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STORMWATER MANAGEMENT REPORT

Sellers Farm Road, MA01821

ASSESSORS MAP 24 PARCEL 1E,1G,1K

March 04, 2022
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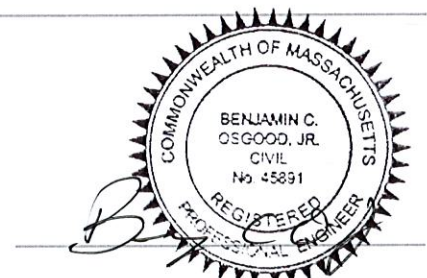
Town of Andover
Andover, MA 01821

Prepared for:

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III.

INTRODUCTION

In accordance with Massachusetts Stormwater Management Regulations and the Town of Andover Stormwater Management and Erosion Control Regulations, Ranger Engineering Group (Ranger) has prepared a comprehensive Stormwater Management Plan for submittal to the Town of Andover, MA planning board on behalf of LRC Builders, LLC (LRC) in support of an Application for a Modified Definitive Subdivision Plan with the planning board and Notice of Intent with the conservation commission for the construction of three (3) new dwellings on a new 382 foot road called Sellers Farm Road which ends in a cul-de-sac.

IV.

EXISTING CONDITIONS

The project site consists of 3 existing lots on an undeveloped road which intersects Highland Road and was approved in 2006. Lot 1 is located on assessor's map 24 lot 1E and is 0.89 acres. Lot 2 is located on assessor's map 24 lot 1G and is 1.10 acres. Lot 3 is located on assessor's map 24 lot 1K and is 0.70 acres. Portions of the drainage area are on assessors Map 24 Lot 1F, 1J, and 1H. (see Ranger Dwg. CS0201). The site is currently undeveloped and consists of grassland, forest, and wetlands. The parcel is bordered by residential properties, with undeveloped forest across Highland Road and a large wetland area to the southeast. A small wetland located on the northeast side of the site drains into the larger wetland to the southeast.

Generally, the topography is sloped away from Highland Road towards the wetland to the southeast. Stormwater sheet flows over the site towards the wetlands. Soils on the site are generally sandy loam on the upper areas of the site and saturated hydric soils in the wetlands.

V.

PROPOSED CONDITIONS

The Applicant proposes to construct a new 382 ft road ending in a cul-de-sac which will provide access to three new dwellings. Each dwelling has a garage and a bituminous concrete driveway. The new roadway will be 18' wide with asphalt berm constructed on each side. The cul-de sac will have a diameter of 96 feet. The dwellings will have water, electric, natural gas, and sewer service. The proposed utility services will be connected to the existing utility mains located in Highland Road.

A closed drainage system consisting of deep sump catch basins, manholes and piping will be constructed to collect stormwater runoff along Sellers Farm Road. Stormwater will be directed via the closed system and sheet flow over the site towards three open basin infiltration/detention ponds with sediment forebays. The treated stormwater is then discharged into the existing wetland.

VI.

STORMWATER DESIGN

The proposed stormwater system will maintain the same drainage patterns as under the pre-development conditions. Increases to peak rates of flow will be mitigated onsite to minimize or eliminate impacts to downstream areas. Stormwater presently flows to the south and east into the surrounding wetland areas.

Closed Drainage Systems

The closed drainage system consists of deep sump catch basins with 4' deep sumps and HDPE piping. Each deep sump catch basin is capable of handling a minimum of one years' worth of sediment. The system conforms to the town of Andover and Massachusetts stormwater regulations.

Stormwater Treatment

Three (3) open infiltration/detention basins are proposed to mitigate peak runoff rates and volumes, promote groundwater recharge, and to provide for water quality. Pond 1 collects water from the proposed road, the entirety of lot 3, and the driveway and front lawn of lot 1. Pond 2 collects water from the driveway and front lawn of lot 2. Pond 3 collects the remaining stormwater from lot 2. Each pond has a sediment forebay which is designed to treat stormwater of sediment and nutrient loading flowing off impervious areas. Each pond is also sized appropriately to remove the remaining nutrient load. The stormwater system is designed to contain and mitigate the 2-year, 10-year, 25-year, and 100-year storm events.

Stormwater Infiltration

The system has been sized to provide both water quality treatment and recharge to satisfy the requirements of both Mass DEP Stormwater Management Standards 3 and 4. Each pond has a raised outlet so a minimum of 1" of runoff from impervious surfaces is infiltrated.

Wetland Resource Areas

The site contains wetlands resource areas that have been flagged and located on the project plans.

Flood Zone Classification

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Essex County, Massachusetts, Community Panel 25009C0238F, effective date July 3, 2012, the site and nearby properties are located within Zone X, which is defined as areas outside of the 500-year floodplains (see attached).

Estimated Habitat for Rare Wildlife and Rare Species

According to current *Massachusetts GIS Online Mapping Tool (Oliver)*, the site is not designated as an area for estimated habitat for rare wildlife or rare species.

Soil Classification

According to the Soil Survey of Essex County, Massachusetts, prepared by the US Department of Agriculture, Soil Conservation Service, underlying soils located within the site consist primarily of Paxton Fine Sandy Loam and Woodbridge Fine Sandy Loam (see Soils Map). Paxton and Woodbridge soils, are classified within SCS Hydrologic Soil Group C.

Table 1
Hydrologic Soil Group Ratings

Map Unit Symbol	Map Unit Name	Rating
305C	Paxton Fine Sandy Loam 8-15% slope	C
311B	Woodbridge Fine Sandy Loam 0 -8%	C

The on-site soils consist of series, described by NRCS, as follows:

Paxton: The Paxton series consists of moderately well drained loamy soils formed in lodgment till and are shallow to bedrock. They are nearly level to moderately steep soils on hills, drumlins, till plains, and ground moraines. Slope ranges from 0 to 25 percent

Woodbridge: The Woodbridge series consists of moderately well drained loamy soils formed in lodgment till and are very deep to bedrock. They are nearly level to moderately steep soils on hills, drumlins, till plains, and ground moraines. Slope ranges from 0 to 25 percent.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

Per the soil survey, the general characteristics of the four (4) hydrologic soil groups are as follows:

Group A – Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B – Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C – Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D – Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Subsurface Investigation

Test pits have been performed and are shown on CS0002 of the planset. Ground water was found between 17-48". Bedrock was found as approximately 32"-80" deep in areas. The soils were found to be consistent with a C soil type as indicated in the USGS soil survey report. Sufficient soils were found beneath the proposed detention/infiltration basin to allow for a conservative infiltration

Methodology

The comparative hydrologic analysis of pre-development conditions to post-development conditions was performed using the Soil Conservation Service, Technical Release 20 (TR-20). The 2, 10, 25, and 100-year storm events were modeled for a 24-hour, Type III storm using HydroCAD version 8.5. HydroCAD calculations for pre-and post-development conditions are include in the Appendices.

The following rainfall amounts were utilized for each design storm event.

2-year Frequency Storm:	3.18 inches per 24-hours
10-year Frequency Storm:	5.04 inches per 24-hours
25-year Frequency Storm:	6.20 inches per 24 hours
100-year Frequency Storm:	7.99 inches per 24-hours

Existing Watershed

The existing site does not contain any drainage systems. Stormwater runoff infiltrates onsite and sheet flows offsite to the southeastern wetlands. The existing catchment areas and drainage runoff flow patterns associated with the site are illustrated on the attached Pre-Development Watershed Plan (Dwg. CS9201). The drainage patterns will be maintained under post-development conditions.

For the purposes of the hydrologic analyses, the existing site has been delineated as two existing catchment areas which flow to two design points. Design Point 1 is located in Highland Road and Design point 2 is located in the wetland to the south east of the site.

The following Catchments flow to design point 1 in the pre-development condition**Catchment E1**

Catchment EX1 includes areas of the site which direct stormwater runoff primarily toward the existing road (Highland Road). The topography within the catchment is moderately sloped (approx. 4%-8%). The catchment has grassed lawn area and a small portion of abutting paved driveway.

The following Catchments flow to design point 2 in the pre-development condition**Catchment E2**

Catchment EX2 includes areas of the site which direct stormwater runoff primarily toward the wetland series A on the southwest side of the property (DP #2). The area includes undeveloped woods areas and grass lawn areas. Slopes are moderate (approx. 5%–20%). The topography within the proposed developed site is gently sloping (approx. 5%).

Catchment E3

Catchment EX3 includes areas of the site which direct stormwater runoff primarily toward the wetland series B on the interior portion of the property. The area includes undeveloped woods areas and grass lawn areas. Slopes are moderate (approx. 5%–20%). The topography within the proposed developed site is gently sloping (approx. 5%).

Catchment E4

Catchment EX4 includes areas of the site which direct stormwater runoff primarily toward the wetland series A on the southeast side of the property (DP #2). The area includes undeveloped woods areas. Slopes are moderate (approx. 5%–20%). The topography within the proposed developed site is gently sloping (approx. 5%).

Proposed Watershed

The proposed subdivision will include a closed drainage system which will collect and convey stormwater runoff into several detention basins. For the purposes of the analyses, the proposed site has been divided into eleven (12) sub-catchment areas. The proposed catchment areas are shown on the Post-Development Watershed Plan (Dwg. CS9301)

The following Catchments flow to Design Point 1 in the post-development condition

Catchment P1

Includes flow from 171 Highland Road. It consists primarily of lawn with a small portion of paved bit. Conc. Driveway. Stormwater sheet flows offsite and matches the predevelopment drainage conditions.

The following Catchments flow to Design Point 2 in the post-development condition

Catchment P2A/P2B

Catchment P2A and P2B includes flow from the proposed Sellers Farm Road and grassed shoulder. Runoff from these catchments flow to deep sump catch basins CB1 and CB2 respectively.

Catchment P3

Is located on lot 3 and consists of landscaped lawn and paved driveway. Stormwater is collected in the curb constructed along the southern edge of lot 3 driveway and conveyed into one of pond 1's sediment forebays.

Catchment P4A/P4B

Consists of the lower section and cul-de-sac of Sellers Farm Road. In addition, P4B collects stormwater from lot 1 driveway and front lawn. The stormwater is directed towards CB3 and CB4 respectively and ultimately discharged into Pond 1.

Catchment P5

Consists of pond 2, a small portion of Lot 1's lawn, and Lot 1 roof area (R1). Pond 2 is discharged into wetland series B after treatment.

Catchment P6

P6 consists of Lot 1's back yard grassed lawn, woodland, and wetland series B. the majority of P6 is unaltered from the predevelopment conditions.

Catchment P7

Catchment P7 consists of lot 2's grassed lawn and a small portion of the Lot 3 driveway which is directed into Pond 3. Pond 3 is discharged into wetland series A.

Catchment P8

Consists of pond 1, areas around the pond, and the two forebays. It collects water from the closed drainage system. Treated stormwater is discharged into wetland series A.

Catchment P9

Consists of woodland and grass areas adjacent to the wetland series A, and a small portion of the rear lawn of lot 3. The majority of P9 is unaltered from the pre-development conditions and flows uncontrolled into the wetland area.

Catchments R1, R2 and R3

These catchments represent the roof areas for each of the three homes. These roof areas are directed with gutters, downspouts, and buried piping into the adjacent detention ponds.

IX. SUMMARY OF PEAK DISCHARGE RATES AND VOLUMES

The estimation of flow rates and volumes were calculated utilizing *HydroCad* stormwater modeling software. The methodology is SCS TR-20, Type III, 24-hour rainfalls (2, 10, 25, & 100-year frequency storm events). Supporting calculations are included in the Appendix.

FLOW RATE TABLES

Point of Analysis	Storm	Pre-Development Rate (CFS)	Post-Development Rate (CFS)
DP #1 (Flow to Highland Rd)	2-year	0.42	0.42
	10-year	0.98	0.78
	25-Year	1.36	1.00
	100-year	1.96	1.34

Point of Analysis	Storm	Pre-Development Rate (CFS)	Post-Development Rate (CFS)
DP #2 (Back Property Line)	2-year	2.97	2.80
	10-year	8.04	6.73
	25-Year	11.54	11.05
	100-year	17.19	16.91

X. STORMWATER MANAGEMENT STANDARDS

The project has been designed to meet the *Mass DEP Stormwater Management Standards* outlined in the *Wetlands Protection Act Regulations*. The design also complies with the standards of the *Town of Andover Stormwater Management and Erosion Control*.

STORMWATER MANAGEMENT PRACTICES

The majority of the stormwater runoff from the developed site is routed through a closed drainage system into detention basins at the low points of the site. All three ponds are equipped with sediment forebays to pretreat stormwater and handle sediment load from impervious areas. Each pond has been designed as an infiltration/detention basin. Discharge from pond 1 and 3 is conveyed through an Outlet control structure to control flows.

Detention basin 2 is an infiltration/detention basin. This basin is sized to provide infiltration and treatment of runoff. The pond has an overflow weir which directs flow to the wetland in the 10, 25, and 100 year storm event

Each pond is sized appropriately for water quality and will successfully remove the required amount of nutrients.

CONFORMANCE WITH STANDARDS

Standard 1: No New Untreated Discharges – Met

There will be no new untreated outfalls proposed as part of this project; the stormwater management system is designed to provide a minimal level of water quality treatment for all discharges.

Standard 2: Peak Rate Attenuation – Met

There will be an increase to the impervious area associated with the redevelopment of this site. Pre- and post-development watershed analyses of the drainage systems were performed for the 2, 10, 25 and 100-year storms. A summary of peak discharge rates for the pre and post development conditions is presented in section IX and the full Hydrocad printouts are included in the Appendix to this report. The results of the analysis indicate that post-development peak discharge rates will not increase from the pre-development peak discharge rates for the design point in the analysis.

Standard 3: Recharge Volume– Met

At a minimum, Standard 3 requires that the post-development site provides at least as much recharge volume as the existing conditions. There will be an increase to the impervious areas of 28,322 square feet in the post development condition which is broken down as follows:

Paved Area = 21,848 square feet

Roof Areas = 6,474 square feet

There is a groundwater recharge requirement associated with this project under the Massachusetts Stormwater management act. Based upon the Type C soil, 0.25" over the area of impervious surface must be infiltrated. Under the Andover Stormwater management act,

the requirement for TSS removal area considered met when 1" of run off from impervious surfaces is infiltrated.

$$28,322 \text{ sf} \times (1"/12") = \mathbf{2,360 \text{ CF}}$$

To meet this requirement infiltration is provided by infiltration in the detention ponds.

Basin 1:

For the area flowing to detention basin 1 the total impervious pavement area is 24,989 square feet. The required infiltration for the area flowing to ponds 1 is calculated as follows:

$$24,989 \times (1"/12") = \mathbf{2,083 \text{ CF}}$$

The total volume of infiltration available in detention basin 1 between elevation 259.5 and elevation 260.40 (outlet elevation) is 2,137 CF

2,137 CF provided >2,082 CF required

Basin 2:

For the area flowing to detention basin 2 the total impervious pavement area is 6,609 square feet. The required infiltration for the area flowing to ponds 1 is calculated as follows:

$$6,609 \text{ sf} \times (1"/12") = \mathbf{550 \text{ CF}}$$

The total volume of infiltration available in detention basin 2 between elevation 262.5 and elevation 263.00 (outlet elevation) is 1,041 cf

1041 CF provided > 550 CF required

Basin 3:

For the area flowing to detention basin 3 the total impervious pavement area is 4,699 square feet. The required infiltration for the area flowing to ponds 3 is calculated as follows:

$$4,699 \text{ sf} \times (1"/12") = \mathbf{391 \text{ CF}}$$

The total volume of infiltration available in detention pond 3 between elevation 262.75 and elevation 263.30 (outlet elevation) = 650 cf

650 CF provided > 391 CF required

The stormwater management act requires that no less than 65% of the impervious area flow to the infiltration systems for the project site. All impervious surfaces flow to infiltration system so an adjustment is not required.

72-Hour Drawdown Calculations

The drawdown time for the detention basin is determined with the following equation.

$$\text{Time (drawdown)} = \frac{\text{ReV}}{(\text{K}) \times \text{Area}}$$

Where, ReV = recharge Volume Provided

K = Saturated Hydraulic Conductivity (Rawls Rate for HSG B soils)
Area = Average Surface area of basin bottom

Three (3) soil samples were taken on site from Test Pit 6, 7 and 10 (see CS0201 and sieve analysis reports) and indicate that the underlying soil is a sandy loamy. The infiltration rate associated with a loamy sand is 1.02 inches per hour and is the rate used in the drawdown calculations below.

Detention Basin 1

The volume of stormwater stored will infiltrate through the bottom of the detention basin in time

$$\text{Time (drawdown)} = \frac{2,137 \text{ cf}}{(1.02\text{"/hr})/12 \times 1956 \text{ sf}} = 12.5 \text{ hours}$$

Detention Basin 2

The volume of stormwater stored will infiltrate through the bottom of the detention basin in time

$$\text{Time (drawdown)} = \frac{1041 \text{ cf}}{(1.02\text{"/hr})/12 \times 1940 \text{ sf}} = 6.3 \text{ hours}$$

Detention Basin 3

The volume of stormwater stored will infiltrate through the bottom of the detention basin in time

$$\text{Time (drawdown)} = \frac{650 \text{ cf}}{(1.02\text{"/hr})/12 \times 954 \text{ sf}} = 8.0 \text{ hours}$$

Standard 4: Water Quality – Met

According to Andover Stormwater regulations, the project is subject to a 90% TSS Removal Rate and a 60% Phosphorus removal rate requirement. The requirement is also considered met when one inch of water over the impervious area is retained. Water quality will be provided in three separate treatment trains as detailed below.

Detention Basin 1-3

Water quality will be provided using deep sump catch basins, sediment forebays, and a infiltration/detention basin. The water quality volume treated within this system will be as follows: The volume subject to treatment is the same volume which was calculated for Standard 3 above

Basin 1
= 2,137 CF provided > 2,083 CF required

Basin 2
= 1,041 CF provided > 550 CF required

Basin 3
= 650 CF provided > 391 CF required

The detention basin water quality treatment train includes deep sump catch basins, which provide a 25% TSS removal rate, sediment forebay which provides 25% TSS removal and the dry detention/infiltration basin which provides 80% TSS removal rate. The total TSS removal rate for this treatment chain is 85% which meets standard 4 of the Massachusetts stormwater regulations of 80% TSS removal. Additionally, Andover Stormwater Management Act requires 60% Total Phosphorous removal. Infiltration/detention Basins equipped with Sediment forebays remove 60-80% Total Phosphorus which meets the requirements.

Revised Universal Soil Loss Equation (RUSLE)

Annual Sediment Load per Catch Basin w/ 4' deep sump

Sediment load (CF/yr) = Paved Area (Ac) * 750 LB/Ac-storm / 90LB/CF * 10 storms/yr
Volume of 4' deep sump catch basin = $\pi * r * r * h = 3.14 \times 2\text{ft} \times 2\text{ft} \times 4\text{ft} = 50.25\text{ CF}$

CB1

Load = $0.034\text{ ac} * 750 * (1/90) * 10 = 2.83\text{ cf/yr}$

CB2

Load = $0.034\text{ ac} * 750 * (1/90) * 10 = 2.83\text{ cf/yr}$

CB3

Load = $0.12\text{ ac} * 750 * (1/90) * 10 = 10\text{ cf/yr}$

CB4

Load = $0.16\text{ ac} * 750 * (1/90) * 10 = 13.3\text{ cf/yr}$

Sediment Forebay Sizing

Required Volume = Impervious Area x (0.1"/12")

Pond 1:

Required Volume = 24,989 SF x (0.1"/12") = 208 CF

Provided Volume = 850 CF

Pond 2:

Required Volume = 6,609 SF x (0.1"/12") = 55 CF

Provided Volume = 76.25 CF

Pond 3:

Required Volume = 4,699 SF x (0.1"/12") = 39 CF

Provided Volume = 285 CF

Standard 5: LUHPPL's – Not applicable

Standard 6: Critical Areas _ Not Applicable

Standard 7: Redevelopment Projects Not Applicable

Standard 8: Erosion and Sediment Control – Met

Soil and erosion control shall be provided during construction by means of siltation fence, and/or compost filter tubes. Inlet protection will be installed on all drain inlets and a construction entrance will be used in areas where the pavement and building are being removed.

The Stormwater Pollution Prevention Plan (SWPPP) has been completed and included with this report. The Contractor will submit the SWPPP through the NPDES Notice system prior to any land disturbance.

Standard 9: Operation and Maintenance Plan – Met

The operation and maintenance plan for the post-construction BMP's on this project will be the responsibility of the Property Owner. The Operation and Maintenance Plan for the proposed drainage systems can be found in the Appendix.

Standard 10: Illicit Discharges – Met

There are no known or suspected illicit discharges to the proposed stormwater conveyance system.

In summary, this project meets Standards 1, 2,3, 4, 8, 9, and 10. Standards 5, 6, and 7 are not applicable to the project.

STORMWATER MANAGEMENT REPORT

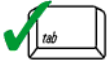
DEP STORMWATER CHECKLIST



Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

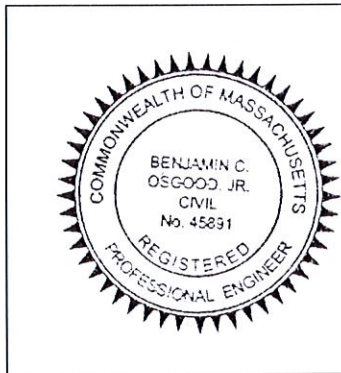
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

Standard 4: Water Quality

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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

Standard 6: Critical Areas

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



Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 9: Operation and Maintenance Plan

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

Standard 10: Prohibition of Illicit Discharges

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

STORMWATER MANAGEMENT REPORT

TSS REMOVAL CALCULATIONS

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: Infiltration Ponds P1, P2 and P3

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Infiltration Basin	0.80	0.75	0.60	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15

Total TSS Removal = 85%

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

Project: 196 Ballardvale Street, Wilmington, MA
Prepared By: BCO Jr.
Date: 3/2/2022

*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



RANGER ENGINEERING GROUP, INC.

STORMWATER MANAGEMENT REPORT

POLLUTION PREVENTION PLANS

Construction Period Erosion and Sedimentation Control Plan:

The BMP's associated with the construction phase this project will be owned by the Applicant's Contractor, which will be responsible for inspection, operation and maintenance. A more detailed SWPPP – per NPDES Phase 2 requirements – is to be kept on site, along with inspection logs. All details and plans required are included in the Site Plan set attached herewith.

1. The contractor is to install and maintain drainage facilities as shown on site plan prepared by Ranger Engineering Group, Inc. (Ranger), dated March 04, 2022.
2. Prior to commencement of construction the contractor shall file a notice of intent under the EPA NPDES construction permit.
3. Any dewatering requires coverage under the NPDES construction site dewatering general permit.
4. The contractor must install erosion control measures as shown on the plans and in the details prior to starting any other work on the site. Erosion control must be installed at every inlet structure (existing and proposed) and maintained for the duration of the project.
5. Erosion controls as shown on plans shall be inspected, repaired and/or maintained by the contractor daily and within 12 hours of each storm event.
6. Sediment deposits shall be removed when they reach a depth of 1/4 to 1/2 the height of the silt fence or sediment sock.
7. Sediment shall be contained within the construction site, away from drainage structures. Sediment reaching the public way shall be removed by street sweeping and not by flushing.
8. Stabilize slopes steeper than 3:1 (horizontal to vertical) with seed, secured geotextile fabric, or rock rip-rap as required to prevent erosion during construction.
9. Clean out catch basins, drain manholes and storm drain pipes after completion of construction.
10. Loam and seed all disturbed areas. Permanent seeding shall occur in the spring from late march through may and in late summer or early fall between August and October.
11. Dust shall be controlled at the site with mechanical water spraying as necessary and during extended dry periods.
12. Upon establishment of permanent vegetation over disturbed areas, remove and dispose of hay wattles and stakes.
13. It is the responsibility of the contractor to maintain and supplement the specified sedimentation controls as necessary to prevent sedimentation of off-site areas and/or any regulated resource areas. Failure by the contractor to control erosion, pollution and/or siltation shall be cause for the owner to employ outside assistance or to use his

own means to provide the necessary corrective measure. The cost of such assistance plus project engineering costs will be the contractor's responsibility.

14. In addition to those locations shown on this plan and on the grading and drainage plans, erosion controls shall be installed at the following locations: toe of slope of embankment construction, toe of temporary earthwork stockpiles. Stockpile side slopes shall not exceed 2:1.
15. Erosion and sedimentation control shall be installed and maintained in compliance with Massachusetts stormwater policy.

LONG TERM POLLUTION PREVENTION PLAN

It is the responsibility of the property owner to properly maintain the drainage systems and structures, including drain pipes. The current property owner will oversee long term maintenance of the stormwater system and will be responsible for compliance with the Long Term Pollution Prevention Plan upon completion of the construction.

Regular maintenance is to include the following:

- 1. Cleaning of Debris from Stormwater Ponds**

Trash and debris shall be removed from the stormwater ponds monthly.

- 2. Mowing Interior of Stormwater Ponds**

Grass slopes within and around stormwater ponds shall be mowed a minimum of twice per year to prevent the growth of woody vegetation

- 3. Pavement Sweeping**

Pavement surfaces shall be swept a minimum of twice per year, preferably just after snow melt and late in the fall.

- 4. Catch Basin Sumps, Drain Manhole and Outlet Control Structures**

Inspect quarterly for the evidence of structural damage, silt accumulation and improper function. Remove accumulated sediments and debris from catch basin sump when sump is more than 25% full, minimum annually just after snow melt.

- 5. Drain Pipes**

Inspect annually for the evidence of structural damage, silt accumulation and improper function. Clean pipes when sediment occupies more than 20% of pipe diameter.

- 6. Sediment Forebays**

Inspect quarterly for accumulation of silt and debris. Remove silt when deeper than 4".

- 7. Dry Detention / Infiltration Ponds**

Inspect after every storm event for first few months of operation to ensure that the ponds are infiltrating properly. Thereafter inspect twice per year for evidence of structural damage, erosion, and sediment accumulation. Inspect outlet structure and rip rap protection for proper function and control of erosion. Mow the side slopes, remove trash, debris, and grass clippings a minimum of twice per year.

8. Graded Slopes and Rip Rap outlets

Inspect every spring for erosion. Repair any erosion by placing rip-rap or loam and seed. Nurtured freshly seeded areas to ensure proper germination and establishment of turf.

Inspections shall be performed by a qualified person with knowledge of stormwater structures and conveyance systems A report of inspections shall be submitted to the Town of Billerica on an annual basis within 30 days of the end of each calendar year.

The requirement and responsibility for the inspection and maintenance of the stormwater system will continue to any subsequent owners of the property.

Current Property Owner who will be responsible for the operation, maintenance, and emergency repairs of the stormwater system.

LRC Builders, LLC
475 Boston Road
Billerica, MA 01821

Inspection Costs

The annual costs of implementing the required inspections and maintenance outlined in the long-term pollution prevention plan are expected to be as follows:

- Quarterly inspections \$ 2,000
- Annual roadway sweeping \$ 1,500
- Removal of silt from stormwater treatment systems \$ 2,000
- Annual mowing of side slopes \$ 500
- Annual catch basin cleaning \$ 1,500

Public Safety

The stormwater management system is designed as a passive system and when maintained properly it should not pose any threat to public safety.

**ANNUAL LONG TERM POLLUTION PREVENTION PLAN
MAINTINANCE AND INSPECTION LOG**

This inspection log shall be maintained on site and completed as required during the calendar year when stormwater system maintenance and inspection is performed. General Maintenance items such as mowing and removal of debris from stormwater systems can be completed by persons employed by the property owner. Inspections of stormwater systems and piping should be performed by a person with knowledge of stormwater systems and is qualified to perform such inspections.

Plan Year _____

Cleaning of Debris from Stormwater Ponds

Trash and debris shall be removed from the stormwater ponds on a monthly basis

MONTH	DATE	PERFORMED BY	COMMENTS
JANUARY			
FEBRUARY			
MARCH			
APRIL			
MAY			
JUNE			
JULY			
AUGUST			
SEPTEMBER			
OCTOBER			
NOVEMBER			
DECEMBER			

Mowing Interior of Stormwater Ponds

Grass slopes within and around stormwater ponds shall be mowed a minimum of twice per year to prevent the growth of woody vegetation

DATE	PERFORMED BY	COMMENTS

Pavement Sweeping

Pavement surfaces shall be swept a minimum of twice per year, preferably just after snow melt and late in the fall.

DATE	PERFORMED BY	COMMENTS

Catch Basin Sumps, Drain Manhole and Outlet Control Structures

Inspect quarterly for the evidence of structural damage, silt accumulation and improper function. Remove accumulated sediments and debris from catch basin sump when sump is more than 25% full, minimum annually just after snow melt.

INSPECTION DATE	PERFORMED BY	COMMENTS

Drain Pipes

Inspect annually for the evidence of structural damage, silt accumulation and improper function. Clean pipes when sediment occupies more than 20% of pipe diameter.

INSPECTION DATE	PERFORMED BY	COMMENTS

Sediment Forebays

Inspect quarterly for accumulation of silt and debris. Remove silt when deeper than 4".

INSPECTION DATE	PERFORMED BY	COMMENTS

Dry Detention / Infiltration Ponds

Inspect after every storm event for first few months of operation to ensure that the ponds are infiltrating properly. Thereafter inspect twice per year for evidence of structural damage, erosion, and sediment accumulation. Inspect outlet structure and rip rap protection for proper function and control of erosion. Mow the side slopes, remove trash, debris, and grass clippings a minimum of twice per year.

INSPECTION DATE	PERFORMED BY	COMMENTS

Graded Slopes and Rip Rap outlets

Inspect every spring for erosion. Repair any erosion by placing rip-rap or loam and seed. Nurtured freshly seeded areas to ensure proper germination and establishment of turf.

INSPECTION DATE	PERFORMED BY	COMMENTS

Corrective actions

In the area below describe any repairs made to the system during the current calendar year. Add additional sheets if necessary

APPENDICES

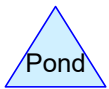
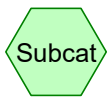
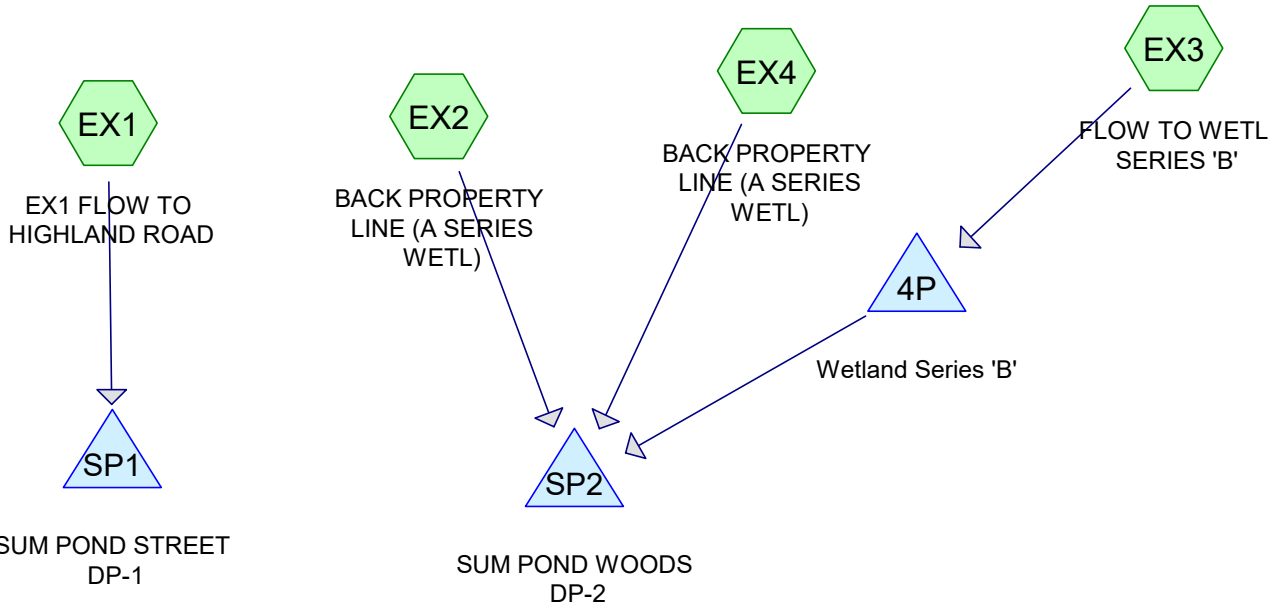
HYDROCAD CALCULATIONS
PRECIPITATION FREQUENCY TABLE
POND STAGE STORAGE TABLES
95TH PERCENTILE STORM WETLAND SEREIS 'B'
MOUNDING ANALYSIS



RANGER ENGINEERING GROUP, INC.

STORMWATER MANAGEMENT REPORT

PRE-DEVELOPMENT DRAINAGE



Routing Diagram for SELLERS FARM PRE DEVELOPMENT
 Prepared by Ranger Engineering Group, Inc., Printed 9/13/2022
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SELLERS FARM PRE DEVELOPMENT

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.18	2
2	10 year	Type III 24-hr		Default	24.00	1	5.04	2
3	25 year	Type III 24-hr		Default	24.00	1	6.20	2
4	100 Year	Type III 24-hr		Default	24.00	1	7.99	2

SELLERS FARM PRE DEVELOPMENT

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
56,765	74	>75% Grass cover, Good, HSG C (EX1, EX2, EX3)
1,415	98	Paved parking, HSG C (EX1)
1,000	98	Roofs, HSG C (EX3)
121,440	70	Woods, Good, HSG C (EX1, EX2, EX3, EX4)
6,822	79	Woods/grass comb., Good, HSG D (EX3)
187,442	72	TOTAL AREA

SELLERS FARM PRE DEVELOPMENT

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
180,620	HSG C	EX1, EX2, EX3, EX4
6,822	HSG D	EX3
0	Other	
187,442		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	56,765	0	0	56,765	>75% Grass cover, Good
0	0	1,415	0	0	1,415	Paved parking
0	0	1,000	0	0	1,000	Roofs
0	0	121,440	0	0	121,440	Woods, Good
0	0	0	6,822	0	6,822	Woods/grass comb., Good
0	0	180,620	6,822	0	187,442	TOTAL AREA

STORMWATER MANAGEMENT REPORT

2 YEAR STORM

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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

Subcatchment EX1: EX1 FLOW TO Runoff Area=14,525 sf 9.74% Impervious Runoff Depth>1.14"
Tc=6.0 min CN=76 Runoff=0.42 cfs 1,376 cf

Subcatchment EX2: BACK PROPERTY LINE Runoff Area=88,780 sf 0.00% Impervious Runoff Depth>0.92"
Flow Length=6' Tc=6.0 min CN=72 Runoff=1.99 cfs 6,778 cf

Subcatchment EX3: FLOW TO WETL Runoff Area=58,237 sf 1.72% Impervious Runoff Depth>0.91"
Flow Length=335' Tc=14.9 min CN=72 Runoff=0.99 cfs 4,435 cf

Subcatchment EX4: BACK PROPERTY LINE Runoff Area=25,900 sf 0.00% Impervious Runoff Depth>0.81"
Flow Length=325' Slope=0.0600 '/' Tc=11.7 min CN=70 Runoff=0.41 cfs 1,757 cf

Pond 4P: Wetland Series 'B' Peak Elev=258.89' Storage=8 cf Inflow=0.99 cfs 4,435 cf
Outflow=0.99 cfs 4,435 cf

Pond SP1: SUM POND STREET DP-1 Inflow=0.42 cfs 1,376 cf
Primary=0.42 cfs 1,376 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=2.97 cfs 12,969 cf
Primary=2.97 cfs 12,969 cf

Total Runoff Area = 187,442 sf Runoff Volume = 14,345 cf Average Runoff Depth = 0.92"
98.71% Pervious = 185,027 sf 1.29% Impervious = 2,415 sf

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Runoff = 0.42 cfs @ 12.10 hrs, Volume= 1,376 cf, Depth> 1.14"
 Routed to Pond SP1 : SUM POND STREET DP-1

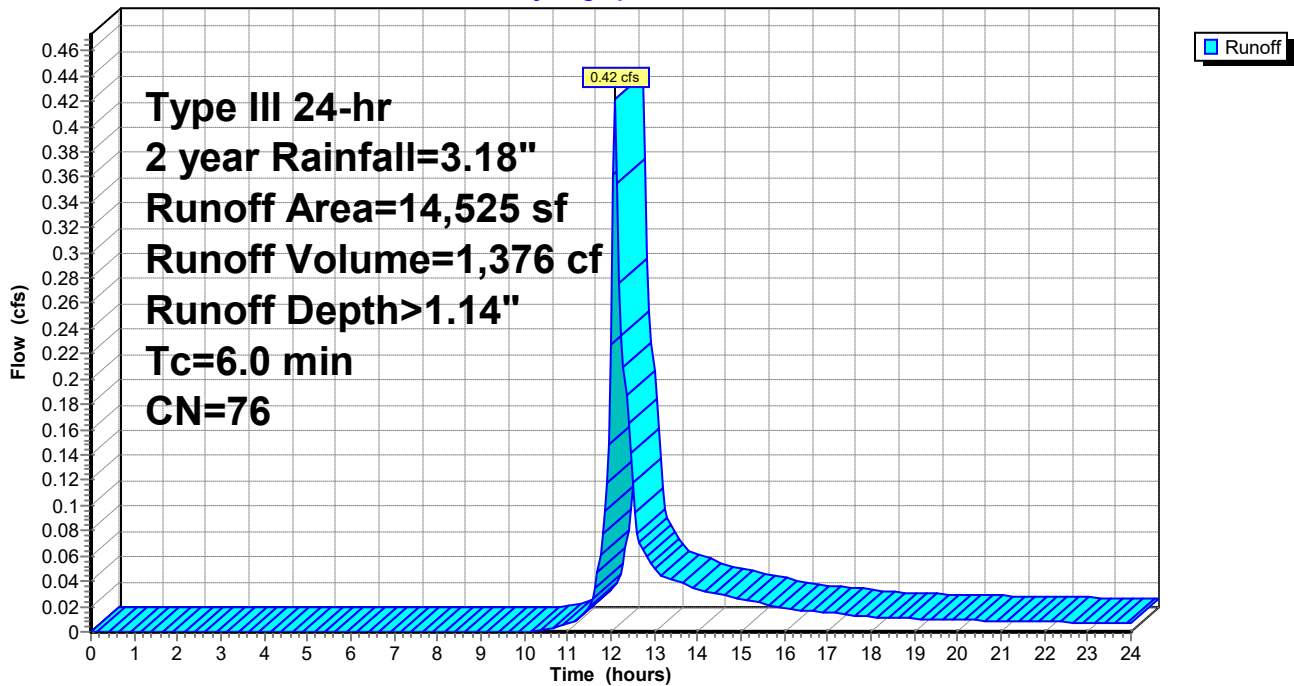
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
11,750	74	>75% Grass cover, Good, HSG C
1,360	70	Woods, Good, HSG C
14,525	76	Weighted Average
13,110		90.26% Pervious Area
1,415		9.74% Impervious Area

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

Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

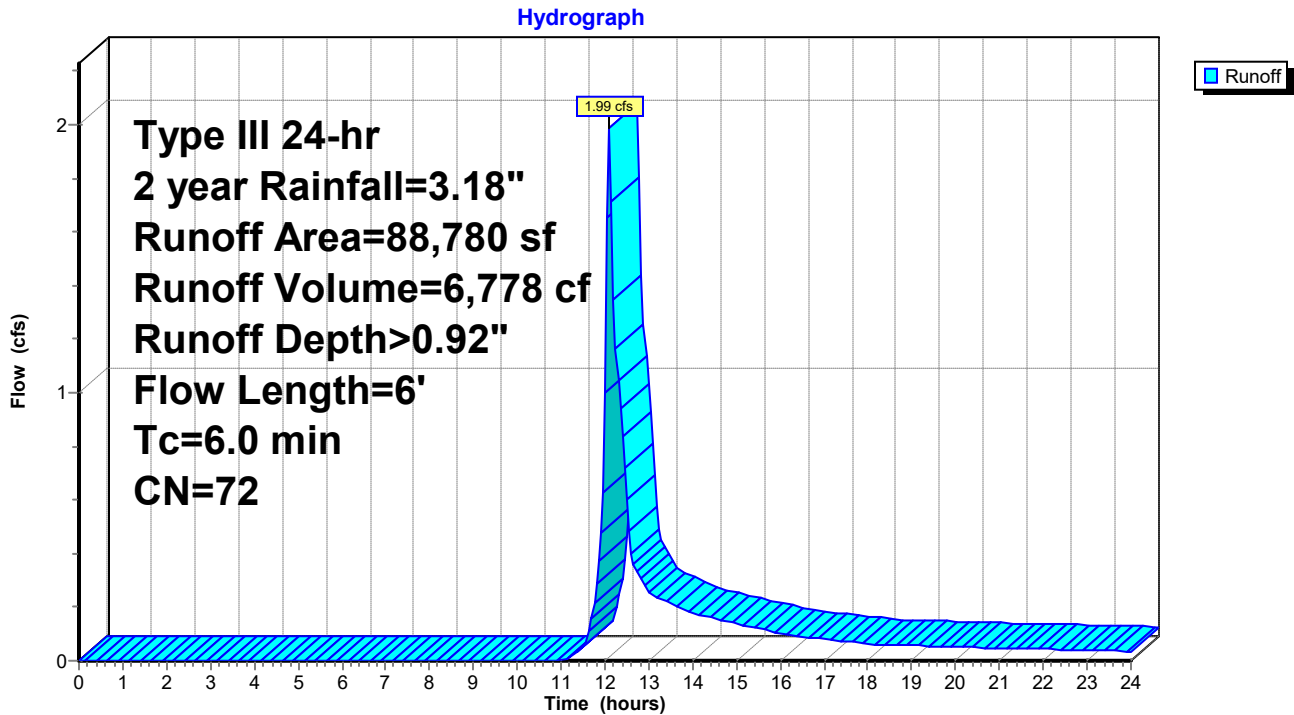
Runoff = 1.99 cfs @ 12.10 hrs, Volume= 6,778 cf, Depth> 0.92"
 Routed to Pond SP2 : SUM POND WOODS DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
41,415	74	>75% Grass cover, Good, HSG C
47,365	70	Woods, Good, HSG C
88,780	72	Weighted Average
88,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	6		0.02		Direct Entry,

Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)



SELLERS FARM PRE DEVELOPMENT

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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment EX3: FLOW TO WETL SERIES 'B'

Runoff = 0.99 cfs @ 12.23 hrs, Volume= 4,435 cf, Depth> 0.91"
 Routed to Pond 4P : Wetland Series 'B'

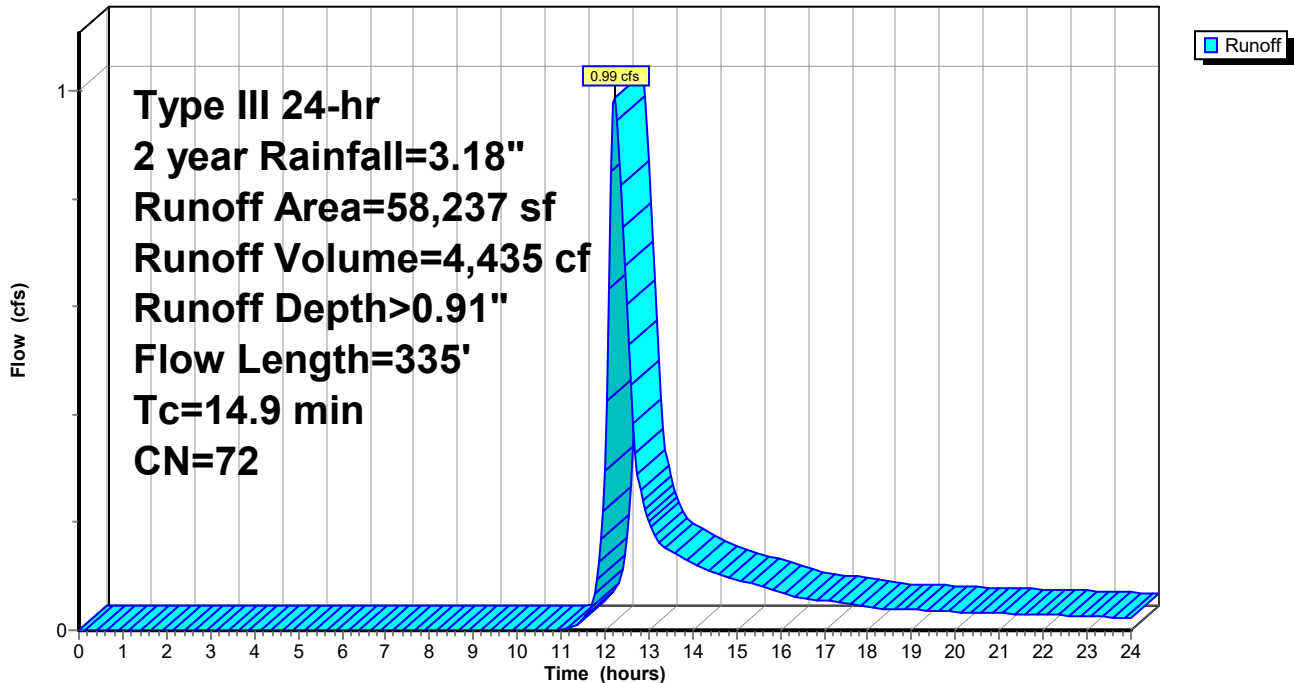
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
3,600	74	>75% Grass cover, Good, HSG C
46,815	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
58,237	72	Weighted Average
57,237		98.28% Pervious Area
1,000		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.12"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THRU WETLAND B Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment EX3: FLOW TO WETL SERIES 'B'

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)

Runoff = 0.41 cfs @ 12.19 hrs, Volume= 1,757 cf, Depth> 0.81"
 Routed to Pond SP2 : SUM POND WOODS DP-2

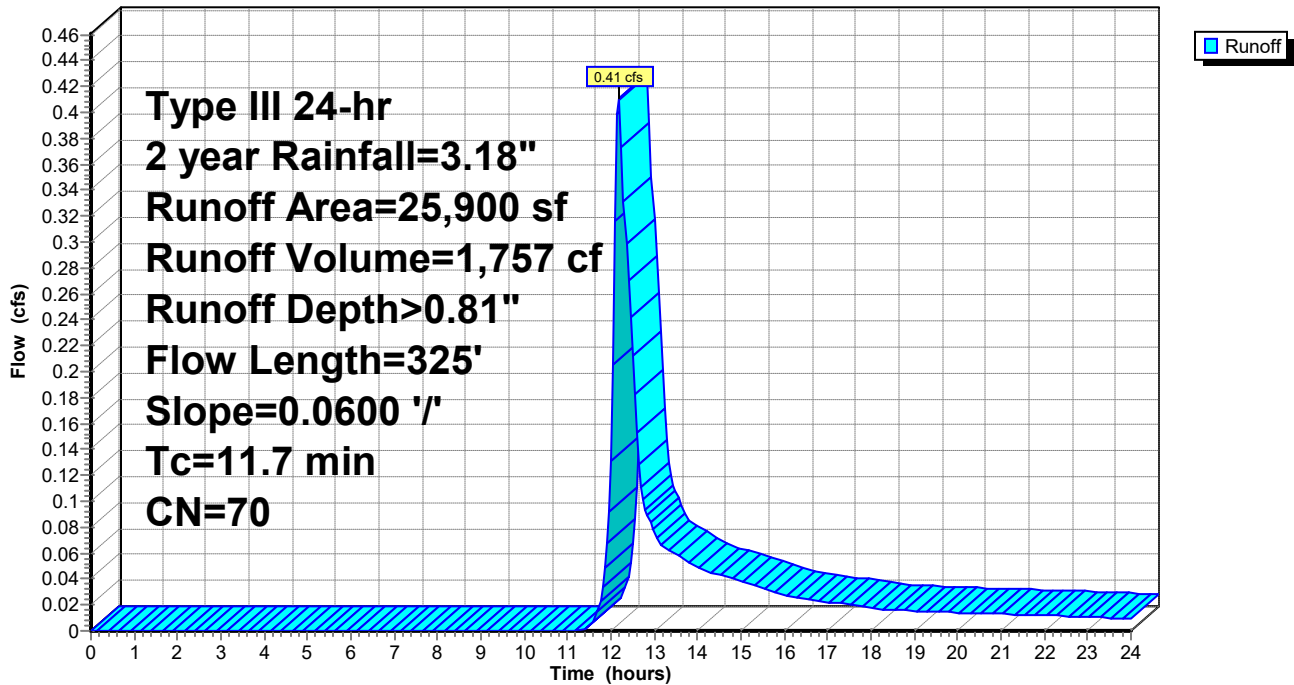
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
25,900	70	Woods, Good, HSG C
25,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0600	0.10		Sheet Flow, FLOW OVER GRASS Woods: Light underbrush n= 0.400 P2= 3.12"
2.0	150	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
1.7	125	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
11.7	325	Total			

Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 58,237 sf, 1.72% Impervious, Inflow Depth > 0.91" for 2 year event
 Inflow = 0.99 cfs @ 12.23 hrs, Volume= 4,435 cf
 Outflow = 0.99 cfs @ 12.23 hrs, Volume= 4,435 cf, Atten= 0%, Lag= 0.3 min
 Primary = 0.99 cfs @ 12.23 hrs, Volume= 4,435 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 258.89' @ 12.23 hrs Surf.Area= 71 sf Storage= 8 cf

Plug-Flow detention time= 0.1 min calculated for 4,435 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (875.3 - 875.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	258.65'	275 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)	
258.65	5	9.0	0	0	5	
259.00	125	47.0	18	18	175	
259.70	685	102.0	257	275	829	

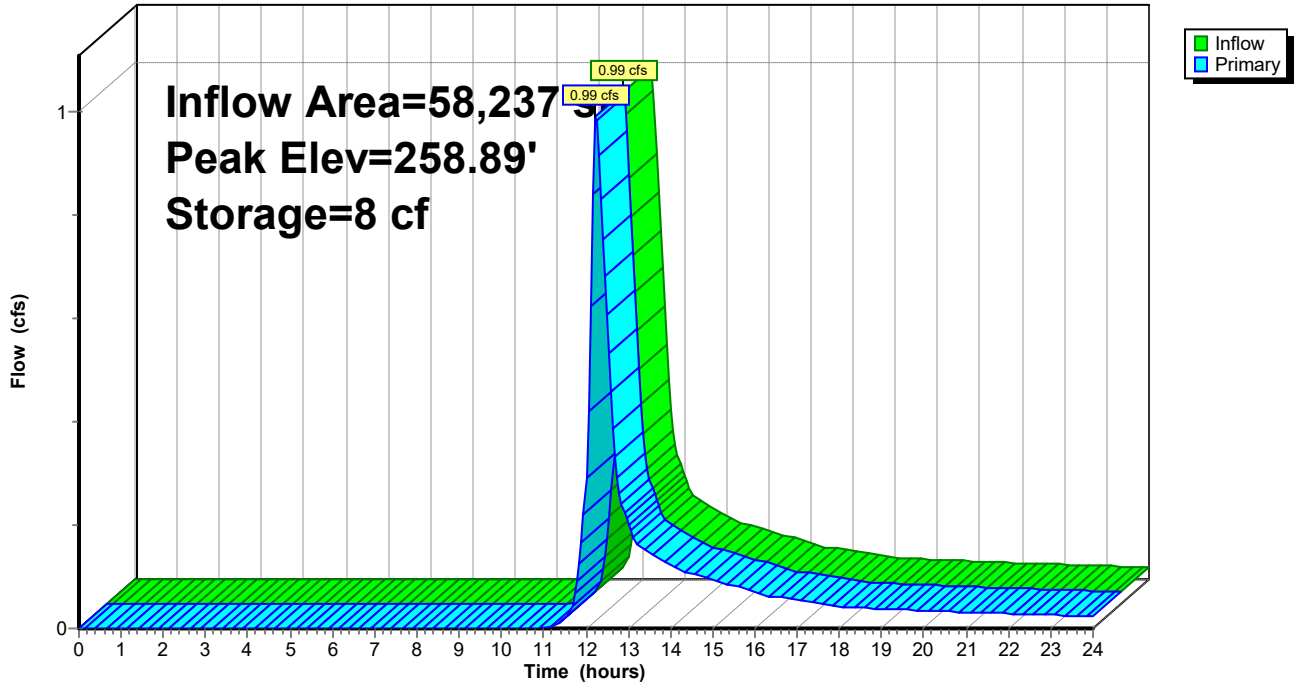
Device	Routing	Invert	Outlet Devices									
#1	Primary	259.70'	25.0' long x 10.0' breadth Broad-Crested Rectangular Weir									
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60									
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64									
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill									
			Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%									

Primary OutFlow Max=0.98 cfs @ 12.23 hrs HW=258.89' TW=0.00' (Dynamic Tailwater)

- 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- 2=Rock Fill (Rockfill Controls 0.98 cfs @ 0.33 fps)

Pond 4P: Wetland Series 'B'

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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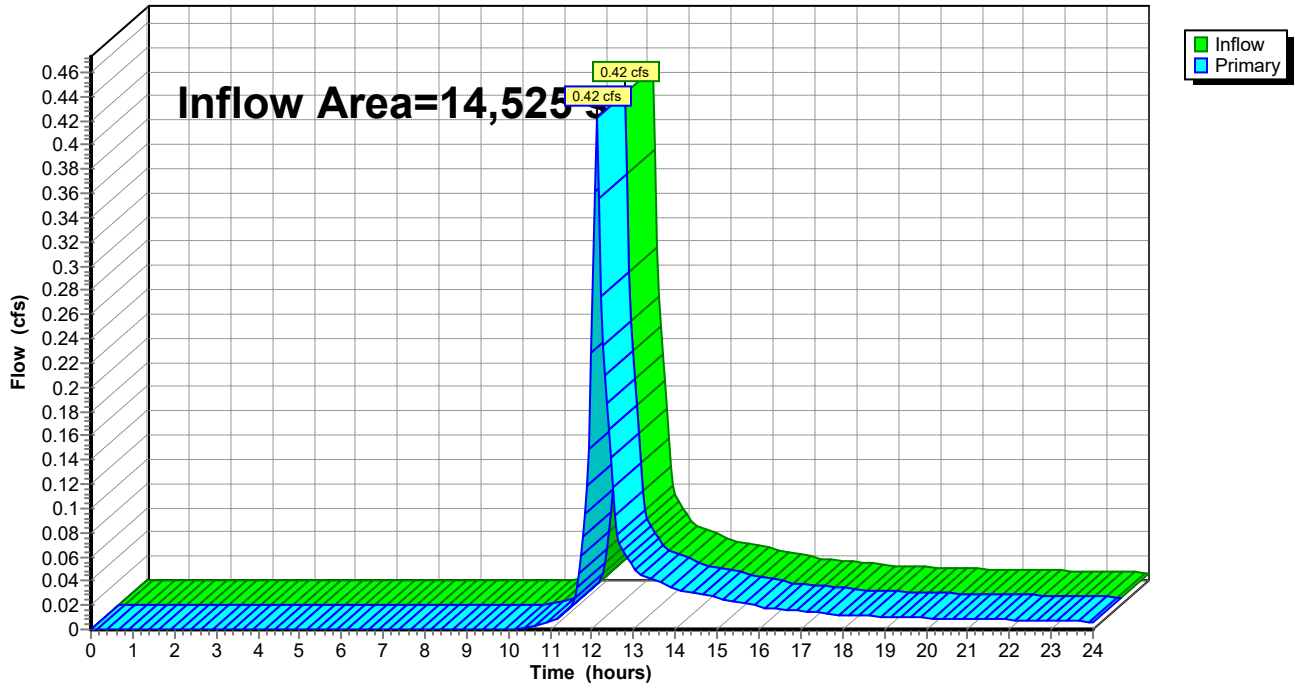
Summary for Pond SP1: SUM POND STREET DP-1

Inflow Area = 14,525 sf, 9.74% Impervious, Inflow Depth > 1.14" for 2 year event
Inflow = 0.42 cfs @ 12.10 hrs, Volume= 1,376 cf
Primary = 0.42 cfs @ 12.10 hrs, Volume= 1,376 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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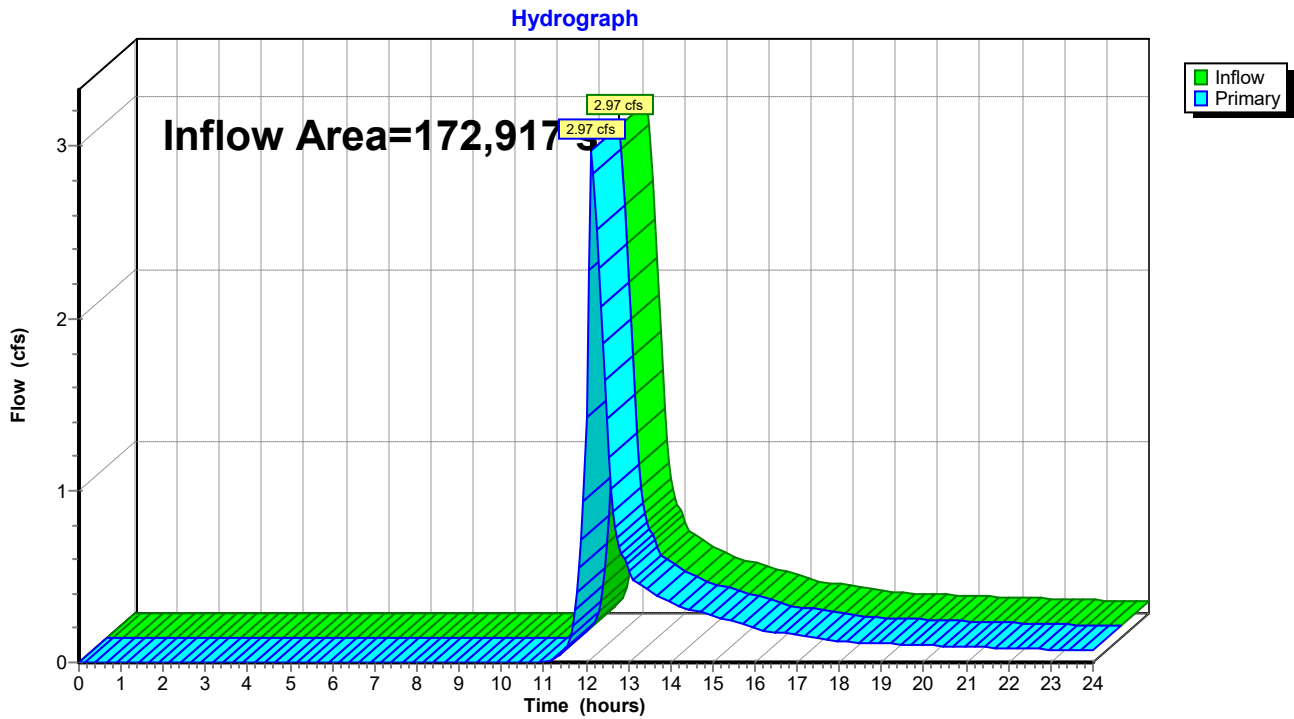
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Summary for Pond SP2: SUM POND WOODS DP-2

Inflow Area = 172,917 sf, 0.58% Impervious, Inflow Depth > 0.90" for 2 year event
Inflow = 2.97 cfs @ 12.13 hrs, Volume= 12,969 cf
Primary = 2.97 cfs @ 12.13 hrs, Volume= 12,969 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2



STORMWATER MANAGEMENT REPORT

10 YEAR STORM

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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

Subcatchment EX1: EX1 FLOW TO Runoff Area=14,525 sf 9.74% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=76 Runoff=0.98 cfs 3,106 cf

Subcatchment EX2: BACK PROPERTY LINE Runoff Area=88,780 sf 0.00% Impervious Runoff Depth>2.23"
Flow Length=6' Tc=6.0 min CN=72 Runoff=5.18 cfs 16,472 cf

Subcatchment EX3: FLOW TO WETL Runoff Area=58,237 sf 1.72% Impervious Runoff Depth>2.22"
Flow Length=335' Tc=14.9 min CN=72 Runoff=2.61 cfs 10,783 cf

Subcatchment EX4: BACK PROPERTY LINE Runoff Area=25,900 sf 0.00% Impervious Runoff Depth>2.06"
Flow Length=325' Slope=0.0600 '/' Tc=11.7 min CN=70 Runoff=1.16 cfs 4,448 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.11' Storage=35 cf Inflow=2.61 cfs 10,783 cf
Outflow=2.60 cfs 10,782 cf

Pond SP1: SUM POND STREET DP-1 Inflow=0.98 cfs 3,106 cf
Primary=0.98 cfs 3,106 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=8.04 cfs 31,703 cf
Primary=8.04 cfs 31,703 cf

Total Runoff Area = 187,442 sf Runoff Volume = 34,809 cf Average Runoff Depth = 2.23"
98.71% Pervious = 185,027 sf 1.29% Impervious = 2,415 sf

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 3,106 cf, Depth> 2.57"
 Routed to Pond SP1 : SUM POND STREET DP-1

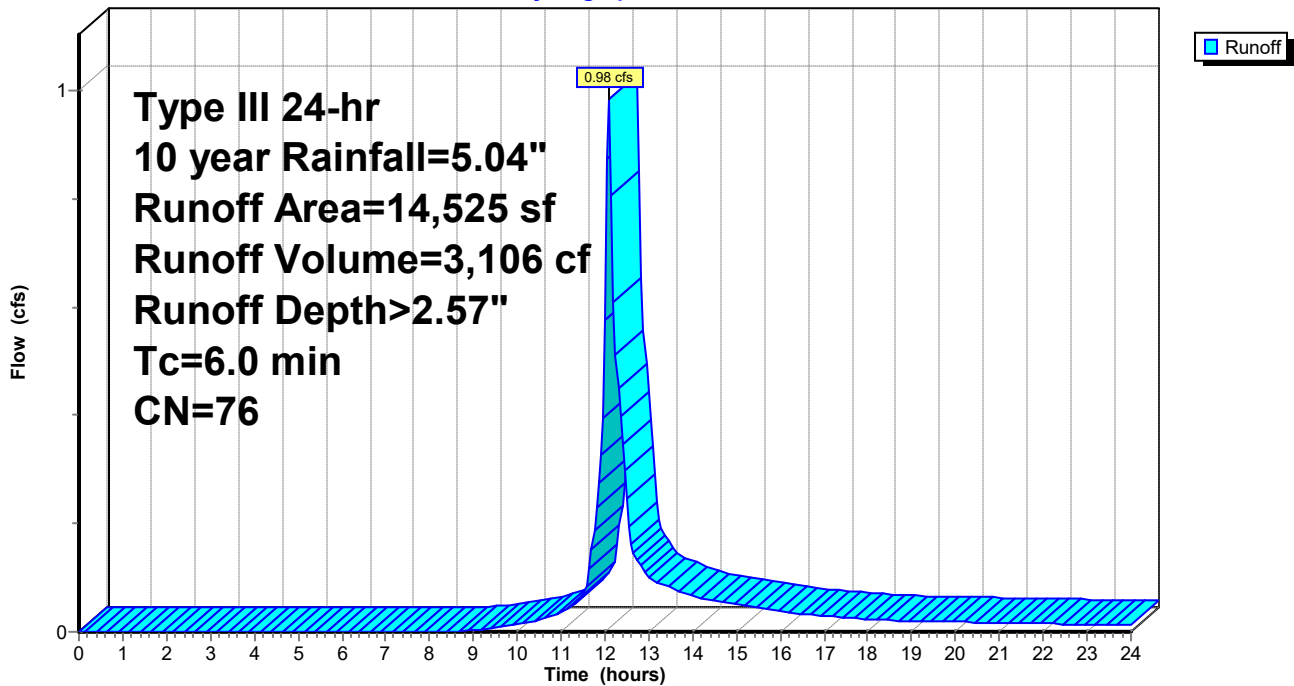
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
11,750	74	>75% Grass cover, Good, HSG C
1,360	70	Woods, Good, HSG C
14,525	76	Weighted Average
13,110		90.26% Pervious Area
1,415		9.74% Impervious Area

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

Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Runoff = 5.18 cfs @ 12.10 hrs, Volume= 16,472 cf, Depth> 2.23"
Routed to Pond SP2 : SUM POND WOODS DP-2

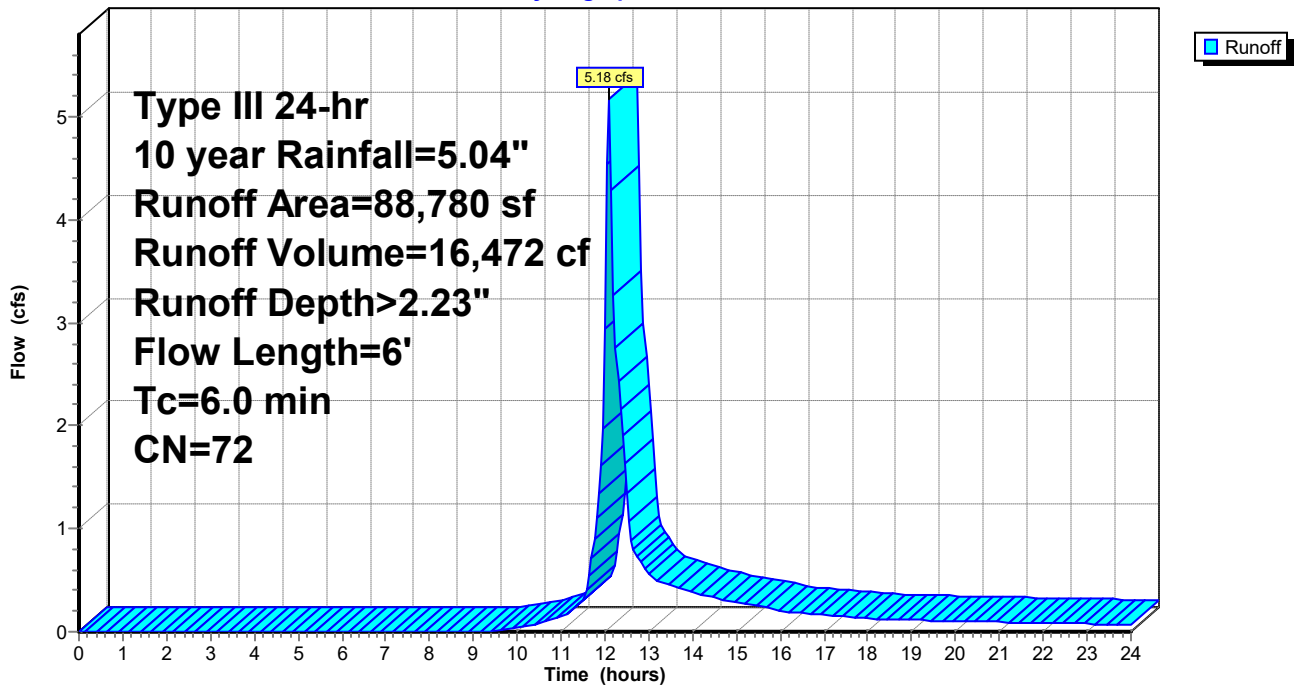
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
41,415	74	>75% Grass cover, Good, HSG C
47,365	70	Woods, Good, HSG C
88,780	72	Weighted Average
88,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	6		0.02		Direct Entry,

Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Hydrograph



SELLERS FARM PRE DEVELOPMENT

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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment EX3: FLOW TO WETL SERIES 'B'

Runoff = 2.61 cfs @ 12.21 hrs, Volume= 10,783 cf, Depth> 2.22"
 Routed to Pond 4P : Wetland Series 'B'

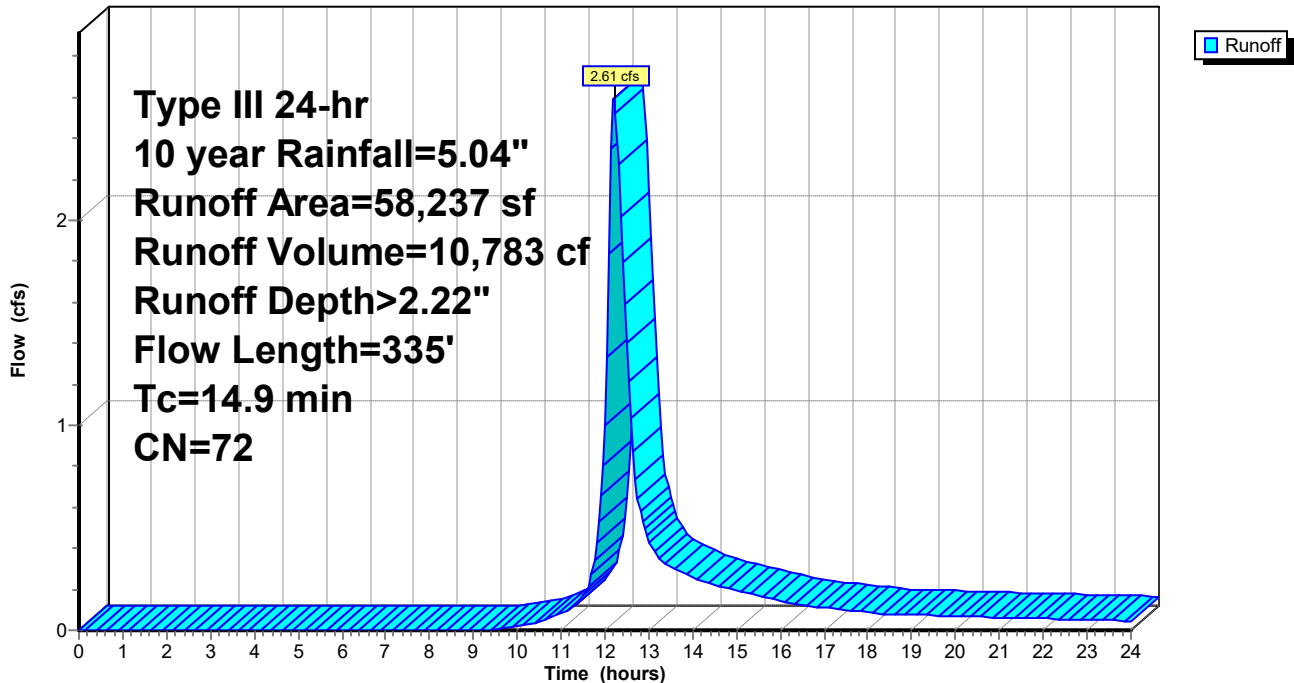
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
3,600	74	>75% Grass cover, Good, HSG C
46,815	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
58,237	72	Weighted Average
57,237		98.28% Pervious Area
1,000		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.12"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THRU WETLAND B Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment EX3: FLOW TO WETL SERIES 'B'

Hydrograph



SELLERS FARM PRE DEVELOPMENT

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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)

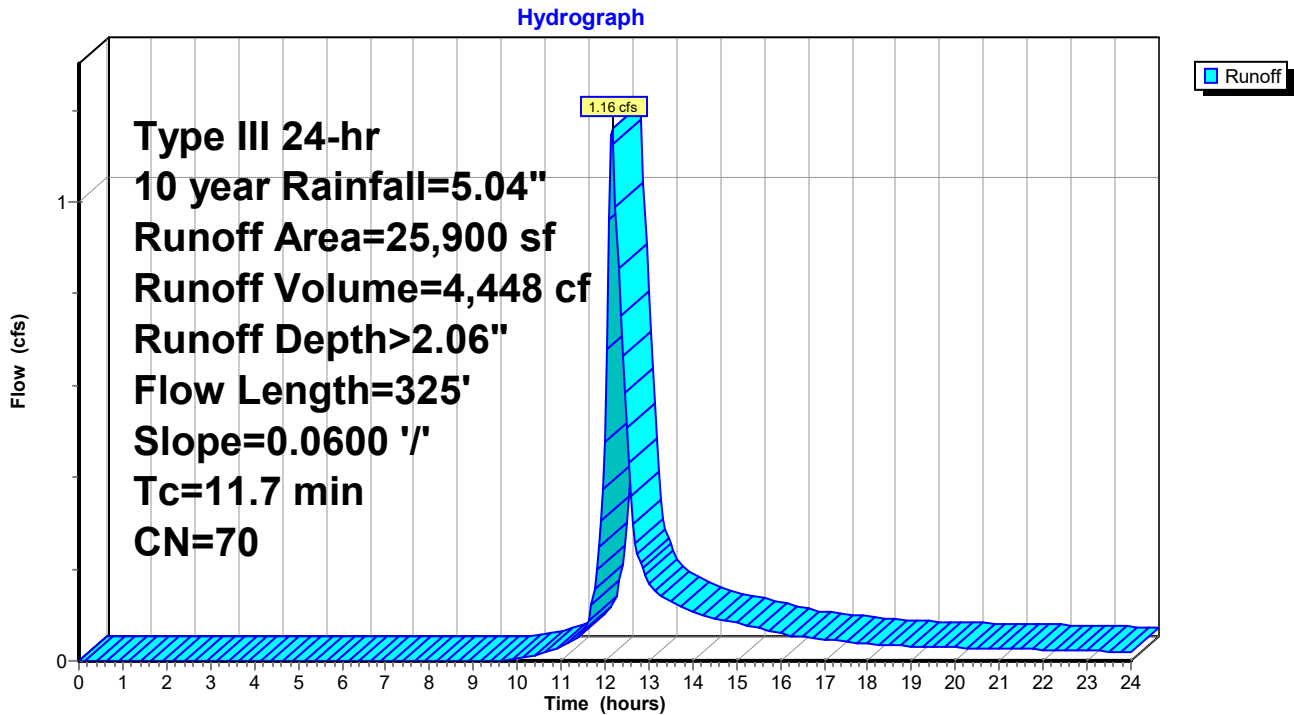
Runoff = 1.16 cfs @ 12.17 hrs, Volume= 4,448 cf, Depth> 2.06"
 Routed to Pond SP2 : SUM POND WOODS DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
25,900	70	Woods, Good, HSG C
25,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0600	0.10		Sheet Flow, FLOW OVER GRASS Woods: Light underbrush n= 0.400 P2= 3.12"
2.0	150	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
1.7	125	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
11.7	325	Total			

Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 58,237 sf, 1.72% Impervious, Inflow Depth > 2.22" for 10 year event
 Inflow = 2.61 cfs @ 12.21 hrs, Volume= 10,783 cf
 Outflow = 2.60 cfs @ 12.22 hrs, Volume= 10,782 cf, Atten= 0%, Lag= 0.3 min
 Primary = 2.60 cfs @ 12.22 hrs, Volume= 10,782 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.11' @ 12.22 hrs Surf.Area= 184 sf Storage= 35 cf

Plug-Flow detention time= 0.1 min calculated for 10,760 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (848.6 - 848.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	258.65'	275 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)	
258.65	5	9.0	0	0	5	
259.00	125	47.0	18	18	175	
259.70	685	102.0	257	275	829	

Device	Routing	Invert	Outlet Devices
#1	Primary	259.70'	25.0' 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
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=2.57 cfs @ 12.22 hrs HW=259.11' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 2=Rock Fill (Rockfill Controls 2.57 cfs @ 0.45 fps)

SELLERS FARM PRE DEVELOPMENT

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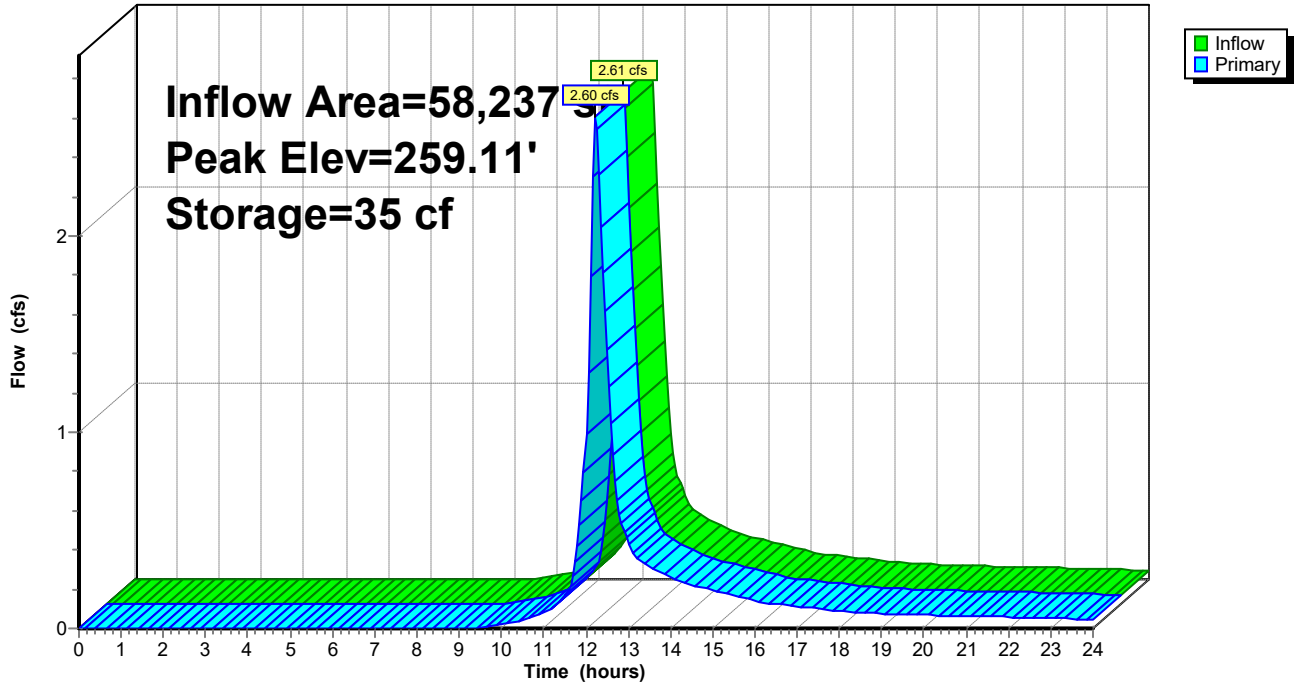
Type III 24-hr 10 year Rainfall=5.04"

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Pond 4P: Wetland Series 'B'

Hydrograph

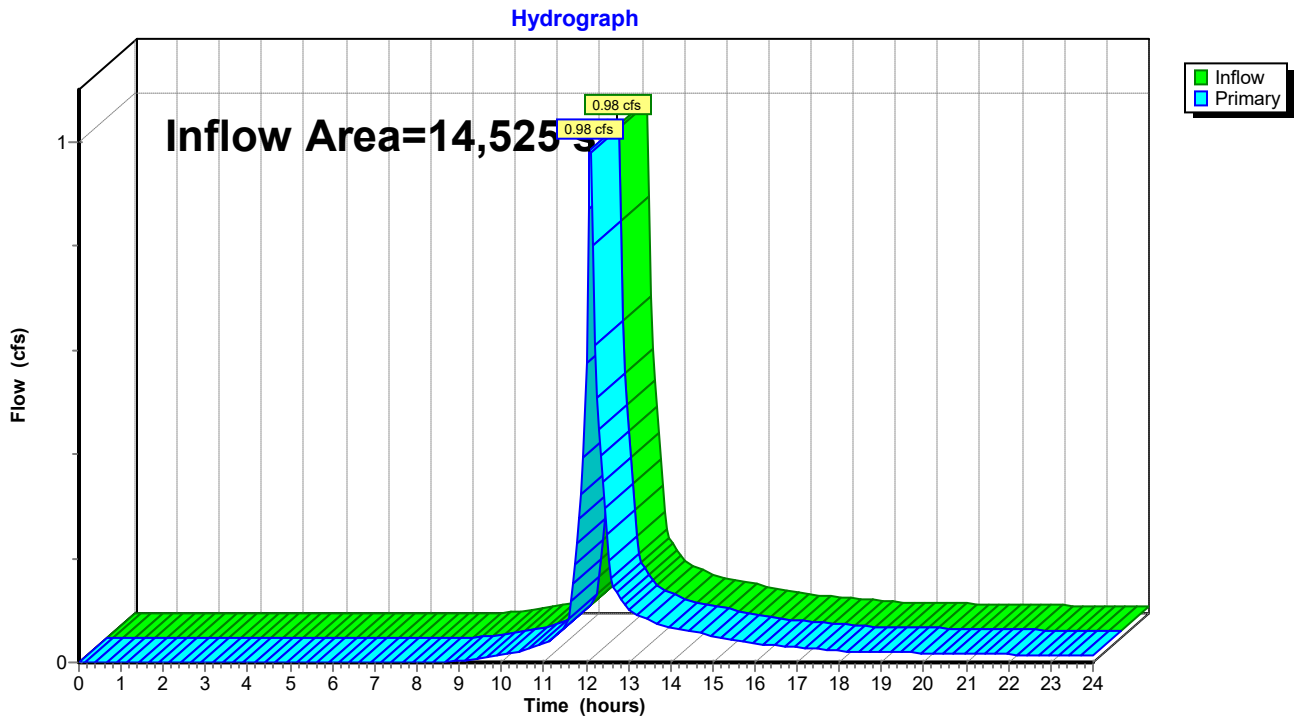


Summary for Pond SP1: SUM POND STREET DP-1

Inflow Area = 14,525 sf, 9.74% Impervious, Inflow Depth > 2.57" for 10 year event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 3,106 cf
Primary = 0.98 cfs @ 12.09 hrs, Volume= 3,106 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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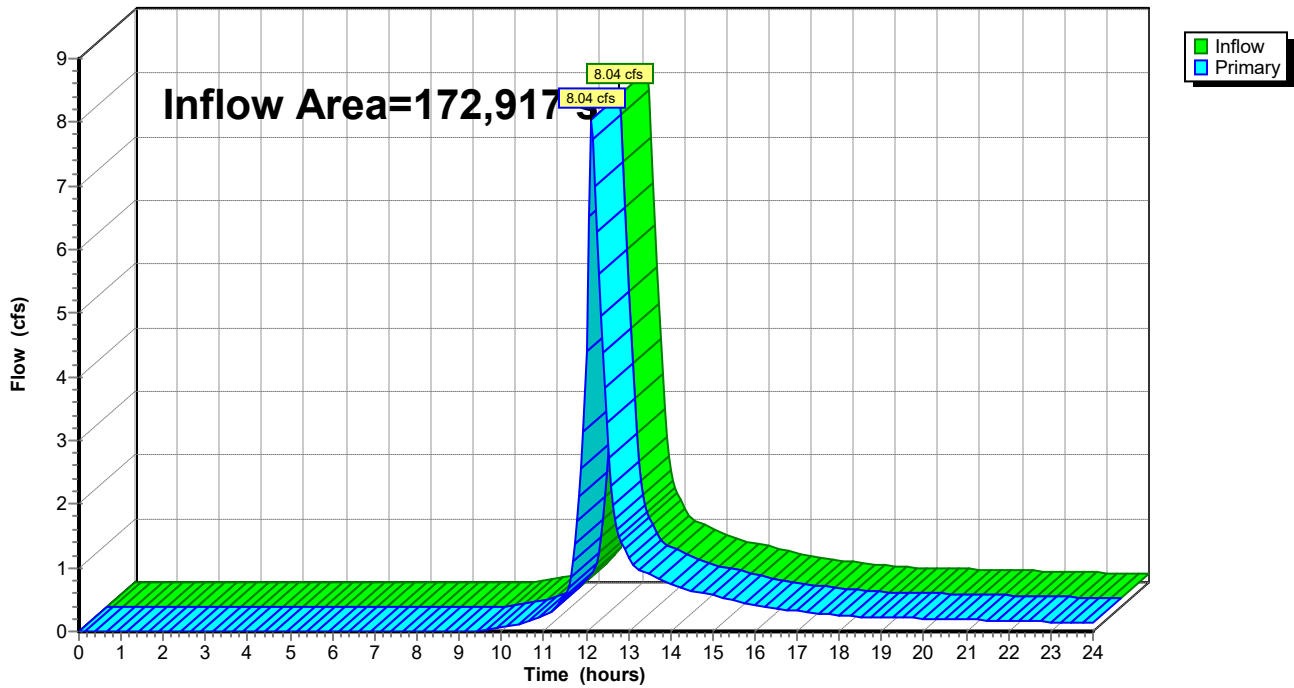
Summary for Pond SP2: SUM POND WOODS DP-2

Inflow Area = 172,917 sf, 0.58% Impervious, Inflow Depth > 2.20" for 10 year event
Inflow = 8.04 cfs @ 12.12 hrs, Volume= 31,703 cf
Primary = 8.04 cfs @ 12.12 hrs, Volume= 31,703 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2

Hydrograph



STORMWATER MANAGEMENT REPORT

25 YEAR STORM

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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

Subcatchment EX1: EX1 FLOW TO Runoff Area=14,525 sf 9.74% Impervious Runoff Depth>3.55"
Tc=6.0 min CN=76 Runoff=1.36 cfs 4,297 cf

Subcatchment EX2: BACK PROPERTY LINE Runoff Area=88,780 sf 0.00% Impervious Runoff Depth>3.15"
Flow Length=6' Tc=6.0 min CN=72 Runoff=7.39 cfs 23,339 cf

Subcatchment EX3: FLOW TO WETL Runoff Area=58,237 sf 1.72% Impervious Runoff Depth>3.15"
Flow Length=335' Tc=14.9 min CN=72 Runoff=3.73 cfs 15,280 cf

Subcatchment EX4: BACK PROPERTY LINE Runoff Area=25,900 sf 0.00% Impervious Runoff Depth>2.96"
Flow Length=325' Slope=0.0600 '/' Tc=11.7 min CN=70 Runoff=1.69 cfs 6,384 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.23' Storage=63 cf Inflow=3.73 cfs 15,280 cf
Outflow=3.73 cfs 15,280 cf

Pond SP1: SUM POND STREET DP-1 Inflow=1.36 cfs 4,297 cf
Primary=1.36 cfs 4,297 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=11.54 cfs 45,003 cf
Primary=11.54 cfs 45,003 cf

Total Runoff Area = 187,442 sf Runoff Volume = 49,300 cf Average Runoff Depth = 3.16"
98.71% Pervious = 185,027 sf 1.29% Impervious = 2,415 sf

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

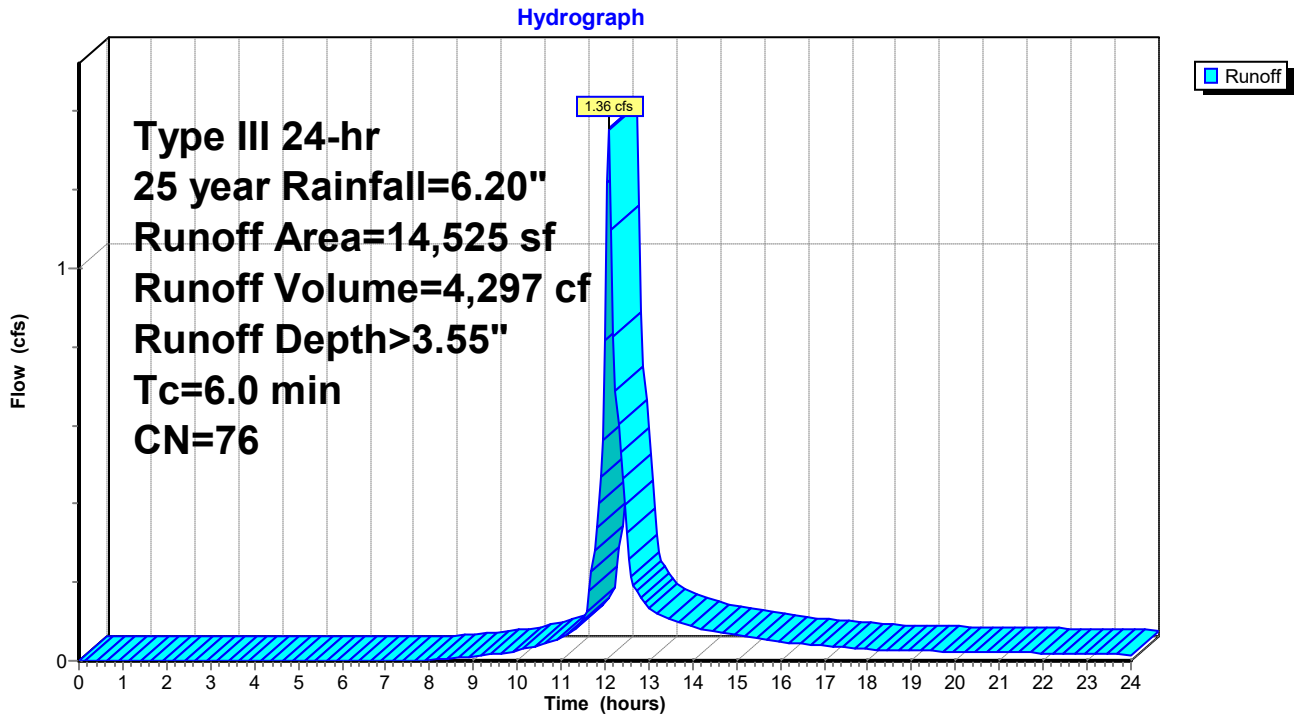
Runoff = 1.36 cfs @ 12.09 hrs, Volume= 4,297 cf, Depth> 3.55"
 Routed to Pond SP1 : SUM POND STREET DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
11,750	74	>75% Grass cover, Good, HSG C
1,360	70	Woods, Good, HSG C
14,525	76	Weighted Average
13,110		90.26% Pervious Area
1,415		9.74% Impervious Area

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

Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Runoff = 7.39 cfs @ 12.09 hrs, Volume= 23,339 cf, Depth> 3.15"
 Routed to Pond SP2 : SUM POND WOODS DP-2

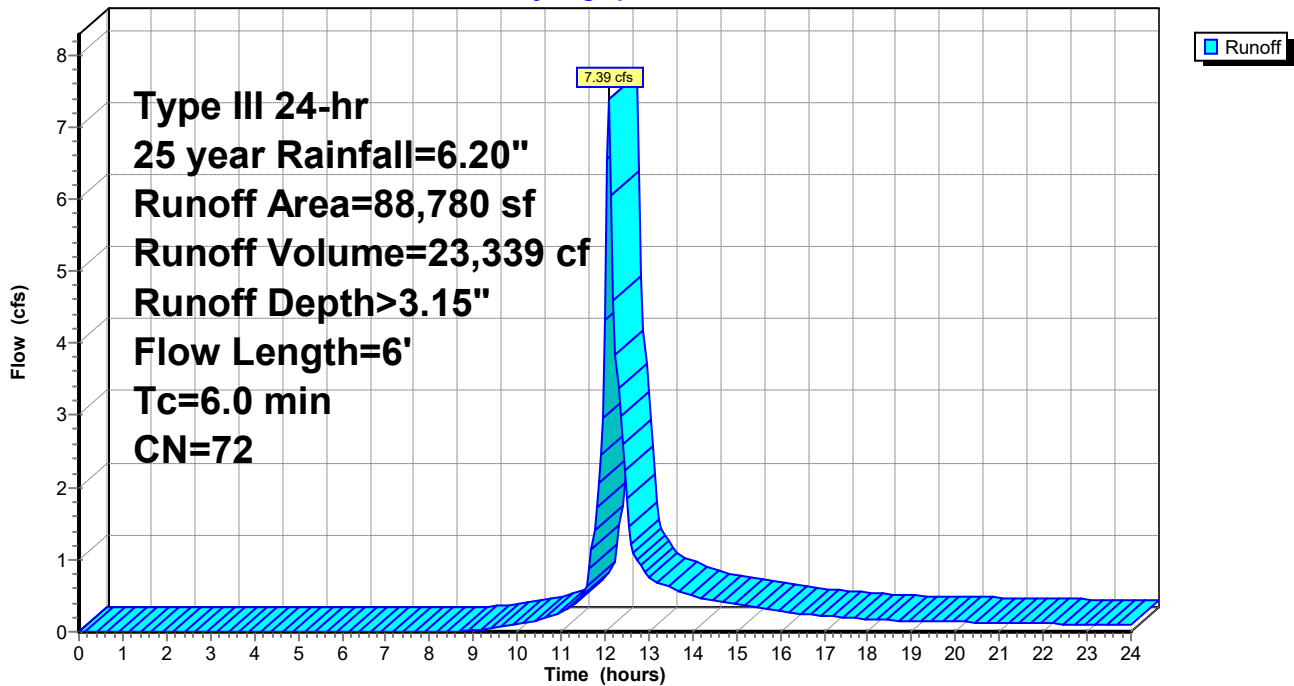
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
41,415	74	>75% Grass cover, Good, HSG C
47,365	70	Woods, Good, HSG C
88,780	72	Weighted Average
88,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	6		0.02		Direct Entry,

Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment EX3: FLOW TO WETL SERIES 'B'

Runoff = 3.73 cfs @ 12.21 hrs, Volume= 15,280 cf, Depth> 3.15"
 Routed to Pond 4P : Wetland Series 'B'

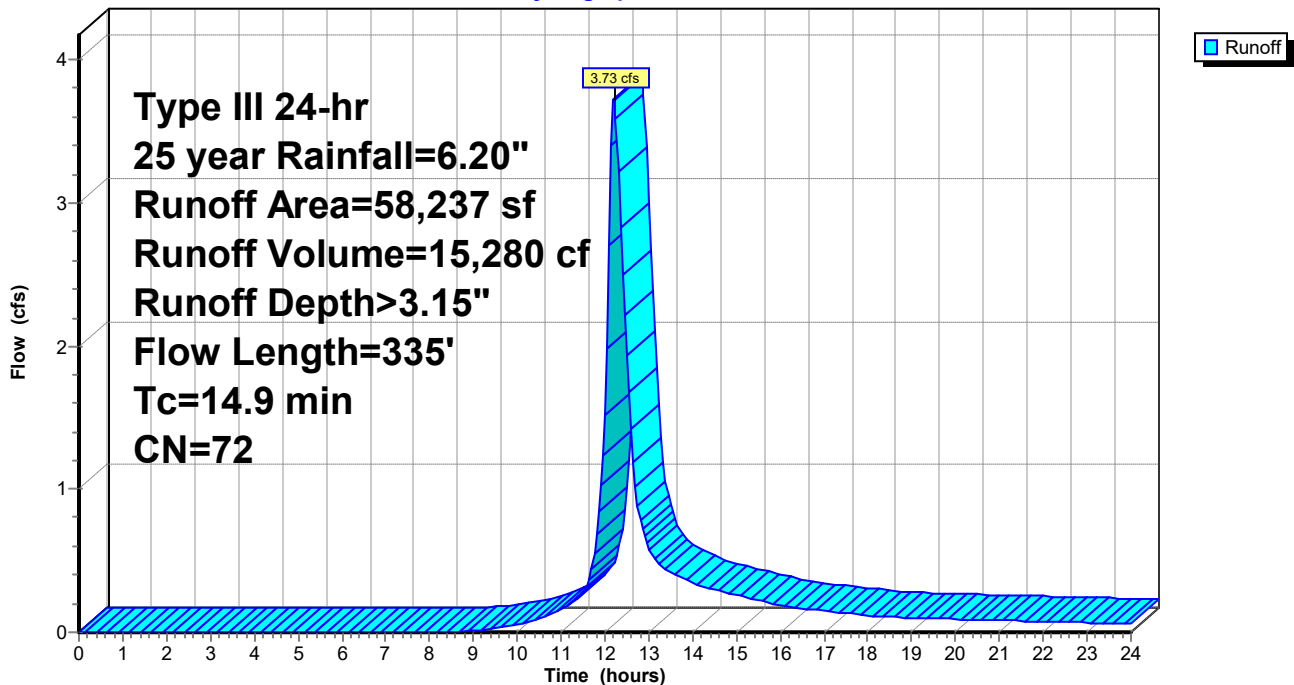
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
3,600	74	>75% Grass cover, Good, HSG C
46,815	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
58,237	72	Weighted Average
57,237		98.28% Pervious Area
1,000		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.12"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THRU WETLAND B Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment EX3: FLOW TO WETL SERIES 'B'

Hydrograph



SELLERS FARM PRE DEVELOPMENT

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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)

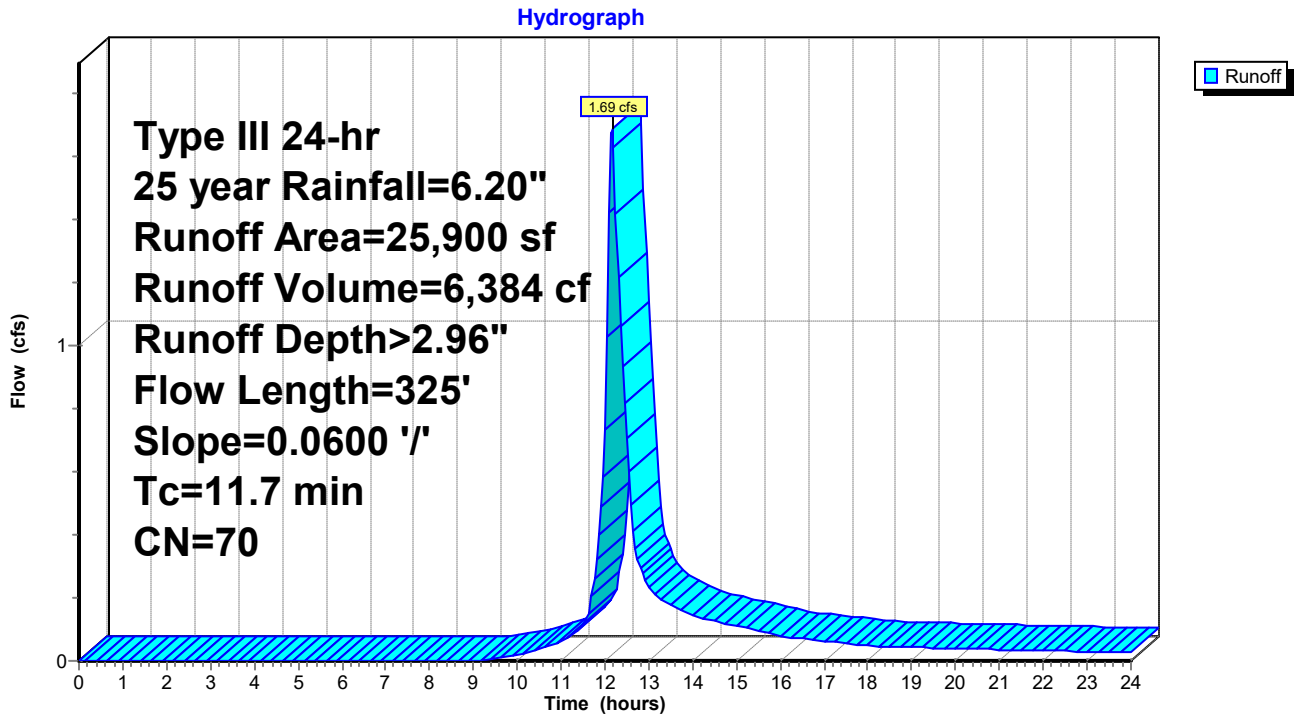
Runoff = 1.69 cfs @ 12.17 hrs, Volume= 6,384 cf, Depth> 2.96"
 Routed to Pond SP2 : SUM POND WOODS DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
25,900	70	Woods, Good, HSG C
25,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0600	0.10		Sheet Flow, FLOW OVER GRASS Woods: Light underbrush n= 0.400 P2= 3.12"
2.0	150	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
1.7	125	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
11.7	325	Total			

Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 58,237 sf, 1.72% Impervious, Inflow Depth > 3.15" for 25 year event
 Inflow = 3.73 cfs @ 12.21 hrs, Volume= 15,280 cf
 Outflow = 3.73 cfs @ 12.22 hrs, Volume= 15,280 cf, Atten= 0%, Lag= 0.4 min
 Primary = 3.73 cfs @ 12.22 hrs, Volume= 15,280 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.23' @ 12.22 hrs Surf.Area= 263 sf Storage= 63 cf

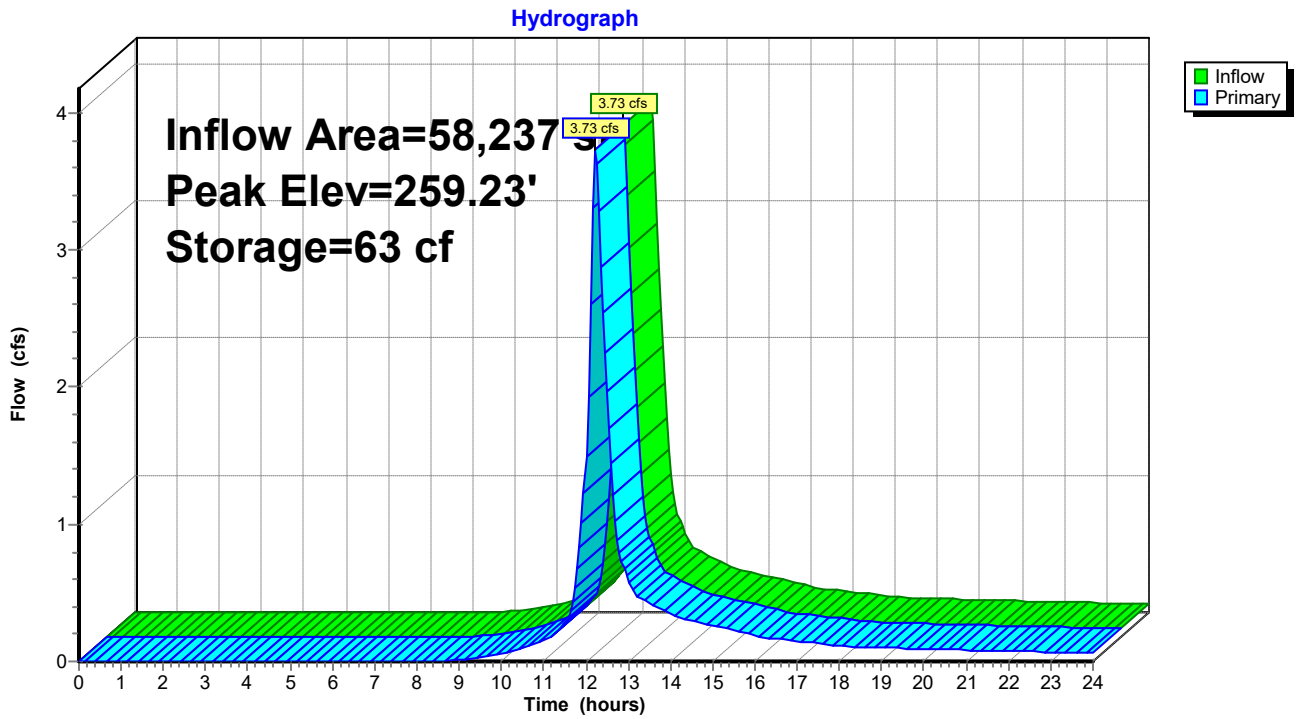
Plug-Flow detention time= 0.1 min calculated for 15,248 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (838.6 - 838.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	258.65'	275 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)	
258.65	5	9.0	0	0	5	
259.00	125	47.0	18	18	175	
259.70	685	102.0	257	275	829	

Device	Routing	Invert	Outlet Devices
#1	Primary	259.70'	25.0' 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
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=3.67 cfs @ 12.22 hrs HW=259.23' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 2=Rock Fill (Rockfill Controls 3.67 cfs @ 0.51 fps)

Pond 4P: Wetland Series 'B'

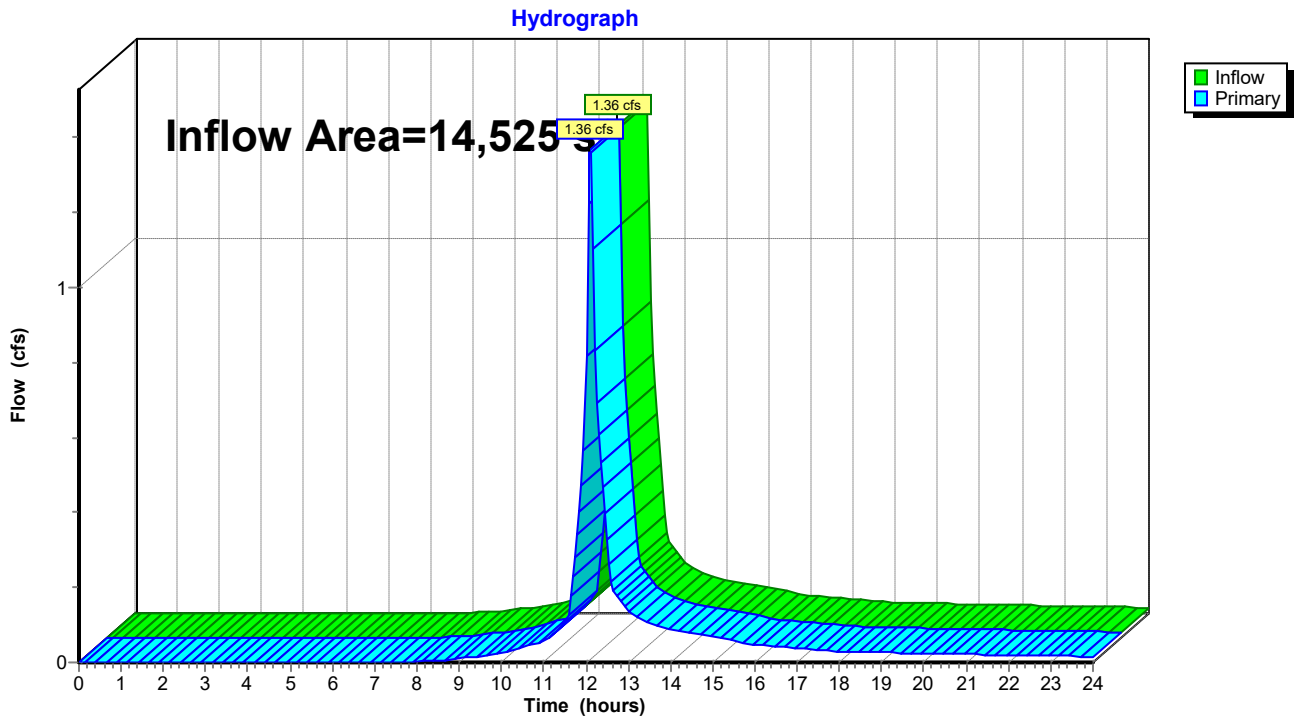


Summary for Pond SP1: SUM POND STREET DP-1

Inflow Area = 14,525 sf, 9.74% Impervious, Inflow Depth > 3.55" for 25 year event
Inflow = 1.36 cfs @ 12.09 hrs, Volume= 4,297 cf
Primary = 1.36 cfs @ 12.09 hrs, Volume= 4,297 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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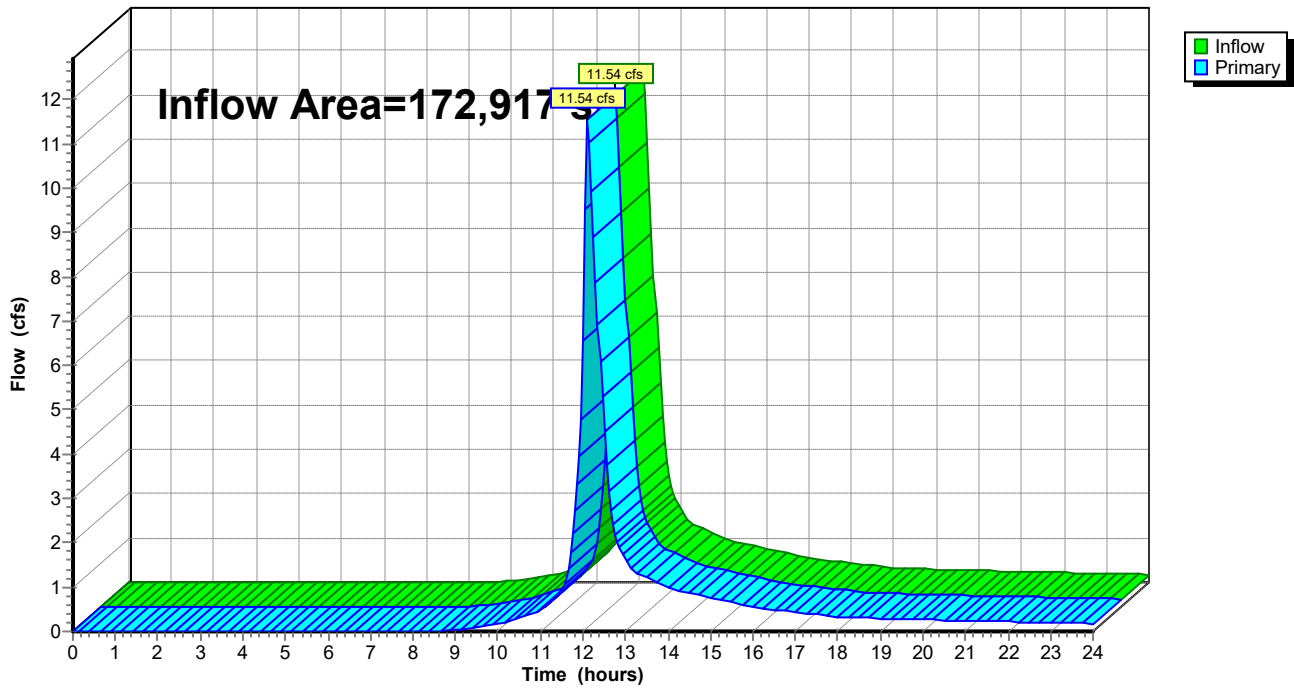
Summary for Pond SP2: SUM POND WOODS DP-2

Inflow Area = 172,917 sf, 0.58% Impervious, Inflow Depth > 3.12" for 25 year event
Inflow = 11.54 cfs @ 12.12 hrs, Volume= 45,003 cf
Primary = 11.54 cfs @ 12.12 hrs, Volume= 45,003 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2

Hydrograph



STORMWATER MANAGEMENT REPORT

100 YEAR STORM

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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

Subcatchment EX1: EX1 FLOW TO Runoff Area=14,525 sf 9.74% Impervious Runoff Depth>5.14"
Tc=6.0 min CN=76 Runoff=1.96 cfs 6,227 cf

Subcatchment EX2: BACK PROPERTY LINE Runoff Area=88,780 sf 0.00% Impervious Runoff Depth>4.68"
Flow Length=6' Tc=6.0 min CN=72 Runoff=10.96 cfs 34,636 cf

Subcatchment EX3: FLOW TO WETL Runoff Area=58,237 sf 1.72% Impervious Runoff Depth>4.67"
Flow Length=335' Tc=14.9 min CN=72 Runoff=5.55 cfs 22,680 cf

Subcatchment EX4: BACK PROPERTY LINE Runoff Area=25,900 sf 0.00% Impervious Runoff Depth>4.45"
Flow Length=325' Slope=0.0600 '/' Tc=11.7 min CN=70 Runoff=2.56 cfs 9,597 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.41' Storage=120 cf Inflow=5.55 cfs 22,680 cf
Outflow=5.54 cfs 22,679 cf

Pond SP1: SUM POND STREET DP-1 Inflow=1.96 cfs 6,227 cf
Primary=1.96 cfs 6,227 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=17.19 cfs 66,912 cf
Primary=17.19 cfs 66,912 cf

Total Runoff Area = 187,442 sf Runoff Volume = 73,140 cf Average Runoff Depth = 4.68"
98.71% Pervious = 185,027 sf 1.29% Impervious = 2,415 sf

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Runoff = 1.96 cfs @ 12.09 hrs, Volume= 6,227 cf, Depth> 5.14"
 Routed to Pond SP1 : SUM POND STREET DP-1

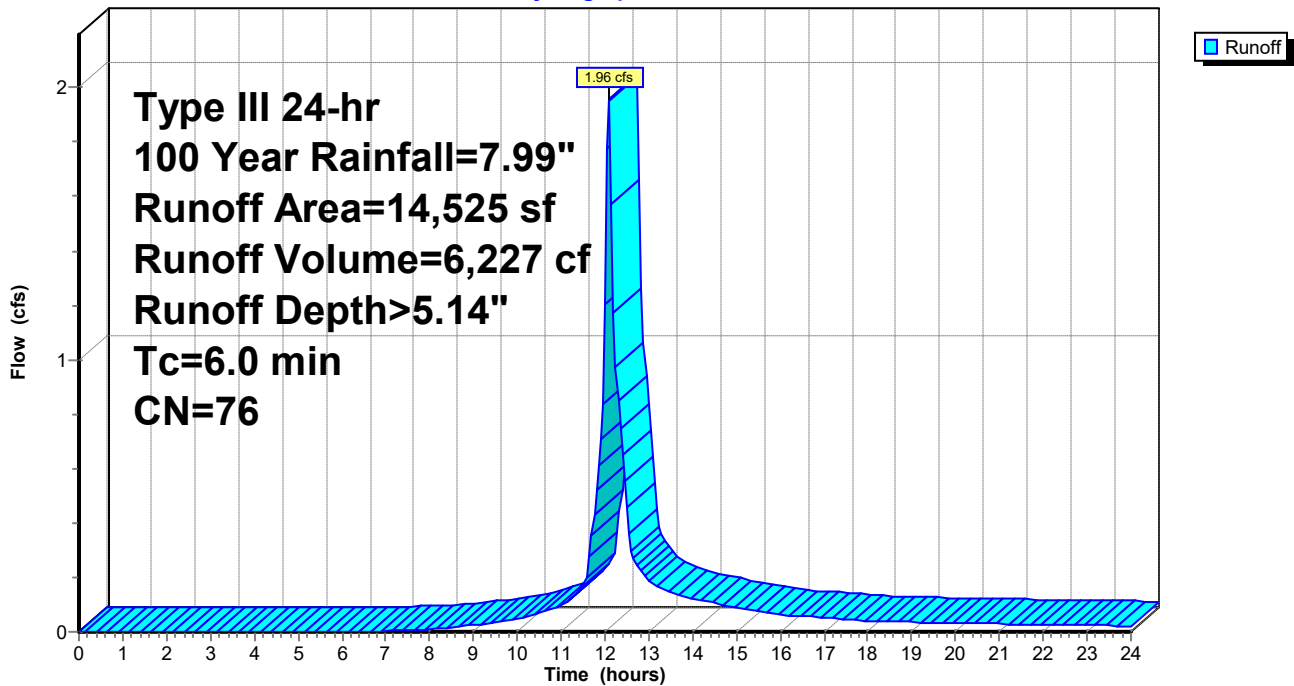
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
11,750	74	>75% Grass cover, Good, HSG C
1,360	70	Woods, Good, HSG C
14,525	76	Weighted Average
13,110		90.26% Pervious Area
1,415		9.74% Impervious Area

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

Subcatchment EX1: EX1 FLOW TO HIGHLAND ROAD

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Runoff = 10.96 cfs @ 12.09 hrs, Volume= 34,636 cf, Depth> 4.68"
 Routed to Pond SP2 : SUM POND WOODS DP-2

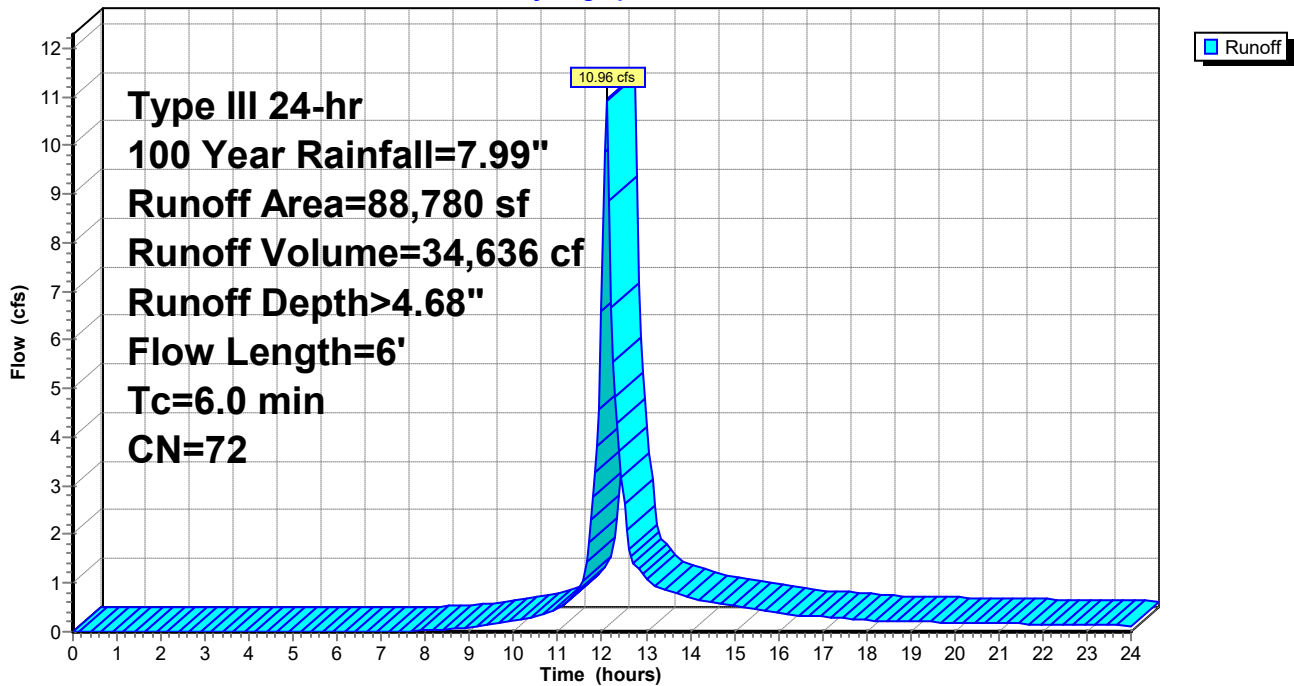
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
41,415	74	>75% Grass cover, Good, HSG C
47,365	70	Woods, Good, HSG C
88,780	72	Weighted Average
88,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	6		0.02		Direct Entry,

Subcatchment EX2: BACK PROPERTY LINE (A SERIES WETL)

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Subcatchment EX3: FLOW TO WETL SERIES 'B'

Runoff = 5.55 cfs @ 12.21 hrs, Volume= 22,680 cf, Depth> 4.67"
 Routed to Pond 4P : Wetland Series 'B'

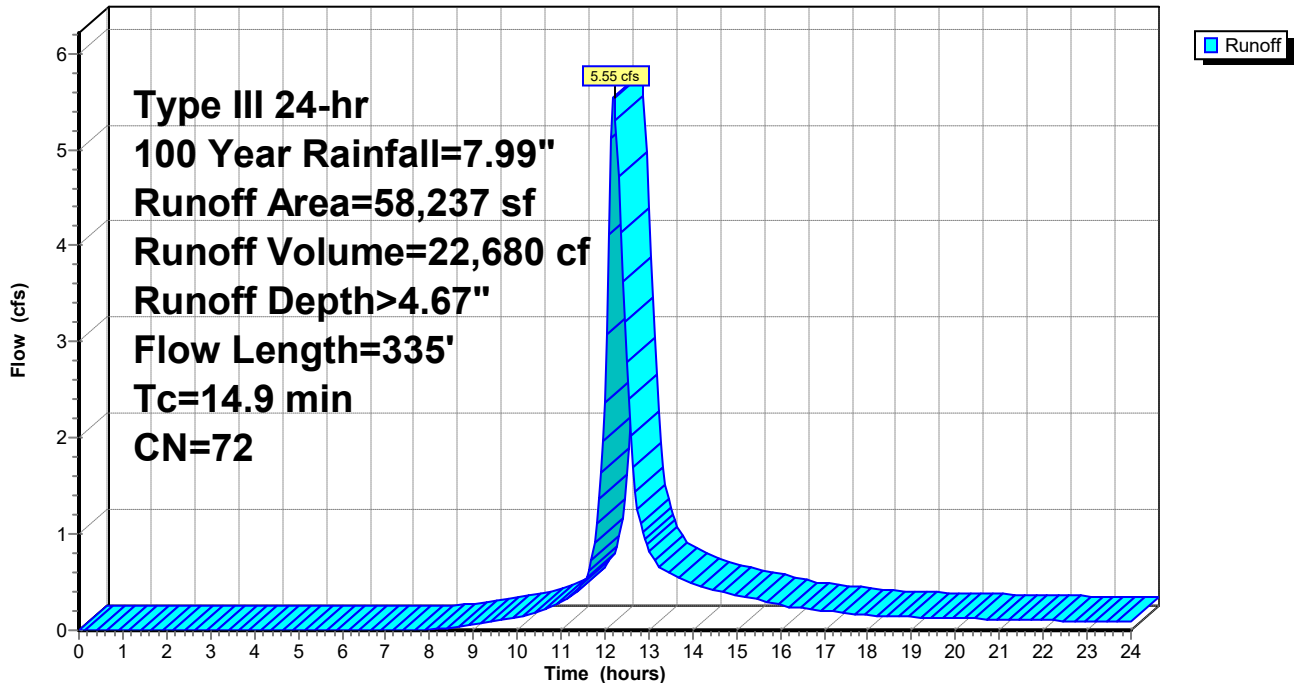
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
3,600	74	>75% Grass cover, Good, HSG C
46,815	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
58,237	72	Weighted Average
57,237		98.28% Pervious Area
1,000		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.12"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THRU WETLAND B Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment EX3: FLOW TO WETL SERIES 'B'

Hydrograph



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)

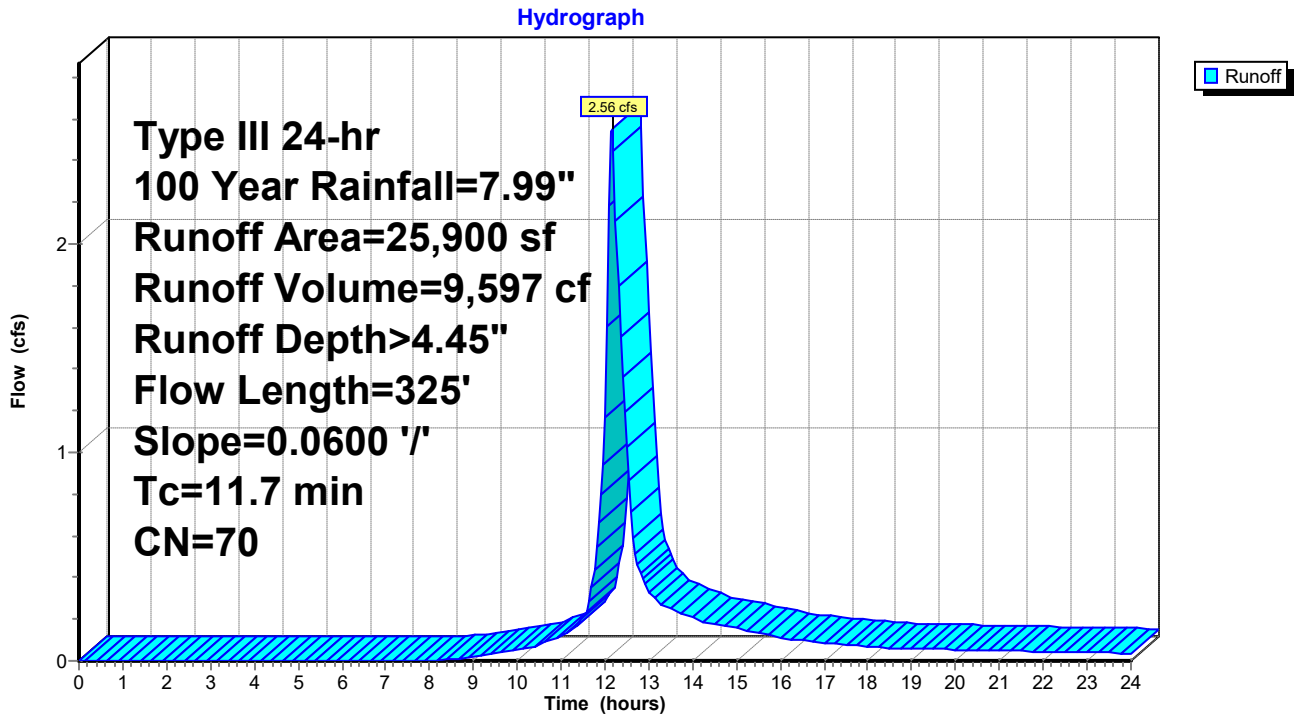
Runoff = 2.56 cfs @ 12.16 hrs, Volume= 9,597 cf, Depth> 4.45"
 Routed to Pond SP2 : SUM POND WOODS DP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
25,900	70	Woods, Good, HSG C
25,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0600	0.10		Sheet Flow, FLOW OVER GRASS Woods: Light underbrush n= 0.400 P2= 3.12"
2.0	150	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
1.7	125	0.0600	1.22		Shallow Concentrated Flow, FLOW IN WOODS Woodland Kv= 5.0 fps
11.7	325	Total			

Subcatchment EX4: BACK PROPERTY LINE (A SERIES WETL)



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 58,237 sf, 1.72% Impervious, Inflow Depth > 4.67" for 100 Year event
 Inflow = 5.55 cfs @ 12.21 hrs, Volume= 22,680 cf
 Outflow = 5.54 cfs @ 12.22 hrs, Volume= 22,679 cf, Atten= 0%, Lag= 0.6 min
 Primary = 5.54 cfs @ 12.22 hrs, Volume= 22,679 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.41' @ 12.22 hrs Surf.Area= 399 sf Storage= 120 cf

Plug-Flow detention time= 0.2 min calculated for 22,632 cf (100% of inflow)
 Center-of-Mass det. time= 0.2 min (827.4 - 827.2)

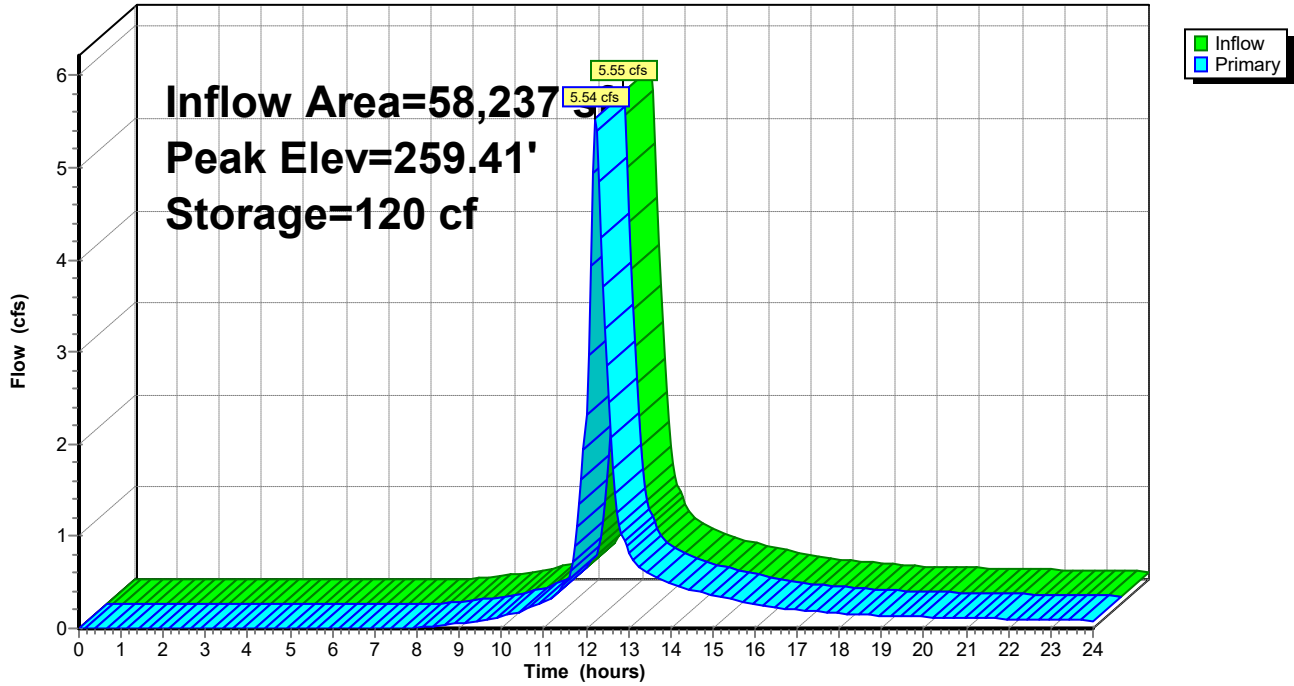
Volume	Invert	Avail.Storage	Storage Description			
#1	258.65'	275 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
258.65	5	9.0	0	0	5	
259.00	125	47.0	18	18	175	
259.70	685	102.0	257	275	829	

Device	Routing	Invert	Outlet Devices
#1	Primary	259.70'	25.0' 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
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=5.46 cfs @ 12.22 hrs HW=259.40' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 2=Rock Fill (Rockfill Controls 5.46 cfs @ 0.58 fps)

Pond 4P: Wetland Series 'B'

Hydrograph

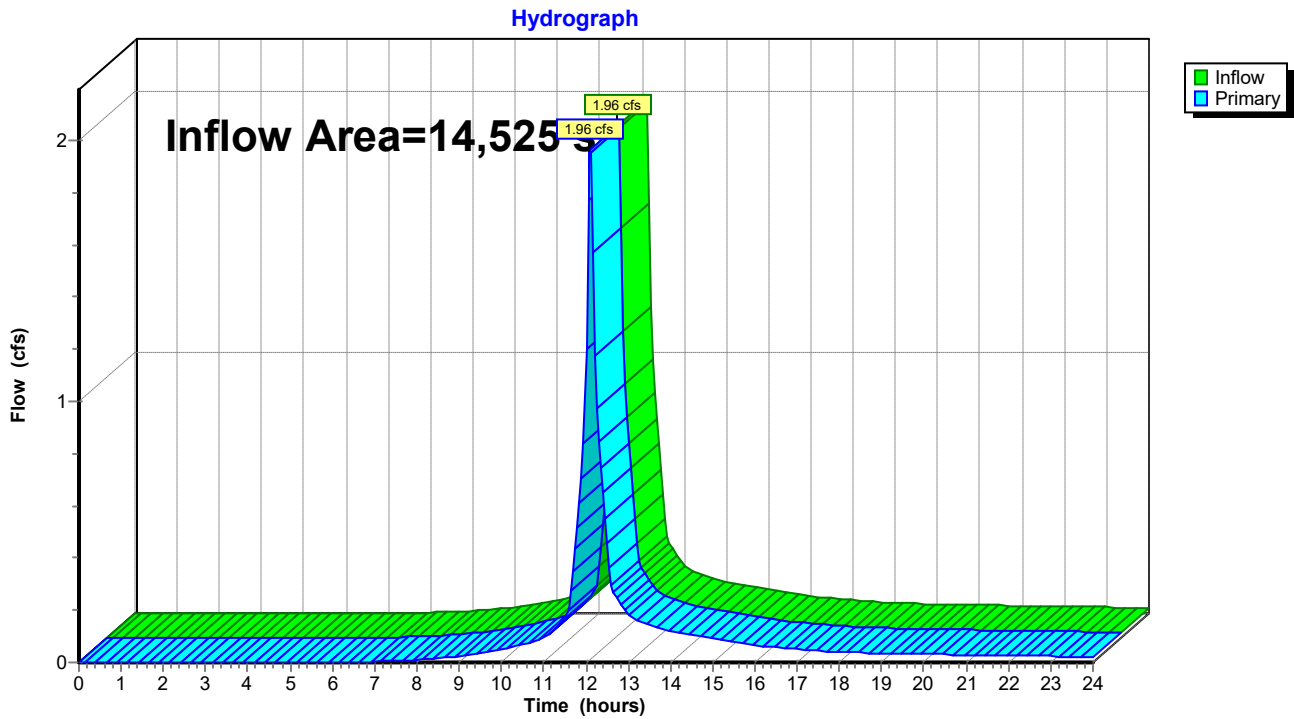


Summary for Pond SP1: SUM POND STREET DP-1

Inflow Area = 14,525 sf, 9.74% Impervious, Inflow Depth > 5.14" for 100 Year event
Inflow = 1.96 cfs @ 12.09 hrs, Volume= 6,227 cf
Primary = 1.96 cfs @ 12.09 hrs, Volume= 6,227 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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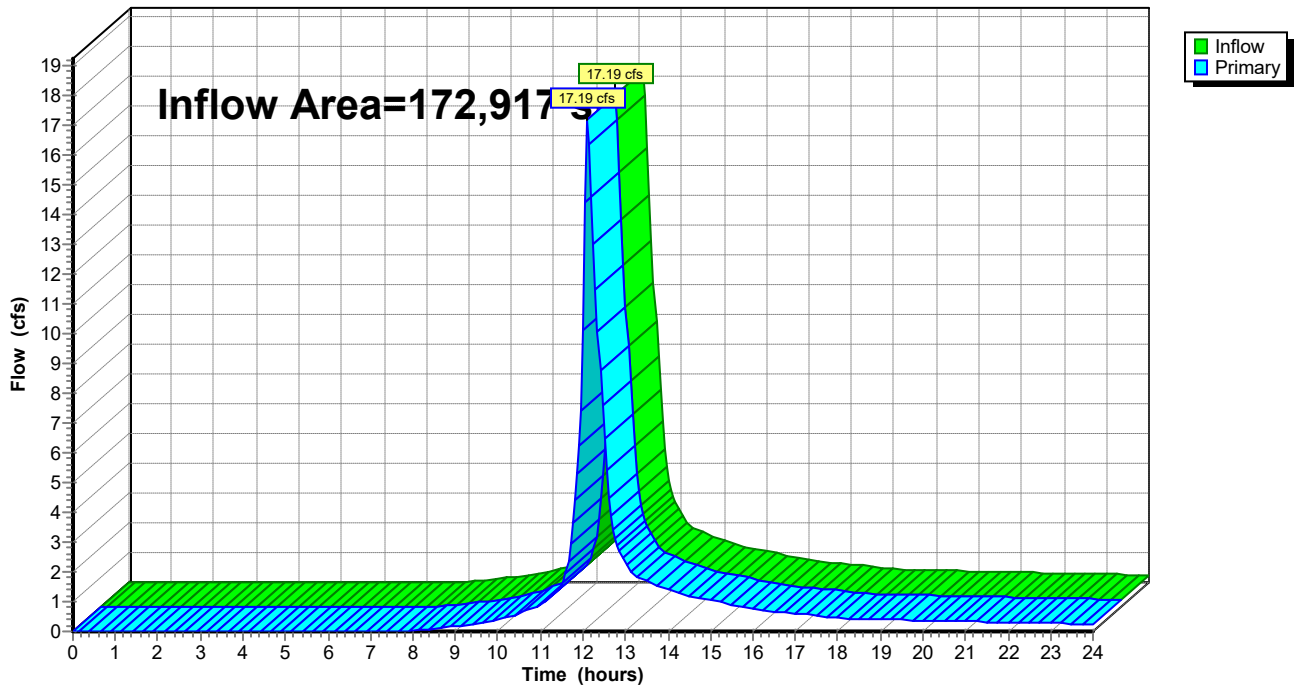
Summary for Pond SP2: SUM POND WOODS DP-2

Inflow Area = 172,917 sf, 0.58% Impervious, Inflow Depth > 4.64" for 100 Year event
Inflow = 17.19 cfs @ 12.11 hrs, Volume= 66,912 cf
Primary = 17.19 cfs @ 12.11 hrs, Volume= 66,912 cf, Atten= 0%, Lag= 0.0 min

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

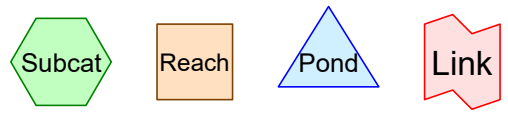
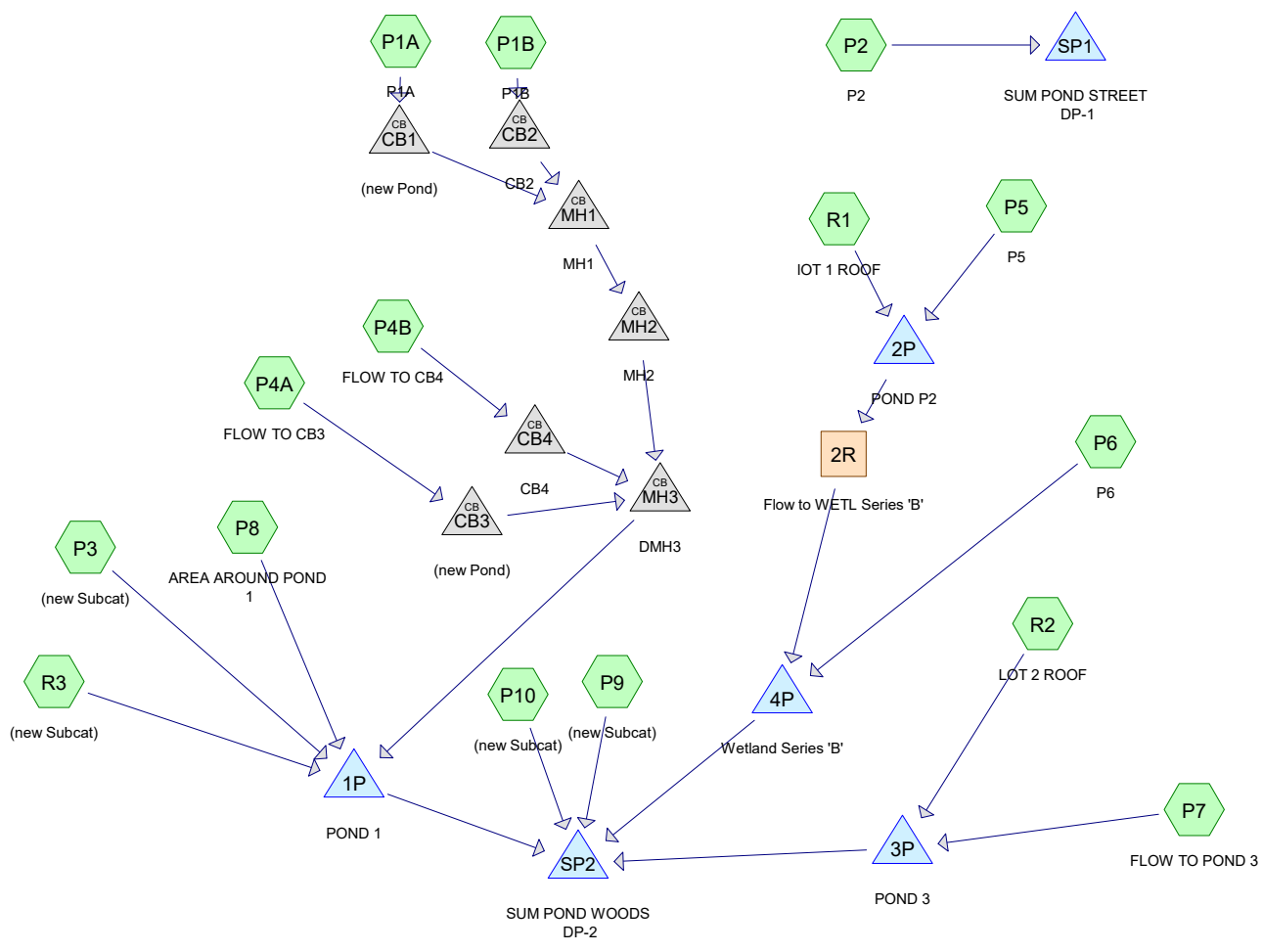
Pond SP2: SUM POND WOODS DP-2

Hydrograph



STORMWATER MANAGEMENT REPORT

POST-DEVELOPMENT DRAINAGE



Routing Diagram for SELLERS FARM POST DEVELOPMENT
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SELLERS FARM POST DEVELOPMENT

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.18	2
2	10 year	Type III 24-hr		Default	24.00	1	5.04	2
3	25 year	Type III 24-hr		Default	24.00	1	6.20	2
4	100 Year	Type III 24-hr		Default	24.00	1	7.99	2

SELLERS FARM POST DEVELOPMENT

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
92,478	86	<50% Grass cover, Poor, HSG C (P1A, P1B, P2, P3, P4B, P5, P6, P7, P8, P9)
23,263	98	Paved parking, HSG C (P1A, P1B, P2, P3, P4A, P4B, P5, P7)
7,474	98	Roofs, HSG C (P6, R1, R2, R3)
490	98	Unconnected pavement, HSG C (P3, P4B)
7,484	98	Water Surface, HSG C (P3, P5, P7, P8)
49,431	70	Woods, Good, HSG C (P10, P6, P9)
6,822	79	Woods/grass comb., Good, HSG D (P6)
187,442	84	TOTAL AREA

SELLERS FARM POST DEVELOPMENT

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
180,620	HSG C	P10, P1A, P1B, P2, P3, P4A, P4B, P5, P6, P7, P8, P9, R1, R2, R3
6,822	HSG D	P6
0	Other	
187,442		TOTAL AREA

SELLERS FARM POST DEVELOPMENT

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	92,478	0	0	92,478	<50% Grass cover, Poor
0	0	23,263	0	0	23,263	Paved parking
0	0	7,474	0	0	7,474	Roofs
0	0	490	0	0	490	Unconnected pavement
0	0	7,484	0	0	7,484	Water Surface
0	0	49,431	0	0	49,431	Woods, Good
0	0	0	6,822	0	6,822	Woods/grass comb., Good
0	0	180,620	6,822	0	187,442	TOTAL AREA

SELLERS FARM POST DEVELOPMENT

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1P	259.00	258.00	30.0	0.0333	0.012	0.0	12.0	0.0
2	3P	263.05	261.50	20.0	0.0775	0.013	0.0	12.0	0.0
3	4P	260.00	259.00	12.0	0.0833	0.013	0.0	12.0	0.0
4	CB1	261.90	261.80	10.0	0.0100	0.013	0.0	12.0	0.0
5	CB2	261.90	261.80	10.0	0.0100	0.013	0.0	12.0	0.0
6	CB3	260.50	260.00	10.0	0.0500	0.013	0.0	12.0	0.0
7	CB4	260.50	260.00	40.0	0.0125	0.013	0.0	12.0	0.0
8	MH1	261.70	260.60	215.0	0.0051	0.013	0.0	12.0	0.0
9	MH2	260.60	260.00	120.0	0.0050	0.013	0.0	12.0	0.0
10	MH3	259.75	259.50	30.0	0.0083	0.013	0.0	12.0	0.0

STORMWATER MANAGEMENT REPORT

2 YEAR STORM

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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

Subcatchment P10: (new Subcat)	Runoff Area=17,550 sf 0.00% Impervious Runoff Depth>0.81" Flow Length=425' Slope=0.0400 '/' Tc=15.7 min CN=70 Runoff=0.25 cfs 1,189 cf
Subcatchment P1A: P1A	Runoff Area=3,286 sf 45.25% Impervious Runoff Depth>2.24" Tc=6.0 min CN=91 Runoff=0.19 cfs 613 cf
Subcatchment P1B: P1B	Runoff Area=3,739 sf 40.28% Impervious Runoff Depth>2.24" Tc=6.0 min CN=91 Runoff=0.22 cfs 697 cf
Subcatchment P2: P2	Runoff Area=8,165 sf 17.33% Impervious Runoff Depth>1.98" Tc=6.0 min CN=88 Runoff=0.42 cfs 1,345 cf
Subcatchment P3: (new Subcat)	Runoff Area=11,734 sf 27.70% Impervious Runoff Depth>2.06" Flow Length=250' Tc=6.2 min CN=89 Runoff=0.63 cfs 2,016 cf
Subcatchment P4A: FLOW TO CB3	Runoff Area=5,280 sf 100.00% Impervious Runoff Depth>2.95" Tc=6.0 min CN=98 Runoff=0.37 cfs 1,296 cf
Subcatchment P4B: FLOW TO CB4	Runoff Area=11,827 sf 61.53% Impervious Runoff Depth>2.42" Tc=6.0 min CN=93 Runoff=0.73 cfs 2,390 cf
Subcatchment P5: P5	Runoff Area=9,084 sf 51.11% Impervious Runoff Depth>2.33" Tc=6.0 min CN=92 Runoff=0.54 cfs 1,764 cf
Subcatchment P6: P6	Runoff Area=56,672 sf 1.76% Impervious Runoff Depth>1.32" Flow Length=335' Tc=14.9 min CN=79 Runoff=1.49 cfs 6,222 cf
Subcatchment P7: FLOW TO POND 3	Runoff Area=13,617 sf 17.96% Impervious Runoff Depth>1.97" Flow Length=180' Tc=14.4 min CN=88 Runoff=0.55 cfs 2,240 cf
Subcatchment P8: AREA AROUND POND 1	Runoff Area=6,584 sf 59.75% Impervious Runoff Depth>2.42" Tc=6.0 min CN=93 Runoff=0.41 cfs 1,330 cf
Subcatchment P9: (new Subcat)	Runoff Area=33,430 sf 0.00% Impervious Runoff Depth>1.45" Tc=6.0 min CN=81 Runoff=1.27 cfs 4,045 cf
Subcatchment R1: IOT 1 ROOF	Runoff Area=1,966 sf 100.00% Impervious Runoff Depth>2.95" Tc=6.0 min CN=98 Runoff=0.14 cfs 483 cf
Subcatchment R2: LOT 2 ROOF	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>2.95" Tc=6.0 min CN=98 Runoff=0.16 cfs 553 cf
Subcatchment R3: (new Subcat)	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>2.95" Tc=6.0 min CN=98 Runoff=0.16 cfs 553 cf
Reach 2R: Flow to WETL Series 'B'	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.050 L=70.0' S=0.0286 '/' Capacity=12.08 cfs Outflow=0.00 cfs 0 cf

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Pond 1P: POND 1 Peak Elev=260.97' Storage=3,951 cf Inflow=2.70 cfs 8,896 cf
Discarded=0.08 cfs 3,910 cf Primary=0.40 cfs 3,296 cf Outflow=0.48 cfs 7,206 cf

Pond 2P: POND P2 Peak Elev=262.94' Storage=912 cf Inflow=0.68 cfs 2,246 cf
Discarded=0.05 cfs 2,247 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 2,247 cf

Pond 3P: POND 3 Peak Elev=263.61' Storage=1,145 cf Inflow=0.65 cfs 2,793 cf
Discarded=0.04 cfs 1,757 cf Primary=0.10 cfs 769 cf Outflow=0.14 cfs 2,526 cf

Pond 4P: Wetland Series 'B' Peak Elev=258.97' Storage=14 cf Inflow=1.49 cfs 6,222 cf
Outflow=1.49 cfs 6,222 cf

Pond CB1: (new Pond) Peak Elev=262.16' Inflow=0.19 cfs 613 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.19 cfs 613 cf

Pond CB2: CB2 Peak Elev=262.17' Inflow=0.22 cfs 697 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.22 cfs 697 cf

Pond CB3: (new Pond) Peak Elev=260.98' Inflow=0.37 cfs 1,296 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0500 '/' Outflow=0.37 cfs 1,296 cf

Pond CB4: CB4 Peak Elev=260.99' Inflow=0.73 cfs 2,390 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0125 '/' Outflow=0.73 cfs 2,390 cf

Pond MH1: MH1 Peak Elev=262.07' Inflow=0.41 cfs 1,310 cf
12.0" Round Culvert n=0.013 L=215.0' S=0.0051 '/' Outflow=0.41 cfs 1,310 cf

Pond MH2: MH2 Peak Elev=261.01' Inflow=0.41 cfs 1,310 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=0.41 cfs 1,310 cf

Pond MH3: DMH3 Peak Elev=260.98' Inflow=1.50 cfs 4,996 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0083 '/' Outflow=1.50 cfs 4,996 cf

Pond SP1: SUM POND STREET DP-1 Inflow=0.42 cfs 1,345 cf
Primary=0.42 cfs 1,345 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=2.80 cfs 15,521 cf
Primary=2.80 cfs 15,521 cf

Total Runoff Area = 187,442 sf Runoff Volume = 26,736 cf Average Runoff Depth = 1.71"
79.35% Pervious = 148,731 sf 20.65% Impervious = 38,711 sf

SELLERS FARM POST DEVELOPMENT

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Summary for Subcatchment P10: (new Subcat)

Runoff = 0.25 cfs @ 12.25 hrs, Volume= 1,189 cf, Depth> 0.81"
 Routed to Pond SP2 : SUM POND WOODS DP-2

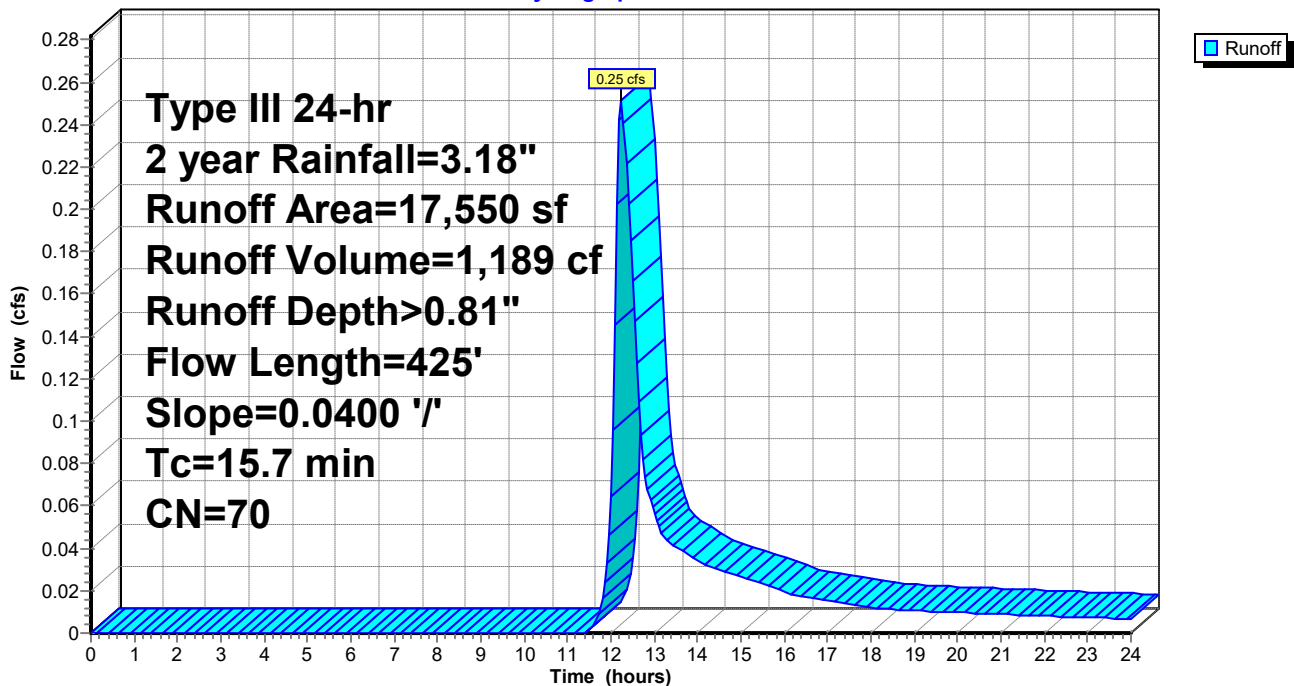
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
17,550	70	Woods, Good, HSG C
17,550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		Sheet Flow, FLOW THROUGH WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
6.2	375	0.0400	1.00		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
15.7	425	Total			

Subcatchment P10: (new Subcat)

Hydrograph



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Summary for Subcatchment P1A: P1A

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 613 cf, Depth> 2.24"
 Routed to Pond CB1 : (new Pond)

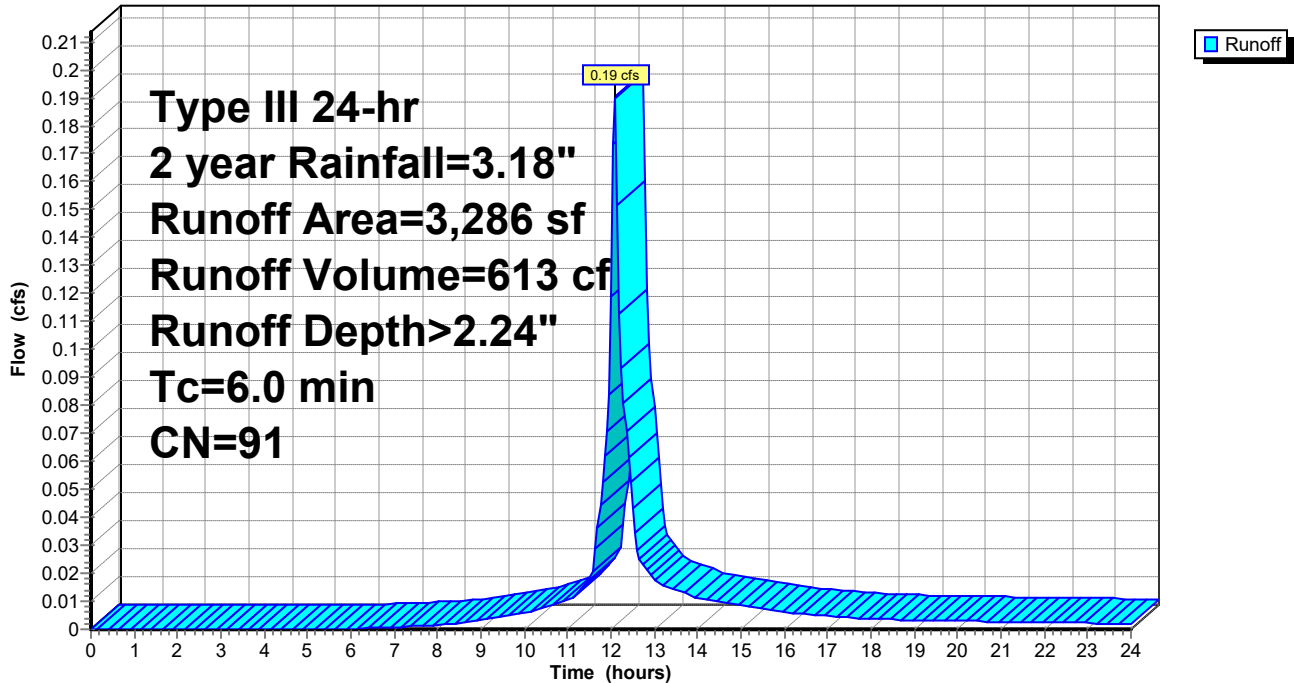
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
1,799	86	<50% Grass cover, Poor, HSG C
1,487	98	Paved parking, HSG C
3,286	91	Weighted Average
1,799		54.75% Pervious Area
1,487		45.25% Impervious Area

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

Subcatchment P1A: P1A

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment P1B: P1B

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 697 cf, Depth> 2.24"
 Routed to Pond CB2 : CB2

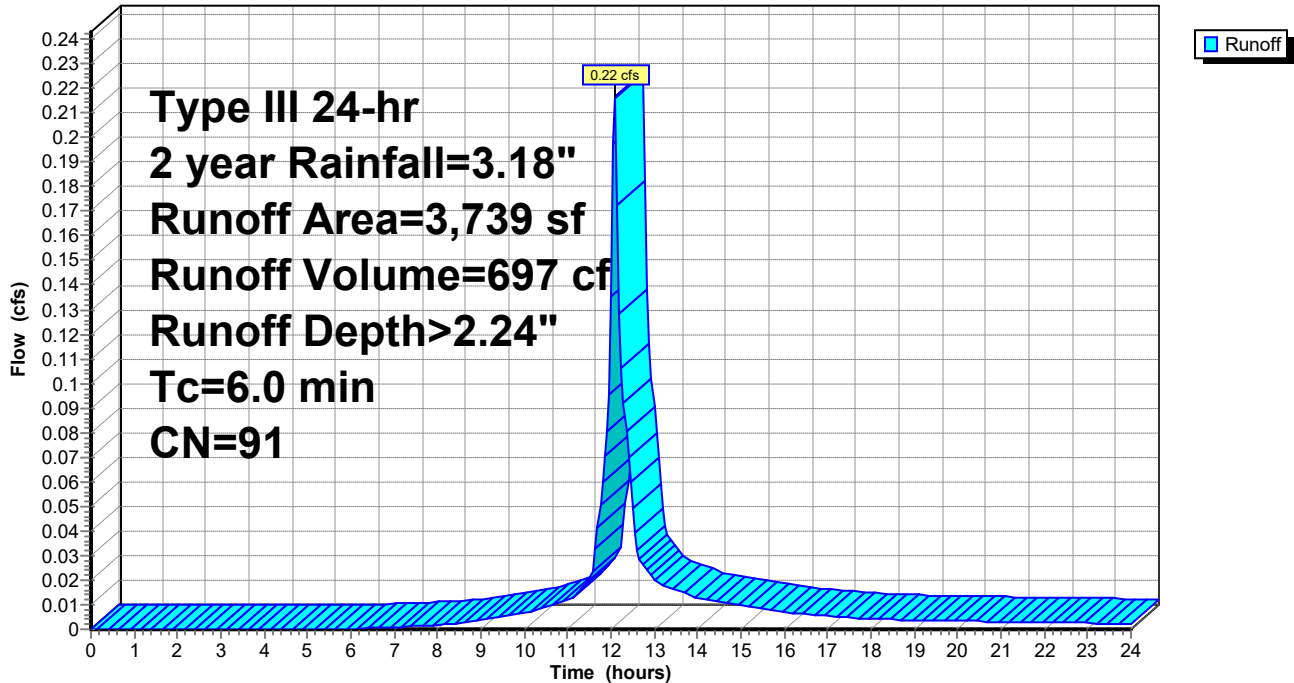
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
1,506	98	Paved parking, HSG C
2,233	86	<50% Grass cover, Poor, HSG C
3,739	91	Weighted Average
2,233		59.72% Pervious Area
1,506		40.28% Impervious Area

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

Subcatchment P1B: P1B

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment P2: P2

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,345 cf, Depth> 1.98"
 Routed to Pond SP1 : SUM POND STREET DP-1

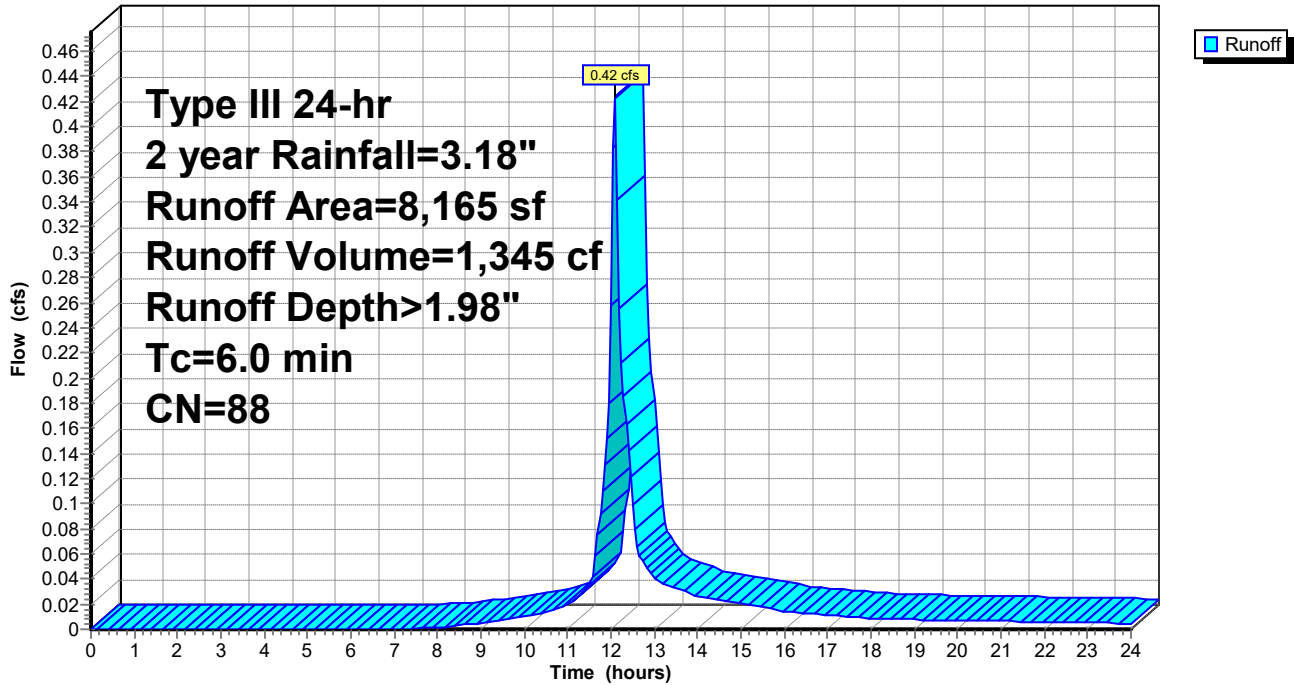
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
6,750	86	<50% Grass cover, Poor, HSG C
8,165	88	Weighted Average
6,750		82.67% Pervious Area
1,415		17.33% Impervious Area

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

Subcatchment P2: P2

Hydrograph



SELLERS FARM POST DEVELOPMENT

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Summary for Subcatchment P3: (new Subcat)

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 2,016 cf, Depth> 2.06"
 Routed to Pond 1P : POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
8,484	86	<50% Grass cover, Poor, HSG C
293	98	Unconnected pavement, HSG C
1,916	98	Paved parking, HSG C
1,041	98	Water Surface, HSG C

11,734	89	Weighted Average
8,484		72.30% Pervious Area
3,250		27.70% Impervious Area
293		9.02% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, FLOW OVER GRASS Grass: Short n= 0.150 P2= 3.18"
1.3	120	0.0500	1.57		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0125	2.27		Shallow Concentrated Flow, FLOW OVER DRIVEWAY Paved Kv= 20.3 fps
6.2	250	Total			

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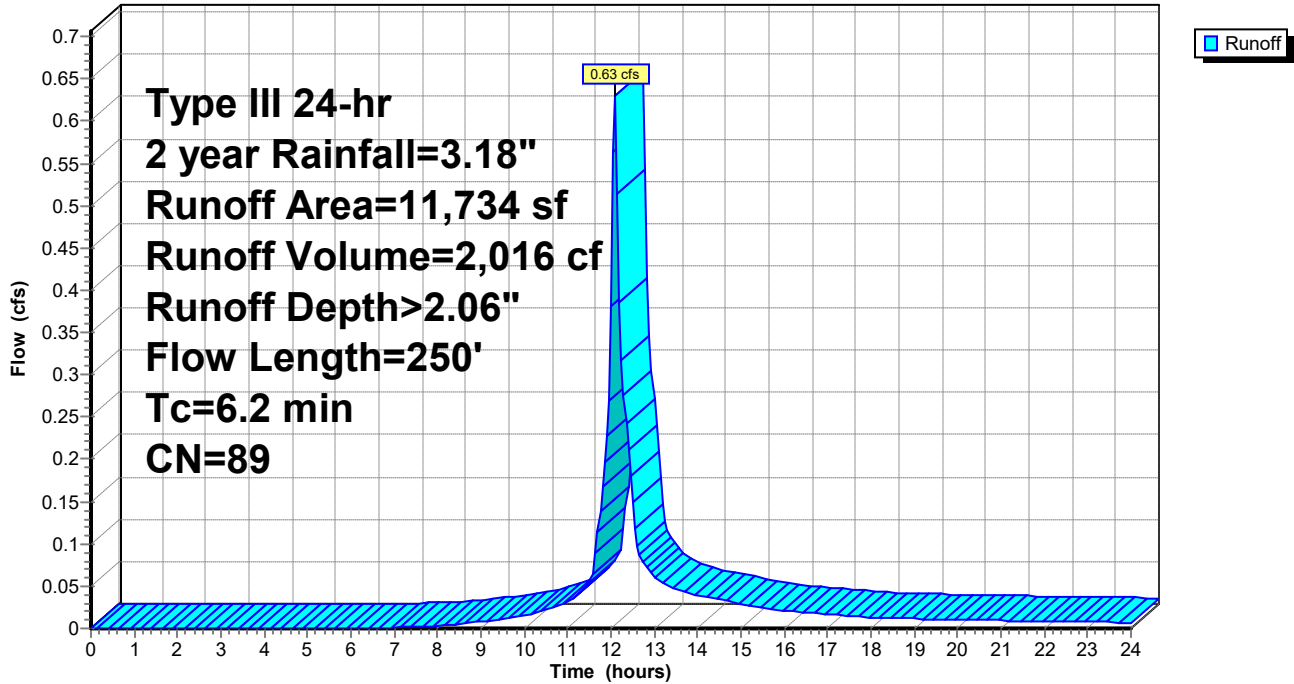
Type III 24-hr 2 year Rainfall=3.18"

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Subcatchment P3: (new Subcat)

Hydrograph



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Summary for Subcatchment P4A: FLOW TO CB3

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 1,296 cf, Depth> 2.95"
 Routed to Pond CB3 : (new Pond)

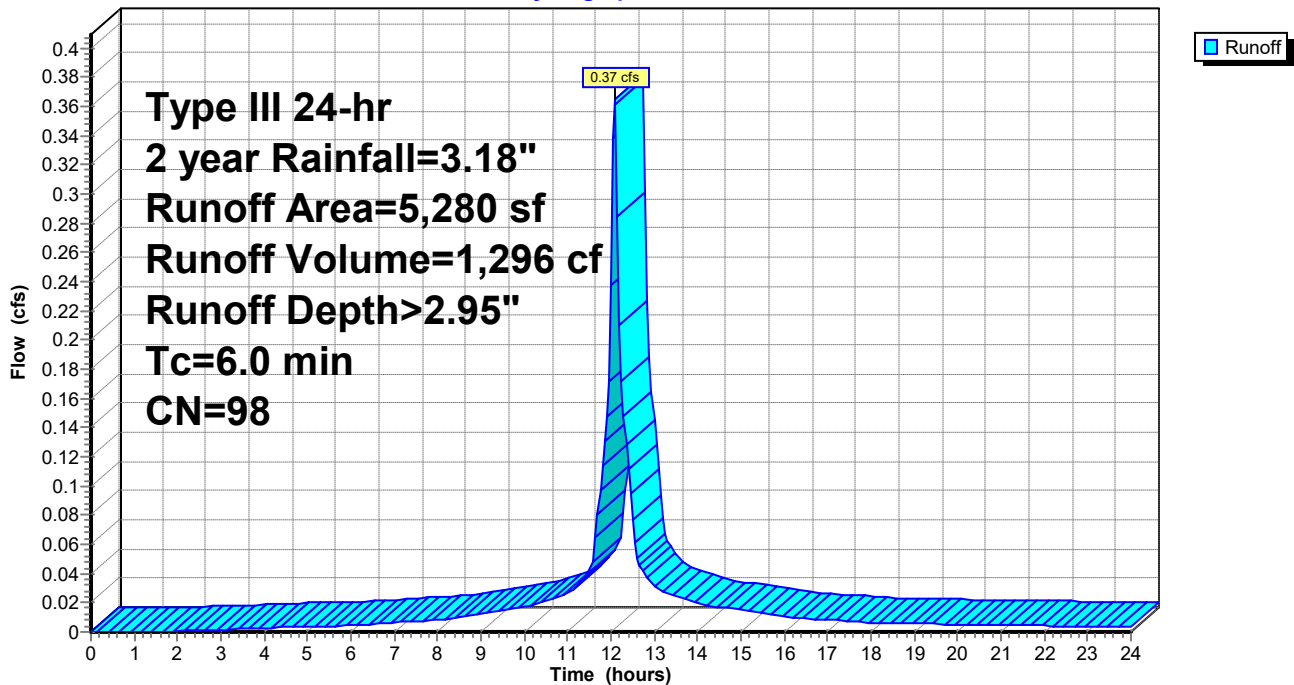
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG C
5,280		100.00% Impervious Area

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

Subcatchment P4A: FLOW TO CB3

Hydrograph



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Summary for Subcatchment P4B: FLOW TO CB4

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 2,390 cf, Depth> 2.42"
 Routed to Pond CB4 : CB4

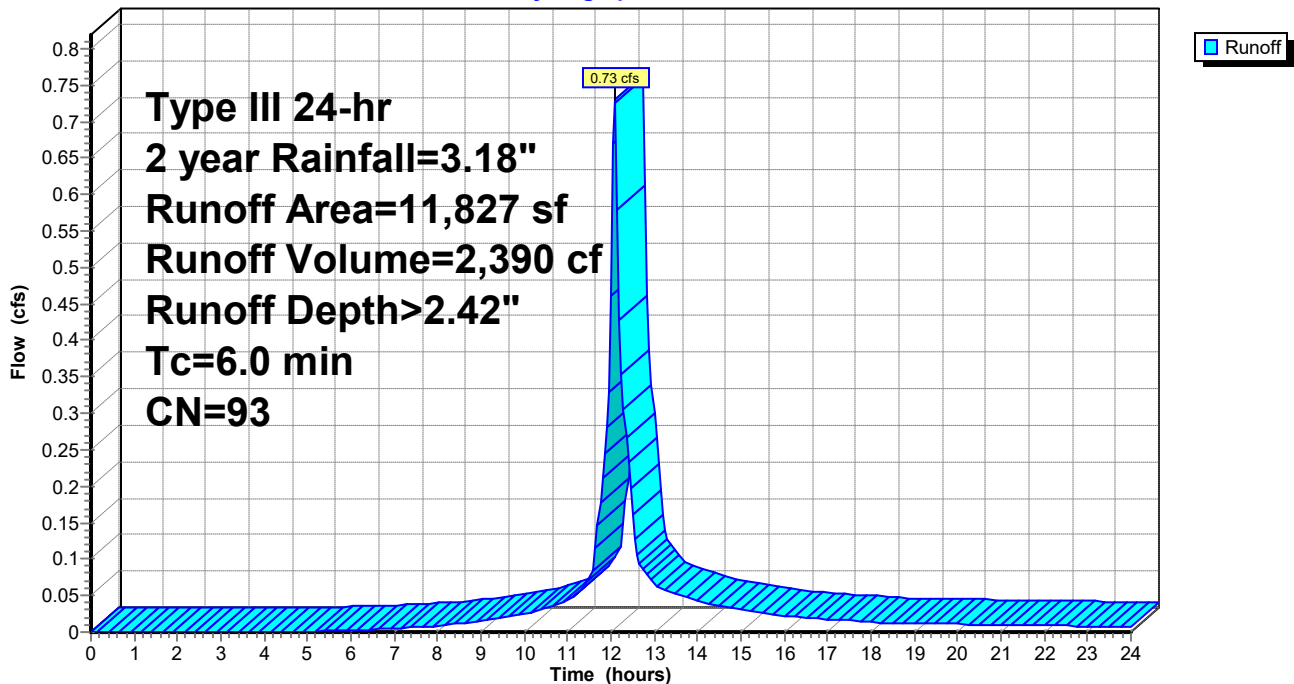
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
7,080	98	Paved parking, HSG C
4,550	86	<50% Grass cover, Poor, HSG C
197	98	Unconnected pavement, HSG C
11,827	93	Weighted Average
4,550		38.47% Pervious Area
7,277		61.53% Impervious Area
197		2.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT TO CB4

Subcatchment P4B: FLOW TO CB4

Hydrograph



SELLERS FARM POST DEVELOPMENT

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Summary for Subcatchment P5: P5

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 1,764 cf, Depth> 2.33"
 Routed to Pond 2P : POND P2

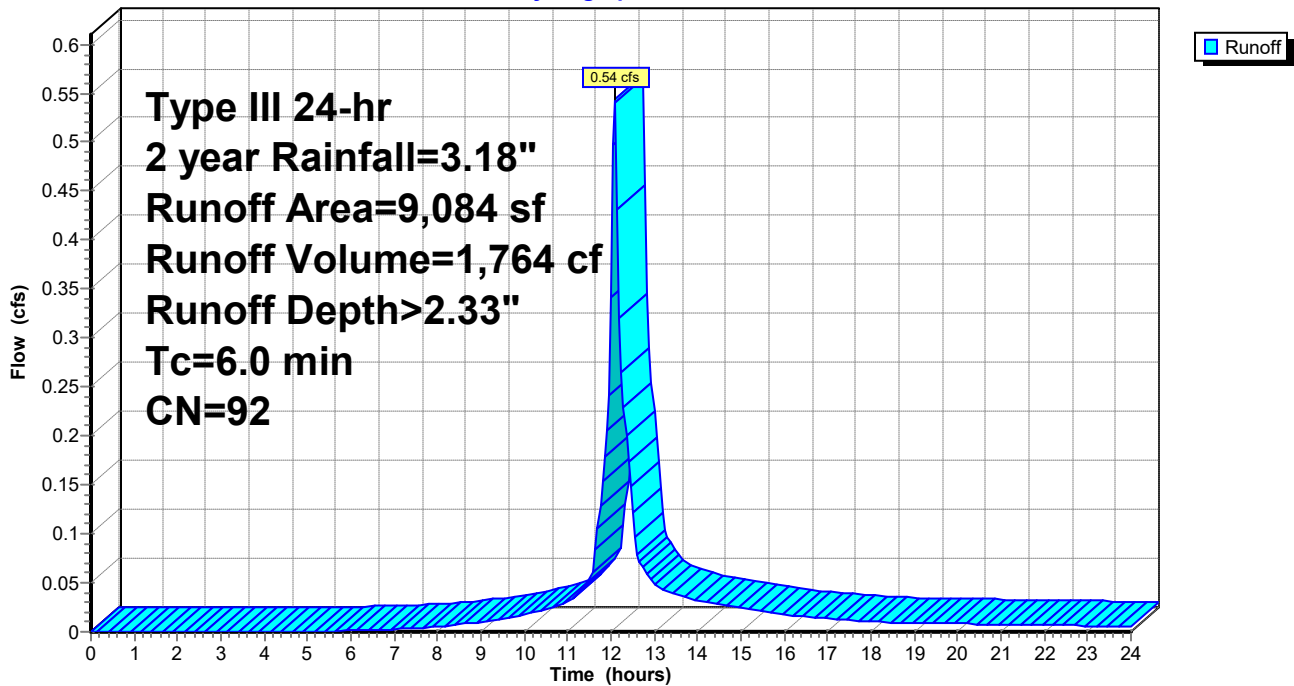
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
4,441	86	<50% Grass cover, Poor, HSG C
1,160	98	Water Surface, HSG C
3,483	98	Paved parking, HSG C
9,084	92	Weighted Average
4,441		48.89% Pervious Area
4,643		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO POND P2

Subcatchment P5: P5

Hydrograph



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Summary for Subcatchment P6: P6

Runoff = 1.49 cfs @ 12.22 hrs, Volume= 6,222 cf, Depth> 1.32"
 Routed to Pond 4P : Wetland Series 'B'

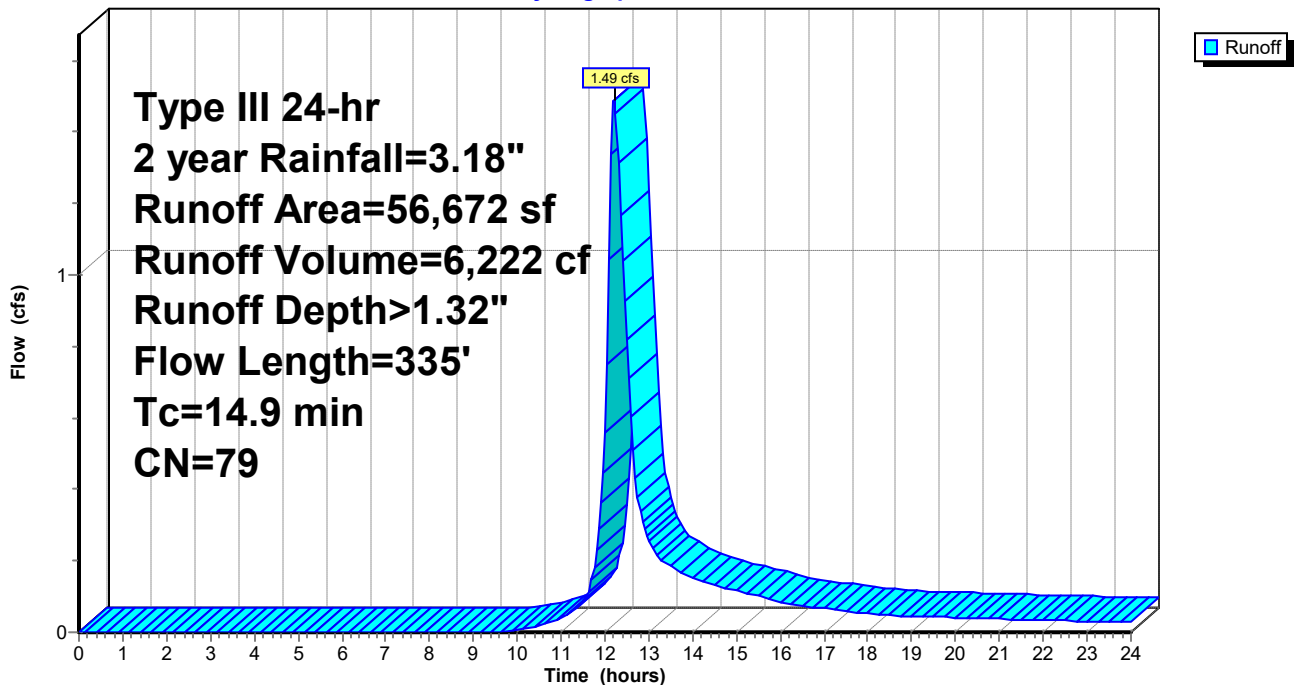
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
27,229	86	<50% Grass cover, Poor, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	79	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment P6: P6

Hydrograph



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Summary for Subcatchment P7: FLOW TO POND 3

Runoff = 0.55 cfs @ 12.20 hrs, Volume= 2,240 cf, Depth> 1.97"
 Routed to Pond 3P : POND 3

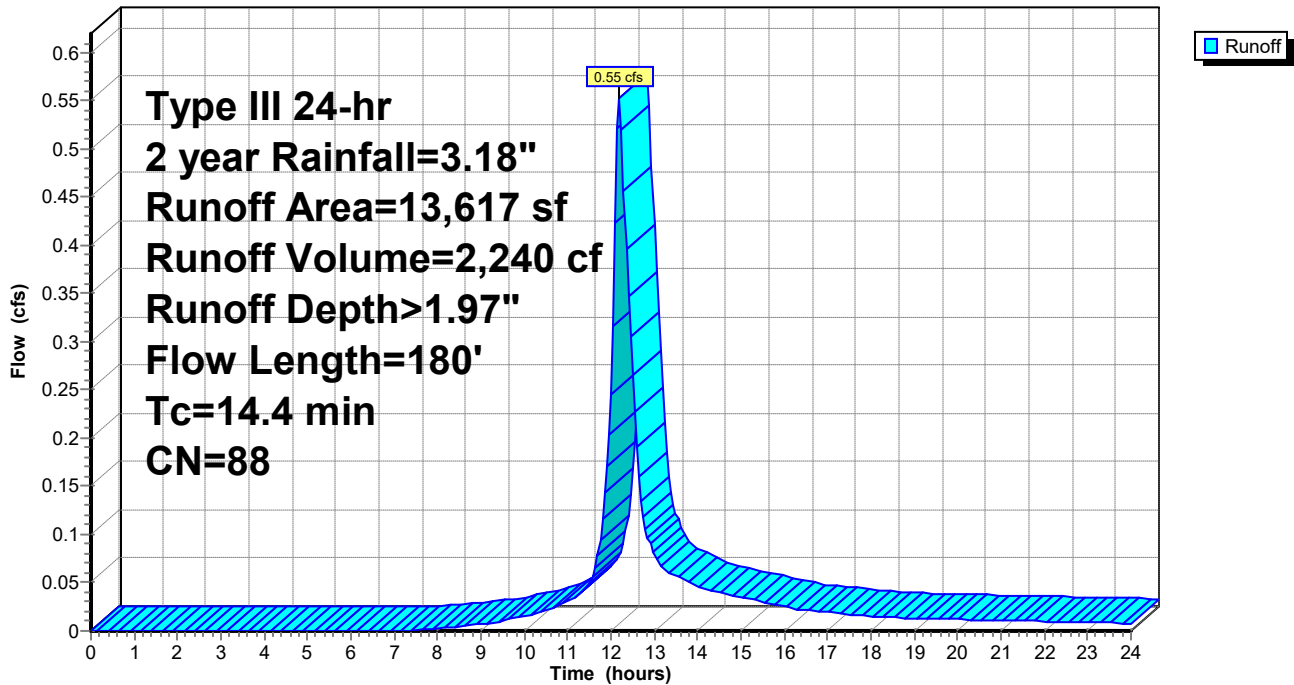
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
11,172	86	<50% Grass cover, Poor, HSG C
1,096	98	Paved parking, HSG C
1,349	98	Water Surface, HSG C
13,617	88	Weighted Average
11,172		82.04% Pervious Area
2,445		17.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, FLOW IN WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
2.0	130	0.0460	1.07		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
14.4	180	Total			

Subcatchment P7: FLOW TO POND 3

Hydrograph



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Summary for Subcatchment P8: AREA AROUND POND 1

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 1,330 cf, Depth> 2.42"
 Routed to Pond 1P : POND 1

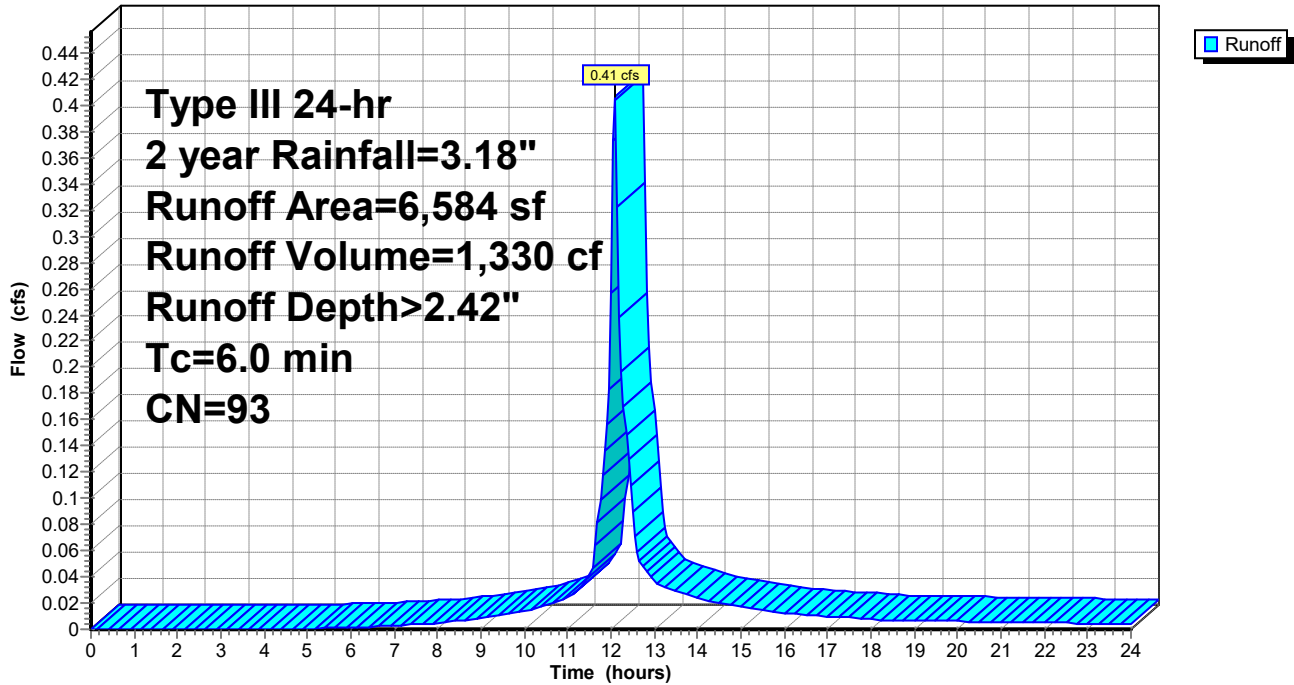
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
2,650	86	<50% Grass cover, Poor, HSG C
3,934	98	Water Surface, HSG C
6,584	93	Weighted Average
2,650		40.25% Pervious Area
3,934		59.75% Impervious Area

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

Subcatchment P8: AREA AROUND POND 1

Hydrograph



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Summary for Subcatchment P9: (new Subcat)

Runoff = 1.27 cfs @ 12.10 hrs, Volume= 4,045 cf, Depth> 1.45"
 Routed to Pond SP2 : SUM POND WOODS DP-2

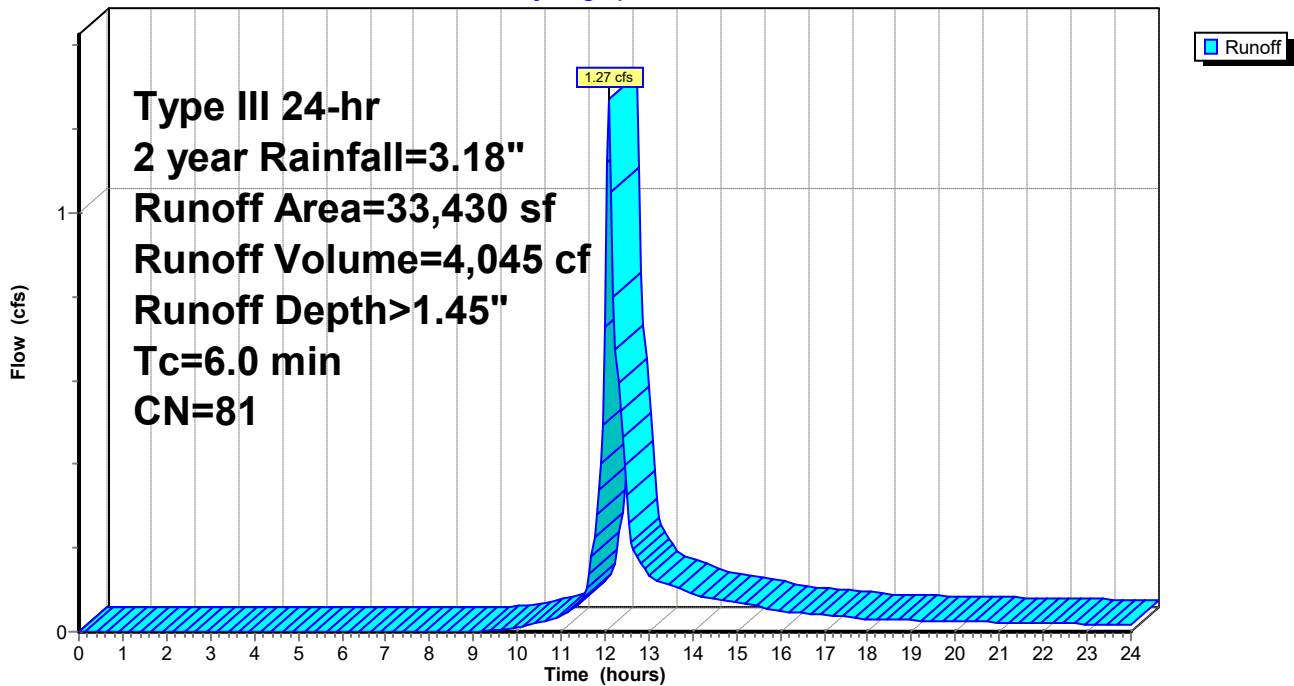
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
23,170	86	<50% Grass cover, Poor, HSG C
10,260	70	Woods, Good, HSG C
33,430	81	Weighted Average
33,430		100.00% Pervious Area

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

Subcatchment P9: (new Subcat)

Hydrograph



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Summary for Subcatchment R1: IOT 1 ROOF

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 483 cf, Depth> 2.95"
 Routed to Pond 2P : POND P2

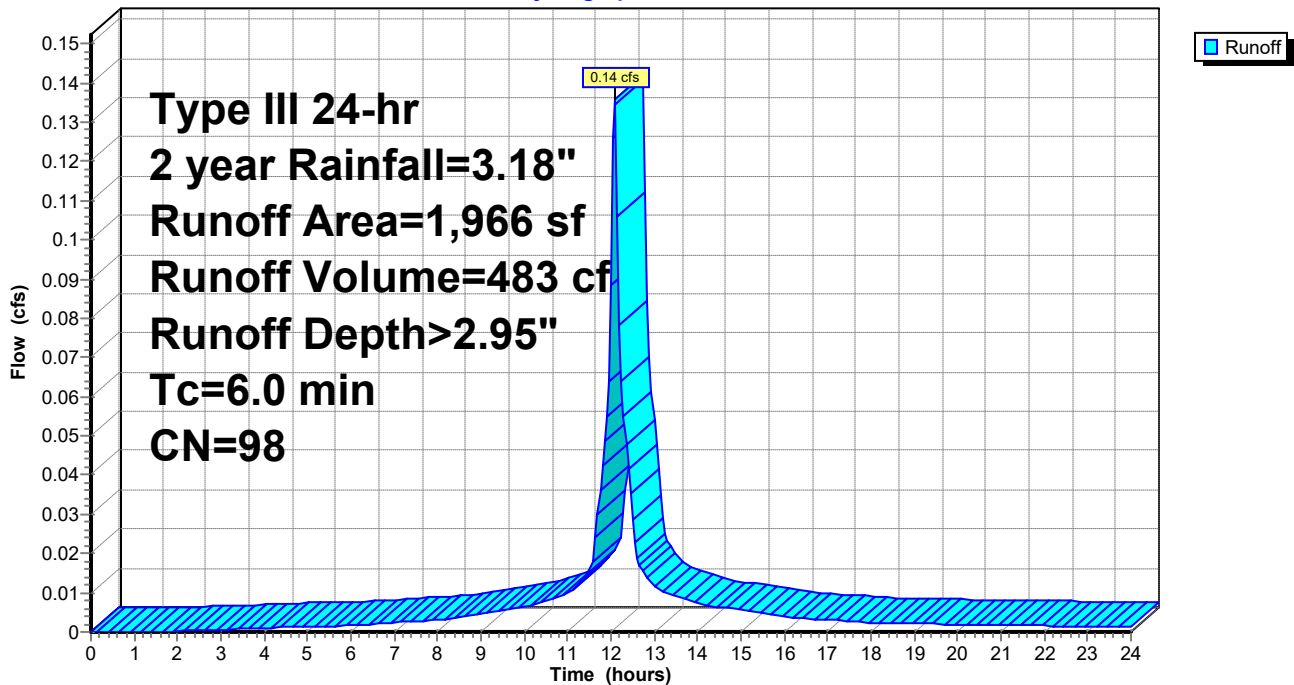
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
1,966	98	Roofs, HSG C
1,966		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW FROM ROOF TO POND

Subcatchment R1: IOT 1 ROOF

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Subcatchment R2: LOT 2 ROOF

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 553 cf, Depth> 2.95"
Routed to Pond 3P : POND 3

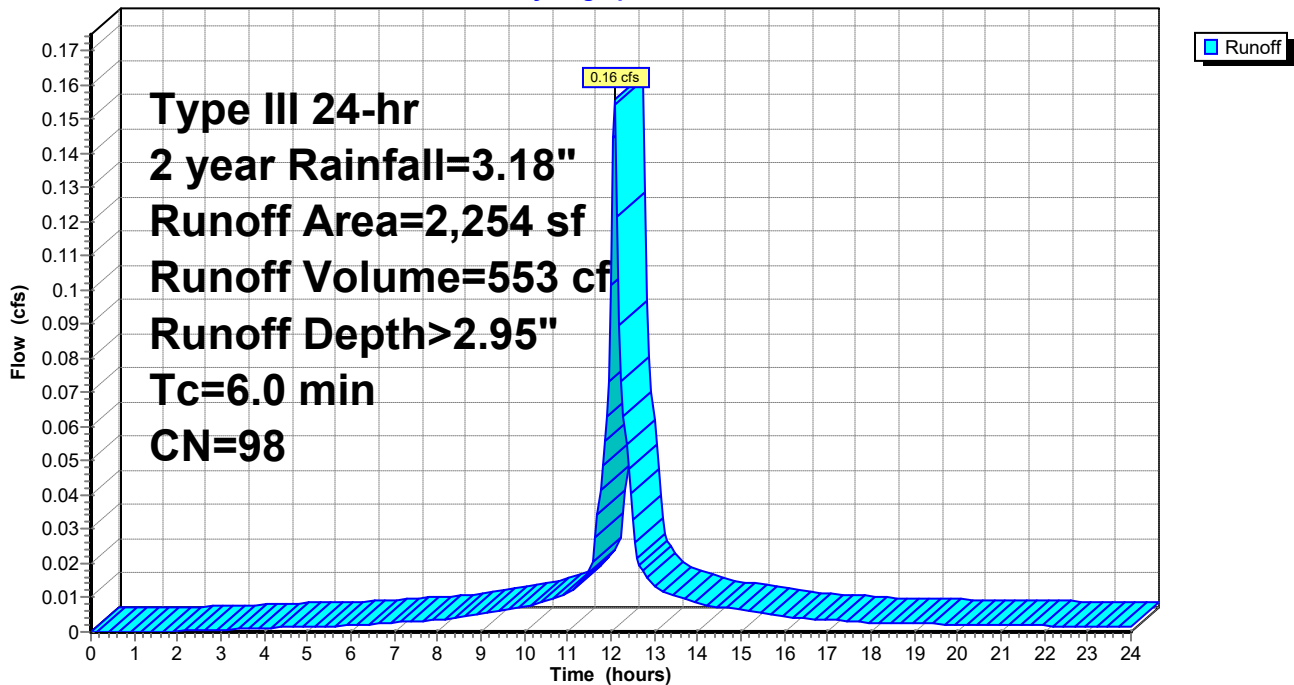
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW IN GUTTERS AND PIPES TO POND 3

Subcatchment R2: LOT 2 ROOF

Hydrograph



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Summary for Subcatchment R3: (new Subcat)

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 553 cf, Depth> 2.95"
 Routed to Pond 1P : POND 1

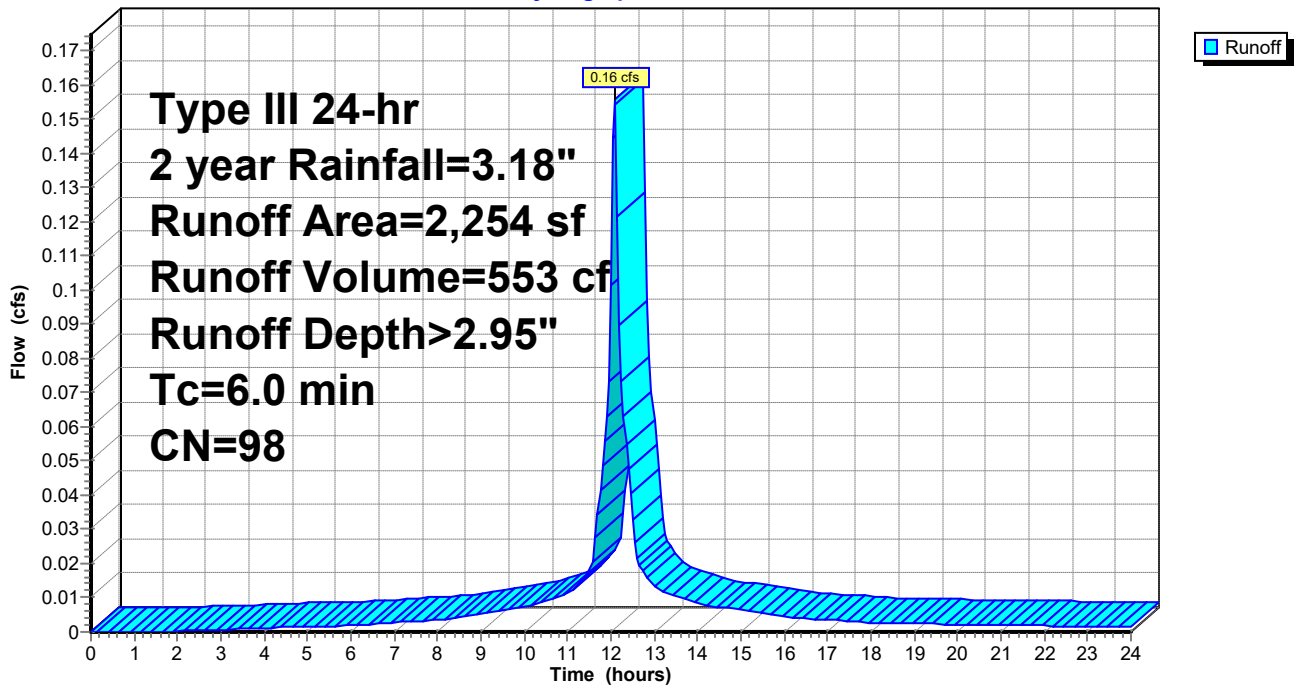
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 year Rainfall=3.18"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW THROUGH GUTTERS TO POND

Subcatchment R3: (new Subcat)

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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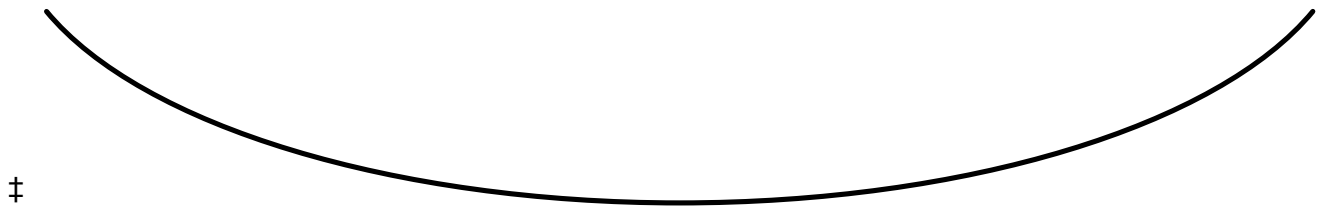
Summary for Reach 2R: Flow to WETL Series 'B'

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth = 0.00" for 2 year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 4P : Wetland Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 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

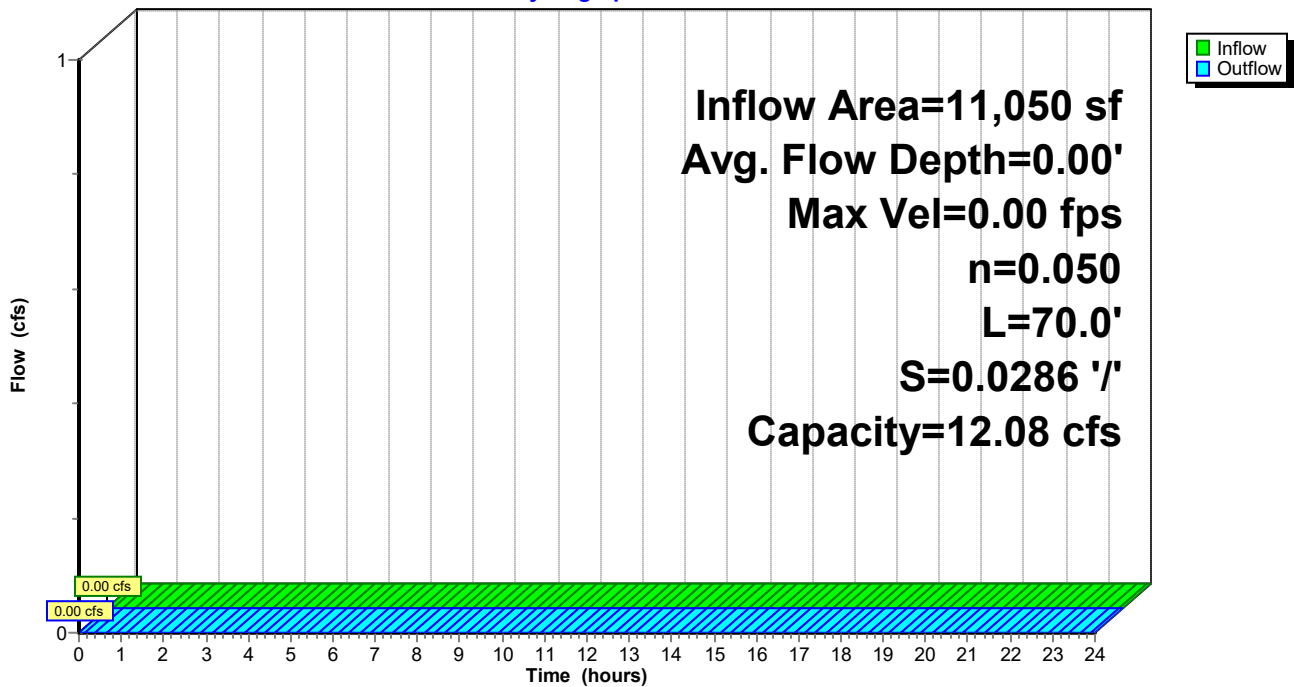
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.33' Flow Area= 6.6 sf, Capacity= 12.08 cfs

30.00' x 0.33' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 70.0' Slope= 0.0286 '/'
Inlet Invert= 263.00', Outlet Invert= 261.00'



Reach 2R: Flow to WETL Series 'B'

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond 1P: POND 1

Inflow Area = 44,704 sf, 55.90% Impervious, Inflow Depth > 2.39" for 2 year event
 Inflow = 2.70 cfs @ 12.09 hrs, Volume= 8,896 cf
 Outflow = 0.48 cfs @ 12.55 hrs, Volume= 7,206 cf, Atten= 82%, Lag= 27.9 min
 Discarded = 0.08 cfs @ 12.55 hrs, Volume= 3,910 cf
 Primary = 0.40 cfs @ 12.55 hrs, Volume= 3,296 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.97' @ 12.55 hrs Surf.Area= 3,494 sf Storage= 3,951 cf
 Flood Elev= 263.00' Surf.Area= 6,275 sf Storage= 13,707 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 102.7 min (893.2 - 790.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	259.50'	13,707 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)	
259.50	1,956	257.0	0	0	1,956	
260.00	2,410	269.0	1,090	1,090	2,475	
261.00	3,525	292.0	2,950	4,039	3,540	
262.00	4,800	393.0	4,146	8,186	9,056	
263.00	6,275	518.0	5,521	13,707	18,129	

Device	Routing	Invert	Outlet Devices	
#1	Primary	259.00'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.00' / 258.00' S= 0.0333 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf	
#2	Device 1	260.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#3	Device 1	261.50'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Discarded	259.50'	1.020 in/hr Exfiltration over Surface area	
#5	Primary	262.20'	10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74	

Discarded OutFlow Max=0.08 cfs @ 12.55 hrs HW=260.97' (Free Discharge)
 ↳ **4=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.40 cfs @ 12.55 hrs HW=260.97' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 0.40 cfs of 4.59 cfs potential flow)
 ↳ **2=Orifice/Grate** (Orifice Controls 0.40 cfs @ 2.91 fps)
 ↳ **3=Orifice/Grate** (Controls 0.00 cfs)
 ↳ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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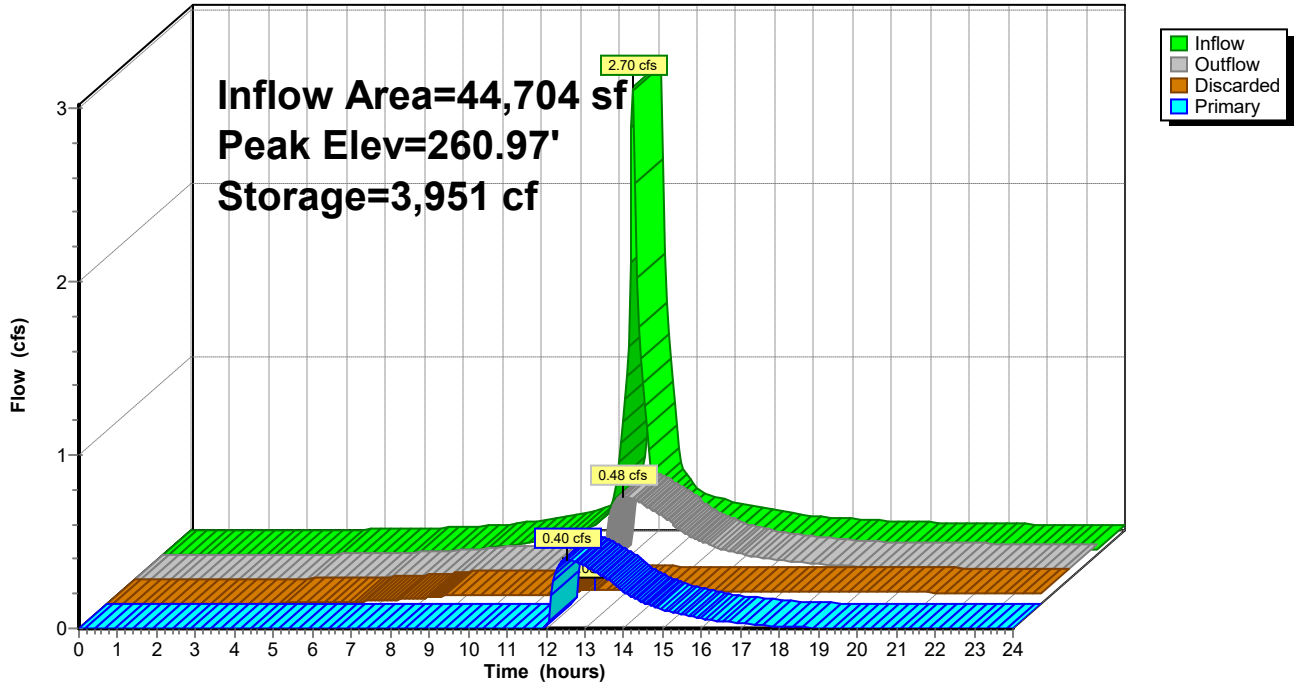
Type III 24-hr 2 year Rainfall=3.18"

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Pond 1P: POND 1

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond 2P: POND P2

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth > 2.44" for 2 year event
 Inflow = 0.68 cfs @ 12.09 hrs, Volume= 2,246 cf
 Outflow = 0.05 cfs @ 13.30 hrs, Volume= 2,247 cf, Atten= 92%, Lag= 72.6 min
 Discarded = 0.05 cfs @ 13.30 hrs, Volume= 2,247 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach 2R : Flow to WETL Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.94' @ 13.30 hrs Surf.Area= 2,193 sf Storage= 912 cf
 Flood Elev= 263.50' Surf.Area= 2,650 sf Storage= 2,259 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 148.8 min (937.4 - 788.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.50'	2,259 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)	
262.50	1,940	193.0	0	0	1,940	
263.00	2,228	235.0	1,041	1,041	3,374	
263.50	2,650	232.0	1,218	2,259	3,536	

Device	Routing	Invert	Outlet Devices													
#1	Discarded	262.50'	1.020 in/hr Exfiltration over Surface area													
#2	Primary	263.00'	10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65													
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88													

Discarded OutFlow Max=0.05 cfs @ 13.30 hrs HW=262.94' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=262.50' TW=263.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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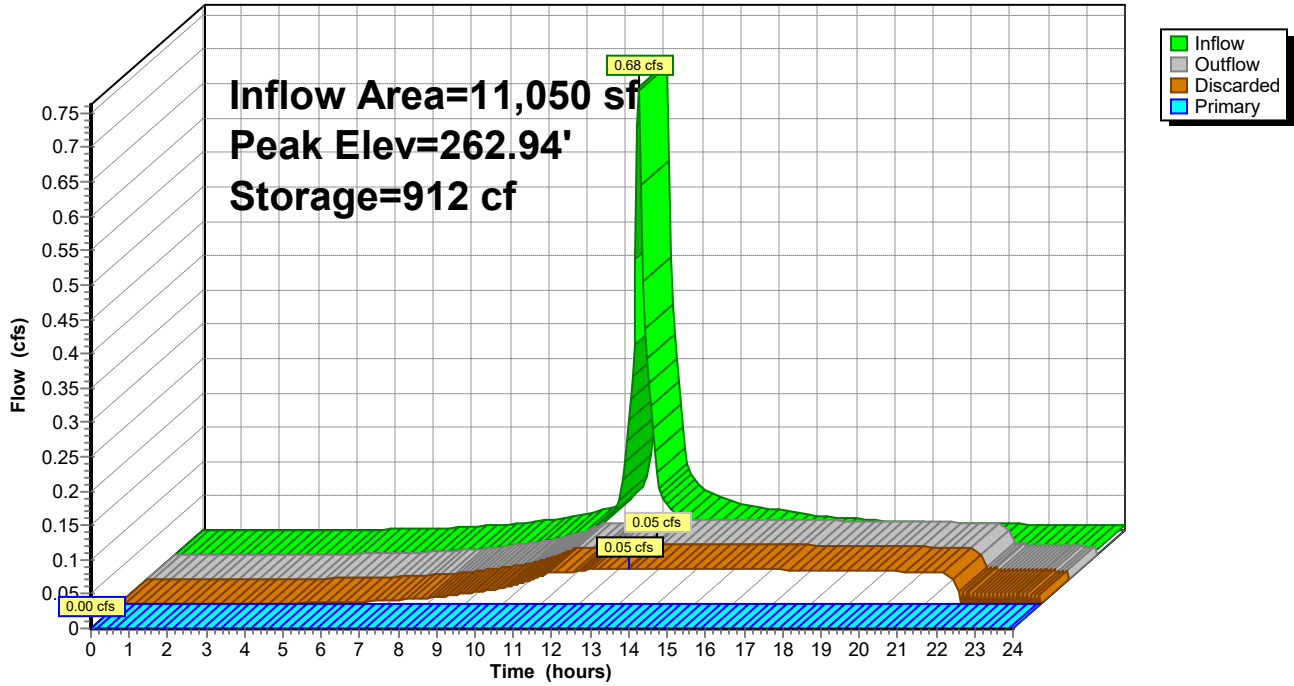
Type III 24-hr 2 year Rainfall=3.18"

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Pond 2P: POND P2

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond 3P: POND 3

Inflow Area = 15,871 sf, 29.61% Impervious, Inflow Depth > 2.11" for 2 year event
 Inflow = 0.65 cfs @ 12.18 hrs, Volume= 2,793 cf
 Outflow = 0.14 cfs @ 12.73 hrs, Volume= 2,526 cf, Atten= 78%, Lag= 33.1 min
 Discarded = 0.04 cfs @ 12.73 hrs, Volume= 1,757 cf
 Primary = 0.10 cfs @ 12.73 hrs, Volume= 769 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.61' @ 12.73 hrs Surf.Area= 1,736 sf Storage= 1,145 cf
 Flood Elev= 265.00' Surf.Area= 3,131 sf Storage= 4,528 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 121.5 min (930.1 - 808.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.75'	4,528 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)	
262.75	954	190.0	0	0	954	
264.00	2,162	300.0	1,897	1,897	5,254	
265.00	3,131	282.0	2,632	4,528	6,137	

Device	Routing	Invert	Outlet Devices											
#1	Primary	263.05'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.05' / 261.50' S= 0.0775 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf											
#2	Device 1	263.30'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads											
#3	Primary	264.00'	10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#4	Discarded	262.75'	1.020 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.04 cfs @ 12.73 hrs HW=263.61' (Free Discharge)
 ↑**4=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.10 cfs @ 12.73 hrs HW=263.61' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Passes 0.10 cfs of 1.16 cfs potential flow)
 ↑**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.09 fps)
 ↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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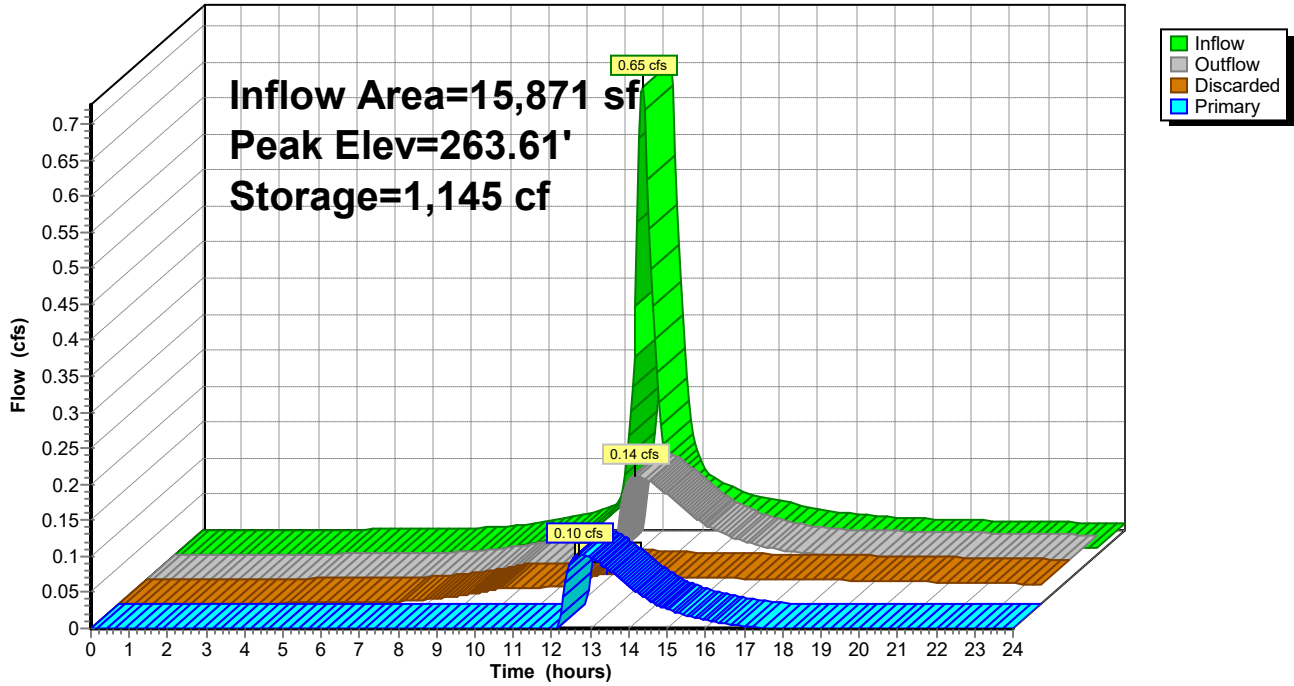
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Pond 3P: POND 3

Hydrograph



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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 67,722 sf, 11.24% Impervious, Inflow Depth > 1.10" for 2 year event
 Inflow = 1.49 cfs @ 12.22 hrs, Volume= 6,222 cf
 Outflow = 1.49 cfs @ 12.22 hrs, Volume= 6,222 cf, Atten= 0%, Lag= 0.2 min
 Primary = 1.49 cfs @ 12.22 hrs, Volume= 6,222 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 258.97' @ 12.22 hrs Surf.Area= 107 sf Storage= 14 cf

Plug-Flow detention time= 0.1 min calculated for 6,222 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (852.7 - 852.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	258.65'	7,771 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)
258.65	5	9.0	0	0	5
259.00	125	47.0	18	18	175
259.70	685	102.0	257	275	829
260.00	933	125.0	242	517	1,246
261.00	3,333	263.0	2,010	2,527	5,511
262.00	7,425	350.0	5,244	7,771	9,766

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	12.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 260.00' / 259.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=1.47 cfs @ 12.22 hrs HW=258.96' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Controls 0.00 cfs)
- 2=Rock Fill (Rockfill Controls 1.47 cfs @ 0.37 fps)

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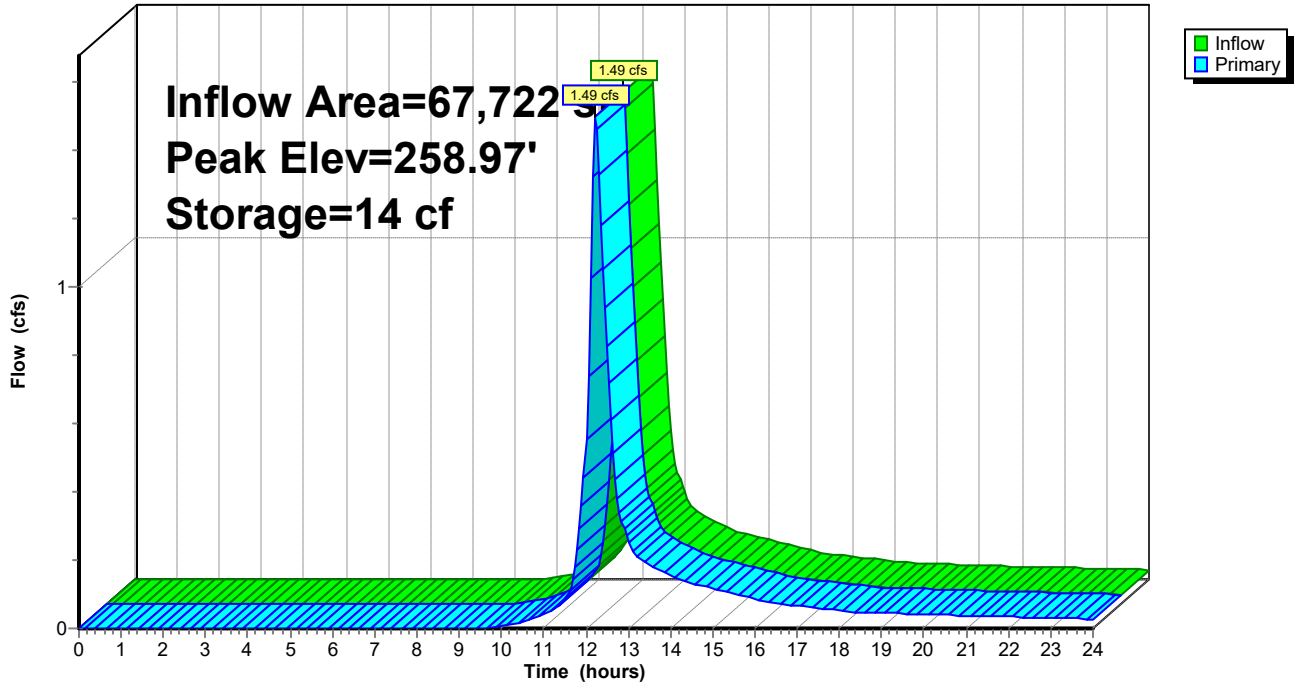
Type III 24-hr 2 year Rainfall=3.18"

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Pond 4P: Wetland Series 'B'

Hydrograph



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Summary for Pond CB1: (new Pond)

Inflow Area = 3,286 sf, 45.25% Impervious, Inflow Depth > 2.24" for 2 year event
 Inflow = 0.19 cfs @ 12.09 hrs, Volume= 613 cf
 Outflow = 0.19 cfs @ 12.09 hrs, Volume= 613 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.19 cfs @ 12.09 hrs, Volume= 613 cf
 Routed to Pond MH1 : MH1

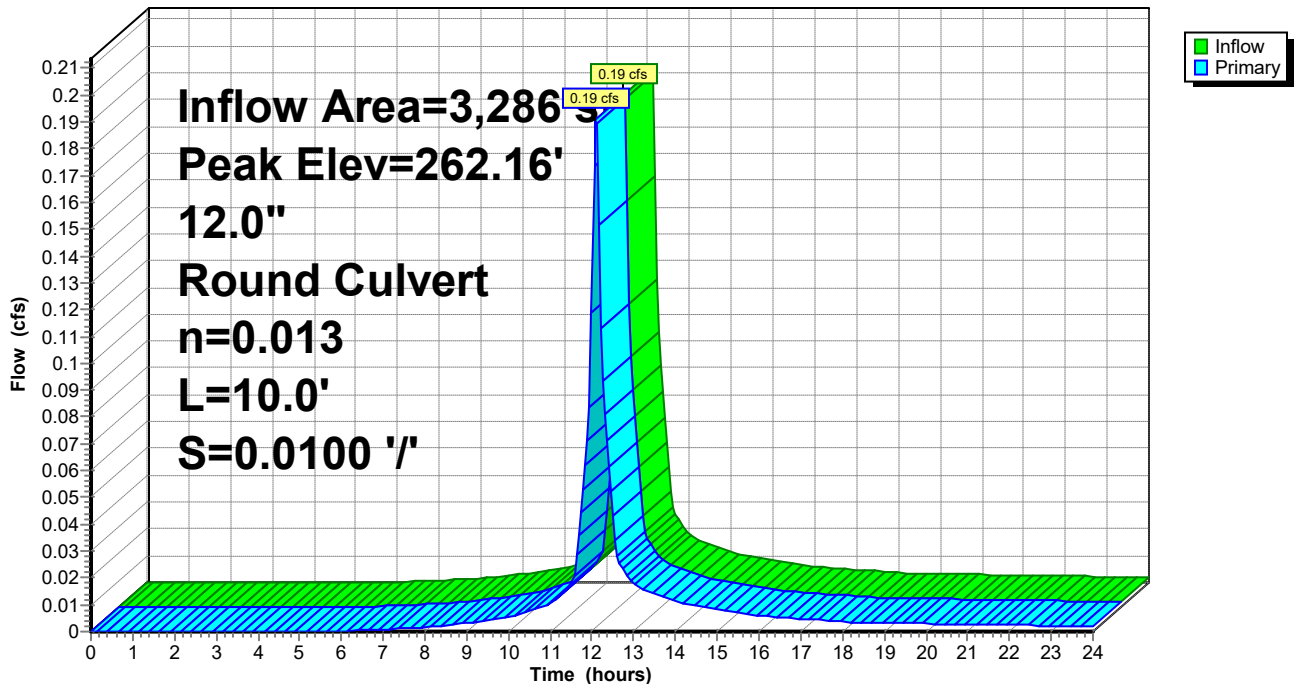
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.16' @ 12.11 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=262.15' TW=262.07' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.16 cfs @ 1.55 fps)

Pond CB1: (new Pond)

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond CB2: CB2

Inflow Area = 3,739 sf, 40.28% Impervious, Inflow Depth > 2.24" for 2 year event
 Inflow = 0.22 cfs @ 12.09 hrs, Volume= 697 cf
 Outflow = 0.22 cfs @ 12.09 hrs, Volume= 697 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 12.09 hrs, Volume= 697 cf
 Routed to Pond MH1 : MH1

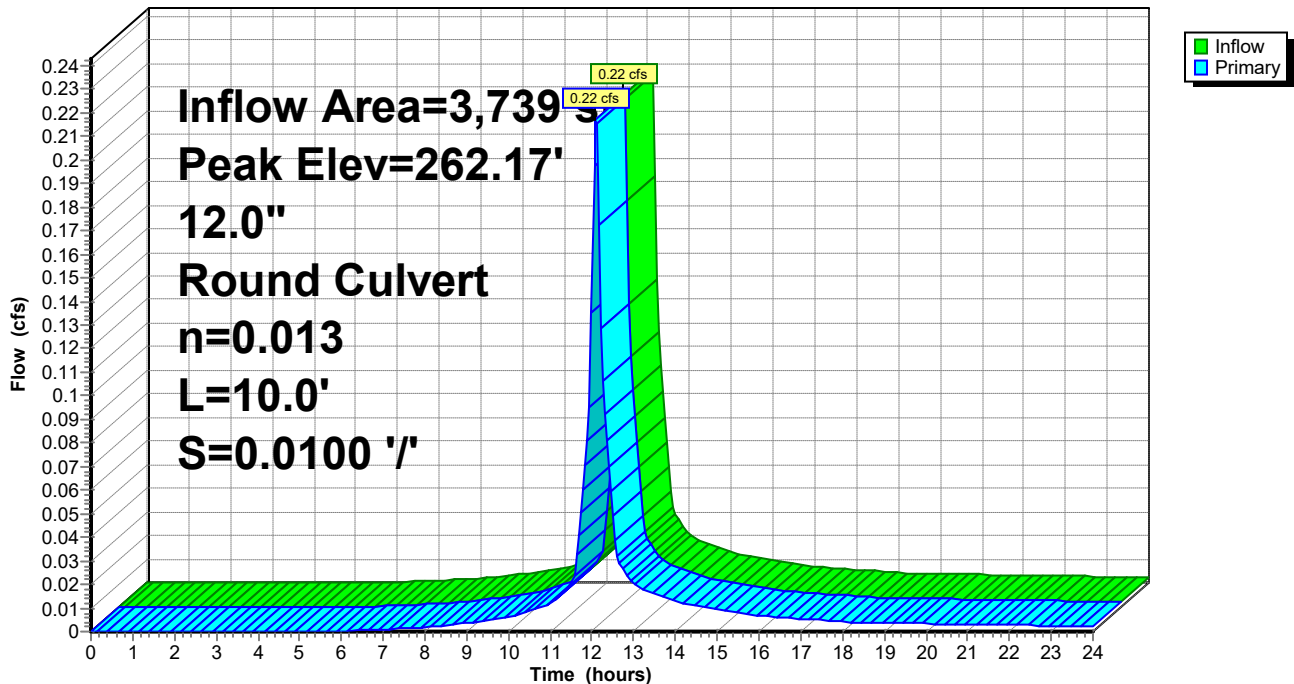
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.17' @ 12.11 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.09 hrs HW=262.17' TW=262.07' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.19 cfs @ 1.67 fps)

Pond CB2: CB2

Hydrograph



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Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond CB3: (new Pond)

Inflow Area = 5,280 sf, 100.00% Impervious, Inflow Depth > 2.95" for 2 year event
 Inflow = 0.37 cfs @ 12.09 hrs, Volume= 1,296 cf
 Outflow = 0.37 cfs @ 12.09 hrs, Volume= 1,296 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.37 cfs @ 12.09 hrs, Volume= 1,296 cf
 Routed to Pond MH3 : DMH3

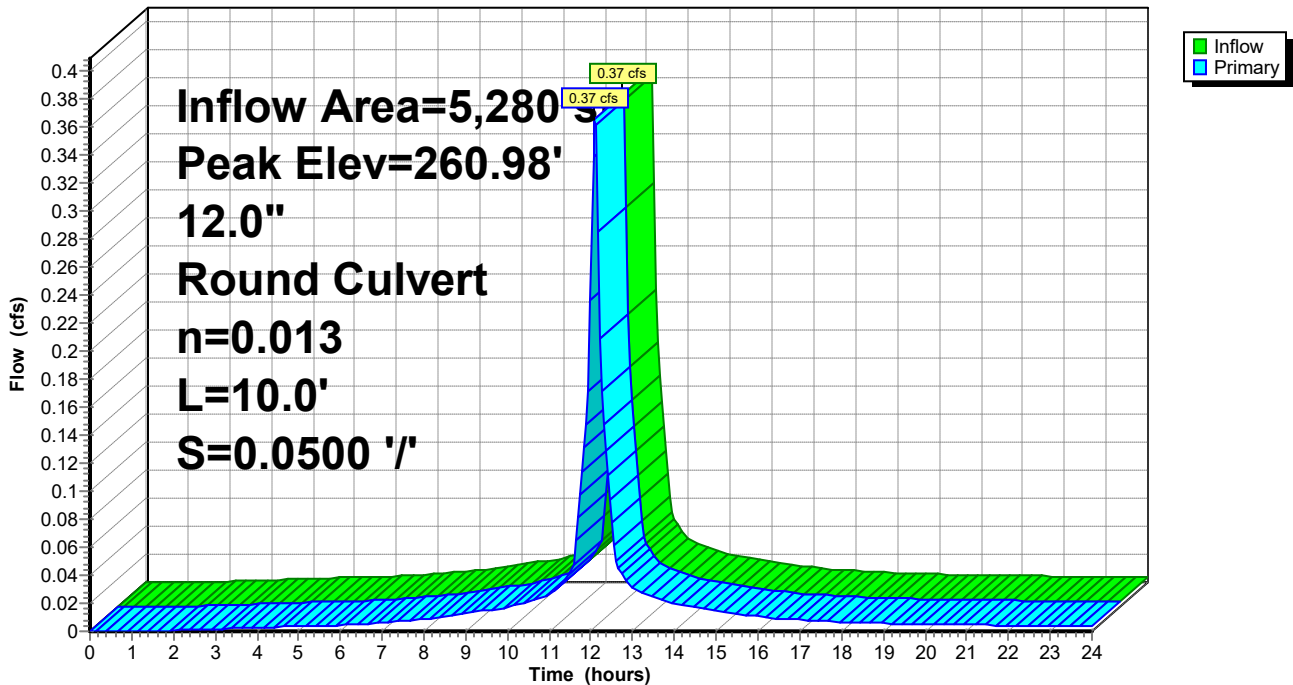
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.98' @ 12.64 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.50'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.09 hrs HW=260.80' TW=260.63' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.29 cfs @ 2.21 fps)

Pond CB3: (new Pond)

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 11,827 sf, 61.53% Impervious, Inflow Depth > 2.42" for 2 year event
 Inflow = 0.73 cfs @ 12.09 hrs, Volume= 2,390 cf
 Outflow = 0.73 cfs @ 12.09 hrs, Volume= 2,390 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.73 cfs @ 12.09 hrs, Volume= 2,390 cf
 Routed to Pond MH3 : DMH3

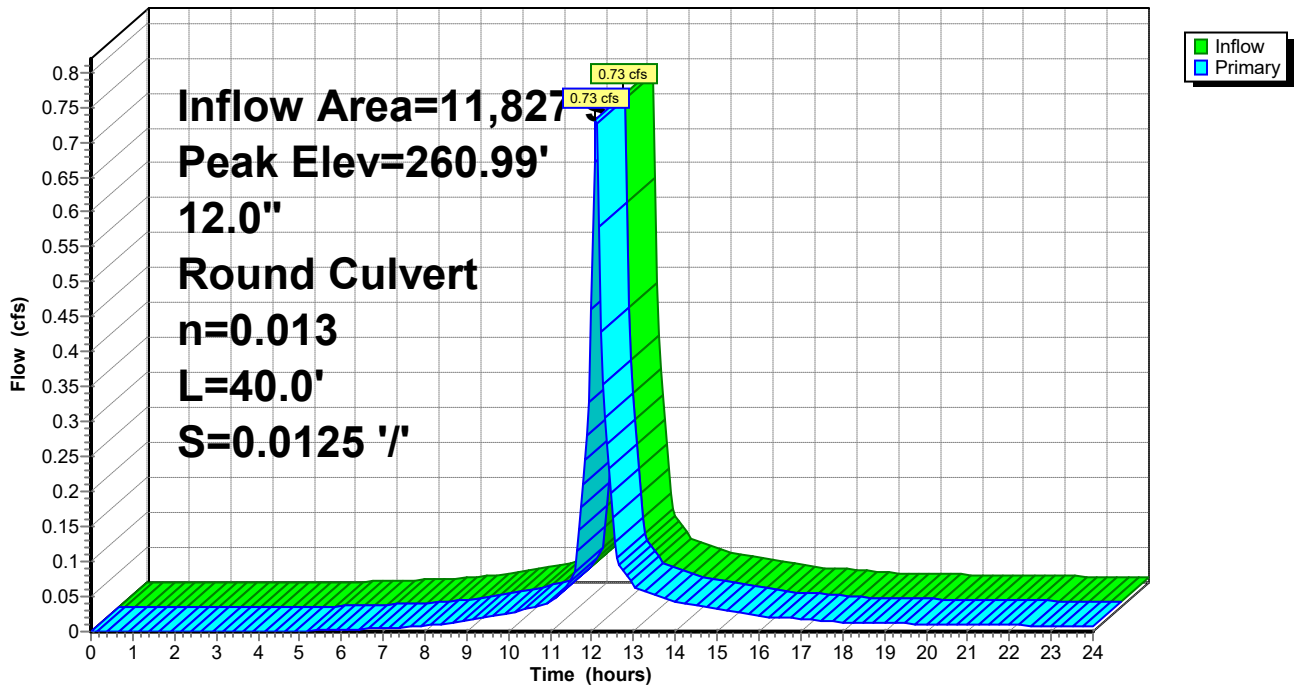
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.99' @ 12.63 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.09 hrs HW=260.97' TW=260.64' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.62 cfs @ 2.55 fps)

Pond CB4: CB4

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond MH1: MH1

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 2.24" for 2 year event
 Inflow = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf
 Outflow = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf
 Routed to Pond MH2 : MH2

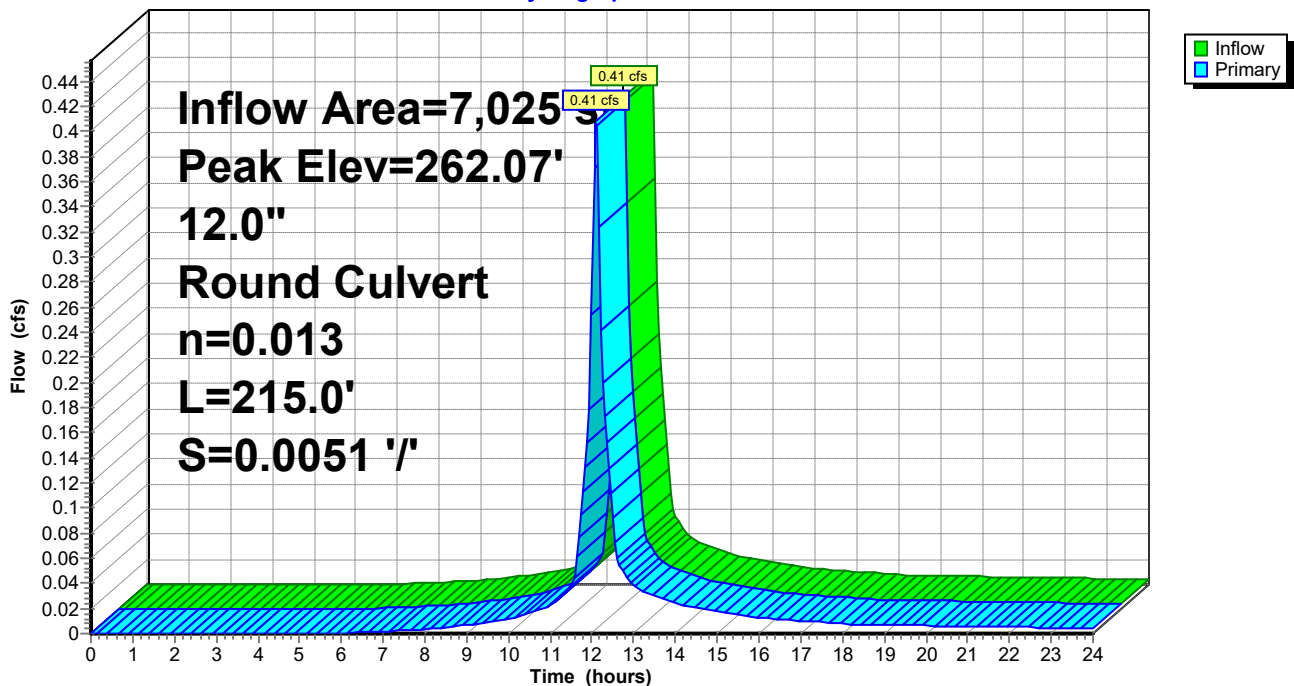
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.07' @ 12.09 hrs
 Flood Elev= 265.00'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.70'	12.0" Round Culvert L= 215.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.70' / 260.60' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.09 hrs HW=262.07' TW=261.00' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.39 cfs @ 2.22 fps)

Pond MH1: MH1

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond MH2: MH2

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 2.24" for 2 year event
 Inflow = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf
 Outflow = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.41 cfs @ 12.09 hrs, Volume= 1,310 cf
 Routed to Pond MH3 : DMH3

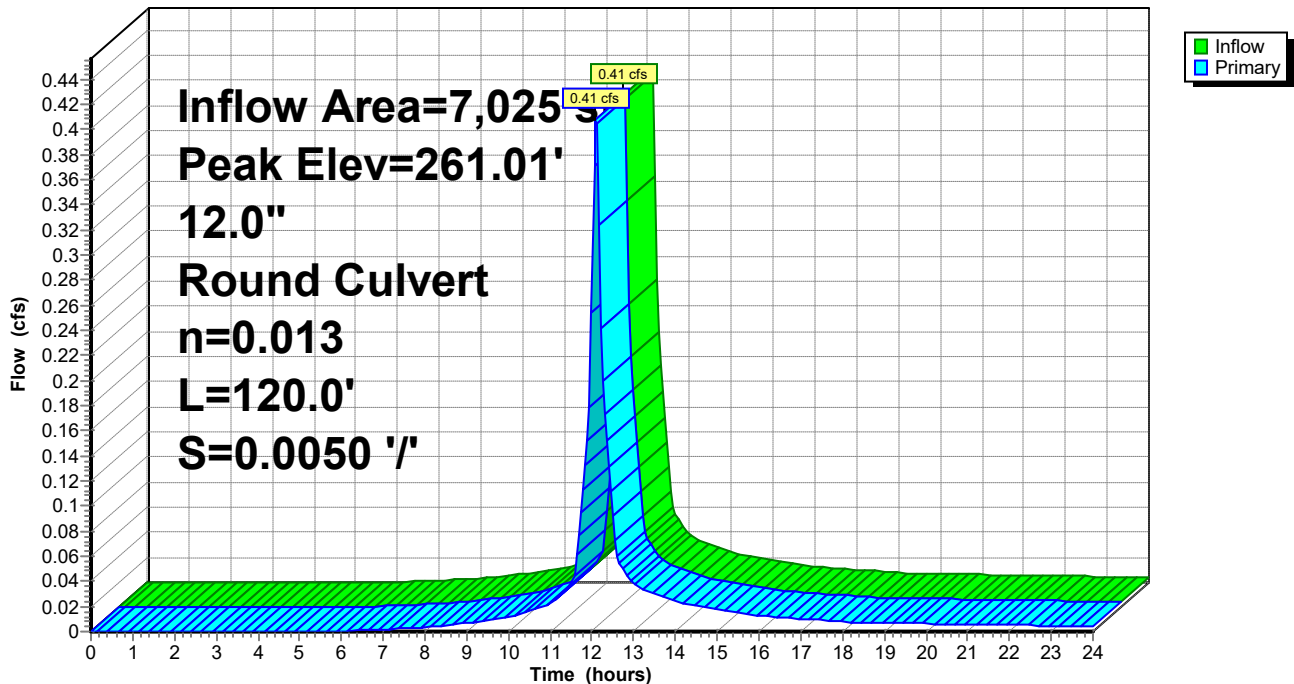
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.01' @ 12.11 hrs
 Flood Elev= 269.75'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.60'	12.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.60' / 260.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=261.00' TW=260.64' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.35 cfs @ 1.75 fps)

Pond MH2: MH2

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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Summary for Pond MH3: DMH3

Inflow Area = 24,132 sf, 64.44% Impervious, Inflow Depth > 2.48" for 2 year event
 Inflow = 1.50 cfs @ 12.09 hrs, Volume= 4,996 cf
 Outflow = 1.50 cfs @ 12.09 hrs, Volume= 4,996 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.50 cfs @ 12.09 hrs, Volume= 4,996 cf
 Routed to Pond 1P : POND 1

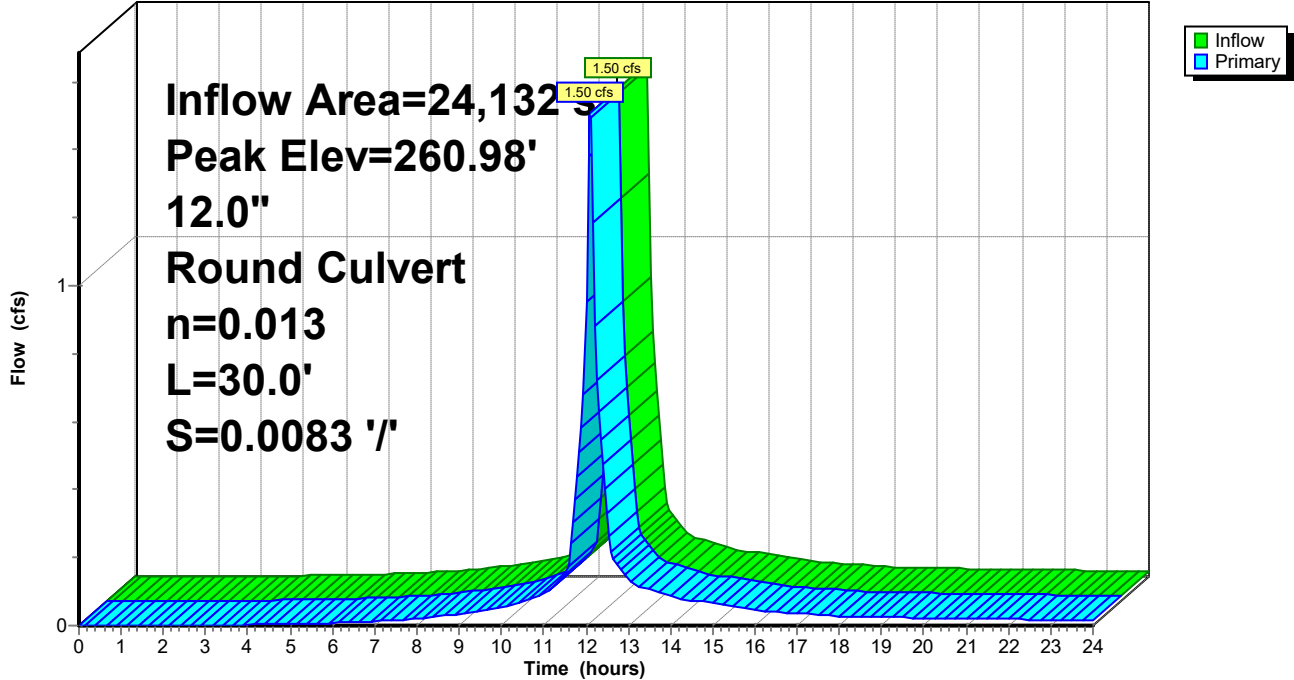
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.98' @ 12.59 hrs
 Flood Elev= 263.60'

Device #	Routing	Invert	Outlet Devices
#1	Primary	259.75'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.75' / 259.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.09 hrs HW=260.64' TW=260.53' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.94 cfs @ 1.70 fps)

Pond MH3: DMH3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 2 year Rainfall=3.18"

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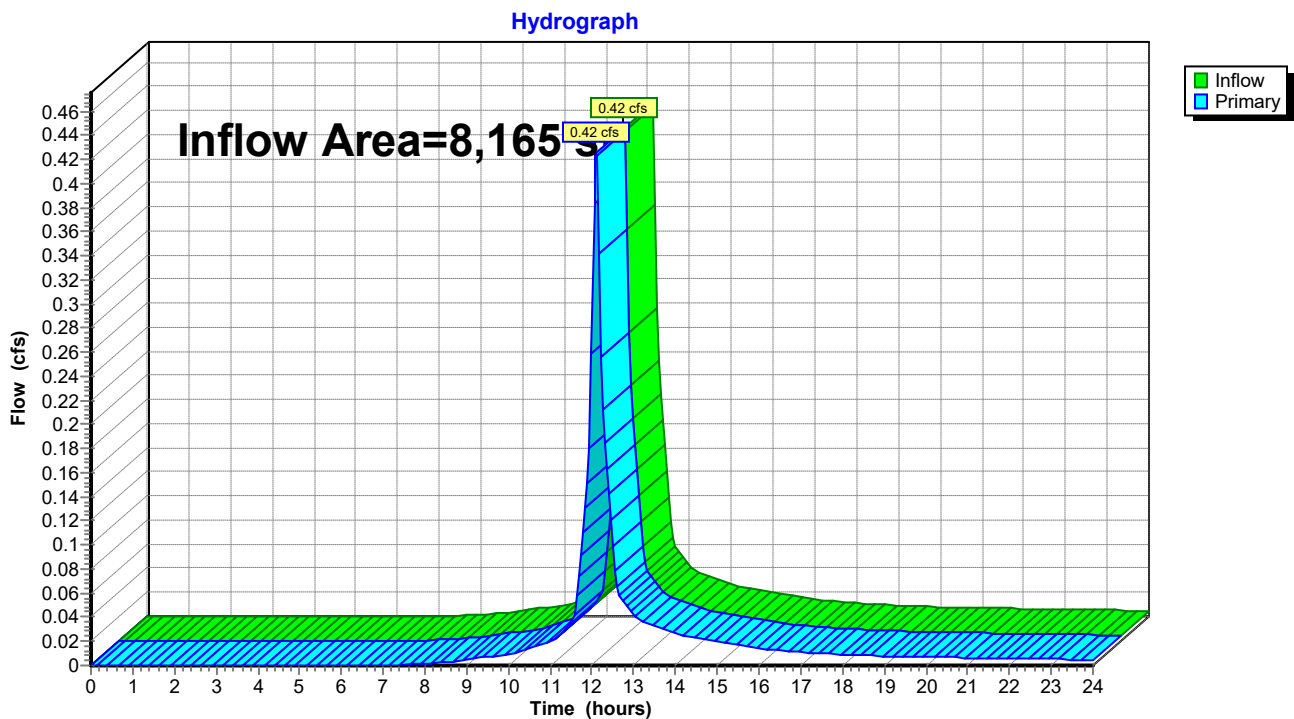
Summary for Pond SP1: SUM POND STREET DP-1

DESIGN POINT AT HIGHLAND ROAD

Inflow Area = 8,165 sf, 17.33% Impervious, Inflow Depth > 1.98" for 2 year event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,345 cf
Primary = 0.42 cfs @ 12.09 hrs, Volume= 1,345 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



SELLERS FARM POST DEVELOPMENT

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Type III 24-hr 2 year Rainfall=3.18"

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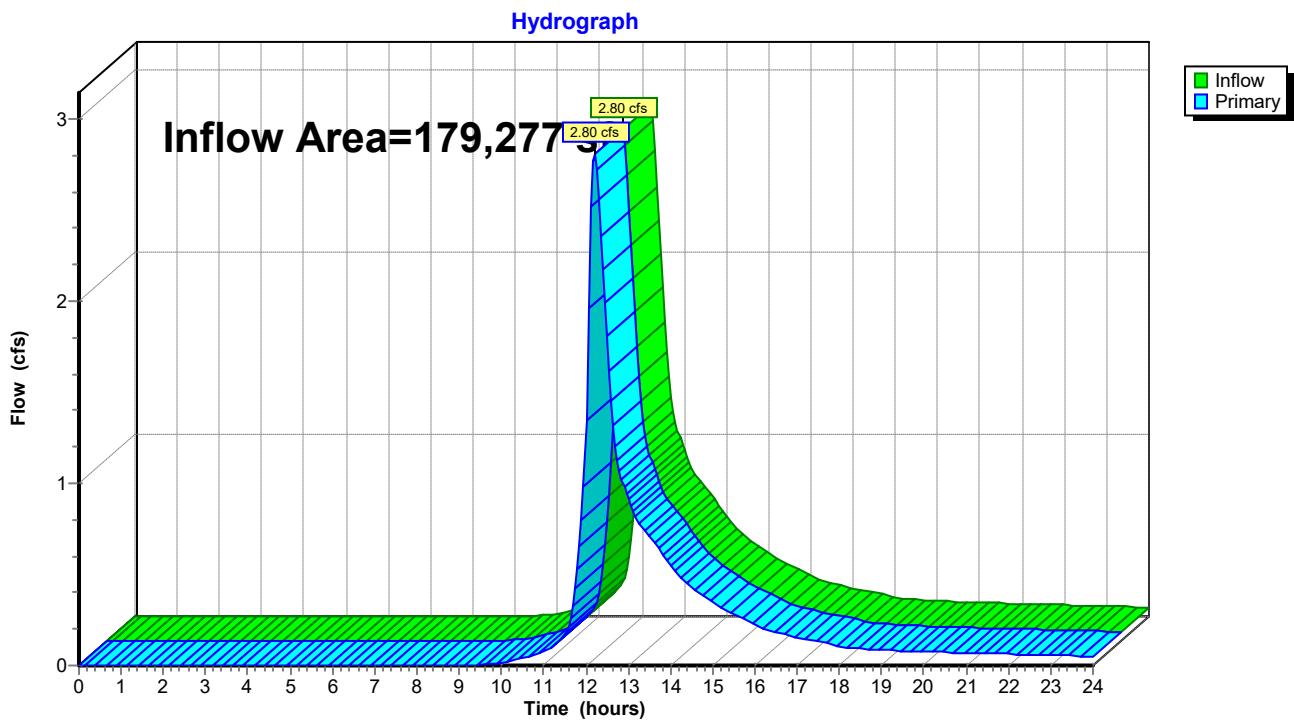
Summary for Pond SP2: SUM POND WOODS DP-2

DESIGN POINT AT REAR PROPERTY LINE

Inflow Area = 179,277 sf, 20.80% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 2.80 cfs @ 12.19 hrs, Volume= 15,521 cf
Primary = 2.80 cfs @ 12.19 hrs, Volume= 15,521 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2



STORMWATER MANAGEMENT REPORT

10 YEAR STORM

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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

Subcatchment P10: (new Subcat)	Runoff Area=17,550 sf 0.00% Impervious Runoff Depth>2.06" Flow Length=425' Slope=0.0400 '/' Tc=15.7 min CN=70 Runoff=0.70 cfs 3,011 cf
Subcatchment P1A: P1A	Runoff Area=3,286 sf 45.25% Impervious Runoff Depth>4.02" Tc=6.0 min CN=91 Runoff=0.33 cfs 1,100 cf
Subcatchment P1B: P1B	Runoff Area=3,739 sf 40.28% Impervious Runoff Depth>4.02" Tc=6.0 min CN=91 Runoff=0.38 cfs 1,252 cf
Subcatchment P2: P2	Runoff Area=8,165 sf 17.33% Impervious Runoff Depth>3.70" Tc=6.0 min CN=88 Runoff=0.78 cfs 2,520 cf
Subcatchment P3: (new Subcat)	Runoff Area=11,734 sf 27.70% Impervious Runoff Depth>3.81" Flow Length=250' Tc=6.2 min CN=89 Runoff=1.14 cfs 3,723 cf
Subcatchment P4A: FLOW TO CB3	Runoff Area=5,280 sf 100.00% Impervious Runoff Depth>4.80" Tc=6.0 min CN=98 Runoff=0.58 cfs 2,112 cf
Subcatchment P4B: FLOW TO CB4	Runoff Area=11,827 sf 61.53% Impervious Runoff Depth>4.23" Tc=6.0 min CN=93 Runoff=1.24 cfs 4,173 cf
Subcatchment P5: P5	Runoff Area=9,084 sf 51.11% Impervious Runoff Depth>4.13" Tc=6.0 min CN=92 Runoff=0.94 cfs 3,123 cf
Subcatchment P6: P6	Runoff Area=56,672 sf 1.76% Impervious Runoff Depth>2.83" Flow Length=335' Tc=14.9 min CN=79 Runoff=3.27 cfs 13,358 cf
Subcatchment P7: FLOW TO POND 3	Runoff Area=13,617 sf 17.96% Impervious Runoff Depth>3.70" Flow Length=180' Tc=14.4 min CN=88 Runoff=1.02 cfs 4,197 cf
Subcatchment P8: AREA AROUND POND 1	Runoff Area=6,584 sf 59.75% Impervious Runoff Depth>4.23" Tc=6.0 min CN=93 Runoff=0.69 cfs 2,323 cf
Subcatchment P9: (new Subcat)	Runoff Area=33,430 sf 0.00% Impervious Runoff Depth>3.02" Tc=6.0 min CN=81 Runoff=2.66 cfs 8,408 cf
Subcatchment R1: IOT 1 ROOF	Runoff Area=1,966 sf 100.00% Impervious Runoff Depth>4.80" Tc=6.0 min CN=98 Runoff=0.22 cfs 786 cf
Subcatchment R2: LOT 2 ROOF	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>4.80" Tc=6.0 min CN=98 Runoff=0.25 cfs 902 cf
Subcatchment R3: (new Subcat)	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>4.80" Tc=6.0 min CN=98 Runoff=0.25 cfs 902 cf
Reach 2R: Flow to WETL Series 'B'	Avg. Flow Depth=0.07' Max Vel=0.65 fps Inflow=0.45 cfs 884 cf n=0.050 L=70.0' S=0.0286 '/' Capacity=12.08 cfs Outflow=0.43 cfs 884 cf

SELLERS FARM POST DEVELOPMENT

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Pond 1P: POND 1 Peak Elev=261.67' Storage=6,677 cf Inflow=4.61 cfs 15,585 cf
Discarded=0.10 cfs 4,582 cf Primary=1.28 cfs 8,900 cf Outflow=1.38 cfs 13,482 cf

Pond 2P: POND P2 Peak Elev=263.09' Storage=1,243 cf Inflow=1.15 cfs 3,909 cf
Discarded=0.05 cfs 2,919 cf Primary=0.45 cfs 884 cf Outflow=0.50 cfs 3,803 cf

Pond 3P: POND 3 Peak Elev=264.05' Storage=2,014 cf Inflow=1.18 cfs 5,099 cf
Discarded=0.05 cfs 2,118 cf Primary=0.48 cfs 2,504 cf Outflow=0.53 cfs 4,622 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.22' Storage=59 cf Inflow=3.60 cfs 14,242 cf
Outflow=3.60 cfs 14,241 cf

Pond CB1: (new Pond) Peak Elev=262.29' Inflow=0.33 cfs 1,100 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.33 cfs 1,100 cf

Pond CB2: CB2 Peak Elev=262.30' Inflow=0.38 cfs 1,252 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.38 cfs 1,252 cf

Pond CB3: (new Pond) Peak Elev=261.71' Inflow=0.58 cfs 2,112 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0500 '/' Outflow=0.58 cfs 2,112 cf

Pond CB4: CB4 Peak Elev=261.71' Inflow=1.24 cfs 4,173 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0125 '/' Outflow=1.24 cfs 4,173 cf

Pond MH1: MH1 Peak Elev=262.22' Inflow=0.71 cfs 2,352 cf
12.0" Round Culvert n=0.013 L=215.0' S=0.0051 '/' Outflow=0.71 cfs 2,352 cf

Pond MH2: MH2 Peak Elev=261.71' Inflow=0.71 cfs 2,352 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=0.71 cfs 2,352 cf

Pond MH3: DMH3 Peak Elev=261.70' Inflow=2.53 cfs 8,638 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0083 '/' Outflow=2.53 cfs 8,638 cf

Pond SP1: SUM POND STREET DP-1 Inflow=0.78 cfs 2,520 cf
Primary=0.78 cfs 2,520 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=6.73 cfs 37,065 cf
Primary=6.73 cfs 37,065 cf

Total Runoff Area = 187,442 sf Runoff Volume = 51,891 cf Average Runoff Depth = 3.32"
79.35% Pervious = 148,731 sf 20.65% Impervious = 38,711 sf

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P10: (new Subcat)

Runoff = 0.70 cfs @ 12.23 hrs, Volume= 3,011 cf, Depth> 2.06"
 Routed to Pond SP2 : SUM POND WOODS DP-2

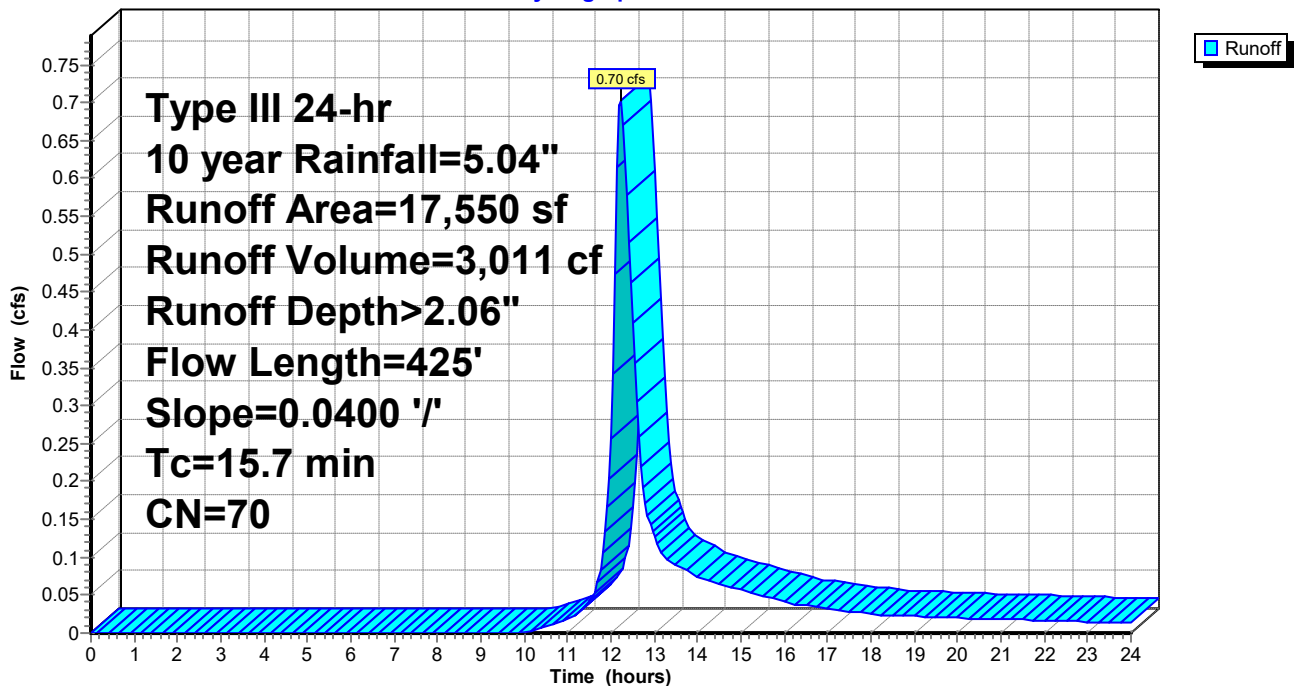
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
17,550	70	Woods, Good, HSG C
17,550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		Sheet Flow, FLOW THROUGH WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
6.2	375	0.0400	1.00		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
15.7	425	Total			

Subcatchment P10: (new Subcat)

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P1A: P1A

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,100 cf, Depth> 4.02"
 Routed to Pond CB1 : (new Pond)

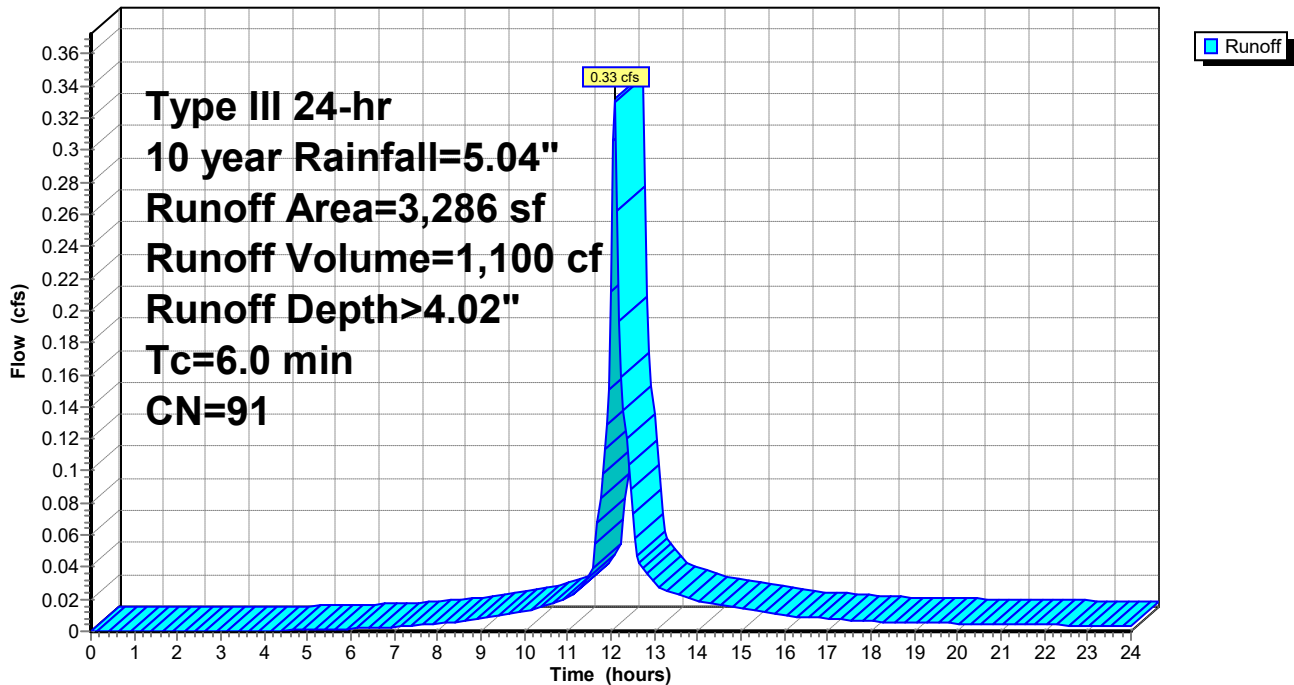
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
1,799	86	<50% Grass cover, Poor, HSG C
1,487	98	Paved parking, HSG C
3,286	91	Weighted Average
1,799		54.75% Pervious Area
1,487		45.25% Impervious Area

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

Subcatchment P1A: P1A

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P1B: P1B

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,252 cf, Depth> 4.02"
 Routed to Pond CB2 : CB2

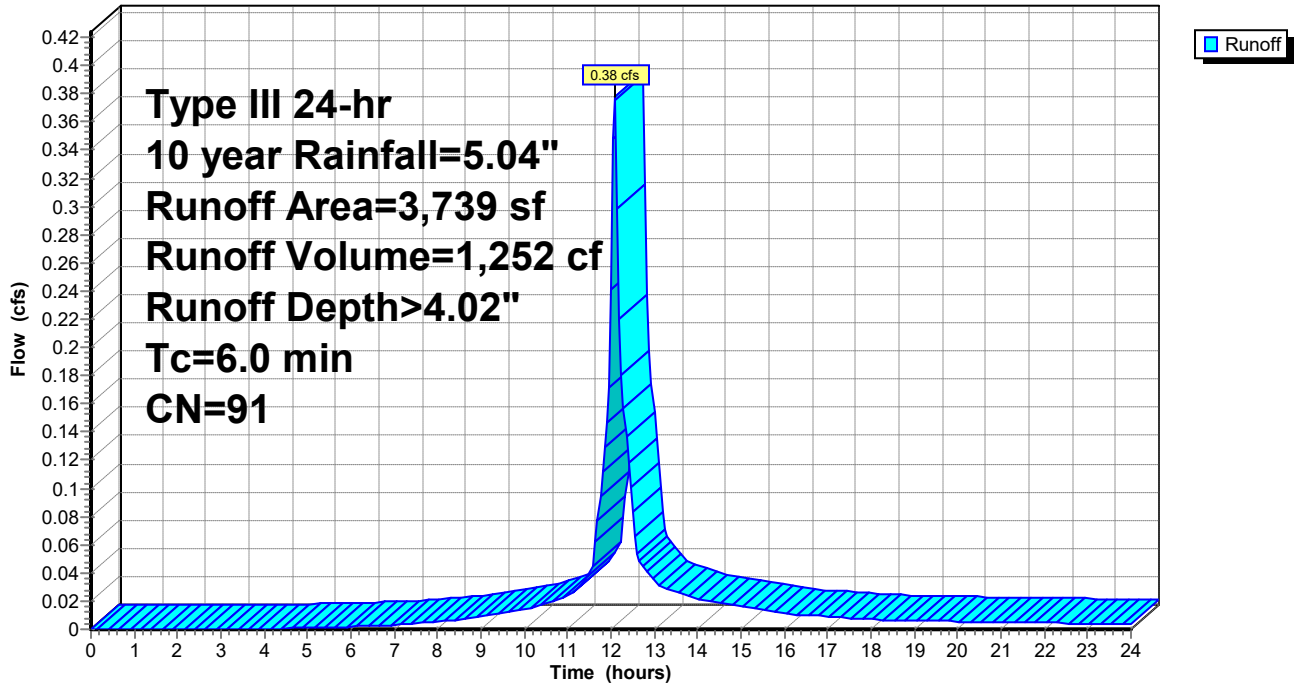
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
1,506	98	Paved parking, HSG C
2,233	86	<50% Grass cover, Poor, HSG C
3,739	91	Weighted Average
2,233		59.72% Pervious Area
1,506		40.28% Impervious Area

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

Subcatchment P1B: P1B

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P2: P2

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 2,520 cf, Depth> 3.70"
 Routed to Pond SP1 : SUM POND STREET DP-1

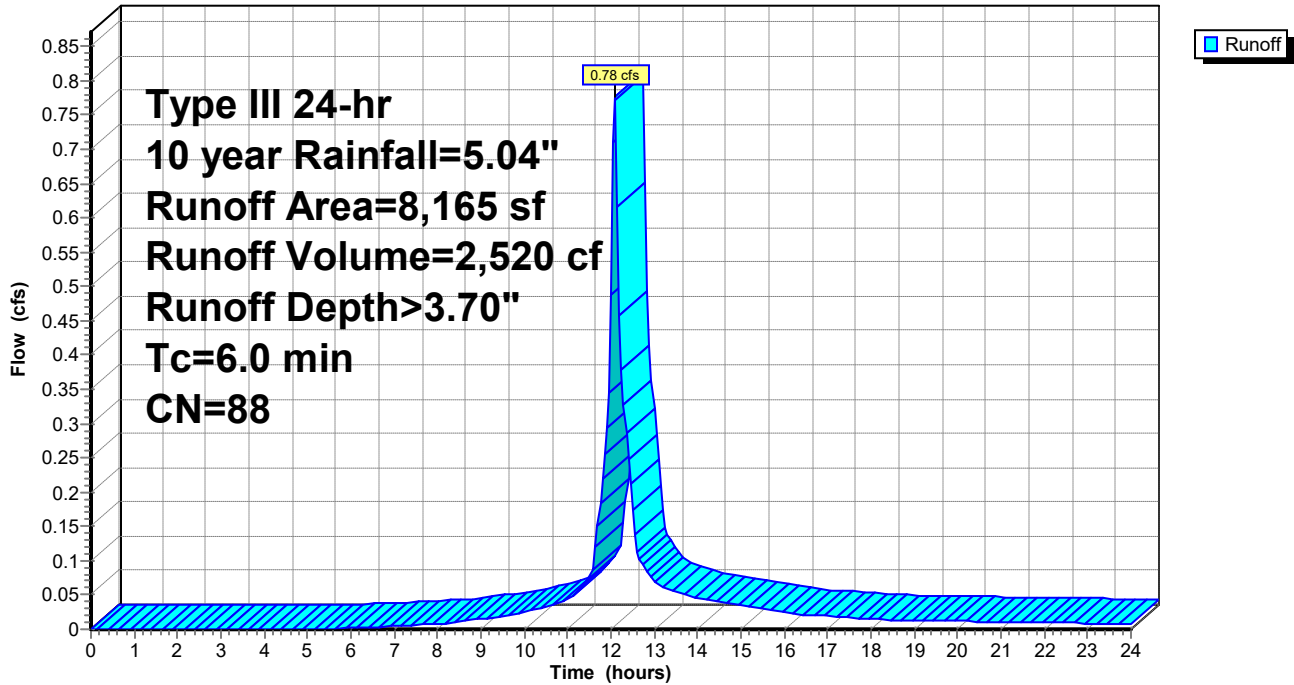
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
6,750	86	<50% Grass cover, Poor, HSG C
8,165	88	Weighted Average
6,750		82.67% Pervious Area
1,415		17.33% Impervious Area

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

Subcatchment P2: P2

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P3: (new Subcat)

Runoff = 1.14 cfs @ 12.09 hrs, Volume= 3,723 cf, Depth> 3.81"
 Routed to Pond 1P : POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
8,484	86	<50% Grass cover, Poor, HSG C
293	98	Unconnected pavement, HSG C
1,916	98	Paved parking, HSG C
1,041	98	Water Surface, HSG C

11,734	89	Weighted Average
8,484		72.30% Pervious Area
3,250		27.70% Impervious Area
293		9.02% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, FLOW OVER GRASS Grass: Short n= 0.150 P2= 3.18"
1.3	120	0.0500	1.57		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0125	2.27		Shallow Concentrated Flow, FLOW OVER DRIVEWAY Paved Kv= 20.3 fps
6.2	250	Total			

SELLERS FARM POST DEVELOPMENT

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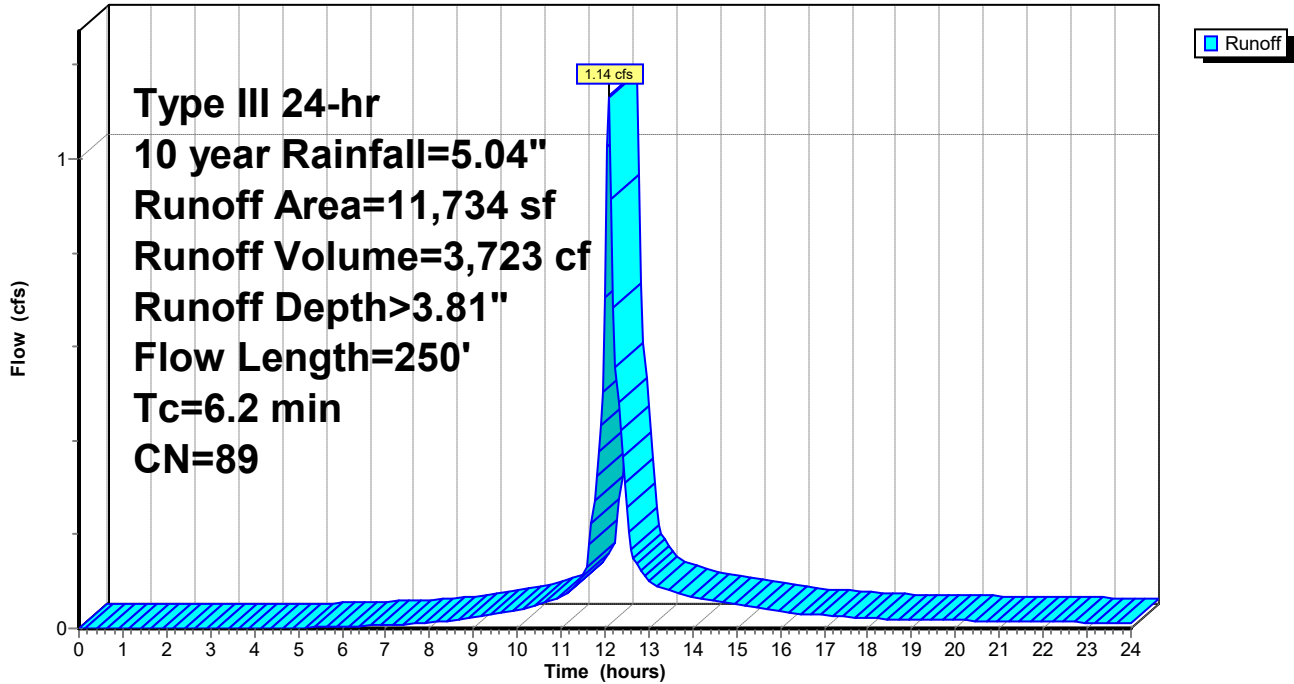
Type III 24-hr 10 year Rainfall=5.04"

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Subcatchment P3: (new Subcat)

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P4A: FLOW TO CB3

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 2,112 cf, Depth> 4.80"
 Routed to Pond CB3 : (new Pond)

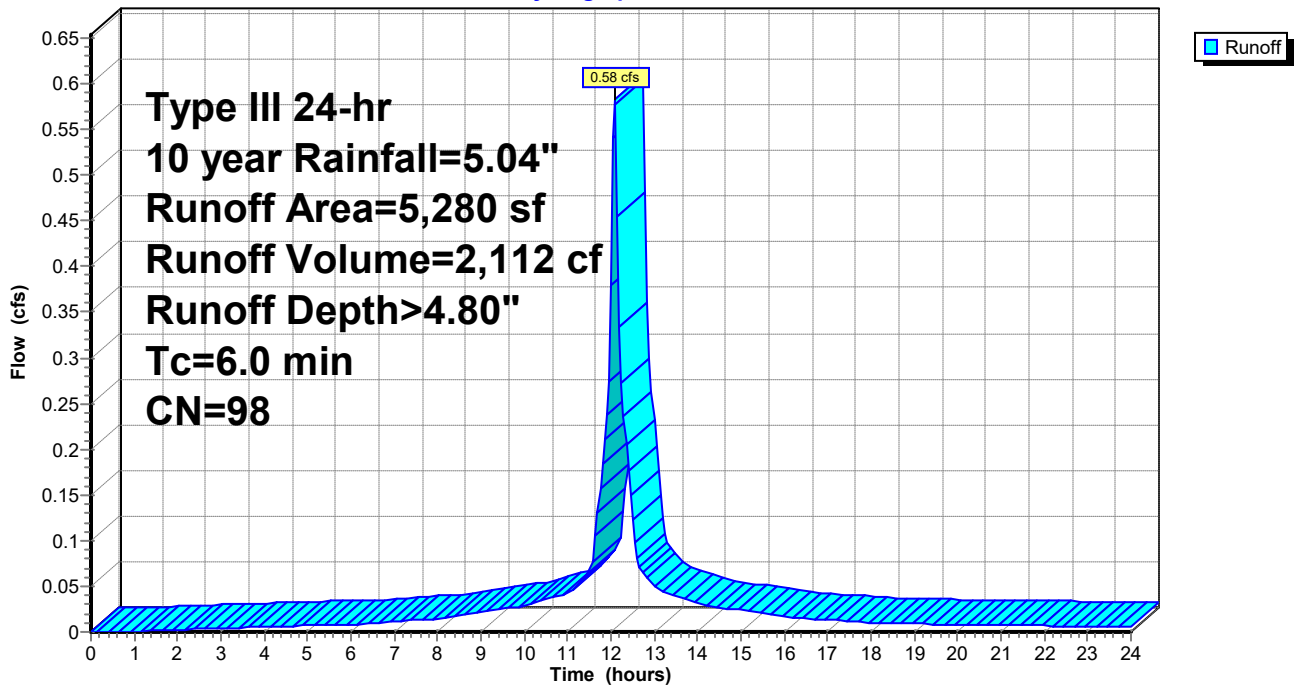
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG C
5,280		100.00% Impervious Area

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

Subcatchment P4A: FLOW TO CB3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P4B: FLOW TO CB4

Runoff = 1.24 cfs @ 12.09 hrs, Volume= 4,173 cf, Depth> 4.23"
 Routed to Pond CB4 : CB4

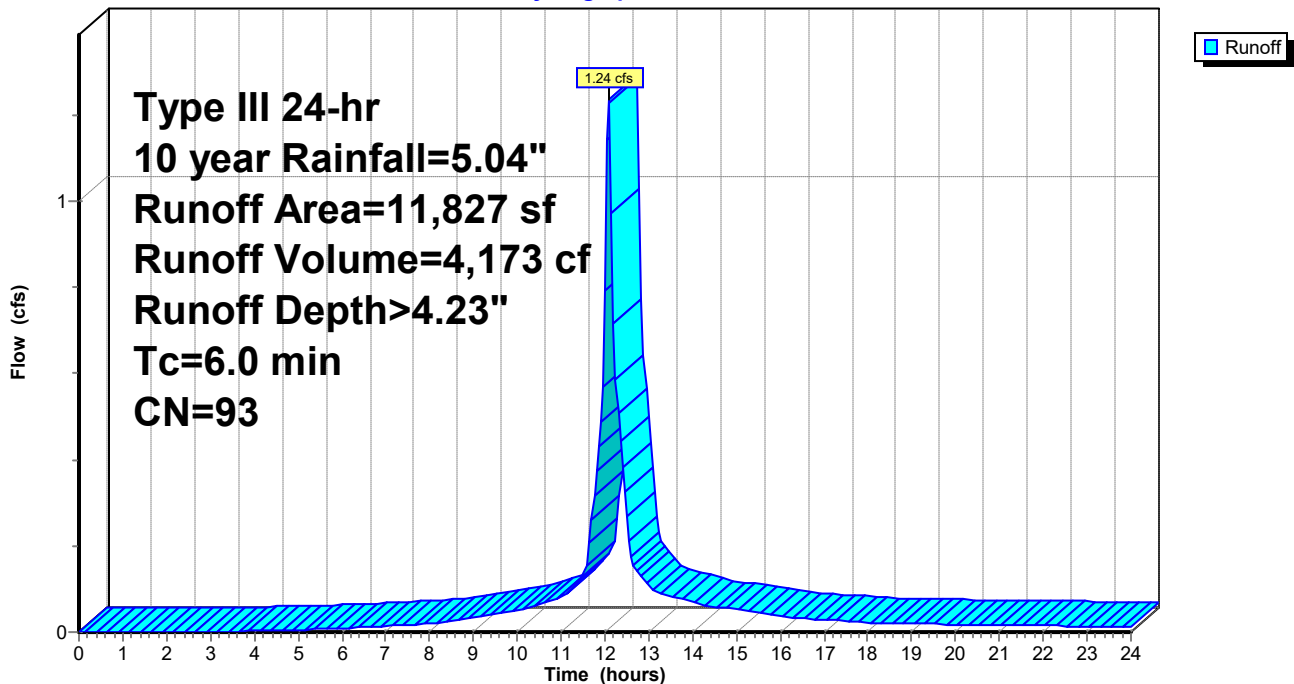
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
7,080	98	Paved parking, HSG C
4,550	86	<50% Grass cover, Poor, HSG C
197	98	Unconnected pavement, HSG C
11,827	93	Weighted Average
4,550		38.47% Pervious Area
7,277		61.53% Impervious Area
197		2.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT TO CB4

Subcatchment P4B: FLOW TO CB4

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P5: P5

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 3,123 cf, Depth> 4.13"
 Routed to Pond 2P : POND P2

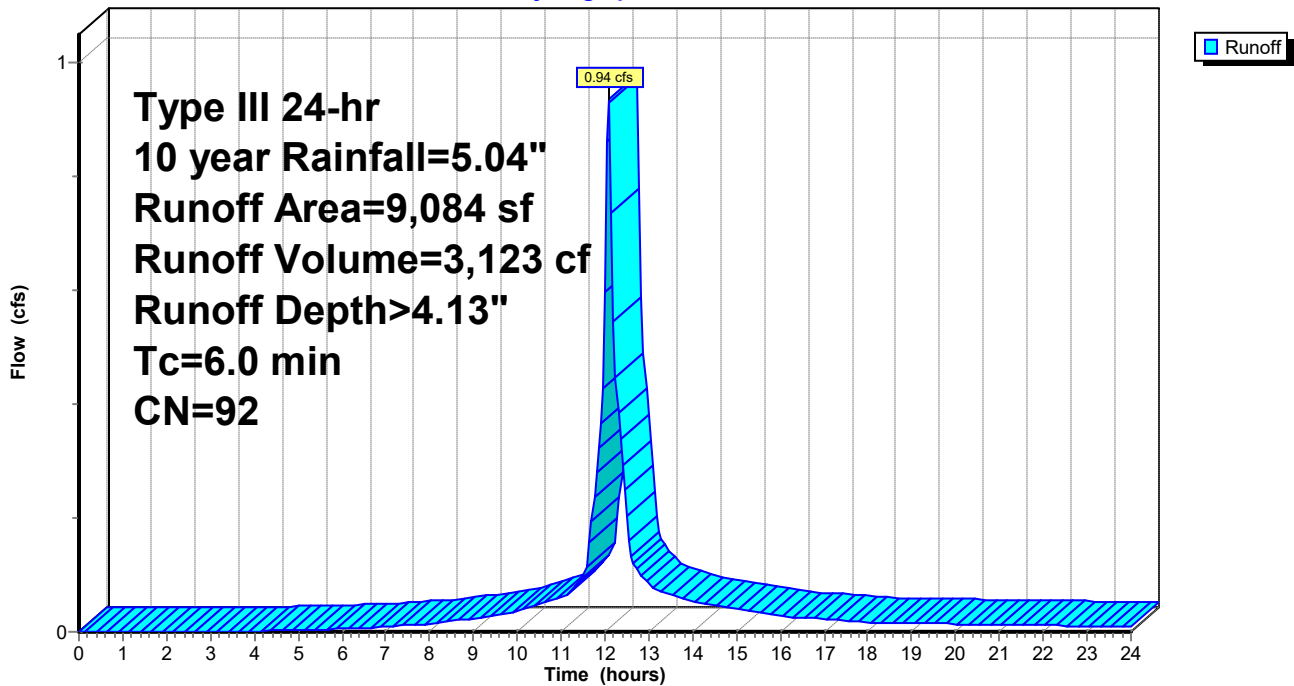
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
4,441	86	<50% Grass cover, Poor, HSG C
1,160	98	Water Surface, HSG C
3,483	98	Paved parking, HSG C
9,084	92	Weighted Average
4,441		48.89% Pervious Area
4,643		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO POND P2

Subcatchment P5: P5

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P6: P6

Runoff = 3.27 cfs @ 12.21 hrs, Volume= 13,358 cf, Depth> 2.83"
 Routed to Pond 4P : Wetland Series 'B'

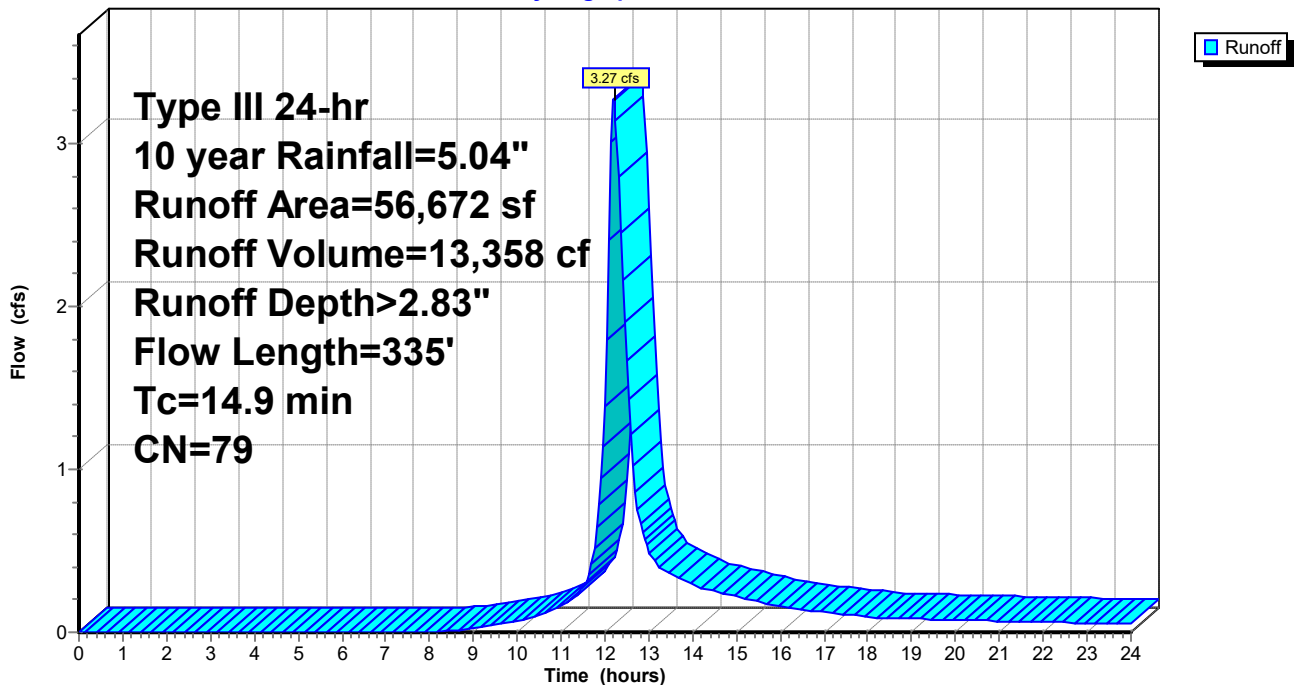
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
27,229	86	<50% Grass cover, Poor, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	79	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment P6: P6

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P7: FLOW TO POND 3

Runoff = 1.02 cfs @ 12.20 hrs, Volume= 4,197 cf, Depth> 3.70"
 Routed to Pond 3P : POND 3

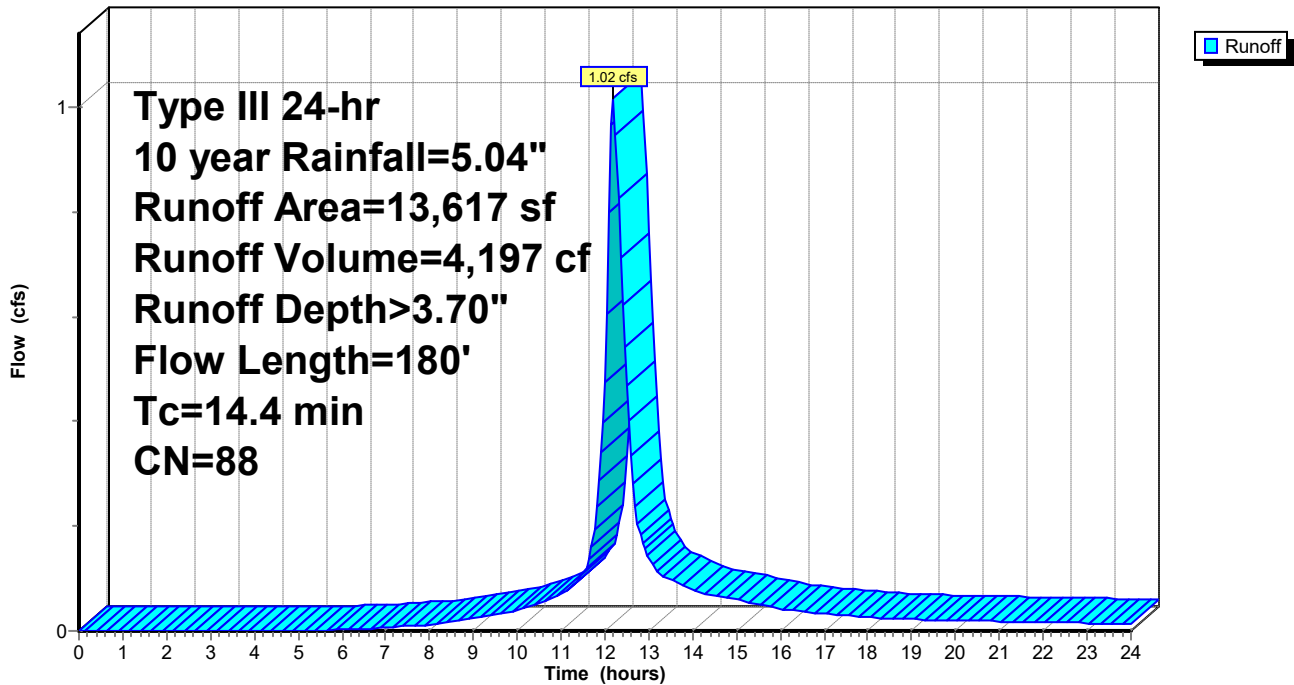
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
11,172	86	<50% Grass cover, Poor, HSG C
1,096	98	Paved parking, HSG C
1,349	98	Water Surface, HSG C
13,617	88	Weighted Average
11,172		82.04% Pervious Area
2,445		17.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, FLOW IN WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
2.0	130	0.0460	1.07		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
14.4	180	Total			

Subcatchment P7: FLOW TO POND 3

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P8: AREA AROUND POND 1

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,323 cf, Depth> 4.23"
 Routed to Pond 1P : POND 1

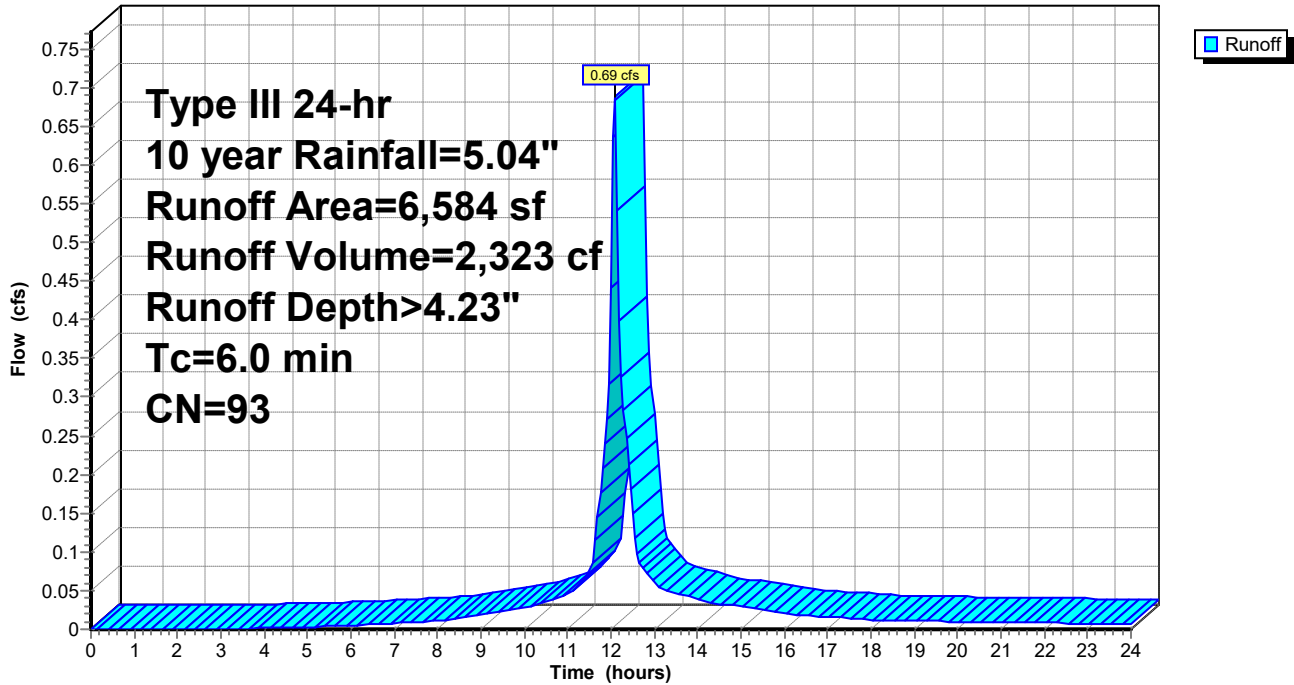
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
2,650	86	<50% Grass cover, Poor, HSG C
3,934	98	Water Surface, HSG C
6,584	93	Weighted Average
2,650		40.25% Pervious Area
3,934		59.75% Impervious Area

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

Subcatchment P8: AREA AROUND POND 1

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment P9: (new Subcat)

Runoff = 2.66 cfs @ 12.09 hrs, Volume= 8,408 cf, Depth> 3.02"
 Routed to Pond SP2 : SUM POND WOODS DP-2

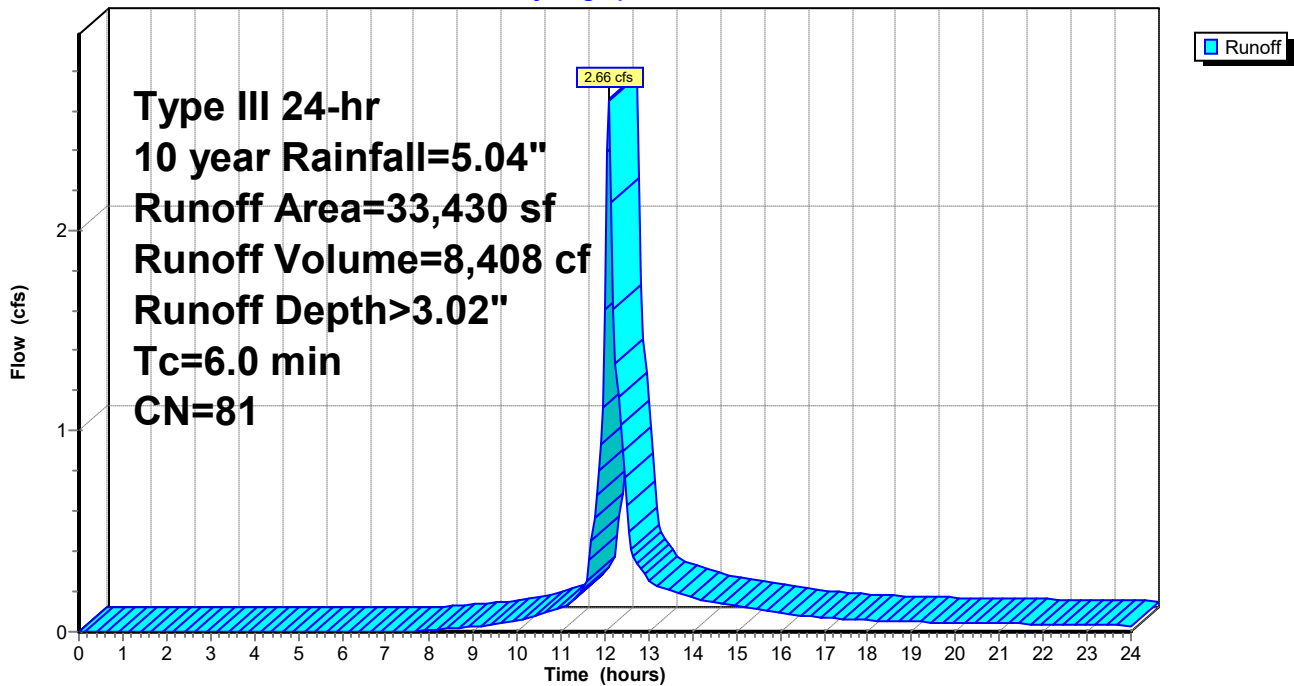
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
23,170	86	<50% Grass cover, Poor, HSG C
10,260	70	Woods, Good, HSG C
33,430	81	Weighted Average
33,430		100.00% Pervious Area

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

Subcatchment P9: (new Subcat)

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment R1: IOT 1 ROOF

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 786 cf, Depth> 4.80"
 Routed to Pond 2P : POND P2

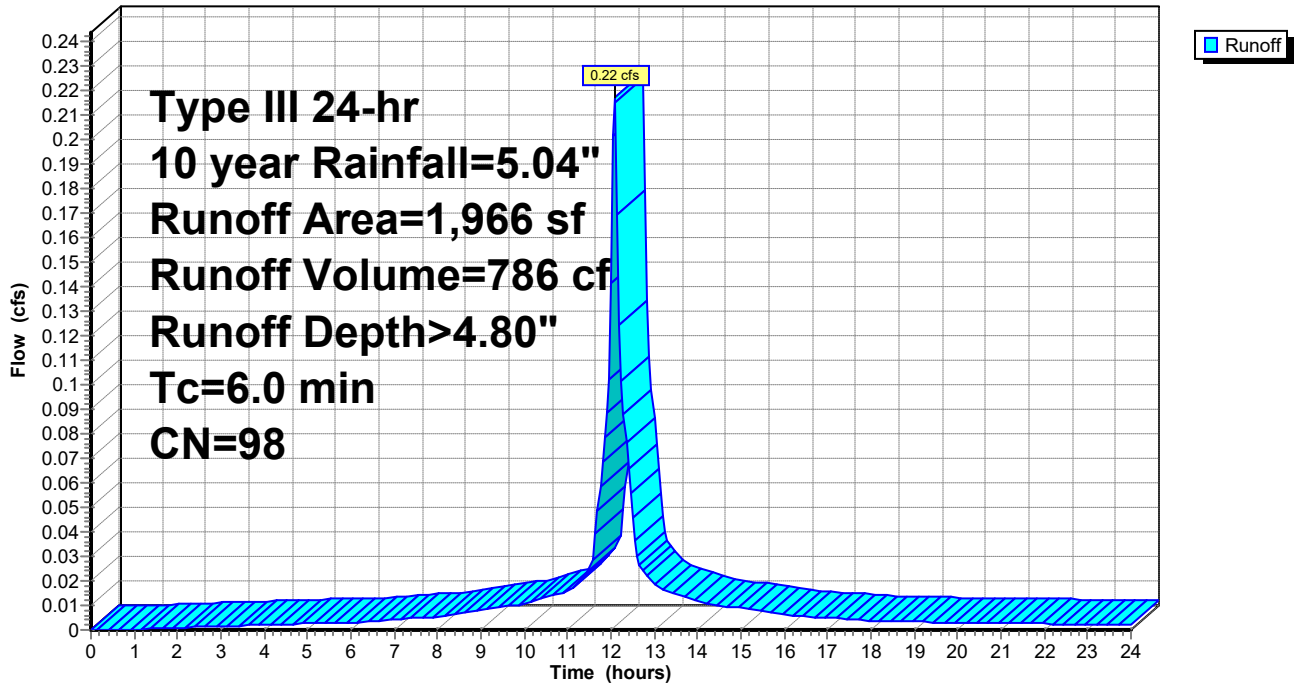
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
1,966	98	Roofs, HSG C
1,966		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW FROM ROOF TO POND

Subcatchment R1: IOT 1 ROOF

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment R2: LOT 2 ROOF

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 902 cf, Depth> 4.80"
 Routed to Pond 3P : POND 3

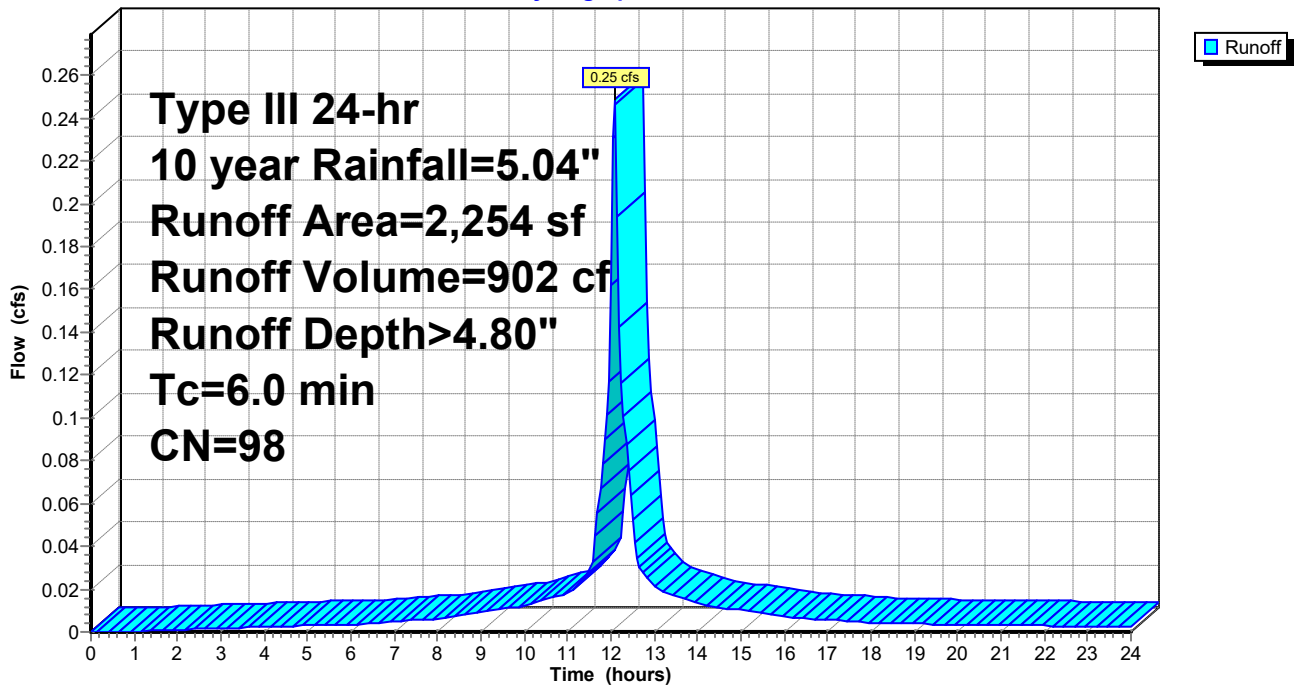
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW IN GUTTERS AND PIPES TO POND 3

Subcatchment R2: LOT 2 ROOF

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Subcatchment R3: (new Subcat)

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 902 cf, Depth> 4.80"
 Routed to Pond 1P : POND 1

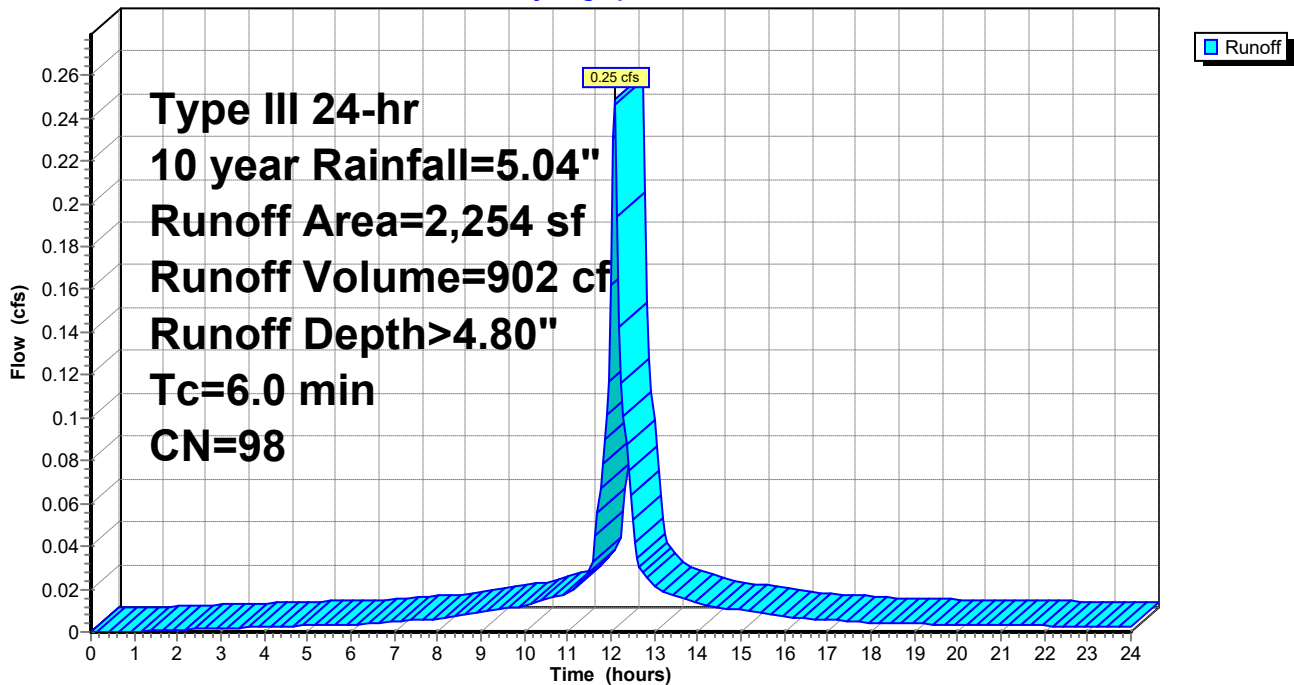
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.04"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW THROUGH GUTTERS TO POND

Subcatchment R3: (new Subcat)

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Reach 2R: Flow to WETL Series 'B'

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth = 0.96" for 10 year event
Inflow = 0.45 cfs @ 12.22 hrs, Volume= 884 cf
Outflow = 0.43 cfs @ 12.27 hrs, Volume= 884 cf, Atten= 3%, Lag= 2.6 min
Routed to Pond 4P : Wetland Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 4.5 min

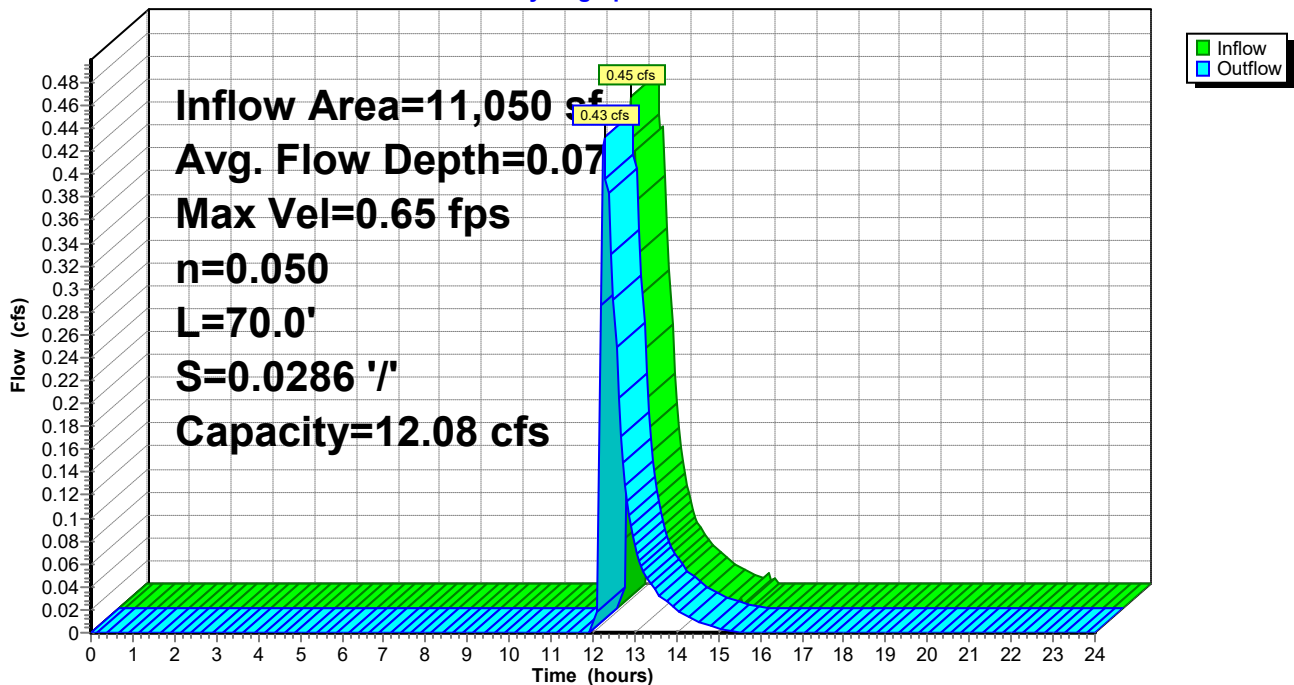
Peak Storage= 46 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 13.92'
Bank-Full Depth= 0.33' Flow Area= 6.6 sf, Capacity= 12.08 cfs

30.00' x 0.33' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 70.0' Slope= 0.0286 '/'
Inlet Invert= 263.00', Outlet Invert= 261.00'



Reach 2R: Flow to WETL Series 'B'

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond 1P: POND 1

Inflow Area = 44,704 sf, 55.90% Impervious, Inflow Depth > 4.18" for 10 year event
 Inflow = 4.61 cfs @ 12.09 hrs, Volume= 15,585 cf
 Outflow = 1.38 cfs @ 12.42 hrs, Volume= 13,482 cf, Atten= 70%, Lag= 19.7 min
 Discarded = 0.10 cfs @ 12.42 hrs, Volume= 4,582 cf
 Primary = 1.28 cfs @ 12.42 hrs, Volume= 8,900 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.67' @ 12.42 hrs Surf.Area= 4,358 sf Storage= 6,677 cf
 Flood Elev= 263.00' Surf.Area= 6,275 sf Storage= 13,707 cf

Plug-Flow detention time= 142.2 min calculated for 13,482 cf (87% of inflow)
 Center-of-Mass det. time= 82.5 min (859.4 - 776.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	259.50'	13,707 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)	
259.50	1,956	257.0	0	0	1,956	
260.00	2,410	269.0	1,090	1,090	2,475	
261.00	3,525	292.0	2,950	4,039	3,540	
262.00	4,800	393.0	4,146	8,186	9,056	
263.00	6,275	518.0	5,521	13,707	18,129	

Device	Routing	Invert	Outlet Devices	
#1	Primary	259.00'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.00' / 258.00' S= 0.0333 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf	
#2	Device 1	260.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#3	Device 1	261.50'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Discarded	259.50'	1.020 in/hr Exfiltration over Surface area	
#5	Primary	262.20'	10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74	

Discarded OutFlow Max=0.10 cfs @ 12.42 hrs HW=261.67' (Free Discharge)
 ↳ **4=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=1.27 cfs @ 12.42 hrs HW=261.67' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 1.27 cfs of 5.57 cfs potential flow)
 ↳ **2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 4.96 fps)
 ↳ **3=Orifice/Grate** (Weir Controls 0.60 cfs @ 1.35 fps)
 ↳ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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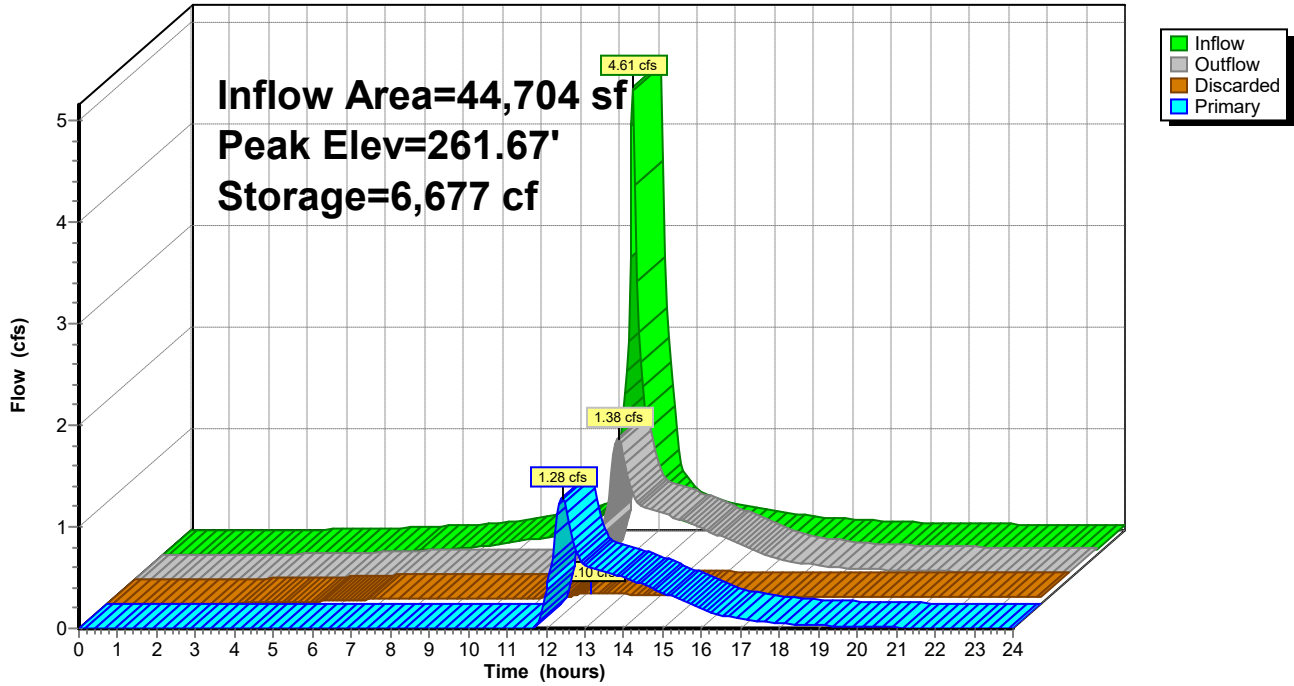
Type III 24-hr 10 year Rainfall=5.04"

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Pond 1P: POND 1

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond 2P: POND P2

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth > 4.25" for 10 year event
 Inflow = 1.15 cfs @ 12.09 hrs, Volume= 3,909 cf
 Outflow = 0.50 cfs @ 12.22 hrs, Volume= 3,803 cf, Atten= 57%, Lag= 8.1 min
 Discarded = 0.05 cfs @ 12.32 hrs, Volume= 2,919 cf
 Primary = 0.45 cfs @ 12.22 hrs, Volume= 884 cf
 Routed to Reach 2R : Flow to WETL Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.09' @ 12.32 hrs Surf.Area= 2,301 sf Storage= 1,243 cf
 Flood Elev= 263.50' Surf.Area= 2,650 sf Storage= 2,259 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 128.4 min (903.5 - 775.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.50'	2,259 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)	
262.50	1,940	193.0	0	0	1,940	
263.00	2,228	235.0	1,041	1,041	3,374	
263.50	2,650	232.0	1,218	2,259	3,536	

Device	Routing	Invert	Outlet Devices												
#1	Discarded	262.50'	1.020 in/hr Exfiltration over Surface area												
#2	Primary	263.00'	10.0' long x 5.0' 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)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65			
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88				

Discarded OutFlow Max=0.05 cfs @ 12.32 hrs HW=263.09' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.31 cfs @ 12.22 hrs HW=263.08' TW=263.06' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.31 cfs @ 0.39 fps)

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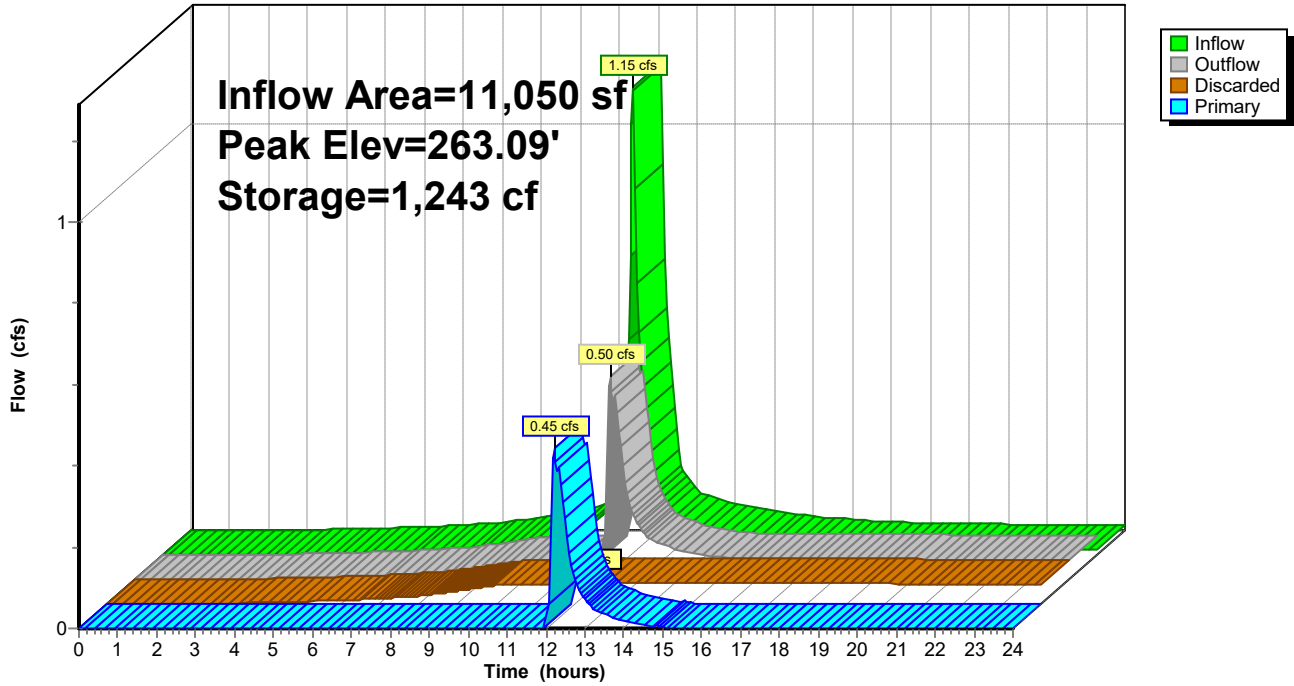
Type III 24-hr 10 year Rainfall=5.04"

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Pond 2P: POND P2

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond 3P: POND 3

Inflow Area = 15,871 sf, 29.61% Impervious, Inflow Depth > 3.86" for 10 year event
 Inflow = 1.18 cfs @ 12.17 hrs, Volume= 5,099 cf
 Outflow = 0.53 cfs @ 12.50 hrs, Volume= 4,622 cf, Atten= 55%, Lag= 19.8 min
 Discarded = 0.05 cfs @ 12.50 hrs, Volume= 2,118 cf
 Primary = 0.48 cfs @ 12.50 hrs, Volume= 2,504 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 264.05' @ 12.50 hrs Surf.Area= 2,209 sf Storage= 2,014 cf
 Flood Elev= 265.00' Surf.Area= 3,131 sf Storage= 4,528 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 87.7 min (881.7 - 794.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.75'	4,528 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)	
262.75	954	190.0	0	0	954	
264.00	2,162	300.0	1,897	1,897	5,254	
265.00	3,131	282.0	2,632	4,528	6,137	

Device	Routing	Invert	Outlet Devices											
#1	Primary	263.05'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.05' / 261.50' S= 0.0775 ' S= 0.0775 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf											
#2	Device 1	263.30'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads											
#3	Primary	264.00'	10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#4	Discarded	262.75'	1.020 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.05 cfs @ 12.50 hrs HW=264.05' (Free Discharge)
 ↑ **4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.48 cfs @ 12.50 hrs HW=264.05' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 0.19 cfs of 2.68 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 3.82 fps)
 ↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.54 fps)

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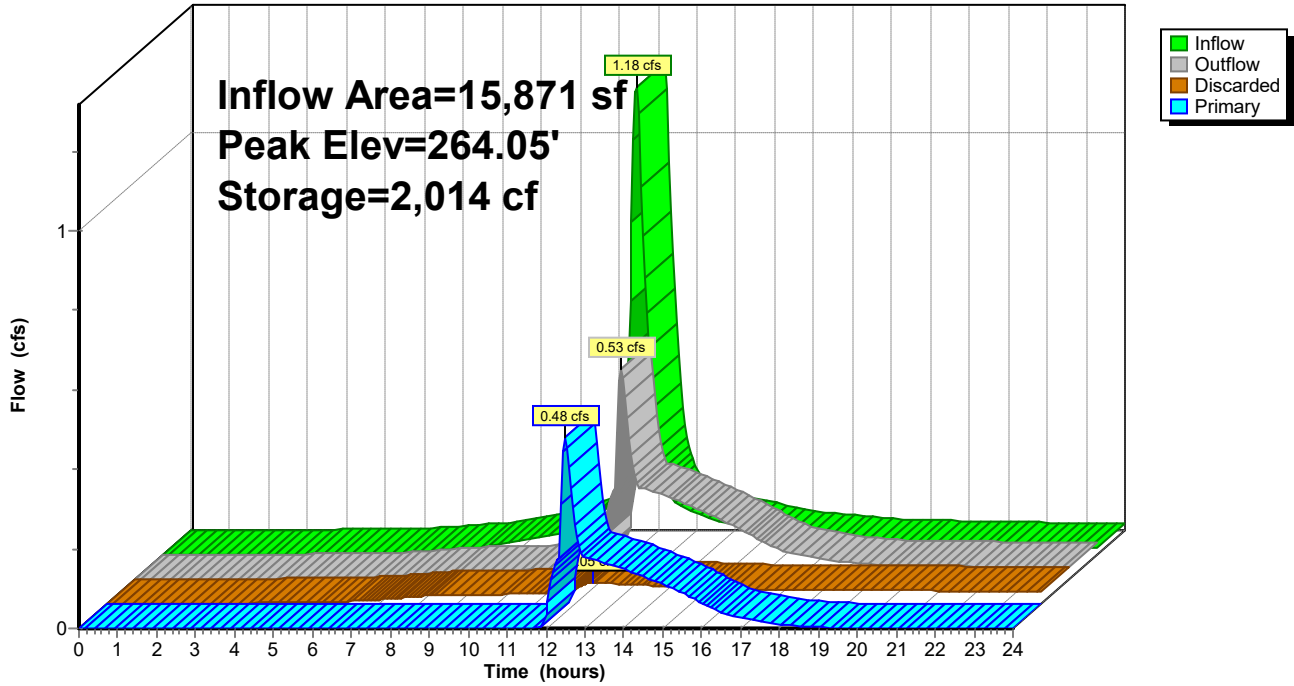
Type III 24-hr 10 year Rainfall=5.04"

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Pond 3P: POND 3

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 67,722 sf, 11.24% Impervious, Inflow Depth > 2.52" for 10 year event
 Inflow = 3.60 cfs @ 12.23 hrs, Volume= 14,242 cf
 Outflow = 3.60 cfs @ 12.24 hrs, Volume= 14,241 cf, Atten= 0%, Lag= 0.6 min
 Primary = 3.60 cfs @ 12.24 hrs, Volume= 14,241 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.22' @ 12.24 hrs Surf.Area= 254 sf Storage= 59 cf

Plug-Flow detention time= 0.1 min calculated for 14,212 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (826.6 - 826.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	258.65'	7,771 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)
258.65	5	9.0	0	0	5
259.00	125	47.0	18	18	175
259.70	685	102.0	257	275	829
260.00	933	125.0	242	517	1,246
261.00	3,333	263.0	2,010	2,527	5,511
262.00	7,425	350.0	5,244	7,771	9,766

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	12.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 260.00' / 259.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=3.56 cfs @ 12.24 hrs HW=259.22' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Controls 0.00 cfs)
- 2=Rock Fill (Rockfill Controls 3.56 cfs @ 0.50 fps)

SELLERS FARM POST DEVELOPMENT

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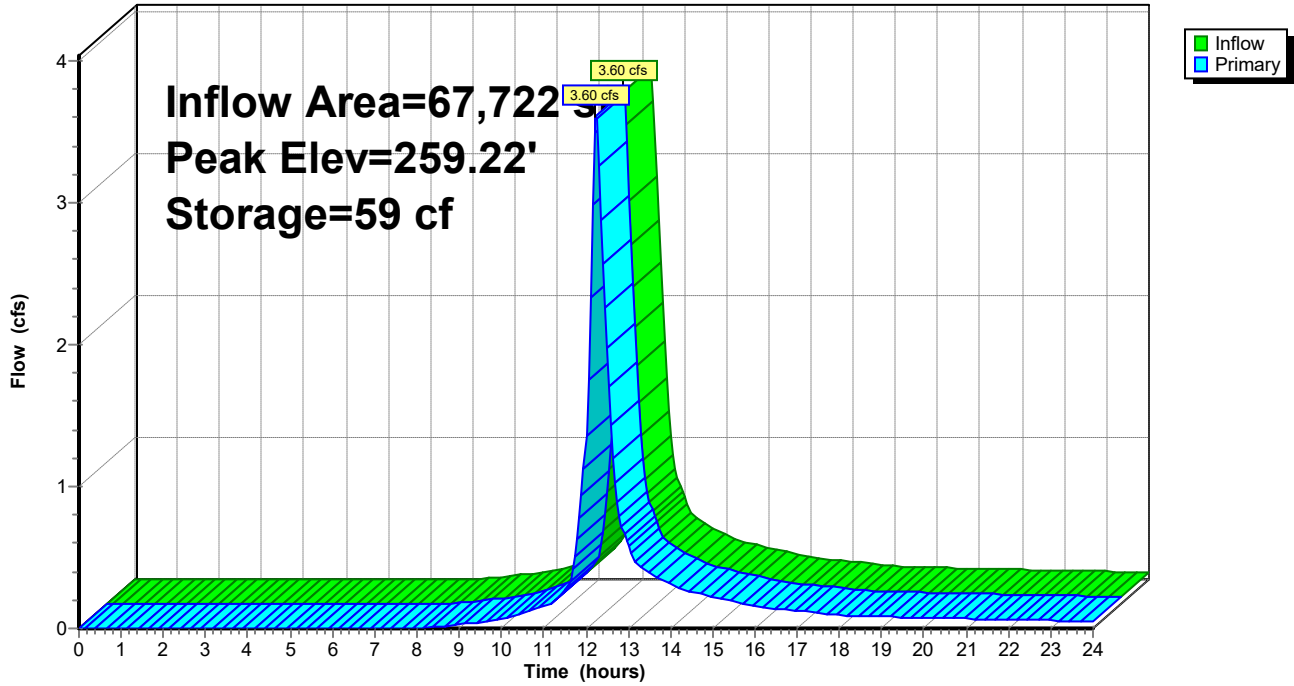
Type III 24-hr 10 year Rainfall=5.04"

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Pond 4P: Wetland Series 'B'

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond CB1: (new Pond)

Inflow Area = 3,286 sf, 45.25% Impervious, Inflow Depth > 4.02" for 10 year event
 Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,100 cf
 Outflow = 0.33 cfs @ 12.09 hrs, Volume= 1,100 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.33 cfs @ 12.09 hrs, Volume= 1,100 cf
 Routed to Pond MH1 : MH1

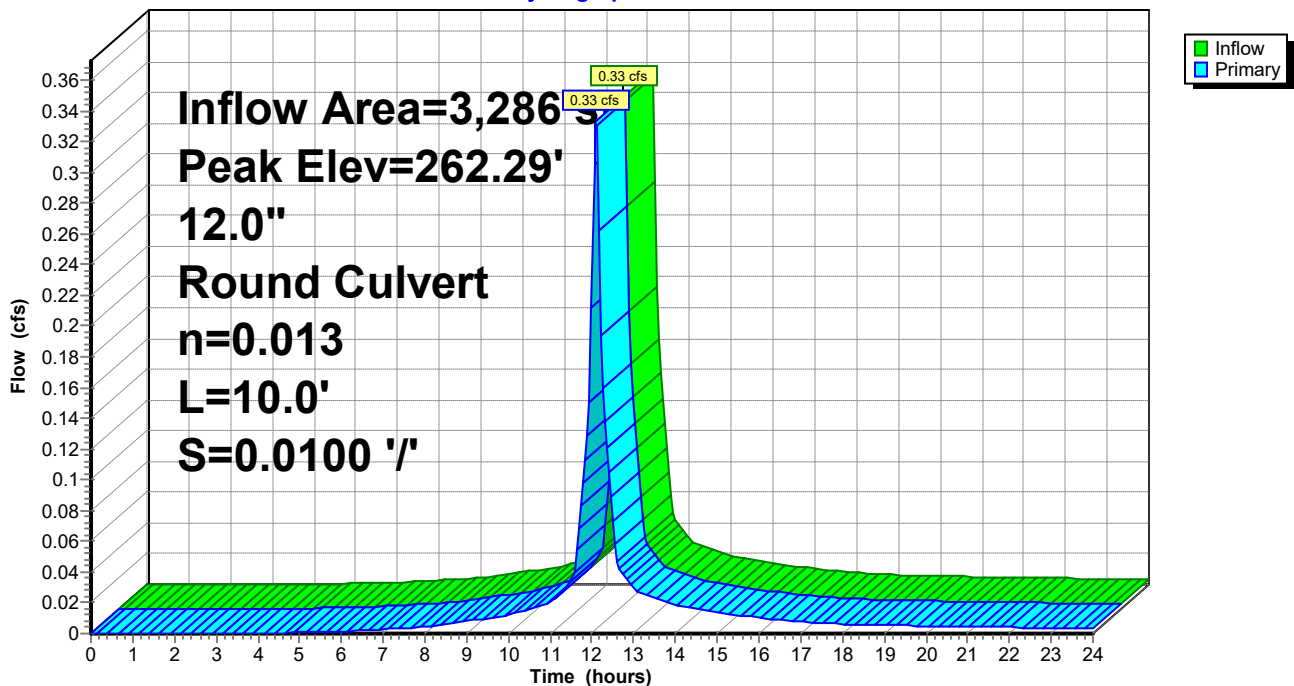
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.29' @ 12.12 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
#1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.09 hrs HW=262.27' TW=262.21' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.24 cfs @ 1.36 fps)

Pond CB1: (new Pond)

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond CB2: CB2

Inflow Area = 3,739 sf, 40.28% Impervious, Inflow Depth > 4.02" for 10 year event
 Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,252 cf
 Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,252 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,252 cf
 Routed to Pond MH1 : MH1

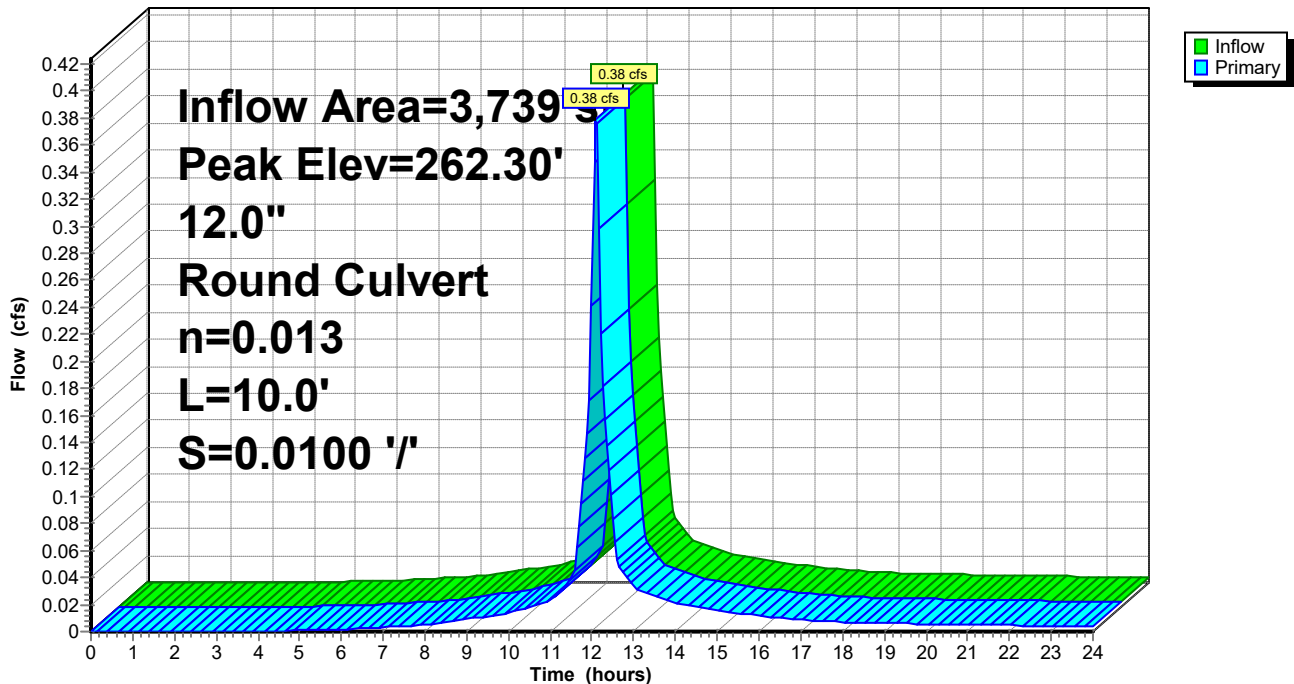
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.30' @ 12.12 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
#1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.09 hrs HW=262.29' TW=262.21' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.29 cfs @ 1.54 fps)

Pond CB2: CB2

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond CB3: (new Pond)

Inflow Area = 5,280 sf, 100.00% Impervious, Inflow Depth > 4.80" for 10 year event
 Inflow = 0.58 cfs @ 12.09 hrs, Volume= 2,112 cf
 Outflow = 0.58 cfs @ 12.09 hrs, Volume= 2,112 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.58 cfs @ 12.09 hrs, Volume= 2,112 cf
 Routed to Pond MH3 : DMH3

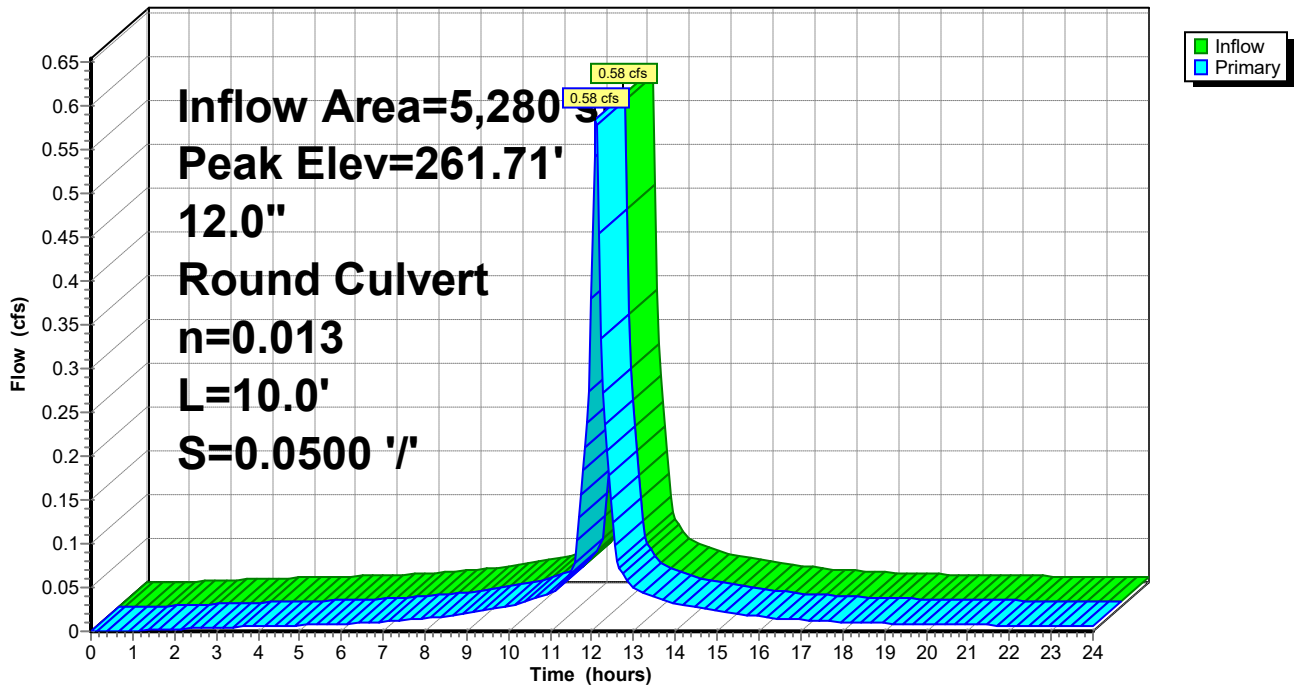
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.71' @ 12.45 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.28' TW=261.47' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond CB3: (new Pond)

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 11,827 sf, 61.53% Impervious, Inflow Depth > 4.23" for 10 year event
Inflow = 1.24 cfs @ 12.09 hrs, Volume= 4,173 cf
Outflow = 1.24 cfs @ 12.09 hrs, Volume= 4,173 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.24 cfs @ 12.09 hrs, Volume= 4,173 cf
Routed to Pond MH3 : DMH3

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

Peak Elev= 261.71' @ 12.44 hrs

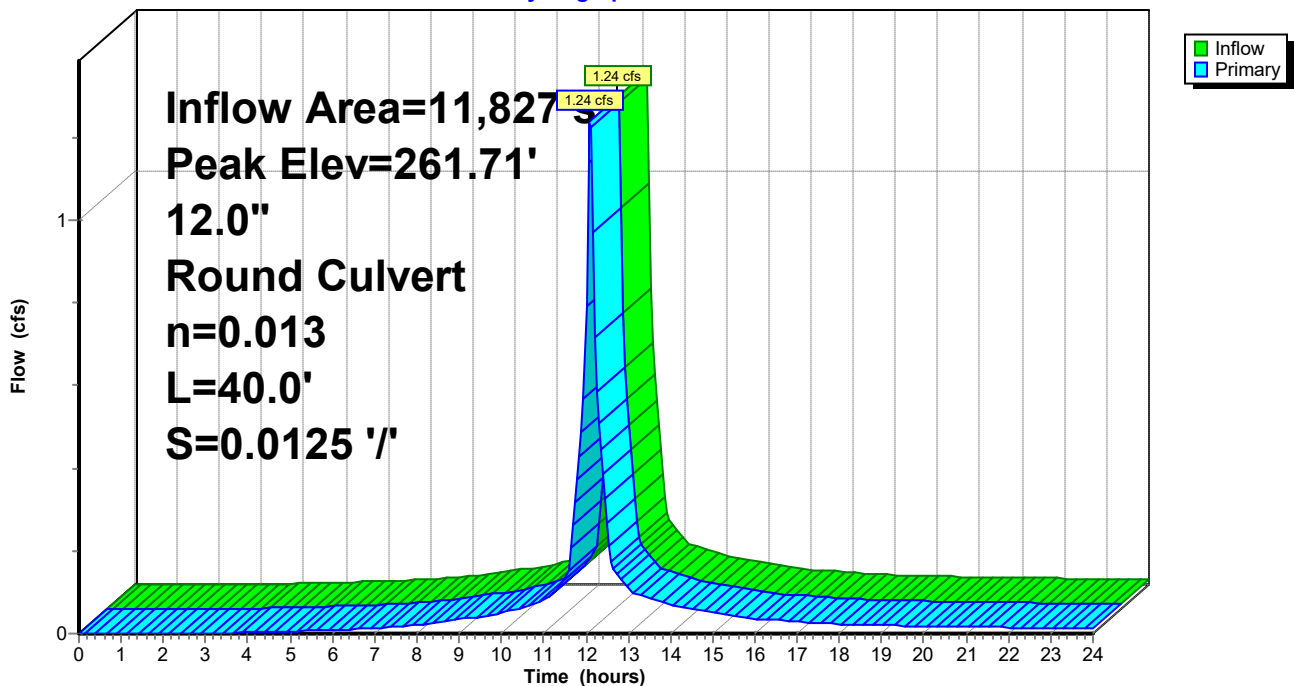
Flood Elev= 263.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.42' TW=261.48' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond CB4: CB4

Hydrograph



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Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond MH1: MH1

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 4.02" for 10 year event
 Inflow = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf
 Outflow = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf
 Routed to Pond MH2 : MH2

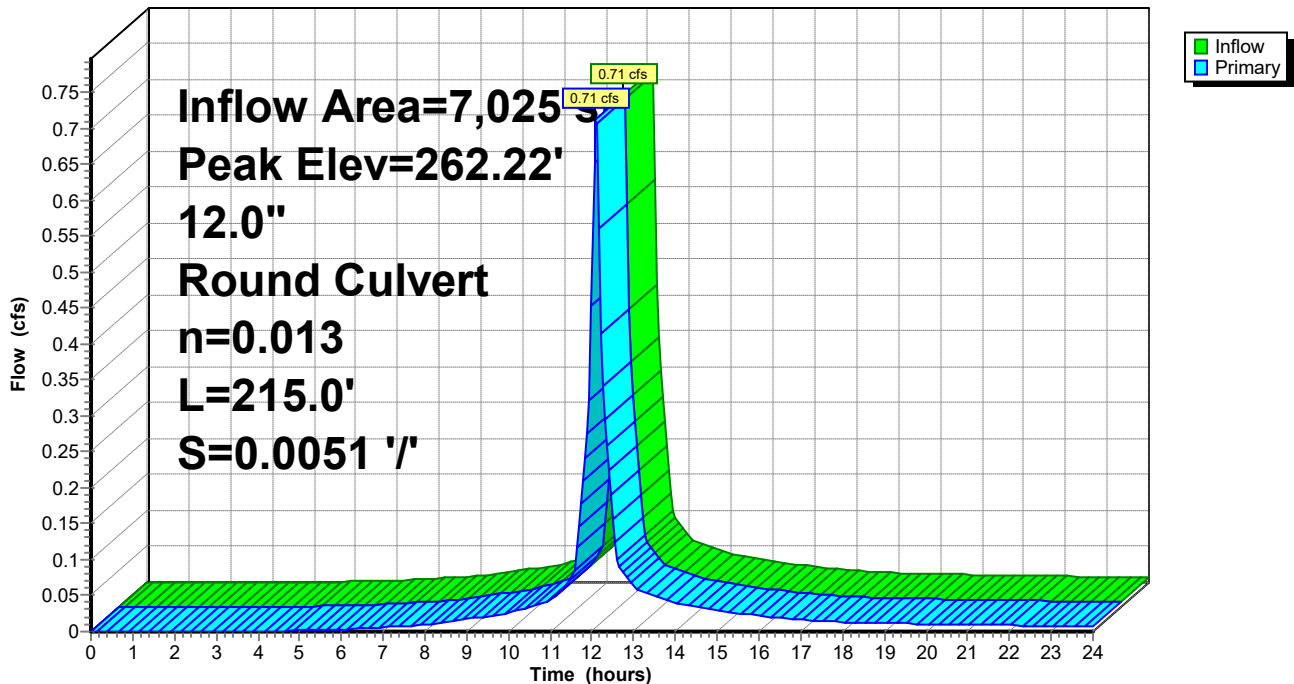
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.22' @ 12.10 hrs
 Flood Elev= 265.00'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.70'	12.0" Round Culvert L= 215.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.70' / 260.60' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.09 hrs HW=262.21' TW=261.40' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.63 cfs @ 2.27 fps)

Pond MH1: MH1

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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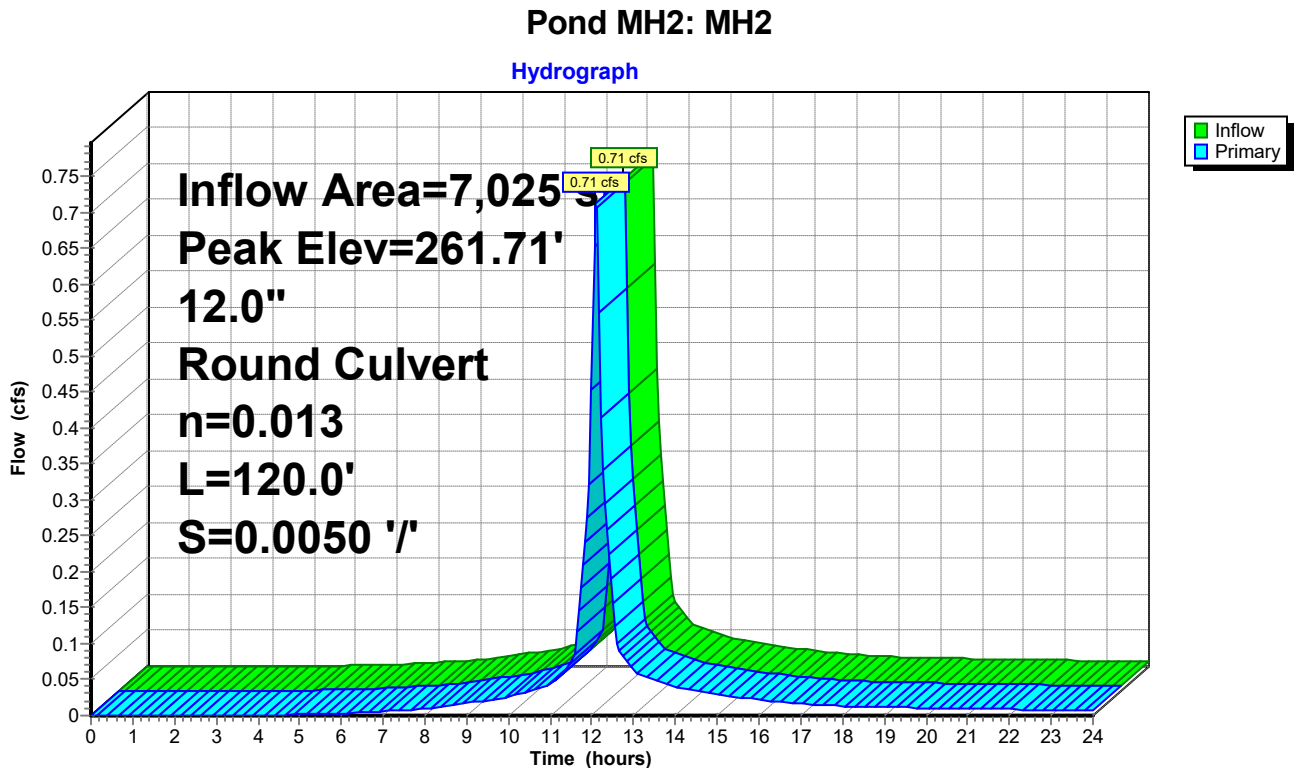
Summary for Pond MH2: MH2

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 4.02" for 10 year event
 Inflow = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf
 Outflow = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.71 cfs @ 12.09 hrs, Volume= 2,352 cf
 Routed to Pond MH3 : DMH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.71' @ 12.45 hrs
 Flood Elev= 269.75'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.60'	12.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.60' / 260.00' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.40' TW=261.48' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 10 year Rainfall=5.04"

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Summary for Pond MH3: DMH3

Inflow Area = 24,132 sf, 64.44% Impervious, Inflow Depth > 4.30" for 10 year event
 Inflow = 2.53 cfs @ 12.09 hrs, Volume= 8,638 cf
 Outflow = 2.53 cfs @ 12.09 hrs, Volume= 8,638 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.53 cfs @ 12.09 hrs, Volume= 8,638 cf
 Routed to Pond 1P : POND 1

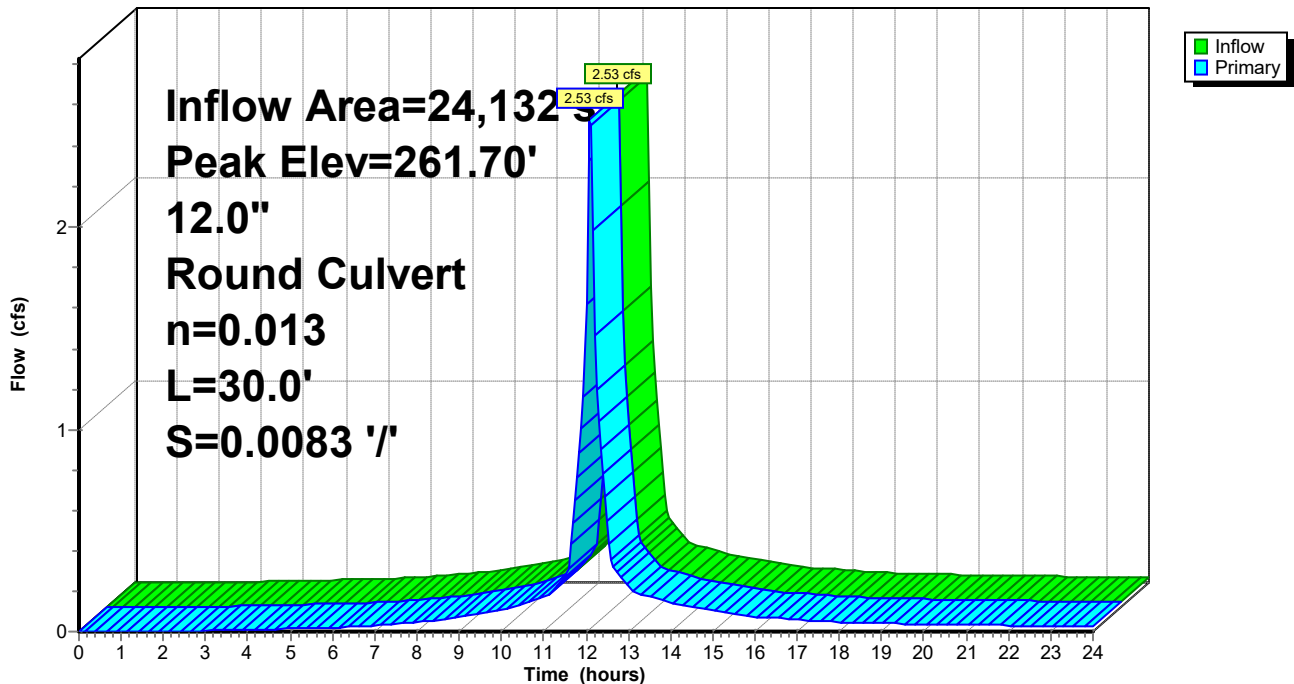
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.70' @ 12.41 hrs
 Flood Elev= 263.60'

Device #	Routing	Invert	Outlet Devices
#1	Primary	259.75'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.75' / 259.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.89 cfs @ 12.09 hrs HW=261.48' TW=261.23' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.89 cfs @ 2.40 fps)

Pond MH3: DMH3

Hydrograph



SELLERS FARM POST DEVELOPMENT

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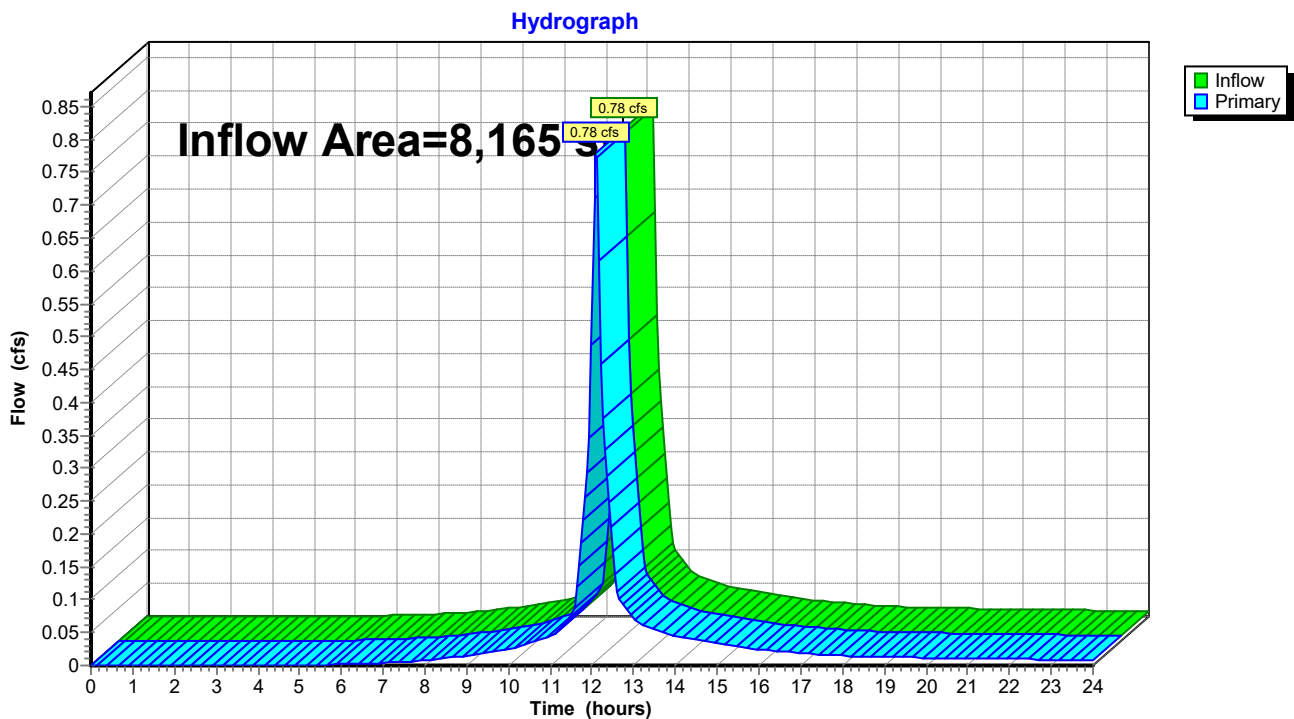
Summary for Pond SP1: SUM POND STREET DP-1

DESIGN POINT AT HIGHLAND ROAD

Inflow Area = 8,165 sf, 17.33% Impervious, Inflow Depth > 3.70" for 10 year event
Inflow = 0.78 cfs @ 12.09 hrs, Volume= 2,520 cf
Primary = 0.78 cfs @ 12.09 hrs, Volume= 2,520 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



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Type III 24-hr 10 year Rainfall=5.04"

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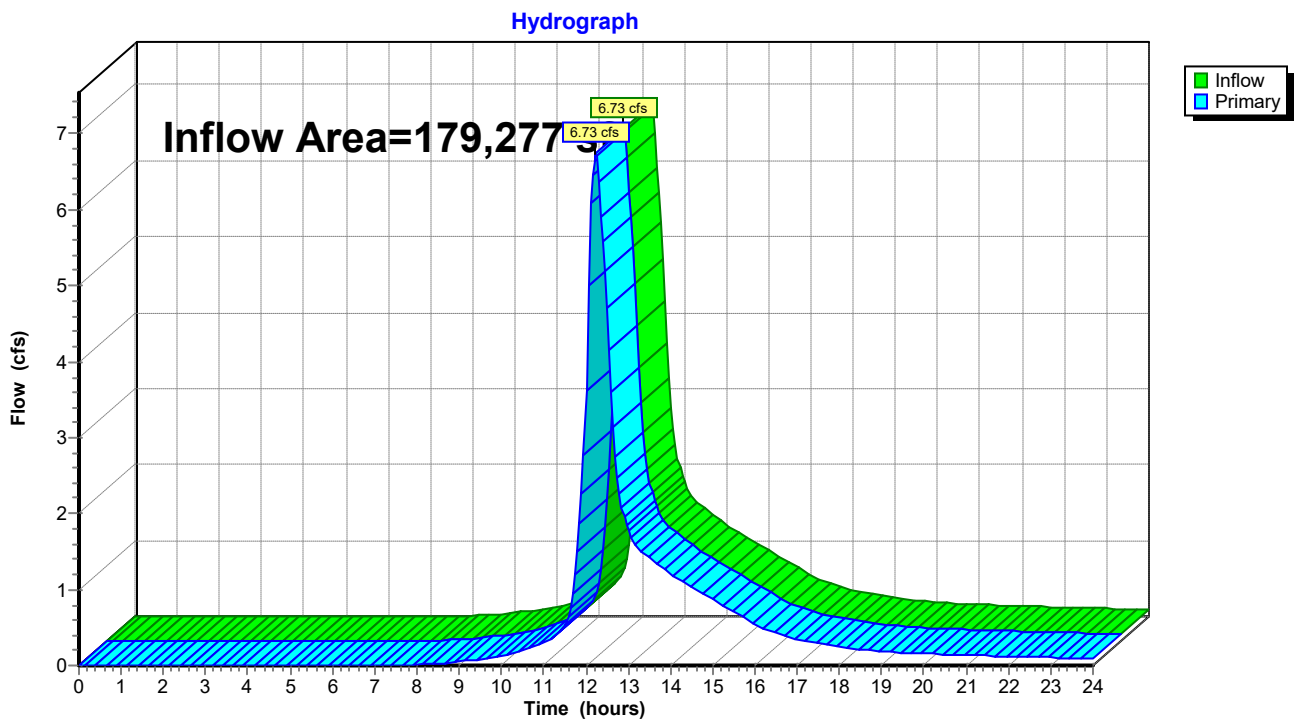
Summary for Pond SP2: SUM POND WOODS DP-2

DESIGN POINT AT REAR PROPERTY LINE

Inflow Area = 179,277 sf, 20.80% Impervious, Inflow Depth > 2.48" for 10 year event
Inflow = 6.73 cfs @ 12.23 hrs, Volume= 37,065 cf
Primary = 6.73 cfs @ 12.23 hrs, Volume= 37,065 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2



STORMWATER MANAGEMENT REPORT

25 YEAR STORM

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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

Subcatchment P10: (new Subcat)	Runoff Area=17,550 sf 0.00% Impervious Runoff Depth>2.96" Flow Length=425' Slope=0.0400 '/' Tc=15.7 min CN=70 Runoff=1.03 cfs 4,322 cf
Subcatchment P1A: P1A	Runoff Area=3,286 sf 45.25% Impervious Runoff Depth>5.15" Tc=6.0 min CN=91 Runoff=0.42 cfs 1,410 cf
Subcatchment P1B: P1B	Runoff Area=3,739 sf 40.28% Impervious Runoff Depth>5.15" Tc=6.0 min CN=91 Runoff=0.48 cfs 1,605 cf
Subcatchment P2: P2	Runoff Area=8,165 sf 17.33% Impervious Runoff Depth>4.82" Tc=6.0 min CN=88 Runoff=1.00 cfs 3,276 cf
Subcatchment P3: (new Subcat)	Runoff Area=11,734 sf 27.70% Impervious Runoff Depth>4.93" Flow Length=250' Tc=6.2 min CN=89 Runoff=1.45 cfs 4,817 cf
Subcatchment P4A: FLOW TO CB3	Runoff Area=5,280 sf 100.00% Impervious Runoff Depth>5.96" Tc=6.0 min CN=98 Runoff=0.72 cfs 2,622 cf
Subcatchment P4B: FLOW TO CB4	Runoff Area=11,827 sf 61.53% Impervious Runoff Depth>5.38" Tc=6.0 min CN=93 Runoff=1.55 cfs 5,299 cf
Subcatchment P5: P5	Runoff Area=9,084 sf 51.11% Impervious Runoff Depth>5.26" Tc=6.0 min CN=92 Runoff=1.18 cfs 3,984 cf
Subcatchment P6: P6	Runoff Area=56,672 sf 1.76% Impervious Runoff Depth>3.85" Flow Length=335' Tc=14.9 min CN=79 Runoff=4.44 cfs 18,177 cf
Subcatchment P7: FLOW TO POND 3	Runoff Area=13,617 sf 17.96% Impervious Runoff Depth>4.81" Flow Length=180' Tc=14.4 min CN=88 Runoff=1.31 cfs 5,456 cf
Subcatchment P8: AREA AROUND POND 1	Runoff Area=6,584 sf 59.75% Impervious Runoff Depth>5.38" Tc=6.0 min CN=93 Runoff=0.86 cfs 2,950 cf
Subcatchment P9: (new Subcat)	Runoff Area=33,430 sf 0.00% Impervious Runoff Depth>4.06" Tc=6.0 min CN=81 Runoff=3.55 cfs 11,319 cf
Subcatchment R1: IOT 1 ROOF	Runoff Area=1,966 sf 100.00% Impervious Runoff Depth>5.96" Tc=6.0 min CN=98 Runoff=0.27 cfs 976 cf
Subcatchment R2: LOT 2 ROOF	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>5.96" Tc=6.0 min CN=98 Runoff=0.31 cfs 1,119 cf
Subcatchment R3: (new Subcat)	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>5.96" Tc=6.0 min CN=98 Runoff=0.31 cfs 1,119 cf
Reach 2R: Flow to WETL Series 'B'	Avg. Flow Depth=0.10' Max Vel=0.82 fps Inflow=0.93 cfs 1,636 cf n=0.050 L=70.0' S=0.0286 '/' Capacity=12.08 cfs Outflow=0.94 cfs 1,636 cf

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Type III 24-hr 25 year Rainfall=6.20"

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Pond 1P: POND 1 Peak Elev=261.87' Storage=7,562 cf Inflow=5.79 cfs 19,821 cf
Discarded=0.11 cfs 4,876 cf Primary=2.33 cfs 12,714 cf Outflow=2.44 cfs 17,590 cf

Pond 2P: POND P2 Peak Elev=263.14' Storage=1,351 cf Inflow=1.44 cfs 4,960 cf
Discarded=0.06 cfs 3,078 cf Primary=0.93 cfs 1,636 cf Outflow=0.99 cfs 4,714 cf

Pond 3P: POND 3 Peak Elev=264.11' Storage=2,149 cf Inflow=1.50 cfs 6,576 cf
Discarded=0.05 cfs 2,268 cf Primary=1.09 cfs 3,742 cf Outflow=1.15 cfs 6,010 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.39' Storage=113 cf Inflow=5.30 cfs 19,813 cf
Outflow=5.33 cfs 19,813 cf

Pond CB1: (new Pond) Peak Elev=262.40' Inflow=0.42 cfs 1,410 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.42 cfs 1,410 cf

Pond CB2: CB2 Peak Elev=262.41' Inflow=0.48 cfs 1,605 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.48 cfs 1,605 cf

Pond CB3: (new Pond) Peak Elev=262.14' Inflow=0.72 cfs 2,622 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0500 '/' Outflow=0.72 cfs 2,622 cf

Pond CB4: CB4 Peak Elev=262.21' Inflow=1.55 cfs 5,299 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0125 '/' Outflow=1.55 cfs 5,299 cf

Pond MH1: MH1 Peak Elev=262.39' Inflow=0.90 cfs 3,015 cf
12.0" Round Culvert n=0.013 L=215.0' S=0.0051 '/' Outflow=0.90 cfs 3,015 cf

Pond MH2: MH2 Peak Elev=262.18' Inflow=0.90 cfs 3,015 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=0.90 cfs 3,015 cf

Pond MH3: DMH3 Peak Elev=262.12' Inflow=3.17 cfs 10,935 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0083 '/' Outflow=3.17 cfs 10,935 cf

Pond SP1: SUM POND STREET DP-1 Inflow=1.00 cfs 3,276 cf
Primary=1.00 cfs 3,276 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=11.05 cfs 51,910 cf
Primary=11.05 cfs 51,910 cf

Total Runoff Area = 187,442 sf Runoff Volume = 68,451 cf Average Runoff Depth = 4.38"
79.35% Pervious = 148,731 sf 20.65% Impervious = 38,711 sf

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P10: (new Subcat)

Runoff = 1.03 cfs @ 12.22 hrs, Volume= 4,322 cf, Depth> 2.96"
 Routed to Pond SP2 : SUM POND WOODS DP-2

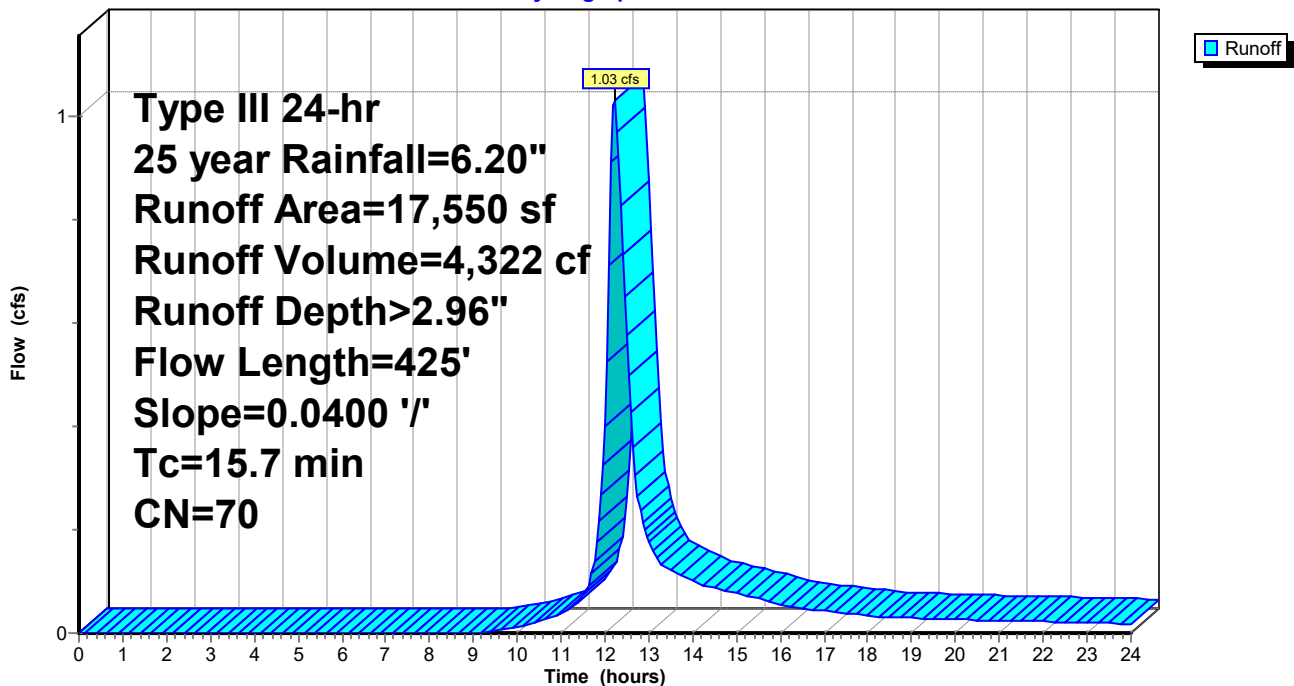
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
17,550	70	Woods, Good, HSG C
17,550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		Sheet Flow, FLOW THROUGH WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
6.2	375	0.0400	1.00		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
15.7	425	Total			

Subcatchment P10: (new Subcat)

Hydrograph



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Summary for Subcatchment P1A: P1A

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,410 cf, Depth> 5.15"
 Routed to Pond CB1 : (new Pond)

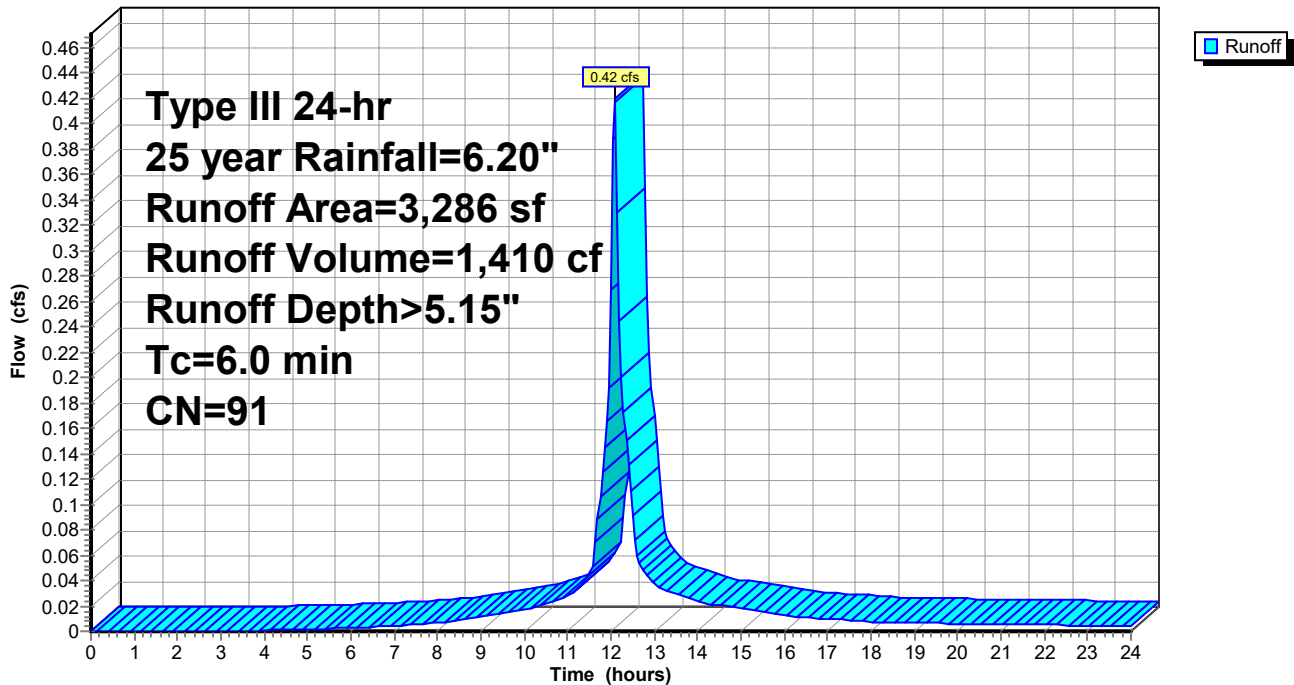
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
1,799	86	<50% Grass cover, Poor, HSG C
1,487	98	Paved parking, HSG C
3,286	91	Weighted Average
1,799		54.75% Pervious Area
1,487		45.25% Impervious Area

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

Subcatchment P1A: P1A

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P1B: P1B

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 1,605 cf, Depth> 5.15"
 Routed to Pond CB2 : CB2

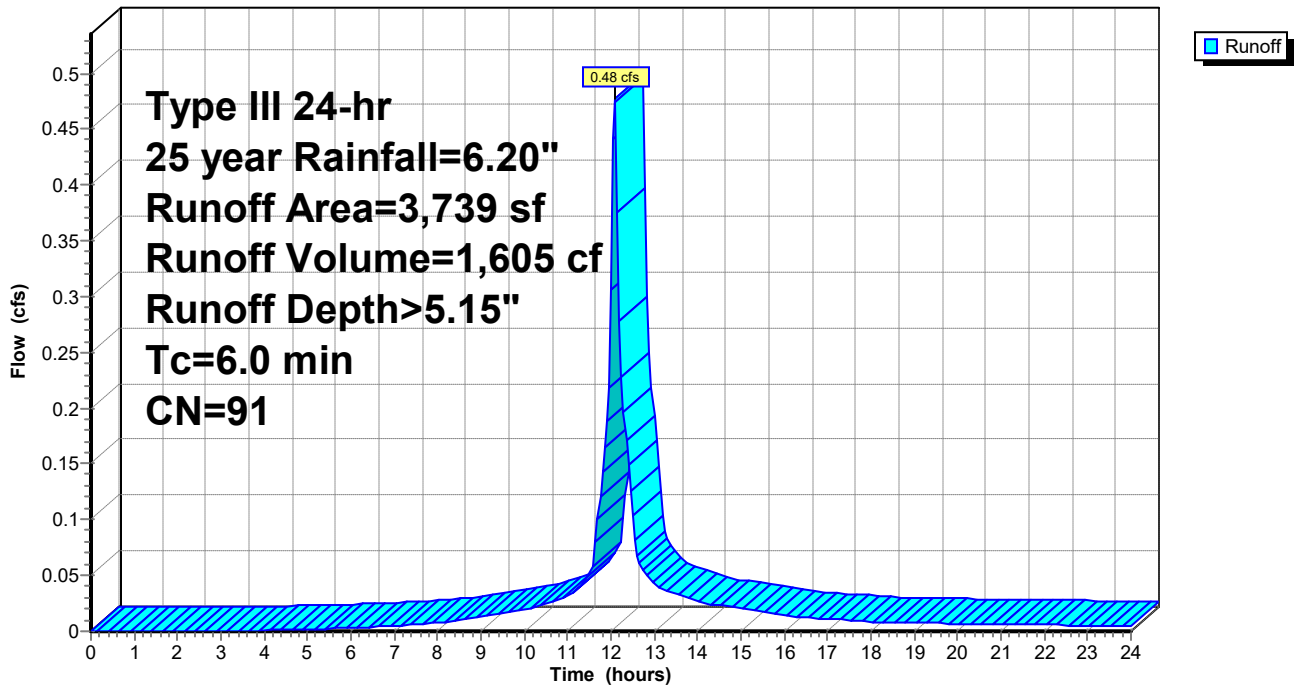
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
1,506	98	Paved parking, HSG C
2,233	86	<50% Grass cover, Poor, HSG C
3,739	91	Weighted Average
2,233		59.72% Pervious Area
1,506		40.28% Impervious Area

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

Subcatchment P1B: P1B

Hydrograph



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Summary for Subcatchment P2: P2

Runoff = 1.00 cfs @ 12.09 hrs, Volume= 3,276 cf, Depth> 4.82"
 Routed to Pond SP1 : SUM POND STREET DP-1

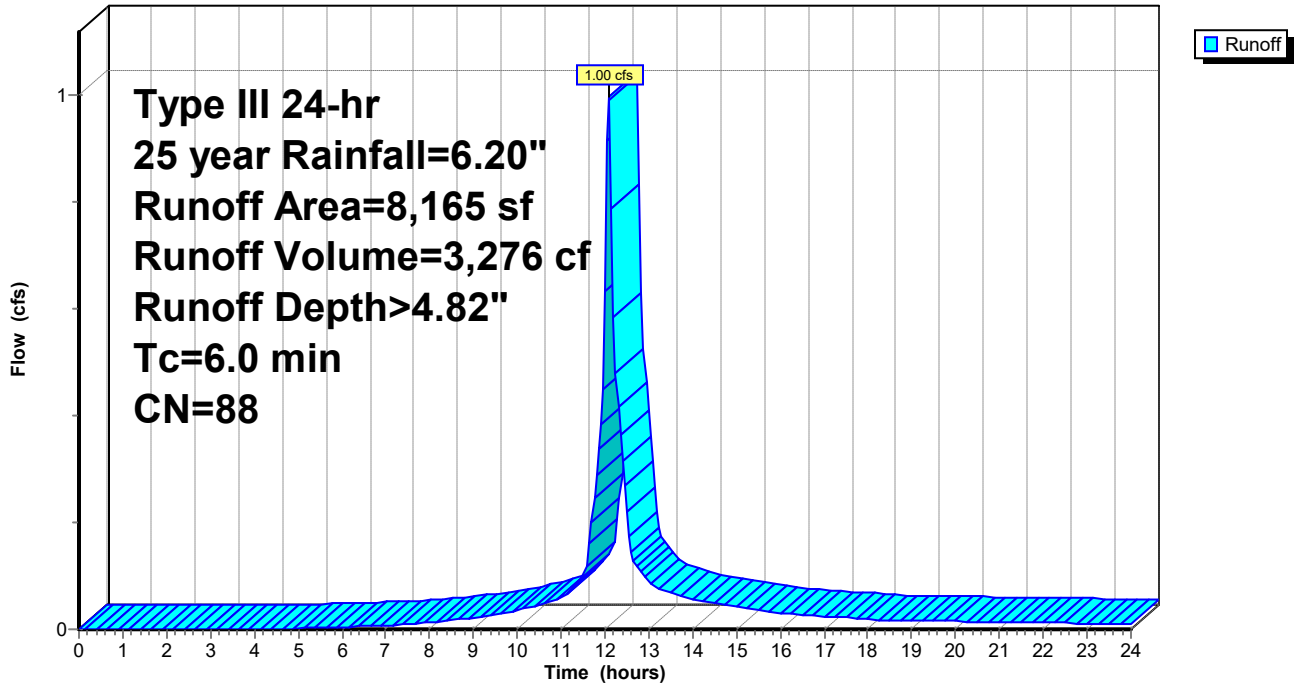
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
6,750	86	<50% Grass cover, Poor, HSG C
8,165	88	Weighted Average
6,750		82.67% Pervious Area
1,415		17.33% Impervious Area

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

Subcatchment P2: P2

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P3: (new Subcat)

Runoff = 1.45 cfs @ 12.09 hrs, Volume= 4,817 cf, Depth> 4.93"
 Routed to Pond 1P : POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
8,484	86	<50% Grass cover, Poor, HSG C
293	98	Unconnected pavement, HSG C
1,916	98	Paved parking, HSG C
1,041	98	Water Surface, HSG C

11,734	89	Weighted Average
8,484		72.30% Pervious Area
3,250		27.70% Impervious Area
293		9.02% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, FLOW OVER GRASS Grass: Short n= 0.150 P2= 3.18"
1.3	120	0.0500	1.57		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0125	2.27		Shallow Concentrated Flow, FLOW OVER DRIVEWAY Paved Kv= 20.3 fps
6.2	250	Total			

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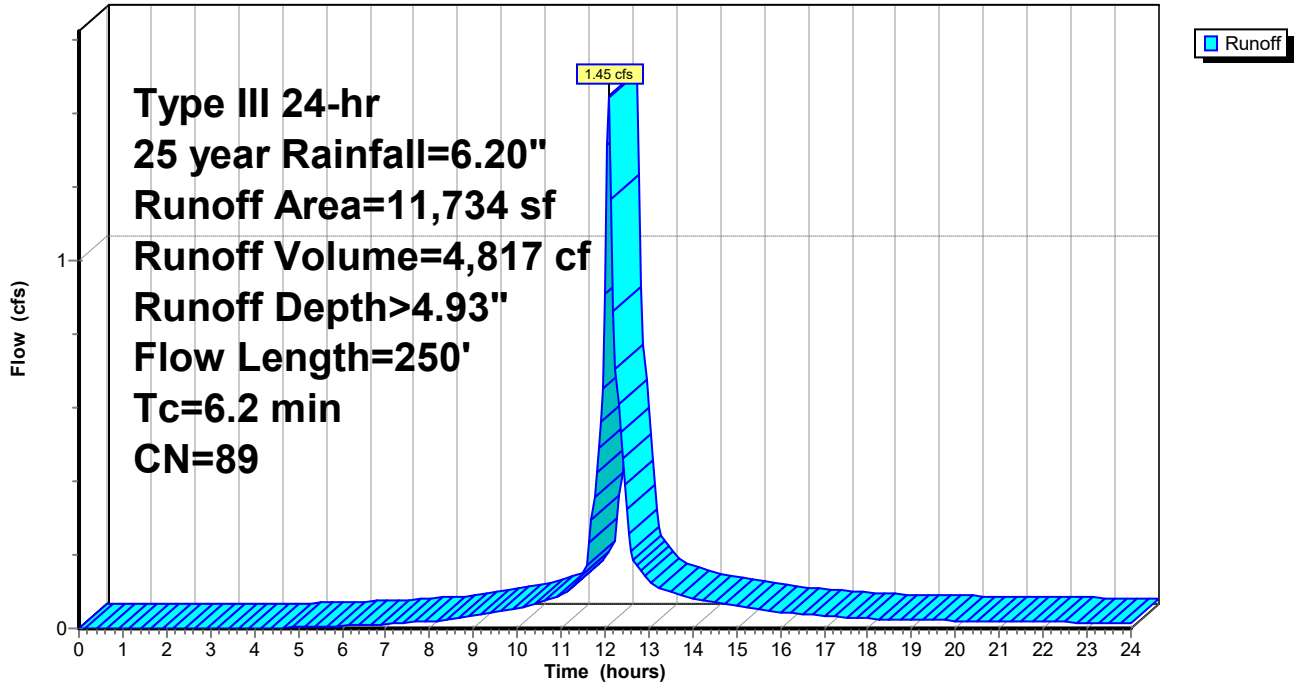
Type III 24-hr 25 year Rainfall=6.20"

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Subcatchment P3: (new Subcat)

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P4A: FLOW TO CB3

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 2,622 cf, Depth> 5.96"
Routed to Pond CB3 : (new Pond)

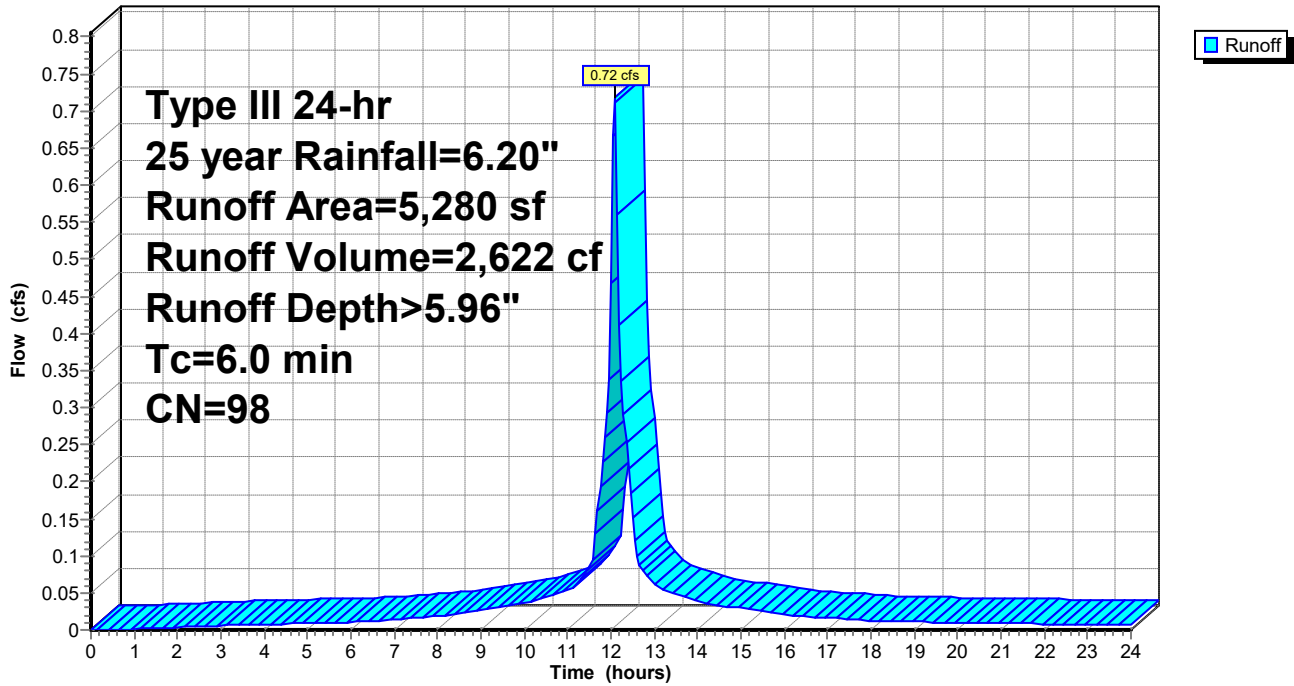
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG C
5,280		100.00% Impervious Area

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

Subcatchment P4A: FLOW TO CB3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P4B: FLOW TO CB4

Runoff = 1.55 cfs @ 12.09 hrs, Volume= 5,299 cf, Depth> 5.38"
 Routed to Pond CB4 : CB4

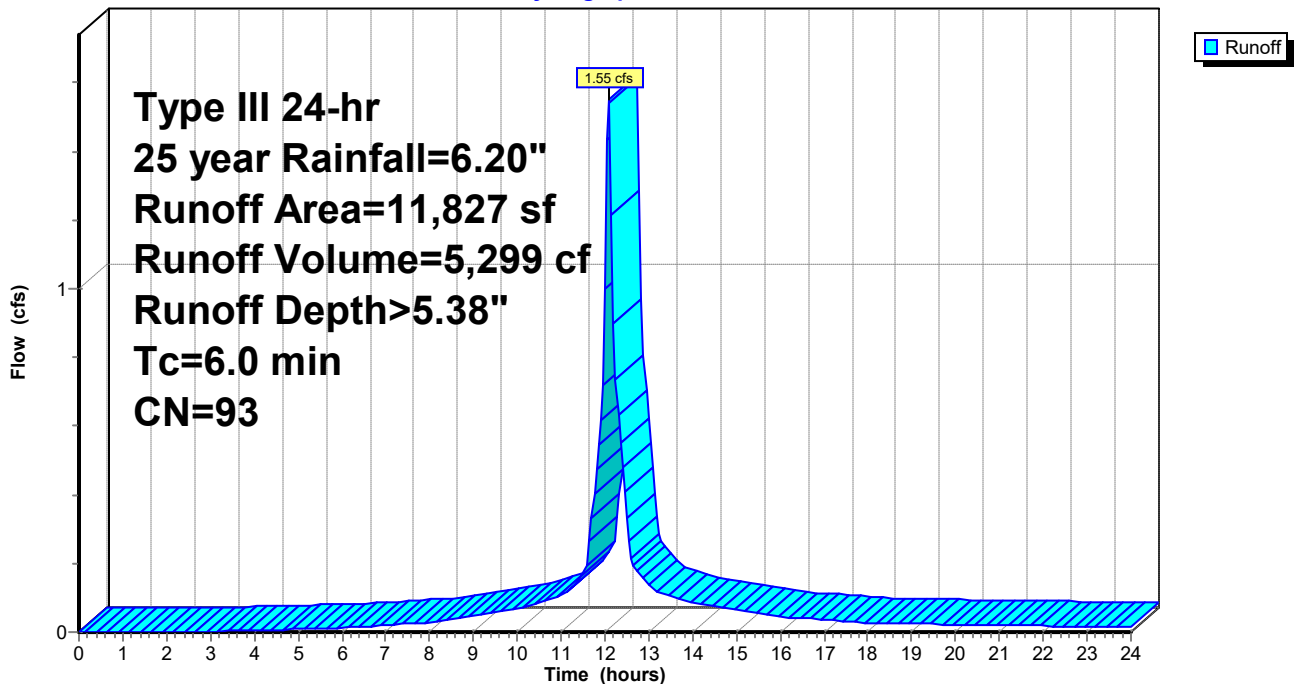
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
7,080	98	Paved parking, HSG C
4,550	86	<50% Grass cover, Poor, HSG C
197	98	Unconnected pavement, HSG C
11,827	93	Weighted Average
4,550		38.47% Pervious Area
7,277		61.53% Impervious Area
197		2.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT TO CB4

Subcatchment P4B: FLOW TO CB4

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P5: P5

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 3,984 cf, Depth> 5.26"
 Routed to Pond 2P : POND P2

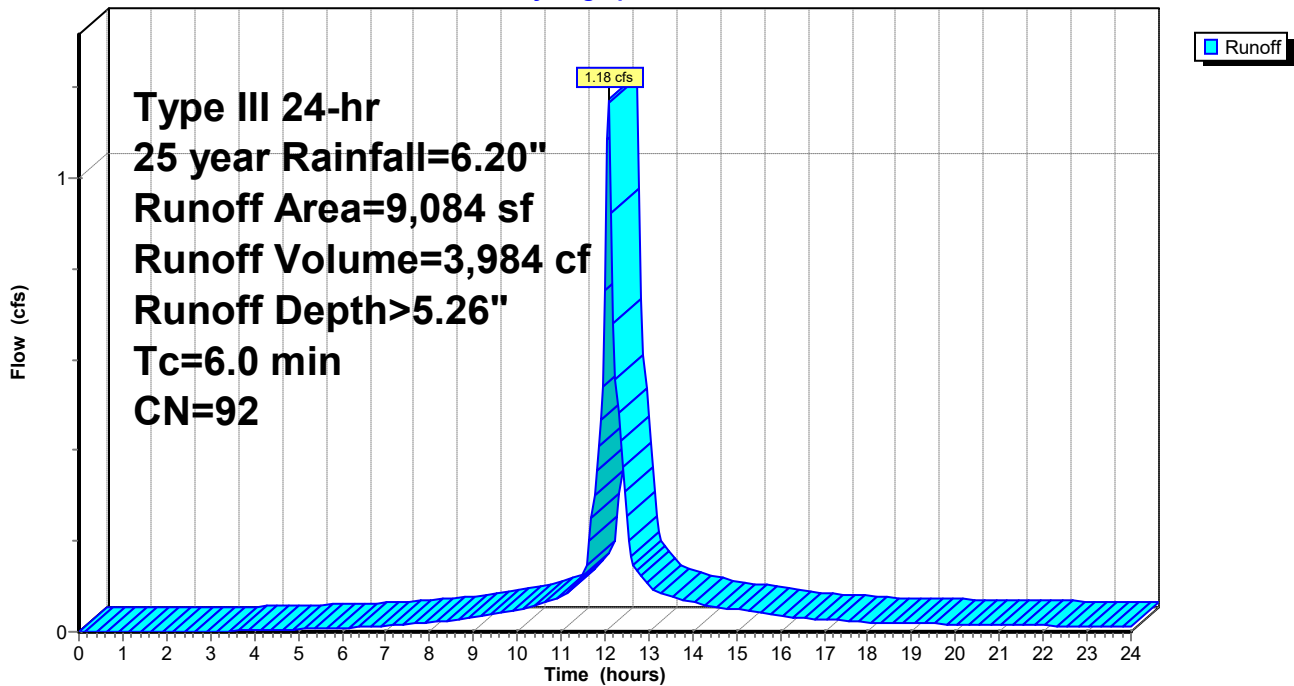
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
4,441	86	<50% Grass cover, Poor, HSG C
1,160	98	Water Surface, HSG C
3,483	98	Paved parking, HSG C
9,084	92	Weighted Average
4,441		48.89% Pervious Area
4,643		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO POND P2

Subcatchment P5: P5

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P6: P6

Runoff = 4.44 cfs @ 12.21 hrs, Volume= 18,177 cf, Depth> 3.85"
 Routed to Pond 4P : Wetland Series 'B'

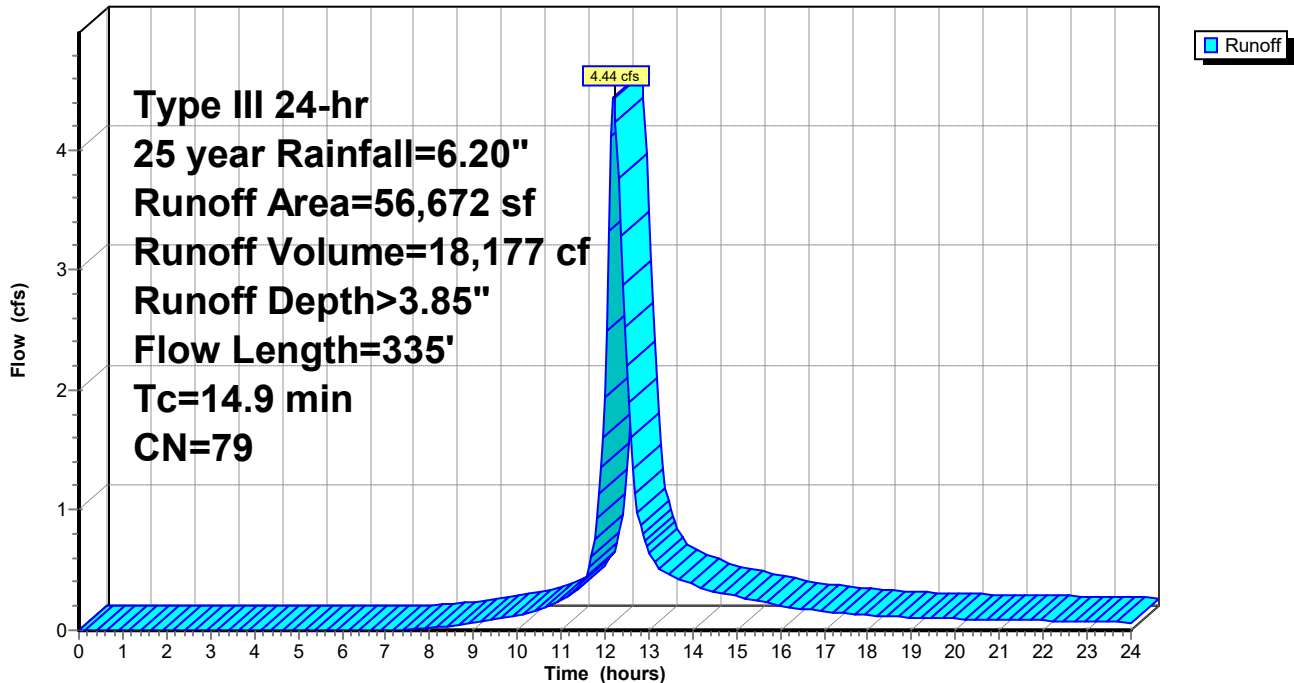
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
27,229	86	<50% Grass cover, Poor, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	79	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment P6: P6

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P7: FLOW TO POND 3

Runoff = 1.31 cfs @ 12.19 hrs, Volume= 5,456 cf, Depth> 4.81"
 Routed to Pond 3P : POND 3

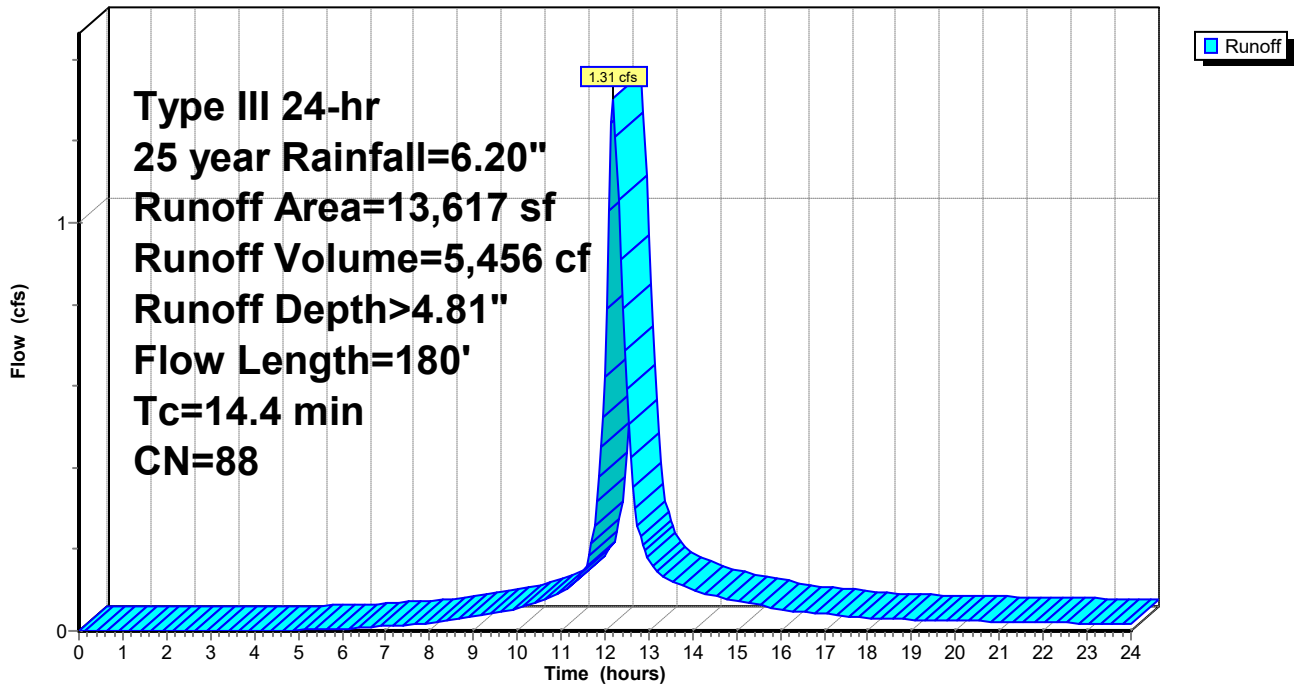
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
11,172	86	<50% Grass cover, Poor, HSG C
1,096	98	Paved parking, HSG C
1,349	98	Water Surface, HSG C
13,617	88	Weighted Average
11,172		82.04% Pervious Area
2,445		17.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, FLOW IN WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
2.0	130	0.0460	1.07		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
14.4	180	Total			

Subcatchment P7: FLOW TO POND 3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P8: AREA AROUND POND 1

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 2,950 cf, Depth> 5.38"
 Routed to Pond 1P : POND 1

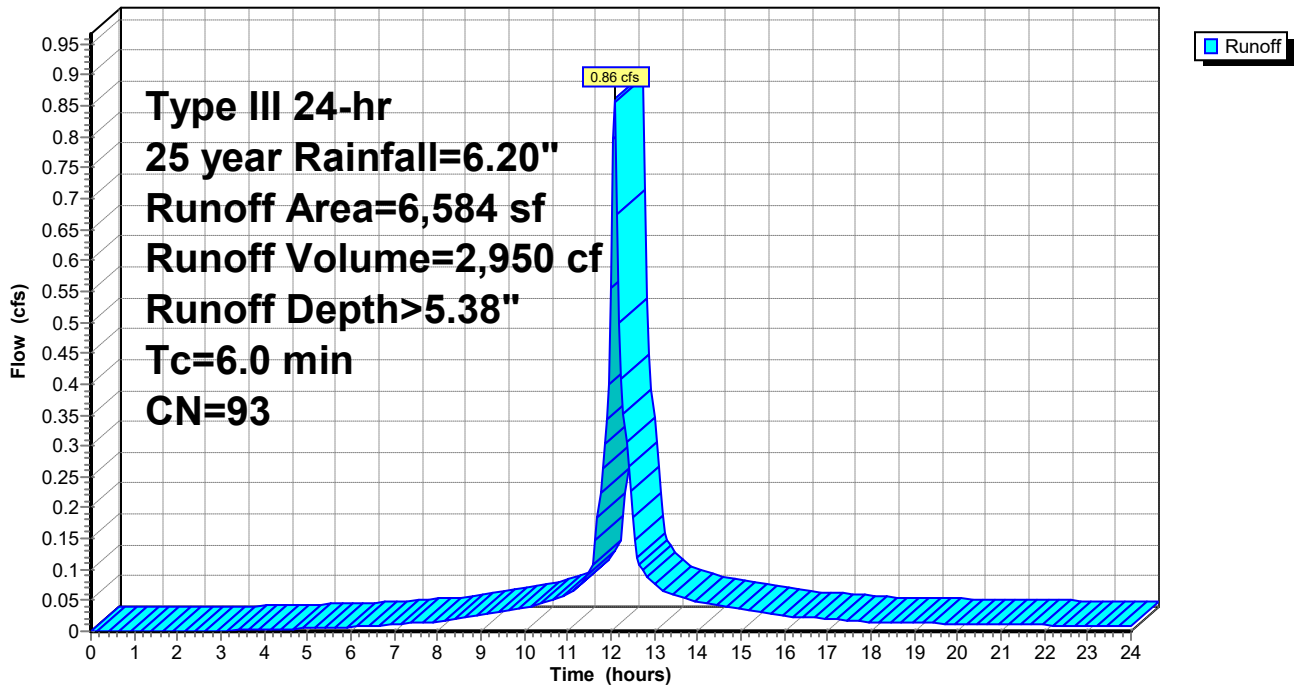
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
2,650	86	<50% Grass cover, Poor, HSG C
3,934	98	Water Surface, HSG C
6,584	93	Weighted Average
2,650		40.25% Pervious Area
3,934		59.75% Impervious Area

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

Subcatchment P8: AREA AROUND POND 1

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment P9: (new Subcat)

Runoff = 3.55 cfs @ 12.09 hrs, Volume= 11,319 cf, Depth> 4.06"
Routed to Pond SP2 : SUM POND WOODS DP-2

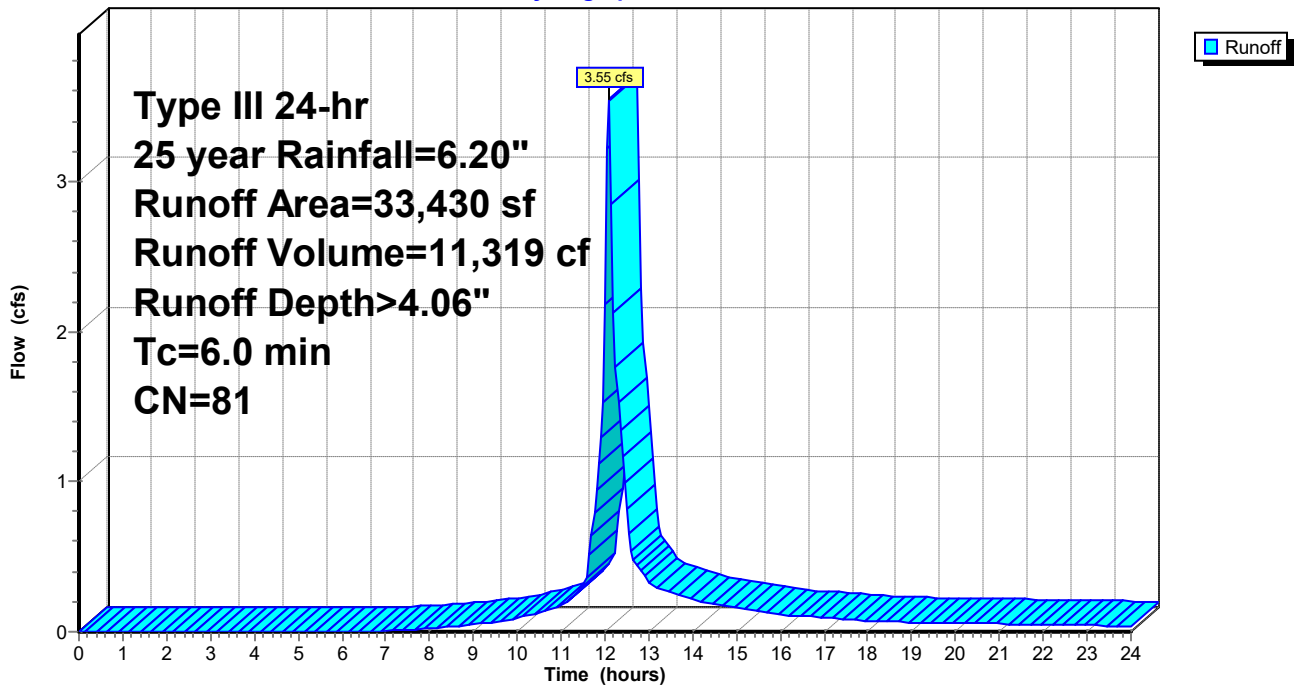
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
23,170	86	<50% Grass cover, Poor, HSG C
10,260	70	Woods, Good, HSG C
33,430	81	Weighted Average
33,430		100.00% Pervious Area

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

Subcatchment P9: (new Subcat)

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment R1: IOT 1 ROOF

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 976 cf, Depth> 5.96"
Routed to Pond 2P : POND P2

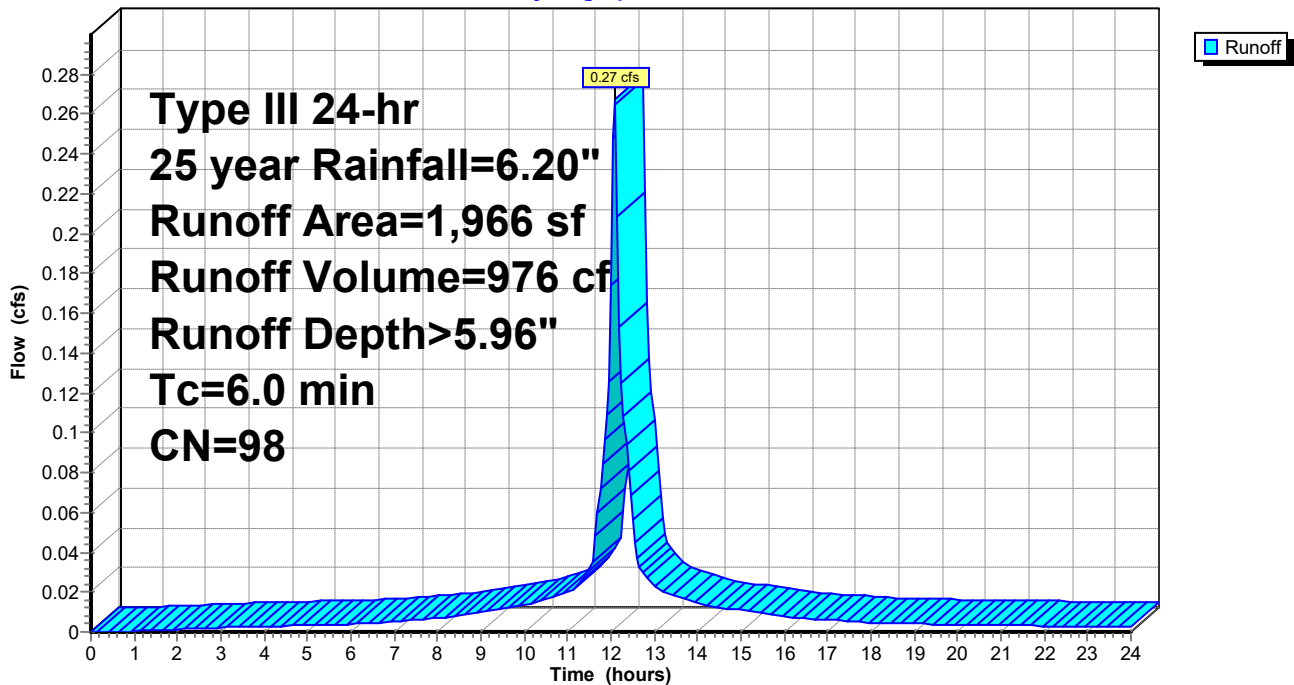
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
1,966	98	Roofs, HSG C
1,966		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW FROM ROOF TO POND

Subcatchment R1: IOT 1 ROOF

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment R2: LOT 2 ROOF

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 1,119 cf, Depth> 5.96"
Routed to Pond 3P : POND 3

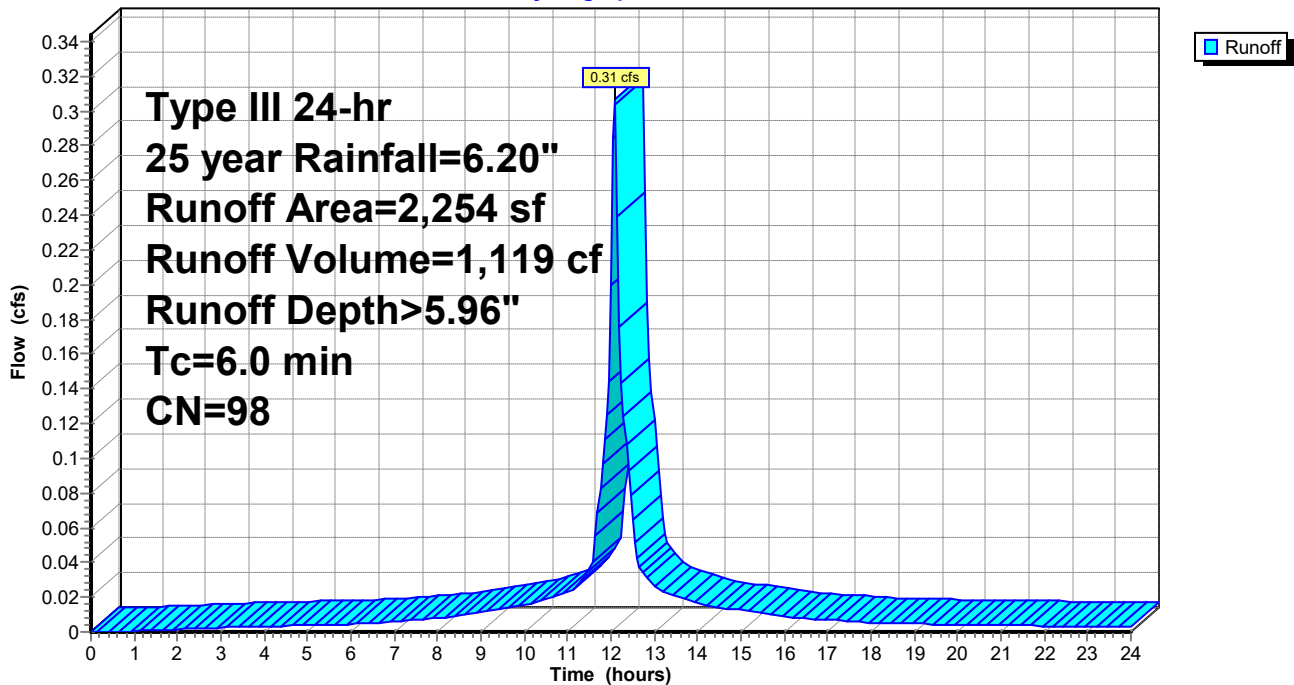
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW IN GUTTERS AND PIPES TO POND 3

Subcatchment R2: LOT 2 ROOF

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Subcatchment R3: (new Subcat)

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 1,119 cf, Depth> 5.96"
 Routed to Pond 1P : POND 1

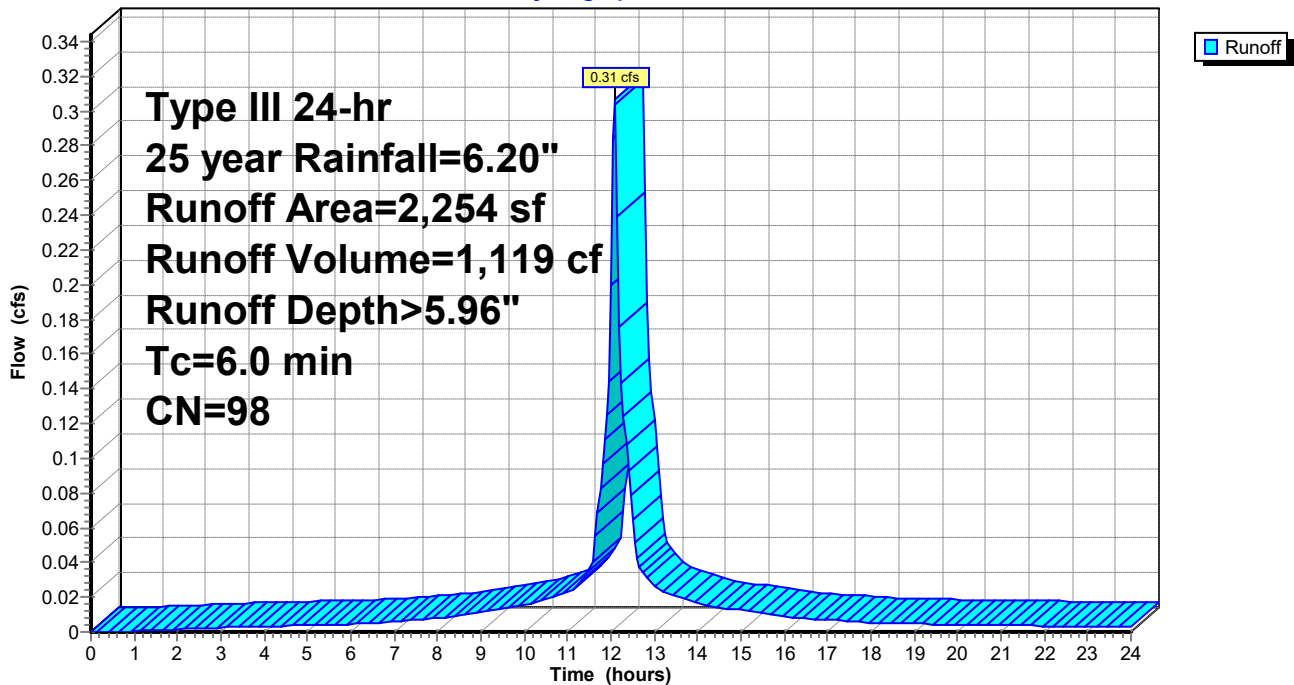
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25 year Rainfall=6.20"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW THROUGH GUTTERS TO POND

Subcatchment R3: (new Subcat)

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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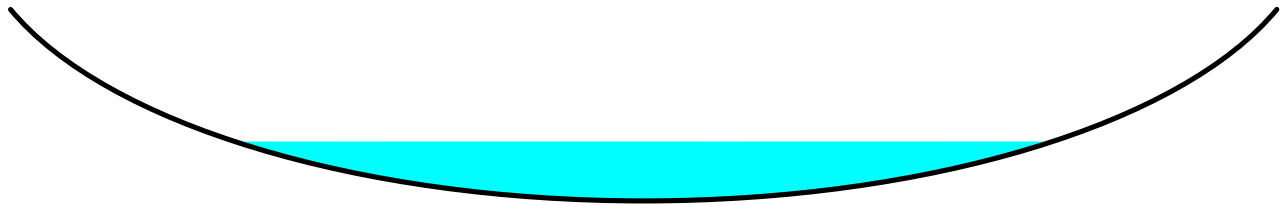
Summary for Reach 2R: Flow to WETL Series 'B'

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth = 1.78" for 25 year event
Inflow = 0.93 cfs @ 12.16 hrs, Volume= 1,636 cf
Outflow = 0.94 cfs @ 12.17 hrs, Volume= 1,636 cf, Atten= 0%, Lag= 1.0 min
Routed to Pond 4P : Wetland Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 4.0 min

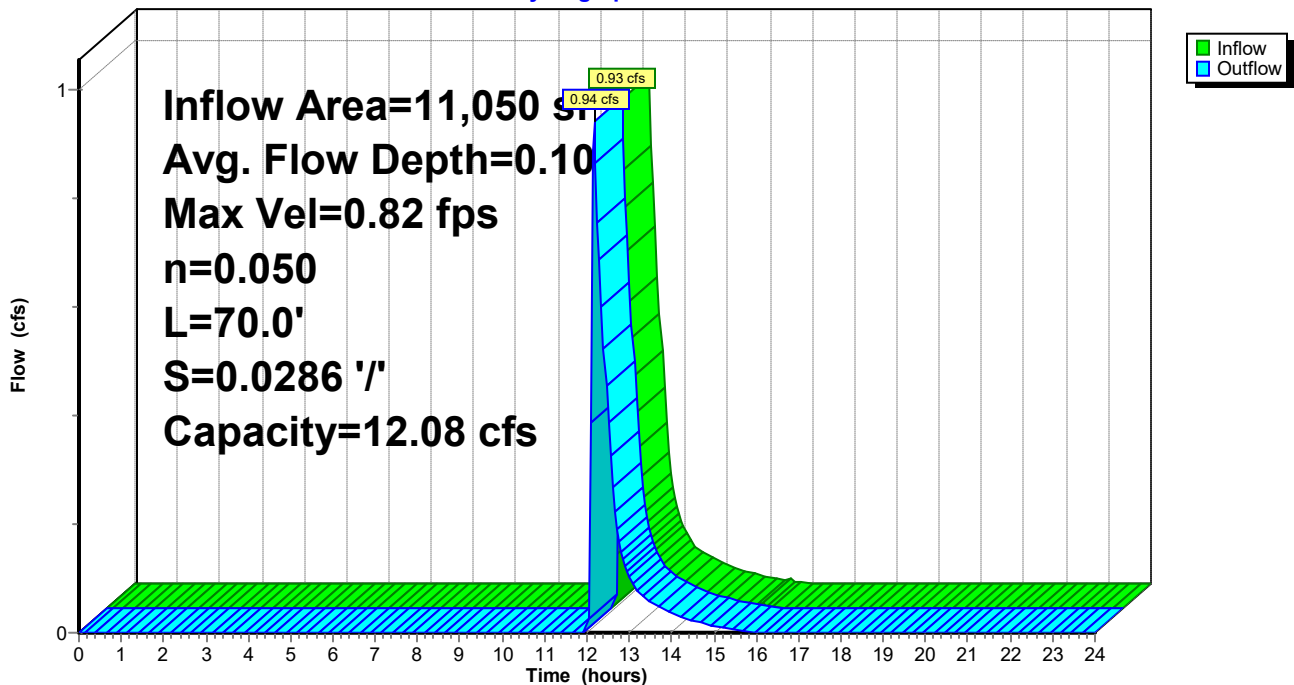
Peak Storage= 79 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 16.71'
Bank-Full Depth= 0.33' Flow Area= 6.6 sf, Capacity= 12.08 cfs

30.00' x 0.33' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 70.0' Slope= 0.0286 '/'
Inlet Invert= 263.00', Outlet Invert= 261.00'



Reach 2R: Flow to WETL Series 'B'

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond 1P: POND 1

Inflow Area = 44,704 sf, 55.90% Impervious, Inflow Depth > 5.32" for 25 year event
 Inflow = 5.79 cfs @ 12.09 hrs, Volume= 19,821 cf
 Outflow = 2.44 cfs @ 12.29 hrs, Volume= 17,590 cf, Atten= 58%, Lag= 12.4 min
 Discarded = 0.11 cfs @ 12.29 hrs, Volume= 4,876 cf
 Primary = 2.33 cfs @ 12.29 hrs, Volume= 12,714 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.87' @ 12.29 hrs Surf.Area= 4,620 sf Storage= 7,562 cf
 Flood Elev= 263.00' Surf.Area= 6,275 sf Storage= 13,707 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 73.3 min (844.7 - 771.4)

Volume	Invert	Avail.Storage	Storage Description			
#1	259.50'	13,707 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)	
259.50	1,956	257.0	0	0	1,956	
260.00	2,410	269.0	1,090	1,090	2,475	
261.00	3,525	292.0	2,950	4,039	3,540	
262.00	4,800	393.0	4,146	8,186	9,056	
263.00	6,275	518.0	5,521	13,707	18,129	

Device	Routing	Invert	Outlet Devices									
#1	Primary	259.00'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.00' / 258.00' S= 0.0333 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf									
#2	Device 1	260.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads									
#3	Device 1	261.50'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads									
#4	Discarded	259.50'	1.020 in/hr Exfiltration over Surface area									
#5	Primary	262.20'	10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74									

Discarded OutFlow Max=0.11 cfs @ 12.29 hrs HW=261.87' (Free Discharge)
 ↳ **4=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=2.33 cfs @ 12.29 hrs HW=261.87' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 2.33 cfs of 5.82 cfs potential flow)
 ↳ **2=Orifice/Grate** (Orifice Controls 0.74 cfs @ 5.40 fps)
 ↳ **3=Orifice/Grate** (Orifice Controls 1.59 cfs @ 2.92 fps)
 ↳ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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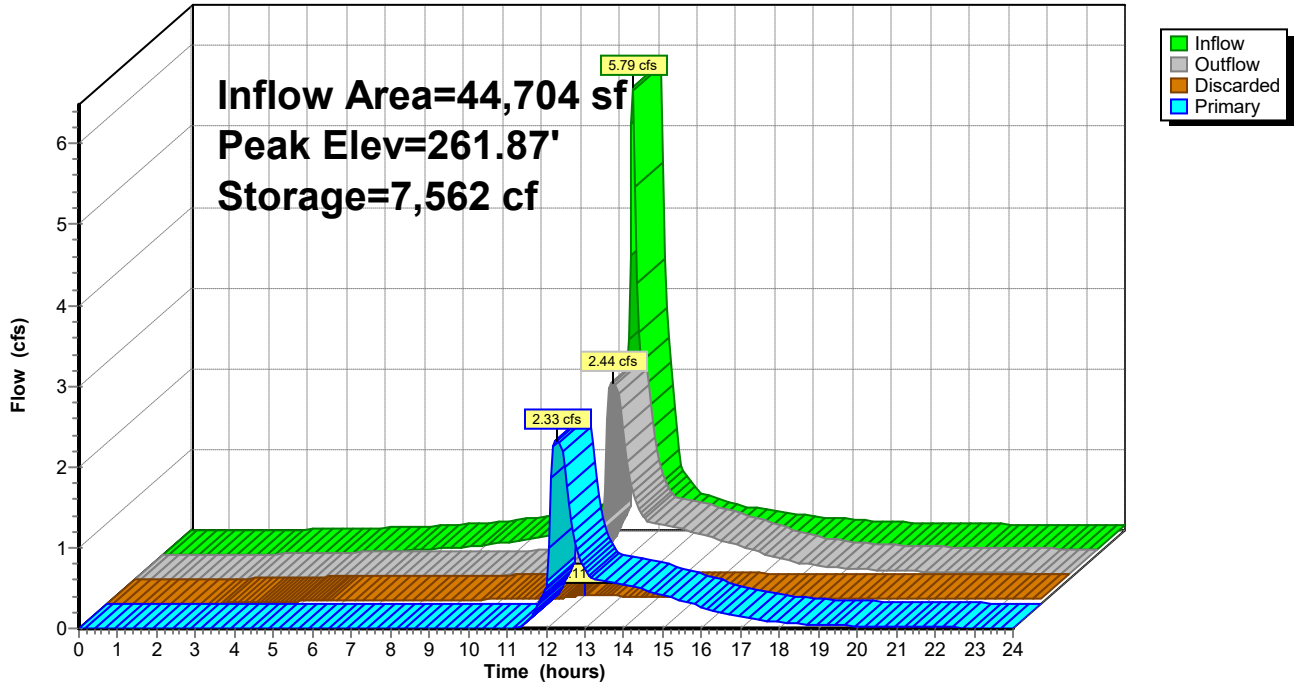
Type III 24-hr 25 year Rainfall=6.20"

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Pond 1P: POND 1

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond 2P: POND P2

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth > 5.39" for 25 year event
 Inflow = 1.44 cfs @ 12.09 hrs, Volume= 4,960 cf
 Outflow = 0.99 cfs @ 12.16 hrs, Volume= 4,714 cf, Atten= 32%, Lag= 4.2 min
 Discarded = 0.06 cfs @ 12.20 hrs, Volume= 3,078 cf
 Primary = 0.93 cfs @ 12.16 hrs, Volume= 1,636 cf
 Routed to Reach 2R : Flow to WETL Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.14' @ 12.20 hrs Surf.Area= 2,339 sf Storage= 1,351 cf
 Flood Elev= 263.50' Surf.Area= 2,650 sf Storage= 2,259 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 98.1 min (867.6 - 769.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.50'	2,259 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)	
262.50	1,940	193.0	0	0	1,940	
263.00	2,228	235.0	1,041	1,041	3,374	
263.50	2,650	232.0	1,218	2,259	3,536	

Device	Routing	Invert	Outlet Devices													
#1	Discarded	262.50'	1.020 in/hr Exfiltration over Surface area													
#2	Primary	263.00'	10.0' long x 5.0' 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)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65				
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88					

Discarded OutFlow Max=0.06 cfs @ 12.20 hrs HW=263.14' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.75 cfs @ 12.16 hrs HW=263.13' TW=263.10' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.75 cfs @ 0.57 fps)

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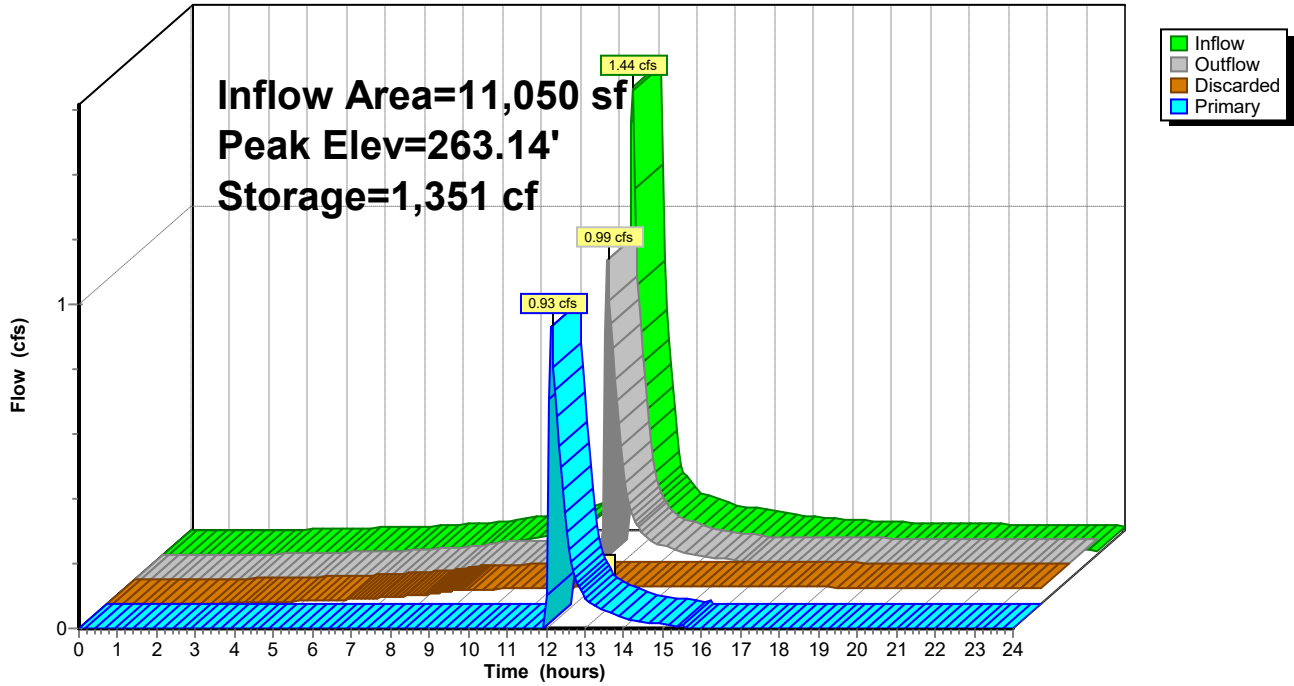
Type III 24-hr 25 year Rainfall=6.20"

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Pond 2P: POND P2

Hydrograph



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Summary for Pond 3P: POND 3

Inflow Area = 15,871 sf, 29.61% Impervious, Inflow Depth > 4.97" for 25 year event
 Inflow = 1.50 cfs @ 12.17 hrs, Volume= 6,576 cf
 Outflow = 1.15 cfs @ 12.32 hrs, Volume= 6,010 cf, Atten= 24%, Lag= 8.9 min
 Discarded = 0.05 cfs @ 12.32 hrs, Volume= 2,268 cf
 Primary = 1.09 cfs @ 12.32 hrs, Volume= 3,742 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 264.11' @ 12.32 hrs Surf.Area= 2,263 sf Storage= 2,149 cf
 Flood Elev= 265.00' Surf.Area= 3,131 sf Storage= 4,528 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 71.5 min (859.4 - 787.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	262.75'	4,528 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)
262.75	954	190.0	0	0	954
264.00	2,162	300.0	1,897	1,897	5,254
265.00	3,131	282.0	2,632	4,528	6,137

Device	Routing	Invert	Outlet Devices
#1	Primary	263.05'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.05' / 261.50' S= 0.0775 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	263.30'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	264.00'	10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	262.75'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.05 cfs @ 12.32 hrs HW=264.11' (Free Discharge)
 ↑**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.06 cfs @ 12.32 hrs HW=264.11' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Passes 0.20 cfs of 2.83 cfs potential flow)
 ↑**2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 3.99 fps)
 ↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.87 cfs @ 0.78 fps)

SELLERS FARM POST DEVELOPMENT

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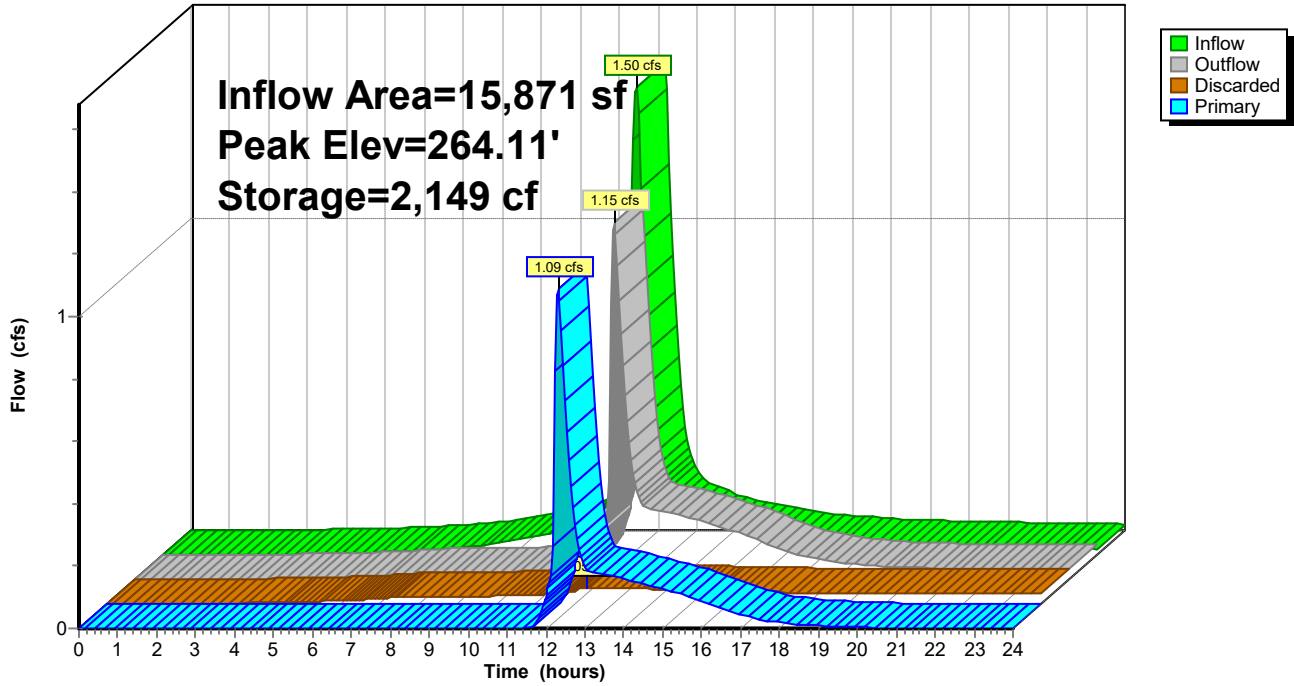
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Pond 3P: POND 3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 67,722 sf, 11.24% Impervious, Inflow Depth > 3.51" for 25 year event
 Inflow = 5.30 cfs @ 12.20 hrs, Volume= 19,813 cf
 Outflow = 5.33 cfs @ 12.21 hrs, Volume= 19,813 cf, Atten= 0%, Lag= 0.6 min
 Primary = 5.33 cfs @ 12.21 hrs, Volume= 19,813 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.39' @ 12.21 hrs Surf.Area= 383 sf Storage= 113 cf

Plug-Flow detention time= 0.2 min calculated for 19,813 cf (100% of inflow)
 Center-of-Mass det. time= 0.2 min (817.0 - 816.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	258.65'	7,771 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)
258.65	5	9.0	0	0	5
259.00	125	47.0	18	18	175
259.70	685	102.0	257	275	829
260.00	933	125.0	242	517	1,246
261.00	3,333	263.0	2,010	2,527	5,511
262.00	7,425	350.0	5,244	7,771	9,766

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	12.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 260.00' / 259.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=5.27 cfs @ 12.21 hrs HW=259.39' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Controls 0.00 cfs)
- 2=Rock Fill (Rockfill Controls 5.27 cfs @ 0.57 fps)

SELLERS FARM POST DEVELOPMENT

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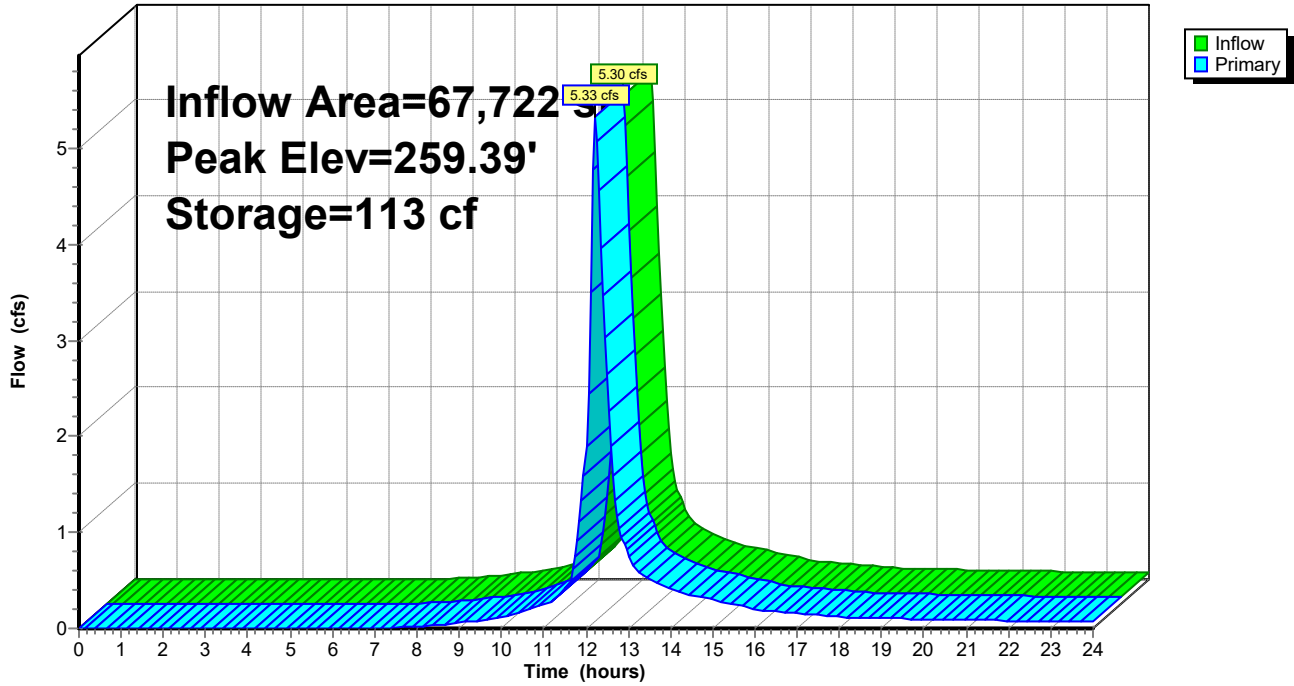
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Pond 4P: Wetland Series 'B'

Hydrograph



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Summary for Pond CB1: (new Pond)

Inflow Area = 3,286 sf, 45.25% Impervious, Inflow Depth > 5.15" for 25 year event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,410 cf
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 1,410 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.09 hrs, Volume= 1,410 cf
Routed to Pond MH1 : MH1

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

Peak Elev= 262.40' @ 12.23 hrs

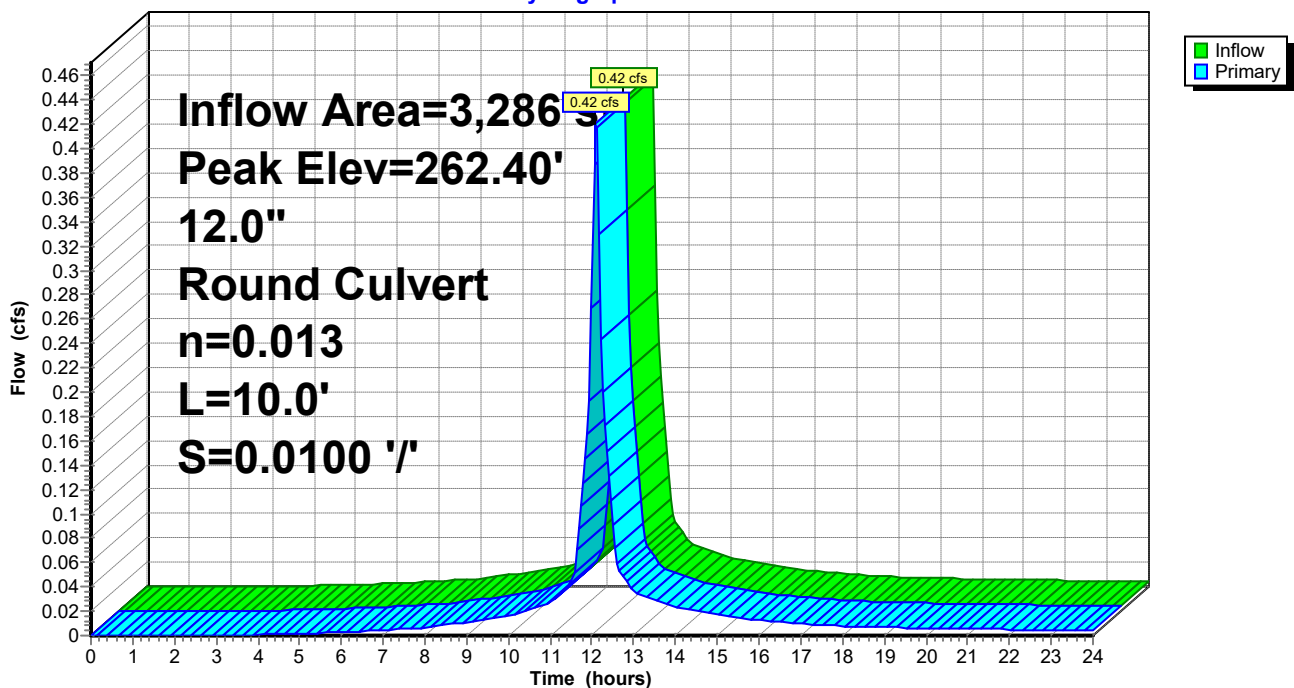
Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=262.34' TW=262.32' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 0.22 cfs @ 0.95 fps)

Pond CB1: (new Pond)

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,739 sf, 40.28% Impervious, Inflow Depth > 5.15" for 25 year event
 Inflow = 0.48 cfs @ 12.09 hrs, Volume= 1,605 cf
 Outflow = 0.48 cfs @ 12.09 hrs, Volume= 1,605 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.09 hrs, Volume= 1,605 cf
 Routed to Pond MH1 : MH1

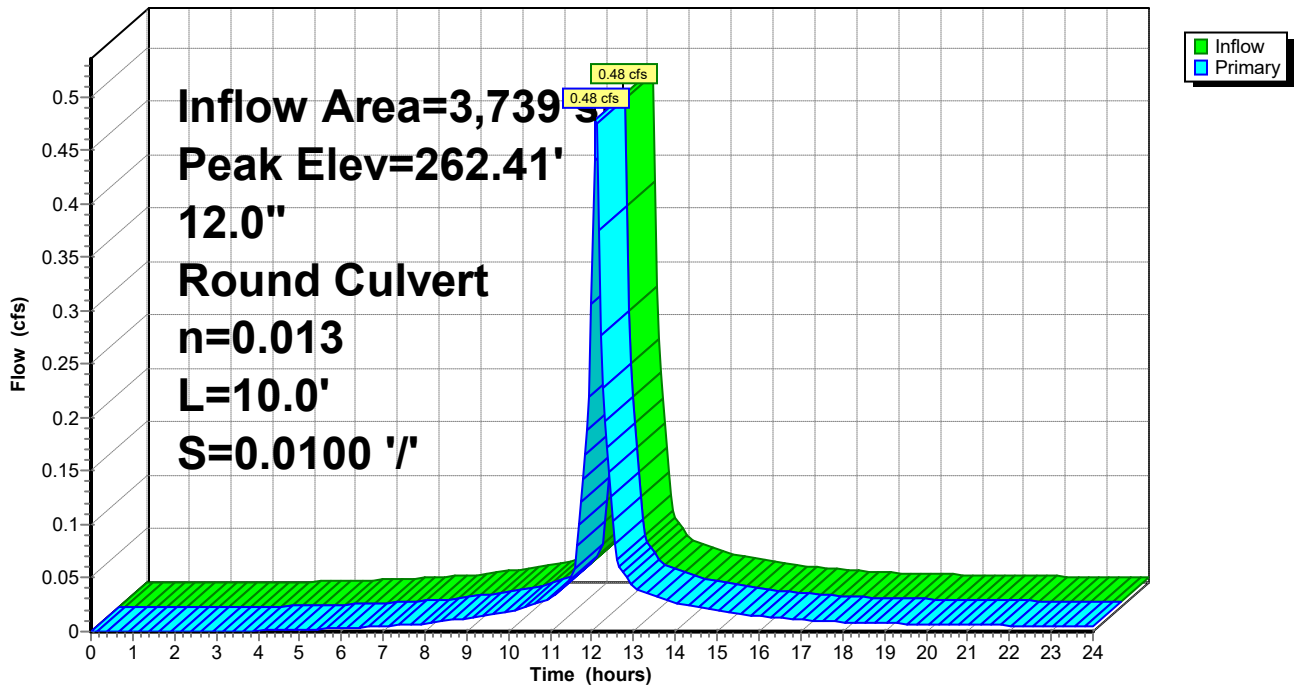
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.41' @ 12.23 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.09 hrs HW=262.36' TW=262.32' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.29 cfs @ 1.20 fps)

Pond CB2: CB2

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond CB3: (new Pond)

Inflow Area = 5,280 sf, 100.00% Impervious, Inflow Depth > 5.96" for 25 year event
 Inflow = 0.72 cfs @ 12.09 hrs, Volume= 2,622 cf
 Outflow = 0.72 cfs @ 12.09 hrs, Volume= 2,622 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.72 cfs @ 12.09 hrs, Volume= 2,622 cf
 Routed to Pond MH3 : DMH3

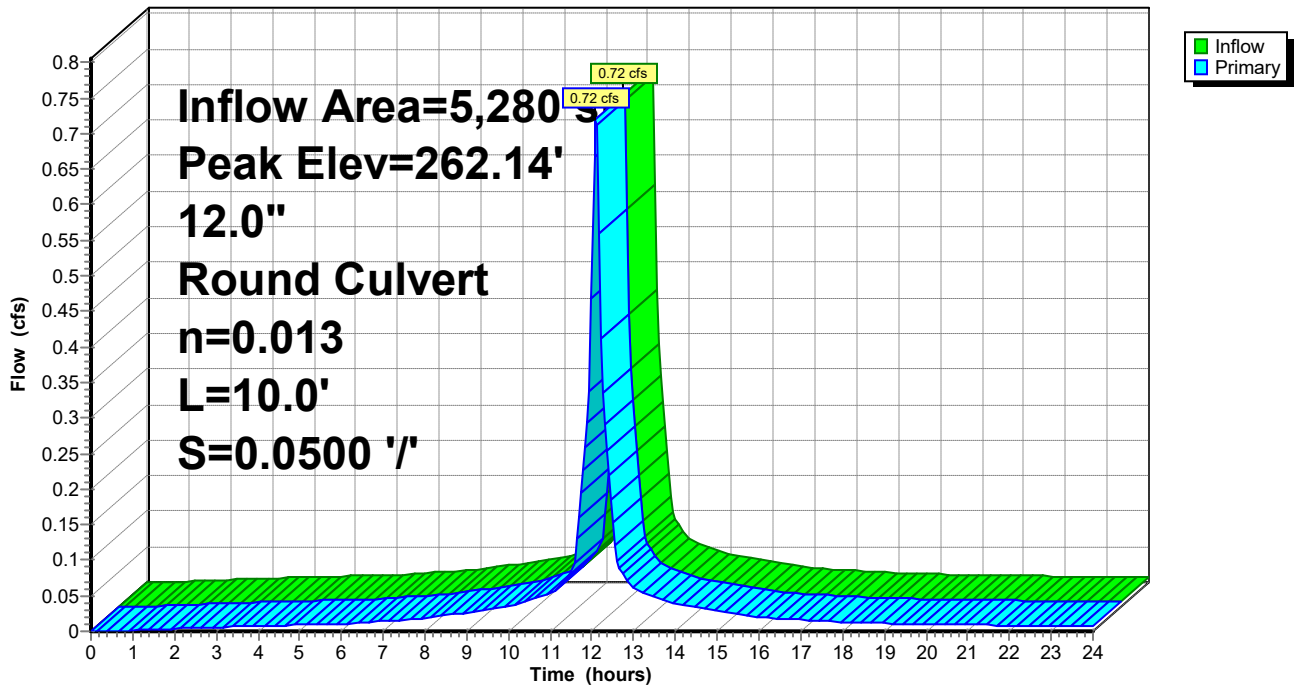
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.14' @ 12.16 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.75' TW=262.03' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond CB3: (new Pond)

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 25 year Rainfall=6.20"

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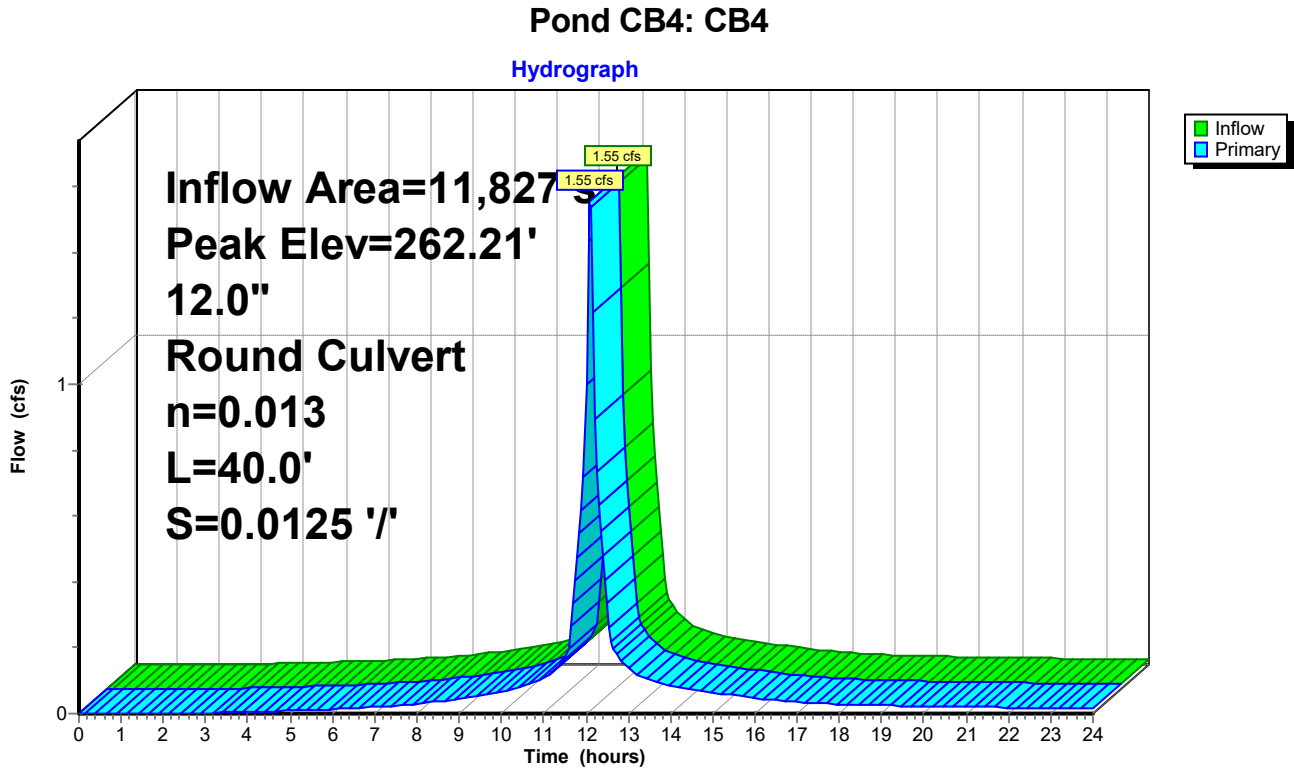
Summary for Pond CB4: CB4

Inflow Area = 11,827 sf, 61.53% Impervious, Inflow Depth > 5.38" for 25 year event
 Inflow = 1.55 cfs @ 12.09 hrs, Volume= 5,299 cf
 Outflow = 1.55 cfs @ 12.09 hrs, Volume= 5,299 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.55 cfs @ 12.09 hrs, Volume= 5,299 cf
 Routed to Pond MH3 : DMH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.21' @ 12.16 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.50'	12.0" Round Culvert L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.89' TW=262.04' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond MH1: MH1

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 5.15" for 25 year event
 Inflow = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf
 Outflow = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf
 Routed to Pond MH2 : MH2

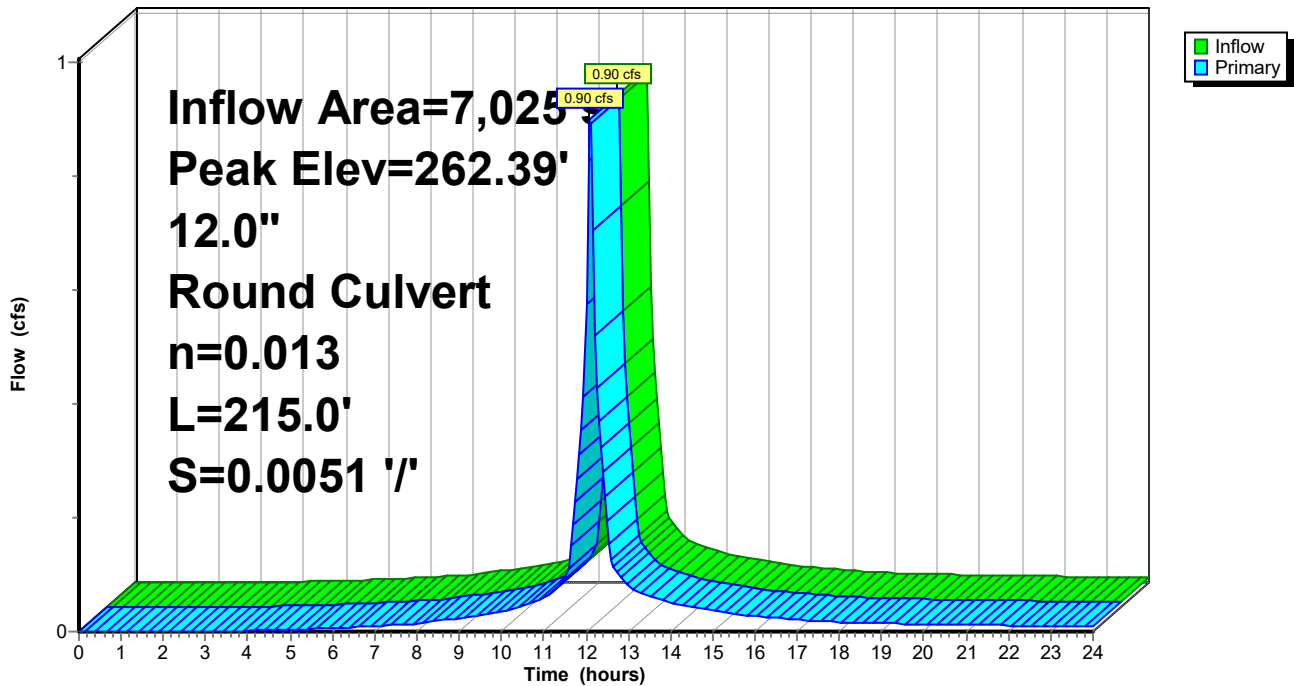
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.39' @ 12.18 hrs
 Flood Elev= 265.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	261.70'	12.0" Round Culvert L= 215.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.70' / 260.60' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=262.32' TW=261.84' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.66 cfs @ 1.87 fps)

Pond MH1: MH1

Hydrograph



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Type III 24-hr 25 year Rainfall=6.20"

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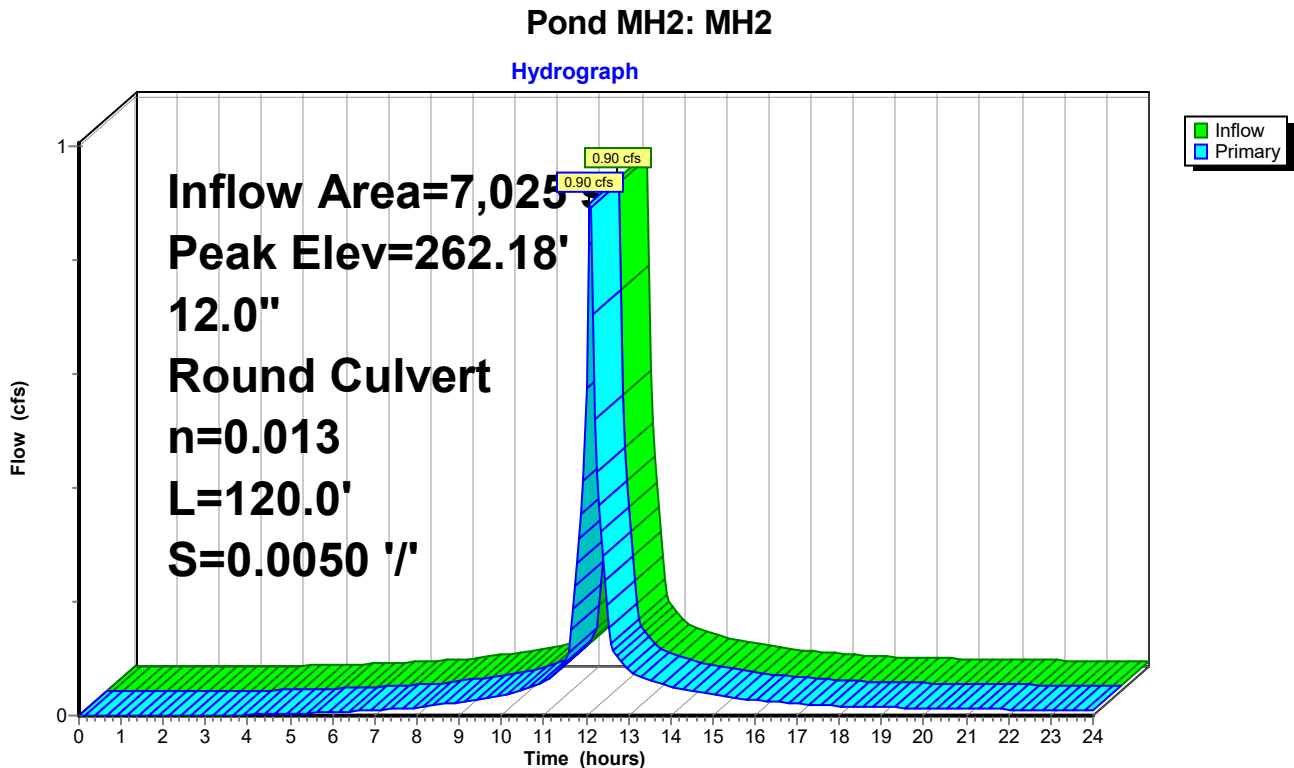
Summary for Pond MH2: MH2

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 5.15" for 25 year event
 Inflow = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf
 Outflow = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.90 cfs @ 12.09 hrs, Volume= 3,015 cf
 Routed to Pond MH3 : DMH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.18' @ 12.16 hrs
 Flood Elev= 269.75'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.60'	12.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.60' / 260.00' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=261.84' TW=262.04' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)



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Type III 24-hr 25 year Rainfall=6.20"

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Summary for Pond MH3: DMH3

Inflow Area = 24,132 sf, 64.44% Impervious, Inflow Depth > 5.44" for 25 year event
 Inflow = 3.17 cfs @ 12.09 hrs, Volume= 10,935 cf
 Outflow = 3.17 cfs @ 12.09 hrs, Volume= 10,935 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.17 cfs @ 12.09 hrs, Volume= 10,935 cf
 Routed to Pond 1P : POND 1

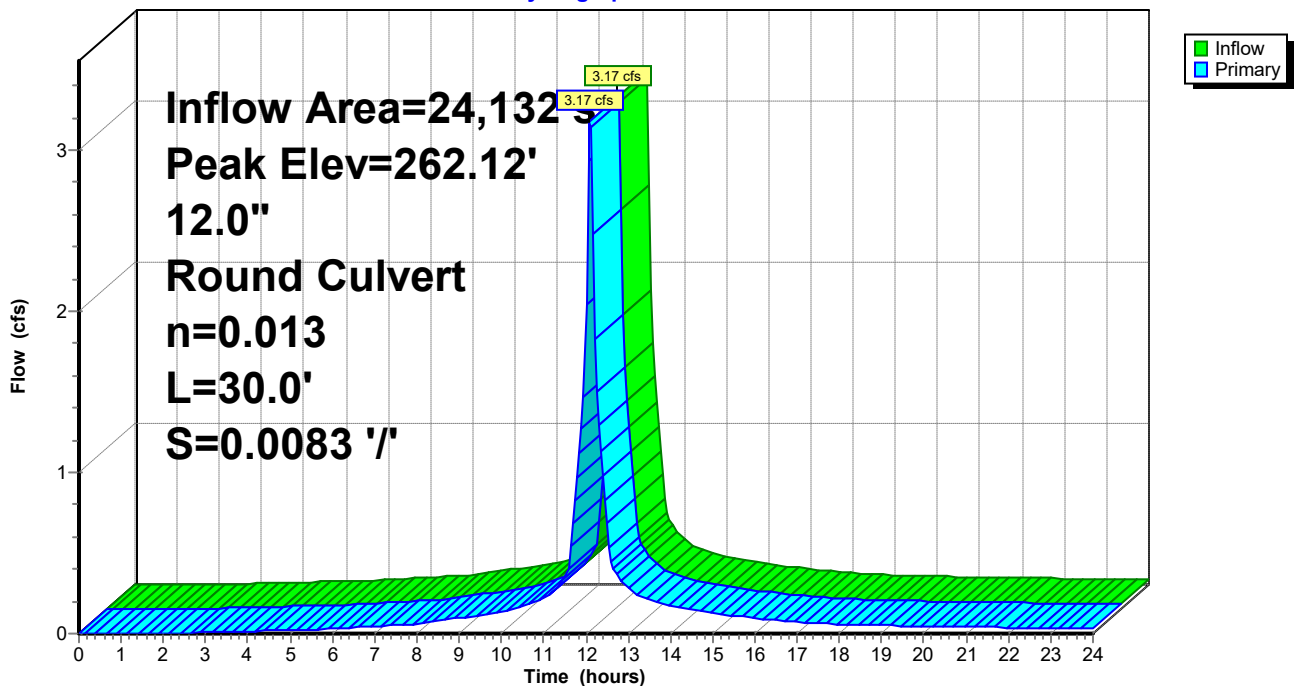
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.12' @ 12.12 hrs
 Flood Elev= 263.60'

Device #	Routing	Invert	Outlet Devices
#1	Primary	259.75'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.75' / 259.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.60 cfs @ 12.09 hrs HW=262.04' TW=261.57' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 2.60 cfs @ 3.30 fps)

Pond MH3: DMH3

Hydrograph



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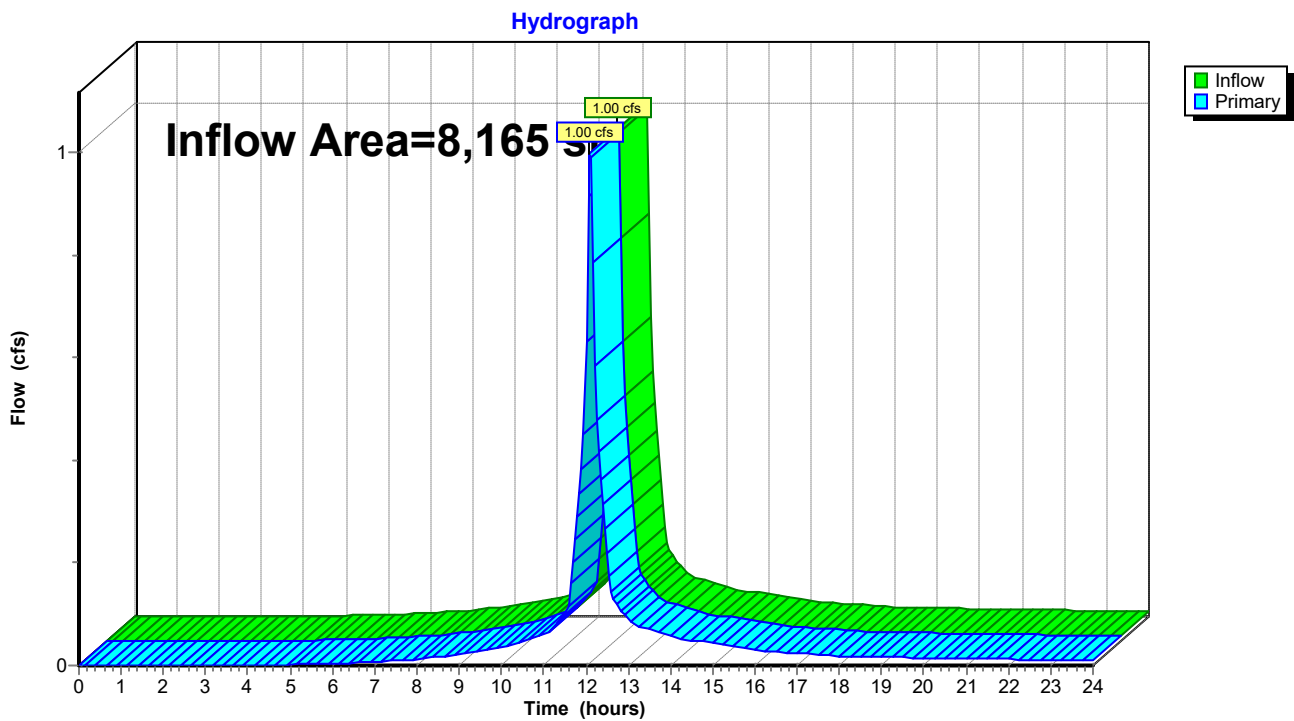
Summary for Pond SP1: SUM POND STREET DP-1

DESIGN POINT AT HIGHLAND ROAD

Inflow Area = 8,165 sf, 17.33% Impervious, Inflow Depth > 4.82" for 25 year event
Inflow = 1.00 cfs @ 12.09 hrs, Volume= 3,276 cf
Primary = 1.00 cfs @ 12.09 hrs, Volume= 3,276 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



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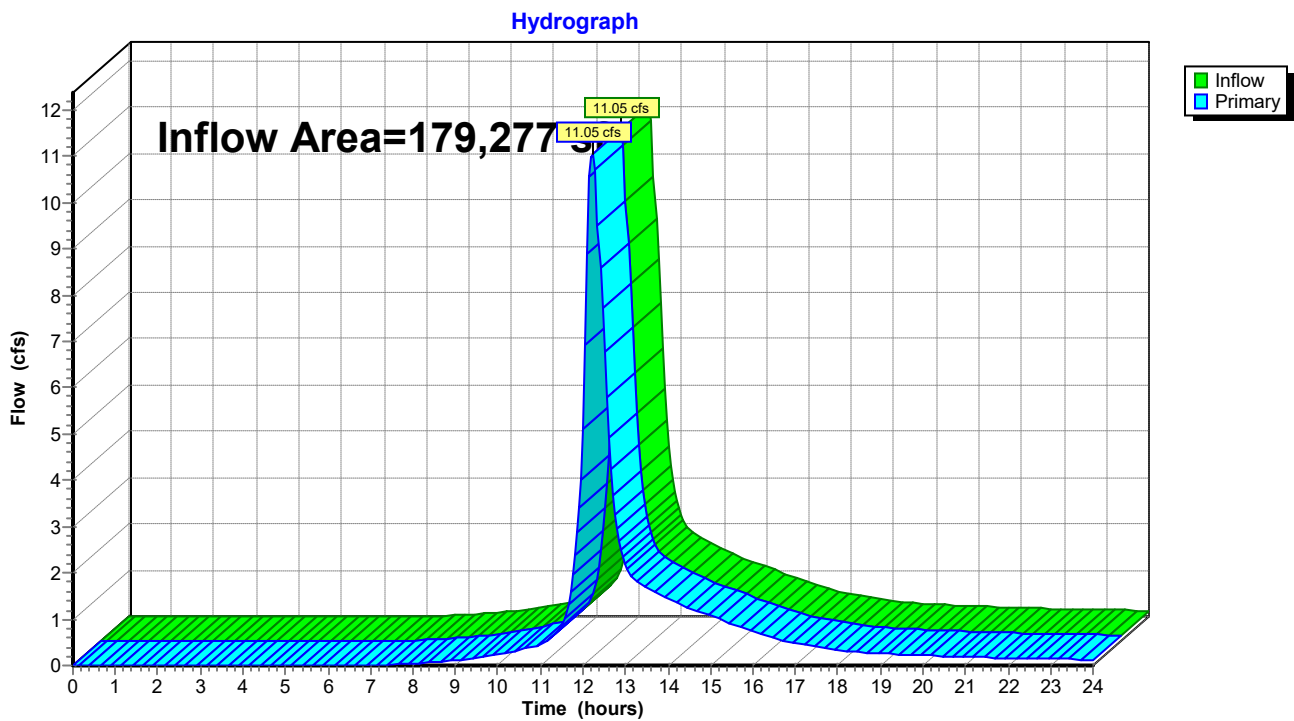
Summary for Pond SP2: SUM POND WOODS DP-2

DESIGN POINT AT REAR PROPERTY LINE

Inflow Area = 179,277 sf, 20.80% Impervious, Inflow Depth > 3.47" for 25 year event
Inflow = 11.05 cfs @ 12.23 hrs, Volume= 51,910 cf
Primary = 11.05 cfs @ 12.23 hrs, Volume= 51,910 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2



STORMWATER MANAGEMENT REPORT

100 YEAR STORM

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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

Subcatchment P10: (new Subcat)	Runoff Area=17,550 sf 0.00% Impervious Runoff Depth>4.44" Flow Length=425' Slope=0.0400 '/' Tc=15.7 min CN=70 Runoff=1.56 cfs 6,498 cf
Subcatchment P1A: P1A	Runoff Area=3,286 sf 45.25% Impervious Runoff Depth>6.91" Tc=6.0 min CN=91 Runoff=0.55 cfs 1,892 cf
Subcatchment P1B: P1B	Runoff Area=3,739 sf 40.28% Impervious Runoff Depth>6.91" Tc=6.0 min CN=91 Runoff=0.63 cfs 2,153 cf
Subcatchment P2: P2	Runoff Area=8,165 sf 17.33% Impervious Runoff Depth>6.55" Tc=6.0 min CN=88 Runoff=1.34 cfs 4,459 cf
Subcatchment P3: (new Subcat)	Runoff Area=11,734 sf 27.70% Impervious Runoff Depth>6.67" Flow Length=250' Tc=6.2 min CN=89 Runoff=1.93 cfs 6,524 cf
Subcatchment P4A: FLOW TO CB3	Runoff Area=5,280 sf 100.00% Impervious Runoff Depth>7.75" Tc=6.0 min CN=98 Runoff=0.93 cfs 3,408 cf
Subcatchment P4B: FLOW TO CB4	Runoff Area=11,827 sf 61.53% Impervious Runoff Depth>7.15" Tc=6.0 min CN=93 Runoff=2.03 cfs 7,045 cf
Subcatchment P5: P5	Runoff Area=9,084 sf 51.11% Impervious Runoff Depth>7.03" Tc=6.0 min CN=92 Runoff=1.55 cfs 5,321 cf
Subcatchment P6: P6	Runoff Area=56,672 sf 1.76% Impervious Runoff Depth>5.49" Flow Length=335' Tc=14.9 min CN=79 Runoff=6.27 cfs 25,906 cf
Subcatchment P7: FLOW TO POND 3	Runoff Area=13,617 sf 17.96% Impervious Runoff Depth>6.55" Flow Length=180' Tc=14.4 min CN=88 Runoff=1.75 cfs 7,427 cf
Subcatchment P8: AREA AROUND POND 1	Runoff Area=6,584 sf 59.75% Impervious Runoff Depth>7.15" Tc=6.0 min CN=93 Runoff=1.13 cfs 3,922 cf
Subcatchment P9: (new Subcat)	Runoff Area=33,430 sf 0.00% Impervious Runoff Depth>5.73" Tc=6.0 min CN=81 Runoff=4.95 cfs 15,959 cf
Subcatchment R1: IOT 1 ROOF	Runoff Area=1,966 sf 100.00% Impervious Runoff Depth>7.75" Tc=6.0 min CN=98 Runoff=0.35 cfs 1,269 cf
Subcatchment R2: LOT 2 ROOF	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>7.75" Tc=6.0 min CN=98 Runoff=0.40 cfs 1,455 cf
Subcatchment R3: (new Subcat)	Runoff Area=2,254 sf 100.00% Impervious Runoff Depth>7.75" Tc=6.0 min CN=98 Runoff=0.40 cfs 1,455 cf
Reach 2R: Flow to WETL Series 'B'	Avg. Flow Depth=0.13' Max Vel=0.97 fps Inflow=1.53 cfs 2,881 cf n=0.050 L=70.0' S=0.0286 '/' Capacity=12.08 cfs Outflow=1.53 cfs 2,881 cf

SELLERS FARM POST DEVELOPMENT*Type III 24-hr 100 Year Rainfall=7.99"*

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Pond 1P: POND 1 Peak Elev=262.22' Storage=9,298 cf Inflow=7.60 cfs 26,399 cf
Discarded=0.12 cfs 5,267 cf Primary=3.16 cfs 18,778 cf Outflow=3.28 cfs 24,045 cf

Pond 2P: POND P2 Peak Elev=263.19' Storage=1,483 cf Inflow=1.89 cfs 6,590 cf
Discarded=0.06 cfs 3,282 cf Primary=1.53 cfs 2,881 cf Outflow=1.58 cfs 6,162 cf

Pond 3P: POND 3 Peak Elev=264.17' Storage=2,273 cf Inflow=2.01 cfs 8,882 cf
Discarded=0.05 cfs 2,467 cf Primary=1.82 cfs 5,760 cf Outflow=1.87 cfs 8,226 cf

Pond 4P: Wetland Series 'B' Peak Elev=259.59' Storage=207 cf Inflow=7.63 cfs 28,786 cf
Outflow=7.62 cfs 28,786 cf

Pond CB1: (new Pond) Peak Elev=263.18' Inflow=0.55 cfs 1,892 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.55 cfs 1,892 cf

Pond CB2: CB2 Peak Elev=263.18' Inflow=0.63 cfs 2,153 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.63 cfs 2,153 cf

Pond CB3: (new Pond) Peak Elev=262.99' Inflow=0.93 cfs 3,408 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0500 '/' Outflow=0.93 cfs 3,408 cf

Pond CB4: CB4 Peak Elev=263.14' Inflow=2.03 cfs 7,045 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0125 '/' Outflow=2.03 cfs 7,045 cf

Pond MH1: MH1 Peak Elev=263.17' Inflow=1.18 cfs 4,045 cf
12.0" Round Culvert n=0.013 L=215.0' S=0.0051 '/' Outflow=1.18 cfs 4,045 cf

Pond MH2: MH2 Peak Elev=263.07' Inflow=1.18 cfs 4,045 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=1.18 cfs 4,045 cf

Pond MH3: DMH3 Peak Elev=262.96' Inflow=4.14 cfs 14,498 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0083 '/' Outflow=4.14 cfs 14,498 cf

Pond SP1: SUM POND STREET DP-1 Inflow=1.34 cfs 4,459 cf
Primary=1.34 cfs 4,459 cf

Pond SP2: SUM POND WOODS DP-2 Inflow=16.91 cfs 75,780 cf
Primary=16.91 cfs 75,780 cf

Total Runoff Area = 187,442 sf Runoff Volume = 94,693 cf Average Runoff Depth = 6.06"
79.35% Pervious = 148,731 sf 20.65% Impervious = 38,711 sf

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Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Subcatchment P10: (new Subcat)

Runoff = 1.56 cfs @ 12.22 hrs, Volume= 6,498 cf, Depth> 4.44"
 Routed to Pond SP2 : SUM POND WOODS DP-2

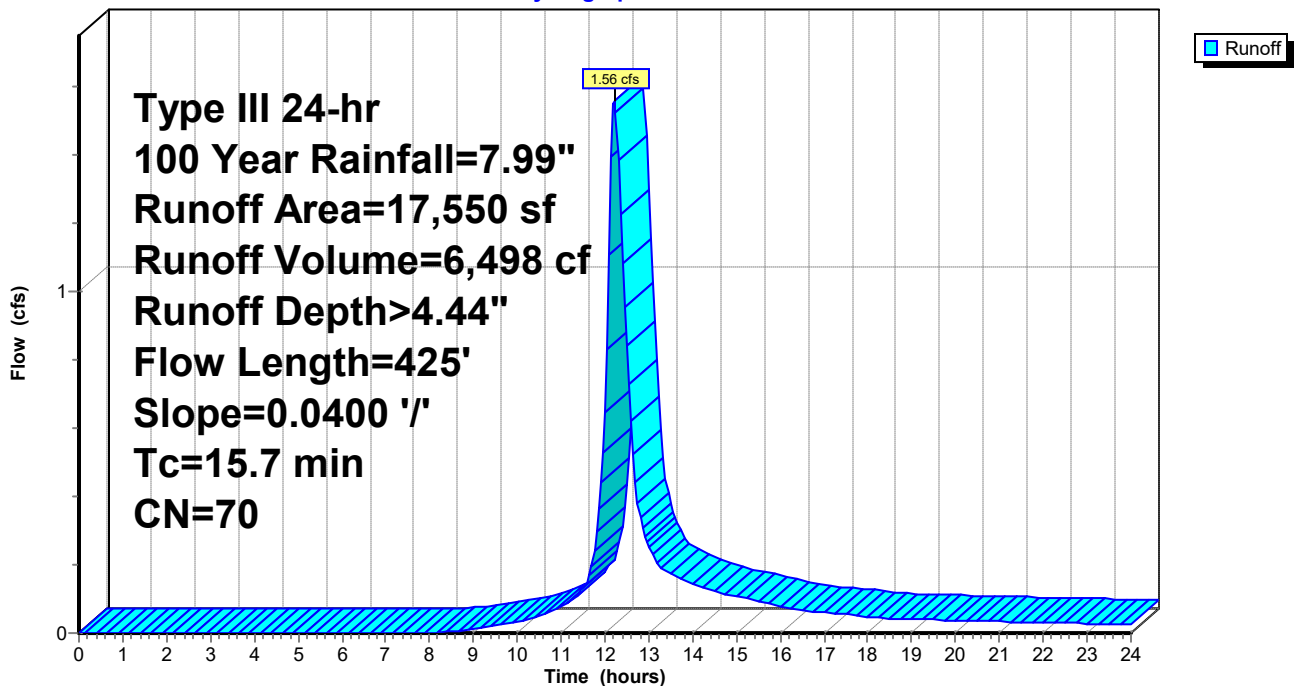
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
17,550	70	Woods, Good, HSG C
17,550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		Sheet Flow, FLOW THROUGH WOODS
					Woods: Light underbrush n= 0.400 P2= 3.18"
6.2	375	0.0400	1.00		Shallow Concentrated Flow, FLOW THROUGH WOODS
					Woodland Kv= 5.0 fps
15.7	425	Total			

Subcatchment P10: (new Subcat)

Hydrograph



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Summary for Subcatchment P1A: P1A

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 1,892 cf, Depth> 6.91"
 Routed to Pond CB1 : (new Pond)

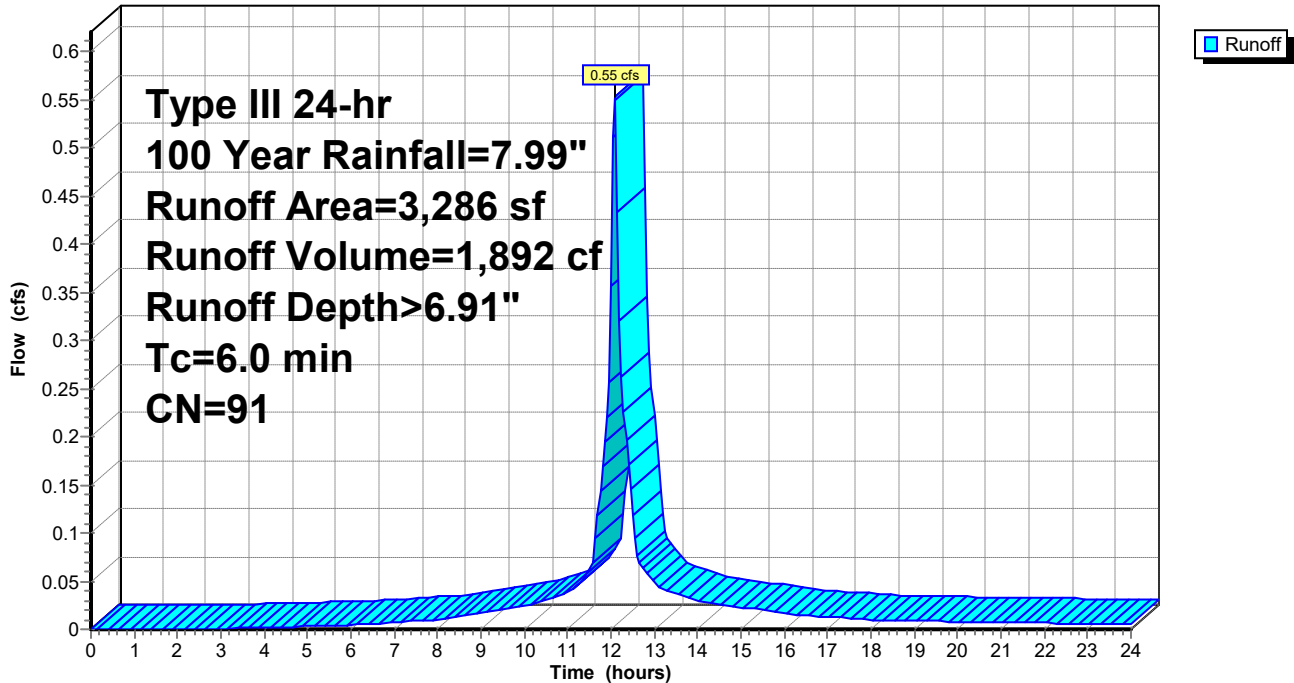
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
1,799	86	<50% Grass cover, Poor, HSG C
1,487	98	Paved parking, HSG C
3,286	91	Weighted Average
1,799		54.75% Pervious Area
1,487		45.25% Impervious Area

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

Subcatchment P1A: P1A

Hydrograph



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Summary for Subcatchment P1B: P1B

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 2,153 cf, Depth> 6.91"
 Routed to Pond CB2 : CB2

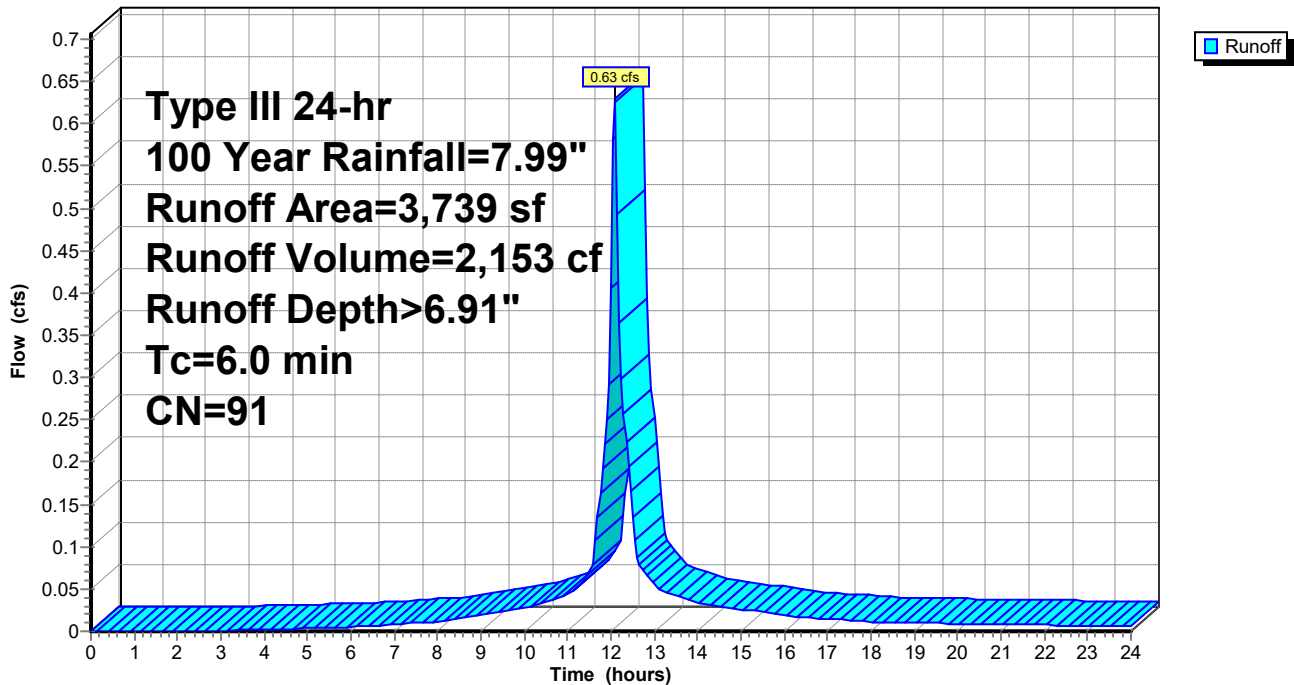
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
1,506	98	Paved parking, HSG C
2,233	86	<50% Grass cover, Poor, HSG C
3,739	91	Weighted Average
2,233		59.72% Pervious Area
1,506		40.28% Impervious Area

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

Subcatchment P1B: P1B

Hydrograph



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Summary for Subcatchment P2: P2

Runoff = 1.34 cfs @ 12.09 hrs, Volume= 4,459 cf, Depth> 6.55"
Routed to Pond SP1 : SUM POND STREET DP-1

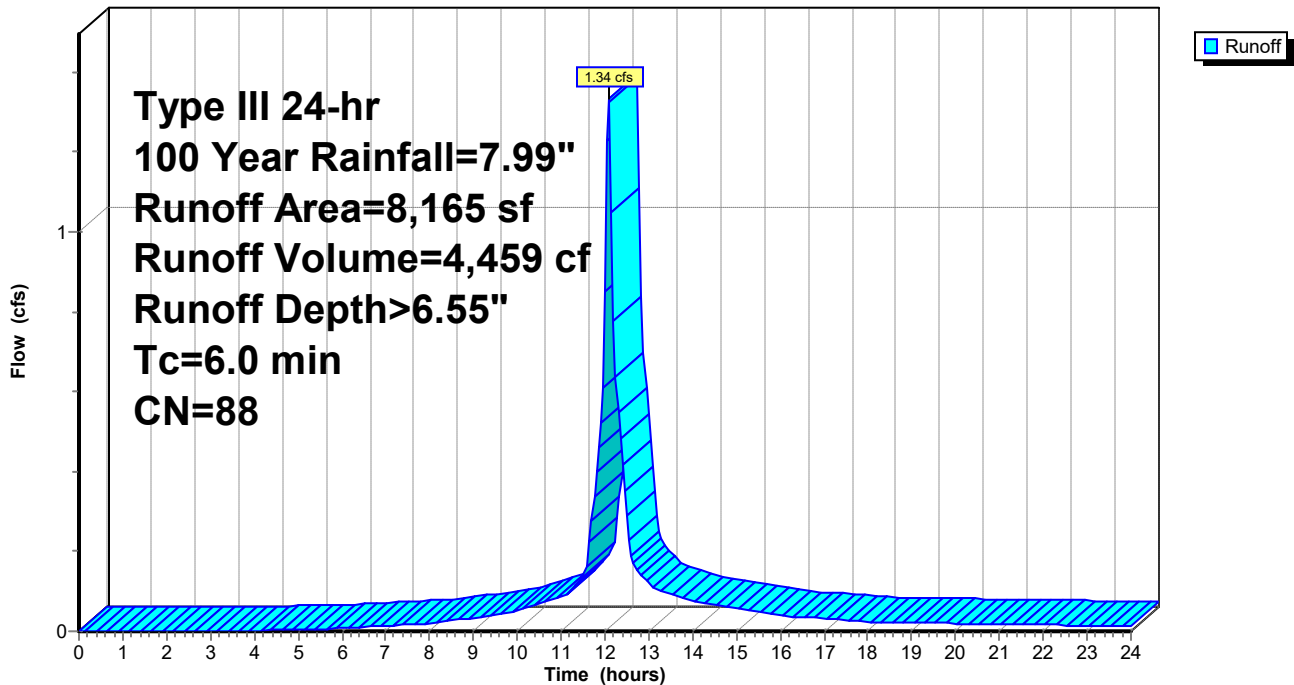
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
1,415	98	Paved parking, HSG C
6,750	86	<50% Grass cover, Poor, HSG C
8,165	88	Weighted Average
6,750		82.67% Pervious Area
1,415		17.33% Impervious Area

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

Subcatchment P2: P2

Hydrograph



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Summary for Subcatchment P3: (new Subcat)

Runoff = 1.93 cfs @ 12.09 hrs, Volume= 6,524 cf, Depth> 6.67"
 Routed to Pond 1P : POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
8,484	86	<50% Grass cover, Poor, HSG C
293	98	Unconnected pavement, HSG C
1,916	98	Paved parking, HSG C
1,041	98	Water Surface, HSG C

11,734	89	Weighted Average
8,484		72.30% Pervious Area
3,250		27.70% Impervious Area
293		9.02% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, FLOW OVER GRASS Grass: Short n= 0.150 P2= 3.18"
1.3	120	0.0500	1.57		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0125	2.27		Shallow Concentrated Flow, FLOW OVER DRIVEWAY Paved Kv= 20.3 fps
6.2	250	Total			

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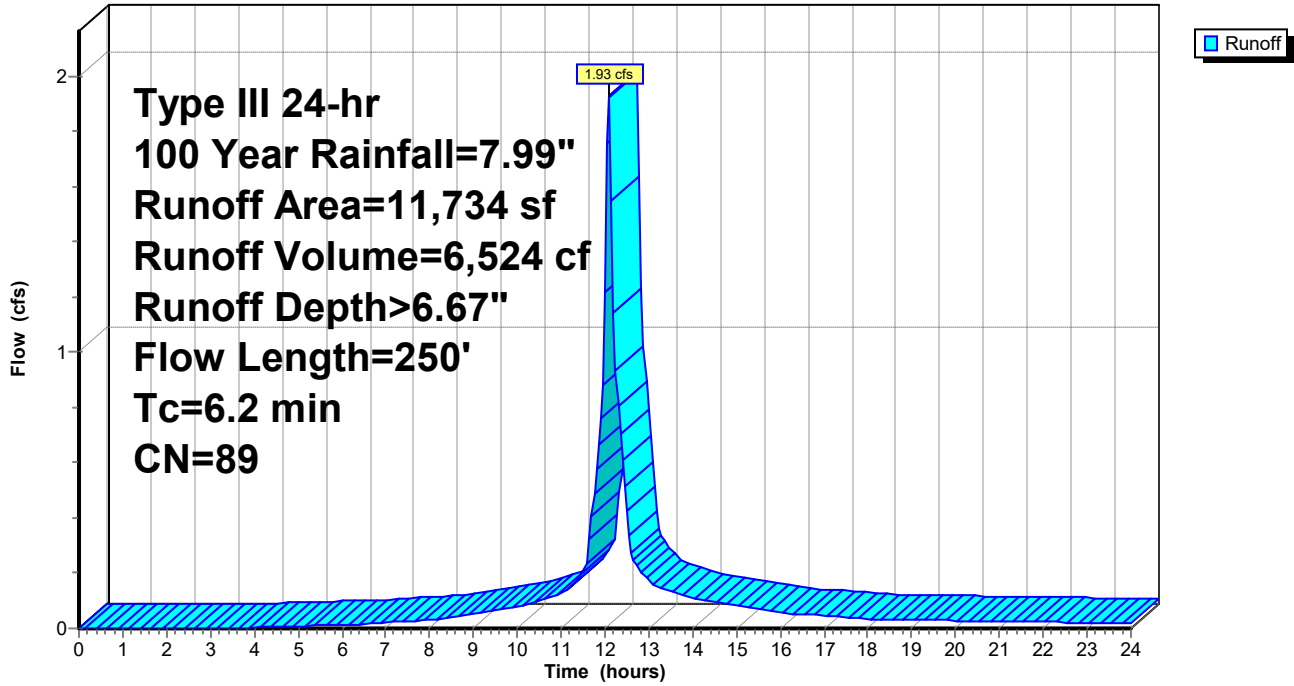
Type III 24-hr 100 Year Rainfall=7.99"

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Subcatchment P3: (new Subcat)

Hydrograph



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Summary for Subcatchment P4A: FLOW TO CB3

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 3,408 cf, Depth> 7.75"

Routed to Pond CB3 : (new Pond)

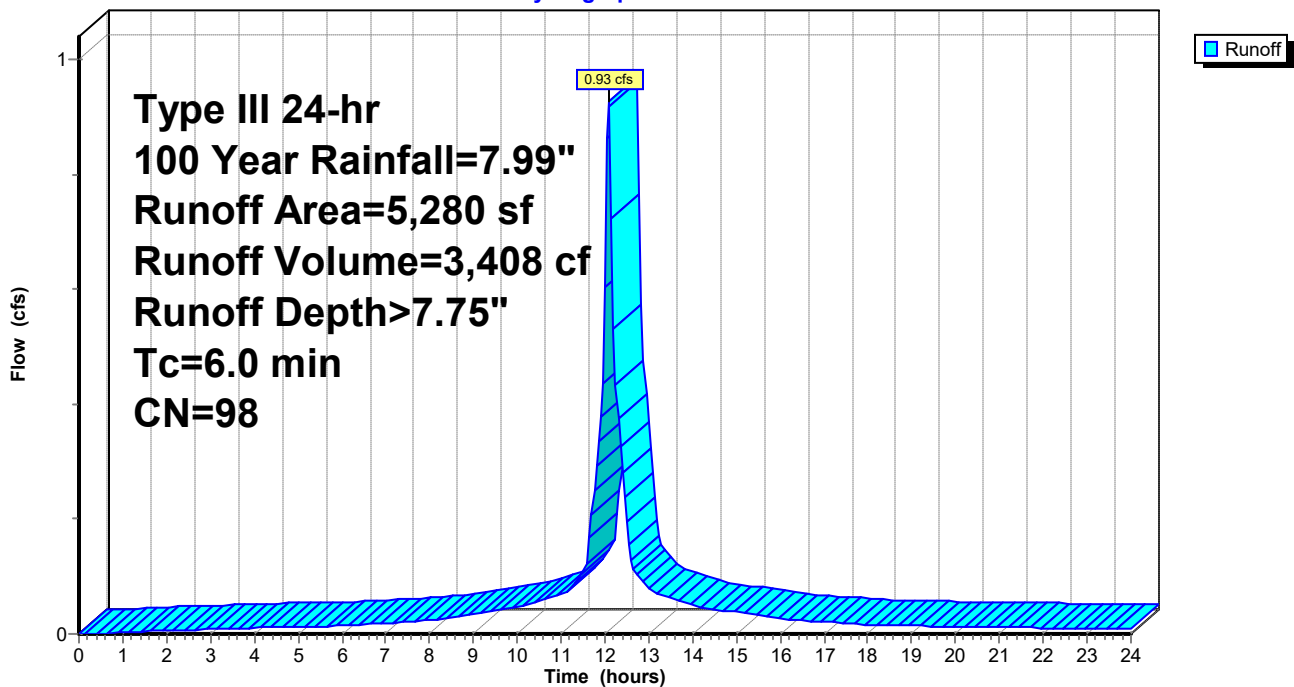
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG C
5,280		100.00% Impervious Area

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

Subcatchment P4A: FLOW TO CB3

Hydrograph



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Summary for Subcatchment P4B: FLOW TO CB4

Runoff = 2.03 cfs @ 12.09 hrs, Volume= 7,045 cf, Depth> 7.15"
 Routed to Pond CB4 : CB4

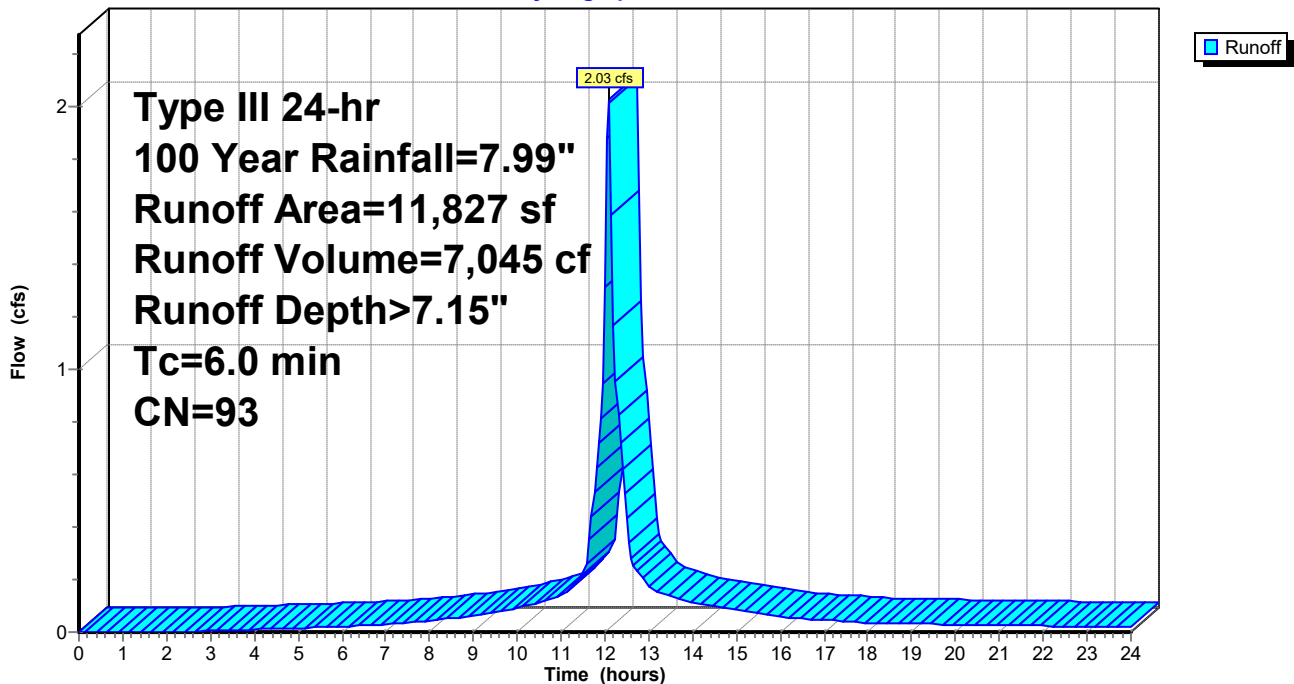
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
7,080	98	Paved parking, HSG C
4,550	86	<50% Grass cover, Poor, HSG C
197	98	Unconnected pavement, HSG C
11,827	93	Weighted Average
4,550		38.47% Pervious Area
7,277		61.53% Impervious Area
197		2.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT TO CB4

Subcatchment P4B: FLOW TO CB4

Hydrograph



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Summary for Subcatchment P5: P5

Runoff = 1.55 cfs @ 12.09 hrs, Volume= 5,321 cf, Depth> 7.03"
 Routed to Pond 2P : POND P2

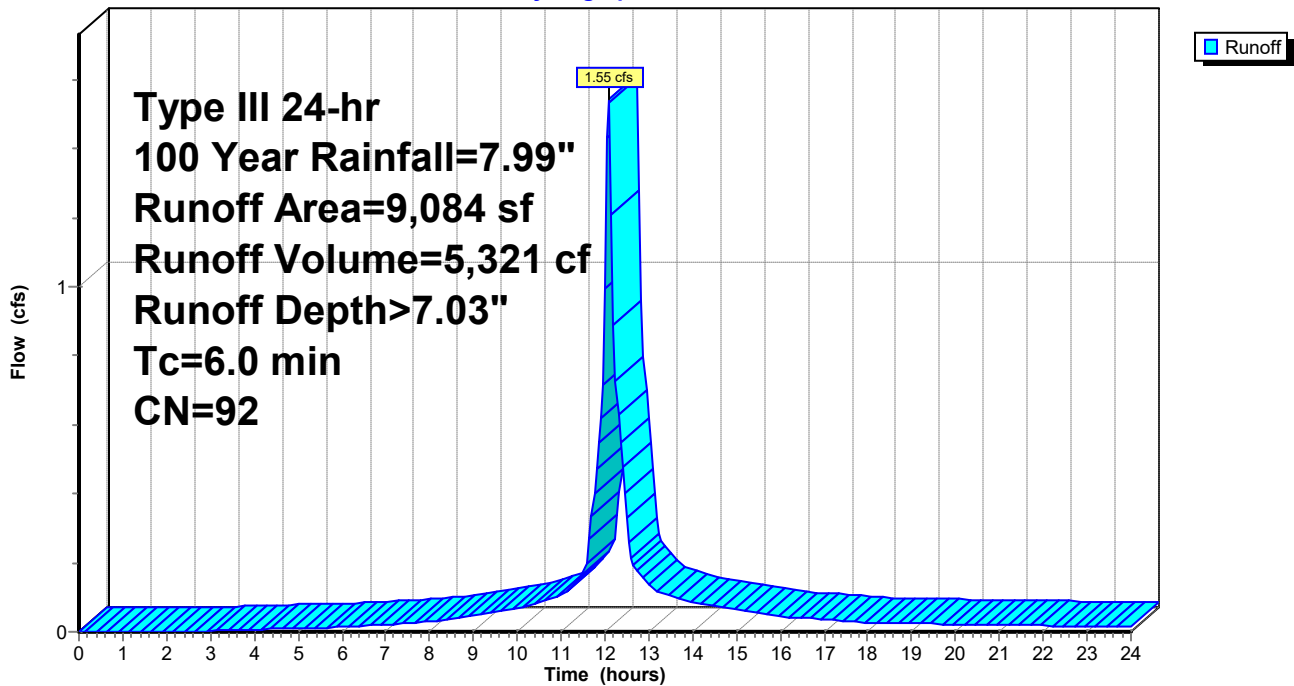
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
4,441	86	<50% Grass cover, Poor, HSG C
1,160	98	Water Surface, HSG C
3,483	98	Paved parking, HSG C
9,084	92	Weighted Average
4,441		48.89% Pervious Area
4,643		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO POND P2

Subcatchment P5: P5

Hydrograph



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Summary for Subcatchment P6: P6

Runoff = 6.27 cfs @ 12.20 hrs, Volume= 25,906 cf, Depth> 5.49"
 Routed to Pond 4P : Wetland Series 'B'

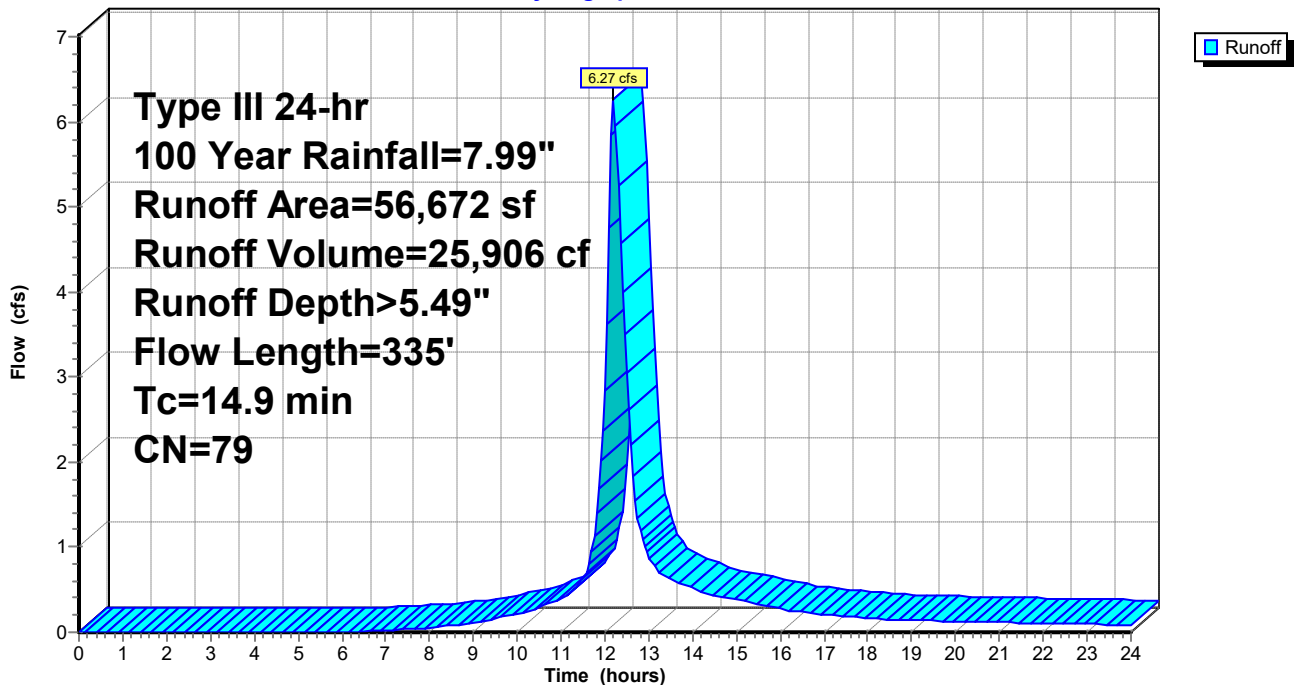
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
27,229	86	<50% Grass cover, Poor, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	79	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

Subcatchment P6: P6

Hydrograph



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Summary for Subcatchment P7: FLOW TO POND 3

Runoff = 1.75 cfs @ 12.19 hrs, Volume= 7,427 cf, Depth> 6.55"
 Routed to Pond 3P : POND 3

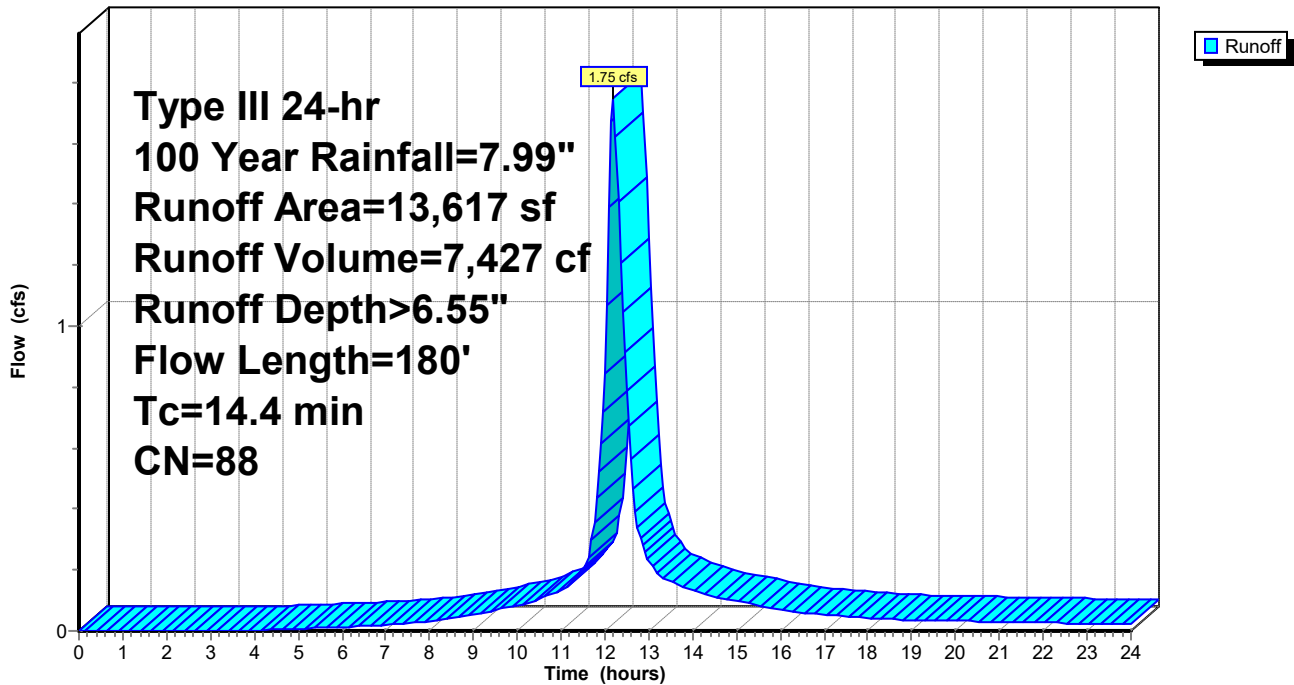
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
11,172	86	<50% Grass cover, Poor, HSG C
1,096	98	Paved parking, HSG C
1,349	98	Water Surface, HSG C
13,617	88	Weighted Average
11,172		82.04% Pervious Area
2,445		17.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, FLOW IN WOODS Woods: Light underbrush n= 0.400 P2= 3.18"
2.0	130	0.0460	1.07		Shallow Concentrated Flow, FLOW THROUGH WOODS Woodland Kv= 5.0 fps
14.4	180	Total			

Subcatchment P7: FLOW TO POND 3

Hydrograph



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Summary for Subcatchment P8: AREA AROUND POND 1

Runoff = 1.13 cfs @ 12.09 hrs, Volume= 3,922 cf, Depth> 7.15"
 Routed to Pond 1P : POND 1

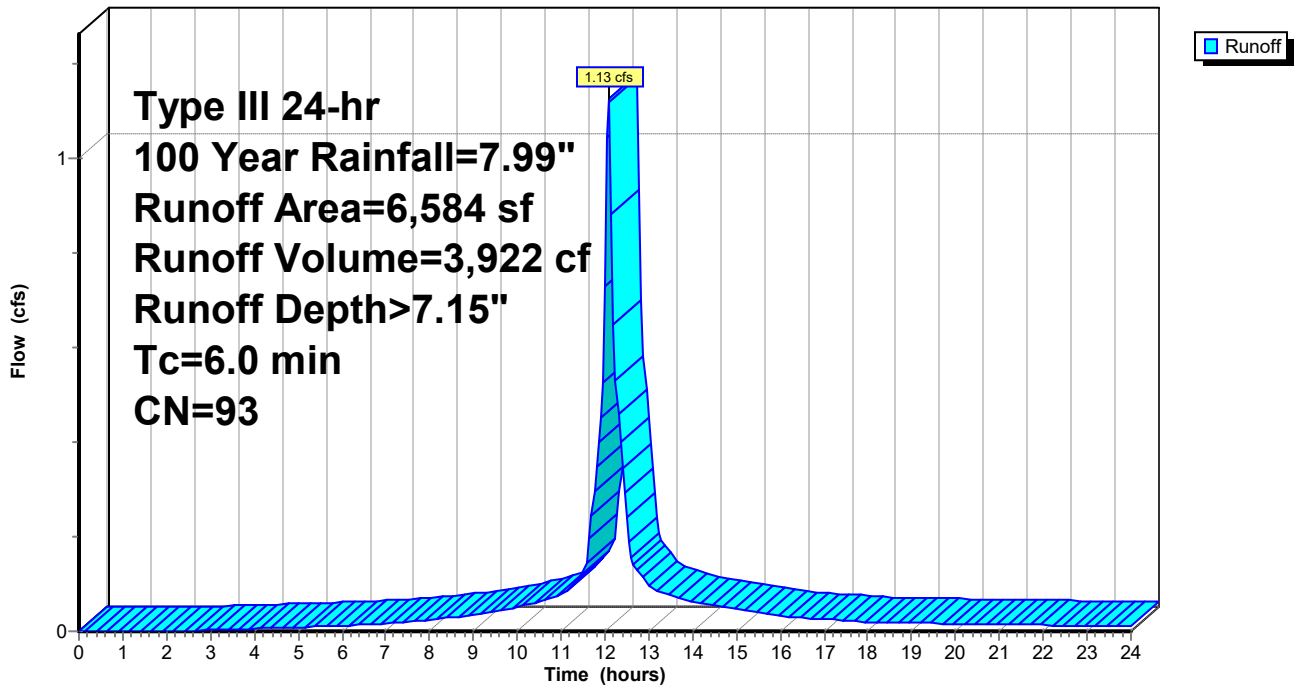
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
2,650	86	<50% Grass cover, Poor, HSG C
3,934	98	Water Surface, HSG C
6,584	93	Weighted Average
2,650		40.25% Pervious Area
3,934		59.75% Impervious Area

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

Subcatchment P8: AREA AROUND POND 1

Hydrograph



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Summary for Subcatchment P9: (new Subcat)

Runoff = 4.95 cfs @ 12.09 hrs, Volume= 15,959 cf, Depth> 5.73"
 Routed to Pond SP2 : SUM POND WOODS DP-2

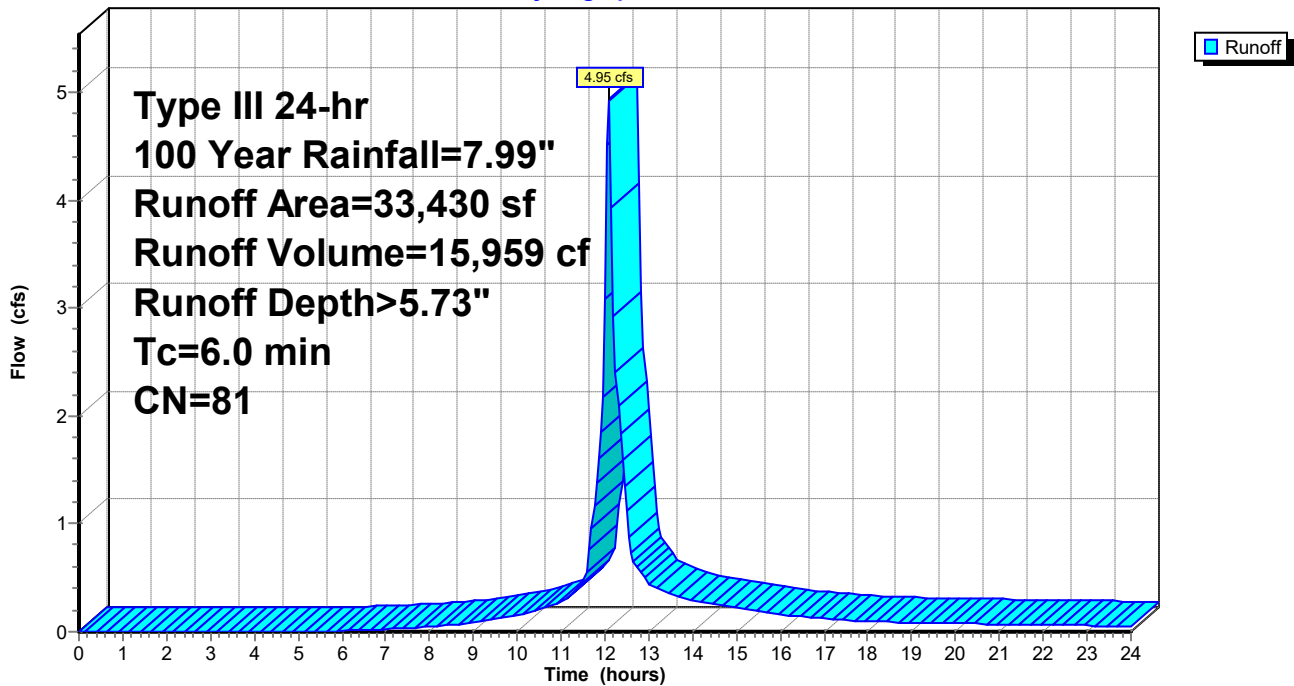
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
23,170	86	<50% Grass cover, Poor, HSG C
10,260	70	Woods, Good, HSG C
33,430	81	Weighted Average
33,430		100.00% Pervious Area

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

Subcatchment P9: (new Subcat)

Hydrograph



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Summary for Subcatchment R1: IOT 1 ROOF

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,269 cf, Depth> 7.75"
Routed to Pond 2P : POND P2

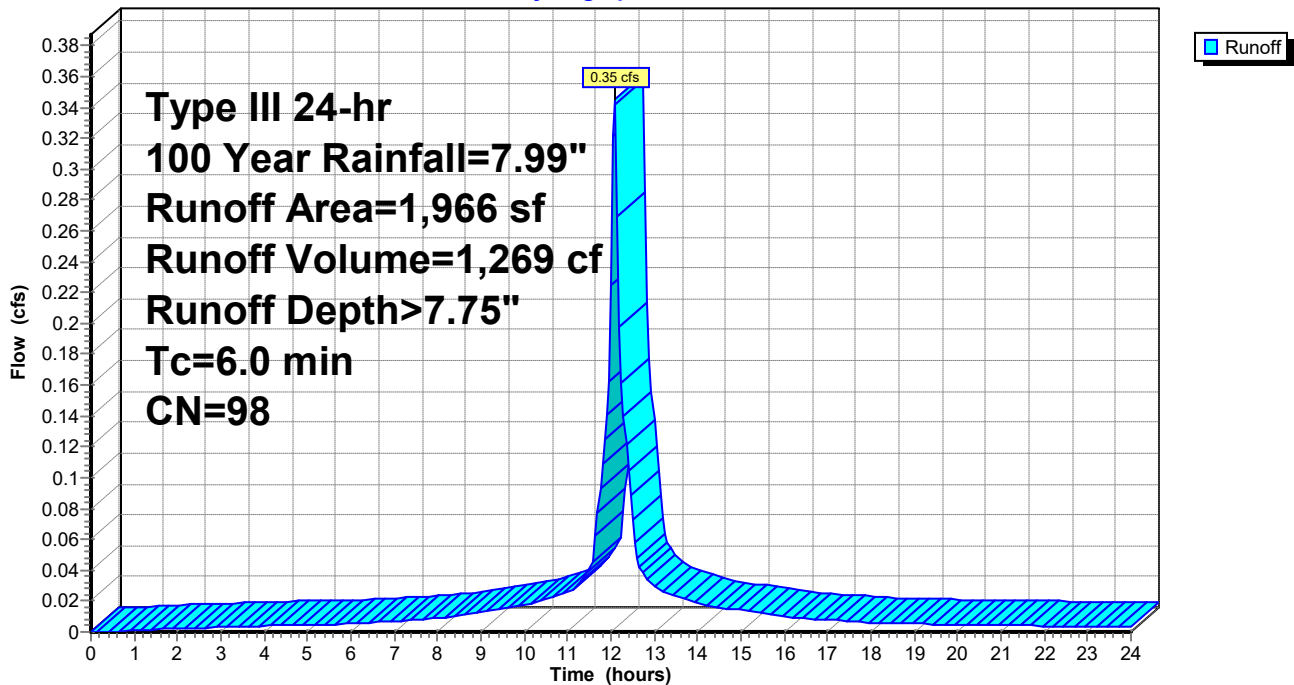
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
1,966	98	Roofs, HSG C
1,966		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW FROM ROOF TO POND

Subcatchment R1: IOT 1 ROOF

Hydrograph



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Summary for Subcatchment R2: LOT 2 ROOF

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,455 cf, Depth> 7.75"
Routed to Pond 3P : POND 3

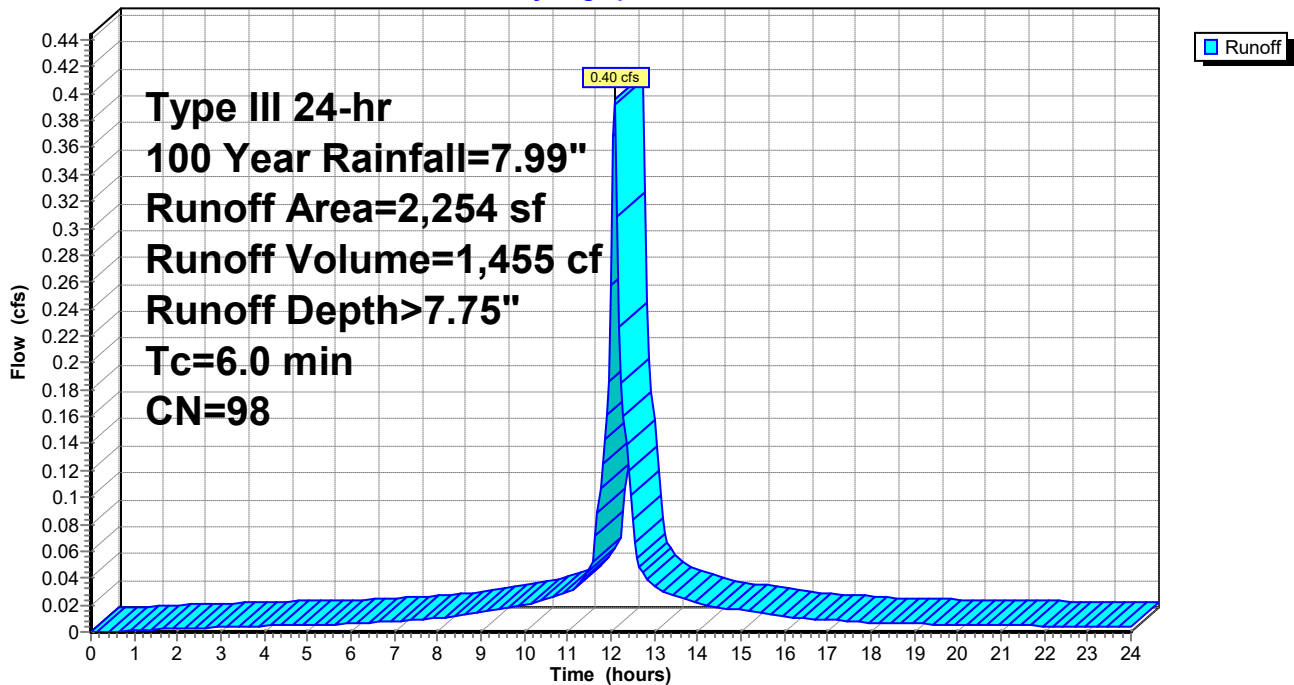
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW IN GUTTERS AND PIPES TO POND 3

Subcatchment R2: LOT 2 ROOF

Hydrograph



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Summary for Subcatchment R3: (new Subcat)

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,455 cf, Depth> 7.75"
Routed to Pond 1P : POND 1

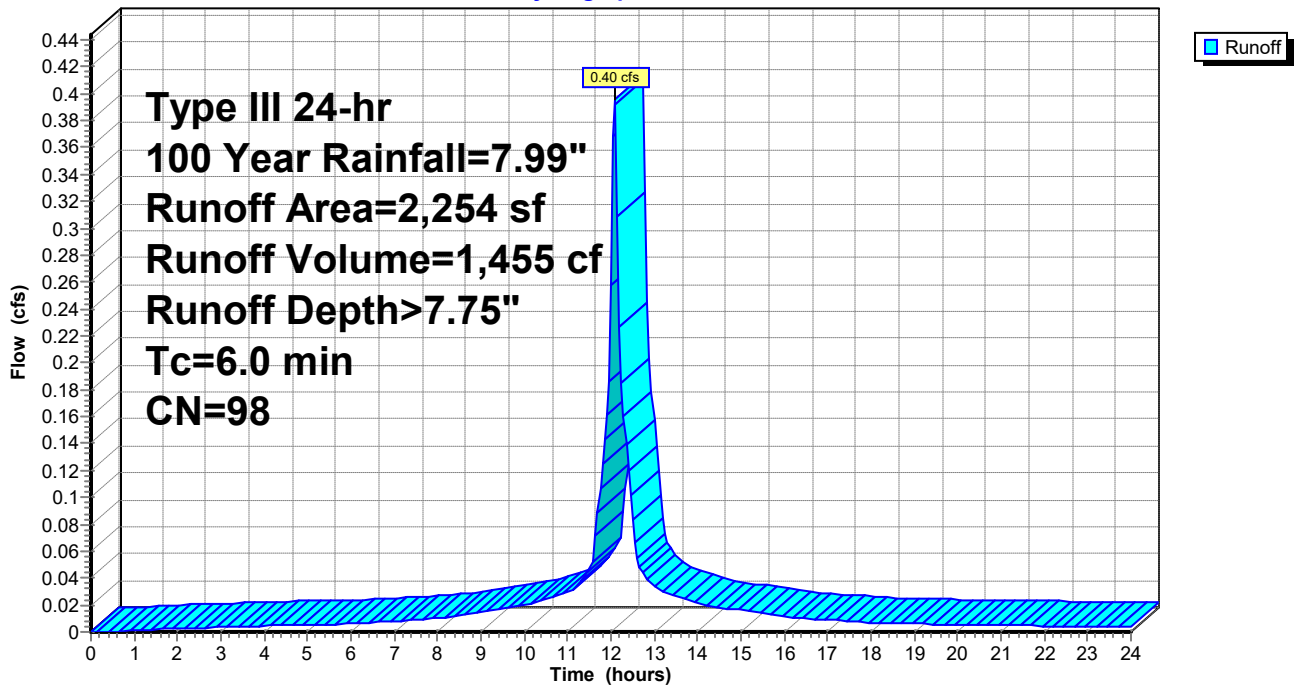
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=7.99"

Area (sf)	CN	Description
2,254	98	Roofs, HSG C
2,254		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW THROUGH GUTTERS TO POND

Subcatchment R3: (new Subcat)

Hydrograph



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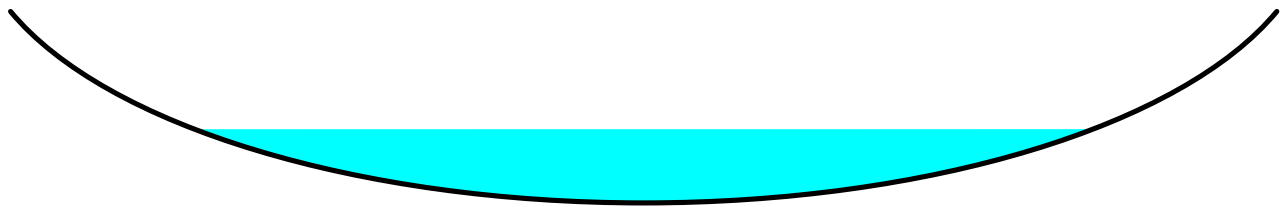
Summary for Reach 2R: Flow to WETL Series 'B'

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth = 3.13" for 100 Year event
 Inflow = 1.53 cfs @ 12.13 hrs, Volume= 2,881 cf
 Outflow = 1.53 cfs @ 12.15 hrs, Volume= 2,881 cf, Atten= 0%, Lag= 1.1 min
 Routed to Pond 4P : Wetland Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.97 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 0.32 fps, Avg. Travel Time= 3.6 min

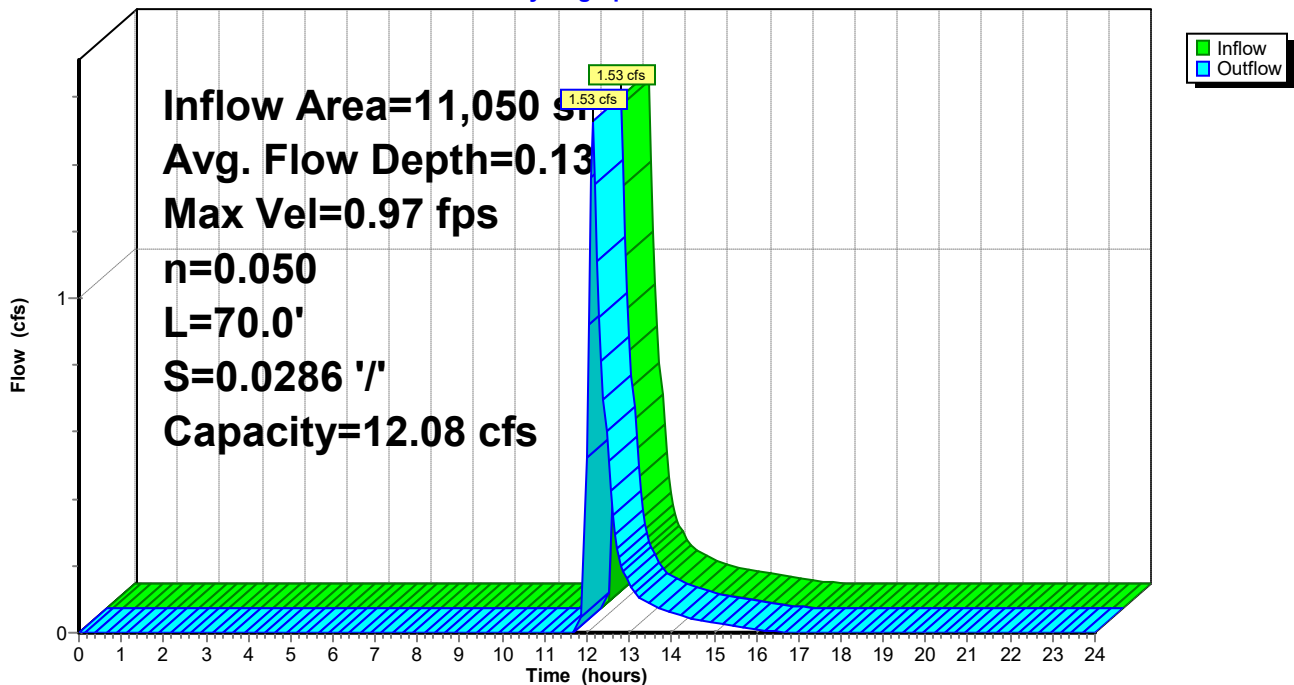
Peak Storage= 110 cf @ 12.15 hrs
 Average Depth at Peak Storage= 0.13' , Surface Width= 18.62'
 Bank-Full Depth= 0.33' Flow Area= 6.6 sf, Capacity= 12.08 cfs

30.00' x 0.33' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
 Length= 70.0' Slope= 0.0286 '/'
 Inlet Invert= 263.00', Outlet Invert= 261.00'



Reach 2R: Flow to WETL Series 'B'

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Summary for Pond 1P: POND 1

Inflow Area = 44,704 sf, 55.90% Impervious, Inflow Depth > 7.09" for 100 Year event
 Inflow = 7.60 cfs @ 12.09 hrs, Volume= 26,399 cf
 Outflow = 3.28 cfs @ 12.29 hrs, Volume= 24,045 cf, Atten= 57%, Lag= 11.9 min
 Discarded = 0.12 cfs @ 12.28 hrs, Volume= 5,267 cf
 Primary = 3.16 cfs @ 12.29 hrs, Volume= 18,778 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.22' @ 12.28 hrs Surf.Area= 5,114 sf Storage= 9,298 cf
 Flood Elev= 263.00' Surf.Area= 6,275 sf Storage= 13,707 cf

Plug-Flow detention time= 112.5 min calculated for 23,995 cf (91% of inflow)
 Center-of-Mass det. time= 67.8 min (832.8 - 765.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	259.50'	13,707 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)	
259.50	1,956	257.0	0	0	1,956	
260.00	2,410	269.0	1,090	1,090	2,475	
261.00	3,525	292.0	2,950	4,039	3,540	
262.00	4,800	393.0	4,146	8,186	9,056	
263.00	6,275	518.0	5,521	13,707	18,129	

Device	Routing	Invert	Outlet Devices	
#1	Primary	259.00'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.00' / 258.00' S= 0.0333 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf	
#2	Device 1	260.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#3	Device 1	261.50'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Discarded	259.50'	1.020 in/hr Exfiltration over Surface area	
#5	Primary	262.20'	10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74	

Discarded OutFlow Max=0.12 cfs @ 12.28 hrs HW=262.22' (Free Discharge)
 ↳ **4=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=3.15 cfs @ 12.29 hrs HW=262.22' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 3.07 cfs of 6.24 cfs potential flow)
 ↳ **2=Orifice/Grate** (Orifice Controls 0.83 cfs @ 6.12 fps)
 ↳ **3=Orifice/Grate** (Orifice Controls 2.23 cfs @ 4.09 fps)
 ↳ **5=Broad-Crested Rectangular Weir** (Weir Controls 0.08 cfs @ 0.37 fps)

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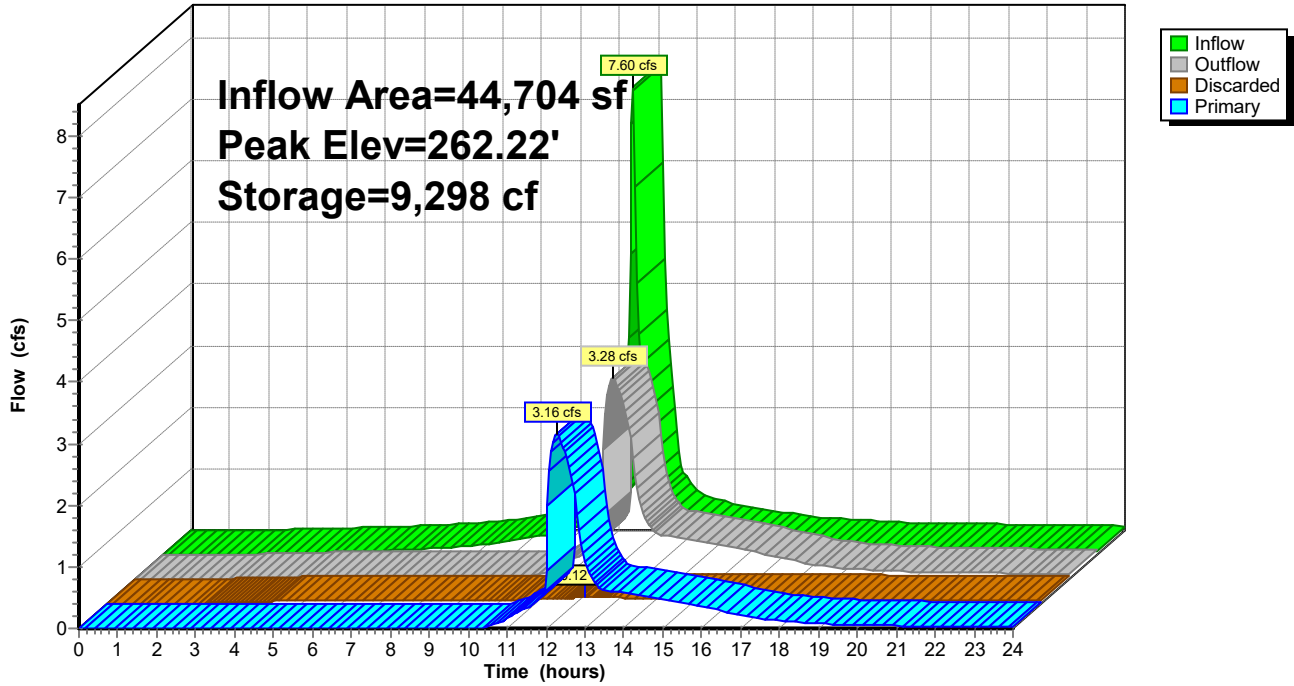
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Pond 1P: POND 1

Hydrograph



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Summary for Pond 2P: POND P2

Inflow Area = 11,050 sf, 59.81% Impervious, Inflow Depth > 7.16" for 100 Year event
 Inflow = 1.89 cfs @ 12.09 hrs, Volume= 6,590 cf
 Outflow = 1.58 cfs @ 12.13 hrs, Volume= 6,162 cf, Atten= 16%, Lag= 2.6 min
 Discarded = 0.06 cfs @ 12.15 hrs, Volume= 3,282 cf
 Primary = 1.53 cfs @ 12.13 hrs, Volume= 2,881 cf
 Routed to Reach 2R : Flow to WETL Series 'B'

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.19' @ 12.15 hrs Surf.Area= 2,385 sf Storage= 1,483 cf
 Flood Elev= 263.50' Surf.Area= 2,650 sf Storage= 2,259 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 69.5 min (832.9 - 763.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.50'	2,259 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)	
262.50	1,940	193.0	0	0	1,940	
263.00	2,228	235.0	1,041	1,041	3,374	
263.50	2,650	232.0	1,218	2,259	3,536	

Device	Routing	Invert	Outlet Devices												
#1	Discarded	262.50'	1.020 in/hr Exfiltration over Surface area												
#2	Primary	263.00'	10.0' long x 5.0' 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)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65	2.65		
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88				

Discarded OutFlow Max=0.06 cfs @ 12.15 hrs HW=263.19' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.41 cfs @ 12.13 hrs HW=263.19' TW=263.12' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 1.41 cfs @ 0.75 fps)

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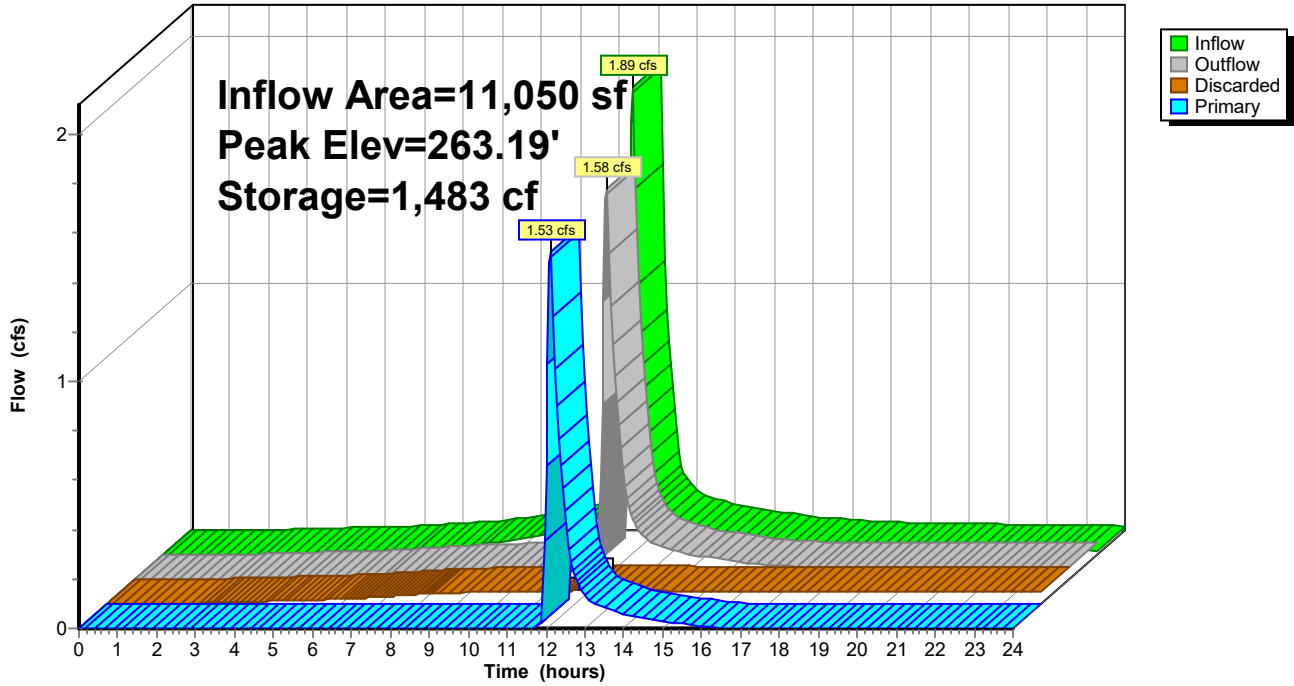
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Pond 2P: POND P2

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Summary for Pond 3P: POND 3

Inflow Area = 15,871 sf, 29.61% Impervious, Inflow Depth > 6.72" for 100 Year event
 Inflow = 2.01 cfs @ 12.17 hrs, Volume= 8,882 cf
 Outflow = 1.87 cfs @ 12.24 hrs, Volume= 8,226 cf, Atten= 7%, Lag= 4.0 min
 Discarded = 0.05 cfs @ 12.24 hrs, Volume= 2,467 cf
 Primary = 1.82 cfs @ 12.24 hrs, Volume= 5,760 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 264.17' @ 12.24 hrs Surf.Area= 2,313 sf Storage= 2,273 cf
 Flood Elev= 265.00' Surf.Area= 3,131 sf Storage= 4,528 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 59.3 min (840.1 - 780.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	262.75'	4,528 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)	
262.75	954	190.0	0	0	954	
264.00	2,162	300.0	1,897	1,897	5,254	
265.00	3,131	282.0	2,632	4,528	6,137	

Device	Routing	Invert	Outlet Devices											
#1	Primary	263.05'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.05' / 261.50' S= 0.0775 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf											
#2	Device 1	263.30'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads											
#3	Primary	264.00'	10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#4	Discarded	262.75'	1.020 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.05 cfs @ 12.24 hrs HW=264.17' (Free Discharge)
 ↑**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.80 cfs @ 12.24 hrs HW=264.17' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Passes 0.20 cfs of 2.97 cfs potential flow)
 ↑**2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 4.15 fps)
 ↑**3=Broad-Crested Rectangular Weir** (Weir Controls 1.60 cfs @ 0.96 fps)

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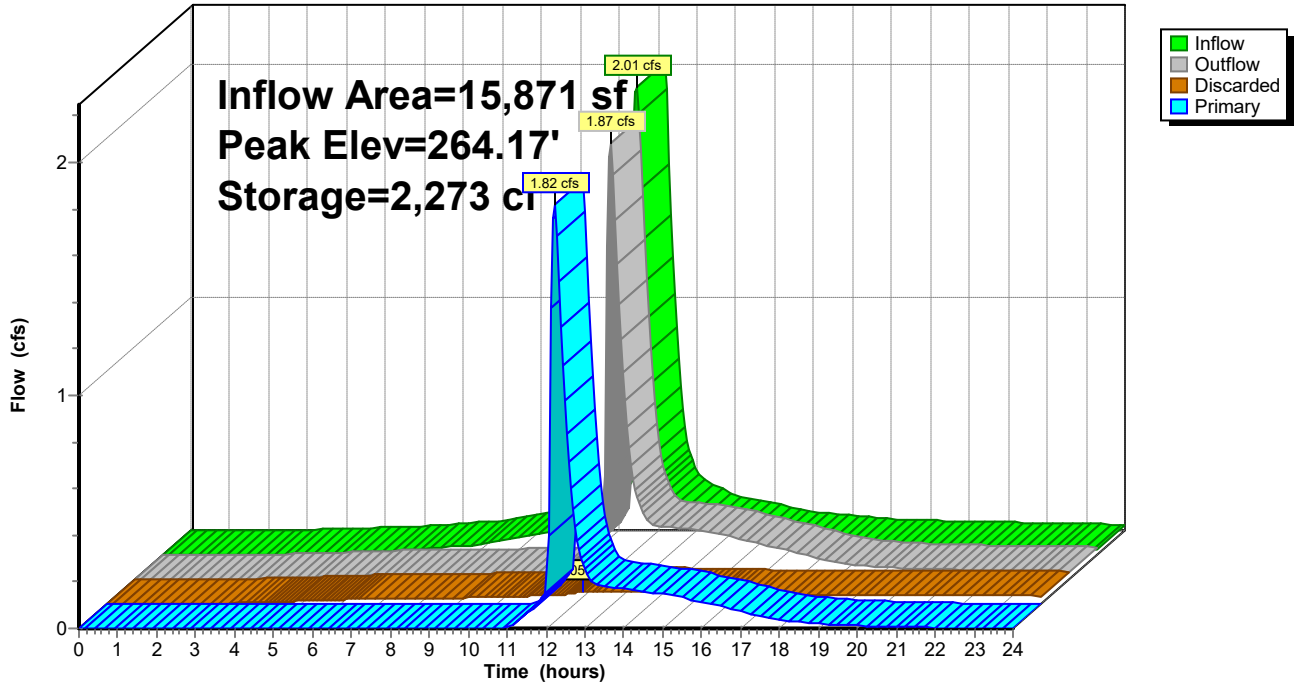
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Pond 3P: POND 3

Hydrograph



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Summary for Pond 4P: Wetland Series 'B'

Inflow Area = 67,722 sf, 11.24% Impervious, Inflow Depth > 5.10" for 100 Year event
 Inflow = 7.63 cfs @ 12.19 hrs, Volume= 28,786 cf
 Outflow = 7.62 cfs @ 12.20 hrs, Volume= 28,786 cf, Atten= 0%, Lag= 0.8 min
 Primary = 7.62 cfs @ 12.20 hrs, Volume= 28,786 cf
 Routed to Pond SP2 : SUM POND WOODS DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 259.59' @ 12.20 hrs Surf.Area= 569 sf Storage= 207 cf

Plug-Flow detention time= 0.2 min calculated for 28,726 cf (100% of inflow)
 Center-of-Mass det. time= 0.2 min (806.9 - 806.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	258.65'	7,771 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)
258.65	5	9.0	0	0	5
259.00	125	47.0	18	18	175
259.70	685	102.0	257	275	829
260.00	933	125.0	242	517	1,246
261.00	3,333	263.0	2,010	2,527	5,511
262.00	7,425	350.0	5,244	7,771	9,766

Device	Routing	Invert	Outlet Devices
#1	Primary	260.00'	12.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 260.00' / 259.00' S= 0.0833 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	258.65'	25.00' long x 2.00' breadth x 1.00' high Rock Fill Rock Diam.= 8.000", S.D.= 2.000", Voids= 40.0%

Primary OutFlow Max=7.59 cfs @ 12.20 hrs HW=259.59' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Controls 0.00 cfs)
- 2=Rock Fill (Rockfill Controls 7.59 cfs @ 0.65 fps)

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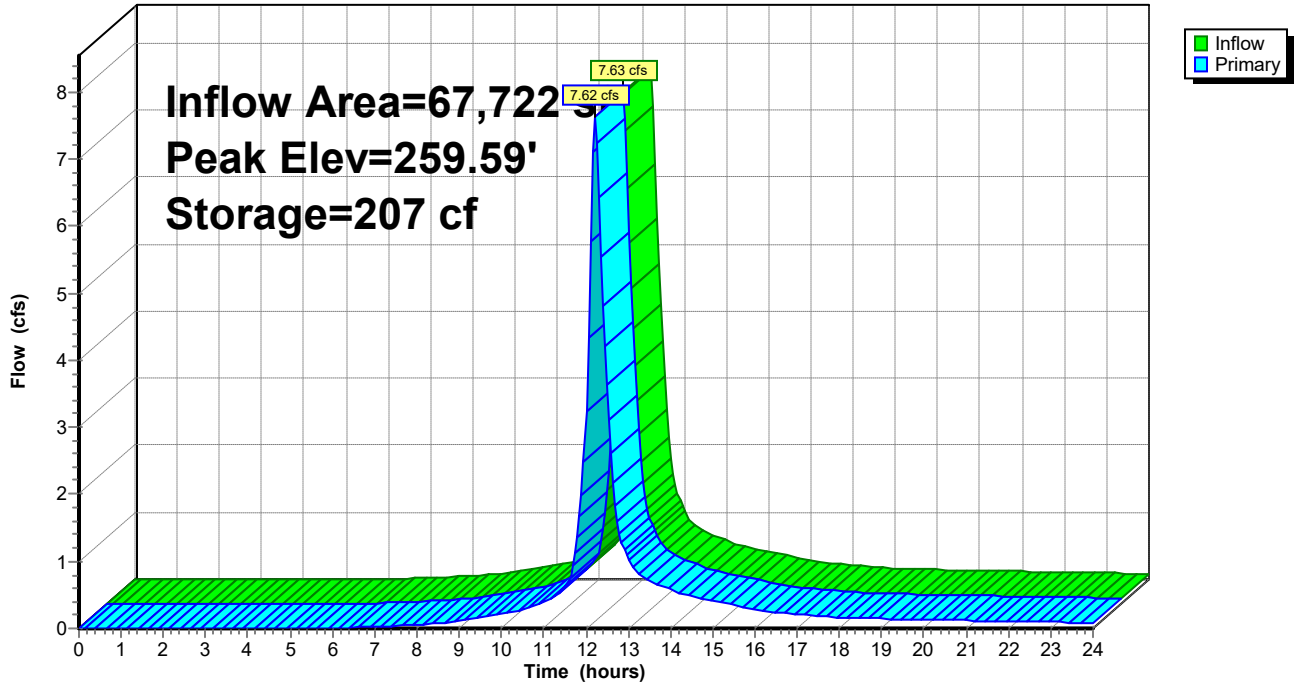
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Pond 4P: Wetland Series 'B'

Hydrograph



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Summary for Pond CB1: (new Pond)

Inflow Area = 3,286 sf, 45.25% Impervious, Inflow Depth > 6.91" for 100 Year event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 1,892 cf
Outflow = 0.55 cfs @ 12.09 hrs, Volume= 1,892 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.09 hrs, Volume= 1,892 cf
Routed to Pond MH1 : MH1

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

Peak Elev= 263.18' @ 12.24 hrs

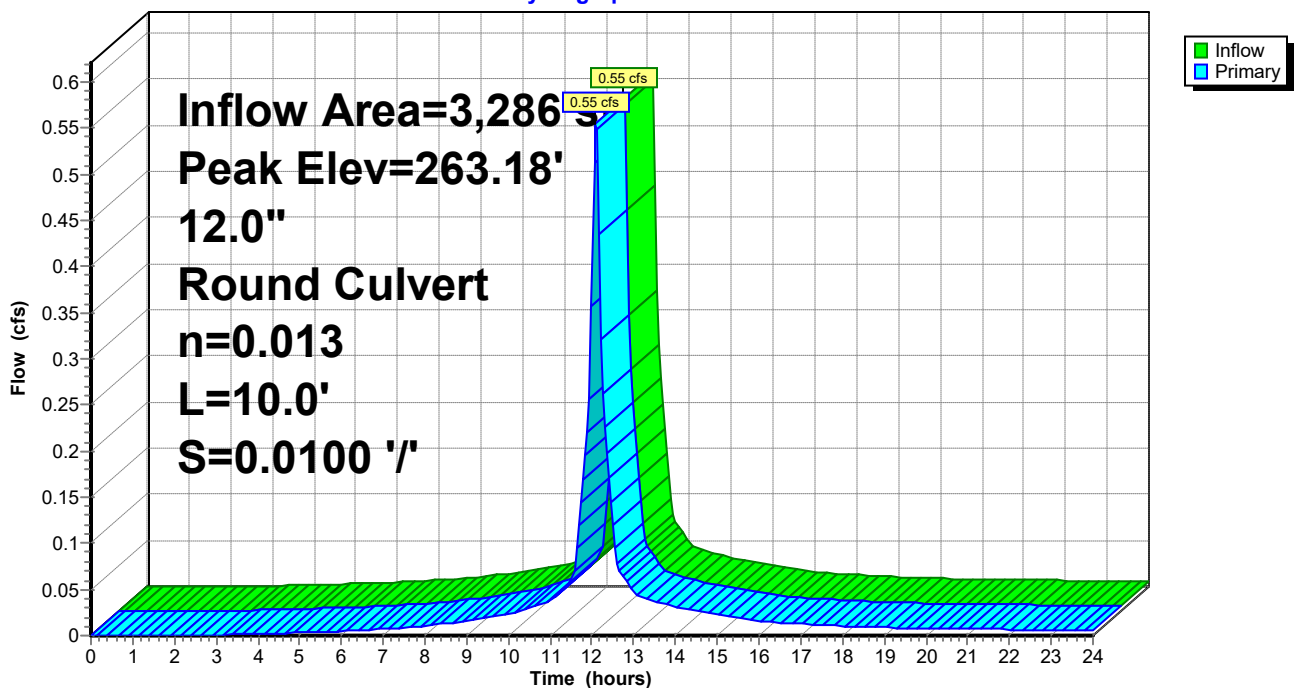
Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.47' TW=262.55' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond CB1: (new Pond)

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,739 sf, 40.28% Impervious, Inflow Depth > 6.91" for 100 Year event
 Inflow = 0.63 cfs @ 12.09 hrs, Volume= 2,153 cf
 Outflow = 0.63 cfs @ 12.09 hrs, Volume= 2,153 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.09 hrs, Volume= 2,153 cf
 Routed to Pond MH1 : MH1

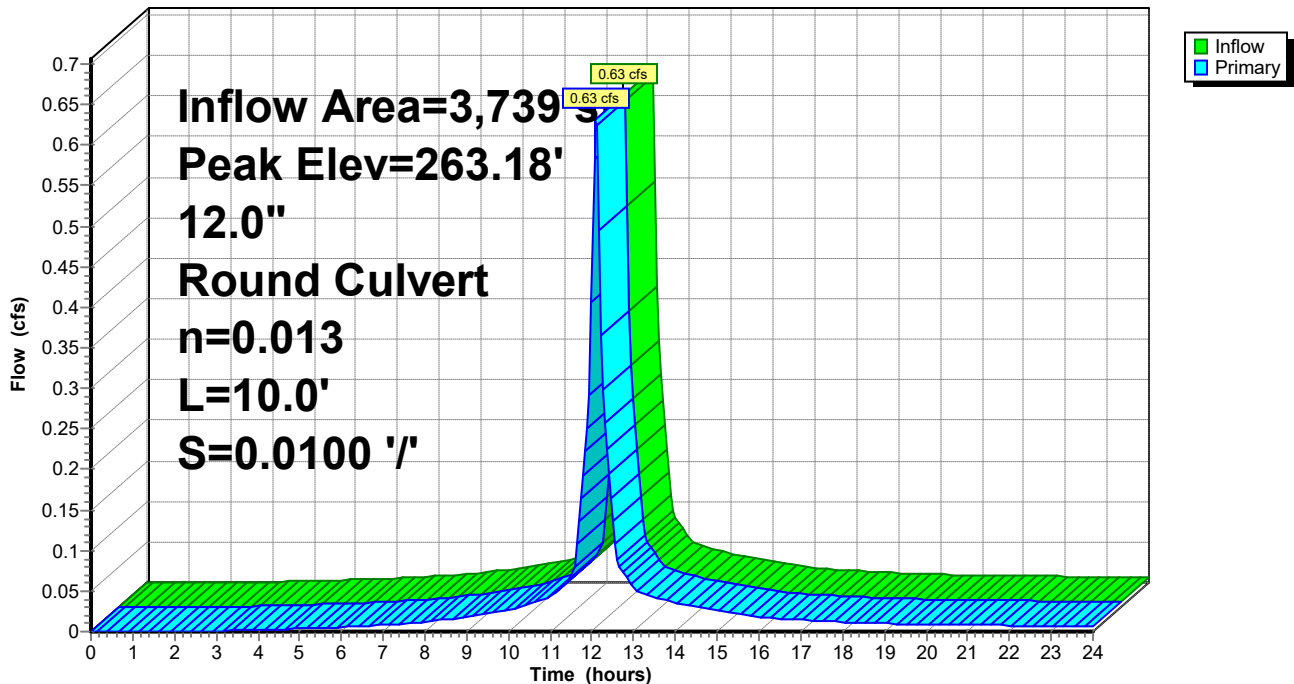
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.18' @ 12.24 hrs
 Flood Elev= 264.40'

Device #	Routing	Invert	Outlet Devices
1	Primary	261.90'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.90' / 261.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.49' TW=262.55' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond CB2: CB2

Hydrograph



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Summary for Pond CB3: (new Pond)

Inflow Area = 5,280 sf, 100.00% Impervious, Inflow Depth > 7.75" for 100 Year event
 Inflow = 0.93 cfs @ 12.09 hrs, Volume= 3,408 cf
 Outflow = 0.93 cfs @ 12.09 hrs, Volume= 3,408 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.93 cfs @ 12.09 hrs, Volume= 3,408 cf
 Routed to Pond MH3 : DMH3

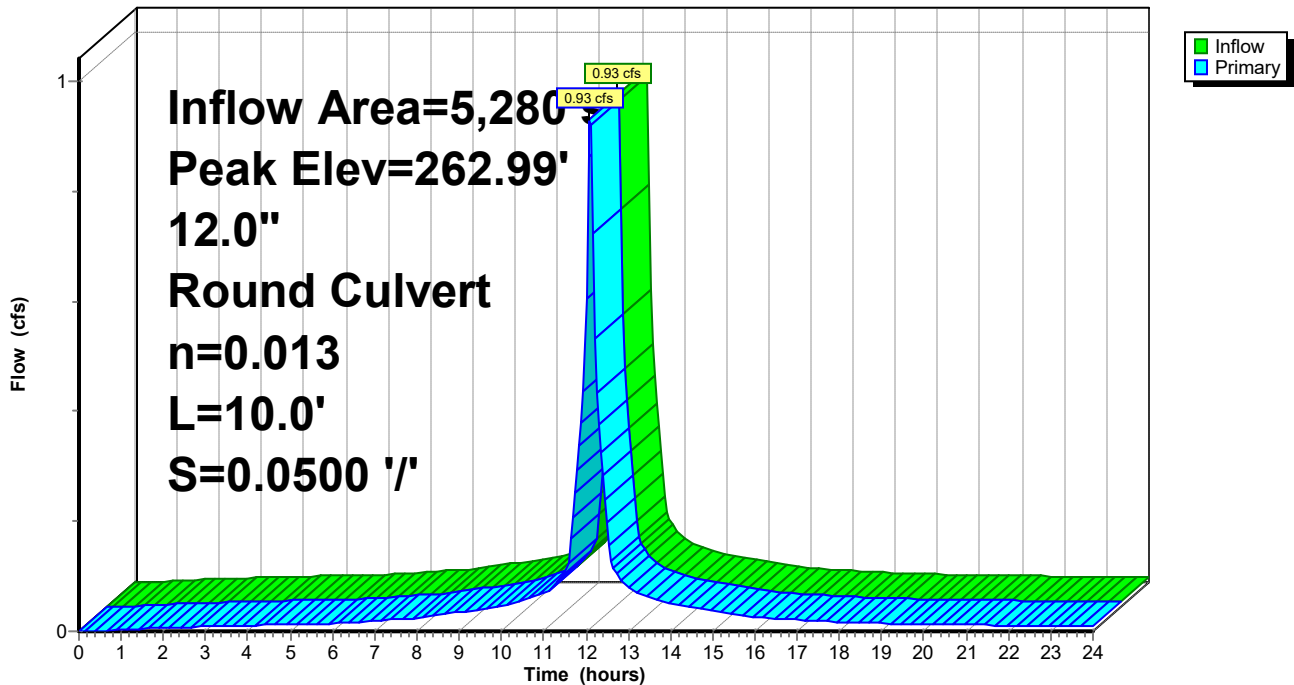
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.99' @ 12.15 hrs
 Flood Elev= 263.50'

Device #	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.50' TW=262.87' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond CB3: (new Pond)

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 11,827 sf, 61.53% Impervious, Inflow Depth > 7.15" for 100 Year event
Inflow = 2.03 cfs @ 12.09 hrs, Volume= 7,045 cf
Outflow = 2.03 cfs @ 12.09 hrs, Volume= 7,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.03 cfs @ 12.09 hrs, Volume= 7,045 cf
Routed to Pond MH3 : DMH3

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

Peak Elev= 263.14' @ 12.14 hrs

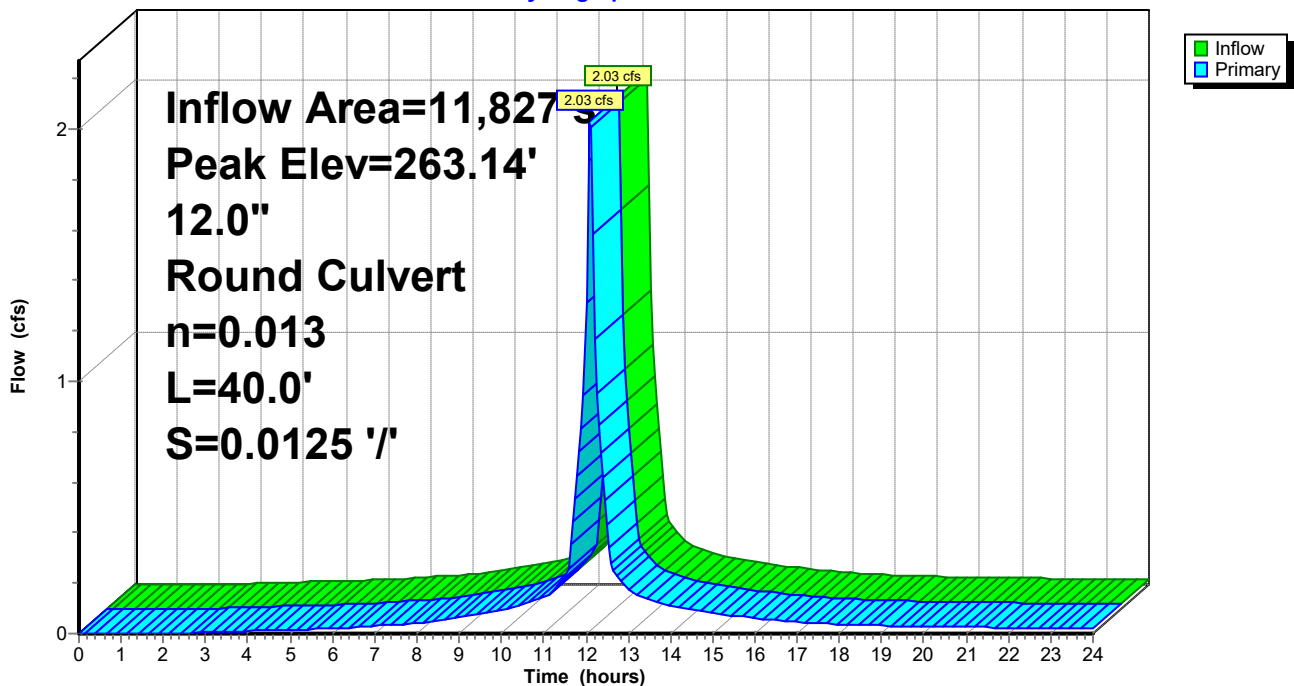
Flood Elev= 263.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	260.50'	12.0" Round Culvert L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.50' / 260.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.73' TW=262.87' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond CB4: CB4

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Summary for Pond MH1: MH1

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 6.91" for 100 Year event
Inflow = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf
Outflow = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf
Routed to Pond MH2 : MH2

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

Peak Elev= 263.17' @ 12.19 hrs

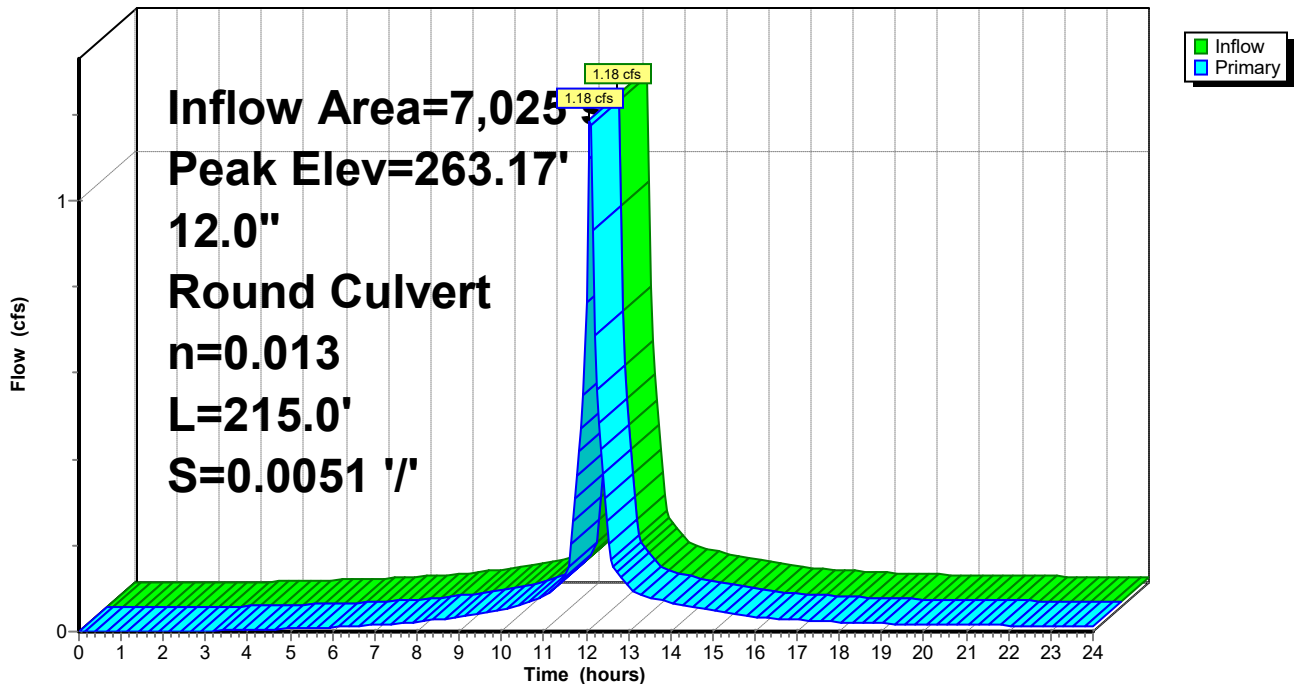
Flood Elev= 265.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	261.70'	12.0" Round Culvert L= 215.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 261.70' / 260.60' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.55' TW=262.63' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond MH1: MH1

Hydrograph



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Summary for Pond MH2: MH2

Inflow Area = 7,025 sf, 42.60% Impervious, Inflow Depth > 6.91" for 100 Year event
Inflow = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf
Outflow = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.09 hrs, Volume= 4,045 cf
Routed to Pond MH3 : DMH3

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

Peak Elev= 263.07' @ 12.15 hrs

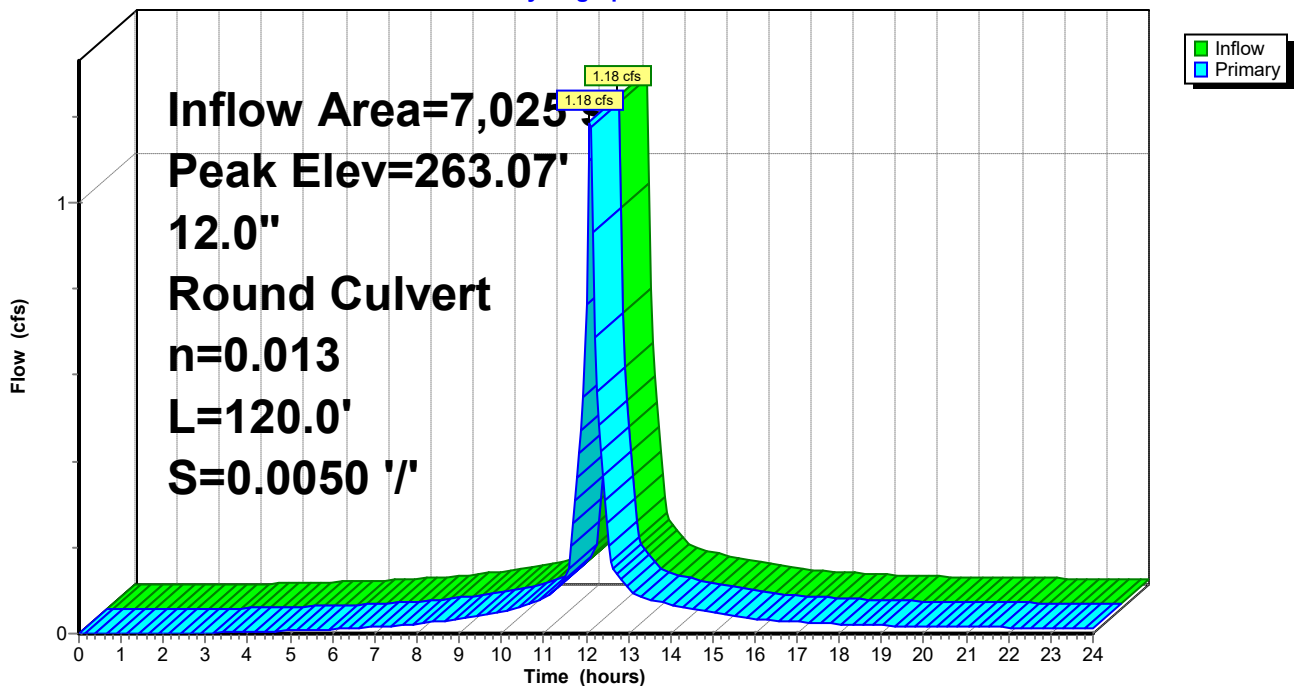
Flood Elev= 269.75'

Device #	Routing	Invert	Outlet Devices
1	Primary	260.60'	12.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 260.60' / 260.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=262.63' TW=262.87' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond MH2: MH2

Hydrograph



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Summary for Pond MH3: DMH3

Inflow Area = 24,132 sf, 64.44% Impervious, Inflow Depth > 7.21" for 100 Year event
Inflow = 4.14 cfs @ 12.09 hrs, Volume= 14,498 cf
Outflow = 4.14 cfs @ 12.09 hrs, Volume= 14,498 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.14 cfs @ 12.09 hrs, Volume= 14,498 cf
Routed to Pond 1P : POND 1

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

Peak Elev= 262.96' @ 12.10 hrs

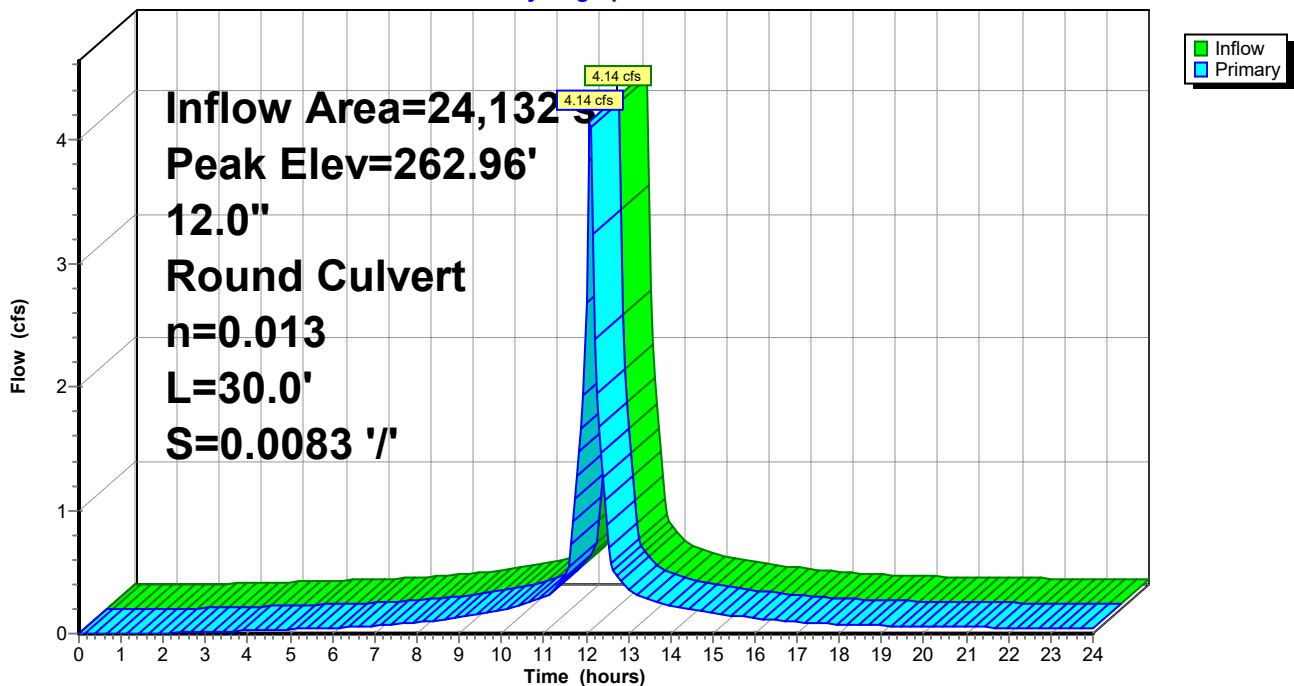
Flood Elev= 263.60'

Device #	Routing	Invert	Outlet Devices
1	Primary	259.75'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 259.75' / 259.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.69 cfs @ 12.09 hrs HW=262.87' TW=261.92' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.69 cfs @ 4.69 fps)

Pond MH3: DMH3

Hydrograph



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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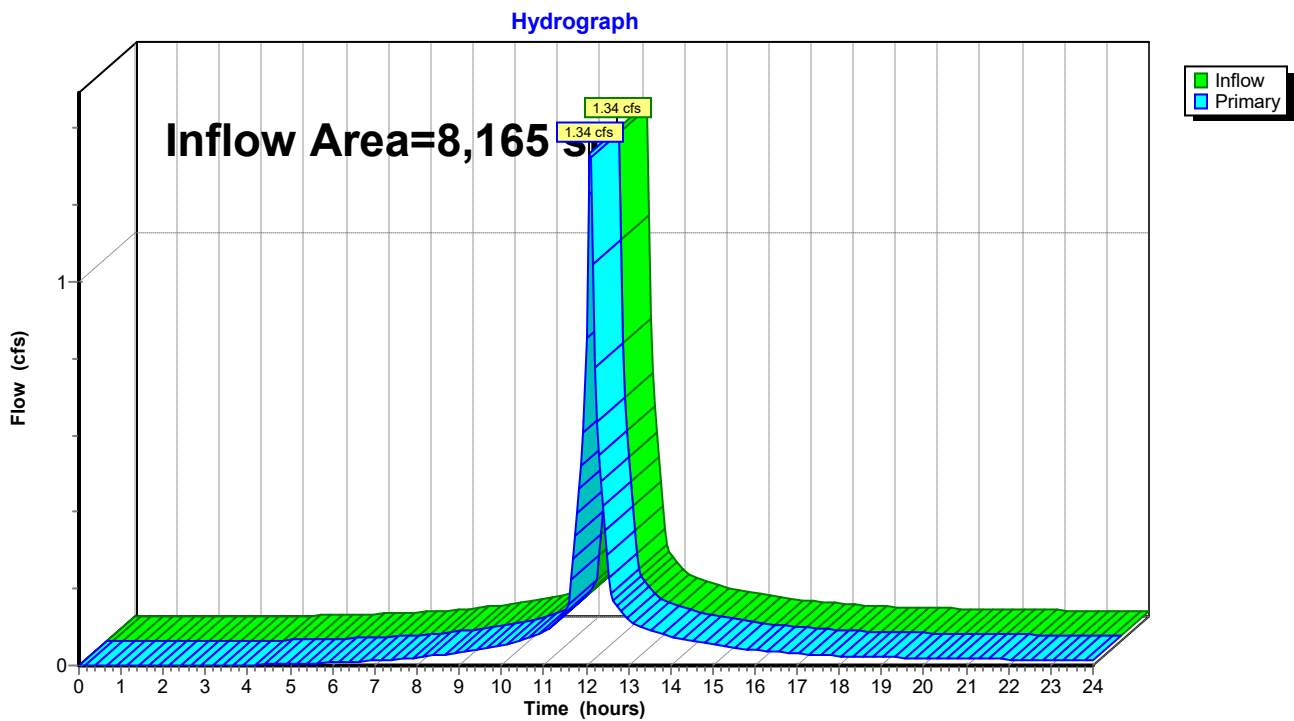
Summary for Pond SP1: SUM POND STREET DP-1

DESIGN POINT AT HIGHLAND ROAD

Inflow Area = 8,165 sf, 17.33% Impervious, Inflow Depth > 6.55" for 100 Year event
Inflow = 1.34 cfs @ 12.09 hrs, Volume= 4,459 cf
Primary = 1.34 cfs @ 12.09 hrs, Volume= 4,459 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP1: SUM POND STREET DP-1



SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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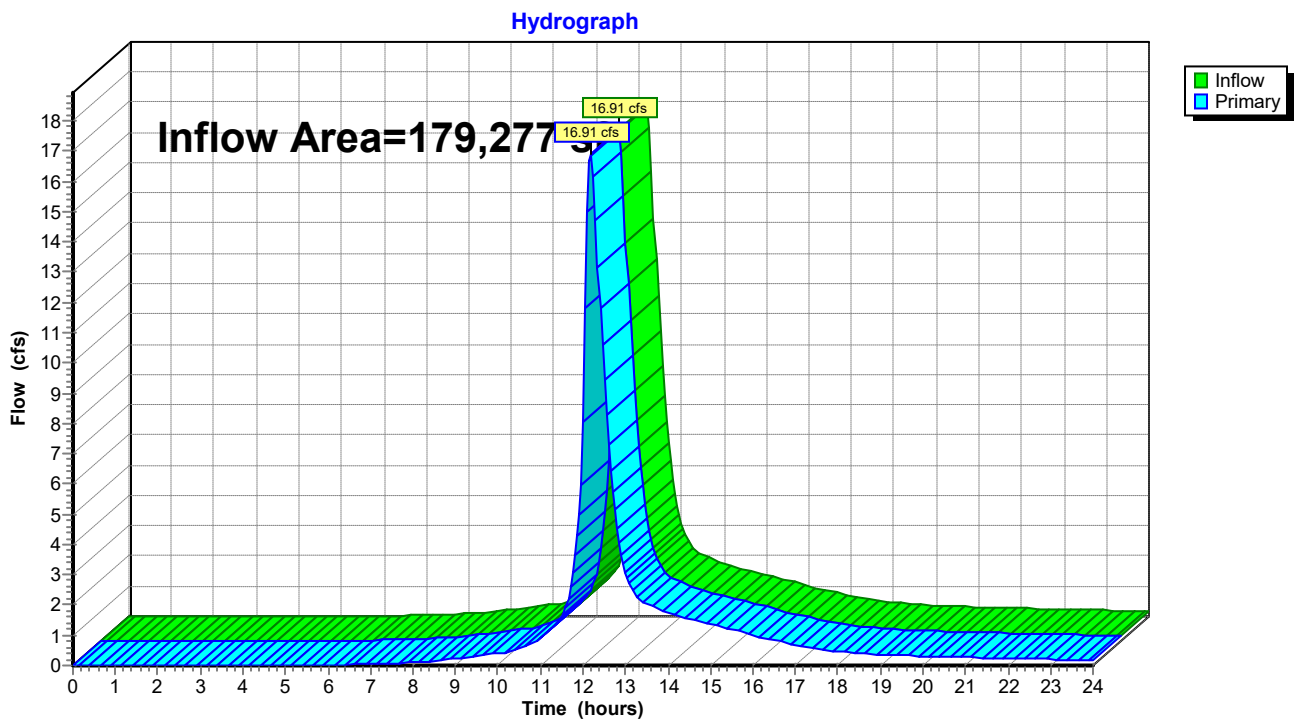
Summary for Pond SP2: SUM POND WOODS DP-2

DESIGN POINT AT REAR PROPERTY LINE

Inflow Area = 179,277 sf, 20.80% Impervious, Inflow Depth > 5.07" for 100 Year event
Inflow = 16.91 cfs @ 12.18 hrs, Volume= 75,780 cf
Primary = 16.91 cfs @ 12.18 hrs, Volume= 75,780 cf, Atten= 0%, Lag= 0.0 min

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

Pond SP2: SUM POND WOODS DP-2



STORMWATER MANAGEMENT REPORT

PRECIPITATION FREQUENCY TABLE



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.311 (0.244-0.384)	0.371 (0.291-0.460)	0.470 (0.367-0.585)	0.553 (0.429-0.690)	0.666 (0.500-0.870)	0.751 (0.553-1.00)	0.840 (0.599-1.16)	0.940 (0.634-1.33)	1.08 (0.702-1.59)	1.20 (0.760-1.80)
10-min	0.440 (0.345-0.545)	0.526 (0.412-0.652)	0.666 (0.520-0.827)	0.783 (0.608-0.979)	0.943 (0.708-1.23)	1.06 (0.782-1.42)	1.19 (0.849-1.65)	1.33 (0.899-1.89)	1.53 (0.995-2.25)	1.70 (1.08-2.55)
15-min	0.518 (0.406-0.641)	0.619 (0.485-0.767)	0.784 (0.612-0.975)	0.921 (0.715-1.15)	1.11 (0.833-1.45)	1.25 (0.921-1.67)	1.40 (0.999-1.94)	1.57 (1.06-2.22)	1.81 (1.17-2.65)	2.00 (1.27-3.00)
30-min	0.712 (0.559-0.881)	0.851 (0.667-1.05)	1.08 (0.843-1.34)	1.27 (0.984-1.59)	1.53 (1.15-2.00)	1.72 (1.27-2.30)	1.93 (1.38-2.67)	2.16 (1.46-3.06)	2.49 (1.61-3.66)	2.76 (1.75-4.14)
60-min	0.906 (0.711-1.12)	1.08 (0.849-1.34)	1.37 (1.07-1.71)	1.62 (1.25-2.02)	1.95 (1.46-2.54)	2.20 (1.61-2.93)	2.46 (1.75-3.41)	2.75 (1.86-3.90)	3.17 (2.06-4.66)	3.52 (2.23-5.28)
2-hr	1.17 (0.923-1.43)	1.41 (1.11-1.73)	1.80 (1.41-2.22)	2.12 (1.66-2.63)	2.57 (1.95-3.34)	2.90 (2.15-3.86)	3.25 (2.35-4.52)	3.68 (2.49-5.19)	4.33 (2.82-6.32)	4.88 (3.10-7.27)
3-hr	1.35 (1.07-1.65)	1.63 (1.30-2.00)	2.09 (1.66-2.57)	2.48 (1.95-3.06)	3.00 (2.29-3.91)	3.39 (2.54-4.52)	3.82 (2.78-5.31)	4.34 (2.94-6.10)	5.14 (3.35-7.48)	5.84 (3.71-8.66)
6-hr	1.72 (1.38-2.10)	2.10 (1.68-2.55)	2.70 (2.16-3.30)	3.21 (2.55-3.94)	3.91 (3.00-5.05)	4.42 (3.33-5.86)	4.98 (3.65-6.90)	5.68 (3.87-7.92)	6.77 (4.42-9.78)	7.71 (4.92-11.4)
12-hr	2.17 (1.75-2.62)	2.65 (2.14-3.20)	3.44 (2.77-4.17)	4.10 (3.27-5.00)	5.00 (3.87-6.42)	5.66 (4.29-7.46)	6.39 (4.71-8.79)	7.29 (4.99-10.1)	8.69 (5.70-12.5)	9.90 (6.34-14.5)
24-hr	2.56 (2.09-3.08)	3.18 (2.59-3.83)	4.20 (3.41-5.06)	5.04 (4.07-6.11)	6.20 (4.84-7.93)	7.05 (5.39-9.25)	7.99 (5.95-11.0)	9.17 (6.31-12.6)	11.0 (7.26-15.7)	12.7 (8.13-18.4)
2-day	2.88 (2.37-3.43)	3.65 (3.00-4.35)	4.91 (4.02-5.88)	5.95 (4.84-7.17)	7.39 (5.82-9.42)	8.44 (6.51-11.0)	9.61 (7.23-13.2)	11.1 (7.68-15.2)	13.6 (8.98-19.3)	15.8 (10.2-22.8)
3-day	3.16 (2.61-3.75)	3.98 (3.29-4.73)	5.34 (4.39-6.36)	6.46 (5.28-7.74)	8.00 (6.33-10.2)	9.12 (7.08-11.9)	10.4 (7.85-14.2)	12.0 (8.32-16.4)	14.7 (9.74-20.8)	17.1 (11.0-24.6)
4-day	3.43 (2.85-4.06)	4.28 (3.55-5.07)	5.67 (4.68-6.74)	6.83 (5.60-8.16)	8.42 (6.68-10.7)	9.57 (7.45-12.4)	10.9 (8.24-14.8)	12.6 (8.72-17.1)	15.4 (10.2-21.6)	17.8 (11.5-25.6)
7-day	4.18 (3.49-4.92)	5.06 (4.22-5.96)	6.49 (5.40-7.68)	7.69 (6.35-9.14)	9.33 (7.45-11.7)	10.5 (8.23-13.6)	11.9 (9.02-16.0)	13.6 (9.48-18.4)	16.5 (11.0-23.0)	19.0 (12.3-27.1)
10-day	4.85 (4.08-5.69)	5.75 (4.83-6.76)	7.23 (6.04-8.52)	8.46 (7.01-10.0)	10.1 (8.12-12.7)	11.4 (8.90-14.6)	12.7 (9.67-17.1)	14.5 (10.1-19.5)	17.3 (11.5-24.1)	19.8 (12.8-28.1)
20-day	6.76 (5.73-7.88)	7.76 (6.57-9.05)	9.39 (7.91-11.0)	10.7 (8.99-12.6)	12.6 (10.1-15.5)	14.0 (10.9-17.6)	15.5 (11.7-20.2)	17.2 (12.1-22.9)	19.7 (13.2-27.2)	21.8 (14.2-30.7)
30-day	8.36 (7.13-9.70)	9.44 (8.03-11.0)	11.2 (9.48-13.0)	12.6 (10.6-14.8)	14.7 (11.8-17.9)	16.2 (12.7-20.1)	17.7 (13.3-22.8)	19.4 (13.7-25.7)	21.7 (14.6-29.8)	23.5 (15.3-33.0)
45-day	10.4 (8.92-12.0)	11.6 (9.90-13.4)	13.5 (11.5-15.6)	15.0 (12.7-17.6)	17.2 (13.9-20.8)	18.9 (14.8-23.3)	20.6 (15.4-26.1)	22.2 (15.8-29.3)	24.3 (16.4-33.2)	25.8 (16.9-36.1)
60-day	12.2 (10.5-14.0)	13.4 (11.5-15.5)	15.4 (13.2-17.8)	17.1 (14.5-19.9)	19.4 (15.7-23.3)	21.1 (16.6-25.9)	22.9 (17.1-28.9)	24.5 (17.5-32.2)	26.5 (18.0-36.1)	27.9 (18.3-39.0)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

STORMWATER MANAGEMENT REPORT

STAGE STORAGE TABLES

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

Prepared by Ranger Engineering Group, Inc..

Printed 9/13/2022

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Stage-Area-Storage for Pond 2P: POND P2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
262.50	1,940	0	263.02	2,244	1,086
262.51	1,946	19	263.03	2,252	1,108
262.52	1,951	39	263.04	2,260	1,131
262.53	1,957	58	263.05	2,269	1,154
262.54	1,962	78	263.06	2,277	1,176
262.55	1,968	98	263.07	2,285	1,199
262.56	1,974	117	263.08	2,293	1,222
262.57	1,979	137	263.09	2,301	1,245
262.58	1,985	157	263.10	2,309	1,268
262.59	1,990	177	263.11	2,318	1,291
262.60	1,996	197	263.12	2,326	1,314
262.61	2,002	217	263.13	2,334	1,338
262.62	2,007	237	263.14	2,342	1,361
262.63	2,013	257	263.15	2,351	1,385
262.64	2,019	277	263.16	2,359	1,408
262.65	2,024	297	263.17	2,367	1,432
262.66	2,030	318	263.18	2,376	1,455
262.67	2,036	338	263.19	2,384	1,479
262.68	2,041	358	263.20	2,392	1,503
262.69	2,047	379	263.21	2,401	1,527
262.70	2,053	399	263.22	2,409	1,551
262.71	2,059	420	263.23	2,418	1,575
262.72	2,064	440	263.24	2,426	1,599
262.73	2,070	461	263.25	2,434	1,624
262.74	2,076	482	263.26	2,443	1,648
262.75	2,082	503	263.27	2,451	1,673
262.76	2,087	523	263.28	2,460	1,697
262.77	2,093	544	263.29	2,468	1,722
262.78	2,099	565	263.30	2,477	1,747
262.79	2,105	586	263.31	2,485	1,771
262.80	2,110	607	263.32	2,494	1,796
262.81	2,116	629	263.33	2,502	1,821
262.82	2,122	650	263.34	2,511	1,846
262.83	2,128	671	263.35	2,520	1,871
262.84	2,134	692	263.36	2,528	1,897
262.85	2,140	714	263.37	2,537	1,922
262.86	2,145	735	263.38	2,545	1,947
262.87	2,151	757	263.39	2,554	1,973
262.88	2,157	778	263.40	2,563	1,999
262.89	2,163	800	263.41	2,571	2,024
262.90	2,169	821	263.42	2,580	2,050
262.91	2,175	843	263.43	2,589	2,076
262.92	2,181	865	263.44	2,597	2,102
262.93	2,186	887	263.45	2,606	2,128
262.94	2,192	909	263.46	2,615	2,154
262.95	2,198	931	263.47	2,624	2,180
262.96	2,204	953	263.48	2,632	2,206
262.97	2,210	975	263.49	2,641	2,233
262.98	2,216	997	263.50	2,650	2,259
262.99	2,222	1,019			
263.00	2,228	1,041			
263.01	2,236	1,063			

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

Prepared by Ranger Engineering Group, Inc..

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

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
259.50	1,956	0	262.10	4,939	8,672
259.55	1,999	99	262.15	5,009	8,921
259.60	2,043	200	262.20	5,079	9,173
259.65	2,087	303	262.25	5,150	9,429
259.70	2,132	409	262.30	5,222	9,688
259.75	2,177	516	262.35	5,294	9,951
259.80	2,223	626	262.40	5,366	10,218
259.85	2,269	739	262.45	5,439	10,488
259.90	2,315	853	262.50	5,513	10,762
259.95	2,362	970	262.55	5,587	11,039
260.00	2,410	1,090	262.60	5,661	11,320
260.05	2,461	1,211	262.65	5,736	11,605
260.10	2,512	1,336	262.70	5,812	11,894
260.15	2,564	1,463	262.75	5,888	12,187
260.20	2,616	1,592	262.80	5,964	12,483
260.25	2,669	1,724	262.85	6,041	12,783
260.30	2,722	1,859	262.90	6,119	13,087
260.35	2,776	1,996	262.95	6,197	13,395
260.40	2,831	2,137	263.00	6,275	13,707
260.45	2,886	2,279			
260.50	2,941	2,425			
260.55	2,997	2,574			
260.60	3,054	2,725			
260.65	3,111	2,879			
260.70	3,168	3,036			
260.75	3,226	3,196			
260.80	3,285	3,359			
260.85	3,344	3,524			
260.90	3,404	3,693			
260.95	3,464	3,865			
261.00	3,525	4,039			
261.05	3,584	4,217			
261.10	3,644	4,398			
261.15	3,704	4,582			
261.20	3,764	4,768			
261.25	3,825	4,958			
261.30	3,887	5,151			
261.35	3,949	5,347			
261.40	4,011	5,546			
261.45	4,074	5,748			
261.50	4,138	5,953			
261.55	4,202	6,162			
261.60	4,266	6,373			
261.65	4,331	6,588			
261.70	4,397	6,806			
261.75	4,463	7,028			
261.80	4,529	7,253			
261.85	4,596	7,481			
261.90	4,664	7,712			
261.95	4,732	7,947			
262.00	4,800	8,186			
262.05	4,869	8,427			

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 100 Year Rainfall=7.99"

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Stage-Area-Storage for Pond 3P: POND 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
262.75	954	0
262.80	993	49
262.85	1,033	99
262.90	1,073	152
262.95	1,115	207
263.00	1,157	263
263.05	1,199	322
263.10	1,243	383
263.15	1,288	447
263.20	1,333	512
263.25	1,379	580
263.30	1,425	650
263.35	1,473	722
263.40	1,521	797
263.45	1,570	875
263.50	1,620	954
263.55	1,671	1,037
263.60	1,722	1,122
263.65	1,775	1,209
263.70	1,828	1,299
263.75	1,881	1,392
263.80	1,936	1,487
263.85	1,991	1,585
263.90	2,047	1,686
263.95	2,104	1,790
264.00	2,162	1,897
264.05	2,206	2,006
264.10	2,251	2,117
264.15	2,296	2,231
264.20	2,341	2,347
264.25	2,387	2,465
264.30	2,434	2,586
264.35	2,481	2,709
264.40	2,528	2,834
264.45	2,576	2,961
264.50	2,624	3,091
264.55	2,673	3,224
264.60	2,722	3,359
264.65	2,771	3,496
264.70	2,822	3,636
264.75	2,872	3,778
264.80	2,923	3,923
264.85	2,974	4,070
264.90	3,026	4,220
264.95	3,078	4,373
265.00	3,131	4,528

STORMWATER MANAGEMENT REPORT

95TH PERCENTILE STORM
WETLAND SERIES B

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

Prepared by Ranger Engineering Group, Inc..

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Summary for Subcatchment EX3: FLOW TO WETL SERIES 'B'

Runoff = 0.05 cfs @ 12.48 hrs, Volume= 545 cf, Depth> 0.11"
 Routed to Pond 4P : Wetland Series 'B'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 95th percentile Rainfall=1.50"

Area (sf)	CN	Description
3,600	74	>75% Grass cover, Good, HSG C
46,815	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
58,237	72	Weighted Average
57,237		98.28% Pervious Area
1,000		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.12"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THRU WETLAND B Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

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Summary for Subcatchment P6: P6 WITH GRASS POOL

Runoff = 0.22 cfs @ 12.27 hrs, Volume= 1,215 cf, Depth> 0.26"
 Routed to Pond 4P : Wetland Series 'B'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 95th percentile Rainfall=1.50"

Area (sf)	CN	Description
27,229	86	<50% Grass cover, Poor, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	79	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

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Summary for Subcatchment P6: P6 WITH GRASS GOOD

Runoff = 0.07 cfs @ 12.45 hrs, Volume= 608 cf, Depth> 0.13"
 Routed to Pond 4P : Wetland Series 'B'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 95th percentile Rainfall=1.50"

Area (sf)	CN	Description
27,229	74	>75% Grass cover, Good, HSG C
21,621	70	Woods, Good, HSG C
6,822	79	Woods/grass comb., Good, HSG D
1,000	98	Roofs, HSG C
56,672	73	Weighted Average
55,672		98.24% Pervious Area
1,000		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.18"
1.4	125	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	160	0.0250	0.40		Shallow Concentrated Flow, FLOW THROUGH wetland Forest w/Heavy Litter Kv= 2.5 fps
14.9	335	Total			

SELLERS FARM PRE DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

Prepared by Ranger Engineering Group, Inc..

Printed 9/13/2022

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Hydrograph for Pond 4P: Wetland Series 'B'

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	258.65	0.00
0.50	0.00	0	258.65	0.00
1.00	0.00	0	258.65	0.00
1.50	0.00	0	258.65	0.00
2.00	0.00	0	258.65	0.00
2.50	0.00	0	258.65	0.00
3.00	0.00	0	258.65	0.00
3.50	0.00	0	258.65	0.00
4.00	0.00	0	258.65	0.00
4.50	0.00	0	258.65	0.00
5.00	0.00	0	258.65	0.00
5.50	0.00	0	258.65	0.00
6.00	0.00	0	258.65	0.00
6.50	0.00	0	258.65	0.00
7.00	0.00	0	258.65	0.00
7.50	0.00	0	258.65	0.00
8.00	0.00	0	258.65	0.00
8.50	0.00	0	258.65	0.00
9.00	0.00	0	258.65	0.00
9.50	0.00	0	258.65	0.00
10.00	0.00	0	258.65	0.00
10.50	0.00	0	258.65	0.00
11.00	0.00	0	258.65	0.00
11.50	0.00	0	258.65	0.00
12.00	0.00	0	258.65	0.00
12.50	0.05	0	258.69	0.05
13.00	0.03	0	258.67	0.03
13.50	0.02	0	258.67	0.02
14.00	0.02	0	258.67	0.02
14.50	0.02	0	258.67	0.02
15.00	0.02	0	258.67	0.02
15.50	0.02	0	258.67	0.02
16.00	0.01	0	258.66	0.01
16.50	0.01	0	258.66	0.01
17.00	0.01	0	258.66	0.01
17.50	0.01	0	258.66	0.01
18.00	0.01	0	258.66	0.01
18.50	0.01	0	258.66	0.01
19.00	0.01	0	258.66	0.01
19.50	0.01	0	258.66	0.01
20.00	0.01	0	258.66	0.01
20.50	0.01	0	258.66	0.01
21.00	0.01	0	258.66	0.01
21.50	0.01	0	258.66	0.01
22.00	0.01	0	258.66	0.01
22.50	0.01	0	258.66	0.01
23.00	0.01	0	258.66	0.01
23.50	0.01	0	258.66	0.01
24.00	0.01	0	258.66	0.01

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

Prepared by Ranger Engineering Group, Inc..

Printed 9/13/2022

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Hydrograph for Pond 4P: Wetland Series 'B' WITH GRASS POOL

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	258.65	0.00
0.50	0.00	0	258.65	0.00
1.00	0.00	0	258.65	0.00
1.50	0.00	0	258.65	0.00
2.00	0.00	0	258.65	0.00
2.50	0.00	0	258.65	0.00
3.00	0.00	0	258.65	0.00
3.50	0.00	0	258.65	0.00
4.00	0.00	0	258.65	0.00
4.50	0.00	0	258.65	0.00
5.00	0.00	0	258.65	0.00
5.50	0.00	0	258.65	0.00
6.00	0.00	0	258.65	0.00
6.50	0.00	0	258.65	0.00
7.00	0.00	0	258.65	0.00
7.50	0.00	0	258.65	0.00
8.00	0.00	0	258.65	0.00
8.50	0.00	0	258.65	0.00
9.00	0.00	0	258.65	0.00
9.50	0.00	0	258.65	0.00
10.00	0.00	0	258.65	0.00
10.50	0.00	0	258.65	0.00
11.00	0.00	0	258.65	0.00
11.50	0.00	0	258.65	0.00
12.00	0.02	0	258.67	0.02
12.50	0.16	1	258.72	0.16
13.00	0.06	0	258.69	0.06
13.50	0.04	0	258.68	0.05
14.00	0.04	0	258.68	0.04
14.50	0.03	0	258.68	0.03
15.00	0.03	0	258.67	0.03
15.50	0.03	0	258.67	0.03
16.00	0.02	0	258.67	0.02
16.50	0.02	0	258.67	0.02
17.00	0.02	0	258.67	0.02
17.50	0.02	0	258.67	0.02
18.00	0.01	0	258.66	0.01
18.50	0.01	0	258.66	0.01
19.00	0.01	0	258.66	0.01
19.50	0.01	0	258.66	0.01
20.00	0.01	0	258.66	0.01
20.50	0.01	0	258.66	0.01
21.00	0.01	0	258.66	0.01
21.50	0.01	0	258.66	0.01
22.00	0.01	0	258.66	0.01
22.50	0.01	0	258.66	0.01
23.00	0.01	0	258.66	0.01
23.50	0.01	0	258.66	0.01
24.00	0.01	0	258.66	0.01

SELLERS FARM POST DEVELOPMENT

Type III 24-hr 95th percentile Rainfall=1.50"

Prepared by Ranger Engineering Group, Inc..

Printed 9/13/2022

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Hydrograph for Pond 4P: Wetland Series 'B' WITH GRASS GOOD

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	258.65	0.00
0.50	0.00	0	258.65	0.00
1.00	0.00	0	258.65	0.00
1.50	0.00	0	258.65	0.00
2.00	0.00	0	258.65	0.00
2.50	0.00	0	258.65	0.00
3.00	0.00	0	258.65	0.00
3.50	0.00	0	258.65	0.00
4.00	0.00	0	258.65	0.00
4.50	0.00	0	258.65	0.00
5.00	0.00	0	258.65	0.00
5.50	0.00	0	258.65	0.00
6.00	0.00	0	258.65	0.00
6.50	0.00	0	258.65	0.00
7.00	0.00	0	258.65	0.00
7.50	0.00	0	258.65	0.00
8.00	0.00	0	258.65	0.00
8.50	0.00	0	258.65	0.00
9.00	0.00	0	258.65	0.00
9.50	0.00	0	258.65	0.00
10.00	0.00	0	258.65	0.00
10.50	0.00	0	258.65	0.00
11.00	0.00	0	258.65	0.00
11.50	0.00	0	258.65	0.00
12.00	0.00	0	258.65	0.00
12.50	0.07	0	258.69	0.07
13.00	0.03	0	258.67	0.03
13.50	0.03	0	258.67	0.03
14.00	0.02	0	258.67	0.02
14.50	0.02	0	258.67	0.02
15.00	0.02	0	258.67	0.02
15.50	0.02	0	258.67	0.02
16.00	0.01	0	258.66	0.01
16.50	0.01	0	258.66	0.01
17.00	0.01	0	258.66	0.01
17.50	0.01	0	258.66	0.01
18.00	0.01	0	258.66	0.01
18.50	0.01	0	258.66	0.01
19.00	0.01	0	258.66	0.01
19.50	0.01	0	258.66	0.01
20.00	0.01	0	258.66	0.01
20.50	0.01	0	258.66	0.01
21.00	0.01	0	258.66	0.01
21.50	0.01	0	258.66	0.01
22.00	0.01	0	258.66	0.01
22.50	0.01	0	258.66	0.01
23.00	0.01	0	258.66	0.01
23.50	0.01	0	258.66	0.01
24.00	0.01	0	258.66	0.01



RANGER ENGINEERING GROUP, INC.

STORMWATER MANAGEMENT REPORT

MOUNDING ANALYSIS

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. **The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed** otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

Input Values	R	Sy	K	x	y	t	hi(0)	Recharge (infiltration) rate (feet/day)	Specific yield, Sy (dimensionless, between 0 and 1)	Horizontal hydraulic conductivity, Kh (feet/day)*	1/2 length of basin (x direction, in feet)	1/2 width of basin (y direction, in feet)	duration of infiltration period (days)	initial thickness of saturated zone (feet)
	0.3500	0.160	20.40	50.000	10.000	3.000	10.000	0.67	1.33	2.00	4.00	36	1.50	

use consistent units (e.g. feet & days or inches & hours)

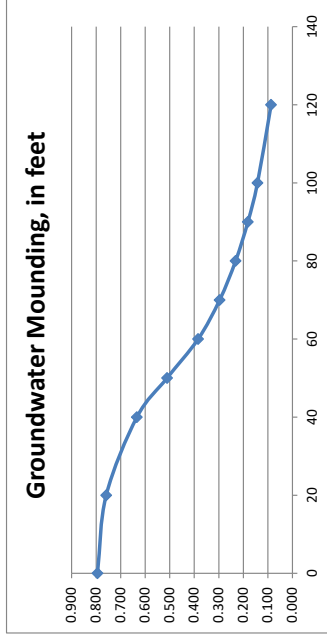
*in the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
 maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.795	0
0.759	20
0.634	40
0.511	50
0.384	60
0.297	70
0.232	80
0.182	90
0.142	100
0.087	120



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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Input Values	Conversion Table
R 0.1780	inch/hour 0.67
Sy 0.160	feet/day 1.33
K 20.40	hours 2.00
x 20.000	days 36
y 15.000	initial thickness of saturated zone (feet) 1.50
t 3.000	
hi(0) 10.000	
h(max) 10.336	
Δh(max) 0.336	

use consistent units (e.g. feet & days or inches & hours)

Recharge (infiltration) rate (feet/day)
 Specific yield, Sy (dimensionless, between 0 and 1)
 Horizontal hydraulic conductivity, Kh (feet/day)*
 1/2 length of basin (x direction, in feet)
 1/2 width of basin (y direction, in feet)
 duration of infiltration period (days)
 initial thickness of saturated zone (feet)

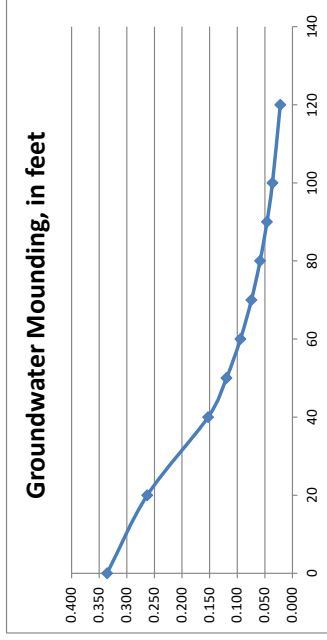
maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
 maximum groundwater mounding (beneath center of basin at end of infiltration period)

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

Ground-water Mounding, in feet	Distance from center of basin Mounding, in feet
0.336	0
0.263	20
0.153	40
0.119	50
0.094	60
0.074	70
0.059	80
0.046	90
0.036	100
0.022	120



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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Input Values	Recharge (infiltration) rate (feet/day)	Specific yield, Sy (dimensionless, between 0 and 1)	Horizontal hydraulic conductivity, Kh (feet/day)*	1/2 length of basin (x direction, in feet)	1/2 width of basin (y direction, in feet)	duration of infiltration period (days)	initial thickness of saturated zone (feet)
0.2270	0.160	20.40	40.000	5.000	3.000	10.000	
10.247	0.247						

use consistent units (e.g. feet & days or inches & hours)

Conversion Table	inch/hour	feet/day
	0.67	1.33
	2.00	4.00
	hours	days
	36	1.50

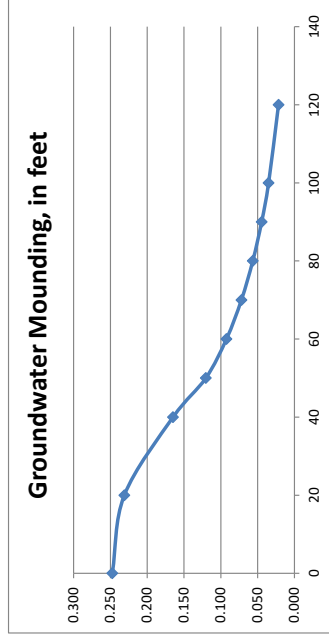
*in the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

maximum thickness of saturated zone (beneath center of basin at end of infiltration period)

maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.247	0
0.231	20
0.165	40
0.170	50
0.092	60
0.072	70
0.057	80
0.045	90
0.035	100
0.022	120

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Particle Size Analysis - Comprehensive

Prepared For:

Benjamin Osgood
Ranger Engineering Group
13 Red Roof Lane, Suite 203
Salem, NH 03079

bosgood@rangereng.com
973-435-1324

Sample Information:

Sample ID: TP 6

Order Number: 58396

Lab Number: X220104-101

Received: 12/28/2021

Reported: 1/19/2022

<u>USDA Size Fraction</u>			<u>Percent of Whole Sample Passing</u>		
<u>Main Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	<u>Size (mm)</u>	<u>Sieve #</u>	<u>Whole Sample % of Sample Passing</u>
Sand	0.05-2.0	68.6	2.00	#10	62.5
Silt	0.002-0.05	24.9	1.00	#18	56.3
Clay	<0.002	6.5	0.50	#35	48.6
			0.25	#60	39.4
<u>Sand Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	0.10	#140	28.1
Very Coarse	1.0-2.0	9.9	0.053	#270	19.6
Coarse	0.5-1.0	12.4	0.02	20 um	12.5
Medium	0.25-0.5	14.7	0.005	5 um	5.4
Fine	0.10-0.25	18.0	0.002	2 um	4.1
Very Fine	0.05-0.10	13.6			
<u>Silt Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>			
Coarse	0.02-0.05	11.3			
Medium	0.005-0.02	11.4			
Fine	0.002-0.005	2.1			

USDA Textural Class: gravelly sandy loam

Gravel Content: (%) 37.5

Particle Size Analysis - Comprehensive

Prepared For:

Benjamin Osgood
Ranger Engineering Group
13 Red Roof Lane, Suite 203
Salem, NH 03079

bosgood@rangereng.com
973-435-1324

Sample Information:

Sample ID: TP 7

Order Number: 58396

Lab Number: X220104-102

Received: 12/28/2021

Reported: 1/19/2022

<u>USDA Size Fraction</u>			<u>Percent of Whole Sample Passing</u>		
<u>Main Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	<u>Size (mm)</u>	<u>Sieve #</u>	<u>Whole Sample % of Sample Passing</u>
Sand	0.05-2.0	63.6	2.00	#10	69.3
Silt	0.002-0.05	24.7	1.00	#18	63.5
Clay	<0.002	11.7	0.50	#35	56.3
			0.25	#60	46.8
			0.10	#140	33.6
<u>Sand Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	0.053	#270	25.2
Very Coarse	1.0-2.0	8.3	0.02	20 um	19.1
Coarse	0.5-1.0	10.4	0.005	5 um	11.2
Medium	0.25-0.5	13.7	0.002	2 um	8.1
Fine	0.10-0.25	19.1			
Very Fine	0.05-0.10	12.1			
<u>Silt Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>			
Coarse	0.02-0.05	8.9			
Medium	0.005-0.02	11.3			
Fine	0.002-0.005	4.5			

USDA Textural Class: sandy loam

Gravel Content: (%) 30.7

Particle Size Analysis - Comprehensive

Prepared For:

Benjamin Osgood
Ranger Engineering Group
13 Red Roof Lane, Suite 203
Salem, NH 03079

bosgood@rangereng.com
973-435-1324

Sample Information:

Sample ID: TP 10

Order Number: 58396

Lab Number: X220104-103

Received: 12/28/2021

Reported: 1/19/2022

<u>USDA Size Fraction</u>			<u>Percent of Whole Sample Passing</u>		
<u>Main Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	<u>Size (mm)</u>	<u>Sieve #</u>	<u>Whole Sample % of Sample Passing</u>
Sand	0.05-2.0	77.6	2.00	#10	65.6
Silt	0.002-0.05	16.6	1.00	#18	56.3
Clay	<0.002	5.8	0.50	#35	46.1
			0.25	#60	35.1
			0.10	#140	22.3
<u>Sand Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>	0.053	#270	14.7
Very Coarse	1.0-2.0	14.3	0.02	20 um	9.6
Coarse	0.5-1.0	15.4	0.005	5 um	4.6
Medium	0.25-0.5	16.8	0.002	2 um	3.8
Fine	0.10-0.25	19.5			
Very Fine	0.05-0.10	11.6			
<u>Silt Fractions</u>	<u>Size (mm)</u>	<u>Percent</u>			
Coarse	0.02-0.05	7.7			
Medium	0.005-0.02	7.6			
Fine	0.002-0.005	1.3			

USDA Textural Class: gravelly loamy coarse sand

Gravel Content: (%) 34.4

MAPS

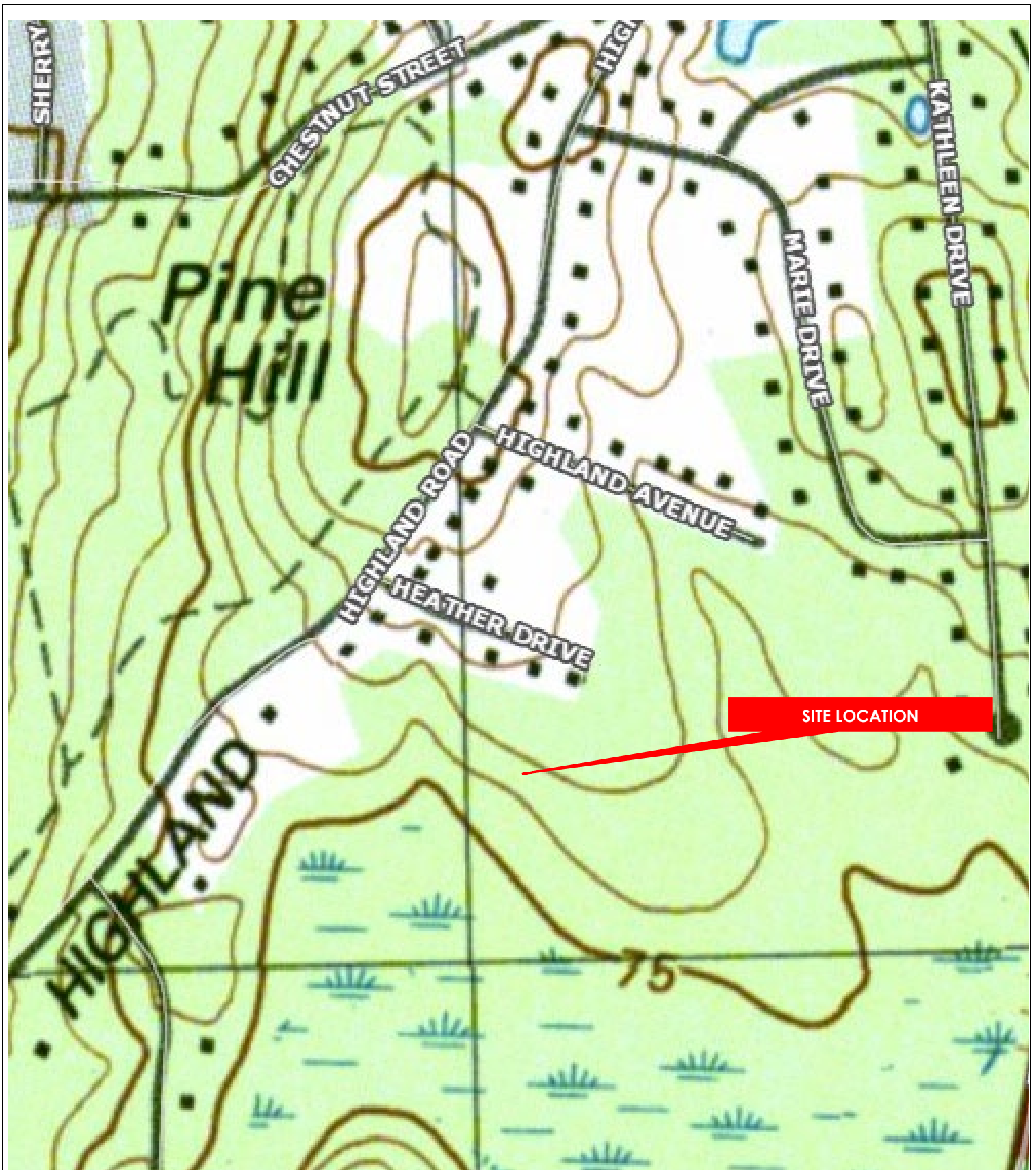
USGS LOCUS

SCS SOILS

FEMA

CS 9201 PRE-DEVELOPMENT DRAINAGE

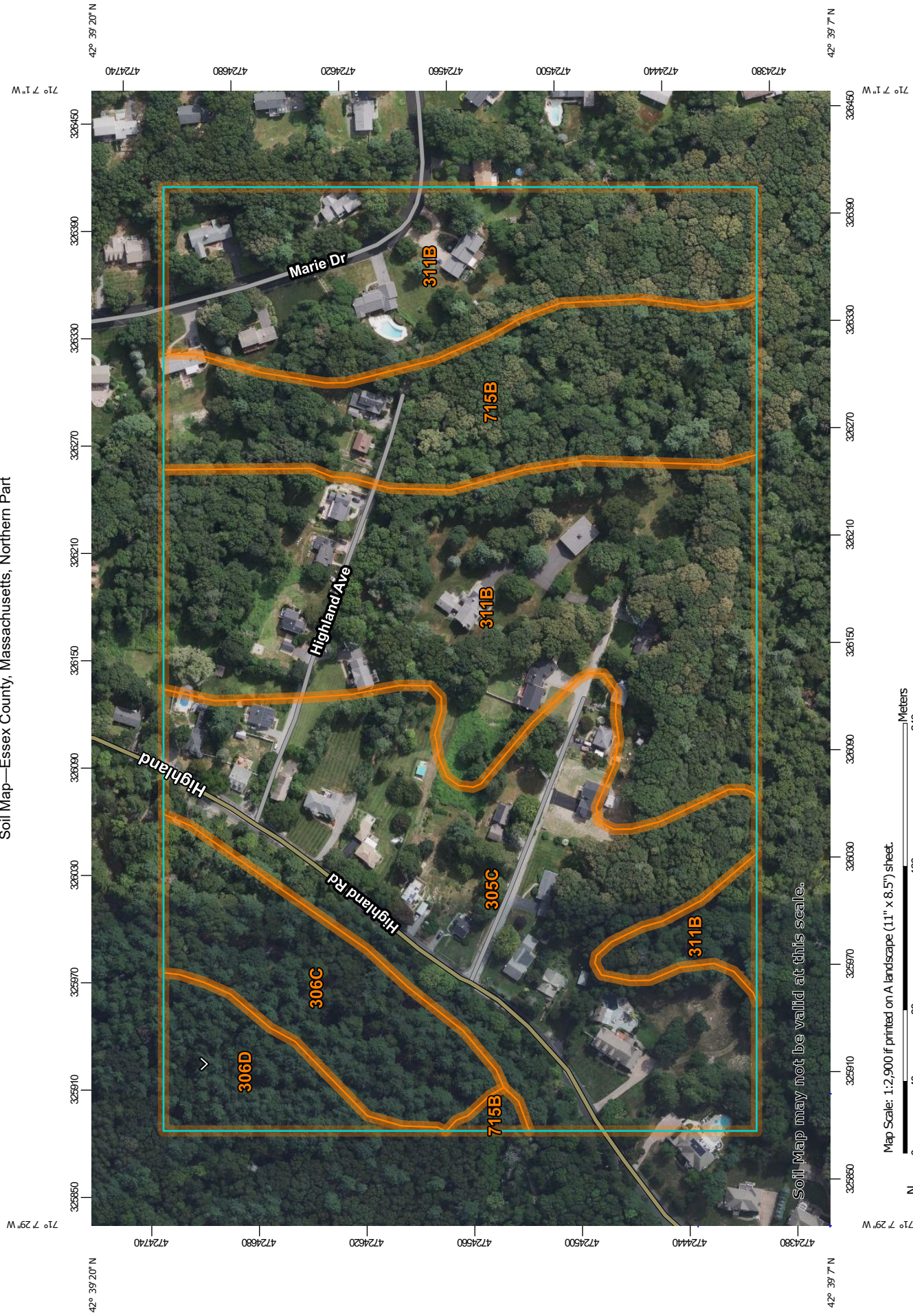
CS 9301 POST DEVELOPMENT DRAINAGE



Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs; USGS Topographic Quadrangle Images

**USGS MAP
SELLERS FARM RD ANDOVER, MA
MAP 24 LOTS 1K, 1J, 1H, 1G, 1E, 1F**

Soil Map—Essex County, Massachusetts, Northern Part



Soil Map may not be valid at this scale.

Map Scale: 1:2,900 if printed on A landscape (11" x 8.5") sheet.



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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
305C	Paxton fine sandy loam, 8 to 15 percent slopes	12.1	28.0%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	3.5	8.0%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	1.7	3.8%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	19.8	45.8%
715B	Ridgebury and Leicester fine sandy loams, 3 to 8 percent slopes, extremely stony	6.2	14.4%
Totals for Area of Interest		43.3	100.0%

National Flood Hazard Layer FIRMeTte



71°7'44"W 42°39'24"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000
 Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
OTHER AREAS		Effective LOMRs
		Area of Undetermined Flood Hazard <i>Zone D</i>
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

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

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

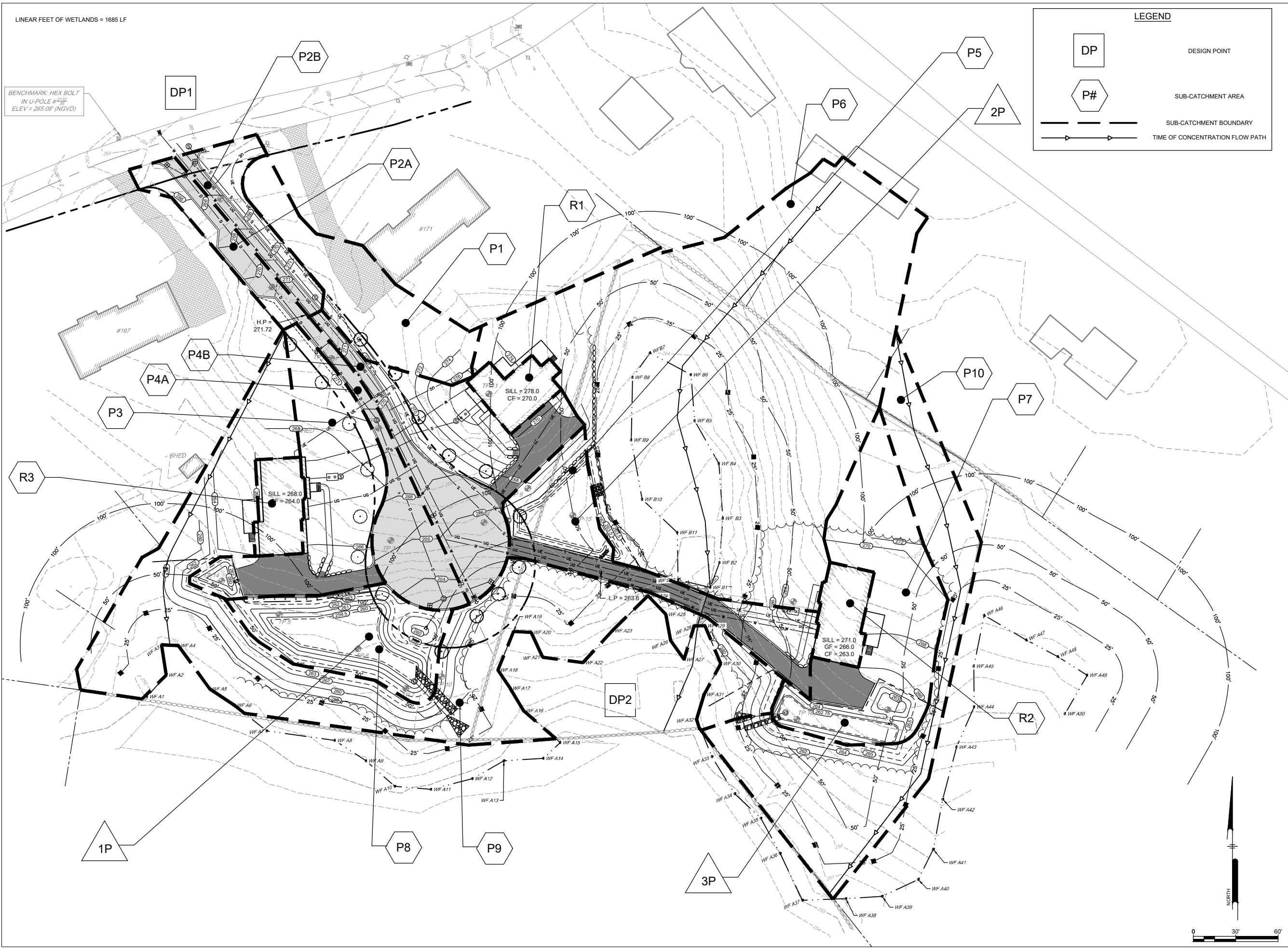
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/21/2022 at 12:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

FEMA MAP SELLERS FARM RD ANDOVER MA MAP 24 LOTS 1K, 1J, 1H, 1G, 1E

LINEAR FEET OF WETLANDS = 1685 LF

BENCHMARK: HEX BOLT
IN U-POLE #133
ELEV = 265.08' (NGVD)



LEGEND

- DP DESIGN POINT
- P# SUB-CATCHMENT AREA
- SUB-CATCHMENT BOUNDARY
- > TIME OF CONCENTRATION FLOW PATH

Ranger Engineering Group, Inc.
13 Red Roof Lane, Suite 203
Salem NH, 03079
Tel: 978-208-1762
rangereng.com

**MODIFIED DEFINITIVE SUBDIVISION
SELLERS FARM ROAD
ANDOVER, MASSACHUSETTS
POST DEVELOPMENT DRAINAGE PLAN
PREPARED FOR
LRC BUILDERS LLC
475 BOSTON ROAD
BILLERICA, MASSACHUSETTS 01821**

NO.	DATE	REVISIONS	BY

PROJECT	21-194
DATE	2021-11-23
DRAWING SCALE	1" = 40'
DRAWN BY	DJO
APPROVED BY	BCO

Z:\PROJECTS\CS9301\Bldg\LIC01-HI_SELLERS FARM RD ANDOVER, MASSACHUSETTS\BUBBLER PUBLISHED SHEETS\CS9301.dwg PLOTTED: 9/15/2022 1:24 PM BY: CWP/PC ROUTEVIEW: T11EN:NC2-HM:8/4/18 PROJECT STATUS: ---