP-2 Inflow=3.59 cfs 0.675 af
Primary=3.59 cfs 0.675 af

Pond AP-3: AP-3 Inflow=0.40 cfs 0.140 af
Primary=0.40 cfs 0.140 af

Total Runoff Area = 19.567 ac Runoff Volume = 1.872 af Average Runoff Depth = 1.15"
82.04% Pervious = 16.053 ac 17.96% Impervious = 3.514 ac

Summary for Subcatchment PR-1: To Basin #1

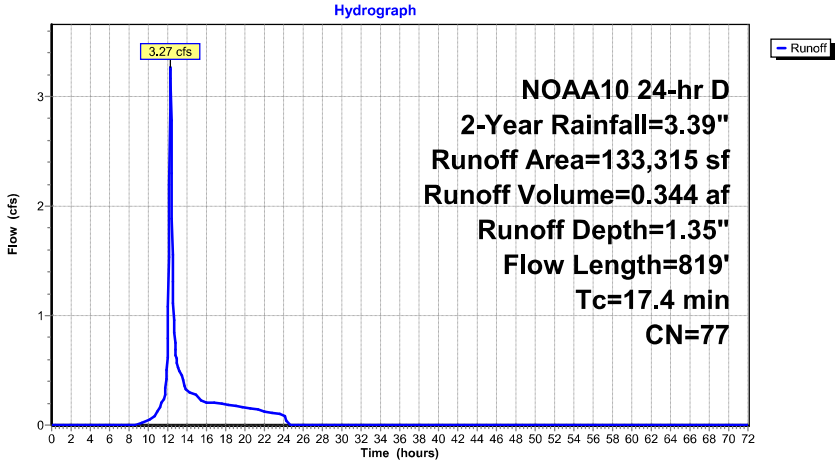
Runoff = 3.27 cfs @ 12.27 hrs, Volume= 0.344 af, Depth= 1.35"
Routed to Pond 10P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
14,748	74	>75% Grass cover, Good, HSG C
17,107	98	Paved parking, HSG C
31,793	70	Woods, Good, HSG C
5,562	98	Water Surface, HSG B
35,828	61	>75% Grass cover, Good, HSG B
23,286	98	Paved parking, HSG B
4,992	55	Woods, Good, HSG B
133,315	77	Weighted Average
87,361		65.53% Pervious Area
45,955		34.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
3.5	223	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.7	228	0.0750	5.56		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.4	293	0.0610	11.20	8.80	**Pipe Channel, E-F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
17.4	819	Total			

Subcatchment PR-1: To Basin #1



Summary for Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE

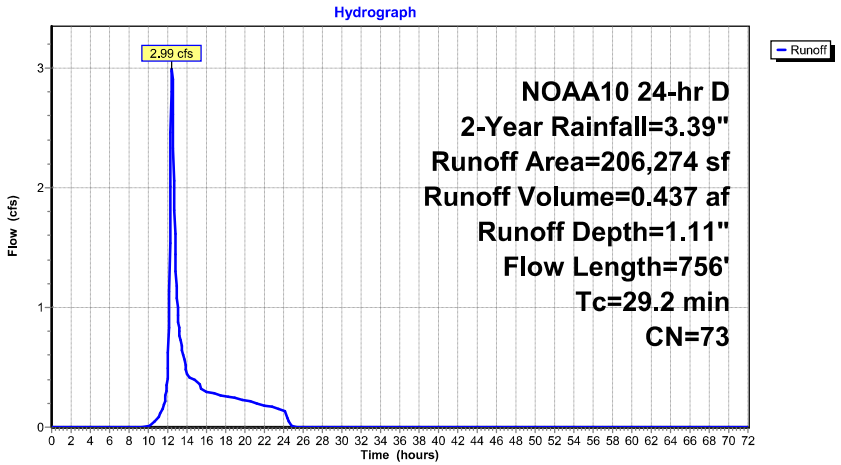
Runoff = 2.99 cfs @ 12.42 hrs, Volume= 0.437 af, Depth= 1.11"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
148,201	70	Woods, Good, HSG C
4,153	74	>75% Grass cover, Good, HSG C
53,920	80	1/2 acre lots, 25% imp, HSG C
206,274	73	Weighted Average
192,794		93.47% Pervious Area
13,480		6.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	286	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.2	756	Total			

Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE



Summary for Subcatchment PR-2: To Basin #2

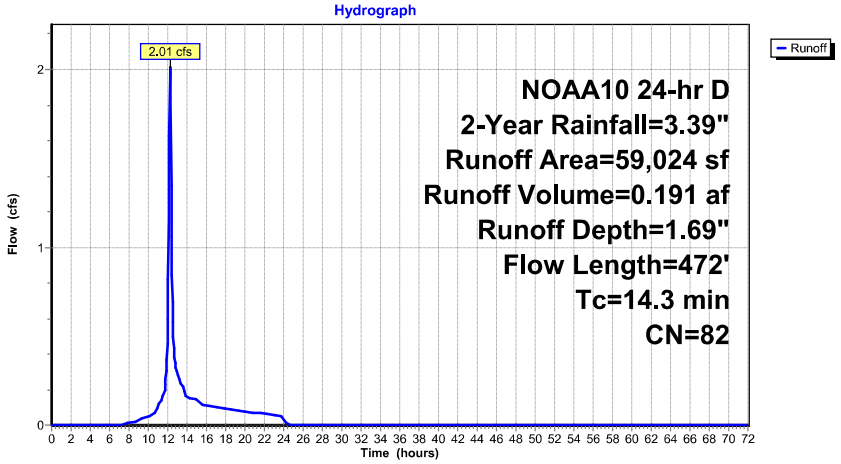
Runoff = 2.01 cfs @ 12.23 hrs, Volume= 0.191 af, Depth= 1.69"
Routed to Pond 12P : CULTEC CHAMBER SYSTEM #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
20,883	74	>75% Grass cover, Good, HSG C
15,236	98	Paved parking, HSG C
6,901	70	Woods, Good, HSG C
6,582	61	>75% Grass cover, Good, HSG B
6,240	98	Water Surface, HSG B
2,825	98	Paved parking, HSG B
358	98	Roofs, HSG B
59,024	82	Weighted Average
34,366		58.22% Pervious Area
24,658		41.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.1	38	0.5000	11.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	21	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	27	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	336	0.0075	5.15	9.10	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
14.3	472	Total			

Subcatchment PR-2: To Basin #2



Summary for Subcatchment PR-3: To Infiltration Basin #3

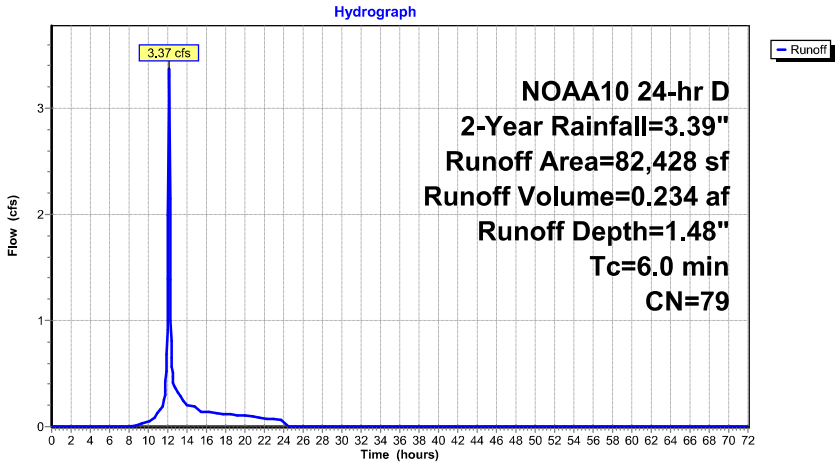
Runoff = 3.37 cfs @ 12.13 hrs, Volume= 0.234 af, Depth= 1.48"
Routed to Pond 14P : CULTEC CHAMBER SYSTEM #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
26,370	74	>75% Grass cover, Good, HSG C
15,608	98	Paved parking, HSG C
9,464	70	Woods, Good, HSG C
15,524	61	>75% Grass cover, Good, HSG B
5,303	98	Paved parking, HSG B
7,109	98	Water Surface, HSG B
0	98	Unconnected pavement, HSG B
3,049	55	Woods, Good, HSG B
82,428	79	Weighted Average
54,408		66.01% Pervious Area
28,020		33.99% Impervious Area
0		0.00% Unconnected

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

Subcatchment PR-3: To Infiltration Basin #3



Summary for Subcatchment PR-4: To Detention Basin #1

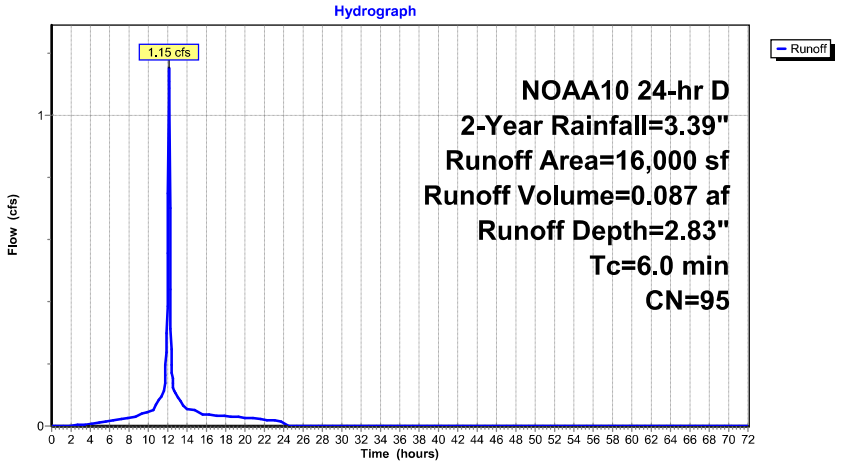
Runoff = 1.15 cfs @ 12.13 hrs, Volume= 0.087 af, Depth= 2.83"
Routed to Pond 7P : Detention Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
42	98	Paved parking, HSG C
12,807	98	Roofs, HSG C
353	74	>75% Grass cover, Good, HSG C
292	98	Paved parking, HSG B
872	61	>75% Grass cover, Good, HSG B
47	98	Roofs, HSG B
1,588	98	Water Surface, HSG B
16,000	95	Weighted Average
1,225		7.66% Pervious Area
14,775		92.34% Impervious Area

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

Subcatchment PR-4: To Detention Basin #1



Summary for Subcatchment PR-5: To Detention Basin #2

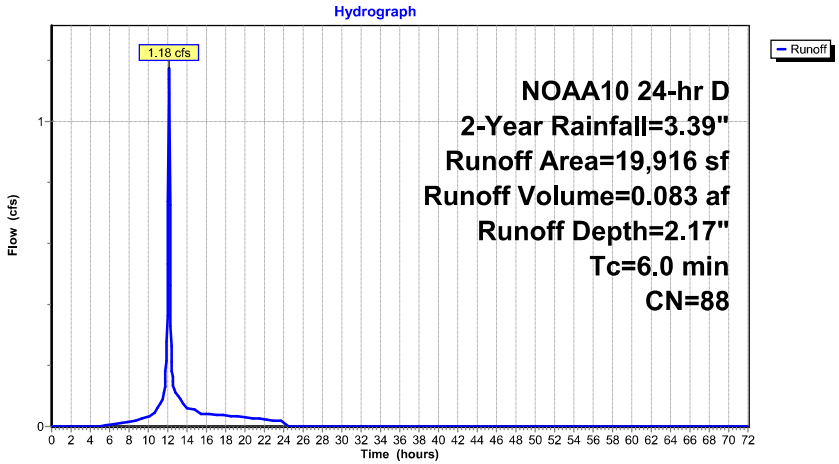
Runoff = 1.18 cfs @ 12.13 hrs, Volume= 0.083 af, Depth= 2.17"
Routed to Pond 8P : Detention Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
	3,739	98	Paved parking, HSG C
	654	98	Roofs, HSG C
	15	98	Water Surface, HSG C
	3,776	74	>75% Grass cover, Good, HSG C
	2,383	61	>75% Grass cover, Good, HSG B
	6,664	98	Paved parking, HSG B
	2,577	98	Water Surface, HSG B
*	108	0	>75% Grass cover, Good
	19,916	88	Weighted Average
	6,267		31.47% Pervious Area
	13,649		68.53% Impervious Area

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

Subcatchment PR-5: To Detention Basin #2



Summary for Subcatchment PR-6: ROOF SOUTH

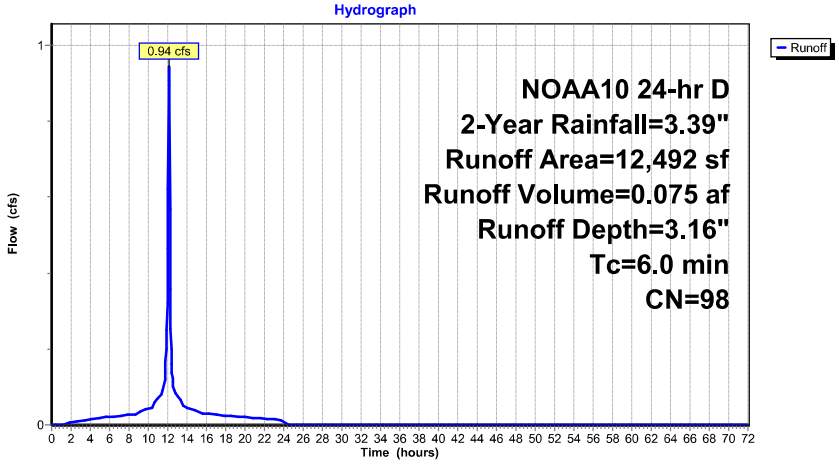
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 0.075 af, Depth= 3.16"
Routed to Pond 6P : Infiltration Basin #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
10,772	98	Roofs, HSG C
1,720	98	Roofs, HSG B
12,492	98	Weighted Average
12,492		100.00% Impervious Area

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

Subcatchment PR-6: ROOF SOUTH



Summary for Subcatchment PR-7: UNCAPTURED TO AP#3

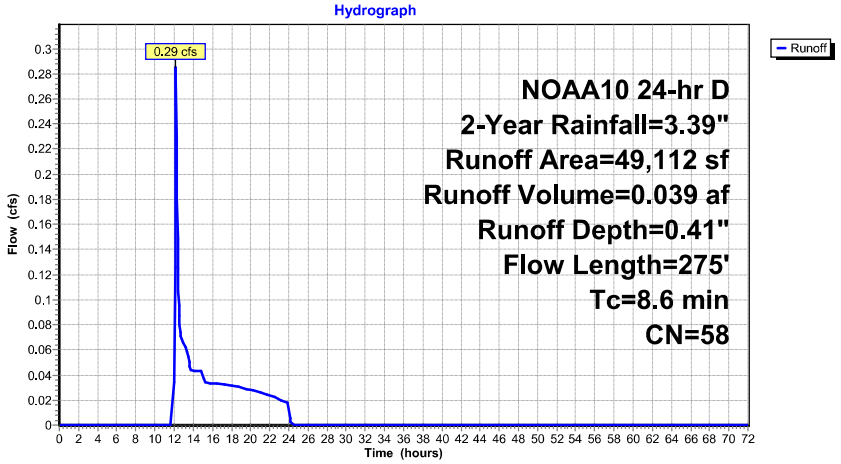
Runoff = 0.29 cfs @ 12.19 hrs, Volume= 0.039 af, Depth= 0.41"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
23,694	55	Woods, Good, HSG B
25,375	61	>75% Grass cover, Good, HSG B
44	98	Paved parking, HSG B
49,112	58	Weighted Average
49,069		99.91% Pervious Area
44		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	40	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	135	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	275	Total			

Subcatchment PR-7: UNCAPTURED TO AP#3



Summary for Subcatchment PR-8: UNCAPTURED TO AP-2

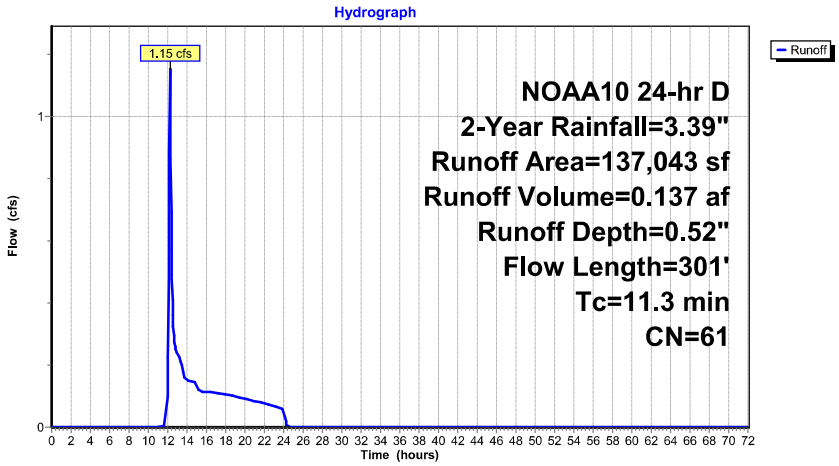
Runoff = 1.15 cfs @ 12.21 hrs, Volume= 0.137 af, Depth= 0.52"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
45,852	70	Woods, Good, HSG C
6,421	74	>75% Grass cover, Good, HSG C
72,303	55	Woods, Good, HSG B
12,457	61	>75% Grass cover, Good, HSG B
10	98	Paved parking, HSG B
137,043	61	Weighted Average
137,033		99.99% Pervious Area
10		0.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
3.1	251	0.0730	1.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	301	Total			

Subcatchment PR-8: UNCAPTURED TO AP-2



Summary for Subcatchment PR-9: UNCAPTURED TO AP-1

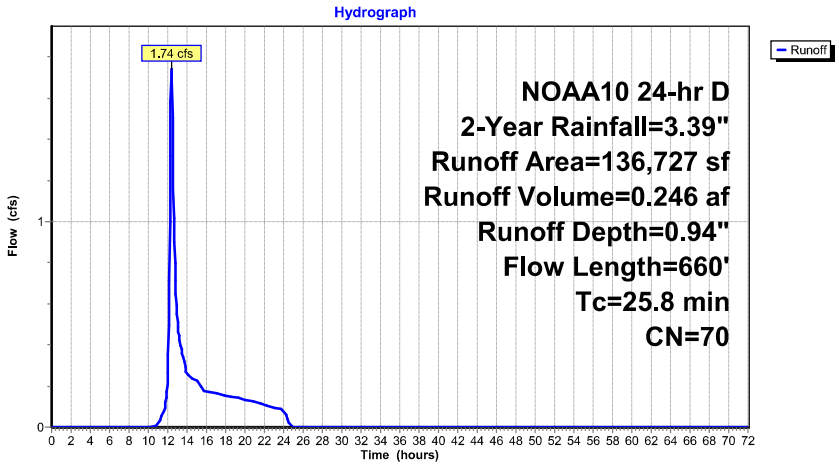
Runoff = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af, Depth= 0.94"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 2-Year Rainfall=3.39"

Area (sf)	CN	Description
136,638	70	Woods, Good, HSG C
89	74	>75% Grass cover, Good, HSG C
136,727	70	Weighted Average
136,727		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment PR-9: UNCAPTURED TO AP-1

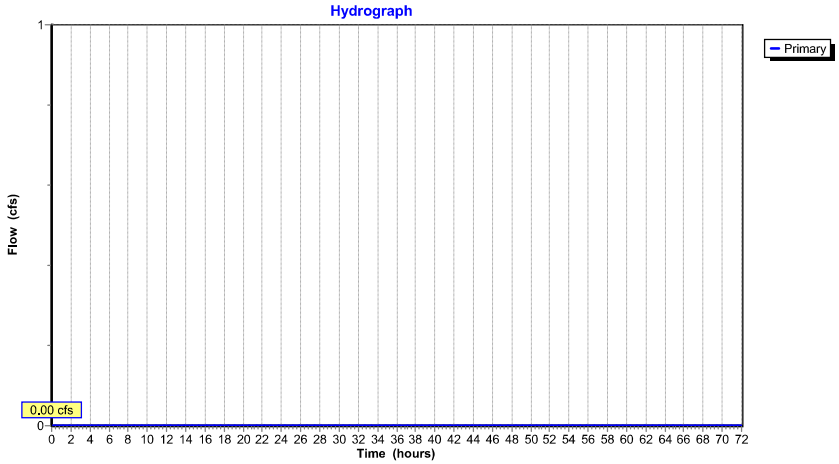


Summary for Pond 1P: AP-4

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

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=0.00' (Dynamic Tailwater)

Pond 1P: AP-4



Summary for Pond 4P: Infiltration Basin #2

Inflow Area = 2.180 ac, 55.91% Impervious, Inflow Depth = 1.92" for 2-Year event
Inflow = 1.60 cfs @ 12.19 hrs, Volume= 0.348 af
Outflow = 0.48 cfs @ 13.58 hrs, Volume= 0.348 af, Atten= 70%, Lag= 82.9 min
Discarded = 0.13 cfs @ 13.58 hrs, Volume= 0.247 af
Primary = 0.35 cfs @ 13.58 hrs, Volume= 0.101 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 358.37' @ 13.58 hrs Surf.Area= 3,677 sf Storage= 4,204 cf
Flood Elev= 360.25' Surf.Area= 5,468 sf Storage= 12,765 cf

Plug-Flow detention time= 276.6 min calculated for 0.348 af (100% of inflow)
Center-of-Mass det. time= 276.6 min (1,241.6 - 965.0)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	17,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

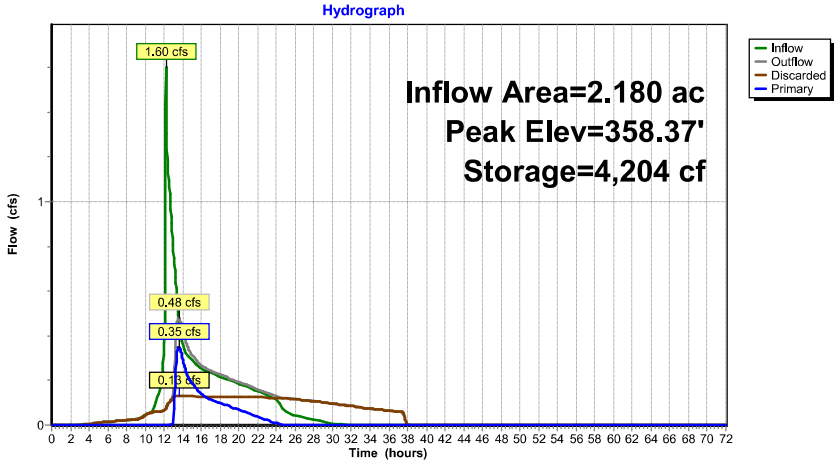
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	2,466	0	0
358.00	3,324	2,895	2,895
360.00	5,211	8,535	11,430
361.00	6,240	5,726	17,156

Device	Routing	Invert	Outlet Devices
#1	Primary	355.00'	**12.0" Round Culvert** L= 200.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 355.00' / 354.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.20'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 354.90' Phase-In= 0.01'

Discarded OutFlow Max=0.13 cfs @ 13.58 hrs HW=358.37' (Free Discharge)
└**4=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.35 cfs @ 13.58 hrs HW=358.37' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.35 cfs of 4.15 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 1.34 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin #2



Summary for Pond 6P: Infiltration Basin #3

Inflow Area = 2.179 ac, 42.68% Impervious, Inflow Depth = 1.67" for 2-Year event
Inflow = 3.82 cfs @ 12.17 hrs, Volume= 0.303 af
Outflow = 0.15 cfs @ 19.83 hrs, Volume= 0.303 af, Atten= 96%, Lag= 459.4 min
Discarded = 0.15 cfs @ 19.83 hrs, Volume= 0.303 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.15' @ 19.83 hrs Surf.Area= 4,644 sf Storage= 4,796 cf
Flood Elev= 359.25' Surf.Area= 6,440 sf Storage= 16,409 cf

Plug-Flow detention time= 381.3 min calculated for 0.303 af (100% of inflow)
Center-of-Mass det. time= 381.3 min (1,343.1 - 961.9)

Volume	Invert	Avail.Storage	Storage Description
#1	356.00'	21,490 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

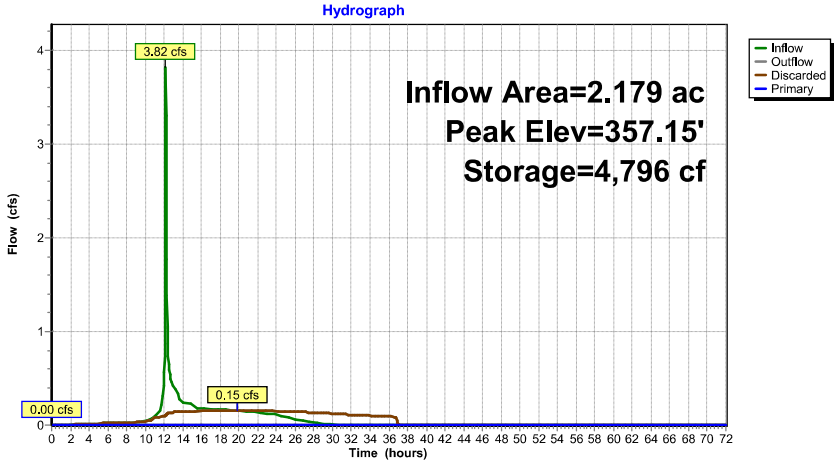
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
356.00	3,731	0	0
358.00	5,325	9,056	9,056
360.00	7,109	12,434	21,490

Device	Routing	Invert	Outlet Devices
#1	Primary	354.00'	**12.0" Round Culvert** L= 68.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 354.00' / 346.00' S= 0.1171 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	356.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 353.50' Phase-In= 0.01'

Discarded OutFlow Max=0.15 cfs @ 19.83 hrs HW=357.15' (Free Discharge)
└**3=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=356.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 4.63 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: Infiltration Basin #3



Summary for Pond 7P: Detention Basin #1

Inflow Area = 0.367 ac, 92.34% Impervious, Inflow Depth = 2.83" for 2-Year event
Inflow = 1.15 cfs @ 12.13 hrs, Volume= 0.087 af
Outflow = 0.95 cfs @ 12.18 hrs, Volume= 0.087 af, Atten= 18%, Lag= 3.2 min
Primary = 0.95 cfs @ 12.18 hrs, Volume= 0.087 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.90' @ 12.18 hrs Surf.Area= 747 sf Storage= 900 cf

Plug-Flow detention time= 89.1 min calculated for 0.087 af (100% of inflow)
Center-of-Mass det. time= 89.4 min (879.3 - 789.9)

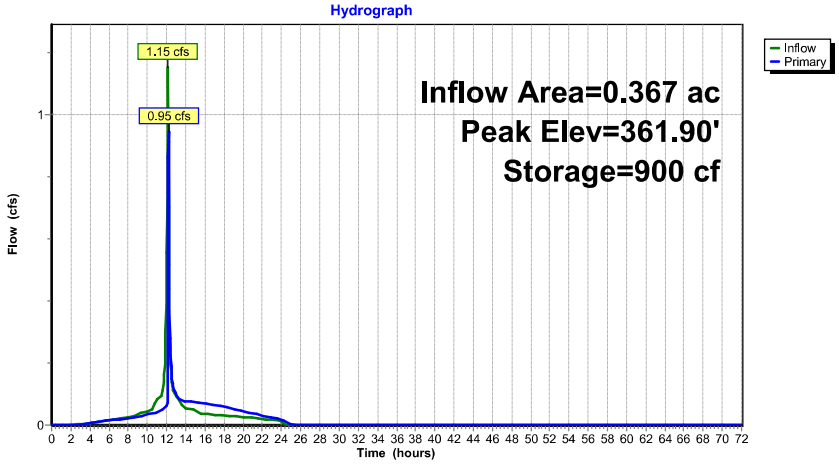
Volume	Invert	Avail.Storage	Storage Description
#1	360.00'	1,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
360.00	198	0	0
362.00	775	973	973
363.00	1,153	964	1,937

Device	Routing	Invert	Outlet Devices
#1	Primary	357.57'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 357.57' / 357.42' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	361.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.89 cfs @ 12.18 hrs HW=361.90' TW=357.34' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.89 cfs of 7.40 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 0.81 cfs @ 1.03 fps)
└**3=Orifice/Grate** (Orifice Controls 0.08 cfs @ 6.52 fps)

Pond 7P: Detention Basin #1



Summary for Pond 8P: Detention Basin #2

Inflow Area = 0.457 ac, 68.53% Impervious, Inflow Depth = 2.17" for 2-Year event
Inflow = 1.18 cfs @ 12.13 hrs, Volume= 0.083 af
Outflow = 0.07 cfs @ 13.61 hrs, Volume= 0.079 af, Atten= 94%, Lag= 88.9 min
Primary = 0.07 cfs @ 13.61 hrs, Volume= 0.079 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.51' @ 13.61 hrs Surf.Area= 1,439 sf Storage= 1,728 cf

Plug-Flow detention time= 327.9 min calculated for 0.079 af (95% of inflow)
Center-of-Mass det. time= 303.3 min (1,138.8 - 835.5)

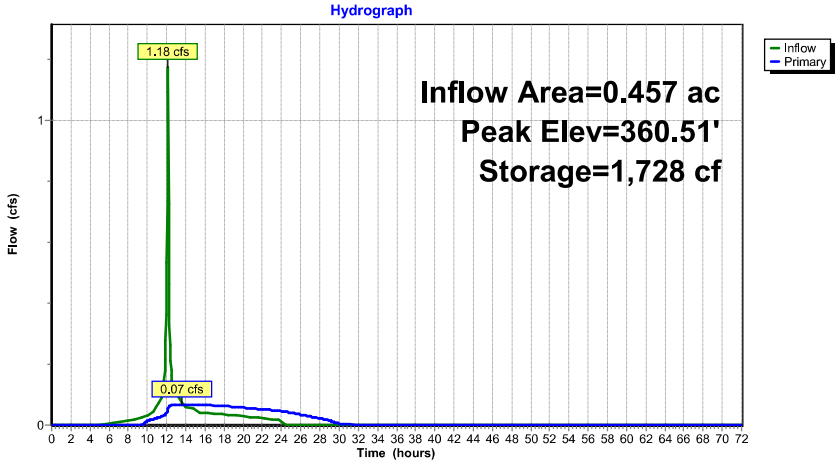
Volume	Invert	Avail.Storage	Storage Description
#1	359.00'	6,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
359.00	873	0	0
360.00	1,218	1,046	1,046
362.00	2,077	3,295	4,341
363.00	2,592	2,335	6,675

Device	Routing	Invert	Outlet Devices
#1	Primary	359.18'	**12.0" Round Culvert** L= 86.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 359.18' / 358.75' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	359.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	362.20'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 13.61 hrs HW=360.51' TW=358.37' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.07 cfs of 3.13 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 5.56 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Pond 8P: Detention Basin #2



Summary for Pond 10P: Infiltration Basin #1

Inflow Area = 3.060 ac, 34.47% Impervious, Inflow Depth = 1.35" for 2-Year event
Inflow = 3.27 cfs @ 12.27 hrs, Volume= 0.344 af
Outflow = 0.72 cfs @ 12.78 hrs, Volume= 0.344 af, Atten= 78%, Lag= 30.7 min
Discarded = 0.16 cfs @ 12.78 hrs, Volume= 0.243 af
Primary = 0.56 cfs @ 12.78 hrs, Volume= 0.101 af
Routed to Pond AP-2 : AP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 324.20' @ 12.78 hrs Surf.Area= 2,808 sf Storage= 4,826 cf

Plug-Flow detention time= 248.0 min calculated for 0.344 af (100% of inflow)
Center-of-Mass det. time= 248.2 min (1,144.2 - 896.0)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	20,497 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

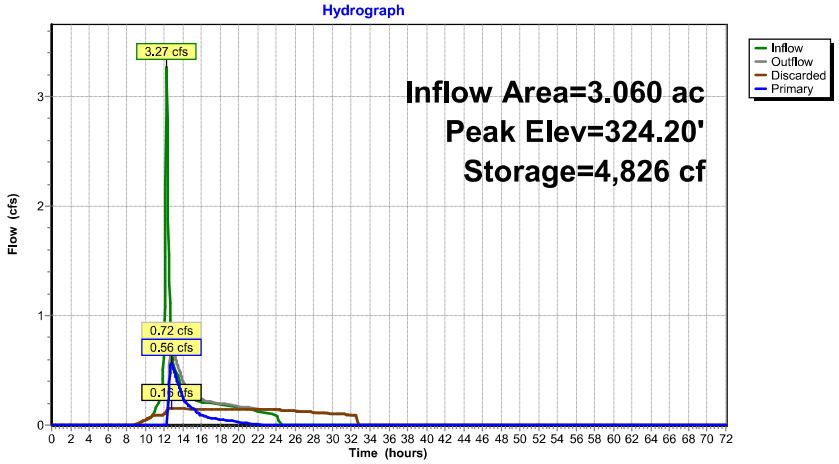
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,609	0	0
324.00	2,681	4,290	4,290
326.00	3,982	6,663	10,953
328.00	5,562	9,544	20,497

Device	Routing	Invert	Outlet Devices
#1	Primary	320.00'	**18.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 320.00' / 318.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Discarded	322.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	323.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	325.35'	**8.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	326.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	327.15'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 12.78 hrs HW=324.19' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.56 cfs @ 12.78 hrs HW=324.19' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.56 cfs of 15.79 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 0.56 cfs @ 2.27 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1



Summary for Pond 12P: CULTEC CHAMBER SYSTEM #1

Inflow Area = 1.355 ac, 41.78% Impervious, Inflow Depth = 1.69" for 2-Year event
Inflow = 2.01 cfs @ 12.23 hrs, Volume= 0.191 af
Outflow = 0.87 cfs @ 12.45 hrs, Volume= 0.182 af, Atten= 57%, Lag= 13.3 min
Primary = 0.87 cfs @ 12.45 hrs, Volume= 0.182 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.70' @ 12.45 hrs Surf.Area= 1,856 sf Storage= 2,095 cf

Plug-Flow detention time= 82.0 min calculated for 0.182 af (95% of inflow)
Center-of-Mass det. time= 58.7 min (930.7 - 871.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	359.10'	1,442 cf	**41.25'W x 45.00'L x 3.21'H Field A** 5,955 cf Overall - 2,350 cf Embedded = 3,606 cf x 40.0% Voids
#2A	359.60'	2,350 cf	**Cultec R-280HD** x 54 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 9 rows
		3,792 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	359.60'	**15.0" Round Culvert** L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 359.60' / 358.94' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	361.30'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	359.60'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.87 cfs @ 12.45 hrs HW=360.70' TW=357.73' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.87 cfs of 3.34 cfs potential flow)
↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.87 cfs @ 4.45 fps)

Pond 12P: CULTEC CHAMBER SYSTEM #1 - 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 9 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

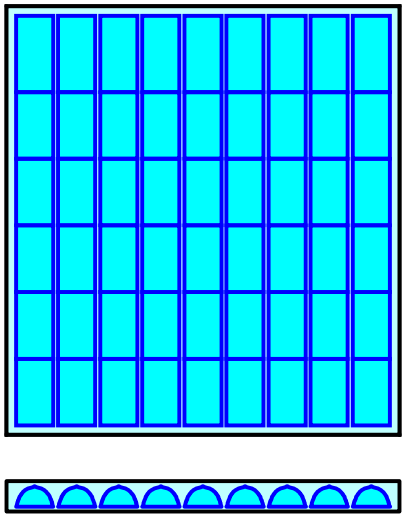
6 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 43.00' Row Length +12.0" End Stone x 2 = 45.00' Base Length
9 Rows x 47.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 41.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

54 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 9 Rows = 2,349.8 cf Chamber Storage

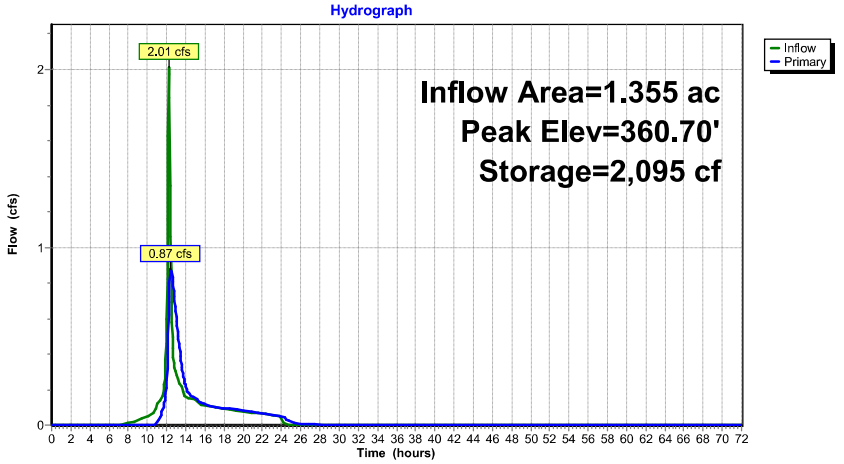
5,955.5 cf Field - 2,349.8 cf Chambers = 3,605.7 cf Stone x 40.0% Voids = 1,442.3 cf Stone Storage

Chamber Storage + Stone Storage = 3,792.0 cf = 0.087 af
Overall Storage Efficiency = 63.7%
Overall System Size = 45.00' x 41.25' x 3.21'

54 Chambers
220.6 cy Field
133.5 cy Stone



Pond 12P: CULTEC CHAMBER SYSTEM #1



Summary for Pond 14P: CULTEC CHAMBER SYSTEM #2

Inflow Area = 1.892 ac, 33.99% Impervious, Inflow Depth = 1.48" for 2-Year event
Inflow = 3.37 cfs @ 12.13 hrs, Volume= 0.234 af
Outflow = 2.88 cfs @ 12.18 hrs, Volume= 0.228 af, Atten= 15%, Lag= 2.6 min
Primary = 2.88 cfs @ 12.18 hrs, Volume= 0.228 af
Routed to Pond 6P : Infiltration Basin #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.31' @ 12.18 hrs Surf.Area= 0.028 ac Storage= 0.055 af

Plug-Flow detention time= 164.1 min calculated for 0.228 af (97% of inflow)
Center-of-Mass det. time= 151.8 min (1,029.0 - 877.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	358.30'	0.022 af	**23.58'W x 52.00'L x 3.21'H Field A** 0.090 af Overall - 0.035 af Embedded = 0.055 af x 40.0% Voids
#2A	358.80'	0.035 af	**Cultec R-280HD** x 35 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 5 rows
		0.057 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	361.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Device 3	358.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	358.80'	**18.0" Round Culvert** L= 15.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 358.80' / 358.65' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.71 cfs @ 12.18 hrs HW=361.29' TW=356.35' (Dynamic Tailwater)
└**3=Culvert** (Passes 2.71 cfs of 11.23 cfs potential flow)
├**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.55 cfs @ 1.77 fps)
└**2=Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.47 fps)

Pond 14P: CULTEC CHAMBER SYSTEM #2 - 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 5 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

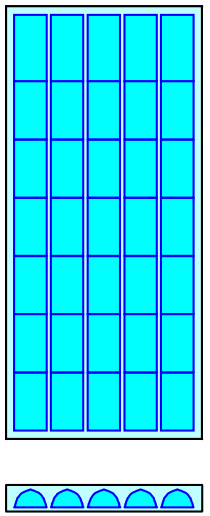
7 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 50.00' Row Length +12.0" End Stone x 2 = 52.00' Base Length
5 Rows x 47.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 23.58' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

35 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 5 Rows = 1,517.9 cf Chamber Storage

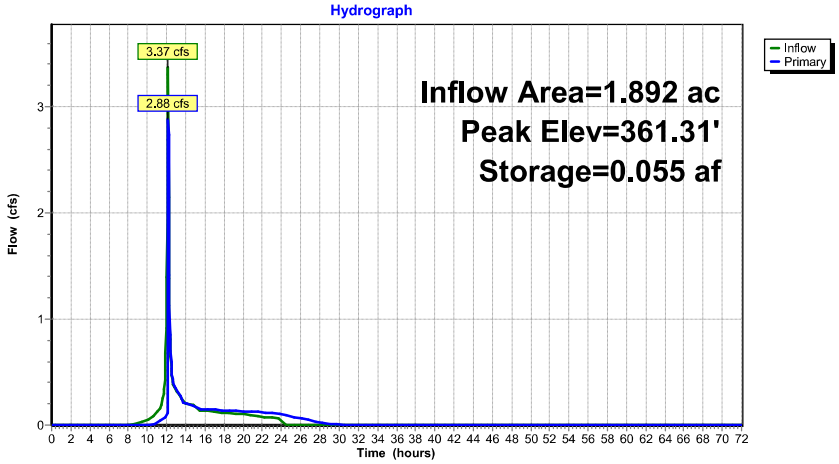
3,934.5 cf Field - 1,517.9 cf Chambers = 2,416.5 cf Stone x 40.0% Voids = 966.6 cf Stone Storage

Chamber Storage + Stone Storage = 2,484.6 cf = 0.057 af
Overall Storage Efficiency = 63.1%
Overall System Size = 52.00' x 23.58' x 3.21'

35 Chambers
145.7 cy Field
89.5 cy Stone



Pond 14P: CULTEC CHAMBER SYSTEM #2



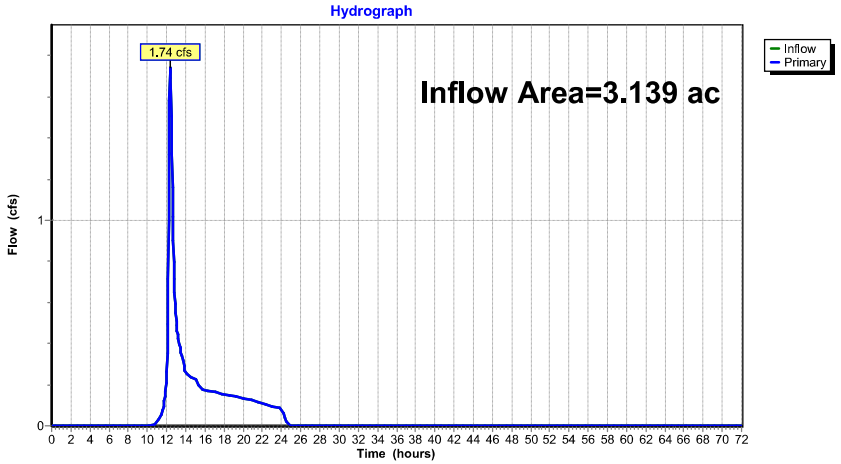
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.139 ac, 0.00% Impervious, Inflow Depth = 0.94" for 2-Year event
Inflow = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af
Primary = 1.74 cfs @ 12.38 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



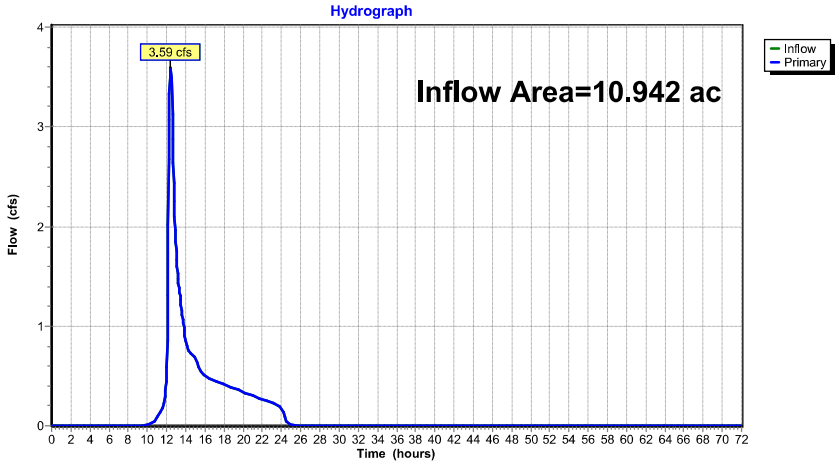
Summary for Pond AP-2: AP-2

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

Inflow Area = 10.942 ac, 12.47% Impervious, Inflow Depth = 0.74" for 2-Year event
Inflow = 3.59 cfs @ 12.44 hrs, Volume= 0.675 af
Primary = 3.59 cfs @ 12.44 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



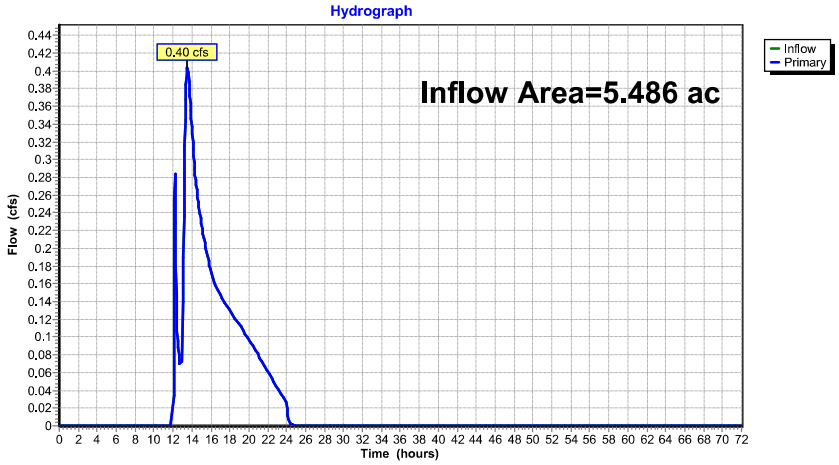
Summary for Pond AP-3: AP-3

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

Inflow Area = 5.486 ac, 39.18% Impervious, Inflow Depth = 0.31" for 2-Year event
Inflow = 0.40 cfs @ 13.54 hrs, Volume= 0.140 af
Primary = 0.40 cfs @ 13.54 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: To Basin #1 Runoff Area=133,315 sf 34.47% Impervious Runoff Depth=2.83"
Flow Length=819' Tc=17.4 min CN=77 Runoff=6.99 cfs 0.723 af

Subcatchment PR-10: WESTERN Runoff Area=206,274 sf 6.53% Impervious Runoff Depth=2.48"
Flow Length=756' Tc=29.2 min CN=73 Runoff=7.05 cfs 0.978 af

Subcatchment PR-2: To Basin #2 Runoff Area=59,024 sf 41.78% Impervious Runoff Depth=3.30"
Flow Length=472' Tc=14.3 min CN=82 Runoff=3.93 cfs 0.373 af

Subcatchment PR-3: To Infiltration Basin Runoff Area=82,428 sf 33.99% Impervious Runoff Depth=3.02"
Tc=6.0 min CN=79 Runoff=6.84 cfs 0.476 af

Subcatchment PR-4: To Detention Basin #1 Runoff Area=16,000 sf 92.34% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=95 Runoff=1.84 cfs 0.143 af

Subcatchment PR-5: To Detention Basin #2 Runoff Area=19,916 sf 68.53% Impervious Runoff Depth=3.91"
Tc=6.0 min CN=88 Runoff=2.06 cfs 0.149 af

Subcatchment PR-6: ROOF SOUTH Runoff Area=12,492 sf 100.00% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=98 Runoff=1.47 cfs 0.120 af

Subcatchment PR-7: UNCAPTURED TO Runoff Area=49,112 sf 0.09% Impervious Runoff Depth=1.31"
Flow Length=275' Tc=8.6 min CN=58 Runoff=1.46 cfs 0.123 af

Subcatchment PR-8: UNCAPTURED TO Runoff Area=137,043 sf 0.01% Impervious Runoff Depth=1.52"
Flow Length=301' Tc=11.3 min CN=61 Runoff=4.42 cfs 0.399 af

Subcatchment PR-9: UNCAPTURED TO Runoff Area=136,727 sf 0.00% Impervious Runoff Depth=2.22"
Flow Length=660' Tc=25.8 min CN=70 Runoff=4.47 cfs 0.582 af

Pond 1P: AP-4
Primary=0.00 cfs 0.000 af

Pond 4P: Infiltration Basin #2 Peak Elev=358.72' Storage=5,532 cf Inflow=4.04 cfs 0.652 af
Discarded=0.15 cfs 0.305 af Primary=1.79 cfs 0.347 af Outflow=1.94 cfs 0.652 af

Pond 6P: Infiltration Basin #3 Peak Elev=358.63' Storage=12,568 cf Inflow=8.58 cfs 0.590 af
Discarded=0.25 cfs 0.590 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.590 af

Pond 7P: Detention Basin #1 Peak Elev=361.96' Storage=945 cf Inflow=1.84 cfs 0.143 af
Outflow=1.82 cfs 0.143 af

Pond 8P: Detention Basin #2 Peak Elev=361.51' Storage=3,371 cf Inflow=2.06 cfs 0.149 af
Outflow=0.09 cfs 0.145 af

Pond 10P: Infiltration Basin #1 Peak Elev=325.61' Storage=9,464 cf Inflow=6.99 cfs 0.723 af
Discarded=0.21 cfs 0.284 af Primary=2.37 cfs 0.439 af Outflow=2.58 cfs 0.723 af

Pond 12P: CULTEC CHAMBER SYSTEM #1 Peak Elev=361.57' Storage=3,219 cf Inflow=3.93 cfs 0.373 af
Outflow=3.44 cfs 0.364 af

Pond 14P: CULTEC CHAMBER SYSTEM #2 Peak Elev=361.57' Storage=0.057 af Inflow=6.84 cfs 0.476 af
Outflow=7.12 cfs 0.470 af

Pond AP-1: AP-1 Inflow=4.47 cfs 0.582 af
Primary=4.47 cfs 0.582 af

Pond AP-2: AP-2 Inflow=10.89 cfs 1.816 af
Primary=10.89 cfs 1.816 af

Pond AP-3: AP-3 Inflow=2.14 cfs 0.470 af
Primary=2.14 cfs 0.470 af

Total Runoff Area = 19.567 ac Runoff Volume = 4.065 af Average Runoff Depth = 2.49"
82.04% Pervious = 16.053 ac 17.96% Impervious = 3.514 ac

Summary for Subcatchment PR-1: To Basin #1

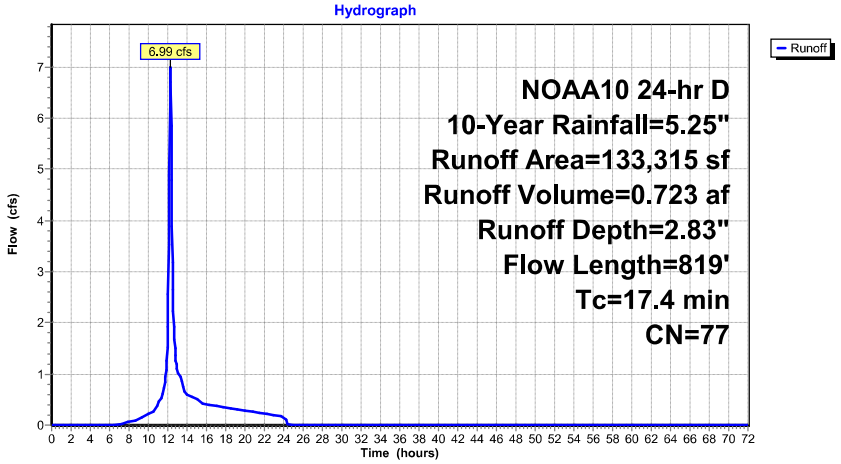
Runoff = 6.99 cfs @ 12.26 hrs, Volume= 0.723 af, Depth= 2.83"
Routed to Pond 10P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
14,748	74	>75% Grass cover, Good, HSG C
17,107	98	Paved parking, HSG C
31,793	70	Woods, Good, HSG C
5,562	98	Water Surface, HSG B
35,828	61	>75% Grass cover, Good, HSG B
23,286	98	Paved parking, HSG B
4,992	55	Woods, Good, HSG B
133,315	77	Weighted Average
87,361		65.53% Pervious Area
45,955		34.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
3.5	223	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.7	228	0.0750	5.56		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.4	293	0.0610	11.20	8.80	**Pipe Channel, E-F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
17.4	819	Total			

Subcatchment PR-1: To Basin #1



Summary for Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE

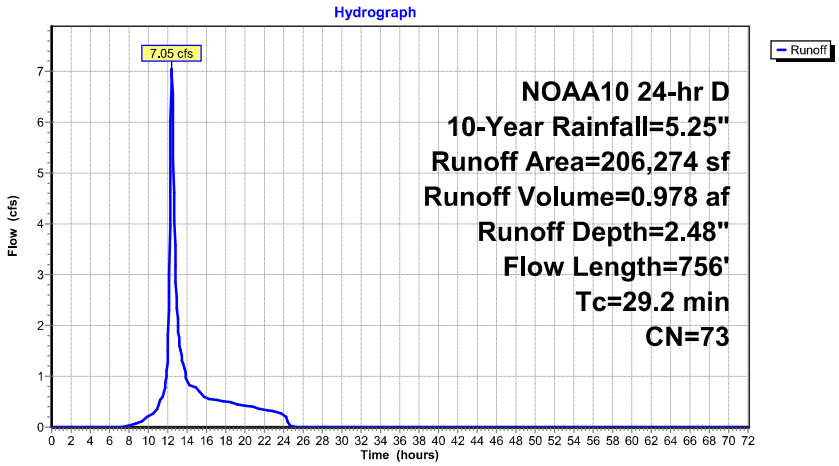
Runoff = 7.05 cfs @ 12.41 hrs, Volume= 0.978 af, Depth= 2.48"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
148,201	70	Woods, Good, HSG C
4,153	74	>75% Grass cover, Good, HSG C
53,920	80	1/2 acre lots, 25% imp, HSG C
206,274	73	Weighted Average
192,794		93.47% Pervious Area
13,480		6.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	286	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.2	756	Total			

Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE



Summary for Subcatchment PR-2: To Basin #2

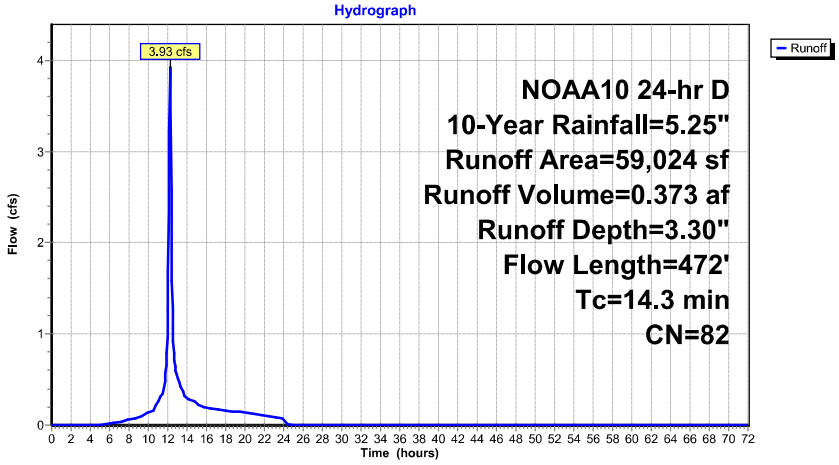
Runoff = 3.93 cfs @ 12.22 hrs, Volume= 0.373 af, Depth= 3.30"
Routed to Pond 12P : CULTEC CHAMBER SYSTEM #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
20,883	74	>75% Grass cover, Good, HSG C
15,236	98	Paved parking, HSG C
6,901	70	Woods, Good, HSG C
6,582	61	>75% Grass cover, Good, HSG B
6,240	98	Water Surface, HSG B
2,825	98	Paved parking, HSG B
358	98	Roofs, HSG B
59,024	82	Weighted Average
34,366		58.22% Pervious Area
24,658		41.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.1	38	0.5000	11.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	21	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	27	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	336	0.0075	5.15	9.10	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
14.3	472	Total			

Subcatchment PR-2: To Basin #2



Summary for Subcatchment PR-3: To Infiltration Basin #3

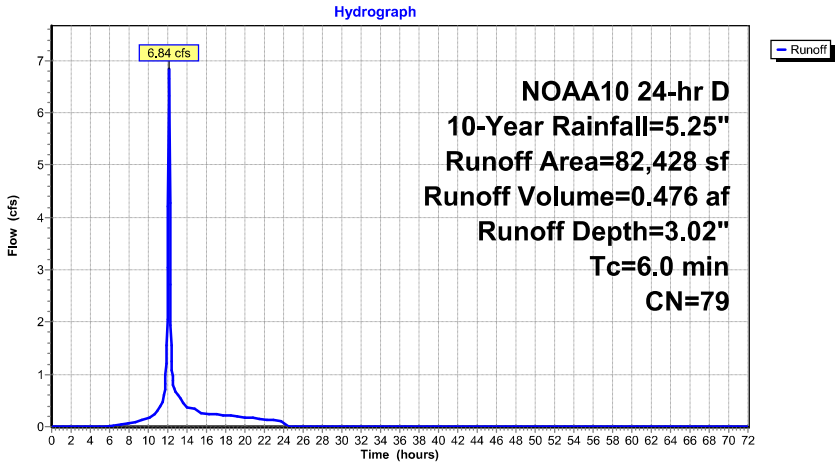
Runoff = 6.84 cfs @ 12.13 hrs, Volume= 0.476 af, Depth= 3.02"
Routed to Pond 14P : CULTEC CHAMBER SYSTEM #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
26,370	74	>75% Grass cover, Good, HSG C
15,608	98	Paved parking, HSG C
9,464	70	Woods, Good, HSG C
15,524	61	>75% Grass cover, Good, HSG B
5,303	98	Paved parking, HSG B
7,109	98	Water Surface, HSG B
0	98	Unconnected pavement, HSG B
3,049	55	Woods, Good, HSG B
82,428	79	Weighted Average
54,408		66.01% Pervious Area
28,020		33.99% Impervious Area
0		0.00% Unconnected

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

Subcatchment PR-3: To Infiltration Basin #3



Summary for Subcatchment PR-4: To Detention Basin #1

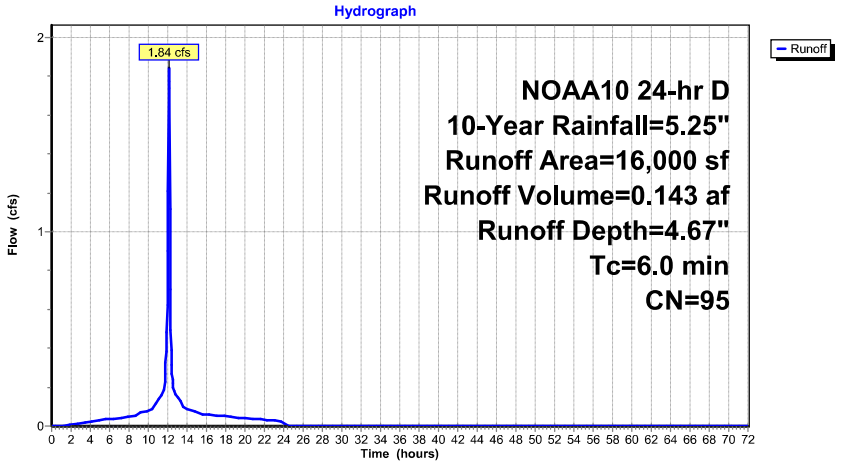
Runoff = 1.84 cfs @ 12.13 hrs, Volume= 0.143 af, Depth= 4.67"
Routed to Pond 7P : Detention Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
42	98	Paved parking, HSG C
12,807	98	Roofs, HSG C
353	74	>75% Grass cover, Good, HSG C
292	98	Paved parking, HSG B
872	61	>75% Grass cover, Good, HSG B
47	98	Roofs, HSG B
1,588	98	Water Surface, HSG B
16,000	95	Weighted Average
1,225		7.66% Pervious Area
14,775		92.34% Impervious Area

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

Subcatchment PR-4: To Detention Basin #1



Summary for Subcatchment PR-5: To Detention Basin #2

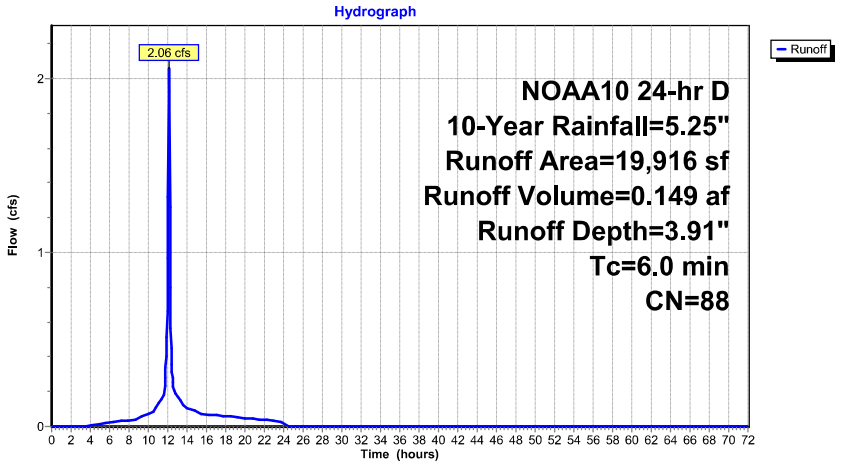
Runoff = 2.06 cfs @ 12.13 hrs, Volume= 0.149 af, Depth= 3.91"
Routed to Pond 8P : Detention Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

	Area (sf)	CN	Description
	3,739	98	Paved parking, HSG C
	654	98	Roofs, HSG C
	15	98	Water Surface, HSG C
	3,776	74	>75% Grass cover, Good, HSG C
	2,383	61	>75% Grass cover, Good, HSG B
	6,664	98	Paved parking, HSG B
	2,577	98	Water Surface, HSG B
*	108	0	>75% Grass cover, Good
	19,916	88	Weighted Average
	6,267		31.47% Pervious Area
	13,649		68.53% Impervious Area

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

Subcatchment PR-5: To Detention Basin #2



Summary for Subcatchment PR-6: ROOF SOUTH

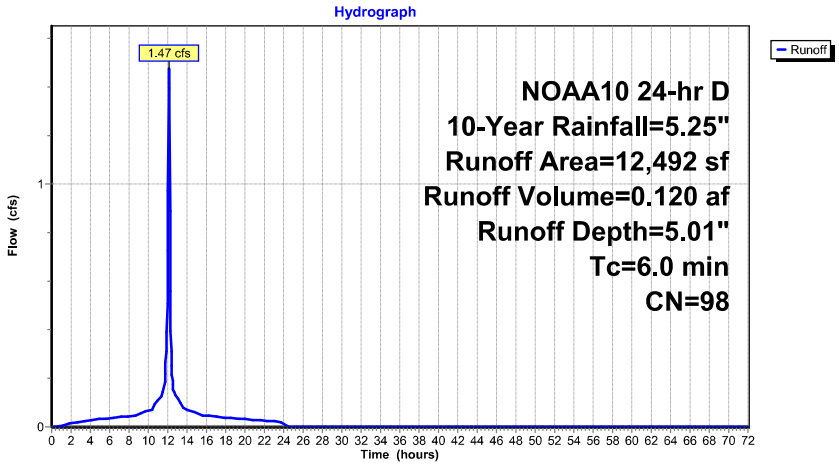
Runoff = 1.47 cfs @ 12.13 hrs, Volume= 0.120 af, Depth= 5.01"
Routed to Pond 6P : Infiltration Basin #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
10,772	98	Roofs, HSG C
1,720	98	Roofs, HSG B
12,492	98	Weighted Average
12,492		100.00% Impervious Area

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

Subcatchment PR-6: ROOF SOUTH



Summary for Subcatchment PR-7: UNCAPTURED TO AP#3

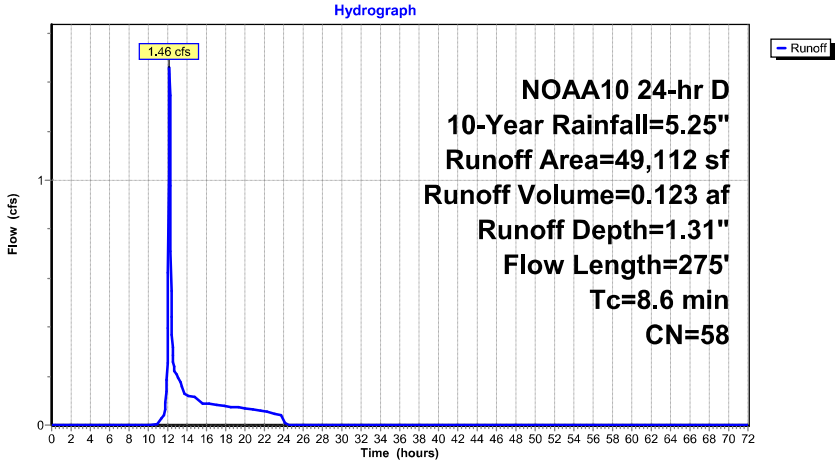
Runoff = 1.46 cfs @ 12.17 hrs, Volume= 0.123 af, Depth= 1.31"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
23,694	55	Woods, Good, HSG B
25,375	61	>75% Grass cover, Good, HSG B
44	98	Paved parking, HSG B
49,112	58	Weighted Average
49,069		99.91% Pervious Area
44		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	40	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	135	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	275	Total			

Subcatchment PR-7: UNCAPTURED TO AP#3



Summary for Subcatchment PR-8: UNCAPTURED TO AP-2

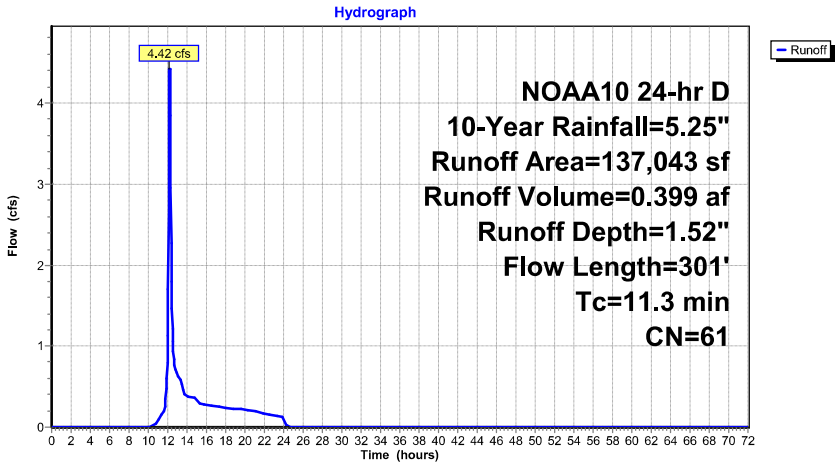
Runoff = 4.42 cfs @ 12.20 hrs, Volume= 0.399 af, Depth= 1.52"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
45,852	70	Woods, Good, HSG C
6,421	74	>75% Grass cover, Good, HSG C
72,303	55	Woods, Good, HSG B
12,457	61	>75% Grass cover, Good, HSG B
10	98	Paved parking, HSG B
137,043	61	Weighted Average
137,033		99.99% Pervious Area
10		0.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
3.1	251	0.0730	1.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	301	Total			

Subcatchment PR-8: UNCAPTURED TO AP-2



Summary for Subcatchment PR-9: UNCAPTURED TO AP-1

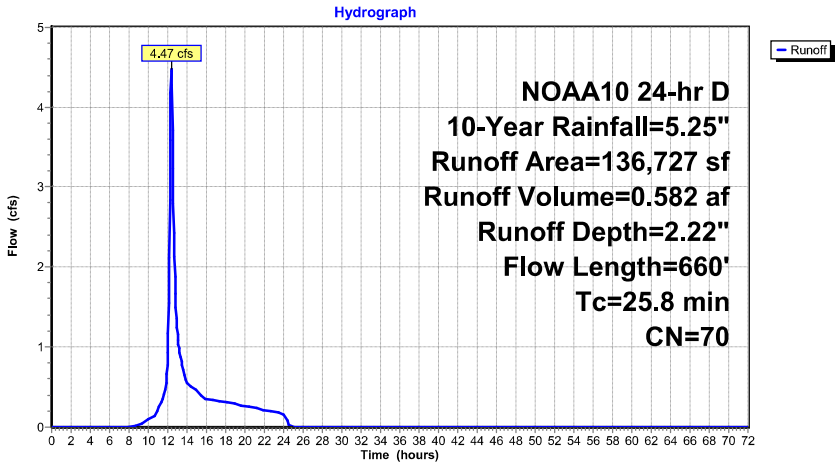
Runoff = 4.47 cfs @ 12.37 hrs, Volume= 0.582 af, Depth= 2.22"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 10-Year Rainfall=5.25"

Area (sf)	CN	Description
136,638	70	Woods, Good, HSG C
89	74	>75% Grass cover, Good, HSG C
136,727	70	Weighted Average
136,727		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment PR-9: UNCAPTURED TO AP-1

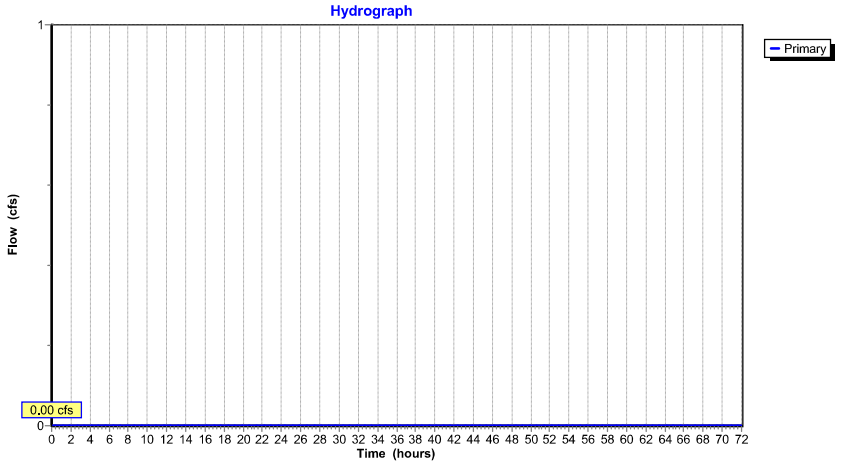


Summary for Pond 1P: AP-4

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

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=0.00' (Dynamic Tailwater)

Pond 1P: AP-4



Summary for Pond 4P: Infiltration Basin #2

Inflow Area = 2.180 ac, 55.91% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 4.04 cfs @ 12.31 hrs, Volume= 0.652 af
Outflow = 1.94 cfs @ 12.50 hrs, Volume= 0.652 af, Atten= 52%, Lag= 11.1 min
Discarded = 0.15 cfs @ 12.50 hrs, Volume= 0.305 af
Primary = 1.79 cfs @ 12.50 hrs, Volume= 0.347 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 358.72' @ 12.50 hrs Surf.Area= 4,003 sf Storage= 5,532 cf
Flood Elev= 360.25' Surf.Area= 5,468 sf Storage= 12,765 cf

Plug-Flow detention time= 188.0 min calculated for 0.652 af (100% of inflow)
Center-of-Mass det. time= 188.0 min (1,153.1 - 965.0)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	17,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

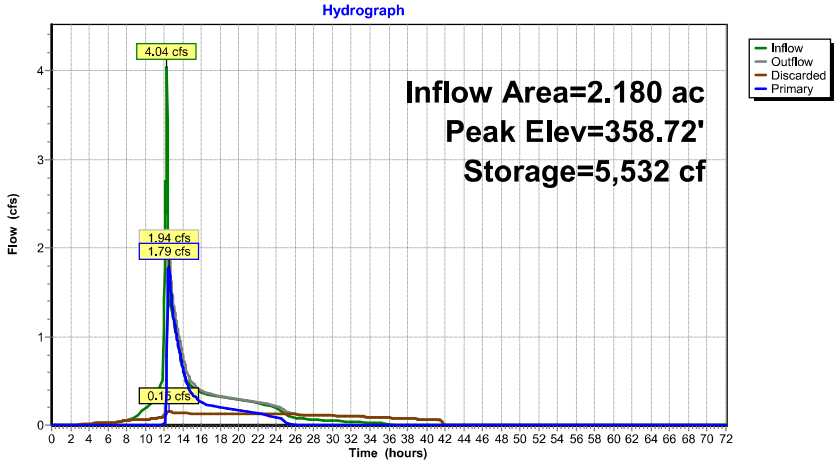
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	2,466	0	0
358.00	3,324	2,895	2,895
360.00	5,211	8,535	11,430
361.00	6,240	5,726	17,156

Device	Routing	Invert	Outlet Devices
#1	Primary	355.00'	**12.0" Round Culvert** L= 200.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 355.00' / 354.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.20'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 354.90' Phase-In= 0.01'

Discarded OutFlow Max=0.15 cfs @ 12.50 hrs HW=358.72' (Free Discharge)
└**4=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=1.79 cfs @ 12.50 hrs HW=358.72' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.79 cfs of 4.36 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.79 cfs @ 2.38 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin #2



Summary for Pond 6P: Infiltration Basin #3

Inflow Area = 2.179 ac, 42.68% Impervious, Inflow Depth = 3.25" for 10-Year event
Inflow = 8.58 cfs @ 12.14 hrs, Volume= 0.590 af
Outflow = 0.25 cfs @ 18.14 hrs, Volume= 0.590 af, Atten= 97%, Lag= 360.3 min
Discarded = 0.25 cfs @ 18.14 hrs, Volume= 0.590 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 358.63' @ 18.14 hrs Surf.Area= 5,884 sf Storage= 12,568 cf
Flood Elev= 359.25' Surf.Area= 6,440 sf Storage= 16,409 cf

Plug-Flow detention time= 623.9 min calculated for 0.590 af (100% of inflow)
Center-of-Mass det. time= 623.9 min (1,530.9 - 907.0)

Volume	Invert	Avail.Storage	Storage Description
#1	356.00'	21,490 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

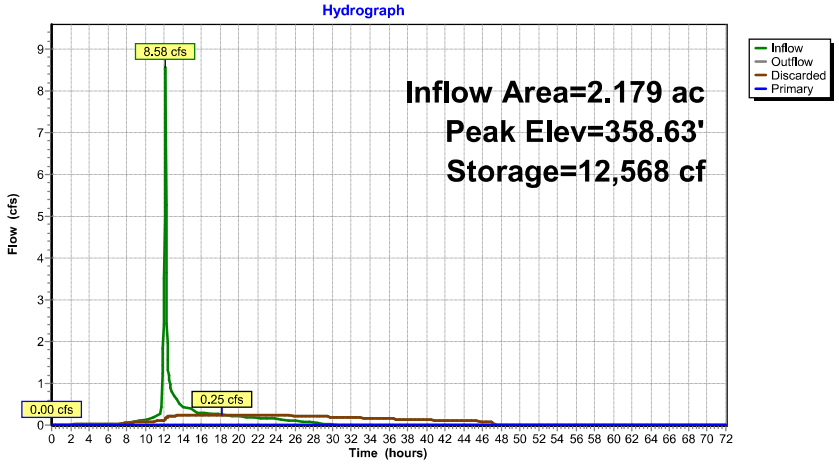
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
356.00	3,731	0	0
358.00	5,325	9,056	9,056
360.00	7,109	12,434	21,490

Device	Routing	Invert	Outlet Devices
#1	Primary	354.00'	**12.0" Round Culvert** L= 68.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 354.00' / 346.00' S= 0.1171 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	356.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 353.50' Phase-In= 0.01'

Discarded OutFlow Max=0.25 cfs @ 18.14 hrs HW=358.63' (Free Discharge)
└**3=Exfiltration** (Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=356.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 4.63 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: Infiltration Basin #3



Summary for Pond 7P: Detention Basin #1

Inflow Area = 0.367 ac, 92.34% Impervious, Inflow Depth = 4.67" for 10-Year event
Inflow = 1.84 cfs @ 12.13 hrs, Volume= 0.143 af
Outflow = 1.82 cfs @ 12.14 hrs, Volume= 0.143 af, Atten= 1%, Lag= 0.9 min
Primary = 1.82 cfs @ 12.14 hrs, Volume= 0.143 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.96' @ 12.14 hrs Surf.Area= 765 sf Storage= 945 cf

Plug-Flow detention time= 83.4 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 83.6 min (857.6 - 774.0)

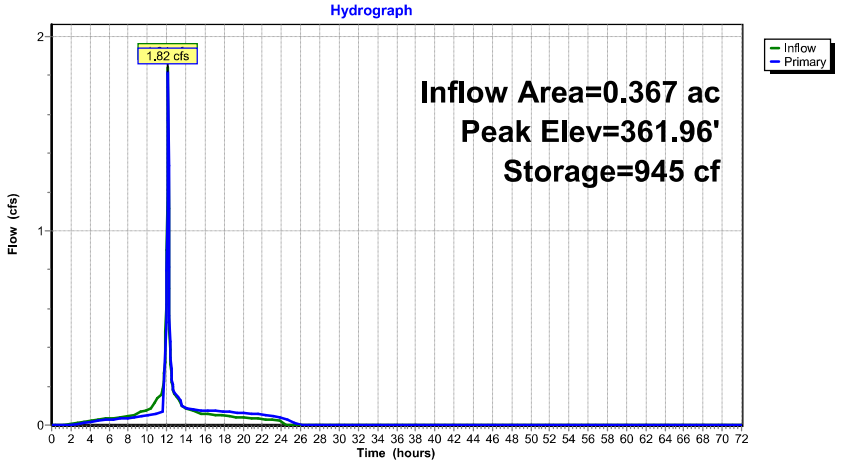
Volume	Invert	Avail.Storage	Storage Description
#1	360.00'	1,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
360.00	198	0	0
362.00	775	973	973
363.00	1,153	964	1,937

Device	Routing	Invert	Outlet Devices
#1	Primary	357.57'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 357.57' / 357.42' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	361.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.77 cfs @ 12.14 hrs HW=361.96' TW=358.14' (Dynamic Tailwater)
↑└─**1=Culvert** (Passes 1.77 cfs of 7.40 cfs potential flow)
↑ ├─**2=Orifice/Grate** (Weir Controls 1.69 cfs @ 1.31 fps)
└─**3=Orifice/Grate** (Orifice Controls 0.08 cfs @ 6.63 fps)

Pond 7P: Detention Basin #1



Summary for Pond 8P: Detention Basin #2

Inflow Area = 0.457 ac, 68.53% Impervious, Inflow Depth = 3.91" for 10-Year event
Inflow = 2.06 cfs @ 12.13 hrs, Volume= 0.149 af
Outflow = 0.09 cfs @ 15.03 hrs, Volume= 0.145 af, Atten= 96%, Lag= 174.1 min
Primary = 0.09 cfs @ 15.03 hrs, Volume= 0.145 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.51' @ 15.03 hrs Surf.Area= 1,866 sf Storage= 3,371 cf

Plug-Flow detention time= 458.4 min calculated for 0.145 af (97% of inflow)
Center-of-Mass det. time= 442.9 min (1,255.5 - 812.7)

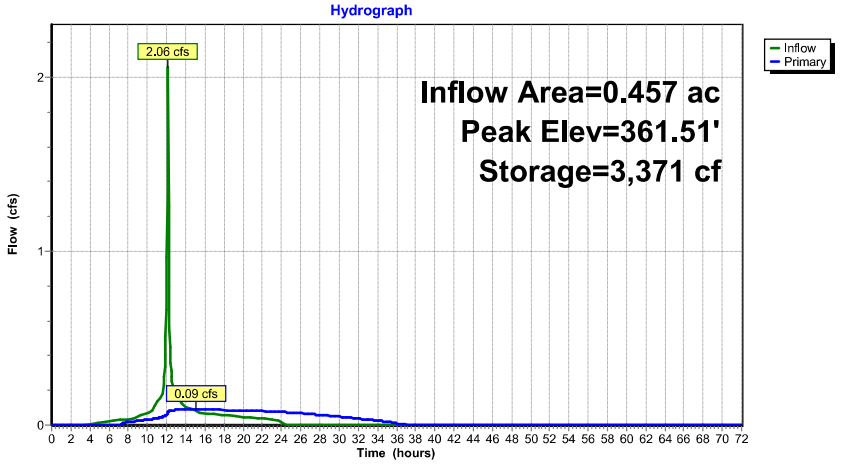
Volume	Invert	Avail.Storage	Storage Description
#1	359.00'	6,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
359.00	873	0	0
360.00	1,218	1,046	1,046
362.00	2,077	3,295	4,341
363.00	2,592	2,335	6,675

Device	Routing	Invert	Outlet Devices
#1	Primary	359.18'	**12.0" Round Culvert** L= 86.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 359.18' / 358.75' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	359.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	362.20'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 15.03 hrs HW=361.51' TW=358.37' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.09 cfs of 4.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 7.35 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Detention Basin #2



Summary for Pond 10P: Infiltration Basin #1

Inflow Area = 3.060 ac, 34.47% Impervious, Inflow Depth = 2.83" for 10-Year event
Inflow = 6.99 cfs @ 12.26 hrs, Volume= 0.723 af
Outflow = 2.58 cfs @ 12.56 hrs, Volume= 0.723 af, Atten= 63%, Lag= 18.0 min
Discarded = 0.21 cfs @ 12.56 hrs, Volume= 0.284 af
Primary = 2.37 cfs @ 12.56 hrs, Volume= 0.439 af
Routed to Pond AP-2 : AP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 325.61' @ 12.56 hrs Surf.Area= 3,731 sf Storage= 9,464 cf

Plug-Flow detention time= 147.9 min calculated for 0.723 af (100% of inflow)
Center-of-Mass det. time= 147.9 min (1,014.5 - 866.6)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	20,497 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

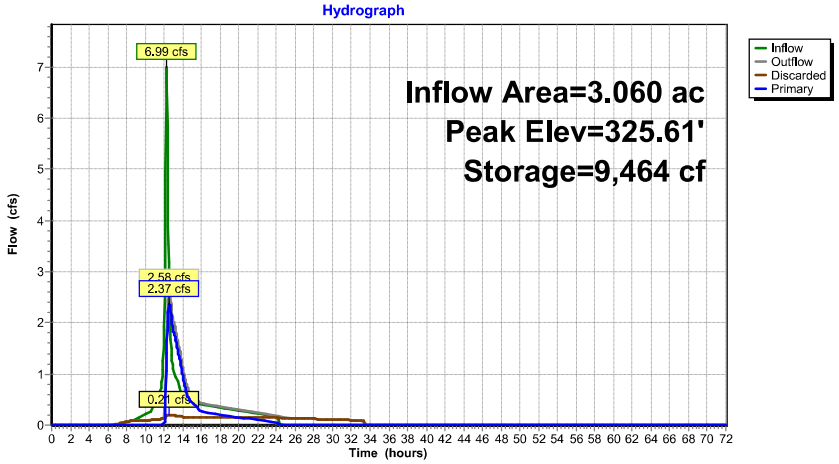
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,609	0	0
324.00	2,681	4,290	4,290
326.00	3,982	6,663	10,953
328.00	5,562	9,544	20,497

Device	Routing	Invert	Outlet Devices
#1	Primary	320.00'	**18.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 320.00' / 318.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Discarded	322.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	323.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	325.35'	**8.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	326.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	327.15'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.21 cfs @ 12.56 hrs HW=325.61' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=2.36 cfs @ 12.56 hrs HW=325.61' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.36 cfs of 18.76 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.08 cfs @ 5.95 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.29 cfs @ 1.64 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1



Summary for Pond 12P: CULTEC CHAMBER SYSTEM #1

Inflow Area = 1.355 ac, 41.78% Impervious, Inflow Depth = 3.30" for 10-Year event
Inflow = 3.93 cfs @ 12.22 hrs, Volume= 0.373 af
Outflow = 3.44 cfs @ 12.32 hrs, Volume= 0.364 af, Atten= 12%, Lag= 5.6 min
Primary = 3.44 cfs @ 12.32 hrs, Volume= 0.364 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.57' @ 12.32 hrs Surf.Area= 1,856 sf Storage= 3,219 cf

Plug-Flow detention time= 58.6 min calculated for 0.364 af (98% of inflow)
Center-of-Mass det. time= 46.1 min (891.5 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	359.10'	1,442 cf	**41.25'W x 45.00'L x 3.21'H Field A** 5,955 cf Overall - 2,350 cf Embedded = 3,606 cf x 40.0% Voids
#2A	359.60'	2,350 cf	**Cultec R-280HD** x 54 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 9 rows
		3,792 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	359.60'	**15.0" Round Culvert** L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 359.60' / 358.94' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	361.30'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	359.60'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.20 cfs @ 12.32 hrs HW=361.55' TW=358.54' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.20 cfs of 5.37 cfs potential flow)
├─**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.97 cfs @ 1.62 fps)
└─**3=Orifice/Grate** (Orifice Controls 1.23 cfs @ 6.27 fps)

Pond 12P: CULTEC CHAMBER SYSTEM #1 - 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 9 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

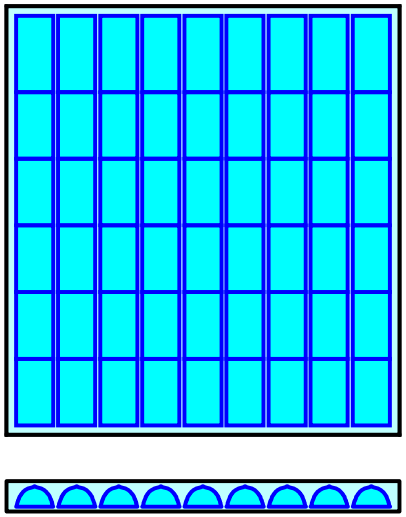
6 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 43.00' Row Length +12.0" End Stone x 2 = 45.00' Base Length
9 Rows x 47.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 41.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

54 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 9 Rows = 2,349.8 cf Chamber Storage

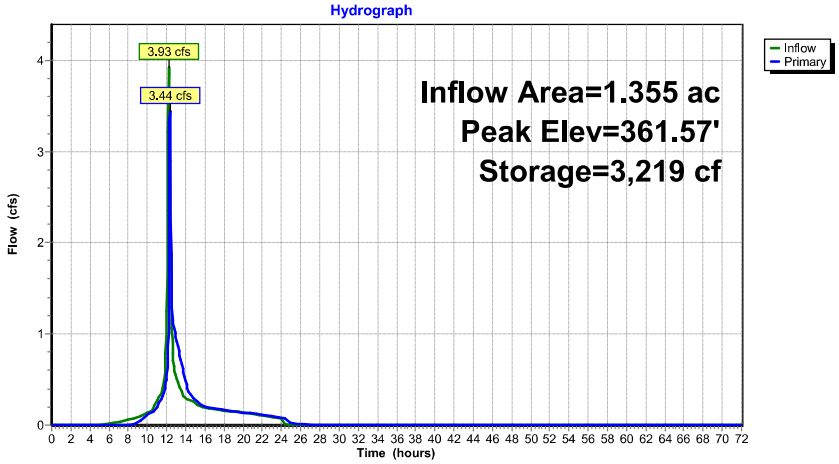
5,955.5 cf Field - 2,349.8 cf Chambers = 3,605.7 cf Stone x 40.0% Voids = 1,442.3 cf Stone Storage

Chamber Storage + Stone Storage = 3,792.0 cf = 0.087 af
Overall Storage Efficiency = 63.7%
Overall System Size = 45.00' x 41.25' x 3.21'

54 Chambers
220.6 cy Field
133.5 cy Stone



Pond 12P: CULTEC CHAMBER SYSTEM #1



Summary for Pond 14P: CULTEC CHAMBER SYSTEM #2

[93] Warning: Storage range exceeded by 0.07'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.892 ac, 33.99% Impervious, Inflow Depth = 3.02" for 10-Year event
Inflow = 6.84 cfs @ 12.13 hrs, Volume= 0.476 af
Outflow = 7.12 cfs @ 12.14 hrs, Volume= 0.470 af, Atten= 0%, Lag= 0.6 min
Primary = 7.12 cfs @ 12.14 hrs, Volume= 0.470 af
Routed to Pond 6P : Infiltration Basin #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.57' @ 12.14 hrs Surf.Area= 0.028 ac Storage= 0.057 af

Plug-Flow detention time= 105.6 min calculated for 0.470 af (99% of inflow)
Center-of-Mass det. time= 98.3 min (947.1 - 848.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	358.30'	0.022 af	**23.58'W x 52.00'L x 3.21'H Field A** 0.090 af Overall - 0.035 af Embedded = 0.055 af x 40.0% Voids
#2A	358.80'	0.035 af	**Cultec R-280HD** x 35 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 5 rows
		0.057 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	361.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Device 3	358.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	358.80'	**18.0" Round Culvert** L= 15.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 358.80' / 358.65' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.82 cfs @ 12.14 hrs HW=361.56' TW=357.25' (Dynamic Tailwater)
└**3=Culvert** (Passes 6.82 cfs of 12.05 cfs potential flow)
  └**1=Sharp-Crested Rectangular Weir** (Weir Controls 6.65 cfs @ 2.44 fps)
  └**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.87 fps)

Pond 14P: CULTEC CHAMBER SYSTEM #2 - 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 5 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

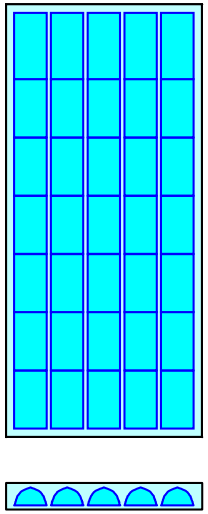
7 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 50.00' Row Length +12.0" End Stone x 2 = 52.00' Base Length
5 Rows x 47.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 23.58' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

35 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 5 Rows = 1,517.9 cf Chamber Storage

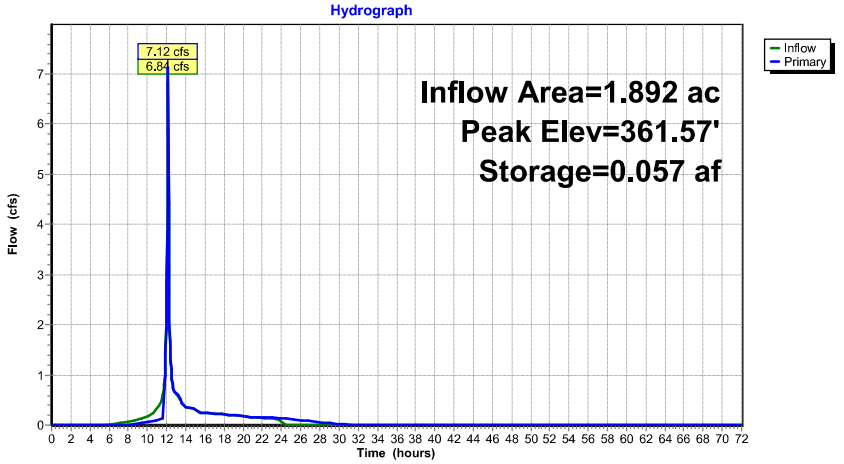
3,934.5 cf Field - 1,517.9 cf Chambers = 2,416.5 cf Stone x 40.0% Voids = 966.6 cf Stone Storage

Chamber Storage + Stone Storage = 2,484.6 cf = 0.057 af
Overall Storage Efficiency = 63.1%
Overall System Size = 52.00' x 23.58' x 3.21'

35 Chambers
145.7 cy Field
89.5 cy Stone



Pond 14P: CULTEC CHAMBER SYSTEM #2



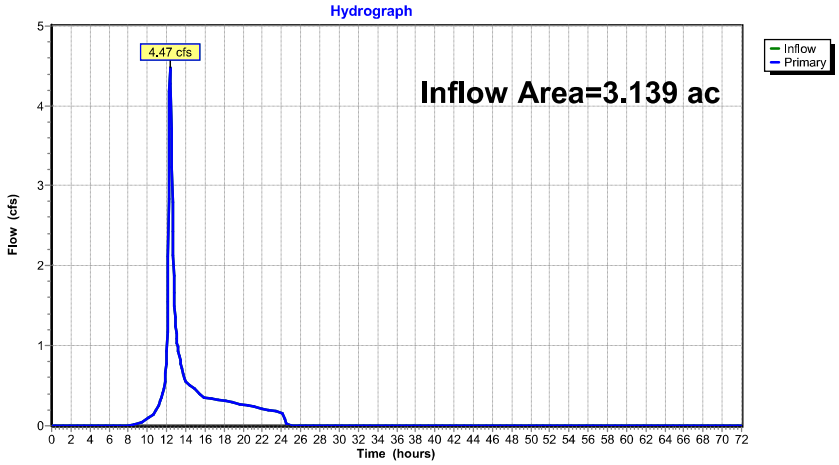
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.139 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10-Year event
Inflow = 4.47 cfs @ 12.37 hrs, Volume= 0.582 af
Primary = 4.47 cfs @ 12.37 hrs, Volume= 0.582 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



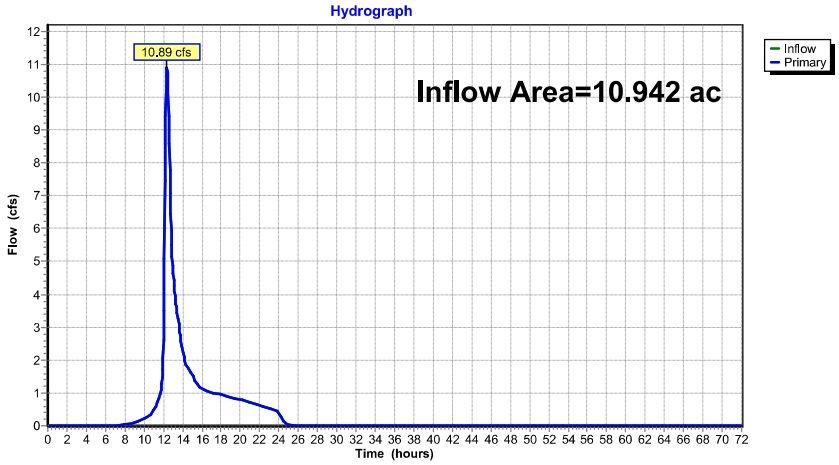
Summary for Pond AP-2: AP-2

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

Inflow Area = 10.942 ac, 12.47% Impervious, Inflow Depth = 1.99" for 10-Year event
Inflow = 10.89 cfs @ 12.38 hrs, Volume= 1.816 af
Primary = 10.89 cfs @ 12.38 hrs, Volume= 1.816 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



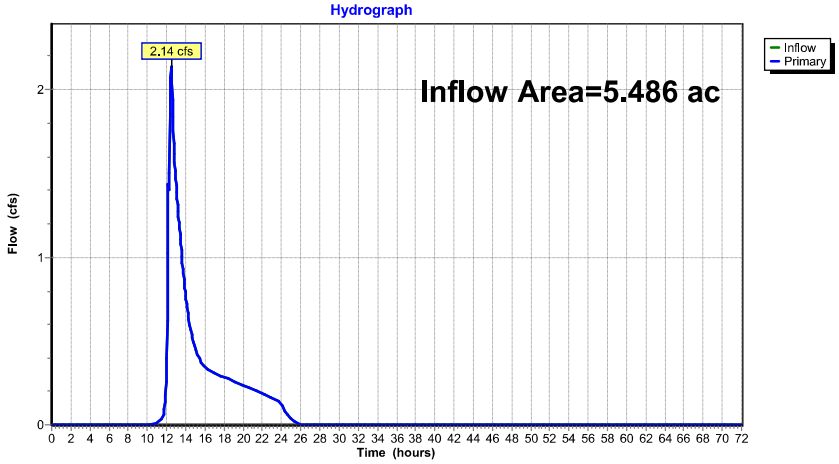
Summary for Pond AP-3: AP-3

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

Inflow Area = 5.486 ac, 39.18% Impervious, Inflow Depth = 1.03" for 10-Year event
Inflow = 2.14 cfs @ 12.46 hrs, Volume= 0.470 af
Primary = 2.14 cfs @ 12.46 hrs, Volume= 0.470 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: To Basin #1 Runoff Area=133,315 sf 34.47% Impervious Runoff Depth=3.84"
Flow Length=819' Tc=17.4 min CN=77 Runoff=9.45 cfs 0.979 af

Subcatchment PR-10: WESTERN Runoff Area=206,274 sf 6.53% Impervious Runoff Depth=3.43"
Flow Length=756' Tc=29.2 min CN=73 Runoff=9.82 cfs 1.354 af

Subcatchment PR-2: To Basin #2 Runoff Area=59,024 sf 41.78% Impervious Runoff Depth=4.37"
Flow Length=472' Tc=14.3 min CN=82 Runoff=5.14 cfs 0.493 af

Subcatchment PR-3: To Infiltration Basin Runoff Area=82,428 sf 33.99% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=79 Runoff=9.09 cfs 0.638 af

Subcatchment PR-4: To Detention Basin #1 Runoff Area=16,000 sf 92.34% Impervious Runoff Depth=5.82"
Tc=6.0 min CN=95 Runoff=2.27 cfs 0.178 af

Subcatchment PR-5: To Detention Basin #2 Runoff Area=19,916 sf 68.53% Impervious Runoff Depth=5.02"
Tc=6.0 min CN=88 Runoff=2.60 cfs 0.191 af

Subcatchment PR-6: ROOF SOUTH Runoff Area=12,492 sf 100.00% Impervious Runoff Depth=6.17"
Tc=6.0 min CN=98 Runoff=1.80 cfs 0.147 af

Subcatchment PR-7: UNCAPTURED TO Runoff Area=49,112 sf 0.09% Impervious Runoff Depth=2.02"
Flow Length=275' Tc=8.6 min CN=58 Runoff=2.38 cfs 0.190 af

Subcatchment PR-8: UNCAPTURED TO Runoff Area=137,043 sf 0.01% Impervious Runoff Depth=2.28"
Flow Length=301' Tc=11.3 min CN=61 Runoff=6.88 cfs 0.599 af

Subcatchment PR-9: UNCAPTURED TO Runoff Area=136,727 sf 0.00% Impervious Runoff Depth=3.13"
Flow Length=660' Tc=25.8 min CN=70 Runoff=6.38 cfs 0.820 af

Pond 1P: AP-4
Primary=0.00 cfs 0.000 af

Pond 4P: Infiltration Basin #2 Peak Elev=359.10' Storage=7,124 cf Inflow=6.42 cfs 0.850 af
Discarded=0.18 cfs 0.343 af Primary=2.89 cfs 0.507 af Outflow=3.07 cfs 0.850 af

Pond 6P: Infiltration Basin #3 Peak Elev=358.96' Storage=14,552 cf Inflow=10.83 cfs 0.780 af
Discarded=0.27 cfs 0.675 af Primary=0.69 cfs 0.105 af Outflow=0.96 cfs 0.780 af

Pond 7P: Detention Basin #1 Peak Elev=361.99' Storage=965 cf Inflow=2.27 cfs 0.178 af
Outflow=2.24 cfs 0.178 af

Pond 8P: Detention Basin #2 Peak Elev=362.08' Storage=4,518 cf Inflow=2.60 cfs 0.191 af
Outflow=0.10 cfs 0.188 af

Pond 10P: Infiltration Basin #1 Peak Elev=326.27' Storage=12,072 cf Inflow=9.45 cfs 0.979 af
Discarded=0.23 cfs 0.302 af Primary=4.11 cfs 0.677 af Outflow=4.34 cfs 0.979 af

Pond 12P: CULTEC CHAMBER SYSTEM #1 Peak Elev=361.71' Storage=3,343 cf Inflow=5.14 cfs 0.493 af
Outflow=5.42 cfs 0.484 af

Pond 14P: CULTEC CHAMBER SYSTEM #2 Peak Elev=361.68' Storage=0.057 af Inflow=9.09 cfs 0.638 af
Outflow=9.03 cfs 0.633 af

Pond AP-1: AP-1 Inflow=6.38 cfs 0.820 af
Primary=6.38 cfs 0.820 af

Pond AP-2: AP-2 Inflow=16.52 cfs 2.630 af
Primary=16.52 cfs 2.630 af

Pond AP-3: AP-3 Inflow=3.84 cfs 0.802 af
Primary=3.84 cfs 0.802 af

Total Runoff Area = 19.567 ac Runoff Volume = 5.590 af Average Runoff Depth = 3.43"
82.04% Pervious = 16.053 ac 17.96% Impervious = 3.514 ac

Summary for Subcatchment PR-1: To Basin #1

[47] Hint: Peak is 107% of capacity of segment #5

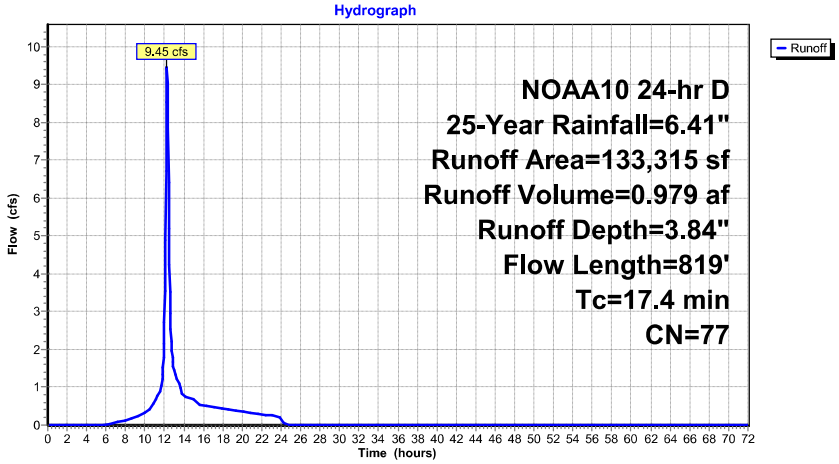
Runoff = 9.45 cfs @ 12.26 hrs, Volume= 0.979 af, Depth= 3.84"
Routed to Pond 10P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
14,748	74	>75% Grass cover, Good, HSG C
17,107	98	Paved parking, HSG C
31,793	70	Woods, Good, HSG C
5,562	98	Water Surface, HSG B
35,828	61	>75% Grass cover, Good, HSG B
23,286	98	Paved parking, HSG B
4,992	55	Woods, Good, HSG B
133,315	77	Weighted Average
87,361		65.53% Pervious Area
45,955		34.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
3.5	223	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.7	228	0.0750	5.56		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.4	293	0.0610	11.20	8.80	**Pipe Channel, E-F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
17.4	819	Total			

Subcatchment PR-1: To Basin #1



Summary for Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE

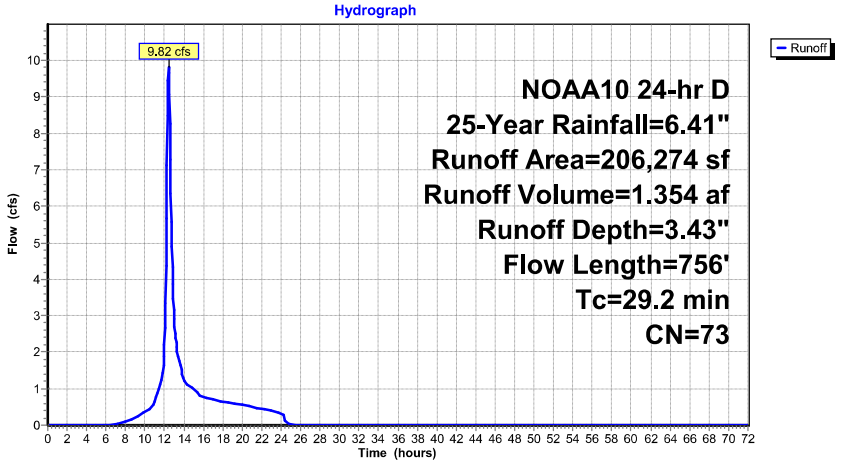
Runoff = 9.82 cfs @ 12.41 hrs, Volume= 1.354 af, Depth= 3.43"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
148,201	70	Woods, Good, HSG C
4,153	74	>75% Grass cover, Good, HSG C
53,920	80	1/2 acre lots, 25% imp, HSG C
206,274	73	Weighted Average
192,794		93.47% Pervious Area
13,480		6.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	286	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.2	756	Total			

Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE



Summary for Subcatchment PR-2: To Basin #2

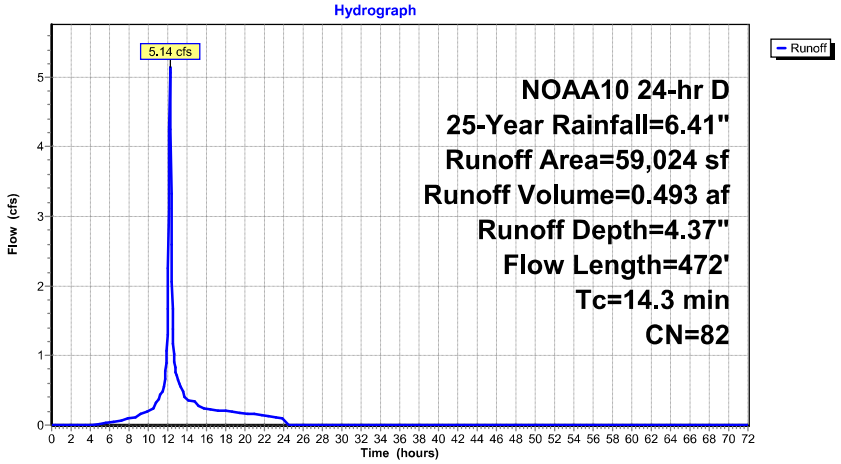
Runoff = 5.14 cfs @ 12.22 hrs, Volume= 0.493 af, Depth= 4.37"
Routed to Pond 12P : CULTEC CHAMBER SYSTEM #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
20,883	74	>75% Grass cover, Good, HSG C
15,236	98	Paved parking, HSG C
6,901	70	Woods, Good, HSG C
6,582	61	>75% Grass cover, Good, HSG B
6,240	98	Water Surface, HSG B
2,825	98	Paved parking, HSG B
358	98	Roofs, HSG B
59,024	82	Weighted Average
34,366		58.22% Pervious Area
24,658		41.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.1	38	0.5000	11.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	21	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	27	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	336	0.0075	5.15	9.10	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
14.3	472	Total			

Subcatchment PR-2: To Basin #2



Summary for Subcatchment PR-3: To Infiltration Basin #3

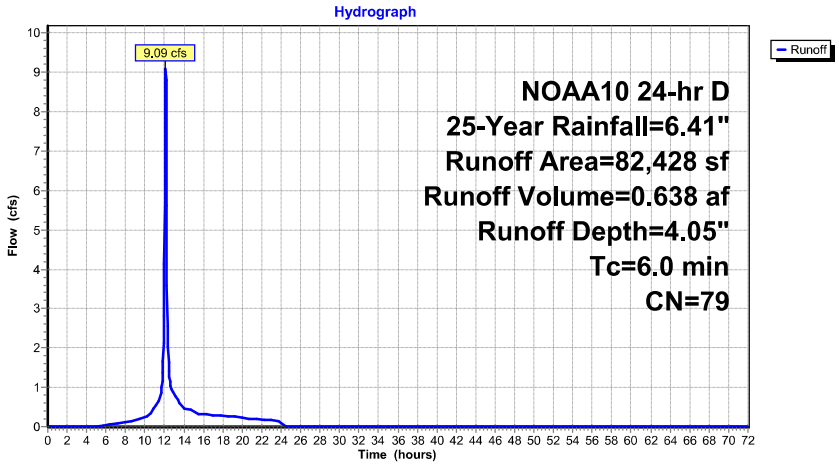
Runoff = 9.09 cfs @ 12.13 hrs, Volume= 0.638 af, Depth= 4.05"
Routed to Pond 14P : CULTEC CHAMBER SYSTEM #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
26,370	74	>75% Grass cover, Good, HSG C
15,608	98	Paved parking, HSG C
9,464	70	Woods, Good, HSG C
15,524	61	>75% Grass cover, Good, HSG B
5,303	98	Paved parking, HSG B
7,109	98	Water Surface, HSG B
0	98	Unconnected pavement, HSG B
3,049	55	Woods, Good, HSG B
82,428	79	Weighted Average
54,408		66.01% Pervious Area
28,020		33.99% Impervious Area
0		0.00% Unconnected

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

Subcatchment PR-3: To Infiltration Basin #3



Summary for Subcatchment PR-4: To Detention Basin #1

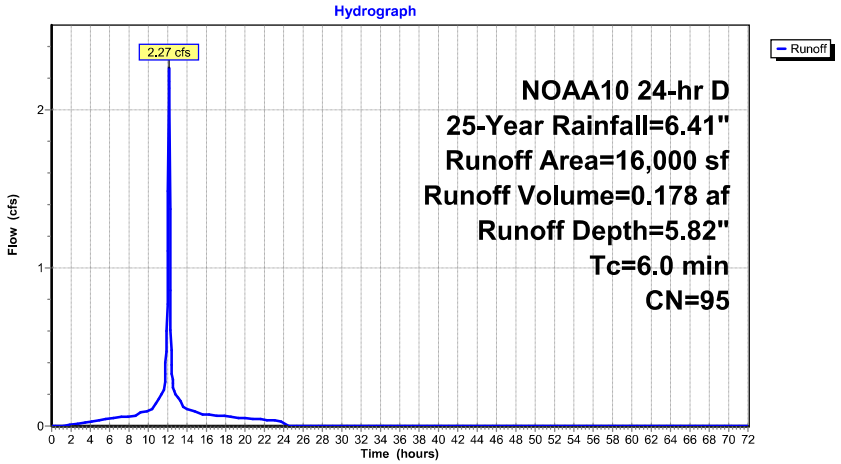
Runoff = 2.27 cfs @ 12.13 hrs, Volume= 0.178 af, Depth= 5.82"
Routed to Pond 7P : Detention Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
42	98	Paved parking, HSG C
12,807	98	Roofs, HSG C
353	74	>75% Grass cover, Good, HSG C
292	98	Paved parking, HSG B
872	61	>75% Grass cover, Good, HSG B
47	98	Roofs, HSG B
1,588	98	Water Surface, HSG B
16,000	95	Weighted Average
1,225		7.66% Pervious Area
14,775		92.34% Impervious Area

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

Subcatchment PR-4: To Detention Basin #1



Summary for Subcatchment PR-5: To Detention Basin #2

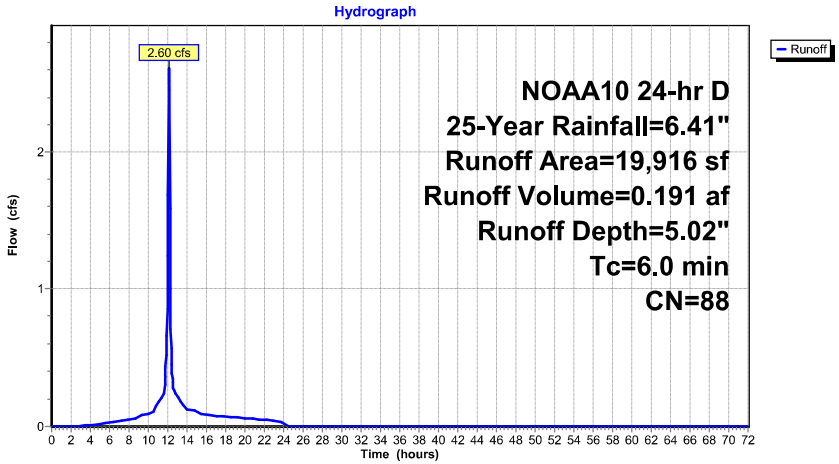
Runoff = 2.60 cfs @ 12.13 hrs, Volume= 0.191 af, Depth= 5.02"
Routed to Pond 8P : Detention Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

	Area (sf)	CN	Description
	3,739	98	Paved parking, HSG C
	654	98	Roofs, HSG C
	15	98	Water Surface, HSG C
	3,776	74	>75% Grass cover, Good, HSG C
	2,383	61	>75% Grass cover, Good, HSG B
	6,664	98	Paved parking, HSG B
	2,577	98	Water Surface, HSG B
*	108	0	>75% Grass cover, Good
	19,916	88	Weighted Average
	6,267		31.47% Pervious Area
	13,649		68.53% Impervious Area

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

Subcatchment PR-5: To Detention Basin #2



Summary for Subcatchment PR-6: ROOF SOUTH

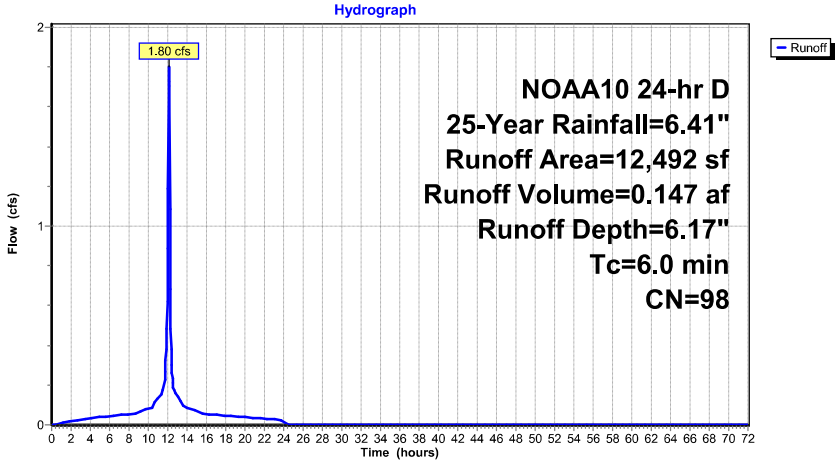
Runoff = 1.80 cfs @ 12.13 hrs, Volume= 0.147 af, Depth= 6.17"
Routed to Pond 6P : Infiltration Basin #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
10,772	98	Roofs, HSG C
1,720	98	Roofs, HSG B
12,492	98	Weighted Average
12,492		100.00% Impervious Area

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

Subcatchment PR-6: ROOF SOUTH



Summary for Subcatchment PR-7: UNCAPTURED TO AP#3

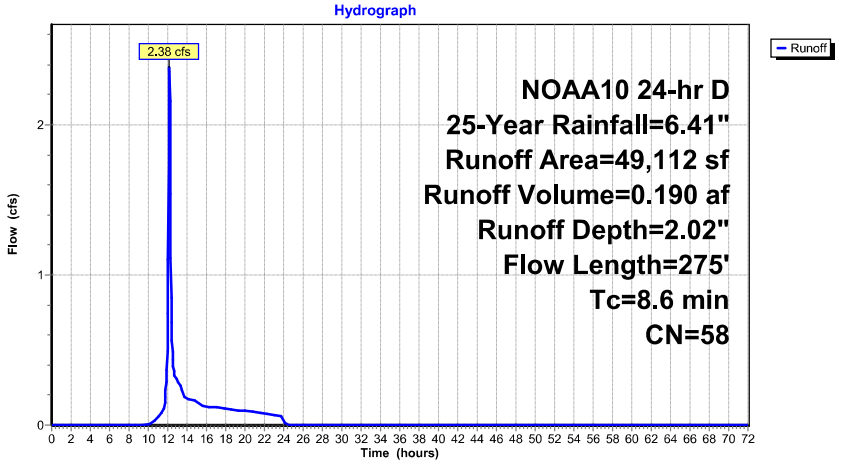
Runoff = 2.38 cfs @ 12.16 hrs, Volume= 0.190 af, Depth= 2.02"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
23,694	55	Woods, Good, HSG B
25,375	61	>75% Grass cover, Good, HSG B
44	98	Paved parking, HSG B
49,112	58	Weighted Average
49,069		99.91% Pervious Area
44		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	40	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	135	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	275	Total			

Subcatchment PR-7: UNCAPTURED TO AP#3



Summary for Subcatchment PR-8: UNCAPTURED TO AP-2

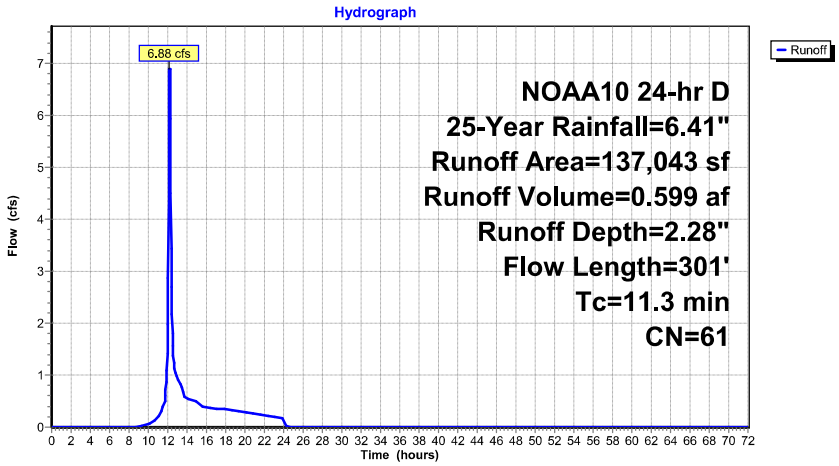
Runoff = 6.88 cfs @ 12.20 hrs, Volume= 0.599 af, Depth= 2.28"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
45,852	70	Woods, Good, HSG C
6,421	74	>75% Grass cover, Good, HSG C
72,303	55	Woods, Good, HSG B
12,457	61	>75% Grass cover, Good, HSG B
10	98	Paved parking, HSG B
137,043	61	Weighted Average
137,033		99.99% Pervious Area
10		0.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
3.1	251	0.0730	1.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	301	Total			

Subcatchment PR-8: UNCAPTURED TO AP-2



Summary for Subcatchment PR-9: UNCAPTURED TO AP-1

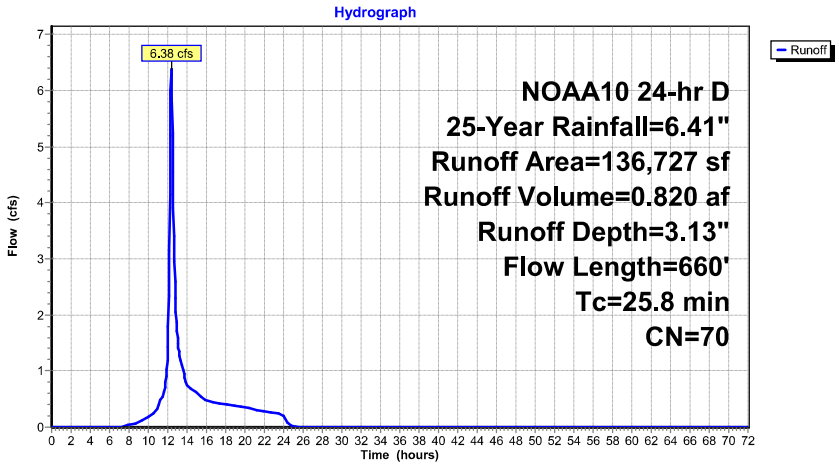
Runoff = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af, Depth= 3.13"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 25-Year Rainfall=6.41"

Area (sf)	CN	Description
136,638	70	Woods, Good, HSG C
89	74	>75% Grass cover, Good, HSG C
136,727	70	Weighted Average
136,727		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment PR-9: UNCAPTURED TO AP-1

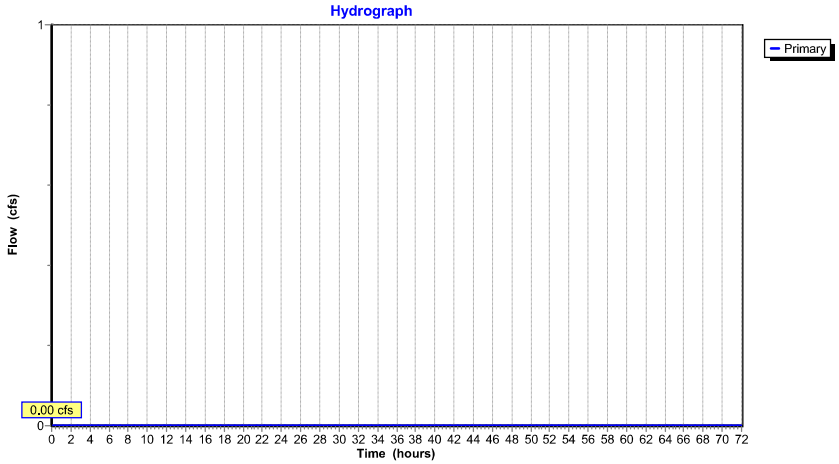


Summary for Pond 1P: AP-4

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

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=0.00' (Dynamic Tailwater)

Pond 1P: AP-4



Summary for Pond 4P: Infiltration Basin #2

Inflow Area = 2.180 ac, 55.91% Impervious, Inflow Depth = 4.68" for 25-Year event
Inflow = 6.42 cfs @ 12.26 hrs, Volume= 0.850 af
Outflow = 3.07 cfs @ 12.43 hrs, Volume= 0.850 af, Atten= 52%, Lag= 10.4 min
Discarded = 0.18 cfs @ 12.43 hrs, Volume= 0.343 af
Primary = 2.89 cfs @ 12.43 hrs, Volume= 0.507 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 359.10' @ 12.43 hrs Surf.Area= 4,362 sf Storage= 7,124 cf
Flood Elev= 360.25' Surf.Area= 5,468 sf Storage= 12,765 cf

Plug-Flow detention time= 166.1 min calculated for 0.850 af (100% of inflow)
Center-of-Mass det. time= 166.1 min (1,135.9 - 969.8)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	17,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

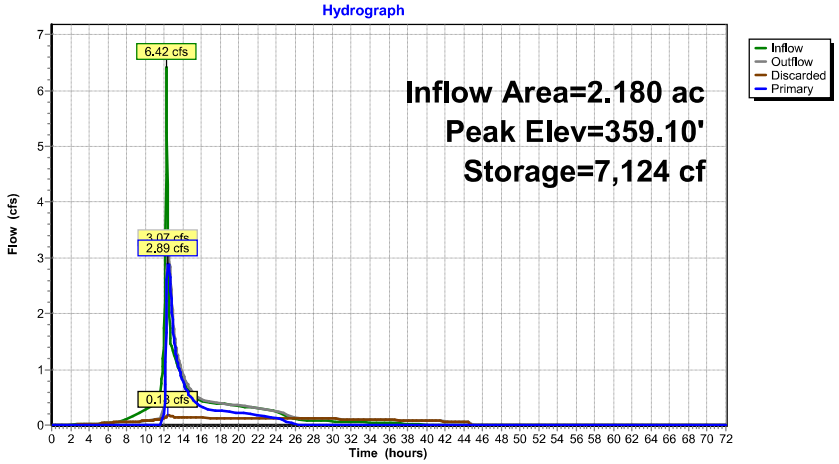
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	2,466	0	0
358.00	3,324	2,895	2,895
360.00	5,211	8,535	11,430
361.00	6,240	5,726	17,156

Device	Routing	Invert	Outlet Devices
#1	Primary	355.00'	**12.0" Round Culvert** L= 200.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 355.00' / 354.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.20'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 354.90' Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 12.43 hrs HW=359.10' (Free Discharge)
└**4=Exfiltration** (Controls 0.18 cfs)

Primary OutFlow Max=2.89 cfs @ 12.43 hrs HW=359.10' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.89 cfs of 4.57 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.89 cfs @ 3.85 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin #2



Summary for Pond 6P: Infiltration Basin #3

Inflow Area = 2.179 ac, 42.68% Impervious, Inflow Depth = 4.30" for 25-Year event
Inflow = 10.83 cfs @ 12.13 hrs, Volume= 0.780 af
Outflow = 0.96 cfs @ 13.04 hrs, Volume= 0.780 af, Atten= 91%, Lag= 54.5 min
Discarded = 0.27 cfs @ 13.04 hrs, Volume= 0.675 af
Primary = 0.69 cfs @ 13.04 hrs, Volume= 0.105 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 358.96' @ 13.04 hrs Surf.Area= 6,177 sf Storage= 14,552 cf
Flood Elev= 359.25' Surf.Area= 6,440 sf Storage= 16,409 cf

Plug-Flow detention time= 576.5 min calculated for 0.780 af (100% of inflow)
Center-of-Mass det. time= 576.4 min (1,460.6 - 884.2)

Volume	Invert	Avail.Storage	Storage Description
#1	356.00'	21,490 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

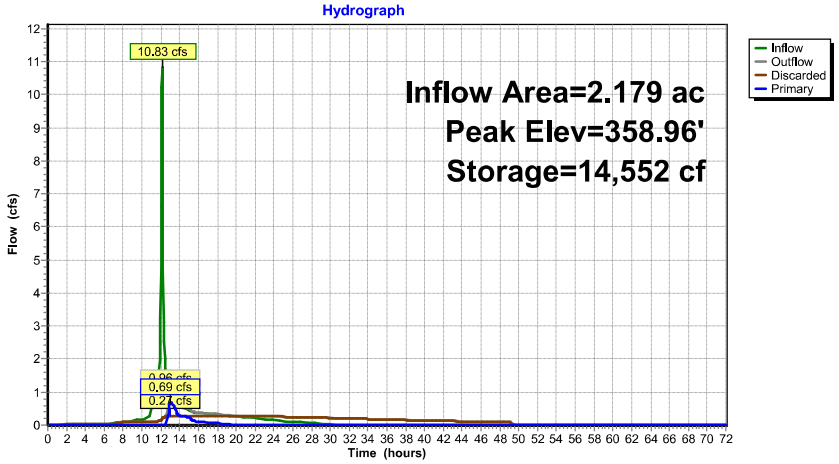
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
356.00	3,731	0	0
358.00	5,325	9,056	9,056
360.00	7,109	12,434	21,490

Device	Routing	Invert	Outlet Devices
#1	Primary	354.00'	**12.0" Round Culvert** L= 68.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 354.00' / 346.00' S= 0.1171 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	356.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 353.50' Phase-In= 0.01'

Discarded OutFlow Max=0.27 cfs @ 13.04 hrs HW=358.96' (Free Discharge)
└**3=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=0.69 cfs @ 13.04 hrs HW=358.96' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.69 cfs of 7.98 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.69 cfs @ 0.77 fps)

Pond 6P: Infiltration Basin #3



Summary for Pond 7P: Detention Basin #1

Inflow Area = 0.367 ac, 92.34% Impervious, Inflow Depth = 5.82" for 25-Year event
Inflow = 2.27 cfs @ 12.13 hrs, Volume= 0.178 af
Outflow = 2.24 cfs @ 12.14 hrs, Volume= 0.178 af, Atten= 1%, Lag= 0.8 min
Primary = 2.24 cfs @ 12.14 hrs, Volume= 0.178 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.99' @ 12.14 hrs Surf.Area= 772 sf Storage= 965 cf

Plug-Flow detention time= 82.4 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 81.6 min (849.4 - 767.7)

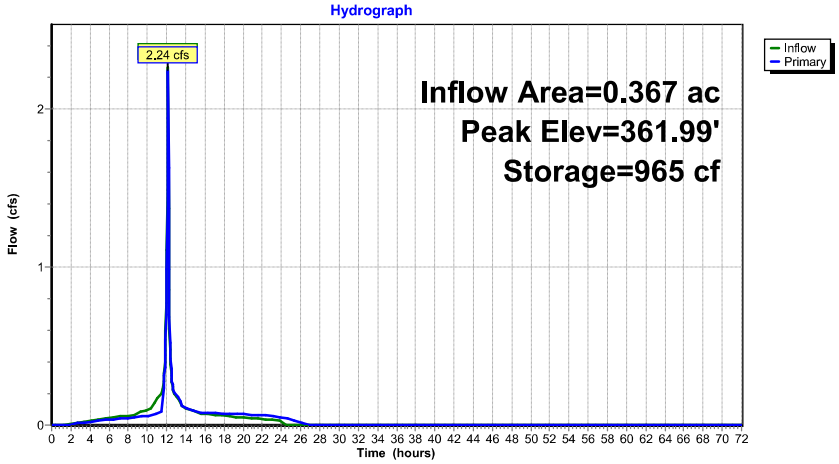
Volume	Invert	Avail.Storage	Storage Description
#1	360.00'	1,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
360.00	198	0	0
362.00	775	973	973
363.00	1,153	964	1,937

Device	Routing	Invert	Outlet Devices
#1	Primary	357.57'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 357.57' / 357.42' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	361.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.18 cfs @ 12.14 hrs HW=361.99' TW=358.57' (Dynamic Tailwater)
↑**1=Culvert** (Passes 2.18 cfs of 6.99 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 2.10 cfs @ 1.41 fps)
3=Orifice/Grate (Orifice Controls 0.08 cfs @ 6.68 fps)

Pond 7P: Detention Basin #1



Summary for Pond 8P: Detention Basin #2

Inflow Area = 0.457 ac, 68.53% Impervious, Inflow Depth = 5.02" for 25-Year event
Inflow = 2.60 cfs @ 12.13 hrs, Volume= 0.191 af
Outflow = 0.10 cfs @ 15.10 hrs, Volume= 0.188 af, Atten= 96%, Lag= 178.0 min
Primary = 0.10 cfs @ 15.10 hrs, Volume= 0.188 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.08' @ 15.10 hrs Surf.Area= 2,121 sf Storage= 4,518 cf

Plug-Flow detention time= 538.0 min calculated for 0.188 af (98% of inflow)
Center-of-Mass det. time= 525.6 min (1,328.9 - 803.3)

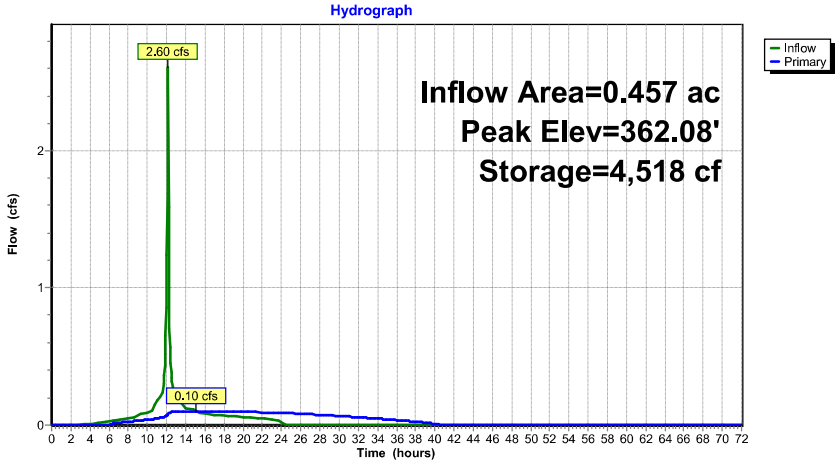
Volume	Invert	Avail.Storage	Storage Description
#1	359.00'	6,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
359.00	873	0	0
360.00	1,218	1,046	1,046
362.00	2,077	3,295	4,341
363.00	2,592	2,335	6,675

Device	Routing	Invert	Outlet Devices
#1	Primary	359.18'	**12.0" Round Culvert** L= 86.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 359.18' / 358.75' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	359.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	362.20'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 15.10 hrs HW=362.08' TW=358.41' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.10 cfs of 5.47 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 8.21 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Pond 8P: Detention Basin #2



Summary for Pond 10P: Infiltration Basin #1

Inflow Area = 3.060 ac, 34.47% Impervious, Inflow Depth = 3.84" for 25-Year event
Inflow = 9.45 cfs @ 12.26 hrs, Volume= 0.979 af
Outflow = 4.34 cfs @ 12.50 hrs, Volume= 0.979 af, Atten= 54%, Lag= 14.3 min
Discarded = 0.23 cfs @ 12.50 hrs, Volume= 0.302 af
Primary = 4.11 cfs @ 12.50 hrs, Volume= 0.677 af
Routed to Pond AP-2 : AP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 326.27' @ 12.50 hrs Surf.Area= 4,198 sf Storage= 12,072 cf

Plug-Flow detention time= 121.7 min calculated for 0.979 af (100% of inflow)
Center-of-Mass det. time= 122.0 min (976.5 - 854.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	20,497 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

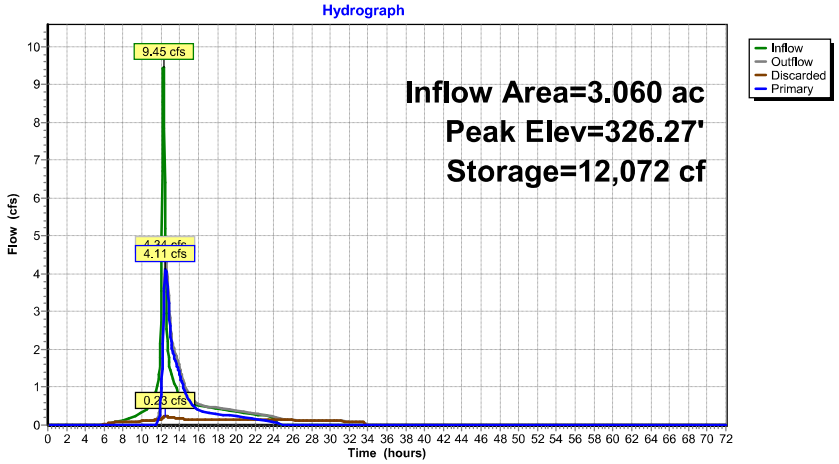
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,609	0	0
324.00	2,681	4,290	4,290
326.00	3,982	6,663	10,953
328.00	5,562	9,544	20,497

Device	Routing	Invert	Outlet Devices
#1	Primary	320.00'	**18.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 320.00' / 318.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Discarded	322.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	323.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	325.35'	**8.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	326.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	327.15'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.23 cfs @ 12.50 hrs HW=326.27' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=4.11 cfs @ 12.50 hrs HW=326.27' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.11 cfs of 20.00 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.49 cfs @ 7.13 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.62 cfs @ 3.64 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1



Summary for Pond 12P: CULTEC CHAMBER SYSTEM #1

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.355 ac, 41.78% Impervious, Inflow Depth = 4.37" for 25-Year event
Inflow = 5.14 cfs @ 12.22 hrs, Volume= 0.493 af
Outflow = 5.42 cfs @ 12.26 hrs, Volume= 0.484 af, Atten= 0%, Lag= 2.5 min
Primary = 5.42 cfs @ 12.26 hrs, Volume= 0.484 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.71' @ 12.26 hrs Surf.Area= 1,856 sf Storage= 3,343 cf

Plug-Flow detention time= 50.2 min calculated for 0.484 af (98% of inflow)
Center-of-Mass det. time= 40.6 min (875.0 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	359.10'	1,442 cf	**41.25'W x 45.00'L x 3.21'H Field A** 5,955 cf Overall - 2,350 cf Embedded = 3,606 cf x 40.0% Voids
#2A	359.60'	2,350 cf	**Cultec R-280HD** x 54 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 9 rows
		3,792 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	359.60'	**15.0" Round Culvert** L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 359.60' / 358.94' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	361.30'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	359.60'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.10 cfs @ 12.26 hrs HW=361.68' TW=358.88' (Dynamic Tailwater)
↑**1=Culvert** (Passes 5.10 cfs of 5.64 cfs potential flow)
↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.82 cfs @ 2.02 fps)
3=Orifice/Grate (Orifice Controls 1.28 cfs @ 6.52 fps)

Pond 12P: CULTEC CHAMBER SYSTEM #1 - 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 9 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

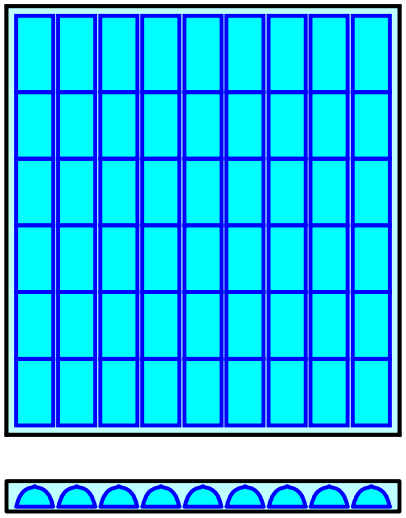
6 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 43.00' Row Length +12.0" End Stone x 2 = 45.00' Base Length
9 Rows x 47.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 41.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

54 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 9 Rows = 2,349.8 cf Chamber Storage

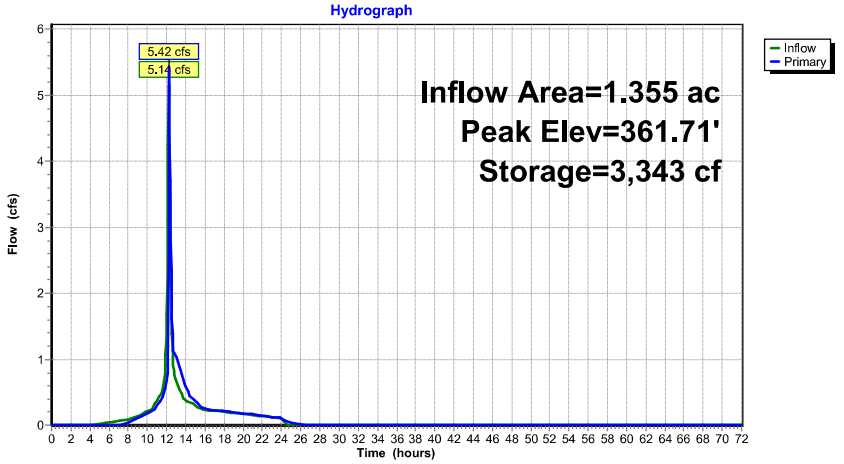
5,955.5 cf Field - 2,349.8 cf Chambers = 3,605.7 cf Stone x 40.0% Voids = 1,442.3 cf Stone Storage

Chamber Storage + Stone Storage = 3,792.0 cf = 0.087 af
Overall Storage Efficiency = 63.7%
Overall System Size = 45.00' x 41.25' x 3.21'

54 Chambers
220.6 cy Field
133.5 cy Stone



Pond 12P: CULTEC CHAMBER SYSTEM #1



Summary for Pond 14P: CULTEC CHAMBER SYSTEM #2

[93] Warning: Storage range exceeded by 0.17'

Inflow Area = 1.892 ac, 33.99% Impervious, Inflow Depth = 4.05" for 25-Year event
Inflow = 9.09 cfs @ 12.13 hrs, Volume= 0.638 af
Outflow = 9.03 cfs @ 12.13 hrs, Volume= 0.633 af, Atten= 1%, Lag= 0.0 min
Primary = 9.03 cfs @ 12.13 hrs, Volume= 0.633 af
Routed to Pond 6P : Infiltration Basin #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.68' @ 12.13 hrs Surf.Area= 0.028 ac Storage= 0.057 af

Plug-Flow detention time= 84.8 min calculated for 0.633 af (99% of inflow)
Center-of-Mass det. time= 79.1 min (916.3 - 837.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	358.30'	0.022 af	**23.58'W x 52.00'L x 3.21'H Field A** 0.090 af Overall - 0.035 af Embedded = 0.055 af x 40.0% Voids
#2A	358.80'	0.035 af	**Cultec R-280HD** x 35 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 5 rows
		0.057 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	361.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Device 3	358.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	358.80'	**18.0" Round Culvert** L= 15.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 358.80' / 358.65' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.65 cfs @ 12.13 hrs HW=361.66' TW=357.82' (Dynamic Tailwater)
└**3=Culvert** (Passes 8.65 cfs of 12.35 cfs potential flow)
├**1=Sharp-Crested Rectangular Weir** (Weir Controls 8.47 cfs @ 2.65 fps)
└**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 8.02 fps)

Pond 14P: CULTEC CHAMBER SYSTEM #2 - 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 5 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

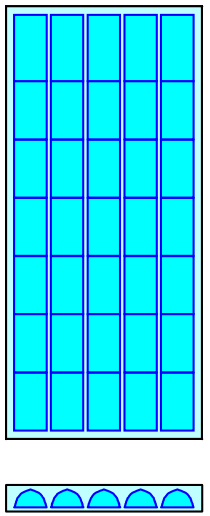
7 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 50.00' Row Length +12.0" End Stone x 2 = 52.00' Base Length
5 Rows x 47.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 23.58' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

35 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 5 Rows = 1,517.9 cf Chamber Storage

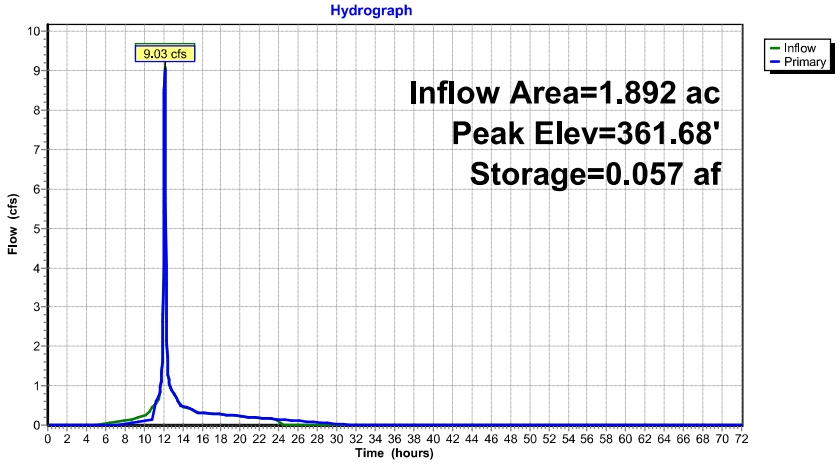
3,934.5 cf Field - 1,517.9 cf Chambers = 2,416.5 cf Stone x 40.0% Voids = 966.6 cf Stone Storage

Chamber Storage + Stone Storage = 2,484.6 cf = 0.057 af
Overall Storage Efficiency = 63.1%
Overall System Size = 52.00' x 23.58' x 3.21'

35 Chambers
145.7 cy Field
89.5 cy Stone



Pond 14P: CULTEC CHAMBER SYSTEM #2



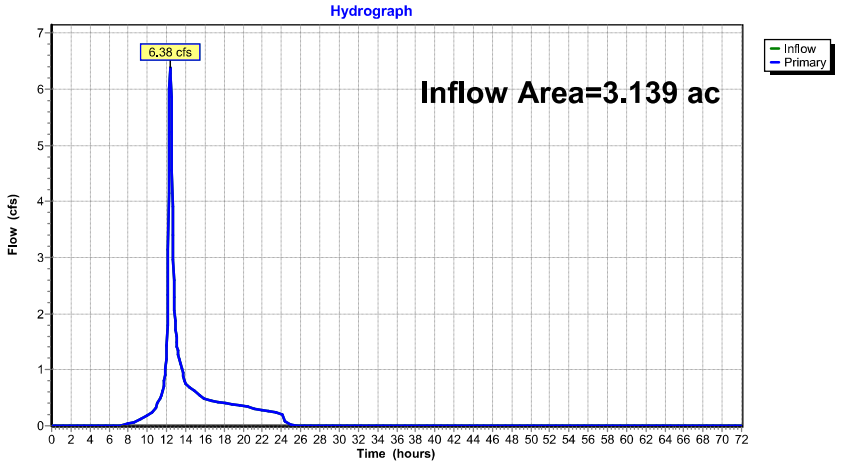
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.139 ac, 0.00% Impervious, Inflow Depth = 3.13" for 25-Year event
Inflow = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af
Primary = 6.38 cfs @ 12.37 hrs, Volume= 0.820 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



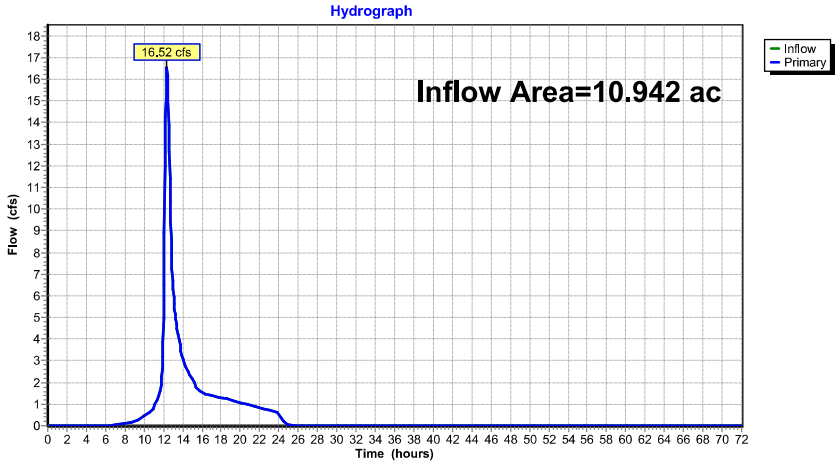
Summary for Pond AP-2: AP-2

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

Inflow Area = 10.942 ac, 12.47% Impervious, Inflow Depth = 2.88" for 25-Year event
Inflow = 16.52 cfs @ 12.37 hrs, Volume= 2.630 af
Primary = 16.52 cfs @ 12.37 hrs, Volume= 2.630 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



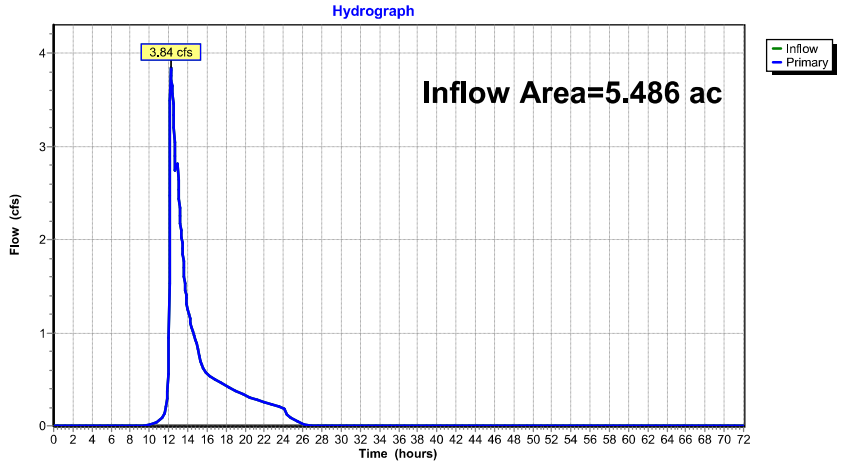
Summary for Pond AP-3: AP-3

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

Inflow Area = 5.486 ac, 39.18% Impervious, Inflow Depth = 1.75" for 25-Year event
Inflow = 3.84 cfs @ 12.22 hrs, Volume= 0.802 af
Primary = 3.84 cfs @ 12.22 hrs, Volume= 0.802 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: To Basin #1 Runoff Area=133,315 sf 34.47% Impervious Runoff Depth=5.45"
Flow Length=819' Tc=17.4 min CN=77 Runoff=13.30 cfs 1.390 af

Subcatchment PR-10: WESTERN Runoff Area=206,274 sf 6.53% Impervious Runoff Depth=4.98"
Flow Length=756' Tc=29.2 min CN=73 Runoff=14.23 cfs 1.965 af

Subcatchment PR-2: To Basin #2 Runoff Area=59,024 sf 41.78% Impervious Runoff Depth=6.04"
Flow Length=472' Tc=14.3 min CN=82 Runoff=7.02 cfs 0.682 af

Subcatchment PR-3: To Infiltration Basin Runoff Area=82,428 sf 33.99% Impervious Runoff Depth=5.69"
Tc=6.0 min CN=79 Runoff=12.59 cfs 0.896 af

Subcatchment PR-4: To Detention Basin #1 Runoff Area=16,000 sf 92.34% Impervious Runoff Depth=7.59"
Tc=6.0 min CN=95 Runoff=2.92 cfs 0.232 af

Subcatchment PR-5: To Detention Basin #2 Runoff Area=19,916 sf 68.53% Impervious Runoff Depth=6.75"
Tc=6.0 min CN=88 Runoff=3.44 cfs 0.257 af

Subcatchment PR-6: ROOF SOUTH Runoff Area=12,492 sf 100.00% Impervious Runoff Depth=7.95"
Tc=6.0 min CN=98 Runoff=2.30 cfs 0.190 af

Subcatchment PR-7: UNCAPTURED TO Runoff Area=49,112 sf 0.09% Impervious Runoff Depth=3.25"
Flow Length=275' Tc=8.6 min CN=58 Runoff=3.96 cfs 0.305 af

Subcatchment PR-8: UNCAPTURED TO Runoff Area=137,043 sf 0.01% Impervious Runoff Depth=3.59"
Flow Length=301' Tc=11.3 min CN=61 Runoff=11.04 cfs 0.941 af

Subcatchment PR-9: UNCAPTURED TO Runoff Area=136,727 sf 0.00% Impervious Runoff Depth=4.63"
Flow Length=660' Tc=25.8 min CN=70 Runoff=9.46 cfs 1.211 af

Pond 1P: AP-4
Primary=0.00 cfs 0.000 af

Pond 4P: Infiltration Basin #2 Peak Elev=359.70' Storage=9,891 cf Inflow=8.19 cfs 1.159 af
Discarded=0.22 cfs 0.376 af Primary=4.02 cfs 0.783 af Outflow=4.24 cfs 1.159 af

Pond 6P: Infiltration Basin #3 Peak Elev=359.17' Storage=15,910 cf Inflow=15.04 cfs 1.081 af
Discarded=0.29 cfs 0.707 af Primary=7.42 cfs 0.374 af Outflow=7.71 cfs 1.081 af

Pond 7P: Detention Basin #1 Peak Elev=362.03' Storage=993 cf Inflow=2.92 cfs 0.232 af
Outflow=2.89 cfs 0.232 af

Pond 8P: Detention Basin #2 Peak Elev=362.29' Storage=4,963 cf Inflow=3.44 cfs 0.257 af
Outflow=0.80 cfs 0.254 af

Pond 10P: Infiltration Basin #1 Peak Elev=327.06' Storage=15,641 cf Inflow=13.30 cfs 1.390 af
Discarded=0.27 cfs 0.327 af Primary=7.16 cfs 1.063 af Outflow=7.43 cfs 1.390 af

Pond 12P: CULTEC CHAMBER SYSTEM #1 Peak Elev=362.08' Storage=3,620 cf Inflow=7.02 cfs 0.682 af
Outflow=6.34 cfs 0.673 af

Pond 14P: CULTEC CHAMBER SYSTEM #2 Peak Elev=361.86' Storage=0.057 af Inflow=12.59 cfs 0.896 af
Outflow=12.74 cfs 0.891 af

Pond AP-1: AP-1 Inflow=9.46 cfs 1.211 af
Primary=9.46 cfs 1.211 af

Pond AP-2: AP-2 Inflow=24.99 cfs 3.969 af
Primary=24.99 cfs 3.969 af

Pond AP-3: AP-3 Inflow=14.28 cfs 1.462 af
Primary=14.28 cfs 1.462 af

Total Runoff Area = 19.567 ac Runoff Volume = 8.070 af Average Runoff Depth = 4.95"
82.04% Pervious = 16.053 ac 17.96% Impervious = 3.514 ac

Summary for Subcatchment PR-1: To Basin #1

[47] Hint: Peak is 151% of capacity of segment #5

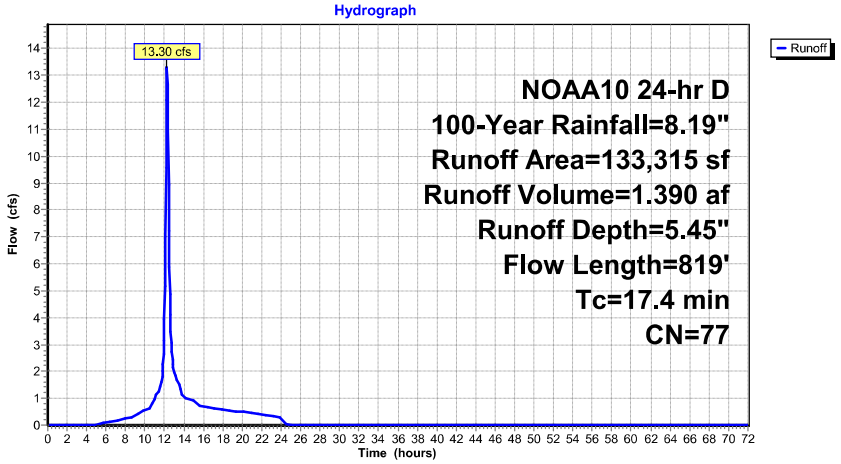
Runoff = 13.30 cfs @ 12.26 hrs, Volume= 1.390 af, Depth= 5.45"
Routed to Pond 10P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
14,748	74	>75% Grass cover, Good, HSG C
17,107	98	Paved parking, HSG C
31,793	70	Woods, Good, HSG C
5,562	98	Water Surface, HSG B
35,828	61	>75% Grass cover, Good, HSG B
23,286	98	Paved parking, HSG B
4,992	55	Woods, Good, HSG B
133,315	77	Weighted Average
87,361		65.53% Pervious Area
45,955		34.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
3.5	223	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.7	228	0.0750	5.56		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.4	293	0.0610	11.20	8.80	**Pipe Channel, E-F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
17.4	819	Total			

Subcatchment PR-1: To Basin #1



Summary for Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE

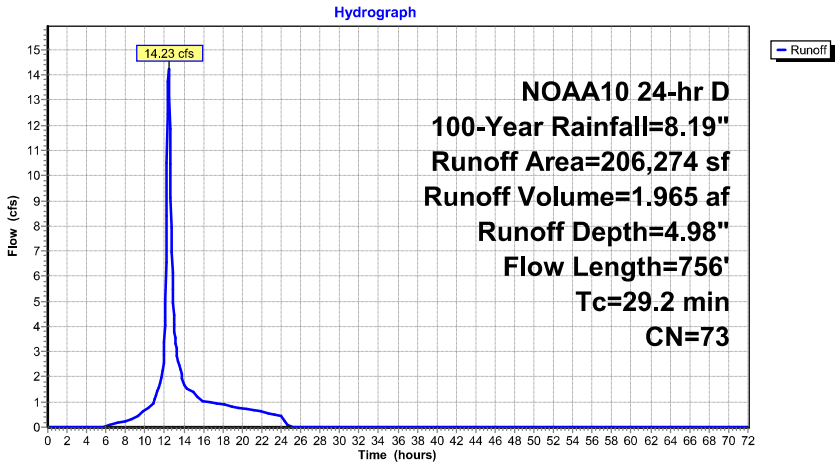
Runoff = 14.23 cfs @ 12.41 hrs, Volume= 1.965 af, Depth= 4.98"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
148,201	70	Woods, Good, HSG C
4,153	74	>75% Grass cover, Good, HSG C
53,920	80	1/2 acre lots, 25% imp, HSG C
206,274	73	Weighted Average
192,794		93.47% Pervious Area
13,480		6.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
8.9	420	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	286	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.2	756	Total			

Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE



Summary for Subcatchment PR-2: To Basin #2

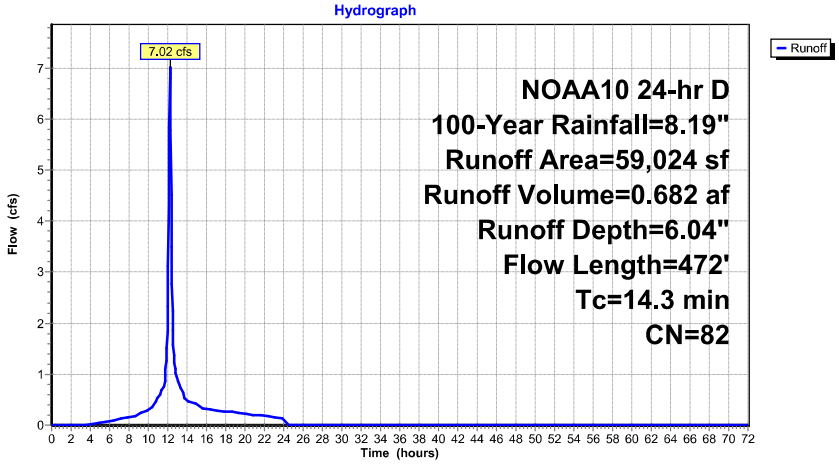
Runoff = 7.02 cfs @ 12.22 hrs, Volume= 0.682 af, Depth= 6.04"
Routed to Pond 12P : CULTEC CHAMBER SYSTEM #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
20,883	74	>75% Grass cover, Good, HSG C
15,236	98	Paved parking, HSG C
6,901	70	Woods, Good, HSG C
6,582	61	>75% Grass cover, Good, HSG B
6,240	98	Water Surface, HSG B
2,825	98	Paved parking, HSG B
358	98	Roofs, HSG B
59,024	82	Weighted Average
34,366		58.22% Pervious Area
24,658		41.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.1	38	0.5000	11.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	21	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	27	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	336	0.0075	5.15	9.10	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
14.3	472	Total			

Subcatchment PR-2: To Basin #2



Summary for Subcatchment PR-3: To Infiltration Basin #3

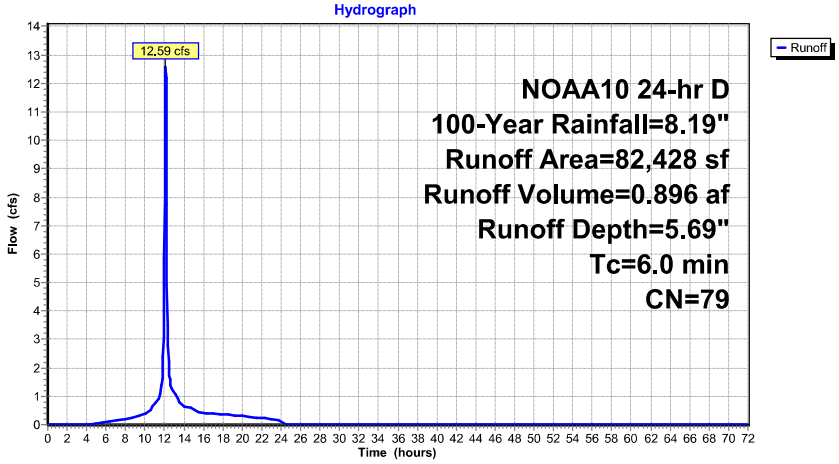
Runoff = 12.59 cfs @ 12.13 hrs, Volume= 0.896 af, Depth= 5.69"
Routed to Pond 14P : CULTEC CHAMBER SYSTEM #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
26,370	74	>75% Grass cover, Good, HSG C
15,608	98	Paved parking, HSG C
9,464	70	Woods, Good, HSG C
15,524	61	>75% Grass cover, Good, HSG B
5,303	98	Paved parking, HSG B
7,109	98	Water Surface, HSG B
0	98	Unconnected pavement, HSG B
3,049	55	Woods, Good, HSG B
82,428	79	Weighted Average
54,408		66.01% Pervious Area
28,020		33.99% Impervious Area
0		0.00% Unconnected

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

Subcatchment PR-3: To Infiltration Basin #3



Summary for Subcatchment PR-4: To Detention Basin #1

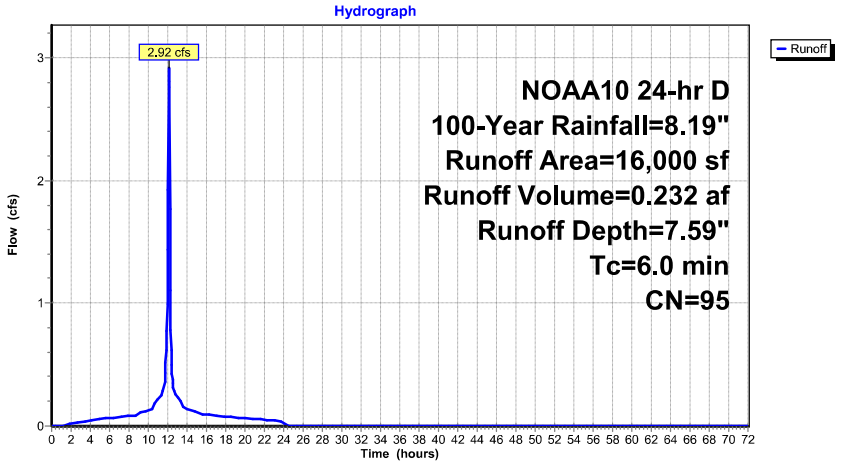
Runoff = 2.92 cfs @ 12.13 hrs, Volume= 0.232 af, Depth= 7.59"
Routed to Pond 7P : Detention Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
42	98	Paved parking, HSG C
12,807	98	Roofs, HSG C
353	74	>75% Grass cover, Good, HSG C
292	98	Paved parking, HSG B
872	61	>75% Grass cover, Good, HSG B
47	98	Roofs, HSG B
1,588	98	Water Surface, HSG B
16,000	95	Weighted Average
1,225		7.66% Pervious Area
14,775		92.34% Impervious Area

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

Subcatchment PR-4: To Detention Basin #1



Summary for Subcatchment PR-5: To Detention Basin #2

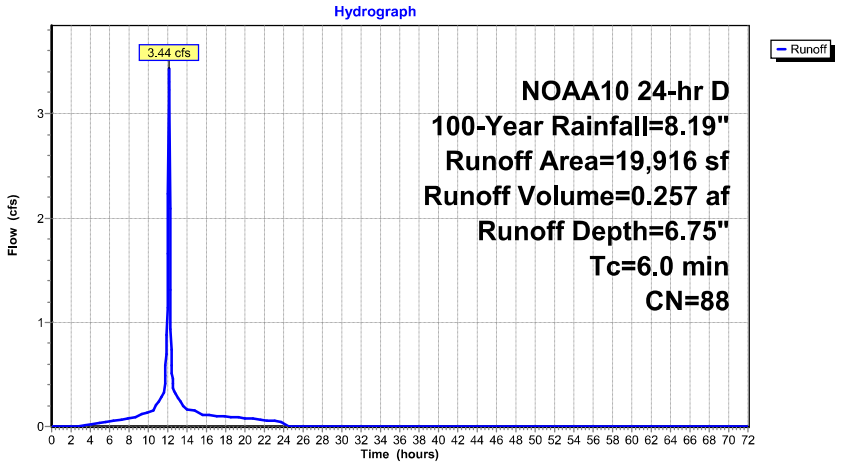
Runoff = 3.44 cfs @ 12.13 hrs, Volume= 0.257 af, Depth= 6.75"
Routed to Pond 8P : Detention Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

	Area (sf)	CN	Description
	3,739	98	Paved parking, HSG C
	654	98	Roofs, HSG C
	15	98	Water Surface, HSG C
	3,776	74	>75% Grass cover, Good, HSG C
	2,383	61	>75% Grass cover, Good, HSG B
	6,664	98	Paved parking, HSG B
	2,577	98	Water Surface, HSG B
*	108	0	>75% Grass cover, Good
	19,916	88	Weighted Average
	6,267		31.47% Pervious Area
	13,649		68.53% Impervious Area

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

Subcatchment PR-5: To Detention Basin #2



Summary for Subcatchment PR-6: ROOF SOUTH

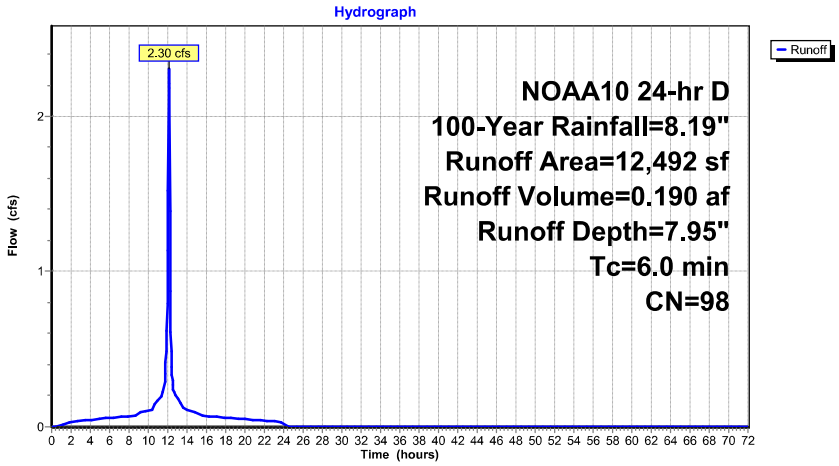
Runoff = 2.30 cfs @ 12.13 hrs, Volume= 0.190 af, Depth= 7.95"
Routed to Pond 6P : Infiltration Basin #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
10,772	98	Roofs, HSG C
1,720	98	Roofs, HSG B
12,492	98	Weighted Average
12,492		100.00% Impervious Area

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

Subcatchment PR-6: ROOF SOUTH



Summary for Subcatchment PR-7: UNCAPTURED TO AP#3

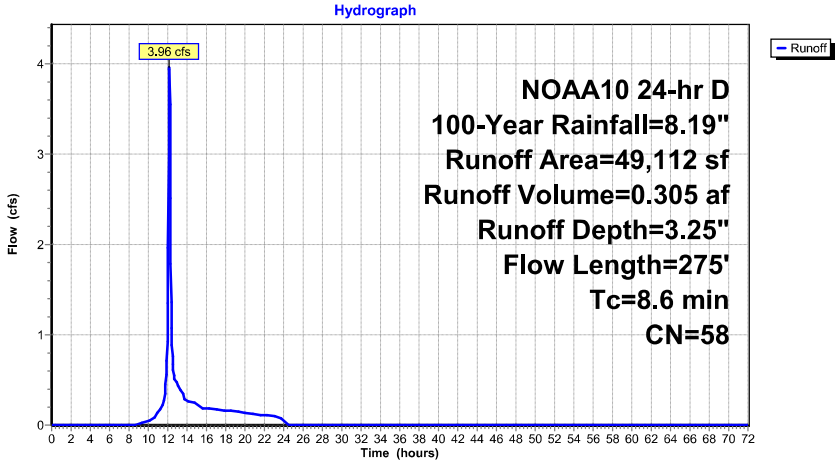
Runoff = 3.96 cfs @ 12.16 hrs, Volume= 0.305 af, Depth= 3.25"
Routed to Pond AP-3 : AP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
23,694	55	Woods, Good, HSG B
25,375	61	>75% Grass cover, Good, HSG B
44	98	Paved parking, HSG B
49,112	58	Weighted Average
49,069		99.91% Pervious Area
44		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	40	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	135	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	275	Total			

Subcatchment PR-7: UNCAPTURED TO AP#3



Summary for Subcatchment PR-8: UNCAPTURED TO AP-2

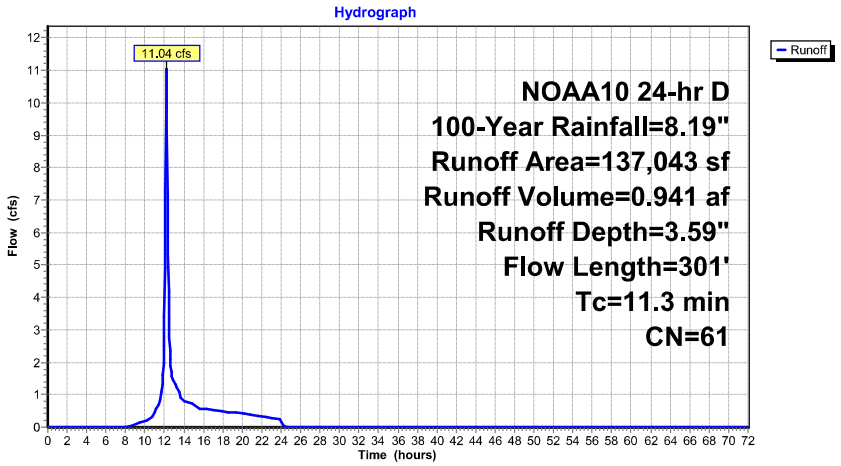
Runoff = 11.04 cfs @ 12.19 hrs, Volume= 0.941 af, Depth= 3.59"
Routed to Pond AP-2 : AP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
45,852	70	Woods, Good, HSG C
6,421	74	>75% Grass cover, Good, HSG C
72,303	55	Woods, Good, HSG B
12,457	61	>75% Grass cover, Good, HSG B
10	98	Paved parking, HSG B
137,043	61	Weighted Average
137,033		99.99% Pervious Area
10		0.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.02"
3.1	251	0.0730	1.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	301	Total			

Subcatchment PR-8: UNCAPTURED TO AP-2



Summary for Subcatchment PR-9: UNCAPTURED TO AP-1

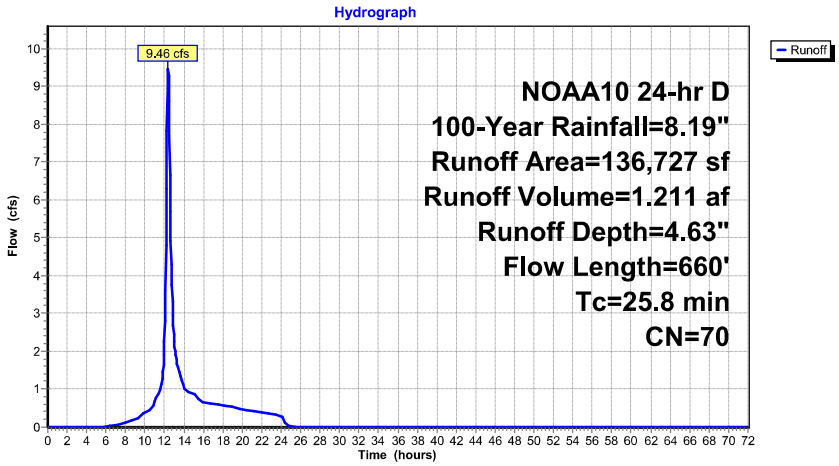
Runoff = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af, Depth= 4.63"
Routed to Pond AP-1 : AP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA10 24-hr D 100-Year Rainfall=8.19"

Area (sf)	CN	Description
136,638	70	Woods, Good, HSG C
89	74	>75% Grass cover, Good, HSG C
136,727	70	Weighted Average
136,727		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.02"
1.3	70	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
8.7	260	0.0100	0.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
5.0	280	0.0350	0.94		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
25.8	660	Total			

Subcatchment PR-9: UNCAPTURED TO AP-1

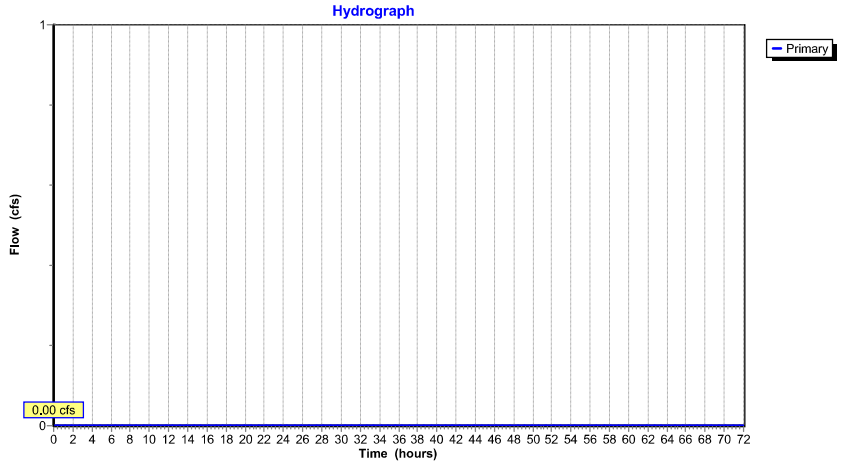


Summary for Pond 1P: AP-4

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

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=0.00' (Dynamic Tailwater)

Pond 1P: AP-4



Summary for Pond 4P: Infiltration Basin #2

Inflow Area = 2.180 ac, 55.91% Impervious, Inflow Depth = 6.38" for 100-Year event
Inflow = 8.19 cfs @ 12.20 hrs, Volume= 1.159 af
Outflow = 4.24 cfs @ 12.45 hrs, Volume= 1.159 af, Atten= 48%, Lag= 15.3 min
Discarded = 0.22 cfs @ 12.45 hrs, Volume= 0.376 af
Primary = 4.02 cfs @ 12.45 hrs, Volume= 0.783 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 359.70' @ 12.45 hrs Surf.Area= 4,925 sf Storage= 9,891 cf
Flood Elev= 360.25' Surf.Area= 5,468 sf Storage= 12,765 cf

Plug-Flow detention time= 139.1 min calculated for 1.158 af (100% of inflow)
Center-of-Mass det. time= 139.1 min (1,081.7 - 942.6)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	17,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

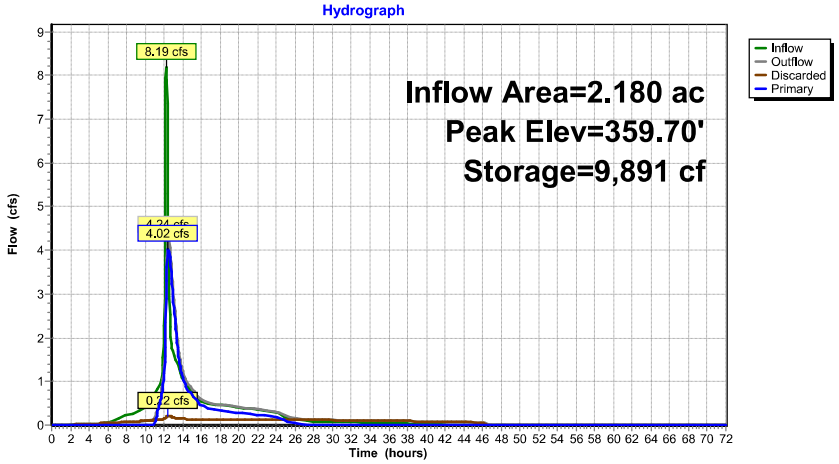
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	2,466	0	0
358.00	3,324	2,895	2,895
360.00	5,211	8,535	11,430
361.00	6,240	5,726	17,156

Device	Routing	Invert	Outlet Devices
#1	Primary	355.00'	**12.0" Round Culvert** L= 200.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 355.00' / 354.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.20'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 354.90' Phase-In= 0.01'

Discarded OutFlow Max=0.22 cfs @ 12.45 hrs HW=359.70' (Free Discharge)
└**4=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=4.02 cfs @ 12.45 hrs HW=359.70' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.02 cfs of 4.90 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 4.02 cfs @ 5.37 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: Infiltration Basin #2



Summary for Pond 6P: Infiltration Basin #3

Inflow Area = 2.179 ac, 42.68% Impervious, Inflow Depth = 5.95" for 100-Year event
Inflow = 15.04 cfs @ 12.13 hrs, Volume= 1.081 af
Outflow = 7.71 cfs @ 12.23 hrs, Volume= 1.081 af, Atten= 49%, Lag= 5.7 min
Discarded = 0.29 cfs @ 12.23 hrs, Volume= 0.707 af
Primary = 7.42 cfs @ 12.23 hrs, Volume= 0.374 af
Routed to Pond AP-3 : AP-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 359.17' @ 12.23 hrs Surf.Area= 6,371 sf Storage= 15,910 cf
Flood Elev= 359.25' Surf.Area= 6,440 sf Storage= 16,409 cf

Plug-Flow detention time= 438.5 min calculated for 1.081 af (100% of inflow)
Center-of-Mass det. time= 438.6 min (1,298.4 - 859.8)

Volume	Invert	Avail.Storage	Storage Description
#1	356.00'	21,490 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

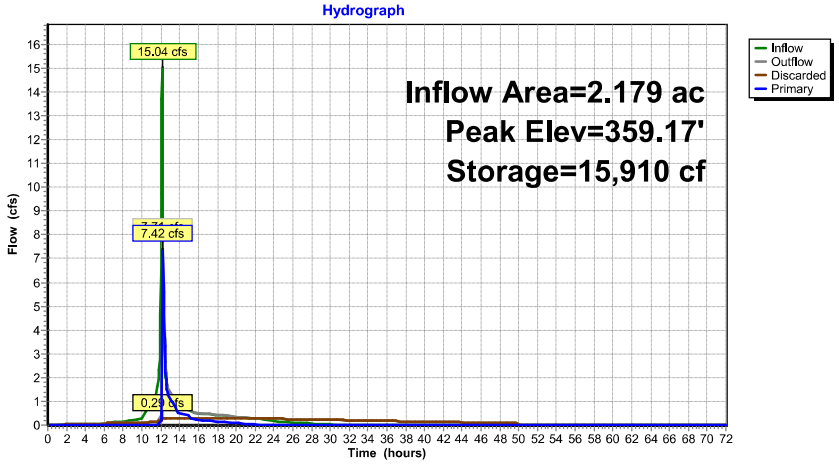
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
356.00	3,731	0	0
358.00	5,325	9,056	9,056
360.00	7,109	12,434	21,490

Device	Routing	Invert	Outlet Devices
#1	Primary	354.00'	**12.0" Round Culvert** L= 68.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 354.00' / 346.00' S= 0.1171 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	358.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	356.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 353.50' Phase-In= 0.01'

Discarded OutFlow Max=0.29 cfs @ 12.23 hrs HW=359.17' (Free Discharge)
└**3=Exfiltration** (Controls 0.29 cfs)

Primary OutFlow Max=7.21 cfs @ 12.23 hrs HW=359.17' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 7.21 cfs of 8.17 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 7.21 cfs @ 1.69 fps)

Pond 6P: Infiltration Basin #3



Summary for Pond 7P: Detention Basin #1

Inflow Area = 0.367 ac, 92.34% Impervious, Inflow Depth = 7.59" for 100-Year event
Inflow = 2.92 cfs @ 12.13 hrs, Volume= 0.232 af
Outflow = 2.89 cfs @ 12.14 hrs, Volume= 0.232 af, Atten= 1%, Lag= 0.8 min
Primary = 2.89 cfs @ 12.14 hrs, Volume= 0.232 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.03' @ 12.14 hrs Surf.Area= 785 sf Storage= 993 cf

Plug-Flow detention time= 79.3 min calculated for 0.232 af (100% of inflow)
Center-of-Mass det. time= 78.5 min (839.4 - 760.9)

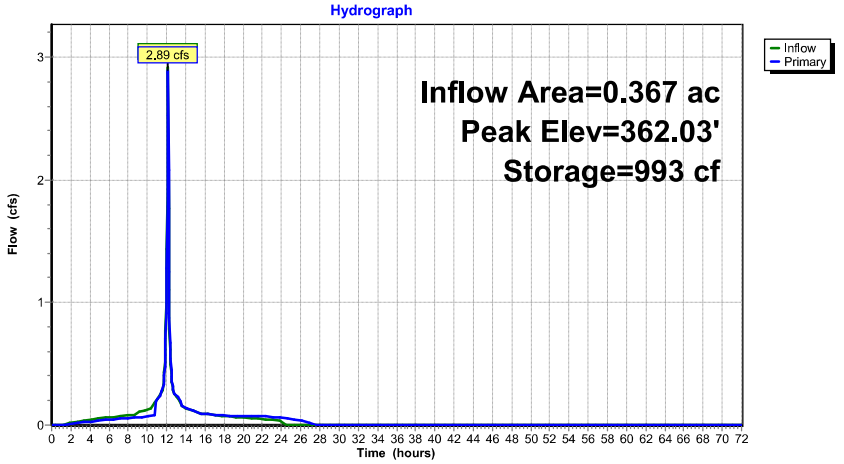
Volume	Invert	Avail.Storage	Storage Description
#1	360.00'	1,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
360.00	198	0	0
362.00	775	973	973
363.00	1,153	964	1,937

Device	Routing	Invert	Outlet Devices
#1	Primary	357.57'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 357.57' / 357.42' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	361.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	360.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.80 cfs @ 12.14 hrs HW=362.02' TW=358.85' (Dynamic Tailwater)
↑└─**1=Culvert** (Passes 2.80 cfs of 6.73 cfs potential flow)
↑ ├─**2=Orifice/Grate** (Weir Controls 2.72 cfs @ 1.54 fps)
└─**3=Orifice/Grate** (Orifice Controls 0.08 cfs @ 6.74 fps)

Pond 7P: Detention Basin #1



Summary for Pond 8P: Detention Basin #2

Inflow Area = 0.457 ac, 68.53% Impervious, Inflow Depth = 6.75" for 100-Year event
Inflow = 3.44 cfs @ 12.13 hrs, Volume= 0.257 af
Outflow = 0.80 cfs @ 12.35 hrs, Volume= 0.254 af, Atten= 77%, Lag= 13.1 min
Primary = 0.80 cfs @ 12.35 hrs, Volume= 0.254 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.29' @ 12.35 hrs Surf.Area= 2,226 sf Storage= 4,963 cf

Plug-Flow detention time= 480.7 min calculated for 0.254 af (99% of inflow)
Center-of-Mass det. time= 471.1 min (1,263.9 - 792.7)

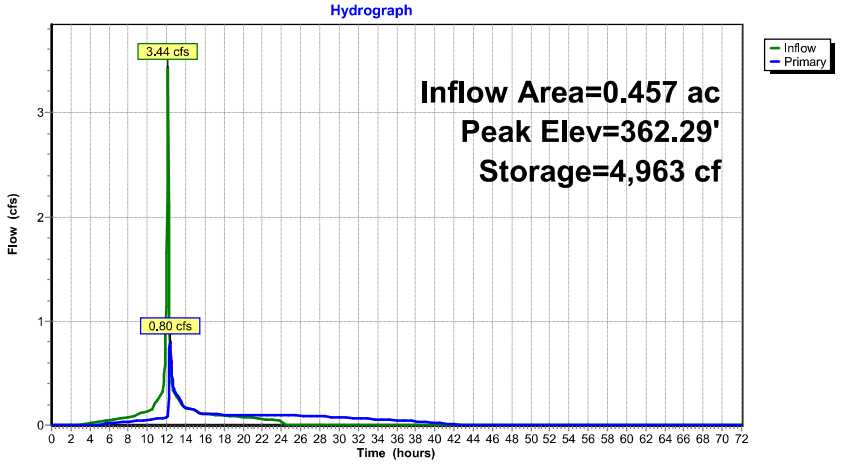
Volume	Invert	Avail.Storage	Storage Description
#1	359.00'	6,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
359.00	873	0	0
360.00	1,218	1,046	1,046
362.00	2,077	3,295	4,341
363.00	2,592	2,335	6,675

Device	Routing	Invert	Outlet Devices
#1	Primary	359.18'	**12.0" Round Culvert** L= 86.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 359.18' / 358.75' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	359.00'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	362.20'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.79 cfs @ 12.35 hrs HW=362.29' TW=359.59' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.79 cfs of 5.71 cfs potential flow)
├─**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 7.92 fps)
└─**3=Orifice/Grate** (Weir Controls 0.69 cfs @ 0.97 fps)

Pond 8P: Detention Basin #2



Summary for Pond 10P: Infiltration Basin #1

Inflow Area = 3.060 ac, 34.47% Impervious, Inflow Depth = 5.45" for 100-Year event
Inflow = 13.30 cfs @ 12.26 hrs, Volume= 1.390 af
Outflow = 7.43 cfs @ 12.45 hrs, Volume= 1.390 af, Atten= 44%, Lag= 11.7 min
Discarded = 0.27 cfs @ 12.45 hrs, Volume= 0.327 af
Primary = 7.16 cfs @ 12.45 hrs, Volume= 1.063 af
Routed to Pond AP-2 : AP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 327.06' @ 12.45 hrs Surf.Area= 4,823 sf Storage= 15,641 cf

Plug-Flow detention time= 99.7 min calculated for 1.389 af (100% of inflow)
Center-of-Mass det. time= 100.0 min (940.7 - 840.7)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	20,497 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

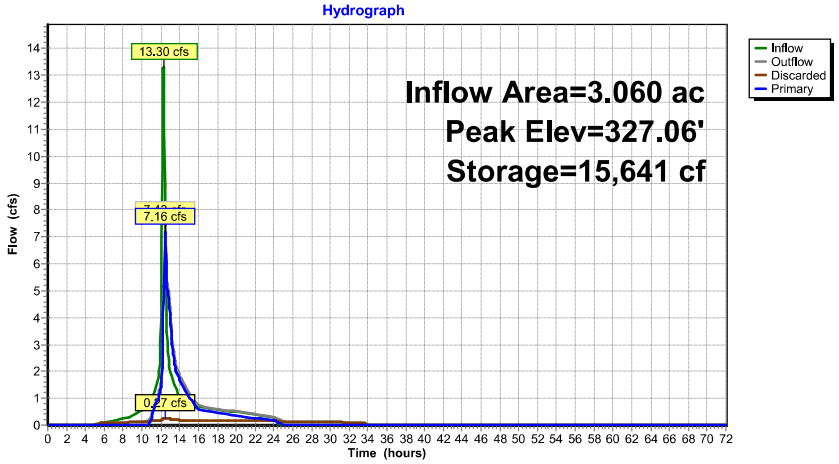
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,609	0	0
324.00	2,681	4,290	4,290
326.00	3,982	6,663	10,953
328.00	5,562	9,544	20,497

Device	Routing	Invert	Outlet Devices
#1	Primary	320.00'	**18.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 320.00' / 318.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Discarded	322.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	323.75'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	325.35'	**8.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	326.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	327.15'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.27 cfs @ 12.45 hrs HW=327.06' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=7.13 cfs @ 12.45 hrs HW=327.06' TW=0.00' (Dynamic Tailwater)
├**1=Culvert** (Passes 7.13 cfs of 21.38 cfs potential flow)
│ ├**3=Orifice/Grate** (Orifice Controls 2.90 cfs @ 8.31 fps)
│ ├**4=Orifice/Grate** (Orifice Controls 2.51 cfs @ 5.64 fps)
│ └**5=Orifice/Grate** (Weir Controls 1.72 cfs @ 1.32 fps)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1



Summary for Pond 12P: CULTEC CHAMBER SYSTEM #1

Inflow Area = 1.355 ac, 41.78% Impervious, Inflow Depth = 6.04" for 100-Year event
Inflow = 7.02 cfs @ 12.22 hrs, Volume= 0.682 af
Outflow = 6.34 cfs @ 12.27 hrs, Volume= 0.673 af, Atten= 10%, Lag= 3.2 min
Primary = 6.34 cfs @ 12.27 hrs, Volume= 0.673 af
Routed to Pond 4P : Infiltration Basin #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.08' @ 12.27 hrs Surf.Area= 1,856 sf Storage= 3,620 cf

Plug-Flow detention time= 42.3 min calculated for 0.673 af (99% of inflow)
Center-of-Mass det. time= 35.3 min (857.3 - 821.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	359.10'	1,442 cf	**41.25'W x 45.00'L x 3.21'H Field A** 5,955 cf Overall - 2,350 cf Embedded = 3,606 cf x 40.0% Voids
#2A	359.60'	2,350 cf	**Cultec R-280HD** x 54 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 9 rows
		3,792 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	359.60'	**15.0" Round Culvert** L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 359.60' / 358.94' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	361.30'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	359.60'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.30 cfs @ 12.27 hrs HW=362.05' TW=359.37' (Dynamic Tailwater)
- **1=Culvert** (Barrel Controls 6.30 cfs @ 5.13 fps)
- **2=Sharp-Crested Rectangular Weir** (Passes < 10.39 cfs potential flow)
- **3=Orifice/Grate** (Passes < 1.40 cfs potential flow)

Pond 12P: CULTEC CHAMBER SYSTEM #1 - 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 9 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

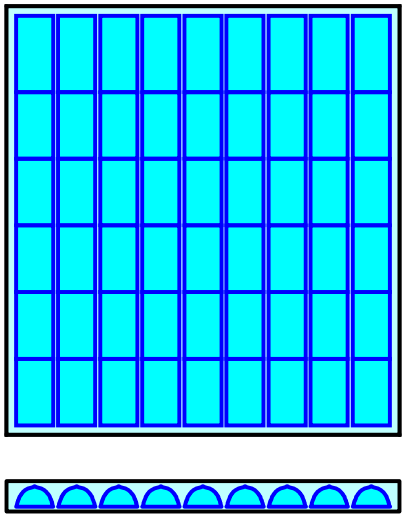
6 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 43.00' Row Length +12.0" End Stone x 2 = 45.00' Base Length
9 Rows x 47.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 41.25' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

54 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 9 Rows = 2,349.8 cf Chamber Storage

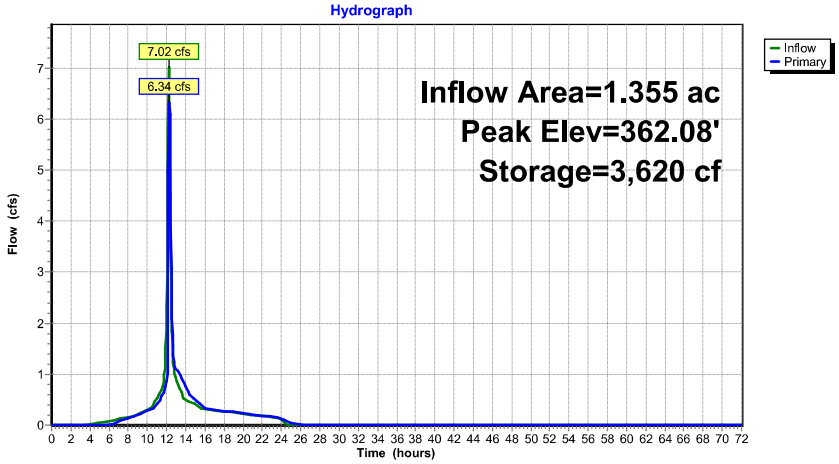
5,955.5 cf Field - 2,349.8 cf Chambers = 3,605.7 cf Stone x 40.0% Voids = 1,442.3 cf Stone Storage

Chamber Storage + Stone Storage = 3,792.0 cf = 0.087 af
Overall Storage Efficiency = 63.7%
Overall System Size = 45.00' x 41.25' x 3.21'

54 Chambers
220.6 cy Field
133.5 cy Stone



Pond 12P: CULTEC CHAMBER SYSTEM #1



Summary for Pond 14P: CULTEC CHAMBER SYSTEM #2

[93] Warning: Storage range exceeded by 0.35'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.892 ac, 33.99% Impervious, Inflow Depth = 5.69" for 100-Year event
Inflow = 12.59 cfs @ 12.13 hrs, Volume= 0.896 af
Outflow = 12.74 cfs @ 12.13 hrs, Volume= 0.891 af, Atten= 0%, Lag= 0.2 min
Primary = 12.74 cfs @ 12.13 hrs, Volume= 0.891 af
Routed to Pond 6P : Infiltration Basin #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.86' @ 12.13 hrs Surf.Area= 0.028 ac Storage= 0.057 af

Plug-Flow detention time= 64.1 min calculated for 0.890 af (99% of inflow)
Center-of-Mass det. time= 60.9 min (884.9 - 823.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	358.30'	0.022 af	**23.58'W x 52.00'L x 3.21'H Field A** 0.090 af Overall - 0.035 af Embedded = 0.055 af x 40.0% Voids
#2A	358.80'	0.035 af	**Cultec R-280HD** x 35 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 5 rows
		0.057 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 3	361.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Device 3	358.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	358.80'	**18.0" Round Culvert** L= 15.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 358.80' / 358.65' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=12.09 cfs @ 12.13 hrs HW=361.83' TW=358.80' (Dynamic Tailwater)
└**3=Culvert** (Passes 12.09 cfs of 12.84 cfs potential flow)
  └**1=Sharp-Crested Rectangular Weir** (Weir Controls 11.91 cfs @ 2.98 fps)
  └**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.26 fps)

Pond 14P: CULTEC CHAMBER SYSTEM #2 - 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 5 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

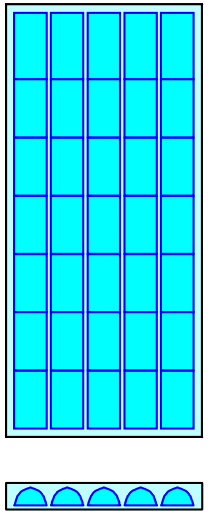
7 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 50.00' Row Length +12.0" End Stone x 2 = 52.00' Base Length
5 Rows x 47.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 23.58' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

35 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 5 Rows = 1,517.9 cf Chamber Storage

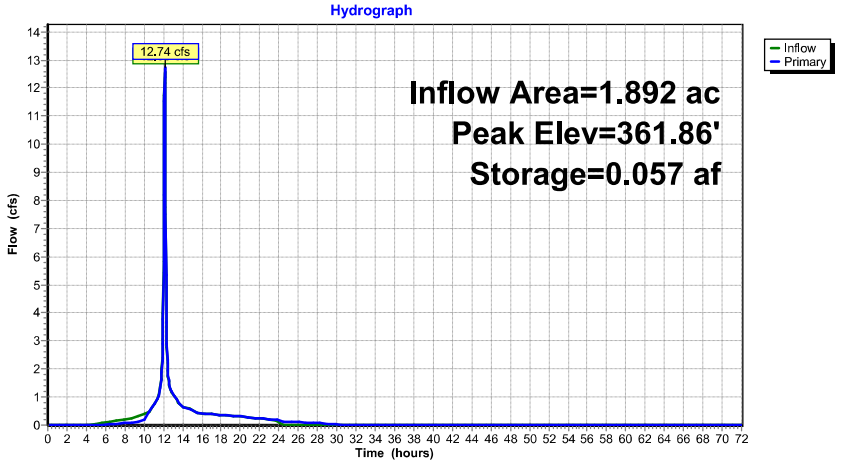
3,934.5 cf Field - 1,517.9 cf Chambers = 2,416.5 cf Stone x 40.0% Voids = 966.6 cf Stone Storage

Chamber Storage + Stone Storage = 2,484.6 cf = 0.057 af
Overall Storage Efficiency = 63.1%
Overall System Size = 52.00' x 23.58' x 3.21'

35 Chambers
145.7 cy Field
89.5 cy Stone



Pond 14P: CULTEC CHAMBER SYSTEM #2



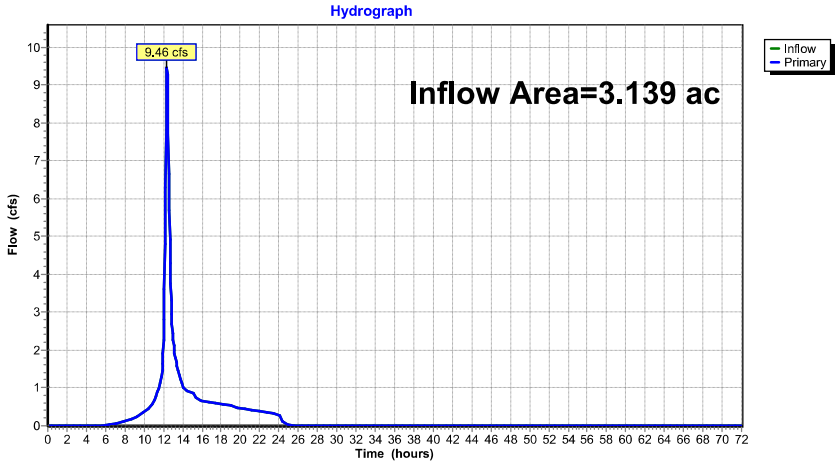
Summary for Pond AP-1: AP-1

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

Inflow Area = 3.139 ac, 0.00% Impervious, Inflow Depth = 4.63" for 100-Year event
Inflow = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af
Primary = 9.46 cfs @ 12.36 hrs, Volume= 1.211 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-1: AP-1



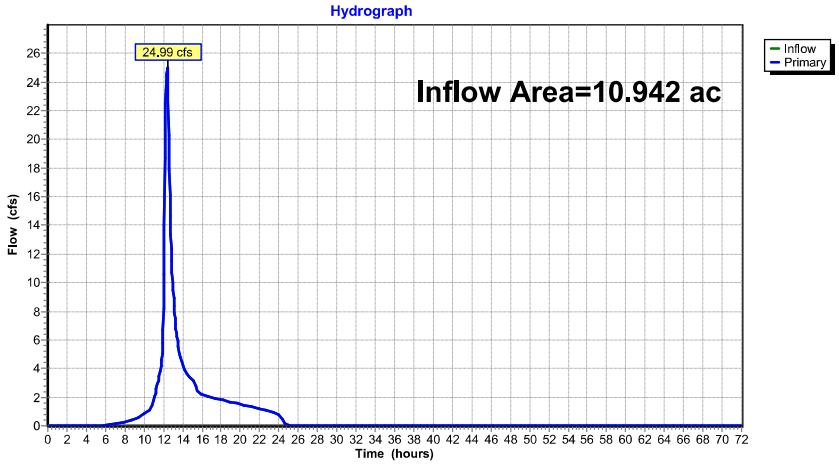
Summary for Pond AP-2: AP-2

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

Inflow Area = 10.942 ac, 12.47% Impervious, Inflow Depth = 4.35" for 100-Year event
Inflow = 24.99 cfs @ 12.40 hrs, Volume= 3.969 af
Primary = 24.99 cfs @ 12.40 hrs, Volume= 3.969 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-2: AP-2



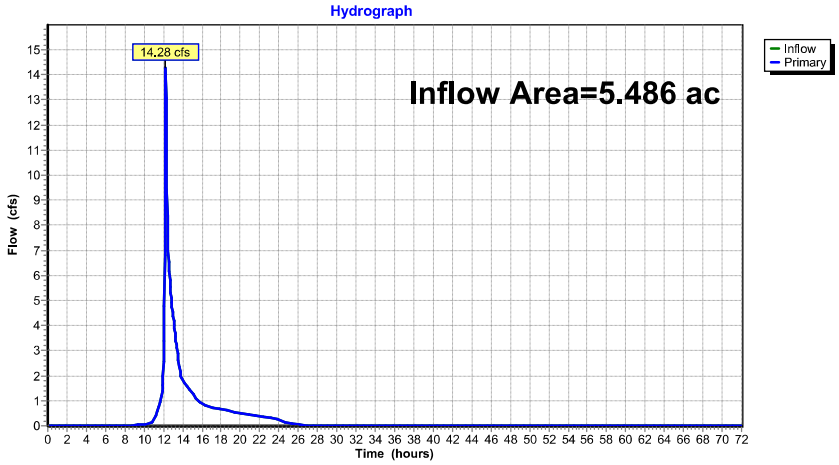
Summary for Pond AP-3: AP-3

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

Inflow Area = 5.486 ac, 39.18% Impervious, Inflow Depth = 3.20" for 100-Year event
Inflow = 14.28 cfs @ 12.22 hrs, Volume= 1.462 af
Primary = 14.28 cfs @ 12.22 hrs, Volume= 1.462 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond AP-3: AP-3



Events for Subcatchment PR-1: To Basin #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	3.27	0.344	1.35
10-Year	5.25	6.99	0.723	2.83
25-Year	6.41	9.45	0.979	3.84
100-Year	**8.19**	**13.30**	**1.390**	**5.45**

Events for Subcatchment PR-10: WESTERN WETLANDS AND OFFSITE

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	2.99	0.437	1.11
10-Year	5.25	7.05	0.978	2.48
25-Year	6.41	9.82	1.354	3.43
100-Year	**8.19**	**14.23**	**1.965**	**4.98**

Events for Subcatchment PR-2: To Basin #2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	2.01	0.191	1.69
10-Year	5.25	3.93	0.373	3.30
25-Year	6.41	5.14	0.493	4.37
100-Year	**8.19**	**7.02**	**0.682**	**6.04**

Events for Subcatchment PR-3: To Infiltration Basin #3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	3.37	0.234	1.48
10-Year	5.25	6.84	0.476	3.02
25-Year	6.41	9.09	0.638	4.05
100-Year	**8.19**	**12.59**	**0.896**	**5.69**

Events for Subcatchment PR-4: To Detention Basin #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.15	0.087	2.83
10-Year	5.25	1.84	0.143	4.67
25-Year	6.41	2.27	0.178	5.82
100-Year	**8.19**	**2.92**	**0.232**	**7.59**

Events for Subcatchment PR-5: To Detention Basin #2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.18	0.083	2.17
10-Year	5.25	2.06	0.149	3.91
25-Year	6.41	2.60	0.191	5.02
100-Year	**8.19**	**3.44**	**0.257**	**6.75**

Events for Subcatchment PR-6: ROOF SOUTH

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	0.94	0.075	3.16
10-Year	5.25	1.47	0.120	5.01
25-Year	6.41	1.80	0.147	6.17
100-Year	**8.19**	**2.30**	**0.190**	**7.95**

Events for Subcatchment PR-7: UNCAPTURED TO AP#3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	0.29	0.039	0.41
10-Year	5.25	1.46	0.123	1.31
25-Year	6.41	2.38	0.190	2.02
100-Year	**8.19**	**3.96**	**0.305**	**3.25**

Events for Subcatchment PR-8: UNCAPTURED TO AP-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.15	0.137	0.52
10-Year	5.25	4.42	0.399	1.52
25-Year	6.41	6.88	0.599	2.28
100-Year	**8.19**	**11.04**	**0.941**	**3.59**

Events for Subcatchment PR-9: UNCAPTURED TO AP-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.39	1.74	0.246	0.94
10-Year	5.25	4.47	0.582	2.22
25-Year	6.41	6.38	0.820	3.13
100-Year	**8.19**	**9.46**	**1.211**	**4.63**

Events for Pond 1P: AP-4

Event	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	**0.00**	**0.00**	**0.000**
10-Year	0.00	0.00	0.000
25-Year	0.00	0.00	0.000
100-Year	0.00	0.00	0.000

Events for Pond 4P: Infiltration Basin #2

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	1.60	0.48	0.13	0.35	358.37	4,204
10-Year	4.04	1.94	0.15	1.79	358.72	5,532
25-Year	6.42	3.07	0.18	2.89	359.10	7,124
100-Year	**8.19**	**4.24**	**0.22**	**4.02**	**359.70**	**9,891**

Events for Pond 6P: Infiltration Basin #3

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	3.82	0.15	0.15	0.00	357.15	4,796
10-Year	8.58	0.25	0.25	0.00	358.63	12,568
25-Year	10.83	0.96	0.27	0.69	358.96	14,552
100-Year	**15.04**	**7.71**	**0.29**	**7.42**	**359.17**	**15,910**

Events for Pond 7P: Detention Basin #1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	1.15	0.95	361.90	900
10-Year	1.84	1.82	361.96	945
25-Year	2.27	2.24	361.99	965
100-Year	**2.92**	**2.89**	**362.03**	**993**

Events for Pond 8P: Detention Basin #2

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	1.18	0.07	360.51	1,728
10-Year	2.06	0.09	361.51	3,371
25-Year	2.60	0.10	362.08	4,518
100-Year	**3.44**	**0.80**	**362.29**	**4,963**

Events for Pond 10P: Infiltration Basin #1

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	3.27	0.72	0.16	0.56	324.20	4,826
10-Year	6.99	2.58	0.21	2.37	325.61	9,464
25-Year	9.45	4.34	0.23	4.11	326.27	12,072
100-Year	**13.30**	**7.43**	**0.27**	**7.16**	**327.06**	**15,641**

Events for Pond 12P: CULTEC CHAMBER SYSTEM #1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	2.01	0.87	360.70	2,095
10-Year	3.93	3.44	361.57	3,219
25-Year	5.14	5.42	361.71	3,343
100-Year	**7.02**	**6.34**	**362.08**	**3,620**

Events for Pond 14P: CULTEC CHAMBER SYSTEM #2

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	3.37	2.88	361.31	0.055
10-Year	6.84	7.12	361.57	**0.057**
25-Year	9.09	9.03	361.68	0.057
100-Year	**12.59**	**12.74**	**361.86**	0.057

Events for Pond AP-1: AP-1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	1.74	1.74	**0.00**	**0.000**
10-Year	4.47	4.47	0.00	0.000
25-Year	6.38	6.38	0.00	0.000
100-Year	**9.46**	**9.46**	0.00	0.000

Events for Pond AP-2: AP-2

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	3.59	3.59	**0.00**	**0.000**
10-Year	10.89	10.89	0.00	0.000
25-Year	16.52	16.52	0.00	0.000
100-Year	**24.99**	**24.99**	0.00	0.000

Events for Pond AP-3: AP-3

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-Year	0.40	0.40	**0.00**	**0.000**
10-Year	2.14	2.14	0.00	0.000
25-Year	3.84	3.84	0.00	0.000
100-Year	**14.28**	**14.28**	0.00	0.000

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Prepared by Guerriere & Halnon Inc Printed 3/13/2024
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Pipe Sizing Calculations

Land Use Coefficients "C"

Pave	0.90
Gravel	0.80
Wetland	0.72
Grass	0.30
Woods	0.25
Roof	0.90

Drainage Area	Land Use Area Impervious (acres)	Gravel (acres)	Wetland (acres)	Pervious (acres)	Woods (acres)	Roof (acres)	Total (acres)	Weighted "C"
CB-A	0.080			0.039	0.000	0.000	0.119	0.70
CB-B	0.053			0.057	0.000	0.000	0.110	0.59
CB-C	0.096			0.069	0.575	0.000	0.741	0.34
CB-D	0.064			0.044	0.000	0.000	0.108	0.66
CB-E	0.305			0.374	0.175	0.000	0.854	0.50
CB-F	0.071			0.137	0.000	0.000	0.209	0.51
CB-G	0.080			0.166	0.095	0.000	0.341	0.43
CB-H	0.058			0.031	0.000	0.000	0.089	0.69
CB-I	0.057			0.000	0.000	0.000	0.057	0.90
CB-J	0.043			0.012	0.000	0.000	0.055	0.77
HW-2	0.202			0.260	0.776	0.000	1.238	0.37
HW-3	0.000			0.045	3.360	0.000	3.404	0.25
CB-1	0.238			0.342	0.155	0.000	0.735	0.48
CB-2	0.031			0.105	0.003	0.000	0.139	0.43
CB-3	0.080			0.032	0.000	0.000	0.112	0.73
CB-6	0.227			0.320	0.040	0.000	0.587	0.53
CB-7	0.188			0.380	0.152	0.000	0.720	0.45
CB-8	0.065			0.064	0.000	0.000	0.129	0.60
CB-9	0.065			0.039	0.008	0.000	0.112	0.64
ROOF NORTH	0.000			0.000	0.000	0.294	0.294	0.90
ROOF SOUTH	0.000			0.000	0.000	0.287	0.287	0.90
SUBTOTAL	2.003			2.517		0.581	10.439	
OVERALL TOTALS	2.003			2.517		0.581	10.439	

Guerriere & Halnon, Inc.
55 West Central Steet
Franklin, MA 01757-0235

Project: Veterans Memorial Drive Extension Subdivision
Job No.: 4598

DESIGN COMPUTATIONS FOR STORM DRAINS

Prepared By: MAH Date: 3/15/2024 Revised:
Checked By: Date: Revised:

Drainage Area	Upper Structure	Lower Structure	Sum of CA's (sf)	Time of Concentration (Tc) (min)	Rainfall Intensity (I) (in/hr)	Actual Peak Flow Rate (Q) (cfs)	Pipe Diameter (in)	Slope (ft/ft)	Roughness Coefficient (n)	Design Flow Full (Q) (cfs)	Velocity Flow Full (V) (fps)	Actual Velocity (V) (fps)	Length of Pipe (L)* (ft)	Time in pipe (min)	Total Fall (ft)	Invert Elevation Elev. Upper End	Invert Elevation Elev. Lower End	Rim Elev Elev. Upper End	Rim Elev Elev. Lower End	Destination
CB-A	CB-A	DMH-A	0.11	6.00	5.80	0.66	12	0.007	0.013	2.90	3.69	0.84	15.1	0.07	0.10	368.30	368.20	371.42	371.97	
CB-B	CB-B	DMH-A	0.06	6.00	5.80	0.38	12	0.007	0.013	2.93	3.73	0.48	14.8	0.07	0.10	368.30	368.20	371.43	371.97	
	DMH-A	DMH-B	0.18	6.07	5.80	1.04	12	0.005	0.013	2.52	3.21	1.32	116.1	0.60	0.58	368.10	367.52	371.97	374.13	
	DMH-B	DMH-C	0.18	6.67	5.69	1.02	12	0.005	0.013	2.52	3.21	1.30	199.8	1.04	1.00	367.42	366.42	374.13	373.74	
	DMH-C	DMH-D	0.18	7.71	5.49	0.98	12	0.037	0.013	6.86	8.73	1.25	74.8	0.14	2.77	366.32	363.55	373.74	371.89	
	DMH-D	DMH-E	0.18	7.85	5.49	0.98	12	0.033	0.013	6.43	8.19	1.25	84.7	0.17	2.76	363.55	360.79	371.89	366.99	
CB-C	CB-C	DMH-E	0.25	6.00	5.80	1.46	12	0.005	0.013	2.43	3.10	1.85	15.0	0.08	0.07	360.76	360.69	367.39	366.99	
CB-D	CB-D	DMH-E	0.07	6.00	5.80	0.41	12	0.005	0.013	2.46	3.13	0.53	14.7	0.08	0.07	360.76	360.69	367.39	366.99	
	DMH-E	DMH-F	0.50	8.02	5.39	2.70	12	0.075	0.013	9.76	12.42	3.44	189.0	0.25	14.17	360.59	346.42	366.99	352.74	Infiltration Basin #1
	DMH-F	DMH-G	0.50	8.28	5.39	2.70	12	0.075	0.013	9.75	12.42	3.44	58.6	0.08	4.39	346.32	341.93	352.74	348.34	
CB-E	CB-E	DMH-G	0.43	6.00	5.80	2.50	12	0.005	0.013	2.53	3.22	3.18	13.9	0.07	0.07	342.00	341.93	348.64	348.34	
CB-F	CB-F	DMH-G	0.11	6.00	5.80	0.61	12	0.005	0.013	2.51	3.20	0.78	14.1	0.07	0.07	342.00	341.93	348.64	348.34	
	DMH-G	DMH-H	1.04	8.36	5.39	5.59	18	0.080	0.013	29.70	16.81	3.16	115.9	0.11	9.27	341.43	332.16	348.34	339.61	
	DMH-H	DMH-I	1.04	8.47	5.39	5.59	18	0.065	0.013	26.77	15.15	3.16	85.0	0.09	5.52	332.06	326.54	339.61	333.49	
CB-G	CB-G	DMH-I	0.15	6.00	5.80	0.84	12	0.005	0.013	2.44	3.11	1.07	14.9	0.08	0.07	327.11	327.04	339.79	333.49	
CB-H	CB-H	DMH-I	0.06	6.00	5.80	0.36	12	0.005	0.013	2.44	3.11	0.45	14.9	0.08	0.07	327.11	327.04	333.79	333.49	
	DMH-I	FES-1	1.24	8.57	5.29	6.57	18	0.006	0.013	7.89	4.47	3.72	77.9	0.29	0.44	326.44	326.00	333.49	0.00	
CB-I	CB-I	DMH-J	0.05	6.00	5.80	0.30	12	0.005	0.013	2.46	3.13	0.38	18.9	0.10	0.09	324.59	324.50	327.17	327.59	
CB-J	CB-J	DMH-J	0.04	6.00	5.80	0.25	12	0.005	0.013	2.58	3.28	0.31	9.6	0.05	0.05	324.55	324.50	327.19	327.59	Infiltration Basin #1
	DMH-J	FES-2	0.09	6.05	5.80	0.54	12	0.005	0.013	2.52	3.20	0.69	80.2	0.42	0.40	324.40	324.00	327.59	0.00	
HW2	HW-2	DMH-K	0.45	6.00	5.80	2.63	15	0.005	0.013	4.51	3.67	2.14	84.3	0.38	0.41	359.64	359.23	362.50	364.20	
HW3	HW-3	DMH-L	0.85	6.00	5.80	4.95	18	0.005	0.013	7.35	4.16	2.80	14.3	0.06	0.07	358.72	358.65	362.10	362.15	
	DMH-K	DMH-L	0.45	6.38	5.80	2.63	12	0.005	0.013	2.54	3.24	3.35	9.8	0.05	0.05	358.70	358.65	362.10	361.60	Headwall #4
	DMH-L	HW-4	1.31	6.43	5.80	7.58	24	0.005	0.013	15.96	5.08	2.41	116.5	0.38	0.58	359.13	358.55	364.20	362.15	
CB-1	CB-1	DMH-1	0.36	6.00	5.80	2.06	12	0.005	0.013	2.53	3.23	2.62	73.2	0.38	0.37	359.97	359.60	363.05	364.10	
	DMH-1	DMH-10	0.36	6.38	5.80	2.06	12	0.000	0.013			2.62	48.0		0.00	359.97	359.97	361.10	363.50	
CB-2	CB-2	DMH-2	0.06	6.00	5.80	0.35	12	0.005	0.013	2.53	3.22	0.44	39.6	0.20	0.20	359.80	359.60	362.20	363.10	
CB-3	CB-3	DMH-2	0.08	6.00	5.80	0.47	12	0.005	0.013	2.57	3.27	0.60	34.7	0.18	0.18	359.78	359.60	362.20	363.10	Infiltration Basin #2
	DMH-10	DMH-3	0.50	6.38	5.80	2.88	15	0.005	0.013	4.58	3.74	2.35	131.1	0.58	0.66	359.60	358.94	363.50	363.00	
	DMH-3	DMH-4	0.50	6.96	5.69	2.83	15	0.005	0.013	4.53	3.69	2.31	36.6	0.16	0.18	358.93	358.75	363.00	362.00	
	DMH-4	BASIN 2	0.50	7.13	5.59	2.78	15	0.005	0.013	4.55	3.71	2.27	62.4	0.28	0.31	358.75	358.44	362.00		
CB-6	CB-6	DMH-5	0.31	6.00	5.80	1.80	12	0.005	0.013	2.55	3.25	2.29	44.9	0.23	0.23	359.78	359.55	363.05	364.20	
	DMH-5	DMH-6	0.31	6.23	5.80	1.80	12	0.005	0.013	2.53	3.22	2.29	59.5	0.31	0.30	359.55	359.25	364.20	362.75	
CB-7	CB-7	DMH-6	0.32	6.00	5.80	1.86	12	0.005	0.013	2.62	3.33	2.37	20.4	0.10	0.11	359.36	359.25	362.40	362.75	Infiltration Basin #3
	DMH-6	DMH-8	0.63	6.54	5.69	3.60	15	0.005	0.013	4.63	3.78	2.93	68.0	0.30	0.35	359.25	358.90	362.75	363.40	
CB-8	CB-8	DMH-9	0.08	6.00	5.80	0.45	12	0.005	0.013	2.61	3.32	0.57	28.0	0.14	0.15	358.95	358.80	362.70	362.50	
	DMH-7	BASIN 3	0.71	6.84	5.69	4.04	15	0.005	0.013	4.35	3.54	3.29	33.2	0.16	0.15	358.80	358.65	362.75		
CB-9	CB-9	BASIN 2	0.07	6.00	5.80	0.42	12	0.005	0.013	2.51	3.20	0.53	114.4	0.60	0.57	359.32	358.75	363.00		
	NORTH ROOF		0.26	6.00	5.80	1.53	12	0.005	0.013	2.59	3.30	1.95	28.3	0.14	0.15	361.15	361.00			Infiltration Basin #2
	SOUTH ROOF	DMH-11	0.26	6.00	5.80	1.50	12	0.005	0.013	2.41	3.07	1.91	54.6	0.30	0.25	359.10	358.85			Infiltration Basin #3
	DMH-11	BASIN 2	0.26	6.00	5.80	1.50	12	0.005	0.013	2.40	3.05	1.91	44.2	0.24	0.20	358.85	358.65			

Basin Drawdown Tabulation

Hydrograph for Pond 7P: Detention Basin #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	360.00	0.00
1.00	0.00	0	360.00	0.00
2.00	0.02	18	360.09	0.01
3.00	0.03	45	360.20	0.02
4.00	0.04	83	360.34	0.03
5.00	0.05	132	360.49	0.04
6.00	0.06	192	360.66	0.05
7.00	0.07	262	360.83	0.05
8.00	0.08	343	361.00	0.06
9.00	0.09	434	361.18	0.06
10.00	0.13	620	361.50	0.07
11.00	0.21	845	361.83	0.21
12.00	**1.43**	**918**	**361.93**	**1.28**
13.00	**0.24**	**848**	**361.83**	**0.24**
14.00	0.14	836	361.82	0.14
15.00	0.12	834	361.81	0.12
16.00	0.09	828	361.81	0.09
17.00	0.08	826	361.80	0.08
18.00	0.08	824	361.80	0.08
19.00	0.07	808	361.78	0.08
20.00	0.06	771	361.73	0.08
21.00	0.06	716	361.65	0.07
22.00	0.05	646	361.54	0.07
23.00	0.04	562	361.40	0.07
24.00	0.04	468	361.24	0.06
25.00	0.00	269	360.84	0.05
26.00	0.00	109	360.42	0.04
27.00	0.00	22	360.10	0.01
28.00	0.00	6	360.03	0.00
29.00	0.00	3	360.02	0.00
30.00	0.00	2	360.01	0.00
31.00	0.00	2	360.01	0.00
32.00	0.00	1	360.01	0.00
33.00	0.00	1	360.01	0.00
34.00	0.00	1	360.00	0.00
35.00	0.00	1	360.00	0.00
36.00	0.00	1	360.00	0.00
37.00	0.00	1	360.00	0.00
38.00	0.00	1	360.00	0.00
39.00	0.00	1	360.00	0.00
40.00	0.00	1	360.00	0.00
41.00	0.00	0	360.00	0.00
42.00	0.00	0	360.00	0.00
43.00	0.00	0	360.00	0.00
44.00	0.00	0	360.00	0.00
45.00	0.00	0	360.00	0.00
46.00	0.00	0	360.00	0.00
47.00	0.00	0	360.00	0.00
48.00	0.00	0	360.00	0.00
49.00	0.00	0	360.00	0.00
50.00	0.00	0	360.00	0.00
51.00	0.00	0	360.00	0.00

Hydrograph for Pond 7P: Detention Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	0	360.00	0.00
53.00	0.00	0	360.00	0.00
54.00	0.00	0	360.00	0.00
55.00	0.00	0	360.00	0.00
56.00	0.00	0	360.00	0.00
57.00	0.00	0	360.00	0.00
58.00	0.00	0	360.00	0.00
59.00	0.00	0	360.00	0.00
60.00	0.00	0	360.00	0.00
61.00	0.00	0	360.00	0.00
62.00	0.00	0	360.00	0.00
63.00	0.00	0	360.00	0.00
64.00	0.00	0	360.00	0.00
65.00	0.00	0	360.00	0.00
66.00	0.00	0	360.00	0.00
67.00	0.00	0	360.00	0.00
68.00	0.00	0	360.00	0.00
69.00	0.00	0	360.00	0.00
70.00	0.00	0	360.00	0.00
71.00	0.00	0	360.00	0.00
72.00	0.00	0	360.00	0.00

Hydrograph for Pond 8P: Detention Basin #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	359.00	0.00
1.00	0.00	0	359.00	0.00
2.00	0.00	0	359.00	0.00
3.00	0.01	9	359.01	0.00
4.00	0.02	64	359.07	0.00
5.00	0.04	168	359.19	0.00
6.00	0.05	279	359.30	0.02
7.00	0.06	393	359.42	0.03
8.00	0.08	527	359.55	0.04
9.00	0.09	683	359.69	0.04
10.00	0.13	950	359.92	0.05
11.00	0.23	1,350	360.24	0.06
12.00	**1.65**	**2,712**	**361.14**	**0.08**
13.00	**0.29**	**4,851**	**362.24**	**0.30**
14.00	0.16	4,806	362.22	0.17
15.00	0.15	4,799	362.22	0.15
16.00	0.11	4,776	362.20	0.11
17.00	0.10	4,769	362.20	0.10
18.00	0.09	4,749	362.19	0.10
19.00	0.09	4,702	362.17	0.10
20.00	0.08	4,628	362.14	0.10
21.00	0.07	4,527	362.09	0.10
22.00	0.06	4,401	362.03	0.10
23.00	0.05	4,250	361.96	0.10
24.00	0.04	4,075	361.87	0.10
25.00	0.00	3,746	361.71	0.09
26.00	0.00	3,414	361.53	0.09
27.00	0.00	3,094	361.36	0.09
28.00	0.00	2,787	361.18	0.08
29.00	0.00	2,492	361.01	0.08
30.00	0.00	2,212	360.83	0.08
31.00	0.00	1,945	360.66	0.07
32.00	0.00	1,694	360.49	0.07
33.00	0.00	1,459	360.32	0.06
34.00	0.00	1,240	360.16	0.06
35.00	0.00	1,039	359.99	0.05
36.00	0.00	856	359.84	0.05
37.00	0.00	693	359.70	0.04
38.00	0.00	550	359.57	0.04
39.00	0.00	429	359.45	0.03
40.00	0.00	329	359.35	0.02
41.00	0.00	252	359.27	0.02
42.00	0.00	205	359.23	0.01
43.00	0.00	190	359.21	0.00
44.00	0.00	183	359.20	0.00
45.00	0.00	179	359.20	0.00
46.00	0.00	176	359.19	0.00
47.00	0.00	175	359.19	0.00
48.00	0.00	173	359.19	0.00
49.00	0.00	172	359.19	0.00
50.00	0.00	171	359.19	0.00
51.00	0.00	171	359.19	0.00

Hydrograph for Pond 8P: Detention Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	170	359.19	0.00
53.00	0.00	169	359.19	0.00
54.00	0.00	169	359.19	0.00
55.00	0.00	169	359.19	0.00
56.00	0.00	168	359.19	0.00
57.00	0.00	168	359.19	0.00
58.00	0.00	168	359.19	0.00
59.00	0.00	168	359.19	0.00
60.00	0.00	167	359.18	0.00
61.00	0.00	167	359.18	0.00
62.00	0.00	167	359.18	0.00
63.00	0.00	167	359.18	0.00
64.00	0.00	167	359.18	0.00
65.00	0.00	166	359.18	0.00
66.00	0.00	166	359.18	0.00
67.00	0.00	166	359.18	0.00
68.00	0.00	166	359.18	0.00
69.00	0.00	166	359.18	0.00
70.00	0.00	166	359.18	0.00
71.00	0.00	166	359.18	0.00
72.00	0.00	166	359.18	0.00

Hydrograph for Pond 10P: Infiltration Basin #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	322.00	0.00	0.00	0.00
1.00	0.00	0	322.00	0.00	0.00	0.00
2.00	0.00	0	322.00	0.00	0.00	0.00
3.00	0.00	0	322.00	0.00	0.00	0.00
4.00	0.00	0	322.00	0.00	0.00	0.00
5.00	0.03	4	322.00	0.02	0.02	0.00
6.00	0.10	17	322.01	0.09	0.09	0.00
7.00	0.17	170	322.10	0.09	0.09	0.00
8.00	0.25	585	322.34	0.10	0.10	0.00
9.00	0.33	1,260	322.70	0.11	0.11	0.00
10.00	0.56	2,501	323.28	0.13	0.13	0.00
11.00	0.98	4,369	324.03	0.40	0.15	0.25
12.00	**3.94**	**6,690**	**324.81**	**1.62**	**0.18**	**1.44**
13.00	**1.95**	**11,745**	**326.20**	**4.17**	**0.23**	**3.94**
14.00	1.03	7,603	325.09	1.88	0.19	1.69
15.00	0.93	5,642	324.48	1.22	0.17	1.05
16.00	0.68	4,882	324.22	0.76	0.16	0.60
17.00	0.64	4,742	324.17	0.66	0.16	0.50
18.00	0.59	4,673	324.14	0.61	0.15	0.45
19.00	0.54	4,607	324.12	0.56	0.15	0.41
20.00	0.49	4,538	324.09	0.51	0.15	0.36
21.00	0.44	4,467	324.07	0.46	0.15	0.31
22.00	0.39	4,392	324.04	0.41	0.15	0.26
23.00	0.34	4,312	324.01	0.37	0.15	0.22
24.00	0.29	4,226	323.98	0.32	0.15	0.17
25.00	0.00	3,697	323.77	0.14	0.14	0.00
26.00	0.00	3,193	323.57	0.14	0.14	0.00
27.00	0.00	2,711	323.37	0.13	0.13	0.00
28.00	0.00	2,251	323.17	0.12	0.12	0.00
29.00	0.00	1,813	322.97	0.12	0.12	0.00
30.00	0.00	1,396	322.77	0.11	0.11	0.00
31.00	0.00	1,001	322.57	0.11	0.11	0.00
32.00	0.00	628	322.37	0.10	0.10	0.00
33.00	0.00	276	322.17	0.09	0.09	0.00
34.00	0.00	0	322.00	0.00	0.00	0.00
35.00	0.00	0	322.00	0.00	0.00	0.00
36.00	0.00	0	322.00	0.00	0.00	0.00
37.00	0.00	0	322.00	0.00	0.00	0.00
38.00	0.00	0	322.00	0.00	0.00	0.00
39.00	0.00	0	322.00	0.00	0.00	0.00
40.00	0.00	0	322.00	0.00	0.00	0.00
41.00	0.00	0	322.00	0.00	0.00	0.00
42.00	0.00	0	322.00	0.00	0.00	0.00
43.00	0.00	0	322.00	0.00	0.00	0.00
44.00	0.00	0	322.00	0.00	0.00	0.00
45.00	0.00	0	322.00	0.00	0.00	0.00
46.00	0.00	0	322.00	0.00	0.00	0.00
47.00	0.00	0	322.00	0.00	0.00	0.00
48.00	0.00	0	322.00	0.00	0.00	0.00
49.00	0.00	0	322.00	0.00	0.00	0.00
50.00	0.00	0	322.00	0.00	0.00	0.00
51.00	0.00	0	322.00	0.00	0.00	0.00

Hydrograph for Pond 10P: Infiltration Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
52.00	0.00	0	322.00	0.00	0.00	0.00
53.00	0.00	0	322.00	0.00	0.00	0.00
54.00	0.00	0	322.00	0.00	0.00	0.00
55.00	0.00	0	322.00	0.00	0.00	0.00
56.00	0.00	0	322.00	0.00	0.00	0.00
57.00	0.00	0	322.00	0.00	0.00	0.00
58.00	0.00	0	322.00	0.00	0.00	0.00
59.00	0.00	0	322.00	0.00	0.00	0.00
60.00	0.00	0	322.00	0.00	0.00	0.00
61.00	0.00	0	322.00	0.00	0.00	0.00
62.00	0.00	0	322.00	0.00	0.00	0.00
63.00	0.00	0	322.00	0.00	0.00	0.00
64.00	0.00	0	322.00	0.00	0.00	0.00
65.00	0.00	0	322.00	0.00	0.00	0.00
66.00	0.00	0	322.00	0.00	0.00	0.00
67.00	0.00	0	322.00	0.00	0.00	0.00
68.00	0.00	0	322.00	0.00	0.00	0.00
69.00	0.00	0	322.00	0.00	0.00	0.00
70.00	0.00	0	322.00	0.00	0.00	0.00
71.00	0.00	0	322.00	0.00	0.00	0.00
72.00	0.00	0	322.00	0.00	0.00	0.00

Hydrograph for Pond 4P: Infiltration Basin #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	357.00	0.00	0.00	0.00
1.00	0.00	0	357.00	0.00	0.00	0.00
2.00	0.01	3	357.00	0.01	0.01	0.00
3.00	0.02	9	357.00	0.02	0.02	0.00
4.00	0.03	13	357.01	0.03	0.03	0.00
5.00	0.04	16	357.01	0.04	0.04	0.00
6.00	0.07	30	357.01	0.06	0.06	0.00
7.00	0.15	168	357.07	0.06	0.06	0.00
8.00	0.23	634	357.25	0.07	0.07	0.00
9.00	0.29	1,295	357.48	0.08	0.08	0.00
10.00	0.41	2,213	357.79	0.10	0.10	0.00
11.00	0.70	3,553	358.19	0.12	0.12	0.00
12.00	**2.27**	**5,042**	**358.60**	**1.34**	**0.15**	**1.20**
13.00	**1.65**	**6,990**	**359.07**	**3.00**	**0.18**	**2.82**
14.00	1.06	4,940	358.57	1.22	0.14	1.08
15.00	0.78	4,582	358.48	0.83	0.14	0.70
16.00	0.54	4,324	358.41	0.59	0.13	0.45
17.00	0.49	4,229	358.38	0.50	0.13	0.37
18.00	0.46	4,187	358.37	0.47	0.13	0.34
19.00	0.43	4,157	358.36	0.44	0.13	0.31
20.00	0.41	4,127	358.35	0.42	0.13	0.29
21.00	0.39	4,095	358.34	0.39	0.13	0.26
22.00	0.36	4,061	358.33	0.37	0.13	0.24
23.00	0.33	4,025	358.32	0.34	0.13	0.21
24.00	0.30	3,986	358.31	0.31	0.13	0.19
25.00	0.18	3,845	358.27	0.23	0.13	0.10
26.00	0.14	3,723	358.24	0.16	0.12	0.04
27.00	0.10	3,632	358.22	0.13	0.12	0.01
28.00	0.09	3,525	358.18	0.12	0.12	0.00
29.00	0.08	3,400	358.15	0.12	0.12	0.00
30.00	0.08	3,265	358.11	0.12	0.12	0.00
31.00	0.07	3,121	358.07	0.11	0.11	0.00
32.00	0.07	2,970	358.02	0.11	0.11	0.00
33.00	0.06	2,812	357.98	0.11	0.11	0.00
34.00	0.06	2,647	357.92	0.11	0.11	0.00
35.00	0.05	2,474	357.87	0.10	0.10	0.00
36.00	0.05	2,293	357.81	0.10	0.10	0.00
37.00	0.04	2,103	357.75	0.10	0.10	0.00
38.00	0.04	1,905	357.69	0.09	0.09	0.00
39.00	0.03	1,699	357.62	0.09	0.09	0.00
40.00	0.02	1,483	357.55	0.09	0.09	0.00
41.00	0.02	1,259	357.47	0.08	0.08	0.00
42.00	0.01	1,021	357.39	0.08	0.08	0.00
43.00	0.00	766	357.30	0.07	0.07	0.00
44.00	0.00	520	357.20	0.07	0.07	0.00
45.00	0.00	287	357.11	0.06	0.06	0.00
46.00	0.00	69	357.03	0.06	0.06	0.00
47.00	0.00	0	357.00	0.00	0.00	0.00
48.00	0.00	0	357.00	0.00	0.00	0.00
49.00	0.00	0	357.00	0.00	0.00	0.00
50.00	0.00	0	357.00	0.00	0.00	0.00
51.00	0.00	0	357.00	0.00	0.00	0.00

Hydrograph for Pond 4P: Infiltration Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
52.00	0.00	0	357.00	0.00	0.00	0.00
53.00	0.00	0	357.00	0.00	0.00	0.00
54.00	0.00	0	357.00	0.00	0.00	0.00
55.00	0.00	0	357.00	0.00	0.00	0.00
56.00	0.00	0	357.00	0.00	0.00	0.00
57.00	0.00	0	357.00	0.00	0.00	0.00
58.00	0.00	0	357.00	0.00	0.00	0.00
59.00	0.00	0	357.00	0.00	0.00	0.00
60.00	0.00	0	357.00	0.00	0.00	0.00
61.00	0.00	0	357.00	0.00	0.00	0.00
62.00	0.00	0	357.00	0.00	0.00	0.00
63.00	0.00	0	357.00	0.00	0.00	0.00
64.00	0.00	0	357.00	0.00	0.00	0.00
65.00	0.00	0	357.00	0.00	0.00	0.00
66.00	0.00	0	357.00	0.00	0.00	0.00
67.00	0.00	0	357.00	0.00	0.00	0.00
68.00	0.00	0	357.00	0.00	0.00	0.00
69.00	0.00	0	357.00	0.00	0.00	0.00
70.00	0.00	0	357.00	0.00	0.00	0.00
71.00	0.00	0	357.00	0.00	0.00	0.00
72.00	0.00	0	357.00	0.00	0.00	0.00

Hydrograph for Pond 6P: Infiltration Basin #3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	356.00	0.00	0.00	0.00
1.00	0.01	4	356.00	0.01	0.01	0.00
2.00	0.03	11	356.00	0.03	0.03	0.00
3.00	0.04	15	356.00	0.04	0.04	0.00
4.00	0.04	18	356.00	0.04	0.04	0.00
5.00	0.05	21	356.01	0.05	0.05	0.00
6.00	0.06	24	356.01	0.06	0.06	0.00
7.00	0.11	65	356.02	0.09	0.09	0.00
8.00	0.15	216	356.06	0.09	0.09	0.00
9.00	0.18	473	356.13	0.09	0.09	0.00
10.00	0.25	922	356.24	0.10	0.10	0.00
11.00	0.91	2,699	356.67	0.13	0.13	0.00
12.00	**6.58**	**8,545**	**357.90**	**0.20**	**0.20**	**0.00**
13.00	**1.30**	**14,673**	**358.98**	**1.35**	**0.28**	**1.08**
14.00	0.74	14,478	358.94	0.75	0.27	0.48
15.00	0.68	14,453	358.94	0.68	0.27	0.41
16.00	0.50	14,373	358.93	0.50	0.27	0.23
17.00	0.46	14,357	358.92	0.47	0.27	0.19
18.00	0.43	14,338	358.92	0.43	0.27	0.16
19.00	0.39	14,319	358.92	0.40	0.27	0.12
20.00	0.35	14,297	358.91	0.36	0.27	0.09
21.00	0.32	14,273	358.91	0.33	0.27	0.05
22.00	0.28	14,243	358.91	0.29	0.27	0.02
23.00	0.24	14,192	358.90	0.27	0.27	0.00
24.00	0.21	14,038	358.87	0.27	0.27	0.00
25.00	0.13	13,602	358.80	0.26	0.26	0.00
26.00	0.11	13,085	358.71	0.26	0.26	0.00
27.00	0.09	12,516	358.62	0.25	0.25	0.00
28.00	0.07	11,901	358.51	0.24	0.24	0.00
29.00	0.05	11,245	358.40	0.24	0.24	0.00
30.00	0.03	10,549	358.27	0.23	0.23	0.00
31.00	0.01	9,819	358.14	0.22	0.22	0.00
32.00	0.01	9,083	358.01	0.21	0.21	0.00
33.00	0.00	8,365	357.87	0.20	0.20	0.00
34.00	0.00	7,673	357.73	0.19	0.19	0.00
35.00	0.00	7,007	357.60	0.18	0.18	0.00
36.00	0.00	6,369	357.47	0.17	0.17	0.00
37.00	0.00	5,758	357.35	0.17	0.17	0.00
38.00	0.00	5,175	357.23	0.16	0.16	0.00
39.00	0.00	4,617	357.11	0.15	0.15	0.00
40.00	0.00	4,085	356.99	0.14	0.14	0.00
41.00	0.00	3,578	356.88	0.14	0.14	0.00
42.00	0.00	3,094	356.77	0.13	0.13	0.00
43.00	0.00	2,634	356.66	0.13	0.13	0.00
44.00	0.00	2,195	356.56	0.12	0.12	0.00
45.00	0.00	1,777	356.45	0.11	0.11	0.00
46.00	0.00	1,380	356.36	0.11	0.11	0.00
47.00	0.00	1,003	356.26	0.10	0.10	0.00
48.00	0.00	644	356.17	0.10	0.10	0.00
49.00	0.00	303	356.08	0.09	0.09	0.00
50.00	0.00	8	356.00	0.02	0.02	0.00
51.00	0.00	0	356.00	0.00	0.00	0.00

Hydrograph for Pond 6P: Infiltration Basin #3 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
52.00	0.00	0	356.00	0.00	0.00	0.00
53.00	0.00	0	356.00	0.00	0.00	0.00
54.00	0.00	0	356.00	0.00	0.00	0.00
55.00	0.00	0	356.00	0.00	0.00	0.00
56.00	0.00	0	356.00	0.00	0.00	0.00
57.00	0.00	0	356.00	0.00	0.00	0.00
58.00	0.00	0	356.00	0.00	0.00	0.00
59.00	0.00	0	356.00	0.00	0.00	0.00
60.00	0.00	0	356.00	0.00	0.00	0.00
61.00	0.00	0	356.00	0.00	0.00	0.00
62.00	0.00	0	356.00	0.00	0.00	0.00
63.00	0.00	0	356.00	0.00	0.00	0.00
64.00	0.00	0	356.00	0.00	0.00	0.00
65.00	0.00	0	356.00	0.00	0.00	0.00
66.00	0.00	0	356.00	0.00	0.00	0.00
67.00	0.00	0	356.00	0.00	0.00	0.00
68.00	0.00	0	356.00	0.00	0.00	0.00
69.00	0.00	0	356.00	0.00	0.00	0.00
70.00	0.00	0	356.00	0.00	0.00	0.00
71.00	0.00	0	356.00	0.00	0.00	0.00
72.00	0.00	0	356.00	0.00	0.00	0.00

Hydrograph for Pond 12P: CULTEC CHAMBER SYSTEM #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	359.10	0.00
1.00	0.00	0	359.10	0.00
2.00	0.00	0	359.10	0.00
3.00	0.00	0	359.10	0.00
4.00	0.01	9	359.11	0.00
5.00	0.05	113	359.25	0.00
6.00	0.08	346	359.57	0.00
7.00	0.12	623	359.75	0.07
8.00	0.16	737	359.83	0.14
9.00	0.20	796	359.86	0.18
10.00	0.31	924	359.94	0.28
11.00	0.54	1,096	360.05	0.42
12.00	**2.33**	**2,184**	**360.76**	**0.90**
13.00	**0.87**	**2,790**	**361.20**	**1.10**
14.00	0.47	1,776	360.49	0.76
15.00	0.43	1,221	360.13	0.50
16.00	0.31	987	359.98	0.34
17.00	0.29	942	359.95	0.30
18.00	0.27	915	359.94	0.28
19.00	0.25	888	359.92	0.26
20.00	0.23	861	359.90	0.23
21.00	0.20	833	359.88	0.21
22.00	0.18	804	359.87	0.19
23.00	0.16	773	359.85	0.16
24.00	0.13	742	359.83	0.14
25.00	0.00	545	359.71	0.03
26.00	0.00	473	359.66	0.01
27.00	0.00	444	359.64	0.01
28.00	0.00	428	359.63	0.00
29.00	0.00	418	359.63	0.00
30.00	0.00	412	359.62	0.00
31.00	0.00	407	359.62	0.00
32.00	0.00	403	359.62	0.00
33.00	0.00	400	359.62	0.00
34.00	0.00	397	359.62	0.00
35.00	0.00	395	359.61	0.00
36.00	0.00	394	359.61	0.00
37.00	0.00	392	359.61	0.00
38.00	0.00	391	359.61	0.00
39.00	0.00	390	359.61	0.00
40.00	0.00	389	359.61	0.00
41.00	0.00	388	359.61	0.00
42.00	0.00	387	359.61	0.00
43.00	0.00	386	359.61	0.00
44.00	0.00	386	359.61	0.00
45.00	0.00	385	359.61	0.00
46.00	0.00	385	359.61	0.00
47.00	0.00	384	359.61	0.00
48.00	0.00	384	359.61	0.00
49.00	0.00	383	359.61	0.00
50.00	0.00	383	359.61	0.00
51.00	0.00	382	359.61	0.00

Hydrograph for Pond 12P: CULTEC CHAMBER SYSTEM #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	382	359.61	0.00
53.00	0.00	382	359.61	0.00
54.00	0.00	381	359.61	0.00
55.00	0.00	381	359.61	0.00
56.00	0.00	381	359.61	0.00
57.00	0.00	381	359.61	0.00
58.00	0.00	380	359.61	0.00
59.00	0.00	380	359.61	0.00
60.00	0.00	380	359.61	0.00
61.00	0.00	380	359.61	0.00
62.00	0.00	380	359.61	0.00
63.00	0.00	379	359.60	0.00
64.00	0.00	379	359.60	0.00
65.00	0.00	379	359.60	0.00
66.00	0.00	379	359.60	0.00
67.00	0.00	379	359.60	0.00
68.00	0.00	379	359.60	0.00
69.00	0.00	378	359.60	0.00
70.00	0.00	378	359.60	0.00
71.00	0.00	378	359.60	0.00
72.00	0.00	378	359.60	0.00

Hydrograph for Pond 14P: CULTEC CHAMBER SYSTEM #2

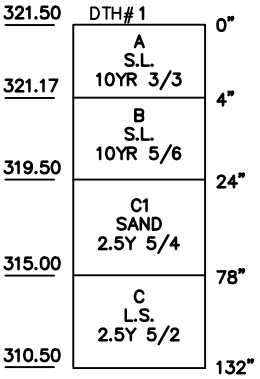
Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	358.30	0.00
1.00	0.00	0.000	358.30	0.00
2.00	0.00	0.000	358.30	0.00
3.00	0.00	0.000	358.30	0.00
4.00	0.00	0.000	358.30	0.00
5.00	0.04	0.002	358.44	0.00
6.00	0.09	0.007	358.85	0.00
7.00	0.14	0.014	359.13	0.05
8.00	0.19	0.022	359.47	0.08
9.00	0.24	0.032	359.91	0.11
10.00	0.40	0.050	360.86	0.15
11.00	0.74	0.053	361.11	0.73
12.00	**5.83**	**0.057**	**361.48**	**5.44**
13.00	**1.11**	**0.053**	**361.15**	**1.12**
14.00	0.63	0.052	361.10	0.63
15.00	0.58	0.052	361.09	0.58
16.00	0.42	0.052	361.07	0.42
17.00	0.39	0.052	361.06	0.40
18.00	0.36	0.052	361.06	0.37
19.00	0.33	0.052	361.05	0.34
20.00	0.30	0.052	361.04	0.30
21.00	0.27	0.052	361.04	0.27
22.00	0.24	0.052	361.03	0.24
23.00	0.21	0.052	361.02	0.21
24.00	0.18	0.051	361.01	0.18
25.00	0.00	0.041	360.36	0.13
26.00	0.00	0.031	359.90	0.11
27.00	0.00	0.024	359.55	0.09
28.00	0.00	0.017	359.28	0.07
29.00	0.00	0.013	359.09	0.05
30.00	0.00	0.009	358.96	0.03
31.00	0.00	0.008	358.89	0.01
32.00	0.00	0.007	358.86	0.01
33.00	0.00	0.007	358.85	0.00
34.00	0.00	0.007	358.84	0.00
35.00	0.00	0.006	358.83	0.00
36.00	0.00	0.006	358.83	0.00
37.00	0.00	0.006	358.82	0.00
38.00	0.00	0.006	358.82	0.00
39.00	0.00	0.006	358.82	0.00
40.00	0.00	0.006	358.82	0.00
41.00	0.00	0.006	358.81	0.00
42.00	0.00	0.006	358.81	0.00
43.00	0.00	0.006	358.81	0.00
44.00	0.00	0.006	358.81	0.00
45.00	0.00	0.006	358.81	0.00
46.00	0.00	0.006	358.81	0.00
47.00	0.00	0.006	358.81	0.00
48.00	0.00	0.006	358.81	0.00
49.00	0.00	0.006	358.81	0.00
50.00	0.00	0.006	358.81	0.00
51.00	0.00	0.006	358.81	0.00

Hydrograph for Pond 14P: CULTEC CHAMBER SYSTEM #2 (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	0.006	358.81	0.00
53.00	0.00	0.006	358.81	0.00
54.00	0.00	0.006	358.81	0.00
55.00	0.00	0.006	358.81	0.00
56.00	0.00	0.006	358.81	0.00
57.00	0.00	0.006	358.81	0.00
58.00	0.00	0.006	358.81	0.00
59.00	0.00	0.006	358.81	0.00
60.00	0.00	0.006	358.81	0.00
61.00	0.00	0.006	358.81	0.00
62.00	0.00	0.006	358.81	0.00
63.00	0.00	0.006	358.80	0.00
64.00	0.00	0.006	358.80	0.00
65.00	0.00	0.006	358.80	0.00
66.00	0.00	0.006	358.80	0.00
67.00	0.00	0.006	358.80	0.00
68.00	0.00	0.006	358.80	0.00
69.00	0.00	0.006	358.80	0.00
70.00	0.00	0.006	358.80	0.00
71.00	0.00	0.006	358.80	0.00
72.00	0.00	0.006	358.80	0.00

NRCS Soils Report

TESTING INFORMATION
SOIL EVALUATOR: MICHAEL HASSETT
TESTING DATES:
8/8/19 DTH #1–#17
8/9/19 DTH #18–#23



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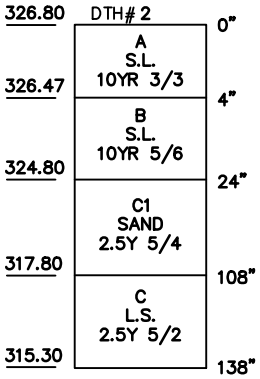
REFUSAL @ N/A MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



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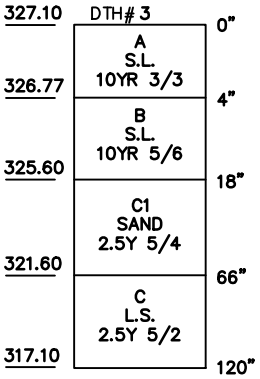
SOIL CLASS I WATER @ N/A



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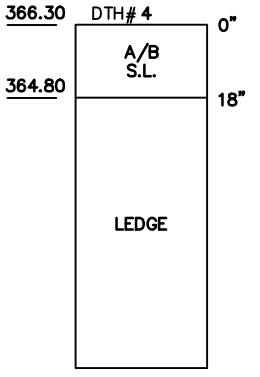
SOIL CLASS I WATER @ N/A



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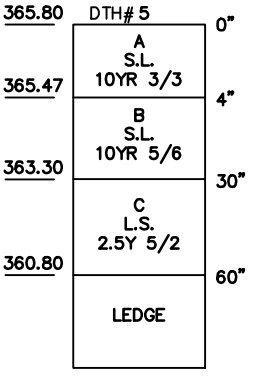
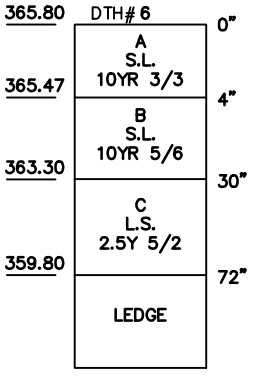
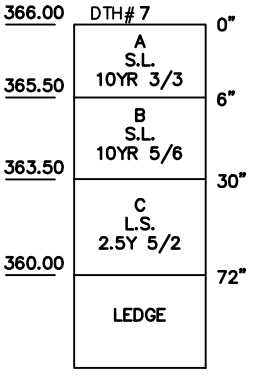
REFUSAL @ 18" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



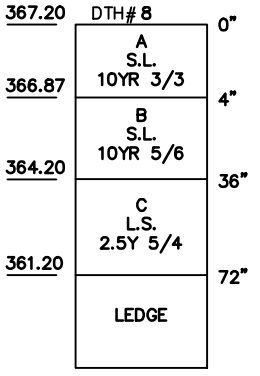
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 60" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



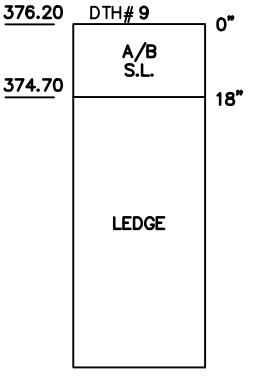
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 72" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



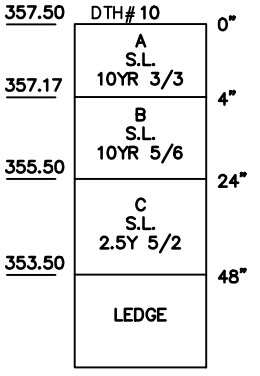
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 72" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



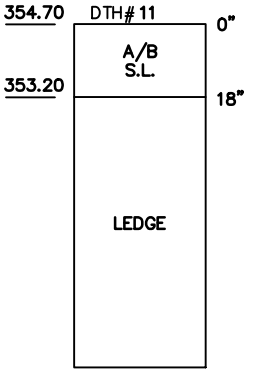
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 72" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



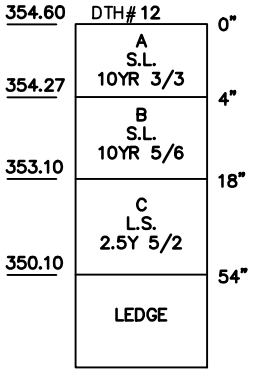
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 18" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 48" MOTTLES @ N/A
SOIL CLASS II WATER @ N/A

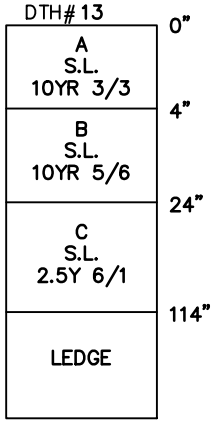


PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 18" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A



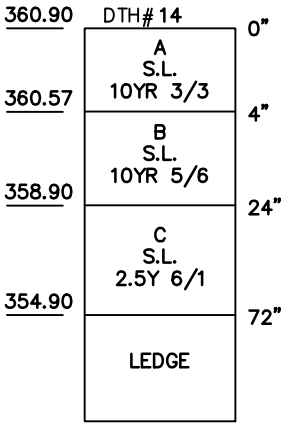
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 54" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A

DTH# 13



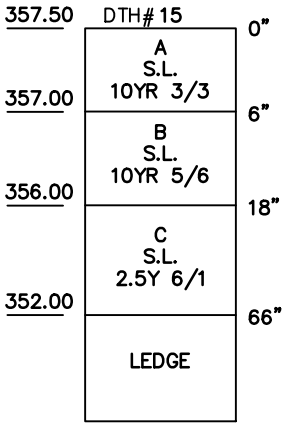
PTH @N/A WEEPING @ N/A
@ 114" MOTTLES @ N/A
.SS II WATER @ N/A

DTH# 14



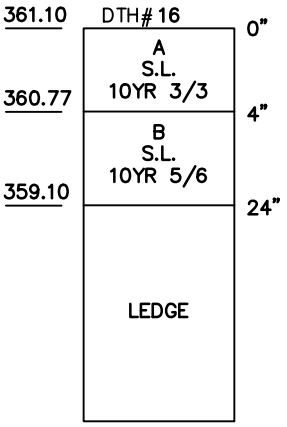
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 72" MOTTLES @ N/A
SOIL CLASS II WATER @ N/A

DTH# 15



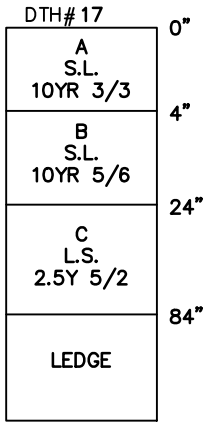
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 66" MOTTLES @ N/A
SOIL CLASS II WATER @ N/A

DTH# 16



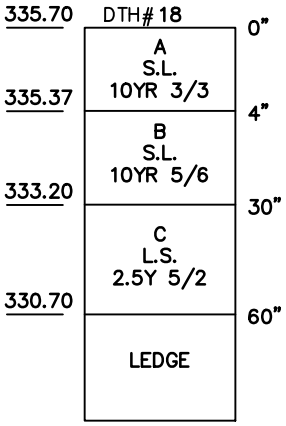
PERC DEPTH @N/A WEEPING @
REFUSAL @ 24" MOTTLES @
SOIL CLASS II WATER @

DTH# 17



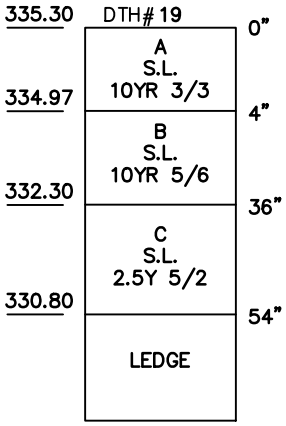
PTH @N/A WEEPING @ N/A
@ 84" MOTTLES @ N/A
.SS I WATER @ N/A

DTH# 18



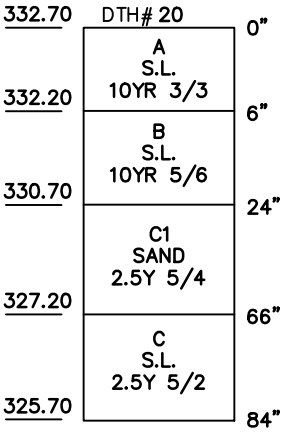
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 60" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A

DTH# 19



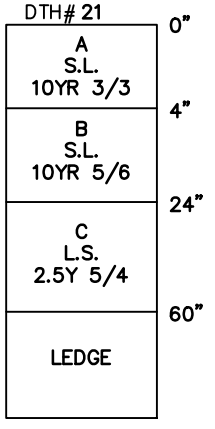
PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 54" MOTTLES @ N/A
SOIL CLASS II WATER @ N/A

DTH# 20



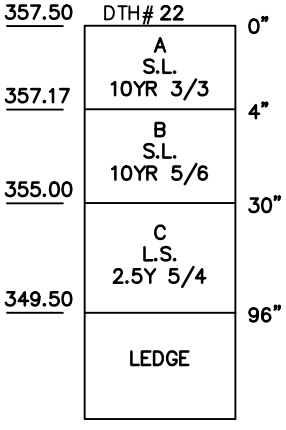
PERC DEPTH @N/A WEEPING @
REFUSAL @ 84" MOTTLES @
SOIL CLASS I WATER @

DTH# 21



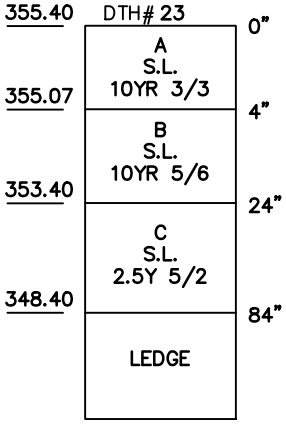
PTH @N/A WEEPING @ N/A
@ 60" MOTTLES @ N/A
.SS I WATER @ N/A

DTH# 22



PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 96" MOTTLES @ N/A
SOIL CLASS I WATER @ N/A

DTH# 23



PERC DEPTH @N/A WEEPING @ N/A
REFUSAL @ 84" MOTTLES @ N/A
SOIL CLASS II WATER @ N/A

United States Department of Agriculture

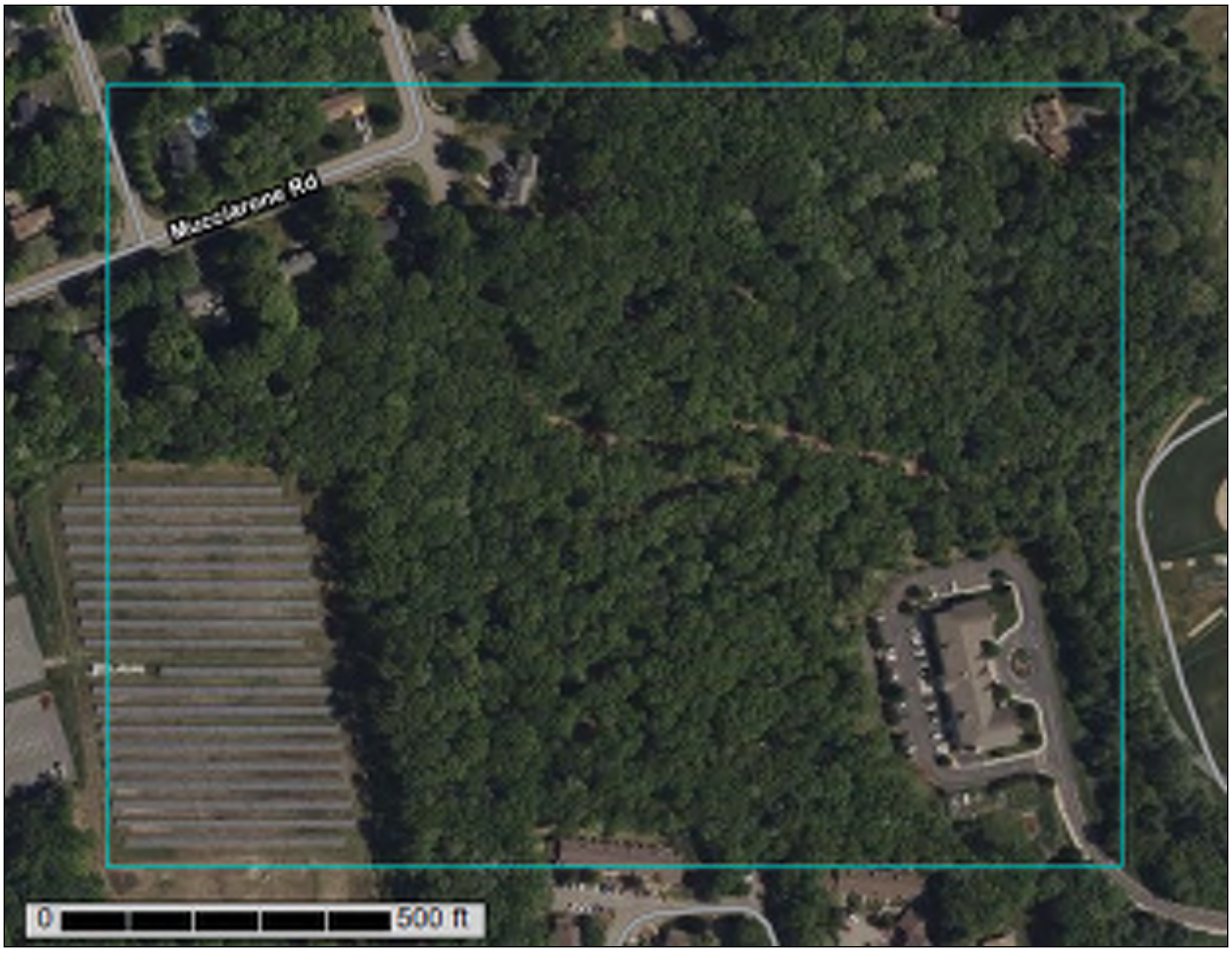
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts

Veteran's Memorial Drive Extension



January 15, 2024

Preface

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

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

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

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

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

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

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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 (Veteran's Memorial Drive Exension)

Map Scale: 1:3,060 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 19, Sep 10, 2023

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

Date(s) aerial images were photographed: 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 (Veteran's Memorial Drive Exension)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.6	1.4%
300B	Montauk fine sandy loam, 3 to 8 percent slopes	21.6	51.6%
422B	Canton fine sandy loam, 0 to 8 percent slopes, extremely stony	0.0	0.0%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	15.8	37.7%
602	Urban land, 0 to 15 percent slopes	2.3	5.5%
654	Udorthents, loamy	1.6	3.8%
Totals for Area of Interest		**42.0**	**100.0%**

Map Unit Descriptions (Veteran's Memorial Drive Exension)

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Norfolk and Suffolk Counties, Massachusetts

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

Map Unit Setting

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

Map Unit Composition

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

Description of Merrimac

Setting

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

Typical profile

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

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash

Hydric soil rating: No

Minor Components

Sudbury

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

Hinckley

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

Windsor

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

Agawam

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

300B—Montauk fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyrh
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Montauk

Setting

Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 26 inches: fine sandy loam
Bw2 - 26 to 34 inches: sandy loam
2Cd - 34 to 72 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Scituate

Percent of map unit: 6 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Canton

Percent of map unit: 5 percent
Landform: Hills

Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 4 percent
Landform: Depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

422B—Canton fine sandy loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w818
Elevation: 0 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Extremely Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, 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: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 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 (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate, extremely stony

Percent of map unit: 6 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton, extremely stony

Percent of map unit: 6 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk, extremely stony

Percent of map unit: 4 percent
Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Swansea

Percent of map unit: 4 percent
Landform: Marshes, depressions, bogs, swamps, kettles
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

422C—Canton fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w815
Elevation: 0 to 1,310 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Extremely Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, 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: 9.0 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 (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate, extremely stony
Percent of map unit: 6 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton, extremely stony
Percent of map unit: 5 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk, extremely stony
Percent of map unit: 5 percent
Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Hollis, extremely stony
Percent of map unit: 4 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

602—Urban land, 0 to 15 percent slopes

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

Map Unit Composition
Urban land: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting
Parent material: Excavated and filled land

Minor Components

Rock outcrops
Percent of map unit: 1 percent
Hydric soil rating: Unranked

654—Udorthents, loamy

Map Unit Setting
National map unit symbol: vkyb
Elevation: 0 to 3,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Riser, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Excavated and filled coarse-loamy human transported material

Typical profile
H1 - 0 to 6 inches: variable
H2 - 6 to 60 inches: variable

Properties and qualities
Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: Unranked

Minor Components

Udorthents,sandy

Percent of map unit: 8 percent
Hydric soil rating: Unranked

Udorthents,wet substr.

Percent of map unit: 8 percent
Hydric soil rating: Unranked

Urban land

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Veteran's Memorial Drive Exension)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

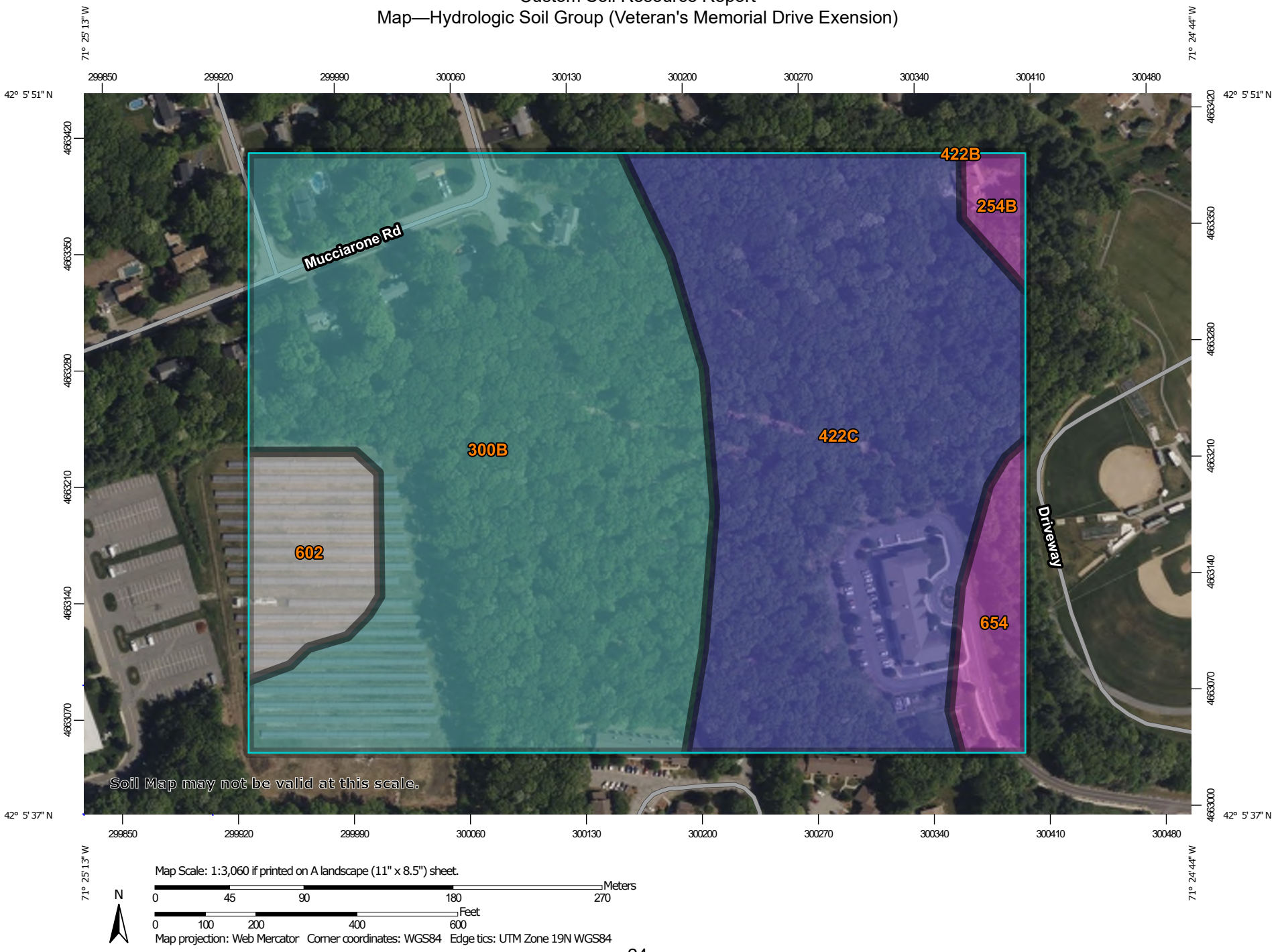
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Veteran's Memorial Drive Exension)



Map Scale: 1:3,060 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 19, Sep 10, 2023

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

Date(s) aerial images were photographed: 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.

Table—Hydrologic Soil Group (Veteran's Memorial Drive Exension)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	0.6	1.4%
300B	Montauk fine sandy loam, 3 to 8 percent slopes	C	21.6	51.6%
422B	Canton fine sandy loam, 0 to 8 percent slopes, extremely stony	B	0.0	0.0%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	B	15.8	37.7%
602	Urban land, 0 to 15 percent slopes		2.3	5.5%
654	Udorthents, loamy	A	1.6	3.8%
Totals for Area of Interest			**42.0**	**100.0%**

Rating Options—Hydrologic Soil Group (Veteran's Memorial Drive Exension)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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1DWLRQDO)ORRG+D]DUG/D\HU)5,50HWWH

FEMA

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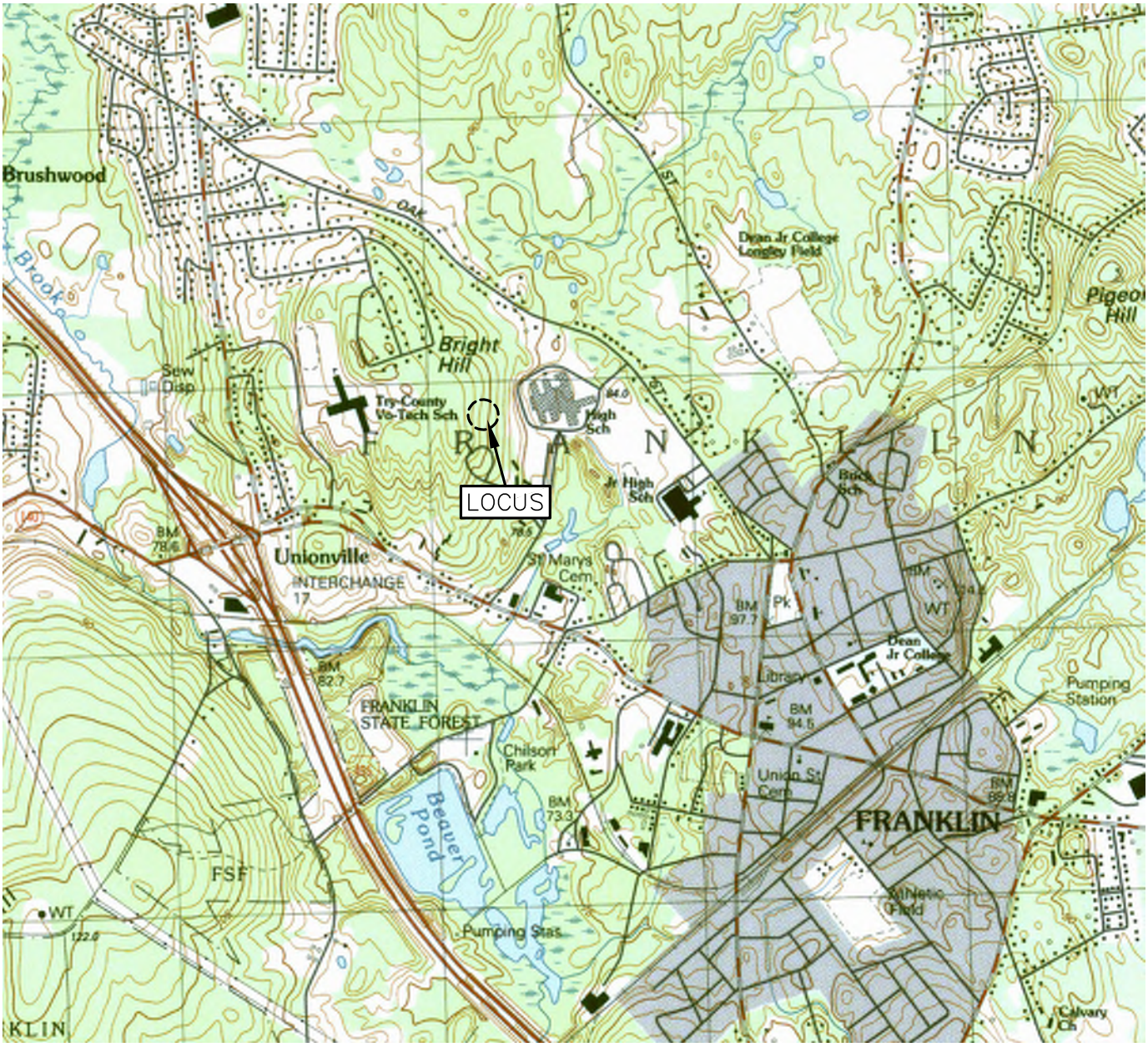


U.S.G.S.
Quadrangle

Scale: 1"=2000'

0 2000' 4000' 6000' 8000'

LOCUS MAP

Veterans Memorial Drive Extension
FRANKLIN, Massachusetts

Date: December 29, 2023 | *Project No. F-4598*

Guerriere & Halnon, Inc.
Engineering & Land Surveying
55 WEST CENTRAL STREET FRANKLIN, MA. 02038
PH: (508) 528-3221
WWW.GUERRIEREANDHALNON.COM

TSS Removal Worksheet

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pretreatment

Total TSS Removal = 44%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pretreatment

Total TSS Removal = 44%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #3

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56

Pretreatment

Total TSS Removal = 44%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Veteran's Memorial Drive Ext, Franklin MA - Basin #3

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal = 80%

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

Project: F-4598

Prepared By: Michael Hassett

Date: 3/15/2024

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

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

1. From MassDEP Stormwater Handbook Vol. 1

Inspection Forms

Post Construction Inspection Report
Veteran's Memorial Drive Extension,
Franklin, Massachusetts

INSPECTION DATE:						
Person Inspecting		Weather				Other Personnel Present
		Clear				
Item	**N/A***	**sat.****	**NMR*****	**CAM****	**MCA***	**Comments:**
Pavement Swept						
Catch Basins						
Road Extention						
CB #A						
CB #B						
CB #C						
CB #D						
CB #E						
CB #F						
CB #G						
CB #H						
CB #I						
CB #J						
CB #K						
40B Development						
CB #1						
CB #2						
CB #3						
CB #4						
CB #5						
CB #6						
CB #7						
CB #8						
CB #9						
HEADWALLS/OUTLETS						
ROAD EXTENTION						
HW #1						
HW #4						
HW #5						
40B DEVELOPMENT						
HW #2						
HW #3						
Infiltration Basin #1						
Sediment Forebay						
Infiltration Basin						
FES-1						
FES-2						
OCS-1						

Post Construction Inspection Report
Veteran's Memorial Drive Extension,
Franklin, Massachusetts

INSPECTION DATE:						
Person Inspecting		Weather				Other Personnel Present
		Clear				
Item	**N/A***	**sat.****	**NMR*****	**CAM****	**MCA***	**Comments:**
Infiltration Basin #2						
Sediment Forebay						
Infiltration Basin						
INLET 1 (15")						
INLET 2 (12")						
INLET 3 (12")						
OCS-2						
Infiltration Basin #3						
Sediment Forebay						
Infiltration Basin						
INLET 1 (15")						
INLET 2 (12")						
OCS-3						
Detention Basin #1						
Detention Basin #2						
NMR* normal maintenance requested						
N/A* not applicable at the time of inspection						
CAM* corrective action - minor						
SAT* satisfactory conditions as compliant						
MCA* Major corrective action						

CULTEC Recharger® 280HD Stormwater Chamber

The Recharger® 280HD is a 26.5" (673 mm) tall, mid-size chamber and is typically used for installations with depth restrictions or when a larger infiltrative area is required. The Recharger® 280HD has the side portal internal manifold feature. HVLV® FC-24 Feed Connectors are inserted into the side portals to create the internal manifold.

Size (L x W x H)	8' x 47" x 26.5"
	2.44 m x 1194 mm x 673 mm
Installed Length	7'
	2.13 m
Length Adjustment per Run	1'
	0.30 m
Chamber Storage	6.08 ft^3/ft
	0.56 m^3/m
	42.55 ft^3/unit
	1.21 m^3/unit
Min. Installed Storage	9.21 ft^3/ft
	0.86 m^3/m
	64.46 ft^3/unit
	1.83 m^3/unit
Min. Area Required	30.33 ft^2
	2.82 m^2
Chamber Weight	64.0 lbs
	29.03 kg
Shipping	35 chambers/skid
	2,345 lbs/skid
	12 skids/48' flatbed
Min. Center-to-Center Spacing	4.33'
	1.32 m
Max. Allowable Cover	12'
	3.66 m
Max. Inlet Opening in End Wall	21" HDPE, PVC
	525 mm HDPE, PVC
Max. Allowable O.D. in Side Portal	10" HDPE, 12" PVC
	250 mm HDPE, 300 mm PVC
Compatible Feed Connector	HVLV FC-24 Feed Connector

Calculations are based on installed chamber length.
All above values are nominal.
Min. installed storage includes 6" (152 mm) stone base, 6" (152 mm) stone above crown of chamber and typical stone surround at 52"(1321 mm) center-to-center spacing.

	Stone Foundation Depth		
	6"	12"	18"
	152 mm	305 mm	457 mm
Chamber and Stone Storage Per Chamber	64.46 ft^3	70.53 ft^3	76.59 ft^3
	1.83 m^3	2.00 m^3	2.17 m^3
Min. Effective Depth	3.21'	3.71'	4.21'
	0.98 m	1.13 m	1.28 m
Stone Required Per Chamber	2.03 yd^3	2.59 yd^3	3.15 yd^3
	1.55 m^3	1.98 m^3	2.41 m^3

Calculations are based on installed chamber length.
Includes 6" (305 mm) stone above crown of chamber and typical stone surround at 52"(1321 mm) center-to-center spacing and stone foundation as listed in table.
Stone void calculated at 40%.

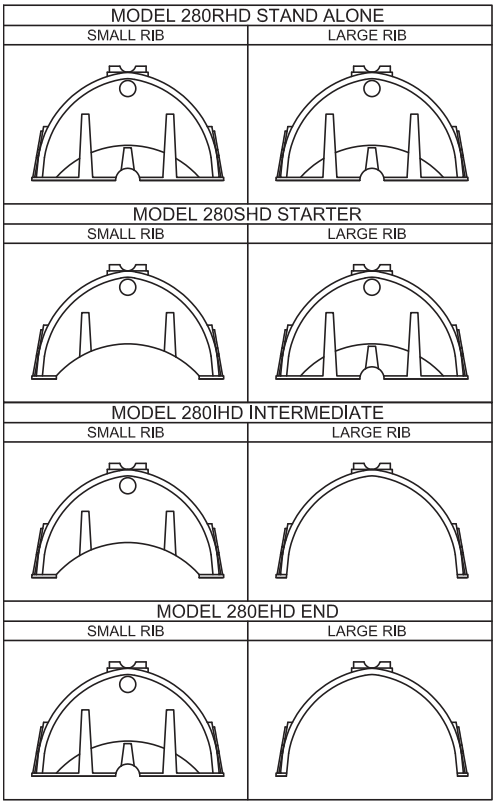
Recharger® 280HD Bare Chamber Storage Volumes

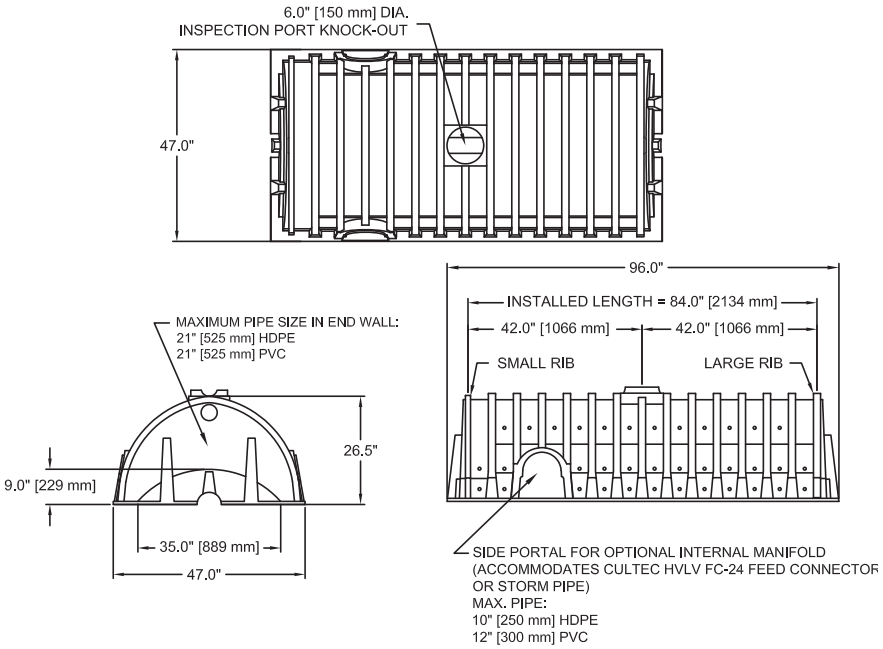
Elevation		Incremental Storage Volume				Cumulative Storage	
in.	mm	ft^3/ft	m^3/m	ft^3	m^3	ft^3	m^3
26.5	686	0.000	0.000	0.000	0.000	42.553	1.205
26	660	0.018	0.002	0.126	0.004	42.553	1.205
25	635	0.047	0.004	0.329	0.009	42.427	1.202
24	609	0.100	0.009	0.700	0.020	42.098	1.192
23	584	0.134	0.012	0.938	0.027	41.398	1.172
22	559	0.159	0.015	1.113	0.032	40.460	1.146
21	533	0.179	0.017	1.253	0.035	39.347	1.114
20	508	0.195	0.018	1.365	0.039	38.094	1.079
19	483	0.209	0.019	1.463	0.041	36.729	1.040
18	457	0.221	0.021	1.547	0.044	35.266	0.999
17	432	0.232	0.022	1.624	0.046	33.719	0.955
16	406	0.241	0.022	1.687	0.048	32.095	0.909
15	381	0.249	0.023	1.743	0.049	30.408	0.861
14	356	0.263	0.024	1.841	0.052	28.665	0.812
13	330	0.267	0.025	1.869	0.053	26.824	0.760
12	305	0.271	0.025	1.897	0.054	24.955	0.707
11	279	0.275	0.026	1.925	0.055	23.058	0.653
10	254	0.279	0.026	1.953	0.055	21.133	0.598
9	229	0.287	0.027	2.009	0.057	19.180	0.543
8	203	0.292	0.027	2.044	0.058	17.171	0.486
7	178	0.294	0.027	2.058	0.058	15.127	0.428
6	152	0.305	0.028	2.135	0.060	13.069	0.370
5	127	0.306	0.028	2.142	0.061	10.934	0.310
4	102	0.308	0.029	2.156	0.061	8.792	0.249
3	76	0.310	0.029	2.170	0.061	6.636	0.188
2	51	0.312	0.029	2.184	0.062	4.466	0.126
1	25	0.326	0.030	2.282	0.065	2.282	0.065
Total		**6.079**	**0.565**	**42.553**	**1.205**	**42.553**	**1.205**

Calculations are based on installed chamber length.

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

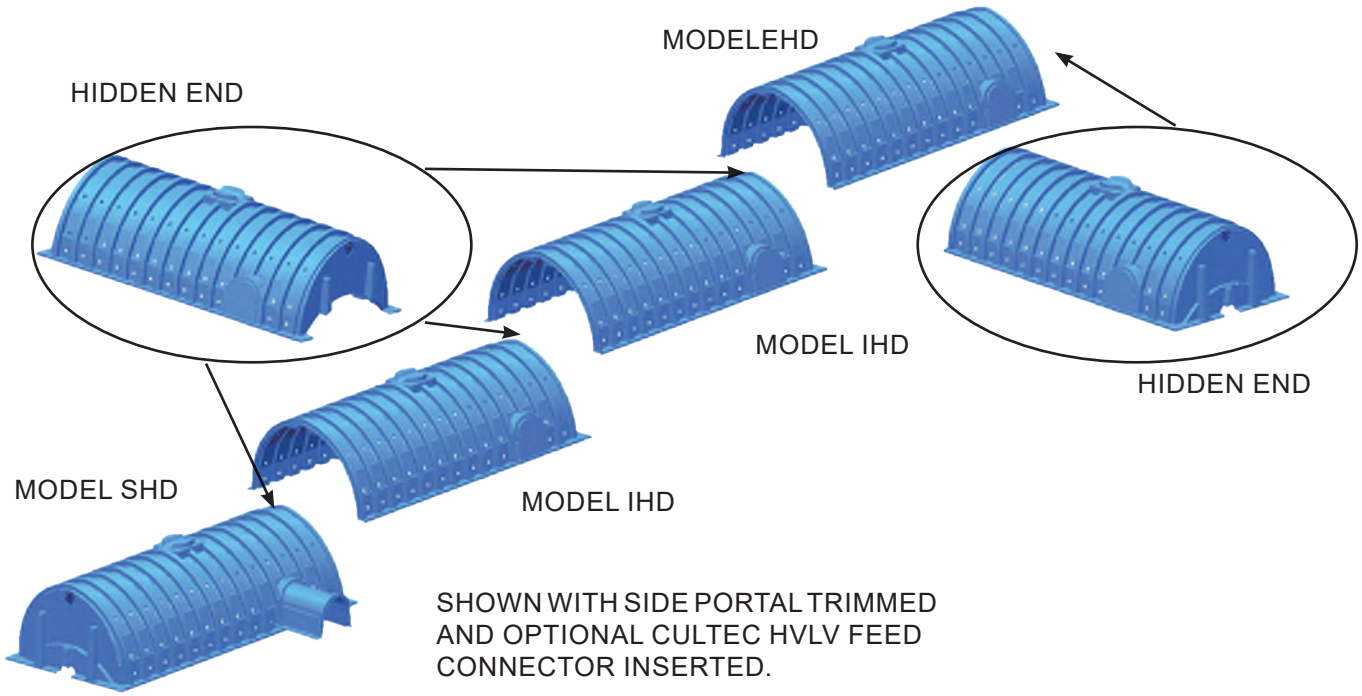
Three View Drawing



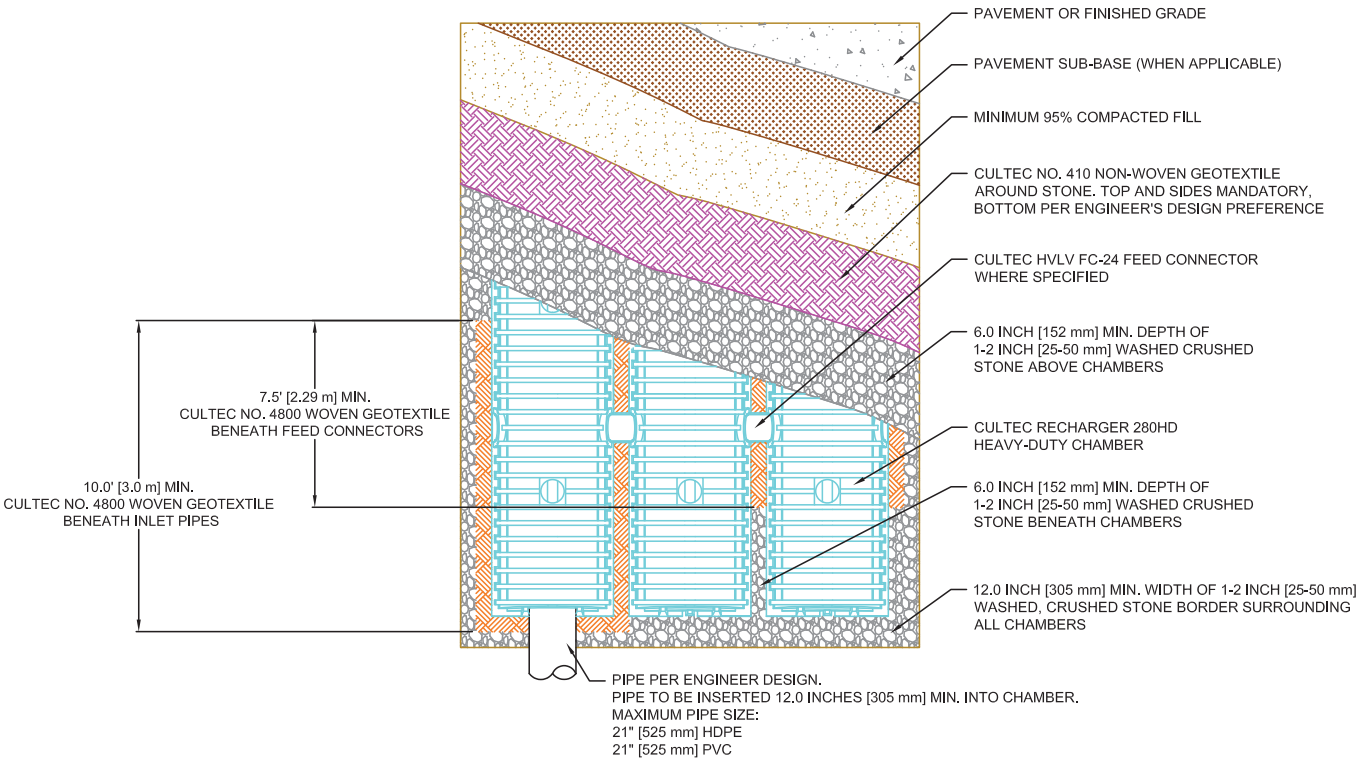


CULTEC RECHARGER 280HD CHAMBER STORAGE = 6.079 CF/FT [0.565 m³/m]
INSTALLED LENGTH ADJUSTMENT = 1.0' [0.3048 m]

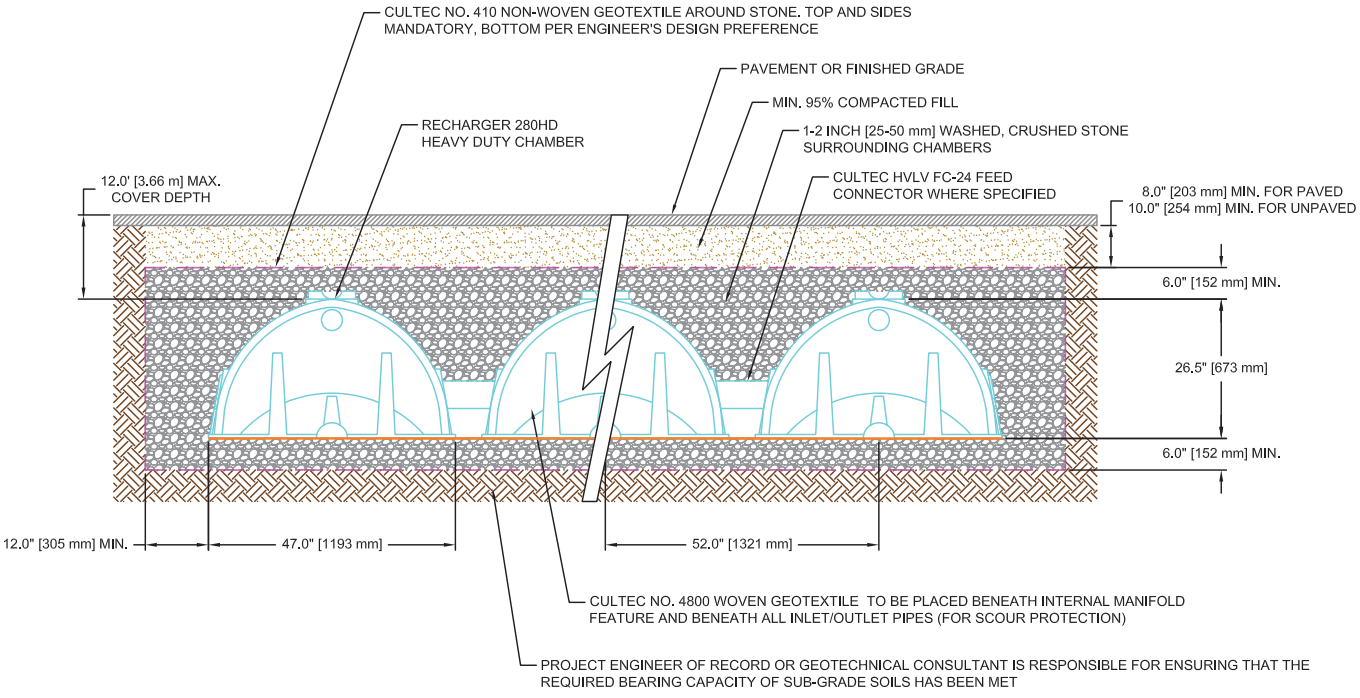
Typical Interlock Installation



Plan View Drawing



Typical Cross Section for Traffic Application



CULTEC Recharger® 280HD Specifications

GENERAL

CULTEC Recharger® 280HD chambers are designed for underground stormwater management. The chambers may be used for retention, recharging, detention or controlling the flow of on-site stormwater runoff.

CHAMBER PARAMETERS

1. The chambers shall be manufactured in the U.S.A. by CULTEC, Inc. of Brookfield, CT (cultec.com, 203-775-4416).
2. The chamber shall be vacuum thermoformed of polyethylene with a black interior and blue exterior.
3. The chamber shall be arched in shape.
4. The chamber shall be open-bottomed.
5. The chamber shall be joined using an interlocking overlapping rib method. Connections must be fully shouldered overlapping ribs, having no separate couplings or separate end walls.
6. The nominal chamber dimensions of the CULTEC Recharger® 280HD shall be 26.5 inches (673 mm) tall, 47 inches (1194 mm) wide and 8 feet (2.44 m) long. The installed length of a joined Recharger® 280HD shall be 7 feet (2.13 m).
7. Maximum inlet opening on the chamber end wall is 21 inches (525 mm) HDPE, PVC.
8. The chamber shall have two side portals to accept CULTEC HVLV® FC-24 Feed Connectors to create an internal manifold. Maximum allowable O.D. in the side portal is 10 inches (250 mm) HDPE, 12 inches (300 mm) PVC.
9. The nominal chamber dimensions of the CULTEC HVLV® FC-24 Feed Connector shall be 12 inches (305 mm) tall, 16 inches (406 mm) wide and 24.2 inches (614 mm) long.
10. The nominal storage volume of the Recharger® 280HD chamber shall be 6.079 ft^3 / ft (0.565 m^3 / m) - without stone. The nominal storage volume of a single Recharger 280RHD Stand Alone unit shall be 48.63 ft^3 (1.38 m^3) - without stone. The nominal storage volume of a joined Recharger® 280IHD Intermediate unit shall be 42.553 ft^3 (1.205 m^3) - without stone. The nominal storage volume of the length adjustment amount per run shall be 6.08 ft^3 (0.56 m^3) - without stone.
11. The nominal storage volume of the HVLV® FC-24 Feed Connector shall be 0.913 ft^3 / ft (0.085 m^3 / m) - without stone.
12. The Recharger® 280HD chamber shall have seventy-two discharge holes bored into the sidewalls of the unit's core to promote lateral conveyance of water.
13. The Recharger® 280HD chamber shall have 15 corrugations.
14. The end wall of the chamber, when present, shall be an integral part of the continuously formed unit. Separate end plates cannot be used with this unit.
15. The Recharger® 280RHD Stand Alone unit must be formed as a whole chamber having two fully formed integral end walls and having no separate end plates or separate end walls.
16. The Recharger® 280SHD Starter unit must be formed as a whole chamber having one fully formed integral end wall and one partially formed integral end wall with a lower transfer opening of 9 inches (229 mm) high x 35 inches (889 mm) wide.
17. The Recharger® 280IHD Intermediate unit must be formed as a whole chamber having one fully open end wall and one partially formed integral end wall with a lower transfer opening of 9 inches (229 mm) high x 35 inches (889 mm) wide.
18. The Recharger® 280EHD End unit must be formed as a whole chamber having one fully formed integral end wall and one fully open end wall and having no separate end plates or end walls.
19. The HVLV® FC-24 Feed Connector must be formed as a whole chamber having two open end walls and having no separate end plates or separate end walls. The unit shall fit into the side portals of the Recharger® 280HD and act as cross feed connections.
20. Chambers must have horizontal stiffening flex reduction steps between the ribs.
21. The chamber shall have a raised integral cap at the top of the arch in the center of each unit to be used as an optional inspection port or clean-out.
22. The units may be trimmed to custom lengths by cutting back to any corrugation on the large rib end.
23. The chamber shall be manufactured in an ISO 9001:2015 certified facility.
24. The chamber shall be designed and manufactured to meet the material and structural requirements of IAPMO PS 63-2019, including resistance to AASHTO H-10 and H-20 highway live loads, when installed in accordance with CULTEC's installation instructions.
25. Maximum allowable cover over the top of the chamber shall be 12' (3.66 m).
26. The chamber shall be designed to withstand traffic loads when installed according to CULTEC's recommended installation instructions.

CULTEC RECHARGER® 280HD SPECIFICATIONS

GENERAL

CULTEC RECHARGER 280HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

CHAMBER PARAMETERS

1. THE CHAMBERS WILL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE CHAMBER WILL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS OR SEPARATE END WALLS.
6. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER 280HD SHALL BE 26.5 INCHES (673 mm) TALL, 47 INCHES (1194 mm) WIDE AND 8 FEET (2.44 m) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER 280HD SHALL BE 7 FEET (2.13 m).
7. MAXIMUM INLET OPENING ON THE CHAMBER ENDWALL IS 21 INCHES (525 mm) HDPE.
8. THE CHAMBER WILL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV® FC-24 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. NOMINAL INSIDE DIMENSIONS OF THE SIDE PORTAL SHALL HAVE A WIDTH OF 11.25" [286 mm] AND HEIGHT OF 11.5" [292 mm]. THE SIDE PORTAL CAN ACCEPT A MAXIMUM OUTER DIAMETER (O.D.) PIPE SIZE OF 12.25 INCHES [311 mm].
9. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV® FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (614 mm) LONG.
10. THE NOMINAL STORAGE VOLUME OF THE RECHARGER 280HD CHAMBER WILL BE 6.079 FT3 / FT (0.565 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER 280HD SHALL BE 42.553 FT³ / UNIT (1.205 m³ / UNIT) - WITHOUT STONE.
11. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
12. THE RECHARGER 280HD CHAMBER WILL SEVENTY-TWO DISCHARGE HOLES BORED INTO THE SIDEWALLS OF THE UNIT'S CORE TO PROMOTE LATERAL CONVEYANCE OF WATER.
13. THE RECHARGER 280HD CHAMBER SHALL HAVE 15 CORRUGATIONS.
14. THE ENDWALL OF THE CHAMBER, WHEN PRESENT, WILL BE AN INTEGRAL PART OF THE CONTINUOUSLY FORMED UNIT. SEPARATE END PLATES CANNOT BE USED WITH THIS UNIT.
15. THE RECHARGER 280RHD STAND ALONE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO FULLY FORMED INTEGRAL ENDWALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS.
16. THE RECHARGER 280SHD STARTER UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 9 INCHES (229 mm) HIGH X 35 INCHES (889 mm) WIDE.
17. THE RECHARGER 280IHD INTERMEDIATE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY OPEN ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 9 INCHES (229 mm) HIGH X 35 INCHES (889 mm) WIDE.
18. THE RECHARGER 280EHD END UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE FULLY OPEN END WALL AND HAVING NO SEPARATE END PLATES OR END WALLS.
19. THE HVLV FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE RECHARGER 280HD AND ACT AS CROSS FEED CONNECTIONS.
20. CHAMBERS MUST HAVE HORIZONTAL STIFFENING FLEX REDUCTION STEPS BETWEEN THE RIBS.
21. THE CHAMBER WILL HAVE A RAISED INTEGRAL CAP AT THE TOP OF THE ARCH IN THE CENTER OF EACH UNIT TO BE USED AS AN OPTIONAL INSPECTION PORT OR CLEAN-OUT.
22. THE UNITS MAY BE TRIMMED TO CUSTOM LENGTHS BY CUTTING BACK TO ANY CORRUGATION.
23. THE CHAMBER SHALL BE MANUFACTURED IN AN IN AN ISO 9001:2015 CERTIFIED FACILITY
24. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S INSTALLATION INSTRUCTIONS.
25. THE CHAMBER SHALL BE DESIGNED AND MANUFACTURED TO MEET THE MATERIAL AND STRUCTURAL REQUIREMENTS OF IAPMO PS 63-2019, INCLUDING RESISTANCE TO AASHTO H-10 AND H-20 HIGHWAY LIVE LOADS, WHEN INSTALLED IN ACCORDANCE WITH CULTEC'S INSTALLATION INSTRUCTIONS.
26. MAXIMUM ALLOWED COVER OVER TOP OF UNIT SHALL BE 12 FEET (3.65 m).

CULTEC HVLV® FC-24 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL

CULTEC HVLV FC-24 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER 280HD STORMWATER CHAMBERS.

CHAMBER PARAMETERS

1. THE CHAMBERS WILL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (614 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
7. THE HVLV FC-24 FEED CONNECTOR CHAMBER SHALL HAVE 2 CORRUGATIONS.
8. THE HVLV FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2015 CERTIFIED FACILITY.

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE.

GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M).
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

CULTEC NO. 4800™ WOVEN GEOTEXTILE

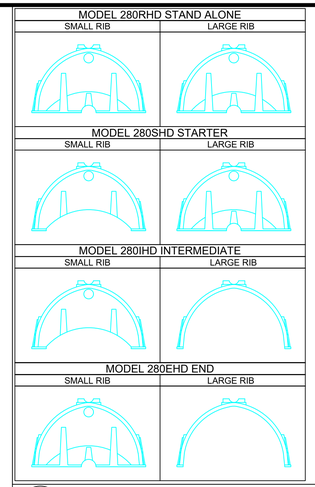
CULTEC NO. 4800 WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

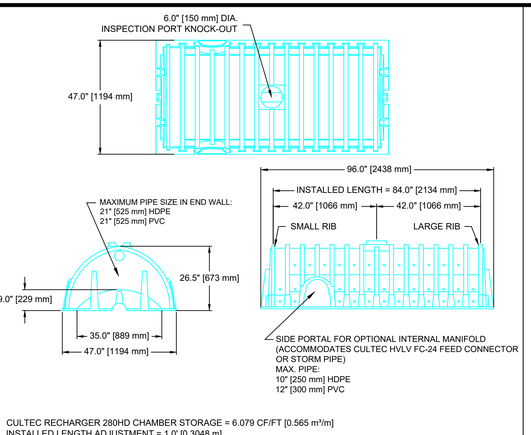
GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 550 X 550 LBS (2,448 X 2,448 N) PER ASTM D4632 TESTING METHOD.
4. THE GEOTEXTILE SHALL HAVE A ELONGATION @ BREAK RESISTANCE OF 20 X 20% PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 5,070 X 5,070 LBS/FT (74 X 74 KN/M) PER ASTM D4595 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 2% STRAIN OF 960 X 1,096 LBS/FT (14 X 16 KN/M) PER ASTM D4595 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 5% STRAIN OF 2,740 X 2, 740 LBS/FT (40 X 40 KN/M) PER ASTM D4595 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 10% STRAIN OF 4,800 X 4,800 LBS/FT (70 X 70 KN/M) PER ASTM D4595 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,700 LBS (7,560 N) PER ASTM D6241 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 180 X 180 LBS (801 X 801 N) PER ASTM D4533 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 40 US STD. SIEVE (0.425 MM) PER ASTM D4751 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.15 SEC-1 PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 11.5 GPM/FT2 (470 LPM/M2) PER ASTM D4491 TESTING METHOD.
14. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 80% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

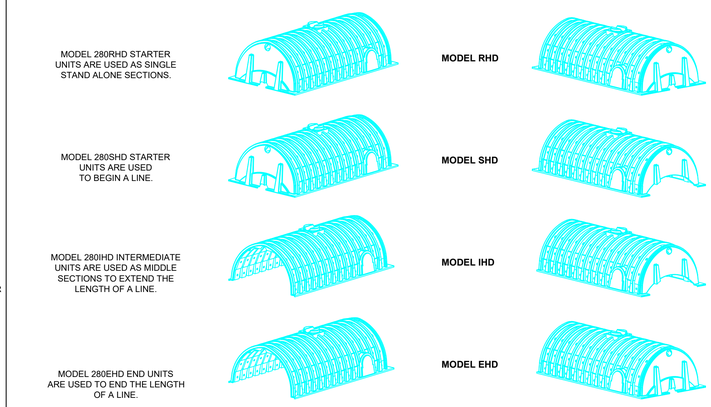
280HD 1.0

GENERAL NOTES



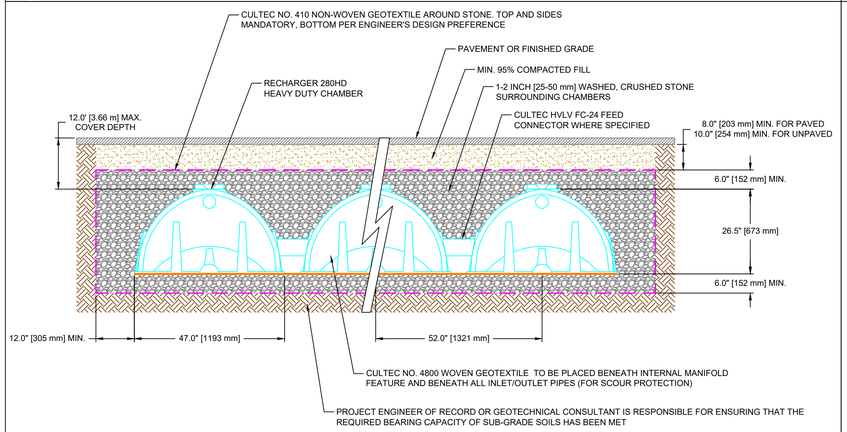


CULTEC RECHARGER 280HD CHAMBER STORAGE = 6.079 CF/FT [0.565 m³/m]
INSTALLED LENGTH ADJUSTMENT = 1.0' [0.3048 m]



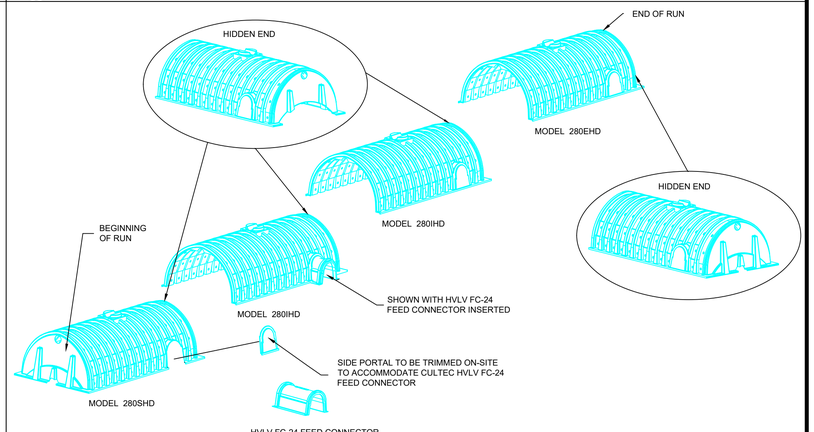
280HD 2.0

CULTEC RECHARGER 280HD HEAVY DUTY THREE VIEW



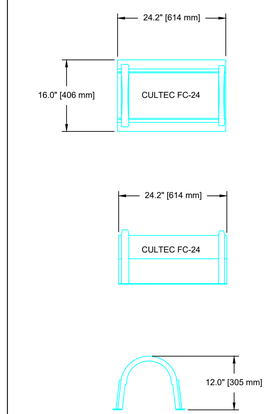
280HD 3.0

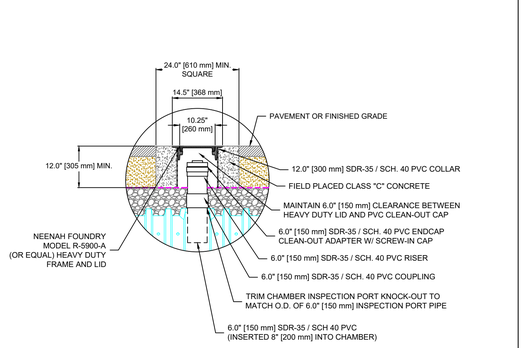
CULTEC RECHARGER 280HD HEAVY DUTY END DETAIL INFORMATION



280HD 4.0

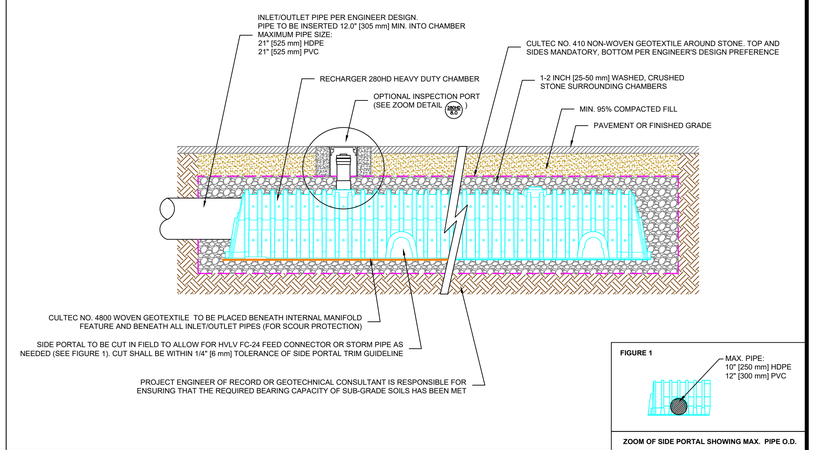
CULTEC RECHARGER 280HD HEAVY DUTY CROSS SECTION





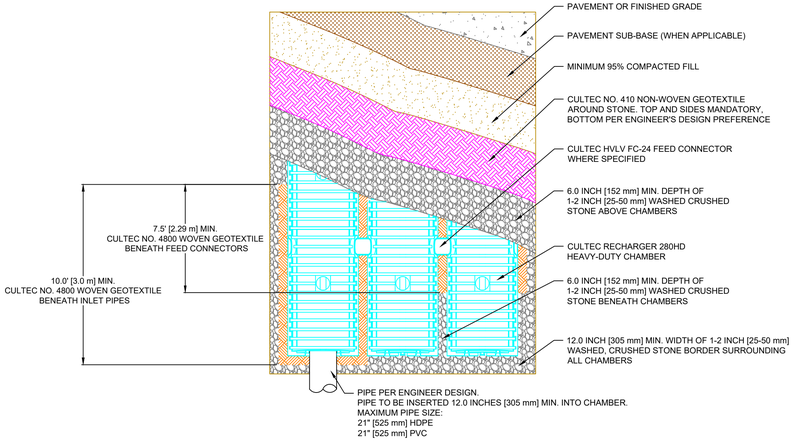
280HD 5.0

CULTEC RECHARGER 280HD HEAVY DUTY TYPICAL INTERLOCK



280HD 6.0

CULTEC RECHARGER 280HD HEAVY DUTY PLAN VIEW



280HD 7.0

CULTEC HVLV FC-24 FEED CONNECTOR THREE VIEW

280HD 8.0

OPTIONAL INSPECTION PORT - ZOOM DETAIL

280HD 9.0

CULTEC INTERNAL MANIFOLD - OPTIONAL INSPECTION PORT DETAIL

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RECHARGER 280HD
DETAIL SHEET
TRAFFIC APPLICATION

CULTEC STORMWATER CHAMBER

PROJECT NO:		DATE:	2019
DRAWN BY:	CULTEC, INC	CHECKED BY:	TECH
SCALE:	N.T.S.	SHEET NO:	1 OF 1

CULTEC RECHARGER® 280HD SPECIFICATIONS

GENERAL

CULTEC RECHARGER 280HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

CHAMBER PARAMETERS

1. THE CHAMBERS WILL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE CHAMBER WILL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS OR SEPARATE END WALLS.
6. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER 280HD SHALL BE 26.5 INCHES (673 mm) TALL, 47 INCHES (1194 mm) WIDE AND 8 FEET (2.44 m) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER 280HD SHALL BE 7 FEET (2.13 m).
7. MAXIMUM INLET OPENING ON THE CHAMBER ENDWALL IS 18 INCHES (450 mm) HDPE.
8. THE CHAMBER WILL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV® FC-24 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. NOMINAL INSIDE DIMENSIONS OF THE SIDE PORTAL SHALL HAVE A WIDTH OF 11.25" [286 mm] AND HEIGHT OF 11.5" [292 mm]. THE SIDE PORTAL CAN ACCEPT A MAXIMUM OUTER DIAMETER (O.D.) PIPE SIZE OF 12.25 INCHES [311 mm].
9. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV® FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (614 mm) LONG.
10. THE NOMINAL STORAGE VOLUME OF THE RECHARGER 280HD CHAMBER WILL BE 6.079 FT3 / FT (0.565 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER 280HD SHALL BE 42.553 FT³ / UNIT (1.205 m³ / UNIT) - WITHOUT STONE.
11. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
12. THE RECHARGER 280HD CHAMBER WILL SEVENTY-TWO DISCHARGE HOLES BORED INTO THE SIDEWALLS OF THE UNIT'S CORE TO PROMOTE LATERAL CONVEYANCE OF WATER.
13. THE RECHARGER 280HD CHAMBER SHALL HAVE 15 CORRUGATIONS.
14. THE ENDWALL OF THE CHAMBER, WHEN PRESENT, WILL BE AN INTEGRAL PART OF THE CONTINUOUSLY FORMED UNIT. SEPARATE END PLATES CANNOT BE USED WITH THIS UNIT.
15. THE RECHARGER 280RHD STAND ALONE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO FULLY FORMED INTEGRAL ENDWALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS.
16. THE RECHARGER 280SHD STARTER UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 9 INCHES (229 mm) HIGH X 35 INCHES (889 mm) WIDE.
17. THE RECHARGER 280IHD INTERMEDIATE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY OPEN ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 9 INCHES (229 mm) HIGH X 35 INCHES (889 mm) WIDE.
18. THE RECHARGER 280EHD END UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE FULLY OPEN END WALL AND HAVING NO SEPARATE END PLATES OR END WALLS.
19. THE HVLV FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE RECHARGER 280HD AND ACT AS CROSS FEED CONNECTIONS.
20. CHAMBERS MUST HAVE HORIZONTAL STIFFENING FLEX REDUCTION STEPS BETWEEN THE RIBS.
21. THE CHAMBER WILL HAVE A RAISED INTEGRAL CAP AT THE TOP OF THE ARCH IN THE CENTER OF EACH UNIT TO BE USED AS AN OPTIONAL INSPECTION PORT OR CLEAN-OUT.
22. THE UNITS MAY BE TRIMMED TO CUSTOM LENGTHS BY CUTTING BACK TO ANY CORRUGATION.
23. THE CHAMBER SHALL BE MANUFACTURED IN AN IN ISO 9001:2015 CERTIFIED FACILITY
24. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S INSTALLATION INSTRUCTIONS.
25. THE CHAMBER SHALL BE DESIGNED AND MANUFACTURED TO MEET THE MATERIAL AND STRUCTURAL REQUIREMENTS OF IAPMO PS 63-2019, INCLUDING RESISTANCE TO AASHTO H-10 AND H-20 HIGHWAY LIVE LOADS, WHEN INSTALLED IN ACCORDANCE WITH CULTEC'S INSTALLATION INSTRUCTIONS.
26. MAXIMUM ALLOWED COVER OVER TOP OF UNIT SHALL BE 12 FEET (3.65 m).

CULTEC HVLV® FC-24 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL

CULTEC HVLV FC-24 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER 280HD STORMWATER CHAMBERS.

CHAMBER PARAMETERS

1. THE CHAMBERS WILL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (614 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
7. THE HVLV FC-24 FEED CONNECTOR CHAMBER SHALL HAVE 2 CORRUGATIONS.
8. THE HVLV FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2015 CERTIFIED FACILITY.

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE.

GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M).
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

CULTEC NO. 4800™ WOVEN GEOTEXTILE

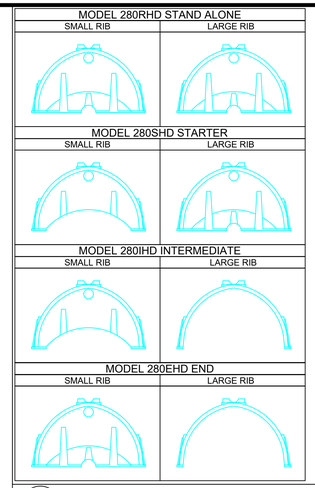
CULTEC NO. 4800 WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

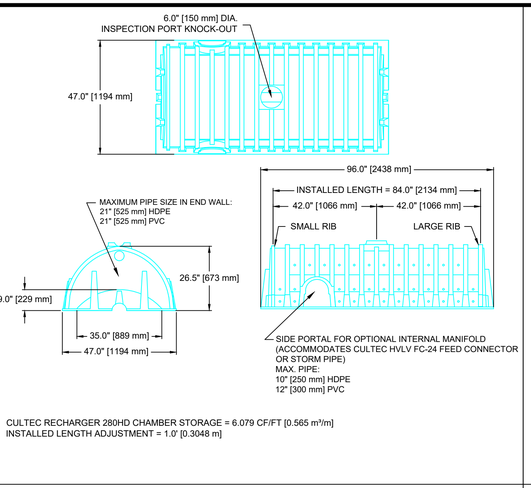
GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 550 X 550 LBS (2,448 X 2,448 N) PER ASTM D4632 TESTING METHOD.
4. THE GEOTEXTILE SHALL HAVE A ELONGATION @ BREAK RESISTANCE OF 20 X 20% PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 5,070 X 5,070 LBS/FT (74 X 74 KN/M) PER ASTM D4595 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 2% STRAIN OF 960 X 1,096 LBS/FT (14 X 16 KN/M) PER ASTM D4595 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 5% STRAIN OF 2,740 X 2, 740 LBS/FT (40 X 40 KN/M) PER ASTM D4595 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 10% STRAIN OF 4,800 X 4,800 LBS/FT (70 X 70 KN/M) PER ASTM D4595 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,700 LBS (7,560 N) PER ASTM D6241 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 180 X 180 LBS (801 X 801 N) PER ASTM D4533 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 40 US STD. SIEVE (0.425 MM) PER ASTM D4751 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.15 SEC-1 PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 11.5 GPM/FT2 (470 LPM/M2) PER ASTM D4491 TESTING METHOD.
14. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 80% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

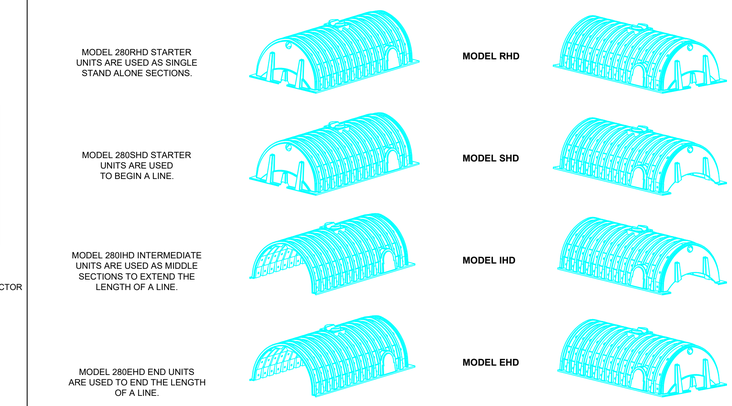
280HD 1.0

GENERAL NOTES



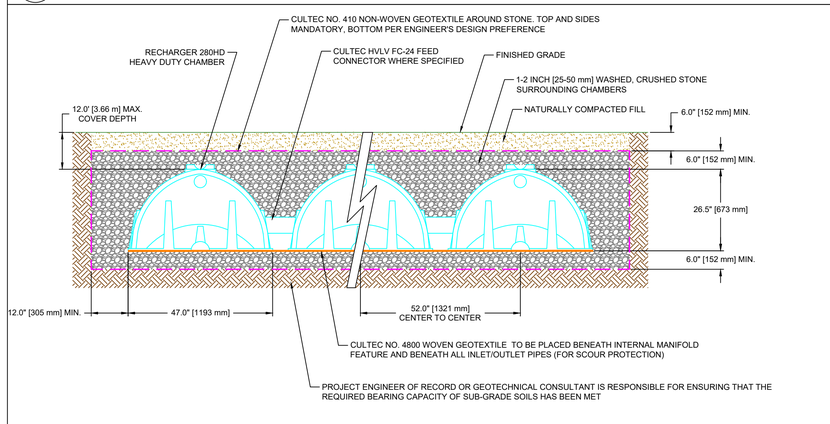


CULTEC RECHARGER 280HD CHAMBER STORAGE = 6.079 CF/FT [0.565 m³/m]
INSTALLED LENGTH ADJUSTMENT = 1.0' [0.3048 m]



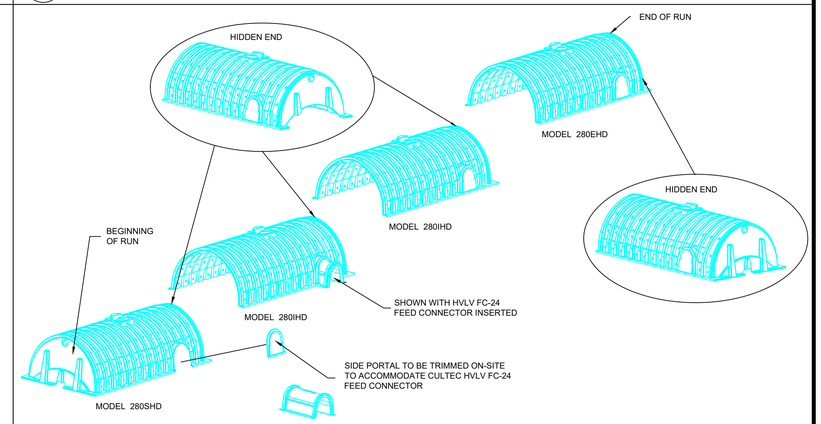
280HD 2.0

CULTEC RECHARGER 280HD HEAVY DUTY THREE VIEW



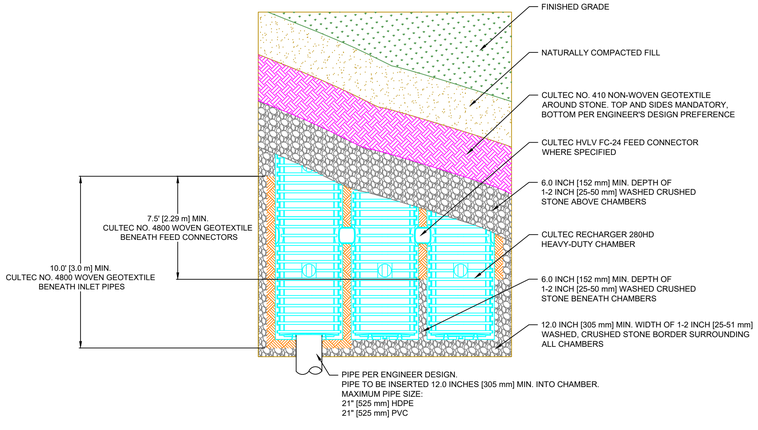
280HD 3.0

CULTEC RECHARGER 280HD HEAVY DUTY END DETAIL INFORMATION



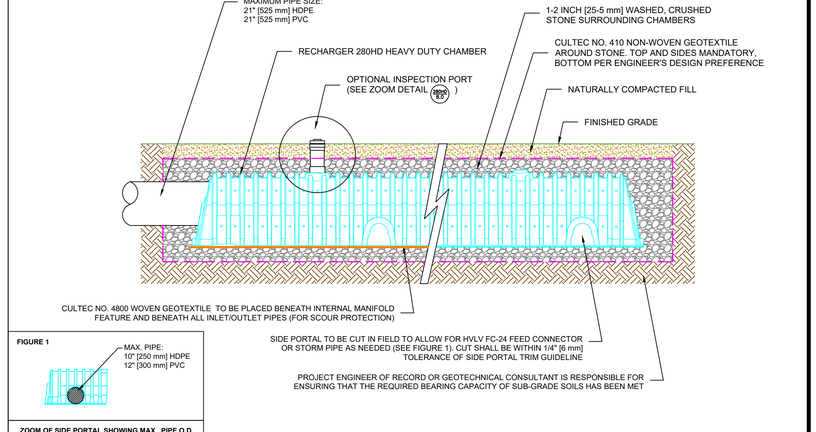
280HD 4.0

CULTEC RECHARGER 280HD HEAVY DUTY CROSS SECTION



280HD 5.0

CULTEC RECHARGER 280HD HEAVY DUTY TYPICAL INTERLOCK

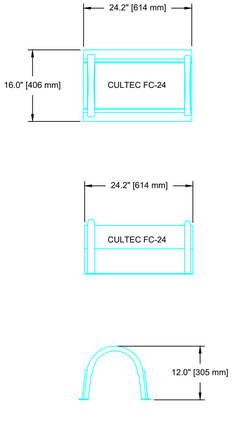


280HD 6.0

CULTEC RECHARGER 280HD HEAVY DUTY PLAN VIEW

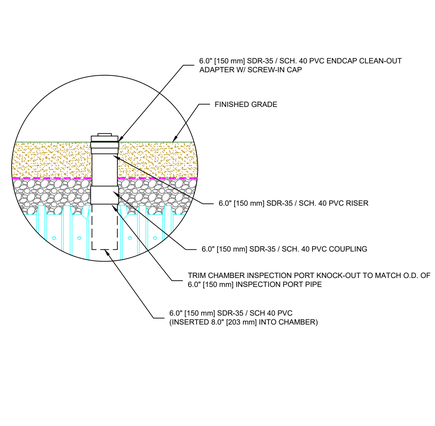
280HD 7.0

CULTEC HVLV FC-24 FEED CONNECTOR THREE VIEW



280HD 8.0

OPTIONAL INSPECTION PORT - ZOOM DETAIL



280HD 9.0

CULTEC INTERNAL MANIFOLD - OPTIONAL INSPECTION PORT DETAIL

TM
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RECHARGER 280HD
DETAIL SHEET
NON-TRAFFIC APPLICATION

CULTEC STORMWATER CHAMBER

PROJECT NO:		DATE:	2019
DRAWN BY:	CULTEC, INC	CHECKED BY:	TECH
SCALE:	N.T.S.	SHEET NO:	1 OF 1

SEPARATOR ROW™ SPECIFICATIONS

GENERAL

1. CULTEC'S SEPARATOR ROW IS USED AS AN INEXPENSIVE MEANS OF REMOVING TOTAL SUSPENDED SOLIDS FROM THE CHAMBER SYSTEM, AS WELL AS PROVIDING EASIER ACCESS FOR INSPECTION AND MAINTENANCE.

2. THE SEPARATOR ROW PERFORMANCE SHALL BE TESTED AND VERIFIED TO THE PROTOCOLS AND PROCEDURES AS DEFINED BY ENVIRONMENTAL TECHNOLOGY VERIFICATION (ETV) CANADA TO ACHIEVE 80% TSS REMOVAL.

INSTALLATION INSTRUCTIONS

A SEPARATOR ROW IS INSTALLED ON A 1-2 INCH [25-51 mm] WASHED, CRUSHED STONE BASE. TYPICALLY, THE CULTEC CHAMBER MODEL USED FOR THE SEPARATOR ROW IS THE SAME CHAMBER USED THROUGHOUT THE ENTIRE CHAMBER BED.

STORMWATER IS DISTRIBUTED TO THE SEPARATOR ROW BY A PRIMARY FEED SYSTEM THAT DIVERTS FLOW TO THE SEPARATOR ROW AND A SECONDARY BYPASS FEED SYSTEM THAT DIVERTS THE FLOW OF CLEAN WATER TO THE OTHER PARTS OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. THE DISTRIBUTION SYSTEM MAY BE BY PIPES SET AT A LOWER ELEVATION THAT PERMIT THE FIRST FLUSH TO THE SEPARATOR ROW VERSUS OTHER PARTS OF THE UNDERGROUND STORMWATER SYSTEM. THIS INITIAL FLOW MAY BE MANAGED BY A BAFFLE OR WEIR. THE SIZING OF THE PIPE(S) THAT PROVIDE STORM WATER TO THE SEPARATOR ROW IS TO BE DETERMINED BY THE DESIGN ENGINEER AND IS BASED UPON THE REQUIREMENT TO ACCOMMODATE THE DESIGN FLOW AND SERVICE CONVENIENCE.

THE CHAMBERS UTILIZED IN THE SEPARATOR ROW ARE TO BE COMPLETELY WRAPPED WITH CULTEC NO. 410 NON-WOVEN GEOTEXTILE. THIS CREATES A PASS-THROUGH FILTER ARRANGEMENT TO SEPARATE TOTAL SUSPENDED SOLIDS IN THE TRANSFER OF STORM WATER TO OTHER CHAMBERS THROUGHOUT THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM.

ONCE WRAPPED, THE SEPARATOR ROW IS TO THEN PLACED ENTIRELY OVER 1 LAYER OF CULTEC No. 4800 WOVEN GEOTEXTILE. THIS WOVEN GEOTEXTILE PROVIDES A DURABLE SURFACE WITHIN THE ROW FOR MAINTENANCE PROCEDURES AS WELL AS TO PREVENT ANY SCOURING OF THE STONE BASE DURING HIGH PRESSURE JETTING.

THE RECOMMENDED INSTALLATION OF SEPARATOR ROW CHAMBERS, IN REGARD TO STONE SEPARATION AND STONE ABOVE THE UNIT, ALONG WITH OTHER MINIMUM BURIAL, MATERIALS AND METHOD SPECIFICATIONS DETAILED FOR THE PROPER INSTALLATION, IS THE SAME AS CULTEC'S REQUIREMENT DETAILED IN THE COMPANY'S INSTALLATION GUIDELINES WITH THE EXCEPTION OF THE PLACEMENT OF THE REQUIRED FILTERING FABRICS. PLEASE REFER TO CULTEC'S CURRENT INSTALLATION INSTRUCTIONS FOR STORMWATER CHAMBERS AS A GUIDE.

MAINTENANCE PROCEDURES

CULTEC RECOMMENDS INSPECTIONS OF THE SEPARATOR ROW TO BE PERFORMED EVERY SIX MONTHS FOR THE FIRST YEAR. THE FREQUENCY OF INSPECTION CAN THEN BE ADJUSTED BASED UPON PREVIOUS OBSERVATION OF SEDIMENT DEPOSITION.

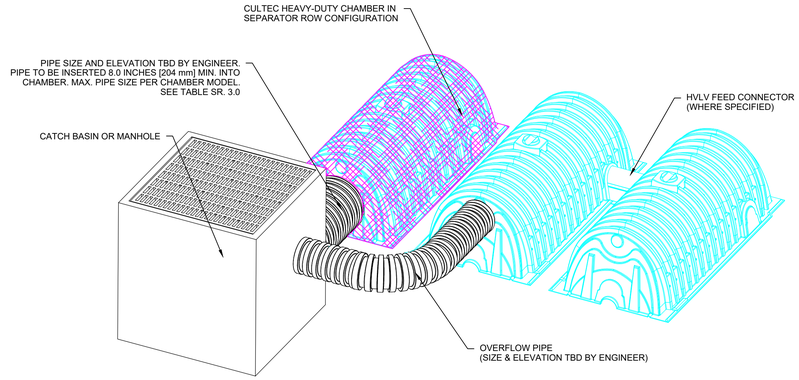
WHILE CLEANING IS POSSIBLE FROM A SINGLE MANHOLE IN SHORTER LINES, A CLEAN-OUT OPTION FROM EITHER END OF A LINE IS PREFERABLE, PARTICULARLY FOR LONGER RUNS. CLEANING INVOLVES FLUSHING SEDIMENT FROM THE BASE FABRIC OF THE SEPARATOR ROW.

ACCESS WILL BE PROVIDED VIA A MANHOLE(S) LOCATED AT THE END(S) OF THE ROW FOR CLEAN OUT.

MAINTENANCE OF THE SEPARATOR ROW IS TO BE ACCOMPLISHED WITH A JETVAC PROCESS.

THE JETVAC IS TO BE SENT DOWN THE ENTIRE LENGTH OF THE SEPARATOR ROW. AS THE HIGH PRESSURE WATER NOZZLE IS RETRIEVED, THE CAPTURED SEDIMENTS ARE PUSHED BACK INTO THE MANHOLE FOR VACUUMING.

SR 1.0 **GENERAL NOTES**

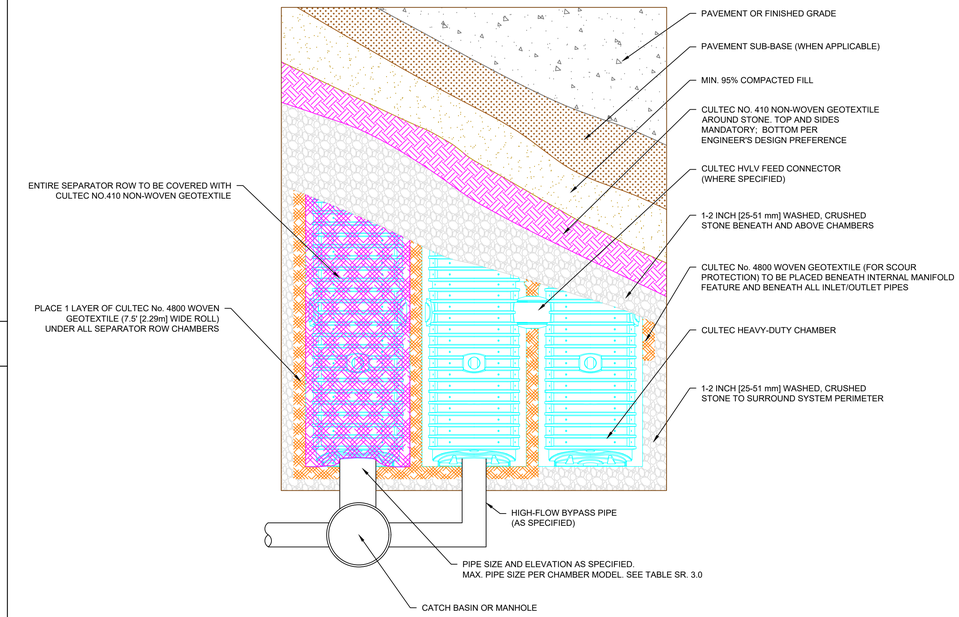


SR 2.0 **TYPICAL SEPARATOR ROW CONFIGURATION INLET CONNECTION**

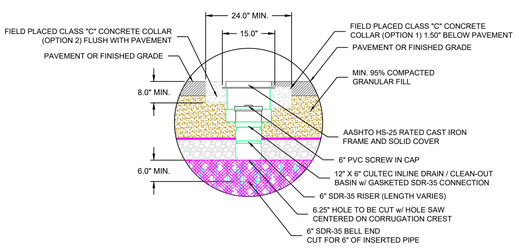
	CULTEC CHAMBER MODEL					
	DESCRIPTION	CONTACTOR 100HD	RECHARGER 150XLHD	RECHARGER 280HD	RECHARGER 330XLHD	RECHARGER 902HD
A[1]	MIN. DEPTH OF STONE BASE	6" 152 mm	6" 152 mm	6" 152 mm	6" 152 mm	9" 229 mm
B	CHAMBER HEIGHT	12.5" 318 mm	18.5" 470 mm	26.5" 673 mm	30.5" 775 mm	48" 1219 mm
C[1]	MIN. DEPTH OF STONE REQUIRED ABOVE UNITS FOR TRAFFIC APPLICATIONS	6" 152 mm	6" 152 mm	6" 152 mm	6" 152 mm	12" 305 mm
D	MIN. DEPTH REQUIRED OF 95% COMPACTED FILL FOR PAVED TRAFFIC	8" 203 mm	8" 203 mm	8" 203 mm	10" 254 mm	12" 305 mm
E	MAX. DEPTH OF COVER ALLOWED ABOVE CROWN OF CHAMBER	12' 3.65 m	12' 3.65 m	12' 3.65 m	12' 3.65 m	8.3' 2.53 m
	MAX. PIPE SIZE TO CHAMBER ENDWALL/ENDCAP	10" 250 mm	12" 300 mm	18" 450 mm	24" 600 mm	24" 600 mm

NOTE[1]: STONE ABOVE AND BELOW UNITS MAY VARY PER SYSTEM.
SEE SYSTEM LAYOUT FOR STONE REQUIREMENTS

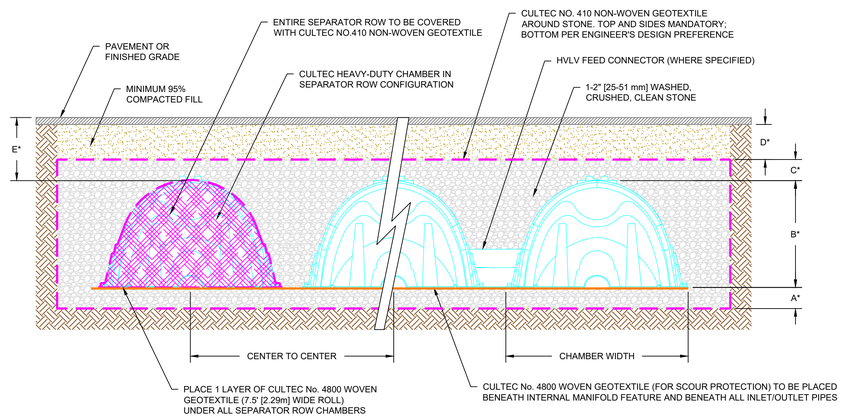
SR 3.0 **CROSS SECTION TABLE REFERENCE**



SR 4.0 **TYPICAL SEPARATOR ROW CONFIGURATION PLAN VIEW**

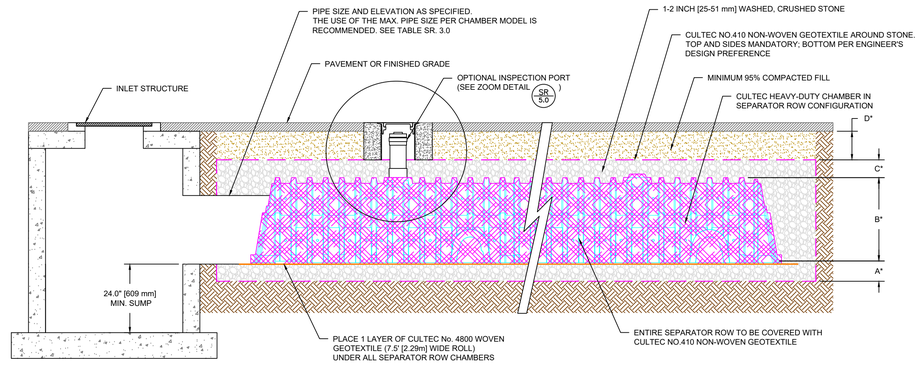


SR 5.0 **TYPICAL INSPECTION PORT - ZOOM DETAIL**



* SEE SR 3.0 - CROSS SECTION TABLE REFERENCE

SR 6.0 **TYPICAL SEPARATOR ROW CONFIGURATION CROSS SECTION**



* SEE SR 3.0 - CROSS SECTION TABLE REFERENCE

SR 7.0 **TYPICAL SEPARATOR ROW CONFIGURATION CROSS SECTION WITH INSPECTION PORT DETAIL**

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SEPARATOR ROW
DETAIL SHEET
TRAFFIC APPLICATION

SEPARATOR ROW DETAIL SHEET

PROJECT NO:	-	DATE:	08/2018
DESIGNED BY:	CULTEC, INC	CHECKED BY:	TECH
SCALE:	N.T.S.	SHEET NO:	-