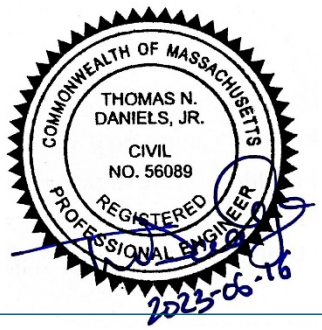
Stormwater Management Report

June 2023



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Holliston Battery Energy Storage System Project | Central Street, Holliston, Massachusetts

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ATTACHMENTS

Attachment A – Massachusetts Checklist for Stormwater Report
Attachment B – Figures, Maps, and Pre- and Post-Development Drainage Plans
Attachment C – Stormwater Calculations & Supporting Documents
Attachment D – Construction & Post Construction Stormwater Inspection Maintenance Forms
Attachment E – Stormwater Management System Long-Term Operation and Maintenance Plan

1.0 Introduction

This Stormwater Management Report has been prepared for the proposed BWC Bogastow Brook, LLC Holliston Battery Energy Storage System (BESS) Project (the Project). The Project is to be located at 600 Central Street in Holliston, Middlesex County, Massachusetts. This report has been prepared in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook.

The goals of the Stormwater Management Report are to analyze the peak rate of runoff under pre- and post-development conditions, demonstrate that post-development rate of runoff will be similar to pre-development rate of runoff, and propose stormwater management strategies to address water quantity and quality standards. This report identifies and details stormwater management pollution prevention and erosion and sediment control measures that will be used during and following completion of construction.

Overall, the proposed development is low impact, preserves existing vegetation and wooded areas to the maximum extent practicable and meets the requirements of the applicable MassDEP Stormwater Management Standards. The Massachusetts Checklist for Stormwater Report is provided in **Attachment A**.

2.0 Project Information

2.1 Project Location

The Project is located on a single 8.5-acre parcel, at 600 Central Street in Holliston, Middlesex County, Massachusetts (Project Site). The parcel is described by the Town's tax assessor as Tax Map 9, Lot 4-62. The Project Site is currently occupied by a church and associated parking lot in the southwestern portion of the site. The remainder of the Project Site is primarily wooded lands. The Project Site is located within the Agricultural-Residential District B, Wellhead Protection Area Zones 1a and 3, and MassDEP Approved Zone II.

2.2 Proposed Battery Energy Storage System (BESS)

The proposed BESS is to be located in the central portion of the Project Site. This area is currently forested and located to the north of the church. The Project Area will be accessed via a proposed gravel access drive that will extend from the existing church parking lot. The proposed gravel access drive will terminate at the location of the BESS where an emergency vehicle turnaround will be provided. The BESS is comprised of a fenced-in facility with 30 battery units housed in 5'x8' containers and four equipment pads with inverters and auxiliary equipment. The total Project Area that is expected to be disturbed by construction activities is 1.5 acres which consists of the fenced-in facility, the gravel access drive, underground electrical conduit runs, and overhead electric line corridor. All work will take place within property limits.

2.3 Surface Water On or Abutting the Project Site

TRC conducted a reconnaissance of the Project Site in January 2021 to determine the presence or absence of wetland resources located within and surrounding the proposed Project Area. No wetlands were delineated within the Project Site but there are MassDEP mapped wetlands on abutting properties as depicted in the civil design drawings. There are no impacts to wetlands resources or buffer zones proposed.

2.4 Downstream Waterbodies

Runoff from the Project Area drains predominantly to Bogastere Swamp which lies to the east. Bogastere Swamp discharges to Bogastow Brook followed by the Charles River which eventually drains into the Atlantic Ocean. The entire Project Site is located within the Charles River Basin watershed. The associated segment of Charles River is classified as Class B waters per 314 CMR 4.00 Division of Water Pollution Control and the Bogastow Brook is identified as Segment MA72-16, Category 4a waters per the Massachusetts Year 2016 Integrated List of Waters with the following identified for total maximum daily loads (TMDLs): E. Coli and Fecal Coliform. Impacts to wetlands and watercourses by the proposed development will be avoided.

2.5 General Topography

A map of the Project Site boundaries overlaid on a USGS 7.5-minute topographic quadrangle map is included as **Figure 1** in **Attachment B**. A topographic survey at 2-foot contours was performed by Land Planning, Inc. in January of 2022 and is the basis of the civil design drawings.

Existing topography generally slopes east and north within the area of the proposed development. The majority of the Project Site drains north and east to the Bogastere Swamp.

Under post-development conditions, overall drainage patterns and will generally remain the same. Changes to grades will take place within the Project Area as follows:

- A gravel access drive and turnaround will be constructed to allow site maintenance and emergency vehicles to access the BESS facility.
- Localized grading will be performed to provide a generally level surface and positive drainage within the BESS facility. An existing slope to the north of the facility will be regraded to 2.5H:1V and stabilized with rip rap.
- A stormwater basin will be constructed to manage stormwater runoff, attenuate peak discharges, exfiltrate the required recharge volume, and treat the required water quality volume.

Earthwork will be balanced to the maximum extent practical. No earth material is anticipated to be exported from the Project Site.

2.6 Flood Plain

The Federal Emergency Management Agency (FEMA) maintains materials developed to support flood hazard mapping for the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Town of Holliston, Massachusetts, panel number 25017C0634E, effective June 4, 2010 is provided in **Attachment B**. The actual flood zone limit was located by a professional land surveyor, Land Planning, Inc. in November of 2022, as depicted in the civil design drawings. The 100-year flood zone intersects the far northeastern corner of the Project Site but the entire Project Area is located outside the 100-year flood zone according to The proposed development will not impact flood storage or habitat function of any on-site or off-site receptors.

2.7 Alterations to Natural Drainage Ways

Construction of the proposed Project will not alter natural drainage ways. Overall, the proposed development design gives preference to existing and natural drainage patterns.

2.8 Alterations to Land Cover Within Watershed

The location of the proposed development consists primarily of wooded lands with a portion of the Project Site developed in the southwestern corner where there is an existing church and associated parking lot. The Project Site is surrounded by residential development to the north, west, and south.

During construction, ground disturbance will be minimized as much as possible and will only occur for the installation of the BESS facility, electrical conduit runs, gravel access drive with turnaround, and security fence. Disturbed areas will be revegetated, unless otherwise stabilized. Some tree clearing is required for the proposed development. The church's existing paved parking lot will be used for contractor parking, material laydown, and storage throughout the duration of construction.

Based on initial consultation with the Town of Holliston the following project items will be considered as impervious surfaces for the purposes of stormwater management treatment system sizing and design: gravel access drive with turnaround, crushed stone aggregate surface within the BESS facility overlain by the 30 battery unit containers, and four concrete equipment pads. Impervious surfaces within the watershed are increased by approximately 0.32 acres and about 1.3 acres of clearing is proposed. The table below provides a summary of land cover changes as represented by the composite runoff curve numbers (CNs) within the assessed watershed:

Table 2.1. Pre- and Post-Development Land Cover Changes

LAND COVER CHANGES				
Subcatchment ID	**Pre-Development Conditions**		**Post-Development Conditions**	
	CN	**Area (Ac.)**	**CN**	**Area (Ac.)**
1S	84.7	1.596	84.7	1.596
2S	32.8	5.840	37.2	5.840
Combined	**43.9**	**7.435**	**47.4**	**7.435**

As shown in the table, changes to the land cover between pre- and post-development conditions within the delineated watershed are minimal with a small increase in the composite CN. A summary of the land cover types and CNs for the pre- and post-development subcatchments are provided in **Attachment C**.

3.0 MassDEP Stormwater Management Standards

The required documentation and computations have been provided for the MassDEP Stormwater Management Standards as follows:

3.1 Standard 1: No Untreated Discharges or Erosion to Wetlands

In accordance with Standard 1 of the Massachusetts Stormwater Handbook, there will be no new untreated discharges or erosion to wetlands or waters of the Commonwealth. The proposed development does not include any new outlets, outfalls, or structures that discharge runoff from the Project Site directly to wetlands or natural resource areas. Stormwater runoff from impervious areas will be treated on-site and will not be directly discharged to wetlands or natural resource areas. Prior to any earth-disturbing activities, perimeter sediment controls will be installed around the limits of disturbance. During Site preparation and construction activities, sediment will be intercepted by sediment controls before reaching the adjacent receptors. New impervious surfaces proposed for the Project will consist of the gravel access drive with turnaround, and aggregate surface within the BESS facility overlain by the battery unit containers and equipment pads. Upon completion of construction activities, any disturbed areas of the Project Site will be revegetated, unless otherwise stabilized, such that runoff will not result in channelized flow from the developed areas and will not cause erosion in wetlands or waters of the Commonwealth. The vegetation will also serve as a vegetated filter strip, attenuating stormwater runoff further and providing a measure of Total Suspended Solids (TSS) treatment.

3.2 Standard 2: Peak Rate Attenuation

In accordance with Standard 2, post-development peak discharge rates are generally the same as pre-development peak discharge rates. In support of this standard, a runoff analysis was completed as detailed in Section 4 of this report. The results of the analysis and assessment of any stormwater runoff quantity control measures are provided in Section 5.

3.3 Standard 3: Stormwater Recharge

In accordance with Standard 3, loss of annual recharge of groundwater was eliminated or minimized through the use of infiltration measures. The necessary computations associated with this requirement are provided in Section 6 of this report.

3.4 Standard 4: Water Quality

In accordance with Standard 4, stormwater management systems were designed to remove 80% of the average annual post-construction load of TSS with at least 44% of TSS removed in pretreatment. The necessary computations associated with this standard are provided in Section 6 of this report.

3.5 Standard 5: Land Uses with Higher Potential Pollutant Loads

The proposed development is not a land use with higher potential pollutant loads. Source control and pollution prevention will be implemented in accordance with the proposed Stormwater Management System Long-Term Operations and Maintenance Plan, to eliminate untreated off-site discharge of stormwater and associated TSS impacts. A Stormwater Pollution Prevention Plan (SWPPP) will be developed as part of the required National Pollutant Discharge Elimination System (NPDES) permitting process. TRC consulted with the US EPA Region 1 office in May 2023 and confirmed that the proposed development would not require a NPDES Multi-Sector General Permit under.

3.6 Standard 6: Critical Areas

The Project Site is located in MassDEP Approved Zone II and in an area of rapid infiltration (greater than 2.4 inches/hour) and therefore is considered a Critical Area. The proposed stormwater best management practices (BMPs) will generally maintain the existing flow conditions at the Project Site and serve to treat stormwater discharges from new impervious areas associated with the Project. The appropriate setbacks from the wetlands and other resource areas have been incorporated into the design drawings. Long-term source control and pollution prevention measures are discussed in Section 9 and will be further detailed in the SWPPP.

3.7 Standard 7: Redevelopment

In accordance with Standard 7, the Project will comply with the other requirements of the Stormwater Management Standards and improve existing conditions.

3.8 Standard 8: Construction Period Controls

In accordance with Standard 8, a plan to control construction-related impacts will be developed by the BESS installation contractor in coordination with TRC to identify potential construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities. Land disturbance and construction activities will be implemented in a manner that limits off-site TSS transport through the installation of silt fencing and other necessary erosion control measures downgradient of the limit of disturbance. A Notice of Intent seeking permit coverage under a NPDES construction stormwater permit will be submitted to the

Environmental Protection Agency prior to Project Site preparation and land disturbance. As a requirement of the NPDES permit, a SWPPP will be prepared to comply with the requirements of Standard 8. The SWPPP will address stormwater management activities necessary during land disturbance and construction, including source control and pollution prevention measures, BMPs to address erosion and sedimentation, stabilization measures, and procedures for operating and maintaining the BMPs. The SWPPP will also include a schedule for sequencing construction and stormwater management activities that minimize land disturbance and expedite restoration activities. The construction sequence will begin with the installation of sedimentation barriers, the construction entrance and any additional erosion and sediment BMPs. Once the temporary BMPs are in place, the installation of the BESS will commence. A temporary stabilized construction entrance will be installed at the Project Site entrance. Disturbed areas (if any) will be stabilized with straw mulch and seeded. After final stabilization has been achieved, temporary erosion and sediment control BMPs will be removed. Construction sequence and erosion and sediment control measures are discussed in Sections 7 and 8 and will be further detailed in the SWPPP.

3.9 Standard 9: Operation and Maintenance Plan

In accordance with Standard 9, a preliminary Stormwater Management System Long-Term Operation and Maintenance Plan to ensure that stormwater management systems function as designed has been prepared and can be found in **Attachment E**. The stormwater management system BMPs will be maintained by BWC Bogastow Brook, LLC. The proposed stormwater features are located entirely on lands that are or will be under control of and will be maintained by BWC Bogastow Brook, LLC for the entire lifecycle of the Project. The plan will be finalized prior to operations.

3.10 Standard 10: Illicit Discharges to Drainage Systems

Stormwater management system operation and maintenance will be performed according to the Long-Term Operation and Maintenance Plan and all specified pollution prevention measures will be implemented as needed to prevent illicit discharges. In the post-development condition, stormwater will generally maintain the existing on-site flow conditions generated during 2,10, and 100-year, 24-hour design storms, for all drainage areas. The BESS facility, including the proposed infiltration basin, will be surrounded by fencing and access to the facility will be further limited by locked gates to limit the probability of illicit discharges to the Site stormwater BMPs. The Illicit Discharge Compliance Statement is provided in the Stormwater Management System Long-Term Operation and Maintenance Plan included as **Attachment E**. The illicit discharge compliance statement will be finalized and submitted prior to the discharge of any stormwater to post-construction BMPs.

4.0 Runoff Analysis

Stormwater runoff was estimated using HydroCAD, Version 10.0. HydroCAD software is based on methodologies developed by the United States Department of Agriculture Soil Conservation Service (USDA-SCS[1]), namely *Urban Hydrology for Small Watersheds*, Technical Release 55 and Technical Release 20 (TR-55 and TR-20), in combination with other hydraulic and hydrologic

[1] Now known as the Natural Resource Conservation Service (NRCS)

calculations. Based on Site-specific information including subcatchment area and slopes, hydrologic soil groups (HSGs), land cover types, and rainfall data, the program estimates inflow and outflow hydrographs for each subcatchment and performs reach and pond routing calculations. The pre- and post-development runoff analysis calculations are provided in **Attachment C**.

The hydrologic analysis for this Project consists of delineating two subcatchments for pre- and post-development conditions which contributes runoff to one analysis point. The subcatchment boundaries were determined from the existing and proposed contours. Runoff from the subcatchments were analyzed at the point of intersection of the respective longest hydrologic flow paths and either a subcatchment boundary, stormwater conveyance or Project Area boundary. The intent of the hydrologic analysis is to demonstrate that the changes in ground cover and grading resulting from the Project will not adversely affect downgradient properties or natural resources.

The Pre- and the Post-Development Drainage Plans for the proposed Project, SW1.00 and SW2.00 respectively, are included in **Attachment B**. Both plans include two-foot contours, land cover types, HSGs, subcatchment boundaries and analysis point, hydrologic flow lines, existing features, and drainage ways where applicable. The Post-Development Drainage Plans include the locations of the proposed gravel access drive, structures, and stormwater management features.

4.1 Precipitation

Design storms modeled for the pre- and post-development runoff analyses are based on rainfall data information provided by the Northeast Regional Climate Center (NRCC) and the rainfall distribution type depicted in Figure B-2 of the NRCS TR-55 manual (June 1986). The precipitation events used in the runoff analyses are 24-hour duration having a Type III distribution with return periods of 2, 10, 25, and 100 years. Rainfall depths for these events are 3.21, 4.81, 6.06, and 8.61 inches respectively. Supporting documentation is provided in **Attachment C**.

4.2 Runoff Curve Numbers

A summary of the land cover types, HSGs, and runoff curve numbers (CNs) for the pre- and post-development subcatchments are provided in the stormwater calculation package in **Attachment C**. Cover types for the impacted areas were determined from the natural resource survey and publicly available aerial imagery.

Published NRCS soils data and mapping were used to support the hydrologic assessment. The HSGs within the runoff analysis area are shown on the Pre- and Post-Development Drainage Plans included in **Attachment B**.

The CNs were selected from HydroCAD software which incorporates a complete CN lookup table based on the data developed by the NRCS and published in TR-55, based on the observed cover types and HSGs.

4.3 Time of Concentration Calculations

Times of concentration were calculated using NRCS TR-55 methodologies considering the hydrologic flow lengths, slope, land cover type, and surface roughness. The type and length of each flow line segment determining travel times in the area to be developed are indicated on the Pre- and Post-Development Drainage Plans. A maximum sheet flow length of 50 feet was used for this analysis. Shallow concentrated flow was used for portions of the flow path beyond 50 feet extending until a channel, culvert, or subcatchment boundary was encountered. For each subcatchment, the travel times were summed to determine the time of concentration, which was then input directly into HydroCAD. The calculation spreadsheets are included in **Attachment C**.

5.0 Stormwater Runoff Quantity Control

5.1 Peak Discharge Calculations

Peak discharge calculations are included in the HydroCAD output. One analysis point was assessed under both pre- and post-development conditions. Results of the pre- and post-development runoff analyses are shown and compared in the table below.

Table 5.1. Pre- and Post-Development Stormwater Runoff Analysis

ANALYSIS POINT: DP-1				
DESIGN STORM	PRE-DEVELOPMENT		POST-DEVELOPMENT	
	RUNOFF VOL. (af)	RUNOFF RATE (cfs)	RUNOFF VOL. (af)	RUNOFF RATE (cfs)
2-Year, 24-hour	0.229	1.00	0.229	0.99
10-Year, 24-hour	0.431	3.12	0.437	3.09
25-Year, 24-hour	0.661	4.40	0.669	4.41
100-Year, 24-hour	1.304	8.92	1.327	9.11

The analyses demonstrate that peak volumes and rates of runoff under post-development conditions are generally the same as those of pre-development conditions. Massachusetts Stormwater Standard 2 requires that the post-development peak discharge rate is equal to or less than the pre-development rate from the 2-year and the 10-year 24-hour storms which has been achieved for this Project as shown in Table 5.1.

Standard 2 also requires that impact of peak discharges from the 100-year 24-hour storm be evaluated. The post-development analysis reflects a 0.19-cfs and 0.023-af increase in the 100-year storm event runoff rate and volume respectively. Therefore, an assessment was carried out to determine if post-development conditions result in an increase in offsite flooding. Runoff from the Project Area drains to Bogastere Swamp which lies to the east. National Oceanic and Atmospheric Administration (NOAA) LiDAR data was utilized to evaluate a portion of Bogastere Swamp where Project Site runoff flows to. Based on this assessment, it was determined that the increased runoff volume from the proposed development would only occupy 0.012% of the Bogastere Swamp study area storage volume. The actual storage capacity of Bogastere Swamp is much larger and therefore, the increased runoff volume resulting from post-development

conditions does not increase the risk of offsite flooding. The Bogastere Swamp assessment is provided in **Attachment C**.

5.2 Stormwater Runoff Quantity Control Measures

As demonstrated above, post-development peak discharge rates are generally the same as pre-development peak discharge rates. One infiltration BMP is proposed to provide storage, attenuate peak discharges, exfiltrate the required recharge volume, and treat the required water quality volume. The plan showing these stormwater features and calculations in support of BMP sizing are provided in **Attachments B** and **C** respectively.

6.0 Stormwater Recharge and Runoff Quality Control

The proposed stormwater management system will be used to provide treatment for the water quality volume (WQV) and to maintain annual recharge to groundwater (recharge volume, RV). The treatment volumes were calculated for the BMP using the MassDEP design criteria and standards for stormwater management (Standards 3 and 4).

The annual recharge requirements and stormwater treatment will be met in post-development conditions by sizing the proposed stormwater management BMPs for the larger of the two volumes. Calculations for both standards are dependent on the impervious surfaces in post-development conditions.

Impervious surfaces associated with the proposed development, which are subject to the recharge to groundwater and stormwater treatment standards, consist of the gravel access drive with turnaround and aggregate surface within the BESS facility overlain by the 30 battery unit containers and four equipment pads. The total impervious area is 13,989 square feet.

6.1 Stormwater Recharge Volume Calculation

The intent of Standard 3 of the MassDEP Stormwater Handbook is to ensure that the infiltration volume of precipitation into the ground under post-development conditions is at least as much as the infiltration volume under pre-development conditions. Both soil investigation at the Project Site and published NRCS soils data and mapping were used to support the following calculations. Soil investigation results are provided in Section 6.6 below. The design soil used for the following calculations is a loamy sand (HSG A) and the design Estimated Seasonal High Groundwater (ESHGW) elevation is 147.5 feet.

The Simple Dynamic Method, as outlined within the Massachusetts Stormwater Handbook, was used for the recharge volume calculation. Because the Simple Dynamic Method was employed, a field-derived saturated hydraulic conductivity was not established and the Rawls infiltration rate for HSG A soils was utilized.

Under post-development conditions, the total impervious area for the purposes of this assessment is 13,989 ft^2.

$$Recharge\ Volume\ (RV) = A_{impervious} * F_{HSG\ A}$$

$A_{impervious}$ = 13,989 ft^2
F = Target Depth Factor = 0.60 inches for HSG A soils per Table 2.3.2 of Stormwater handbook

$$RV = 13{,}989 ft^2 * \frac{0.60\ in}{12\ \frac{in}{ft}} = 700\ ft^3$$

6.2 Water Quality Volume Calculation

The below calculation is based on the requirements of Standard 4 of the MassDEP Stormwater Handbook. The required Water Quality Volume equals 1.0 inch of runoff times the total impervious area:

$$Water\ Quality\ Volume\ (WQV) = \left(\frac{WQD}{12\ \frac{in}{ft}}\right) * A_{impervious}$$

$A_{impervious}$ = 13,989 ft^2
WQD = Water Quality Depth = 1 inch for discharges within a Zone II and exfiltration to soils with infiltration rate greater than 2.4 inches/hour per Equation (3) of the Stormwater handbook.

$$WQV = \left(\frac{1.0\ in}{12\ \frac{in}{ft}}\right) * 13{,}989 ft^2 = 1{,}166\ ft^3$$

WQV>RV, therefore WQV will be used in BMP sizing calculations.

6.3 BMP Sizing Calculation

Groundwater recharge and TSS removal will be provided by an infiltration BMP constructed downgradient of the proposed impervious surfaces. The Rawls rate for loamy sand (2.41in/hr) was selected as a conservative infiltration rate for soils at the Project Site.

$$Minimum\ Infiltration\ BMP\ Surface\ Area\ (A) = \frac{WQV}{D_1 + D_2 * Voids + K * T}$$

WQV = Water Quality Volume = 1,166 ft^3
D_1 = Proposed Basin Facility Depth = 3ft
D_2 = Proposed Infiltration Facility Depth = 2ft
K = Rawls Rate = 2.41 in/hr for HSG A, loamy sand per Table 2.3.3 of Stormwater handbook
T = Allowable drawdown during the peak of the storm = 2 hours per Stormwater handbook

$$A = \frac{1{,}166\ ft^3}{3ft + 2ft * 0.40 + \left(2.41\ \frac{in}{hr}\right)\left(\frac{1ft}{12in}\right) * 2\ hours} = 278 ft^2$$

The proposed infiltration BMP, as shown on the drawings, will have an area of approximately 694 ft^2 with a basin depth of 3' and infiltration trench depth of 2' for holding the WQV. The stage storage table for the infiltration basin included in the post-development HydroCAD model included in **Attachment C**, demonstrates that 4,407 ft^3 (greater than WQV) is provided below the primary outlet. Therefore, the BMP sizing is acceptable for design purposes.

An emergency spillway has been provided to manage flows from larger storm events or in the event of primary outlet failure. The estimated maximum flow velocities through the emergency spillway and into the existing vegetated downgradient area were calculated for post-development conditions for the full range of design flows up to a 100-year storm event. The calculated maximum velocities remain below the maximum permissible velocities for channels lined with vegetation, as provided in the U.S. Soil Conservation Service (SCS) 1966 *Handbook of Channel Design for Soil and Water Conservation*. The emergency spillway sizing calculations are included in the HydroCAD output in **Attachment C**.

6.4 BMP Drawdown Analysis

This analysis is performed to determine whether an infiltration BMP will drain within 72 hours. In accordance with the Simple Dynamic Method, the Rawls rate for loamy sand of 2.41 inches per hour was used to calculate the drawdown time of the proposed infiltration basin. For the purpose of the analysis, the infiltration rate was assumed to be constant and was only considered for the bottom surface. No credit is claimed for sidewall exfiltration.

$$Time_{drawdown} = \frac{Storage\ Below\ Primary\ Outlet}{K * Trench\ Bottom\ Area} = \frac{4407\ ft^3}{\left(2.41\frac{in}{hr}\right)\left(\frac{1ft}{12in}\right)(694ft^2)} = 31.6\ hrs$$

31.6hrs < 72hrs; therefore, the result is satisfactory for design purposes.

6.5 Total Suspended Solids (TSS) Calculations

The intent of Standard 4 is to provide stormwater management systems designed to remove 80% of the average annual post-construction load of TSS. As described above, the proposed infiltration BMP was sized to provide treatment of the water quality volume and meet recharge requirements for the new development impervious areas. All of the stormwater runoff generated from the impervious areas will be directed to a stormwater pretreatment facility, followed by the infiltration BMP which will provide 80% TSS removal. This removal efficiency is provided in Table TSS of Volume 1 of the Stormwater Handbook for an infiltration BMP combined with adequate pretreatment. With proper maintenance, as specified in the prepared Operation & Maintenance Plan, the proposed BMP will effectively remove 80% of the average annual TSS load for the life of the proposed BESS facility.

As the proposed infiltration BMP is located within an area of rapid infiltration (greater than 2.4 inches per hour) and within a Zone II, at least 44% of TSS is required to be removed in pretreatment prior to discharging to the infiltration BMP. As described above, all stormwater runoff from the new development impervious areas is directed to a pretreatment facility. The pretreatment facility consists of 2 sediment forebays which provides 44% of TSS removal, as provided in the TSS Removal Calculation Worksheet provided in **Attachment C**.

The required Treatment Volume for each sediment forebay equals 0.1 inch of runoff times the total impervious area:

$$Treatment\ Volume = \left(\frac{WQD}{12\ \frac{in}{ft}}\right) * A_{impervious} = \left(\frac{0.1\ in}{12\ \frac{in}{ft}}\right) * 13{,}989\ ft^2 = 117\ ft^3$$

Each sediment forebay, as shown on the drawings, will have a minimum treatment volume of greater than 117 ft^3; therefore, the pretreatment facility sizing is acceptable for design purposes.

6.6 Soil Evaluation

A competent soils professional oversaw a soil test pit investigation to determine soil conditions and depth to seasonal high groundwater at the Project Site and to verify that the assumptions used for the above calculations were appropriate.

The subsurface conditions were explored by completing two test pits on March 23, 2023 which were advanced to 8 and 6 feet below the ground surface (bgs) at TP-1 and TP-2 respectively, locations shown on the Post-Development Drainage Plan, Sheet SW2.00. The soil test pit data showed that this location is characterized by fine sand. Although the test pits were completed approximately 150 feet north of the proposed stormwater basin location, it is anticipated that the soils at the stormwater basin location are also characterized by a fine sand material. NRCS soils data indicates that the soils at the test pit locations and within the area of the proposed impervious surfaces and infiltration BMP are characterized by loamy sand (HSG A). The geotechnical investigation confirmed that the above assumptions were conservative.

Groundwater was observed between elevations of 146.5 and 147.5 feet which coincided with the ESHGW elevation based on observed redox features. The recommended design ESHGW elevation is 147.5 feet which is a large margin below the proposed bottom of the infiltration BMP, located at an elevation of 172 feet.

7.0 Construction Sequence

7.1 Project Schedule

The Project's construction will be approximately 4 months in duration. Initial work will involve tree clearing and installation of associated erosion control measures. Installation of additional erosion control and species protection measures will follow. Formal construction notice to proceed is tentatively scheduled to commence in spring 2024. As each discrete area of installation is completed, the ground surface will be stabilized, although temporary BMPs will remain in place until final stabilization occurs. Land preparation and site work is anticipated to continue through summer 2024, with the final installation of the BESS in summer 2024. Final site stabilization, testing, and commissioning is expected to be completed in fall 2024. Construction activities are expected to occur Monday through Saturday between the hours of 7:00 a.m. and 9:00 p.m. The Contractor shall sequence construction in a manner to minimize the area of disturbance contributing to a discharge point. Temporary or permanent stabilization shall be implemented as soon as possible.

Additionally, specifics of how work is completed will be based on environmental considerations associated with seasonal changes. The following dates are provided to establish a general guideline for these seasons:

- Winter: November 1 to March 19
- Mud Season: March 20 to April 30
- Spring: May 1 to June 21
- Summer: June 22 to September 21
- Fall: September 22 to October 31

7.2 Project Construction Activities Sequence

1. Schedule a pre-construction meeting that shall be attended by the qualified inspector and any involved subcontractors to discuss responsibilities as they relate to the implementation of the measures detailed in this report to avoid and minimize impacts during construction. In particular, it shall be ensured that construction activities will be phased to limit the area of disturbance at one time and that erosion and sediment controls are maintained as needed until the Project Site is stabilized.
2. Install erosion and sediment controls for clearing activities.
3. Perform clearing and grubbing during allowable timeframes and only within the footprints of the proposed fenced-in facility, access drive, and for proper placement of temporary erosion and sediment control measures.
4. Install additional erosion and sediment controls around Project Area as detailed in the drawing set and additional measures as needed.
5. Delineate soil stockpile area and establish silt fence barrier around the perimeter.
6. Construct the permanent and temporary access drives and stormwater management system (i.e., roadside ditching and stormwater treatment BMPs).
7. Perform site grading for the BESS aggregate surface and to promote positive drainage.
8. Install BESS components.
9. Carry out grading work around equipment pad, and other structures as needed, to promote positive drainage.
10. Seed and mulch disturbed areas. Install additional stabilization measures as needed.
11. Remove temporary sediment controls only after disturbed surfaces are stabilized.

8.0 Erosion and Sediment Control Plan

The following measures were developed, and will be implemented into the SWPPP, based on good engineering practices, generally accepted industry standards, applicable MassDEP stormwater management requirements and guidelines, and established practices associated with the Project Site. These temporary and permanent erosion and sediment control measures will be implemented during and after construction to minimize soil erosion and control sediment transport off-site and to control the quality and quantity of stormwater runoff from the Project Area.

This plan and the drawing set specifies the construction schedule for implementing the erosion and sediment control measures, criteria for when the measures shall be implemented, specifications for placement and installation of the measures, and a maintenance schedule.

The contractor shall use the following general measures and practices throughout construction and development of the Project:

- Erosion and sedimentation control BMPs shall be implemented prior to commencing earth disturbing activities;
- Phase construction activities as practicable to minimize the area and duration bare soils are exposed;
- Route all construction traffic through approved points of access and egress and over stabilized construction entrances;
- Only areas of active construction shall remain unstabilized or unvegetated;
- Preserve existing vegetation as much as possible;
- Protect and maintain identified buffer areas throughout construction; and
- Continuously maintain and inspect installed BMPs.

Where construction activities have permanently ceased, stabilization and protection practices shall be implemented within 7 days. Areas that will remain disturbed but inactive for at least 30 days shall receive temporary seeding or soil protection within 7 days in accordance with this plan. Areas that will remain disturbed beyond the seeding season, which is normally April 1st through June 15th and August 15th through October 1st, shall receive long-term, non-vegetative stabilization and protection sufficient to protect the Project Site through the winter. Areas that will remain unvegetated for habitat enhancement will also utilize non-vegetative stabilization measures. In all cases, stabilization and protection measures shall be implemented as soon as possible.

8.1 Temporary Measures

The following temporary erosion control BMPs are proposed and/or are likely anticipated to be needed during construction and development of the Project.

8.1.1 Construction Entrance

As indicated on the civil design drawings, construction entrances will be required at each point of ingress/egress. These features will be of significant importance at intersections with paved roads with the purpose of trapping dust and mud that would otherwise be carried off-site by construction traffic. Construction entrances shall have a minimum length of 50 feet and an appropriate width

(minimum of 12 feet) to fully contain anticipated construction vehicles. Construction entrances shall be constructed of a 6-inch-thick layer of angular crushed stone sized according to the standards set by ASTM C-33, size No. 2 or 3, underlain by a geotextile fabric. Under extremely wet conditions or during the mud season, a standard construction entrance may not be sufficient to fully remove sediment from vehicle tires and prevent tracking. In these instances, a construction entrance may either be lengthened as necessary or a wheel washing procedure shall be employed. Stabilized construction entrances shall be inspected weekly and prior to and immediately following a major storm. Tracked mud or sediment shall be removed prior to the next rain event. Roads adjacent to a construction site shall be left clean at the end of each day. Periodic replacement of the stone material may be required as sediment accumulates and fills the voids.

8.1.2 Dust Control

Measures to control creation and migration of nuisance dust shall be implemented throughout construction. Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Primary travel ways and laydown areas shall be surfaced with base gravel or coarse gravel as soon as possible to minimize the creation of dust. Traffic control shall be implemented to reduce speeds and restrict traffic. Frequently traveled surfaces shall be periodically watered to reduce dust. Wet dust suppression shall be used for any construction activity that causes airborne particulates. Water trucks may be used as needed during construction to reduce dust generated on the Project Area. Paved surfaces shall be vacuum swept when dry. The volume of water sprayed for controlling dust shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain or cause a visible oil sheen, floating solids, visible discoloration, or foaming in the receiving stream.

8.1.3 Temporary Soil Stockpile

Stockpile management for topsoil and other types of erodible soils is necessary to prevent unnecessary damage resulting from erosion of stockpile material. Stockpiles shall be located in an area that is dry and stable and away from storm drainage, wetlands, water bodies and/or courses, and steep slopes. Attempt to maximize the distance of stockpiles from wetlands, watercourses, drainage ways, and steep slopes. When the stockpile is downgradient from a long slope, divert runoff water away from or around the stockpile utilizing a temporary diversion berm or swale. Stockpiles shall have a maximum slope of 2H:1V and be completely surrounded by perimeter sediment barriers (i.e., silt fence, filter socks, etc.). Stockpiles that are not to be used within 30 days must be seeded and mulched immediately after formation of the stockpile. The seed mix used depends upon the stockpiled material and the length of time it is to remain stockpiled. After the stockpile has been removed, the area shall be graded and permanently stabilized.

8.1.4 Hay Bale Barrier

Hay bales can be used to create a temporary sediment barrier consisting of a row of entrenched and anchored bales of hay or straw. Hay bales are suitable for use below small disturbed areas where the drainage area (disturbed and undisturbed) is less than 1 acre in size or above disturbed slopes to direct surface water away from erodible areas where the drainage area (disturbed and undisturbed) is less than 1 acre in size. Hay bales are also appropriate for use where protection and effectiveness are required for less than 3 months, and where sedimentation will reduce the capacity of storm drainage systems or adversely affect adjacent areas, watercourses and other

sensitive areas. Hay bales must not be used in drainageways, except in special cases where they are applied with other measures, such as geotextile silt fences and stone check dams. Hay bales are not intended for use in streams. When installed, hay bales should be entrenched a minimum of 4 inches and anchored with 2 stakes per bale. Gaps between adjacent bales should be chinked with straw to prevent flow between the bales. Over time, hay bales will degrade and deteriorate and will require frequent inspection and periodic replacement. Due to their versatility and ability for rapid deployment during an emergency situation, it is recommended that a supply of hay bales be maintained on the Project Site at all times.

8.1.5 Silt Fence

Silt fence is a temporary sediment barrier consisting of a geotextile fabric pulled taut and attached to supporting posts and entrenched. The purpose of a geotextile silt fence is to intercept and retain sediment from disturbed areas and to decrease the velocity of sheet flows and low volume concentrated flows. Prior to the initiation of and during construction activities, a geotextile silt fence will be established along the perimeter of areas to be disturbed as a result of the construction that lies upgradient of water courses or adjacent properties. These barriers may extend into non-impact areas to ensure adequate protection of adjacent lands. Clearing and grubbing shall be performed only as necessary for the installation of the sediment control barrier. Silt fence shall be installed in an alignment that follows the contour as much as practicable. To ensure effectiveness of the sediment control barrier, daily inspections and inspections immediately after significant storm events will be performed by Project Site personnel. Inspect the silt fence at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater to determine maintenance needs. Remove the sediment deposits or, if room allows, install a secondary silt fence up slope of the existing fence when sediment deposits reach approximately one half the height of the existing fence. Replace or repair the fence within 24 hours of observed failure. Maintain the fence until the contributing area is stabilized. After the contributing area is stabilized, determine if sediment contained by the fence requires removal or regrading and stabilization. If the depth is greater than or equal to 6 inches, regrading or removal of the accumulated sediment is required. No removal or regrading is required if sediment depth is less than 6 inches.

8.1.6 Erosion Control Mix

Erosion control mix (ECM) mulch may be utilized to stabilize slopes, frozen ground, forested areas, or to provide immediate stabilization without waiting for vegetation to establish. ECM shall be placed at a minimum thickness of 2 inches on slopes of 3H:1V or flatter. Slopes steeper than 3H:1V require a minimum of 4 inches. ECM shall be evenly distributed by hand, excavator bucket, or pneumatic blower. ECM alone is not suitable in areas of groundwater seepage, converging flows, or low-lying areas where ponding is expected. ECM may be produced from stumpage and rootballs generated during clearing and grubbing activities.

8.1.7 Erosion Control Mix Berms

Erosion control mix berms shall be lightly compacted or bucket-tamped to minimize large voids within the filter media. Berms shall be a minimum of 12-inches tall and 2 feet wide. The condition of ECM berms shall be continuously monitored throughout construction and replaced or repaired as necessary.

8.1.8 Compost Filter Sock

Compost filter sock (also referred to as “Silt Sock”) can be purchased from a commercial manufacturer or field-built from nonwoven geotextile fabric and processed ECM or other finely shredded material (i.e., coconut fiber, etc.). Compost filter sock can be a useful sediment barrier for small drainage areas or where trenching for silt fence is not possible (i.e., pavement). Compost filter socks shall be installed so that complete contact with the ground is achieved across the entire length. Staking will be necessary on steeper slopes. Once stabilization is achieved compost filter socks can be cut open and the filter material can be spread in place.

8.1.9 Temporary Mulching

Temporary mulching shall be applied to areas not yet prepared for permanent stabilization but that have been or shall be inactive for a maximum of 7 days. Temporary mulching shall consist of spreading straw mulch or erosion control mix across bare soil. Erosion control blankets or other methods may be substituted for areas where temporary mulching has proven to be ineffective. Areas of temporary mulching shall be inspected weekly and before and after significant storm events (greater than 0.5 inches in 24 hours). Temporary mulch application rates shall be doubled from November 1 through April 15.

8.1.10 Temporary Seeding

In areas where soil disturbance activity has temporarily or permanently ceased, a temporary stand of grass and/or legumes by seeding and mulching soils shall be established on those areas that will be exposed for a period greater than 1 month but less than 12 months. Seeding shall commence within the first 7 days of suspending work on a grading operation that exposes erodible soils where such suspension is expected to last for 1 to 12 months. Permanent seeding shall be used in areas to be left dormant for more than 1 year.

8.1.11 Temporary Erosion Control Blankets

Erosion control blankets shall be installed on all slopes exceeding 3H:1V. Erosion control blankets provide temporary erosion protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses produced by high runoff flow velocities associated with steep slopes. Care must be taken to choose the type of blanket that is appropriate for the specific application. The success of temporary erosion control blankets is dependent upon strict adherence to the manufacturer’s installation recommendations.

8.1.12 Temporary Diversions

Temporary diversions (swales) shall be used to divert off-site runoff around the constructi on-site, divert runoff from stabilized areas around disturbed areas, and direct runoff from disturbed areas into sediment traps. Temporary diversions shall be used where the drainage area at the point of discharge is 5 acres or less.

8.1.13 Stone Check Dams

Stone check dams may be necessary in existing or proposed upland swales and ditches to reduce flow velocity and promote sedimentation prior to final discharge of runoff. Reduction in flow

velocity will serve to reduce rilling in flow paths and promote establishment of vegetation. Check dams shall be spaced so that the top of the downgradient check dam is at the same elevation as the toe of the preceding check dam. Stone check dams shall be inspected at least once a week and within 24-hours of a storm event with a rainfall amount of 0.5 inches or greater. Damage shall be repaired upon discovery. If significant erosion has occurred between structures, a liner of stone or other suitable material shall be installed in that portion of the channel. Sediment accumulated behind the stone check dam shall be removed when sediment deposits reach approximately half the height of the check dam. Stones shall be replaced as needed to maintain the design cross section of the structures. The maximum height at the center of the check dam shall be 3 feet.

8.1.14 Dewatering

Dewatering shall be used, as necessary, to intercept sediment-laden stormwater or pumped groundwater and allow it to settle out of the pumped discharge prior to being discharged from the Project Site. Water from dewatering operations shall be treated to eliminate the discharge of sediment and other pollutants. Water resulting from dewatering operations shall be directed to temporary sediment traps, or dewatering devices, such as a Dewatering Bag or an approved equivalent. Temporary sediment traps and dewatering bags shall be provided, installed, and maintained on upland locations. No discharge of dewatering wastewater(s) shall contain or cause a visible oil sheen, floating solids, or foaming in the receiving water.

8.2 Permanent Measures

The following permanent erosion control BMPs are proposed to be used during construction and shall remain in-place after Project completion and be maintained throughout operation of the facility.

8.2.1 Permanent Seeding

Disturbed areas that will be vegetated must be seeded in accordance with the civil design drawing set. The type of seed, mulch, and maintenance measures are described in the drawings. Do not used permanent seeding on slopes steeper than 2H:1V. All areas at final grade must be seeded and mulched within 7 days after completion of construction activities. All seeded areas should be protected with mulch. Inspect seeded area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inches or greater during the first growing season. In the event seed does not grow, re-seed and re-mulch. If the cause was the result of wind, re-apply seed and mulch, and apply mulch anchoring. If the cause was concentrated water, install additional measures to control water and sediment movement, repair erosion damage, re-seed and re-apply mulch with anchoring or use Temporary Erosion Control Blanket measure and/or Permanent Turf Reinforcement Mat measure. If there is no erosion, but seed survival is less than 100 plants per square foot after 4 weeks of growth, re-seed as planting season allows. Continue inspections until at least 100 plants per square foot have grown at least 6 inches tall or until the first mowing.

8.2.2 Permanent Turf Reinforcement

Permanent turf reinforcement mats (TRMs) provide long-term erosion protection and vegetation establishment assistance while permanently reinforcing vegetation. TRMs shall be installed on all slopes exceeding 3H:1V and in channels where design flows exceed the stability of the soils

and/or proposed vegetation. Care must be taken to choose the type of turf reinforcement that is appropriate for the specific application. Success is dependent upon strict adherence to the manufacturer's installation recommendations.

Care must be taken to choose the type of blanket that is appropriate for the specific application. The success of temporary erosion control blankets is dependent upon strict adherence to the manufacturer's installation recommendations.

8.2.3 Gravel Drives

Drives shall be constructed with a crown or super-elevated as indicated on the design drawings to ensure runoff is delivered immediately to adjacent stabilized areas. Roadways shall be aligned in general conformance with those shown on the design drawings and constructed of specified aggregate base and subbase materials. At a minimum, permeable road base (rock sandwich) shall be constructed in sections of the drive indicated in the civil design drawing set; however, additional sections may be added dependent on encountered site conditions. Roadways shall be inspected for rutting, washboarding, and other signs of erosion. Installation of water bars, french drains, or other features may be necessary depending on conditions observed in the field and as directed by the Engineer during construction.

8.2.4 Level Spreader

The existing development stormwater discharge shall turn-out in the location noted on the civil design plans and discharge to a stone-bermed level spreader to convert runoff to sheet flow prior to discharging to undisturbed vegetated areas. Stone berms shall be at least 20 feet in length and constructed along the contour. Level spreaders shall be inspected for failures following heavy rainfall and repaired as necessary to mitigate newly formed channels or gullies. Bare spots or displaced riprap should be corrected where identified. Trash, leaves, and/or accumulated sediments should be removed and woody or other undesirable growth should be controlled. Temporary or permanent checkdams at the level spreader inlet may be necessary depending on conditions observed in the field and as directed by the Engineer during construction.

8.2.5 Stormwater Pretreatment Facility and Infiltration BMP

Two sediment forebays and infiltration BMP (infiltration basin with infiltration trench) shall be constructed in accordance with the design drawings to provide adequate stormwater recharge and water quality treatment. During construction, the location for these BMPs shall be isolated to prevent heavy equipment from compacting the soil and adversely affecting the performance of the BMPs. Diversion berms or staked and lined hay bales around the perimeter of the basin shall be implemented during their construction. Light earth-moving equipment shall be used to excavate the basin and excavated materials should be placed downstream of the BMPs. Drainage shall be diverted away from these BMPs until the contributing drainage area is fully stabilized.

8.3 Erosion Control Measure Removal

The removal and disposal of erosion and sedimentation control measures shall be the responsibility of the Contractor. BMPs shall remain in-place until a minimum of 90% cover of vegetation has been achieved or other permanent measures of stabilization are installed (i.e., rip rap, ECM, etc.). Sediment trapped in front of perimeter sediment barriers shall be spread within

an area undergoing final grading and distributed in a uniform manner conforming to local topography, and then seeded and mulched. Erosion control berms and compost filter socks may be demolished, and the erosion control mix filter media may be evenly distributed across the adjacent areas.

8.4 Overwinter Construction

The following general practices and procedures should be utilized during any construction occurring over the winter season and through April 15:

- Exposed areas should be limited to those where work will occur within the next 14 calendar days;
- Exposed areas should not exceed the limit of what can be mulched in one day (prior to predicted precipitation);
- At the end of each construction day, areas that have been brought to final grade must be stabilized; Where frozen ground prevents installation of silt fence or ground penetrating sediment barriers, the Contractor shall request an appropriate detail modification from the Engineer;
- Permanent seeding shall not be attempted, unless a dormant seeding application method is approved by the Engineer;
- All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers; and
- All vegetated ditch lines that have not been stabilized by November 1, or will be worked on between November 1 and April 15, must be stabilized with stone lining backed by gravel bed or geotextile as specified by the Engineer.

8.5 Housekeeping

As an authorized agent of the Applicant, the Contractor shall maintain the Project Site in accordance with the following performance standards and housekeeping practices:

Spill Prevention: Controls shall be in place to prevent pollutants from being discharged from materials used and stored on-site. Appropriate controls include, but are not limited to, proper storage practices that minimize exposure of materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

Groundwater Protection: During construction, the Contractor may not store or handle liquid petroleum products and other hazardous materials with the potential to contaminate groundwater in areas of the Project Site draining to an infiltration area or within 100 feet of a critical resource area or stream. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the Project Site for the purposes of storing and handling liquid hazardous materials.

Fugitive Sediment and Dust: During construction, the Contractor shall take the necessary actions to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive. Oil may not be used for dust control. The Contractor shall monitor vehicles entering and exiting the Project Site for evidence of tracking mud onto public or private roadways outside the

work area. If necessary, the Contractor shall provide a means for sweeping and cleaning road areas experiencing tracking. If off-site tracking occurs on public roads, they should be swept immediately and no less than once a week and prior to significant storm events. During the mud season, it may be necessary to increase the size of stabilized construction entrances or provide a wheel washing station.

Debris and Other Materials: The Contractor shall manage litter, construction debris, and construction chemicals exposed to stormwater to prevent materials from becoming a source of pollution.

Non-Stormwater Discharges: The Contractor shall identify and prevent contamination by unauthorized non-stormwater discharges. Unauthorized stormwater discharges include, but are not limited to, wastewater from concrete washout, fuels or hazardous substances, and detergents used in vehicle and equipment washing.

8.6 Inspection and Maintenance

The Contractor shall bear the responsibility of installation, maintenance, and day-to-day monitoring, repair, and replacement of erosion and sedimentation control measures throughout the entire duration of the Project. It is the responsibility of the Contractor to ensure installed measures are effective and functioning as designed. Inspections may indicate additional or more substantive measures are required.

At a minimum, inspections shall be conducted weekly and within 24 hours of a significant rain event (greater than 0.5 inches in 24 hours). Inspections shall be documented in site inspection reports that are kept on the Project Site at all times. An example inspection report template is provided as **Attachment D**. A copy of the site inspection reports shall be retained by BWC Bogastow Brook, LLC for a period of at least three years from the completion of permanent stabilization.

Presence of a third-party inspector does not relieve the Contractor of inspection and reporting responsibilities.

8.7 Erosion and Sedimentation Control Conclusion

In the event that a situation arises that is not specified above or depicted on the civil design drawings, the Contractor shall follow the guidance of “Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas” (Rev. May 2003) and the Volume 2 Chapter 2 of the Stormwater Handbook. If the Project is phased and constructed in accordance with the specifications and requirements of the civil design drawings and basic standards listed above, the Project will not result in significant erosion or sedimentation.

9.0 Post-Construction Stormwater Maintenance Plan

The Project will be owned, operated, and maintained solely by BWC Bogastow Brook, LLC. During construction, the Project Site will be periodically inspected by a qualified engineer or professional (PE, CPESC, or similar specialist) to ensure the work is being conducted in accordance with the civil design drawings and the erosion and sedimentation control plan, and

that applicable features are functioning as designed. Once permanent stabilization is achieved, the Project will be operated by a qualified maintenance representative who will be responsible for inspection and maintenance of the entire grounds and stormwater management features. The following maintenance requirements are provided in the Stormwater Management System Long-Term Operation and Maintenance Plan included as **Attachment E**.

9.1 Facilities to be Maintained

The stormwater management features to be maintained at the Project include:

- Access Drive;
- Stormwater Pretreatment Facility and Infiltration BMP;
- Level Spreader; and
- Revegetated Areas and Embankments.

9.2 General Inspection and Maintenance Requirements

Generally, the proposed facility will be operated and maintained in a manner consistent with good utility practices, including a minimum of bi-annual on-site inspections and maintenance of stormwater management system components, as needed. A post-construction maintenance and inspection log will be completed as part of the quarterly on-site inspections, refer to **Attachment D** for a template of this inspection log. A copy of the log shall be retained by BWC Bogastow Brook, LLC for a period of at least five years from the completion of permanent stabilization.

Potential maintenance activities associated with specific areas and stormwater management features at the facility are discussed in the following paragraphs.

9.3 Access Drive

The access drive will typically require little ongoing maintenance, owing to their primary and limited use by light-duty vehicles. These areas will be inspected for signs of existing or developing erosion, rutting, trash or unwanted vegetation which will be removed/repaired as needed. Additionally, shoulders shall be inspected for low spots or evidence of channelized flow and false ditching. Repair/maintenance shall be completed as necessary to ensure runoff from the roadways is conveyed as sheet flow to the downgradient stabilized areas.

9.4 Stormwater Pretreatment Facility and Infiltration BMP

The two sediment forebays (including underdrain outlets into first sediment forebay) and infiltration BMP (including associated emergency spillways, outlet structures, culverts, outlet protection and plunge pools) shall be inspected periodically, at least twice a year and after major rain events. They will be inspected for evidence of erosion, sediment accumulation, outlet structure obstructions, debris, or other conditions that may present operational difficulties. Overall condition of the culvert barrel sections shall be assessed for signs of damage, heaving, settlement, deflection, or other structural damage. BMPs shall be cleaned, as needed, by removing accumulated sediment, trash, debris, leaves, grass clippings from mowing, and tree seedlings before they become firmly established. The sediment forebays shall have sediment markers to determine the height of sediment accumulation. After removing the sediment, replace any vegetation damaged during the clean-out by either reseeding or resodding. When mowing

grasses in the sediment forebays, keep the grass height no greater than 6 inches and set mower blades no lower than 3 to 4 inches. Mowing of the infiltration basin will be limited to twice per year to ensure a healthy grass cover is present. Weeding, pruning, and removal of woody growth on basin embankments shall be completed as necessary.

If there is water ponding on the surface of the infiltration trench, even after removal of visible sediment and debris, the sand filter material shall be replaced. If there is water ponding inside the basin as observed in the observation well (even after a 72-hour drawdown period following a storm), it may be an indication that the bottom of the basin has failed. To rehabilitate the basin, all accumulated sediment must be stripped from the bottom, the bottom of the basin must be scarified and tilled to induce infiltration, and all stone aggregate and filter fabric must be removed and replaced.

9.5 Level Spreader

The level spreader and stone berm should be inspected in the spring and fall of each year and following major storm events (25-year 24-hour storms). Newly formed channels or gullies at the inlet or outlet of the stone berm should be repaired. Bare spots or signs of stressed vegetation should be re-seeded or re-sodded as necessary. Trash, leaf litter, debris, and sediment accumulating in the level spreader or against the stone berm should be removed. Mowing should be limited to a minimum height of 6 inches and any signs of woody vegetation growth should be removed.

9.6 Revegetated Areas and Embankments

Revegetated areas and embankments will be inspected quarterly. Any signs of erosion, inadequate revegetation, rip-rap displacement, or woody growth will be corrected as needed.

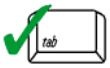
Attachment A: Massachusetts Checklist for Stormwater Report

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.

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

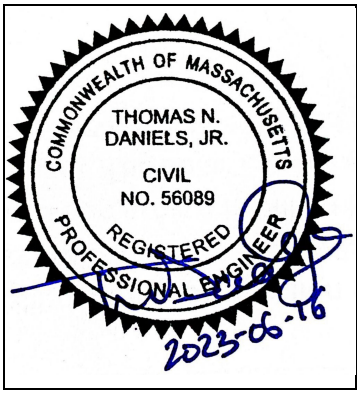
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



June 16, 2023
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.

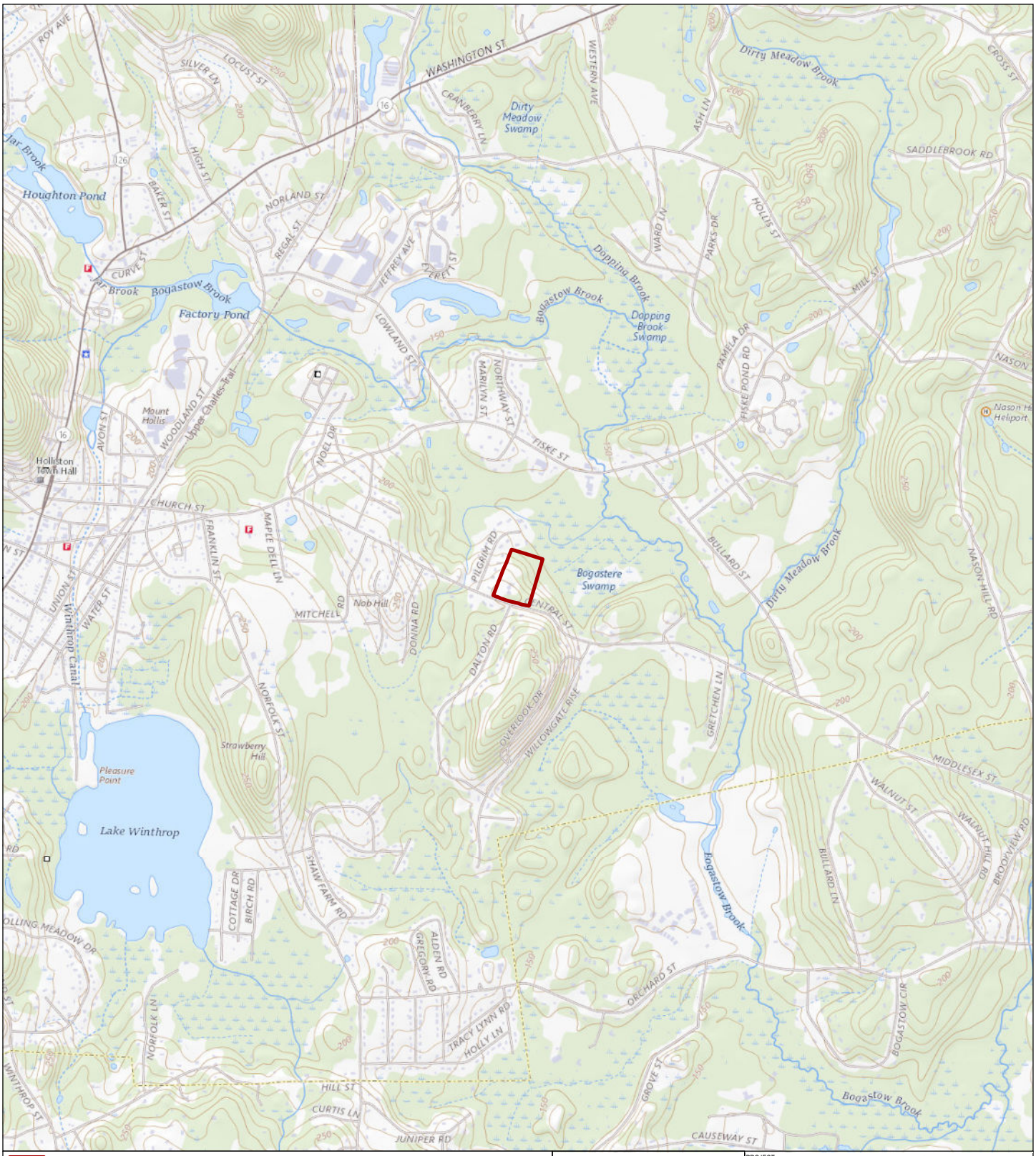
Standard 10: Prohibition of Illicit Discharges

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

☐ An Illicit Discharge Compliance Statement is attached;

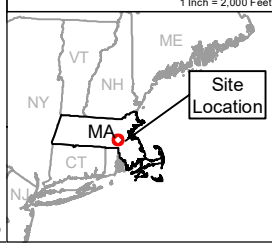
☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Attachment B: Figures, Maps, and Pre- and Post- Development Drainage Plans



0 1,000 2,000
Feet
1:24,000
1 Inch = 2,000 Feet

N



Base Map: USGS Topo Map

PROJECT:
BLUEWAVE
BATTERY STORAGE - HOLLISTON

TITLE:
LOCATION MAP
HOLLISTAN, MA

DRAWN BY:	S. MOTURI	PROJECT NO:	4125899.0000.0001
CHECKED BY:	S. TRACY		
APPROVED BY:	S. TRACY		**FIGURE 1**
DATE:	JUNE 2022		

TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
(978-970-5600)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' National North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland zone (FIPSZONE 2001), meters. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs. This information was derived from digital orthophotos produced at a scale of 1:5,000 from aerial photography dated April 2005.

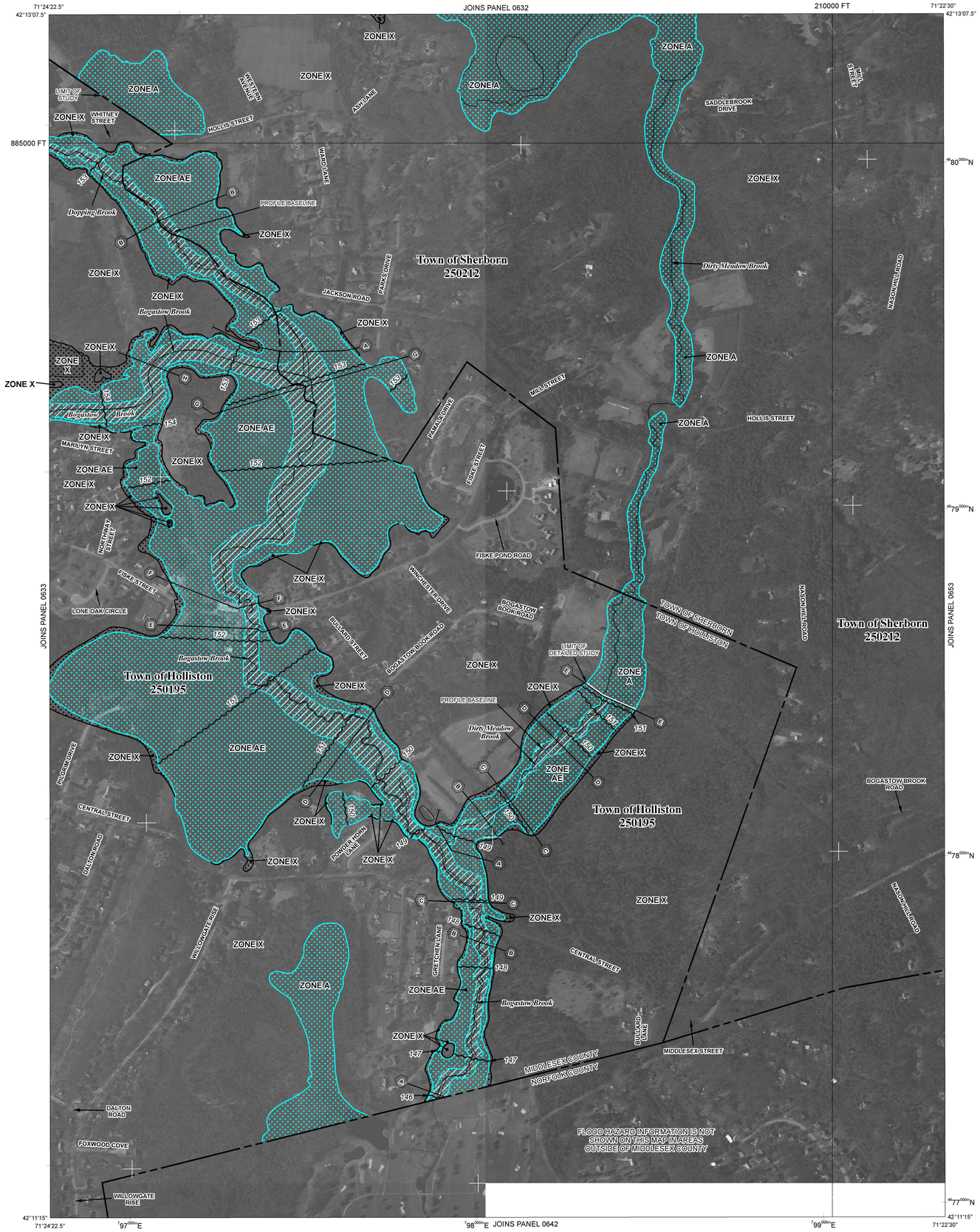
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4676000mN — 1000-meter Universal Transverse Mercator grid values, zone 19
- 600000 FT — 5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPSZONE 2001), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0634E

FIRM

FLOOD INSURANCE RATE MAP

MIDDLESEX COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 634 OF 656
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HOLLISTON, TOWN OF	250195	0634	E
SHERBORN, TOWN OF	250212	0634	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25017C0634E

EFFECTIVE DATE
JUNE 4, 2010

Federal Emergency Management Agency

Custom Soil Resource Report
Soil Map

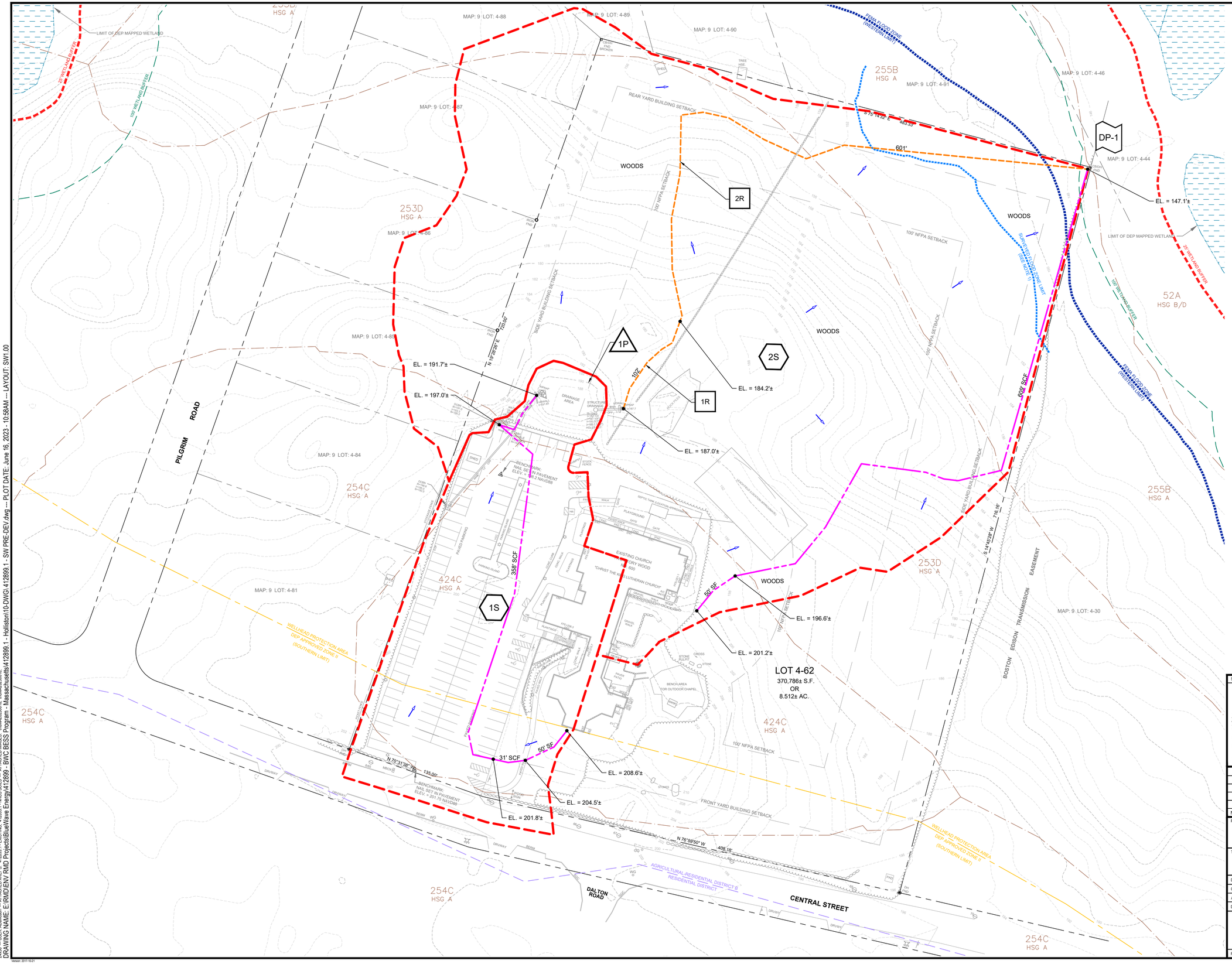
Map Scale: 1:4,740 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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



LEGEND

- 1S — SUBCATCHMENT
- 1R — REACH
- 1P — POND
- DP-1 — ANALYSIS POINT
- SURVEYED PROPERTY BOUNDARY
- TC FLOWPATH
- REACH FLOWPATH
- SUBCATCHMENT BOUNDARY
- 253D HSG A — NRCS SOILS DATA
- STORMWATER RUNOFF FLOW DIRECTION

GENERAL NOTES

1. FEMA FLOOD MAPS DEPICT A BASE FLOOD ELEVATION OF 151 FEET. ACTUAL FLOOD ZONE LIMIT CONFIRMED BY SURVEYOR AS SHOWN IN PLAN.
2. WETLAND PROTECTION AREA DEP APPROVED ZONE III ENCOMPASSES FULL PROJECT SITE.
3. THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MASSACHUSETTS STATE PLANE (US SURVEY FEET, MAINLAND ZONE, MA83F). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
4. PROJECT PROPERTY BOUNDARIES AND SITE TOPOGRAPHIC INFORMATION ARE BASED UPON ON-THE-GROUND FIELD SURVEY COMPLETED BY LAND PLANNING, INC. IN JANUARY 2022 AS PROVIDED IN A PLAN ENTITLED "EXISTING CONDITIONS PLAN, 600 CENTRAL STREET, IN HOLLISTON, MA" AND DATED JANUARY 19, 2022. SURVEY PLANS SEALED BY A LICENSED PROFESSIONAL LAND SURVEYOR ARE PROVIDED UNDER SEPARATE COVER.
5. SITE TOPOGRAPHIC INFORMATION OUTSIDE PROJECT LIMITS IS FROM AERIAL MAPPING (LiDAR) RETRIEVED FROM NOAA DATA ACCESS VIEWER.
6. UTILITY INFORMATION DEPICTED IS COMPILED USING PHYSICAL SURFACE EVIDENCE LOCATED IN THE FIELD IN CONJUNCTION WITH ANY RECORD INFORMATION AVAILABLE AT THE TIME OF THE FIELD SURVEY AND MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. THEREFORE ALL UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND BE VERIFIED BY THE CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION. FULL UTILITY COORDINATION WITH NON-MEMBER UTILITIES AND USE OF GROUND-PENETRATING RADAR TO LOCATE UTILITIES SHOULD BE PERFORMED AS NECESSARY.
7. WETLAND DELINEATION WITHIN THE PROJECT AREA WAS PERFORMED BY TRC IN THE SUMMER OF 2021 AND LOCATED USING MAPPING GRADE GPS UNITS. ADDITIONAL NATURAL RESOURCE AND ZONING INFORMATION IS COMPILED FROM A COMBINATION OF SOURCES INCLUDING STATE OF MASSACHUSETTS GIS DATA.
8. SOIL MAP INFORMATION IS BASED UPON UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE SOIL MAP DATA. A GEOTECHNICAL SUBSURFACE INVESTIGATION TO OBTAIN SITE-SPECIFIC SOIL DATA AND DEPTH TO GROUNDWATER IS PLANNED TO OCCUR PRIOR TO CONSTRUCTION.

0 40 80 120 160
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

SEAL:

COMMONWEALTH OF MASSACHUSETTS — THOMAS N. DANIELS, JR. — CIVIL NO. 56089 — REGISTERED PROFESSIONAL ENGINEER — 2023.06.16

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
JUNE 16, 2023

NO.	BY	DATE	REVISION	APP'D.
0	TRC	06/16/2023	ISSUED FOR PERMITTING	TND

PROJECT:
BLUEWAVE SOLAR
BWC BOGASTOW BROOK, LLC
HOLLISTON BATTERY ENERGY STORAGE SYSTEM
CENTRAL STREET, HOLLISTON, MASSACHUSETTS

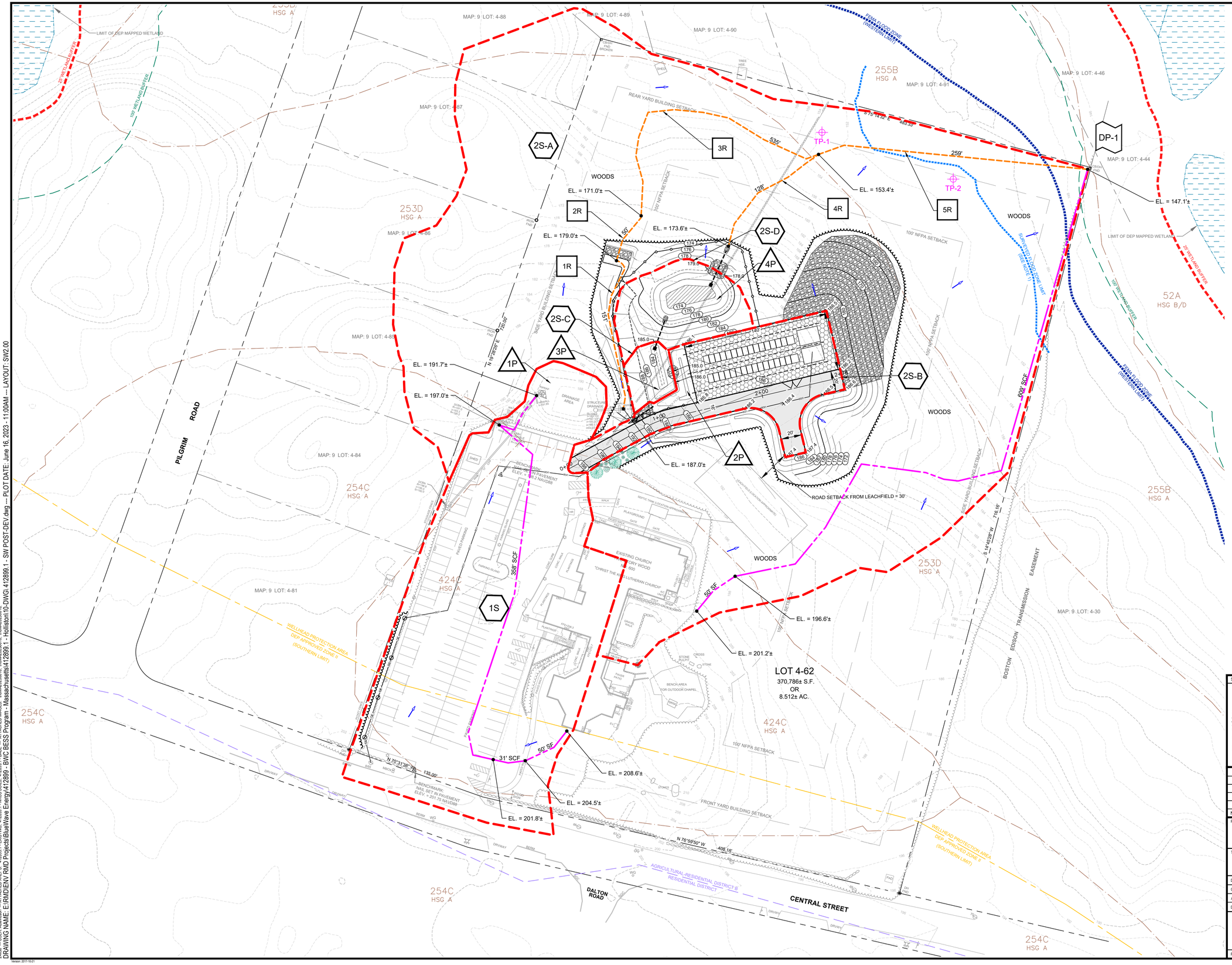
TITLE:
PRE-DEVELOPMENT DRAINAGE PLAN
PERMITTING

DRAWN BY:	TRC	PROJ. NO.:	412899.0001
CHECKED BY:	TND		
APPROVED BY:	TND		SW1.00
DATE:	JUNE 2023		

TRC
650 Suffolk Street
Suite 200
Lowell, MA 01854
Phone: 978.970.5600

FILE NO.: 412899.1 - SW PRE-DEV.dwg

24x36 --- USER: ADavidson --- ATTACHED XREFS: 412899.1 - EXISTING; 412899.1 - NRCS SOILS --- ATTACHED IMAGES: tndMA20220616; tndMA20220616; tndMA20220616;
DRAWING NAME: E:\RMD\ENV RMD Projects\BlueWave Energy\412899 - BWC BESS Program - Massachusetts\412899.1 - Holliston\10-DWG\412899.1 - SW PRE-DEV.dwg --- PLOT DATE: June 16, 2023 - 10:58AM --- LAYOUT: SW1.00
Version: 2017.10.21



LEGEND

- 1S — SUBCATCHMENT
- 1R — REACH
- 1P — POND
- DP-1 — ANALYSIS POINT
- SURVEYED PROPERTY BOUNDARY
- TC FLOWPATH
- REACH FLOWPATH
- SUBCATCHMENT BOUNDARY
- 253D HSG A — NRCS SOILS DATA
- STORMWATER RUNOFF FLOW DIRECTION
- TP-1 — SOIL TEST PIT

GENERAL NOTES

1. FEMA FLOOD MAPS DEPICT A BASE FLOOD ELEVATION OF 151 FEET. ACTUAL FLOOD ZONE LIMIT CONFIRMED BY SURVEYOR AS SHOWN IN PLAN.
2. WETLAND PROTECTION AREA DEP APPROVED ZONE III ENCOMPASSES FULL PROJECT SITE.
3. THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MASSACHUSETTS STATE PLANE (US SURVEY FEET, MAINLAND ZONE, MA83F). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
4. PROJECT PROPERTY BOUNDARIES AND SITE TOPOGRAPHIC INFORMATION ARE BASED UPON ON-THE-GROUND FIELD SURVEY COMPLETED BY LAND PLANNING, INC. IN JANUARY 2022 AS PROVIDED IN A PLAN ENTITLED "EXISTING CONDITIONS PLAN, 600 CENTRAL STREET, IN HOLLISTON, MA" AND DATED JANUARY 19, 2022. SURVEY PLANS SEALED BY A LICENSED PROFESSIONAL LAND SURVEYOR ARE PROVIDED UNDER SEPARATE COVER.
5. SITE TOPOGRAPHIC INFORMATION OUTSIDE PROJECT LIMITS IS FROM AERIAL MAPPING (LIDAR) RETRIEVED FROM NOAA DATA ACCESS VIEWER.
6. UTILITY INFORMATION DEPICTED IS COMPILED USING PHYSICAL SURFACE EVIDENCE LOCATED IN THE FIELD IN CONJUNCTION WITH ANY RECORD INFORMATION AVAILABLE AT THE TIME OF THE FIELD SURVEY AND MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. THEREFORE ALL UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND BE VERIFIED BY THE CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION. FULL UTILITY COORDINATION WITH NON-MEMBER UTILITIES AND USE OF GROUND-PENETRATING RADAR TO LOCATE UTILITIES SHOULD BE PERFORMED AS NECESSARY.
7. WETLAND DELINEATION WITHIN THE PROJECT AREA WAS PERFORMED BY TRC IN THE SUMMER OF 2021 AND LOCATED USING MAPPING GRADE GPS UNITS. ADDITIONAL NATURAL RESOURCE AND ZONING INFORMATION IS COMPILED FROM A COMBINATION OF SOURCES INCLUDING STATE OF MASSACHUSETTS GIS DATA.
8. SOIL MAP INFORMATION IS BASED UPON UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE SOIL MAP DATA. A GEOTECHNICAL SUBSURFACE INVESTIGATION TO OBTAIN SITE-SPECIFIC SOIL DATA AND DEPTH TO GROUNDWATER IS PLANNED TO OCCUR PRIOR TO CONSTRUCTION.
9. SOIL TEST PITS WERE COMPLETED ON MARCH 23, 2023 BY GEOSEARCH, INC. UNDER THE DIRECTION OF TRC STAFF.

0 40 80 120 160
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

SEAL:
COMMONWEALTH OF MASSACHUSETTS — THOMAS N. DANIELS, JR. — CIVIL NO. 56089 — REGISTERED PROFESSIONAL ENGINEER — 2023.06.16

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
JUNE 16, 2023

NO.	BY	DATE	REVISION	APP'D.
0	TRC	06/16/2023	ISSUED FOR PERMITTING	TND

PROJECT:
BLUEWAVE SOLAR
BWC BOGASTOW BROOK, LLC
HOLLISTON BATTERY ENERGY STORAGE SYSTEM
CENTRAL STREET, HOLLISTON, MASSACHUSETTS

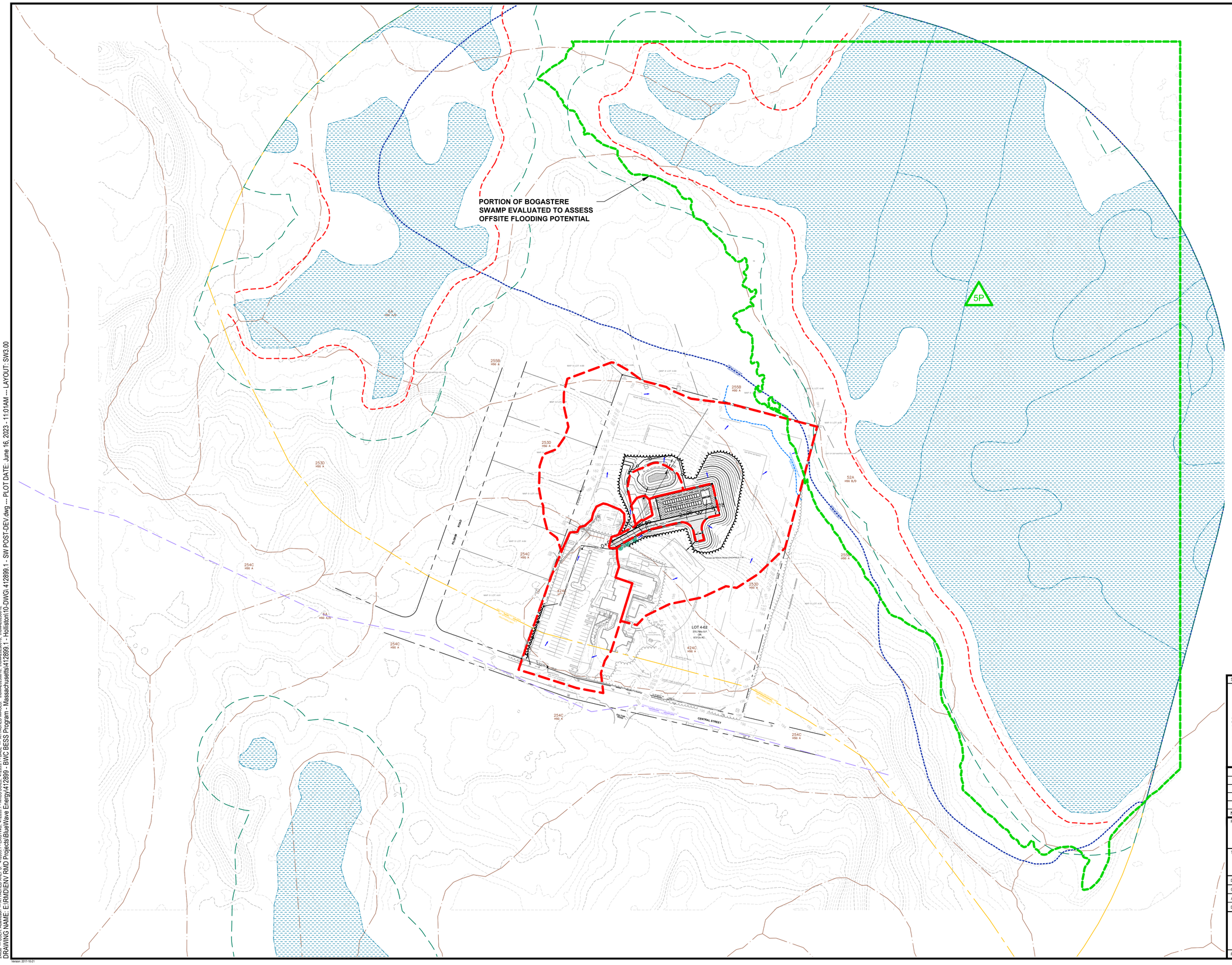
TITLE:
POST-DEVELOPMENT DRAINAGE PLAN
PERMITTING

DRAWN BY:	TRC	PROJ NO.:	412899.0001
CHECKED BY:	TND		
APPROVED BY:	TND		**SW2.00**
DATE:	JUNE 2023		

TRC
650 Suffolk Street
Suite 200
Lowell, MA 01854
Phone: 978.970.5600

FILE NO.: 412899.1 - SW POST-DEV.dwg

24x36 --- USER: ADavidson --- ATTACHED XREFS: 412899.1 - EXISTING; 412899.1 - NRCS SOILS; 412899.1 - BASE --- ATTACHED IMAGES: tndMA20230616; tndMA20230616; tndMA20230616; tndMA20230616
DRAWING NAME: E:\RMD\ENV RMD Projects\BlueWave Energy\412899 - BWC BESS Program - Massachusetts\412899.1 - Holliston\10-DWG\412899.1 - SW POST-DEV.dwg --- PLOT DATE: June 16, 2023 - 11:00AM --- LAYOUT: SW2.00
Version: 2017.10.21



LEGEND

- POND
- BOGASTERE SWAMP ASSESSMENT BOUNDARY
- SURVEYED PROPERTY BOUNDARY
- SUBCATCHMENT BOUNDARY
- NRCS SOILS DATA
- STORMWATER RUNOFF FLOW DIRECTION

GENERAL NOTES

1. FEMA FLOOD MAPS DEPICT A BASE FLOOD ELEVATION OF 151 FEET. ACTUAL FLOOD ZONE LIMIT CONFIRMED BY SURVEYOR AS SHOWN IN PLAN.
2. WETLAND PROTECTION AREA DEP APPROVED ZONE III ENCOMPASSES FULL PROJECT SITE.
3. THE PROJECT HORIZONTAL COORDINATES SYSTEM IS BASED ON NAD83 MASSACHUSETTS STATE PLANE (US SURVEY FEET, MAINLAND ZONE, MA83F). ELEVATIONS ARE BASED ON NAVD88 (US SURVEY FEET).
4. PROJECT PROPERTY BOUNDARIES AND SITE TOPOGRAPHIC INFORMATION ARE BASED UPON ON-THE-GROUND FIELD SURVEY COMPLETED BY LAND PLANNING, INC. IN JANUARY 2022 AS PROVIDED IN A PLAN ENTITLED "EXISTING CONDITIONS PLAN, 600 CENTRAL STREET, IN HOLLISTON, MA" AND DATED JANUARY 19, 2022. SURVEY PLANS SEALED BY A LICENSED PROFESSIONAL LAND SURVEYOR ARE PROVIDED UNDER SEPARATE COVER.
5. SITE TOPOGRAPHIC INFORMATION OUTSIDE PROJECT LIMITS IS FROM AERIAL MAPPING (LiDAR) RETRIEVED FROM NOAA DATA ACCESS VIEWER.
6. UTILITY INFORMATION DEPICTED IS COMPILED USING PHYSICAL SURFACE EVIDENCE LOCATED IN THE FIELD IN CONJUNCTION WITH ANY RECORD INFORMATION AVAILABLE AT THE TIME OF THE FIELD SURVEY AND MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. THEREFORE ALL UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND BE VERIFIED BY THE CONTRACTOR. DIGSAFE SHALL BE NOTIFIED A MINIMUM OF 72-HOURS PRIOR TO COMMENCING ANY EXCAVATION. FULL UTILITY COORDINATION WITH NON-MEMBER UTILITIES AND USE OF GROUND-PENETRATING RADAR TO LOCATE UTILITIES SHOULD BE PERFORMED AS NECESSARY.
7. WETLAND DELINEATION WITHIN THE PROJECT AREA WAS PERFORMED BY TRC IN THE SUMMER OF 2021 AND LOCATED USING MAPPING GRADE GPS UNITS. ADDITIONAL NATURAL RESOURCE AND ZONING INFORMATION IS COMPILED FROM A COMBINATION OF SOURCES INCLUDING STATE OF MASSACHUSETTS GIS DATA.
8. SOIL MAP INFORMATION IS BASED UPON UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE SOIL MAP DATA. A GEOTECHNICAL SUBSURFACE INVESTIGATION TO OBTAIN SITE-SPECIFIC SOIL DATA AND DEPTH TO GROUNDWATER IS PLANNED TO OCCUR PRIOR TO CONSTRUCTION.

0 100 200 300 400
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

SEAL:

COMMONWEALTH OF MASSACHUSETTS
THOMAS N. DANIELS, JR.
CIVIL
NO. 56089
REGISTERED PROFESSIONAL ENGINEER
2023-06-16

PROFESSIONAL ENGINEER:
THOMAS N. DANIELS, JR.

DATE:
JUNE 16, 2023

NO.	BY	DATE	REVISION	APP'D
0	TRC	06/16/2023	ISSUED FOR PERMITTING	TND

PROJECT:
BLUEWAVE SOLAR
BWC BOGASTOW BROOK, LLC
HOLLISTON BATTERY ENERGY STORAGE SYSTEM
CENTRAL STREET, HOLLISTON, MASSACHUSETTS

TITLE:
BOGASTERE SWAMP ASSESSMENT
PERMITTING

DRAWN BY:	TRC	PROJ. NO.:	412899.0001
CHECKED BY:	TND		
APPROVED BY:	TND		**SW3.00**
DATE:	JUNE 2023		

TRC
650 Suffolk Street
Suite 200
Lowell, MA 01854
Phone: 978.970.5600

FILE NO.: 412899.1 - SW POST-DEV.dwg

24x36 --- USER: ADavidson --- ATTACHED XREFS: 412899.1 - EXISTING; 412899.1 - NRCS SOILS; 412899.1 - BASE --- ATTACHED IMAGES: trcdMA20230616; trcdMA20230616; trcdMA20230616; trcdMA20230616
DRAWING NAME: E:\RMD\ENV RMD Projects\BlueWave Energy\412899 - BWC BESS Program - Massachusetts\412899.1 - Holliston\10-DWG\ 412899.1 - SW POST-DEV.dwg --- PLOT DATE: June 16, 2023 - 11:01AM --- LAYOUT: SW3.00
Version: 2017-10-21

Attachment C: Stormwater Calculations & Supporting Documents

HOLLISTON BATTERY ENERGY STORAGE SYSTEM

Land Use Summary

PROJECT NO.: 412899.0001
CALC. BY: A.DAVIDSON
CHECKED BY: T. DANIELS
DATE: 2023.06.14

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: 1S Subcatchment Area: 1.596 Ac.

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Pavement, Roofs, Concrete Pads	98	1.260	Pavement, Roofs, Concrete Pads	98	1.260	0.000
Compacted Gravel	96	0.000	Compacted Gravel	96	0.000	0.000
Crushed Stone Yard, Rip Rap Surfaces	55	0.000	Crushed Stone Yard, Rip Rap Surfaces	55	0.000	0.000
Lawn, Good (HSG A)	39	0.180	Lawn, Good (HSG A)	39	0.180	0.000
Meadow (HSG A)	30	0.000	Meadow (HSG A)	30	0.016	0.016
Woods, Good (HSG A)	30	0.156	Woods, Good (HSG A)	30	0.140	-0.016
Impervious Borrow (HSG D)	80	0.000	Impervious Borrow (HSG D)	80	0.000	0.000
						0.000
						0.000
						0.000
						0.000
						0.000
Total:	**84.7**	**1.596**	**Total:**	**84.7**	**1.596**	

Notes:

HOLLISTON BATTERY ENERGY STORAGE SYSTEM

Land Use Summary

PROJECT NO.: 412899.0001
CALC. BY: A.DAVIDSON
CHECKED BY: T. DANIELS
DATE: 2023.06.14

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: 2S Subcatchment Area: 5.840 Ac.

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Pavement, Roofs, Concrete Pads	98	0.134	Pavement, Roofs, Concrete Pads	98	0.177	0.043
Compacted Gravel	96	0.024	Compacted Gravel	96	0.163	0.138
Crushed Stone Yard, Rip Rap Surfaces	55	0.000	Crushed Stone Yard, Rip Rap Surfaces	55	0.357	0.357
Lawn, Good (HSG A)	39	0.612	Lawn, Good (HSG A)	39	0.844	0.233
Meadow (HSG A)	30	0.000	Meadow (HSG A)	30	0.456	0.456
Woods, Good (HSG A)	30	5.070	Woods, Good (HSG A)	30	3.786	-1.284
Impervious Borrow (HSG D)	80	0.000	Impervious Borrow (HSG D)	80	0.056	0.056
						0.000
						0.000
						0.000
						0.000
						0.000
Total:	**32.8**	**5.840**	**Total:**	**37.2**	**5.840**	**0.000**

Notes:

HOLLISTON BATTERY ENERGY STORAGE SYSTEM

Land Use Summary

PROJECT NO.: 412899.0001
CALC. BY: A.DAVIDSON
CHECKED BY: T. DANIELS
DATE: 2023.06.14

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: **Combined Subcatchment Area:** **7.435 Ac.**

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Pavement, Roofs, Concrete Pads	98	1.394	Pavement, Roofs, Concrete Pads	98	1.436	0.043
Compacted Gravel	96	0.024	Compacted Gravel	96	0.163	0.138
Crushed Stone Yard, Rip Rap Surfaces	55	0.000	Crushed Stone Yard, Rip Rap Surfaces	55	0.357	0.357
Lawn, Good (HSG A)	39	0.792	Lawn, Good (HSG A)	39	1.024	0.233
Meadow (HSG A)	30	0.000	Meadow (HSG A)	30	0.473	0.473
Woods, Good (HSG A)	30	5.226	Woods, Good (HSG A)	30	3.926	-1.300
Impervious Borrow (HSG D)	80	0.000	Impervious Borrow (HSG D)	80	0.056	0.056
						0.000
						0.000
						0.000
						0.000
						0.000
Total:	**43.9**	**7.435**	**Total:**	**47.4**	**7.435**	

Notes:

Description: This worksheet provides the equations and constants used to determine the time of concentrations calculated in the subsequent worksheets using the Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service (SCS)) velocity method.

Time of Concentration Equations:

1. Where	$T_t = \frac{0.007(n\ell)^{0.8}}{(P_2)^{0.5} S^{0.4}}$	from NRCS TR-55 where P_2 = 2-Year, 24 Hour Rainfall (in)	For Sheet Flow (300 feet or less, typically no more than 100 feet) (NRCC Extreme Precipitation Tables: P2= 3.21 inches)
2. Where	$T_t = \frac{\ell}{3{,}600V}$	from the SCS Upland Method *Channel Flow Chart*	Travel time equation
3. Where	$V = 20.328(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Paved surfaces
4. Where	$V = 16.1345(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Unpaved surfaces and grassed waterways
5. Where	$V = 6.962(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Short-grass pasture
6. Where	$V = 5.032(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Woodlands
7. Where	$V = 12(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Waterways and swamps, no channels
8. Where	$V = 15(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Grassed waterways and roadside ditches
9. Where	$V = 21(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Small tributary & swamp w/ channels
10. Where	$V = 35(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Large tributary
11. Where	$V = 60(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Main river
12. Where	$V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$		For Channel Flow - Culvert flow

Manning's Roughness Coefficients for Sheet Flow

Surface Description	n - value
Smooth surface	0.011
Crushed stone/Substation yard	0.025
Fallow	0.050
Cultivated: Residue<=20%	0.060
Cultivated: Residue>20%	0.170
Grass: Short	0.150
Grass: Dense	0.240
Grass: Bermuda	0.410
Range	0.130
Woods: Light underbrush	0.400
Woods: Dense underbrush	0.800

Subcatchment ID: Pre-Development 1S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW									
Manning's No.	0.150								
Length, ft	50								
$P_{2,}$ in	3.2								
Slope, ft/ft	0.082								
T_t[1], hr	0.053								0.0533
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft			358						
Slope, ft/ft			0.013						
Velocity[3], ft/sec			2.3538						
T_t[2], hr			0.042						0.0422
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture									
Length, ft		31							
Slope, ft/ft		0.087							
Velocity[5], ft/sec		2.0546							
T_t[2], hr		0.004							0.0042
Woodland									
Length, ft									
Slope, ft/ft									
Velocity[6], ft/sec									
T_t[2], hr									0.0000
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.100
Time of Concentration, T_c, min:	**5.98**

Notes:

1. It is assumed that time of concentration from catch basin in parking lot, through water quality tank, and into existing "drainiage area" pond is negligible to be conservative.

Subcatchment ID:	Pre-Development 2S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW									
Manning's No.	0.400								
Length, ft	50								
$P_{2,}$ in	3.2								
Slope, ft/ft	0.092								
T_t[1], hr	0.111								0.1115
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture									
Length, ft									
Slope, ft/ft									
Velocity[5], ft/sec									
T_t[2], hr									0.0000
Woodland									
Length, ft		609							
Slope, ft/ft		0.081							
Velocity[6], ft/sec		1.4346							
T_t[2], hr		0.118							0.1179
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.229
Time of Concentration, T_c, min:	**13.76**

Subcatchment ID:	Post-Development 1S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW									
Manning's No.	0.150								
Length, ft	50								
$P_{2,}$ in	3.2								
Slope, ft/ft	0.082								
T_t[1], hr	0.053								0.0533
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft			358						
Slope, ft/ft			0.013						
Velocity[3], ft/sec			2.3538						
T_t[2], hr			0.042						0.0422
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture									
Length, ft		31							
Slope, ft/ft		0.087							
Velocity[5], ft/sec		2.0546							
T_t[2], hr		0.004							0.0042
Woodland									
Length, ft									
Slope, ft/ft									
Velocity[6], ft/sec									
T_t[2], hr									0.0000
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.100
Time of Concentration, T_c, min:	**5.98**

Notes:

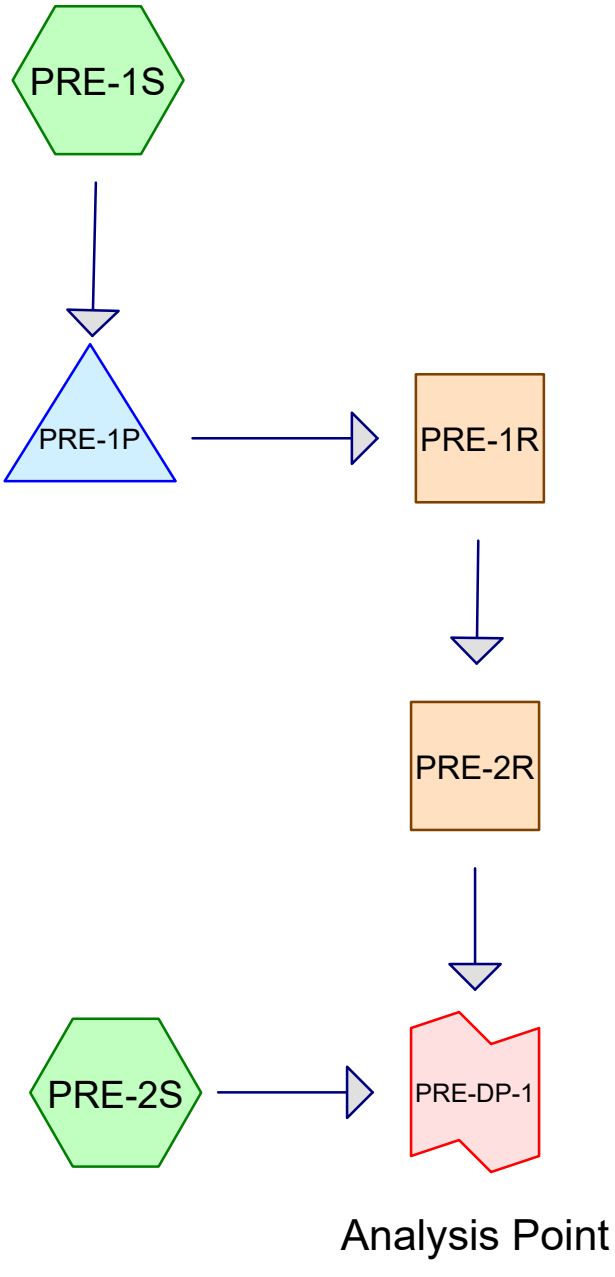
1. It is assumed that time of concentration from catch basin in parking lot, through water quality tank, and into existing "drainiage area" pond is negligible to be conservative.

Subcatchment ID:	Post-Development 2S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW									
Manning's No.	0.400								
Length, ft	50								
$P_{2,}$ in	3.2								
Slope, ft/ft	0.092								
T_t[1], hr	0.111								0.1115
SHALLOW CONCENTRATED FLOW									
Paved									
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture									
Length, ft									
Slope, ft/ft									
Velocity[5], ft/sec									
T_t[2], hr									0.0000
Woodland									
Length, ft		609							
Slope, ft/ft		0.081							
Velocity[6], ft/sec		1.4346							
T_t[2], hr		0.118							0.1179
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.229
Time of Concentration, T_c, min:	**13.76**

PRE-DEVELOPMENT



Subcat Reach Pond Link

Routing Diagram for Holliston - Stormwater Model
Prepared by TRC, Printed 6/14/2023
HydroCAD® 10.10-5a s/n 01402 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.21	2
2	10-year	Type III 24-hr		Default	24.00	1	4.81	2
3	25-year	Type III 24-hr		Default	24.00	1	6.06	2
4	100-year	Type III 24-hr		Default	24.00	1	8.61	2

Summary for Subcatchment PRE-1S:

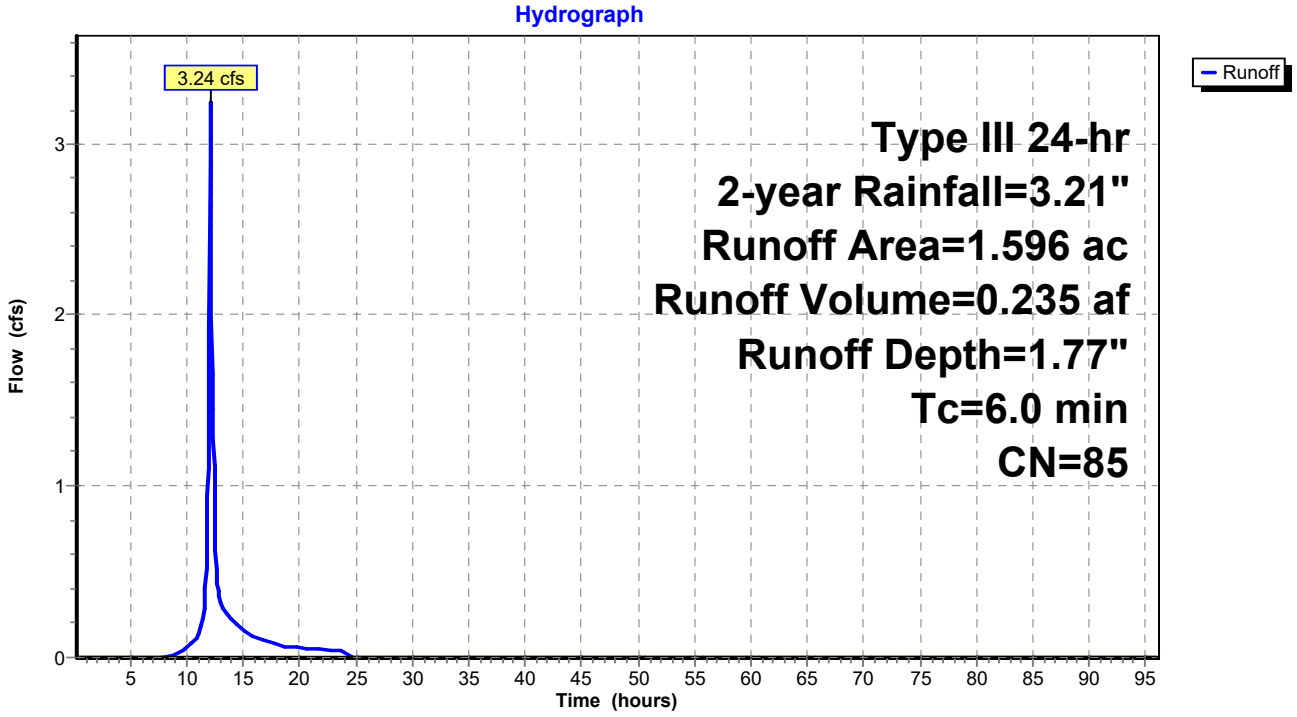
Runoff = 3.24 cfs @ 12.09 hrs, Volume= 0.235 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.000	30	Meadow, non-grazed, HSG A
	0.156	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment PRE-1S:



Summary for Subcatchment PRE-2S:

[45] Hint: Runoff=Zero

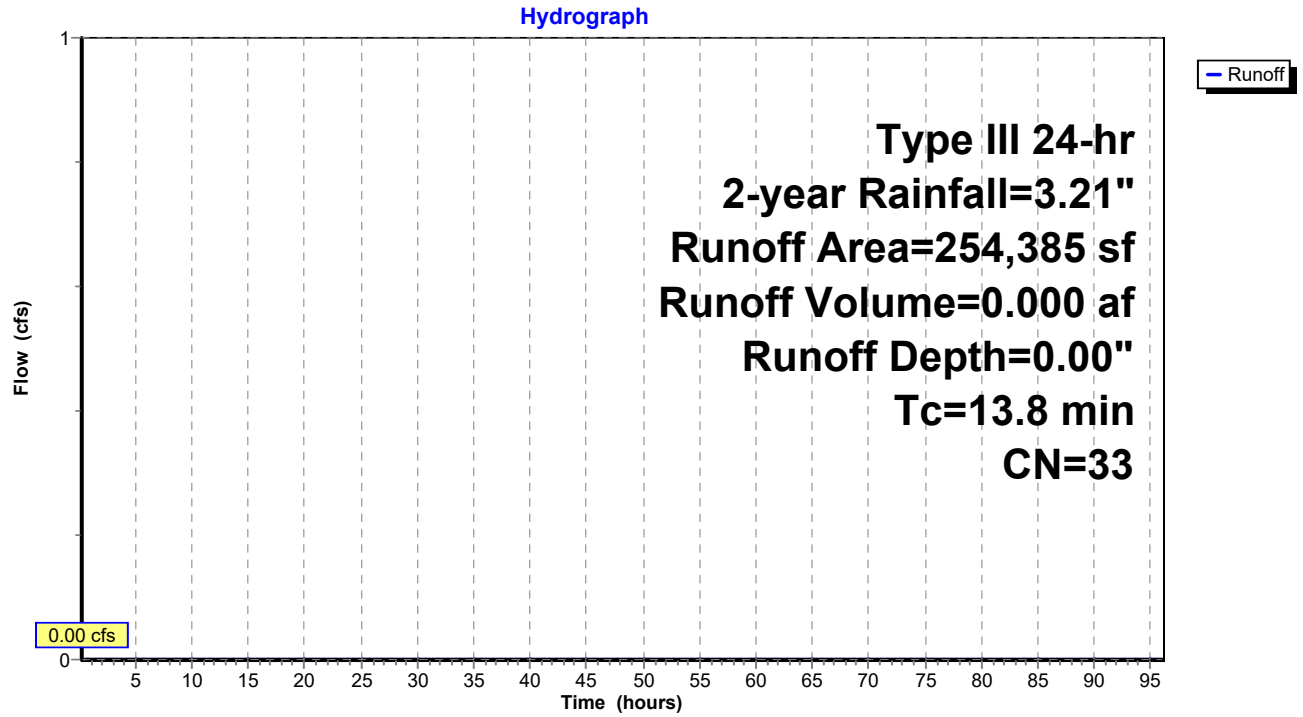
Runoff = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	5,841	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	220,830	30	Woods, Good, HSG A
	254,385	33	Weighted Average
	248,544		97.70% Pervious Area
	5,841		2.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment PRE-2S:



Summary for Reach PRE-1R:

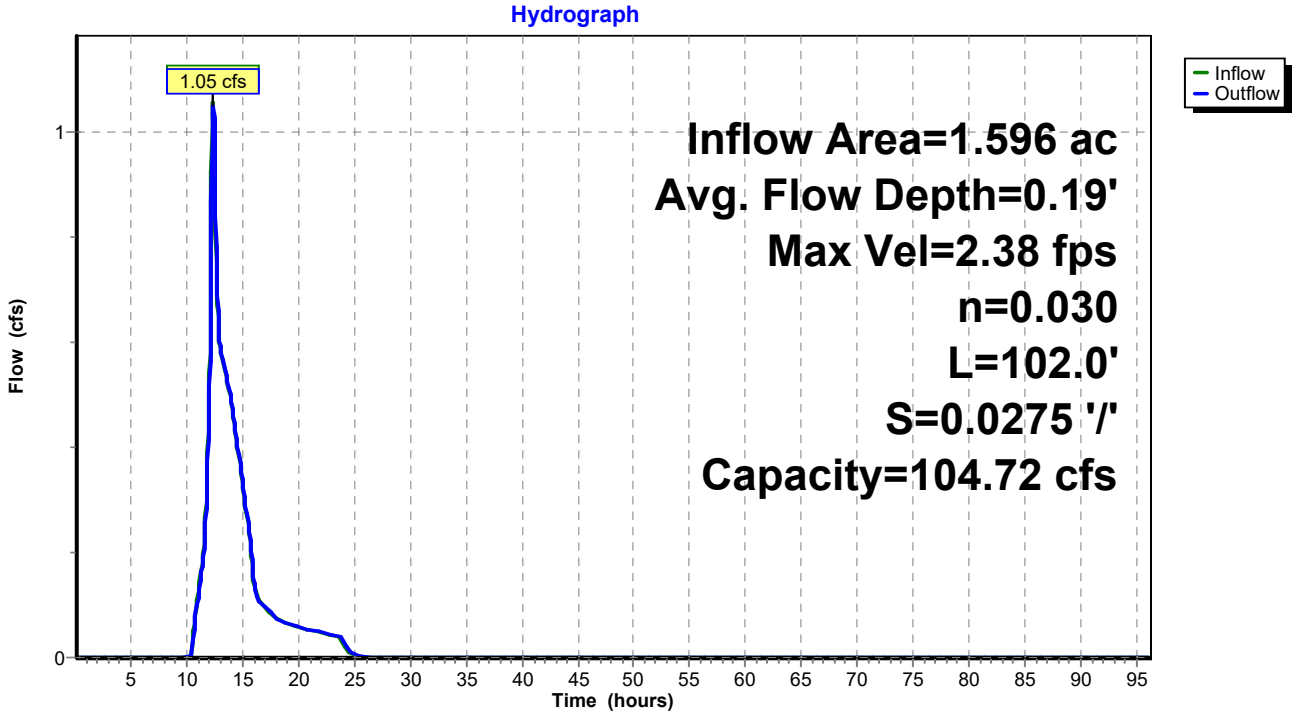
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af
Outflow = 1.05 cfs @ 12.44 hrs, Volume= 0.229 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 45 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 2.75'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 104.72 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 102.0' Slope= 0.0275 '/'
Inlet Invert= 187.00', Outlet Invert= 184.20'

Reach PRE-1R:



Stage-Area-Storage for Reach PRE-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0
187.02	0.0	4
187.04	0.1	8
187.06	0.1	13
187.08	0.2	18
187.10	0.2	22
187.12	0.3	27
187.14	0.3	33
187.16	0.4	38
187.18	0.4	43
187.20	0.5	49
187.22	0.5	55
187.24	0.6	61
187.26	0.7	67
187.28	0.7	73
187.30	0.8	80
187.32	0.8	86
187.34	0.9	93
187.36	1.0	100
187.38	1.0	107
187.40	1.1	114
187.42	1.2	122
187.44	1.3	129
187.46	1.3	137
187.48	1.4	145
187.50	1.5	153
187.52	1.6	161
187.54	1.7	170
187.56	1.7	178
187.58	1.8	187
187.60	1.9	196
187.62	2.0	205
187.64	2.1	214
187.66	2.2	224
187.68	2.3	233
187.70	2.4	243
187.72	2.5	253
187.74	2.6	263
187.76	2.7	273
187.78	2.8	283
187.80	2.9	294
187.82	3.0	304
187.84	3.1	315
187.86	3.2	326
187.88	3.3	337
187.90	3.4	349
187.92	3.5	360
187.94	3.6	372
187.96	3.8	384
187.98	3.9	396
188.00	4.0	408
188.02	4.1	420
188.04	4.2	433
188.06	4.4	445
188.08	4.5	458
188.10	4.6	471
188.12	4.7	484
188.14	4.9	498
188.16	5.0	511
188.18	5.1	525
188.20	5.3	539
188.22	5.4	553
188.24	5.6	567
188.26	5.7	581
188.28	5.8	595
188.30	6.0	610
188.32	6.1	625
188.34	6.3	640
188.36	6.4	655
188.38	6.6	670
188.40	6.7	685
188.42	6.9	701
188.44	7.0	717
188.46	7.2	733
188.48	7.3	749
188.50	7.5	765
188.52	7.7	781
188.54	7.8	798
188.56	8.0	815
188.58	8.2	832
188.60	8.3	849
188.62	8.5	866
188.64	8.7	883
188.66	8.8	901
188.68	9.0	918
188.70	9.2	936
188.72	9.4	954
188.74	9.5	973
188.76	9.7	991
188.78	9.9	1,009
188.80	10.1	1,028
188.82	10.3	1,047
188.84	10.5	1,066
188.86	10.6	1,085
188.88	10.8	1,105
188.90	11.0	1,124
188.92	11.2	1,144
188.94	11.4	1,164
188.96	11.6	1,184
188.98	11.8	1,204
189.00	**12.0**	**1,224**

Summary for Reach PRE-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 1.05 cfs @ 12.44 hrs, Volume= 0.229 af
Outflow = 1.00 cfs @ 12.65 hrs, Volume= 0.229 af, Atten= 5%, Lag= 12.4 min

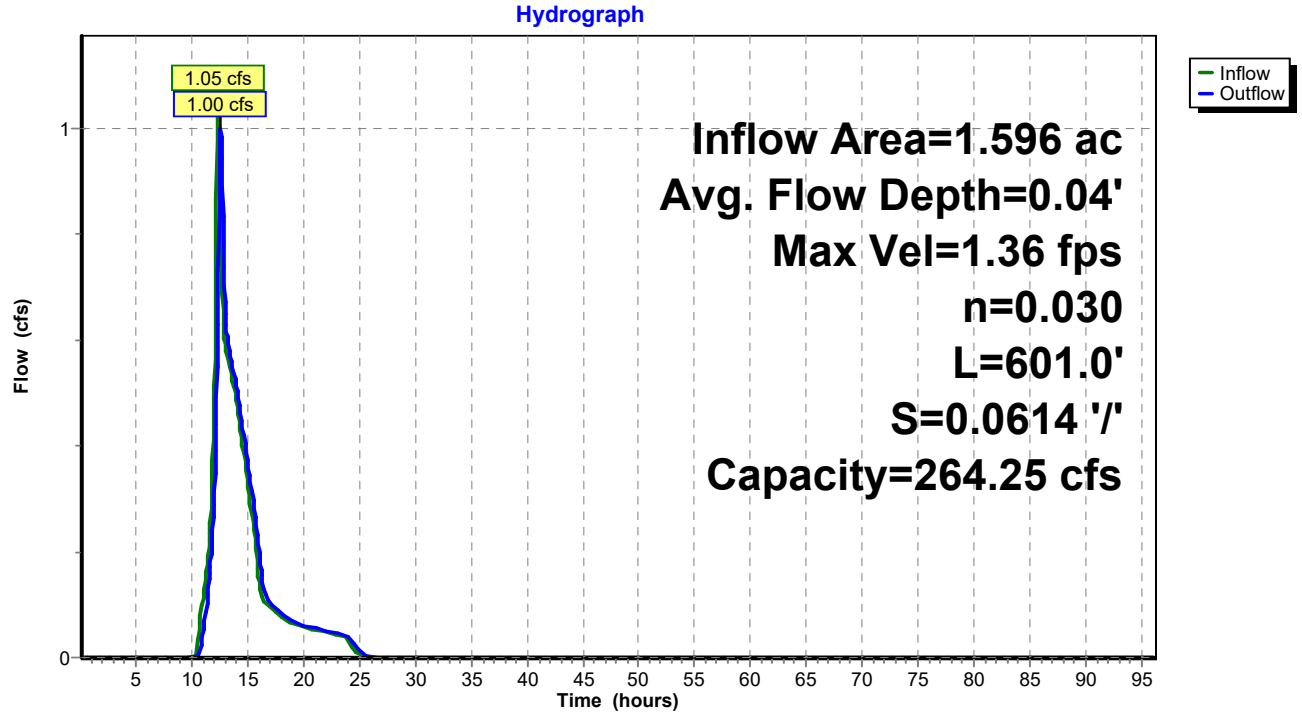
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.36 fps, Min. Travel Time= 7.4 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 15.2 min

Peak Storage= 444 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 20.29'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 264.25 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 601.0' Slope= 0.0614 '/'
Inlet Invert= 184.00', Outlet Invert= 147.10'

‡

Reach PRE-2R:



Stage-Area-Storage for Reach PRE-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
184.00	0.0	0
184.01	0.2	120
184.02	0.4	241
184.03	0.6	363
184.04	0.8	485
184.05	1.0	607
184.06	1.2	730
184.07	1.4	853
184.08	1.6	977
184.09	1.8	1,101
184.10	2.0	1,226
184.11	2.2	1,351
184.12	2.5	1,477
184.13	2.7	1,603
184.14	2.9	1,730
184.15	3.1	1,857
184.16	3.3	1,985
184.17	3.5	2,113
184.18	3.7	2,241
184.19	3.9	2,371
184.20	4.2	2,500
184.21	4.4	2,630
184.22	4.6	2,761
184.23	4.8	2,892
184.24	5.0	3,023
184.25	5.3	3,155
184.26	5.5	3,288
184.27	5.7	3,421
184.28	5.9	3,554
184.29	6.1	3,688
184.30	6.4	3,822
184.31	6.6	3,957
184.32	6.8	4,093
184.33	7.0	4,228
184.34	7.3	4,365
184.35	7.5	4,501
184.36	7.7	4,639
184.37	7.9	4,777
184.38	8.2	4,915
184.39	8.4	5,053
184.40	8.6	5,193
184.41	8.9	5,332
184.42	9.1	5,472
184.43	9.3	5,613
184.44	9.6	5,754
184.45	9.8	5,896
184.46	10.0	6,038
184.47	10.3	6,180
184.48	10.5	6,323
184.49	10.8	6,467
184.50	11.0	6,611
184.51	11.2	6,755
184.52	11.5	6,900
184.53	11.7	7,046
184.54	12.0	7,192
184.55	12.2	7,338
184.56	12.5	7,485
184.57	12.7	7,632
184.58	12.9	7,780
184.59	13.2	7,929
184.60	13.4	8,077
184.61	13.7	8,227
184.62	13.9	8,376
184.63	14.2	8,527
184.64	14.4	8,677
184.65	14.7	8,829
184.66	14.9	8,980
184.67	15.2	9,133
184.68	15.4	9,285
184.69	15.7	9,438
184.70	16.0	9,592
184.71	16.2	9,746
184.72	16.5	9,901
184.73	16.7	10,056
184.74	17.0	10,211
184.75	17.3	10,367
184.76	17.5	10,524
184.77	17.8	10,681
184.78	18.0	10,838
184.79	18.3	10,996
184.80	18.6	11,155
184.81	18.8	11,313
184.82	19.1	11,473
184.83	19.4	11,633
184.84	19.6	11,793
184.85	19.9	11,954
184.86	20.2	12,115
184.87	20.4	12,277
184.88	20.7	12,439
184.89	21.0	12,602
184.90	21.2	12,765
184.91	21.5	12,929
184.92	21.8	13,093
184.93	22.1	13,258
184.94	22.3	13,423
184.95	22.6	13,589
184.96	22.9	13,755
184.97	23.2	13,921
184.98	23.4	14,088
184.99	23.7	14,256
185.00	**24.0**	**14,424**

Summary for Pond PRE-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.77" for 2-year event
Inflow = 3.24 cfs @ 12.09 hrs, Volume= 0.235 af
Outflow = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af, Atten= 67%, Lag= 19.7 min
Primary = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 190.02' @ 12.42 hrs Surf.Area= 1,924 sf Storage= 3,232 cf

Plug-Flow detention time= 61.8 min calculated for 0.229 af (97% of inflow)
Center-of-Mass det. time= 46.7 min (872.6 - 826.0)

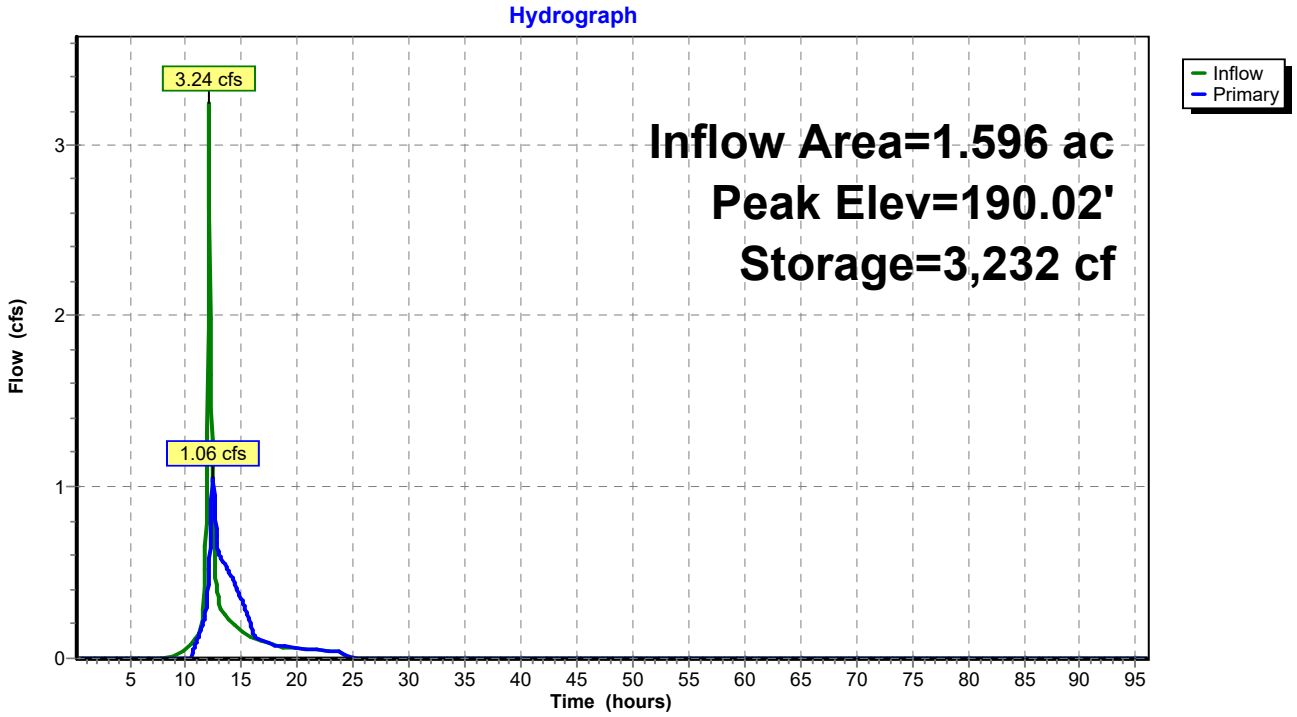
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.05 cfs @ 12.42 hrs HW=190.02' (Free Discharge)
└**1=Culvert** (Passes 1.05 cfs of 8.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.33 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.41 cfs @ 1.91 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond PRE-1P:


Hydrograph
3.24 cfs
1.06 cfs
Inflow Area=1.596 ac
Peak Elev=190.02'
Storage=3,232 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond PRE-1P:

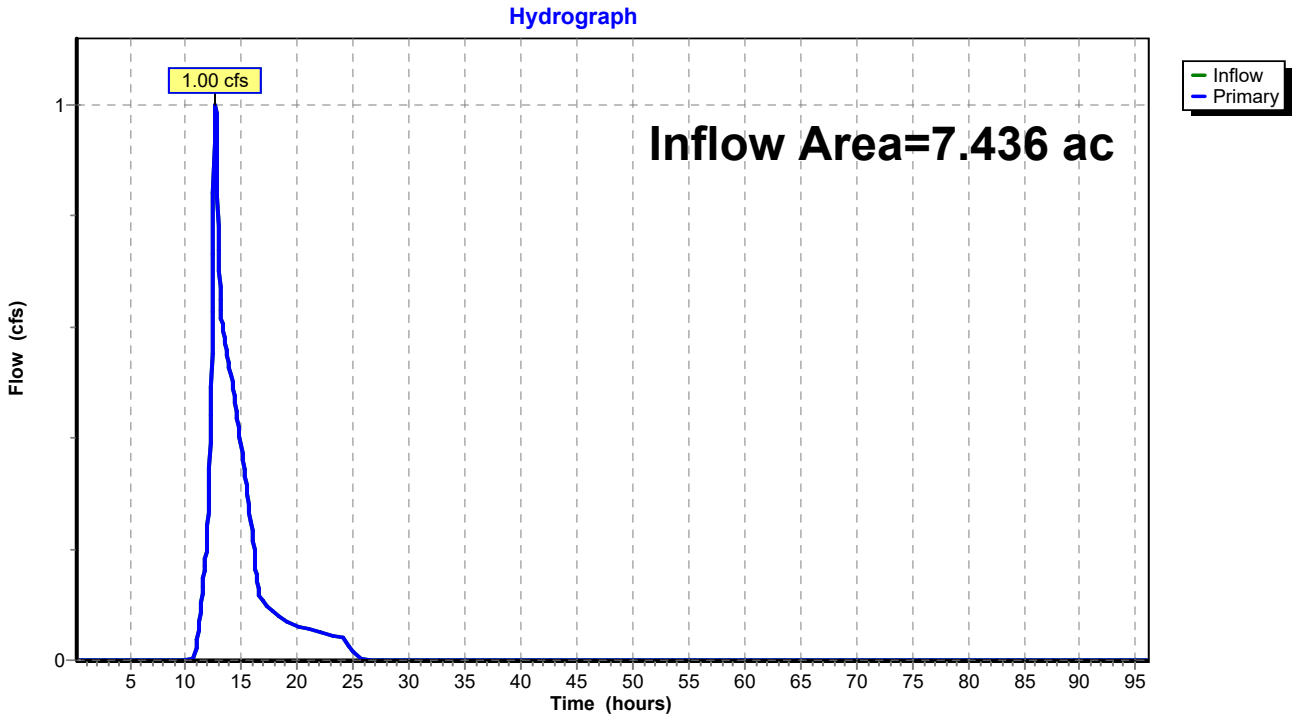
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.10	245	22
187.20	295	49
187.30	349	81
187.40	408	119
187.50	472	163
187.60	540	214
187.70	613	271
187.80	690	337
187.90	772	410
188.00	859	491
188.10	902	579
188.20	946	672
188.30	991	768
188.40	1,037	870
188.50	1,084	976
188.60	1,132	1,087
188.70	1,181	1,202
188.80	1,232	1,323
188.90	1,283	1,449
189.00	1,335	1,580
189.10	1,389	1,716
189.20	1,443	1,857
189.30	1,498	2,004
189.40	1,555	2,157
189.50	1,613	2,315
189.60	1,671	2,480
189.70	1,731	2,650
189.80	1,791	2,826
189.90	1,853	3,008
190.00	1,916	3,196
190.10	1,961	3,390
190.20	2,007	3,589
190.30	2,053	3,792
190.40	2,099	3,999
190.50	2,146	4,211
190.60	2,194	4,428
190.70	2,242	4,650
190.80	2,291	4,877
190.90	2,340	5,108
191.00	2,389	5,345
191.10	2,440	5,586
191.20	2,490	5,833
191.30	2,542	6,084
191.40	2,593	6,341
191.50	2,646	6,603
191.60	2,698	6,870
191.70	2,752	7,143
191.80	2,806	7,421
191.90	2,860	7,704
192.00	2,915	7,993
192.10	2,972	8,287
192.20	3,030	8,587
192.30	3,088	8,893
192.40	3,147	9,205
192.50	3,207	9,522
192.60	3,267	9,846
192.70	3,327	10,176
192.80	3,388	10,512
192.90	3,450	10,853
193.00	**3,512**	**11,201**

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 7.436 ac, 18.75% Impervious, Inflow Depth = 0.37" for 2-year event
Inflow = 1.00 cfs @ 12.65 hrs, Volume= 0.229 af
Primary = 1.00 cfs @ 12.65 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link PRE-DP-1: Analysis Point



Summary for Subcatchment PRE-1S:

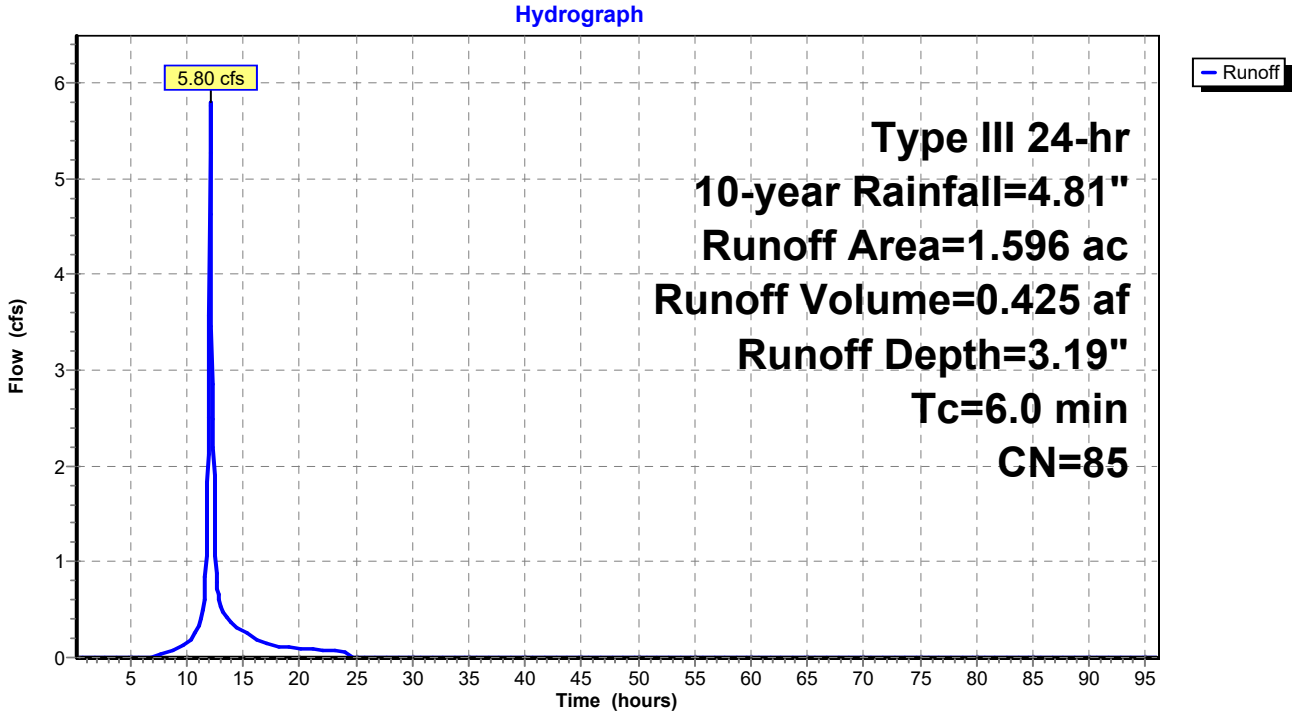
Runoff = 5.80 cfs @ 12.09 hrs, Volume= 0.425 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.000	30	Meadow, non-grazed, HSG A
	0.156	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment PRE-1S:



Summary for Subcatchment PRE-2S:

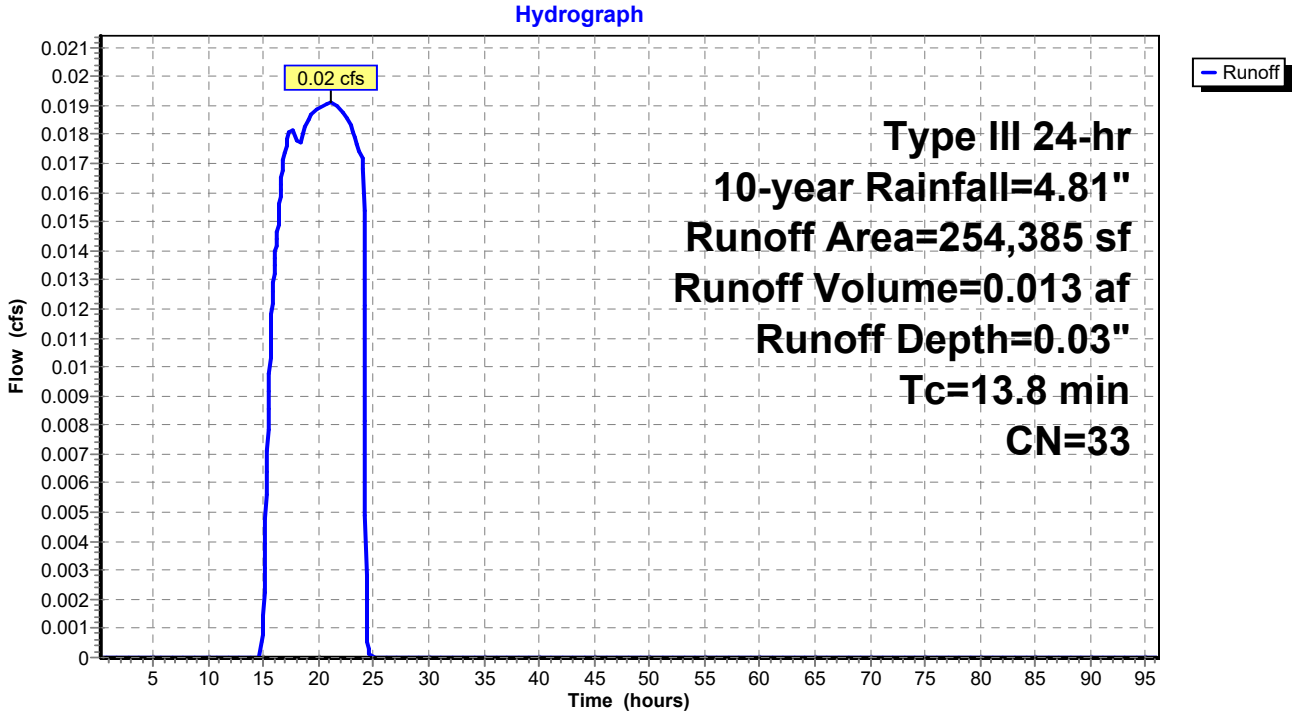
Runoff = 0.02 cfs @ 21.10 hrs, Volume= 0.013 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	5,841	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	220,830	30	Woods, Good, HSG A
	254,385	33	Weighted Average
	248,544		97.70% Pervious Area
	5,841		2.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment PRE-2S:



Summary for Reach PRE-1R:

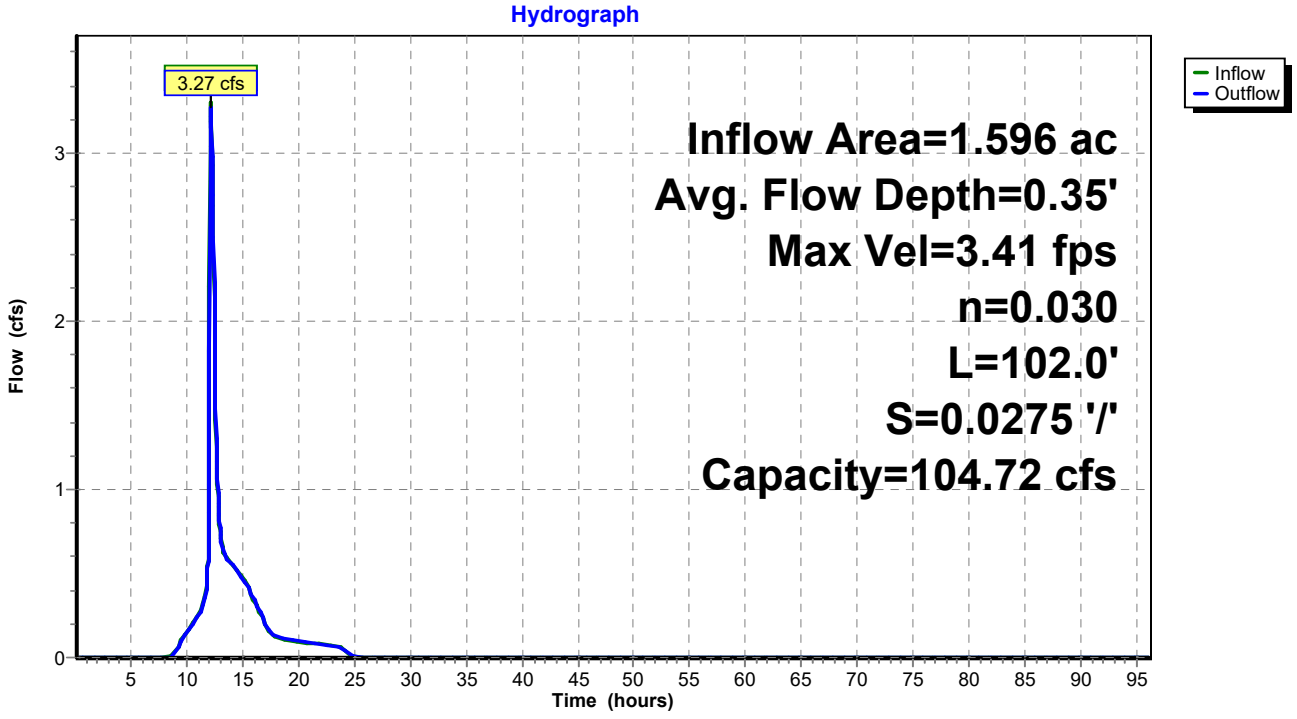
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af
Outflow = 3.27 cfs @ 12.24 hrs, Volume= 0.418 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 1.5 min

Peak Storage= 98 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 3.42'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 104.72 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 102.0' Slope= 0.0275 '/'
Inlet Invert= 187.00', Outlet Invert= 184.20'

Reach PRE-1R:



Stage-Area-Storage for Reach PRE-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0
187.02	0.0	4
187.04	0.1	8
187.06	0.1	13
187.08	0.2	18
187.10	0.2	22
187.12	0.3	27
187.14	0.3	33
187.16	0.4	38
187.18	0.4	43
187.20	0.5	49
187.22	0.5	55
187.24	0.6	61
187.26	0.7	67
187.28	0.7	73
187.30	0.8	80
187.32	0.8	86
187.34	0.9	93
187.36	1.0	100
187.38	1.0	107
187.40	1.1	114
187.42	1.2	122
187.44	1.3	129
187.46	1.3	137
187.48	1.4	145
187.50	1.5	153
187.52	1.6	161
187.54	1.7	170
187.56	1.7	178
187.58	1.8	187
187.60	1.9	196
187.62	2.0	205
187.64	2.1	214
187.66	2.2	224
187.68	2.3	233
187.70	2.4	243
187.72	2.5	253
187.74	2.6	263
187.76	2.7	273
187.78	2.8	283
187.80	2.9	294
187.82	3.0	304
187.84	3.1	315
187.86	3.2	326
187.88	3.3	337
187.90	3.4	349
187.92	3.5	360
187.94	3.6	372
187.96	3.8	384
187.98	3.9	396
188.00	4.0	408
188.02	4.1	420
188.04	4.2	433
188.06	4.4	445
188.08	4.5	458
188.10	4.6	471
188.12	4.7	484
188.14	4.9	498
188.16	5.0	511
188.18	5.1	525
188.20	5.3	539
188.22	5.4	553
188.24	5.6	567
188.26	5.7	581
188.28	5.8	595
188.30	6.0	610
188.32	6.1	625
188.34	6.3	640
188.36	6.4	655
188.38	6.6	670
188.40	6.7	685
188.42	6.9	701
188.44	7.0	717
188.46	7.2	733
188.48	7.3	749
188.50	7.5	765
188.52	7.7	781
188.54	7.8	798
188.56	8.0	815
188.58	8.2	832
188.60	8.3	849
188.62	8.5	866
188.64	8.7	883
188.66	8.8	901
188.68	9.0	918
188.70	9.2	936
188.72	9.4	954
188.74	9.5	973
188.76	9.7	991
188.78	9.9	1,009
188.80	10.1	1,028
188.82	10.3	1,047
188.84	10.5	1,066
188.86	10.6	1,085
188.88	10.8	1,105
188.90	11.0	1,124
188.92	11.2	1,144
188.94	11.4	1,164
188.96	11.6	1,184
188.98	11.8	1,204
189.00	**12.0**	**1,224**

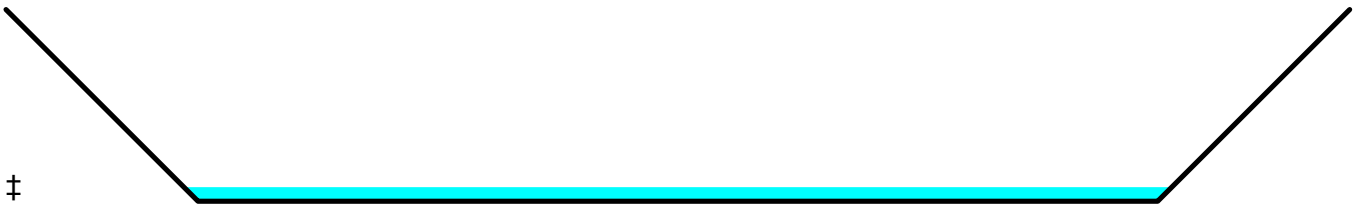
Summary for Reach PRE-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 3.27 cfs @ 12.24 hrs, Volume= 0.418 af
Outflow = 3.12 cfs @ 12.39 hrs, Volume= 0.418 af, Atten= 4%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.13 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 14.0 min

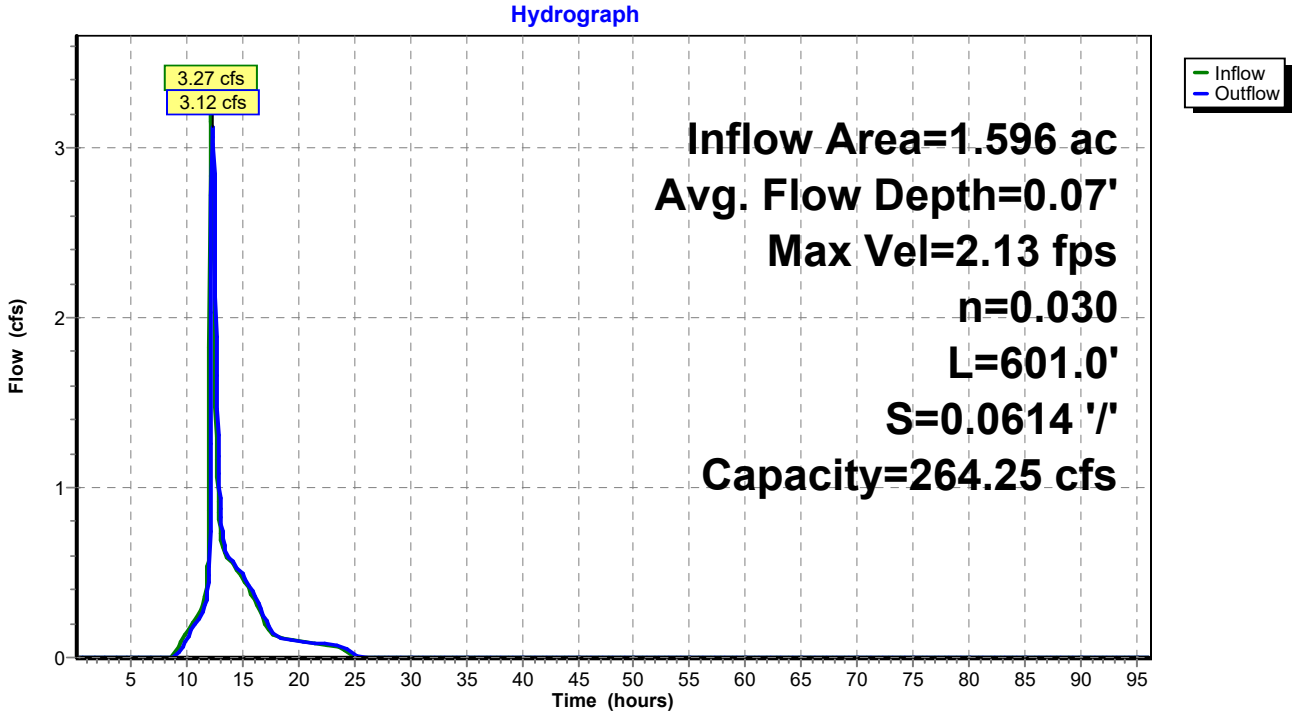
Peak Storage= 890 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 20.58'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 264.25 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 601.0' Slope= 0.0614 '/'
Inlet Invert= 184.00', Outlet Invert= 147.10'



‡

Reach PRE-2R:



Stage-Area-Storage for Reach PRE-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
184.00	0.0	0
184.01	0.2	120
184.02	0.4	241
184.03	0.6	363
184.04	0.8	485
184.05	1.0	607
184.06	1.2	730
184.07	1.4	853
184.08	1.6	977
184.09	1.8	1,101
184.10	2.0	1,226
184.11	2.2	1,351
184.12	2.5	1,477
184.13	2.7	1,603
184.14	2.9	1,730
184.15	3.1	1,857
184.16	3.3	1,985
184.17	3.5	2,113
184.18	3.7	2,241
184.19	3.9	2,371
184.20	4.2	2,500
184.21	4.4	2,630
184.22	4.6	2,761
184.23	4.8	2,892
184.24	5.0	3,023
184.25	5.3	3,155
184.26	5.5	3,288
184.27	5.7	3,421
184.28	5.9	3,554
184.29	6.1	3,688
184.30	6.4	3,822
184.31	6.6	3,957
184.32	6.8	4,093
184.33	7.0	4,228
184.34	7.3	4,365
184.35	7.5	4,501
184.36	7.7	4,639
184.37	7.9	4,777
184.38	8.2	4,915
184.39	8.4	5,053
184.40	8.6	5,193
184.41	8.9	5,332
184.42	9.1	5,472
184.43	9.3	5,613
184.44	9.6	5,754
184.45	9.8	5,896
184.46	10.0	6,038
184.47	10.3	6,180
184.48	10.5	6,323
184.49	10.8	6,467
184.50	11.0	6,611
184.51	11.2	6,755
184.52	11.5	6,900
184.53	11.7	7,046
184.54	12.0	7,192
184.55	12.2	7,338
184.56	12.5	7,485
184.57	12.7	7,632
184.58	12.9	7,780
184.59	13.2	7,929
184.60	13.4	8,077
184.61	13.7	8,227
184.62	13.9	8,376
184.63	14.2	8,527
184.64	14.4	8,677
184.65	14.7	8,829
184.66	14.9	8,980
184.67	15.2	9,133
184.68	15.4	9,285
184.69	15.7	9,438
184.70	16.0	9,592
184.71	16.2	9,746
184.72	16.5	9,901
184.73	16.7	10,056
184.74	17.0	10,211
184.75	17.3	10,367
184.76	17.5	10,524
184.77	17.8	10,681
184.78	18.0	10,838
184.79	18.3	10,996
184.80	18.6	11,155
184.81	18.8	11,313
184.82	19.1	11,473
184.83	19.4	11,633
184.84	19.6	11,793
184.85	19.9	11,954
184.86	20.2	12,115
184.87	20.4	12,277
184.88	20.7	12,439
184.89	21.0	12,602
184.90	21.2	12,765
184.91	21.5	12,929
184.92	21.8	13,093
184.93	22.1	13,258
184.94	22.3	13,423
184.95	22.6	13,589
184.96	22.9	13,755
184.97	23.2	13,921
184.98	23.4	14,088
184.99	23.7	14,256
185.00	**24.0**	**14,424**

Summary for Pond PRE-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.19" for 10-year event
Inflow = 5.80 cfs @ 12.09 hrs, Volume= 0.425 af
Outflow = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af, Atten= 43%, Lag= 7.8 min
Primary = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 190.66' @ 12.22 hrs Surf.Area= 2,221 sf Storage= 4,553 cf

Plug-Flow detention time= 48.1 min calculated for 0.418 af (98% of inflow)
Center-of-Mass det. time= 39.3 min (848.4 - 809.0)

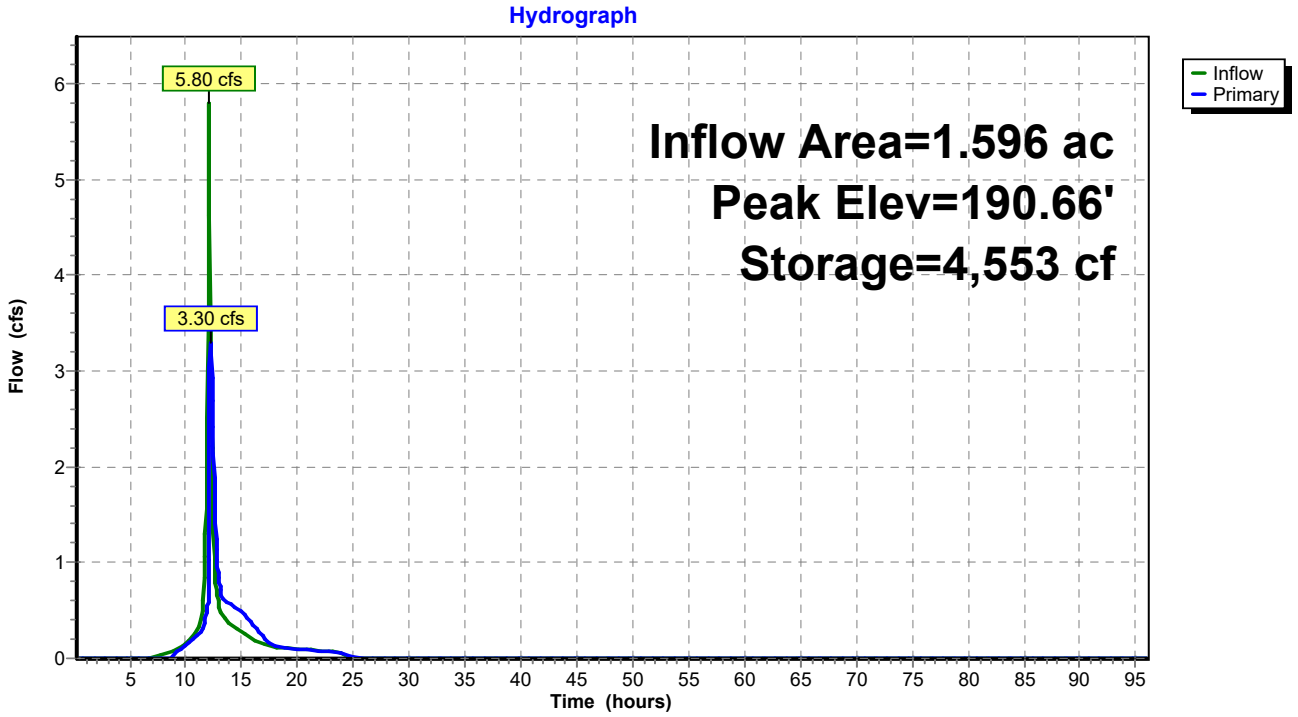
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.27 cfs @ 12.22 hrs HW=190.65' (Free Discharge)
└**1=Culvert** (Passes 3.27 cfs of 9.96 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 8.27 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.55 cfs @ 3.31 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond PRE-1P:


Hydrograph
5.80 cfs
3.30 cfs
Inflow Area=1.596 ac
Peak Elev=190.66'
Storage=4,553 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond PRE-1P:

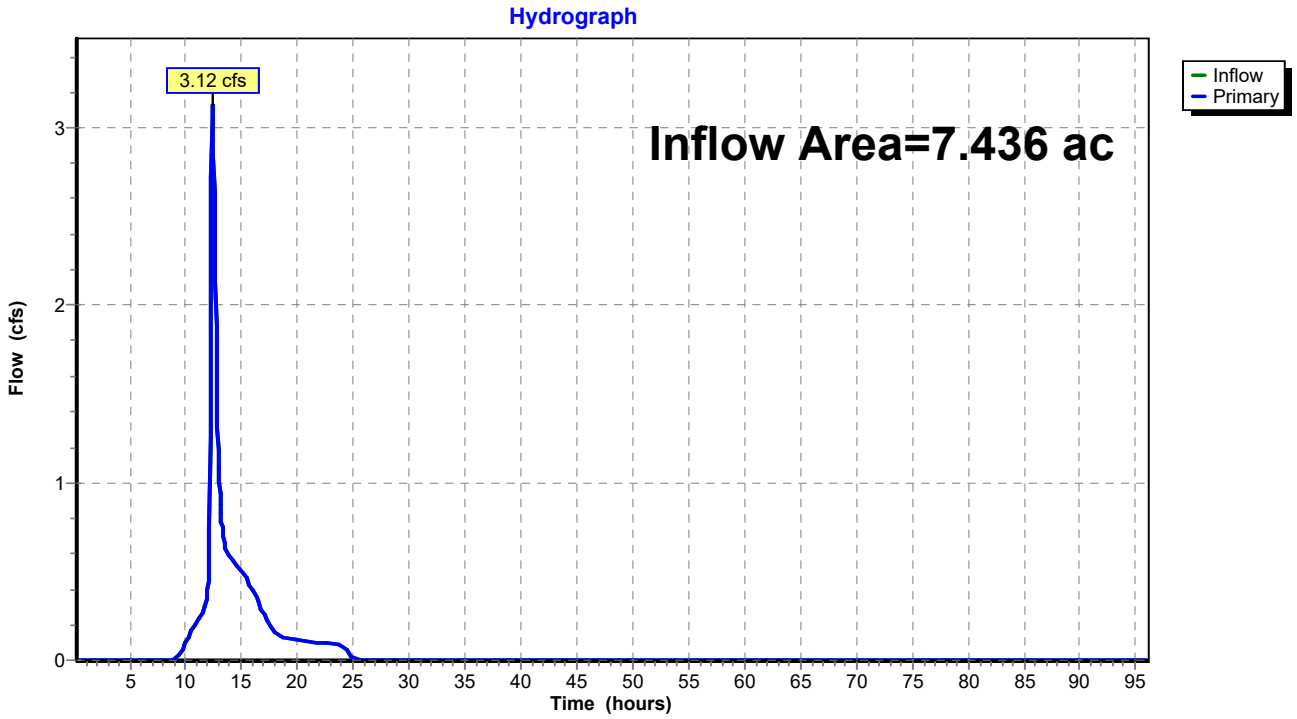
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.10	245	22
187.20	295	49
187.30	349	81
187.40	408	119
187.50	472	163
187.60	540	214
187.70	613	271
187.80	690	337
187.90	772	410
188.00	859	491
188.10	902	579
188.20	946	672
188.30	991	768
188.40	1,037	870
188.50	1,084	976
188.60	1,132	1,087
188.70	1,181	1,202
188.80	1,232	1,323
188.90	1,283	1,449
189.00	1,335	1,580
189.10	1,389	1,716
189.20	1,443	1,857
189.30	1,498	2,004
189.40	1,555	2,157
189.50	1,613	2,315
189.60	1,671	2,480
189.70	1,731	2,650
189.80	1,791	2,826
189.90	1,853	3,008
190.00	1,916	3,196
190.10	1,961	3,390
190.20	2,007	3,589
190.30	2,053	3,792
190.40	2,099	3,999
190.50	2,146	4,211
190.60	2,194	4,428
190.70	2,242	4,650
190.80	2,291	4,877
190.90	2,340	5,108
191.00	2,389	5,345
191.10	2,440	5,586
191.20	2,490	5,833
191.30	2,542	6,084
191.40	2,593	6,341
191.50	2,646	6,603
191.60	2,698	6,870
191.70	2,752	7,143
191.80	2,806	7,421
191.90	2,860	7,704
192.00	2,915	7,993
192.10	2,972	8,287
192.20	3,030	8,587
192.30	3,088	8,893
192.40	3,147	9,205
192.50	3,207	9,522
192.60	3,267	9,846
192.70	3,327	10,176
192.80	3,388	10,512
192.90	3,450	10,853
193.00	**3,512**	**11,201**

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 7.436 ac, 18.75% Impervious, Inflow Depth = 0.70" for 10-year event
Inflow = 3.12 cfs @ 12.39 hrs, Volume= 0.431 af
Primary = 3.12 cfs @ 12.39 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link PRE-DP-1: Analysis Point



Summary for Subcatchment PRE-1S:

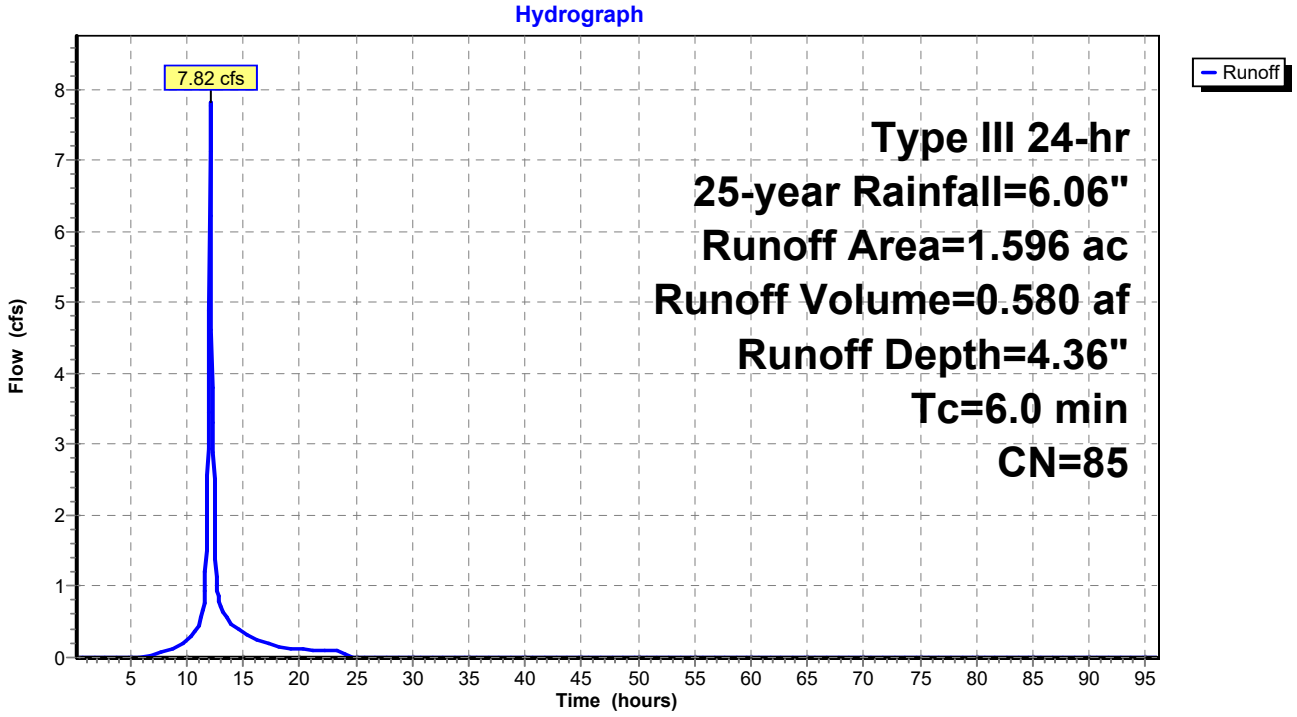
Runoff = 7.82 cfs @ 12.09 hrs, Volume= 0.580 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.000	30	Meadow, non-grazed, HSG A
	0.156	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment PRE-1S:



Summary for Subcatchment PRE-2S:

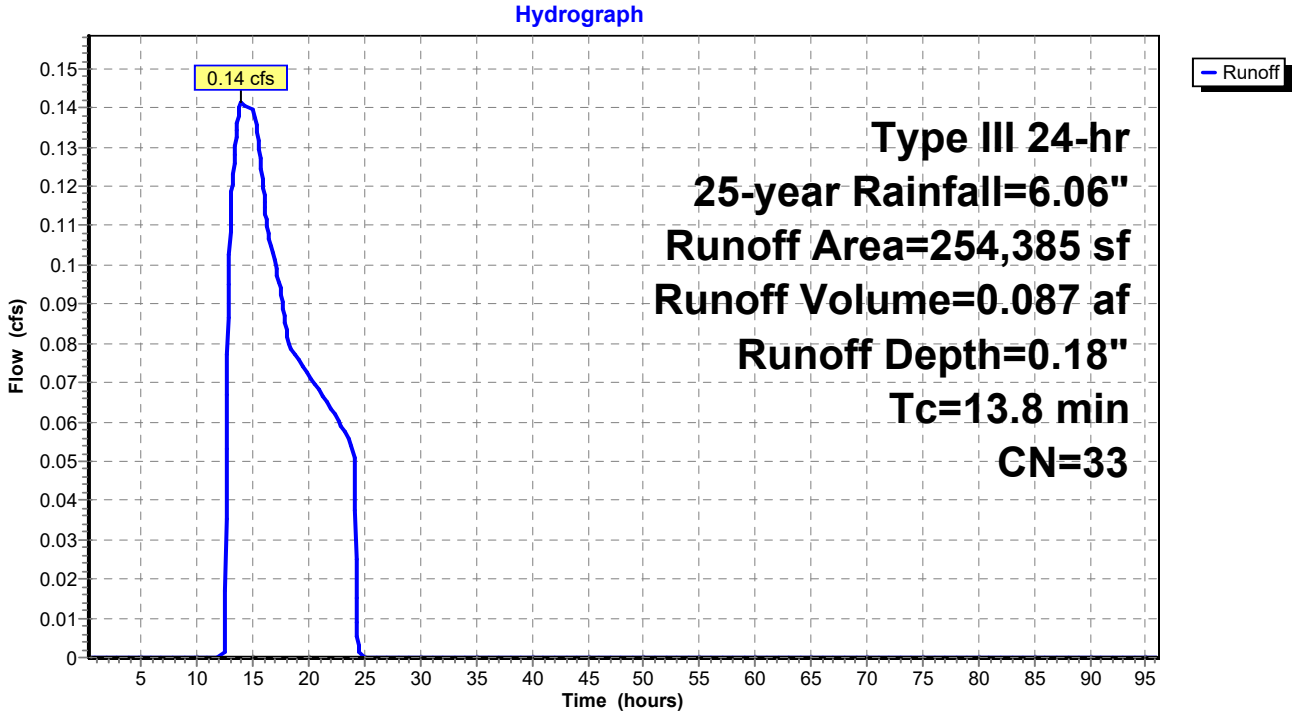
Runoff = 0.14 cfs @ 13.92 hrs, Volume= 0.087 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	5,841	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	220,830	30	Woods, Good, HSG A
	254,385	33	Weighted Average
	248,544		97.70% Pervious Area
	5,841		2.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment PRE-2S:



Summary for Reach PRE-1R:

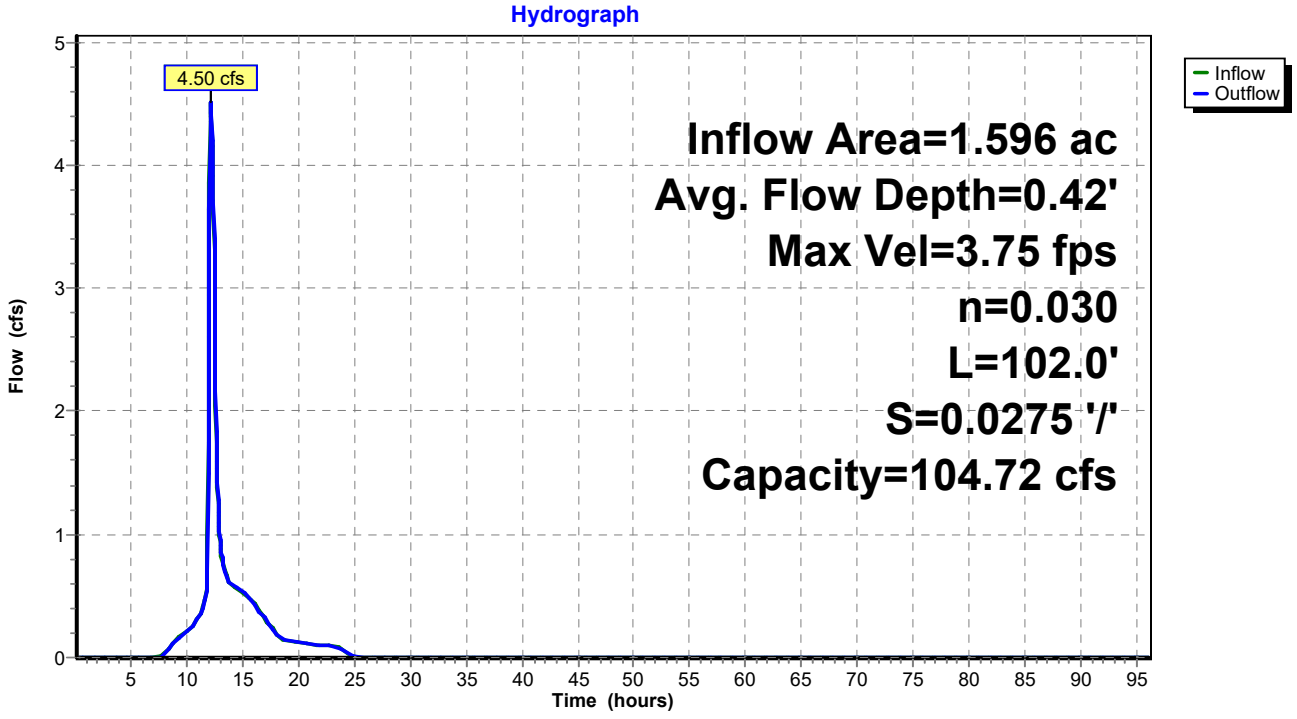
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.31" for 25-year event
Inflow = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af
Outflow = 4.50 cfs @ 12.22 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.4 min

Peak Storage= 123 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 3.69'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 104.72 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 102.0' Slope= 0.0275 '/'
Inlet Invert= 187.00', Outlet Invert= 184.20'

Reach PRE-1R:



Stage-Area-Storage for Reach PRE-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0
187.02	0.0	4
187.04	0.1	8
187.06	0.1	13
187.08	0.2	18
187.10	0.2	22
187.12	0.3	27
187.14	0.3	33
187.16	0.4	38
187.18	0.4	43
187.20	0.5	49
187.22	0.5	55
187.24	0.6	61
187.26	0.7	67
187.28	0.7	73
187.30	0.8	80
187.32	0.8	86
187.34	0.9	93
187.36	1.0	100
187.38	1.0	107
187.40	1.1	114
187.42	1.2	122
187.44	1.3	129
187.46	1.3	137
187.48	1.4	145
187.50	1.5	153
187.52	1.6	161
187.54	1.7	170
187.56	1.7	178
187.58	1.8	187
187.60	1.9	196
187.62	2.0	205
187.64	2.1	214
187.66	2.2	224
187.68	2.3	233
187.70	2.4	243
187.72	2.5	253
187.74	2.6	263
187.76	2.7	273
187.78	2.8	283
187.80	2.9	294
187.82	3.0	304
187.84	3.1	315
187.86	3.2	326
187.88	3.3	337
187.90	3.4	349
187.92	3.5	360
187.94	3.6	372
187.96	3.8	384
187.98	3.9	396
188.00	4.0	408
188.02	4.1	420
188.04	4.2	433
188.06	4.4	445
188.08	4.5	458
188.10	4.6	471
188.12	4.7	484
188.14	4.9	498
188.16	5.0	511
188.18	5.1	525
188.20	5.3	539
188.22	5.4	553
188.24	5.6	567
188.26	5.7	581
188.28	5.8	595
188.30	6.0	610
188.32	6.1	625
188.34	6.3	640
188.36	6.4	655
188.38	6.6	670
188.40	6.7	685
188.42	6.9	701
188.44	7.0	717
188.46	7.2	733
188.48	7.3	749
188.50	7.5	765
188.52	7.7	781
188.54	7.8	798
188.56	8.0	815
188.58	8.2	832
188.60	8.3	849
188.62	8.5	866
188.64	8.7	883
188.66	8.8	901
188.68	9.0	918
188.70	9.2	936
188.72	9.4	954
188.74	9.5	973
188.76	9.7	991
188.78	9.9	1,009
188.80	10.1	1,028
188.82	10.3	1,047
188.84	10.5	1,066
188.86	10.6	1,085
188.88	10.8	1,105
188.90	11.0	1,124
188.92	11.2	1,144
188.94	11.4	1,164
188.96	11.6	1,184
188.98	11.8	1,204
189.00	**12.0**	**1,224**

Summary for Reach PRE-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.31" for 25-year event
Inflow = 4.50 cfs @ 12.22 hrs, Volume= 0.574 af
Outflow = 4.40 cfs @ 12.36 hrs, Volume= 0.574 af, Atten= 2%, Lag= 8.2 min

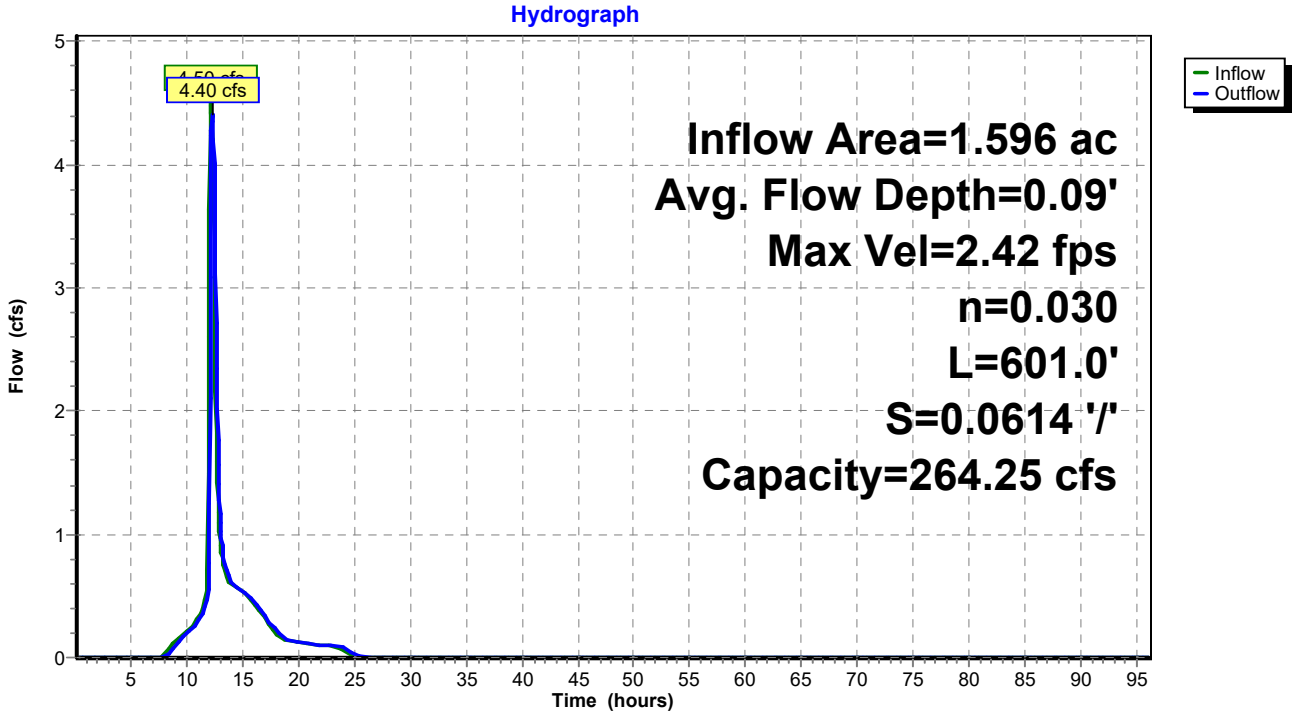
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.42 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 13.3 min

Peak Storage= 1,094 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 20.72'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 264.25 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 601.0' Slope= 0.0614 '/'
Inlet Invert= 184.00', Outlet Invert= 147.10'

‡

Reach PRE-2R:



Stage-Area-Storage for Reach PRE-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
184.00	0.0	0
184.01	0.2	120
184.02	0.4	241
184.03	0.6	363
184.04	0.8	485
184.05	1.0	607
184.06	1.2	730
184.07	1.4	853
184.08	1.6	977
184.09	1.8	1,101
184.10	2.0	1,226
184.11	2.2	1,351
184.12	2.5	1,477
184.13	2.7	1,603
184.14	2.9	1,730
184.15	3.1	1,857
184.16	3.3	1,985
184.17	3.5	2,113
184.18	3.7	2,241
184.19	3.9	2,371
184.20	4.2	2,500
184.21	4.4	2,630
184.22	4.6	2,761
184.23	4.8	2,892
184.24	5.0	3,023
184.25	5.3	3,155
184.26	5.5	3,288
184.27	5.7	3,421
184.28	5.9	3,554
184.29	6.1	3,688
184.30	6.4	3,822
184.31	6.6	3,957
184.32	6.8	4,093
184.33	7.0	4,228
184.34	7.3	4,365
184.35	7.5	4,501
184.36	7.7	4,639
184.37	7.9	4,777
184.38	8.2	4,915
184.39	8.4	5,053
184.40	8.6	5,193
184.41	8.9	5,332
184.42	9.1	5,472
184.43	9.3	5,613
184.44	9.6	5,754
184.45	9.8	5,896
184.46	10.0	6,038
184.47	10.3	6,180
184.48	10.5	6,323
184.49	10.8	6,467
184.50	11.0	6,611
184.51	11.2	6,755
184.52	11.5	6,900
184.53	11.7	7,046
184.54	12.0	7,192
184.55	12.2	7,338
184.56	12.5	7,485
184.57	12.7	7,632
184.58	12.9	7,780
184.59	13.2	7,929
184.60	13.4	8,077
184.61	13.7	8,227
184.62	13.9	8,376
184.63	14.2	8,527
184.64	14.4	8,677
184.65	14.7	8,829
184.66	14.9	8,980
184.67	15.2	9,133
184.68	15.4	9,285
184.69	15.7	9,438
184.70	16.0	9,592
184.71	16.2	9,746
184.72	16.5	9,901
184.73	16.7	10,056
184.74	17.0	10,211
184.75	17.3	10,367
184.76	17.5	10,524
184.77	17.8	10,681
184.78	18.0	10,838
184.79	18.3	10,996
184.80	18.6	11,155
184.81	18.8	11,313
184.82	19.1	11,473
184.83	19.4	11,633
184.84	19.6	11,793
184.85	19.9	11,954
184.86	20.2	12,115
184.87	20.4	12,277
184.88	20.7	12,439
184.89	21.0	12,602
184.90	21.2	12,765
184.91	21.5	12,929
184.92	21.8	13,093
184.93	22.1	13,258
184.94	22.3	13,423
184.95	22.6	13,589
184.96	22.9	13,755
184.97	23.2	13,921
184.98	23.4	14,088
184.99	23.7	14,256
185.00	**24.0**	**14,424**

Summary for Pond PRE-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.36" for 25-year event
Inflow = 7.82 cfs @ 12.09 hrs, Volume= 0.580 af
Outflow = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af, Atten= 42%, Lag= 7.5 min
Primary = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 191.17' @ 12.21 hrs Surf.Area= 2,476 sf Storage= 5,761 cf

Plug-Flow detention time= 43.6 min calculated for 0.573 af (99% of inflow)
Center-of-Mass det. time= 37.0 min (837.3 - 800.3)

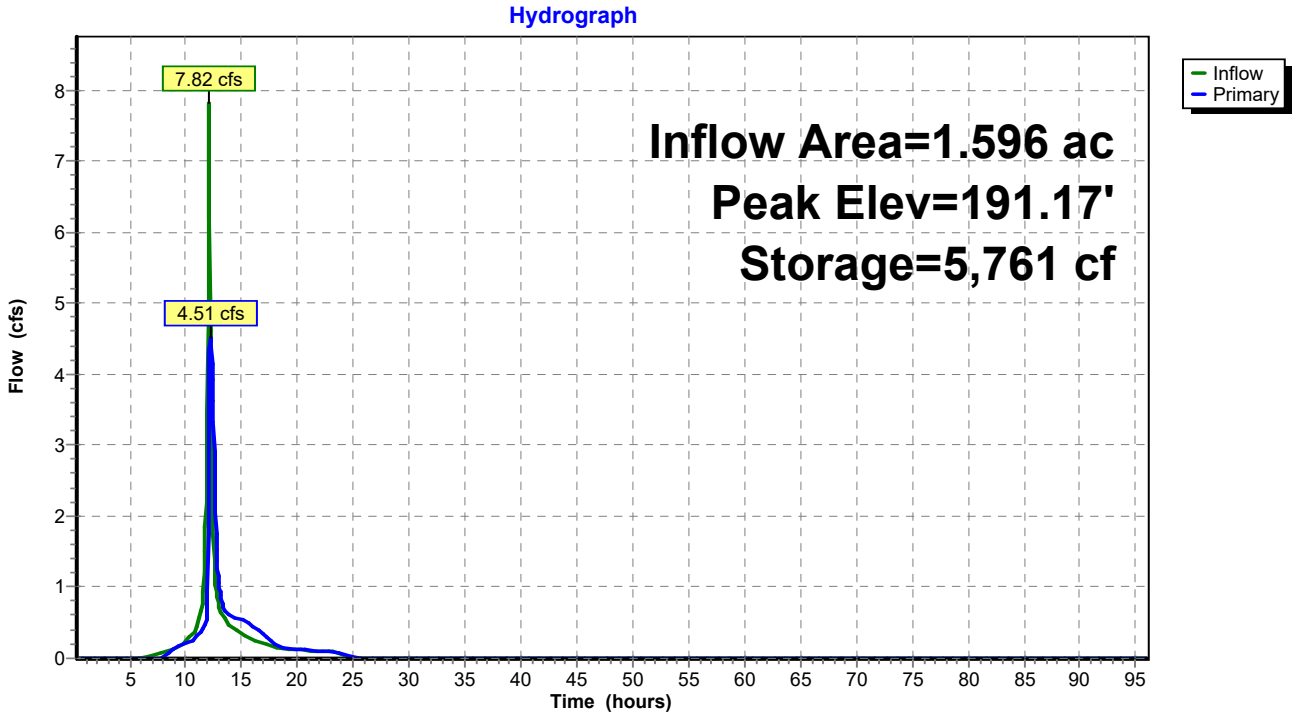
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.49 cfs @ 12.21 hrs HW=191.16' (Free Discharge)
└**1=Culvert** (Passes 4.49 cfs of 11.06 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.78 cfs @ 8.96 fps)
  ├**3=Orifice/Grate** (Orifice Controls 3.71 cfs @ 4.72 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond PRE-1P:


Hydrograph
7.82 cfs
4.51 cfs
Inflow Area=1.596 ac
Peak Elev=191.17'
Storage=5,761 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond PRE-1P:

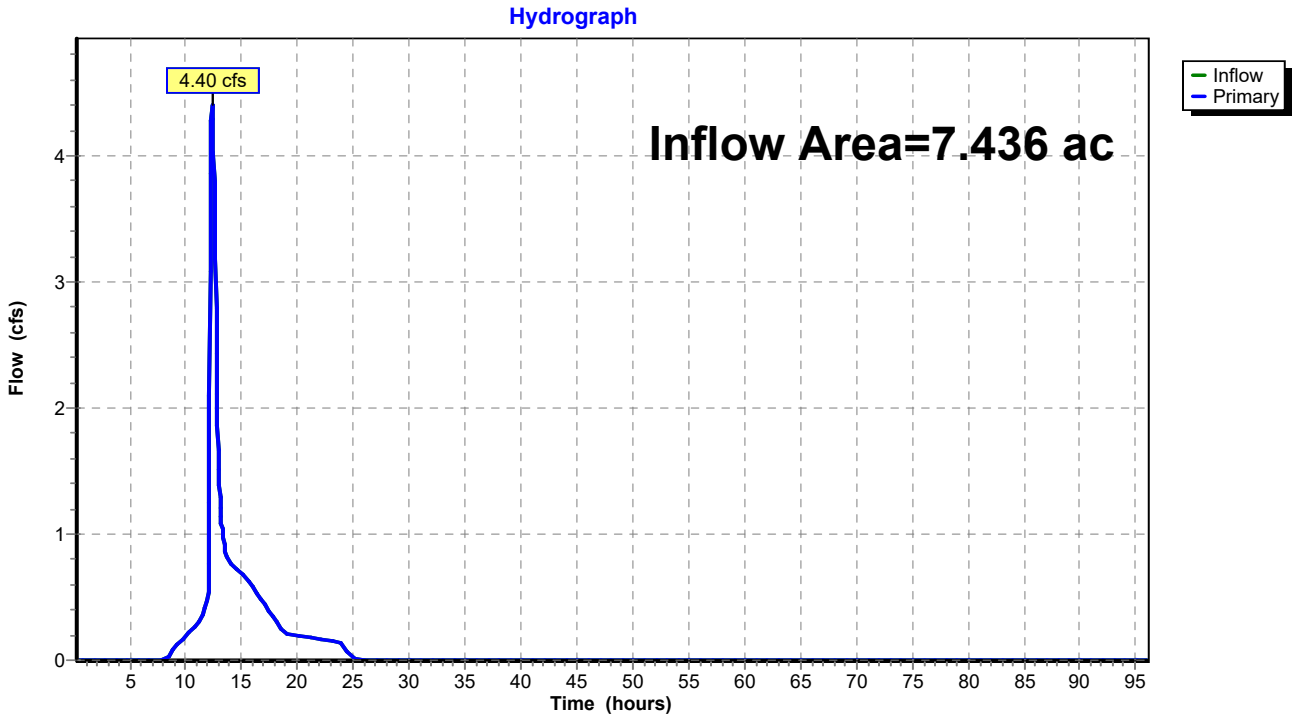
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.10	245	22
187.20	295	49
187.30	349	81
187.40	408	119
187.50	472	163
187.60	540	214
187.70	613	271
187.80	690	337
187.90	772	410
188.00	859	491
188.10	902	579
188.20	946	672
188.30	991	768
188.40	1,037	870
188.50	1,084	976
188.60	1,132	1,087
188.70	1,181	1,202
188.80	1,232	1,323
188.90	1,283	1,449
189.00	1,335	1,580
189.10	1,389	1,716
189.20	1,443	1,857
189.30	1,498	2,004
189.40	1,555	2,157
189.50	1,613	2,315
189.60	1,671	2,480
189.70	1,731	2,650
189.80	1,791	2,826
189.90	1,853	3,008
190.00	1,916	3,196
190.10	1,961	3,390
190.20	2,007	3,589
190.30	2,053	3,792
190.40	2,099	3,999
190.50	2,146	4,211
190.60	2,194	4,428
190.70	2,242	4,650
190.80	2,291	4,877
190.90	2,340	5,108
191.00	2,389	5,345
191.10	2,440	5,586
191.20	2,490	5,833
191.30	2,542	6,084
191.40	2,593	6,341
191.50	2,646	6,603
191.60	2,698	6,870
191.70	2,752	7,143
191.80	2,806	7,421
191.90	2,860	7,704
192.00	2,915	7,993
192.10	2,972	8,287
192.20	3,030	8,587
192.30	3,088	8,893
192.40	3,147	9,205
192.50	3,207	9,522
192.60	3,267	9,846
192.70	3,327	10,176
192.80	3,388	10,512
192.90	3,450	10,853
193.00	**3,512**	**11,201**

Summary for Link PRE-DP-1: Analysis Point

Inflow Area = 7.436 ac, 18.75% Impervious, Inflow Depth = 1.07" for 25-year event
Inflow = 4.40 cfs @ 12.36 hrs, Volume= 0.661 af
Primary = 4.40 cfs @ 12.36 hrs, Volume= 0.661 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link PRE-DP-1: Analysis Point



Summary for Subcatchment PRE-1S:

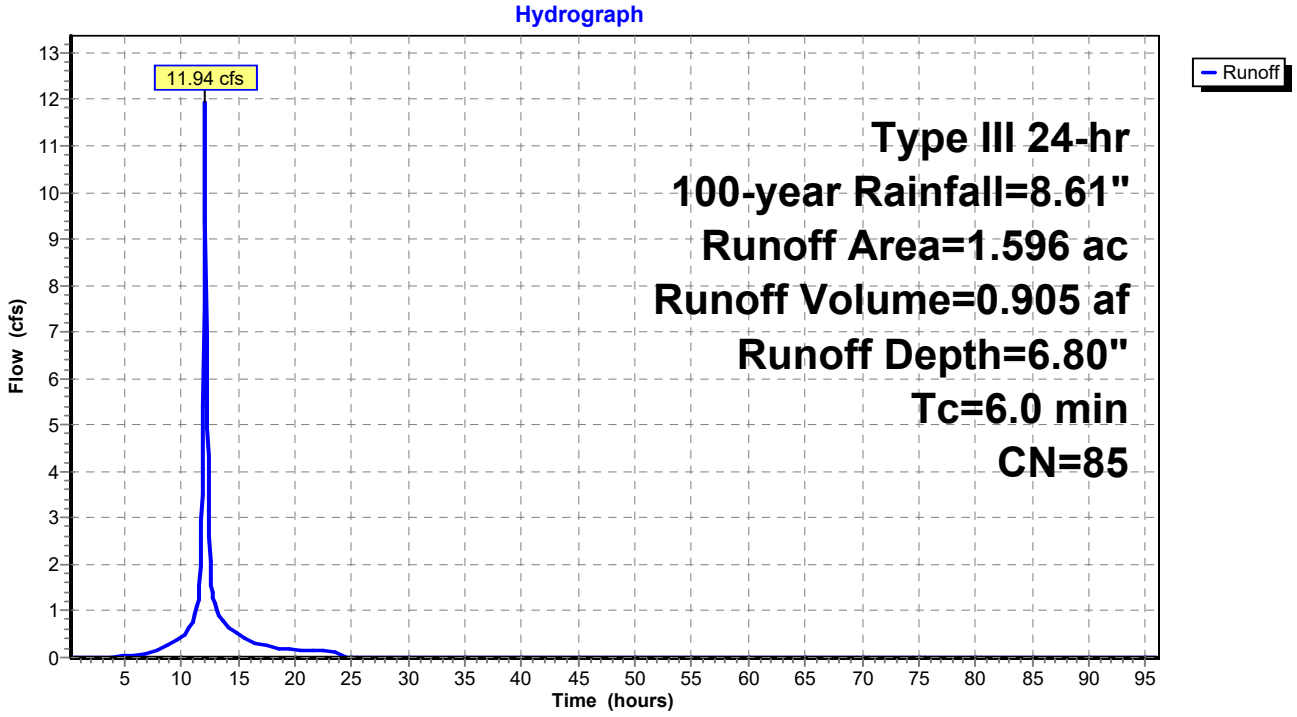
Runoff = 11.94 cfs @ 12.09 hrs, Volume= 0.905 af, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.000	30	Meadow, non-grazed, HSG A
	0.156	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment PRE-1S:



Summary for Subcatchment PRE-2S:

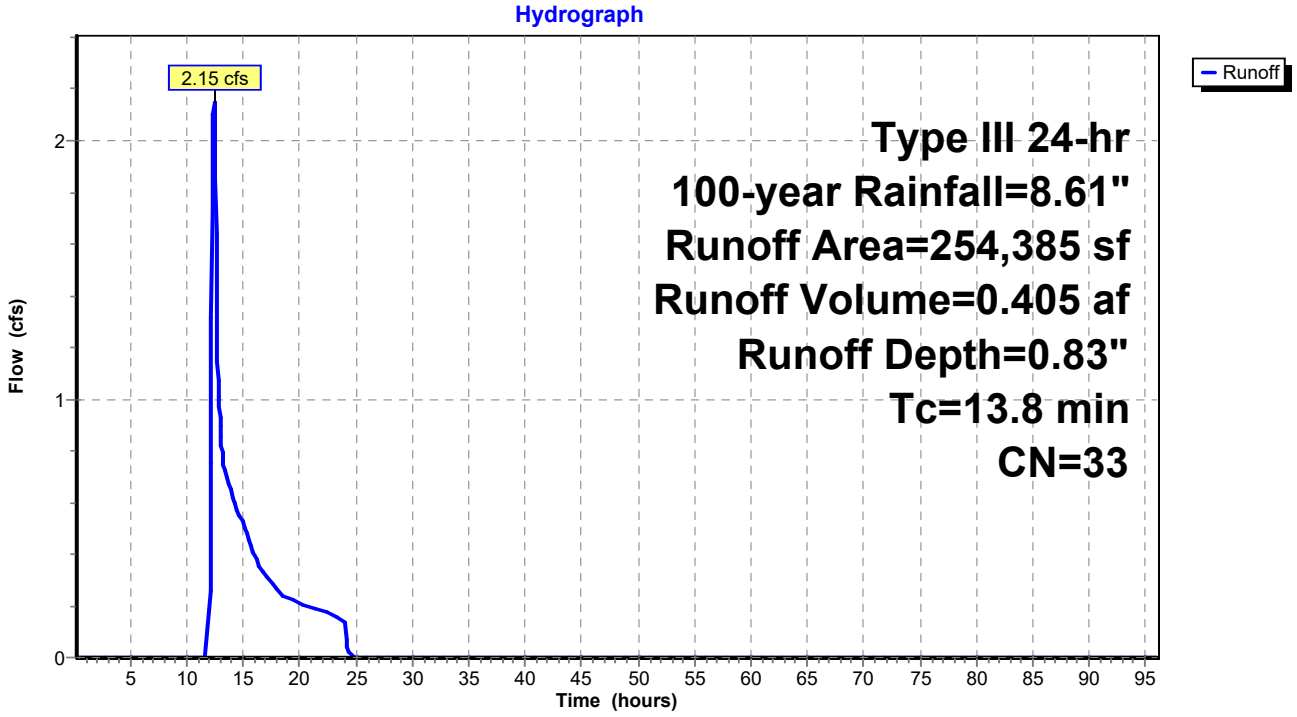
Runoff = 2.15 cfs @ 12.41 hrs, Volume= 0.405 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	5,841	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	220,830	30	Woods, Good, HSG A
	254,385	33	Weighted Average
	248,544		97.70% Pervious Area
	5,841		2.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment PRE-2S:



Summary for Reach PRE-1R:

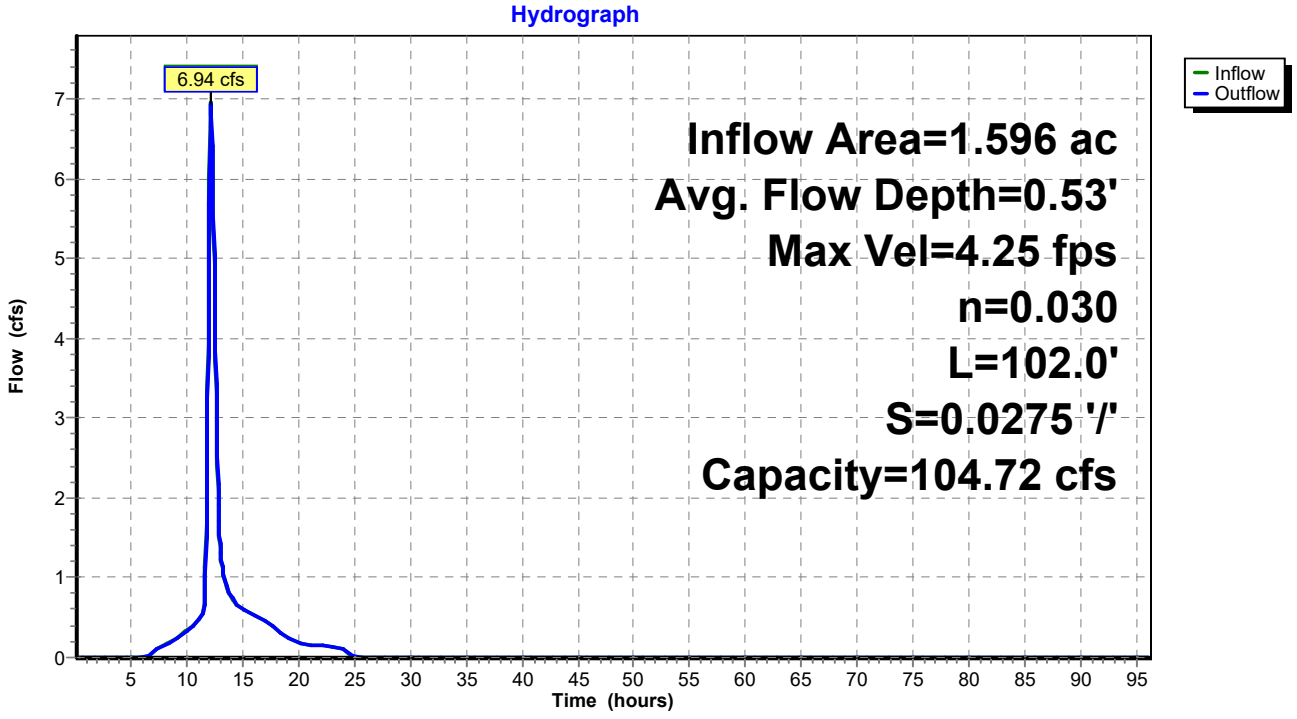
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.76" for 100-year event
Inflow = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af
Outflow = 6.94 cfs @ 12.22 hrs, Volume= 0.899 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.25 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 1.3 min

Peak Storage= 167 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 4.13'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 104.72 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 102.0' Slope= 0.0275 '/'
Inlet Invert= 187.00', Outlet Invert= 184.20'

Reach PRE-1R:



Stage-Area-Storage for Reach PRE-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0
187.02	0.0	4
187.04	0.1	8
187.06	0.1	13
187.08	0.2	18
187.10	0.2	22
187.12	0.3	27
187.14	0.3	33
187.16	0.4	38
187.18	0.4	43
187.20	0.5	49
187.22	0.5	55
187.24	0.6	61
187.26	0.7	67
187.28	0.7	73
187.30	0.8	80
187.32	0.8	86
187.34	0.9	93
187.36	1.0	100
187.38	1.0	107
187.40	1.1	114
187.42	1.2	122
187.44	1.3	129
187.46	1.3	137
187.48	1.4	145
187.50	1.5	153
187.52	1.6	161
187.54	1.7	170
187.56	1.7	178
187.58	1.8	187
187.60	1.9	196
187.62	2.0	205
187.64	2.1	214
187.66	2.2	224
187.68	2.3	233
187.70	2.4	243
187.72	2.5	253
187.74	2.6	263
187.76	2.7	273
187.78	2.8	283
187.80	2.9	294
187.82	3.0	304
187.84	3.1	315
187.86	3.2	326
187.88	3.3	337
187.90	3.4	349
187.92	3.5	360
187.94	3.6	372
187.96	3.8	384
187.98	3.9	396
188.00	4.0	408
188.02	4.1	420
188.04	4.2	433
188.06	4.4	445
188.08	4.5	458
188.10	4.6	471
188.12	4.7	484
188.14	4.9	498
188.16	5.0	511
188.18	5.1	525
188.20	5.3	539
188.22	5.4	553
188.24	5.6	567
188.26	5.7	581
188.28	5.8	595
188.30	6.0	610
188.32	6.1	625
188.34	6.3	640
188.36	6.4	655
188.38	6.6	670
188.40	6.7	685
188.42	6.9	701
188.44	7.0	717
188.46	7.2	733
188.48	7.3	749
188.50	7.5	765
188.52	7.7	781
188.54	7.8	798
188.56	8.0	815
188.58	8.2	832
188.60	8.3	849
188.62	8.5	866
188.64	8.7	883
188.66	8.8	901
188.68	9.0	918
188.70	9.2	936
188.72	9.4	954
188.74	9.5	973
188.76	9.7	991
188.78	9.9	1,009
188.80	10.1	1,028
188.82	10.3	1,047
188.84	10.5	1,066
188.86	10.6	1,085
188.88	10.8	1,105
188.90	11.0	1,124
188.92	11.2	1,144
188.94	11.4	1,164
188.96	11.6	1,184
188.98	11.8	1,204
189.00	**12.0**	**1,224**

Summary for Reach PRE-2R:

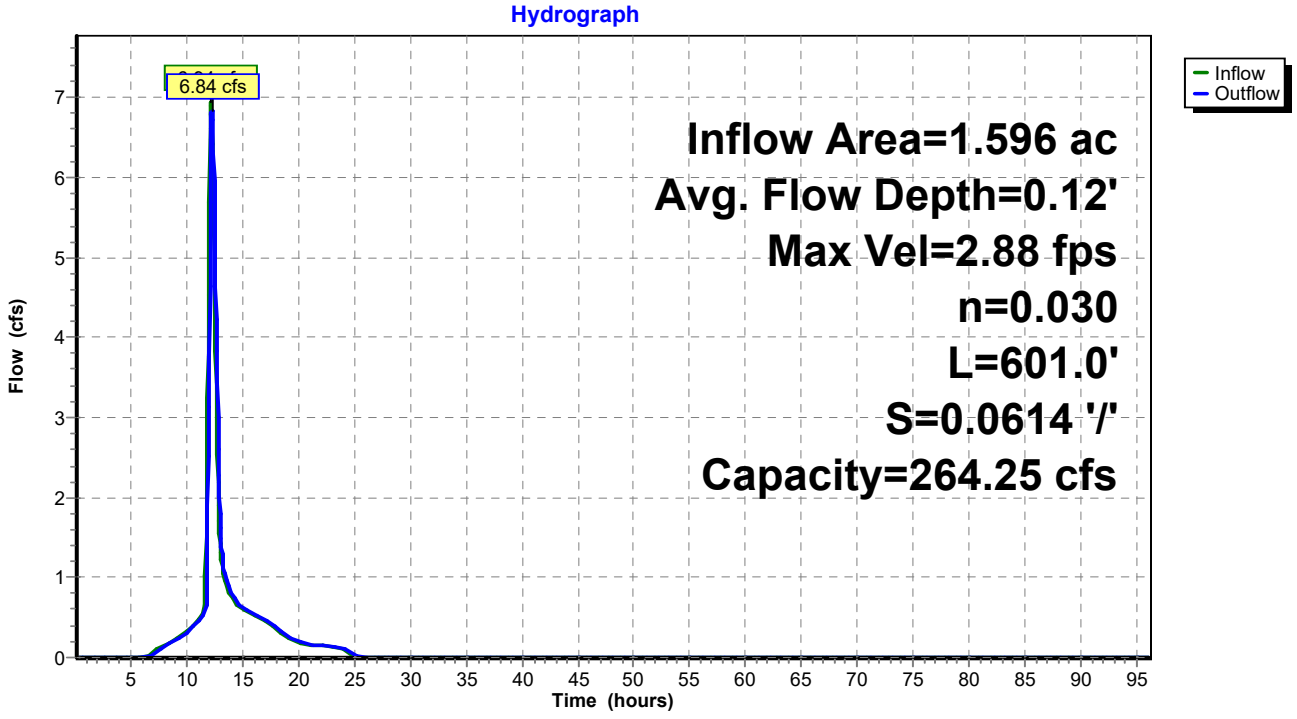
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.76" for 100-year event
Inflow = 6.94 cfs @ 12.22 hrs, Volume= 0.899 af
Outflow = 6.84 cfs @ 12.33 hrs, Volume= 0.899 af, Atten= 2%, Lag= 6.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 12.0 min

Peak Storage= 1,432 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 20.93'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 264.25 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 601.0' Slope= 0.0614 '/'
Inlet Invert= 184.00', Outlet Invert= 147.10'

Reach PRE-2R:



Stage-Area-Storage for Reach PRE-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
184.00	0.0	0
184.01	0.2	120
184.02	0.4	241
184.03	0.6	363
184.04	0.8	485
184.05	1.0	607
184.06	1.2	730
184.07	1.4	853
184.08	1.6	977
184.09	1.8	1,101
184.10	2.0	1,226
184.11	2.2	1,351
184.12	2.5	1,477
184.13	2.7	1,603
184.14	2.9	1,730
184.15	3.1	1,857
184.16	3.3	1,985
184.17	3.5	2,113
184.18	3.7	2,241
184.19	3.9	2,371
184.20	4.2	2,500
184.21	4.4	2,630
184.22	4.6	2,761
184.23	4.8	2,892
184.24	5.0	3,023
184.25	5.3	3,155
184.26	5.5	3,288
184.27	5.7	3,421
184.28	5.9	3,554
184.29	6.1	3,688
184.30	6.4	3,822
184.31	6.6	3,957
184.32	6.8	4,093
184.33	7.0	4,228
184.34	7.3	4,365
184.35	7.5	4,501
184.36	7.7	4,639
184.37	7.9	4,777
184.38	8.2	4,915
184.39	8.4	5,053
184.40	8.6	5,193
184.41	8.9	5,332
184.42	9.1	5,472
184.43	9.3	5,613
184.44	9.6	5,754
184.45	9.8	5,896
184.46	10.0	6,038
184.47	10.3	6,180
184.48	10.5	6,323
184.49	10.8	6,467
184.50	11.0	6,611
184.51	11.2	6,755
184.52	11.5	6,900
184.53	11.7	7,046
184.54	12.0	7,192
184.55	12.2	7,338
184.56	12.5	7,485
184.57	12.7	7,632
184.58	12.9	7,780
184.59	13.2	7,929
184.60	13.4	8,077
184.61	13.7	8,227
184.62	13.9	8,376
184.63	14.2	8,527
184.64	14.4	8,677
184.65	14.7	8,829
184.66	14.9	8,980
184.67	15.2	9,133
184.68	15.4	9,285
184.69	15.7	9,438
184.70	16.0	9,592
184.71	16.2	9,746
184.72	16.5	9,901
184.73	16.7	10,056
184.74	17.0	10,211
184.75	17.3	10,367
184.76	17.5	10,524
184.77	17.8	10,681
184.78	18.0	10,838
184.79	18.3	10,996
184.80	18.6	11,155
184.81	18.8	11,313
184.82	19.1	11,473
184.83	19.4	11,633
184.84	19.6	11,793
184.85	19.9	11,954
184.86	20.2	12,115
184.87	20.4	12,277
184.88	20.7	12,439
184.89	21.0	12,602
184.90	21.2	12,765
184.91	21.5	12,929
184.92	21.8	13,093
184.93	22.1	13,258
184.94	22.3	13,423
184.95	22.6	13,589
184.96	22.9	13,755
184.97	23.2	13,921
184.98	23.4	14,088
184.99	23.7	14,256
185.00	**24.0**	**14,424**

Summary for Pond PRE-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.80" for 100-year event
Inflow = 11.94 cfs @ 12.09 hrs, Volume= 0.905 af
Outflow = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af, Atten= 42%, Lag= 7.3 min
Primary = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 192.04' @ 12.21 hrs Surf.Area= 2,938 sf Storage= 8,112 cf

Plug-Flow detention time= 39.9 min calculated for 0.899 af (99% of inflow)
Center-of-Mass det. time= 34.9 min (822.9 - 788.0)

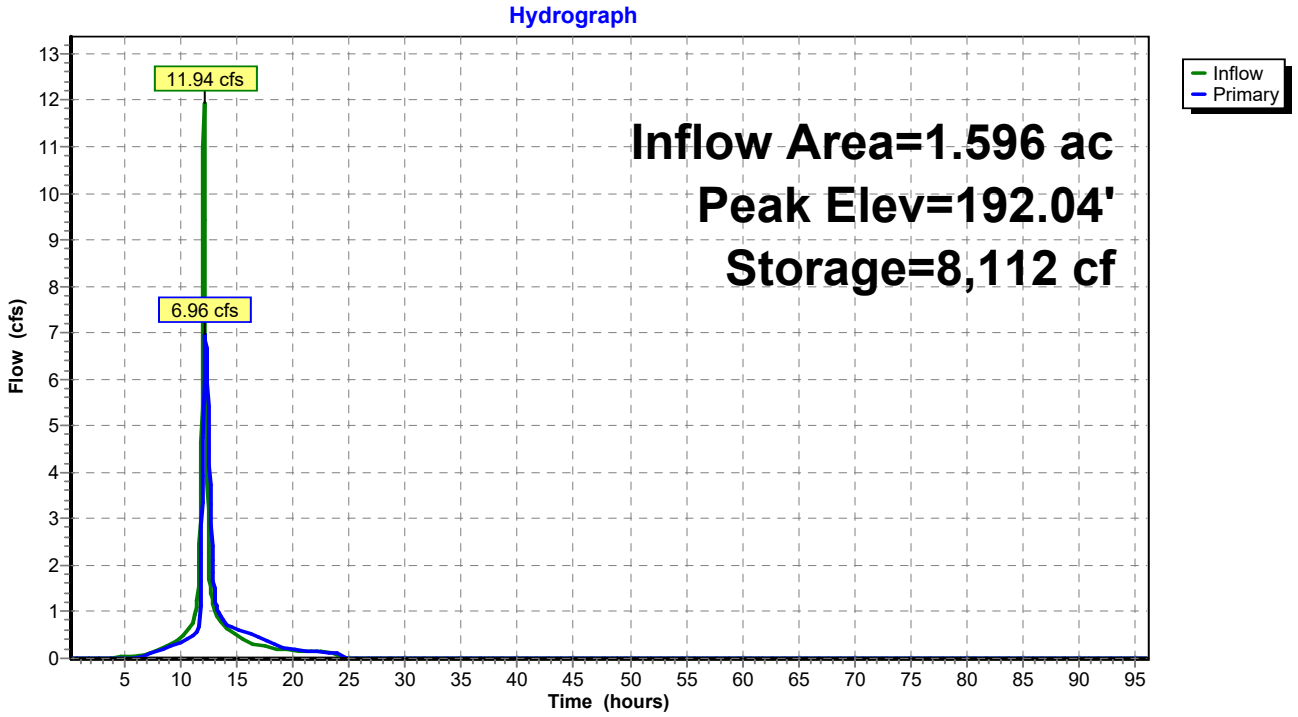
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.94 cfs @ 12.21 hrs HW=192.03' (Free Discharge)
└**1=Culvert** (Passes 6.94 cfs of 12.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.87 cfs @ 10.02 fps)
  ├**3=Orifice/Grate** (Orifice Controls 5.12 cfs @ 6.52 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.95 cfs @ 3.54 fps)

Pond PRE-1P:


Hydrograph
Inflow Area=1.596 ac
Peak Elev=192.04'
Storage=8,112 cf
11.94 cfs
6.96 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond PRE-1P:

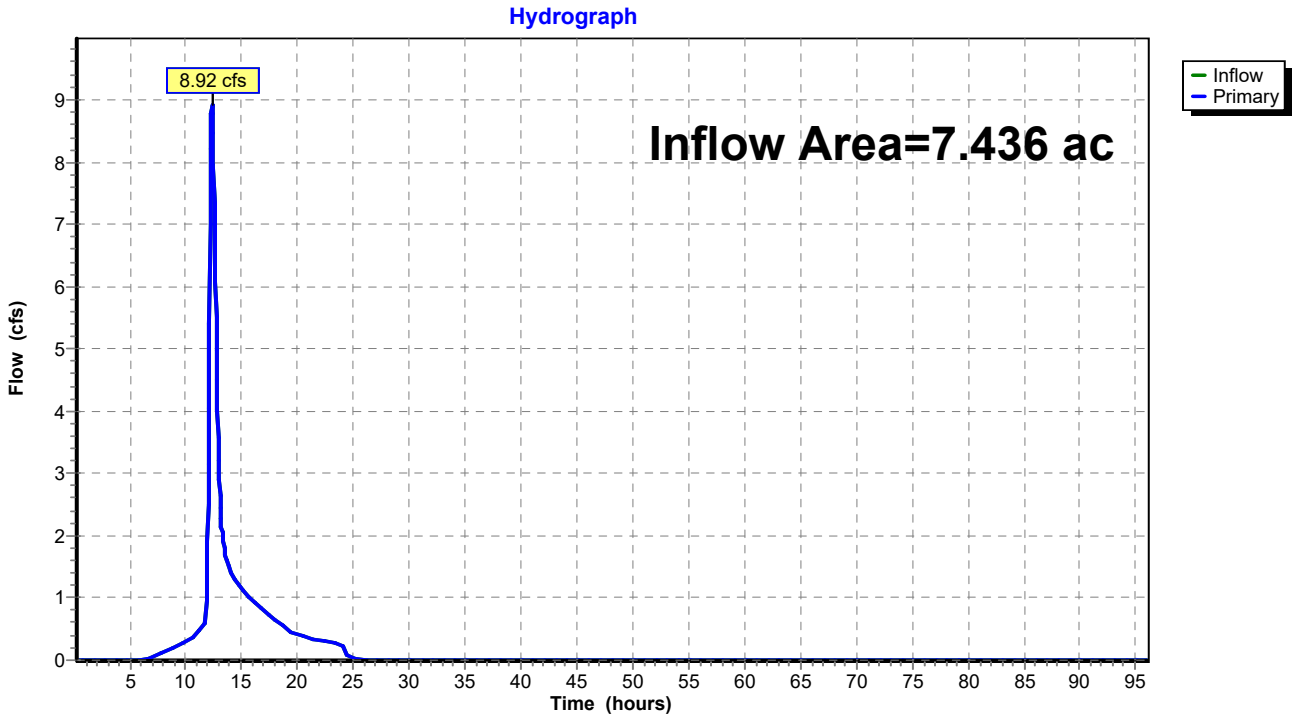
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.10	245	22
187.20	295	49
187.30	349	81
187.40	408	119
187.50	472	163
187.60	540	214
187.70	613	271
187.80	690	337
187.90	772	410
188.00	859	491
188.10	902	579
188.20	946	672
188.30	991	768
188.40	1,037	870
188.50	1,084	976
188.60	1,132	1,087
188.70	1,181	1,202
188.80	1,232	1,323
188.90	1,283	1,449
189.00	1,335	1,580
189.10	1,389	1,716
189.20	1,443	1,857
189.30	1,498	2,004
189.40	1,555	2,157
189.50	1,613	2,315
189.60	1,671	2,480
189.70	1,731	2,650
189.80	1,791	2,826
189.90	1,853	3,008
190.00	1,916	3,196
190.10	1,961	3,390
190.20	2,007	3,589
190.30	2,053	3,792
190.40	2,099	3,999
190.50	2,146	4,211
190.60	2,194	4,428
190.70	2,242	4,650
190.80	2,291	4,877
190.90	2,340	5,108
191.00	2,389	5,345
191.10	2,440	5,586
191.20	2,490	5,833
191.30	2,542	6,084
191.40	2,593	6,341
191.50	2,646	6,603
191.60	2,698	6,870
191.70	2,752	7,143
191.80	2,806	7,421
191.90	2,860	7,704
192.00	2,915	7,993
192.10	2,972	8,287
192.20	3,030	8,587
192.30	3,088	8,893
192.40	3,147	9,205
192.50	3,207	9,522
192.60	3,267	9,846
192.70	3,327	10,176
192.80	3,388	10,512
192.90	3,450	10,853
193.00	**3,512**	**11,201**

Summary for Link PRE-DP-1: Analysis Point

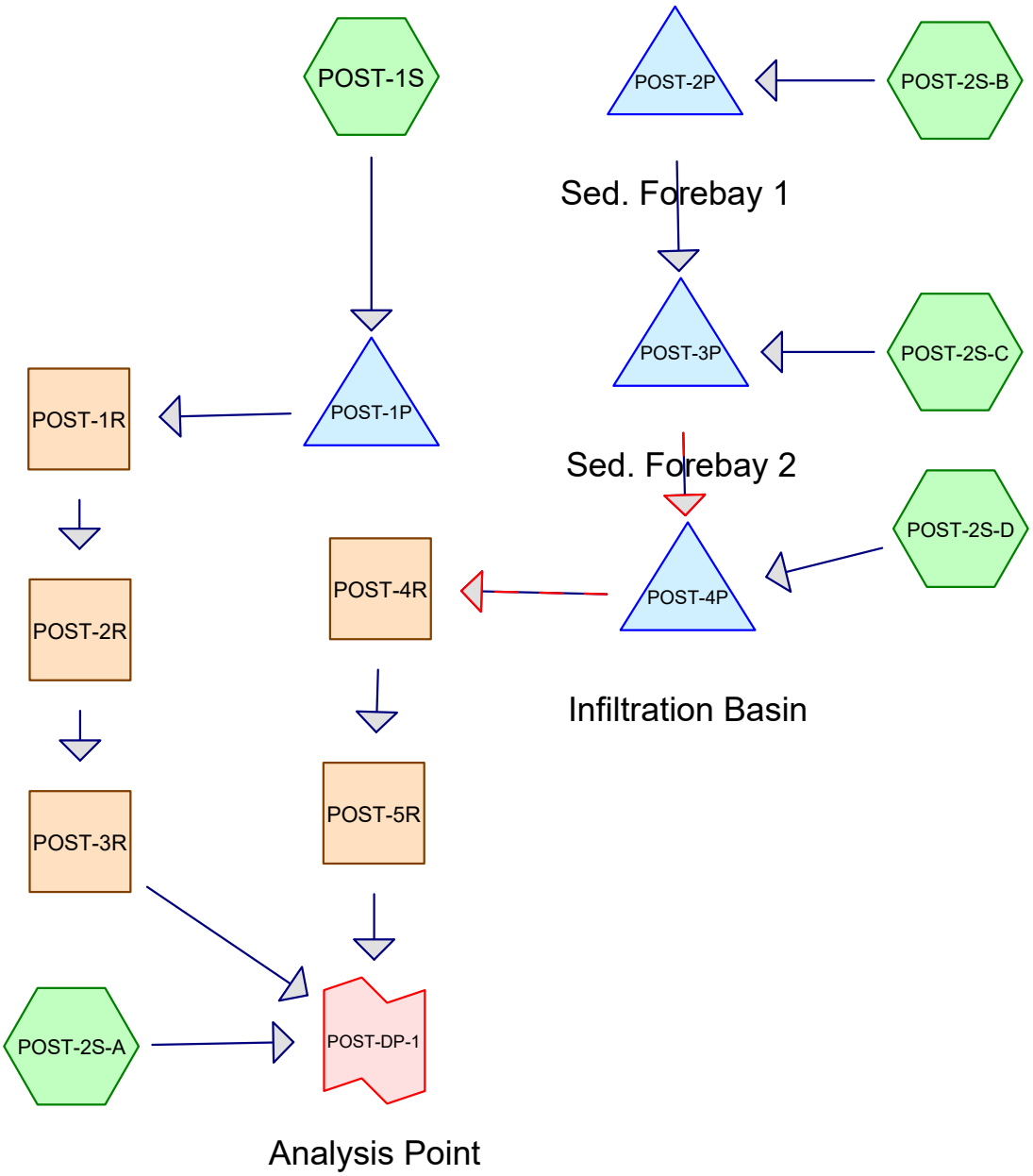
Inflow Area = 7.436 ac, 18.75% Impervious, Inflow Depth = 2.10" for 100-year event
Inflow = 8.92 cfs @ 12.35 hrs, Volume= 1.304 af
Primary = 8.92 cfs @ 12.35 hrs, Volume= 1.304 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link PRE-DP-1: Analysis Point



POST-DEVELOPMENT



Subcat Reach Pond Link

Routing Diagram for Holliston - Stormwater Model
Prepared by TRC, Printed 6/16/2023
HydroCAD® 10.10-5a s/n 01402 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.21	2
2	10-year	Type III 24-hr		Default	24.00	1	4.81	2
3	25-year	Type III 24-hr		Default	24.00	1	6.06	2
4	100-year	Type III 24-hr		Default	24.00	1	8.61	2

Summary for Subcatchment POST-1S:

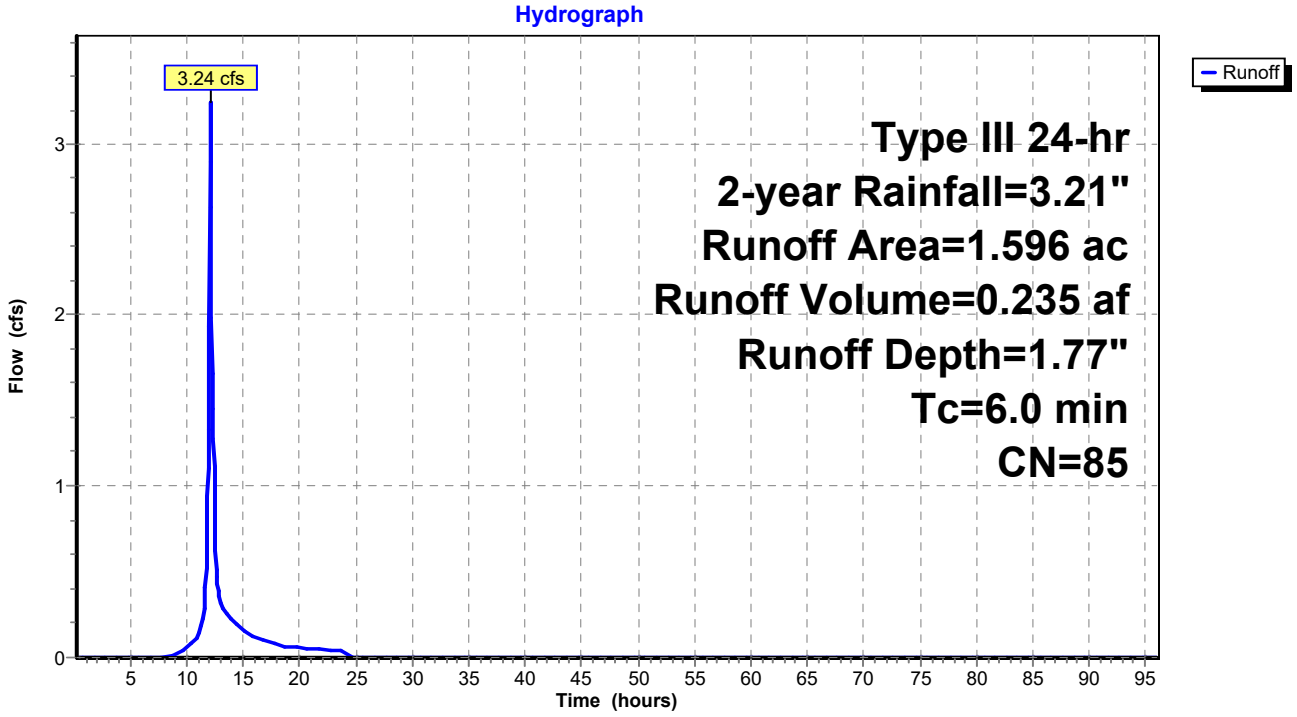
Runoff = 3.24 cfs @ 12.09 hrs, Volume= 0.235 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.016	30	Meadow, non-grazed, HSG A
	0.140	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-1S:



Summary for Subcatchment POST-2S-A:

[45] Hint: Runoff=Zero

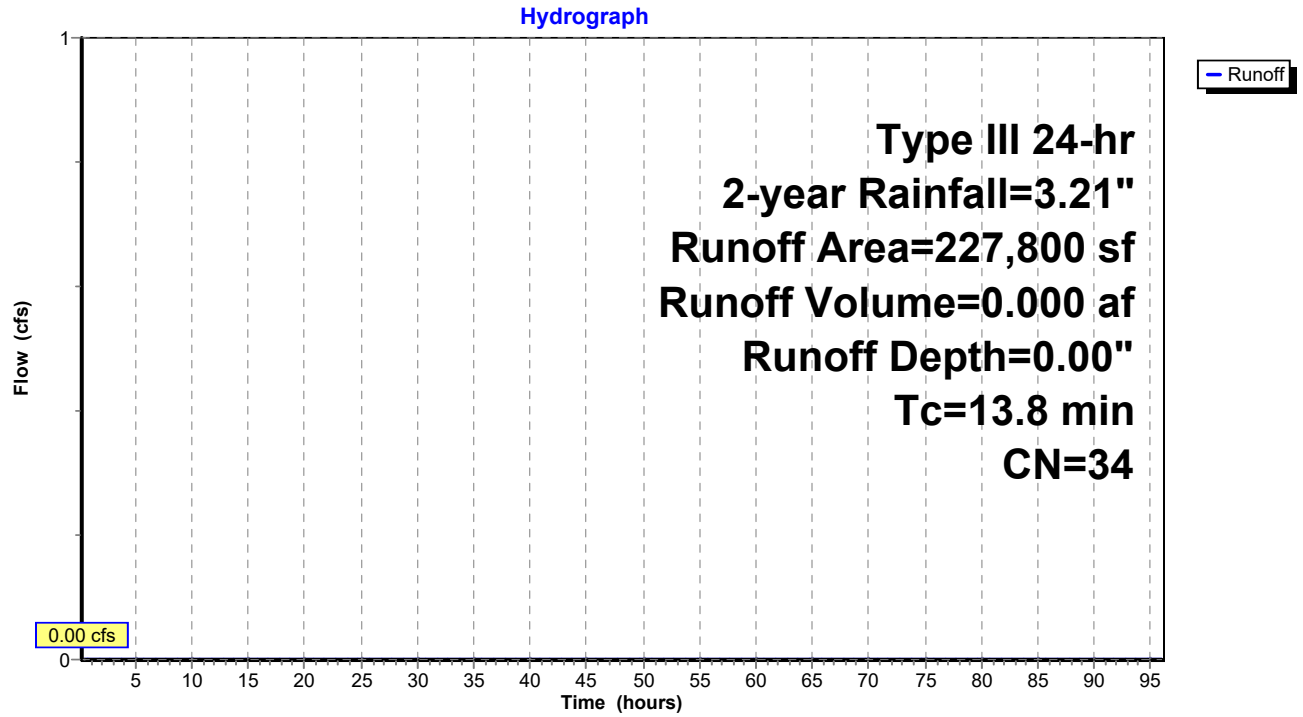
Runoff = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	5,732	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	9,568	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	19,869	30	Meadow, non-grazed, HSG A
	164,917	30	Woods, Good, HSG A
	227,800	34	Weighted Average
	222,068		97.48% Pervious Area
	5,732		2.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment POST-2S-A:



Summary for Subcatchment POST-2S-B:

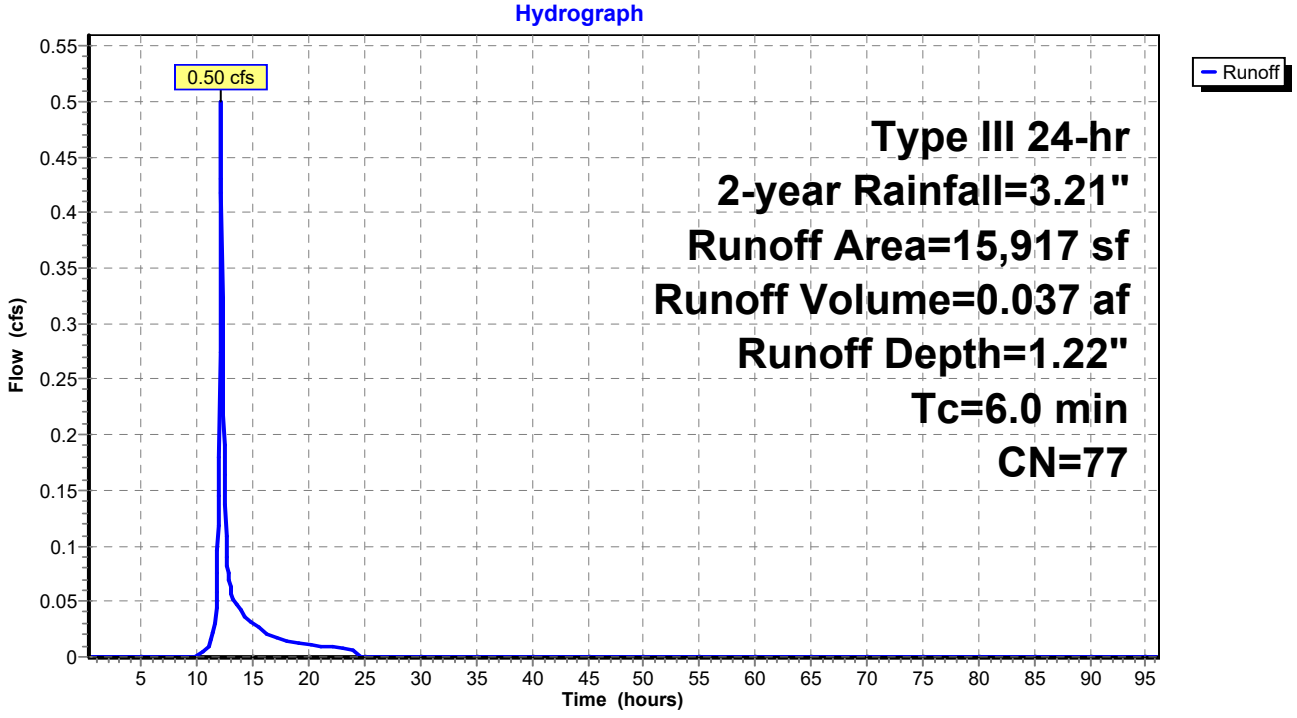
Runoff = 0.50 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

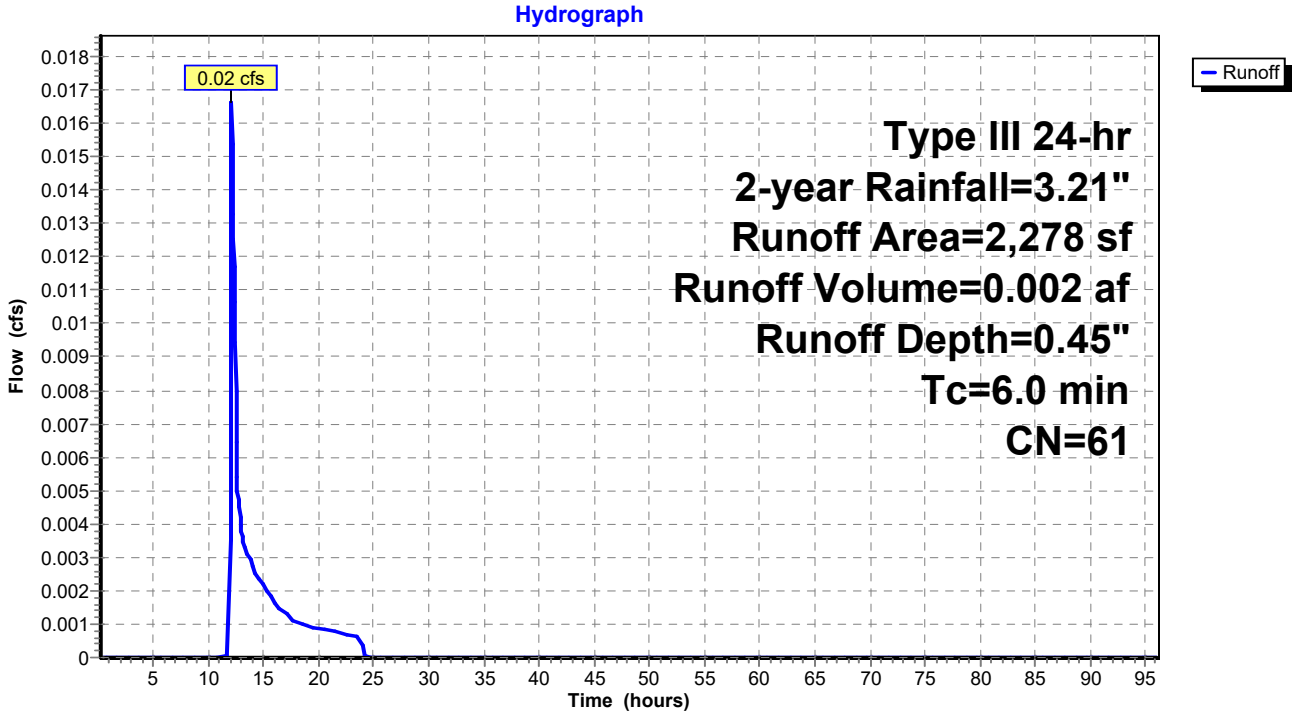
Runoff = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

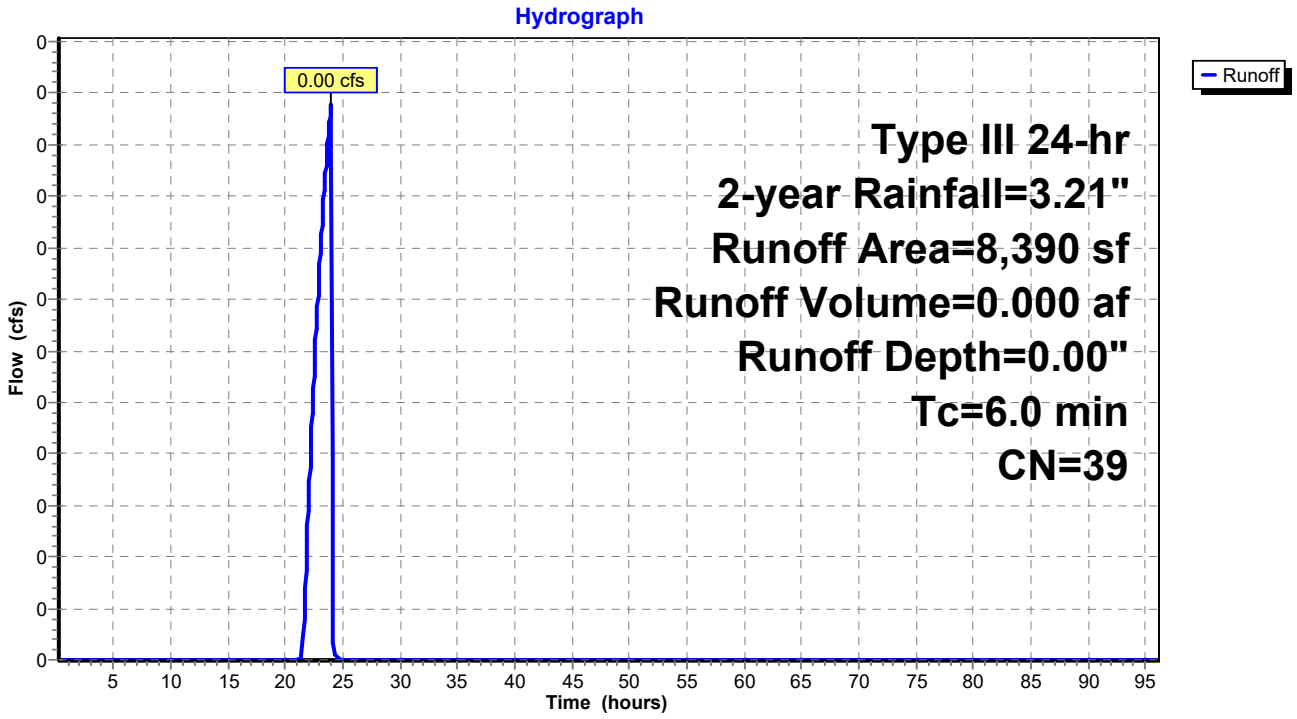
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-1R:

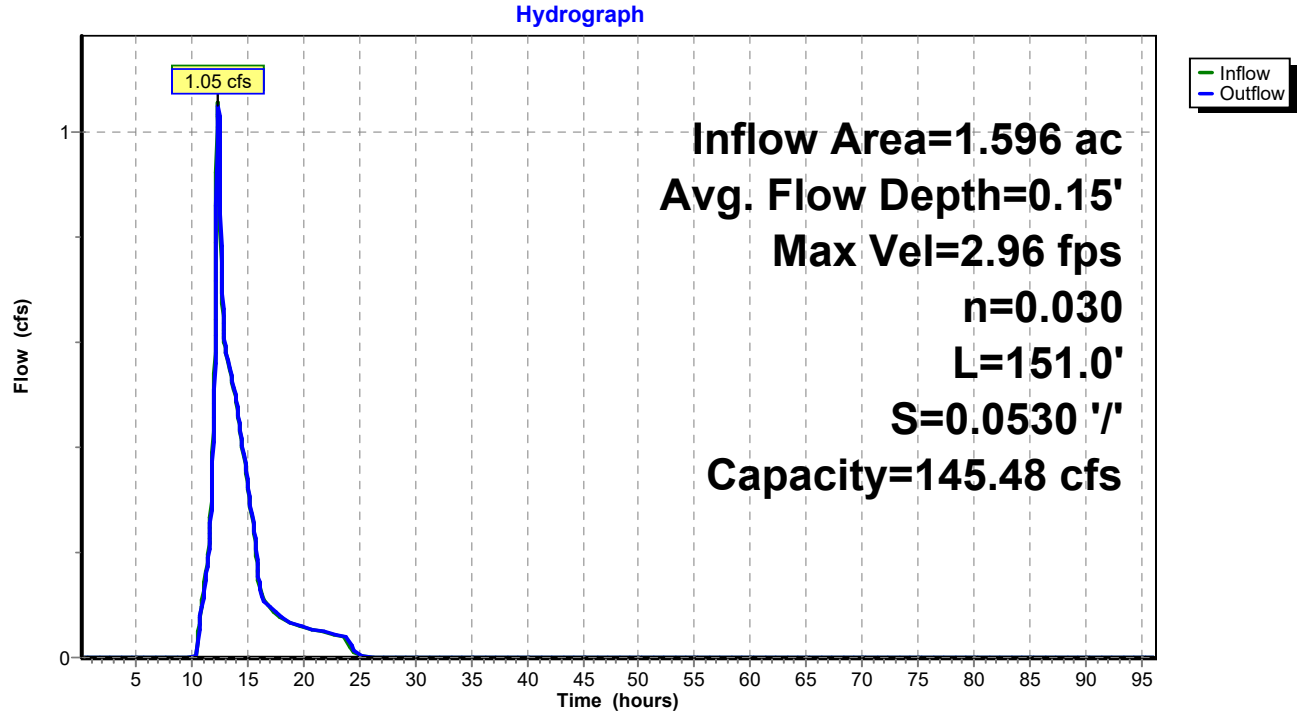
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af
Outflow = 1.05 cfs @ 12.45 hrs, Volume= 0.229 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 2.0 min

Peak Storage= 54 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 2.62'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 145.48 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 151.0' Slope= 0.0530 '/'
Inlet Invert= 187.00', Outlet Invert= 179.00'

Reach POST-1R:



Stage-Area-Storage for Reach POST-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0	187.52	1.6	239
187.01	0.0	3	187.53	1.6	245
187.02	0.0	6	187.54	1.7	251
187.03	0.1	9	187.55	1.7	257
187.04	0.1	13	187.56	1.7	264
187.05	0.1	16	187.57	1.8	270
187.06	0.1	19	187.58	1.8	277
187.07	0.2	23	187.59	1.9	283
187.08	0.2	26	187.60	1.9	290
187.09	0.2	30	187.61	2.0	297
187.10	0.2	33	187.62	2.0	303
187.11	0.2	37	187.63	2.1	310
187.12	0.3	41	187.64	2.1	317
187.13	0.3	44	187.65	2.1	324
187.14	0.3	48	187.66	2.2	331
187.15	0.3	52	187.67	2.2	338
187.16	0.4	56	187.68	2.3	345
187.17	0.4	60	187.69	2.3	352
187.18	0.4	64	187.70	2.4	359
187.19	0.5	68	187.71	2.4	367
187.20	0.5	72	187.72	2.5	374
187.21	0.5	77	187.73	2.5	381
187.22	0.5	81	187.74	2.6	389
187.23	0.6	85	187.75	2.6	396
187.24	0.6	90	187.76	2.7	404
187.25	0.6	94	187.77	2.7	412
187.26	0.7	99	187.78	2.8	419
187.27	0.7	104	187.79	2.8	427
187.28	0.7	108	187.80	2.9	435
187.29	0.7	113	187.81	2.9	443
187.30	0.8	118	187.82	3.0	451
187.31	0.8	123	187.83	3.0	459
187.32	0.8	128	187.84	3.1	467
187.33	0.9	133	187.85	3.1	475
187.34	0.9	138	187.86	3.2	483
187.35	0.9	143	187.87	3.3	491
187.36	1.0	148	187.88	3.3	500
187.37	1.0	153	187.89	3.4	508
187.38	1.0	158	187.90	3.4	516
187.39	1.1	164	187.91	3.5	525
187.40	1.1	169	187.92	3.5	533
187.41	1.2	175	187.93	3.6	542
187.42	1.2	180	187.94	3.6	551
187.43	1.2	186	187.95	3.7	559
187.44	1.3	191	187.96	3.8	568
187.45	1.3	197	187.97	3.8	577
187.46	1.3	203	187.98	3.9	586
187.47	1.4	209	187.99	3.9	595
187.48	1.4	215	188.00	4.0	604
187.49	1.5	221	188.01	4.1	613
187.50	1.5	227	188.02	4.1	622
187.51	1.5	233	188.03	4.2	631

Stage-Area-Storage for Reach POST-1R: (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
188.04	4.2	641
188.05	4.3	650
188.06	4.4	659
188.07	4.4	669
188.08	4.5	678
188.09	4.6	688
188.10	4.6	698
188.11	4.7	707
188.12	4.7	717
188.13	4.8	727
188.14	4.9	737
188.15	4.9	747
188.16	5.0	757
188.17	5.1	767
188.18	5.1	777
188.19	5.2	787
188.20	5.3	797
188.21	5.3	808
188.22	5.4	818
188.23	5.5	828
188.24	5.6	839
188.25	5.6	849
188.26	5.7	860
188.27	5.8	871
188.28	5.8	881
188.29	5.9	892
188.30	6.0	903
188.31	6.1	914
188.32	6.1	925
188.33	6.2	936
188.34	6.3	947
188.35	6.3	958
188.36	6.4	969
188.37	6.5	981
188.38	6.6	992
188.39	6.6	1,003
188.40	6.7	1,015
188.41	6.8	1,026
188.42	6.9	1,038
188.43	6.9	1,049
188.44	7.0	1,061
188.45	7.1	1,073
188.46	7.2	1,085
188.47	7.3	1,097
188.48	7.3	1,108
188.49	7.4	1,120
188.50	7.5	1,133
188.51	7.6	1,145
188.52	7.7	1,157
188.53	7.7	1,169
188.54	7.8	1,181
188.55	7.9	1,194
188.56	8.0	1,206
188.57	8.1	1,219
188.58	8.2	1,231
188.59	8.2	1,244
188.60	8.3	1,256
188.61	8.4	1,269
188.62	8.5	1,282
188.63	8.6	1,295
188.64	8.7	1,308
188.65	8.7	1,321
188.66	8.8	1,334
188.67	8.9	1,347
188.68	9.0	1,360
188.69	9.1	1,373
188.70	9.2	1,386
188.71	9.3	1,400
188.72	9.4	1,413
188.73	9.4	1,426
188.74	9.5	1,440
188.75	9.6	1,453
188.76	9.7	1,467
188.77	9.8	1,481
188.78	9.9	1,494
188.79	10.0	1,508
188.80	10.1	1,522
188.81	10.2	1,536
188.82	10.3	1,550
188.83	10.4	1,564
188.84	10.5	1,578
188.85	10.5	1,592
188.86	10.6	1,607
188.87	10.7	1,621
188.88	10.8	1,635
188.89	10.9	1,650
188.90	11.0	1,664
188.91	11.1	1,679
188.92	11.2	1,693
188.93	11.3	1,708
188.94	11.4	1,722
188.95	11.5	1,737
188.96	11.6	1,752
188.97	11.7	1,767
188.98	11.8	1,782
188.99	11.9	1,797
189.00	**12.0**	**1,812**

Summary for Reach POST-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 1.05 cfs @ 12.45 hrs, Volume= 0.229 af
Outflow = 1.04 cfs @ 12.52 hrs, Volume= 0.229 af, Atten= 1%, Lag= 4.1 min

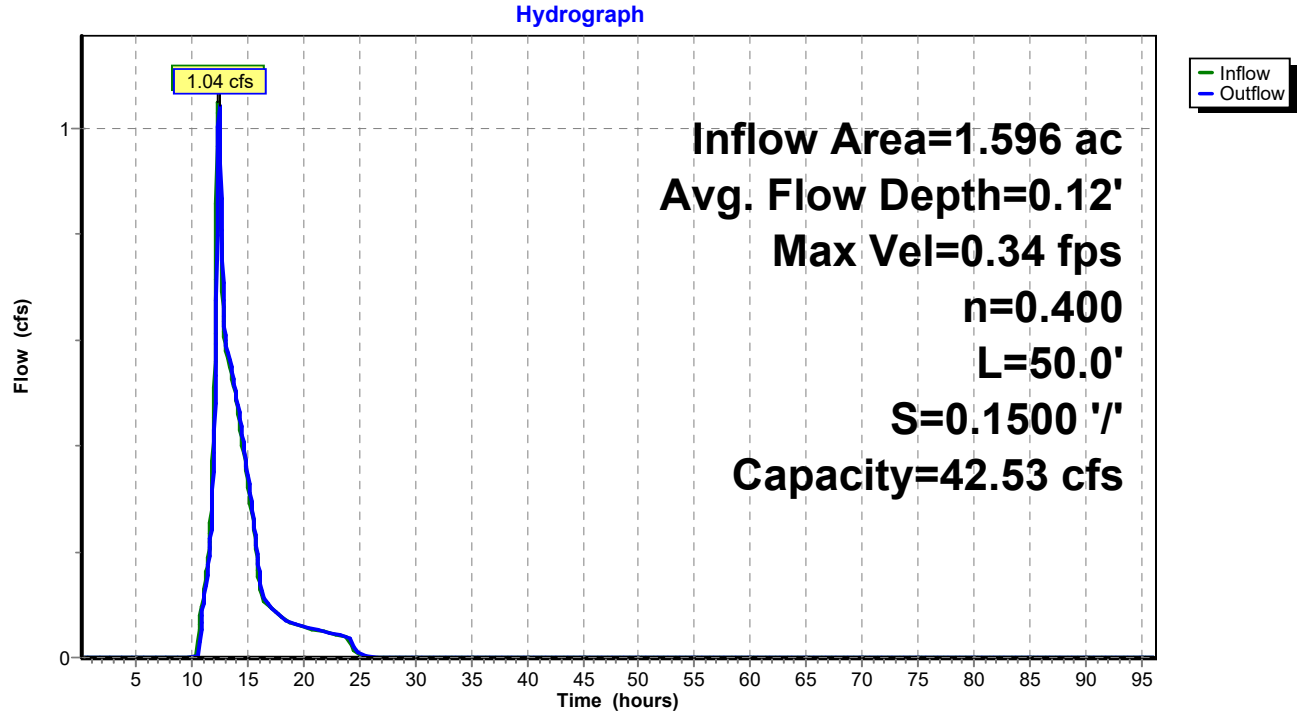
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.34 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 7.3 min

Peak Storage= 155 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 27.37'
Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 42.53 cfs

25.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 50.0' Slope= 0.1500 '/'
Inlet Invert= 178.50', Outlet Invert= 171.00'

‡

Reach POST-2R:



Stage-Area-Storage for Reach POST-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
178.50	0.0	0
178.51	0.3	13
178.52	0.5	25
178.53	0.8	38
178.54	1.0	51
178.55	1.3	64
178.56	1.5	77
178.57	1.8	90
178.58	2.1	103
178.59	2.3	117
178.60	2.6	130
178.61	2.9	144
178.62	3.1	157
178.63	3.4	171
178.64	3.7	185
178.65	4.0	199
178.66	4.3	213
178.67	4.5	227
178.68	4.8	241
178.69	5.1	256
178.70	5.4	270
178.71	5.7	285
178.72	6.0	299
178.73	6.3	314
178.74	6.6	329
178.75	6.9	344
178.76	7.2	359
178.77	7.5	374
178.78	7.8	389
178.79	8.1	405
178.80	8.4	420
178.81	8.7	436
178.82	9.0	451
178.83	9.3	467
178.84	9.7	483
178.85	10.0	499
178.86	10.3	515
178.87	10.6	531
178.88	10.9	547
178.89	11.3	564
178.90	11.6	580
178.91	11.9	597
178.92	12.3	613
178.93	12.6	630
178.94	12.9	647
178.95	13.3	664
178.96	13.6	681
178.97	14.0	698
178.98	14.3	715
178.99	14.7	733
179.00	15.0	750
179.01	15.4	768
179.02	15.7	785
179.03	16.1	803
179.04	16.4	821
179.05	16.8	839
179.06	17.1	857
179.07	17.5	875
179.08	17.9	893
179.09	18.2	912
179.10	18.6	930
179.11	19.0	949
179.12	19.3	967
179.13	19.7	986
179.14	20.1	1,005
179.15	20.5	1,024
179.16	20.9	1,043
179.17	21.2	1,062
179.18	21.6	1,081
179.19	22.0	1,101
179.20	22.4	1,120
179.21	22.8	1,140
179.22	23.2	1,159
179.23	23.6	1,179
179.24	24.0	1,199
179.25	24.4	1,219
179.26	24.8	1,239
179.27	25.2	1,259
179.28	25.6	1,279
179.29	26.0	1,300
179.30	26.4	1,320
179.31	26.8	1,341
179.32	27.2	1,361
179.33	27.6	1,382
179.34	28.1	1,403
179.35	28.5	1,424
179.36	28.9	1,445
179.37	29.3	1,466
179.38	29.7	1,487
179.39	30.2	1,509
179.40	30.6	1,530
179.41	31.0	1,552
179.42	31.5	1,573
179.43	31.9	1,595
179.44	32.3	1,617
179.45	32.8	1,639
179.46	33.2	1,661
179.47	33.7	1,683
179.48	34.1	1,705
179.49	34.6	1,728
179.50	**35.0**	**1,750**

Summary for Reach POST-3R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 1.04 cfs @ 12.52 hrs, Volume= 0.229 af
Outflow = 0.99 cfs @ 12.72 hrs, Volume= 0.229 af, Atten= 5%, Lag= 12.3 min

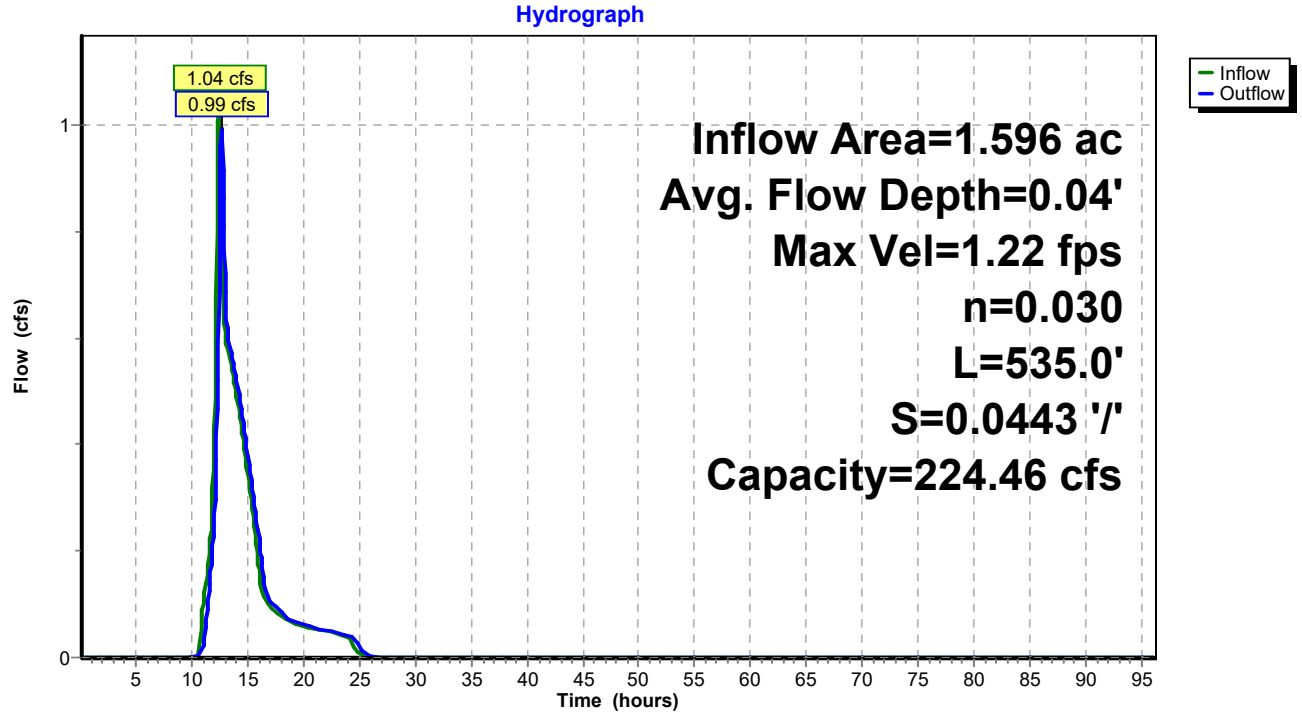
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.22 fps, Min. Travel Time= 7.3 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 15.7 min

Peak Storage= 436 cf @ 12.60 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 20.32'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 224.46 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 535.0' Slope= 0.0443 '/'
Inlet Invert= 170.80', Outlet Invert= 147.10'

‡

Reach POST-3R:



Stage-Area-Storage for Reach POST-3R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
170.80	0.0	0
170.81	0.2	107
170.82	0.4	215
170.83	0.6	323
170.84	0.8	431
170.85	1.0	540
170.86	1.2	650
170.87	1.4	759
170.88	1.6	870
170.89	1.8	980
170.90	2.0	1,091
170.91	2.2	1,203
170.92	2.5	1,315
170.93	2.7	1,427
170.94	2.9	1,540
170.95	3.1	1,653
170.96	3.3	1,767
170.97	3.5	1,881
170.98	3.7	1,995
170.99	3.9	2,110
171.00	4.2	2,226
171.01	4.4	2,341
171.02	4.6	2,458
171.03	4.8	2,574
171.04	5.0	2,691
171.05	5.3	2,809
171.06	5.5	2,927
171.07	5.7	3,045
171.08	5.9	3,164
171.09	6.1	3,283
171.10	6.4	3,403
171.11	6.6	3,523
171.12	6.8	3,643
171.13	7.0	3,764
171.14	7.3	3,885
171.15	7.5	4,007
171.16	7.7	4,129
171.17	7.9	4,252
171.18	8.2	4,375
171.19	8.4	4,498
171.20	8.6	4,622
171.21	8.9	4,747
171.22	9.1	4,871
171.23	9.3	4,997
171.24	9.6	5,122
171.25	9.8	5,248
171.26	10.0	5,375
171.27	10.3	5,502
171.28	10.5	5,629
171.29	10.8	5,757
171.30	11.0	5,885
171.31	11.2	6,014
171.32	11.5	6,143
171.33	11.7	6,272
171.34	12.0	6,402
171.35	12.2	6,532
171.36	12.5	6,663
171.37	12.7	6,794
171.38	12.9	6,926
171.39	13.2	7,058
171.40	13.4	7,190
171.41	13.7	7,323
171.42	13.9	7,457
171.43	14.2	7,590
171.44	14.4	7,725
171.45	14.7	7,859
171.46	14.9	7,994
171.47	15.2	8,130
171.48	15.4	8,266
171.49	15.7	8,402
171.50	16.0	8,539
171.51	16.2	8,676
171.52	16.5	8,813
171.53	16.7	8,951
171.54	17.0	9,090
171.55	17.3	9,229
171.56	17.5	9,368
171.57	17.8	9,508
171.58	18.0	9,648
171.59	18.3	9,789
171.60	18.6	9,930
171.61	18.8	10,071
171.62	19.1	10,213
171.63	19.4	10,355
171.64	19.6	10,498
171.65	19.9	10,641
171.66	20.2	10,785
171.67	20.4	10,929
171.68	20.7	11,073
171.69	21.0	11,218
171.70	21.2	11,363
171.71	21.5	11,509
171.72	21.8	11,655
171.73	22.1	11,802
171.74	22.3	11,949
171.75	22.6	12,096
171.76	22.9	12,244
171.77	23.2	12,393
171.78	23.4	12,541
171.79	23.7	12,690
171.80	**24.0**	**12,840**

Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

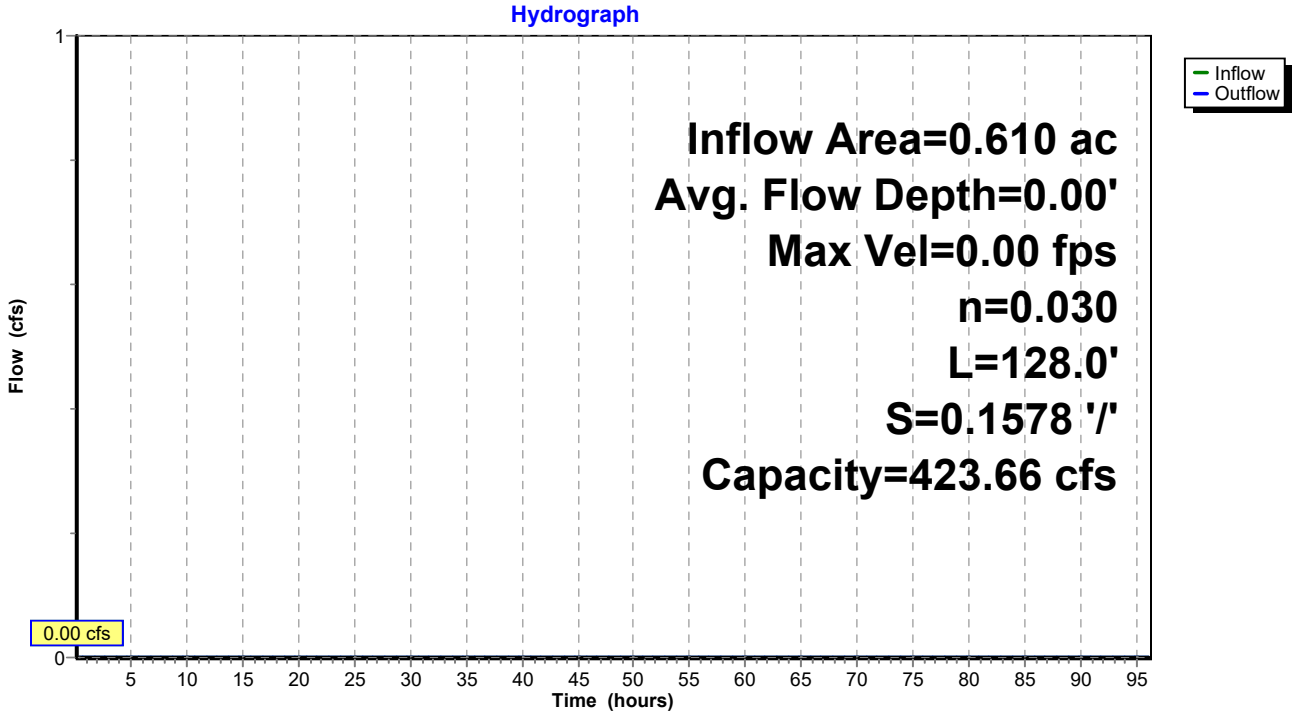
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Reach POST-5R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

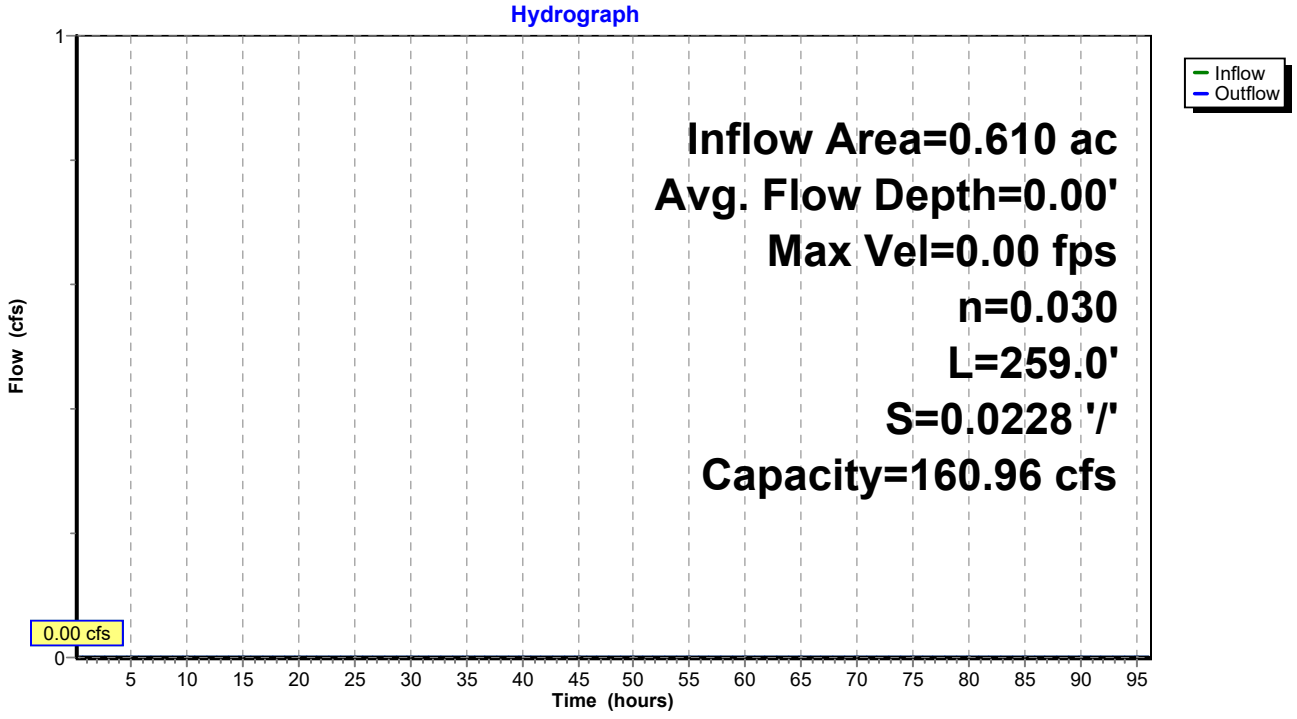
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 160.96 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 259.0' Slope= 0.0228 '/'
Inlet Invert= 153.00', Outlet Invert= 147.10'

‡

Reach POST-5R:



Stage-Area-Storage for Reach POST-5R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
153.00	0.0	0
153.01	0.2	52
153.02	0.4	104
153.03	0.6	156
153.04	0.8	209
153.05	1.0	262
153.06	1.2	315
153.07	1.4	368
153.08	1.6	421
153.09	1.8	475
153.10	2.0	528
153.11	2.2	582
153.12	2.5	637
153.13	2.7	691
153.14	2.9	746
153.15	3.1	800
153.16	3.3	855
153.17	3.5	911
153.18	3.7	966
153.19	3.9	1,022
153.20	4.2	1,077
153.21	4.4	1,133
153.22	4.6	1,190
153.23	4.8	1,246
153.24	5.0	1,303
153.25	5.3	1,360
153.26	5.5	1,417
153.27	5.7	1,474
153.28	5.9	1,532
153.29	6.1	1,589
153.30	6.4	1,647
153.31	6.6	1,705
153.32	6.8	1,764
153.33	7.0	1,822
153.34	7.3	1,881
153.35	7.5	1,940
153.36	7.7	1,999
153.37	7.9	2,058
153.38	8.2	2,118
153.39	8.4	2,178
153.40	8.6	2,238
153.41	8.9	2,298
153.42	9.1	2,358
153.43	9.3	2,419
153.44	9.6	2,480
153.45	9.8	2,541
153.46	10.0	2,602
153.47	10.3	2,663
153.48	10.5	2,725
153.49	10.8	2,787
153.50	11.0	2,849
153.51	11.2	2,911
153.52	11.5	2,974
153.53	11.7	3,036
153.54	12.0	3,099
153.55	12.2	3,162
153.56	12.5	3,226
153.57	12.7	3,289
153.58	12.9	3,353
153.59	13.2	3,417
153.60	13.4	3,481
153.61	13.7	3,545
153.62	13.9	3,610
153.63	14.2	3,675
153.64	14.4	3,740
153.65	14.7	3,805
153.66	14.9	3,870
153.67	15.2	3,936
153.68	15.4	4,001
153.69	15.7	4,067
153.70	16.0	4,134
153.71	16.2	4,200
153.72	16.5	4,267
153.73	16.7	4,333
153.74	17.0	4,401
153.75	17.3	4,468
153.76	17.5	4,535
153.77	17.8	4,603
153.78	18.0	4,671
153.79	18.3	4,739
153.80	18.6	4,807
153.81	18.8	4,876
153.82	19.1	4,944
153.83	19.4	5,013
153.84	19.6	5,082
153.85	19.9	5,152
153.86	20.2	5,221
153.87	20.4	5,291
153.88	20.7	5,361
153.89	21.0	5,431
153.90	21.2	5,501
153.91	21.5	5,572
153.92	21.8	5,642
153.93	22.1	5,713
153.94	22.3	5,785
153.95	22.6	5,856
153.96	22.9	5,928
153.97	23.2	5,999
153.98	23.4	6,071
153.99	23.7	6,144
154.00	**24.0**	**6,216**

Summary for Pond POST-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 1.77" for 2-year event
Inflow = 3.24 cfs @ 12.09 hrs, Volume= 0.235 af
Outflow = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af, Atten= 67%, Lag= 19.7 min
Primary = 1.06 cfs @ 12.42 hrs, Volume= 0.229 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 190.02' @ 12.42 hrs Surf.Area= 1,924 sf Storage= 3,232 cf

Plug-Flow detention time= 61.8 min calculated for 0.229 af (97% of inflow)
Center-of-Mass det. time= 46.7 min (872.6 - 826.0)

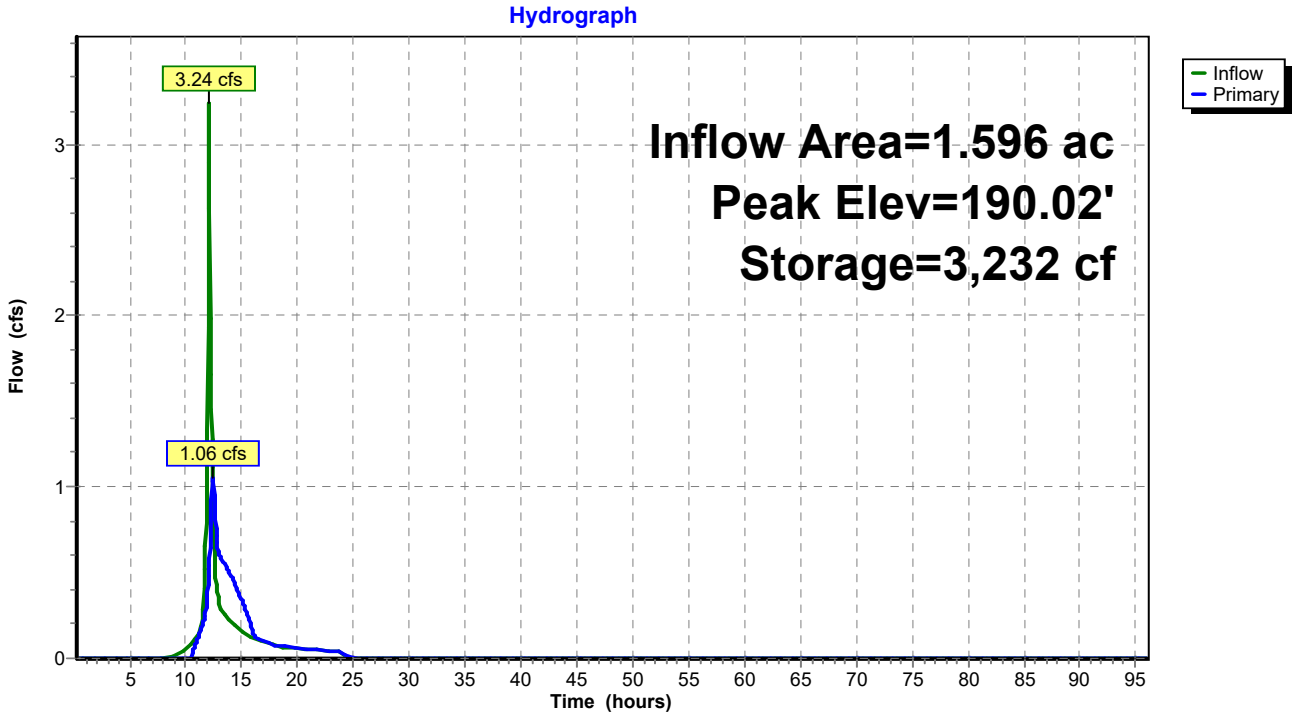
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.05 cfs @ 12.42 hrs HW=190.02' (Free Discharge)
└**1=Culvert** (Passes 1.05 cfs of 8.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.33 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.41 cfs @ 1.91 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-1P:


Hydrograph
Inflow Area=1.596 ac
Peak Elev=190.02'
Storage=3,232 cf
3.24 cfs
1.06 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond POST-1P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0	187.52	485	173
187.01	204	2	187.53	492	178
187.02	209	4	187.54	499	183
187.03	213	6	187.55	506	188
187.04	218	8	187.56	512	193
187.05	222	11	187.57	519	198
187.06	227	13	187.58	526	203
187.07	231	15	187.59	533	208
187.08	236	17	187.60	540	214
187.09	240	20	187.61	547	219
187.10	245	22	187.62	554	225
187.11	250	25	187.63	562	230
187.12	255	27	187.64	569	236
187.13	260	30	187.65	576	242
187.14	265	32	187.66	583	247
187.15	270	35	187.67	591	253
187.16	275	38	187.68	598	259
187.17	280	41	187.69	606	265
187.18	285	43	187.70	613	271
187.19	290	46	187.71	621	278
187.20	295	49	187.72	628	284
187.21	300	52	187.73	636	290
187.22	306	55	187.74	643	297
187.23	311	58	187.75	651	303
187.24	316	61	187.76	659	310
187.25	322	65	187.77	667	316
187.26	327	68	187.78	675	323
187.27	333	71	187.79	682	330
187.28	338	74	187.80	690	337
187.29	344	78	187.81	698	343
187.30	349	81	187.82	706	350
187.31	355	85	187.83	715	358
187.32	361	88	187.84	723	365
187.33	367	92	187.85	731	372
187.34	372	96	187.86	739	379
187.35	378	100	187.87	747	387
187.36	384	103	187.88	756	394
187.37	390	107	187.89	764	402
187.38	396	111	187.90	772	410
187.39	402	115	187.91	781	417
187.40	408	119	187.92	789	425
187.41	415	123	187.93	798	433
187.42	421	128	187.94	806	441
187.43	427	132	187.95	815	449
187.44	433	136	187.96	824	458
187.45	440	140	187.97	833	466
187.46	446	145	187.98	841	474
187.47	452	149	187.99	850	483
187.48	459	154	188.00	859	491
187.49	465	159	188.01	863	500
187.50	472	163	188.02	867	508
187.51	479	168	188.03	872	517

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.04	876	526	188.56	1,113	1,042
188.05	880	535	188.57	1,118	1,053
188.06	885	543	188.58	1,122	1,064
188.07	889	552	188.59	1,127	1,075
188.08	893	561	188.60	1,132	1,087
188.09	898	570	188.61	1,137	1,098
188.10	902	579	188.62	1,142	1,109
188.11	906	588	188.63	1,147	1,121
188.12	911	597	188.64	1,152	1,132
188.13	915	606	188.65	1,157	1,144
188.14	919	616	188.66	1,162	1,155
188.15	924	625	188.67	1,166	1,167
188.16	928	634	188.68	1,171	1,179
188.17	933	643	188.69	1,176	1,191
188.18	937	653	188.70	1,181	1,202
188.19	941	662	188.71	1,186	1,214
188.20	946	672	188.72	1,191	1,226
188.21	950	681	188.73	1,196	1,238
188.22	955	691	188.74	1,201	1,250
188.23	959	700	188.75	1,206	1,262
188.24	964	710	188.76	1,211	1,274
188.25	968	719	188.77	1,216	1,286
188.26	973	729	188.78	1,221	1,298
188.27	977	739	188.79	1,227	1,311
188.28	982	749	188.80	1,232	1,323
188.29	986	759	188.81	1,237	1,335
188.30	991	768	188.82	1,242	1,348
188.31	995	778	188.83	1,247	1,360
188.32	1,000	788	188.84	1,252	1,373
188.33	1,005	798	188.85	1,257	1,385
188.34	1,009	808	188.86	1,262	1,398
188.35	1,014	819	188.87	1,267	1,410
188.36	1,018	829	188.88	1,273	1,423
188.37	1,023	839	188.89	1,278	1,436
188.38	1,028	849	188.90	1,283	1,449
188.39	1,032	859	188.91	1,288	1,462
188.40	1,037	870	188.92	1,293	1,474
188.41	1,042	880	188.93	1,298	1,487
188.42	1,046	891	188.94	1,304	1,500
188.43	1,051	901	188.95	1,309	1,513
188.44	1,056	912	188.96	1,314	1,527
188.45	1,060	922	188.97	1,319	1,540
188.46	1,065	933	188.98	1,325	1,553
188.47	1,070	944	188.99	1,330	1,566
188.48	1,075	954	189.00	1,335	1,580
188.49	1,079	965	189.01	1,340	1,593
188.50	1,084	976	189.02	1,346	1,606
188.51	1,089	987	189.03	1,351	1,620
188.52	1,094	998	189.04	1,356	1,633
188.53	1,098	1,009	189.05	1,362	1,647
188.54	1,103	1,020	189.06	1,367	1,661
188.55	1,108	1,031	189.07	1,372	1,674

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
189.08	1,378	1,688	189.60	1,671	2,480
189.09	1,383	1,702	189.61	1,677	2,496
189.10	1,389	1,716	189.62	1,683	2,513
189.11	1,394	1,730	189.63	1,689	2,530
189.12	1,399	1,744	189.64	1,695	2,547
189.13	1,405	1,758	189.65	1,701	2,564
189.14	1,410	1,772	189.66	1,707	2,581
189.15	1,416	1,786	189.67	1,713	2,598
189.16	1,421	1,800	189.68	1,719	2,615
189.17	1,427	1,814	189.69	1,725	2,632
189.18	1,432	1,829	189.70	1,731	2,650
189.19	1,438	1,843	189.71	1,737	2,667
189.20	1,443	1,857	189.72	1,743	2,684
189.21	1,448	1,872	189.73	1,749	2,702
189.22	1,454	1,886	189.74	1,755	2,719
189.23	1,460	1,901	189.75	1,761	2,737
189.24	1,465	1,915	189.76	1,767	2,755
189.25	1,471	1,930	189.77	1,773	2,772
189.26	1,476	1,945	189.78	1,779	2,790
189.27	1,482	1,960	189.79	1,785	2,808
189.28	1,487	1,975	189.80	1,791	2,826
189.29	1,493	1,989	189.81	1,798	2,844
189.30	1,498	2,004	189.82	1,804	2,862
189.31	1,504	2,019	189.83	1,810	2,880
189.32	1,510	2,034	189.84	1,816	2,898
189.33	1,515	2,050	189.85	1,822	2,916
189.34	1,521	2,065	189.86	1,828	2,934
189.35	1,527	2,080	189.87	1,835	2,953
189.36	1,532	2,095	189.88	1,841	2,971
189.37	1,538	2,111	189.89	1,847	2,989
189.38	1,544	2,126	189.90	1,853	3,008
189.39	1,549	2,142	189.91	1,859	3,027
189.40	1,555	2,157	189.92	1,866	3,045
189.41	1,561	2,173	189.93	1,872	3,064
189.42	1,566	2,188	189.94	1,878	3,083
189.43	1,572	2,204	189.95	1,884	3,101
189.44	1,578	2,220	189.96	1,891	3,120
189.45	1,584	2,235	189.97	1,897	3,139
189.46	1,589	2,251	189.98	1,903	3,158
189.47	1,595	2,267	189.99	1,910	3,177
189.48	1,601	2,283	190.00	1,916	3,196
189.49	1,607	2,299	190.01	1,920	3,216
189.50	1,613	2,315	190.02	1,925	3,235
189.51	1,618	2,332	190.03	1,929	3,254
189.52	1,624	2,348	190.04	1,934	3,273
189.53	1,630	2,364	190.05	1,938	3,293
189.54	1,636	2,380	190.06	1,943	3,312
189.55	1,642	2,397	190.07	1,947	3,332
189.56	1,648	2,413	190.08	1,952	3,351
189.57	1,653	2,430	190.09	1,956	3,371
189.58	1,659	2,446	190.10	1,961	3,390
189.59	1,665	2,463	190.11	1,966	3,410

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
190.12	1,970	3,430
190.13	1,975	3,449
190.14	1,979	3,469
190.15	1,984	3,489
190.16	1,988	3,509
190.17	1,993	3,529
190.18	1,997	3,549
190.19	2,002	3,569
190.20	2,007	3,589
190.21	2,011	3,609
190.22	2,016	3,629
190.23	2,020	3,649
190.24	2,025	3,669
190.25	2,029	3,690
190.26	2,034	3,710
190.27	2,039	3,730
190.28	2,043	3,751
190.29	2,048	3,771
190.30	2,053	3,792
190.31	2,057	3,812
190.32	2,062	3,833
190.33	2,066	3,853
190.34	2,071	3,874
190.35	2,076	3,895
190.36	2,080	3,916
190.37	2,085	3,936
190.38	2,090	3,957
190.39	2,094	3,978
190.40	2,099	3,999
190.41	2,104	4,020
190.42	2,108	4,041
190.43	2,113	4,062
190.44	2,118	4,084
190.45	2,123	4,105
190.46	2,127	4,126
190.47	2,132	4,147
190.48	2,137	4,169
190.49	2,141	4,190
190.50	2,146	4,211
190.51	2,151	4,233
190.52	2,156	4,254
190.53	2,160	4,276
190.54	2,165	4,298
190.55	2,170	4,319
190.56	2,175	4,341
190.57	2,179	4,363
190.58	2,184	4,385
190.59	2,189	4,407
190.60	2,194	4,428
190.61	2,199	4,450
190.62	2,203	4,472
190.63	2,208	4,494
190.64	2,213	4,517
190.65	2,218	4,539
190.66	2,223	4,561
190.67	2,227	4,583
190.68	2,232	4,605
190.69	2,237	4,628
190.70	2,242	4,650
190.71	2,247	4,673
190.72	2,252	4,695
190.73	2,256	4,718
190.74	2,261	4,740
190.75	2,266	4,763
190.76	2,271	4,786
190.77	2,276	4,808
190.78	2,281	4,831
190.79	2,286	4,854
190.80	2,291	4,877
190.81	2,295	4,900
190.82	2,300	4,923
190.83	2,305	4,946
190.84	2,310	4,969
190.85	2,315	4,992
190.86	2,320	5,015
190.87	2,325	5,038
190.88	2,330	5,062
190.89	2,335	5,085
190.90	2,340	5,108
190.91	2,345	5,132
190.92	2,350	5,155
190.93	2,355	5,179
190.94	2,360	5,202
190.95	2,364	5,226
190.96	2,369	5,250
190.97	2,374	5,273
190.98	2,379	5,297
190.99	2,384	5,321
191.00	2,389	5,345
191.01	2,394	5,369
191.02	2,399	5,393
191.03	2,404	5,417
191.04	2,409	5,441
191.05	2,414	5,465
191.06	2,419	5,489
191.07	2,424	5,513
191.08	2,430	5,538
191.09	2,435	5,562
191.10	2,440	5,586
191.11	2,445	5,611
191.12	2,450	5,635
191.13	2,455	5,660
191.14	2,460	5,684
191.15	2,465	5,709

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
191.16	2,470	5,734
191.17	2,475	5,758
191.18	2,480	5,783
191.19	2,485	5,808
191.20	2,490	5,833
191.21	2,495	5,858
191.22	2,501	5,883
191.23	2,506	5,908
191.24	2,511	5,933
191.25	2,516	5,958
191.26	2,521	5,983
191.27	2,526	6,008
191.28	2,531	6,034
191.29	2,536	6,059
191.30	2,542	6,084
191.31	2,547	6,110
191.32	2,552	6,135
191.33	2,557	6,161
191.34	2,562	6,186
191.35	2,567	6,212
191.36	2,573	6,238
191.37	2,578	6,263
191.38	2,583	6,289
191.39	2,588	6,315
191.40	2,593	6,341
191.41	2,599	6,367
191.42	2,604	6,393
191.43	2,609	6,419
191.44	2,614	6,445
191.45	2,619	6,471
191.46	2,625	6,498
191.47	2,630	6,524
191.48	2,635	6,550
191.49	2,640	6,577
191.50	2,646	6,603
191.51	2,651	6,629
191.52	2,656	6,656
191.53	2,661	6,683
191.54	2,667	6,709
191.55	2,672	6,736
191.56	2,677	6,763
191.57	2,683	6,789
191.58	2,688	6,816
191.59	2,693	6,843
191.60	2,698	6,870
191.61	2,704	6,897
191.62	2,709	6,924
191.63	2,714	6,951
191.64	2,720	6,979
191.65	2,725	7,006
191.66	2,730	7,033
191.67	2,736	7,060
191.68	2,741	7,088
191.69	2,746	7,115
191.70	2,752	7,143
191.71	2,757	7,170
191.72	2,763	7,198
191.73	2,768	7,226
191.74	2,773	7,253
191.75	2,779	7,281
191.76	2,784	7,309
191.77	2,789	7,337
191.78	2,795	7,365
191.79	2,800	7,393
191.80	2,806	7,421
191.81	2,811	7,449
191.82	2,817	7,477
191.83	2,822	7,505
191.84	2,827	7,533
191.85	2,833	7,562
191.86	2,838	7,590
191.87	2,844	7,618
191.88	2,849	7,647
191.89	2,855	7,675
191.90	2,860	7,704
191.91	2,866	7,733
191.92	2,871	7,761
191.93	2,877	7,790
191.94	2,882	7,819
191.95	2,887	7,848
191.96	2,893	7,876
191.97	2,898	7,905
191.98	2,904	7,934
191.99	2,909	7,964
192.00	2,915	7,993
192.01	2,921	8,022
192.02	2,926	8,051
192.03	2,932	8,080
192.04	2,938	8,110
192.05	2,944	8,139
192.06	2,949	8,169
192.07	2,955	8,198
192.08	2,961	8,228
192.09	2,966	8,257
192.10	2,972	8,287
192.11	2,978	8,317
192.12	2,984	8,347
192.13	2,989	8,376
192.14	2,995	8,406
192.15	3,001	8,436
192.16	3,007	8,466
192.17	3,013	8,496
192.18	3,018	8,527
192.19	3,024	8,557

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
192.20	3,030	8,587
192.21	3,036	8,617
192.22	3,042	8,648
192.23	3,047	8,678
192.24	3,053	8,709
192.25	3,059	8,739
192.26	3,065	8,770
192.27	3,071	8,801
192.28	3,077	8,831
192.29	3,082	8,862
192.30	3,088	8,893
192.31	3,094	8,924
192.32	3,100	8,955
192.33	3,106	8,986
192.34	3,112	9,017
192.35	3,118	9,048
192.36	3,124	9,079
192.37	3,129	9,111
192.38	3,135	9,142
192.39	3,141	9,173
192.40	3,147	9,205
192.41	3,153	9,236
192.42	3,159	9,268
192.43	3,165	9,299
192.44	3,171	9,331
192.45	3,177	9,363
192.46	3,183	9,395
192.47	3,189	9,427
192.48	3,195	9,458
192.49	3,201	9,490
192.50	3,207	9,522
192.51	3,213	9,555
192.52	3,219	9,587
192.53	3,224	9,619
192.54	3,230	9,651
192.55	3,236	9,684
192.56	3,242	9,716
192.57	3,248	9,748
192.58	3,254	9,781
192.59	3,261	9,813
192.60	3,267	9,846
192.61	3,273	9,879
192.62	3,279	9,912
192.63	3,285	9,944
192.64	3,291	9,977
192.65	3,297	10,010
192.66	3,303	10,043
192.67	3,309	10,076
192.68	3,315	10,109
192.69	3,321	10,143
192.70	3,327	10,176
192.71	3,333	10,209
192.72	3,339	10,242
192.73	3,345	10,276
192.74	3,351	10,309
192.75	3,358	10,343
192.76	3,364	10,376
192.77	3,370	10,410
192.78	3,376	10,444
192.79	3,382	10,478
192.80	3,388	10,512
192.81	3,394	10,545
192.82	3,400	10,579
192.83	3,407	10,613
192.84	3,413	10,648
192.85	3,419	10,682
192.86	3,425	10,716
192.87	3,431	10,750
192.88	3,437	10,785
192.89	3,444	10,819
192.90	3,450	10,853
192.91	3,456	10,888
192.92	3,462	10,923
192.93	3,468	10,957
192.94	3,475	10,992
192.95	3,481	11,027
192.96	3,487	11,062
192.97	3,493	11,096
192.98	3,500	11,131
192.99	3,506	11,166
193.00	**3,512**	**11,201**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 1.22" for 2-year event
Inflow = 0.50 cfs @ 12.10 hrs, Volume= 0.037 af
Outflow = 0.48 cfs @ 12.15 hrs, Volume= 0.030 af, Atten= 3%, Lag= 3.1 min
Primary = 0.48 cfs @ 12.15 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.07' @ 12.15 hrs Surf.Area= 533 sf Storage= 333 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 110.6 min calculated for 0.030 af (82% of inflow)
Center-of-Mass det. time= 34.4 min (886.6 - 852.2)

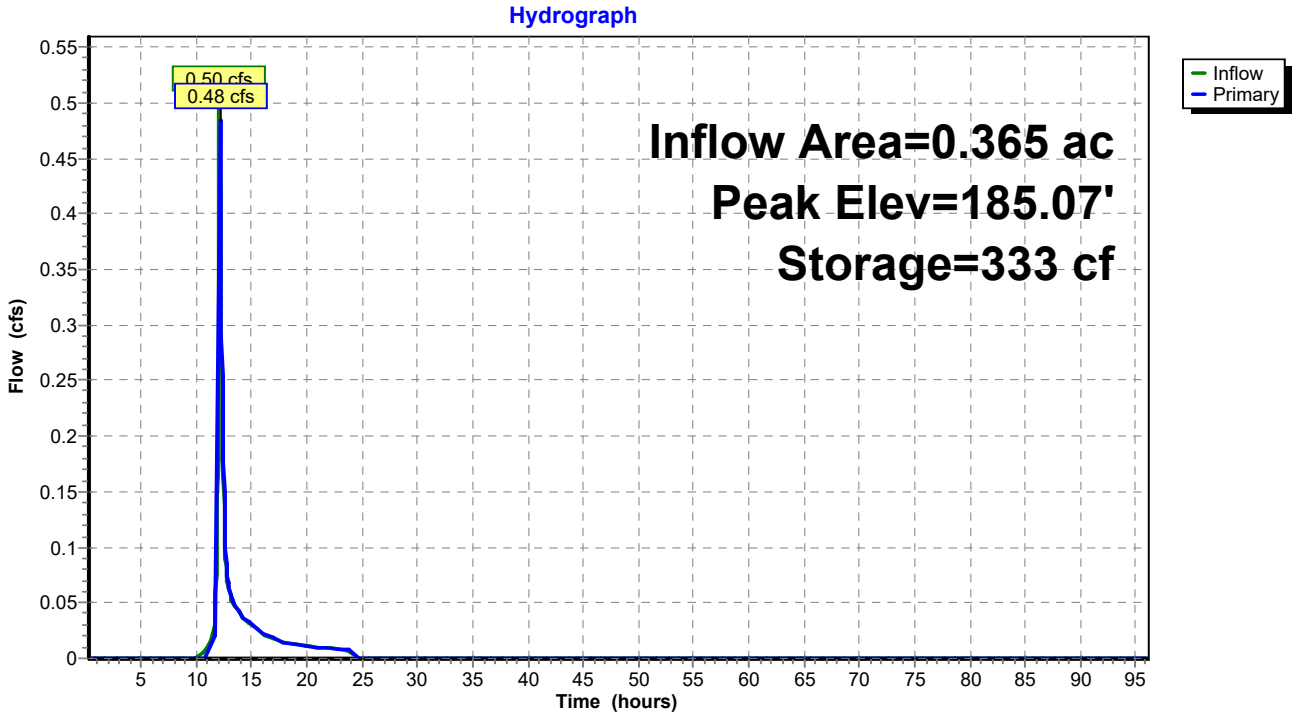
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.48 cfs @ 12.15 hrs HW=185.07' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.48 cfs @ 0.65 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 0.93" for 2-year event
Inflow = 0.50 cfs @ 12.15 hrs, Volume= 0.032 af
Outflow = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af, Atten= 44%, Lag= 9.3 min
Primary = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.12' @ 12.31 hrs Surf.Area= 370 sf Storage= 232 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 90.4 min calculated for 0.028 af (87% of inflow)
Center-of-Mass det. time= 29.4 min (917.7 - 888.3)

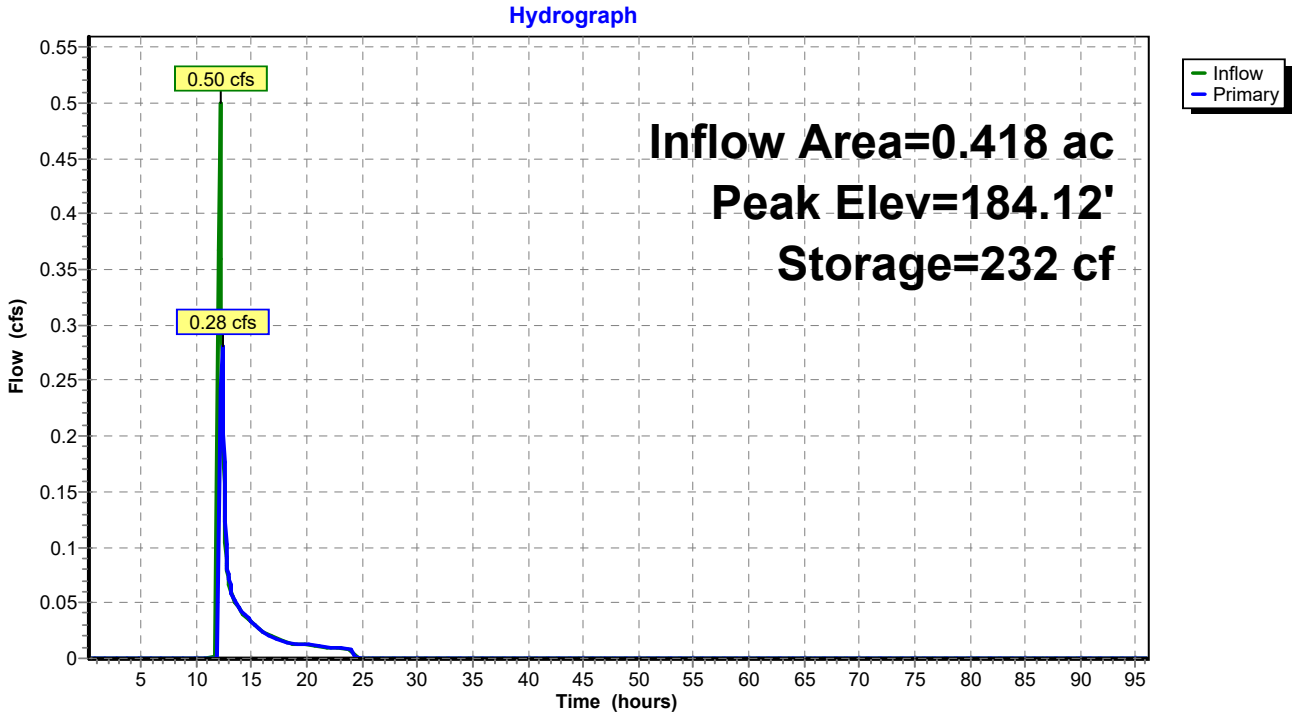
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 12.31 hrs HW=184.12' (Free Discharge)
└**1=Culvert** (Passes 0.28 cfs of 7.20 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.13 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.55" for 2-year event
Inflow = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af
Outflow = 0.04 cfs @ 12.25 hrs, Volume= 0.028 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.04 cfs @ 12.25 hrs, Volume= 0.028 af
Primary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 173.26' @ 14.33 hrs Surf.Area= 694 sf Storage= 352 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 90.0 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 89.6 min (1,007.3 - 917.8)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

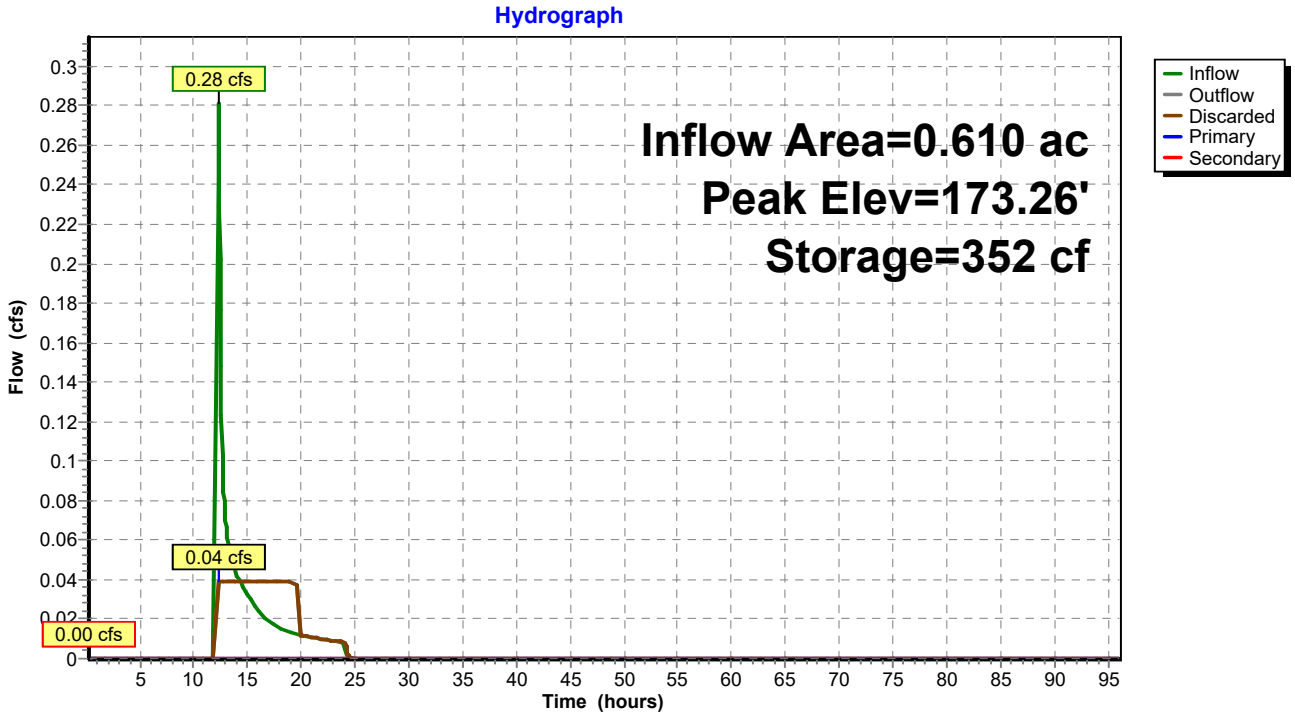
Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	175.00'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 175.00' / 174.50' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	177.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	177.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	178.00'	**16.0' 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=0.04 cfs @ 12.25 hrs HW=172.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811
177.20	2,075	4,832
177.21	2,081	4,853
177.22	2,086	4,873
177.23	2,091	4,894
177.24	2,096	4,915
177.25	2,102	4,936
177.26	2,107	4,957
177.27	2,112	4,978
177.28	2,118	4,999
177.29	2,123	5,021
177.30	2,128	5,042
177.31	2,133	5,063
177.32	2,139	5,085
177.33	2,144	5,106
177.34	2,149	5,127
177.35	2,155	5,149
177.36	2,160	5,171
177.37	2,165	5,192
177.38	2,171	5,214
177.39	2,176	5,236
177.40	2,182	5,257
177.41	2,187	5,279
177.42	2,192	5,301
177.43	2,198	5,323
177.44	2,203	5,345
177.45	2,209	5,367
177.46	2,214	5,389
177.47	2,219	5,411
177.48	2,225	5,434
177.49	2,230	5,456
177.50	2,236	5,478
177.51	2,241	5,501
177.52	2,247	5,523
177.53	2,252	5,546
177.54	2,257	5,568
177.55	2,263	5,591
177.56	2,268	5,613
177.57	2,274	5,636
177.58	2,279	5,659
177.59	2,285	5,682
177.60	2,290	5,705
177.61	2,296	5,728
177.62	2,301	5,750
177.63	2,307	5,774
177.64	2,312	5,797
177.65	2,318	5,820
177.66	2,324	5,843
177.67	2,329	5,866
177.68	2,335	5,890
177.69	2,340	5,913
177.70	2,346	5,936
177.71	2,351	5,960
177.72	2,357	5,983
177.73	2,363	6,007
177.74	2,368	6,031
177.75	2,374	6,054
177.76	2,379	6,078
177.77	2,385	6,102
177.78	2,391	6,126
177.79	2,396	6,150
177.80	2,402	6,174
177.81	2,408	6,198
177.82	2,413	6,222
177.83	2,419	6,246
177.84	2,424	6,270
177.85	2,430	6,295
177.86	2,436	6,319
177.87	2,442	6,343
177.88	2,447	6,368
177.89	2,453	6,392
177.90	2,459	6,417
177.91	2,464	6,441
177.92	2,470	6,466
177.93	2,476	6,491
177.94	2,481	6,516
177.95	2,487	6,540
177.96	2,493	6,565
177.97	2,499	6,590
177.98	2,504	6,615
177.99	2,510	6,640
178.00	2,516	6,666
178.01	2,522	6,691
178.02	2,527	6,716
178.03	2,533	6,741
178.04	2,539	6,767
178.05	2,544	6,792
178.06	2,550	6,817
178.07	2,556	6,843
178.08	2,562	6,869
178.09	2,567	6,894
178.10	2,573	6,920
178.11	2,579	6,946
178.12	2,585	6,972
178.13	2,590	6,997
178.14	2,596	7,023
178.15	2,602	7,049
178.16	2,608	7,075
178.17	2,613	7,101
178.18	2,619	7,128
178.19	2,625	7,154
178.20	2,631	7,180
178.21	2,637	7,206
178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

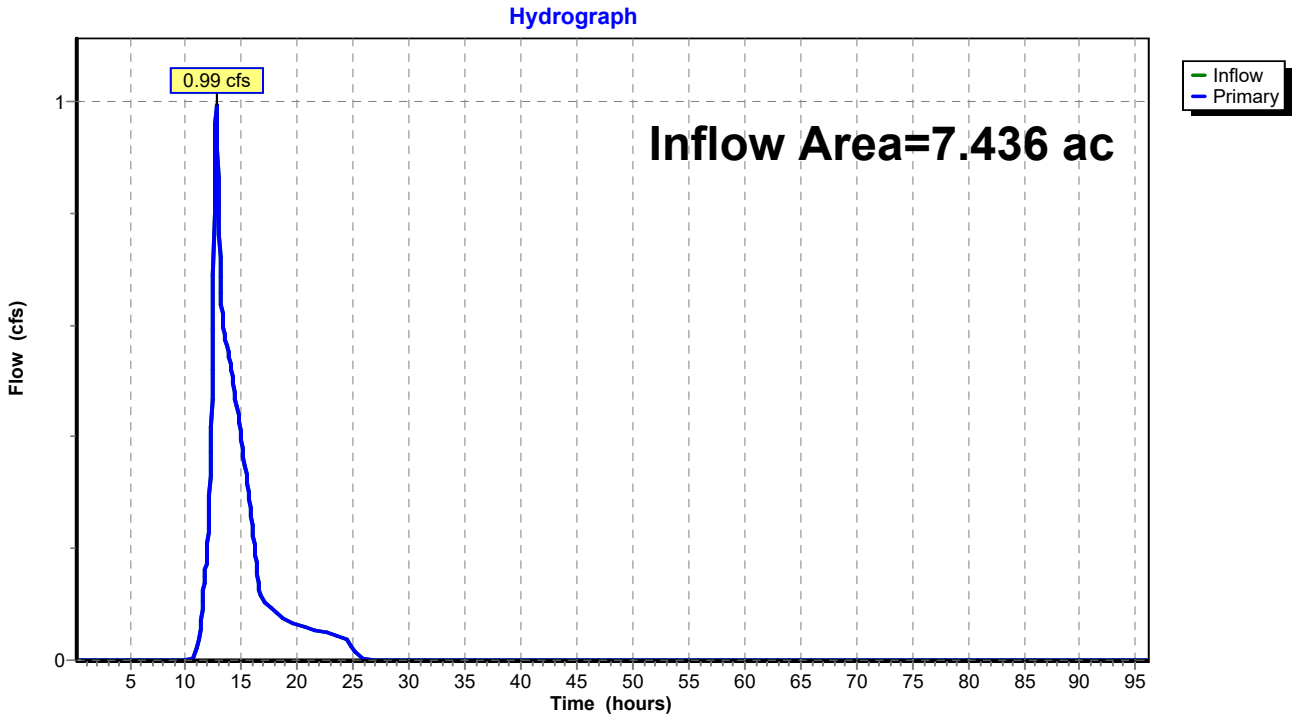
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 7.436 ac, 19.32% Impervious, Inflow Depth = 0.37" for 2-year event
Inflow = 0.99 cfs @ 12.72 hrs, Volume= 0.229 af
Primary = 0.99 cfs @ 12.72 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link POST-DP-1: Analysis Point



Summary for Subcatchment POST-1S:

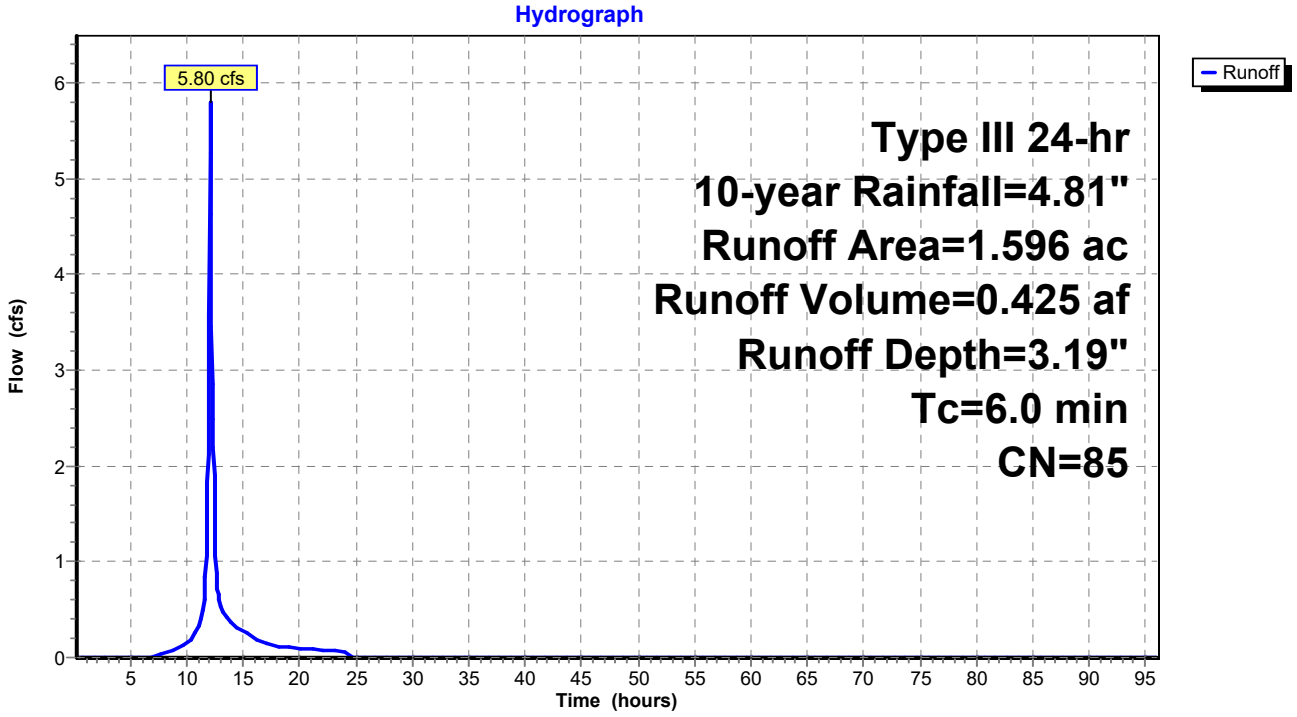
Runoff = 5.80 cfs @ 12.09 hrs, Volume= 0.425 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.016	30	Meadow, non-grazed, HSG A
	0.140	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-1S:



Summary for Subcatchment POST-2S-A:

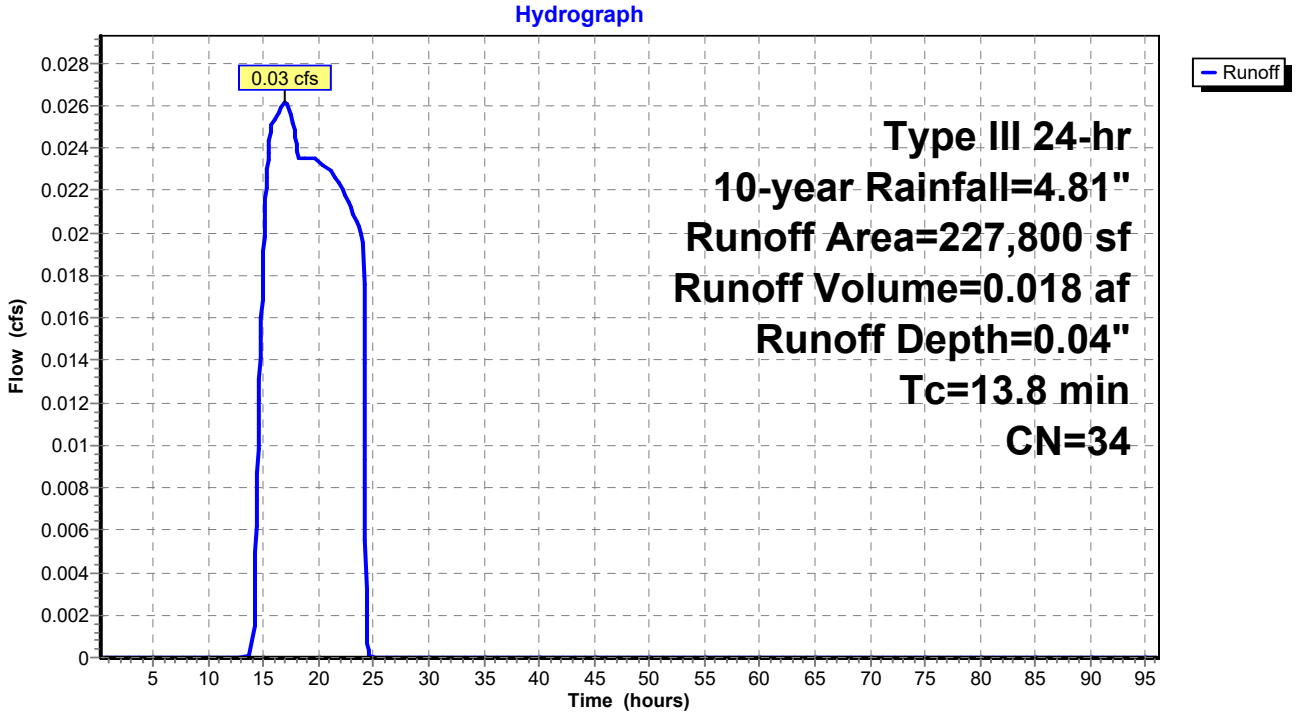
Runoff = 0.03 cfs @ 16.93 hrs, Volume= 0.018 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	5,732	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	9,568	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	19,869	30	Meadow, non-grazed, HSG A
	164,917	30	Woods, Good, HSG A
	227,800	34	Weighted Average
	222,068		97.48% Pervious Area
	5,732		2.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment POST-2S-A:



Summary for Subcatchment POST-2S-B:

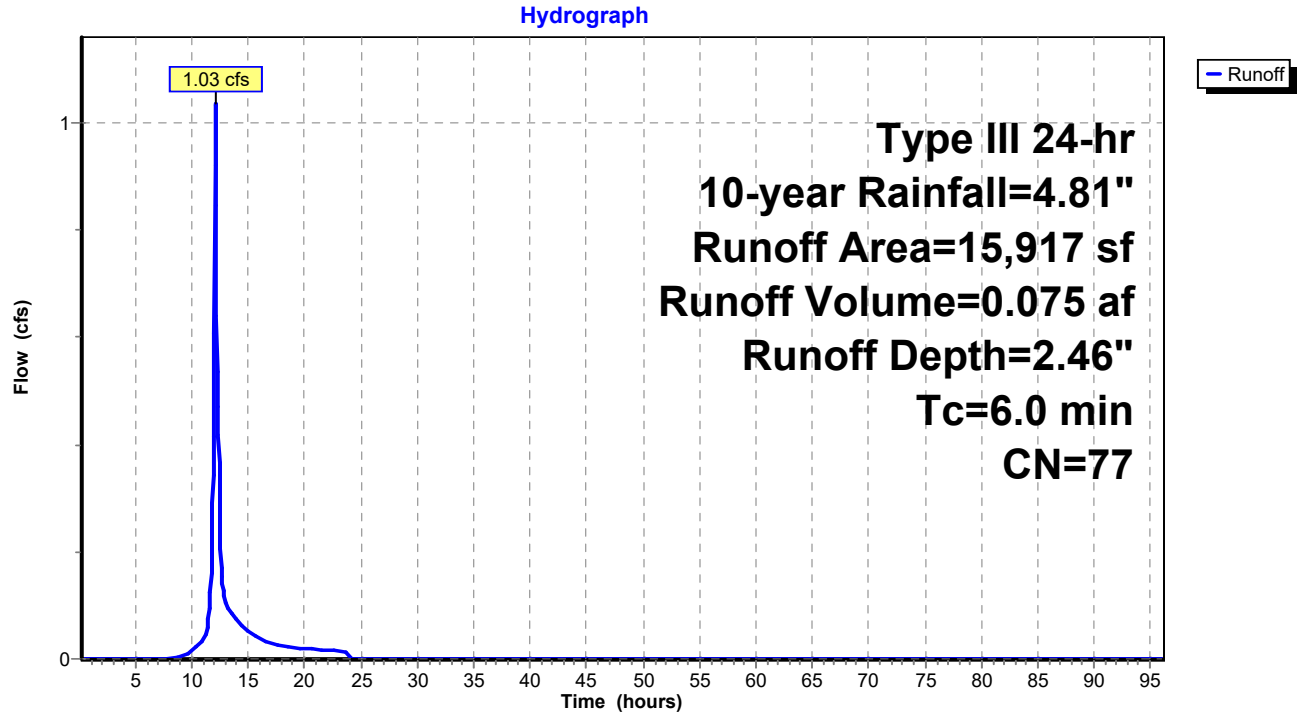
Runoff = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

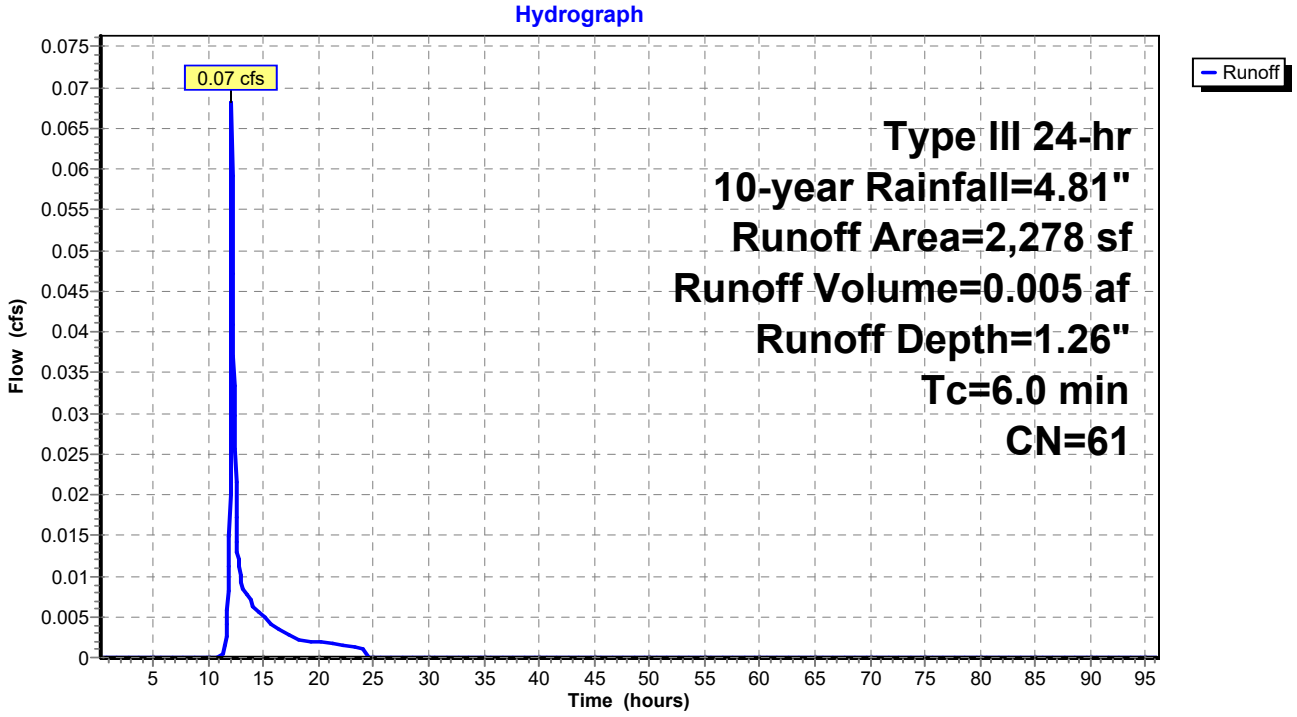
Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

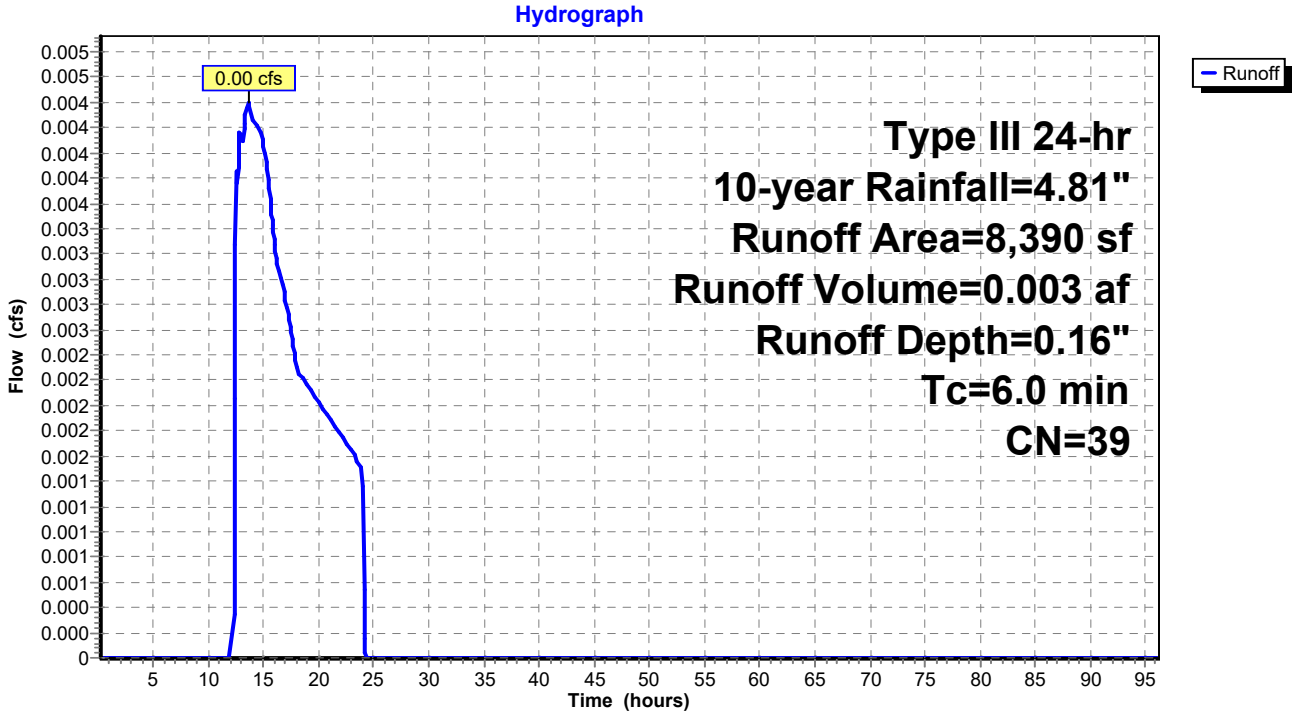
Runoff = 0.00 cfs @ 13.66 hrs, Volume= 0.003 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-1R:

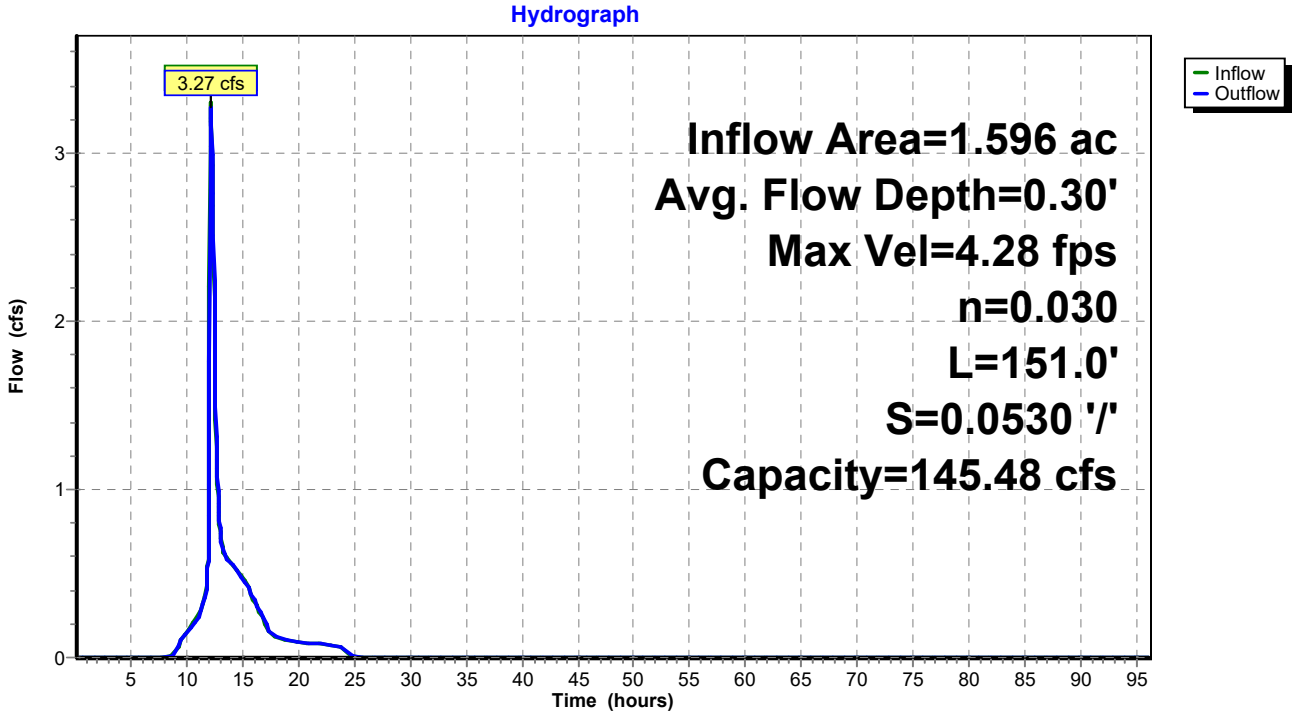
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af
Outflow = 3.27 cfs @ 12.24 hrs, Volume= 0.418 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.28 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 1.8 min

Peak Storage= 116 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 3.18'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 145.48 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 151.0' Slope= 0.0530 '/'
Inlet Invert= 187.00', Outlet Invert= 179.00'

Reach POST-1R:



Stage-Area-Storage for Reach POST-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0	187.52	1.6	239
187.01	0.0	3	187.53	1.6	245
187.02	0.0	6	187.54	1.7	251
187.03	0.1	9	187.55	1.7	257
187.04	0.1	13	187.56	1.7	264
187.05	0.1	16	187.57	1.8	270
187.06	0.1	19	187.58	1.8	277
187.07	0.2	23	187.59	1.9	283
187.08	0.2	26	187.60	1.9	290
187.09	0.2	30	187.61	2.0	297
187.10	0.2	33	187.62	2.0	303
187.11	0.2	37	187.63	2.1	310
187.12	0.3	41	187.64	2.1	317
187.13	0.3	44	187.65	2.1	324
187.14	0.3	48	187.66	2.2	331
187.15	0.3	52	187.67	2.2	338
187.16	0.4	56	187.68	2.3	345
187.17	0.4	60	187.69	2.3	352
187.18	0.4	64	187.70	2.4	359
187.19	0.5	68	187.71	2.4	367
187.20	0.5	72	187.72	2.5	374
187.21	0.5	77	187.73	2.5	381
187.22	0.5	81	187.74	2.6	389
187.23	0.6	85	187.75	2.6	396
187.24	0.6	90	187.76	2.7	404
187.25	0.6	94	187.77	2.7	412
187.26	0.7	99	187.78	2.8	419
187.27	0.7	104	187.79	2.8	427
187.28	0.7	108	187.80	2.9	435
187.29	0.7	113	187.81	2.9	443
187.30	0.8	118	187.82	3.0	451
187.31	0.8	123	187.83	3.0	459
187.32	0.8	128	187.84	3.1	467
187.33	0.9	133	187.85	3.1	475
187.34	0.9	138	187.86	3.2	483
187.35	0.9	143	187.87	3.3	491
187.36	1.0	148	187.88	3.3	500
187.37	1.0	153	187.89	3.4	508
187.38	1.0	158	187.90	3.4	516
187.39	1.1	164	187.91	3.5	525
187.40	1.1	169	187.92	3.5	533
187.41	1.2	175	187.93	3.6	542
187.42	1.2	180	187.94	3.6	551
187.43	1.2	186	187.95	3.7	559
187.44	1.3	191	187.96	3.8	568
187.45	1.3	197	187.97	3.8	577
187.46	1.3	203	187.98	3.9	586
187.47	1.4	209	187.99	3.9	595
187.48	1.4	215	188.00	4.0	604
187.49	1.5	221	188.01	4.1	613
187.50	1.5	227	188.02	4.1	622
187.51	1.5	233	188.03	4.2	631

Stage-Area-Storage for Reach POST-1R: (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
188.04	4.2	641
188.05	4.3	650
188.06	4.4	659
188.07	4.4	669
188.08	4.5	678
188.09	4.6	688
188.10	4.6	698
188.11	4.7	707
188.12	4.7	717
188.13	4.8	727
188.14	4.9	737
188.15	4.9	747
188.16	5.0	757
188.17	5.1	767
188.18	5.1	777
188.19	5.2	787
188.20	5.3	797
188.21	5.3	808
188.22	5.4	818
188.23	5.5	828
188.24	5.6	839
188.25	5.6	849
188.26	5.7	860
188.27	5.8	871
188.28	5.8	881
188.29	5.9	892
188.30	6.0	903
188.31	6.1	914
188.32	6.1	925
188.33	6.2	936
188.34	6.3	947
188.35	6.3	958
188.36	6.4	969
188.37	6.5	981
188.38	6.6	992
188.39	6.6	1,003
188.40	6.7	1,015
188.41	6.8	1,026
188.42	6.9	1,038
188.43	6.9	1,049
188.44	7.0	1,061
188.45	7.1	1,073
188.46	7.2	1,085
188.47	7.3	1,097
188.48	7.3	1,108
188.49	7.4	1,120
188.50	7.5	1,133
188.51	7.6	1,145
188.52	7.7	1,157
188.53	7.7	1,169
188.54	7.8	1,181
188.55	7.9	1,194
188.56	8.0	1,206
188.57	8.1	1,219
188.58	8.2	1,231
188.59	8.2	1,244
188.60	8.3	1,256
188.61	8.4	1,269
188.62	8.5	1,282
188.63	8.6	1,295
188.64	8.7	1,308
188.65	8.7	1,321
188.66	8.8	1,334
188.67	8.9	1,347
188.68	9.0	1,360
188.69	9.1	1,373
188.70	9.2	1,386
188.71	9.3	1,400
188.72	9.4	1,413
188.73	9.4	1,426
188.74	9.5	1,440
188.75	9.6	1,453
188.76	9.7	1,467
188.77	9.8	1,481
188.78	9.9	1,494
188.79	10.0	1,508
188.80	10.1	1,522
188.81	10.2	1,536
188.82	10.3	1,550
188.83	10.4	1,564
188.84	10.5	1,578
188.85	10.5	1,592
188.86	10.6	1,607
188.87	10.7	1,621
188.88	10.8	1,635
188.89	10.9	1,650
188.90	11.0	1,664
188.91	11.1	1,679
188.92	11.2	1,693
188.93	11.3	1,708
188.94	11.4	1,722
188.95	11.5	1,737
188.96	11.6	1,752
188.97	11.7	1,767
188.98	11.8	1,782
188.99	11.9	1,797
189.00	**12.0**	**1,812**

Summary for Reach POST-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 3.27 cfs @ 12.24 hrs, Volume= 0.418 af
Outflow = 3.24 cfs @ 12.29 hrs, Volume= 0.418 af, Atten= 1%, Lag= 3.1 min

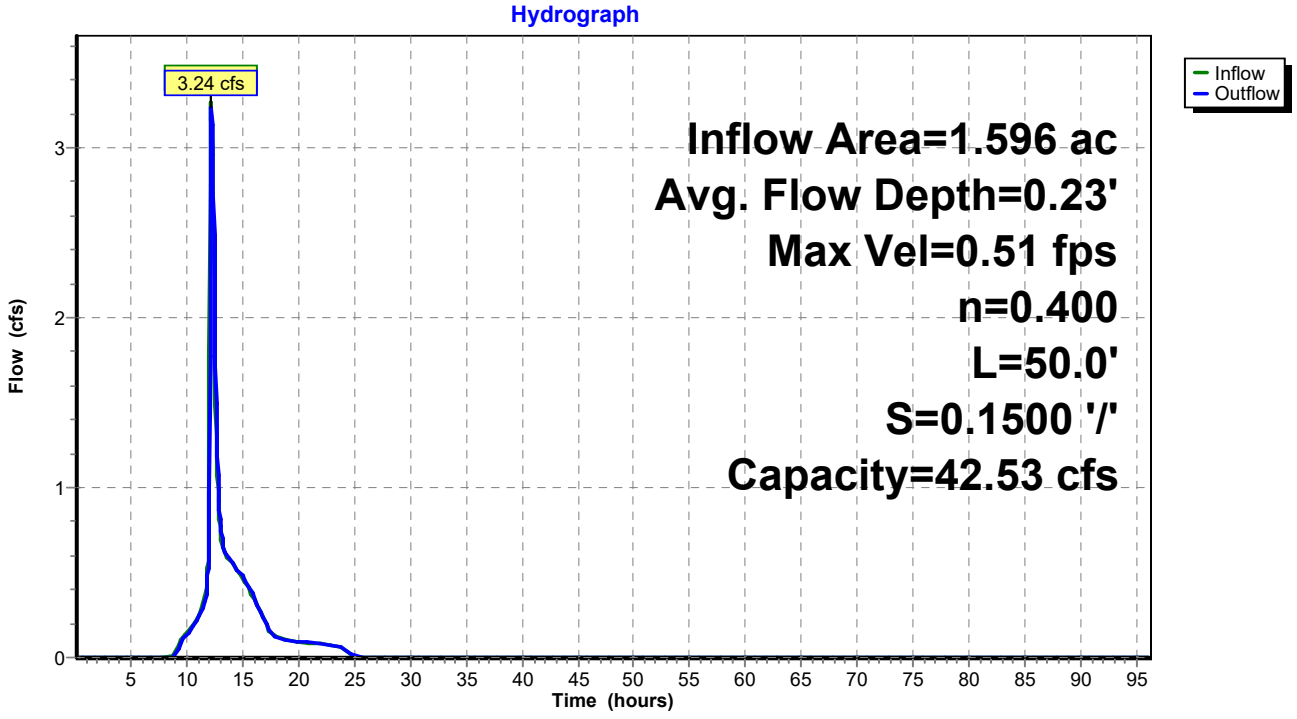
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.51 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 6.3 min

Peak Storage= 317 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 29.65'
Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 42.53 cfs

25.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 50.0' Slope= 0.1500 '/'
Inlet Invert= 178.50', Outlet Invert= 171.00'

‡

Reach POST-2R:



Stage-Area-Storage for Reach POST-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
178.50	0.0	0
178.51	0.3	13
178.52	0.5	25
178.53	0.8	38
178.54	1.0	51
178.55	1.3	64
178.56	1.5	77
178.57	1.8	90
178.58	2.1	103
178.59	2.3	117
178.60	2.6	130
178.61	2.9	144
178.62	3.1	157
178.63	3.4	171
178.64	3.7	185
178.65	4.0	199
178.66	4.3	213
178.67	4.5	227
178.68	4.8	241
178.69	5.1	256
178.70	5.4	270
178.71	5.7	285
178.72	6.0	299
178.73	6.3	314
178.74	6.6	329
178.75	6.9	344
178.76	7.2	359
178.77	7.5	374
178.78	7.8	389
178.79	8.1	405
178.80	8.4	420
178.81	8.7	436
178.82	9.0	451
178.83	9.3	467
178.84	9.7	483
178.85	10.0	499
178.86	10.3	515
178.87	10.6	531
178.88	10.9	547
178.89	11.3	564
178.90	11.6	580
178.91	11.9	597
178.92	12.3	613
178.93	12.6	630
178.94	12.9	647
178.95	13.3	664
178.96	13.6	681
178.97	14.0	698
178.98	14.3	715
178.99	14.7	733
179.00	15.0	750
179.01	15.4	768
179.02	15.7	785
179.03	16.1	803
179.04	16.4	821
179.05	16.8	839
179.06	17.1	857
179.07	17.5	875
179.08	17.9	893
179.09	18.2	912
179.10	18.6	930
179.11	19.0	949
179.12	19.3	967
179.13	19.7	986
179.14	20.1	1,005
179.15	20.5	1,024
179.16	20.9	1,043
179.17	21.2	1,062
179.18	21.6	1,081
179.19	22.0	1,101
179.20	22.4	1,120
179.21	22.8	1,140
179.22	23.2	1,159
179.23	23.6	1,179
179.24	24.0	1,199
179.25	24.4	1,219
179.26	24.8	1,239
179.27	25.2	1,259
179.28	25.6	1,279
179.29	26.0	1,300
179.30	26.4	1,320
179.31	26.8	1,341
179.32	27.2	1,361
179.33	27.6	1,382
179.34	28.1	1,403
179.35	28.5	1,424
179.36	28.9	1,445
179.37	29.3	1,466
179.38	29.7	1,487
179.39	30.2	1,509
179.40	30.6	1,530
179.41	31.0	1,552
179.42	31.5	1,573
179.43	31.9	1,595
179.44	32.3	1,617
179.45	32.8	1,639
179.46	33.2	1,661
179.47	33.7	1,683
179.48	34.1	1,705
179.49	34.6	1,728
179.50	**35.0**	**1,750**

Summary for Reach POST-3R:

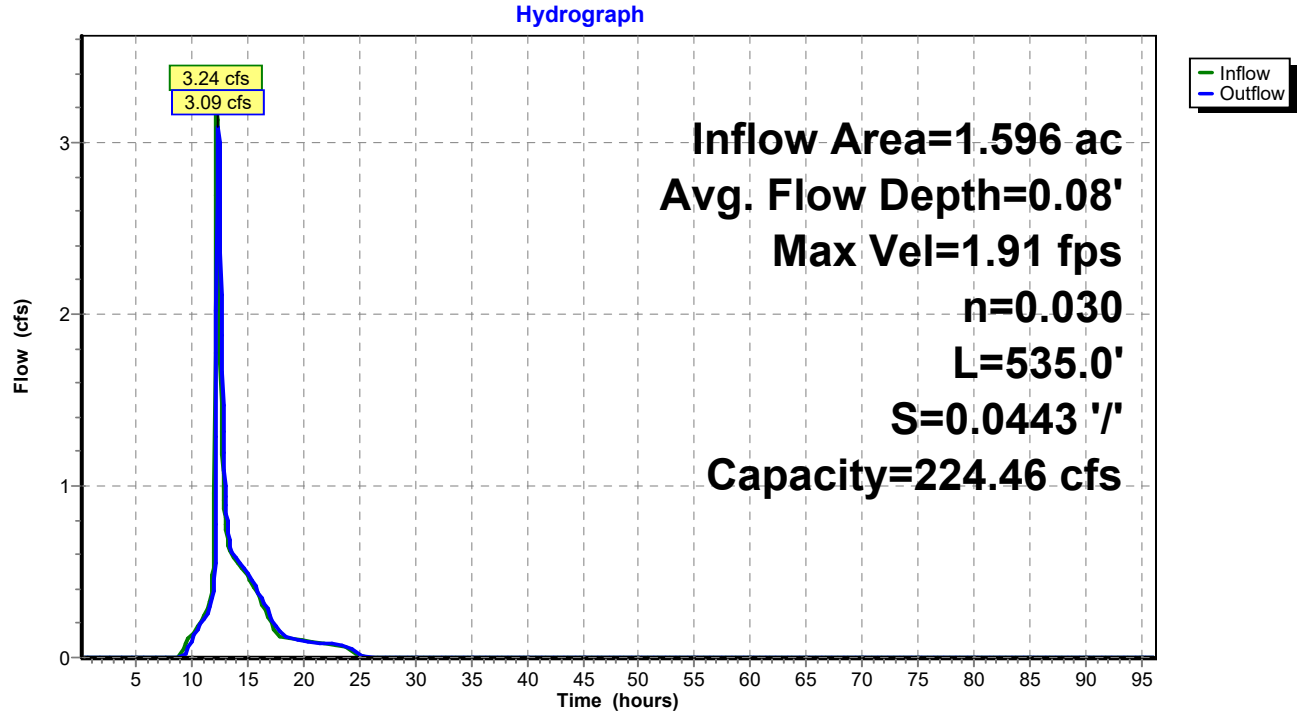
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 3.24 cfs @ 12.29 hrs, Volume= 0.418 af
Outflow = 3.09 cfs @ 12.45 hrs, Volume= 0.418 af, Atten= 4%, Lag= 9.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 14.3 min

Peak Storage= 871 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 20.64'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 224.46 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 535.0' Slope= 0.0443 '/'
Inlet Invert= 170.80', Outlet Invert= 147.10'

Reach POST-3R:



Stage-Area-Storage for Reach POST-3R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
170.80	0.0	0
170.81	0.2	107
170.82	0.4	215
170.83	0.6	323
170.84	0.8	431
170.85	1.0	540
170.86	1.2	650
170.87	1.4	759
170.88	1.6	870
170.89	1.8	980
170.90	2.0	1,091
170.91	2.2	1,203
170.92	2.5	1,315
170.93	2.7	1,427
170.94	2.9	1,540
170.95	3.1	1,653
170.96	3.3	1,767
170.97	3.5	1,881
170.98	3.7	1,995
170.99	3.9	2,110
171.00	4.2	2,226
171.01	4.4	2,341
171.02	4.6	2,458
171.03	4.8	2,574
171.04	5.0	2,691
171.05	5.3	2,809
171.06	5.5	2,927
171.07	5.7	3,045
171.08	5.9	3,164
171.09	6.1	3,283
171.10	6.4	3,403
171.11	6.6	3,523
171.12	6.8	3,643
171.13	7.0	3,764
171.14	7.3	3,885
171.15	7.5	4,007
171.16	7.7	4,129
171.17	7.9	4,252
171.18	8.2	4,375
171.19	8.4	4,498
171.20	8.6	4,622
171.21	8.9	4,747
171.22	9.1	4,871
171.23	9.3	4,997
171.24	9.6	5,122
171.25	9.8	5,248
171.26	10.0	5,375
171.27	10.3	5,502
171.28	10.5	5,629
171.29	10.8	5,757
171.30	11.0	5,885
171.31	11.2	6,014
171.32	11.5	6,143
171.33	11.7	6,272
171.34	12.0	6,402
171.35	12.2	6,532
171.36	12.5	6,663
171.37	12.7	6,794
171.38	12.9	6,926
171.39	13.2	7,058
171.40	13.4	7,190
171.41	13.7	7,323
171.42	13.9	7,457
171.43	14.2	7,590
171.44	14.4	7,725
171.45	14.7	7,859
171.46	14.9	7,994
171.47	15.2	8,130
171.48	15.4	8,266
171.49	15.7	8,402
171.50	16.0	8,539
171.51	16.2	8,676
171.52	16.5	8,813
171.53	16.7	8,951
171.54	17.0	9,090
171.55	17.3	9,229
171.56	17.5	9,368
171.57	17.8	9,508
171.58	18.0	9,648
171.59	18.3	9,789
171.60	18.6	9,930
171.61	18.8	10,071
171.62	19.1	10,213
171.63	19.4	10,355
171.64	19.6	10,498
171.65	19.9	10,641
171.66	20.2	10,785
171.67	20.4	10,929
171.68	20.7	11,073
171.69	21.0	11,218
171.70	21.2	11,363
171.71	21.5	11,509
171.72	21.8	11,655
171.73	22.1	11,802
171.74	22.3	11,949
171.75	22.6	12,096
171.76	22.9	12,244
171.77	23.2	12,393
171.78	23.4	12,541
171.79	23.7	12,690
171.80	**24.0**	**12,840**

Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 10-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

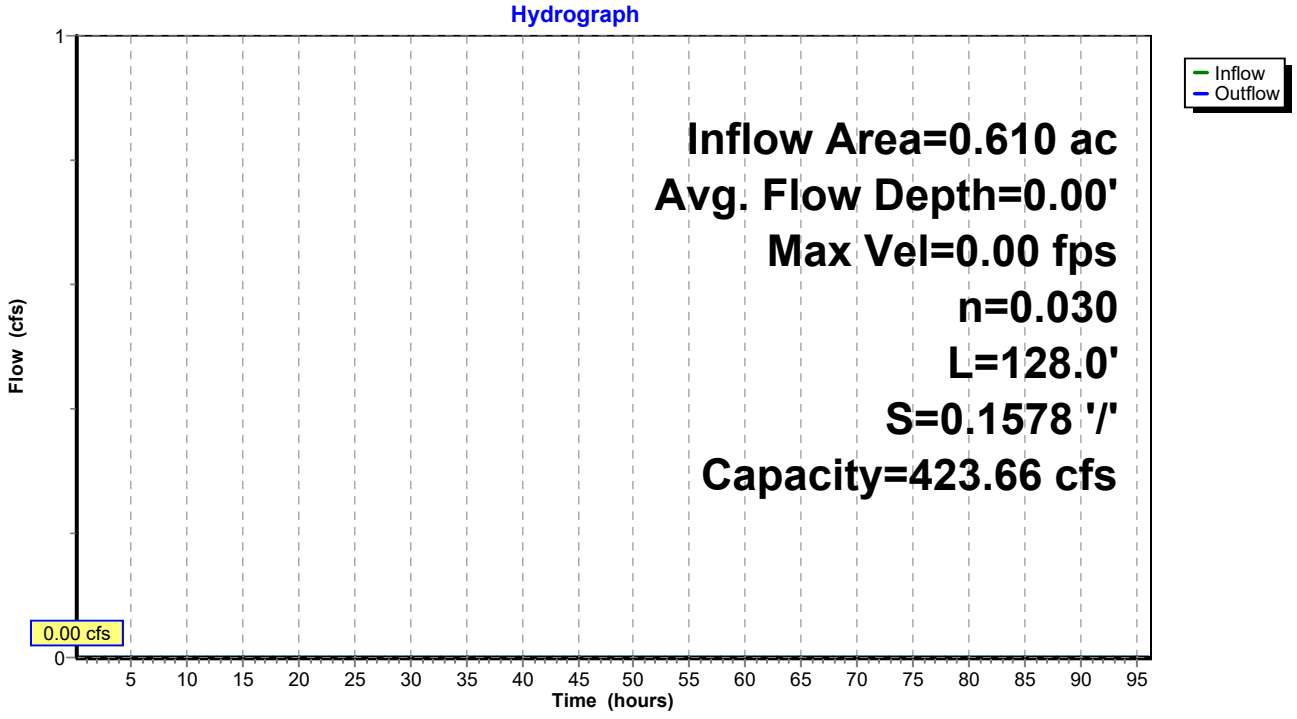
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Reach POST-5R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 10-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

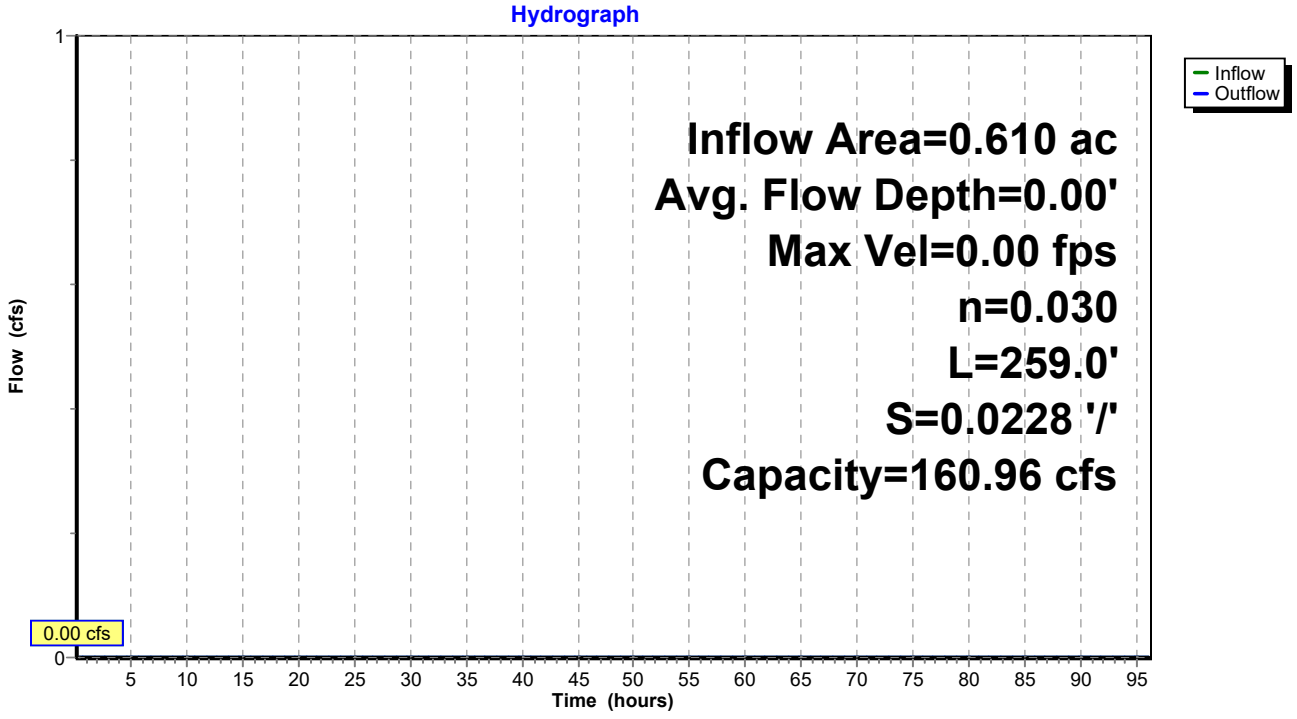
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 160.96 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 259.0' Slope= 0.0228 '/'
Inlet Invert= 153.00', Outlet Invert= 147.10'

‡

Reach POST-5R:



Stage-Area-Storage for Reach POST-5R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
153.00	0.0	0
153.01	0.2	52
153.02	0.4	104
153.03	0.6	156
153.04	0.8	209
153.05	1.0	262
153.06	1.2	315
153.07	1.4	368
153.08	1.6	421
153.09	1.8	475
153.10	2.0	528
153.11	2.2	582
153.12	2.5	637
153.13	2.7	691
153.14	2.9	746
153.15	3.1	800
153.16	3.3	855
153.17	3.5	911
153.18	3.7	966
153.19	3.9	1,022
153.20	4.2	1,077
153.21	4.4	1,133
153.22	4.6	1,190
153.23	4.8	1,246
153.24	5.0	1,303
153.25	5.3	1,360
153.26	5.5	1,417
153.27	5.7	1,474
153.28	5.9	1,532
153.29	6.1	1,589
153.30	6.4	1,647
153.31	6.6	1,705
153.32	6.8	1,764
153.33	7.0	1,822
153.34	7.3	1,881
153.35	7.5	1,940
153.36	7.7	1,999
153.37	7.9	2,058
153.38	8.2	2,118
153.39	8.4	2,178
153.40	8.6	2,238
153.41	8.9	2,298
153.42	9.1	2,358
153.43	9.3	2,419
153.44	9.6	2,480
153.45	9.8	2,541
153.46	10.0	2,602
153.47	10.3	2,663
153.48	10.5	2,725
153.49	10.8	2,787
153.50	11.0	2,849
153.51	11.2	2,911
153.52	11.5	2,974
153.53	11.7	3,036
153.54	12.0	3,099
153.55	12.2	3,162
153.56	12.5	3,226
153.57	12.7	3,289
153.58	12.9	3,353
153.59	13.2	3,417
153.60	13.4	3,481
153.61	13.7	3,545
153.62	13.9	3,610
153.63	14.2	3,675
153.64	14.4	3,740
153.65	14.7	3,805
153.66	14.9	3,870
153.67	15.2	3,936
153.68	15.4	4,001
153.69	15.7	4,067
153.70	16.0	4,134
153.71	16.2	4,200
153.72	16.5	4,267
153.73	16.7	4,333
153.74	17.0	4,401
153.75	17.3	4,468
153.76	17.5	4,535
153.77	17.8	4,603
153.78	18.0	4,671
153.79	18.3	4,739
153.80	18.6	4,807
153.81	18.8	4,876
153.82	19.1	4,944
153.83	19.4	5,013
153.84	19.6	5,082
153.85	19.9	5,152
153.86	20.2	5,221
153.87	20.4	5,291
153.88	20.7	5,361
153.89	21.0	5,431
153.90	21.2	5,501
153.91	21.5	5,572
153.92	21.8	5,642
153.93	22.1	5,713
153.94	22.3	5,785
153.95	22.6	5,856
153.96	22.9	5,928
153.97	23.2	5,999
153.98	23.4	6,071
153.99	23.7	6,144
154.00	**24.0**	**6,216**

Summary for Pond POST-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 3.19" for 10-year event
Inflow = 5.80 cfs @ 12.09 hrs, Volume= 0.425 af
Outflow = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af, Atten= 43%, Lag= 7.8 min
Primary = 3.30 cfs @ 12.22 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 190.66' @ 12.22 hrs Surf.Area= 2,221 sf Storage= 4,553 cf

Plug-Flow detention time= 48.1 min calculated for 0.418 af (98% of inflow)
Center-of-Mass det. time= 39.3 min (848.4 - 809.0)

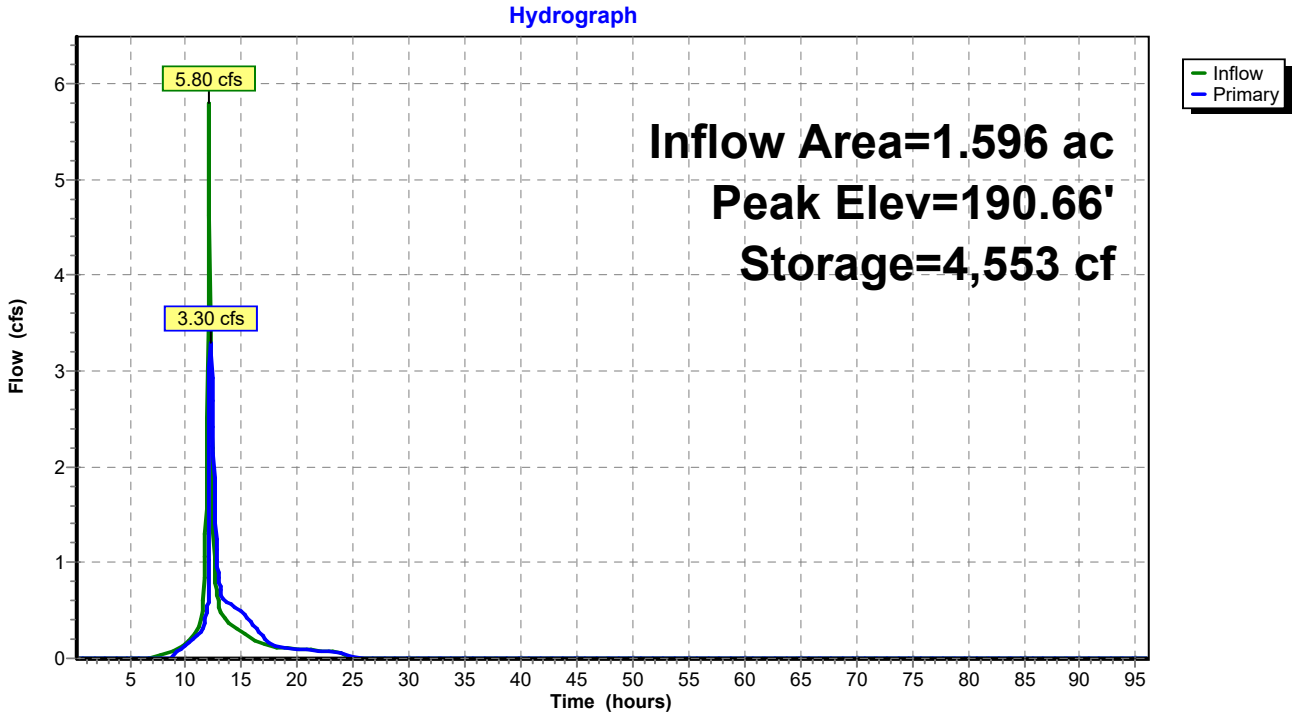
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.27 cfs @ 12.22 hrs HW=190.65' (Free Discharge)
└**1=Culvert** (Passes 3.27 cfs of 9.96 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 8.27 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.55 cfs @ 3.31 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-1P:


Hydrograph
Inflow Area=1.596 ac
Peak Elev=190.66'
Storage=4,553 cf
5.80 cfs
3.30 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond POST-1P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.01	204	2
187.02	209	4
187.03	213	6
187.04	218	8
187.05	222	11
187.06	227	13
187.07	231	15
187.08	236	17
187.09	240	20
187.10	245	22
187.11	250	25
187.12	255	27
187.13	260	30
187.14	265	32
187.15	270	35
187.16	275	38
187.17	280	41
187.18	285	43
187.19	290	46
187.20	295	49
187.21	300	52
187.22	306	55
187.23	311	58
187.24	316	61
187.25	322	65
187.26	327	68
187.27	333	71
187.28	338	74
187.29	344	78
187.30	349	81
187.31	355	85
187.32	361	88
187.33	367	92
187.34	372	96
187.35	378	100
187.36	384	103
187.37	390	107
187.38	396	111
187.39	402	115
187.40	408	119
187.41	415	123
187.42	421	128
187.43	427	132
187.44	433	136
187.45	440	140
187.46	446	145
187.47	452	149
187.48	459	154
187.49	465	159
187.50	472	163
187.51	479	168
187.52	485	173
187.53	492	178
187.54	499	183
187.55	506	188
187.56	512	193
187.57	519	198
187.58	526	203
187.59	533	208
187.60	540	214
187.61	547	219
187.62	554	225
187.63	562	230
187.64	569	236
187.65	576	242
187.66	583	247
187.67	591	253
187.68	598	259
187.69	606	265
187.70	613	271
187.71	621	278
187.72	628	284
187.73	636	290
187.74	643	297
187.75	651	303
187.76	659	310
187.77	667	316
187.78	675	323
187.79	682	330
187.80	690	337
187.81	698	343
187.82	706	350
187.83	715	358
187.84	723	365
187.85	731	372
187.86	739	379
187.87	747	387
187.88	756	394
187.89	764	402
187.90	772	410
187.91	781	417
187.92	789	425
187.93	798	433
187.94	806	441
187.95	815	449
187.96	824	458
187.97	833	466
187.98	841	474
187.99	850	483
188.00	859	491
188.01	863	500
188.02	867	508
188.03	872	517

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.04	876	526
188.05	880	535
188.06	885	543
188.07	889	552
188.08	893	561
188.09	898	570
188.10	902	579
188.11	906	588
188.12	911	597
188.13	915	606
188.14	919	616
188.15	924	625
188.16	928	634
188.17	933	643
188.18	937	653
188.19	941	662
188.20	946	672
188.21	950	681
188.22	955	691
188.23	959	700
188.24	964	710
188.25	968	719
188.26	973	729
188.27	977	739
188.28	982	749
188.29	986	759
188.30	991	768
188.31	995	778
188.32	1,000	788
188.33	1,005	798
188.34	1,009	808
188.35	1,014	819
188.36	1,018	829
188.37	1,023	839
188.38	1,028	849
188.39	1,032	859
188.40	1,037	870
188.41	1,042	880
188.42	1,046	891
188.43	1,051	901
188.44	1,056	912
188.45	1,060	922
188.46	1,065	933
188.47	1,070	944
188.48	1,075	954
188.49	1,079	965
188.50	1,084	976
188.51	1,089	987
188.52	1,094	998
188.53	1,098	1,009
188.54	1,103	1,020
188.55	1,108	1,031
188.56	1,113	1,042
188.57	1,118	1,053
188.58	1,122	1,064
188.59	1,127	1,075
188.60	1,132	1,087
188.61	1,137	1,098
188.62	1,142	1,109
188.63	1,147	1,121
188.64	1,152	1,132
188.65	1,157	1,144
188.66	1,162	1,155
188.67	1,166	1,167
188.68	1,171	1,179
188.69	1,176	1,191
188.70	1,181	1,202
188.71	1,186	1,214
188.72	1,191	1,226
188.73	1,196	1,238
188.74	1,201	1,250
188.75	1,206	1,262
188.76	1,211	1,274
188.77	1,216	1,286
188.78	1,221	1,298
188.79	1,227	1,311
188.80	1,232	1,323
188.81	1,237	1,335
188.82	1,242	1,348
188.83	1,247	1,360
188.84	1,252	1,373
188.85	1,257	1,385
188.86	1,262	1,398
188.87	1,267	1,410
188.88	1,273	1,423
188.89	1,278	1,436
188.90	1,283	1,449
188.91	1,288	1,462
188.92	1,293	1,474
188.93	1,298	1,487
188.94	1,304	1,500
188.95	1,309	1,513
188.96	1,314	1,527
188.97	1,319	1,540
188.98	1,325	1,553
188.99	1,330	1,566
189.00	1,335	1,580
189.01	1,340	1,593
189.02	1,346	1,606
189.03	1,351	1,620
189.04	1,356	1,633
189.05	1,362	1,647
189.06	1,367	1,661
189.07	1,372	1,674

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
189.08	1,378	1,688	189.60	1,671	2,480
189.09	1,383	1,702	189.61	1,677	2,496
189.10	1,389	1,716	189.62	1,683	2,513
189.11	1,394	1,730	189.63	1,689	2,530
189.12	1,399	1,744	189.64	1,695	2,547
189.13	1,405	1,758	189.65	1,701	2,564
189.14	1,410	1,772	189.66	1,707	2,581
189.15	1,416	1,786	189.67	1,713	2,598
189.16	1,421	1,800	189.68	1,719	2,615
189.17	1,427	1,814	189.69	1,725	2,632
189.18	1,432	1,829	189.70	1,731	2,650
189.19	1,438	1,843	189.71	1,737	2,667
189.20	1,443	1,857	189.72	1,743	2,684
189.21	1,448	1,872	189.73	1,749	2,702
189.22	1,454	1,886	189.74	1,755	2,719
189.23	1,460	1,901	189.75	1,761	2,737
189.24	1,465	1,915	189.76	1,767	2,755
189.25	1,471	1,930	189.77	1,773	2,772
189.26	1,476	1,945	189.78	1,779	2,790
189.27	1,482	1,960	189.79	1,785	2,808
189.28	1,487	1,975	189.80	1,791	2,826
189.29	1,493	1,989	189.81	1,798	2,844
189.30	1,498	2,004	189.82	1,804	2,862
189.31	1,504	2,019	189.83	1,810	2,880
189.32	1,510	2,034	189.84	1,816	2,898
189.33	1,515	2,050	189.85	1,822	2,916
189.34	1,521	2,065	189.86	1,828	2,934
189.35	1,527	2,080	189.87	1,835	2,953
189.36	1,532	2,095	189.88	1,841	2,971
189.37	1,538	2,111	189.89	1,847	2,989
189.38	1,544	2,126	189.90	1,853	3,008
189.39	1,549	2,142	189.91	1,859	3,027
189.40	1,555	2,157	189.92	1,866	3,045
189.41	1,561	2,173	189.93	1,872	3,064
189.42	1,566	2,188	189.94	1,878	3,083
189.43	1,572	2,204	189.95	1,884	3,101
189.44	1,578	2,220	189.96	1,891	3,120
189.45	1,584	2,235	189.97	1,897	3,139
189.46	1,589	2,251	189.98	1,903	3,158
189.47	1,595	2,267	189.99	1,910	3,177
189.48	1,601	2,283	190.00	1,916	3,196
189.49	1,607	2,299	190.01	1,920	3,216
189.50	1,613	2,315	190.02	1,925	3,235
189.51	1,618	2,332	190.03	1,929	3,254
189.52	1,624	2,348	190.04	1,934	3,273
189.53	1,630	2,364	190.05	1,938	3,293
189.54	1,636	2,380	190.06	1,943	3,312
189.55	1,642	2,397	190.07	1,947	3,332
189.56	1,648	2,413	190.08	1,952	3,351
189.57	1,653	2,430	190.09	1,956	3,371
189.58	1,659	2,446	190.10	1,961	3,390
189.59	1,665	2,463	190.11	1,966	3,410

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
190.12	1,970	3,430
190.13	1,975	3,449
190.14	1,979	3,469
190.15	1,984	3,489
190.16	1,988	3,509
190.17	1,993	3,529
190.18	1,997	3,549
190.19	2,002	3,569
190.20	2,007	3,589
190.21	2,011	3,609
190.22	2,016	3,629
190.23	2,020	3,649
190.24	2,025	3,669
190.25	2,029	3,690
190.26	2,034	3,710
190.27	2,039	3,730
190.28	2,043	3,751
190.29	2,048	3,771
190.30	2,053	3,792
190.31	2,057	3,812
190.32	2,062	3,833
190.33	2,066	3,853
190.34	2,071	3,874
190.35	2,076	3,895
190.36	2,080	3,916
190.37	2,085	3,936
190.38	2,090	3,957
190.39	2,094	3,978
190.40	2,099	3,999
190.41	2,104	4,020
190.42	2,108	4,041
190.43	2,113	4,062
190.44	2,118	4,084
190.45	2,123	4,105
190.46	2,127	4,126
190.47	2,132	4,147
190.48	2,137	4,169
190.49	2,141	4,190
190.50	2,146	4,211
190.51	2,151	4,233
190.52	2,156	4,254
190.53	2,160	4,276
190.54	2,165	4,298
190.55	2,170	4,319
190.56	2,175	4,341
190.57	2,179	4,363
190.58	2,184	4,385
190.59	2,189	4,407
190.60	2,194	4,428
190.61	2,199	4,450
190.62	2,203	4,472
190.63	2,208	4,494
190.64	2,213	4,517
190.65	2,218	4,539
190.66	2,223	4,561
190.67	2,227	4,583
190.68	2,232	4,605
190.69	2,237	4,628
190.70	2,242	4,650
190.71	2,247	4,673
190.72	2,252	4,695
190.73	2,256	4,718
190.74	2,261	4,740
190.75	2,266	4,763
190.76	2,271	4,786
190.77	2,276	4,808
190.78	2,281	4,831
190.79	2,286	4,854
190.80	2,291	4,877
190.81	2,295	4,900
190.82	2,300	4,923
190.83	2,305	4,946
190.84	2,310	4,969
190.85	2,315	4,992
190.86	2,320	5,015
190.87	2,325	5,038
190.88	2,330	5,062
190.89	2,335	5,085
190.90	2,340	5,108
190.91	2,345	5,132
190.92	2,350	5,155
190.93	2,355	5,179
190.94	2,360	5,202
190.95	2,364	5,226
190.96	2,369	5,250
190.97	2,374	5,273
190.98	2,379	5,297
190.99	2,384	5,321
191.00	2,389	5,345
191.01	2,394	5,369
191.02	2,399	5,393
191.03	2,404	5,417
191.04	2,409	5,441
191.05	2,414	5,465
191.06	2,419	5,489
191.07	2,424	5,513
191.08	2,430	5,538
191.09	2,435	5,562
191.10	2,440	5,586
191.11	2,445	5,611
191.12	2,450	5,635
191.13	2,455	5,660
191.14	2,460	5,684
191.15	2,465	5,709

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
191.16	2,470	5,734	191.68	2,741	7,088
191.17	2,475	5,758	191.69	2,746	7,115
191.18	2,480	5,783	191.70	2,752	7,143
191.19	2,485	5,808	191.71	2,757	7,170
191.20	2,490	5,833	191.72	2,763	7,198
191.21	2,495	5,858	191.73	2,768	7,226
191.22	2,501	5,883	191.74	2,773	7,253
191.23	2,506	5,908	191.75	2,779	7,281
191.24	2,511	5,933	191.76	2,784	7,309
191.25	2,516	5,958	191.77	2,789	7,337
191.26	2,521	5,983	191.78	2,795	7,365
191.27	2,526	6,008	191.79	2,800	7,393
191.28	2,531	6,034	191.80	2,806	7,421
191.29	2,536	6,059	191.81	2,811	7,449
191.30	2,542	6,084	191.82	2,817	7,477
191.31	2,547	6,110	191.83	2,822	7,505
191.32	2,552	6,135	191.84	2,827	7,533
191.33	2,557	6,161	191.85	2,833	7,562
191.34	2,562	6,186	191.86	2,838	7,590
191.35	2,567	6,212	191.87	2,844	7,618
191.36	2,573	6,238	191.88	2,849	7,647
191.37	2,578	6,263	191.89	2,855	7,675
191.38	2,583	6,289	191.90	2,860	7,704
191.39	2,588	6,315	191.91	2,866	7,733
191.40	2,593	6,341	191.92	2,871	7,761
191.41	2,599	6,367	191.93	2,877	7,790
191.42	2,604	6,393	191.94	2,882	7,819
191.43	2,609	6,419	191.95	2,887	7,848
191.44	2,614	6,445	191.96	2,893	7,876
191.45	2,619	6,471	191.97	2,898	7,905
191.46	2,625	6,498	191.98	2,904	7,934
191.47	2,630	6,524	191.99	2,909	7,964
191.48	2,635	6,550	192.00	2,915	7,993
191.49	2,640	6,577	192.01	2,921	8,022
191.50	2,646	6,603	192.02	2,926	8,051
191.51	2,651	6,629	192.03	2,932	8,080
191.52	2,656	6,656	192.04	2,938	8,110
191.53	2,661	6,683	192.05	2,944	8,139
191.54	2,667	6,709	192.06	2,949	8,169
191.55	2,672	6,736	192.07	2,955	8,198
191.56	2,677	6,763	192.08	2,961	8,228
191.57	2,683	6,789	192.09	2,966	8,257
191.58	2,688	6,816	192.10	2,972	8,287
191.59	2,693	6,843	192.11	2,978	8,317
191.60	2,698	6,870	192.12	2,984	8,347
191.61	2,704	6,897	192.13	2,989	8,376
191.62	2,709	6,924	192.14	2,995	8,406
191.63	2,714	6,951	192.15	3,001	8,436
191.64	2,720	6,979	192.16	3,007	8,466
191.65	2,725	7,006	192.17	3,013	8,496
191.66	2,730	7,033	192.18	3,018	8,527
191.67	2,736	7,060	192.19	3,024	8,557

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
192.20	3,030	8,587
192.21	3,036	8,617
192.22	3,042	8,648
192.23	3,047	8,678
192.24	3,053	8,709
192.25	3,059	8,739
192.26	3,065	8,770
192.27	3,071	8,801
192.28	3,077	8,831
192.29	3,082	8,862
192.30	3,088	8,893
192.31	3,094	8,924
192.32	3,100	8,955
192.33	3,106	8,986
192.34	3,112	9,017
192.35	3,118	9,048
192.36	3,124	9,079
192.37	3,129	9,111
192.38	3,135	9,142
192.39	3,141	9,173
192.40	3,147	9,205
192.41	3,153	9,236
192.42	3,159	9,268
192.43	3,165	9,299
192.44	3,171	9,331
192.45	3,177	9,363
192.46	3,183	9,395
192.47	3,189	9,427
192.48	3,195	9,458
192.49	3,201	9,490
192.50	3,207	9,522
192.51	3,213	9,555
192.52	3,219	9,587
192.53	3,224	9,619
192.54	3,230	9,651
192.55	3,236	9,684
192.56	3,242	9,716
192.57	3,248	9,748
192.58	3,254	9,781
192.59	3,261	9,813
192.60	3,267	9,846
192.61	3,273	9,879
192.62	3,279	9,912
192.63	3,285	9,944
192.64	3,291	9,977
192.65	3,297	10,010
192.66	3,303	10,043
192.67	3,309	10,076
192.68	3,315	10,109
192.69	3,321	10,143
192.70	3,327	10,176
192.71	3,333	10,209
192.72	3,339	10,242
192.73	3,345	10,276
192.74	3,351	10,309
192.75	3,358	10,343
192.76	3,364	10,376
192.77	3,370	10,410
192.78	3,376	10,444
192.79	3,382	10,478
192.80	3,388	10,512
192.81	3,394	10,545
192.82	3,400	10,579
192.83	3,407	10,613
192.84	3,413	10,648
192.85	3,419	10,682
192.86	3,425	10,716
192.87	3,431	10,750
192.88	3,437	10,785
192.89	3,444	10,819
192.90	3,450	10,853
192.91	3,456	10,888
192.92	3,462	10,923
192.93	3,468	10,957
192.94	3,475	10,992
192.95	3,481	11,027
192.96	3,487	11,062
192.97	3,493	11,096
192.98	3,500	11,131
192.99	3,506	11,166
193.00	**3,512**	**11,201**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 2.46" for 10-year event
Inflow = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af
Outflow = 1.03 cfs @ 12.11 hrs, Volume= 0.068 af, Atten= 1%, Lag= 0.8 min
Primary = 1.03 cfs @ 12.11 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.12' @ 12.11 hrs Surf.Area= 553 sf Storage= 359 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 63.9 min calculated for 0.068 af (91% of inflow)
Center-of-Mass det. time= 19.1 min (850.6 - 831.5)

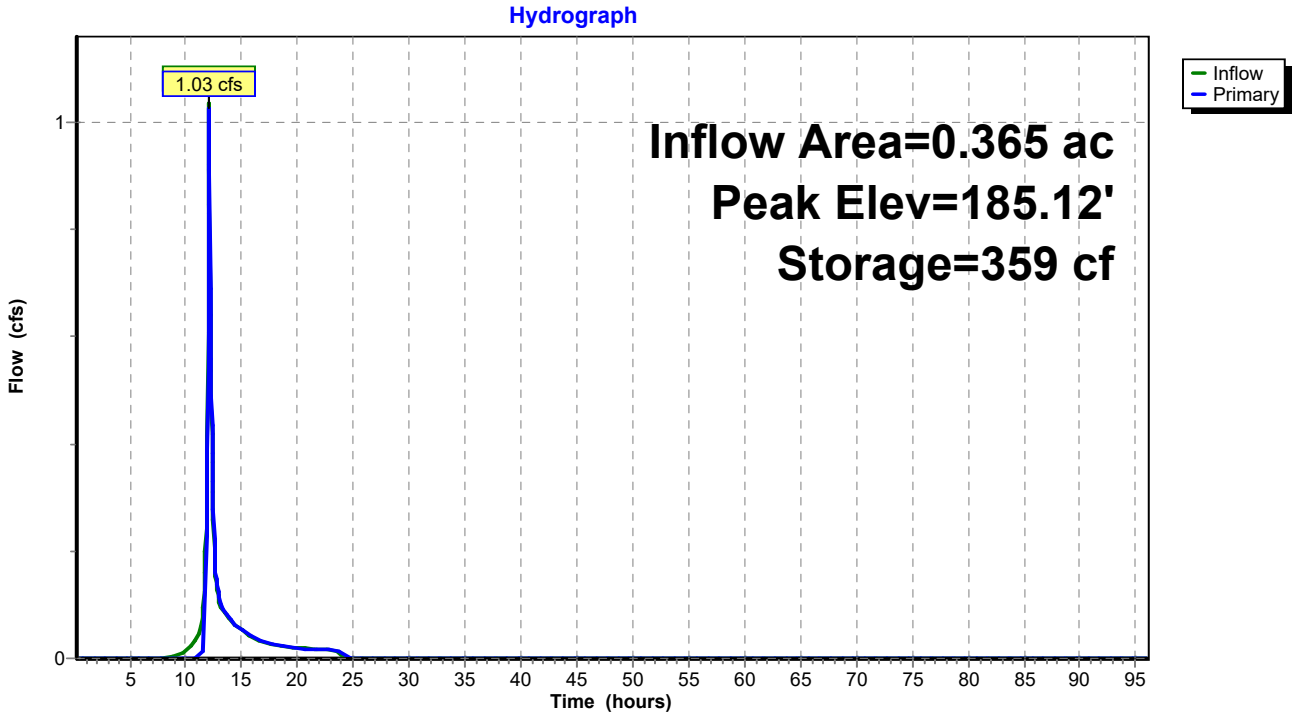
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.01 cfs @ 12.11 hrs HW=185.12' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 0.83 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 2.12" for 10-year event
Inflow = 1.09 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 1.05 cfs @ 12.13 hrs, Volume= 0.069 af, Atten= 4%, Lag= 1.6 min
Primary = 1.05 cfs @ 12.13 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.30' @ 12.13 hrs Surf.Area= 420 sf Storage= 301 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 43.2 min calculated for 0.069 af (94% of inflow)
Center-of-Mass det. time= 12.3 min (864.7 - 852.4)

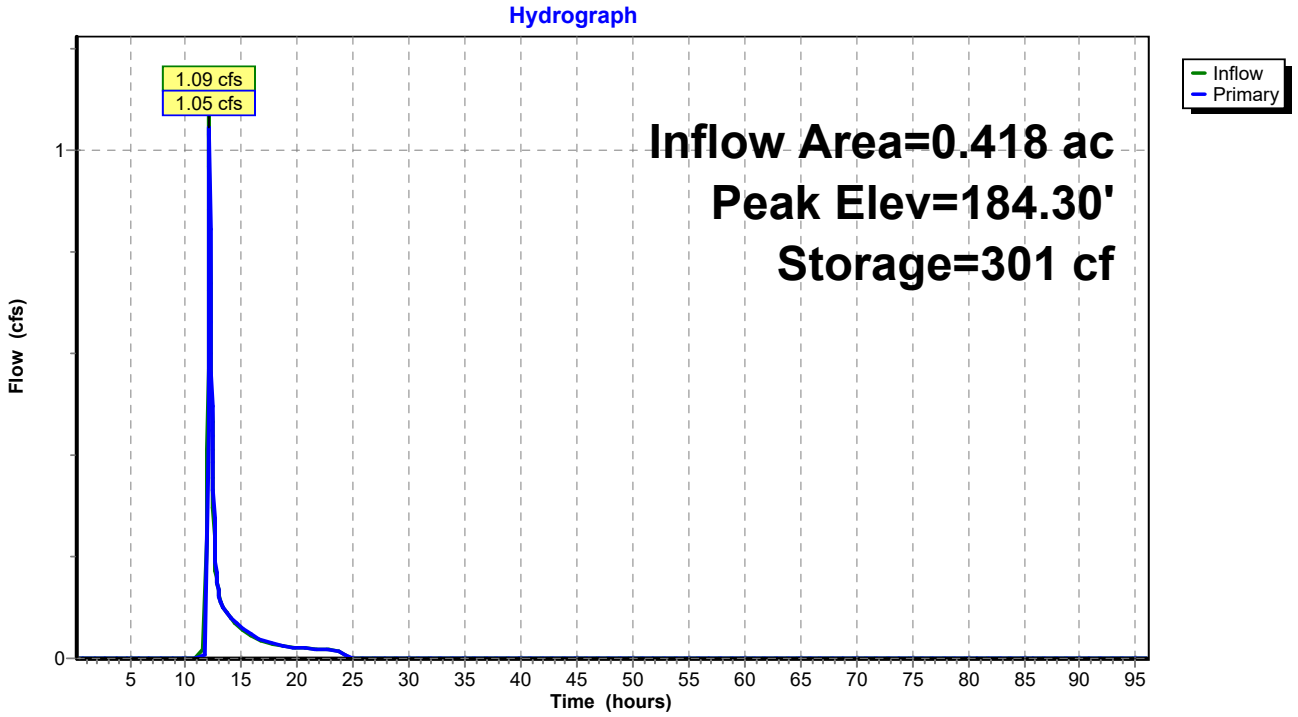
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=184.29' (Free Discharge)
└**1=Culvert** (Passes 1.02 cfs of 7.37 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 1.74 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 1.42" for 10-year event
Inflow = 1.05 cfs @ 12.13 hrs, Volume= 0.072 af
Outflow = 0.06 cfs @ 15.15 hrs, Volume= 0.072 af, Atten= 94%, Lag= 181.0 min
Discarded = 0.06 cfs @ 15.15 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 175.13' @ 15.15 hrs Surf.Area= 1,108 sf Storage= 1,569 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 323.5 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 323.5 min (1,194.0 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

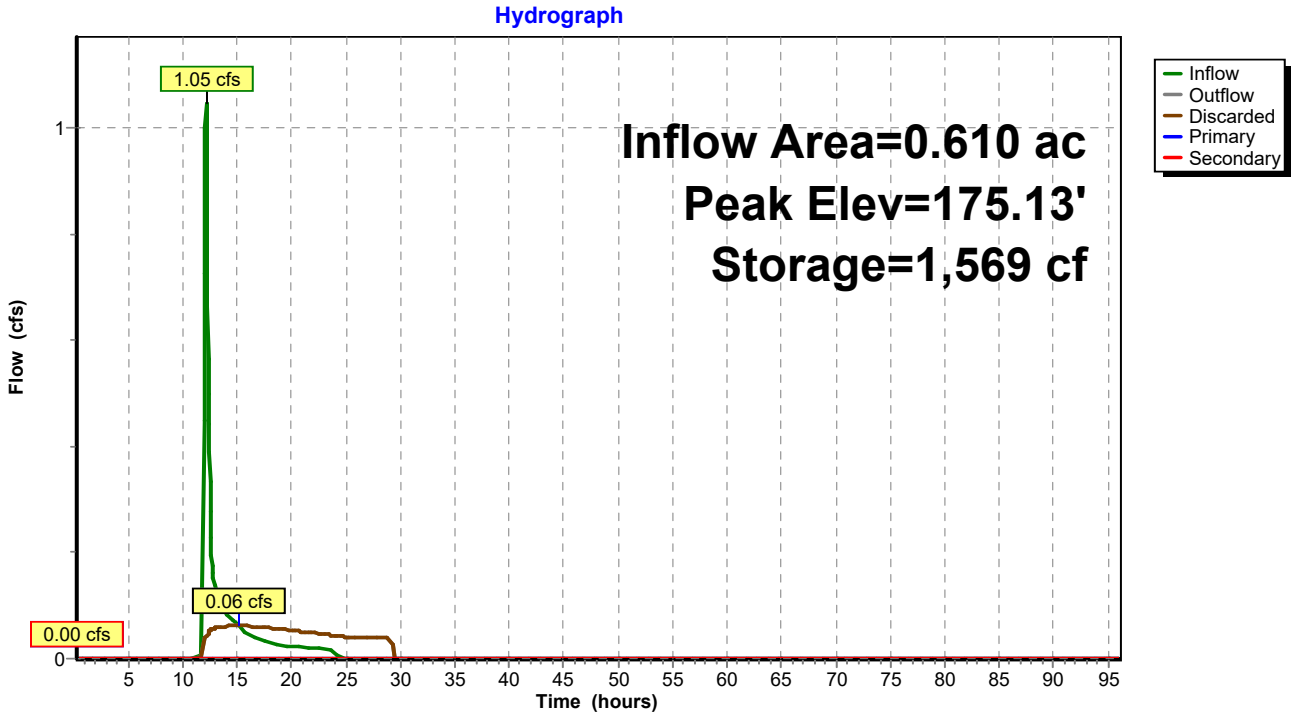
Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	175.00'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 175.00' / 174.50' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	177.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	177.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	178.00'	**16.0' 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=0.06 cfs @ 15.15 hrs HW=175.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811	177.71	2,351	5,960
177.20	2,075	4,832	177.72	2,357	5,983
177.21	2,081	4,853	177.73	2,363	6,007
177.22	2,086	4,873	177.74	2,368	6,031
177.23	2,091	4,894	177.75	2,374	6,054
177.24	2,096	4,915	177.76	2,379	6,078
177.25	2,102	4,936	177.77	2,385	6,102
177.26	2,107	4,957	177.78	2,391	6,126
177.27	2,112	4,978	177.79	2,396	6,150
177.28	2,118	4,999	177.80	2,402	6,174
177.29	2,123	5,021	177.81	2,408	6,198
177.30	2,128	5,042	177.82	2,413	6,222
177.31	2,133	5,063	177.83	2,419	6,246
177.32	2,139	5,085	177.84	2,424	6,270
177.33	2,144	5,106	177.85	2,430	6,295
177.34	2,149	5,127	177.86	2,436	6,319
177.35	2,155	5,149	177.87	2,442	6,343
177.36	2,160	5,171	177.88	2,447	6,368
177.37	2,165	5,192	177.89	2,453	6,392
177.38	2,171	5,214	177.90	2,459	6,417
177.39	2,176	5,236	177.91	2,464	6,441
177.40	2,182	5,257	177.92	2,470	6,466
177.41	2,187	5,279	177.93	2,476	6,491
177.42	2,192	5,301	177.94	2,481	6,516
177.43	2,198	5,323	177.95	2,487	6,540
177.44	2,203	5,345	177.96	2,493	6,565
177.45	2,209	5,367	177.97	2,499	6,590
177.46	2,214	5,389	177.98	2,504	6,615
177.47	2,219	5,411	177.99	2,510	6,640
177.48	2,225	5,434	178.00	2,516	6,666
177.49	2,230	5,456	178.01	2,522	6,691
177.50	2,236	5,478	178.02	2,527	6,716
177.51	2,241	5,501	178.03	2,533	6,741
177.52	2,247	5,523	178.04	2,539	6,767
177.53	2,252	5,546	178.05	2,544	6,792
177.54	2,257	5,568	178.06	2,550	6,817
177.55	2,263	5,591	178.07	2,556	6,843
177.56	2,268	5,613	178.08	2,562	6,869
177.57	2,274	5,636	178.09	2,567	6,894
177.58	2,279	5,659	178.10	2,573	6,920
177.59	2,285	5,682	178.11	2,579	6,946
177.60	2,290	5,705	178.12	2,585	6,972
177.61	2,296	5,728	178.13	2,590	6,997
177.62	2,301	5,750	178.14	2,596	7,023
177.63	2,307	5,774	178.15	2,602	7,049
177.64	2,312	5,797	178.16	2,608	7,075
177.65	2,318	5,820	178.17	2,613	7,101
177.66	2,324	5,843	178.18	2,619	7,128
177.67	2,329	5,866	178.19	2,625	7,154
177.68	2,335	5,890	178.20	2,631	7,180
177.69	2,340	5,913	178.21	2,637	7,206
177.70	2,346	5,936	178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

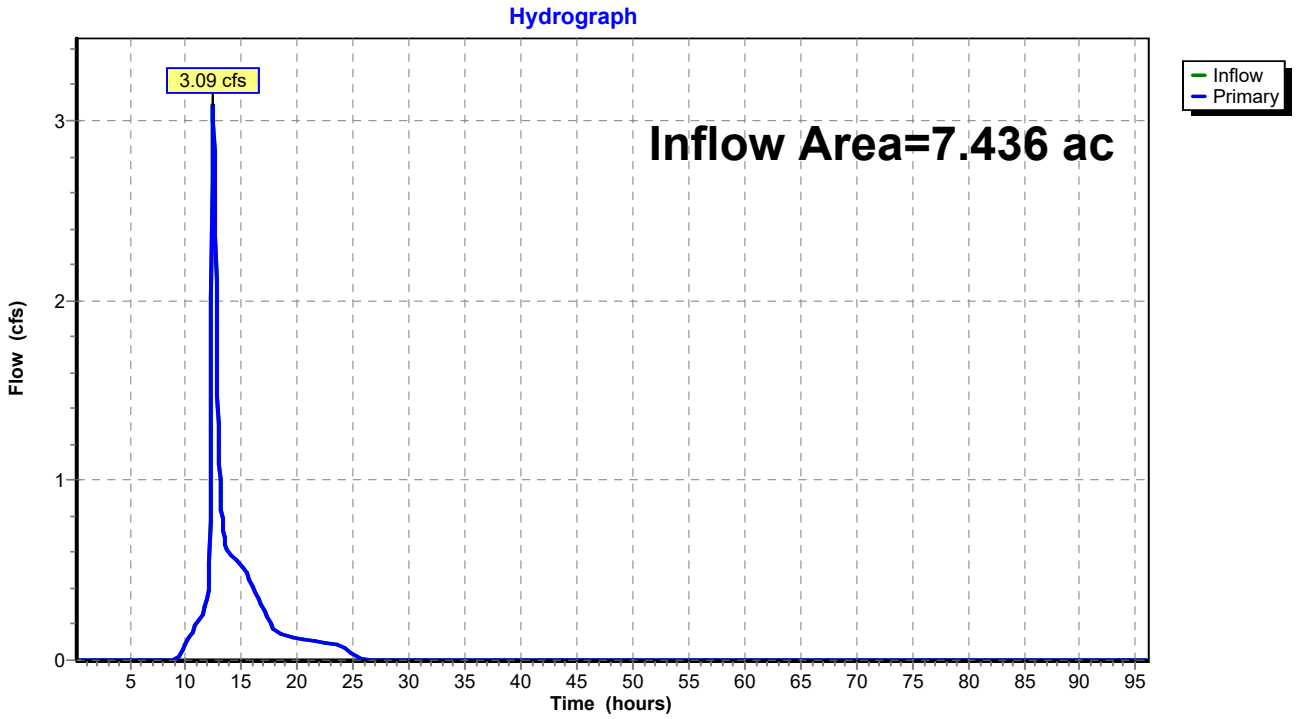
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 7.436 ac, 19.32% Impervious, Inflow Depth = 0.71" for 10-year event
Inflow = 3.09 cfs @ 12.45 hrs, Volume= 0.437 af
Primary = 3.09 cfs @ 12.45 hrs, Volume= 0.437 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link POST-DP-1: Analysis Point



Summary for Subcatchment POST-1S:

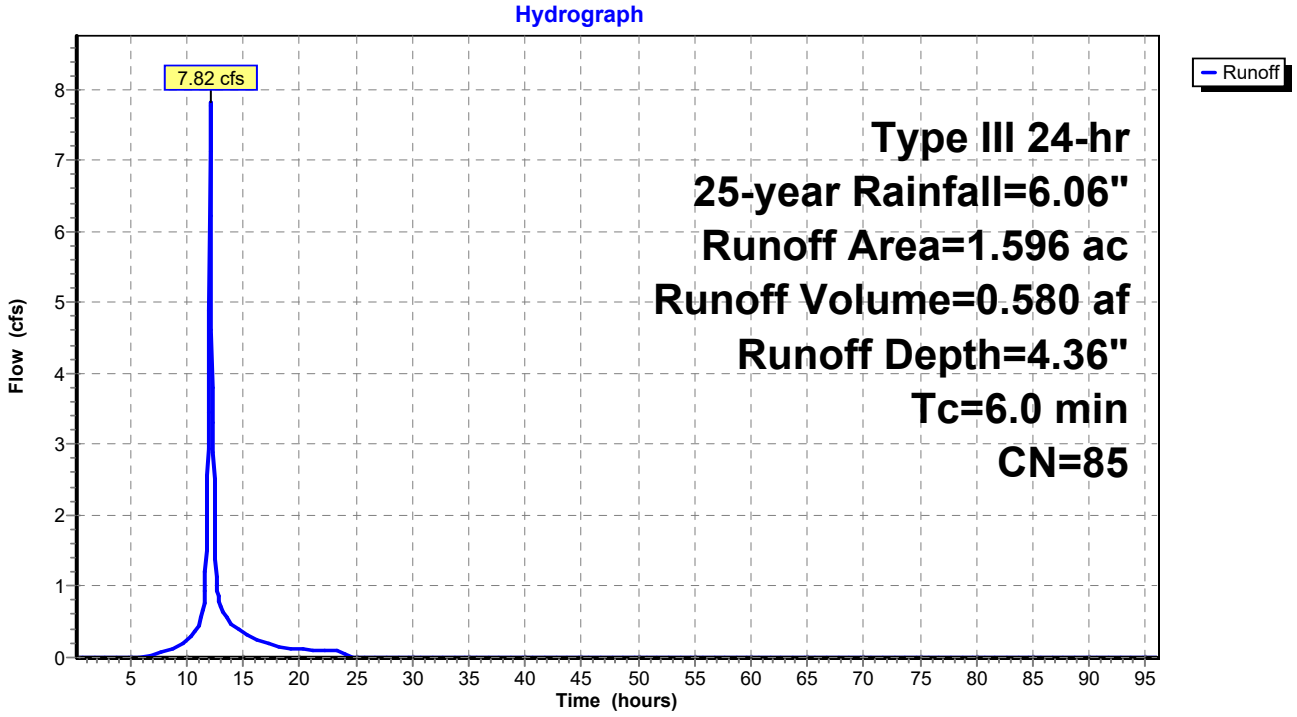
Runoff = 7.82 cfs @ 12.09 hrs, Volume= 0.580 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.016	30	Meadow, non-grazed, HSG A
	0.140	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-1S:



Summary for Subcatchment POST-2S-A:

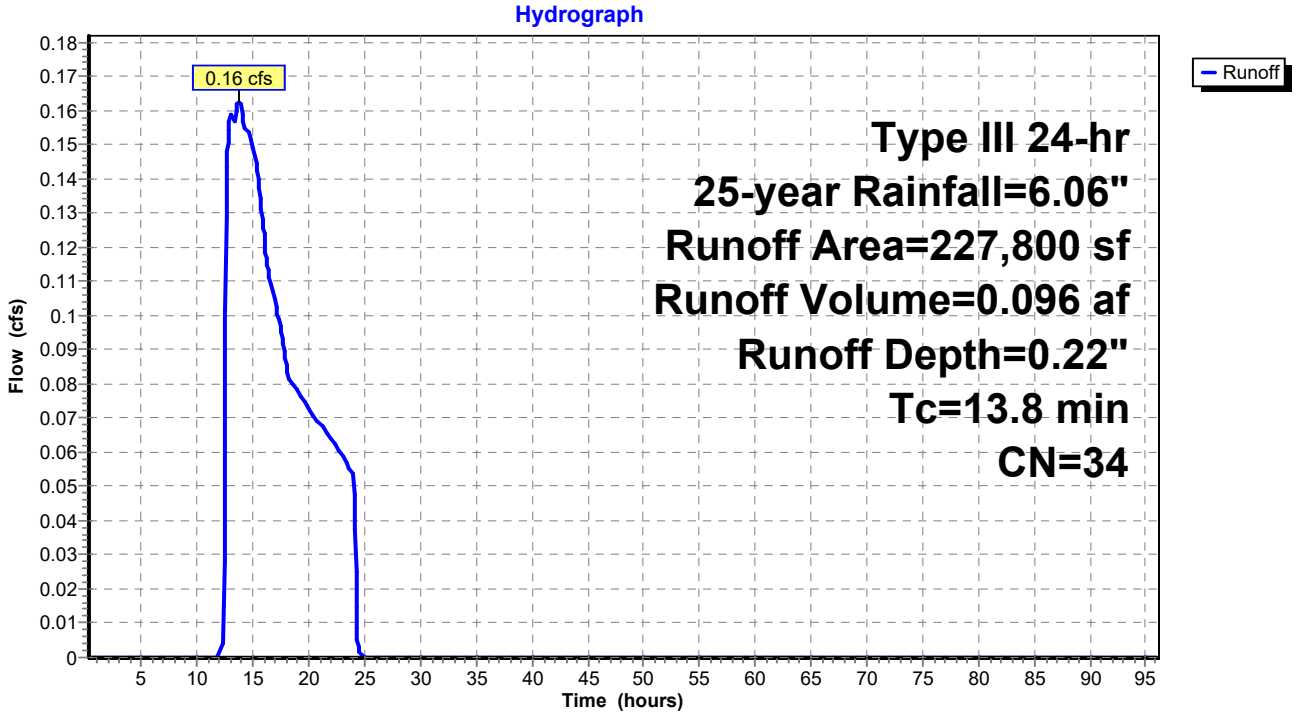
Runoff = 0.16 cfs @ 13.72 hrs, Volume= 0.096 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	5,732	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	9,568	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	19,869	30	Meadow, non-grazed, HSG A
	164,917	30	Woods, Good, HSG A
	227,800	34	Weighted Average
	222,068		97.48% Pervious Area
	5,732		2.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment POST-2S-A:



Summary for Subcatchment POST-2S-B:

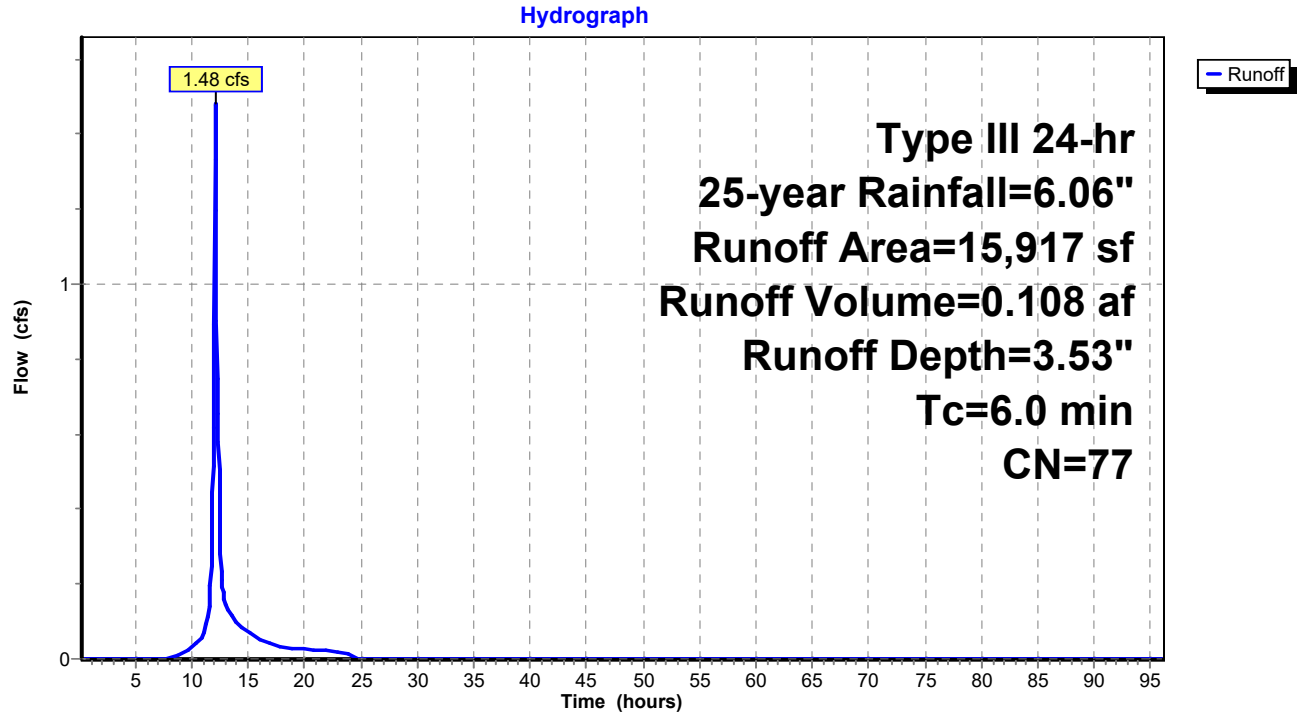
Runoff = 1.48 cfs @ 12.09 hrs, Volume= 0.108 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

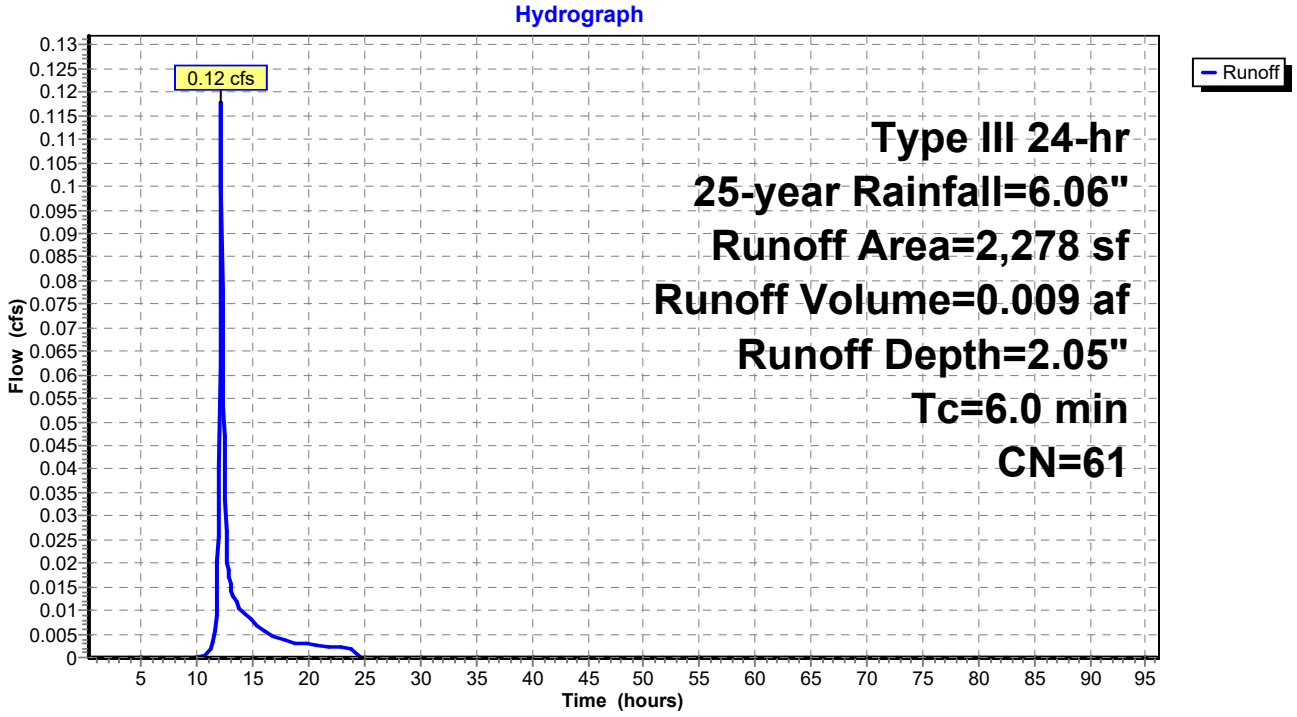
Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

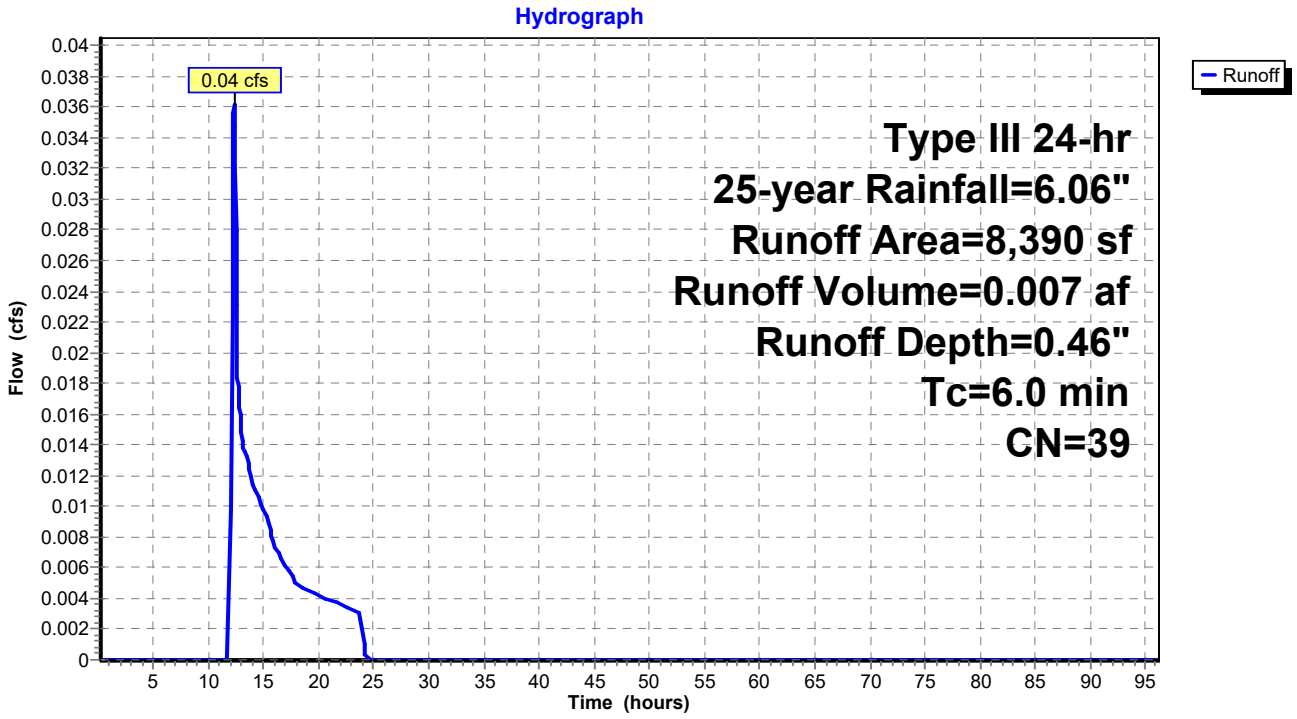
Runoff = 0.04 cfs @ 12.34 hrs, Volume= 0.007 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-1R:

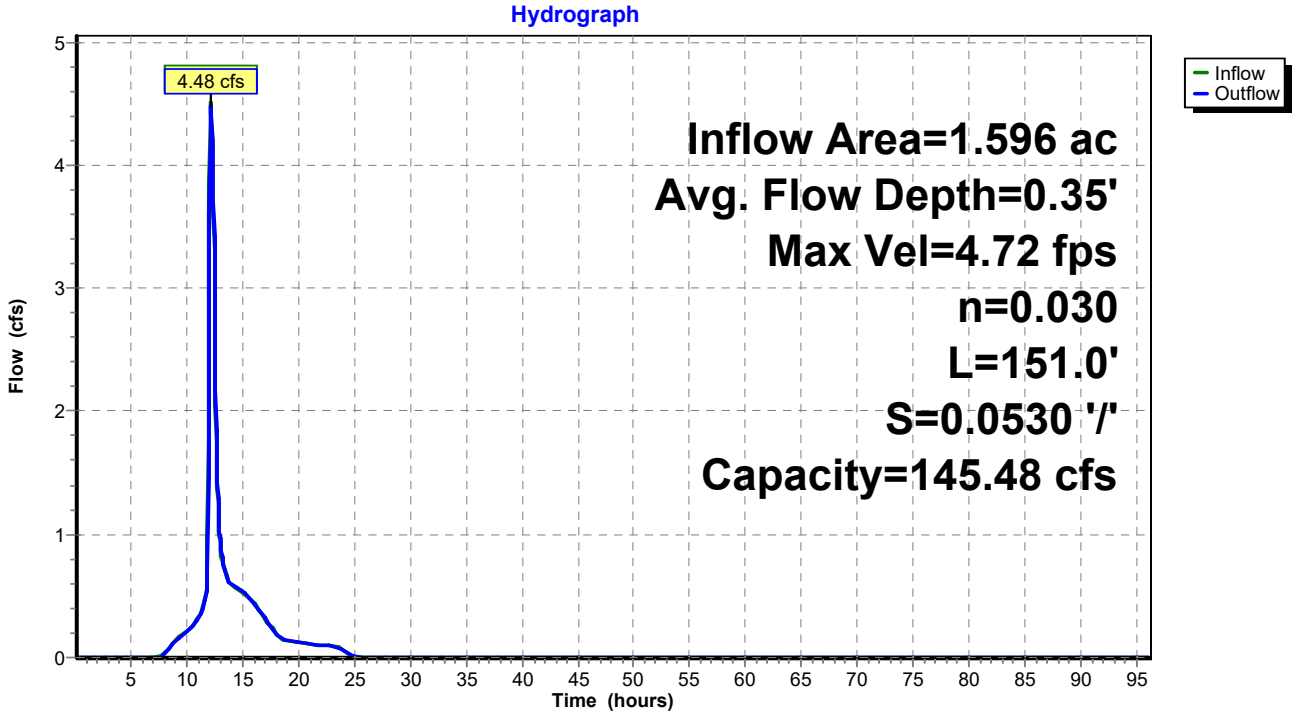
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.31" for 25-year event
Inflow = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af
Outflow = 4.48 cfs @ 12.23 hrs, Volume= 0.574 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.72 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 1.6 min

Peak Storage= 144 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 3.41'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 145.48 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 151.0' Slope= 0.0530 '/'
Inlet Invert= 187.00', Outlet Invert= 179.00'

Reach POST-1R:



Stage-Area-Storage for Reach POST-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0	187.52	1.6	239
187.01	0.0	3	187.53	1.6	245
187.02	0.0	6	187.54	1.7	251
187.03	0.1	9	187.55	1.7	257
187.04	0.1	13	187.56	1.7	264
187.05	0.1	16	187.57	1.8	270
187.06	0.1	19	187.58	1.8	277
187.07	0.2	23	187.59	1.9	283
187.08	0.2	26	187.60	1.9	290
187.09	0.2	30	187.61	2.0	297
187.10	0.2	33	187.62	2.0	303
187.11	0.2	37	187.63	2.1	310
187.12	0.3	41	187.64	2.1	317
187.13	0.3	44	187.65	2.1	324
187.14	0.3	48	187.66	2.2	331
187.15	0.3	52	187.67	2.2	338
187.16	0.4	56	187.68	2.3	345
187.17	0.4	60	187.69	2.3	352
187.18	0.4	64	187.70	2.4	359
187.19	0.5	68	187.71	2.4	367
187.20	0.5	72	187.72	2.5	374
187.21	0.5	77	187.73	2.5	381
187.22	0.5	81	187.74	2.6	389
187.23	0.6	85	187.75	2.6	396
187.24	0.6	90	187.76	2.7	404
187.25	0.6	94	187.77	2.7	412
187.26	0.7	99	187.78	2.8	419
187.27	0.7	104	187.79	2.8	427
187.28	0.7	108	187.80	2.9	435
187.29	0.7	113	187.81	2.9	443
187.30	0.8	118	187.82	3.0	451
187.31	0.8	123	187.83	3.0	459
187.32	0.8	128	187.84	3.1	467
187.33	0.9	133	187.85	3.1	475
187.34	0.9	138	187.86	3.2	483
187.35	0.9	143	187.87	3.3	491
187.36	1.0	148	187.88	3.3	500
187.37	1.0	153	187.89	3.4	508
187.38	1.0	158	187.90	3.4	516
187.39	1.1	164	187.91	3.5	525
187.40	1.1	169	187.92	3.5	533
187.41	1.2	175	187.93	3.6	542
187.42	1.2	180	187.94	3.6	551
187.43	1.2	186	187.95	3.7	559
187.44	1.3	191	187.96	3.8	568
187.45	1.3	197	187.97	3.8	577
187.46	1.3	203	187.98	3.9	586
187.47	1.4	209	187.99	3.9	595
187.48	1.4	215	188.00	4.0	604
187.49	1.5	221	188.01	4.1	613
187.50	1.5	227	188.02	4.1	622
187.51	1.5	233	188.03	4.2	631

Stage-Area-Storage for Reach POST-1R: (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
188.04	4.2	641
188.05	4.3	650
188.06	4.4	659
188.07	4.4	669
188.08	4.5	678
188.09	4.6	688
188.10	4.6	698
188.11	4.7	707
188.12	4.7	717
188.13	4.8	727
188.14	4.9	737
188.15	4.9	747
188.16	5.0	757
188.17	5.1	767
188.18	5.1	777
188.19	5.2	787
188.20	5.3	797
188.21	5.3	808
188.22	5.4	818
188.23	5.5	828
188.24	5.6	839
188.25	5.6	849
188.26	5.7	860
188.27	5.8	871
188.28	5.8	881
188.29	5.9	892
188.30	6.0	903
188.31	6.1	914
188.32	6.1	925
188.33	6.2	936
188.34	6.3	947
188.35	6.3	958
188.36	6.4	969
188.37	6.5	981
188.38	6.6	992
188.39	6.6	1,003
188.40	6.7	1,015
188.41	6.8	1,026
188.42	6.9	1,038
188.43	6.9	1,049
188.44	7.0	1,061
188.45	7.1	1,073
188.46	7.2	1,085
188.47	7.3	1,097
188.48	7.3	1,108
188.49	7.4	1,120
188.50	7.5	1,133
188.51	7.6	1,145
188.52	7.7	1,157
188.53	7.7	1,169
188.54	7.8	1,181
188.55	7.9	1,194
188.56	8.0	1,206
188.57	8.1	1,219
188.58	8.2	1,231
188.59	8.2	1,244
188.60	8.3	1,256
188.61	8.4	1,269
188.62	8.5	1,282
188.63	8.6	1,295
188.64	8.7	1,308
188.65	8.7	1,321
188.66	8.8	1,334
188.67	8.9	1,347
188.68	9.0	1,360
188.69	9.1	1,373
188.70	9.2	1,386
188.71	9.3	1,400
188.72	9.4	1,413
188.73	9.4	1,426
188.74	9.5	1,440
188.75	9.6	1,453
188.76	9.7	1,467
188.77	9.8	1,481
188.78	9.9	1,494
188.79	10.0	1,508
188.80	10.1	1,522
188.81	10.2	1,536
188.82	10.3	1,550
188.83	10.4	1,564
188.84	10.5	1,578
188.85	10.5	1,592
188.86	10.6	1,607
188.87	10.7	1,621
188.88	10.8	1,635
188.89	10.9	1,650
188.90	11.0	1,664
188.91	11.1	1,679
188.92	11.2	1,693
188.93	11.3	1,708
188.94	11.4	1,722
188.95	11.5	1,737
188.96	11.6	1,752
188.97	11.7	1,767
188.98	11.8	1,782
188.99	11.9	1,797
189.00	**12.0**	**1,812**

Summary for Reach POST-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.31" for 25-year event
Inflow = 4.48 cfs @ 12.23 hrs, Volume= 0.574 af
Outflow = 4.46 cfs @ 12.28 hrs, Volume= 0.574 af, Atten= 1%, Lag= 2.8 min

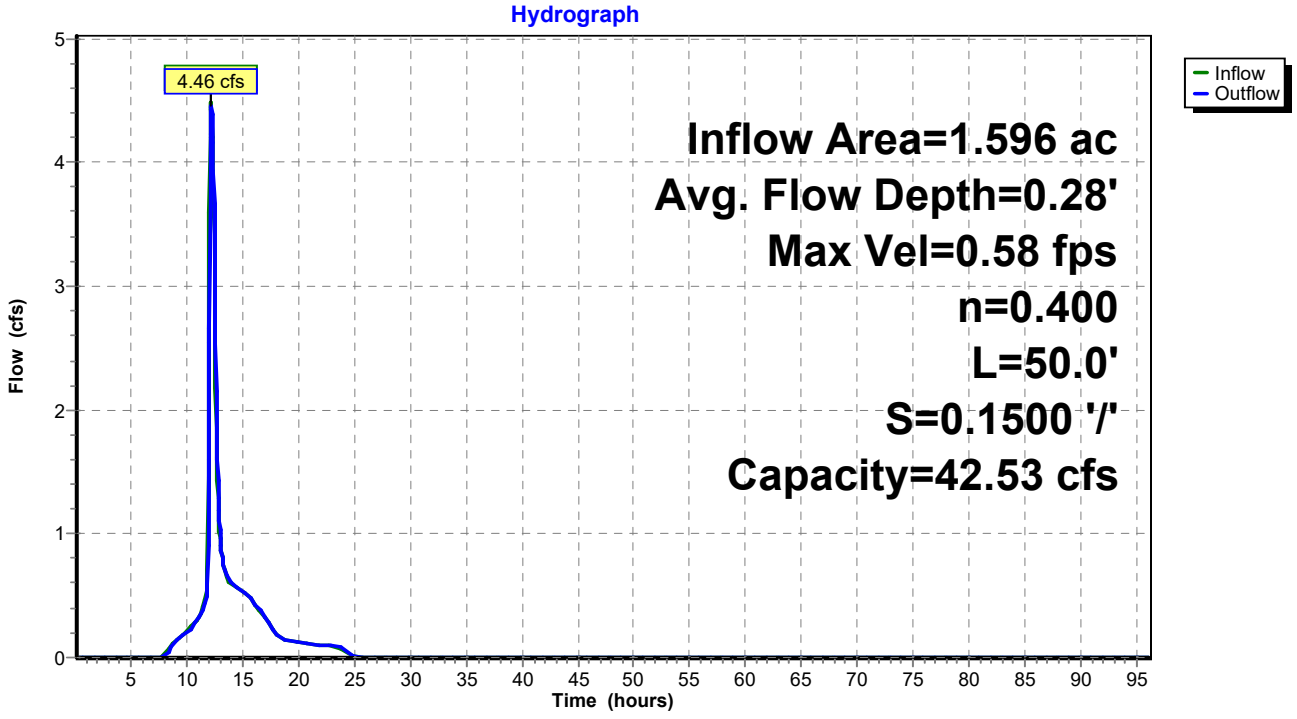
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.58 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 5.8 min

Peak Storage= 389 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 30.59'
Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 42.53 cfs

25.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 50.0' Slope= 0.1500 '/'
Inlet Invert= 178.50', Outlet Invert= 171.00'

‡

Reach POST-2R:



Stage-Area-Storage for Reach POST-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
178.50	0.0	0
178.51	0.3	13
178.52	0.5	25
178.53	0.8	38
178.54	1.0	51
178.55	1.3	64
178.56	1.5	77
178.57	1.8	90
178.58	2.1	103
178.59	2.3	117
178.60	2.6	130
178.61	2.9	144
178.62	3.1	157
178.63	3.4	171
178.64	3.7	185
178.65	4.0	199
178.66	4.3	213
178.67	4.5	227
178.68	4.8	241
178.69	5.1	256
178.70	5.4	270
178.71	5.7	285
178.72	6.0	299
178.73	6.3	314
178.74	6.6	329
178.75	6.9	344
178.76	7.2	359
178.77	7.5	374
178.78	7.8	389
178.79	8.1	405
178.80	8.4	420
178.81	8.7	436
178.82	9.0	451
178.83	9.3	467
178.84	9.7	483
178.85	10.0	499
178.86	10.3	515
178.87	10.6	531
178.88	10.9	547
178.89	11.3	564
178.90	11.6	580
178.91	11.9	597
178.92	12.3	613
178.93	12.6	630
178.94	12.9	647
178.95	13.3	664
178.96	13.6	681
178.97	14.0	698
178.98	14.3	715
178.99	14.7	733
179.00	15.0	750
179.01	15.4	768
179.02	15.7	785
179.03	16.1	803
179.04	16.4	821
179.05	16.8	839
179.06	17.1	857
179.07	17.5	875
179.08	17.9	893
179.09	18.2	912
179.10	18.6	930
179.11	19.0	949
179.12	19.3	967
179.13	19.7	986
179.14	20.1	1,005
179.15	20.5	1,024
179.16	20.9	1,043
179.17	21.2	1,062
179.18	21.6	1,081
179.19	22.0	1,101
179.20	22.4	1,120
179.21	22.8	1,140
179.22	23.2	1,159
179.23	23.6	1,179
179.24	24.0	1,199
179.25	24.4	1,219
179.26	24.8	1,239
179.27	25.2	1,259
179.28	25.6	1,279
179.29	26.0	1,300
179.30	26.4	1,320
179.31	26.8	1,341
179.32	27.2	1,361
179.33	27.6	1,382
179.34	28.1	1,403
179.35	28.5	1,424
179.36	28.9	1,445
179.37	29.3	1,466
179.38	29.7	1,487
179.39	30.2	1,509
179.40	30.6	1,530
179.41	31.0	1,552
179.42	31.5	1,573
179.43	31.9	1,595
179.44	32.3	1,617
179.45	32.8	1,639
179.46	33.2	1,661
179.47	33.7	1,683
179.48	34.1	1,705
179.49	34.6	1,728
179.50	**35.0**	**1,750**

Summary for Reach POST-3R:

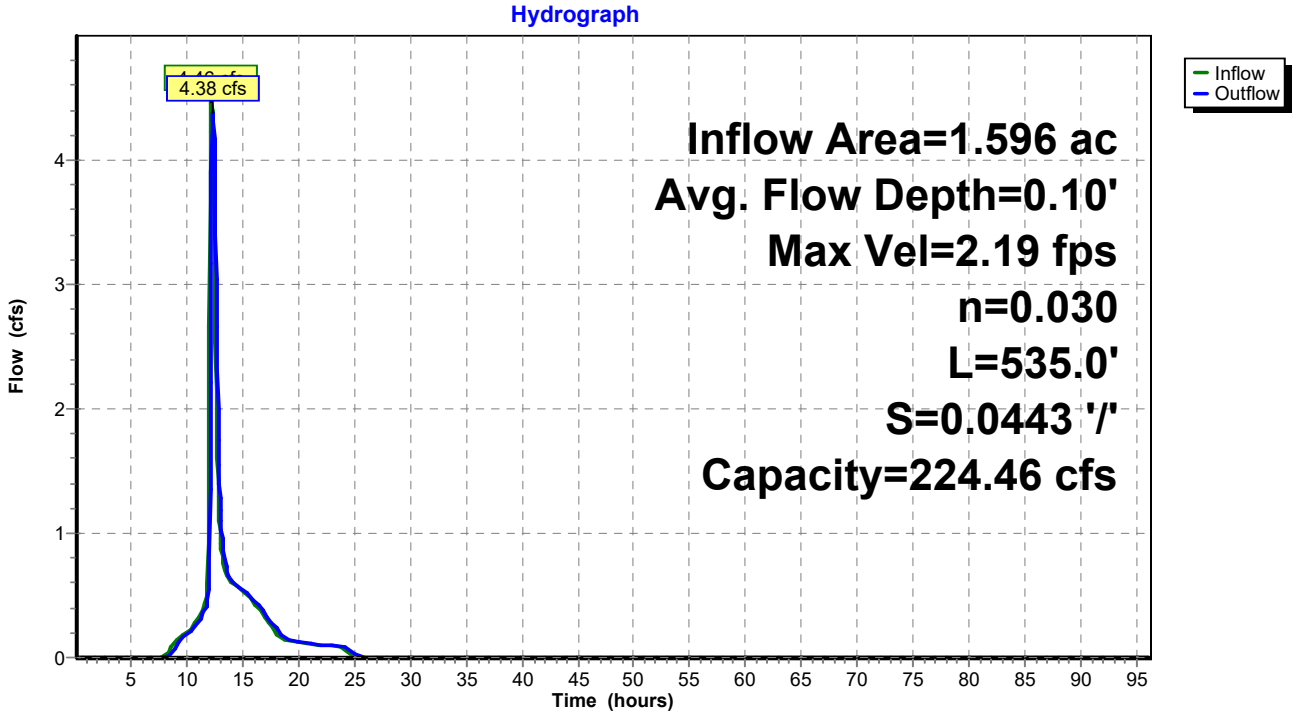
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.31" for 25-year event
Inflow = 4.46 cfs @ 12.28 hrs, Volume= 0.574 af
Outflow = 4.38 cfs @ 12.41 hrs, Volume= 0.574 af, Atten= 2%, Lag= 7.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 13.4 min

Peak Storage= 1,071 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 20.79'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 224.46 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 535.0' Slope= 0.0443 '/'
Inlet Invert= 170.80', Outlet Invert= 147.10'

Reach POST-3R:



Stage-Area-Storage for Reach POST-3R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
170.80	0.0	0
170.81	0.2	107
170.82	0.4	215
170.83	0.6	323
170.84	0.8	431
170.85	1.0	540
170.86	1.2	650
170.87	1.4	759
170.88	1.6	870
170.89	1.8	980
170.90	2.0	1,091
170.91	2.2	1,203
170.92	2.5	1,315
170.93	2.7	1,427
170.94	2.9	1,540
170.95	3.1	1,653
170.96	3.3	1,767
170.97	3.5	1,881
170.98	3.7	1,995
170.99	3.9	2,110
171.00	4.2	2,226
171.01	4.4	2,341
171.02	4.6	2,458
171.03	4.8	2,574
171.04	5.0	2,691
171.05	5.3	2,809
171.06	5.5	2,927
171.07	5.7	3,045
171.08	5.9	3,164
171.09	6.1	3,283
171.10	6.4	3,403
171.11	6.6	3,523
171.12	6.8	3,643
171.13	7.0	3,764
171.14	7.3	3,885
171.15	7.5	4,007
171.16	7.7	4,129
171.17	7.9	4,252
171.18	8.2	4,375
171.19	8.4	4,498
171.20	8.6	4,622
171.21	8.9	4,747
171.22	9.1	4,871
171.23	9.3	4,997
171.24	9.6	5,122
171.25	9.8	5,248
171.26	10.0	5,375
171.27	10.3	5,502
171.28	10.5	5,629
171.29	10.8	5,757
171.30	11.0	5,885
171.31	11.2	6,014
171.32	11.5	6,143
171.33	11.7	6,272
171.34	12.0	6,402
171.35	12.2	6,532
171.36	12.5	6,663
171.37	12.7	6,794
171.38	12.9	6,926
171.39	13.2	7,058
171.40	13.4	7,190
171.41	13.7	7,323
171.42	13.9	7,457
171.43	14.2	7,590
171.44	14.4	7,725
171.45	14.7	7,859
171.46	14.9	7,994
171.47	15.2	8,130
171.48	15.4	8,266
171.49	15.7	8,402
171.50	16.0	8,539
171.51	16.2	8,676
171.52	16.5	8,813
171.53	16.7	8,951
171.54	17.0	9,090
171.55	17.3	9,229
171.56	17.5	9,368
171.57	17.8	9,508
171.58	18.0	9,648
171.59	18.3	9,789
171.60	18.6	9,930
171.61	18.8	10,071
171.62	19.1	10,213
171.63	19.4	10,355
171.64	19.6	10,498
171.65	19.9	10,641
171.66	20.2	10,785
171.67	20.4	10,929
171.68	20.7	11,073
171.69	21.0	11,218
171.70	21.2	11,363
171.71	21.5	11,509
171.72	21.8	11,655
171.73	22.1	11,802
171.74	22.3	11,949
171.75	22.6	12,096
171.76	22.9	12,244
171.77	23.2	12,393
171.78	23.4	12,541
171.79	23.7	12,690
171.80	**24.0**	**12,840**

Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 25-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

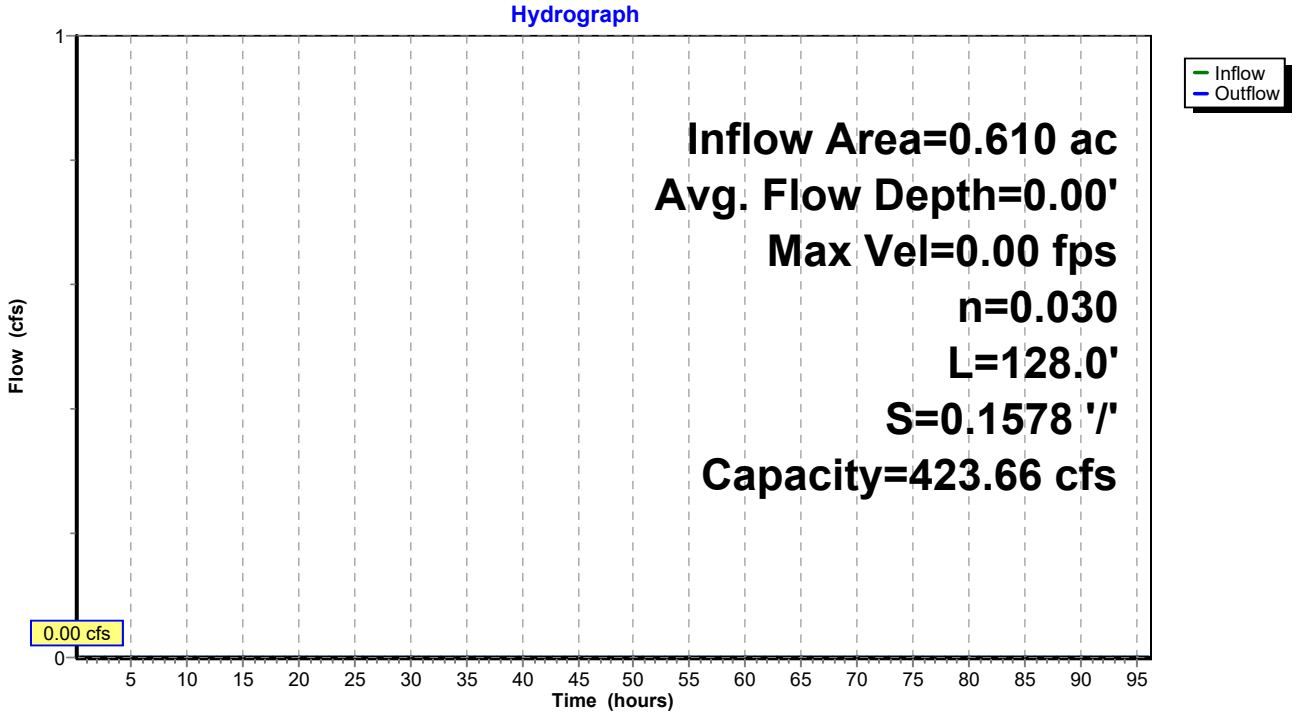
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Reach POST-5R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 25-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

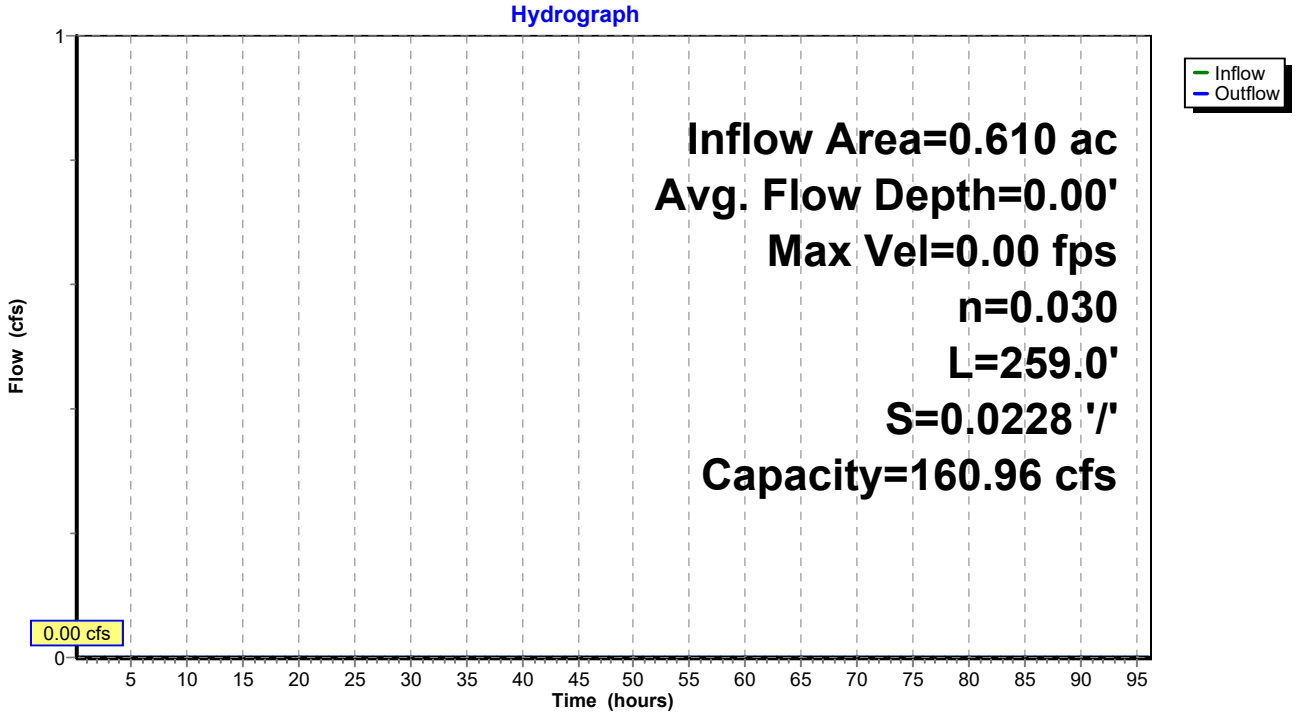
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 160.96 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 259.0' Slope= 0.0228 '/'
Inlet Invert= 153.00', Outlet Invert= 147.10'

‡

Reach POST-5R:



Stage-Area-Storage for Reach POST-5R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
153.00	0.0	0
153.01	0.2	52
153.02	0.4	104
153.03	0.6	156
153.04	0.8	209
153.05	1.0	262
153.06	1.2	315
153.07	1.4	368
153.08	1.6	421
153.09	1.8	475
153.10	2.0	528
153.11	2.2	582
153.12	2.5	637
153.13	2.7	691
153.14	2.9	746
153.15	3.1	800
153.16	3.3	855
153.17	3.5	911
153.18	3.7	966
153.19	3.9	1,022
153.20	4.2	1,077
153.21	4.4	1,133
153.22	4.6	1,190
153.23	4.8	1,246
153.24	5.0	1,303
153.25	5.3	1,360
153.26	5.5	1,417
153.27	5.7	1,474
153.28	5.9	1,532
153.29	6.1	1,589
153.30	6.4	1,647
153.31	6.6	1,705
153.32	6.8	1,764
153.33	7.0	1,822
153.34	7.3	1,881
153.35	7.5	1,940
153.36	7.7	1,999
153.37	7.9	2,058
153.38	8.2	2,118
153.39	8.4	2,178
153.40	8.6	2,238
153.41	8.9	2,298
153.42	9.1	2,358
153.43	9.3	2,419
153.44	9.6	2,480
153.45	9.8	2,541
153.46	10.0	2,602
153.47	10.3	2,663
153.48	10.5	2,725
153.49	10.8	2,787
153.50	11.0	2,849
153.51	11.2	2,911
153.52	11.5	2,974
153.53	11.7	3,036
153.54	12.0	3,099
153.55	12.2	3,162
153.56	12.5	3,226
153.57	12.7	3,289
153.58	12.9	3,353
153.59	13.2	3,417
153.60	13.4	3,481
153.61	13.7	3,545
153.62	13.9	3,610
153.63	14.2	3,675
153.64	14.4	3,740
153.65	14.7	3,805
153.66	14.9	3,870
153.67	15.2	3,936
153.68	15.4	4,001
153.69	15.7	4,067
153.70	16.0	4,134
153.71	16.2	4,200
153.72	16.5	4,267
153.73	16.7	4,333
153.74	17.0	4,401
153.75	17.3	4,468
153.76	17.5	4,535
153.77	17.8	4,603
153.78	18.0	4,671
153.79	18.3	4,739
153.80	18.6	4,807
153.81	18.8	4,876
153.82	19.1	4,944
153.83	19.4	5,013
153.84	19.6	5,082
153.85	19.9	5,152
153.86	20.2	5,221
153.87	20.4	5,291
153.88	20.7	5,361
153.89	21.0	5,431
153.90	21.2	5,501
153.91	21.5	5,572
153.92	21.8	5,642
153.93	22.1	5,713
153.94	22.3	5,785
153.95	22.6	5,856
153.96	22.9	5,928
153.97	23.2	5,999
153.98	23.4	6,071
153.99	23.7	6,144
154.00	**24.0**	**6,216**

Summary for Pond POST-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 4.36" for 25-year event
Inflow = 7.82 cfs @ 12.09 hrs, Volume= 0.580 af
Outflow = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af, Atten= 42%, Lag= 7.5 min
Primary = 4.51 cfs @ 12.21 hrs, Volume= 0.574 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 191.17' @ 12.21 hrs Surf.Area= 2,476 sf Storage= 5,761 cf

Plug-Flow detention time= 43.6 min calculated for 0.573 af (99% of inflow)
Center-of-Mass det. time= 37.0 min (837.3 - 800.3)

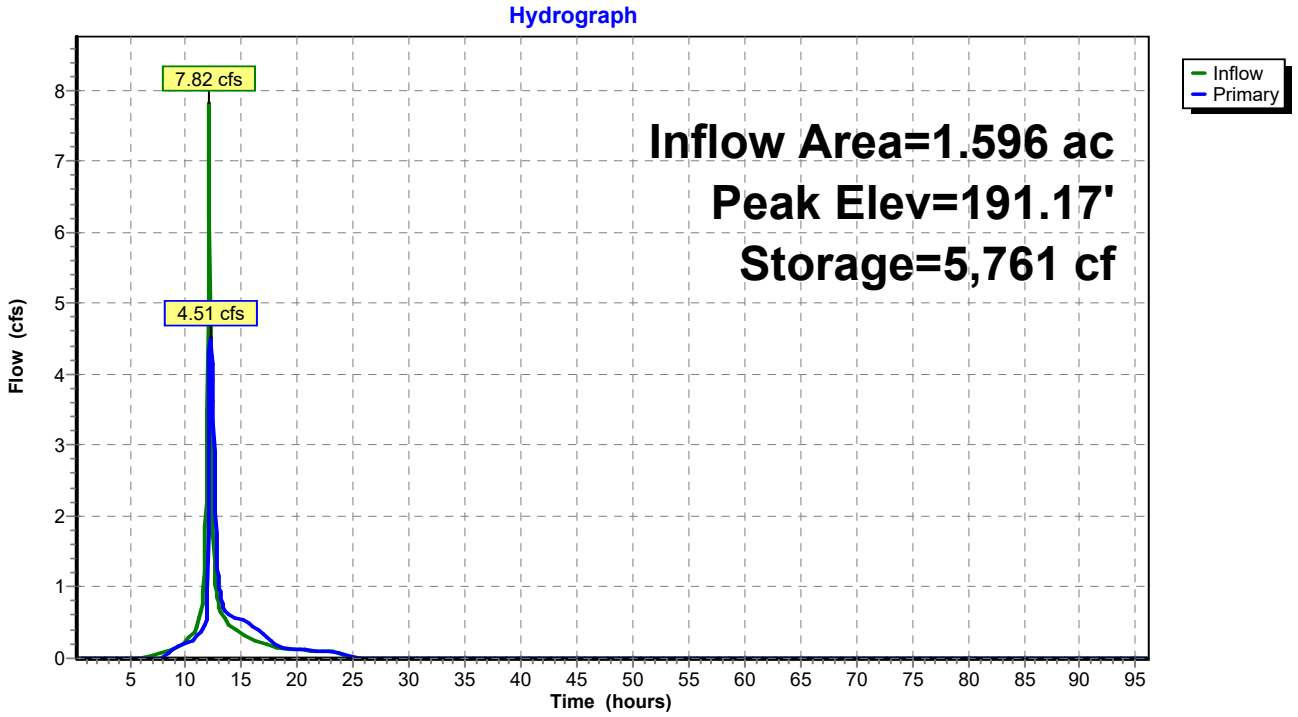
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.49 cfs @ 12.21 hrs HW=191.16' (Free Discharge)
└**1=Culvert** (Passes 4.49 cfs of 11.06 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.78 cfs @ 8.96 fps)
  ├**3=Orifice/Grate** (Orifice Controls 3.71 cfs @ 4.72 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-1P:


Hydrograph
7.82 cfs
4.51 cfs
Inflow Area=1.596 ac
Peak Elev=191.17'
Storage=5,761 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Stage-Area-Storage for Pond POST-1P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0
187.01	204	2
187.02	209	4
187.03	213	6
187.04	218	8
187.05	222	11
187.06	227	13
187.07	231	15
187.08	236	17
187.09	240	20
187.10	245	22
187.11	250	25
187.12	255	27
187.13	260	30
187.14	265	32
187.15	270	35
187.16	275	38
187.17	280	41
187.18	285	43
187.19	290	46
187.20	295	49
187.21	300	52
187.22	306	55
187.23	311	58
187.24	316	61
187.25	322	65
187.26	327	68
187.27	333	71
187.28	338	74
187.29	344	78
187.30	349	81
187.31	355	85
187.32	361	88
187.33	367	92
187.34	372	96
187.35	378	100
187.36	384	103
187.37	390	107
187.38	396	111
187.39	402	115
187.40	408	119
187.41	415	123
187.42	421	128
187.43	427	132
187.44	433	136
187.45	440	140
187.46	446	145
187.47	452	149
187.48	459	154
187.49	465	159
187.50	472	163
187.51	479	168
187.52	485	173
187.53	492	178
187.54	499	183
187.55	506	188
187.56	512	193
187.57	519	198
187.58	526	203
187.59	533	208
187.60	540	214
187.61	547	219
187.62	554	225
187.63	562	230
187.64	569	236
187.65	576	242
187.66	583	247
187.67	591	253
187.68	598	259
187.69	606	265
187.70	613	271
187.71	621	278
187.72	628	284
187.73	636	290
187.74	643	297
187.75	651	303
187.76	659	310
187.77	667	316
187.78	675	323
187.79	682	330
187.80	690	337
187.81	698	343
187.82	706	350
187.83	715	358
187.84	723	365
187.85	731	372
187.86	739	379
187.87	747	387
187.88	756	394
187.89	764	402
187.90	772	410
187.91	781	417
187.92	789	425
187.93	798	433
187.94	806	441
187.95	815	449
187.96	824	458
187.97	833	466
187.98	841	474
187.99	850	483
188.00	859	491
188.01	863	500
188.02	867	508
188.03	872	517

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.04	876	526
188.05	880	535
188.06	885	543
188.07	889	552
188.08	893	561
188.09	898	570
188.10	902	579
188.11	906	588
188.12	911	597
188.13	915	606
188.14	919	616
188.15	924	625
188.16	928	634
188.17	933	643
188.18	937	653
188.19	941	662
188.20	946	672
188.21	950	681
188.22	955	691
188.23	959	700
188.24	964	710
188.25	968	719
188.26	973	729
188.27	977	739
188.28	982	749
188.29	986	759
188.30	991	768
188.31	995	778
188.32	1,000	788
188.33	1,005	798
188.34	1,009	808
188.35	1,014	819
188.36	1,018	829
188.37	1,023	839
188.38	1,028	849
188.39	1,032	859
188.40	1,037	870
188.41	1,042	880
188.42	1,046	891
188.43	1,051	901
188.44	1,056	912
188.45	1,060	922
188.46	1,065	933
188.47	1,070	944
188.48	1,075	954
188.49	1,079	965
188.50	1,084	976
188.51	1,089	987
188.52	1,094	998
188.53	1,098	1,009
188.54	1,103	1,020
188.55	1,108	1,031
188.56	1,113	1,042
188.57	1,118	1,053
188.58	1,122	1,064
188.59	1,127	1,075
188.60	1,132	1,087
188.61	1,137	1,098
188.62	1,142	1,109
188.63	1,147	1,121
188.64	1,152	1,132
188.65	1,157	1,144
188.66	1,162	1,155
188.67	1,166	1,167
188.68	1,171	1,179
188.69	1,176	1,191
188.70	1,181	1,202
188.71	1,186	1,214
188.72	1,191	1,226
188.73	1,196	1,238
188.74	1,201	1,250
188.75	1,206	1,262
188.76	1,211	1,274
188.77	1,216	1,286
188.78	1,221	1,298
188.79	1,227	1,311
188.80	1,232	1,323
188.81	1,237	1,335
188.82	1,242	1,348
188.83	1,247	1,360
188.84	1,252	1,373
188.85	1,257	1,385
188.86	1,262	1,398
188.87	1,267	1,410
188.88	1,273	1,423
188.89	1,278	1,436
188.90	1,283	1,449
188.91	1,288	1,462
188.92	1,293	1,474
188.93	1,298	1,487
188.94	1,304	1,500
188.95	1,309	1,513
188.96	1,314	1,527
188.97	1,319	1,540
188.98	1,325	1,553
188.99	1,330	1,566
189.00	1,335	1,580
189.01	1,340	1,593
189.02	1,346	1,606
189.03	1,351	1,620
189.04	1,356	1,633
189.05	1,362	1,647
189.06	1,367	1,661
189.07	1,372	1,674

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
189.08	1,378	1,688	189.60	1,671	2,480
189.09	1,383	1,702	189.61	1,677	2,496
189.10	1,389	1,716	189.62	1,683	2,513
189.11	1,394	1,730	189.63	1,689	2,530
189.12	1,399	1,744	189.64	1,695	2,547
189.13	1,405	1,758	189.65	1,701	2,564
189.14	1,410	1,772	189.66	1,707	2,581
189.15	1,416	1,786	189.67	1,713	2,598
189.16	1,421	1,800	189.68	1,719	2,615
189.17	1,427	1,814	189.69	1,725	2,632
189.18	1,432	1,829	189.70	1,731	2,650
189.19	1,438	1,843	189.71	1,737	2,667
189.20	1,443	1,857	189.72	1,743	2,684
189.21	1,448	1,872	189.73	1,749	2,702
189.22	1,454	1,886	189.74	1,755	2,719
189.23	1,460	1,901	189.75	1,761	2,737
189.24	1,465	1,915	189.76	1,767	2,755
189.25	1,471	1,930	189.77	1,773	2,772
189.26	1,476	1,945	189.78	1,779	2,790
189.27	1,482	1,960	189.79	1,785	2,808
189.28	1,487	1,975	189.80	1,791	2,826
189.29	1,493	1,989	189.81	1,798	2,844
189.30	1,498	2,004	189.82	1,804	2,862
189.31	1,504	2,019	189.83	1,810	2,880
189.32	1,510	2,034	189.84	1,816	2,898
189.33	1,515	2,050	189.85	1,822	2,916
189.34	1,521	2,065	189.86	1,828	2,934
189.35	1,527	2,080	189.87	1,835	2,953
189.36	1,532	2,095	189.88	1,841	2,971
189.37	1,538	2,111	189.89	1,847	2,989
189.38	1,544	2,126	189.90	1,853	3,008
189.39	1,549	2,142	189.91	1,859	3,027
189.40	1,555	2,157	189.92	1,866	3,045
189.41	1,561	2,173	189.93	1,872	3,064
189.42	1,566	2,188	189.94	1,878	3,083
189.43	1,572	2,204	189.95	1,884	3,101
189.44	1,578	2,220	189.96	1,891	3,120
189.45	1,584	2,235	189.97	1,897	3,139
189.46	1,589	2,251	189.98	1,903	3,158
189.47	1,595	2,267	189.99	1,910	3,177
189.48	1,601	2,283	190.00	1,916	3,196
189.49	1,607	2,299	190.01	1,920	3,216
189.50	1,613	2,315	190.02	1,925	3,235
189.51	1,618	2,332	190.03	1,929	3,254
189.52	1,624	2,348	190.04	1,934	3,273
189.53	1,630	2,364	190.05	1,938	3,293
189.54	1,636	2,380	190.06	1,943	3,312
189.55	1,642	2,397	190.07	1,947	3,332
189.56	1,648	2,413	190.08	1,952	3,351
189.57	1,653	2,430	190.09	1,956	3,371
189.58	1,659	2,446	190.10	1,961	3,390
189.59	1,665	2,463	190.11	1,966	3,410

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
190.12	1,970	3,430	190.64	2,213	4,517
190.13	1,975	3,449	190.65	2,218	4,539
190.14	1,979	3,469	190.66	2,223	4,561
190.15	1,984	3,489	190.67	2,227	4,583
190.16	1,988	3,509	190.68	2,232	4,605
190.17	1,993	3,529	190.69	2,237	4,628
190.18	1,997	3,549	190.70	2,242	4,650
190.19	2,002	3,569	190.71	2,247	4,673
190.20	2,007	3,589	190.72	2,252	4,695
190.21	2,011	3,609	190.73	2,256	4,718
190.22	2,016	3,629	190.74	2,261	4,740
190.23	2,020	3,649	190.75	2,266	4,763
190.24	2,025	3,669	190.76	2,271	4,786
190.25	2,029	3,690	190.77	2,276	4,808
190.26	2,034	3,710	190.78	2,281	4,831
190.27	2,039	3,730	190.79	2,286	4,854
190.28	2,043	3,751	190.80	2,291	4,877
190.29	2,048	3,771	190.81	2,295	4,900
190.30	2,053	3,792	190.82	2,300	4,923
190.31	2,057	3,812	190.83	2,305	4,946
190.32	2,062	3,833	190.84	2,310	4,969
190.33	2,066	3,853	190.85	2,315	4,992
190.34	2,071	3,874	190.86	2,320	5,015
190.35	2,076	3,895	190.87	2,325	5,038
190.36	2,080	3,916	190.88	2,330	5,062
190.37	2,085	3,936	190.89	2,335	5,085
190.38	2,090	3,957	190.90	2,340	5,108
190.39	2,094	3,978	190.91	2,345	5,132
190.40	2,099	3,999	190.92	2,350	5,155
190.41	2,104	4,020	190.93	2,355	5,179
190.42	2,108	4,041	190.94	2,360	5,202
190.43	2,113	4,062	190.95	2,364	5,226
190.44	2,118	4,084	190.96	2,369	5,250
190.45	2,123	4,105	190.97	2,374	5,273
190.46	2,127	4,126	190.98	2,379	5,297
190.47	2,132	4,147	190.99	2,384	5,321
190.48	2,137	4,169	191.00	2,389	5,345
190.49	2,141	4,190	191.01	2,394	5,369
190.50	2,146	4,211	191.02	2,399	5,393
190.51	2,151	4,233	191.03	2,404	5,417
190.52	2,156	4,254	191.04	2,409	5,441
190.53	2,160	4,276	191.05	2,414	5,465
190.54	2,165	4,298	191.06	2,419	5,489
190.55	2,170	4,319	191.07	2,424	5,513
190.56	2,175	4,341	191.08	2,430	5,538
190.57	2,179	4,363	191.09	2,435	5,562
190.58	2,184	4,385	191.10	2,440	5,586
190.59	2,189	4,407	191.11	2,445	5,611
190.60	2,194	4,428	191.12	2,450	5,635
190.61	2,199	4,450	191.13	2,455	5,660
190.62	2,203	4,472	191.14	2,460	5,684
190.63	2,208	4,494	191.15	2,465	5,709

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
191.16	2,470	5,734
191.17	2,475	5,758
191.18	2,480	5,783
191.19	2,485	5,808
191.20	2,490	5,833
191.21	2,495	5,858
191.22	2,501	5,883
191.23	2,506	5,908
191.24	2,511	5,933
191.25	2,516	5,958
191.26	2,521	5,983
191.27	2,526	6,008
191.28	2,531	6,034
191.29	2,536	6,059
191.30	2,542	6,084
191.31	2,547	6,110
191.32	2,552	6,135
191.33	2,557	6,161
191.34	2,562	6,186
191.35	2,567	6,212
191.36	2,573	6,238
191.37	2,578	6,263
191.38	2,583	6,289
191.39	2,588	6,315
191.40	2,593	6,341
191.41	2,599	6,367
191.42	2,604	6,393
191.43	2,609	6,419
191.44	2,614	6,445
191.45	2,619	6,471
191.46	2,625	6,498
191.47	2,630	6,524
191.48	2,635	6,550
191.49	2,640	6,577
191.50	2,646	6,603
191.51	2,651	6,629
191.52	2,656	6,656
191.53	2,661	6,683
191.54	2,667	6,709
191.55	2,672	6,736
191.56	2,677	6,763
191.57	2,683	6,789
191.58	2,688	6,816
191.59	2,693	6,843
191.60	2,698	6,870
191.61	2,704	6,897
191.62	2,709	6,924
191.63	2,714	6,951
191.64	2,720	6,979
191.65	2,725	7,006
191.66	2,730	7,033
191.67	2,736	7,060
191.68	2,741	7,088
191.69	2,746	7,115
191.70	2,752	7,143
191.71	2,757	7,170
191.72	2,763	7,198
191.73	2,768	7,226
191.74	2,773	7,253
191.75	2,779	7,281
191.76	2,784	7,309
191.77	2,789	7,337
191.78	2,795	7,365
191.79	2,800	7,393
191.80	2,806	7,421
191.81	2,811	7,449
191.82	2,817	7,477
191.83	2,822	7,505
191.84	2,827	7,533
191.85	2,833	7,562
191.86	2,838	7,590
191.87	2,844	7,618
191.88	2,849	7,647
191.89	2,855	7,675
191.90	2,860	7,704
191.91	2,866	7,733
191.92	2,871	7,761
191.93	2,877	7,790
191.94	2,882	7,819
191.95	2,887	7,848
191.96	2,893	7,876
191.97	2,898	7,905
191.98	2,904	7,934
191.99	2,909	7,964
192.00	2,915	7,993
192.01	2,921	8,022
192.02	2,926	8,051
192.03	2,932	8,080
192.04	2,938	8,110
192.05	2,944	8,139
192.06	2,949	8,169
192.07	2,955	8,198
192.08	2,961	8,228
192.09	2,966	8,257
192.10	2,972	8,287
192.11	2,978	8,317
192.12	2,984	8,347
192.13	2,989	8,376
192.14	2,995	8,406
192.15	3,001	8,436
192.16	3,007	8,466
192.17	3,013	8,496
192.18	3,018	8,527
192.19	3,024	8,557

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
192.20	3,030	8,587
192.21	3,036	8,617
192.22	3,042	8,648
192.23	3,047	8,678
192.24	3,053	8,709
192.25	3,059	8,739
192.26	3,065	8,770
192.27	3,071	8,801
192.28	3,077	8,831
192.29	3,082	8,862
192.30	3,088	8,893
192.31	3,094	8,924
192.32	3,100	8,955
192.33	3,106	8,986
192.34	3,112	9,017
192.35	3,118	9,048
192.36	3,124	9,079
192.37	3,129	9,111
192.38	3,135	9,142
192.39	3,141	9,173
192.40	3,147	9,205
192.41	3,153	9,236
192.42	3,159	9,268
192.43	3,165	9,299
192.44	3,171	9,331
192.45	3,177	9,363
192.46	3,183	9,395
192.47	3,189	9,427
192.48	3,195	9,458
192.49	3,201	9,490
192.50	3,207	9,522
192.51	3,213	9,555
192.52	3,219	9,587
192.53	3,224	9,619
192.54	3,230	9,651
192.55	3,236	9,684
192.56	3,242	9,716
192.57	3,248	9,748
192.58	3,254	9,781
192.59	3,261	9,813
192.60	3,267	9,846
192.61	3,273	9,879
192.62	3,279	9,912
192.63	3,285	9,944
192.64	3,291	9,977
192.65	3,297	10,010
192.66	3,303	10,043
192.67	3,309	10,076
192.68	3,315	10,109
192.69	3,321	10,143
192.70	3,327	10,176
192.71	3,333	10,209
192.72	3,339	10,242
192.73	3,345	10,276
192.74	3,351	10,309
192.75	3,358	10,343
192.76	3,364	10,376
192.77	3,370	10,410
192.78	3,376	10,444
192.79	3,382	10,478
192.80	3,388	10,512
192.81	3,394	10,545
192.82	3,400	10,579
192.83	3,407	10,613
192.84	3,413	10,648
192.85	3,419	10,682
192.86	3,425	10,716
192.87	3,431	10,750
192.88	3,437	10,785
192.89	3,444	10,819
192.90	3,450	10,853
192.91	3,456	10,888
192.92	3,462	10,923
192.93	3,468	10,957
192.94	3,475	10,992
192.95	3,481	11,027
192.96	3,487	11,062
192.97	3,493	11,096
192.98	3,500	11,131
192.99	3,506	11,166
193.00	**3,512**	**11,201**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 3.53" for 25-year event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.108 af
Outflow = 1.48 cfs @ 12.10 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.7 min
Primary = 1.48 cfs @ 12.10 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.16' @ 12.10 hrs Surf.Area= 567 sf Storage= 378 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 49.3 min calculated for 0.101 af (94% of inflow)
Center-of-Mass det. time= 15.9 min (837.1 - 821.2)

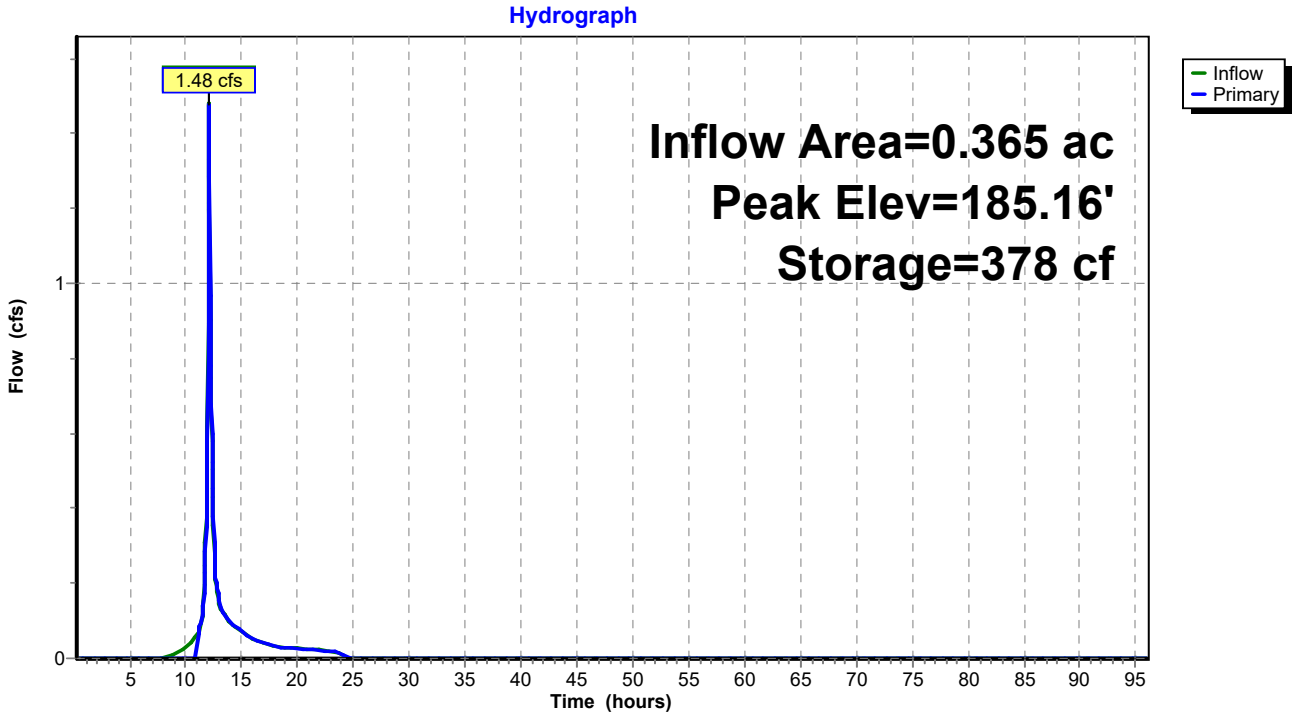
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.46 cfs @ 12.10 hrs HW=185.16' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.46 cfs @ 0.94 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 3.15" for 25-year event
Inflow = 1.59 cfs @ 12.10 hrs, Volume= 0.110 af
Outflow = 1.52 cfs @ 12.13 hrs, Volume= 0.105 af, Atten= 4%, Lag= 1.4 min
Primary = 1.52 cfs @ 12.13 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.38' @ 12.13 hrs Surf.Area= 445 sf Storage= 338 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 31.1 min calculated for 0.105 af (96% of inflow)
Center-of-Mass det. time= 9.3 min (848.2 - 838.9)

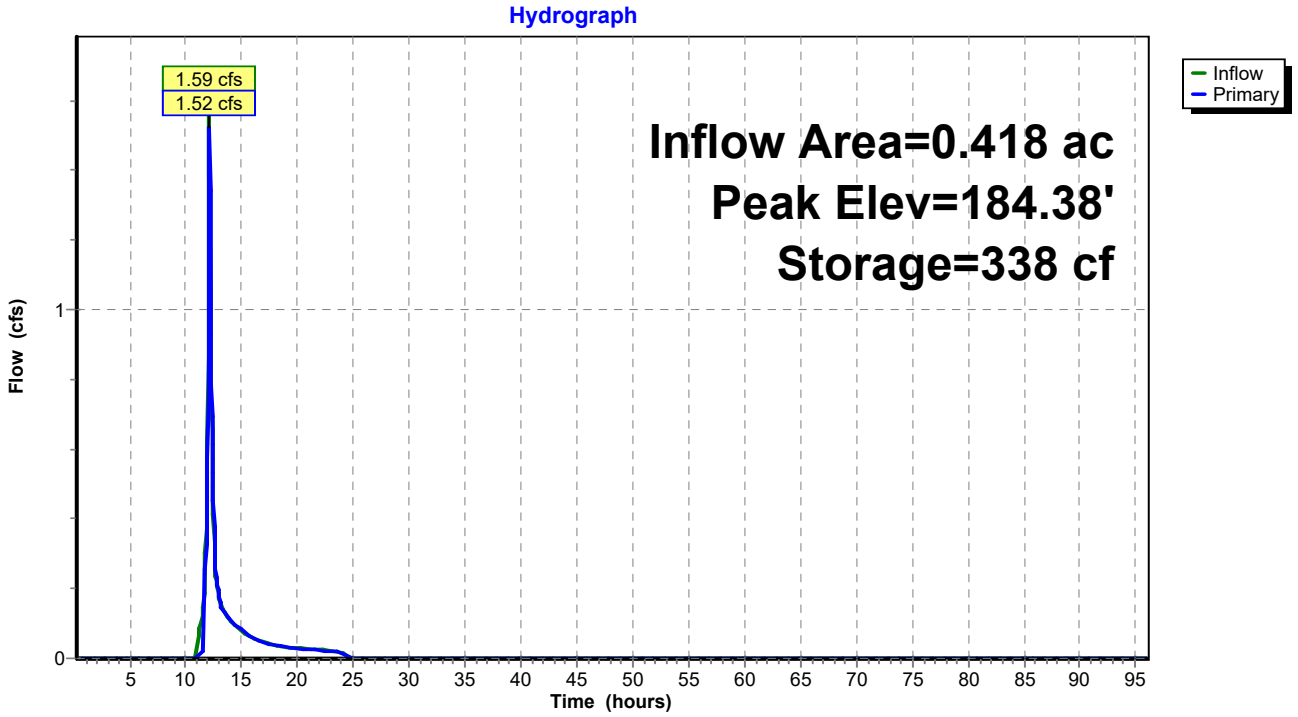
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.48 cfs @ 12.13 hrs HW=184.38' (Free Discharge)
└**1=Culvert** (Passes 1.48 cfs of 7.45 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.48 cfs @ 1.97 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 2.22" for 25-year event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 0.113 af
Outflow = 0.08 cfs @ 15.32 hrs, Volume= 0.113 af, Atten= 95%, Lag= 191.5 min
Discarded = 0.08 cfs @ 15.32 hrs, Volume= 0.113 af
Primary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 176.01' @ 15.32 hrs Surf.Area= 1,498 sf Storage= 2,712 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 420.9 min calculated for 0.113 af (100% of inflow)
Center-of-Mass det. time= 421.0 min (1,276.4 - 855.4)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

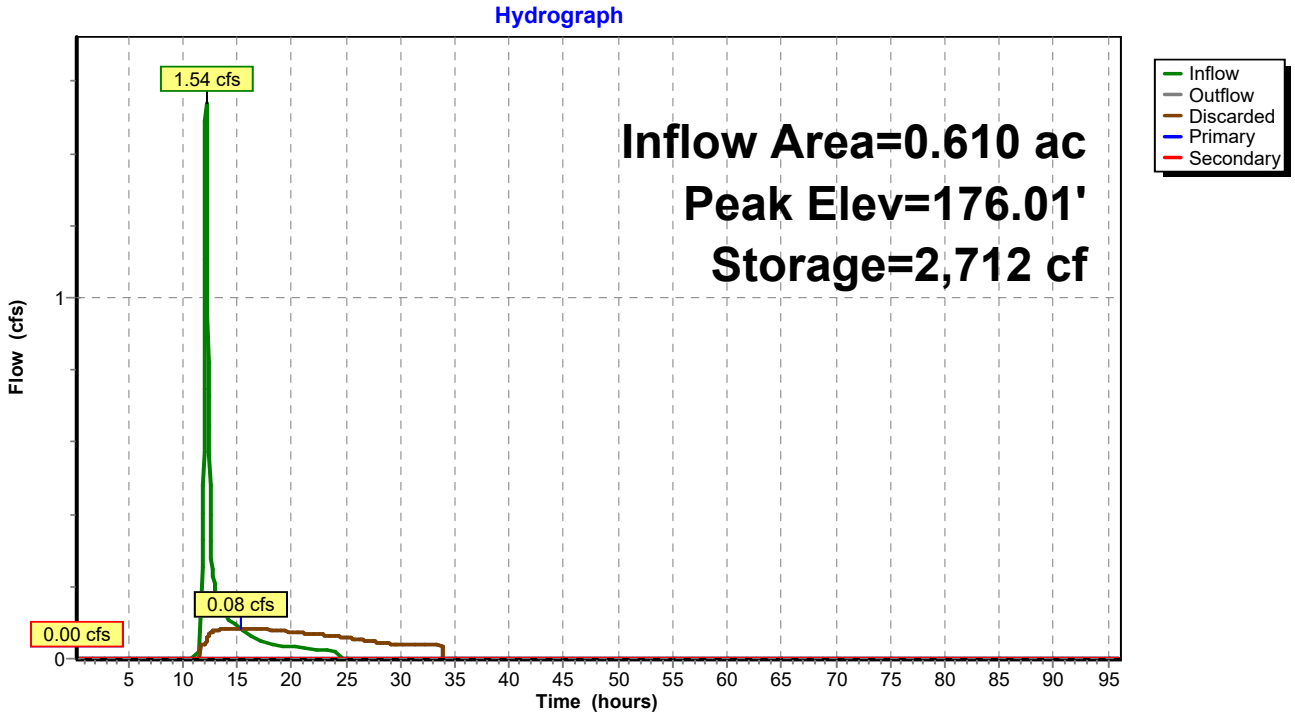
Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	175.00'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 175.00' / 174.50' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	177.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	177.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	178.00'	**16.0' 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=0.08 cfs @ 15.32 hrs HW=176.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289
173.04	694	291
173.05	694	294
173.06	694	297
173.07	694	300
173.08	694	303
173.09	694	305
173.10	694	308
173.11	694	311
173.12	694	314
173.13	694	316
173.14	694	319
173.15	694	322
173.16	694	325
173.17	694	328
173.18	694	330
173.19	694	333
173.20	694	336
173.21	694	339
173.22	694	341
173.23	694	344
173.24	694	347
173.25	694	350
173.26	694	353
173.27	694	355
173.28	694	358
173.29	694	361
173.30	694	364
173.31	694	366
173.32	694	369
173.33	694	372
173.34	694	375
173.35	694	378
173.36	694	380
173.37	694	383
173.38	694	386
173.39	694	389
173.40	694	391
173.41	694	394
173.42	694	397
173.43	694	400
173.44	694	403
173.45	694	405
173.46	694	408
173.47	694	411
173.48	694	414
173.49	694	416
173.50	694	419
173.51	694	422
173.52	694	425
173.53	694	428
173.54	694	430
173.55	694	433
173.56	694	436
173.57	694	439
173.58	694	441
173.59	694	444
173.60	694	447
173.61	694	450
173.62	694	452
173.63	694	455
173.64	694	458
173.65	694	461
173.66	694	464
173.67	694	466
173.68	694	469
173.69	694	472
173.70	694	475
173.71	694	477
173.72	694	480
173.73	694	483
173.74	694	486
173.75	694	489
173.76	694	491
173.77	694	494
173.78	694	497
173.79	694	500
173.80	694	502
173.81	694	505
173.82	694	508
173.83	694	511
173.84	694	514
173.85	694	516
173.86	694	519
173.87	694	522
173.88	694	525
173.89	694	527
173.90	694	530
173.91	694	533
173.92	694	536
173.93	694	539
173.94	694	541
173.95	694	544
173.96	694	547
173.97	694	550
173.98	694	552
173.99	694	555
174.00	694	562
174.01	697	569
174.02	701	576
174.03	704	583
174.04	707	590
174.05	710	597
174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811
177.20	2,075	4,832
177.21	2,081	4,853
177.22	2,086	4,873
177.23	2,091	4,894
177.24	2,096	4,915
177.25	2,102	4,936
177.26	2,107	4,957
177.27	2,112	4,978
177.28	2,118	4,999
177.29	2,123	5,021
177.30	2,128	5,042
177.31	2,133	5,063
177.32	2,139	5,085
177.33	2,144	5,106
177.34	2,149	5,127
177.35	2,155	5,149
177.36	2,160	5,171
177.37	2,165	5,192
177.38	2,171	5,214
177.39	2,176	5,236
177.40	2,182	5,257
177.41	2,187	5,279
177.42	2,192	5,301
177.43	2,198	5,323
177.44	2,203	5,345
177.45	2,209	5,367
177.46	2,214	5,389
177.47	2,219	5,411
177.48	2,225	5,434
177.49	2,230	5,456
177.50	2,236	5,478
177.51	2,241	5,501
177.52	2,247	5,523
177.53	2,252	5,546
177.54	2,257	5,568
177.55	2,263	5,591
177.56	2,268	5,613
177.57	2,274	5,636
177.58	2,279	5,659
177.59	2,285	5,682
177.60	2,290	5,705
177.61	2,296	5,728
177.62	2,301	5,750
177.63	2,307	5,774
177.64	2,312	5,797
177.65	2,318	5,820
177.66	2,324	5,843
177.67	2,329	5,866
177.68	2,335	5,890
177.69	2,340	5,913
177.70	2,346	5,936
177.71	2,351	5,960
177.72	2,357	5,983
177.73	2,363	6,007
177.74	2,368	6,031
177.75	2,374	6,054
177.76	2,379	6,078
177.77	2,385	6,102
177.78	2,391	6,126
177.79	2,396	6,150
177.80	2,402	6,174
177.81	2,408	6,198
177.82	2,413	6,222
177.83	2,419	6,246
177.84	2,424	6,270
177.85	2,430	6,295
177.86	2,436	6,319
177.87	2,442	6,343
177.88	2,447	6,368
177.89	2,453	6,392
177.90	2,459	6,417
177.91	2,464	6,441
177.92	2,470	6,466
177.93	2,476	6,491
177.94	2,481	6,516
177.95	2,487	6,540
177.96	2,493	6,565
177.97	2,499	6,590
177.98	2,504	6,615
177.99	2,510	6,640
178.00	2,516	6,666
178.01	2,522	6,691
178.02	2,527	6,716
178.03	2,533	6,741
178.04	2,539	6,767
178.05	2,544	6,792
178.06	2,550	6,817
178.07	2,556	6,843
178.08	2,562	6,869
178.09	2,567	6,894
178.10	2,573	6,920
178.11	2,579	6,946
178.12	2,585	6,972
178.13	2,590	6,997
178.14	2,596	7,023
178.15	2,602	7,049
178.16	2,608	7,075
178.17	2,613	7,101
178.18	2,619	7,128
178.19	2,625	7,154
178.20	2,631	7,180
178.21	2,637	7,206
178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

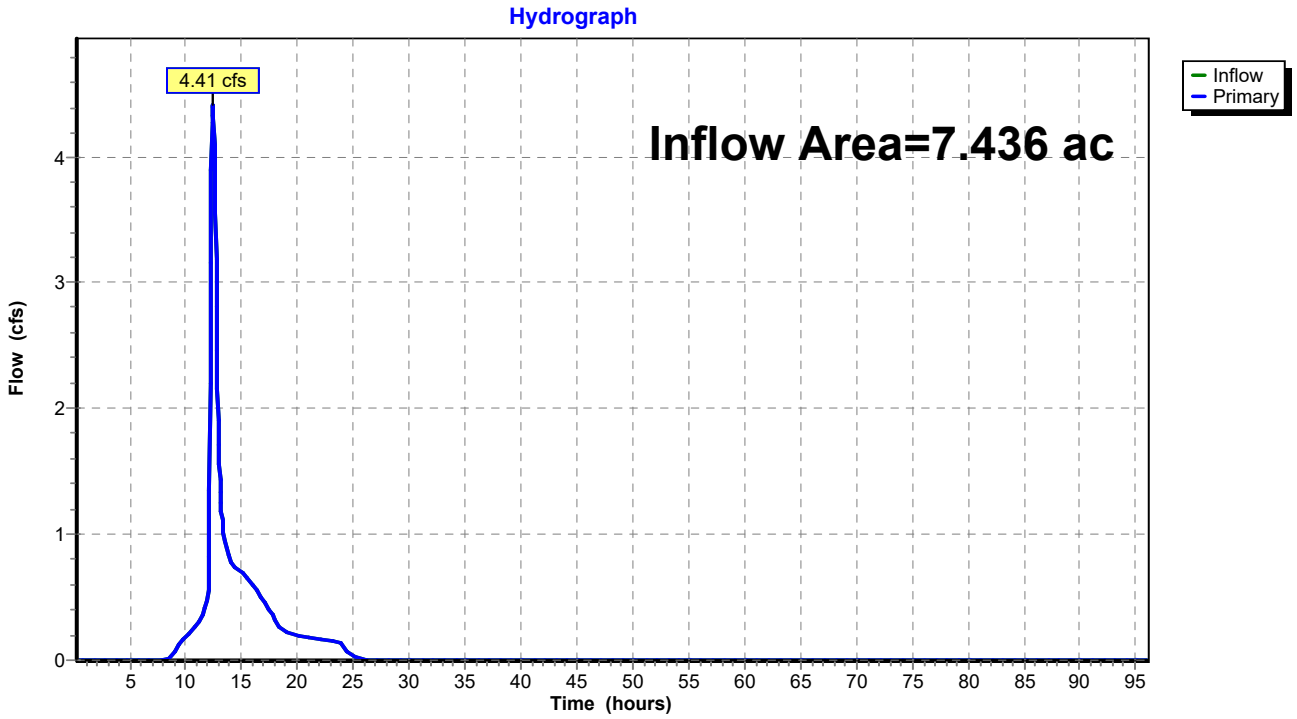
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 7.436 ac, 19.32% Impervious, Inflow Depth = 1.08" for 25-year event
Inflow = 4.41 cfs @ 12.42 hrs, Volume= 0.669 af
Primary = 4.41 cfs @ 12.42 hrs, Volume= 0.669 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link POST-DP-1: Analysis Point



Summary for Subcatchment POST-1S:

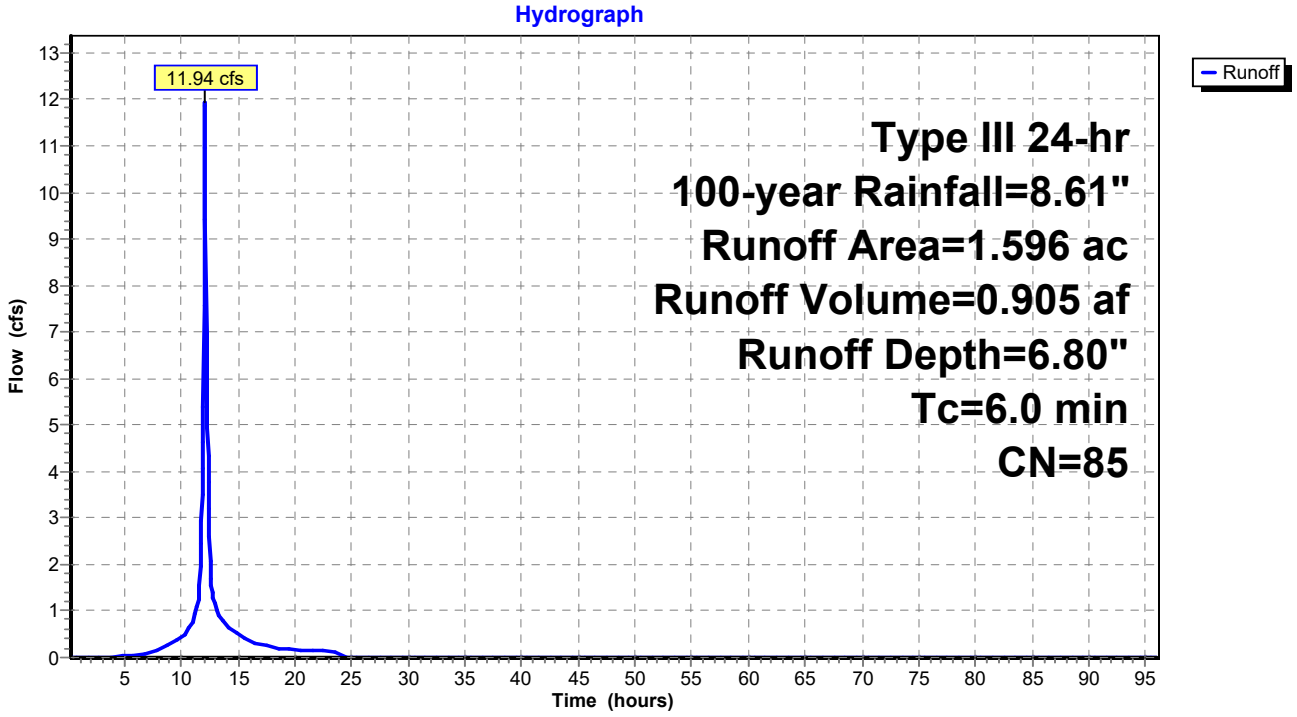
Runoff = 11.94 cfs @ 12.09 hrs, Volume= 0.905 af, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (ac)	CN	Description
*	1.260	98	Pavement, Roofs, Concrete Pads
*	0.000	96	Compacted Gravel
*	0.000	76	Crushed Stone Yard
	0.180	39	>75% Grass cover, Good, HSG A
	0.016	30	Meadow, non-grazed, HSG A
	0.140	30	Woods, Good, HSG A
	1.596	85	Weighted Average
	0.336		21.05% Pervious Area
	1.260		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-1S:



Summary for Subcatchment POST-2S-A:

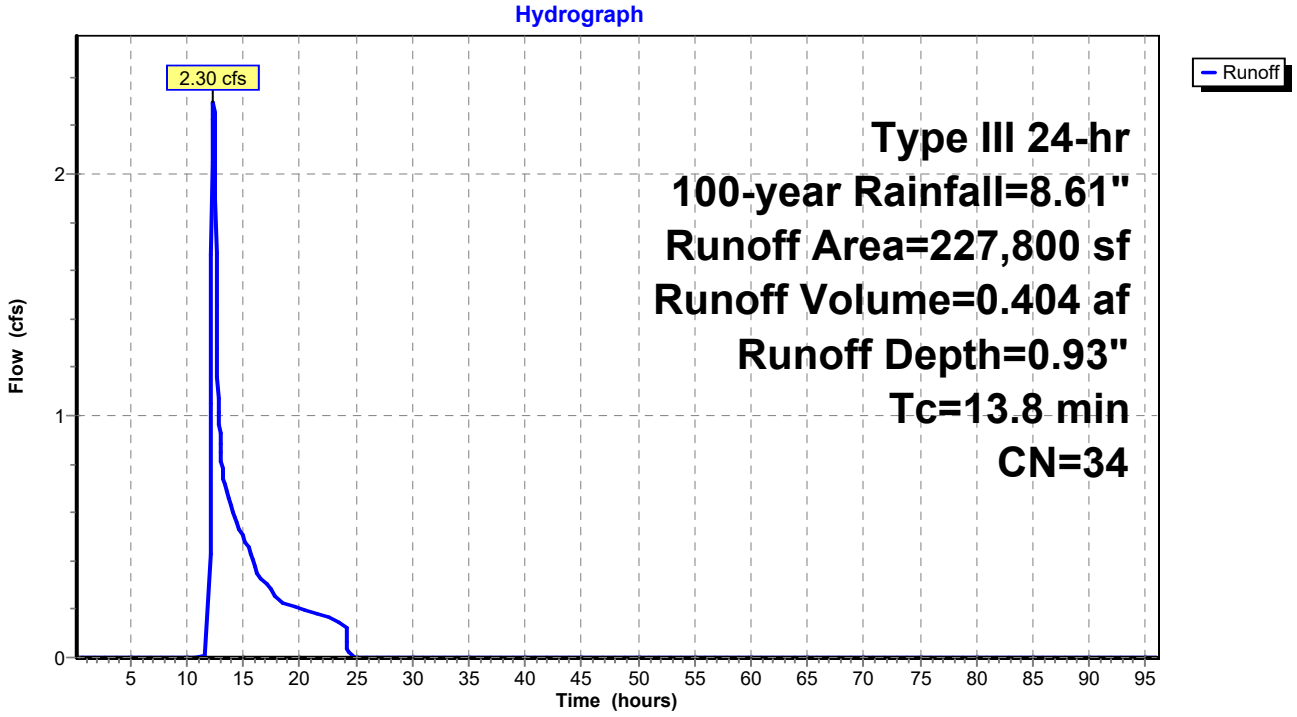
Runoff = 2.30 cfs @ 12.38 hrs, Volume= 0.404 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	5,732	98	Pavement, Roofs, Concrete Pads
*	1,067	96	Compacted Gravel
*	9,568	55	Crushed Stone Yard
	26,647	39	>75% Grass cover, Good, HSG A
	19,869	30	Meadow, non-grazed, HSG A
	164,917	30	Woods, Good, HSG A
	227,800	34	Weighted Average
	222,068		97.48% Pervious Area
	5,732		2.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry, See Tc calc sheet**

Subcatchment POST-2S-A:



Summary for Subcatchment POST-2S-B:

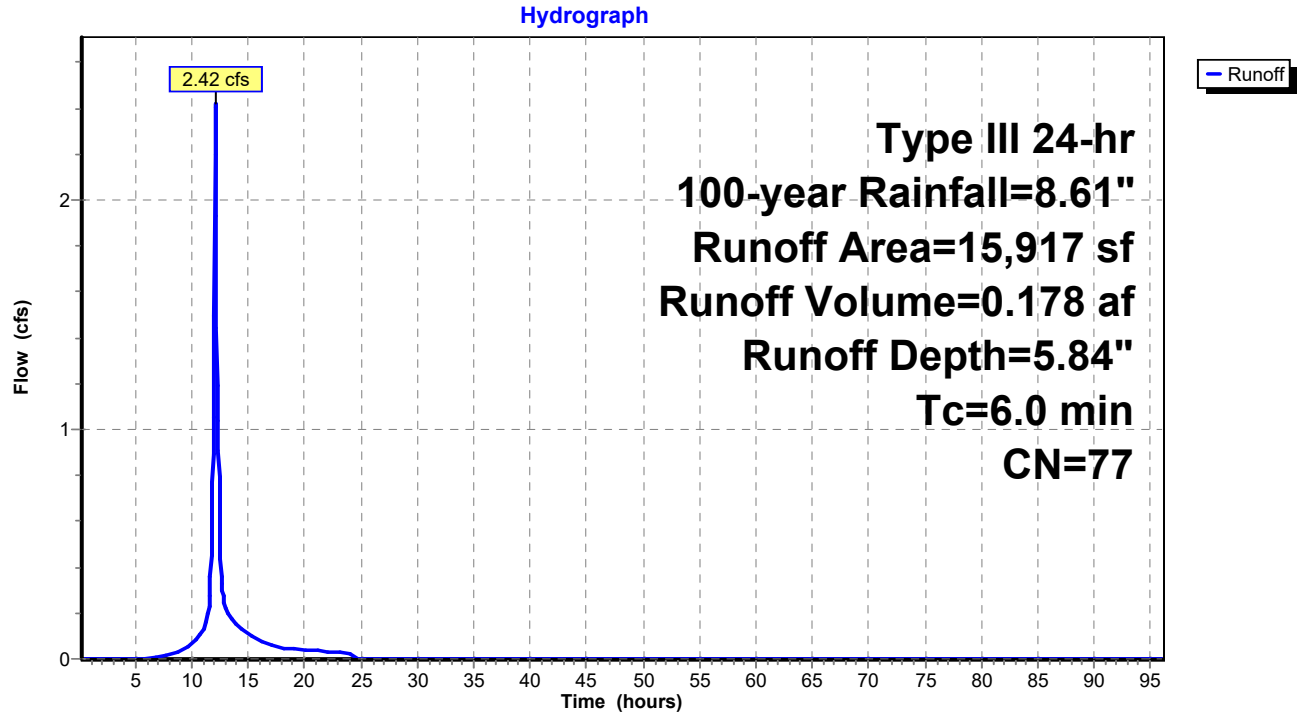
Runoff = 2.42 cfs @ 12.09 hrs, Volume= 0.178 af, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

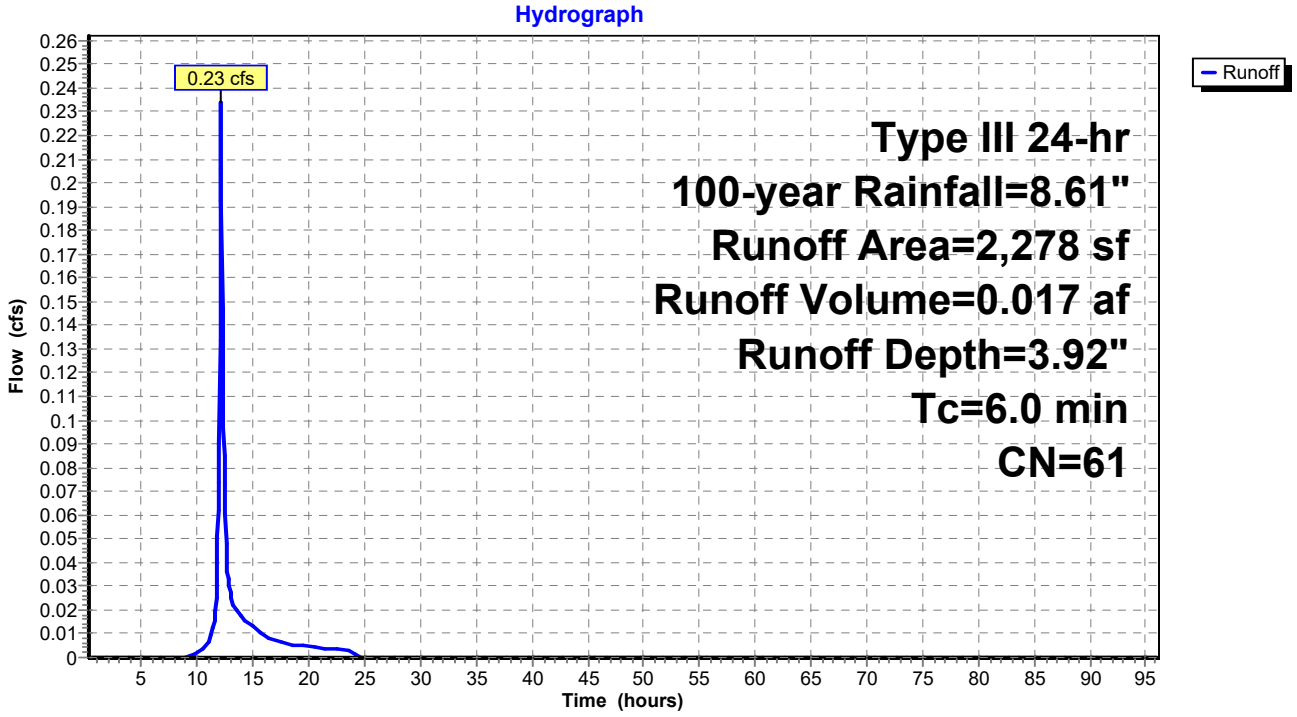
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

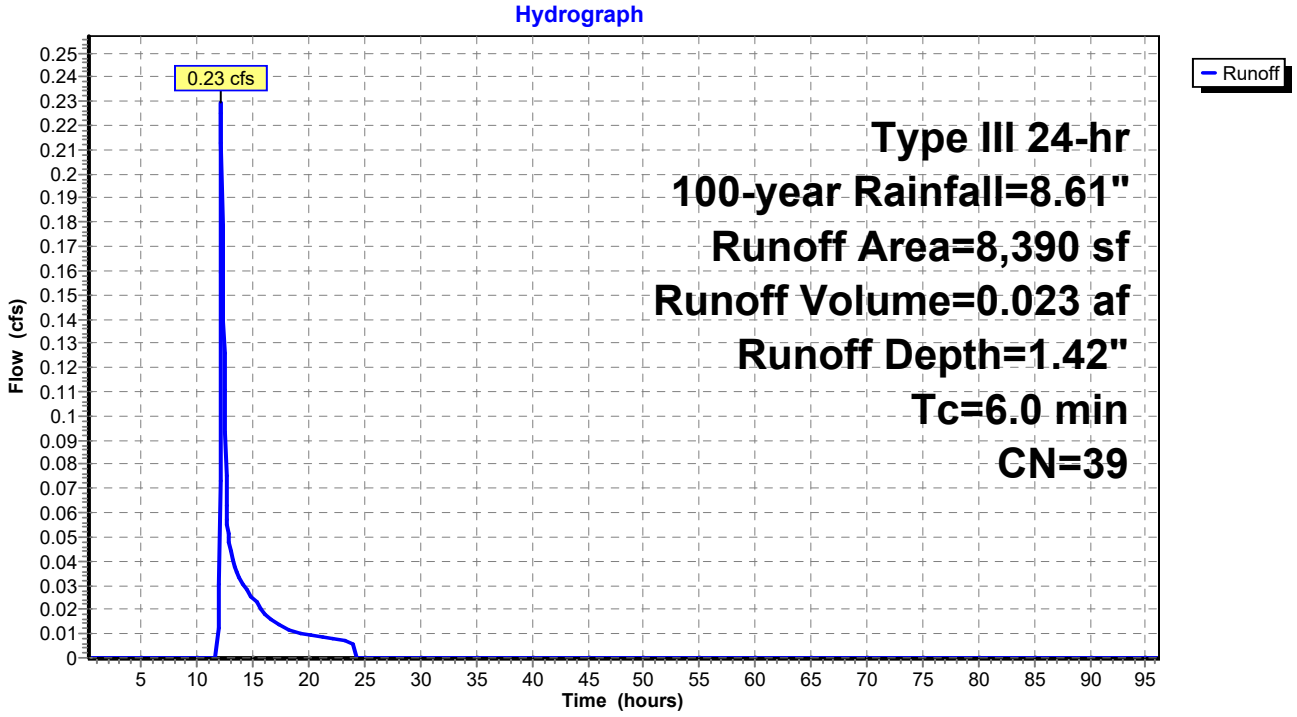
Runoff = 0.23 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-1R:

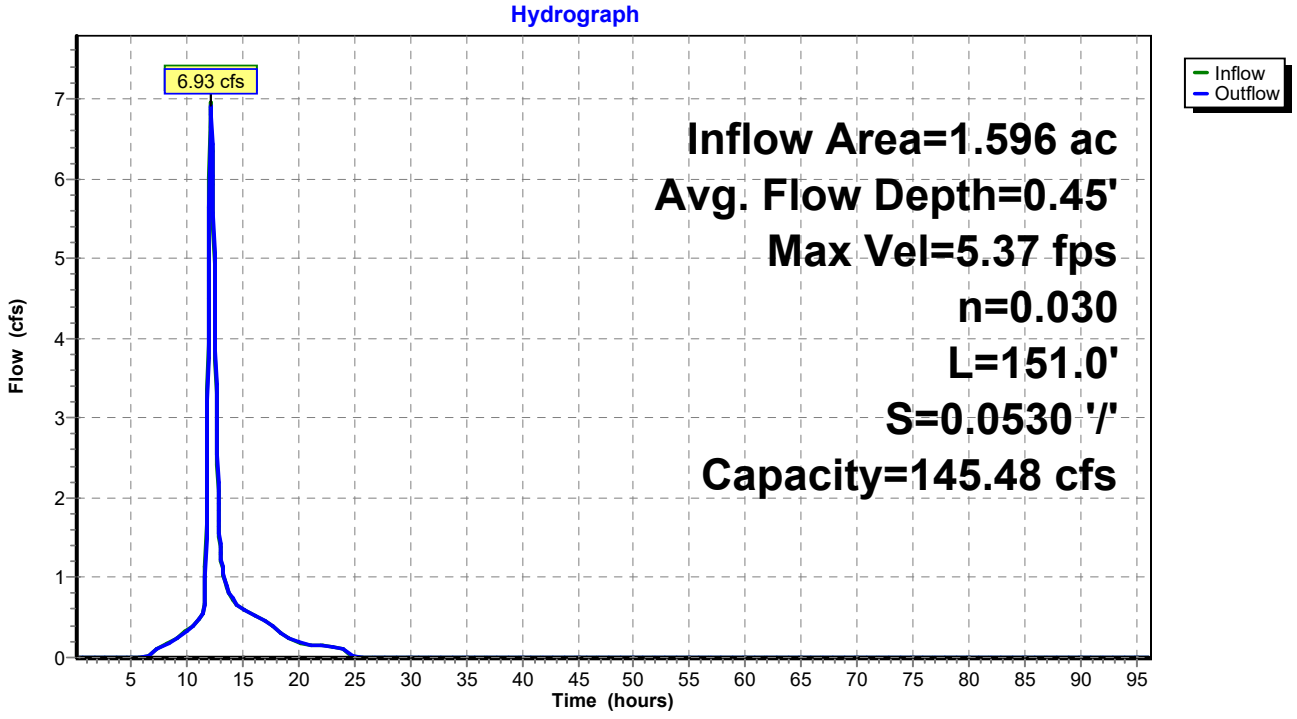
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.76" for 100-year event
Inflow = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af
Outflow = 6.93 cfs @ 12.23 hrs, Volume= 0.899 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.37 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 1.5 min

Peak Storage= 195 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 3.79'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 145.48 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 151.0' Slope= 0.0530 '/'
Inlet Invert= 187.00', Outlet Invert= 179.00'

Reach POST-1R:



Stage-Area-Storage for Reach POST-1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
187.00	0.0	0	187.52	1.6	239
187.01	0.0	3	187.53	1.6	245
187.02	0.0	6	187.54	1.7	251
187.03	0.1	9	187.55	1.7	257
187.04	0.1	13	187.56	1.7	264
187.05	0.1	16	187.57	1.8	270
187.06	0.1	19	187.58	1.8	277
187.07	0.2	23	187.59	1.9	283
187.08	0.2	26	187.60	1.9	290
187.09	0.2	30	187.61	2.0	297
187.10	0.2	33	187.62	2.0	303
187.11	0.2	37	187.63	2.1	310
187.12	0.3	41	187.64	2.1	317
187.13	0.3	44	187.65	2.1	324
187.14	0.3	48	187.66	2.2	331
187.15	0.3	52	187.67	2.2	338
187.16	0.4	56	187.68	2.3	345
187.17	0.4	60	187.69	2.3	352
187.18	0.4	64	187.70	2.4	359
187.19	0.5	68	187.71	2.4	367
187.20	0.5	72	187.72	2.5	374
187.21	0.5	77	187.73	2.5	381
187.22	0.5	81	187.74	2.6	389
187.23	0.6	85	187.75	2.6	396
187.24	0.6	90	187.76	2.7	404
187.25	0.6	94	187.77	2.7	412
187.26	0.7	99	187.78	2.8	419
187.27	0.7	104	187.79	2.8	427
187.28	0.7	108	187.80	2.9	435
187.29	0.7	113	187.81	2.9	443
187.30	0.8	118	187.82	3.0	451
187.31	0.8	123	187.83	3.0	459
187.32	0.8	128	187.84	3.1	467
187.33	0.9	133	187.85	3.1	475
187.34	0.9	138	187.86	3.2	483
187.35	0.9	143	187.87	3.3	491
187.36	1.0	148	187.88	3.3	500
187.37	1.0	153	187.89	3.4	508
187.38	1.0	158	187.90	3.4	516
187.39	1.1	164	187.91	3.5	525
187.40	1.1	169	187.92	3.5	533
187.41	1.2	175	187.93	3.6	542
187.42	1.2	180	187.94	3.6	551
187.43	1.2	186	187.95	3.7	559
187.44	1.3	191	187.96	3.8	568
187.45	1.3	197	187.97	3.8	577
187.46	1.3	203	187.98	3.9	586
187.47	1.4	209	187.99	3.9	595
187.48	1.4	215	188.00	4.0	604
187.49	1.5	221	188.01	4.1	613
187.50	1.5	227	188.02	4.1	622
187.51	1.5	233	188.03	4.2	631

Stage-Area-Storage for Reach POST-1R: (continued)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
188.04	4.2	641
188.05	4.3	650
188.06	4.4	659
188.07	4.4	669
188.08	4.5	678
188.09	4.6	688
188.10	4.6	698
188.11	4.7	707
188.12	4.7	717
188.13	4.8	727
188.14	4.9	737
188.15	4.9	747
188.16	5.0	757
188.17	5.1	767
188.18	5.1	777
188.19	5.2	787
188.20	5.3	797
188.21	5.3	808
188.22	5.4	818
188.23	5.5	828
188.24	5.6	839
188.25	5.6	849
188.26	5.7	860
188.27	5.8	871
188.28	5.8	881
188.29	5.9	892
188.30	6.0	903
188.31	6.1	914
188.32	6.1	925
188.33	6.2	936
188.34	6.3	947
188.35	6.3	958
188.36	6.4	969
188.37	6.5	981
188.38	6.6	992
188.39	6.6	1,003
188.40	6.7	1,015
188.41	6.8	1,026
188.42	6.9	1,038
188.43	6.9	1,049
188.44	7.0	1,061
188.45	7.1	1,073
188.46	7.2	1,085
188.47	7.3	1,097
188.48	7.3	1,108
188.49	7.4	1,120
188.50	7.5	1,133
188.51	7.6	1,145
188.52	7.7	1,157
188.53	7.7	1,169
188.54	7.8	1,181
188.55	7.9	1,194
188.56	8.0	1,206
188.57	8.1	1,219
188.58	8.2	1,231
188.59	8.2	1,244
188.60	8.3	1,256
188.61	8.4	1,269
188.62	8.5	1,282
188.63	8.6	1,295
188.64	8.7	1,308
188.65	8.7	1,321
188.66	8.8	1,334
188.67	8.9	1,347
188.68	9.0	1,360
188.69	9.1	1,373
188.70	9.2	1,386
188.71	9.3	1,400
188.72	9.4	1,413
188.73	9.4	1,426
188.74	9.5	1,440
188.75	9.6	1,453
188.76	9.7	1,467
188.77	9.8	1,481
188.78	9.9	1,494
188.79	10.0	1,508
188.80	10.1	1,522
188.81	10.2	1,536
188.82	10.3	1,550
188.83	10.4	1,564
188.84	10.5	1,578
188.85	10.5	1,592
188.86	10.6	1,607
188.87	10.7	1,621
188.88	10.8	1,635
188.89	10.9	1,650
188.90	11.0	1,664
188.91	11.1	1,679
188.92	11.2	1,693
188.93	11.3	1,708
188.94	11.4	1,722
188.95	11.5	1,737
188.96	11.6	1,752
188.97	11.7	1,767
188.98	11.8	1,782
188.99	11.9	1,797
189.00	**12.0**	**1,812**

Summary for Reach POST-2R:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.76" for 100-year event
Inflow = 6.93 cfs @ 12.23 hrs, Volume= 0.899 af
Outflow = 6.91 cfs @ 12.26 hrs, Volume= 0.899 af, Atten= 0%, Lag= 2.4 min

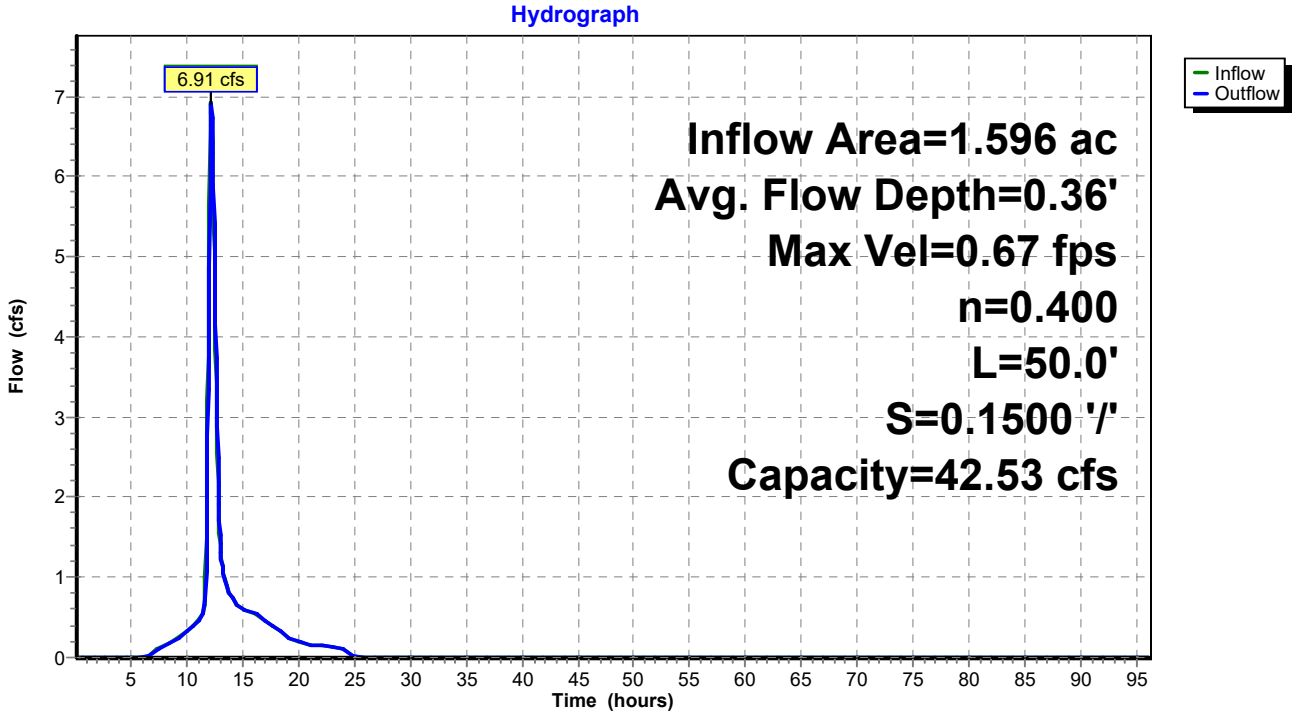
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.67 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 5.1 min

Peak Storage= 515 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 32.20'
Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 42.53 cfs

25.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 50.0' Slope= 0.1500 '/'
Inlet Invert= 178.50', Outlet Invert= 171.00'

‡

Reach POST-2R:



Stage-Area-Storage for Reach POST-2R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
178.50	0.0	0
178.51	0.3	13
178.52	0.5	25
178.53	0.8	38
178.54	1.0	51
178.55	1.3	64
178.56	1.5	77
178.57	1.8	90
178.58	2.1	103
178.59	2.3	117
178.60	2.6	130
178.61	2.9	144
178.62	3.1	157
178.63	3.4	171
178.64	3.7	185
178.65	4.0	199
178.66	4.3	213
178.67	4.5	227
178.68	4.8	241
178.69	5.1	256
178.70	5.4	270
178.71	5.7	285
178.72	6.0	299
178.73	6.3	314
178.74	6.6	329
178.75	6.9	344
178.76	7.2	359
178.77	7.5	374
178.78	7.8	389
178.79	8.1	405
178.80	8.4	420
178.81	8.7	436
178.82	9.0	451
178.83	9.3	467
178.84	9.7	483
178.85	10.0	499
178.86	10.3	515
178.87	10.6	531
178.88	10.9	547
178.89	11.3	564
178.90	11.6	580
178.91	11.9	597
178.92	12.3	613
178.93	12.6	630
178.94	12.9	647
178.95	13.3	664
178.96	13.6	681
178.97	14.0	698
178.98	14.3	715
178.99	14.7	733
179.00	15.0	750
179.01	15.4	768
179.02	15.7	785
179.03	16.1	803
179.04	16.4	821
179.05	16.8	839
179.06	17.1	857
179.07	17.5	875
179.08	17.9	893
179.09	18.2	912
179.10	18.6	930
179.11	19.0	949
179.12	19.3	967
179.13	19.7	986
179.14	20.1	1,005
179.15	20.5	1,024
179.16	20.9	1,043
179.17	21.2	1,062
179.18	21.6	1,081
179.19	22.0	1,101
179.20	22.4	1,120
179.21	22.8	1,140
179.22	23.2	1,159
179.23	23.6	1,179
179.24	24.0	1,199
179.25	24.4	1,219
179.26	24.8	1,239
179.27	25.2	1,259
179.28	25.6	1,279
179.29	26.0	1,300
179.30	26.4	1,320
179.31	26.8	1,341
179.32	27.2	1,361
179.33	27.6	1,382
179.34	28.1	1,403
179.35	28.5	1,424
179.36	28.9	1,445
179.37	29.3	1,466
179.38	29.7	1,487
179.39	30.2	1,509
179.40	30.6	1,530
179.41	31.0	1,552
179.42	31.5	1,573
179.43	31.9	1,595
179.44	32.3	1,617
179.45	32.8	1,639
179.46	33.2	1,661
179.47	33.7	1,683
179.48	34.1	1,705
179.49	34.6	1,728
179.50	**35.0**	**1,750**

Summary for Reach POST-3R:

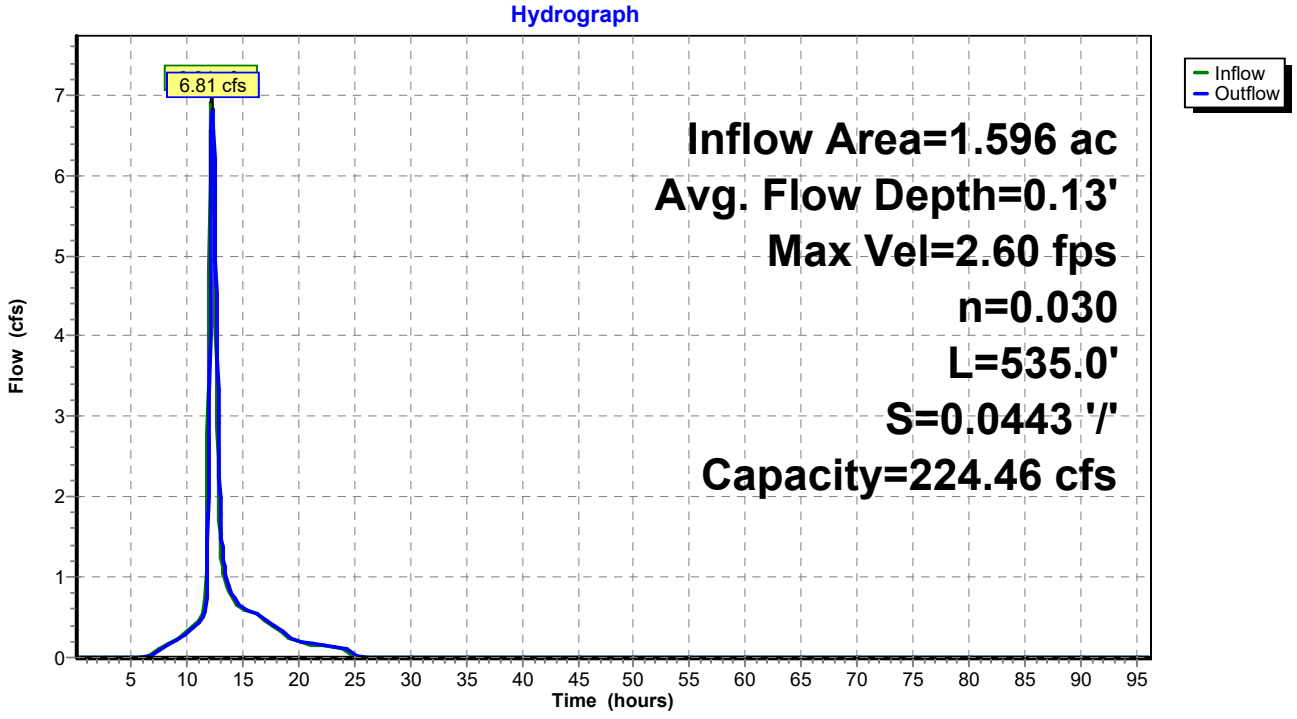
Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.76" for 100-year event
Inflow = 6.91 cfs @ 12.26 hrs, Volume= 0.899 af
Outflow = 6.81 cfs @ 12.37 hrs, Volume= 0.899 af, Atten= 1%, Lag= 6.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.60 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 12.1 min

Peak Storage= 1,404 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 21.02'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 224.46 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 535.0' Slope= 0.0443 '/'
Inlet Invert= 170.80', Outlet Invert= 147.10'

Reach POST-3R:



Stage-Area-Storage for Reach POST-3R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
170.80	0.0	0
170.81	0.2	107
170.82	0.4	215
170.83	0.6	323
170.84	0.8	431
170.85	1.0	540
170.86	1.2	650
170.87	1.4	759
170.88	1.6	870
170.89	1.8	980
170.90	2.0	1,091
170.91	2.2	1,203
170.92	2.5	1,315
170.93	2.7	1,427
170.94	2.9	1,540
170.95	3.1	1,653
170.96	3.3	1,767
170.97	3.5	1,881
170.98	3.7	1,995
170.99	3.9	2,110
171.00	4.2	2,226
171.01	4.4	2,341
171.02	4.6	2,458
171.03	4.8	2,574
171.04	5.0	2,691
171.05	5.3	2,809
171.06	5.5	2,927
171.07	5.7	3,045
171.08	5.9	3,164
171.09	6.1	3,283
171.10	6.4	3,403
171.11	6.6	3,523
171.12	6.8	3,643
171.13	7.0	3,764
171.14	7.3	3,885
171.15	7.5	4,007
171.16	7.7	4,129
171.17	7.9	4,252
171.18	8.2	4,375
171.19	8.4	4,498
171.20	8.6	4,622
171.21	8.9	4,747
171.22	9.1	4,871
171.23	9.3	4,997
171.24	9.6	5,122
171.25	9.8	5,248
171.26	10.0	5,375
171.27	10.3	5,502
171.28	10.5	5,629
171.29	10.8	5,757
171.30	11.0	5,885
171.31	11.2	6,014
171.32	11.5	6,143
171.33	11.7	6,272
171.34	12.0	6,402
171.35	12.2	6,532
171.36	12.5	6,663
171.37	12.7	6,794
171.38	12.9	6,926
171.39	13.2	7,058
171.40	13.4	7,190
171.41	13.7	7,323
171.42	13.9	7,457
171.43	14.2	7,590
171.44	14.4	7,725
171.45	14.7	7,859
171.46	14.9	7,994
171.47	15.2	8,130
171.48	15.4	8,266
171.49	15.7	8,402
171.50	16.0	8,539
171.51	16.2	8,676
171.52	16.5	8,813
171.53	16.7	8,951
171.54	17.0	9,090
171.55	17.3	9,229
171.56	17.5	9,368
171.57	17.8	9,508
171.58	18.0	9,648
171.59	18.3	9,789
171.60	18.6	9,930
171.61	18.8	10,071
171.62	19.1	10,213
171.63	19.4	10,355
171.64	19.6	10,498
171.65	19.9	10,641
171.66	20.2	10,785
171.67	20.4	10,929
171.68	20.7	11,073
171.69	21.0	11,218
171.70	21.2	11,363
171.71	21.5	11,509
171.72	21.8	11,655
171.73	22.1	11,802
171.74	22.3	11,949
171.75	22.6	12,096
171.76	22.9	12,244
171.77	23.2	12,393
171.78	23.4	12,541
171.79	23.7	12,690
171.80	**24.0**	**12,840**

Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.49" for 100-year event
Inflow = 0.19 cfs @ 13.02 hrs, Volume= 0.025 af
Outflow = 0.19 cfs @ 13.07 hrs, Volume= 0.025 af, Atten= 0%, Lag= 3.4 min

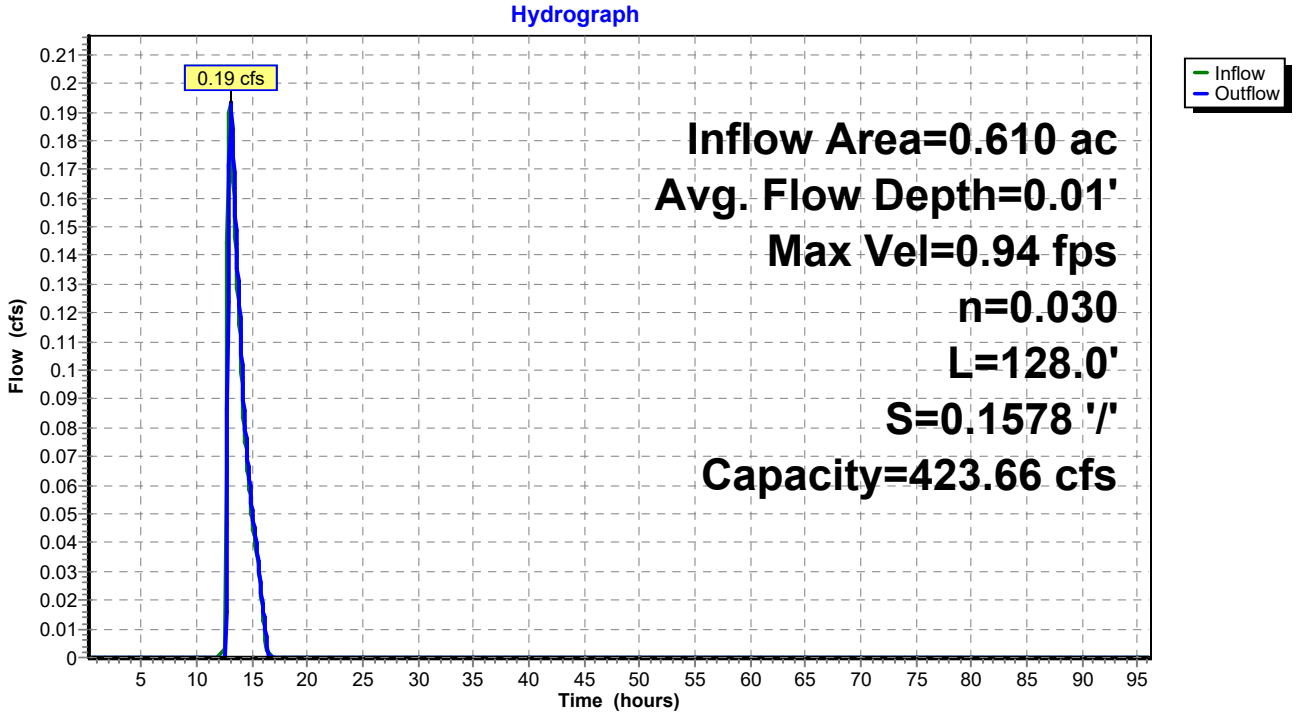
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.94 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 2.3 min

Peak Storage= 26 cf @ 13.03 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.08'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

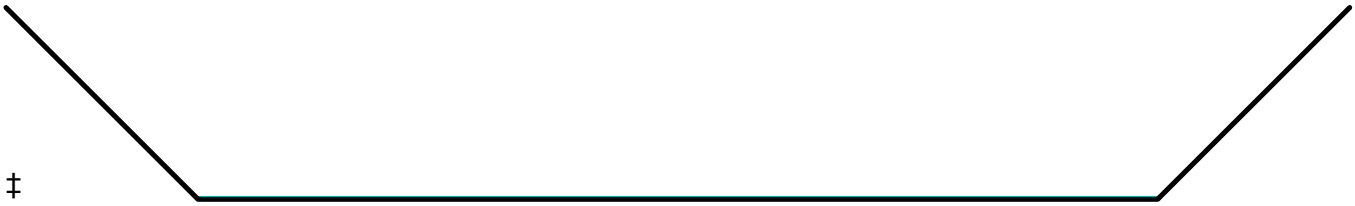
Summary for Reach POST-5R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.49" for 100-year event
Inflow = 0.19 cfs @ 13.07 hrs, Volume= 0.025 af
Outflow = 0.18 cfs @ 13.37 hrs, Volume= 0.025 af, Atten= 6%, Lag= 17.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.52 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 11.2 min

Peak Storage= 91 cf @ 13.23 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 20.14'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 160.96 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 259.0' Slope= 0.0228 '/'
Inlet Invert= 153.00', Outlet Invert= 147.10'



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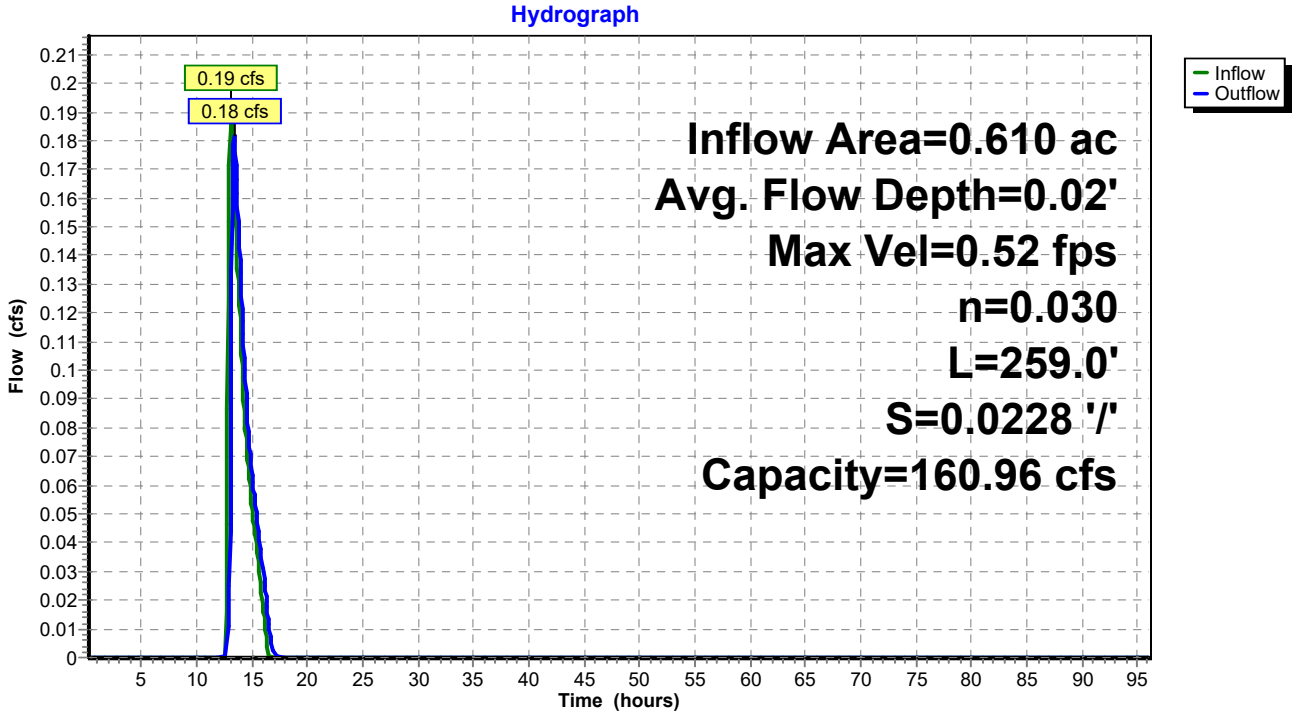
Reach POST-5R:



Stage-Area-Storage for Reach POST-5R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
153.00	0.0	0
153.01	0.2	52
153.02	0.4	104
153.03	0.6	156
153.04	0.8	209
153.05	1.0	262
153.06	1.2	315
153.07	1.4	368
153.08	1.6	421
153.09	1.8	475
153.10	2.0	528
153.11	2.2	582
153.12	2.5	637
153.13	2.7	691
153.14	2.9	746
153.15	3.1	800
153.16	3.3	855
153.17	3.5	911
153.18	3.7	966
153.19	3.9	1,022
153.20	4.2	1,077
153.21	4.4	1,133
153.22	4.6	1,190
153.23	4.8	1,246
153.24	5.0	1,303
153.25	5.3	1,360
153.26	5.5	1,417
153.27	5.7	1,474
153.28	5.9	1,532
153.29	6.1	1,589
153.30	6.4	1,647
153.31	6.6	1,705
153.32	6.8	1,764
153.33	7.0	1,822
153.34	7.3	1,881
153.35	7.5	1,940
153.36	7.7	1,999
153.37	7.9	2,058
153.38	8.2	2,118
153.39	8.4	2,178
153.40	8.6	2,238
153.41	8.9	2,298
153.42	9.1	2,358
153.43	9.3	2,419
153.44	9.6	2,480
153.45	9.8	2,541
153.46	10.0	2,602
153.47	10.3	2,663
153.48	10.5	2,725
153.49	10.8	2,787
153.50	11.0	2,849
153.51	11.2	2,911
153.52	11.5	2,974
153.53	11.7	3,036
153.54	12.0	3,099
153.55	12.2	3,162
153.56	12.5	3,226
153.57	12.7	3,289
153.58	12.9	3,353
153.59	13.2	3,417
153.60	13.4	3,481
153.61	13.7	3,545
153.62	13.9	3,610
153.63	14.2	3,675
153.64	14.4	3,740
153.65	14.7	3,805
153.66	14.9	3,870
153.67	15.2	3,936
153.68	15.4	4,001
153.69	15.7	4,067
153.70	16.0	4,134
153.71	16.2	4,200
153.72	16.5	4,267
153.73	16.7	4,333
153.74	17.0	4,401
153.75	17.3	4,468
153.76	17.5	4,535
153.77	17.8	4,603
153.78	18.0	4,671
153.79	18.3	4,739
153.80	18.6	4,807
153.81	18.8	4,876
153.82	19.1	4,944
153.83	19.4	5,013
153.84	19.6	5,082
153.85	19.9	5,152
153.86	20.2	5,221
153.87	20.4	5,291
153.88	20.7	5,361
153.89	21.0	5,431
153.90	21.2	5,501
153.91	21.5	5,572
153.92	21.8	5,642
153.93	22.1	5,713
153.94	22.3	5,785
153.95	22.6	5,856
153.96	22.9	5,928
153.97	23.2	5,999
153.98	23.4	6,071
153.99	23.7	6,144
154.00	**24.0**	**6,216**

Summary for Pond POST-1P:

Inflow Area = 1.596 ac, 78.95% Impervious, Inflow Depth = 6.80" for 100-year event
Inflow = 11.94 cfs @ 12.09 hrs, Volume= 0.905 af
Outflow = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af, Atten= 42%, Lag= 7.3 min
Primary = 6.96 cfs @ 12.21 hrs, Volume= 0.899 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 192.04' @ 12.21 hrs Surf.Area= 2,938 sf Storage= 8,112 cf

Plug-Flow detention time= 39.9 min calculated for 0.899 af (99% of inflow)
Center-of-Mass det. time= 34.9 min (822.9 - 788.0)

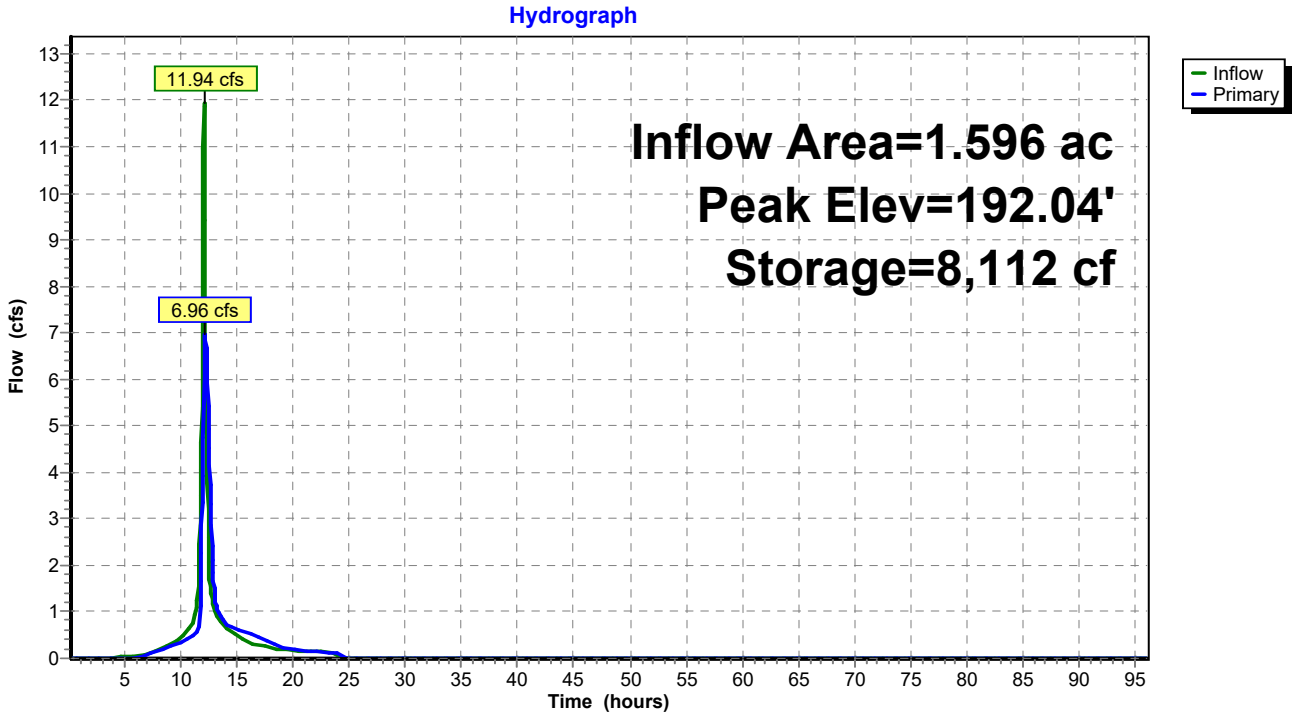
Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	11,201 cf	**Custom Stage Data (Pyramidal)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.00	200	0	0	200
188.00	859	491	491	865
190.00	1,916	2,705	3,196	1,961
192.00	2,915	4,796	7,993	3,034
193.00	3,512	3,209	11,201	3,673

Device	Routing	Invert	Outlet Devices
#1	Primary	187.70'	**18.0" Round Culvert** L= 22.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.10' / 187.70' S= -0.0273 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	187.10'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	189.70'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	191.20'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.94 cfs @ 12.21 hrs HW=192.03' (Free Discharge)
└**1=Culvert** (Passes 6.94 cfs of 12.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.87 cfs @ 10.02 fps)
  ├**3=Orifice/Grate** (Orifice Controls 5.12 cfs @ 6.52 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.95 cfs @ 3.54 fps)

Pond POST-1P:


Hydrograph
Inflow Area=1.596 ac
Peak Elev=192.04'
Storage=8,112 cf
11.94 cfs
6.96 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
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95

Stage-Area-Storage for Pond POST-1P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.00	200	0	187.52	485	173
187.01	204	2	187.53	492	178
187.02	209	4	187.54	499	183
187.03	213	6	187.55	506	188
187.04	218	8	187.56	512	193
187.05	222	11	187.57	519	198
187.06	227	13	187.58	526	203
187.07	231	15	187.59	533	208
187.08	236	17	187.60	540	214
187.09	240	20	187.61	547	219
187.10	245	22	187.62	554	225
187.11	250	25	187.63	562	230
187.12	255	27	187.64	569	236
187.13	260	30	187.65	576	242
187.14	265	32	187.66	583	247
187.15	270	35	187.67	591	253
187.16	275	38	187.68	598	259
187.17	280	41	187.69	606	265
187.18	285	43	187.70	613	271
187.19	290	46	187.71	621	278
187.20	295	49	187.72	628	284
187.21	300	52	187.73	636	290
187.22	306	55	187.74	643	297
187.23	311	58	187.75	651	303
187.24	316	61	187.76	659	310
187.25	322	65	187.77	667	316
187.26	327	68	187.78	675	323
187.27	333	71	187.79	682	330
187.28	338	74	187.80	690	337
187.29	344	78	187.81	698	343
187.30	349	81	187.82	706	350
187.31	355	85	187.83	715	358
187.32	361	88	187.84	723	365
187.33	367	92	187.85	731	372
187.34	372	96	187.86	739	379
187.35	378	100	187.87	747	387
187.36	384	103	187.88	756	394
187.37	390	107	187.89	764	402
187.38	396	111	187.90	772	410
187.39	402	115	187.91	781	417
187.40	408	119	187.92	789	425
187.41	415	123	187.93	798	433
187.42	421	128	187.94	806	441
187.43	427	132	187.95	815	449
187.44	433	136	187.96	824	458
187.45	440	140	187.97	833	466
187.46	446	145	187.98	841	474
187.47	452	149	187.99	850	483
187.48	459	154	188.00	859	491
187.49	465	159	188.01	863	500
187.50	472	163	188.02	867	508
187.51	479	168	188.03	872	517

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.04	876	526
188.05	880	535
188.06	885	543
188.07	889	552
188.08	893	561
188.09	898	570
188.10	902	579
188.11	906	588
188.12	911	597
188.13	915	606
188.14	919	616
188.15	924	625
188.16	928	634
188.17	933	643
188.18	937	653
188.19	941	662
188.20	946	672
188.21	950	681
188.22	955	691
188.23	959	700
188.24	964	710
188.25	968	719
188.26	973	729
188.27	977	739
188.28	982	749
188.29	986	759
188.30	991	768
188.31	995	778
188.32	1,000	788
188.33	1,005	798
188.34	1,009	808
188.35	1,014	819
188.36	1,018	829
188.37	1,023	839
188.38	1,028	849
188.39	1,032	859
188.40	1,037	870
188.41	1,042	880
188.42	1,046	891
188.43	1,051	901
188.44	1,056	912
188.45	1,060	922
188.46	1,065	933
188.47	1,070	944
188.48	1,075	954
188.49	1,079	965
188.50	1,084	976
188.51	1,089	987
188.52	1,094	998
188.53	1,098	1,009
188.54	1,103	1,020
188.55	1,108	1,031
188.56	1,113	1,042
188.57	1,118	1,053
188.58	1,122	1,064
188.59	1,127	1,075
188.60	1,132	1,087
188.61	1,137	1,098
188.62	1,142	1,109
188.63	1,147	1,121
188.64	1,152	1,132
188.65	1,157	1,144
188.66	1,162	1,155
188.67	1,166	1,167
188.68	1,171	1,179
188.69	1,176	1,191
188.70	1,181	1,202
188.71	1,186	1,214
188.72	1,191	1,226
188.73	1,196	1,238
188.74	1,201	1,250
188.75	1,206	1,262
188.76	1,211	1,274
188.77	1,216	1,286
188.78	1,221	1,298
188.79	1,227	1,311
188.80	1,232	1,323
188.81	1,237	1,335
188.82	1,242	1,348
188.83	1,247	1,360
188.84	1,252	1,373
188.85	1,257	1,385
188.86	1,262	1,398
188.87	1,267	1,410
188.88	1,273	1,423
188.89	1,278	1,436
188.90	1,283	1,449
188.91	1,288	1,462
188.92	1,293	1,474
188.93	1,298	1,487
188.94	1,304	1,500
188.95	1,309	1,513
188.96	1,314	1,527
188.97	1,319	1,540
188.98	1,325	1,553
188.99	1,330	1,566
189.00	1,335	1,580
189.01	1,340	1,593
189.02	1,346	1,606
189.03	1,351	1,620
189.04	1,356	1,633
189.05	1,362	1,647
189.06	1,367	1,661
189.07	1,372	1,674

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
189.08	1,378	1,688	189.60	1,671	2,480
189.09	1,383	1,702	189.61	1,677	2,496
189.10	1,389	1,716	189.62	1,683	2,513
189.11	1,394	1,730	189.63	1,689	2,530
189.12	1,399	1,744	189.64	1,695	2,547
189.13	1,405	1,758	189.65	1,701	2,564
189.14	1,410	1,772	189.66	1,707	2,581
189.15	1,416	1,786	189.67	1,713	2,598
189.16	1,421	1,800	189.68	1,719	2,615
189.17	1,427	1,814	189.69	1,725	2,632
189.18	1,432	1,829	189.70	1,731	2,650
189.19	1,438	1,843	189.71	1,737	2,667
189.20	1,443	1,857	189.72	1,743	2,684
189.21	1,448	1,872	189.73	1,749	2,702
189.22	1,454	1,886	189.74	1,755	2,719
189.23	1,460	1,901	189.75	1,761	2,737
189.24	1,465	1,915	189.76	1,767	2,755
189.25	1,471	1,930	189.77	1,773	2,772
189.26	1,476	1,945	189.78	1,779	2,790
189.27	1,482	1,960	189.79	1,785	2,808
189.28	1,487	1,975	189.80	1,791	2,826
189.29	1,493	1,989	189.81	1,798	2,844
189.30	1,498	2,004	189.82	1,804	2,862
189.31	1,504	2,019	189.83	1,810	2,880
189.32	1,510	2,034	189.84	1,816	2,898
189.33	1,515	2,050	189.85	1,822	2,916
189.34	1,521	2,065	189.86	1,828	2,934
189.35	1,527	2,080	189.87	1,835	2,953
189.36	1,532	2,095	189.88	1,841	2,971
189.37	1,538	2,111	189.89	1,847	2,989
189.38	1,544	2,126	189.90	1,853	3,008
189.39	1,549	2,142	189.91	1,859	3,027
189.40	1,555	2,157	189.92	1,866	3,045
189.41	1,561	2,173	189.93	1,872	3,064
189.42	1,566	2,188	189.94	1,878	3,083
189.43	1,572	2,204	189.95	1,884	3,101
189.44	1,578	2,220	189.96	1,891	3,120
189.45	1,584	2,235	189.97	1,897	3,139
189.46	1,589	2,251	189.98	1,903	3,158
189.47	1,595	2,267	189.99	1,910	3,177
189.48	1,601	2,283	190.00	1,916	3,196
189.49	1,607	2,299	190.01	1,920	3,216
189.50	1,613	2,315	190.02	1,925	3,235
189.51	1,618	2,332	190.03	1,929	3,254
189.52	1,624	2,348	190.04	1,934	3,273
189.53	1,630	2,364	190.05	1,938	3,293
189.54	1,636	2,380	190.06	1,943	3,312
189.55	1,642	2,397	190.07	1,947	3,332
189.56	1,648	2,413	190.08	1,952	3,351
189.57	1,653	2,430	190.09	1,956	3,371
189.58	1,659	2,446	190.10	1,961	3,390
189.59	1,665	2,463	190.11	1,966	3,410

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
190.12	1,970	3,430
190.13	1,975	3,449
190.14	1,979	3,469
190.15	1,984	3,489
190.16	1,988	3,509
190.17	1,993	3,529
190.18	1,997	3,549
190.19	2,002	3,569
190.20	2,007	3,589
190.21	2,011	3,609
190.22	2,016	3,629
190.23	2,020	3,649
190.24	2,025	3,669
190.25	2,029	3,690
190.26	2,034	3,710
190.27	2,039	3,730
190.28	2,043	3,751
190.29	2,048	3,771
190.30	2,053	3,792
190.31	2,057	3,812
190.32	2,062	3,833
190.33	2,066	3,853
190.34	2,071	3,874
190.35	2,076	3,895
190.36	2,080	3,916
190.37	2,085	3,936
190.38	2,090	3,957
190.39	2,094	3,978
190.40	2,099	3,999
190.41	2,104	4,020
190.42	2,108	4,041
190.43	2,113	4,062
190.44	2,118	4,084
190.45	2,123	4,105
190.46	2,127	4,126
190.47	2,132	4,147
190.48	2,137	4,169
190.49	2,141	4,190
190.50	2,146	4,211
190.51	2,151	4,233
190.52	2,156	4,254
190.53	2,160	4,276
190.54	2,165	4,298
190.55	2,170	4,319
190.56	2,175	4,341
190.57	2,179	4,363
190.58	2,184	4,385
190.59	2,189	4,407
190.60	2,194	4,428
190.61	2,199	4,450
190.62	2,203	4,472
190.63	2,208	4,494
190.64	2,213	4,517
190.65	2,218	4,539
190.66	2,223	4,561
190.67	2,227	4,583
190.68	2,232	4,605
190.69	2,237	4,628
190.70	2,242	4,650
190.71	2,247	4,673
190.72	2,252	4,695
190.73	2,256	4,718
190.74	2,261	4,740
190.75	2,266	4,763
190.76	2,271	4,786
190.77	2,276	4,808
190.78	2,281	4,831
190.79	2,286	4,854
190.80	2,291	4,877
190.81	2,295	4,900
190.82	2,300	4,923
190.83	2,305	4,946
190.84	2,310	4,969
190.85	2,315	4,992
190.86	2,320	5,015
190.87	2,325	5,038
190.88	2,330	5,062
190.89	2,335	5,085
190.90	2,340	5,108
190.91	2,345	5,132
190.92	2,350	5,155
190.93	2,355	5,179
190.94	2,360	5,202
190.95	2,364	5,226
190.96	2,369	5,250
190.97	2,374	5,273
190.98	2,379	5,297
190.99	2,384	5,321
191.00	2,389	5,345
191.01	2,394	5,369
191.02	2,399	5,393
191.03	2,404	5,417
191.04	2,409	5,441
191.05	2,414	5,465
191.06	2,419	5,489
191.07	2,424	5,513
191.08	2,430	5,538
191.09	2,435	5,562
191.10	2,440	5,586
191.11	2,445	5,611
191.12	2,450	5,635
191.13	2,455	5,660
191.14	2,460	5,684
191.15	2,465	5,709

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
191.16	2,470	5,734
191.17	2,475	5,758
191.18	2,480	5,783
191.19	2,485	5,808
191.20	2,490	5,833
191.21	2,495	5,858
191.22	2,501	5,883
191.23	2,506	5,908
191.24	2,511	5,933
191.25	2,516	5,958
191.26	2,521	5,983
191.27	2,526	6,008
191.28	2,531	6,034
191.29	2,536	6,059
191.30	2,542	6,084
191.31	2,547	6,110
191.32	2,552	6,135
191.33	2,557	6,161
191.34	2,562	6,186
191.35	2,567	6,212
191.36	2,573	6,238
191.37	2,578	6,263
191.38	2,583	6,289
191.39	2,588	6,315
191.40	2,593	6,341
191.41	2,599	6,367
191.42	2,604	6,393
191.43	2,609	6,419
191.44	2,614	6,445
191.45	2,619	6,471
191.46	2,625	6,498
191.47	2,630	6,524
191.48	2,635	6,550
191.49	2,640	6,577
191.50	2,646	6,603
191.51	2,651	6,629
191.52	2,656	6,656
191.53	2,661	6,683
191.54	2,667	6,709
191.55	2,672	6,736
191.56	2,677	6,763
191.57	2,683	6,789
191.58	2,688	6,816
191.59	2,693	6,843
191.60	2,698	6,870
191.61	2,704	6,897
191.62	2,709	6,924
191.63	2,714	6,951
191.64	2,720	6,979
191.65	2,725	7,006
191.66	2,730	7,033
191.67	2,736	7,060
191.68	2,741	7,088
191.69	2,746	7,115
191.70	2,752	7,143
191.71	2,757	7,170
191.72	2,763	7,198
191.73	2,768	7,226
191.74	2,773	7,253
191.75	2,779	7,281
191.76	2,784	7,309
191.77	2,789	7,337
191.78	2,795	7,365
191.79	2,800	7,393
191.80	2,806	7,421
191.81	2,811	7,449
191.82	2,817	7,477
191.83	2,822	7,505
191.84	2,827	7,533
191.85	2,833	7,562
191.86	2,838	7,590
191.87	2,844	7,618
191.88	2,849	7,647
191.89	2,855	7,675
191.90	2,860	7,704
191.91	2,866	7,733
191.92	2,871	7,761
191.93	2,877	7,790
191.94	2,882	7,819
191.95	2,887	7,848
191.96	2,893	7,876
191.97	2,898	7,905
191.98	2,904	7,934
191.99	2,909	7,964
192.00	2,915	7,993
192.01	2,921	8,022
192.02	2,926	8,051
192.03	2,932	8,080
192.04	2,938	8,110
192.05	2,944	8,139
192.06	2,949	8,169
192.07	2,955	8,198
192.08	2,961	8,228
192.09	2,966	8,257
192.10	2,972	8,287
192.11	2,978	8,317
192.12	2,984	8,347
192.13	2,989	8,376
192.14	2,995	8,406
192.15	3,001	8,436
192.16	3,007	8,466
192.17	3,013	8,496
192.18	3,018	8,527
192.19	3,024	8,557

Stage-Area-Storage for Pond POST-1P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
192.20	3,030	8,587
192.21	3,036	8,617
192.22	3,042	8,648
192.23	3,047	8,678
192.24	3,053	8,709
192.25	3,059	8,739
192.26	3,065	8,770
192.27	3,071	8,801
192.28	3,077	8,831
192.29	3,082	8,862
192.30	3,088	8,893
192.31	3,094	8,924
192.32	3,100	8,955
192.33	3,106	8,986
192.34	3,112	9,017
192.35	3,118	9,048
192.36	3,124	9,079
192.37	3,129	9,111
192.38	3,135	9,142
192.39	3,141	9,173
192.40	3,147	9,205
192.41	3,153	9,236
192.42	3,159	9,268
192.43	3,165	9,299
192.44	3,171	9,331
192.45	3,177	9,363
192.46	3,183	9,395
192.47	3,189	9,427
192.48	3,195	9,458
192.49	3,201	9,490
192.50	3,207	9,522
192.51	3,213	9,555
192.52	3,219	9,587
192.53	3,224	9,619
192.54	3,230	9,651
192.55	3,236	9,684
192.56	3,242	9,716
192.57	3,248	9,748
192.58	3,254	9,781
192.59	3,261	9,813
192.60	3,267	9,846
192.61	3,273	9,879
192.62	3,279	9,912
192.63	3,285	9,944
192.64	3,291	9,977
192.65	3,297	10,010
192.66	3,303	10,043
192.67	3,309	10,076
192.68	3,315	10,109
192.69	3,321	10,143
192.70	3,327	10,176
192.71	3,333	10,209
192.72	3,339	10,242
192.73	3,345	10,276
192.74	3,351	10,309
192.75	3,358	10,343
192.76	3,364	10,376
192.77	3,370	10,410
192.78	3,376	10,444
192.79	3,382	10,478
192.80	3,388	10,512
192.81	3,394	10,545
192.82	3,400	10,579
192.83	3,407	10,613
192.84	3,413	10,648
192.85	3,419	10,682
192.86	3,425	10,716
192.87	3,431	10,750
192.88	3,437	10,785
192.89	3,444	10,819
192.90	3,450	10,853
192.91	3,456	10,888
192.92	3,462	10,923
192.93	3,468	10,957
192.94	3,475	10,992
192.95	3,481	11,027
192.96	3,487	11,062
192.97	3,493	11,096
192.98	3,500	11,131
192.99	3,506	11,166
193.00	**3,512**	**11,201**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 5.84" for 100-year event
Inflow = 2.42 cfs @ 12.09 hrs, Volume= 0.178 af
Outflow = 2.42 cfs @ 12.10 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.6 min
Primary = 2.42 cfs @ 12.10 hrs, Volume= 0.171 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.22' @ 12.10 hrs Surf.Area= 593 sf Storage= 413 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 34.3 min calculated for 0.171 af (96% of inflow)
Center-of-Mass det. time= 12.6 min (819.4 - 806.9)

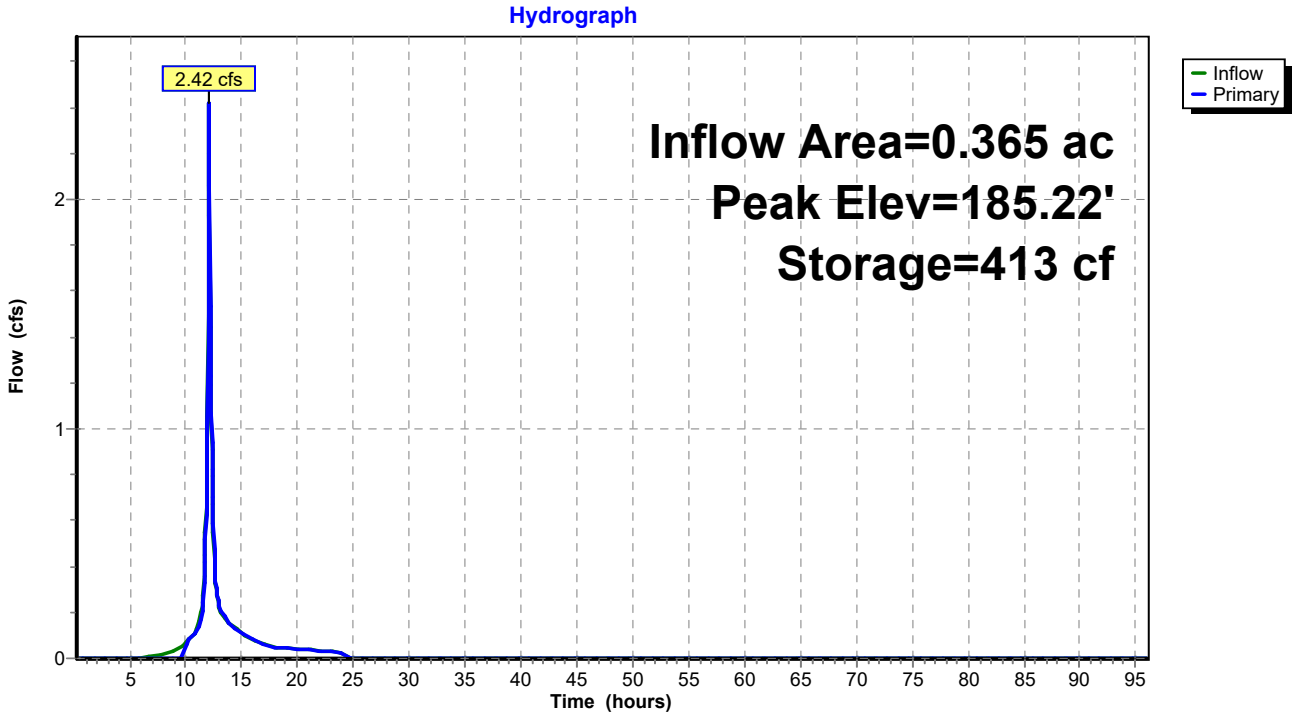
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.41 cfs @ 12.10 hrs HW=185.22' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.41 cfs @ 1.11 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0
184.01	130	1
184.02	132	3
184.03	135	4
184.04	137	5
184.05	140	7
184.06	143	8
184.07	145	10
184.08	148	11
184.09	151	12
184.10	153	14
184.11	156	16
184.12	159	17
184.13	162	19
184.14	165	20
184.15	168	22
184.16	170	24
184.17	173	25
184.18	176	27
184.19	179	29
184.20	182	31
184.21	185	33
184.22	188	34
184.23	191	36
184.24	195	38
184.25	198	40
184.26	201	42
184.27	204	44
184.28	207	46
184.29	210	48
184.30	214	51
184.31	217	53
184.32	220	55
184.33	224	57
184.34	227	59
184.35	230	62
184.36	234	64
184.37	237	66
184.38	241	69
184.39	244	71
184.40	248	74
184.41	251	76
184.42	255	79
184.43	258	81
184.44	262	84
184.45	265	86
184.46	269	89
184.47	273	92
184.48	276	95
184.49	280	97
184.50	284	100
184.51	288	103
184.52	291	106
184.53	295	109
184.54	299	112
184.55	303	115
184.56	307	118
184.57	311	121
184.58	315	124
184.59	319	127
184.60	323	130
184.61	327	134
184.62	331	137
184.63	335	140
184.64	339	144
184.65	343	147
184.66	347	151
184.67	351	154
184.68	356	158
184.69	360	161
184.70	364	165
184.71	368	168
184.72	373	172
184.73	377	176
184.74	381	180
184.75	386	183
184.76	390	187
184.77	394	191
184.78	399	195
184.79	403	199
184.80	408	203
184.81	412	207
184.82	417	212
184.83	422	216
184.84	426	220
184.85	431	224
184.86	435	229
184.87	440	233
184.88	445	237
184.89	449	242
184.90	454	246
184.91	459	251
184.92	464	256
184.93	469	260
184.94	473	265
184.95	478	270
184.96	483	275
184.97	488	279
184.98	493	284
184.99	498	289
185.00	503	294
185.01	507	299
185.02	511	304
185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 5.40" for 100-year event
Inflow = 2.65 cfs @ 12.10 hrs, Volume= 0.188 af
Outflow = 2.55 cfs @ 12.12 hrs, Volume= 0.184 af, Atten= 4%, Lag= 1.3 min
Primary = 2.55 cfs @ 12.12 hrs, Volume= 0.184 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.55' @ 12.12 hrs Surf.Area= 497 sf Storage= 415 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 21.1 min calculated for 0.184 af (98% of inflow)
Center-of-Mass det. time= 7.5 min (828.8 - 821.3)

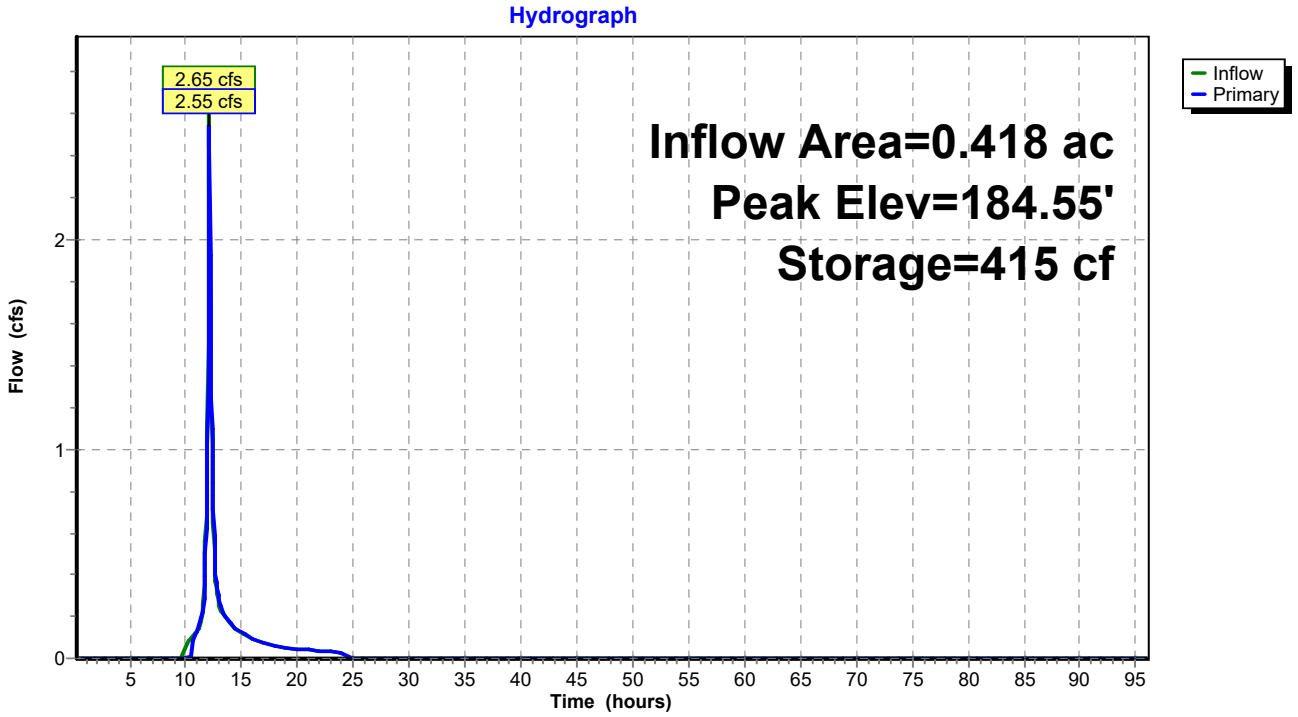
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.47 cfs @ 12.12 hrs HW=184.54' (Free Discharge)
└**1=Culvert** (Passes 2.47 cfs of 7.60 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.47 cfs @ 2.47 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 4.06" for 100-year event
Inflow = 2.78 cfs @ 12.12 hrs, Volume= 0.207 af
Outflow = 0.31 cfs @ 13.02 hrs, Volume= 0.207 af, Atten= 89%, Lag= 53.7 min
Discarded = 0.11 cfs @ 13.02 hrs, Volume= 0.181 af
Primary = 0.19 cfs @ 13.02 hrs, Volume= 0.025 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 177.09' @ 13.02 hrs Surf.Area= 2,021 sf Storage= 4,616 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 464.4 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 464.7 min (1,301.8 - 837.1)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

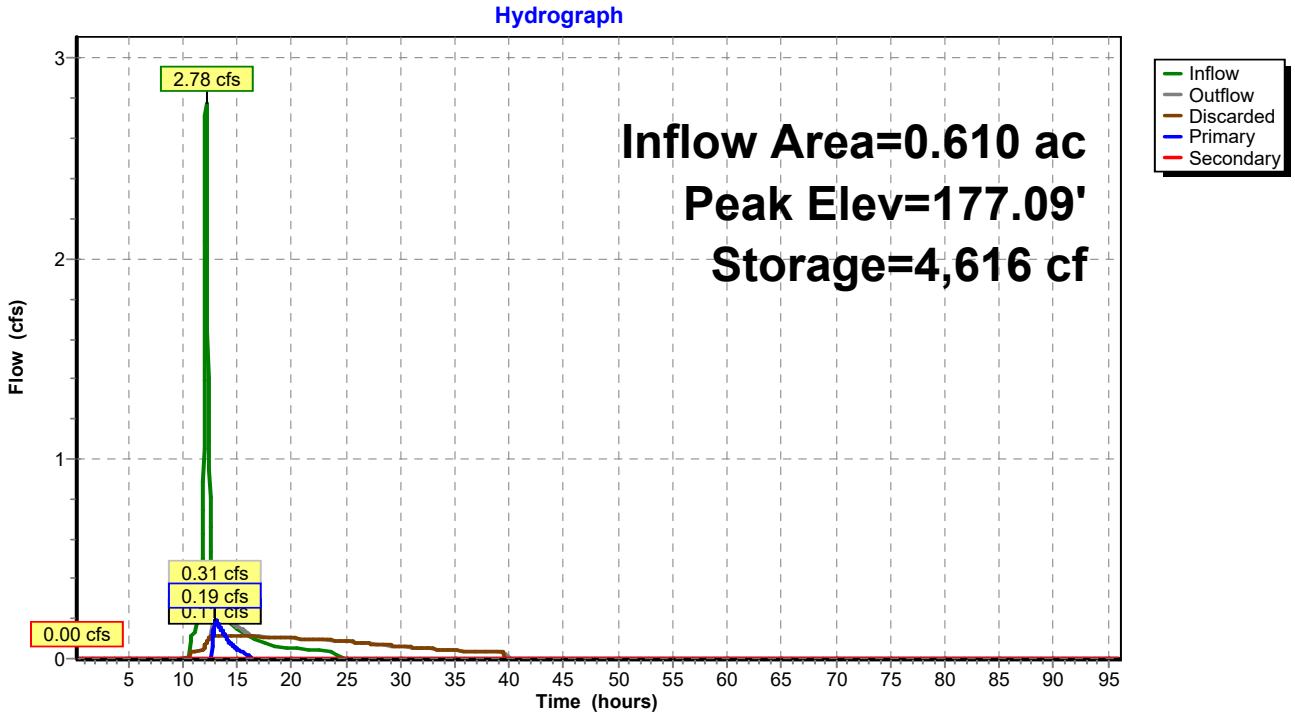
Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	175.00'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 175.00' / 174.50' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	177.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	177.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	178.00'	**16.0' 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=0.11 cfs @ 13.02 hrs HW=177.09' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.19 cfs @ 13.02 hrs HW=177.09' (Free Discharge)
└**2=Culvert** (Passes 0.19 cfs of 4.78 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 0.19 cfs @ 0.99 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
└**5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289
173.04	694	291
173.05	694	294
173.06	694	297
173.07	694	300
173.08	694	303
173.09	694	305
173.10	694	308
173.11	694	311
173.12	694	314
173.13	694	316
173.14	694	319
173.15	694	322
173.16	694	325
173.17	694	328
173.18	694	330
173.19	694	333
173.20	694	336
173.21	694	339
173.22	694	341
173.23	694	344
173.24	694	347
173.25	694	350
173.26	694	353
173.27	694	355
173.28	694	358
173.29	694	361
173.30	694	364
173.31	694	366
173.32	694	369
173.33	694	372
173.34	694	375
173.35	694	378
173.36	694	380
173.37	694	383
173.38	694	386
173.39	694	389
173.40	694	391
173.41	694	394
173.42	694	397
173.43	694	400
173.44	694	403
173.45	694	405
173.46	694	408
173.47	694	411
173.48	694	414
173.49	694	416
173.50	694	419
173.51	694	422
173.52	694	425
173.53	694	428
173.54	694	430
173.55	694	433
173.56	694	436
173.57	694	439
173.58	694	441
173.59	694	444
173.60	694	447
173.61	694	450
173.62	694	452
173.63	694	455
173.64	694	458
173.65	694	461
173.66	694	464
173.67	694	466
173.68	694	469
173.69	694	472
173.70	694	475
173.71	694	477
173.72	694	480
173.73	694	483
173.74	694	486
173.75	694	489
173.76	694	491
173.77	694	494
173.78	694	497
173.79	694	500
173.80	694	502
173.81	694	505
173.82	694	508
173.83	694	511
173.84	694	514
173.85	694	516
173.86	694	519
173.87	694	522
173.88	694	525
173.89	694	527
173.90	694	530
173.91	694	533
173.92	694	536
173.93	694	539
173.94	694	541
173.95	694	544
173.96	694	547
173.97	694	550
173.98	694	552
173.99	694	555
174.00	694	562
174.01	697	569
174.02	701	576
174.03	704	583
174.04	707	590
174.05	710	597
174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811	177.71	2,351	5,960
177.20	2,075	4,832	177.72	2,357	5,983
177.21	2,081	4,853	177.73	2,363	6,007
177.22	2,086	4,873	177.74	2,368	6,031
177.23	2,091	4,894	177.75	2,374	6,054
177.24	2,096	4,915	177.76	2,379	6,078
177.25	2,102	4,936	177.77	2,385	6,102
177.26	2,107	4,957	177.78	2,391	6,126
177.27	2,112	4,978	177.79	2,396	6,150
177.28	2,118	4,999	177.80	2,402	6,174
177.29	2,123	5,021	177.81	2,408	6,198
177.30	2,128	5,042	177.82	2,413	6,222
177.31	2,133	5,063	177.83	2,419	6,246
177.32	2,139	5,085	177.84	2,424	6,270
177.33	2,144	5,106	177.85	2,430	6,295
177.34	2,149	5,127	177.86	2,436	6,319
177.35	2,155	5,149	177.87	2,442	6,343
177.36	2,160	5,171	177.88	2,447	6,368
177.37	2,165	5,192	177.89	2,453	6,392
177.38	2,171	5,214	177.90	2,459	6,417
177.39	2,176	5,236	177.91	2,464	6,441
177.40	2,182	5,257	177.92	2,470	6,466
177.41	2,187	5,279	177.93	2,476	6,491
177.42	2,192	5,301	177.94	2,481	6,516
177.43	2,198	5,323	177.95	2,487	6,540
177.44	2,203	5,345	177.96	2,493	6,565
177.45	2,209	5,367	177.97	2,499	6,590
177.46	2,214	5,389	177.98	2,504	6,615
177.47	2,219	5,411	177.99	2,510	6,640
177.48	2,225	5,434	178.00	2,516	6,666
177.49	2,230	5,456	178.01	2,522	6,691
177.50	2,236	5,478	178.02	2,527	6,716
177.51	2,241	5,501	178.03	2,533	6,741
177.52	2,247	5,523	178.04	2,539	6,767
177.53	2,252	5,546	178.05	2,544	6,792
177.54	2,257	5,568	178.06	2,550	6,817
177.55	2,263	5,591	178.07	2,556	6,843
177.56	2,268	5,613	178.08	2,562	6,869
177.57	2,274	5,636	178.09	2,567	6,894
177.58	2,279	5,659	178.10	2,573	6,920
177.59	2,285	5,682	178.11	2,579	6,946
177.60	2,290	5,705	178.12	2,585	6,972
177.61	2,296	5,728	178.13	2,590	6,997
177.62	2,301	5,750	178.14	2,596	7,023
177.63	2,307	5,774	178.15	2,602	7,049
177.64	2,312	5,797	178.16	2,608	7,075
177.65	2,318	5,820	178.17	2,613	7,101
177.66	2,324	5,843	178.18	2,619	7,128
177.67	2,329	5,866	178.19	2,625	7,154
177.68	2,335	5,890	178.20	2,631	7,180
177.69	2,340	5,913	178.21	2,637	7,206
177.70	2,346	5,936	178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

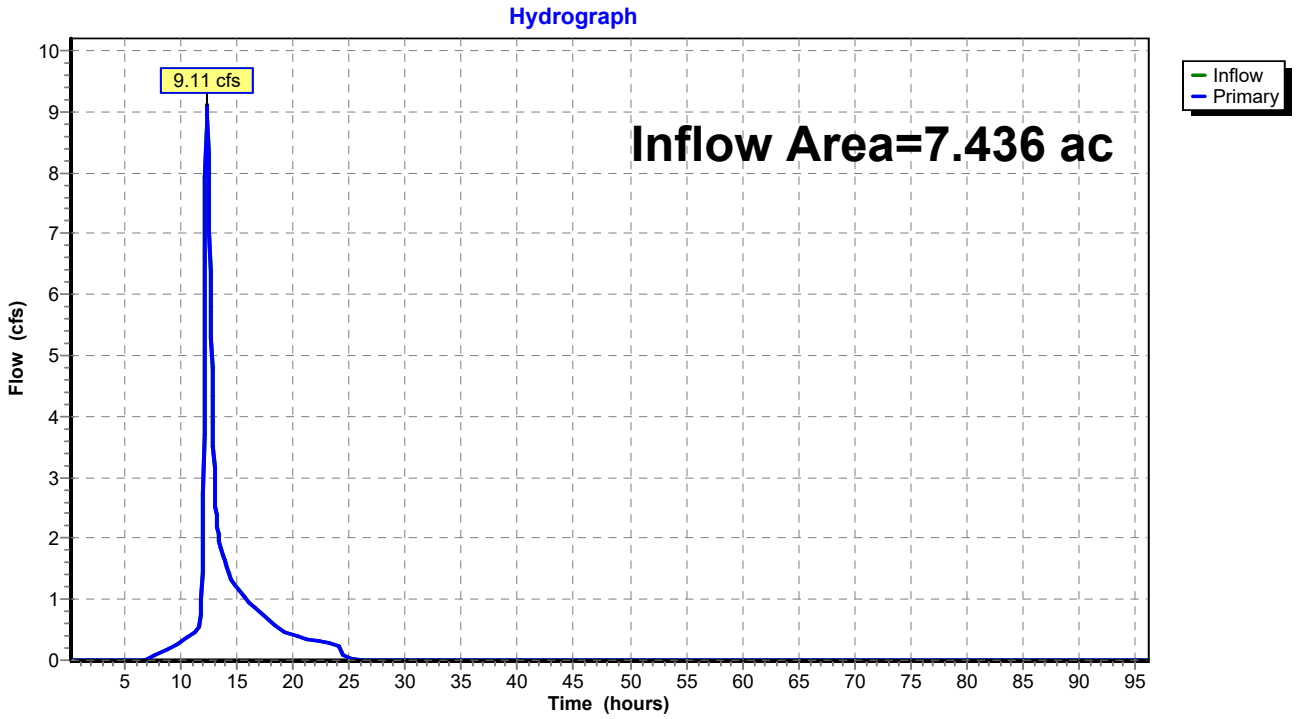
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Link POST-DP-1: Analysis Point

Inflow Area = 7.436 ac, 19.32% Impervious, Inflow Depth = 2.14" for 100-year event
Inflow = 9.11 cfs @ 12.37 hrs, Volume= 1.327 af
Primary = 9.11 cfs @ 12.37 hrs, Volume= 1.327 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs

Link POST-DP-1: Analysis Point



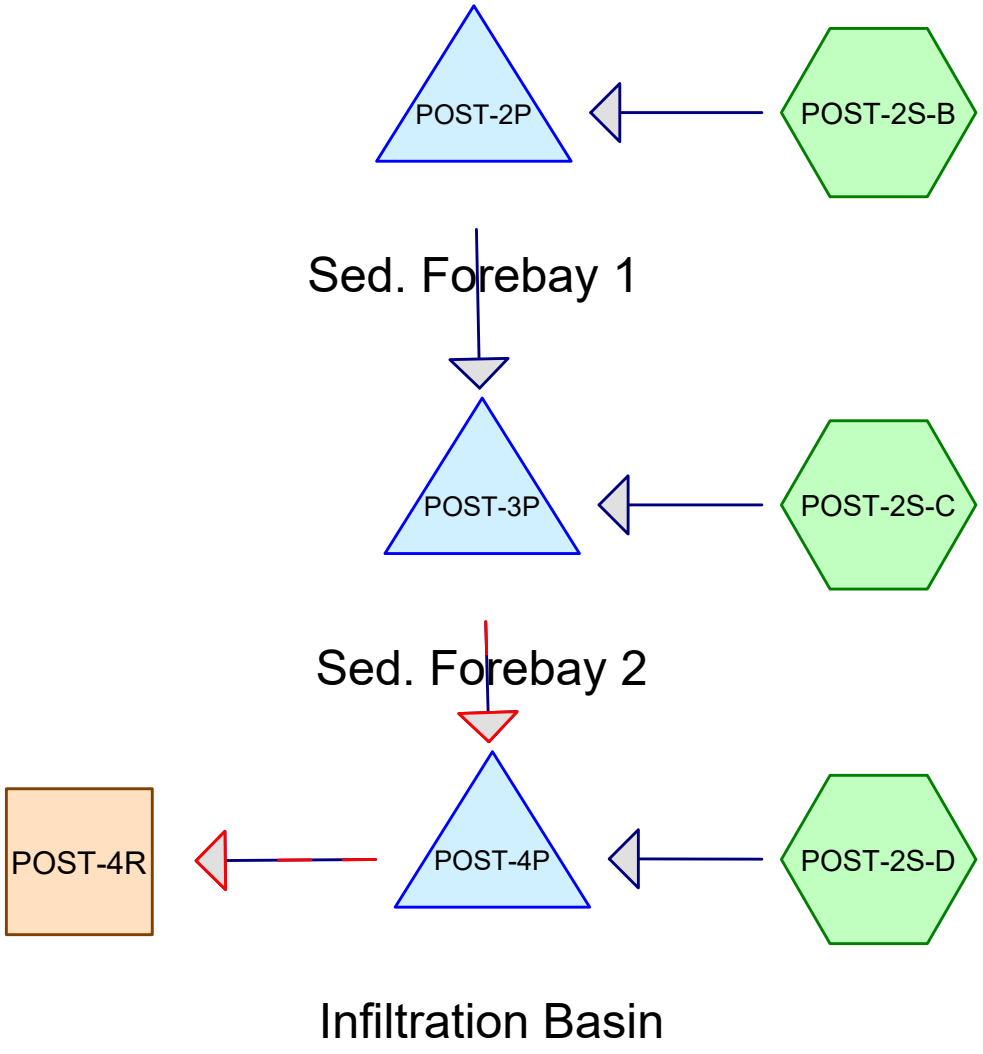
Summary for Pond 5P: Bogastere Swamp

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,426,972 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.00	572,472	0	0
146.00	1,417,717	1,990,189	1,990,189
148.00	1,635,524	3,053,241	5,043,430
150.00	1,748,018	3,383,542	8,426,972

Based on the HydroCAD model, the proposed development will cause a runoff volume increase of **0.023 af (or 1,002 CF)** and peak runoff rate increase of **0.19 cfs** for the 100-year 24-hour design storm to the downgradient area. As shown by the stage-storage volume table above, the Bogastere Swamp study area (as depicted in the Bogastere Swamp Assessment Plan, Sheet SW3.00) has a storage capacity of **8,426,972 CF**, as assessed up to elevation 150ft. The increased runoff volume from the proposed development would only occupy **0.012%** of the Bogastere Swamp study area. The actual storage capacity of Bogastere Swamp is much larger and therefore, the increased runoff volume resulting from post-development conditions does not increase the risk of offsite flooding.

EMERGENCY SPILLWAY



Subcat Reach Pond Link

Routing Diagram for Holliston - Stormwater Model_Emergency Spillway
Prepared by TRC, Printed 6/16/2023
HydroCAD® 10.10-5a s/n 01402 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.21	2
2	10-year	Type III 24-hr		Default	24.00	1	4.81	2
3	25-year	Type III 24-hr		Default	24.00	1	6.06	2
4	100-year	Type III 24-hr		Default	24.00	1	8.61	2

Summary for Subcatchment POST-2S-B:

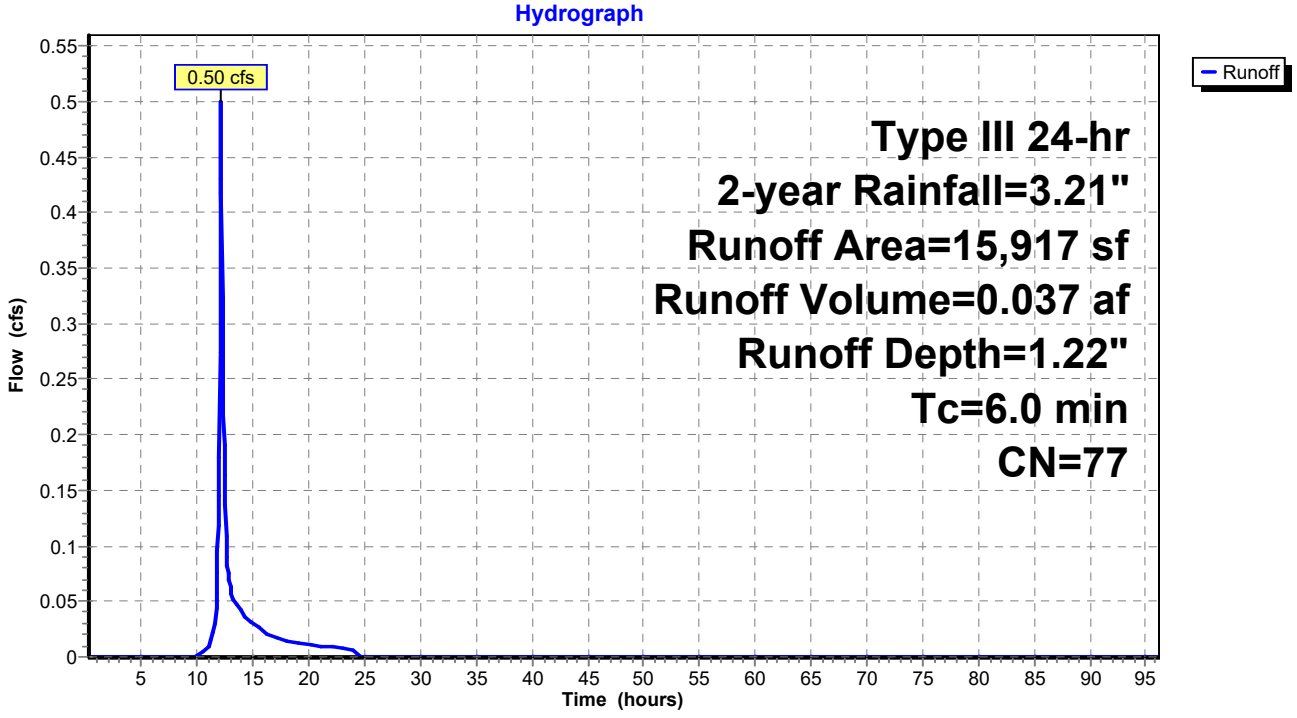
Runoff = 0.50 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

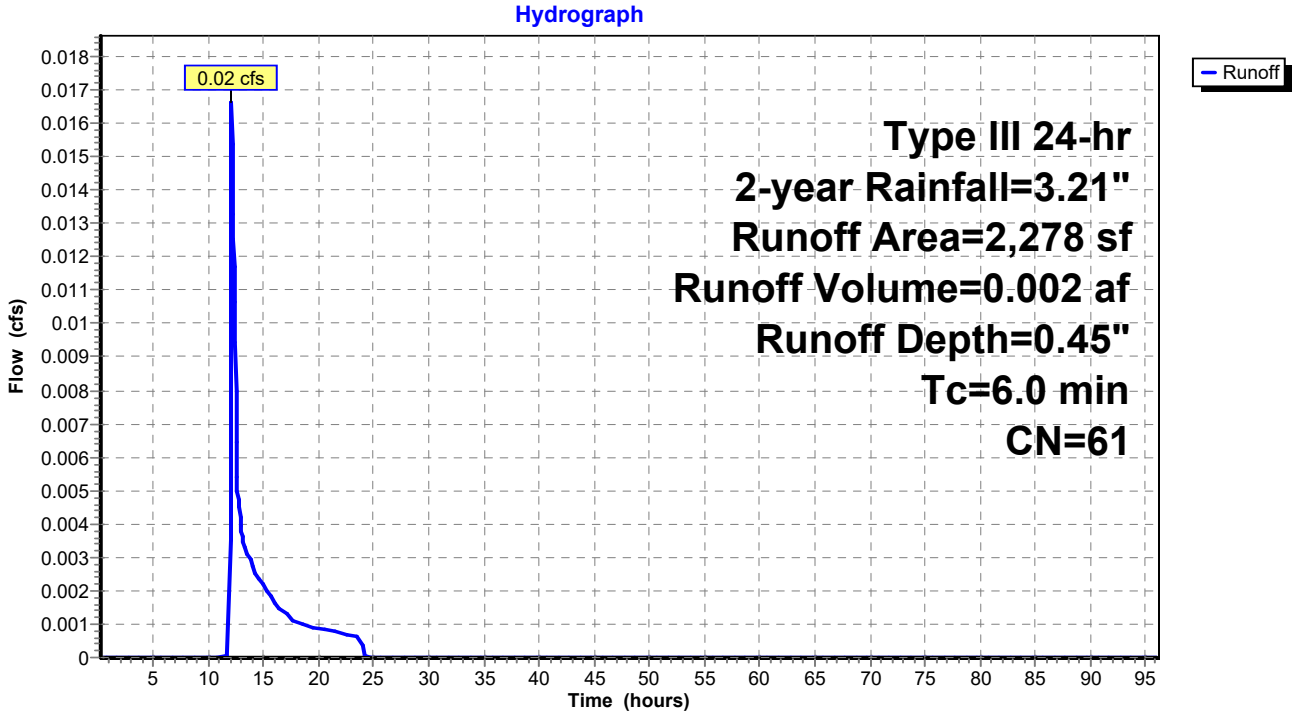
Runoff = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

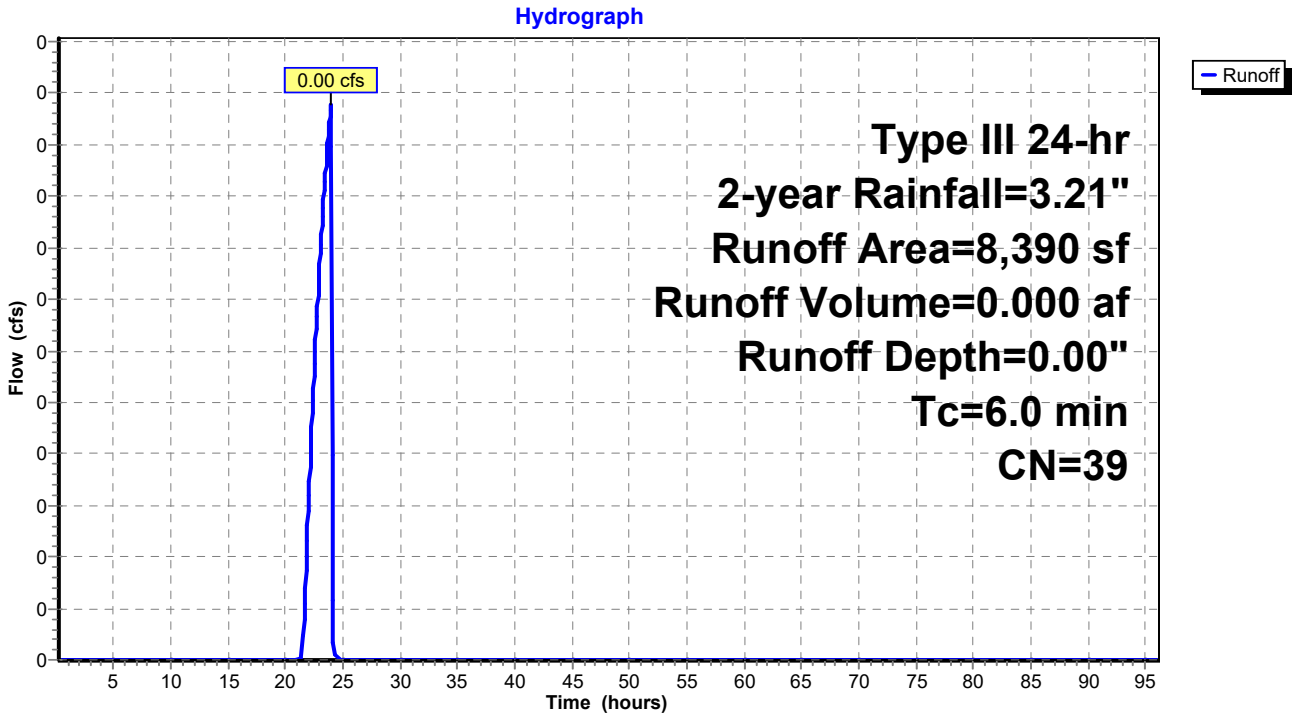
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.21"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

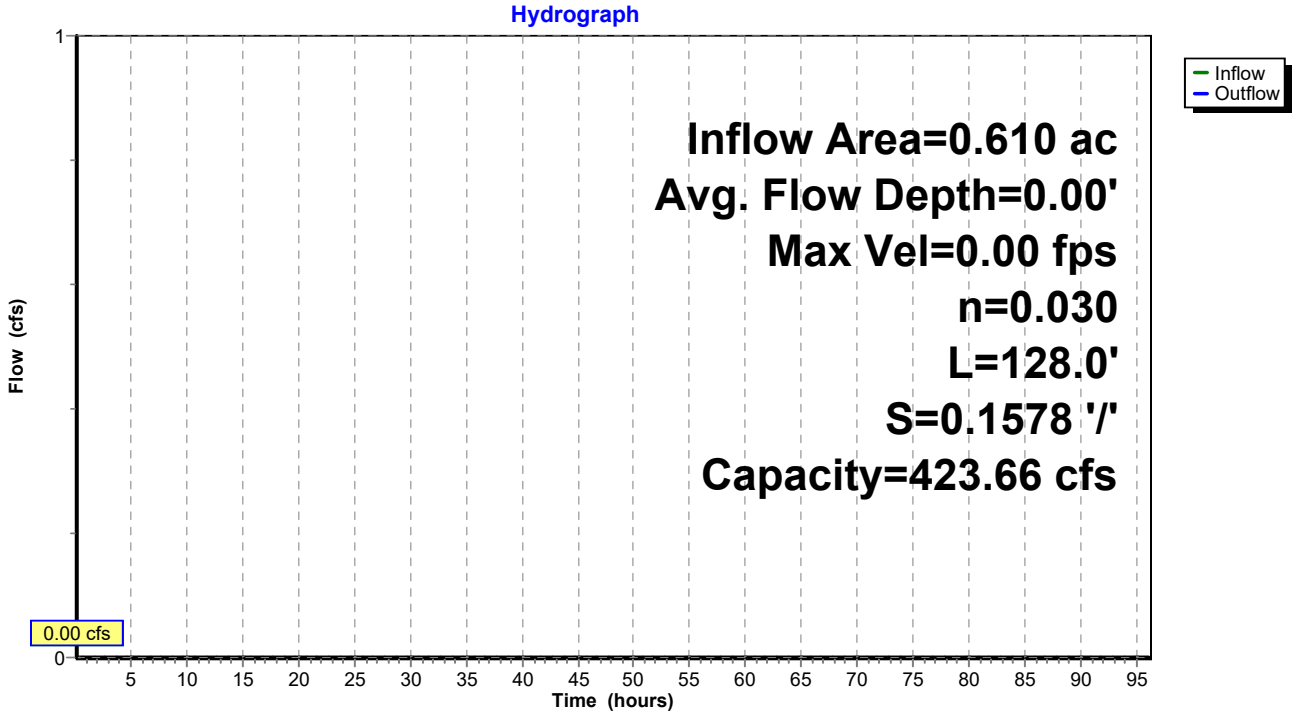
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 1.22" for 2-year event
Inflow = 0.50 cfs @ 12.10 hrs, Volume= 0.037 af
Outflow = 0.48 cfs @ 12.15 hrs, Volume= 0.030 af, Atten= 3%, Lag= 3.1 min
Primary = 0.48 cfs @ 12.15 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.07' @ 12.15 hrs Surf.Area= 533 sf Storage= 333 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 110.6 min calculated for 0.030 af (82% of inflow)
Center-of-Mass det. time= 34.4 min (886.6 - 852.2)

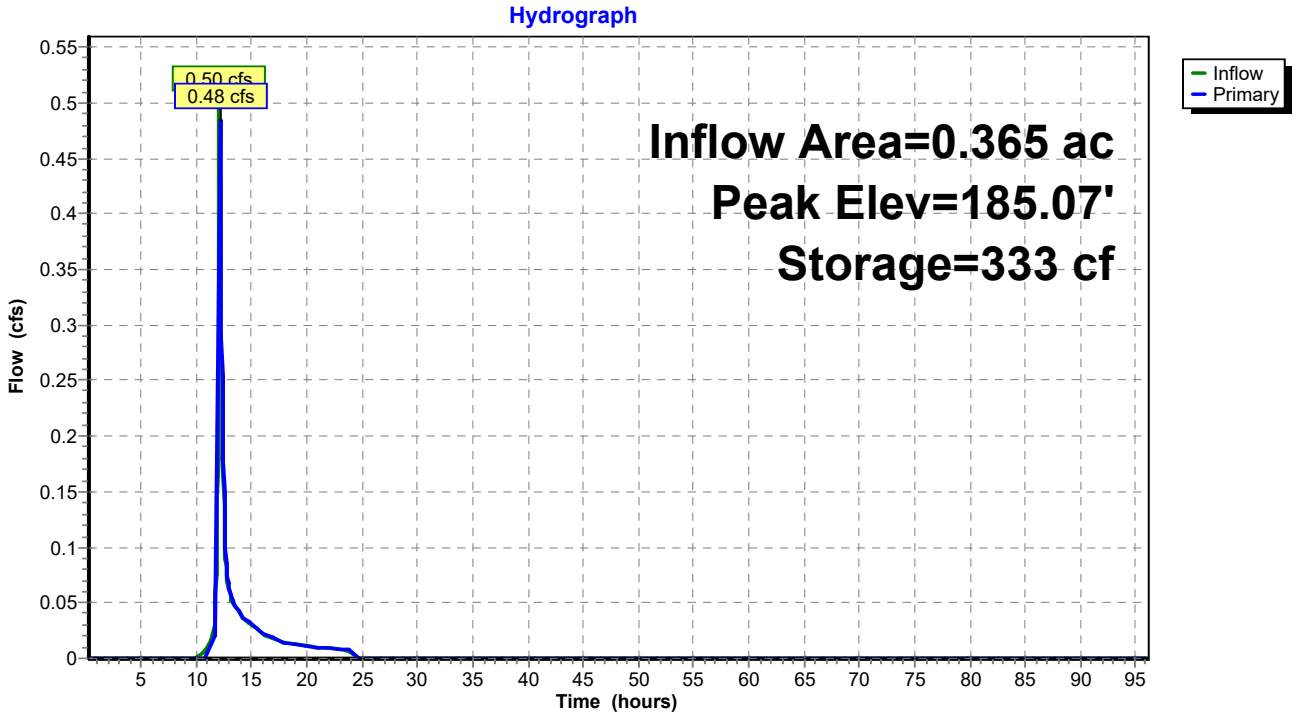
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.48 cfs @ 12.15 hrs HW=185.07' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.48 cfs @ 0.65 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 0.93" for 2-year event
Inflow = 0.50 cfs @ 12.15 hrs, Volume= 0.032 af
Outflow = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af, Atten= 44%, Lag= 9.3 min
Primary = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.12' @ 12.31 hrs Surf.Area= 370 sf Storage= 232 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 90.4 min calculated for 0.028 af (87% of inflow)
Center-of-Mass det. time= 29.4 min (917.7 - 888.3)

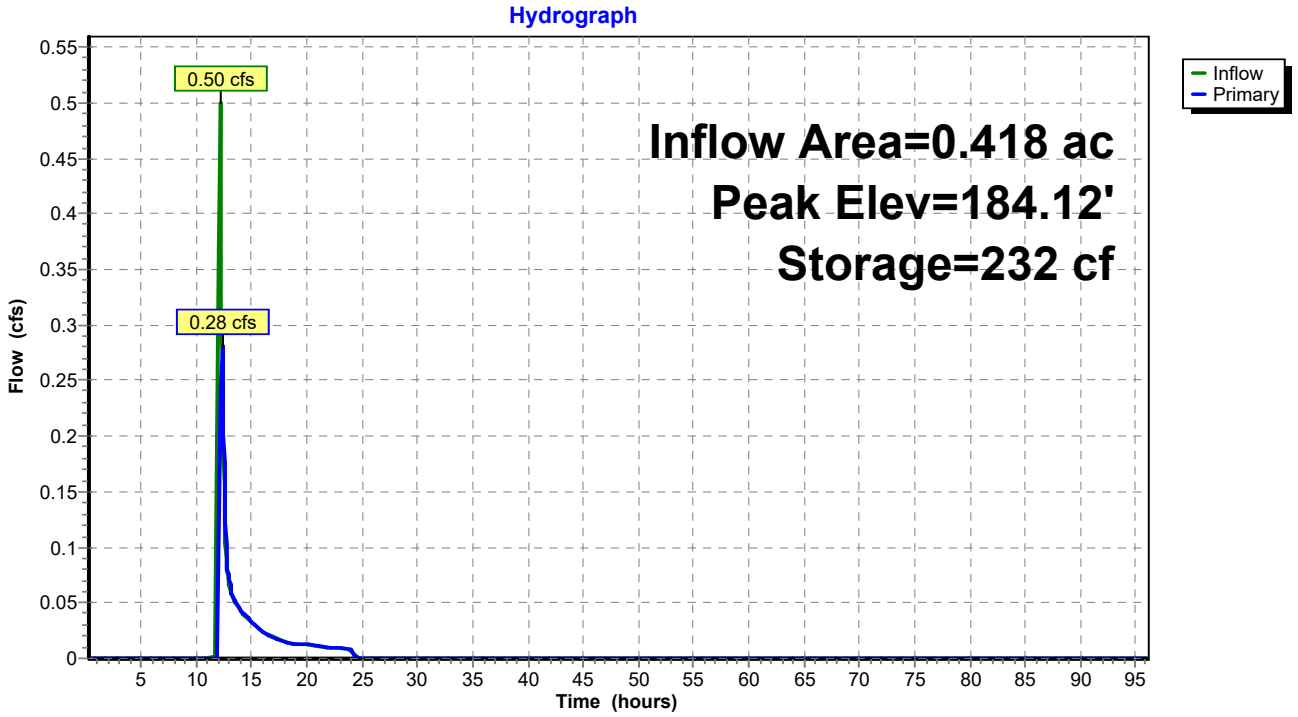
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 12.31 hrs HW=184.12' (Free Discharge)
└**1=Culvert** (Passes 0.28 cfs of 7.20 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.13 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.55" for 2-year event
Inflow = 0.28 cfs @ 12.31 hrs, Volume= 0.028 af
Outflow = 0.04 cfs @ 12.25 hrs, Volume= 0.028 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.04 cfs @ 12.25 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 173.26' @ 14.33 hrs Surf.Area= 694 sf Storage= 352 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 90.0 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 89.6 min (1,007.3 - 917.8)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

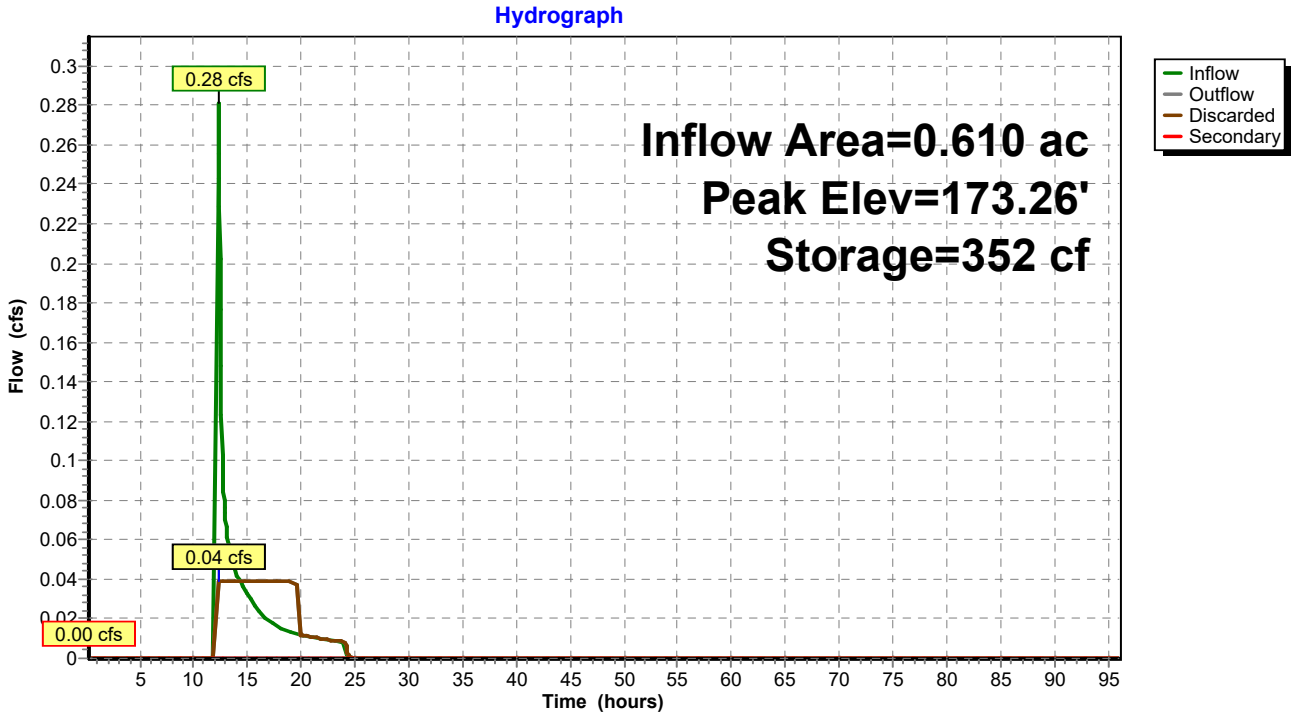
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Secondary	178.00'	**16.0' 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=0.04 cfs @ 12.25 hrs HW=172.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811
177.20	2,075	4,832
177.21	2,081	4,853
177.22	2,086	4,873
177.23	2,091	4,894
177.24	2,096	4,915
177.25	2,102	4,936
177.26	2,107	4,957
177.27	2,112	4,978
177.28	2,118	4,999
177.29	2,123	5,021
177.30	2,128	5,042
177.31	2,133	5,063
177.32	2,139	5,085
177.33	2,144	5,106
177.34	2,149	5,127
177.35	2,155	5,149
177.36	2,160	5,171
177.37	2,165	5,192
177.38	2,171	5,214
177.39	2,176	5,236
177.40	2,182	5,257
177.41	2,187	5,279
177.42	2,192	5,301
177.43	2,198	5,323
177.44	2,203	5,345
177.45	2,209	5,367
177.46	2,214	5,389
177.47	2,219	5,411
177.48	2,225	5,434
177.49	2,230	5,456
177.50	2,236	5,478
177.51	2,241	5,501
177.52	2,247	5,523
177.53	2,252	5,546
177.54	2,257	5,568
177.55	2,263	5,591
177.56	2,268	5,613
177.57	2,274	5,636
177.58	2,279	5,659
177.59	2,285	5,682
177.60	2,290	5,705
177.61	2,296	5,728
177.62	2,301	5,750
177.63	2,307	5,774
177.64	2,312	5,797
177.65	2,318	5,820
177.66	2,324	5,843
177.67	2,329	5,866
177.68	2,335	5,890
177.69	2,340	5,913
177.70	2,346	5,936
177.71	2,351	5,960
177.72	2,357	5,983
177.73	2,363	6,007
177.74	2,368	6,031
177.75	2,374	6,054
177.76	2,379	6,078
177.77	2,385	6,102
177.78	2,391	6,126
177.79	2,396	6,150
177.80	2,402	6,174
177.81	2,408	6,198
177.82	2,413	6,222
177.83	2,419	6,246
177.84	2,424	6,270
177.85	2,430	6,295
177.86	2,436	6,319
177.87	2,442	6,343
177.88	2,447	6,368
177.89	2,453	6,392
177.90	2,459	6,417
177.91	2,464	6,441
177.92	2,470	6,466
177.93	2,476	6,491
177.94	2,481	6,516
177.95	2,487	6,540
177.96	2,493	6,565
177.97	2,499	6,590
177.98	2,504	6,615
177.99	2,510	6,640
178.00	2,516	6,666
178.01	2,522	6,691
178.02	2,527	6,716
178.03	2,533	6,741
178.04	2,539	6,767
178.05	2,544	6,792
178.06	2,550	6,817
178.07	2,556	6,843
178.08	2,562	6,869
178.09	2,567	6,894
178.10	2,573	6,920
178.11	2,579	6,946
178.12	2,585	6,972
178.13	2,590	6,997
178.14	2,596	7,023
178.15	2,602	7,049
178.16	2,608	7,075
178.17	2,613	7,101
178.18	2,619	7,128
178.19	2,625	7,154
178.20	2,631	7,180
178.21	2,637	7,206
178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Subcatchment POST-2S-B:

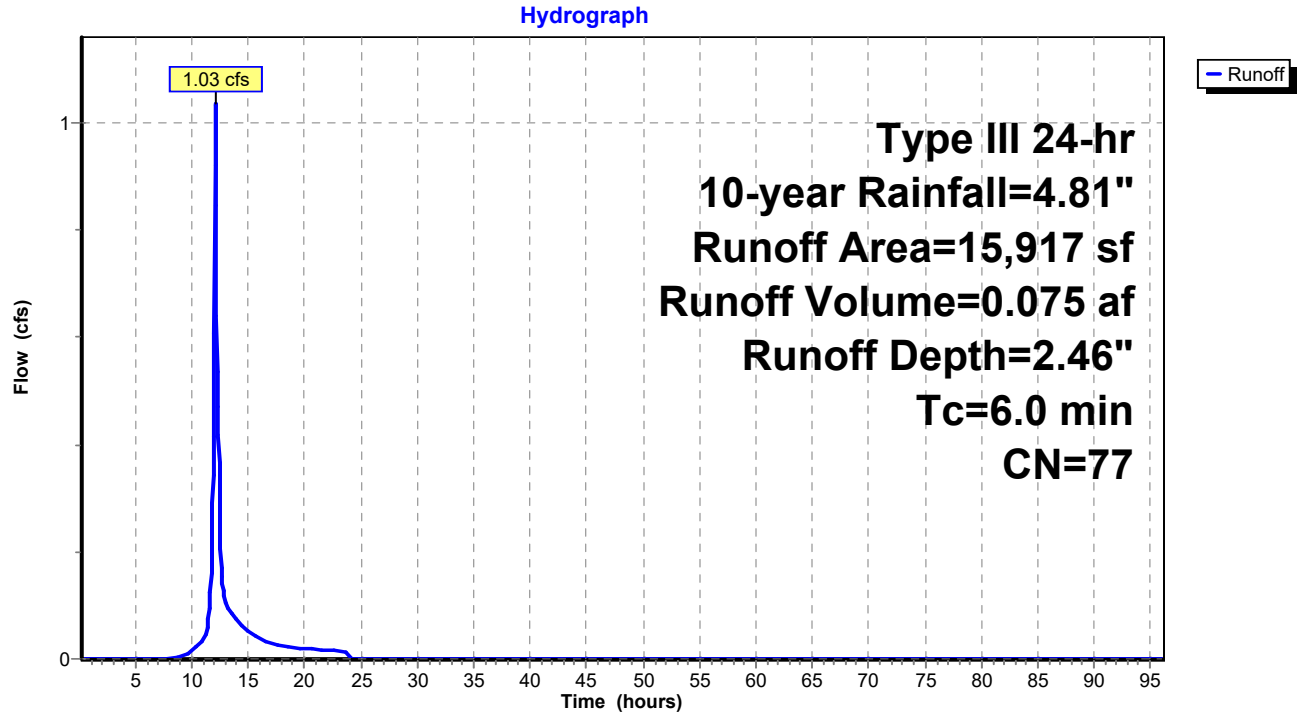
Runoff = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

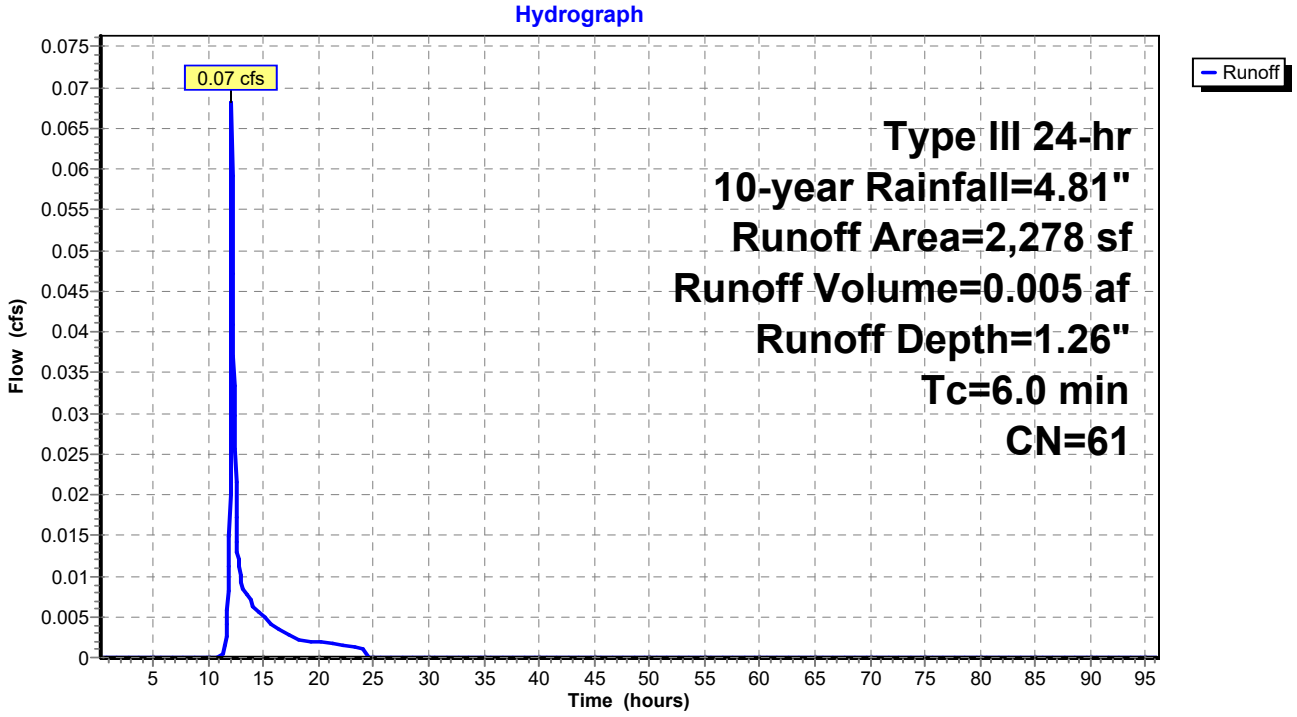
Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

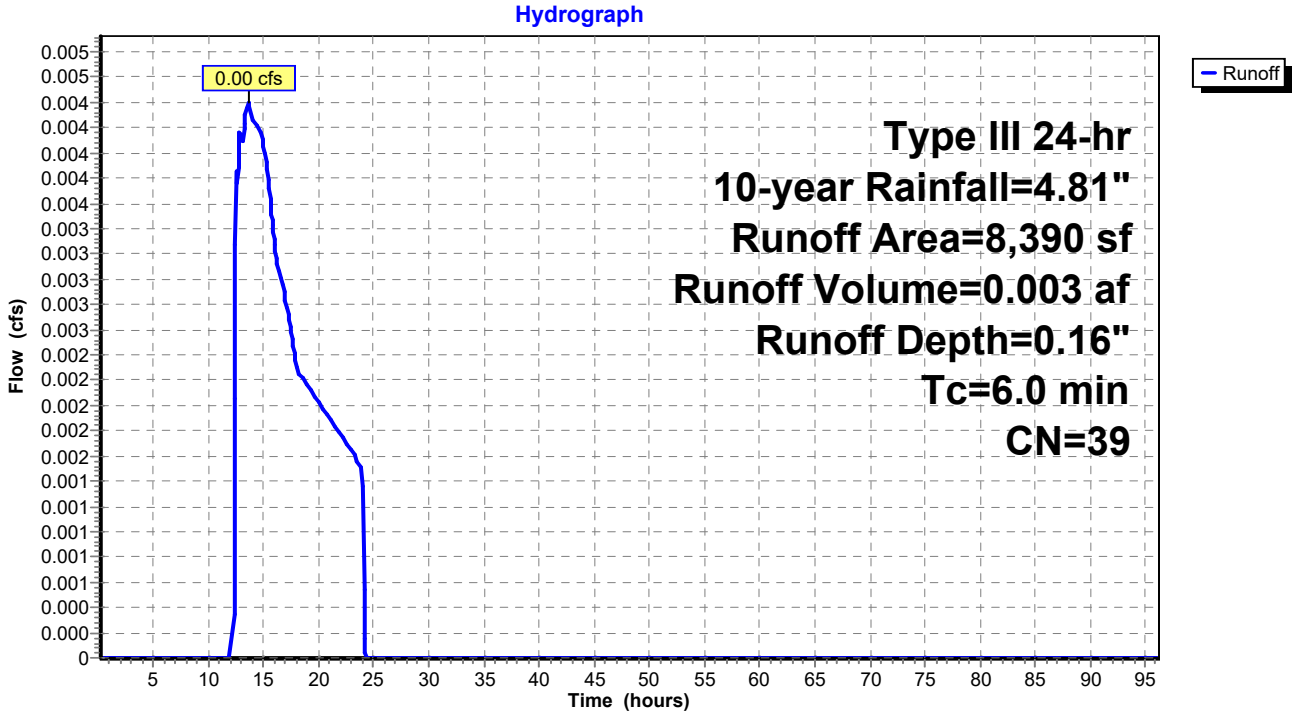
Runoff = 0.00 cfs @ 13.66 hrs, Volume= 0.003 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.81"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 10-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

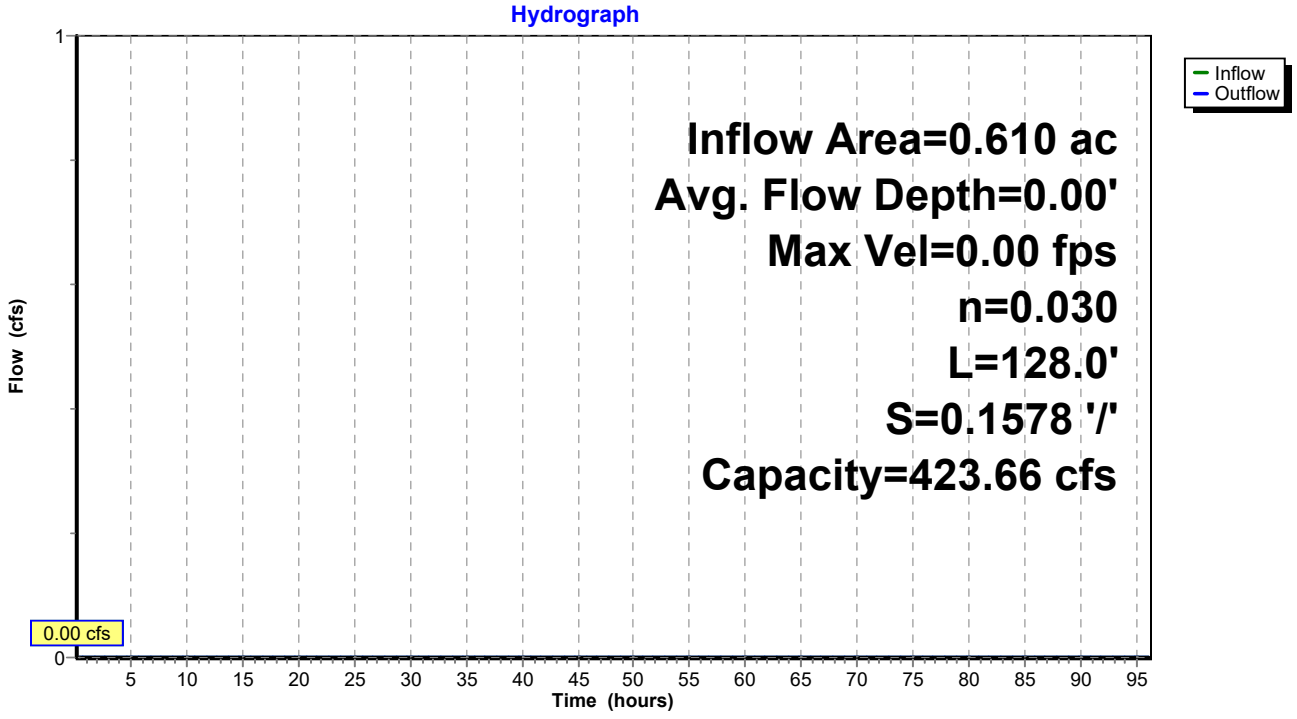
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 2.46" for 10-year event
Inflow = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af
Outflow = 1.03 cfs @ 12.11 hrs, Volume= 0.068 af, Atten= 1%, Lag= 0.8 min
Primary = 1.03 cfs @ 12.11 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.12' @ 12.11 hrs Surf.Area= 553 sf Storage= 359 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 63.9 min calculated for 0.068 af (91% of inflow)
Center-of-Mass det. time= 19.1 min (850.6 - 831.5)

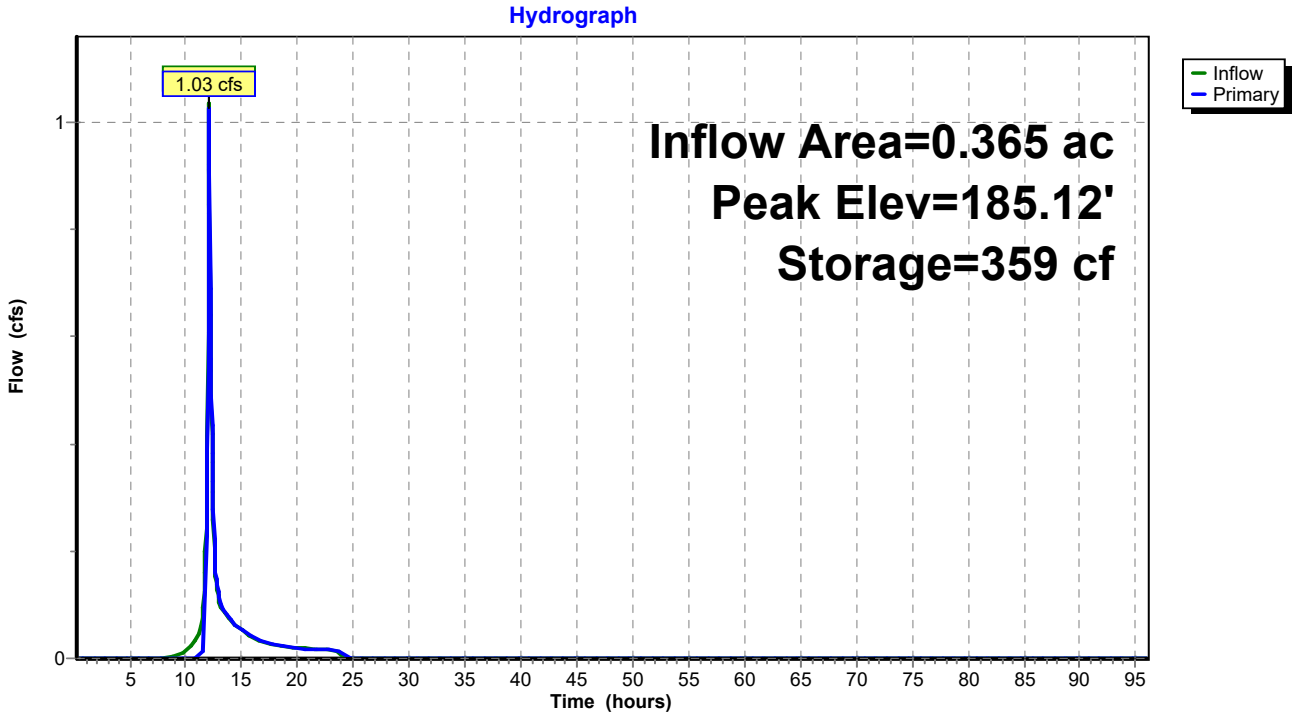
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.01 cfs @ 12.11 hrs HW=185.12' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 0.83 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 2.12" for 10-year event
Inflow = 1.09 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 1.05 cfs @ 12.13 hrs, Volume= 0.069 af, Atten= 4%, Lag= 1.6 min
Primary = 1.05 cfs @ 12.13 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.30' @ 12.13 hrs Surf.Area= 420 sf Storage= 301 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 43.2 min calculated for 0.069 af (94% of inflow)
Center-of-Mass det. time= 12.3 min (864.7 - 852.4)

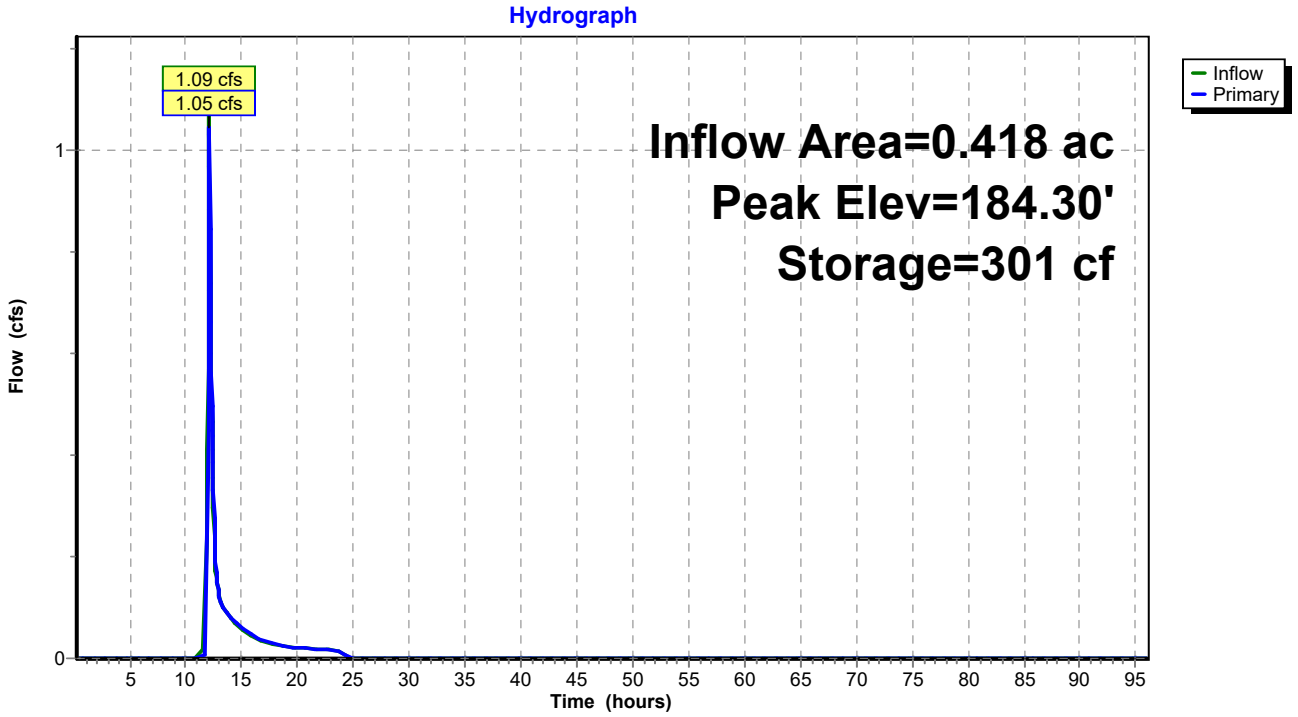
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=184.29' (Free Discharge)
└**1=Culvert** (Passes 1.02 cfs of 7.37 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 1.74 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 1.42" for 10-year event
Inflow = 1.05 cfs @ 12.13 hrs, Volume= 0.072 af
Outflow = 0.06 cfs @ 15.15 hrs, Volume= 0.072 af, Atten= 94%, Lag= 181.0 min
Discarded = 0.06 cfs @ 15.15 hrs, Volume= 0.072 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 175.13' @ 15.15 hrs Surf.Area= 1,108 sf Storage= 1,569 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 323.5 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 323.5 min (1,194.0 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

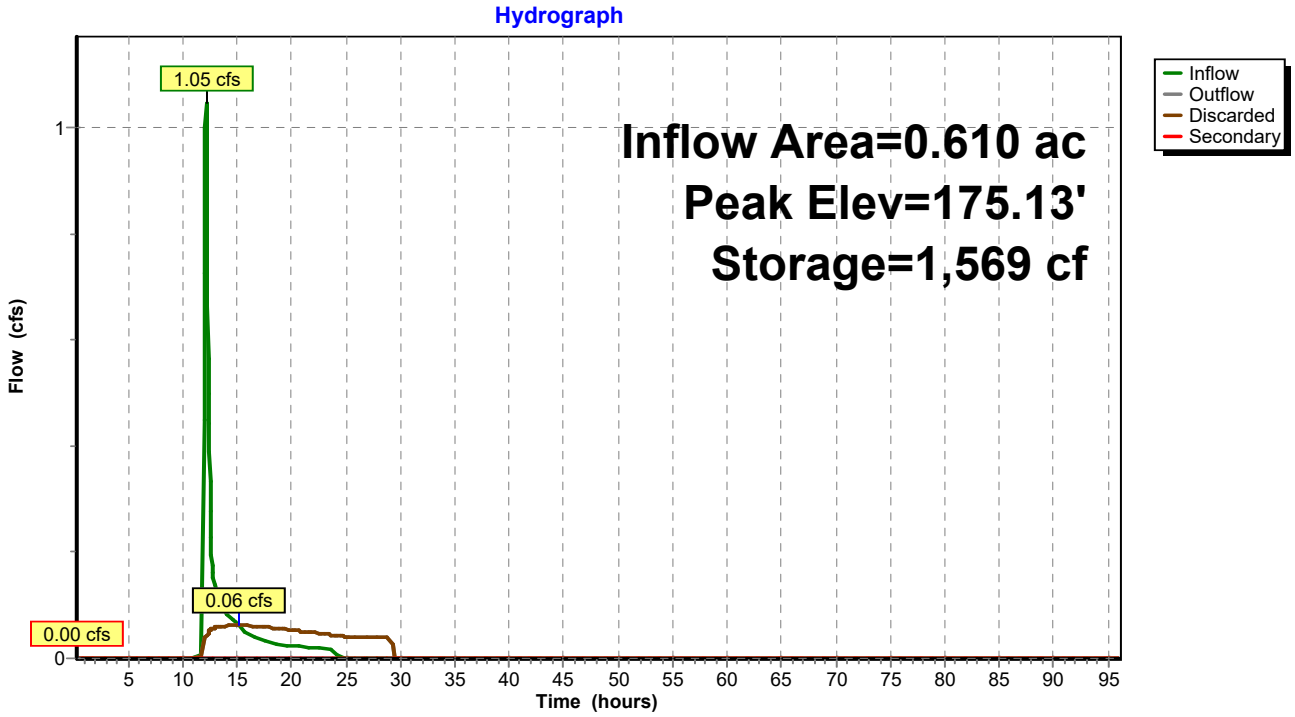
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Secondary	178.00'	**16.0' 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=0.06 cfs @ 15.15 hrs HW=175.13' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550	175.63	1,323	2,179
175.12	1,105	1,561	175.64	1,328	2,192
175.13	1,109	1,572	175.65	1,332	2,205
175.14	1,113	1,583	175.66	1,337	2,219
175.15	1,117	1,594	175.67	1,341	2,232
175.16	1,121	1,605	175.68	1,346	2,246
175.17	1,125	1,616	175.69	1,350	2,259
175.18	1,129	1,628	175.70	1,355	2,273
175.19	1,133	1,639	175.71	1,359	2,286
175.20	1,138	1,650	175.72	1,364	2,300
175.21	1,142	1,662	175.73	1,368	2,313
175.22	1,146	1,673	175.74	1,373	2,327
175.23	1,150	1,685	175.75	1,377	2,341
175.24	1,154	1,696	175.76	1,382	2,355
175.25	1,158	1,708	175.77	1,387	2,368
175.26	1,163	1,719	175.78	1,391	2,382
175.27	1,167	1,731	175.79	1,396	2,396
175.28	1,171	1,743	175.80	1,400	2,410
175.29	1,175	1,754	175.81	1,405	2,424
175.30	1,180	1,766	175.82	1,410	2,438
175.31	1,184	1,778	175.83	1,414	2,452
175.32	1,188	1,790	175.84	1,419	2,467
175.33	1,192	1,802	175.85	1,423	2,481
175.34	1,197	1,814	175.86	1,428	2,495
175.35	1,201	1,826	175.87	1,433	2,509
175.36	1,205	1,838	175.88	1,437	2,524
175.37	1,209	1,850	175.89	1,442	2,538
175.38	1,214	1,862	175.90	1,447	2,553
175.39	1,218	1,874	175.91	1,451	2,567
175.40	1,222	1,886	175.92	1,456	2,582
175.41	1,226	1,898	175.93	1,461	2,596
175.42	1,231	1,911	175.94	1,466	2,611
175.43	1,235	1,923	175.95	1,470	2,626
175.44	1,239	1,935	175.96	1,475	2,640
175.45	1,244	1,948	175.97	1,480	2,655
175.46	1,248	1,960	175.98	1,485	2,670
175.47	1,252	1,973	175.99	1,489	2,685
175.48	1,257	1,985	176.00	1,494	2,700
175.49	1,261	1,998	176.01	1,498	2,715
175.50	1,266	2,011	176.02	1,503	2,730
175.51	1,270	2,023	176.03	1,507	2,745
175.52	1,274	2,036	176.04	1,512	2,760
175.53	1,279	2,049	176.05	1,516	2,775
175.54	1,283	2,062	176.06	1,521	2,790
175.55	1,288	2,074	176.07	1,525	2,805
175.56	1,292	2,087	176.08	1,530	2,821
175.57	1,296	2,100	176.09	1,534	2,836
175.58	1,301	2,113	176.10	1,539	2,851
175.59	1,305	2,126	176.11	1,543	2,867
175.60	1,310	2,139	176.12	1,548	2,882
175.61	1,314	2,152	176.13	1,552	2,898
175.62	1,319	2,166	176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811	177.71	2,351	5,960
177.20	2,075	4,832	177.72	2,357	5,983
177.21	2,081	4,853	177.73	2,363	6,007
177.22	2,086	4,873	177.74	2,368	6,031
177.23	2,091	4,894	177.75	2,374	6,054
177.24	2,096	4,915	177.76	2,379	6,078
177.25	2,102	4,936	177.77	2,385	6,102
177.26	2,107	4,957	177.78	2,391	6,126
177.27	2,112	4,978	177.79	2,396	6,150
177.28	2,118	4,999	177.80	2,402	6,174
177.29	2,123	5,021	177.81	2,408	6,198
177.30	2,128	5,042	177.82	2,413	6,222
177.31	2,133	5,063	177.83	2,419	6,246
177.32	2,139	5,085	177.84	2,424	6,270
177.33	2,144	5,106	177.85	2,430	6,295
177.34	2,149	5,127	177.86	2,436	6,319
177.35	2,155	5,149	177.87	2,442	6,343
177.36	2,160	5,171	177.88	2,447	6,368
177.37	2,165	5,192	177.89	2,453	6,392
177.38	2,171	5,214	177.90	2,459	6,417
177.39	2,176	5,236	177.91	2,464	6,441
177.40	2,182	5,257	177.92	2,470	6,466
177.41	2,187	5,279	177.93	2,476	6,491
177.42	2,192	5,301	177.94	2,481	6,516
177.43	2,198	5,323	177.95	2,487	6,540
177.44	2,203	5,345	177.96	2,493	6,565
177.45	2,209	5,367	177.97	2,499	6,590
177.46	2,214	5,389	177.98	2,504	6,615
177.47	2,219	5,411	177.99	2,510	6,640
177.48	2,225	5,434	178.00	2,516	6,666
177.49	2,230	5,456	178.01	2,522	6,691
177.50	2,236	5,478	178.02	2,527	6,716
177.51	2,241	5,501	178.03	2,533	6,741
177.52	2,247	5,523	178.04	2,539	6,767
177.53	2,252	5,546	178.05	2,544	6,792
177.54	2,257	5,568	178.06	2,550	6,817
177.55	2,263	5,591	178.07	2,556	6,843
177.56	2,268	5,613	178.08	2,562	6,869
177.57	2,274	5,636	178.09	2,567	6,894
177.58	2,279	5,659	178.10	2,573	6,920
177.59	2,285	5,682	178.11	2,579	6,946
177.60	2,290	5,705	178.12	2,585	6,972
177.61	2,296	5,728	178.13	2,590	6,997
177.62	2,301	5,750	178.14	2,596	7,023
177.63	2,307	5,774	178.15	2,602	7,049
177.64	2,312	5,797	178.16	2,608	7,075
177.65	2,318	5,820	178.17	2,613	7,101
177.66	2,324	5,843	178.18	2,619	7,128
177.67	2,329	5,866	178.19	2,625	7,154
177.68	2,335	5,890	178.20	2,631	7,180
177.69	2,340	5,913	178.21	2,637	7,206
177.70	2,346	5,936	178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Subcatchment POST-2S-B:

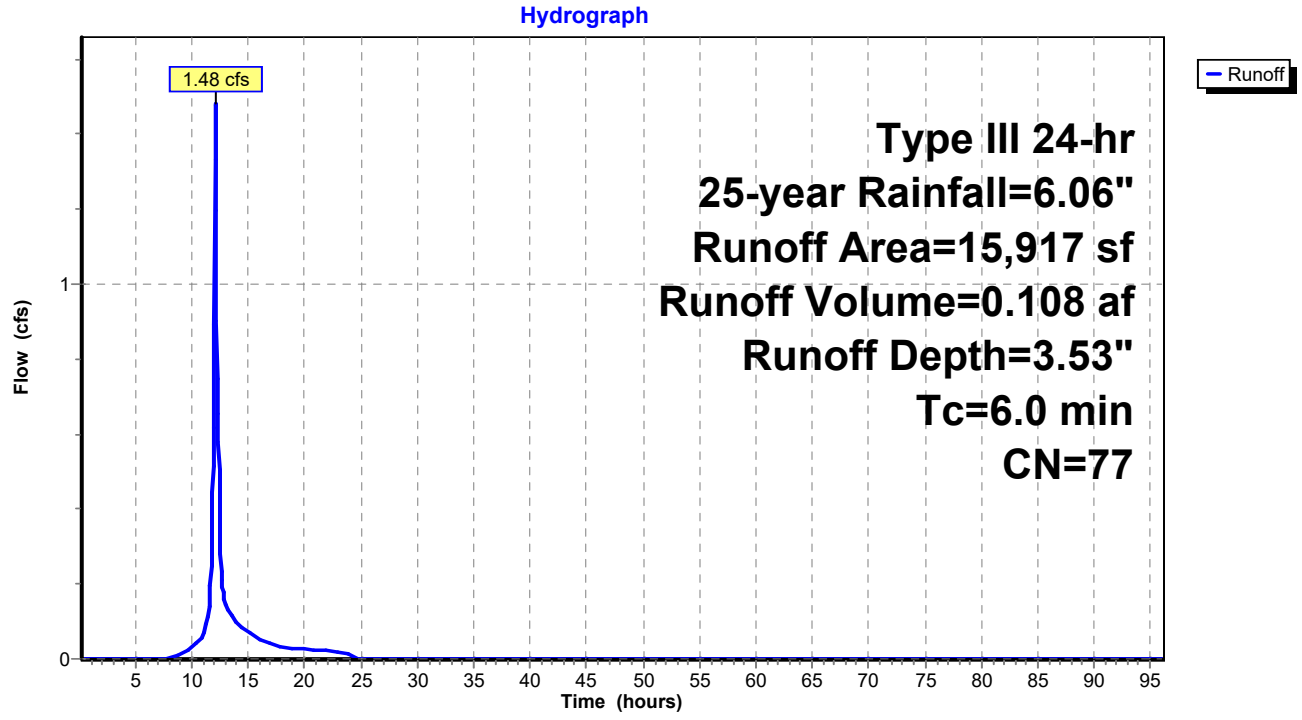
Runoff = 1.48 cfs @ 12.09 hrs, Volume= 0.108 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

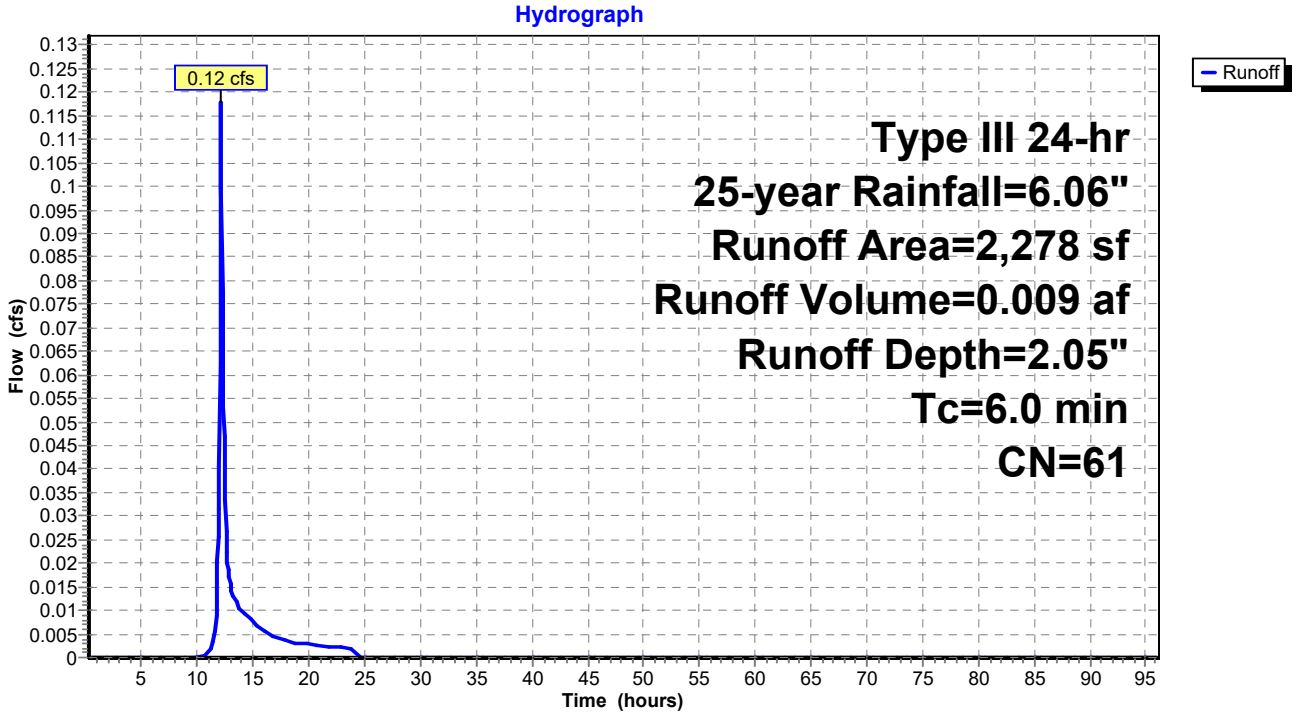
Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

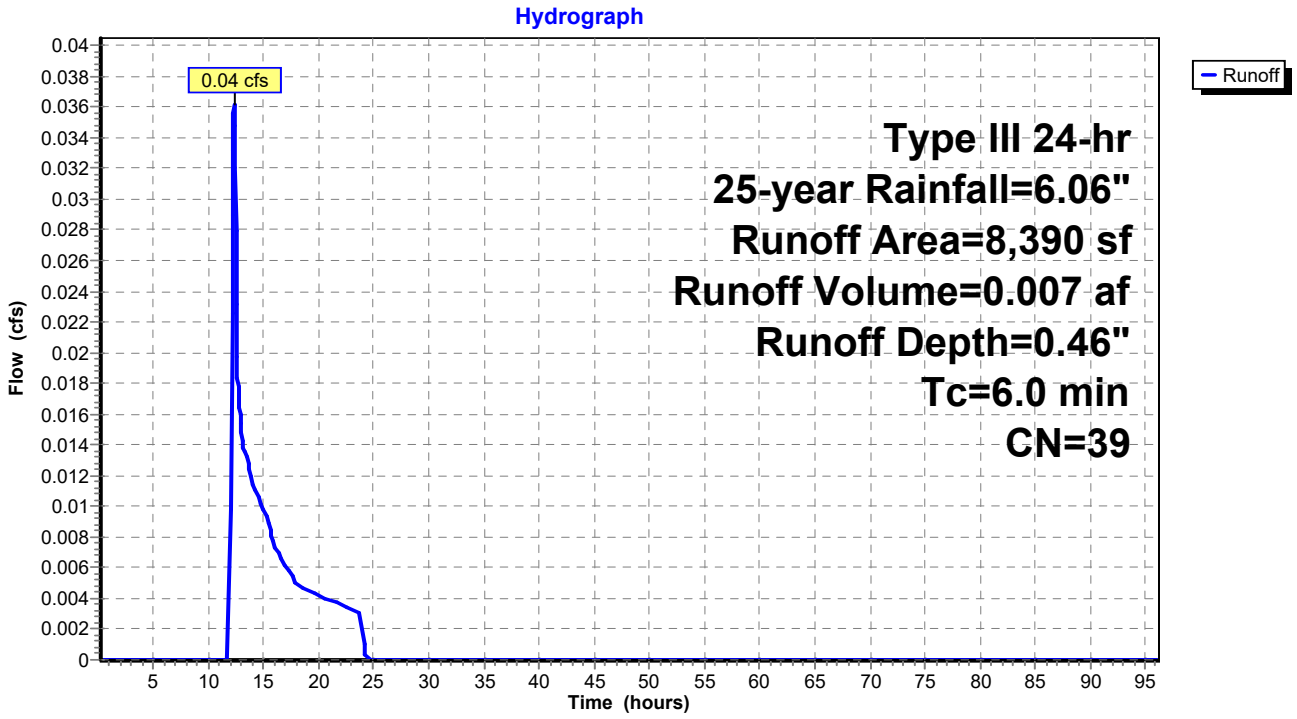
Runoff = 0.04 cfs @ 12.34 hrs, Volume= 0.007 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.06"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 25-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

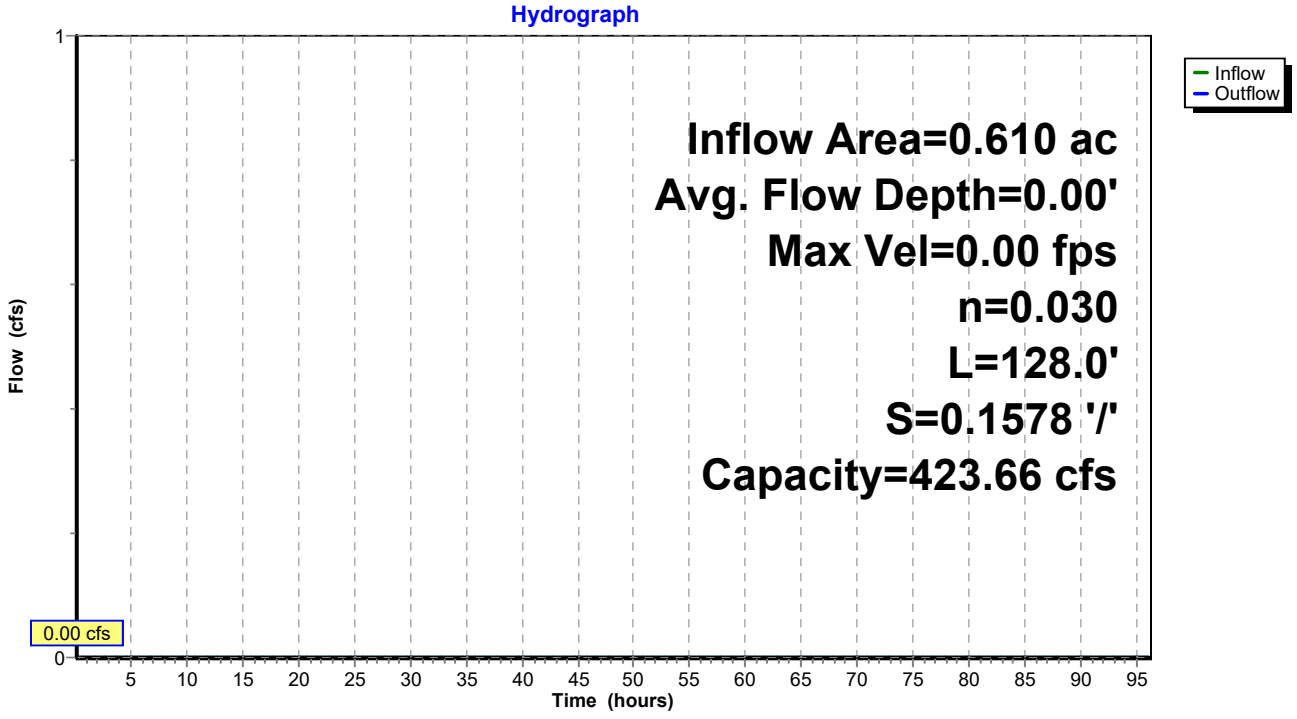
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 3.53" for 25-year event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.108 af
Outflow = 1.48 cfs @ 12.10 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.7 min
Primary = 1.48 cfs @ 12.10 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.16' @ 12.10 hrs Surf.Area= 567 sf Storage= 378 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 49.3 min calculated for 0.101 af (94% of inflow)
Center-of-Mass det. time= 15.9 min (837.1 - 821.2)

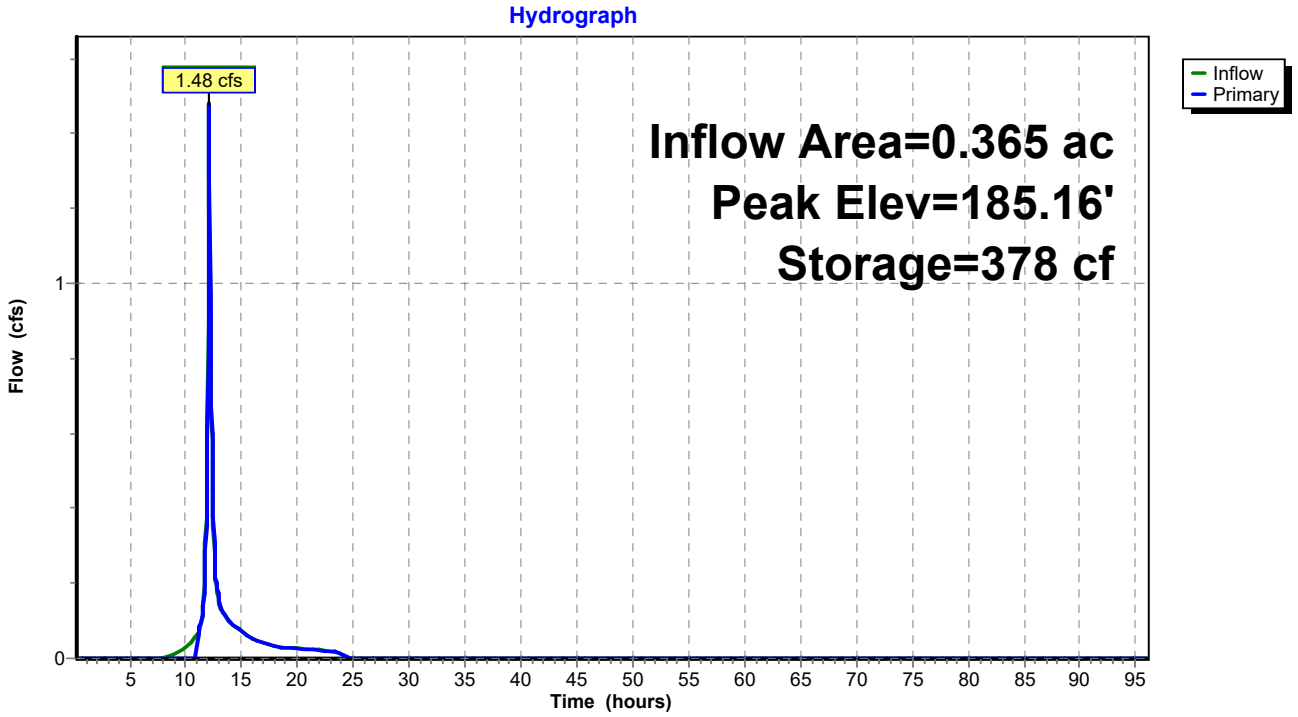
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.46 cfs @ 12.10 hrs HW=185.16' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.46 cfs @ 0.94 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0
184.01	130	1
184.02	132	3
184.03	135	4
184.04	137	5
184.05	140	7
184.06	143	8
184.07	145	10
184.08	148	11
184.09	151	12
184.10	153	14
184.11	156	16
184.12	159	17
184.13	162	19
184.14	165	20
184.15	168	22
184.16	170	24
184.17	173	25
184.18	176	27
184.19	179	29
184.20	182	31
184.21	185	33
184.22	188	34
184.23	191	36
184.24	195	38
184.25	198	40
184.26	201	42
184.27	204	44
184.28	207	46
184.29	210	48
184.30	214	51
184.31	217	53
184.32	220	55
184.33	224	57
184.34	227	59
184.35	230	62
184.36	234	64
184.37	237	66
184.38	241	69
184.39	244	71
184.40	248	74
184.41	251	76
184.42	255	79
184.43	258	81
184.44	262	84
184.45	265	86
184.46	269	89
184.47	273	92
184.48	276	95
184.49	280	97
184.50	284	100
184.51	288	103
184.52	291	106
184.53	295	109
184.54	299	112
184.55	303	115
184.56	307	118
184.57	311	121
184.58	315	124
184.59	319	127
184.60	323	130
184.61	327	134
184.62	331	137
184.63	335	140
184.64	339	144
184.65	343	147
184.66	347	151
184.67	351	154
184.68	356	158
184.69	360	161
184.70	364	165
184.71	368	168
184.72	373	172
184.73	377	176
184.74	381	180
184.75	386	183
184.76	390	187
184.77	394	191
184.78	399	195
184.79	403	199
184.80	408	203
184.81	412	207
184.82	417	212
184.83	422	216
184.84	426	220
184.85	431	224
184.86	435	229
184.87	440	233
184.88	445	237
184.89	449	242
184.90	454	246
184.91	459	251
184.92	464	256
184.93	469	260
184.94	473	265
184.95	478	270
184.96	483	275
184.97	488	279
184.98	493	284
184.99	498	289
185.00	503	294
185.01	507	299
185.02	511	304
185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 3.15" for 25-year event
Inflow = 1.59 cfs @ 12.10 hrs, Volume= 0.110 af
Outflow = 1.52 cfs @ 12.13 hrs, Volume= 0.105 af, Atten= 4%, Lag= 1.4 min
Primary = 1.52 cfs @ 12.13 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.38' @ 12.13 hrs Surf.Area= 445 sf Storage= 338 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 31.1 min calculated for 0.105 af (96% of inflow)
Center-of-Mass det. time= 9.3 min (848.2 - 838.9)

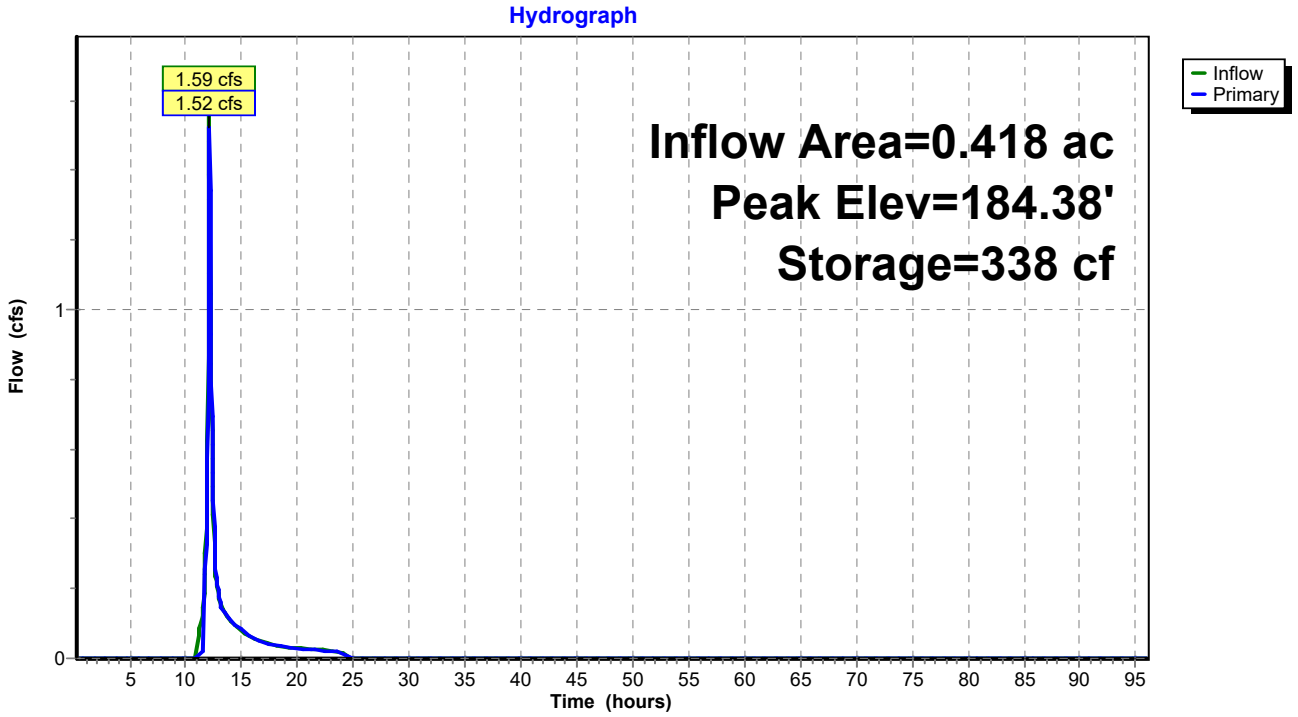
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.48 cfs @ 12.13 hrs HW=184.38' (Free Discharge)
└**1=Culvert** (Passes 1.48 cfs of 7.45 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.48 cfs @ 1.97 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 2.22" for 25-year event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 0.113 af
Outflow = 0.08 cfs @ 15.32 hrs, Volume= 0.113 af, Atten= 95%, Lag= 191.5 min
Discarded = 0.08 cfs @ 15.32 hrs, Volume= 0.113 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 176.01' @ 15.32 hrs Surf.Area= 1,498 sf Storage= 2,712 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 420.9 min calculated for 0.113 af (100% of inflow)
Center-of-Mass det. time= 421.0 min (1,276.4 - 855.4)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

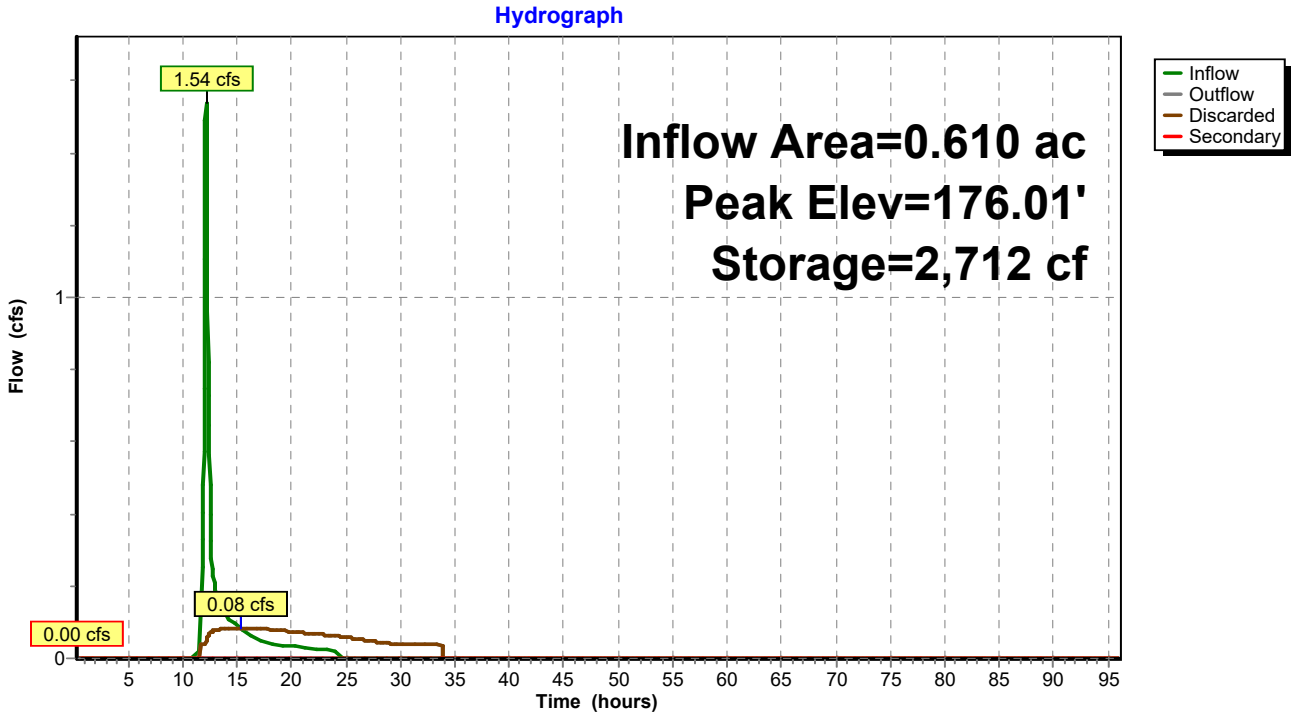
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Secondary	178.00'	**16.0' 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=0.08 cfs @ 15.32 hrs HW=176.01' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811	177.71	2,351	5,960
177.20	2,075	4,832	177.72	2,357	5,983
177.21	2,081	4,853	177.73	2,363	6,007
177.22	2,086	4,873	177.74	2,368	6,031
177.23	2,091	4,894	177.75	2,374	6,054
177.24	2,096	4,915	177.76	2,379	6,078
177.25	2,102	4,936	177.77	2,385	6,102
177.26	2,107	4,957	177.78	2,391	6,126
177.27	2,112	4,978	177.79	2,396	6,150
177.28	2,118	4,999	177.80	2,402	6,174
177.29	2,123	5,021	177.81	2,408	6,198
177.30	2,128	5,042	177.82	2,413	6,222
177.31	2,133	5,063	177.83	2,419	6,246
177.32	2,139	5,085	177.84	2,424	6,270
177.33	2,144	5,106	177.85	2,430	6,295
177.34	2,149	5,127	177.86	2,436	6,319
177.35	2,155	5,149	177.87	2,442	6,343
177.36	2,160	5,171	177.88	2,447	6,368
177.37	2,165	5,192	177.89	2,453	6,392
177.38	2,171	5,214	177.90	2,459	6,417
177.39	2,176	5,236	177.91	2,464	6,441
177.40	2,182	5,257	177.92	2,470	6,466
177.41	2,187	5,279	177.93	2,476	6,491
177.42	2,192	5,301	177.94	2,481	6,516
177.43	2,198	5,323	177.95	2,487	6,540
177.44	2,203	5,345	177.96	2,493	6,565
177.45	2,209	5,367	177.97	2,499	6,590
177.46	2,214	5,389	177.98	2,504	6,615
177.47	2,219	5,411	177.99	2,510	6,640
177.48	2,225	5,434	178.00	2,516	6,666
177.49	2,230	5,456	178.01	2,522	6,691
177.50	2,236	5,478	178.02	2,527	6,716
177.51	2,241	5,501	178.03	2,533	6,741
177.52	2,247	5,523	178.04	2,539	6,767
177.53	2,252	5,546	178.05	2,544	6,792
177.54	2,257	5,568	178.06	2,550	6,817
177.55	2,263	5,591	178.07	2,556	6,843
177.56	2,268	5,613	178.08	2,562	6,869
177.57	2,274	5,636	178.09	2,567	6,894
177.58	2,279	5,659	178.10	2,573	6,920
177.59	2,285	5,682	178.11	2,579	6,946
177.60	2,290	5,705	178.12	2,585	6,972
177.61	2,296	5,728	178.13	2,590	6,997
177.62	2,301	5,750	178.14	2,596	7,023
177.63	2,307	5,774	178.15	2,602	7,049
177.64	2,312	5,797	178.16	2,608	7,075
177.65	2,318	5,820	178.17	2,613	7,101
177.66	2,324	5,843	178.18	2,619	7,128
177.67	2,329	5,866	178.19	2,625	7,154
177.68	2,335	5,890	178.20	2,631	7,180
177.69	2,340	5,913	178.21	2,637	7,206
177.70	2,346	5,936	178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

Summary for Subcatchment POST-2S-B:

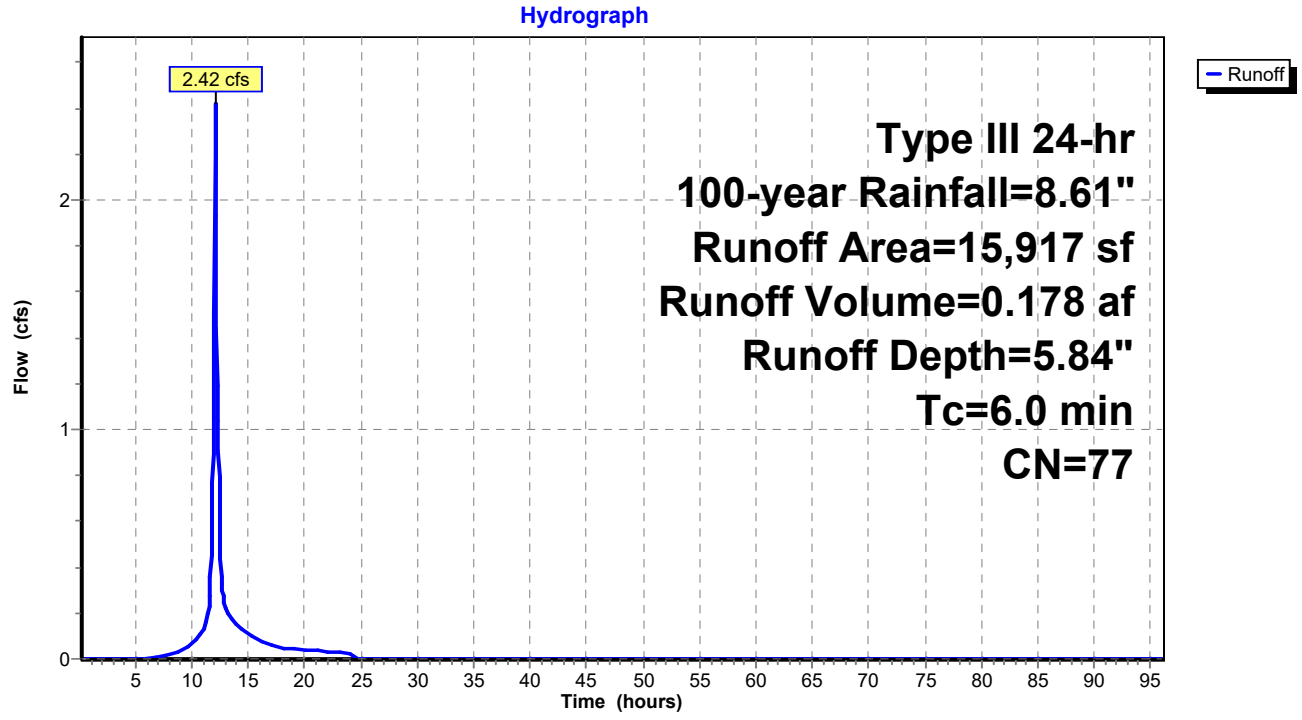
Runoff = 2.42 cfs @ 12.09 hrs, Volume= 0.178 af, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	1,971	98	Pavement, Roofs, Concrete Pads
*	6,029	96	Compacted Gravel
*	5,989	55	Crushed Stone Yard
	668	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,260	80	>75% Grass cover, Good, HSG D
	15,917	77	Weighted Average
	13,946		87.62% Pervious Area
	1,971		12.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-B:



Summary for Subcatchment POST-2S-C:

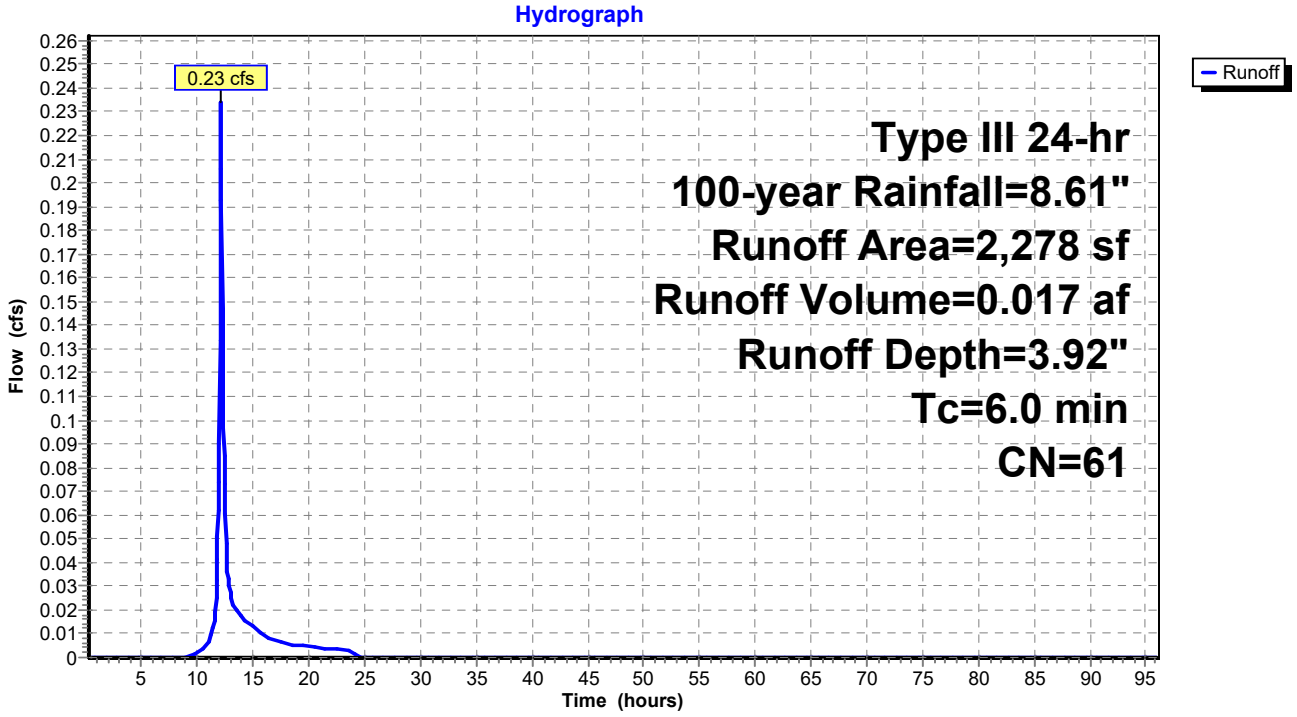
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	1,078	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	1,200	80	>75% Grass cover, Good, HSG D
	2,278	61	Weighted Average
	2,278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-C:



Summary for Subcatchment POST-2S-D:

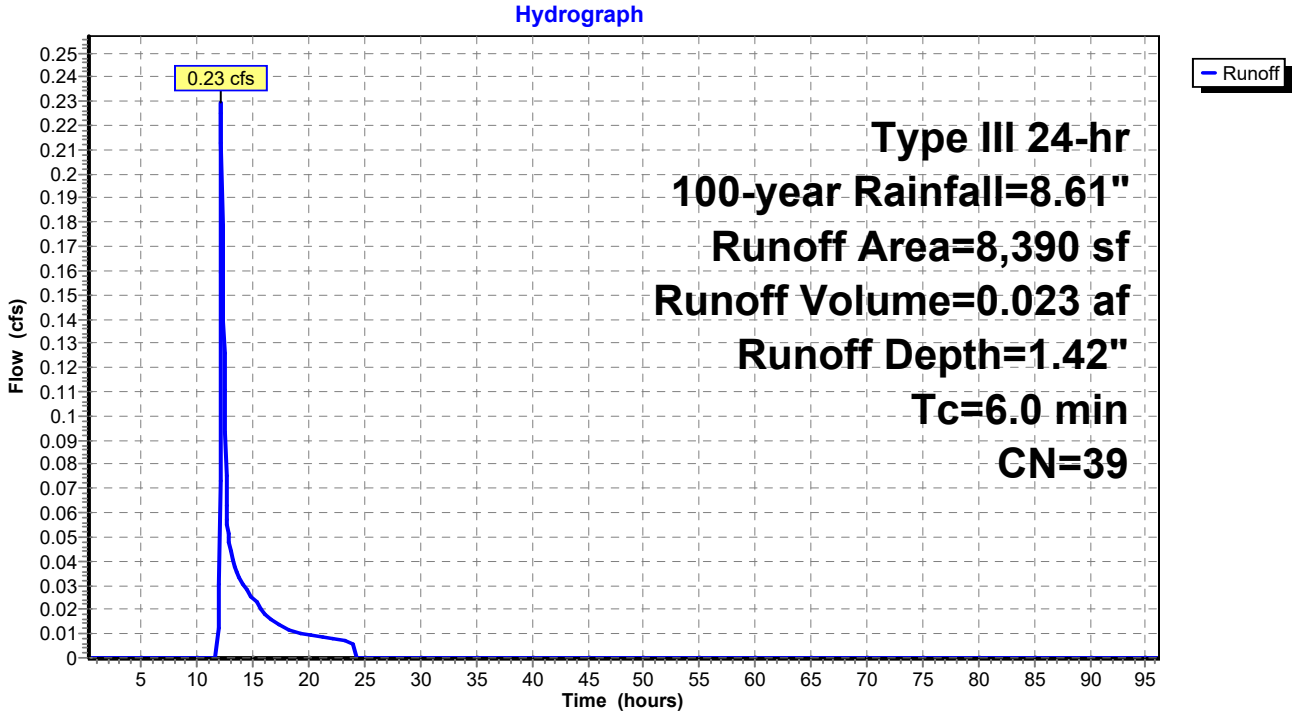
Runoff = 0.23 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.61"

	Area (sf)	CN	Description
*	0	98	Pavement, Roofs, Concrete Pads
*	0	96	Compacted Gravel
*	0	55	Crushed Stone Yard
	8,390	39	>75% Grass cover, Good, HSG A
	0	30	Meadow, non-grazed, HSG A
	0	30	Woods, Good, HSG A
	8,390	39	Weighted Average
	8,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum of 6 mins for HydroCAD model**

Subcatchment POST-2S-D:



Summary for Reach POST-4R:

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 0.00" for 100-year event
Inflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

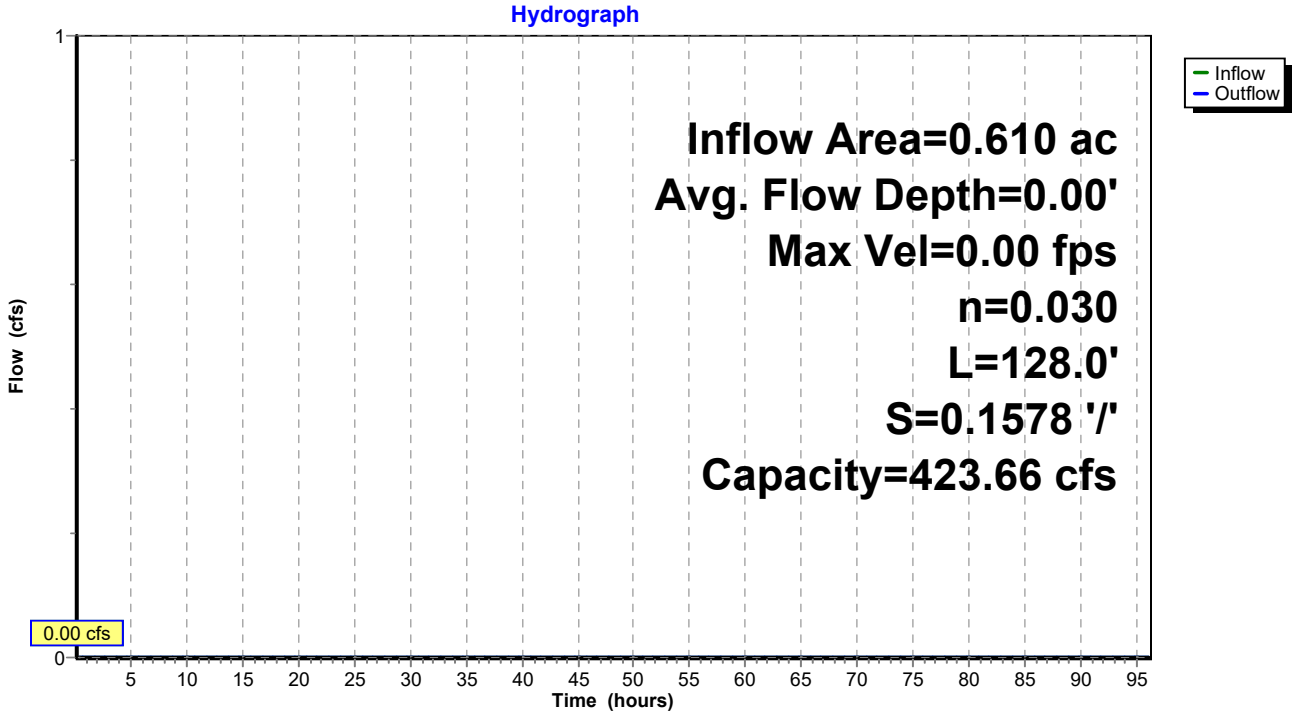
Routing by Stor-Ind+Trans method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.25 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 24.0 sf, Capacity= 423.66 cfs

20.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 128.0' Slope= 0.1578 '/'
Inlet Invert= 173.60', Outlet Invert= 153.40'

‡

Reach POST-4R:



Stage-Area-Storage for Reach POST-4R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
173.60	0.0	0
173.61	0.2	26
173.62	0.4	51
173.63	0.6	77
173.64	0.8	103
173.65	1.0	129
173.66	1.2	155
173.67	1.4	182
173.68	1.6	208
173.69	1.8	235
173.70	2.0	261
173.71	2.2	288
173.72	2.5	315
173.73	2.7	341
173.74	2.9	368
173.75	3.1	396
173.76	3.3	423
173.77	3.5	450
173.78	3.7	477
173.79	3.9	505
173.80	4.2	532
173.81	4.4	560
173.82	4.6	588
173.83	4.8	616
173.84	5.0	644
173.85	5.3	672
173.86	5.5	700
173.87	5.7	729
173.88	5.9	757
173.89	6.1	785
173.90	6.4	814
173.91	6.6	843
173.92	6.8	872
173.93	7.0	901
173.94	7.3	930
173.95	7.5	959
173.96	7.7	988
173.97	7.9	1,017
173.98	8.2	1,047
173.99	8.4	1,076
174.00	8.6	1,106
174.01	8.9	1,136
174.02	9.1	1,166
174.03	9.3	1,195
174.04	9.6	1,226
174.05	9.8	1,256
174.06	10.0	1,286
174.07	10.3	1,316
174.08	10.5	1,347
174.09	10.8	1,377
174.10	11.0	1,408
174.11	11.2	1,439
174.12	11.5	1,470
174.13	11.7	1,501
174.14	12.0	1,532
174.15	12.2	1,563
174.16	12.5	1,594
174.17	12.7	1,626
174.18	12.9	1,657
174.19	13.2	1,689
174.20	13.4	1,720
174.21	13.7	1,752
174.22	13.9	1,784
174.23	14.2	1,816
174.24	14.4	1,848
174.25	14.7	1,880
174.26	14.9	1,913
174.27	15.2	1,945
174.28	15.4	1,978
174.29	15.7	2,010
174.30	16.0	2,043
174.31	16.2	2,076
174.32	16.5	2,109
174.33	16.7	2,142
174.34	17.0	2,175
174.35	17.3	2,208
174.36	17.5	2,241
174.37	17.8	2,275
174.38	18.0	2,308
174.39	18.3	2,342
174.40	18.6	2,376
174.41	18.8	2,410
174.42	19.1	2,443
174.43	19.4	2,478
174.44	19.6	2,512
174.45	19.9	2,546
174.46	20.2	2,580
174.47	20.4	2,615
174.48	20.7	2,649
174.49	21.0	2,684
174.50	21.2	2,719
174.51	21.5	2,754
174.52	21.8	2,789
174.53	22.1	2,824
174.54	22.3	2,859
174.55	22.6	2,894
174.56	22.9	2,929
174.57	23.2	2,965
174.58	23.4	3,001
174.59	23.7	3,036
174.60	**24.0**	**3,072**

Summary for Pond POST-2P: Sed. Forebay 1

Inflow Area = 0.365 ac, 12.38% Impervious, Inflow Depth = 5.84" for 100-year event
Inflow = 2.42 cfs @ 12.09 hrs, Volume= 0.178 af
Outflow = 2.42 cfs @ 12.10 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.6 min
Primary = 2.42 cfs @ 12.10 hrs, Volume= 0.171 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 185.22' @ 12.10 hrs Surf.Area= 593 sf Storage= 413 cf
Flood Elev= 186.00' Surf.Area= 976 sf Storage= 1,021 cf

Plug-Flow detention time= 34.3 min calculated for 0.171 af (96% of inflow)
Center-of-Mass det. time= 12.6 min (819.4 - 806.9)

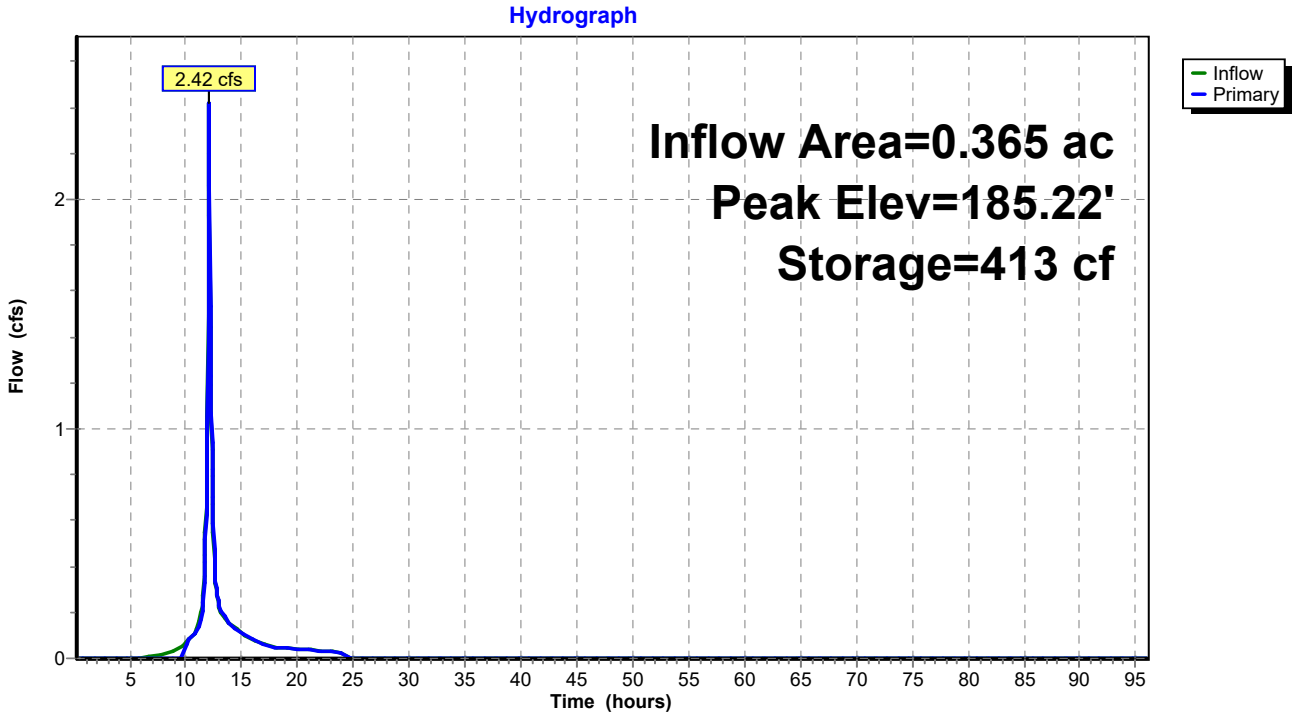
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,021 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
184.00	127	99.0	0	0	127
185.00	503	141.0	294	294	938
186.00	976	172.0	727	1,021	1,726

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.41 cfs @ 12.10 hrs HW=185.22' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.41 cfs @ 1.11 fps)

Pond POST-2P: Sed. Forebay 1



Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.00	127	0	184.52	291	106
184.01	130	1	184.53	295	109
184.02	132	3	184.54	299	112
184.03	135	4	184.55	303	115
184.04	137	5	184.56	307	118
184.05	140	7	184.57	311	121
184.06	143	8	184.58	315	124
184.07	145	10	184.59	319	127
184.08	148	11	184.60	323	130
184.09	151	12	184.61	327	134
184.10	153	14	184.62	331	137
184.11	156	16	184.63	335	140
184.12	159	17	184.64	339	144
184.13	162	19	184.65	343	147
184.14	165	20	184.66	347	151
184.15	168	22	184.67	351	154
184.16	170	24	184.68	356	158
184.17	173	25	184.69	360	161
184.18	176	27	184.70	364	165
184.19	179	29	184.71	368	168
184.20	182	31	184.72	373	172
184.21	185	33	184.73	377	176
184.22	188	34	184.74	381	180
184.23	191	36	184.75	386	183
184.24	195	38	184.76	390	187
184.25	198	40	184.77	394	191
184.26	201	42	184.78	399	195
184.27	204	44	184.79	403	199
184.28	207	46	184.80	408	203
184.29	210	48	184.81	412	207
184.30	214	51	184.82	417	212
184.31	217	53	184.83	422	216
184.32	220	55	184.84	426	220
184.33	224	57	184.85	431	224
184.34	227	59	184.86	435	229
184.35	230	62	184.87	440	233
184.36	234	64	184.88	445	237
184.37	237	66	184.89	449	242
184.38	241	69	184.90	454	246
184.39	244	71	184.91	459	251
184.40	248	74	184.92	464	256
184.41	251	76	184.93	469	260
184.42	255	79	184.94	473	265
184.43	258	81	184.95	478	270
184.44	262	84	184.96	483	275
184.45	265	86	184.97	488	279
184.46	269	89	184.98	493	284
184.47	273	92	184.99	498	289
184.48	276	95	185.00	503	294
184.49	280	97	185.01	507	299
184.50	284	100	185.02	511	304
184.51	288	103	185.03	515	310

Stage-Area-Storage for Pond POST-2P: Sed. Forebay 1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
185.04	519	315
185.05	523	320
185.06	527	325
185.07	531	330
185.08	535	336
185.09	539	341
185.10	543	347
185.11	547	352
185.12	552	358
185.13	556	363
185.14	560	369
185.15	564	374
185.16	568	380
185.17	572	386
185.18	577	391
185.19	581	397
185.20	585	403
185.21	589	409
185.22	594	415
185.23	598	421
185.24	602	427
185.25	607	433
185.26	611	439
185.27	615	445
185.28	620	451
185.29	624	457
185.30	629	464
185.31	633	470
185.32	637	476
185.33	642	483
185.34	646	489
185.35	651	496
185.36	655	502
185.37	660	509
185.38	664	515
185.39	669	522
185.40	674	529
185.41	678	535
185.42	683	542
185.43	687	549
185.44	692	556
185.45	697	563
185.46	701	570
185.47	706	577
185.48	711	584
185.49	715	591
185.50	720	598
185.51	725	606
185.52	730	613
185.53	734	620
185.54	739	628
185.55	744	635
185.56	749	642
185.57	754	650
185.58	758	658
185.59	763	665
185.60	768	673
185.61	773	681
185.62	778	688
185.63	783	696
185.64	788	704
185.65	793	712
185.66	798	720
185.67	803	728
185.68	808	736
185.69	813	744
185.70	818	752
185.71	823	760
185.72	828	769
185.73	833	777
185.74	838	785
185.75	843	794
185.76	848	802
185.77	853	811
185.78	859	819
185.79	864	828
185.80	869	836
185.81	874	845
185.82	879	854
185.83	885	863
185.84	890	872
185.85	895	881
185.86	900	889
185.87	906	899
185.88	911	908
185.89	916	917
185.90	922	926
185.91	927	935
185.92	932	944
185.93	938	954
185.94	943	963
185.95	949	973
185.96	954	982
185.97	960	992
185.98	965	1,001
185.99	971	1,011
186.00	**976**	**1,021**

Summary for Pond POST-3P: Sed. Forebay 2

Inflow Area = 0.418 ac, 10.83% Impervious, Inflow Depth = 5.40" for 100-year event
Inflow = 2.65 cfs @ 12.10 hrs, Volume= 0.188 af
Outflow = 2.55 cfs @ 12.12 hrs, Volume= 0.184 af, Atten= 4%, Lag= 1.3 min
Primary = 2.55 cfs @ 12.12 hrs, Volume= 0.184 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 184.55' @ 12.12 hrs Surf.Area= 497 sf Storage= 415 cf
Flood Elev= 185.00' Surf.Area= 653 sf Storage= 674 cf

Plug-Flow detention time= 21.1 min calculated for 0.184 af (98% of inflow)
Center-of-Mass det. time= 7.5 min (828.8 - 821.3)

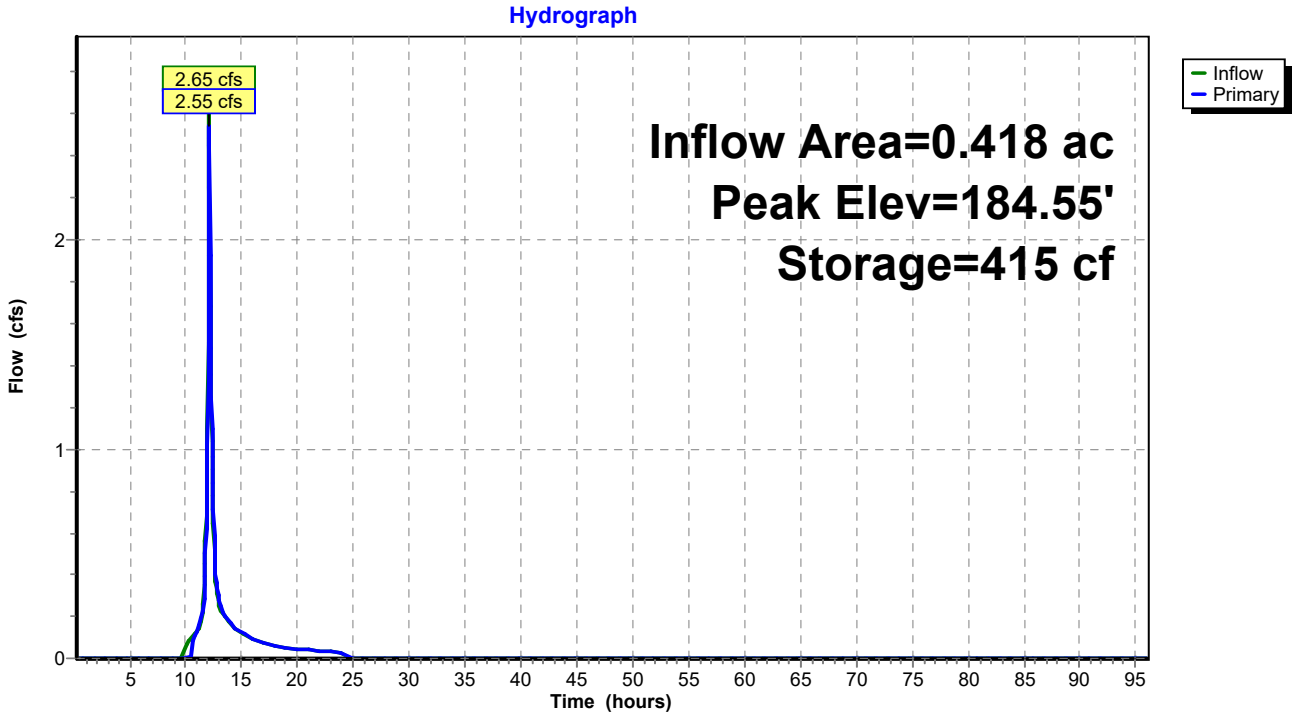
Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	674 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
183.00	73	74.0	0	0	73
184.00	336	97.0	189	189	397
185.00	653	115.0	486	674	719

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 26.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 180.00' / 178.20' S= 0.0679 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	184.00'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	184.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.47 cfs @ 12.12 hrs HW=184.54' (Free Discharge)
└**1=Culvert** (Passes 2.47 cfs of 7.60 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.47 cfs @ 2.47 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond POST-3P: Sed. Forebay 2



Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
183.00	73	0	183.52	186	65
183.01	75	1	183.53	189	67
183.02	76	1	183.54	191	69
183.03	78	2	183.55	194	71
183.04	80	3	183.56	197	73
183.05	82	4	183.57	199	75
183.06	83	5	183.58	202	77
183.07	85	6	183.59	205	79
183.08	87	6	183.60	208	81
183.09	89	7	183.61	211	83
183.10	91	8	183.62	213	85
183.11	93	9	183.63	216	87
183.12	94	10	183.64	219	89
183.13	96	11	183.65	222	92
183.14	98	12	183.66	225	94
183.15	100	13	183.67	228	96
183.16	102	14	183.68	231	98
183.17	104	15	183.69	234	101
183.18	106	16	183.70	237	103
183.19	108	17	183.71	240	105
183.20	110	18	183.72	243	108
183.21	112	19	183.73	246	110
183.22	114	20	183.74	249	113
183.23	117	22	183.75	252	115
183.24	119	23	183.76	255	118
183.25	121	24	183.77	259	120
183.26	123	25	183.78	262	123
183.27	125	26	183.79	265	126
183.28	127	28	183.80	268	128
183.29	130	29	183.81	271	131
183.30	132	30	183.82	275	134
183.31	134	32	183.83	278	136
183.32	136	33	183.84	281	139
183.33	139	34	183.85	284	142
183.34	141	36	183.86	288	145
183.35	143	37	183.87	291	148
183.36	146	39	183.88	294	151
183.37	148	40	183.89	298	154
183.38	150	42	183.90	301	157
183.39	153	43	183.91	304	160
183.40	155	45	183.92	308	163
183.41	158	46	183.93	311	166
183.42	160	48	183.94	315	169
183.43	163	49	183.95	318	172
183.44	165	51	183.96	322	175
183.45	168	53	183.97	325	179
183.46	170	54	183.98	329	182
183.47	173	56	183.99	332	185
183.48	175	58	184.00	336	189
183.49	178	60	184.01	339	192
183.50	181	61	184.02	341	195
183.51	183	63	184.03	344	199

Stage-Area-Storage for Pond POST-3P: Sed. Forebay 2 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.04	347	202
184.05	349	206
184.06	352	209
184.07	355	213
184.08	358	216
184.09	360	220
184.10	363	223
184.11	366	227
184.12	369	231
184.13	371	234
184.14	374	238
184.15	377	242
184.16	380	246
184.17	383	250
184.18	385	253
184.19	388	257
184.20	391	261
184.21	394	265
184.22	397	269
184.23	400	273
184.24	403	277
184.25	405	281
184.26	408	285
184.27	411	289
184.28	414	293
184.29	417	298
184.30	420	302
184.31	423	306
184.32	426	310
184.33	429	314
184.34	432	319
184.35	435	323
184.36	438	327
184.37	441	332
184.38	444	336
184.39	447	341
184.40	450	345
184.41	453	350
184.42	456	354
184.43	460	359
184.44	463	363
184.45	466	368
184.46	469	373
184.47	472	378
184.48	475	382
184.49	478	387
184.50	481	392
184.51	485	397
184.52	488	402
184.53	491	406
184.54	494	411
184.55	497	416
184.56	501	421
184.57	504	426
184.58	507	431
184.59	510	436
184.60	514	442
184.61	517	447
184.62	520	452
184.63	524	457
184.64	527	462
184.65	530	468
184.66	534	473
184.67	537	478
184.68	540	484
184.69	544	489
184.70	547	495
184.71	550	500
184.72	554	506
184.73	557	511
184.74	561	517
184.75	564	522
184.76	567	528
184.77	571	534
184.78	574	539
184.79	578	545
184.80	581	551
184.81	585	557
184.82	588	563
184.83	592	569
184.84	595	575
184.85	599	580
184.86	602	586
184.87	606	593
184.88	609	599
184.89	613	605
184.90	617	611
184.91	620	617
184.92	624	623
184.93	627	630
184.94	631	636
184.95	635	642
184.96	638	649
184.97	642	655
184.98	646	661
184.99	649	668
185.00	**653**	**674**

Summary for Pond POST-4P: Infiltration Basin

Inflow Area = 0.610 ac, 7.41% Impervious, Inflow Depth = 4.06" for 100-year event
Inflow = 2.78 cfs @ 12.12 hrs, Volume= 0.207 af
Outflow = 0.12 cfs @ 15.62 hrs, Volume= 0.207 af, Atten= 96%, Lag= 209.6 min
Discarded = 0.12 cfs @ 15.62 hrs, Volume= 0.207 af
Secondary = 0.00 cfs @ 0.25 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.25-96.00 hrs, dt= 0.05 hrs
Peak Elev= 177.48' @ 15.62 hrs Surf.Area= 2,225 sf Storage= 5,434 cf
Flood Elev= 179.00' Surf.Area= 3,116 sf Storage= 9,476 cf

Plug-Flow detention time= 565.8 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 566.1 min (1,403.1 - 837.1)

Volume	Invert	Avail.Storage	Storage Description
#1	171.99'	9,476 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

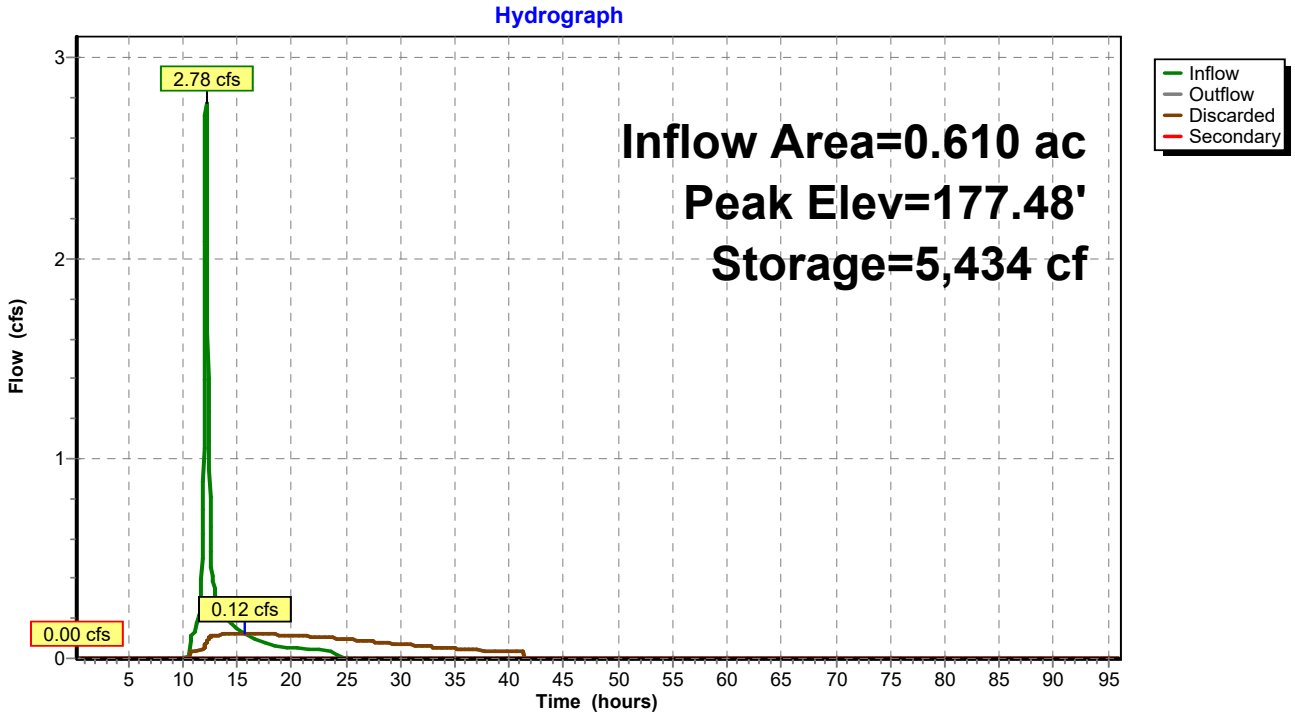
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.99	694	115.0	0.0	0	0	694
172.00	694	115.0	40.0	3	3	695
173.99	694	115.0	40.0	552	555	924
174.00	694	115.0	100.0	7	562	925
176.00	1,494	152.0	100.0	2,138	2,700	1,755
178.00	2,516	190.0	100.0	3,966	6,666	2,845
179.00	3,116	210.0	100.0	2,811	9,476	3,512

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.99'	**2.410 in/hr Exfiltration over Surface area**
#2	Secondary	178.00'	**16.0' 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=0.12 cfs @ 15.62 hrs HW=177.48' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.25 hrs HW=171.99' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond POST-4P: Infiltration Basin



Stage-Area-Storage for Pond POST-4P: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.99	694	0	172.51	694	144
172.00	694	3	172.52	694	147
172.01	694	6	172.53	694	150
172.02	694	8	172.54	694	153
172.03	694	11	172.55	694	155
172.04	694	14	172.56	694	158
172.05	694	17	172.57	694	161
172.06	694	19	172.58	694	164
172.07	694	22	172.59	694	167
172.08	694	25	172.60	694	169
172.09	694	28	172.61	694	172
172.10	694	31	172.62	694	175
172.11	694	33	172.63	694	178
172.12	694	36	172.64	694	180
172.13	694	39	172.65	694	183
172.14	694	42	172.66	694	186
172.15	694	44	172.67	694	189
172.16	694	47	172.68	694	192
172.17	694	50	172.69	694	194
172.18	694	53	172.70	694	197
172.19	694	56	172.71	694	200
172.20	694	58	172.72	694	203
172.21	694	61	172.73	694	205
172.22	694	64	172.74	694	208
172.23	694	67	172.75	694	211
172.24	694	69	172.76	694	214
172.25	694	72	172.77	694	217
172.26	694	75	172.78	694	219
172.27	694	78	172.79	694	222
172.28	694	81	172.80	694	225
172.29	694	83	172.81	694	228
172.30	694	86	172.82	694	230
172.31	694	89	172.83	694	233
172.32	694	92	172.84	694	236
172.33	694	94	172.85	694	239
172.34	694	97	172.86	694	242
172.35	694	100	172.87	694	244
172.36	694	103	172.88	694	247
172.37	694	105	172.89	694	250
172.38	694	108	172.90	694	253
172.39	694	111	172.91	694	255
172.40	694	114	172.92	694	258
172.41	694	117	172.93	694	261
172.42	694	119	172.94	694	264
172.43	694	122	172.95	694	266
172.44	694	125	172.96	694	269
172.45	694	128	172.97	694	272
172.46	694	130	172.98	694	275
172.47	694	133	172.99	694	278
172.48	694	136	173.00	694	280
172.49	694	139	173.01	694	283
172.50	694	142	173.02	694	286

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
173.03	694	289	173.55	694	433
173.04	694	291	173.56	694	436
173.05	694	294	173.57	694	439
173.06	694	297	173.58	694	441
173.07	694	300	173.59	694	444
173.08	694	303	173.60	694	447
173.09	694	305	173.61	694	450
173.10	694	308	173.62	694	452
173.11	694	311	173.63	694	455
173.12	694	314	173.64	694	458
173.13	694	316	173.65	694	461
173.14	694	319	173.66	694	464
173.15	694	322	173.67	694	466
173.16	694	325	173.68	694	469
173.17	694	328	173.69	694	472
173.18	694	330	173.70	694	475
173.19	694	333	173.71	694	477
173.20	694	336	173.72	694	480
173.21	694	339	173.73	694	483
173.22	694	341	173.74	694	486
173.23	694	344	173.75	694	489
173.24	694	347	173.76	694	491
173.25	694	350	173.77	694	494
173.26	694	353	173.78	694	497
173.27	694	355	173.79	694	500
173.28	694	358	173.80	694	502
173.29	694	361	173.81	694	505
173.30	694	364	173.82	694	508
173.31	694	366	173.83	694	511
173.32	694	369	173.84	694	514
173.33	694	372	173.85	694	516
173.34	694	375	173.86	694	519
173.35	694	378	173.87	694	522
173.36	694	380	173.88	694	525
173.37	694	383	173.89	694	527
173.38	694	386	173.90	694	530
173.39	694	389	173.91	694	533
173.40	694	391	173.92	694	536
173.41	694	394	173.93	694	539
173.42	694	397	173.94	694	541
173.43	694	400	173.95	694	544
173.44	694	403	173.96	694	547
173.45	694	405	173.97	694	550
173.46	694	408	173.98	694	552
173.47	694	411	173.99	694	555
173.48	694	414	174.00	694	562
173.49	694	416	174.01	697	569
173.50	694	419	174.02	701	576
173.51	694	422	174.03	704	583
173.52	694	425	174.04	707	590
173.53	694	428	174.05	710	597
173.54	694	430	174.06	714	604

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.07	717	612
174.08	720	619
174.09	723	626
174.10	727	633
174.11	730	640
174.12	733	648
174.13	737	655
174.14	740	663
174.15	743	670
174.16	747	677
174.17	750	685
174.18	754	692
174.19	757	700
174.20	760	708
174.21	764	715
174.22	767	723
174.23	771	730
174.24	774	738
174.25	777	746
174.26	781	754
174.27	784	762
174.28	788	769
174.29	791	777
174.30	795	785
174.31	798	793
174.32	802	801
174.33	805	809
174.34	809	817
174.35	812	825
174.36	816	834
174.37	819	842
174.38	823	850
174.39	826	858
174.40	830	866
174.41	833	875
174.42	837	883
174.43	840	892
174.44	844	900
174.45	848	908
174.46	851	917
174.47	855	925
174.48	858	934
174.49	862	943
174.50	866	951
174.51	869	960
174.52	873	969
174.53	876	977
174.54	880	986
174.55	884	995
174.56	887	1,004
174.57	891	1,013
174.58	895	1,022
174.59	898	1,031
174.60	902	1,040
174.61	906	1,049
174.62	910	1,058
174.63	913	1,067
174.64	917	1,076
174.65	921	1,085
174.66	925	1,094
174.67	928	1,104
174.68	932	1,113
174.69	936	1,122
174.70	940	1,132
174.71	943	1,141
174.72	947	1,151
174.73	951	1,160
174.74	955	1,170
174.75	958	1,179
174.76	962	1,189
174.77	966	1,198
174.78	970	1,208
174.79	974	1,218
174.80	978	1,228
174.81	981	1,237
174.82	985	1,247
174.83	989	1,257
174.84	993	1,267
174.85	997	1,277
174.86	1,001	1,287
174.87	1,005	1,297
174.88	1,009	1,307
174.89	1,013	1,317
174.90	1,017	1,327
174.91	1,020	1,337
174.92	1,024	1,348
174.93	1,028	1,358
174.94	1,032	1,368
174.95	1,036	1,379
174.96	1,040	1,389
174.97	1,044	1,399
174.98	1,048	1,410
174.99	1,052	1,420
175.00	1,056	1,431
175.01	1,060	1,441
175.02	1,064	1,452
175.03	1,068	1,463
175.04	1,072	1,473
175.05	1,076	1,484
175.06	1,080	1,495
175.07	1,084	1,506
175.08	1,088	1,517
175.09	1,092	1,528
175.10	1,097	1,539

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.11	1,101	1,550
175.12	1,105	1,561
175.13	1,109	1,572
175.14	1,113	1,583
175.15	1,117	1,594
175.16	1,121	1,605
175.17	1,125	1,616
175.18	1,129	1,628
175.19	1,133	1,639
175.20	1,138	1,650
175.21	1,142	1,662
175.22	1,146	1,673
175.23	1,150	1,685
175.24	1,154	1,696
175.25	1,158	1,708
175.26	1,163	1,719
175.27	1,167	1,731
175.28	1,171	1,743
175.29	1,175	1,754
175.30	1,180	1,766
175.31	1,184	1,778
175.32	1,188	1,790
175.33	1,192	1,802
175.34	1,197	1,814
175.35	1,201	1,826
175.36	1,205	1,838
175.37	1,209	1,850
175.38	1,214	1,862
175.39	1,218	1,874
175.40	1,222	1,886
175.41	1,226	1,898
175.42	1,231	1,911
175.43	1,235	1,923
175.44	1,239	1,935
175.45	1,244	1,948
175.46	1,248	1,960
175.47	1,252	1,973
175.48	1,257	1,985
175.49	1,261	1,998
175.50	1,266	2,011
175.51	1,270	2,023
175.52	1,274	2,036
175.53	1,279	2,049
175.54	1,283	2,062
175.55	1,288	2,074
175.56	1,292	2,087
175.57	1,296	2,100
175.58	1,301	2,113
175.59	1,305	2,126
175.60	1,310	2,139
175.61	1,314	2,152
175.62	1,319	2,166
175.63	1,323	2,179
175.64	1,328	2,192
175.65	1,332	2,205
175.66	1,337	2,219
175.67	1,341	2,232
175.68	1,346	2,246
175.69	1,350	2,259
175.70	1,355	2,273
175.71	1,359	2,286
175.72	1,364	2,300
175.73	1,368	2,313
175.74	1,373	2,327
175.75	1,377	2,341
175.76	1,382	2,355
175.77	1,387	2,368
175.78	1,391	2,382
175.79	1,396	2,396
175.80	1,400	2,410
175.81	1,405	2,424
175.82	1,410	2,438
175.83	1,414	2,452
175.84	1,419	2,467
175.85	1,423	2,481
175.86	1,428	2,495
175.87	1,433	2,509
175.88	1,437	2,524
175.89	1,442	2,538
175.90	1,447	2,553
175.91	1,451	2,567
175.92	1,456	2,582
175.93	1,461	2,596
175.94	1,466	2,611
175.95	1,470	2,626
175.96	1,475	2,640
175.97	1,480	2,655
175.98	1,485	2,670
175.99	1,489	2,685
176.00	1,494	2,700
176.01	1,498	2,715
176.02	1,503	2,730
176.03	1,507	2,745
176.04	1,512	2,760
176.05	1,516	2,775
176.06	1,521	2,790
176.07	1,525	2,805
176.08	1,530	2,821
176.09	1,534	2,836
176.10	1,539	2,851
176.11	1,543	2,867
176.12	1,548	2,882
176.13	1,552	2,898
176.14	1,557	2,913

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.15	1,561	2,929
176.16	1,566	2,944
176.17	1,571	2,960
176.18	1,575	2,976
176.19	1,580	2,992
176.20	1,584	3,007
176.21	1,589	3,023
176.22	1,593	3,039
176.23	1,598	3,055
176.24	1,603	3,071
176.25	1,607	3,087
176.26	1,612	3,103
176.27	1,617	3,119
176.28	1,621	3,136
176.29	1,626	3,152
176.30	1,630	3,168
176.31	1,635	3,184
176.32	1,640	3,201
176.33	1,644	3,217
176.34	1,649	3,234
176.35	1,654	3,250
176.36	1,658	3,267
176.37	1,663	3,283
176.38	1,668	3,300
176.39	1,673	3,317
176.40	1,677	3,334
176.41	1,682	3,350
176.42	1,687	3,367
176.43	1,691	3,384
176.44	1,696	3,401
176.45	1,701	3,418
176.46	1,706	3,435
176.47	1,710	3,452
176.48	1,715	3,469
176.49	1,720	3,486
176.50	1,725	3,504
176.51	1,729	3,521
176.52	1,734	3,538
176.53	1,739	3,556
176.54	1,744	3,573
176.55	1,749	3,590
176.56	1,753	3,608
176.57	1,758	3,626
176.58	1,763	3,643
176.59	1,768	3,661
176.60	1,773	3,678
176.61	1,778	3,696
176.62	1,782	3,714
176.63	1,787	3,732
176.64	1,792	3,750
176.65	1,797	3,768
176.66	1,802	3,786
176.67	1,807	3,804
176.68	1,812	3,822
176.69	1,817	3,840
176.70	1,822	3,858
176.71	1,826	3,876
176.72	1,831	3,895
176.73	1,836	3,913
176.74	1,841	3,931
176.75	1,846	3,950
176.76	1,851	3,968
176.77	1,856	3,987
176.78	1,861	4,006
176.79	1,866	4,024
176.80	1,871	4,043
176.81	1,876	4,062
176.82	1,881	4,080
176.83	1,886	4,099
176.84	1,891	4,118
176.85	1,896	4,137
176.86	1,901	4,156
176.87	1,906	4,175
176.88	1,911	4,194
176.89	1,916	4,213
176.90	1,921	4,232
176.91	1,926	4,252
176.92	1,931	4,271
176.93	1,936	4,290
176.94	1,941	4,310
176.95	1,946	4,329
176.96	1,952	4,349
176.97	1,957	4,368
176.98	1,962	4,388
176.99	1,967	4,407
177.00	1,972	4,427
177.01	1,977	4,447
177.02	1,982	4,467
177.03	1,987	4,486
177.04	1,992	4,506
177.05	1,998	4,526
177.06	2,003	4,546
177.07	2,008	4,566
177.08	2,013	4,586
177.09	2,018	4,607
177.10	2,023	4,627
177.11	2,029	4,647
177.12	2,034	4,667
177.13	2,039	4,688
177.14	2,044	4,708
177.15	2,049	4,729
177.16	2,055	4,749
177.17	2,060	4,770
177.18	2,065	4,790

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.19	2,070	4,811	177.71	2,351	5,960
177.20	2,075	4,832	177.72	2,357	5,983
177.21	2,081	4,853	177.73	2,363	6,007
177.22	2,086	4,873	177.74	2,368	6,031
177.23	2,091	4,894	177.75	2,374	6,054
177.24	2,096	4,915	177.76	2,379	6,078
177.25	2,102	4,936	177.77	2,385	6,102
177.26	2,107	4,957	177.78	2,391	6,126
177.27	2,112	4,978	177.79	2,396	6,150
177.28	2,118	4,999	177.80	2,402	6,174
177.29	2,123	5,021	177.81	2,408	6,198
177.30	2,128	5,042	177.82	2,413	6,222
177.31	2,133	5,063	177.83	2,419	6,246
177.32	2,139	5,085	177.84	2,424	6,270
177.33	2,144	5,106	177.85	2,430	6,295
177.34	2,149	5,127	177.86	2,436	6,319
177.35	2,155	5,149	177.87	2,442	6,343
177.36	2,160	5,171	177.88	2,447	6,368
177.37	2,165	5,192	177.89	2,453	6,392
177.38	2,171	5,214	177.90	2,459	6,417
177.39	2,176	5,236	177.91	2,464	6,441
177.40	2,182	5,257	177.92	2,470	6,466
177.41	2,187	5,279	177.93	2,476	6,491
177.42	2,192	5,301	177.94	2,481	6,516
177.43	2,198	5,323	177.95	2,487	6,540
177.44	2,203	5,345	177.96	2,493	6,565
177.45	2,209	5,367	177.97	2,499	6,590
177.46	2,214	5,389	177.98	2,504	6,615
177.47	2,219	5,411	177.99	2,510	6,640
177.48	2,225	5,434	178.00	2,516	6,666
177.49	2,230	5,456	178.01	2,522	6,691
177.50	2,236	5,478	178.02	2,527	6,716
177.51	2,241	5,501	178.03	2,533	6,741
177.52	2,247	5,523	178.04	2,539	6,767
177.53	2,252	5,546	178.05	2,544	6,792
177.54	2,257	5,568	178.06	2,550	6,817
177.55	2,263	5,591	178.07	2,556	6,843
177.56	2,268	5,613	178.08	2,562	6,869
177.57	2,274	5,636	178.09	2,567	6,894
177.58	2,279	5,659	178.10	2,573	6,920
177.59	2,285	5,682	178.11	2,579	6,946
177.60	2,290	5,705	178.12	2,585	6,972
177.61	2,296	5,728	178.13	2,590	6,997
177.62	2,301	5,750	178.14	2,596	7,023
177.63	2,307	5,774	178.15	2,602	7,049
177.64	2,312	5,797	178.16	2,608	7,075
177.65	2,318	5,820	178.17	2,613	7,101
177.66	2,324	5,843	178.18	2,619	7,128
177.67	2,329	5,866	178.19	2,625	7,154
177.68	2,335	5,890	178.20	2,631	7,180
177.69	2,340	5,913	178.21	2,637	7,206
177.70	2,346	5,936	178.22	2,642	7,233

Stage-Area-Storage for Pond POST-4P: Infiltration Basin (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
178.23	2,648	7,259
178.24	2,654	7,286
178.25	2,660	7,312
178.26	2,666	7,339
178.27	2,672	7,366
178.28	2,678	7,392
178.29	2,683	7,419
178.30	2,689	7,446
178.31	2,695	7,473
178.32	2,701	7,500
178.33	2,707	7,527
178.34	2,713	7,554
178.35	2,719	7,581
178.36	2,725	7,609
178.37	2,731	7,636
178.38	2,736	7,663
178.39	2,742	7,691
178.40	2,748	7,718
178.41	2,754	7,746
178.42	2,760	7,773
178.43	2,766	7,801
178.44	2,772	7,828
178.45	2,778	7,856
178.46	2,784	7,884
178.47	2,790	7,912
178.48	2,796	7,940
178.49	2,802	7,968
178.50	2,808	7,996
178.51	2,814	8,024
178.52	2,820	8,052
178.53	2,826	8,080
178.54	2,832	8,109
178.55	2,838	8,137
178.56	2,844	8,165
178.57	2,850	8,194
178.58	2,856	8,222
178.59	2,862	8,251
178.60	2,868	8,280
178.61	2,874	8,308
178.62	2,880	8,337
178.63	2,887	8,366
178.64	2,893	8,395
178.65	2,899	8,424
178.66	2,905	8,453
178.67	2,911	8,482
178.68	2,917	8,511
178.69	2,923	8,540
178.70	2,929	8,570
178.71	2,935	8,599
178.72	2,942	8,628
178.73	2,948	8,658
178.74	2,954	8,687
178.75	2,960	8,717
178.76	2,966	8,746
178.77	2,972	8,776
178.78	2,978	8,806
178.79	2,985	8,836
178.80	2,991	8,866
178.81	2,997	8,895
178.82	3,003	8,925
178.83	3,009	8,956
178.84	3,016	8,986
178.85	3,022	9,016
178.86	3,028	9,046
178.87	3,034	9,076
178.88	3,041	9,107
178.89	3,047	9,137
178.90	3,053	9,168
178.91	3,059	9,198
178.92	3,066	9,229
178.93	3,072	9,260
178.94	3,078	9,290
178.95	3,084	9,321
178.96	3,091	9,352
178.97	3,097	9,383
178.98	3,103	9,414
178.99	3,110	9,445
179.00	**3,116**	**9,476**

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 Middlesex County, Massachusetts

April 15, 2022

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

Map Scale: 1:4,740 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

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

Date(s) aerial images were photographed: Aug 31, 2020—Oct 22, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	10.1	10.7%
33B	Raypol silt loam, 0 to 5 percent slopes	0.6	0.6%
52A	Freetown muck, 0 to 1 percent slopes	36.1	38.1%
253D	Hinckley loamy sand, 15 to 25 percent slopes	12.7	13.4%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	12.1	12.8%
255B	Windsor loamy sand, 3 to 8 percent slopes	11.3	11.9%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	4.8	5.1%
416C	Narragansett silt loam, 8 to 15 percent slopes, very stony	3.4	3.6%
424C	Canton fine sandy loam, 8 to 15 percent slopes, extremely bouldery	3.0	3.2%
653	Udorthents, sandy	0.5	0.6%
Totals for Area of Interest		**94.8**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties

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

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

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

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

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

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

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

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

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

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

Middlesex County, Massachusetts

6A—Scarboro mucky fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svky
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro

Setting

Landform: Drainageways, outwash deltas, outwash terraces, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from schist and/or sandy glaciofluvial deposits derived from gneiss and/or sandy glaciofluvial deposits derived from granite

Typical profile

Oe - 0 to 3 inches: mucky peat
A - 3 to 11 inches: mucky fine sandy loam
Cg1 - 11 to 21 inches: sand
Cg2 - 21 to 65 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wareham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole

Percent of map unit: 5 percent
Landform: Deltas, depressions, outwash terraces, depressions, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

33B—Raypol silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: vqnf
Elevation: 50 to 1,000 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

Raypol and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raypol

Setting

Landform: Depressions, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Loamy glaciolacustrine deposits over loose sandy and gravelly glaciofluvial deposits derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 19 inches: silt loam
H3 - 19 to 48 inches: very gravelly loamy sand
H4 - 48 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Raynham

Percent of map unit: 8 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wareham

Percent of map unit: 8 percent
Landform: Deltas, depressions, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tisbury

Percent of map unit: 2 percent
Landform: Terraces, plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Birdsall

Percent of map unit: 2 percent
Landform: Flats, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Freetown

Setting

Landform: Depressions, depressions, swamps, kettles, marshes, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
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: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs, swamps, marshes, depressions, depressions, kettles
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

253D—Hinckley loamy sand, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2svmc
Elevation: 0 to 1,460 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

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

Typical profile

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

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

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

Minor Components

Merrimac

Percent of map unit: 8 percent
Landform: Eskers, outwash terraces, kames, outwash plains, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent

Landform: Kames, kame terraces, moraines, eskers, outwash deltas, outwash terraces, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

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

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
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: Farmland of statewide importance

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: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, 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: 8 to 15 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): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

255B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Windsor, Loamy Sand

Setting

Landform: Dunes, outwash plains, deltas, outwash terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Deerfield, loamy sand

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

260B—Sudbury fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9915
Elevation: 0 to 2,100 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: All areas are prime farmland

Map Unit Composition

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

Description of Sudbury

Setting

Landform: Plains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable loamy eolian deposits over loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 20 inches: fine sandy loam
H3 - 20 to 27 inches: loamy sand
H4 - 27 to 65 inches: stratified gravelly coarse sand to sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 8 percent
Landform: Terraces, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wareham

Percent of map unit: 4 percent
Landform: Depressions, deltas, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Windsor

Percent of map unit: 2 percent
Landform: Flats, deltas, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

416C—Narragansett silt loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 9941
Elevation: 0 to 1,000 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: Farmland of statewide importance

Map Unit Composition

Narragansett and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Narragansett

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: silt loam
Bw - 7 to 35 inches: silt loam
2C1 - 35 to 60 inches: very gravelly loamy sand
2C2 - 60 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 10 percent
Landform: Ground moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Canton
Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Scituate
Percent of map unit: 3 percent
Landform: Hillslopes, depressions
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

424C—Canton fine sandy loam, 8 to 15 percent slopes, extremely bouldery

Map Unit Setting
National map unit symbol: vqs4
Elevation: 0 to 1,000 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
Canton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable sandy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 21 inches: fine sandy loam
H3 - 21 to 65 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: 18 to 30 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 10 percent
Landform: Ground moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scituate

Percent of map unit: 5 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

653—Udorthents, sandy

Map Unit Setting

National map unit symbol: vr1k
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Udorthents, Sandy

Setting

Parent material: Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Udorthents, loamy

Percent of map unit: 5 percent
Hydric soil rating: No

Urban land

Percent of map unit: 5 percent
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

Unnamed

Percent of map unit: 5 percent

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

Version 1, Automated: Mar. 4, 2008

Location: Holliston BESS Project - Stormwater Pretreatment

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Sediment Forebay	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56
	0.00	0.56	0.00	0.56

Total TSS Removal = 44%

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

Project: 412899.0001
Prepared By: TRC/ARD
Date: 8/3/2022

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

Version 1, Automated: Mar. 4, 2008

Location: Holliston BESS Project - Stormwater Final Treatment

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Basin	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

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

Project: **412899.0001**
Prepared By: **TRC/ARD**
Date: **8/3/2022**

*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

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.404 degrees West
Latitude	42.198 degrees North
Elevation	0 feet
Date/Time	Tue, 01 Feb 2022 16:04:47 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.55	0.72	0.89	1.13	**1yr**	0.77	1.07	1.31	1.66	2.10	2.68	2.93	**1yr**	2.37	2.81	3.27	3.93	4.59	**1yr**
2yr	0.35	0.54	0.68	0.89	1.12	1.41	**2yr**	0.97	1.30	1.63	2.05	2.56	3.21	3.52	**2yr**	2.85	3.39	3.89	4.64	5.26	**2yr**
5yr	0.42	0.65	0.82	1.10	1.41	1.79	**5yr**	1.21	1.62	2.07	2.60	3.24	4.04	4.50	**5yr**	3.58	4.32	4.96	5.87	6.55	**5yr**
10yr	0.48	0.75	0.95	1.29	1.67	2.14	**10yr**	1.44	1.92	2.49	3.12	3.89	4.81	5.41	**10yr**	4.26	5.20	5.96	7.01	7.74	**10yr**
25yr	0.57	0.90	1.15	1.58	2.10	2.71	**25yr**	1.81	2.39	3.16	3.96	4.92	6.06	6.91	**25yr**	5.36	6.64	7.59	8.88	9.65	**25yr**
50yr	0.64	1.03	1.32	1.86	2.50	3.25	**50yr**	2.16	2.83	3.81	4.77	5.90	7.22	8.32	**50yr**	6.39	8.00	9.13	10.61	11.41	**50yr**
100yr	0.74	1.19	1.54	2.18	2.98	3.90	**100yr**	2.57	3.35	4.57	5.73	7.06	8.61	10.02	**100yr**	7.62	9.64	10.98	12.70	13.50	**100yr**
200yr	0.85	1.39	1.80	2.58	3.55	4.67	**200yr**	3.07	3.97	5.48	6.86	8.45	10.27	12.08	**200yr**	9.09	11.62	13.21	15.19	15.97	**200yr**
500yr	1.04	1.70	2.22	3.21	4.49	5.94	**500yr**	3.87	4.97	6.97	8.73	10.72	12.98	15.48	**500yr**	11.49	14.88	16.88	19.27	19.95	**500yr**

Lower Confidence Limits

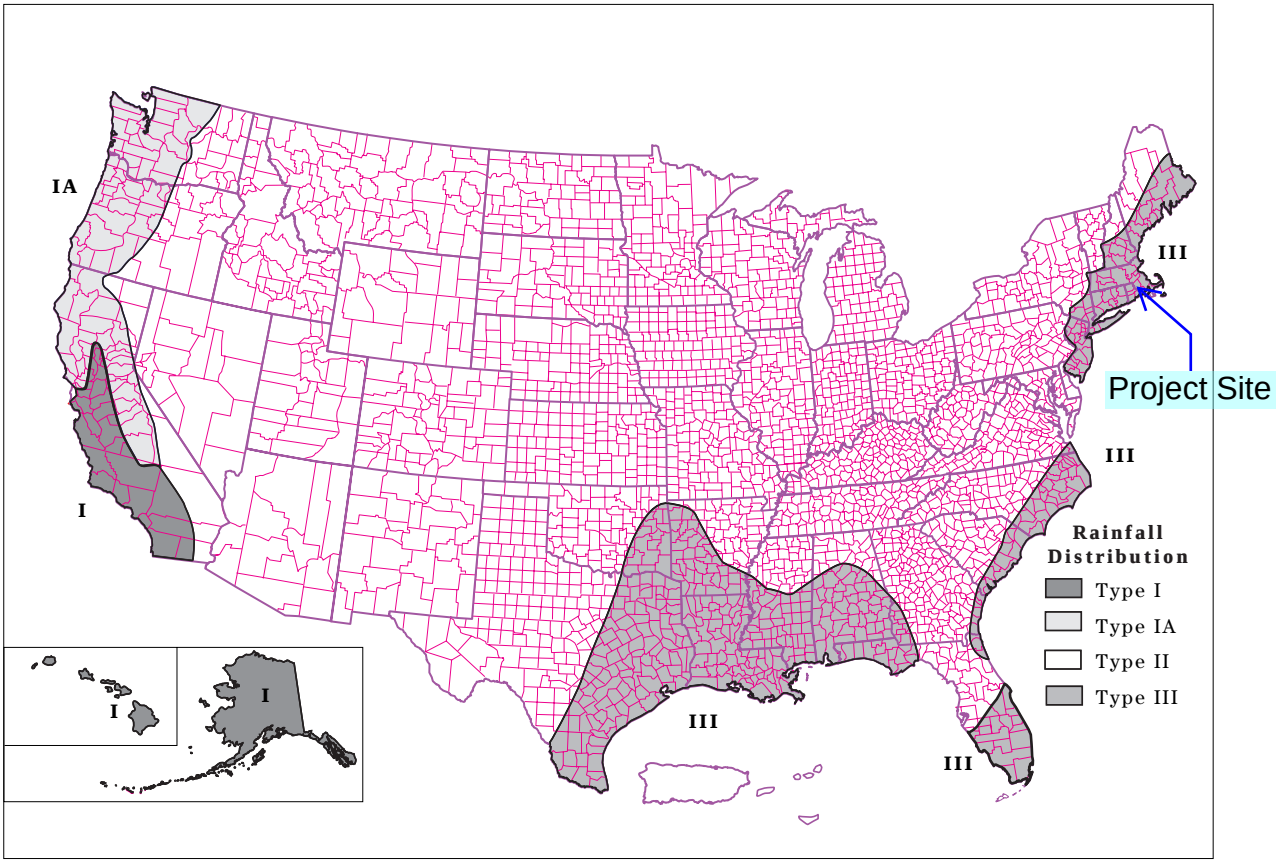
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.93	**1yr**	0.62	0.91	1.06	1.41	1.85	2.31	2.54	**1yr**	2.04	2.44	2.96	3.26	3.98	**1yr**
2yr	0.34	0.53	0.65	0.88	1.08	1.28	**2yr**	0.93	1.25	1.46	1.93	2.47	3.09	3.38	**2yr**	2.74	3.25	3.74	4.49	5.09	**2yr**
5yr	0.38	0.59	0.73	1.01	1.28	1.53	**5yr**	1.11	1.49	1.73	2.27	2.89	3.66	4.08	**5yr**	3.24	3.92	4.58	5.43	6.06	**5yr**
10yr	0.42	0.65	0.81	1.13	1.46	1.74	**10yr**	1.26	1.70	1.96	2.57	3.24	4.14	4.69	**10yr**	3.67	4.51	5.30	6.20	6.91	**10yr**
25yr	0.49	0.74	0.92	1.32	1.73	2.06	**25yr**	1.50	2.02	2.32	3.03	3.79	4.90	5.64	**25yr**	4.33	5.42	6.44	7.43	8.24	**25yr**
50yr	0.54	0.82	1.02	1.46	1.97	2.34	**50yr**	1.70	2.29	2.64	3.43	4.27	5.55	6.50	**50yr**	4.91	6.25	7.46	8.51	9.41	**50yr**
100yr	0.59	0.90	1.12	1.62	2.23	2.66	**100yr**	1.92	2.60	2.99	3.88	4.81	6.29	7.51	**100yr**	5.57	7.22	8.65	9.76	10.76	**100yr**
200yr	0.65	0.98	1.25	1.80	2.52	3.03	**200yr**	2.17	2.97	3.40	4.41	5.42	7.16	8.64	**200yr**	6.34	8.31	10.04	11.21	12.32	**200yr**
500yr	0.74	1.10	1.42	2.06	2.94	3.60	**500yr**	2.53	3.52	4.01	5.22	6.36	8.50	10.51	**500yr**	7.53	10.11	12.20	13.47	14.78	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.32	0.49	0.60	0.81	1.00	1.19	**1yr**	0.86	1.17	1.37	1.78	2.31	2.97	3.14	**1yr**	2.63	3.02	3.67	4.30	5.11	**1yr**
2yr	0.37	0.57	0.70	0.95	1.17	1.37	**2yr**	1.01	1.34	1.58	2.06	2.64	3.38	3.72	**2yr**	2.99	3.57	4.11	4.84	5.45	**2yr**
5yr	0.46	0.71	0.88	1.21	1.54	1.80	**5yr**	1.33	1.76	2.06	2.66	3.36	4.47	4.93	**5yr**	3.95	4.74	5.35	6.39	7.07	**5yr**
10yr	0.56	0.85	1.06	1.48	1.91	2.22	**10yr**	1.65	2.17	2.54	3.23	4.04	5.51	6.14	**10yr**	4.88	5.91	6.64	7.88	8.61	**10yr**
25yr	0.72	1.09	1.36	1.94	2.55	2.94	**25yr**	2.20	2.87	3.33	4.16	5.16	7.31	8.23	**25yr**	6.47	7.91	8.84	10.40	11.18	**25yr**
50yr	0.87	1.32	1.64	2.36	3.18	3.62	**50yr**	2.74	3.54	4.10	5.04	6.20	9.04	10.26	**50yr**	8.00	9.87	10.97	12.86	13.61	**50yr**
100yr	1.06	1.60	2.00	2.89	3.96	4.48	**100yr**	3.42	4.38	5.05	6.11	7.47	11.20	12.77	**100yr**	9.91	12.28	13.61	15.89	16.57	**100yr**
200yr	1.29	1.94	2.45	3.55	4.95	5.54	**200yr**	4.27	5.41	6.23	7.41	8.99	13.86	15.90	**200yr**	12.26	15.29	16.89	19.64	20.17	**200yr**
500yr	1.69	2.51	3.23	4.70	6.68	7.32	**500yr**	5.76	7.16	8.23	9.58	11.48	18.35	21.26	**500yr**	16.24	20.45	22.48	25.98	26.13	**500yr**

Powered by ACIS Northeast Regional Climate Center

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



Rainfall data sources

This section lists the most current 24-hour rainfall data published by the National Weather Service (NWS) for various parts of the country. Because NWS Technical Paper 40 (TP-40) is out of print, the 24-hour rainfall maps for areas east of the 105th meridian are included here as figures B-3 through B-8. For the area generally west of the 105th meridian, TP-40 has been superseded by NOAA Atlas 2, the Precipitation-Frequency Atlas of the Western United States, published by the National Ocean and Atmospheric Administration.

East of 105th meridian

Hershfield, D.M. 1961. Rainfall frequency atlas of the United States for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 40. Washington, DC. 155 p.

West of 105th meridian

Miller, J.F., R.H. Frederick, and R.J. Tracey. 1973. Precipitation-frequency atlas of the Western United States. Vol. I Montana; Vol. II, Wyoming; Vol III, Colorado; Vol. IV, New Mexico; Vol V, Idaho; Vol. VI, Utah; Vol. VII, Nevada; Vol. VIII, Arizona; Vol. IX, Washington; Vol. X, Oregon; Vol. XI, California. U.S. Dept. of Commerce, National Weather Service, NOAA Atlas 2. Silver Spring, MD.

Alaska

Miller, John F. 1963. Probable maximum precipitation and rainfall-frequency data for Alaska for areas to 400 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. of Commerce, Weather Bur. Tech. Pap. No. 47. Washington, DC. 69 p.

Hawaii

Weather Bureau. 1962. Rainfall-frequency atlas of the Hawaiian Islands for areas to 200 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 43. Washington, DC. 60 p.

Puerto Rico and Virgin Islands

Weather Bureau. 1961. Generalized estimates of probable maximum precipitation and rainfall-frequency data for Puerto Rico and Virgin Islands for areas to 400 square miles, durations to 24 hours, and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 42. Washington, DC. 94 P.

Attachment D: Construction & Post-Construction Stormwater Inspection Maintenance Forms

CONSTRUCTION STORMWATER SITE INSPECTION REPORT
Holliston Battery Energy Storage System Project

General Information			
Project Name	Holliston Battery Energy Storage System Project		
Permit No.		**Location**	Holliston, MA
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your Stormwater Management Report on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes

Overall Site Issues

- *Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.*

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are perimeter controls and sediment barriers adequately installed?	❑Yes ❑No	❑Yes ❑No	
3	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
4	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
5	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
6	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
7	Are vehicle and equipment cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
8	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
10	Are areas beneath solar array drip edges properly stabilized?	❑Yes ❑No	❑Yes ❑No	
11	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

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

Print name and title: _____

Signature:_____ Date:_____

STORMWATER MANAGEMENT SYSTEM: POST-CONSTRUCTION MAINTENANCE & INSPECTION LOG				
	SCHEDULE		INITIALS & DATE	COMMENTS
	INSPECTION	MAINTENANCE		
REVEGETATED AREAS AND EMBANKMENTS				
Inspect revegetated areas and embankments	Quarterly			
Replant bare areas or areas with sparse growth		As Required		
Armor areas with rill erosion with an appropriate lining		As Required		
DRAINAGE CONVEYANCE SYSTEMS & STORMWATER BMPS				
Inspect swales, areas of concentrated flow, sediment forebays, infiltration BMPs, outlet structures, level spreader, outlet protection/plunge pools, and emergency spillways for evidence of erosion, debris, woody growth, and excessive sediment accumulation	Twice a year and after major rain event			
Remove any obstructions and accumulated sediments or debris		As Required		
Control vegetated growth and woody vegetation (as allowed)		As Required		
Repair any erosion of the swale lining		As Required		
Clean-out any accumulation of sediment		As Required		
Remove woody vegetation growing through rip-rap		As Required		
Repair any slumping side slopes		As Required		
Replace rip-rap where underlying filter fabric is showing or where stones have dislodged		As Required		
Relocate snow to approved snow storage locations.		As Required		
CULVERTS AND UNDERDRAIN				
Inspect Culvert inlets, outlets, and armoring. Inspect underdrain outlets and armoring.	Twice a year and after major rain event			
Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit		As Required		
Repair any erosion damage at the culvert's inlet and outlet		As Required		
ACCESS DRIVE SURFACES				
Inspect access drive surfaces and shoulders for erosion, false ditches, rutting, or excess accumulation of fines that could impede water flow	Quarterly			
Remove excess fines either manually or with a front-end loader		As Required		
Re-grade roads and shoulders		As Required		
VEGETATED BUFFERS				
Inspect meadow buffers for existing or developing erosion, rutting, debris, unwanted vegetation, concentrated runoff	Quarterly			
Correct any erosion/rutting/concentrated flows and remove debris		As Required		
Maintain dense cover of grasses (mow no more than twice per year, and cut vegetation no shorter than 6 inches)		As Required		
MAINTENANCE NEEDED AND WHEN:				

Attachment E: Stormwater Management System Long-Term Operation and Maintenance Plan

STORMWATER MANAGEMENT SYSTEM
LONG-TERM OPERATION AND MAINTENANCE PLAN

Prepared for the

HOLLISTON BATTERY ENERGY STORAGE SYSTEM PROJECT

Location

600 Central Street
Holliston, Massachusetts

Owner

BLUEWAVE

BWC Bogastow Brook, LLC
c/o BlueWave Solar
501 Boylston Street, Suite 10B134
Boston, MA 02116

Prepared by

TRC

650 Suffolk Street, Suite 200
Lowell, MA 01854

June 2023

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4.0 General Inspection and Maintenance Requirements 2

5.0 Facilities to be Maintained 2

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7.0 Stormwater and BESS Decommissioning Plan 4

8.0 Illicit Discharge Compliance Statement 4

ATTACHMENTS

Attachment A: Legal Responsibility for Stormwater O&M
Attachment B: Site Maintenance Plan
Attachment C: Post-Construction Maintenance and Inspection Log Example

1.0 Objective

This Stormwater Management System Long-Term Operation and Maintenance Plan has been prepared for the BWC Bogastow Brook, LLC Holliston Battery Energy Storage System (BESS) Project (the Project). BWC Bogastow Brook, LLC (BWC Bogastow Brook) will be the owner of the BESS and per Massachusetts stormwater requirements will be responsible for long term maintenance of all components of the stormwater management system. BWC Bogastow Brook will also be responsible for the operation and maintenance of the BESS. These components must be periodically inspected and maintained in effective operating condition. This plan is designed to provide guidance to properly inspect and maintain the stormwater facilities. Should the BESS be decommissioned, the Property Owner will be responsible for maintenance of the stormwater facilities if necessary.

2.0 Maintenance Responsibility

BWC Bogastow Brook will be responsible for the maintenance and inspection of stormwater management facilities during BESS operations. They shall maintain an adequate annual estimated operation and maintenance budget for the proposed stormwater management system. All stormwater maintenance and inspection work will be performed under the direction and supervision of BWC Bogastow Brook. BWC Bogastow Brook may select to hire a contractor to perform the stormwater operation and maintenance work. The emergency contact for the project will be the current Property Owner.

Contact information for these parties are as follows:

BESS Owner and Operator:

BWC Bogastow Brook, LLC
c/o BlueWave Solar
501 Boylston Street, Suite 10B134
Boston, MA 02116
Contact Person: _____
Contact Number: _____

Property Owner:

Christ the King Lutheran Church
600 Central Street
Holliston, MA 01746
Contact Person: _____
Contact Number: _____

A copy of the legal instrument that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs is provided as **Attachment A**.

3.0 Public Safety Features

A 7-foot high perimeter security fence is provided around the BESS and infiltration BMP. Access gates provide access control but also have Knox box or similar locking systems. These locking systems will maintain public safety by keeping trespassers away

from the array but will not prevent emergency services, maintenance personnel, or other authorized entrants from gaining access. An emergency vehicle turnaround is provided at the equipment pad.

In the event of an emergency at the facility, dial 911. For non-emergency events, the Town of Holliston Fire and Police Departments can be contacted directly as follows:

- Holliston Fire Department: (508) 429-4631
- Holliston Police Department: (508) 429-1212

4.0 General Inspection and Maintenance Requirements

The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the state of Massachusetts. At a minimum, BWC Bogastow Brook, or its designated contractor will inspect stormwater management features at the site on a quarterly basis. Additional inspections may occur, as needed, depending on the results of routine inspections and site conditions. Stormwater system maintenance and repairs will be performed on an as-needed basis, in accordance with recommendations made by the site inspector.

A Site Maintenance Plan depicting the locations of the stormwater BMPs is provided as **Attachment B**. The proposed access road shown in the plan will provide maintenance access. A post-construction maintenance and inspection log will be completed as part of the quarterly onsite inspections, refer to **Attachment C** for a template of this inspection log. A copy of the log shall be retained by BWC Bogastow Brook for a period of at least five years from the completion of permanent stabilization.

5.0 Facilities to be Maintained

The stormwater management facilities to be maintained at the Holliston BESS Project include:

- Access Drive;
- Stormwater Pretreatment Facility and Infiltration BMP;
- Level Spreader; and
- Revegetated Areas and Embankments.

Potential maintenance activities associated with these specific areas and stormwater management features at the facility are identified in the following paragraphs.

Access Drive

The access drive will typically require little ongoing maintenance, owing to their primary and limited use by light-duty vehicles. These areas will be inspected for signs of existing or developing erosion, rutting, trash or unwanted vegetation which will be

removed/repaired as needed. Additionally, shoulders shall be inspected for low spots or evidence of channelized flow and false ditching. Repair/maintenance shall be completed as necessary to ensure runoff from the roadways is conveyed as sheet flow to the downgradient stabilized areas.

Stormwater Pretreatment Facility and Infiltration Trench

The two sediment forebays (including underdrain outlets into first sediment forebay) and infiltration BMP (including associated emergency spillways, outlet structures, culverts, outlet protection and plunge pools) shall be inspected periodically, at least twice a year and after major rain events. They will be inspected for evidence of erosion, sediment accumulation, outlet structure obstructions, debris, or other conditions that may present operational difficulties. Overall condition of the culvert barrel sections shall be assessed for signs of damage, heaving, settlement, deflection, or other structural damage. BMPs shall be cleaned, as needed, by removing accumulated sediment, trash, debris, leaves, grass clippings from mowing, and tree seedlings before they become firmly established. The sediment forebays shall have sediment markers to determine the height of sediment accumulation. After removing the sediment, replace any vegetation damaged during the clean-out by either reseeding or resodding. When mowing grasses in the sediment forebays, keep the grass height no greater than 6 inches and set mower blades no lower than 3 to 4 inches. Mowing of the infiltration basin will be limited to twice per year to ensure a healthy grass cover is present. Weeding, pruning, and removal of woody growth on basin embankments shall be completed as necessary.

If there is water ponding on the surface of the infiltration trench, even after removal of visible sediment and debris, the sand filter material shall be replaced. If there is water ponding inside the basin as observed in the observation well (even after a 72-hour drawdown period following a storm), it may be an indication that the bottom of the basin has failed. To rehabilitate the basin, all accumulated sediment must be stripped from the bottom, the bottom of the basin must be scarified and tilled to induce infiltration, and all stone aggregate and filter fabric must be removed and replaced.

Level Spreader

The level spreader and stone berm should be inspected in the spring and fall of each year and following major storm events (25-year 24-hour storms). Newly formed channels or gullies at the inlet or outlet of the stone berm should be repaired. Bare spots or signs of stressed vegetation should be re-seeded or re-sodded as necessary. Trash, leaf litter, debris, and sediment accumulating in the level spreader or against the stone berm should be removed. Mowing should be limited to a minimum height of 6 inches and any signs of woody vegetation growth should be removed.

Revegetated Areas and Embankments

Revegetated areas and embankments will be inspected quarterly. Any signs of erosion or inadequate revegetation of these areas will be corrected as needed.

6.0 Miscellaneous Maintenance Activities

Snow removal activities for the BESS are anticipated to be minimal. A Site Maintenance Plan depicting the locations of snow storage areas is provided as **Attachment B**. If access to system components within the fenced-in BESS facility is restricted by substantial snow, then a limited area would be cleared as needed, likely by shoveling. Snow storage locations shall be inspected during quarterly inspections. Snow shall be relocated to approved storage locations as needed. Sediment accumulation shall be removed as needed.

7.0 Stormwater and BESS Decommissioning Plan

BWC Bogastow Brook would implement the following measures should it be decided that the BESS be decommissioned.

- The electrical equipment will be de-energized by licensed electricians;
- Electrical equipment, wiring, copper and aluminum will be removed and recycled;
- Conduits, both above and below grade, and other electrical assemblies will be removed;
- Fencing and fence posts will be removed and taken to a recycling facility. Some portions or all of the fence may remain in place as coordinated with the Property Owner;
- Concrete foundations for BESS and equipment pads will be fractured into manageable sizes and removed from the site for recycling;
- Disturbed areas or areas of bare soil resulting from decommissioning the BESS will be graded to match into surrounding areas and stabilized with loam, seed, and mulch;
- Underground raceways will be pulled out of the ground using an excavator. Depressions and voids left from removal of raceways and equipment will be backfilled and graded to proper elevation; and
- Stormwater BMPs and other control improvements will be maintained by the Property Owner following BESS decommissioning.

8.0 Illicit Discharge Compliance Statement

Stormwater management system operation and maintenance will be performed according to this plan and all specified pollution prevention measures will be implemented as needed to prevent illicit discharges. In the post-development condition, stormwater will generally maintain the existing on-site flow conditions generated during a 100-year, 24-hour design storm, for all drainage areas. The Site will be surrounded by fencing and access to the Site will be further limited by locked gates to limit the probability of illicit discharges to the Site stormwater BMPs.

The Site Maintenance Plan, provided as **Attachment B**, depicts the stormwater facility locations at the site and shows that these systems do not allow the entry of any illicit discharges into the

stormwater management system. There are no connections between stormwater and wastewater management systems.

ATTACHMENT A

Legal Responsibility for Stormwater O&M

ATTACHMENT B

Site Maintenance Plan

24x36 --- USER: ADavidson --- ATTACHED XREFS: 412899.1 - EXISTING --- ATTACHED IMAGES:
DRAWING NAME: \\augusta-fp1\Environmental\RMD\ENV RMD Projects\BlueWave Energy\412899 - BWC BESS Program - Massachusetts\412899.1 - Holliston\10-DWG\412899.1 - BASE.dwg --- PLOT DATE: June 15, 2023 - 1:45PM --- LAYOUT: Maintenance Plan
Version: 2017-10-21

10'W X 16'L RIP RAP EMERGENCY SPILLWAY AND PLUNGE POOL. PP-2. SEE DETAILS SHEET C4.01.

LEVEL SPREADER LS-1
INVERT ELEV.: 178.5'
BERM LENGTH: 25'
PER DETAIL SHEET C4.01

INFILTRATION BASIN AND TRENCH SEE DETAILS SHEET C4.01.

15' WIDE MAINTENANCE PATH FOR STORMWATER FACILITIES

SEDIMENT FOREBAY 2
STABILIZED WITH VEGETATION W/ OUTLET CONTROL STRUCTURE AND PLUNGE POOL. PP-1
PER DETAILS SHEET C4.01

SEDIMENT FOREBAY 1
STABILIZED WITH VEGETATION W/ 6'W X 10'L CHECK DAM OUTLET
PER DETAILS SHEET C4.01

DITCH D-3
VEGETATED W/ ECB
START ELEV.: 187.0'
END ELEV.: 179.0'
S: 0.053
PER DETAIL SHEET G1.02

16' MAINTENANCE ACCESS GATE WITH PROVISIONS FOR KNOX BOX (TYP OF 2). CRUSHED STONE WITH 12" CULVERT TO ALLOW ACCESS OVER DITCH. SEE OUTLET PROTECTION SD-1 DETAIL SHEET G1.02.

DITCH D-2
VEGETATED W/ ECB
START ELEV.: 196.0'
END ELEV.: 188.5'
S: 0.100
PER DETAIL SHEET G1.02

PROPOSED 16' WIDE GRAVEL ACCESS DRIVE TO EXTEND FROM EXISTING PARKING LOT. SEE DETAILS SHEET C4.00.

PROPOSED LANDSCAPED SCREENING. SEE DETAIL SHEET C4.00.

UNDERGROUND ELECTRIC LINE TO FACILITY

OVERHEAD GENERATION LEAD TO POINT OF INTERCONNECTION

EXISTING SITE ENTRANCE TO BE USED AND MAINTAINED AS NECESSARY

RIP RAP EMBANKMENT GRADED TO 2.5H:1V. SEE DETAIL SHEET G1.02 AND NOTE 3 THIS SHEET.

PROPOSED SNOW STORAGE LOCATION

PROPOSED CHAINLINK FENCE

PROPOSED SOUND BARRIER/SECURITY WALL

PROPOSED BESS FACILITY AND EQUIPMENT PADS

CRUSHED STONE YARD SURFACE GRADED TO MAXIMUM 2% SLOPE. SEE DETAIL SHEET C5.00.

4" UNDERDRAIN PIPE (TYP. OF 3). SEE DETAILS SHEET C4.01 AND OUTLET PROTECTION SD-2 DETAIL SHEET G1.02.

20' VEHICLE GATE WITH PROVISIONS FOR KNOX BOX

NFPA COMPLIANT VEHICLE TURNAROUND

PROPOSED SNOW STORAGE LOCATION

ROAD SETBACK FROM LEACHFIELD = 30'

DITCH D-1
VEGETATED W/ECB
START ELEV: 188.0'
END ELEV: 184.0'
S:0.033
PER DETAIL SHEET G1.02

LOT 4-62
370,786± S.F.
OR
8.512± AC.

MAP: 9 LOT: 4-88
MAP: 9 LOT: 4-89
MAP: 9 LOT: 4-90
MAP: 9 LOT: 4-91
MAP: 9 LOT: 4-46
MAP: 9 LOT: 4-44
MAP: 9 LOT: 4-87
MAP: 9 LOT: 4-86
MAP: 9 LOT: 4-81
MAP: 9 LOT: 4-30

LIMIT OF DEP MAPPED WETLAND
25' WETLAND BUFFER
100' WETLAND BUFFER
FEMA FLOOD ZONE (WESTERN LIMIT)
100' NFPA SETBACK
SIDE YARD BUILDING SETBACK
REAR YARD BUILDING SETBACK
FRONT YARD BUILDING SETBACK
S 75°14'32" E 483.33'
S 14°45'28" W 716.16'
N 19°25'28" E 218.60'
N 70°31'36" W 135.00'
N 76°59'50" W 408.16'
BOSTON EDISON TRANSMISSION EASEMENT
WELLHEAD PROTECTION AREA DEP APPROVED ZONE II (SOUTHERN LIMIT)
AGRICULTURAL-RESIDENTIAL DISTRICT B
RESIDENTIAL DISTRICT
ROAD
PILGRIM
DALTON ROAD
CENTRAL STREET
EXISTING CHURCH TWO STORY WOOD NO. 600 "CHRIST THE KING LUTHERAN CHURCH"
BENCHMARK - NAIL SET IN PAVEMENT ELEV. = 198.3 NAVD88
BENCHMARK - NAIL SET IN PAVEMENT ELEV. = 201.0 NAVD88
BENCH AREA FOR OUTDOOR CHAPEL
PARKING
PLAYGROUND
SHED
GRAVEL AREA
PAVED RUNNING
WETLAND FLAG & I.D.

LEGEND

- SURVEYED PROPERTY BOUNDARY
- APPROXIMATE ABUTTING PROPERTY BOUNDARY
- BOUNDARY MONUMENT, FOUND
- IRON PIPE, FOUND
- WATER HYDRANT
- BENCHMARK, FOUND
- LIGHT POST
- EXISTING EDGE OF PAVEMENT/CONCRETE
- EXISTING EDGE OF GRAVEL
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC & POLES
- EXISTING RIP RAP
- EXISTING TREE
- EXISTING BUILDING
- 280 EXISTING MAJOR CONTOUR
- 278 EXISTING MINOR CONTOUR
- x 269.7 EXISTING SPOT ELEVATION
- EXISTING TREES AND/OR BRUSH
- FIELD DELINEATED WETLAND
- DEP WETLAND
- ## WETLAND FLAG & I.D.
- CERTIFIED VERNAL POOL IDENTIFIED
- POTENTIAL VERNAL POOL IDENTIFIED
- FIELD DELINEATED STREAM OR WATERBODY
- DEP MAPPED STREAM
- 25' NO-DISTURBANCE BUFFER
- 100' WETLAND BUFFER
- 200' RIVERFRONT AREA
- FEMA 100-YEAR FLOOD ZONE
- APPROXIMATE FLOOD ZONE LIMIT
- PROPOSED GRAVEL ACCESS
- PROPOSED CONCRETE EQUIPMENT PAD
- 279 PROPOSED MINOR CONTOUR
- 280 PROPOSED MAJOR CONTOUR
- PROPOSED TREE LINE/CLEARING LIMITS
- PROPOSED CHAIN LINK FENCE
- PROPOSED OVERHEAD ELECTRIC LINE AND POLE
- PROPOSED MV UNDERGROUND ELECTRIC LINE

NOTES

1. FEMA FLOOD MAPS DEPICT A BASE FLOOD ELEVATION OF 151 FEET. ACTUAL FLOOD ZONE LIMIT CONFIRMED BY A SURVEYOR.
2. PROJECT PROPERTY BOUNDARIES AND SITE TOPOGRAPHIC INFORMATION ARE BASED UPON ON-THE-GROUND FIELD SURVEY COMPLETED BY LAND PLANNING, INC. IN JANUARY 2022 AS PROVIDED IN A PLAN ENTITLED "EXISTING CONDITIONS PLAN, 600 CENTRAL STREET, IN HOLLISTON, MA" AND DATED JANUARY 19, 2022.
3. PROPOSED FEATURES ARE BASED ON ISSUED FOR PERMITTING PROJECT DRAWINGS DATED JUNE 2023 AND DO NOT REPRESENT AS-BUILT CONDITIONS.

N

0 40 80 120 160
SCALE IN FEET

PERMITTING
NOT FOR CONSTRUCTION

PROJECT:
BLUEWAVE SOLAR
BWC BOGASTOW BROOK, LLC
HOLLISTON BATTERY ENERGY STORAGE SYSTEM
CENTRAL STREET, HOLLISTON, MASSACHUSETTS

TITLE:
SITE MAINTENANCE PLAN

DRAWN BY:	TRC	PROJ. NO.:	412899.0001
CHECKED BY:	TND		
APPROVED BY:	TND		**FIGURE 1**
DATE:	JUNE 2023		

TRC
650 Suffolk Street
Suite 200
Lowell, MA 01854
Phone: 978.970.5600

FILE NO.: 412899.1 - BASE.dwg

ATTACHMENT C

Post-Construction Maintenance and Inspection Log Example

STORMWATER MANAGEMENT SYSTEM: POST-CONSTRUCTION MAINTENANCE & INSPECTION LOG				
	SCHEDULE		INITIALS & DATE	COMMENTS
	INSPECTION	MAINTENANCE		
REVEGETATED AREAS AND EMBANKMENTS				
Inspect revegetated areas and embankments	Quarterly			
Replant bare areas or areas with sparse growth		As Required		
Armor areas with rill erosion with an appropriate lining		As Required		
DRAINAGE CONVEYANCE SYSTEMS & STORMWATER BMPS				
Inspect swales, areas of concentrated flow, sediment forebays, infiltration BMPs, outlet structures, level spreader, outlet protection/plunge pools, and emergency spillways for evidence of erosion, debris, woody growth, and excessive sediment accumulation	Twice a year and after major rain event			
Remove any obstructions and accumulated sediments or debris		As Required		
Control vegetated growth and woody vegetation (as allowed)		As Required		
Repair any erosion of the swale lining		As Required		
Clean-out any accumulation of sediment		As Required		
Remove woody vegetation growing through rip-rap		As Required		
Repair any slumping side slopes		As Required		
Replace rip-rap where underlying filter fabric is showing or where stones have dislodged		As Required		
Relocate snow to approved snow storage locations.		As Required		
CULVERTS AND UNDERDRAIN				
Inspect Culvert inlets, outlets, and armoring. Inspect underdrain outlets and armoring.	Twice a year and after major rain event			
Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit		As Required		
Repair any erosion damage at the culvert's inlet and outlet		As Required		
ACCESS DRIVE SURFACES				
Inspect access drive surfaces and shoulders for erosion, false ditches, rutting, or excess accumulation of fines that could impede water flow	Quarterly			
Remove excess fines either manually or with a front-end loader		As Required		
Re-grade roads and shoulders		As Required		
VEGETATED BUFFERS				
Inspect meadow buffers for existing or developing erosion, rutting, debris, unwanted vegetation, concentrated runoff	Quarterly			
Correct any erosion/rutting/concentrated flows and remove debris		As Required		
Maintain dense cover of grasses (mow no more than twice per year, and cut vegetation no shorter than 6 inches)		As Required		
MAINTENANCE NEEDED AND WHEN:				