

STORMWATER MANAGEMENT REPORT

THE GREENS AT MENDHAM VILLAGE

**BLOCK 1801, LOT 5
BOROUGH OF MENDHAM
MORRIS COUNTY, NEW JERSEY**

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I. INTRODUCTION

This report has been prepared to accompany the set of Preliminary and Final Site Plans submitted to the Borough of Mendham's Joint Land Use Board seeking approval for the construction of a 147-unit multifamily-residential project. The existing lot (Block 1801, Lot 5) is approximately 25.95 acres. The site has frontage on West Main Street (County Route 510, formerly State Route 24).

The report explains the design of the stormwater management system proposed for the project, including demonstrating the design's compliance with the applicable regulations, which are summarized in Subsection II-A of this report. The appendices of this report contain engineering calculations and related technical documentation supporting the design information presented herein.

A. Description of Project Site

The site is located in the western part of the Borough of Mendham, with frontage on West Main Street. The street address of 80-88 West Main Street is indicated on NJDEP GeoWeb. Several buildings, most recently utilized as a religious school are located at the center of the site. Several paved driveways and parking areas cross the site. A large portion of the site is open lawn. Some areas of trees and some wooded areas are present. Approximately 3.14 acres of the site is impervious, or about 12.1%. Approximately 1.7 acres is existing motor vehicle surface area.

A man-made pond is located at the southwestern portion of the property. A portion of the shoreline of this pond features a wetland. An isolated wetland is located to the east of the pond; and a wetland complex that has been delineated is located in the southern portion of the project site. Limits of freshwater wetlands and wetland transition areas as shown on the site plans have been delineated by Environmental Technology, Inc., August 19, 2022 and verified by the NJDEP Letter of Interpretation issued on Feb. 19, 2025 (File and Activity No.: 1418-04-0003.1 FWW230001).

Topographically, the buildings are located at the crest of a hill. The crest of the hill is at about elevation 627. The site slopes down in each direction, to elevation 550 at West Main Street and to 562 at the rear of the site. Slopes on the site vary significantly, but most areas are on the order of 10%-15%.

The project site is located in the North and South Branch Raritan new jersey watershed management area and the Raritan River North Branch (Including McVickers To India Brook) new jersey sub-watershed area. The USGS hydrologic unit code delineations locate the project site in the Raritan River North Branch (above Lamington) HUC-11 watershed; and the North and South Branch Raritan HUC-14 watershed.

The project site receiving waters are North Branch Raritan River Tributary, located approximately 1,500 ft to the west of the project site; and McVickers Brook Tributary, located approximately 1,000 ft east of the project site. The northern and western portions of the project site drain to North Branch Raritan River Tributary and southern and eastern portions of the site drain to McVickers Brook Tributary. The project site lies outside the regulated Flood Hazard area per FEMA Map no. 340540-0003A.

B. Soil Conditions

The NRCS Custom Soil Source Report for Morris County, New Jersey identifies one soil series with three subtypes within the project limits. The entire site is mapped to be located within a soil series identified as “Gladstone gravelly loam”, with the subtypes depending on the slope (3%-8%, 8%-15%, 15%-25%). Gladstone gravelly loam is identified as Hydrologic Soil Group B. A copy of the Soil Source Report is included in **Appendix B**.

Soil testing consistent with the BMP Manual Chapter 12 was conducted on the site by Geo-Technology Associates (GTA) in August through October 2023 and September 2024; and additional investigations were conducted by M&Z Engineering Associates, PC (M&Z) in November and December 2025. Refer to Summary of Geotechnical Investigations section below.

The geotechnical investigation determined most of the site is underlain by sandy material, often decomposed gneiss bedrock. Highly weathered rock was encountered frequently; often at the top of the hill, rock was encountered relatively shallow, whereas lower in elevation, rock was encountered deeper. The uppermost level of the rock was able to be removed without significant difficulty and more competent rock was identified deeper. Groundwater was only encountered in certain areas of the rear of the site.

Infiltration tests and Basin flooding tests were conducted in accordance with BMP Manual Chapter 12. **Appendix C** contains a summary of the findings.

C. Project Description

The proposed project entails the construction of 32 residential buildings comprised of 147 units, paved roadways and parking, concrete walks, retaining walls, landscape and lighting improvements, stormwater basins, a sanitary sewer pumping station and requisite utility improvements. The proposed project driveway intersects with existing West Main Street (aka County Route 510). The proposed project site will largely seek to maintain similar drainage patterns, while managing stormwater runoff in accordance with regulatory requirements. The proposed site will increase

impervious coverage by 7.48 acres to 10.62 acres, or 40.9% of the site. Motor vehicle surface area is increased by 2.63 acres to 4.33 acres.

II. PROPOSED STORMWATER MANAGEMENT PLAN

This section of the report describes the proposed stormwater management system designed for the project and demonstrates its compliance with applicable regulations.

A. Overview of Regulatory Requirements

The stormwater management system for the proposed project has been designed to comply with current regulatory requirements and standards. The applicable requirements and standards are as follows:

- The Stormwater Control Ordinance of the Borough of Mendham
- The Stormwater Management requirements of the County of Morris
- The State of New Jersey’s “Stormwater Management Rules,” as set forth at NJAC 7:8
- The “Residential Site Improvement Standards” (NJAC 5:21); hereinafter referred to as “RSIS”, and
- “The Standards for Soil Erosion and Sediment Control in New Jersey,”

This project meets the definition of a “major project” as defined at NJAC 7:8-1.2. as the project will disturb greater than one acre of land, create more than one-quarter acre of “regulated impervious surface”, and create more than one quarter acre of “regulated motor vehicle surface.” Therefore, the project is required to provide erosion control, groundwater recharge, stormwater runoff quantity control and stormwater runoff quality treatment by incorporating green infrastructure Best Management Practices (BMPs).

We note that as per NJAC 7:8-5.2(b), the development shall incorporate a maintenance plan under NJAC 7:8-5.8 for the stormwater management measures. We recommend the preparation of a “Stormwater Management System Operations and Maintenance Manual” be prepared as a separate document for review and approval by the Board’s Engineer as a condition of any approval granted by the Board.

B. Methodologies

The *New Jersey Stormwater Best Management Practices Manual*, hereinafter referred to as the “BMP Manual”, gives guidance on the analysis, modeling, design, and maintenance of stormwater management BMPs. This report is prepared with the intention of consistency with the guidance provided in the BMP Manual.

1. Quantity Control Calculations.

Estimating runoff rates and volumes for quantity control purposes is done by utilizing what is referred to as the “NRCS Method”, which is also known as the “TR-55” methodology. This is described at length in Chapter 5 of the BMP Manual (pp. 10-69).

According to the National Engineering Handbook, as published by the NRCS, the combination of a hydrologic soil group and a land use and treatment class is a hydrologic soil-cover complex, to which a runoff curve number (CN) can be assigned. The CN is an indication of the complex’s runoff potential.

The Hydrologic Soil Group(s) for the project site were determined by referencing the NRCS’s Web Soil Survey for the appropriate county. As discussed above the hydrologic soil groups are Type B soils.

Land cover was determined by site observations and reviewing the current site conditions. These site conditions are reproduced in the “Existing Drainage Areas” Figure in **Appendix M**. Land covers utilized for this site include open space, woods, and impervious areas. Where applicable, “good” hydrologic condition was assumed.

Appendix A includes a reference table of CN assignments for the utilized land cover-soil complexes from the National Engineering Handbook. Below is a summary of values utilized.

Cover	HSG B
Impervious Areas	98
Gravel	96
Open Space	61
Woods	55

As discussed in the BMP manual, the connectedness of the impervious cover was considered. Utilizing an option in the Hydrocad Software, the subcatchments were analyzed considering separate pervious and impervious runoff, such that runoff for pervious is generated separately from that of the impervious, and then these are added to present one number for the subcatchment.

The rainfall depths utilized for the project’s design were derived from NOAA Atlas 14 Point Precipitation Frequency Estimates for 24-hour duration storms using the project site location. The 2-, 10-, and 100-year storms were adjusted first by a

“current day” adjustment factor for Morris County and then by a “projected change” adjustment factor to arrive at six storms.

Table 1.1 – Design Storm Rainfall Depths					
Storm	Rainfall per Atlas-14 (inches)	Current Adjustment Factor	Current Day Design Storm (in)	Projected Change Factor	Projected Day Design Storm (in)
2-year	3.52	1.01	3.56	1.23	4.33
10-year	5.22	1.03	5.38	1.28	6.68
100-year	8.38	1.06	8.88	1.46	12.23

In the hydrologic model calculations, the future storms are noted as ‘-Future’. Additionally, the twenty-five-year storm (**6.36 in**) was analyzed for certain soil erosion calculations. The rainfall distribution utilized is a NOAA Region D Rainfall Distribution as developed by the NRCS.

Time of concentration, which is the time required for runoff to travel from the hydraulically most distant point in the watershed to the outlet, was determined by utilizing the “velocity method”. Sheet Flow was limited to the lesser of 100 feet and the value calculated by the McCuen-Speiss Equation in the proposed condition and to 100 feet outright in the existing condition. In accordance with BMP Manual guidance, no minimum time of concentration was utilized.

The stormwater model for the system was developed utilizing the “HydroCAD” a stormwater modelling software. Such software incorporates stage-storage routing methods.

- Weighted Average Volume Technique

As stated in the BMP Manual, due to the non-linear character of the runoff equations inherent in the TR-55 methodology, variations in cover conditions are not always accurately reflected by calculating a weighted CN value for an entire sub watershed. Rather, a procedure termed the “weighted average volume technique” is presented and recommended in the BMP Manual for such sub watershed areas. Therefore, the sub watershed areas considered in the design of the project’s stormwater management system utilize the weighted average volume technique. The HydroCad software used to develop the hydraulic model applies this technique by calculating runoff for each CN value separately.

- Exfiltration

Exfiltration of stormwater from proposed BMP’s was not used in stormwater routings.

2. Stormwater Runoff Water Quality

Estimating runoff rates and volumes for water quality purposes is done in much the same fashion as that of the water quantity purposes, namely the “NRCS Methodology” as discussed above. The key difference is utilizing the Water Quality Design storm, a 1.25-inch, 2-hour rainfall event as described in the BMP Manual. A copy of this rainfall distribution is included in **Appendix A**. BMPs are designed in accordance with methodologies specified in the BMP Manual chapters for the specific BMPs.

3. Groundwater Recharge

Groundwater Recharge for the project site was analyzed in accordance with BMP Manual Chapter 6. The BMP Manual discusses the “Groundwater Recharge Spreadsheet” at length. The entire site was analyzed in the existing and proposed conditions to determine the annual average recharge deficit, if any, produced by the project. The spreadsheet also enables analysis of proposed recharge facilities to determine the recharge provided by the site’s proposed BMPs.

4. Collection and Conveyance System

The collection and conveyance system for the proposed project was designed to convey a 100-year storm into the proposed stormwater detention basins and at least a 25-year storm otherwise, in accordance with NJAC 5:21-7.2.

Runoff was estimated by the “Rational Method”. Runoff coefficients for the various land cover/soil complexes were determined by referencing a table provided in RSIS. Rainfall rates were determined from NOAA Atlas 14 rainfall intensity data for the project site. Copies of both are provided in **Appendix J**. A minimum time of concentration of 10 minutes was used in accordance with RSIS and the BMP Manual (Ch. 5, p. 72).

The site’s conveyance system was designed utilizing StormCAD, a hydraulic modeling software application.

5. Soil Erosion and Sediment Control

Whereas minimization of soil erosion is a concern for the project’s design, the *Standards for Soil Erosion and Sediment Control in New Jersey* (SESC Stds.) were followed. Specifically, the design methodology in Standard for Conduit Outlet Protection (SESC Stds. Ch. 12) was utilized for the design of rip-rap aprons and scour holes. Additional

SESC BMPs are depicted on the Soil Erosion and Sediment Control Plan of the Site Plans.

C. Green Infrastructure and Overview of Proposed Stormwater Management Facilities

The proposed stormwater management facilities for the project entail the following:

- Collection and conveyance system
- Green infrastructure Manufactured Treatment Devices
- Small-scale underground infiltration basins
- Small-scale above-ground bio-retention basins
- Conduit outlet protection (riprap aprons and scour holes)

Small-scale bioretention basins have a maximum contributory drainage area of 2.5 acres. The basin area (bottom footprint) is not included in the contributory drainage area. Some small-scale bioretention basins are underdrained, while others allow for infiltration of runoff from the water quality storm as determined to be suitable by underlying soils testing.

Similarly, small-scale underground infiltration basins have a maximum contributory drainage area of 2.5 acres. Green infrastructure manufactured treatment devices are located upstream of the proposed underground infiltration basins for pre-treatment of stormwater runoff. Stormwater runoff from proposed building roofs will be pre-treated by leaf screens and may discharge directly to underground infiltration.

Stormwater runoff from the proposed project site will be collected via curb inlets, small and large area inlets, and a roof drain collection system and conveyed via HDPE, RCP and PVC pipe to proposed BMP's for water quality treatment, recharge of groundwater, and attenuation of peak flows via outlet control structures. Stormwater will discharge offsite at outfalls with conduit outlet protection and connection to existing stormwater infrastructure.

D. Stormwater Runoff Quantity Control

This section of the report describes the quantity control provisions of the stormwater management system's design.

1. Existing Conditions

The existing site drains in 5 distinct directions from the top of the hill. Starting from northern project limit, the first area runs-off toward Main Street (X-DA-1), the second to the northeast toward Linden Lane (X-DA-2), the third to the west to Lot 5.01 (X-DA-3), the fourth to the south towards Lot 38.01 (a portion of which is contributory to the existing pond and wetlands) (X-DA-4), and a fifth to the south east to Lot 16 (X-DA-5).

The existing site features a drywell near the southeastern corner of the existing building, as identified on the survey of the property. A portion of the most-recently constructed building was assumed to be contributory to this drywell. As the specifics of the system are not fully known, a portion of this area was calculated as “open space” rather than as “impervious”, with a lower CN of 61, which does not generate run-off for the water quality design storm.

The existing man-made pond was not modeled specifically within the calculations, as the pond appears to have very little freeboard above its normal water surface, and thus a negligible storage volume in which to detain runoff.

Refer to the existing condition hydrographs located in **Appendix D**. Roofs that are contributory to an existing drywell system. For the purposes of this calculation, these roof areas were assigned a CN of 61, which is equivalent to open space in B soils, and does not produce any runoff for the water quality storm. Hydrocad reports CN values other than 98 as pervious land cover.

Table 1.2 - Existing Conditions (pre-development) Peak Runoff (cfs) to Points of Analysis

Storm	Rainfall, in	Points of Analysis (POA)				
		POA-1	POA-2	POA-3	POA-4	POA-5
2-yr C	3.56 in	2.67 cfs	0.71 cfs	2.77 cfs	2.28 cfs	4.68 cfs
2-yr F	4.33 in	4.81 cfs	1.15 cfs	4.61 cfs	3.48 cfs	7.66 cfs
10-yr C	5.38 in	7.61 cfs	1.79 cfs	7.05 cfs	5.17 cfs	11.69 cfs
10-yr F	6.68 in	12.23 cfs	2.94 cfs	11.04 cfs	8.10 cfs	18.17 cfs
100-yr C	8.88 in	19.67 cfs	4.71 cfs	17.32 cfs	12.57 cfs	28.61 cfs
100-yr F	12.23 in	33.64 cfs	8.16 cfs	29.22 cfs	21.51 cfs	48.12 cfs

Calculations for the existing condition are included in **Appendix D**.

2. Allowable Runoff

Under NJAC 7:8-5.6, there are four ways to satisfy runoff control. Specifically, subparagraph 3 states: *“Design stormwater management measures so that the post-construction peak runoff rates for the two-, 10-, and 100-year storm events are 50, 75, and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.”*

Accordingly, the allowable peak rates of runoff are as follows:

Table 1.3 - Allowable Proposed (post-development) Peak Runoff (cfs) to Points of Analysis

Storm	Reduction Factor	POA-1	POA-2	POA-3	POA-4	POA-5
2-yr C	50%	1.34 cfs	0.36 cfs	1.39 cfs	1.14 cfs	2.34 cfs
2-yr F	50%	2.41 cfs	0.58 cfs	2.31 cfs	1.74 cfs	3.83 cfs
10-yr C	75%	5.71 cfs	1.34 cfs	5.29 cfs	3.88 cfs	8.77 cfs
10-yr F	75%	9.17 cfs	2.19 cfs	8.28 cfs	6.08 cfs	13.63 cfs
100-yr C	80%	15.74 cfs	3.77 cfs	13.86 cfs	10.06 cfs	28.89 cfs
100-yr F	80%	26.91 cfs	6.53 cfs	23.38 cfs	17.21 cfs	38.50 cfs

3. Proposed Conditions

Under proposed conditions, the project site generally maintains the pre-development drainage patterns with flows to 5 points of analysis (POA's). Five (5) points of analysis are reviewed. The stormwater features for each drainage point are described separately to each design point. Proposed Conditions Calculations are provided in **Appendix E**.

Point of Analysis 1 (POA-1):

Point of analysis 1 analyzes pre-and post-development stormwater flows to existing West Main Street at the northwest boundary of the project site. Downstream receiving waters is North Branch Raritan River tributary.

Post-development flows to POA-1 are modeled by subwatersheds P-DA-1A, P-DA-1B, P-DA-1C, P-DA-1F, P-DA-1H, P-DA-1G, and P-DA-1-Bypass. Subwatersheds P-DA-1A, P-DA-1B, P-DA-1C, P-DA-1F, P-DA-1H, and P-DA-1G model contributory flows to proposed basins A, B, C, F, H and G, respectively. P-DA-1-Bypass models proposed flows to POA-1 that are not routed to a proposed BMP.

The Basins A, B, C, F, G and H are summarized below.

*Surface Elevation for above-ground basins, invert elevation for underground basins

** Area noted includes basin footprint area. As noted in NJAC 7:8 definitions, contributory drainage area does not include the area of the stormwater management measure itself.

Table 1.4 – Proposed BMP's Discharging to POA-1

Basin #	Type	Elevation *	Bottom Area (SF)	WQ volume (CF)	WQ Peak Elev.	Basin Lowest Orifice Elev.	Contributory Drainage Area (ac)**
A	Small-scale Bioretention (Infiltration)	551.50	1,445 sf	1,052	552.15	552.25	0.76
B	Small-scale Bioretention (infiltration)	560.00	13,937 sf	6,125	560.44	560.50	2.84 (basin area = 0.31 ac) $\approx$ 2.5 ac net contributory DA
C	Small-scale Bioretention (underdrained)	560.00	6,986 sf	3,868	560.53	560.55	1.22
F	Small-scale infiltration (underground)	599.20	2,230 sf	1,502	599.90	599.90	0.55
G	Small-scale Bioretention (underdrained)	609.00	3,088 sf	1,314	609.40	609.60	0.79
H	Small-scale Bioretention (underdrained)	610.00	6,303 sf	2,028	610.31	610.40	1.02

Project compliance with allowable runoff requirements to POA-1 is summarized in the table below:

Table 1.5 - POA-1 Peak Flows

Storm	Allowable Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year current	1.34 cfs	1.24 cfs
2-year future	2.41 cfs	1.82 cfs
10-year current	5.71 cfs	2.79 cfs
10-year future	9.17 cfs	3.93 cfs
100-year current	15.74 cfs	8.82 cfs
100-year future	26.91 cfs	22.45 cfs

Point of Analysis 2 (POA-2):

Point of analysis 2 analyzes pre-and post-development stormwater flows off-site to the east at the northeast boundary of the project site. Downstream receiving waters is North Branch Raritan River tributary. There are no proposed BMP's treating flows to POA-2 and no runoff from proposed motor vehicle surface areas flow to POA-2. The post-development tributary drainage area to POA-2 is reduced from 1.33 ac to 0.52 ac.

Project compliance with the stormwater quantity component to POA-2 of the SWM Rules is summarized in the table below:

Table 1.6 - POA-2 Peak Flows

Storm	Allowable Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year current	0.36 cfs	0.29 cfs
2-year future	0.58 cfs	0.54 cfs
10-year current	1.34 cfs	0.92 cfs
10-year future	2.19 cfs	1.47 cfs
100-year current	3.77 cfs	2.46 cfs
100-year future	6.53 cfs	4.13 cfs

Point of Analysis 3 (POA-3):

Point of analysis 3 analyzes pre-and post-development stormwater flows to the western property boundary and includes overland flow and piped flow towards adjacent Lot 5.01. Downstream receiving waters is North Branch Raritan River tributary.

Post-development flows to POA-3 are modeled by subwatersheds P-DA-3I and P-DA-3-Bypass. Subwatersheds P-DA-3I models contributory drainage area to proposed basin I. P-DA-4-Bypass models proposed flows to POA-3 that are not routed to a proposed BMP.

The proposed BMP is summarized below.

*Surface Elevation for above-ground basins, invert elevation for underground basins.

** Area noted includes basin footprint area. As noted in NJAC 7:8 definitions, contributory drainage area does not include the area of the stormwater management measure itself.

Table 1.7 – Proposed BMP's Discharging to POA-3

Basin #	Type	Elevation*	Bottom Area (SF)	WQ volume (CF)	WQ Peak Elev.	Basin Lowest Orifice Elev.	Contributory Drainage Area (ac)**
I	Small-scale Bioretention (Infiltration)	613.20	2,027 sf	2,103	614.11	614.20	0.94

Project compliance with allowable runoff requirements to POA-3 is summarized in the table below:

Table 1.8 - POA-3 Peak Flows

Storm	Allowable Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year current	1.39 cfs	1.17 cfs
2-year future	2.31 cfs	1.77 cfs
10-year current	5.29 cfs	2.48 cfs
10-year future	8.28 cfs	3.54 cfs
100-year current	13.86 cfs	7.65 cfs
100-year future	23.38 cfs	13.93 cfs

Point of Analysis 4 (POA-4):

Point of analysis 4 analyzes pre-and post-development stormwater flows to the southern property boundary, adjacent to Lot 16. Portions of the pre- and post-development watersheds to POA-4 flow to the existing man made pond and existing isolated wetland and wetland complex located at the project south boundary. Downstream receiving waters is McVickers Brook tributary.

Post-development flows to POA-4 are modeled by subwatersheds P-DA-4J, P-DA-4K, and P-DA-4-Bypass. Subwatersheds P-DA-4J and P-DA-4K model contributory drainage areas to proposed basins J and K, respectively. P-DA-4-Bypass models proposed flows to POA-4 that are not routed to a proposed BMP.

The proposed BMP is summarized below.

*Surface Elevation for above-ground basins, invert elevation for underground basins.

** Area noted includes basin footprint area. As noted in NJAC 7:8 definitions, contributory drainage area does not include the area of the stormwater management measure itself

Table 1.9 – Proposed BMP's Discharging to POA-4

Basin #	Type	Elevation*	Bottom Area (SF)	WQ volume (CF)	WQ Peak Elev.	Basin Lowest Orifice Elev.	Contributory Drainage Area (ac)**
J	Small-scale Bioretention (Underdrained)	607.00	2,351 sf	1,990	607.80	607.80	0.94
K	Small-scale infiltration basin (underground)	593.30	2,960 sf	2,903	594.33	594.40	1.21

Project compliance with allowable runoff requirements to POA-4 is summarized in the table below:

Table 1.10 - POA-4 Peak Flows

Storm	Allowable Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year current	1.14 cfs	1.06 cfs
2-year future	1.74 cfs	1.72 cfs
10-year current	3.88 cfs	2.76 cfs
10-year future	6.08 cfs	5.59 cfs
100-year current	10.06 cfs	10.03 cfs
100-year future	17.21 cfs	16.78 cfs

Point of Analysis 5 (POA-5):

Point of analysis 5 analyzes pre-and post-development stormwater flows to the south-eastern property boundary and southeastern corner property boundary, adjacent to Lot 16. Downstream receiving waters is McVickers Brook tributary.

Post-development flows to POA-5 are modeled by subwatersheds P-DA-5N, P-DA-5M, P-DA-5P, P-DA-5R, and P-DA-5-Bypass. Subwatersheds P-DA-5N, P-DA-5M, P-DA-5P, and P-DA-5R model contributory drainage areas to proposed basins N, M, P, and R, respectively. P-DA-5-Bypass models proposed flows to POA-5 that are not routed to a proposed BMP.

The proposed BMP is summarized below.

*Surface Elevation for above-ground basins, invert elevation for underground basins

** Area noted includes basin footprint area. As noted in NJAC 7:8 definitions, contributory drainage area does not include the area of the stormwater management measure itself

Table 1.11 – Proposed BMP's Discharging to POA-5

Basin #	Type	Elevation*	Bottom Area (SF)	WQ volume (CF)	WQ Peak Elev.	Basin Lowest Orifice Elev.	Contributory Drainage Area (ac)**
N	Small-scale Bioretention (infiltration)	596.50	2,488 sf	2,366	597.44	597.50	1.05
M	Small-scale Bioretention (Underdrained)	568.00	5,308 sf	5,258	568.93	568.95	2.16
P	Small-scale Bioretention (Underdrained)	576.00	5,411 sf	5,633	577.00	577.00	2.38
R	Small-scale Bioretention (Underdrained)	562.50	12,536 sf	3,080	562.74	562.80	2.16

Project compliance with allowable runoff requirements to POA-5 is summarized in the table below:

Table 1.12 - POA-5 Peak Flows

Storm	Allowable Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year current	2.34 cfs	2.27 cfs
2-year future	3.83 cfs	3.27 cfs
10-year current	8.77 cfs	5.49 cfs
10-year future	13.63 cfs	10.52 cfs
100-year current	28.89 cfs	21.30 cfs
100-year future	38.50 cfs	37.34 cfs

E. Stormwater Runoff Quality

This section of the report describes the water quality control provisions of the stormwater management system's design.

Per NJAC 7:8-5.5, the stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80% from the net increase in motor vehicle surface. Note that although several of the receiving waterways are considered "Category One" by the Surface Water Quality Standards, no discharge

is proposed directly within riparian zone; the site discharges to storm sewer in Main Street and several points on the project site; none of which are within any riparian zone therefore the 95% requirement for discharges within the Riparian Zone is not applicable.

Across the site, stormwater runoff is conveyed to various BMPs which have a water quality function, each of which has a TSS-removal rating of 80% or greater.

Small-scale bioretention basins and small-scale infiltration Basins are rated at 80% TSS removal. Basins A, B, C, G, H I, J, M, N, P and Q are each small-scale bioretention basins designed in accordance with BMP Manual subchapter 9.7; Basins F and K are small-scale underground infiltration basins designed in accordance with BMP Manual subchapter 9.8.

Pre-treatment for roof runoff will be provided by leaf screens. Pretreatment for surface runoff contributory to proposed underground infiltration basins will be provided by proposed Green Infrastructure Manufactured Treatment Device with 80% Certified TSS removal treatment rate. A proposed EcoStream MTD by Advanced Drainage Systems has been selected. This MTD is certified by NJDEP and verified by NJCAT. Refer to **Appendix I** for the proposed MTD sizing and certification information.

Stormwater runoff from all proposed motor vehicle surfaces is directed to proposed BMP's with 80 percent Stormwater Runoff Quality TSS removal rate as indicated in NJAC 7:8 Table 5-1. The proposed small-scale bioretention basins and small-scale underground infiltration basins store the water quality volume from the contributory drainage area without overflow. Calculations for the Water Quality Storm are included in **Appendix E**.

F. Groundwater Recharge

This section of the report describes the groundwater recharge provisions of the stormwater management system's design.

The site was analyzed to determine the deficit in average annual groundwater recharge created by the site's development. The entire project site is located in the same HUC-14 watershed. Pre- and post- recharge volumes were analyzed at existing subwatersheds tributary to North Branch Raritan River tributary (POA-1, POA-2 and POA-3); and existing subwatersheds tributary to McVickers Brook tributary (POA-4 & POA-5).

Table 1.13 – Groundwater Recharge Summary

Point of Analysis	Existing Recharge	Prop. Recharge	Post-Development Recharge Deficit	Proposed BMP Recharge Volume	Post-Development Net recharge volume
POA-1 + POA2 + POA-3	671,090 cf	374,166cf	-296,924 cf	303,967 cf (Basin B bioretention)	7,040 cf
POA-4 + POA-5	685,434 cf	461,447 cf	-223,990 cf	187,491 cf (Basin I bioretention)	124,134 cf
				160,543 cf (Basin K underground infiltration)	

The post-development recharge volume provided by proposed BMP's noted above exceeds the post-development recharge deficit.

Water Quality Storm NRCS Methodology Calculations are included in **Appendix E**. Calculations based upon the Groundwater Recharge Spreadsheet are included in **Appendix F**.

G. Summary of Geotechnical Investigations

Geotechnical investigations in accordance with Chapter 12 were conducted for each basin by Geo-Technology Associates, Inc (GTA) in August thru October 2023 and September 2024, and additional investigations by M&Z Engineering Associates, PC (M&Z) in November and December 2025. Refer to **Appendix C** for the GTA and M&Z Geotechnical Reports. Test pits performed by M&Z are noted as MZ-TP in the table below.

The following is a summary of the explorations and the limiting strata for each:

Table 1.14 – Geotechnical Investigation Summary

Basin	Test Pit Ref(s).	Limit of Exploration	Elevation of Rock	Elevation of Groundwater	Limiting Elevation
A	TP-17, TP-18	546.9, 547.6	N/E, N/E	N/E, N/E	547.6
B	TP-1, TP-16	557.1, 560.9	562.1, 566.9	N/E, N/E	566.9 (Rock)
C	TP-17, TP-5	565.6, 566.7	N/E, 569.7	N/E, N/E	569.7 (Rock)
F	TP-209, TP-210	596.7, 598.2	596.7, 598.2	N/E	586.5 (Rock)

Basin	Test Ref(s).	Pit	Limit of Exploration	Elevation of Rock	Elevation of Groundwater	Limiting Elevation
G	TP-8, TP-9, TP-228, TP-229		604.1, 606.9, 605.2, 604.9	608.6, 611.9, 606.2, 607.9	N/E, N/E, N/E, N/E	611.9 (Rock)
H	TP-12, TP-13		609.0, 606.2	614.5, 611.2	N/E, N/E	614.5 (Rock)
I	TP-19, TP-20		601.2, 601.7	N/E, 602.7	N/E, N/E	602.7 (Rock)
J	TP-21, TP-22		600.0, 600.6	N/E, N/E	N/E, N/E	600.6
K	TP-23, TP-24, TP-109, TP-110		593.8, 591.5, 592.8, 593.0	595.8, 595.5, 595.8, 595.5	N/E, N/E, N/E, N/E	595.8 (Rock)
M	MZ-TP-106, MZ-TP-107		557.9, 558.6	N/E, N/E	N/E, N/E	558.6
N	TP-38, TP-39		582.9, 587.5	585.9, N/E	N/E, N/E	585.9 (Rock)
P	TP-227		567.5	N/E	N/E	567.5
R	MZ-TP-104, MZ-TP-105, MZ-TP-106		558.2, 557.0, 557.9	N/E, N/E, N/E	N/E, N/E, N/E	558.2

Notes:

- N/E = Not Encountered
- MZ-TP = Test Pits performed by M&Z Engineering

H. Infiltration, Groundwater Mounding & Estimated Drain Time

While many of the proposed BMPs provide infiltration and groundwater recharge, infiltration was (conservatively) not included in the routing calculations utilized for the quantity control calculations. Infiltration Testing was done for most of the basins, however this portion of the report only discusses where basins are proposed to infiltrate into the subsoil.

For infiltrating basins, testing is required to determine the depth of restrictive layers. Where the basin is less than 4 feet or less in storage depth, the required depth of exploration is 8.0 feet below the bottom of the basin to locate rock or groundwater. Where storage depth is greater than 4.0 feet, exploration of twice the storage depth is required to find rock or groundwater. If rock is encountered within the required testing depth, a basin flood test is required to utilize infiltration within the basin.

Refer to **Appendix G** for bedrock, groundwater, groundwater mounding analysis and estimate drain time summary of proposed BMP's. Also in **Appendix G** are Hantush Excel Spreadsheet for groundwater mounding analysis of proposed infiltration BMP's.

Portions of proposed basins are located in partial fill condition. For these basins, once topsoil and other deleterious material is removed, highly permeable (K-5) sand is to be

placed to arrive at the specified elevation. Such sand is not considered in any storage volumes. Such sand material, as it is highly permeable, is not to be a limiting stratum beneath the basins.

The construction of Basins A, F, G, H and K may require the removal of rock from all or a portion of the basin's footprint to develop the required separation to rock for these BMP's. The remainder of the basins have sufficient separation to rock or groundwater.

I. Basin Emergency Spillway Sizing

The proposed bioretention basins have been designed with surficial spillways in case of principal control structure failure. The spillway design storm has been calculated as the future 100-year inflow. Proposed Basin B meets the definition of a Class IV Dam as defined in NJAC 7:20-1.8 and must provide a spillway sized to convey the future 100-yr/24-hr design storm plus 50%. Emergency spillway calculations are provided in **Appendix H**. The weir equation is used due to the low head applied to the spillway design

J. Collection and Conveyance System, and Conduit of Outlet Protection

The collection and conveyance system, including roof leader drains, was designed in accordance with RSIS, NJAC 5:21-7.3. The design storm utilized was the 100-year storm, to provide adequate conveyance into the stormwater basins. Pipe Routing Calculations are provided in **Appendix J**. An inlet area map is provided in **Appendix L**.

Rip-Rap apron and scour hole calculations were designed in accordance with the SESC Standard for Conduit Outlet Protection. Calculations for these are provided in **Appendix K**.

K. Maintenance and Safety Requirements

This section discusses the various maintenance and safety considerations as required variously by the NJDEP, County, and Township.

1. Maintenance Plan

Maintenance of the stormwater management system is key to its functionality. It is required that a maintenance plan be prepared for the development, incorporating specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement).

A separate "Stormwater Management System Operations and Maintenance Manual" is to be prepared for this development.

2. Deed Notice

It is required that a deed notice be filed with the County Clerk's office regarding the installation of the proposed BMPs. Additionally, the title and date of the maintenance plan and the name, address, and telephone number of the person with stormwater management measure maintenance responsibility as specified in the plan must be recorded on the deed of the property on which the measure, are located.

We recommend the recording of a deed notice be a condition of any approval granted by the Planning Board.

3. Detention Basin Safety

NJAC 7:8-6.2 provides requirements for trash racks, overflow grates, and escape provisions. These are supplemented by guidance provided in the BMP Manual Chapter for Infiltration Basins.

The proposed above-ground basins both have outlet structures with trash racks. A detail for the proposed trash racks is included on the Site Plans. These trash racks are to be made of parallel bars at a particular spacing as set forth in the regulations and to be manufactured of aluminum, which is a rigid, durable and corrosion resistant material. The associated detail sets forth the bar spacing requirements as well as that the trash rack shall withstand a 300 lb/sf live loading.

Similarly, the above ground basins' outlet structures have overflow grates. The details for the overflow grates provided on the Site Plans specifies that they are to be made of parallel aluminum bars at a particular spacing as set forth in the regulations and shall withstand a 300 lb/sf live loading.

The outlet structures are designed to incorporate escape provisions, namely in the way of permanent ladder rungs (manhole steps) provided in the wall of each of the structures. The bottoms of the outlet structures are noted to have the volume below the outlet pipe to be filled with concrete or grout and sloped to facilitate drainage within the structure.

The basin is not intended nor designed to hold water on a permanent basis, therefore no ledge is required. The maximum earthen embankment slope on the interior of the basins is three horizontal to one vertical (3:1).

The outfalls of the basins are designed in accordance with the SESC Standard for Offsite stability and for Conduit Outlet Protection to provide a safe and stable discharge from the basins.

II. REFERENCES

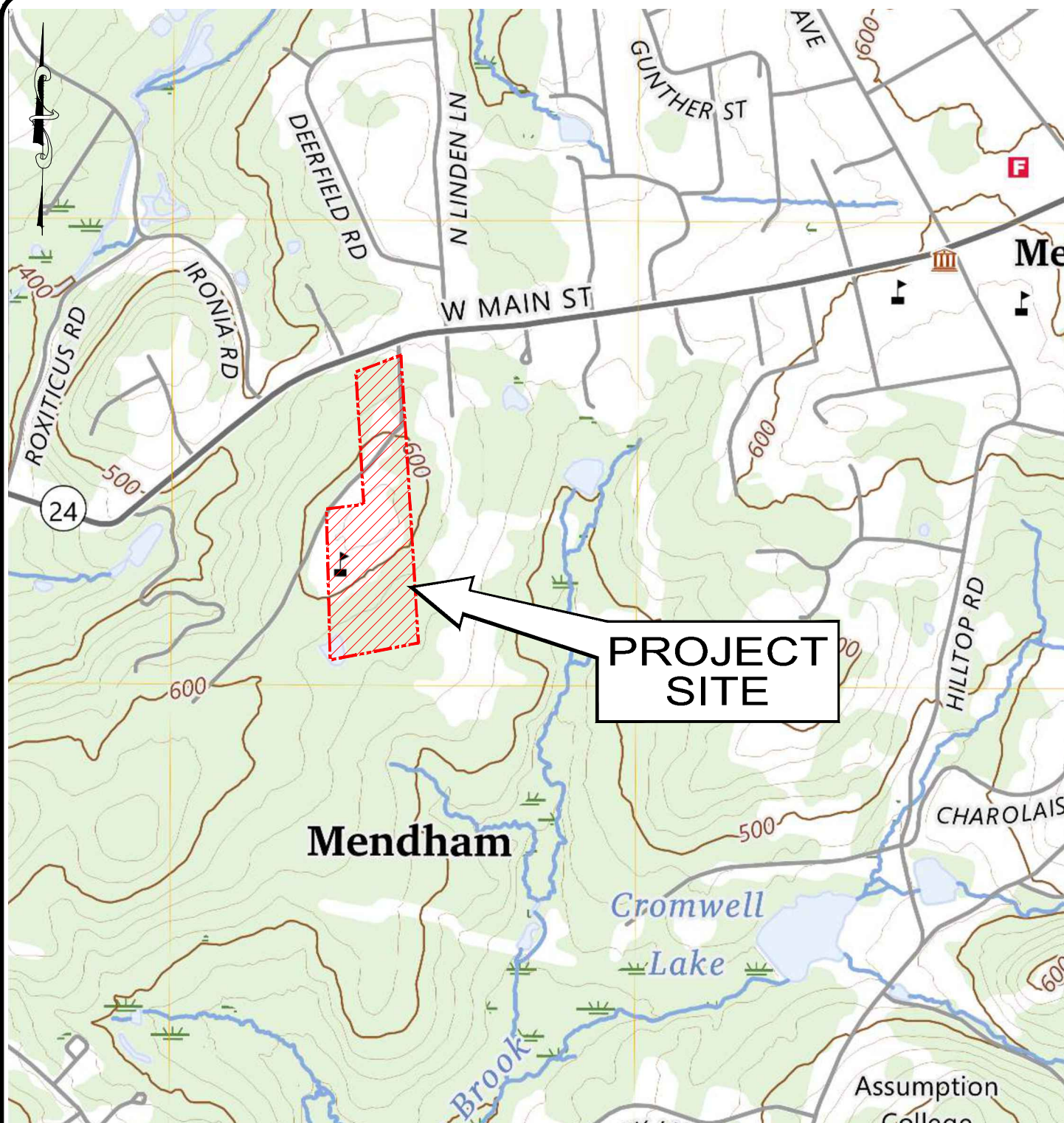
The following documents were relied upon during the preparation of the project's stormwater management plan:

1. New Jersey Stormwater Best Management Practices Manual, New Jersey Department of Environmental Protection; Revised through July 2023
2. Residential Site Improvement Standards, New Jersey Administrative Code Title 5, Chapter 21; Revised through May 2021
3. Stormwater Management Rules, New Jersey Administrative Code, Title 7, Chapter 8, revised to July 2023
4. Dam Safety Standards, New Jersey Administrative Code, Title 7, Chapter 8, revised to December 15, 2017
5. Standards for Soil Erosion and Sediment Control in New Jersey, New Jersey State Soil Conservation Committee; Revised through 2017
6. National Engineering Handbook, Part 630, Chapter 15, Issued May 2010

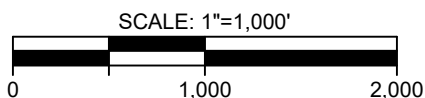
APPENDIX A

GENERAL DESIGN REFERENCES

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SOURCE: US GEOLOGICAL SURVEY, MENDHAM QUADRANGLE, NEW JERSEY, 7.5 MINUTE SERIES, 2023



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NJ Certificate of Authorization
No. 24GA28222600

DATE: 1/29/2026

SCALE: 1"=1,000'

CHKD.:

PROJ.: 081228-01-001

THE GREENS AT MENDHAM VILLAGE USGS SITE LOCATION MAP

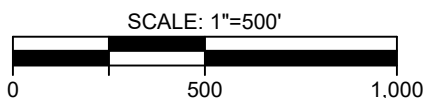
BLOCK 1801, LOT 5

BOROUGH OF MENDHAM
MORRIS COUNTY, NEW JERSEY



**PROJECT
SITE**

SOURCE: NearMap Aerial Image Dated Oct. 4, 2025 © 2026 Nearmap



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THE GREENS AT MENDHAM VILLAGE AERIAL SITE LOCATION MAP

BLOCK 1801, LOT 5

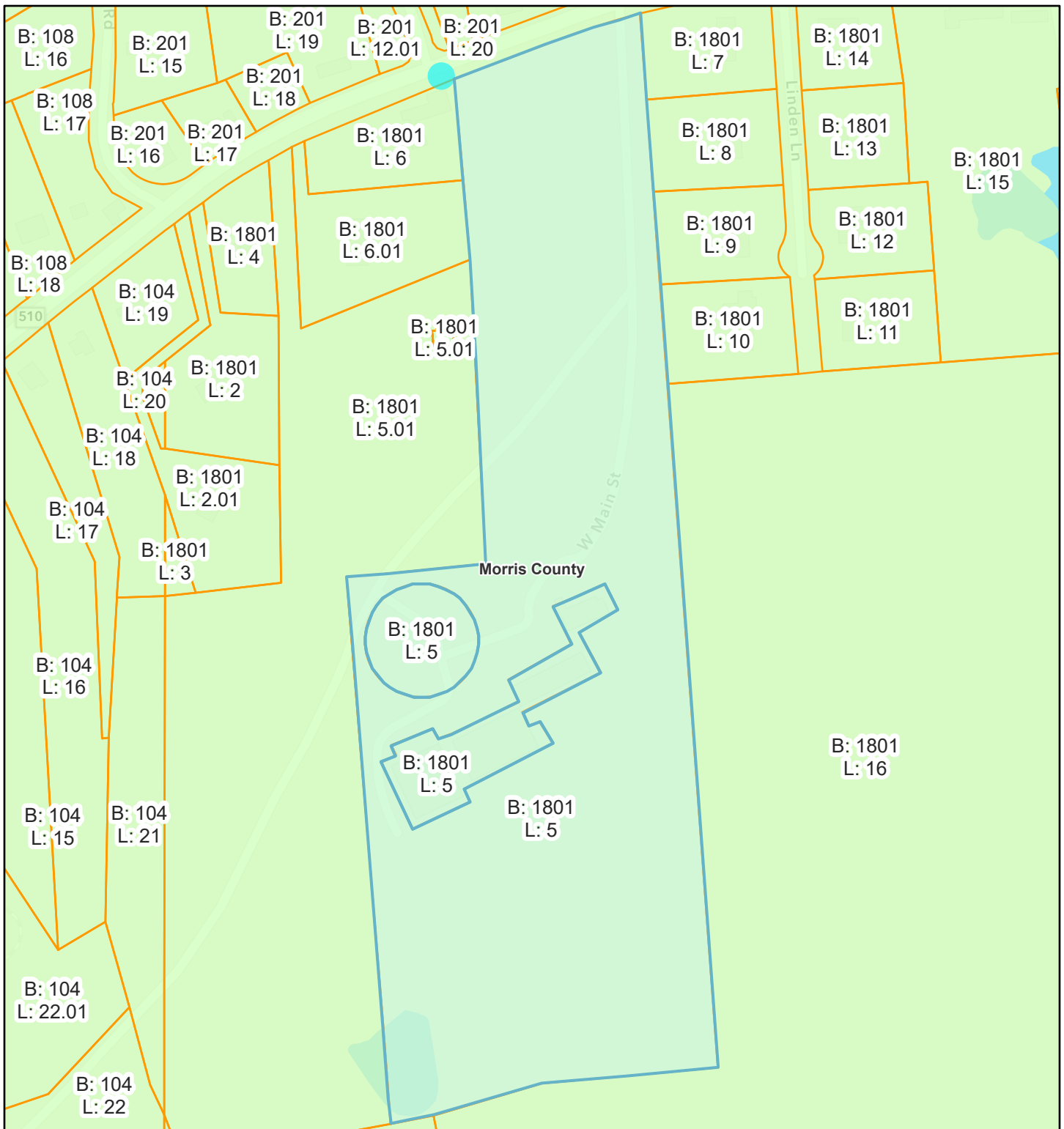
BOROUGH OF MENDHAM
MORRIS COUNTY, NEW JERSEY

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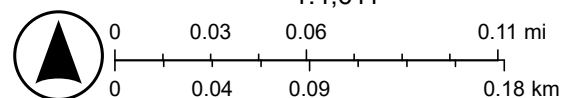
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

NJ-GeoWeb Map



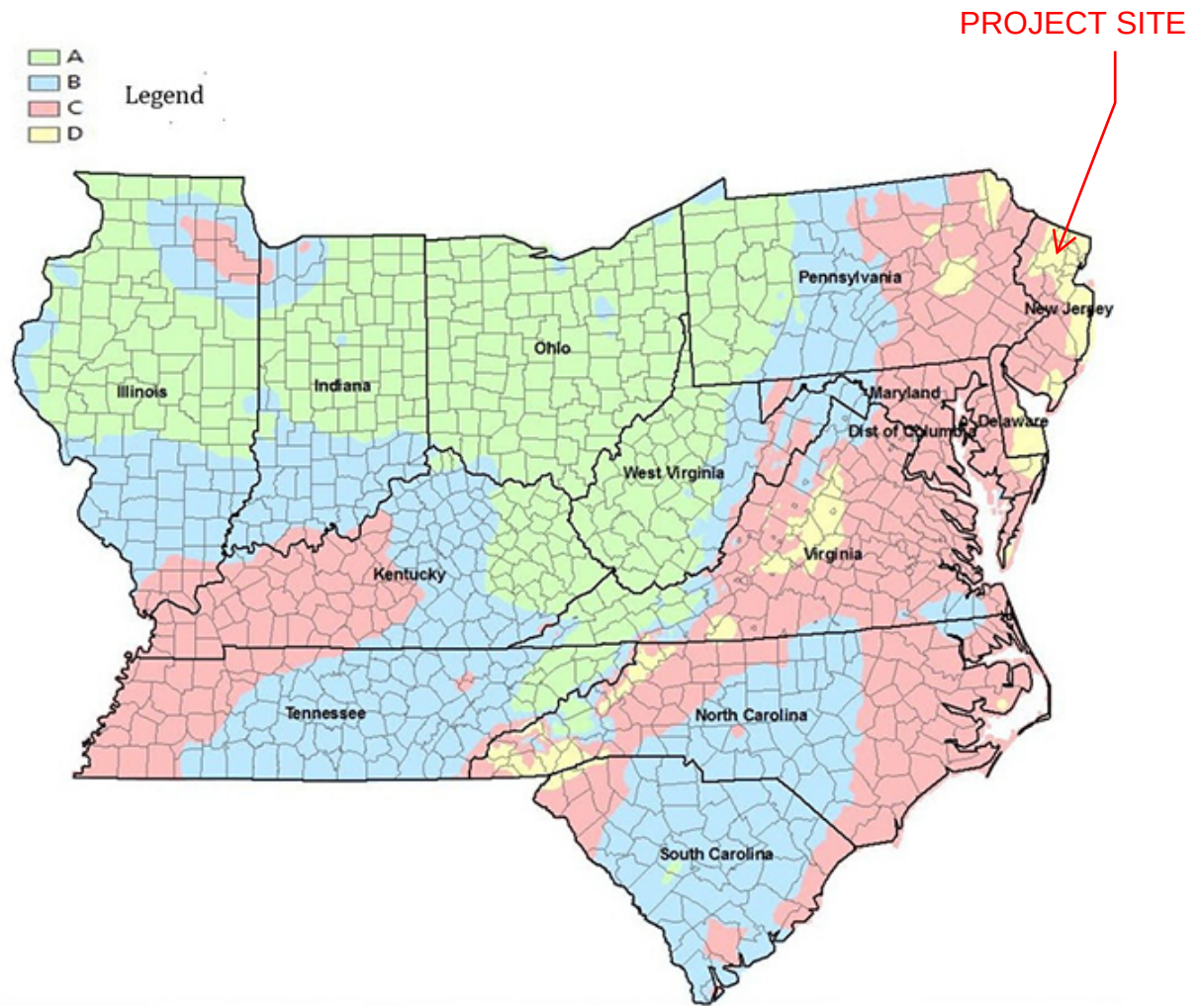
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- outputQueryP
- County Boundaries
- Parcels Data (Block and Lot)
- Wetlands (2020)
- State Planning Area Boundaries
- Environmentally Sensitive Planning Area (PA 5)



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 4-71: NOAA Atlas 14 Volume 2 Region, Rainfall Distribution Regions





NOAA Atlas 14, Volume 2, Version 3
Location name: Borough of Mendham, New
Jersey, USA*
Latitude: 40.7704°, Longitude: -74.6156°
Elevation: 627 ft**
* source: ESRI Maps
** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

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	0.338 (0.307-0.373)	0.403 (0.366-0.444)	0.476 (0.432-0.525)	0.528 (0.478-0.582)	0.592 (0.534-0.652)	0.640 (0.575-0.704)	0.685 (0.612-0.753)	0.725 (0.644-0.798)	0.776 (0.684-0.855)	0.812 (0.712-0.897)
10-min	0.537 (0.489-0.593)	0.641 (0.583-0.708)	0.761 (0.690-0.839)	0.843 (0.763-0.929)	0.942 (0.850-1.04)	1.01 (0.910-1.11)	1.08 (0.966-1.19)	1.14 (1.02-1.26)	1.22 (1.07-1.34)	1.27 (1.11-1.40)
15-min	0.671 (0.610-0.741)	0.805 (0.732-0.889)	0.959 (0.869-1.06)	1.06 (0.962-1.17)	1.19 (1.07-1.31)	1.28 (1.15-1.41)	1.36 (1.22-1.50)	1.44 (1.28-1.58)	1.53 (1.35-1.69)	1.60 (1.40-1.76)
30-min	0.916 (0.834-1.01)	1.11 (1.01-1.22)	1.36 (1.23-1.50)	1.54 (1.39-1.69)	1.76 (1.58-1.93)	1.92 (1.72-2.11)	2.08 (1.86-2.28)	2.23 (1.98-2.45)	2.42 (2.13-2.67)	2.56 (2.24-2.83)
60-min	1.14 (1.04-1.26)	1.39 (1.26-1.53)	1.74 (1.58-1.92)	1.99 (1.80-2.20)	2.33 (2.10-2.57)	2.59 (2.33-2.85)	2.86 (2.55-3.14)	3.11 (2.77-3.42)	3.46 (3.05-3.82)	3.73 (3.26-4.11)
2-hr	1.40 (1.26-1.54)	1.70 (1.55-1.88)	2.16 (1.95-2.38)	2.51 (2.26-2.76)	2.99 (2.69-3.29)	3.39 (3.03-3.72)	3.80 (3.37-4.17)	4.23 (3.73-4.65)	4.84 (4.21-5.32)	5.32 (4.59-5.86)
3-hr	1.57 (1.43-1.74)	1.91 (1.74-2.12)	2.42 (2.20-2.68)	2.82 (2.55-3.11)	3.37 (3.02-3.71)	3.81 (3.40-4.19)	4.27 (3.79-4.70)	4.75 (4.19-5.23)	5.42 (4.73-5.98)	5.96 (5.14-6.58)
6-hr	2.03 (1.85-2.25)	2.47 (2.25-2.72)	3.12 (2.83-3.44)	3.65 (3.30-4.01)	4.40 (3.95-4.83)	5.04 (4.49-5.52)	5.72 (5.05-6.25)	6.45 (5.64-7.05)	7.50 (6.47-8.21)	8.39 (7.15-9.19)
12-hr	2.54 (2.31-2.82)	3.09 (2.81-3.43)	3.93 (3.57-4.35)	4.64 (4.19-5.11)	5.68 (5.08-6.23)	6.58 (5.83-7.20)	7.55 (6.62-8.26)	8.64 (7.48-9.45)	10.3 (8.72-11.2)	11.6 (9.74-12.7)
24-hr	2.92 (2.69-3.19)	3.52 (3.25-3.85)	4.44 (4.10-4.86)	5.22 (4.80-5.70)	6.36 (5.81-6.93)	7.33 (6.66-7.97)	8.38 (7.57-9.12)	9.54 (8.53-10.4)	11.2 (9.92-12.2)	12.7 (11.1-13.8)
2-day	3.44 (3.17-3.76)	4.15 (3.83-4.54)	5.24 (4.82-5.73)	6.14 (5.63-6.70)	7.42 (6.78-8.10)	8.49 (7.72-9.25)	9.64 (8.71-10.5)	10.9 (9.74-11.9)	12.7 (11.2-13.9)	14.1 (12.4-15.5)
3-day	3.61 (3.34-3.93)	4.35 (4.02-4.74)	5.48 (5.06-5.96)	6.40 (5.89-6.95)	7.72 (7.07-8.38)	8.81 (8.03-9.55)	9.98 (9.04-10.8)	11.2 (10.1-12.2)	13.0 (11.6-14.2)	14.5 (12.8-15.8)
4-day	3.78 (3.50-4.09)	4.56 (4.22-4.94)	5.72 (5.29-6.19)	6.66 (6.15-7.21)	8.01 (7.36-8.66)	9.13 (8.35-9.86)	10.3 (9.37-11.1)	11.6 (10.4-12.5)	13.4 (11.9-14.5)	14.9 (13.1-16.2)
7-day	4.46 (4.14-4.83)	5.34 (4.96-5.79)	6.61 (6.13-7.15)	7.66 (7.08-8.27)	9.15 (8.42-9.88)	10.4 (9.50-11.2)	11.7 (10.6-12.6)	13.1 (11.8-14.1)	15.1 (13.5-16.3)	16.7 (14.8-18.1)
10-day	5.13 (4.79-5.51)	6.13 (5.72-6.59)	7.48 (6.97-8.03)	8.57 (7.96-9.20)	10.1 (9.34-10.8)	11.3 (10.4-12.2)	12.6 (11.6-13.5)	14.0 (12.7-15.0)	15.9 (14.3-17.1)	17.4 (15.5-18.8)
20-day	6.92 (6.50-7.39)	8.21 (7.71-8.77)	9.79 (9.19-10.5)	11.0 (10.3-11.8)	12.7 (11.9-13.6)	14.0 (13.1-15.0)	15.3 (14.2-16.4)	16.7 (15.4-17.8)	18.5 (16.9-19.8)	19.9 (18.1-21.3)
30-day	8.62 (8.14-9.13)	10.2 (9.60-10.8)	11.9 (11.2-12.6)	13.2 (12.4-13.9)	14.9 (14.0-15.7)	16.2 (15.2-17.1)	17.4 (16.3-18.5)	18.7 (17.4-19.8)	20.3 (18.8-21.6)	21.5 (19.9-22.9)
45-day	10.9 (10.4-11.6)	12.9 (12.2-13.6)	14.8 (14.0-15.6)	16.3 (15.4-17.2)	18.1 (17.1-19.1)	19.5 (18.4-20.6)	20.8 (19.6-22.0)	22.1 (20.7-23.3)	23.6 (22.1-25.0)	24.7 (23.1-26.3)
60-day	13.1 (12.5-13.8)	15.4 (14.6-16.2)	17.6 (16.7-18.5)	19.2 (18.2-20.2)	21.2 (20.1-22.4)	22.7 (21.5-23.9)	24.0 (22.7-25.4)	25.3 (23.9-26.8)	26.9 (25.3-28.4)	28.0 (26.3-29.7)

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.

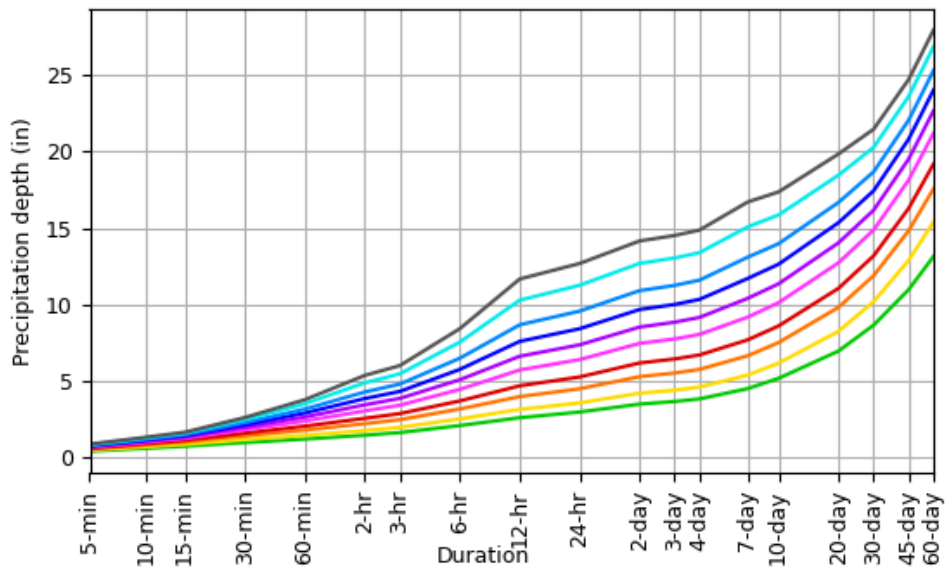
Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

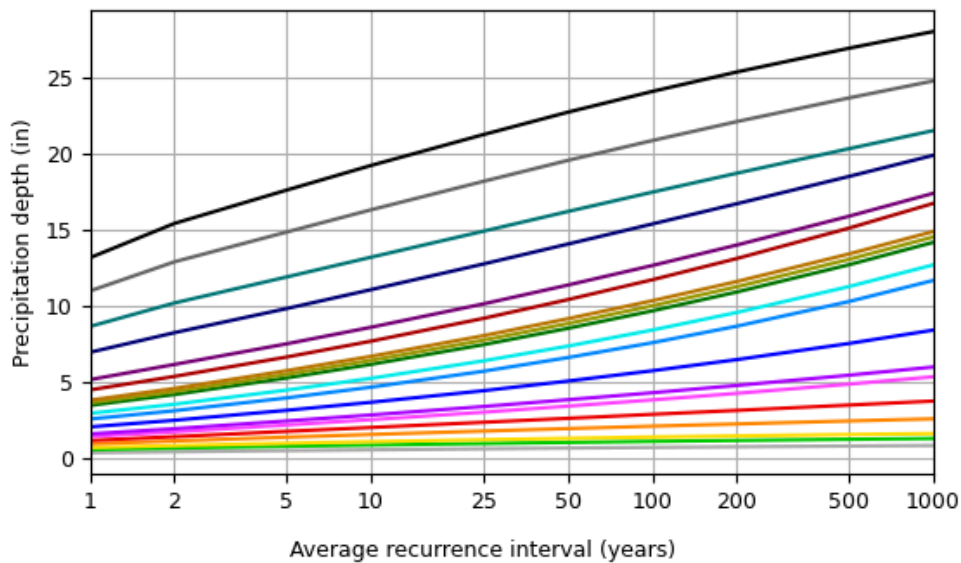
PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 40.7704°, Longitude: -74.6156°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000

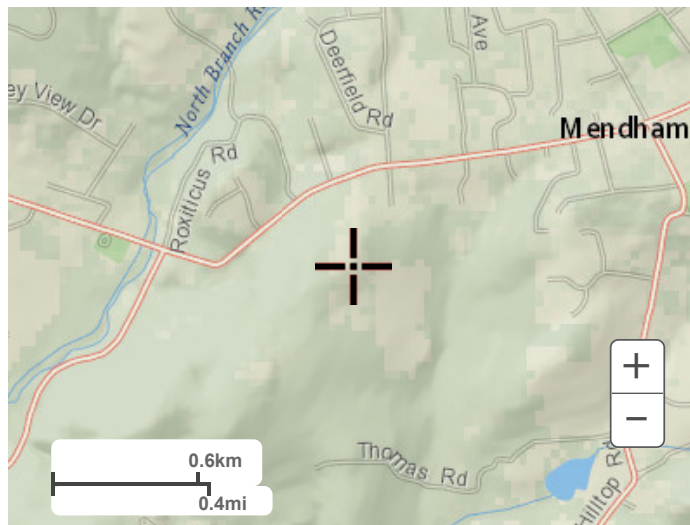


Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

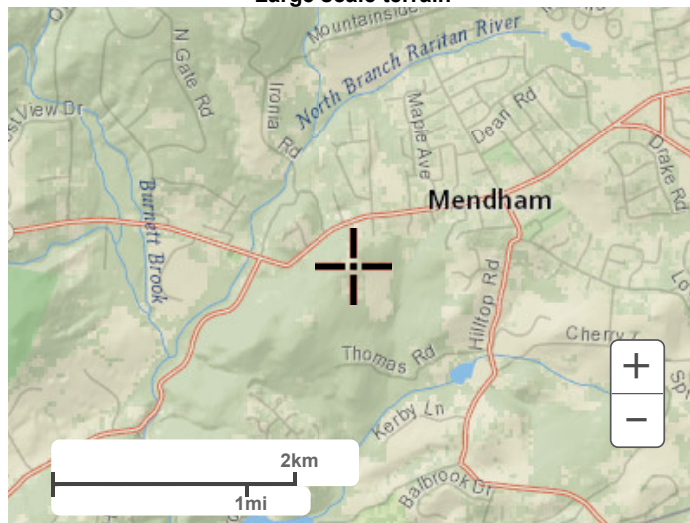
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Maps & aerials

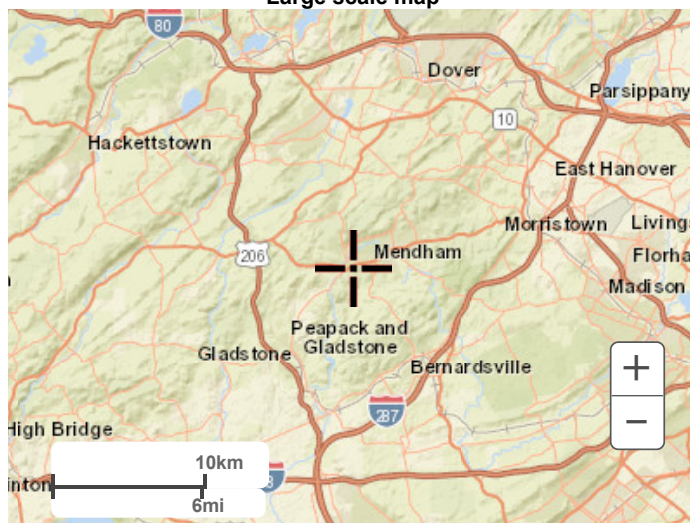
Small scale terrain



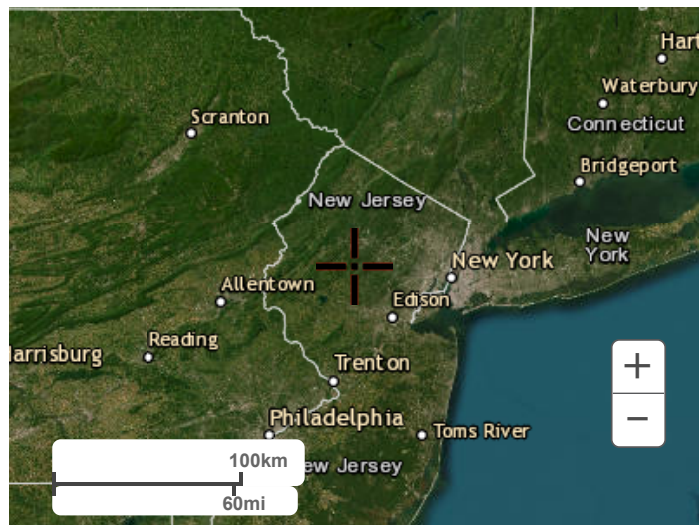
Large scale terrain



Large scale map



Large scale aerial



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1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Table 5-4: Water Quality Design Storm Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
1	0.00166	41	0.1728	81	1.0906
2	0.00332	42	0.1796	82	1.0972
3	0.00498	43	0.1864	83	1.1038
4	0.00664	44	0.1932	84	1.1104
5	0.00830	45	0.2000	85	1.1170
6	0.00996	46	0.2117	86	1.1236
7	0.01162	47	0.2233	87	1.1302
8	0.01328	48	0.2350	88	1.1368
9	0.01494	49	0.2466	89	1.1434
10	0.01660	50	0.2583	90	1.1500
11	0.01828	51	0.2783	91	1.1550
12	0.01996	52	0.2983	92	1.1600
13	0.02164	53	0.3183	93	1.1650
14	0.02332	54	0.3383	94	1.1700
15	0.02500	55	0.3583	95	1.1750
16	0.03000	56	0.4116	96	1.1800
17	0.03500	57	0.4650	97	1.1850
18	0.04000	58	0.5183	98	1.1900
19	0.04500	59	0.5717	99	1.1950
20	0.05000	60	0.6250	100	1.2000
21	0.05500	61	0.6783	101	1.2050
22	0.06000	62	0.7317	102	1.2100
23	0.06500	63	0.7850	103	1.2150
24	0.07000	64	0.8384	104	1.2200
25	0.07500	65	0.8917	105	1.2250
26	0.08000	66	0.9117	106	1.2267
27	0.08500	67	0.9317	107	1.2284
28	0.09000	68	0.9517	108	1.2300
29	0.09500	69	0.9717	109	1.2317
30	0.10000	70	0.9917	110	1.2334
31	0.10660	71	1.0034	111	1.2351
32	0.11320	72	1.0150	112	1.2367
33	0.11980	73	1.0267	113	1.2384
34	0.12640	74	1.0383	114	1.2400
35	0.13300	75	1.0500	115	1.2417
36	0.13960	76	1.0568	116	1.2434
37	0.14620	77	1.0636	117	1.2450
38	0.15280	78	1.0704	118	1.2467
39	0.15940	79	1.0772	119	1.2483
40	0.16600	80	1.0840	120	1.2500

(e) If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area ^{2/}	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	96 85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas					
(pervious areas only, no vegetation) ^{5/}		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. ^{2/}	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. ^{3/}	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 ^{4/}	48	65	73
Woods—grass combination (orchard or tree farm). ^{5/}	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. ^{6/}	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 ^{4/}	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

¹ Average runoff condition, and $I_a = 0.2S$.² *Poor*: <50% ground cover or heavily grazed with no mulch.*Fair*: 50 to 75% ground cover and not heavily grazed.*Good*: > 75% ground cover and lightly or only occasionally grazed.³ *Poor*: <50% ground cover.*Fair*: 50 to 75% ground cover.*Good*: >75% ground cover.⁴ Actual curve number is less than 30; use CN = 30 for runoff computations.⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.⁶ *Poor*: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.*Fair*: Woods are grazed but not burned, and some forest litter covers the soil.*Good*: Woods are protected from grazing, and litter and brush adequately cover the soil.

APPENDIX B

NRCS SOILS REPORT



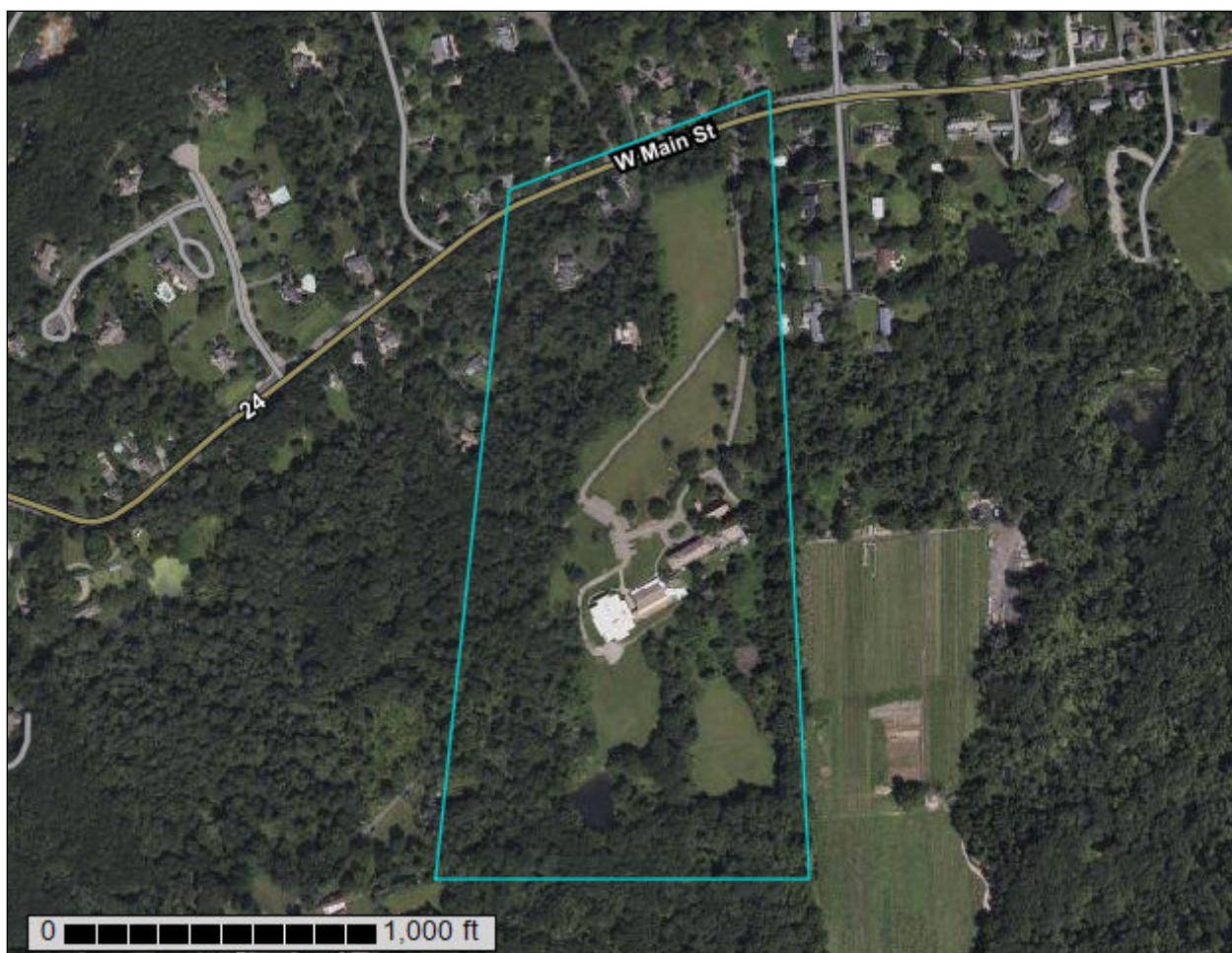
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for **Morris County, New Jersey**



Preface

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

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

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

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

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

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

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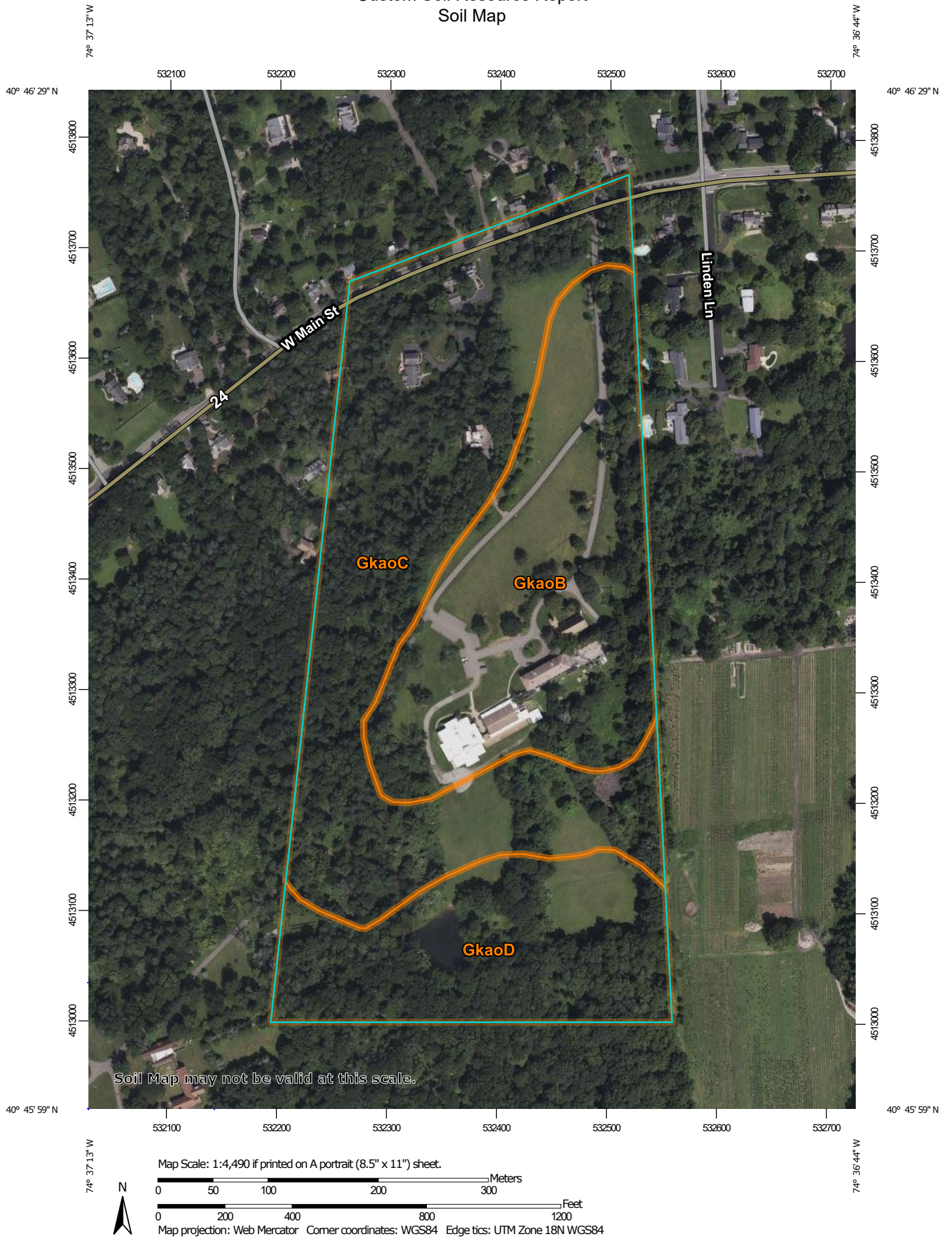
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Soil Map

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

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Morris County, New Jersey
Survey Area Data: Version 17, Aug 30, 2022

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

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GkaoB	Gladstone gravelly loam, 3 to 8 percent slopes	18.3	33.3%
GkaoC	Gladstone gravelly loam, 8 to 15 percent slopes	25.3	46.0%
GkaoD	Gladstone gravelly loam, 15 to 25 percent slopes	11.4	20.7%
Totals for Area of Interest		55.0	100.0%

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Morris County, New Jersey

GkaoB—Gladstone gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v7gk
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy colluvium derived from granite and gneiss and/or loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam
Bt1 - 10 to 22 inches: sandy clay loam
Bt2 - 22 to 37 inches: loam
C - 37 to 66 inches: sandy loam
R - 66 to 76 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 60 to 80 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Annandale

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Parker

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Califon

Percent of map unit: 5 percent
Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

GkaoC—Gladstone gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2v7gl
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 170 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope

Custom Soil Resource Report

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Loamy colluvium derived from granite and gneiss and/or loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam

Bt1 - 10 to 22 inches: gravelly sandy clay loam

Bt2 - 22 to 37 inches: gravelly loam

C - 37 to 66 inches: gravelly sandy loam

R - 66 to 76 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 65 to 67 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest

Hydric soil rating: No

Minor Components

Califon

Percent of map unit: 5 percent

Landform: Flats

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Parker

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Annandale

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear
Hydric soil rating: No

GkaoD—Gladstone gravelly loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2v7hd
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy colluvium derived from granite and gneiss over loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam
Bt1 - 10 to 22 inches: gravelly sandy clay loam
Bt2 - 22 to 37 inches: gravelly loam
C - 37 to 66 inches: gravelly sandy loam
R - 66 to 80 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 65 to 67 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Custom Soil Resource Report

Hydrologic Soil Group: B

Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak -
Hardwood - Conifer Forest

Hydric soil rating: No

Minor Components

Califon

Percent of map unit: 5 percent

Landform: Flats

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Parker

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Annandale

Percent of map unit: 5 percent

Landform: Ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

APPENDIX C

**GEOTECHNICAL INFORMATION
(GEO-TECHNICAL ASSOCIATES &
M&Z ENGINEERING ASSOCIATES, PC REPORTS)**



STORMWATER MANAGEMENT TESTING REPORT

Daytop Development, Mendham

Morris County, New Jersey

November 21, 2023

Revised October 15, 2024



Prepared for:

80-88 W. Main Street, LLC

225 Littleton Road

Morris Plains, New Jersey, 07950

Attn: Mark Calabro

Prepared By:

Geo-Technology Associates, Inc.

Geotechnical and Environmental Consultants

14 Worlds Fair Drive, Suite A

Somerset, New Jersey 08873

(732) 271-9301

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GTA Project No: 31231605x1

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS



A Practicing Geoprofessional Business Association Member Firm

November 21, 2023

Revised October 15, 2024

80-88 W. Main Street, LLC
225 Littleton Road
Morris Plains, New Jersey 07950

Attn: Mark Calabro

Re: Stormwater Management Testing Report
Daytop Development, Mendham
Morris County, New Jersey

Dear Mark:

In accordance with our agreements dated August 8, 2023, October 16, 2023, and September 11, 2024, Geo-Technology Associates, Inc. (GTA) has performed geotechnical explorations for the planning and design of stormwater management (SWM) facilities related to a proposed residential development to be constructed in the Borough of Mendham, Morris County, New Jersey. The explorations pertaining to the stormwater management testing consisted of a total of 60 test pit excavations within the proposed SWM basin areas, visually classifying the encountered soils, and performing in-situ infiltration tests. The results of the field testing, and GTA's recommendations regarding the design and construction of the proposed SWM basins are included in this report.

GTA appreciates the opportunity to have been of assistance to you on this project. Please contact our office at (732) 271-9301 if you have questions or require additional information. Please note that, unless you make other arrangements, GTA will discard all soil samples obtained from the explorations 60 days after the date of this report.

Sincerely,

GEO-TECHNOLOGY ASSOCIATES, INC.

Allison Tether, P.G.
Senior Project Manager

Kyle T. Plaza, P.E.
Associate

Robert Dykstra, P.E.
Vice President

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Important Information About This Geotechnical Engineering Report

Appendix A – Figures

Figure No. 1	Site Location Map
Figure No. 2	Test Pit Location Plan

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Notes for Exploration Logs
Logs of Test Pits (89 pages)

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1.0 INTRODUCTION

This report presents the results of a geotechnical engineering investigation performed by Geo-Technology Associates, Inc. (GTA) for the planning and design of stormwater management (SWM) facilities relating to a proposed residential development to be located in Borough of Mendham, Morris County, New Jersey. GTA has performed a geotechnical engineering study and prepared this report for 80-88 W. Main Street, LLC in accordance with our proposals dated August 8, 2023, October 16, 2023, and September 11, 2024.

1.1 Study Purpose

GTA conducted this study to develop confirmation-dependent geotechnical engineering recommendations for the proposed SWM facilities related to the proposed development. The scope of GTA's study pertaining to the SWM testing included a field exploration consisting of a total of 60 test pit excavations with in-situ infiltration testing within the proposed SWM basin areas. The conclusions and recommendations presented in this report were derived from engineering analyses of field data and details of the proposed SWM facilities as detailed herein.

1.2 Reference Documents

GTA was most recently provided with a plan prepared by Bowman Consulting Group, Ltd. (Bowman) titled "Constraints Plan" with a latest revision date of August 13, 2024. The plan indicates the site boundaries, existing site features and topography, proposed site grading, and the layout and dimensions of the proposed townhome buildings, multi-family building, associated roadways and parking lots, and 22 proposed SWM basins. The plan was marked up to show the requested locations of 29 explorations within the proposed basin areas.

GTA has based our understanding of the project on our review of the provided plans. If the reference documents are modified after the date of GTA's initial review, Client should provide the updated versions to GTA. Modifications may make it necessary for GTA to revise its geotechnical engineering recommendations.

1.3 Background

GTA previously performed a geotechnical engineering exploration at the site, the results of which were presented in a report dated September 15, 2023. The subsurface exploration consisted of 8 Standard Penetration Test (SPT) borings and 52 test pit excavations throughout the proposed development area, and preliminary infiltration testing was performed adjacent to 38 of the test pits within the proposed SWM basin areas.



Following our initial study, the layout and dimensions of some of the proposed basins changed. GTA was requested to perform additional testing within the SWM basins to satisfy the provisions of Chapter 12 of the New Jersey Stormwater Best Management Practices (BMP) Manual. GTA was also requested to perform basin flood testing at 5 test pit locations where rock was encountered within 8 feet of the proposed basin bottom elevations.

Following our supplementary SWM study, additional modifications were made to the layout and dimensions of the proposed SWM facilities. GTA was provided with an updated plan, referenced in the [Reference Documents](#) section of this report, which indicated the locations of the proposed SWM basins and 29 requested explorations throughout the site. This report was updated to include the results of all the SWM testing performed at the site to date.

2.0 PROJECT DESCRIPTION

2.1 Site Location

The project site is located in the Borough of Mendham, Morris County, New Jersey. The project site is located on the southern side of West Main Street (Route 24), between its intersections with Ironia Road and Linden Lane, and is identified as Lot 5 in Block 1801 on the Borough of Mendham tax map. The site is bounded by Route 24 to the north, residential properties to the east and west, and wooded areas to the south. The *Site Location Map*, in Appendix A, Figure No. 1, indicates the site location in relation to adjacent properties.

2.2 Existing Site Conditions

At the time of GTA's exploration, four existing buildings and associated parking areas were present in the south-central portion of the site. Wooded areas and a pond were present in the southern portion of the site along the edges of the property, and the northern portion of the site was an open lawn area. A long driveway leading from Route 24 provided access to the existing structures.

Based on our review of topographic information shown on the plans provided to us, the central portion of the site contains a topographic high at about Elevation (EL) 626 feet. The ground surface generally slopes moderately down to about EL 560 feet in the northern portion of the site and down to about EL 562 feet to in the southern portion of the site.

2.3 Proposed SWM Basin Construction

Based on the plan provided to us, we understand that the proposed residential development will include 22 SWM basins throughout the site, which are labeled as Basins A through U, and one basin was labeled as a "potential" basin. The planned basin bottom elevations were not indicated on the



provided plan and were not available at the time of our exploration. However, the approximate requested infiltration test depths were indicated for each requested test pit located within the SWM infiltration basins. Several of the basins were labeled as “underdrained” on the plan and infiltration testing was not requested in these basins. The approximate basin bottom areas, ground surface elevations, basin type, and requested infiltration test depth for each proposed basin are summarized in the table below:

Basin Name	Approximate Infiltration Area (ft ²)	Approximate Existing Ground EL (ft)	Basin Type	Requested Infiltration Test Depth (ft)
Basin A	22,300	568 – 580	Underdrained	-
Basin B	450	594	Infiltration	6
Basin C	1,600	584 – 590	Infiltration	4
Basin D	450	594	Infiltration	6
Basin E	1,000	604 – 606	Infiltration	6
Basin F	450	604 – 606	Infiltration	6
Basin G	5,500	616 – 620	Underdrained	-
Basin H	7,000	614 – 618	Underdrained	-
Basin I	4,200	614 – 618	Infiltration	-
Basin J	5,000	614 – 616	Underdrained	-
Basin K	1,500	606 – 608	Infiltration	-
Basin L	2,200	616 – 622	Infiltration	8
Basin M	1,000	588 – 594	Infiltration	2
Basin N	1,300	506 – 618	Infiltration	8
Basin O	1,300	614 – 616	Infiltration	8
Basin P	7,500	572 – 580	Underdrained	-
Basin Q	1,000	576 – 580	Infiltration	-
Basin R	9,700	564 – 566	Underdrained	-
Basin S	13,100	564 – 566	Underdrained	-
Basin T	2,100	560 – 564	Underdrained	-
Basin U	5,800	594 – 610	Underdrained	-
Potential Basin	5,300	588 – 600	Underdrained	-

3.0 GEOTECHNICAL ENGINEERING STUDY

3.1 Geologic Review

The subject site is situated within the Highlands physiographic province characterized by rugged topography with discontinuous rounded ridges separated by deep narrow valleys. The surficial geology of the site, as shown on the *Surficial Geology of the Mendham Quadrangle, Morris and Somerset Counties, New Jersey (OFM 94, 2012)* published by the New Jersey Geological Survey, consists of predominantly weathered gneiss. The weathered gneiss is described as yellowish-brown, yellow, very pale brown, and reddish-yellow silty sand, silty clayey sand, and sandy clayey silt, with few to many pebbles and cobbles of gneiss. The unit includes granular decomposed rock, fractured rock rubble, and saprolite that preserves the original rock structure. The total thickness of the weathered material can be as much as 150 feet but is typically less than about 50 feet.

The site is underlain by Mesoproterozoic age Hornblende Granite, as shown on the *Bedrock Geologic Map of the Mendham Quadrangle, Morris and Somerset Counties, New Jersey (OFM 126, 2019)* published by the New Jersey Geological Survey. The unit is described as pinkish-gray or buff weathering, pinkish-white or light-pinkish gray, medium- to coarse-grained, foliated granite composed of microcline microperthite, quartz, oligoclase, and hornblende.

Please refer to the referenced publications for more detailed descriptions of the geologic members.

3.2 Subsurface Exploration

Our initial subsurface exploration program consisted of excavating 42 test pits with in-situ infiltration testing within the proposed SWM basin areas. The test pits were excavated by Harrington & Sons Construction Company, Inc. (HSCC) on August 14 through August 23, 2023, using a Volvo EC160DL excavator and extended to depths ranging from about 3 feet to 16 feet below the ground surface. GTA observed 18 additional test pit excavations on October 25 through 27, 2023. The test pits were excavated by HSCC using a John Deere 160G LC excavator, and extended to depths ranging from about 4½ to 20 feet below the ground surface. On September 24 through September 27, 2024, GTA observed 29 additional test pits that were excavated by HSCC using a Volvo EC160DL excavator and extended to depths ranging from about 5 feet to 16 feet below the ground surface.

The initial SWM exploration locations were selected by GTA and all additional test pit and basin flood test locations were selected by Bowman. All explorations were surveyed and staked in the field by Bowman prior to our field work.

The approximate locations of the stormwater test pits performed for both of our studies are shown on the Exploration Location Plan, which is included as Figure 2 in Appendix A. Detailed descriptions of the subsurface conditions encountered in the test pits are indicated on the Logs of Test Pits, which are included in Appendix B. The ground surface elevations for the staked locations were provided by Bowman. A few of the test pits (TP-14A, TP-25A, TP-33A, TP-35A, TP-101A, TP-102A, and TP-102B) were offset from the staked locations for various reasons, and the elevations shown on the logs of the relocated test pits were obtained by interpolating between topographic contours indicated on the plans provided to us.

The soil samples retrieved from the test pits were delivered to GTA's laboratory for visual classification by a geotechnical engineer and limited laboratory testing. The soil descriptions indicated on the logs are based on visual observations of the individual soil samples as summarized in the Notes for Exploration Logs included in Appendix B, supplemented by the laboratory test results.

3.3 Subsurface Conditions

The results of the subsurface exploration were, for the most part, consistent with the known site history and geologic mapping of the project site, and our previous explorations. The specific subsurface conditions at each exploration location are shown on the individual exploration logs within Appendix B. GTA has summarized the subsurface conditions encountered in the following sections.

3.3.1 Surficial Materials

An approximately 6- to 12-inch-thick layer of topsoil was encountered at the ground surface in all of the explorations performed for this and our previous studies, averaging about 10 inches. The reported topsoil thicknesses generally represent the upper layer of dark and organic soil.

3.3.2 Existing Fill

Thirteen of the explorations performed for this and our previous studies encountered materials that GTA representatives visually identified as existing fill materials. The encountered fill generally extended to depths ranging from about 3 to 14 feet below the ground surface and consisted predominantly of silty sands with gravel and contained debris including plastic, fabric, concrete, bricks, cinder blocks, and abandoned utility lines. Test Pits TP-39, TP-216 and TP-219 encountered layers of buried topsoil below the fill at depths ranging from about 3 to 8 feet below the ground surface.

3.3.3 Native Soils

Beneath the topsoil and existing fill, where present, the explorations encountered native surficial soils consistent with the geologic mapping of the site. The subsurface profile predominantly consisted of sandy silts (ML), silty sands (SM), and gravel soils (GM, GW-GM, GP-GM). Additionally, cobbles and boulders were frequently encountered within the excavated materials.

Below the surficial soils, the explorations encountered decomposed gneiss bedrock at depths ranging from about 2 to 14 feet below the ground surface. The decomposed rock, also called saprolite, generally preserves the appearance of the original rock structure but due to chemical weathering processes over time generally breaks apart easily when excavated and behaves as soil.

3.3.4 Weathered Rock

GTA defines highly weathered rock (HWR) as residual materials that exhibit SPT N-values of 50 bpf to 50 blows for 1 inch of penetration for Standard Penetration Testing, and by visual identification of the rock plate sizes and increased excavation effort in test pits. The surface of HWR was encountered in 56 of the 89 explorations performed for this study at depths ranging from about 1 foot to 14 feet below the existing surface grades. Refusal to further penetration was encountered in 32 of the 89 test pits at depths ranging from about 5 feet to 16 feet below the ground surface.

3.3.5 Groundwater

Groundwater was encountered in 3 of the test pits at depths of about 11 feet below the ground surface, which generally corresponded to about EL 561 to 564 feet. Note that groundwater levels can fluctuate with seasonal variations in precipitation and as a result of development activity. Also, perched water conditions may develop in localized areas where granular soils are underlain by less permeable, fine-grained soils or rock.

3.5 Laboratory Testing

GTA performed laboratory testing on selected soil samples obtained from the explorations, including grain size analyses and Atterberg limits testing for classification of the soils in accordance with the Unified Soil Classification System (USCS), as well as natural moisture content determinations. Classification of the soils in accordance with the USCS provides information regarding the engineering properties of the on-site soils that will likely support the proposed foundations, slabs, and pavements, and be used as controlled compacted fill and backfill. Detailed results of the laboratory testing performed for this study are included in Appendix C. The results of the laboratory tests are summarized in the following table:

SUMMARY OF CLASSIFICATION TESTING

Test Pit No.	Depth (ft.)	LL (%)	PI (%)	USCS Classification	NMC (%)	Fines (%)
TP-2	3	42.1	13.8	Sandy SILT (ML)	37.5	66.0
TP-6	7	NP	NP	Well-graded GRAVEL with silt and sand (GW-GM)	6.8	5.2
TP-12	1	NP	NP	Silty SAND with gravel (SM)	14.6	24.5
TP-18	7	NP	NP	Poorly-graded GRAVEL with silt and sand (GP-GM)	5.2	6.2
TP-22	½	NP	NP	Silty SAND (SM)	19.2	39.3
TP-35A	6	NP	NP	Silty SAND (SM)	21.2	21.3
TP-49	2½	NP	NP	Silty SAND (SM)	17.0	49.9

Note: NMC=Natural Moisture Content, LL=Liquid Limit, PI=Plasticity Index, Fines=Material passing the #200 sieve

3.6 Infiltration Test Results

In-situ infiltration tests were performed adjacent to 53 of the test pits using a double-ring infiltrometer in general accordance with Chapter 12 of the NJDEP Stormwater Best Management Practices Manual (SWM BMP). The results of the infiltration tests are included in Appendix D.

3.7 Basin Flood Test Results

Due to the presence of shallow bedrock at the site, basin flood testing was performed to establish the permeability rate of the bedrock in accordance with Subsection A3 of Chapter 12 of the NJ Stormwater BMP Manual (Chapter 12). A basin flood test involves excavating a “basin” with a minimum bottom area of 50 square feet. If groundwater is observed within the basin, the basin flood test shall not be used. If no groundwater is observed, the basin shall be filled with 12 inches (about 375 gallons) of water and allowed to drain completely. If the time required for the basin to drain is greater than 24 hours, the test shall be terminated, and the rock shall be considered to be a massive rock substratum. If the basin drains completely within 24 hours, the basin shall be filled with another 12 inches of water. If the basin drains completely within 24 hours of the second filling, the rock shall be considered to be fractured rock substratum, and suitable for infiltration with a design infiltration rate of 0.5 inches per hour.

Five basins with dimensions of approximately 10 feet by 5 feet were excavated adjacent to Test Pits TP-6, TP-7, TP-15, TP-23 and TP-24 and are labeled as TP-106, TP-107, TP-108, TP-109 and TP-110 on

our Test Pit Location Plan. An additional 15 basins were excavated as part of our testing performed in September 2024 and were located adjacent to Test Pits TP-201 through TP-206, TP-209 through TP-212, and TP-215 through TP-219. The basins were terminated at depths ranging from about 6 to 15 feet below the ground surface within the weathered rock that was encountered. Following excavation, the basins were filled with 12 inches of water and the water levels were checked 24 hours after filling. Following the initial 24-hour presoak period, it was observed that all but 2 of the basins (TP-202 and TP-204) had drained. Those 18 basins were refilled to 12 inches above the basin bottom levels. Following the second 24-hour period, it was observed that all 18 basins had completely drained again. Therefore, per the guidance in Chapter 12, it is our opinion that the bedrock in those areas should be classified as a fractured rock substratum with a design infiltration rate of 0.5 inches per hour. However, based on the results of our testing, the rock in the areas of Test Pits TP-202 and TP-204 is not suitable for infiltration. The results of the basin flood tests are included in Appendix D.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The primary conditions that affect the capacity of soil to infiltrate water are the soil gradation and density properties and the presence of hydraulically restrictive layers such as silt or clay (fines), rock, or groundwater, each of which would restrict the flow of water into the underlying aquifer. The subsurface profile in the proposed SWM basin areas generally consisted of sandy silts (ML), silty sands (SM), and gravel soils (GM, GW-GM, GP-GM) overlying highly weathered gneiss bedrock.

In general, the gravel soils appeared receptive to infiltration with measured infiltration rates ranging from about 1.5 to 45 inches per hour. The silty sand soils appeared mostly receptive to infiltration with measured infiltration rates ranging from about 0.25 to 12 inches per hour; however, the silty sand tested at TP-113 was not receptive to infiltration and resulted in zero (0) inches per hour. The sandy silt tested at TP-2 was also not receptive to infiltration, which is typical for fine-grained soils.

Chapter 12 requires that infiltration tests be performed within the most restrictive layer within 8 feet of the proposed infiltration elevations. Therefore, per the Chapter 12 guidance, basin flood testing was performed to establish the permeability rate of the bedrock at 20 locations within the proposed SWM basins. The basin flood tests drained fully at 18 of the 20 test locations.

We believe the results of the testing indicate that infiltration of collected stormwater generally appears feasible at the planned basin locations, depending on the proposed basin bottom elevations. However, undercutting and replacement of fine-grained soils should be anticipated where these soils are exposed following the excavation to achieve the proposed basin bottom elevations. The overexcavations should then be backfilled to the proposed basin bottom elevations using granular soils, washed gravel, or sand

meeting the design infiltration rate. Scarifying or replacement of silty sand soils may also be necessary during construction depending on the basin design infiltration rates.

It will be important to limit disturbance and compaction of the infiltration surface during construction. Infiltration areas should not be exposed to unstabilized runoff that may contribute to sedimentation and clogging of the subgrade, and possible system failure, prior to the completion of construction. Where possible, the operation of heavy construction equipment directly on the infiltration area subgrades should be avoided or kept to a minimum. After grubbing and rough grading, infiltration areas should be tilled with a disc or rotary tiller followed by a leveling drag to restore the soils to a loose condition.

Construction oversight by competent engineering personnel during installation of stormwater management facilities is critical to successful functioning of the system. Ideally, construction oversight should be provided by the geotechnical engineer, or qualified representative, retained by the project owner to document construction operations and assure that project specifications and special construction requirements are met. Periodic inspection and maintenance of the system will be required to maximize the efficiency and design life of the system.

5.0 ADDITIONAL SERVICES

We recommended that GTA be retained during construction of the subject project to provide geotechnical consultation and construction observation and testing services as outlined below:

- Review final site plans to evaluate if they conform to the intent of this report.
- Provide on-site observation during SWM basin construction.
- Perform as-built testing once basin subgrades are properly prepared.

6.0 LIMITATIONS

This report, including all supporting test pit logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared for the exclusive use of Weichert Development Company (Client) pursuant to the Agreements between GTA and Client dated August 8, 2023, October 16, 2023, and September 11, 2024, and in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and Client is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test pits indicate subsurface conditions only at specific locations and times, and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between the exploration locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed, and conclusions of this report are verified in writing. GTA is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of GTA.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual site-wide subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*



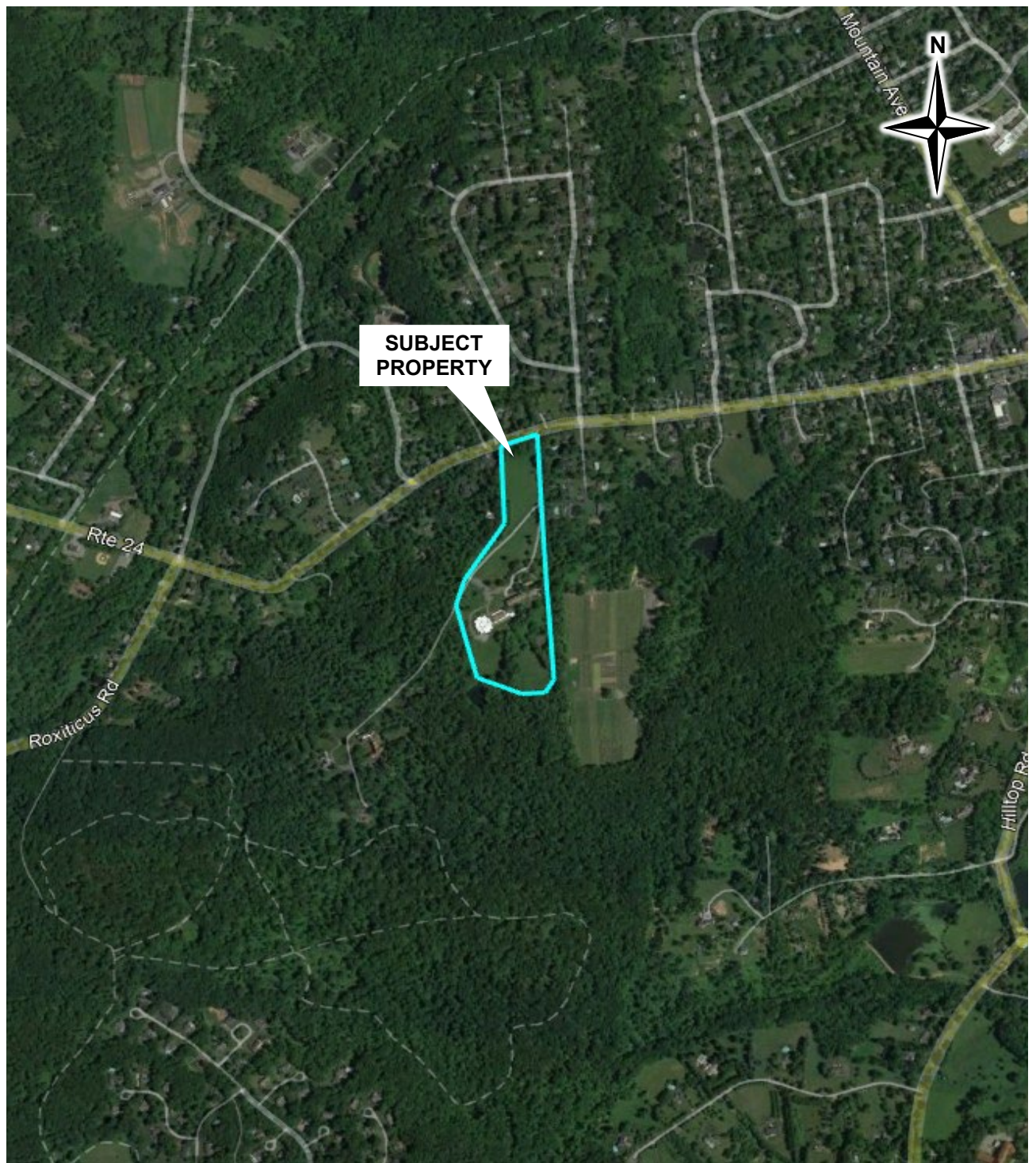
**GEOPROFESSIONAL
BUSINESS
ASSOCIATION**

Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX A

Figures



Note: Site boundary is approximate.

SITE LOCATION MAP



14 Worlds Fair Drive, Suite A
Somerset, New Jersey 08873
(732) 271-9301
fax (732) 271-9306

GEO-TECHNOLOGY ASSOCIATES, INC.

DAYTOP DEVELOPMENT, MENDHAM

Borough of Mendham,
Morris County, New Jersey

Prepared For: 80-88 W. Main Street, LLC

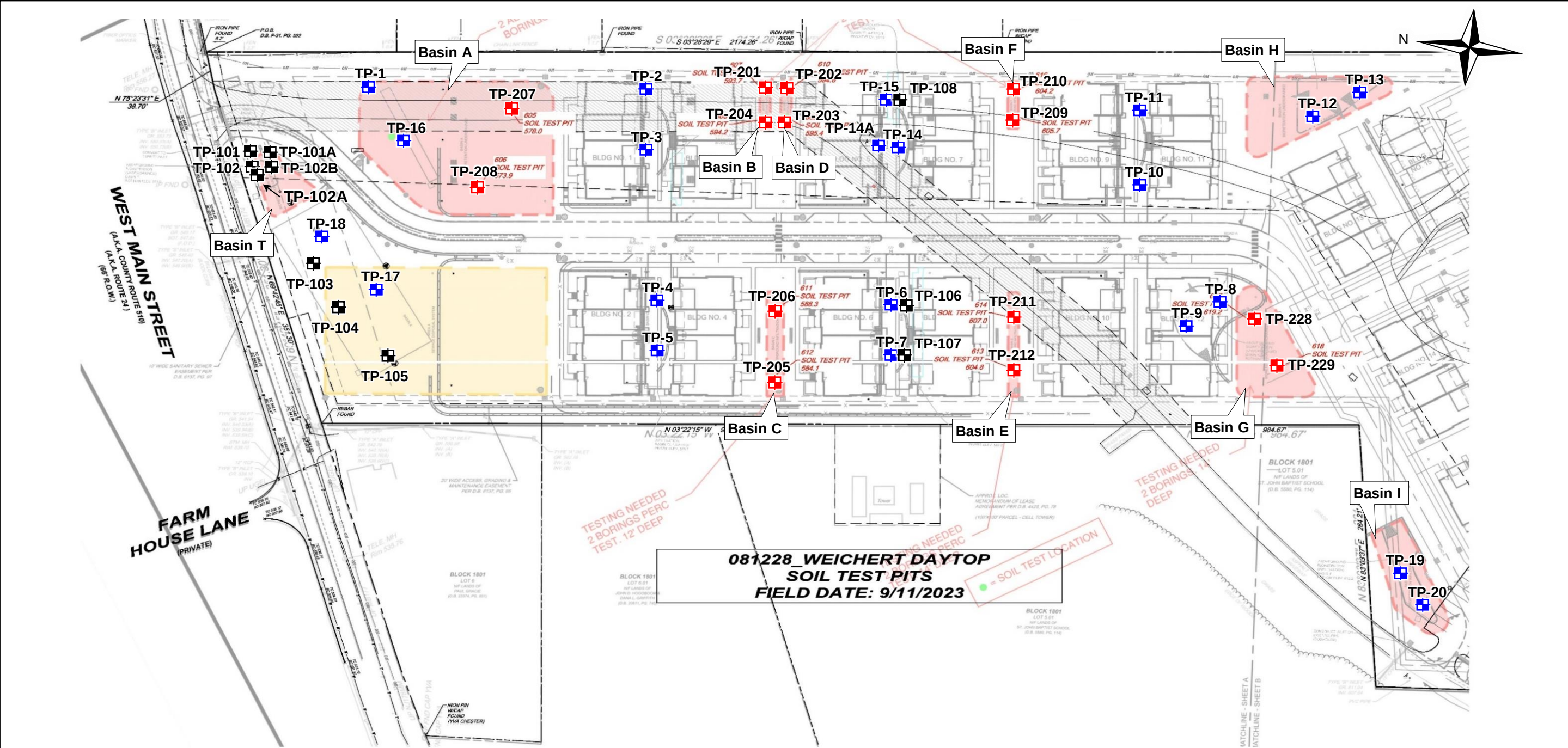
SOURCE: Google Maps

SCALE: NTS

DATE: OCT. 2024

PROJECT #: 3123160x1

Figure 1



*Undated and untitled base plan provided to GTA.

LEGEND:

- TP-X [blue square with cross] Indicates the number and approximate locations of test pits performed in SWM basin areas in August 2023.
- TP-10X [black square with cross] Indicates the number and approximate locations of test pits performed in SWM basin areas in October 2023.
- TP-20X [red square with cross] Indicates the number and approximate locations of additional test pits performed in SWM basin areas by GTA for this study.

EXPLORATION LOCATION PLAN		DAYTOP DEVELOPMENT, MENDHAM		
GTA 14 Worlds Fair Drive, Suite A Somerset, New Jersey 08873 (732) 271-9301 fax (732) 271-9306 GEO-TECHNOLOGY ASSOCIATES, INC.		Borough of Mendham, Morris County, New Jersey		
		Prepared For: 80-88 W. Main Street, LLC		
DESIGN BY: *		DRAWN BY: AFS	REVIEWED BY: AMT	
SCALE: NTS		DATE: OCT. 2024	PROJECT #: 31231605x1	

Figure 2A

APPENDIX B

Exploration Logs

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS	
			GRAPHIC	LETTER
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)		GW
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GP
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)		SW
				SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
				SC
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILT OR CLAY ($<15\%$ RETAINED ON THE NO. 200 SIEVE) SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE) SANDY OR GRAVELLY SILT OR CLAY ($>30\%$ RETAINED ON THE NO. 200 SIEVE)			ML
				CL
				OL
	ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT LESS THAN 50 ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT GREATER THAN 50			MH
				CH
				OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

ADDITIONAL DESIGNATIONS	DESCRIPTION		GRAPHIC SYMBOLS
	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATIONS	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

FINE-GRAINED SOILS (SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF TEST PIT NO. TP-1 (Stake #503)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **569.10 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
568.3	0			10 In. of Topsoil	
567.1		ML		Dark yellow-brown (10YR 3/6), moist, Sandy SILT with gravel [Silt Loam per USDA]	
		SM		Dark yellow-brown, moist, Silty SAND [Loamy Sand per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel and cobbles (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Infiltration rate = 8 in/hr at 2-1/2 Ft.
562.1		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 7 Ft.
557.1	10				
				Test pit complete at 12 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-1 (Stake #503)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-2 (Stake #504)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **587.73 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
586.9	0			10 In. of Topsoil	- Infiltration rate = 0 in/hr at 2 Ft. - NMC = 37.5%
		ML		Dark yellow-brown (10YR 4/6), moist, Sandy SILT with gravel and cobbles [Silt Loam per USDA]	
582.7	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 5 Ft.
577.7	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-2 (Stake #504)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-3 (Stake #505)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **587.47 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
	0			12 In. of Topsoil	
586.5		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Loamy Sand per USDA]	- Infiltration rate = 24 in/hr at 2 Ft.
584.5		GM		Dark yellow-brown (10YR 3/6), moist, Silty GRAVEL with sand, cobbles, and boulders [Gravelly Sand per USDA]	
582.5	5	SM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA]	
579.5		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft.
577.5	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-3 (Stake #505)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-4 (Stake #506)

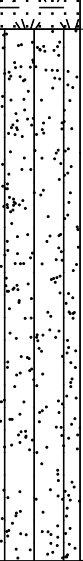
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **580.61 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
579.8	0			10 In. of Topsoil	- Infiltration rate = 4 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles and boulders at 2 Ft. - Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	
565.6	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

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LOG OF TEST PIT NO. TP-4 (Stake #506)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-5 (Stake #507)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **577.72 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
576.9	0			10 In. of Topsoil	- Infiltration rate = 4 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA] - with cobbles and boulders at 3 Ft.	
569.7	5				
		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft.
566.7	10			Test pit complete at 11 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-5 (Stake #507)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-6 (Stake #509)

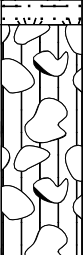
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/14/2023**
 DATE COMPLETED: **8/14/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **601.04 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
600.4	0			8 In. of Topsoil	- Infiltration rate = 3 in/hr at 2 Ft. - NMC = 6.8% - Hard excavating at 7 Ft.
		GW-GM		Dark yellow-brown (10YR 3/6), moist, Well-graded GRAVEL with silt and sand [Gravelly Sand per USDA]	
	594.0	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
591.0	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-6 (Stake #509)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-7 (Stake #508)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **597.33 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
596.7	0	GW-GM		8 In. of Topsoil	- Infiltration rate = 3 in/hr at 2 Ft.
				Dark yellow-brown (10YR 3/6), moist, Well-graded GRAVEL with silt and sand [Gravelly Sand per USDA]	
590.3	5	HW			- Hard excavating at 7 Ft.
				Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
587.3	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-7 (Stake #508)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-8 (Stake #514)

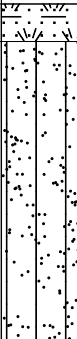
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **617.61 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
616.6	0			12 In. of Topsoil	- Infiltration rate = 4 in/hr at 6 Ft. - Hard excavating at 9 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4-1/2 Ft.	
	608.6	10	HW		
604.1				Test pit complete at 13-1/2 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-8 (Stake #514)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-9 (Stake #515)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.85 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
614.2	0			8 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
611.9		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 3 Ft.
	5				
606.9				Test pit complete at 8 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-9 (Stake #515)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-10 (Stake #513)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.28 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
613.6	0			8 In. of Topsoil	- Boulders at surface - Infiltration rate = 6 in/hr at 1 Ft. - Hard excavating at 2 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
	612.3	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
606.3				Test pit complete at 8 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-10 (Stake #513)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-11 (Stake #512)

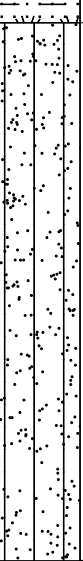
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **609.45 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
608.8	0			8 In. of Topsoil	- Infiltration rate = 0.5 in/hr at 2 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- with boulders at 3 Ft. - Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4-1/2 Ft.	
	10			- with cobbles at 10 Ft.	
594.5	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-11 (Stake #512)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-12 (Stake #516)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/15/2023**
 DATE COMPLETED: **8/15/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **616.51 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
615.9	0			8 In. of Topsoil	- NMC = 14.6% - Infiltration rate = 1 in/hr at 1 Ft. - Hard excavating at 2 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
	614.5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
609.0	7-1/2			Test pit complete at 7-1/2 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-12 (Stake #516)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-13 (Stake #517)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.21 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
613.6	0			8 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
611.2		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 3 Ft.
	5				
606.2				Test pit complete at 8 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-13 (Stake #517)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-14 (Stake #510)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **601.00 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
600.3	0			8 In. of Topsoil	
				FILL - Dark yellow-brown, moist, silty sand with gravel	
				- with a communication line (2 In. thick) at 2 Ft.	
598.0				Test pit terminated at 3 Ft. due to existing utility.	- Offset 10 Ft. to the north and continued as TP-14A.
	5				
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-14 (Stake #510)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-14A (Not Staked)

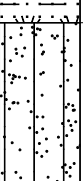
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **601 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
600.3	0			8 In. of Topsoil	- Infiltration rate = 6 in/hr at 2 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
596.0	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
594.0				Test pit complete at 7 Ft. due to refusal on highly-weathered rock.	- Hard excavating at 5 Ft.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-14A (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-15 (Stake #511)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **599.51 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
598.7	0			10 In. of Topsoil	- Infiltration rate = 1 in/hr at 2 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
586.5		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 13 Ft.
584.5	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-15 (Stake #511)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-16 (Stake #502)

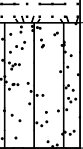
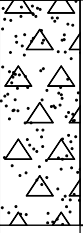
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **570.93 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
570.3	0			8 In. of Topsoil	- Infiltration rate = 4 in/hr at 2 Ft. - Hard excavating at 4 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
566.9	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
560.9	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-16 (Stake #502)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-17 (Stake #500)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/16/2023**
 DATE COMPLETED: **8/16/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **562.64 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
561.6	0			12 In. of Topsoil	- Infiltration rate = 3 in/hr at 7 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
555.6		GP-GM		Dark yellow-brown (10YR 3 6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA]	
	10				
547.6	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-17 (Stake #500)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-18 (Stake #501)

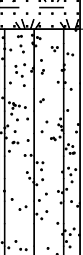
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **561.85 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
561.0	0			10 In. of Topsoil	- NMC = 5.2% - Infiltration rate = 24 in/hr at 7 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
554.9		GP-GM		Dark yellow-brown (10YR 3 6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA]	
546.9	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-18 (Stake #501)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-19 (Stake #564)

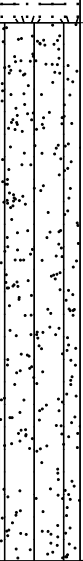
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **616.18 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
615.5	0			8 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 3 Ft. - Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
601.2	15			Test pit complete at 15 Ft.	- Infiltration rate = 3 in/hr at 6 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.
 14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-19 (Stake #564)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-20 (Stake #563)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.74 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
614.1	0			8 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Infiltration rate = 6 in/hr at 4 Ft.
602.7		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
601.7				Test pit complete at 13 Ft. due to refusal on highly-weathered rock.	- Hard excavating at 12 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-20 (Stake #563)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-21 (Stake #561)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **615.03 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
614.5	0			6 In. of Topsoil	- Infiltration rate = 0.25 in/hr at 5 Ft.
				FILL - Dark yellow-brown (10YR 3/6), moist, silty sand with gravel [Sandy Loam per USDA]	
				- with cobbles at 2 Ft.	
				- with plastic pieces at 3 Ft.	
611.0	5	SM		- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA]	
	10				
600.0	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-21 (Stake #561)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-22 (Stake #562)

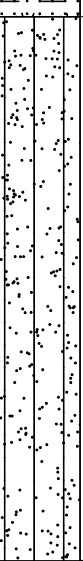
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **615.63 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
615.1	0	SM		6 In. of Topsoil	- NMC = 19.2%
				Dark yellow-brown (10YR 4/6), moist, Silty SAND [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6) and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	- Infiltration rate = 0.5 in/hr at 5 Ft.
	10				
600.6	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-22 (Stake #562)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-23 (Stake #560)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **607.82 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
606.8	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 3 Ft. - Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4-1/2 Ft.	- Infiltration rate = 10 in/hr at 7 Ft.
	5				
595.8		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 12 Ft.
593.8				Test pit complete at 14 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-23 (Stake #560)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-24 (Stake #559)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **606.53 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
605.5	0			12 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft. - with cobbles at 6 Ft.	- Infiltration rate = 9 in/hr at 5-1/2 Ft.
595.5	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Competent rock at 11 Ft.
591.5	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-24 (Stake #559)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-25 (Stake #542)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **603.20 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
602.5	0			8 In. of Topsoil	
				FILL - Dark yellow-brown, moist, silty sand with gravel, cobbles, and boulders	
	5			- with a PVC pipe (4 In. thick) at 6 Ft.	
				Test pit complete at 6-1/2 Ft. due to presence of utility.	- Offset 5 Ft. to the west and continued as TP-25A.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-25 (Stake #542)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-25A (Not Staked)

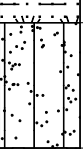
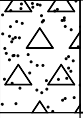
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **603 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
602.3	0			8 In. of Topsoil	- Infiltration rate = 0.5 in/hr at 2 Ft. - Hard excavating at 4 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
599.0	5	HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	
596.0				Test pit complete at 7 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-25A (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-26 (Stake #563)

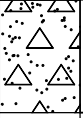
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/17/2023**
 DATE COMPLETED: **8/17/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **604.19 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
603.2	0			12 In. of Topsoil	- Infiltration rate = 6 in/hr at 2 Ft. - Hard excavating at 4 Ft.
		SM		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA]	
600.2	5	HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	
597.2				Test pit complete at 7 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-26 (Stake #563)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-27 (Stake #541)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **597 Ft.**
 DATUM: **Topo**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
596.0	0			12 In. of Topsoil	- Infiltration rate = 8 in/hr at 1-1/2 Ft.
				FILL - Dark yellow-brown (10YR 3/6), moist, silty sand with gravel and a large concrete chunk [Sandy Loam per USDA]	
592.0	5	SM		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] - with cobbles at 8 Ft.	
582.0	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-27 (Stake #541)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-28 (Stake #540)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **597.34 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
596.7	0			8 In. of Topsoil	- Infiltration rate = 4 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Hard excavating at 6 Ft.
591.3		HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	
	10				
584.3				Test pit complete at 13 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-28 (Stake #540)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-33 (Stake# 522)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **596.05 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
595.4	0			8 In. of Topsoil	
				FILL - Yellow-brown, moist, silty sand with gravel	
				- with a PVC pipe (6 In. thick) at 2 Ft.	
593.1				Test pit terminated at 3 Ft. due to presence of utility.	- Offset by 4 Ft. to the east and continued as TP-33A.
	5				
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-33 (Stake# 522)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-33A (Not Staked)

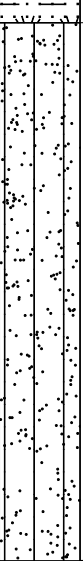
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **596 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
595.3	0			8 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft. - with cobbles at 6 Ft.	
581.0	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: Location and elevation are provided by project surveyor.
 Backfilled on completion.



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 ASSOCIATES, INC.**

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-33A (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-34 (Stake# 523)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **595.11 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
594.1	0			12 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	- Hard excavating at 8 Ft.
587.1		HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	
585.1	10			Test pit complete at 10 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-34 (Stake# 523)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-35 (Stake# 521)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **585.85 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
585.2	0			8 In. of Topsoil	- Offset by 5 Ft. to the southwest and continued as TP-35A.
				FILL - Dark yellow-brown, moist, silty sand with gravel	
				- with a PVC (4 In. thick) at 2 Ft.	
582.9				Test pit terminated at 3 Ft. due to presence of utility.	
	5				
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-35 (Stake# 521)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-35A (Not Staked)

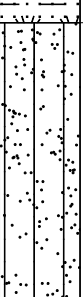
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **586 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
585.3	0			8 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	- NMC = 21.2%
578.0		HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft.
577.0	10			Test pit complete at 9 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-35A (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-36 (Stake# 520)

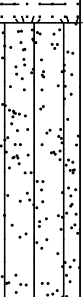
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/21/2023**
 DATE COMPLETED: **8/21/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **588.08 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
587.4	0			8 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	- Infiltration rate = 1 in/hr at 1-1/2 Ft.
	5			- Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Sidewall collapse at 4 Ft.
580.1	10	HW		Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft.
573.1	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-36 (Stake# 520)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-37 (Stake# 524)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/22/2023**
 DATE COMPLETED: **8/22/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **591.26 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
590.6	0			8 In. of Topsoil	
		SM		Dark yellow-brown, moist, Silty SAND with gravel	
	5				
				- Dark yellow-brown, gray, and white, moist, Silty SAND with gravel (Decomposed Gneiss) at 8 Ft.	
581.3	10	HW		Dark yellow-brown, gray, and white, moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 10 Ft.
578.3				Test pit complete at 13 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-37 (Stake# 524)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-38 (Stake# 519)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/22/2023**
 DATE COMPLETED: **8/22/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **597.90 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
597.2	0			8 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	- Infiltration rate = 2 in/hr at 2 Ft. - Hard excavating at 12 Ft.
585.9		HW		Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	
582.9	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-38 (Stake# 519)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-39 (Stake# 518)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/22/2023**
 DATE COMPLETED: **8/22/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **602.48 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
601.8	0			8 In. of Topsoil	- Infiltration rate = 2 in/hr at 6-1/2 Ft.
				FILL - Yellow-brown (10YR 5/8), moist, silty sand with gravel [sandy loam per USDA]	
	5			- with a PVC pipe (4 In. thick) at 6 Ft.	
				- with buried topsoil layer (12 In. thick) at 8 Ft.	
593.5	10	SM		Yellow-brown (10YR 5/8), moist, Silty SAND [Sandy Loam per USDA]	
				- Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 12 Ft.	
587.5	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: Location and elevation are provided by project surveyor.
 Backfilled on completion.



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 14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-39 (Stake# 518)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-47 (Stake# 529)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/23/2023**
 DATE COMPLETED: **8/23/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **11 Ft.**
 GROUND SURFACE ELEVATION: **575.05 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
574.1	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND [Loamy Sand per USDA]	
	5			- Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Infiltration rate = 6 in/hr at 3 Ft.
568.1		HW		Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 7 Ft.
	10			- wet at 11 Ft.	▼ Rapid water seepage at 11 Ft.
563.1				Test pit complete at 12 Ft. due to rapid water seepage.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-47 (Stake# 529)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-48 (Stake# 527)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/23/2023**
 DATE COMPLETED: **8/23/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **11 Ft.**
 GROUND SURFACE ELEVATION: **572.80 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
571.8	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND [Loamy Sand per USDA] - with cobbles at 3 Ft. - Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Infiltration rate = 6 in/hr at 2-1/2 Ft.
565.8	5				
		HW		Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Highly-weathered ROCK (Gneiss) - wet at 11 Ft.	- Hard excavating at 7 Ft. ▼ Rapid water seepage at 11 Ft.
556.8	10				
	15				
				Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-48 (Stake# 527)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-49 (Not Staked)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **8/23/2023**
 DATE COMPLETED: **8/23/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **11 Ft.**
 GROUND SURFACE ELEVATION: **572 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
571.0	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND [Loamy Sand per USDA] - with cobbles at 4 Ft. - Yellow-brown (10YR 5/8), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft. - wet at 11 Ft.	- NMC = 17.0% - Infiltration rate = 6 in/hr at 2-1/2 Ft.
560.0				Test pit complete at 12 Ft. due to rapid water seepage.	▼ Rapid water seepage at 11 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are approximate.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-49 (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-101 (Stake #565)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **564.31 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
563.3	0			12 In. of Topsoil	- Test pit performed within utility easement. Relocated 15 Ft. south to TP-101A.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND [Sandy Loam per USDA] - Yellow-brown (10YR 5/6) and white (10YR 8/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
548.3	5				- Infiltration rate = 0.5 in/hr at 4 Ft.
	10				
	15				
	20			Test pit complete at 16 Ft.	
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-101 (Stake #565)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-101A (Not Staked)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **561 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
560.0	0			12 In. of Topsoil	- Infiltration rate = 1 in/hr at 4 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6) and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft. - with cobbles at 7 Ft.	
	10				
	15				
545.0				Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are approximate.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-101A (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-102 (Stake #566)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **560.39 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
559.4	0			12 In. of Topsoil	- Test pit terminated due to existing utility. Offset 5 Ft. to TP-102A.
				FILL - Dark yellow-brown (10YR 4/6), moist, silty sand with gravel [Sandy Loam per USDA]	
555.9	5			- with a sewer line (3 In. in thickness) at 4 Ft. Test pit terminated at 4-1/2 Ft. due to existing utility.	- Offset by 5 Ft.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-102 (Stake #566)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-102A (Stake #566)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **560.39 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
559.4	0			12 In. of Topsoil	- Test pit performed within utility easement. Relocated 15 Ft. south to TP-102B.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
555.4	5	GP-GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA]	- Infiltration rate = 1.5 in/hr at 4 Ft.
548.4	10				- Hard excavating at 12 Ft.
		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
544.4	15			Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-102A (Stake #566)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-102B (Not Staked)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **561 Ft.**
 DATUM: **TOPO**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
560.0	0			12 In. of Topsoil	- Infiltration rate = 0.5 in/hr at 4 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
5				- Yellow-brown (10YR 5/6) and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
				- with cobbles at 8 Ft.	
10					
15					
545.0				Test pit complete at 16 Ft.	
20					
25					
30					

NOTES: **Location and elevation are approximate.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-102B (Not Staked)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-103 (Stake #567)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **559.54 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
558.5	0			12 In. of Topsoil	- Infiltration rate = 1.5 in/hr at 8 Ft. - Hard excavating at 11 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA] - Dark yellow-brown (10YR 3/6) at 3 Ft.	
553.5	5	GP-GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA] - with cobbles at 8 Ft.	
548.5	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
543.5	15			Test pit complete at 16 Ft. due to refusal on highly-weathered rock.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-103 (Stake #567)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-104 (Stake #568)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **558.39 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
557.4	0			12 In. of Topsoil	- Infiltration rate = 30 in/hr at 8 Ft.
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
553.4	5			- with cobbles at 4 Ft.	
		GP-GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA]	
538.4	10			- with cobbles at 9 Ft.	
	15				
	20			Test pit complete at 20 Ft.	
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-104 (Stake #568)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-105 (Stake #569)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/26/2023**
 DATE COMPLETED: **10/26/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **560.82 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
559.8	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 3 Ft.	
553.8	5				
		GP-GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Poorly-graded GRAVEL with silt and sand (Decomposed Gneiss) [Gravelly Sand per USDA] - with cobbles at 15 Ft.	- Infiltration rate = 45 in/hr at 8 Ft.
	10				
	15				
540.8	20			Test pit complete at 20 Ft.	
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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 14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-105 (Stake #569)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-106 (Stake #575)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/25/2023**
 DATE COMPLETED: **10/25/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **602.20 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
601.5	0			8 In. of Topsoil	
		GW-GM		Dark yellow-brown (10YR 3/6), moist, Well-graded GRAVEL with silt and sand [Gravelly Sand per USDA]	
596.2	5				
		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 6 Ft.
591.2	10				
				Test pit complete at 11 Ft.	- Basin Flood Test performed at 11 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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LOG OF TEST PIT NO. TP-106 (Stake #575)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-107 (Stake #576)

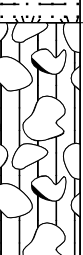
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/25/2023**
 DATE COMPLETED: **10/25/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **598.92 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
598.3	0			8 In. of Topsoil	
		GW-GM		Dark yellow-brown (10YR 3/6), moist, Well-graded GRAVEL with silt and sand [Gravelly Sand per USDA]	
591.9	5				
590.9		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 7 Ft.
				Test pit complete at 8 Ft.	- Basin Flood Test performed at 8 Ft.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-107 (Stake #576)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-108 (Stake #511)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/25/2023**
 DATE COMPLETED: **10/25/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **599.52 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
598.7	0			10 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
	10				
586.5		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 13 Ft.
585.5	15			Test pit complete at 14 Ft.	- Basin Flood Test performed at 14 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-108 (Stake #511)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-109 (Stake #560)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/25/2023**
 DATE COMPLETED: **10/25/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **607.82 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
606.8	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 3 Ft. - Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4-1/2 Ft.	
	5				
595.8		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 12 Ft.
592.8	15			Test pit complete at 15 Ft.	- Basin Flood Test performed at 15 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-109 (Stake #560)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-110 (Stake #559)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/25/2023**
 DATE COMPLETED: **10/25/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **606.53 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
605.5	0			12 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft. - with cobbles at 6 Ft.	
595.5	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 11 Ft.
593.0	13-1/2			Test pit complete at 13-1/2 Ft.	- Basin Flood Test performed at 13-1/2 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-110 (Stake #559)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-111 (Stake #574)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **577.44 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
576.4	0			12 In. of Topsoil	- Infiltration rate = 6 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	
				- with cobbles at 9 Ft.	
565.4	10			Test pit complete at 12 Ft.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-111 (Stake #574)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-112 (Stake #573)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **577.71 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
576.7	0			12 In. of Topsoil	- Infiltration rate = 3 in/hr at 1 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	
	10			- with cobbles at 9 Ft.	
565.7				Test pit complete at 12 Ft.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-112 (Stake #573)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-113 (Stake #572)

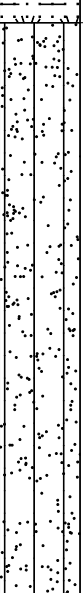
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **579.50 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
578.8	0			8 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel and boulders (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	- Infiltration rate = 0 in/hr at 4 Ft.
	10				
	15				
563.5				Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: Location and elevation are provided by project surveyor.
 Backfilled on completion.



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14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-113 (Stake #572)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-114 (Stake #570)

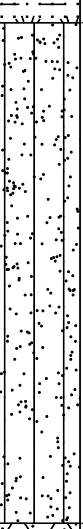
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere 160G LC**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **596.66 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
596.0	0			8 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 3 Ft. - Yellow-brown (10YR 5/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft. - with cobbles at 6 Ft. - with boulders at 12 Ft.	- Infiltration rate = 3 in/hr at 6 Ft.
582.7	15	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
581.7	15			Test pit complete at 15 Ft.	
	20				
	25				
	30				

NOTES: Location and elevation are provided by project surveyor.
 Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-114 (Stake #570)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-115 (Stake #571)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **10/27/2023**
 DATE COMPLETED: **10/27/2023**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **John Deere**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **598.01 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
597.0	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 3/6), moist, Silty SAND [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), gray (10YR 5/1), and white (10YR 8/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA]	
				- with cobbles at 8 Ft.	- Infiltration rate = 4.5 in/hr at 8 Ft.
	10				
	15				
582.0				Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation are provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-115 (Stake #571)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-201 (Stake #607)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **593.7 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
592.7	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
588.7	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 6 Ft.
584.7	10			Test pit complete at 9 Ft. due to refusal on highly-weathered rock.	- Basin Flood Test performed at 8 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-201 (Stake #607)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-202 (Stake #610)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **594.6 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
593.6	0			12 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 7 Ft.	- Infiltration test attempted at 6 Ft.
582.6		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 12 Ft.
580.6	15			Test pit complete at 14 Ft.	- Basin Flood Test performed at 14 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-202 (Stake #610)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-203 (Stake #609)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **595.4 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
594.4	0			12 In. of Topsoil	
		ML		Yellow-brown (10YR 5/8), moist, Sandy SILT [Silt Loam per USDA]	
588.4	5	SM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA]	- Infiltration test attempted at 7 Ft.
583.4	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 12 Ft.
581.4	15			Test pit complete at 14 Ft.	- Basin Flood Test performed at 14 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-203 (Stake #609)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-204 (Stake #608)

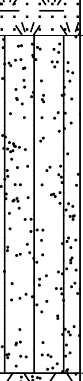
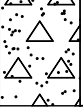
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **594.2 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
593.2	0			12 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA] - with boulders at 3 Ft.	- Infiltration test attempted at 6 Ft.
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	
584.2	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
581.2				Test pit complete at 13 Ft.	- Basin Flood Test performed at 12 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-204 (Stake #608)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-205 (Stake #612)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **584.1 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
583.1	0			12 In. of Topsoil	
		SM		Yellow-brown (10YR 5/8), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	- Infiltration test attempted at 5 Ft.
576.1		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft.
	10				- Basin Flood Test performed at 10 Ft.
572.1				Test pit complete at 12 Ft.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-205 (Stake #612)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-206 (Stake #611)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **588.3 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
587.5	0			10 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel, cobbles, and boulders [Sandy Loam per USDA]	
584.3	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 4 Ft. - Basin Flood Test performed at 6 Ft.
577.3	10			Test pit complete at 11 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-206 (Stake #611)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-207 (Stake #605A)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **578.0 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
577.2	0			10 In. of Topsoil	- Hard excavating at 4 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
574.0	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
	10				
564.0	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-207 (Stake #605A)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-208 (Stake #606)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/24/2024**
 DATE COMPLETED: **9/24/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **573.9 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
573.1	0			10 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
569.4	5	GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty GRAVEL (Decomposed Gneiss) [Gravelly Sand per USDA] at 5 Ft.	
564.9	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 9 Ft.
561.9				Test pit complete at 12 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-208 (Stake #606)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-209 (Stake #615)

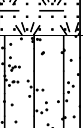
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **605.7 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
604.7	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
602.2	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 3-1/2 Ft. - Basin Flood Test performed at 6 Ft.
596.7	10			Test pit complete at 9 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-209 (Stake #615)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-210 (Stake #616)

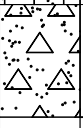
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **604.2 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
603.4	0			10 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
601.2		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 3 Ft.
598.2	5			Test pit complete at 6 Ft. due to refusal on highly-weathered rock.	- Basin Flood Test performed at 6 Ft.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-210 (Stake #616)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-211 (Stake #614)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **607.0 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
606.2	0			10 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles and boulders at 3 Ft.	
602.0	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 5 Ft. - Basin Flood Test performed at 7 Ft.
595.0	10				
	15				
	20				
	25				
	30			Test pit complete at 12 Ft. due to refusal on highly-weathered rock.	

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-211 (Stake #614)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-212 (Stake #613)

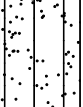
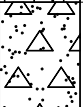
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **604.8 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
604.0	0			10 In. of Topsoil	
		GM		Dark yellow-brown (10YR 4/6), moist, Silty GRAVEL with sand [Gravelly Sand per USDA]	
599.8	5	SM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 5 Ft.	- Infiltration test attempted at 6 Ft.
596.8	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 8 Ft. - Basin Flood Test performed at 9 Ft.
592.8	12			Test pit complete at 12 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-212 (Stake #613)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-213 (Stake #620)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **618.4 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
617.9	0			6 In. of Topsoil	
				FILL - Dark yellow-brown (10YR 4/6), moist, silty gravel with cobbles [Gravelly Sand per USDA]	
				- with boulders at 4 Ft.	- Sidewall collapse at 3 Ft.
	5			- with bricks and cinder blocks at 7 Ft.	
	10				- Infiltration rate = 2 in/hr at 8 Ft.
604.9		CL		Yellow-brown (10YR 5/6), moist, Lean CLAY with sand and cobbles [Clay per USDA]	
603.9	15			Test pit complete at 14-1/2 Ft. due to sidewall collapse.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.
 14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-213 (Stake #620)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-214 (Stake #619)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **618 Ft.**
 DATUM: **Topo**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
617.0	0			12 In. of Topsoil	- Offset from staked location 8 feet to the east. - Sidewall collapse at 3 Ft. - Infiltration rate = 1 in/hr at 8 Ft.
				FILL - Dark yellow-brown (10YR 4/6), moist, silty sand with gravel, cobbles, and boulders [Sandy Loam per USDA]	
				- with fabric at 4 Ft. - with concrete fragments at 5 Ft. - with asphalt fragments at 6-1/2 Ft.	
604.0	5				
	10				
	15			- with concrete fragments and slabs at 13 Ft.	
	15			Test pit complete at 14 Ft. due to sidewall collapse.	
	20				
	25				
	30				

NOTES: **Location and elevation are approximate.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
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LOG OF TEST PIT NO. TP-214 (Stake #619)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-215 (Stake #624)

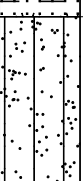
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.0 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
613.5	0	SM		6 In. of Topsoil Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
609.0	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 5 Ft.
606.0				Test pit complete at 8 Ft. due to refusal on highly-weathered rock.	- Basin Flood Test performed at 8 Ft.
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-215 (Stake #624)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-216 (Stake #623)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/25/2024**
 DATE COMPLETED: **9/25/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **614.0 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
613.2	0			10 In. of Topsoil	
				FILL - Dark yellow-brown (10YR 4/6), moist, silty sand with gravel [Sandy Loam per USDA]	
	5			- with buried topsoil layer at 5 Ft.	
607.0		SM		Yellow-brown (10YR 5/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	- Infiltration test attempted at 8 Ft.
	10			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 10 Ft.	
601.0		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Basin Flood Test performed at 14 Ft.
	15				
598.0				Test pit complete at 16 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-216 (Stake #623)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-217 (Stake #625)

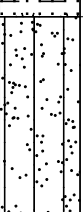
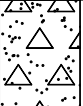
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **621.3 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
620.8	0	SM		6 In. of Topsoil	
				Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
615.3	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 6 Ft.
612.3	10			Test pit complete at 9 Ft. due to refusal on highly-weathered rock.	- Basin Flood Test performed at 9 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-217 (Stake #625)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-218 (Stake #626)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **616.5 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
615.8	0			8 In. of Topsoil	
				FILL - Dark yellow-brown (10YR 4/6), moist, silty sand with gravel [Sandy Loam per USDA]	
611.0	5	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	- Hard excavating at 5-1/2 Ft.
607.5	10			Test pit complete at 9 Ft. due to refusal on highly-weathered rock.	- Basin Flood Test performed at 9 Ft.
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-218 (Stake #626)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-219 (Stake #628)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **589.5 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
589.0	0			6 In. of Topsoil	- Infiltration rate = 6 in/hr at 2 Ft.
				FILL - Dark yellow-brown (10YR 4/6), moist, silty sand with gravel [Sandy Loam per USDA]	
				- Dark brown (10YR 3/3) buried topsoil layer at 3 Ft.	
585.5	5	SM		Yellow-brown (10YR 5/6), moist, Silty SAND [Sandy Loam per USDA]	- Basin Flood Test performed at 10 Ft.
				- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	
580.5	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
577.5				Test pit complete at 12 Ft.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-219 (Stake #628)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-220 (Stake #630)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **592.7 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
591.7	0			12 In. of Topsoil	- Hard excavating at 1 Ft.
		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
587.7	5			Test pit complete at 5 Ft. due to refusal on highly-weathered rock.	
	10				
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



**GEO-TECHNOLOGY
ASSOCIATES, INC.**

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-220 (Stake #630)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-221 (Stake #629)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **597.4 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
596.9	0			6 In. of Topsoil	
595.9		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND [Sandy Loam per USDA]	
		GM		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty GRAVEL with sand, cobbles, and boulders (Decomposed Gneiss) [Gravelly Sand per USDA]	- Hard excavating at 1-1/2 Ft.
	5				
	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
587.4					
584.4				Test pit complete at 13 Ft. due to refusal on highly-weathered rock.	
	15				
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-221 (Stake #629)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-222 (Stake #633)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **565.3 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
564.3	0			12 In. of Topsoil	
		ML		Yellow-brown (10YR 5/6), moist, Sandy SILT with gravel [Silt Loam per USDA] - Pale brown (10YR 6/3) and yellow-brown (10YR 5/6) at 3-1/2 Ft. - Dark yellow-brown (10YR 4/6) at 5-1/2 Ft. - with boulders at 6 Ft. - Yellow-brown (10YR 5/6) at 12 Ft.	
551.3	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-222 (Stake #633)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-223 (Stake #634)

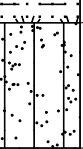
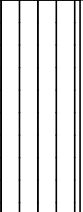
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/26/2024**
 DATE COMPLETED: **9/26/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **565.1 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
564.4	0			8 In. of Topsoil	- Hard excavating at 9 Ft.
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles at 2 Ft.	
561.1	5	ML		Dark yellow-brown (10YR 4/6), moist, Sandy SILT [Silt Loam per USDA] - with boulders at 9 Ft.	
555.1	10	SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel and cobbles [Sandy Loam per USDA]	
551.1	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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ASSOCIATES, INC.**

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 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-223 (Stake #634)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-224 (Stake #635)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **564.9 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
564.2	0			8 In. of Topsoil	
		ML		Yellow-brown (10YR 5/6), moist, Sandy SILT with gravel [Silt Loam per USDA]	
562.9		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
				- with cobbles at 4 Ft.	
	5				- Hard excavating at 8 Ft.
				- with boulders at 8 Ft.	
	10				
550.9	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-224 (Stake #635)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-225 (Stake #636)

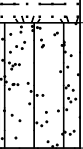
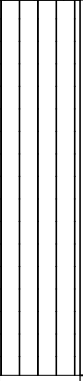
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **564.8 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
564.1	0			8 In. of Topsoil	
		SM		Yellow-brown (10YR 5/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
560.8	5	ML		Dark yellow-brown (10YR 4/6), moist, Sandy SILT [Silt Loam per USDA] - with cobbles and boulders at 6 Ft.	- Hard excavating at 6 Ft.
550.8	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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 14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-225 (Stake #636)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-226 (Stake #637)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **564.6 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
563.6	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
559.6	5	ML		Dark yellow-brown (10YR 4/6), moist, Sandy SILT with gravel [Silt Loam per USDA]	
				- with cobbles and boulders at 8 Ft.	
550.6	15			Test pit complete at 14 Ft.	- Hard excavating at 8 Ft.
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-226 (Stake #637)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-227 (Stake #621)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **579.5 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
578.5	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 6 Ft.	
567.5	10				
	15			Test pit complete at 12 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-227 (Stake #621)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-228 (Stake #617)

Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **619.2 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
618.2	0			12 In. of Topsoil	
		SM		Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA] - with cobbles and boulders at 3 Ft.	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 7 Ft.	
606.2	10				
605.2		HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



GEO-TECHNOLOGY ASSOCIATES, INC.

14 Worlds Fair Drive, Suite A
 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-228 (Stake #617)

Sheet 1 of 1

LOG OF TEST PIT NO. TP-229 (Stake #618)

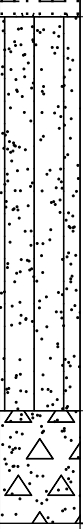
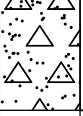
Sheet 1 of 1

PROJECT: **Daytop Development, Mendham**
 PROJECT LOCATION: **Borough of Mendham, Morris County, New Jersey**
 CLIENT: **80-88 W. Main Street, LLC**

PROJECT NO.: **31231605x1**

DATE STARTED: **9/27/2024**
 DATE COMPLETED: **9/27/2024**
 CONTRACTOR: **Harrington & Sons Construction Co. Inc.**
 EQUIPMENT: **Volvo EC160DL**

GROUNDWATER ENCOUNTERED: **N/E**
 GROUND SURFACE ELEVATION: **618.9 Ft.**
 DATUM: **Survey**
 LOGGED BY: **AFS**
 CHECKED BY: **AMT**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL		
				DESCRIPTION	REMARKS
618.4	0	SM		6 In. of Topsoil	
				Dark yellow-brown (10YR 4/6), moist, Silty SAND with gravel [Sandy Loam per USDA]	
	5			- Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Silty SAND with gravel (Decomposed Gneiss) [Loamy Sand per USDA] at 4 Ft.	
607.9	10	HW		Dark yellow-brown (10YR 3/6), white (10YR 8/1), and black (10YR 2/1), moist, Highly-weathered ROCK (Gneiss)	
604.9	15			Test pit complete at 14 Ft.	
	20				
	25				
	30				

NOTES: **Location and elevation provided by project surveyor.**
Backfilled on completion.



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 Somerset, NJ 08873

LOG OF TEST PIT NO. TP-229 (Stake #618)

Sheet 1 of 1

APPENDIX C

Laboratory Data

Particle Size Distribution Report



	% +3"		% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
○	0.0		0.0	0.2	1.9	8.7	23.2	66.0		
⊗	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	42.1	28.3	0.3119							

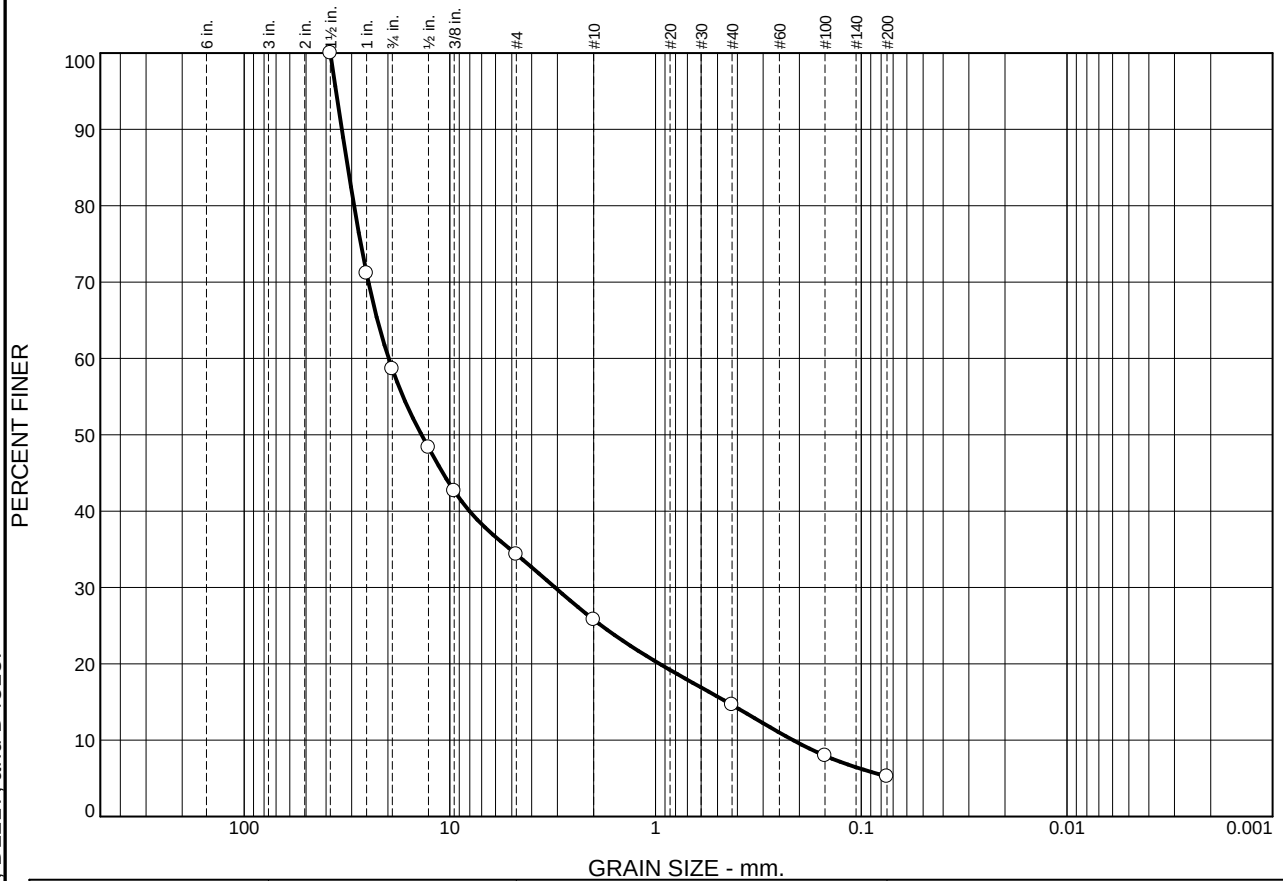
Material Description							USCS	AASHTO
Sandy SILT							ML	A-7-6(9)

Project No. 31231605x1 Client: 80-88 W. Main Street, LLC Project: Daytop Development, Mendham Source of Sample: TP-2 (Stake #504) Depth: 3	Remarks: ONMC = 37.5%
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873	Figure

Tested By: RR Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Particle Size Distribution Report



	% +3"		% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
○	0.0		41.4	24.3	8.5	11.2	9.4	5.2		
⊗	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NP	NP	31.3376	19.8310	13.7286	3.0833	0.4496	0.2144	2.24	92.49

Material Description	USCS	AASHTO
Well-graded GRAVEL with silt and sand	GW-GM	A-1-a

Project No. 31231605x1 Client: 80-88 W. Main Street, LLC Project: Daytop Development, Mendham Source of Sample: TP-6 (Stake# 509) Depth: 7	Remarks: ONMC = 6.8%
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873	Figure

Tested By: RR Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

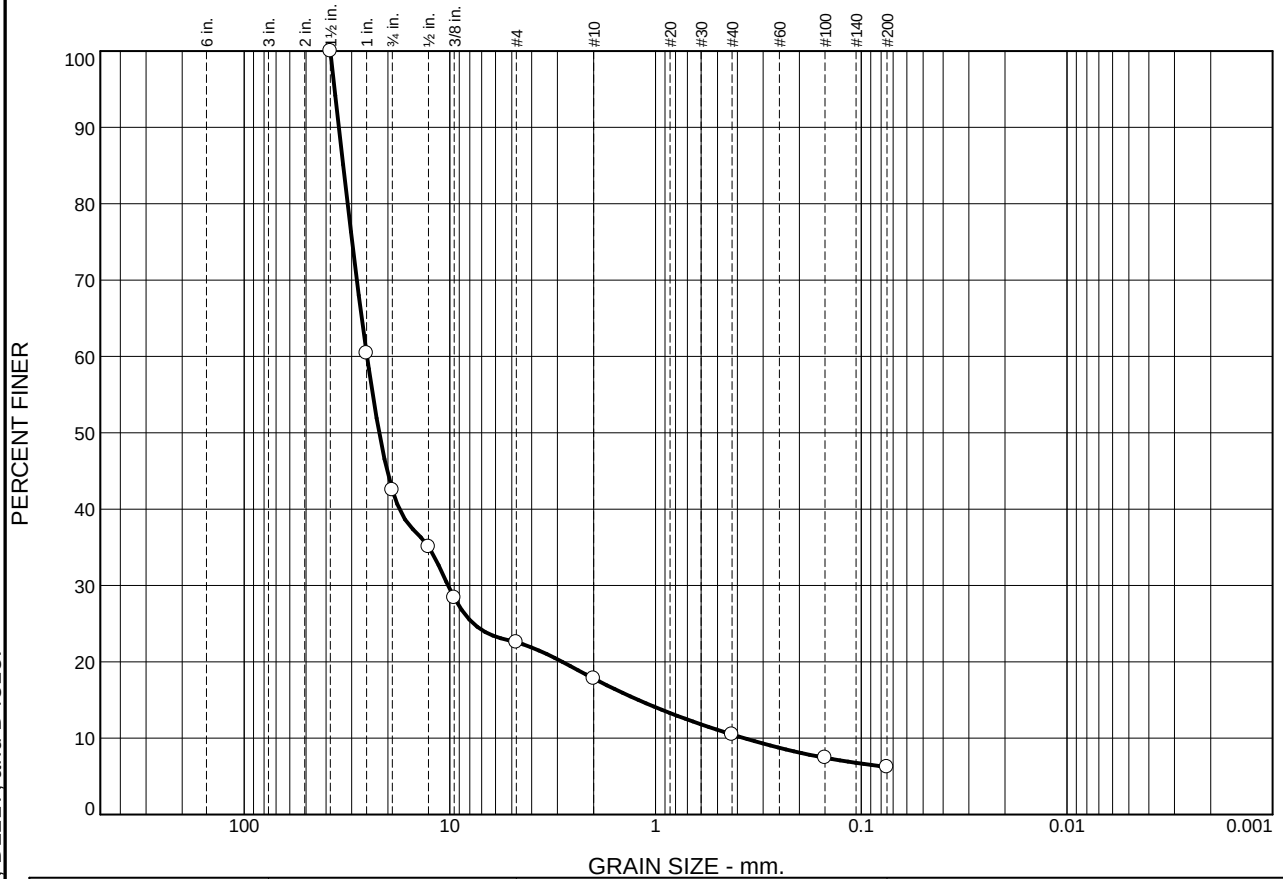
Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
☐	0.0	13.9	10.6	7.8	17.6	25.6	24.5			
☒	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
☐	NP	NP	13.8234	0.9015	0.4221	0.1234				
Material Description								USCS	AASHTO	
☐ Silty SAND with gravel								SM	A-1-b	
Project No. 31231605x1 Client: 80-88 W. Main Street, LLC										
Project: Daytop Development, Mendham										
☐ Source of Sample: TP-12 (Stake #516) Depth: 1										
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873										
								Remarks: ☐ ONMC = 14.6%		
								Figure		

Tested By: RR Checked By: AMT

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	57.5	19.9	4.8	7.3	4.3	6.2	

LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	32.9957	25.2705	22.0392	10.2002	1.2110	0.3702	11.12	68.27

Material Description							USCS	AASHTO
Poorly-graded GRAVEL with silt and sand							GP-GM	A-1-a

Project No. 31231605x1 Client: 80-88 W. Main Street, LLC Project: Daytop Development, Mendham Source of Sample: TP-18 (Stake# 501) Depth: 7	Remarks: ONMC = 5.2%
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873	Figure

Tested By: RR Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Particle Size Distribution Report



	% +3"		% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
○	0.0		0.0	1.4	4.7	27.7	44.9	21.3		
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	NP	NP	0.9434	0.3547	0.2700	0.1426				
Material Description								USCS	AASHTO	
○ Silty SAND								SM	A-2-4(0)	

Project No. 31231605x1 Client: 80-88 W. Main Street, LLC Project: Daytop Development, Mendham Source of Sample: TP-35A (Stake# 521) Depth: 6	Remarks: ONMC = 21.2%
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873	Figure

Tested By: RR Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Particle Size Distribution Report



	% +3"		% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
○	0.0		5.2	8.6	5.0	15.3	16.0	49.9		
⊗	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NP	NP	3.7605	0.2568	0.0761					

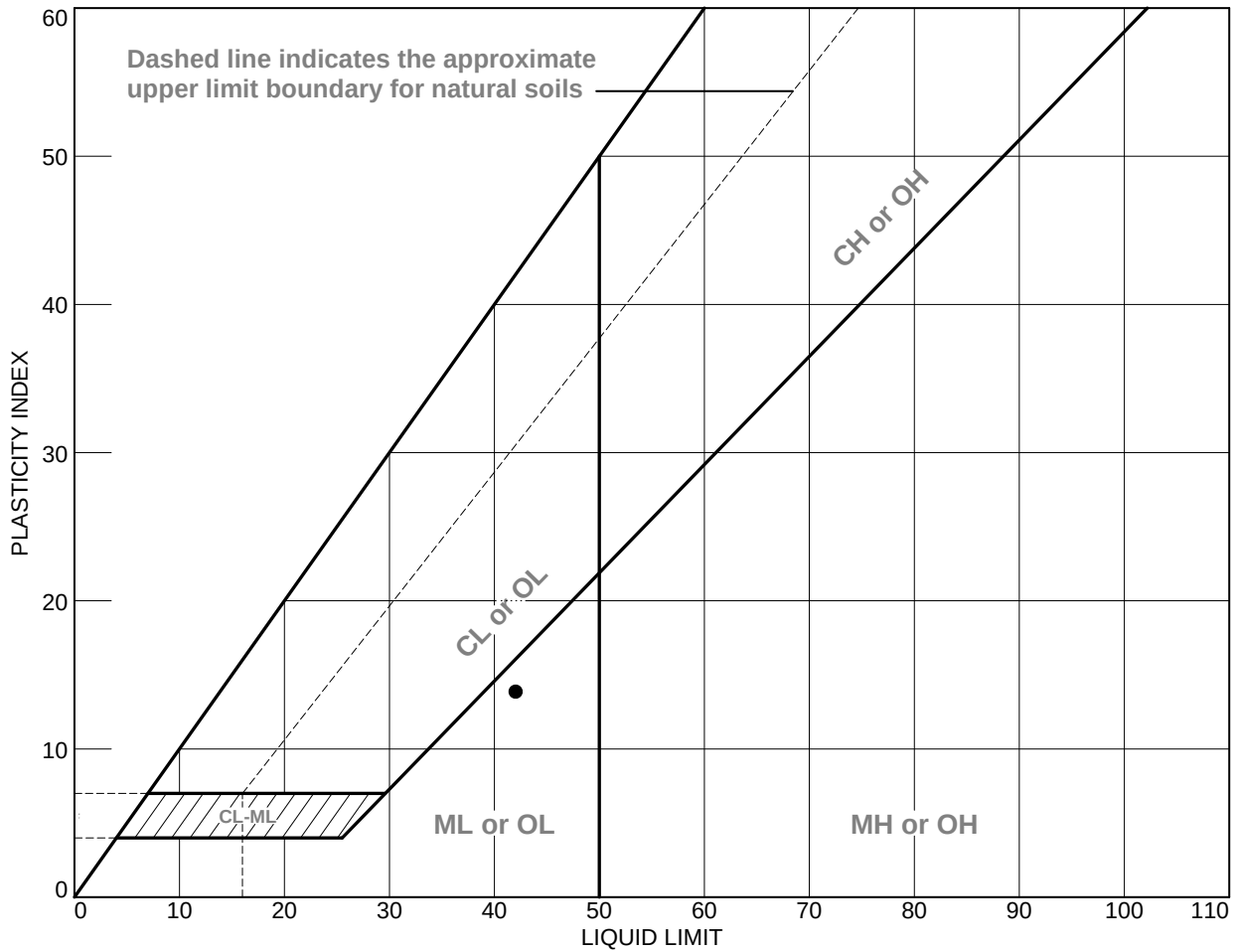
Material Description						USCS	AASHTO
Silty SAND						SM	A-4(0)

Project No. 31231605x1 Client: 80-88 W. Main Street, LLC Project: Daytop Development, Mendham Source of Sample: TP-49 Depth: 2.5	Remarks: ONMC = 17.0%
 GEO-TECHNOLOGY ASSOCIATES, INC. 14 Worlds Fair Drive, Suite A Somerset, NJ 08873	Figure

Tested By: RR Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4318



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	TP-2 (Stake #504)		3	37.5	28.3	42.1	13.8	ML



GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite A
Somerset, NJ 08873

Client: 80-88 W. Main Street, LLC
Project: Daytop Development, Mendham

Project No.: 31231605x1

Figure

Tested By: RR

Checked By: AMT

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

APPENDIX D

Infiltration Test Results

SUMMARY OF INFILTRATION TEST RESULTS

Test Pit No.	Approximate Test Depth (ft.)	USCS Classification	USDA Classification	Measured Infiltration Rate (in/hr)
TP-101	4	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	0.5
TP-101A	4	Silty SAND (SM)	Sandy Loam	1
TP-102A	4	Silty SAND (SM)	Sandy Loam	1.5
TP-102B	4	Silty SAND (SM)	Sandy Loam	0.5
TP-103	8	Poorly-graded GRAVEL with silt and sand (GP-GM) (<i>Decomposed Gneiss</i>)	Gravelly Sand	1.5
TP-104	8	Poorly-graded GRAVEL with silt and sand (GP-GM) (<i>Decomposed Gneiss</i>)	Gravelly Sand	30
TP-105	8	Poorly-graded GRAVEL with silt and sand (GP-GM) (<i>Decomposed Gneiss</i>)	Gravelly Sand	45
TP-111	1	Silty SAND (SM)	Sandy Loam	6
TP-112	1	Silty SAND (SM)	Sandy Loam	3
TP-113	4	Silty SAND with gravel (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	0
TP-114	6	Silty SAND with gravel (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	3
TP-115	8	Silty SAND with gravel (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	4.5
TP-1	2½	Silty SAND (SM)	Loamy Sand	8
TP-2	2	Sandy SILT (ML)	Silt Loam	0
TP-3	2	Silty SAND with gravel (SM)	Loamy Sand	24
TP-4	1	Silty SAND with gravel (SM)	Sandy Loam	4
TP-5	1	Silty SAND with gravel (SM)	Sandy Loam	4
TP-6	2	Well-graded GRAVEL with silt and sand (GW-GM)	Gravelly Sand	3
TP-7	2	Well-graded GRAVEL with silt and sand (GW-GM)	Gravelly Sand	3
TP-8	6	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	4
TP-9	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-10	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-11	2	Silty SAND with gravel (SM)	Sandy Loam	0.5
TP-12	1	Silty SAND with gravel (SM)	Sandy Loam	1
TP-13	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-14A	2	Silty SAND with gravel (SM)	Sandy Loam	6
TP-15	2	Silty SAND with gravel (SM)	Sandy Loam	1
TP-16	2	Silty SAND with gravel (SM)	Sandy Loam	4
TP-17	7	Poorly-graded GRAVEL with silt and sand (GP-GM) (<i>Decomposed Gneiss</i>)	Gravelly Sand	3
TP-18	7	Poorly-graded GRAVEL with silt and sand (GP-GM) (<i>Decomposed Gneiss</i>)	Gravelly Sand	24
TP-19	6	Silty SAND with gravel (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	3
TP-20	4	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	6
TP-21	5	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	0.25
TP-22	5	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	0.5
TP-23	7	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	10
TP-24	5½	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	9
TP-25A	2	Silty SAND with gravel (SM)	Sandy Loam	0.5
TP-26	2	Silty SAND (SM) (<i>Decomposed Gneiss</i>)	Loamy Sand	6
TP-27	1½	FILL – silty sand with gravel	Sandy Loam	8
TP-28	1	Silty SAND (SM)	Sandy Loam	4
TP-33A	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-34	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-35A	1	Silty SAND with gravel (SM)	Sandy Loam	6
TP-36	1½	Silty SAND with gravel (SM)	Sandy Loam	1
TP-38	2	Silty SAND with gravel (SM)	Sandy Loam	2
TP-39	6½	FILL – silty sand with gravel	Sandy Loam	2
TP-46	1½	Silty SAND (SM)	Loamy Sand	12
TP-47	3	Silty SAND (SM)	Loamy Sand	6
TP-48	2½	Silty SAND (SM)	Loamy Sand	6
TP-49	2½	Silty SAND (SM)	Loamy Sand	6
TP-213	8	FILL – silty gravel with cobbles (GM)	Gravelly Sand	2
TP-214	8	FILL – silty sand with gravel, cobbles, and boulders (SM)	Sandy Loam	1
TP-219	2	FILL – silty sand with gravel (SM)	Sandy Loam	6

Note: A factor of safety of at least 2 should be applied to the measured infiltration rates for design purposes.

SUMMARY OF IN-SITU BASIN FLOOD TEST RESULTS

Test Pit Location	Existing Ground EL (ft.)	Basin Flood Test Depth (ft.)	Drop in Water after 24 Hours (in.)	Drop in Water 24 Hours after Refill (ft.)	Design Infiltration Rate (in/hr)
TP-106	602.2	11	12	12	0.5
TP-107	598.92	8	12	12	0.5
TP-108	599.52	14	12	12	0.5
TP-109	607.82	15	12	12	0.5
TP-110	606.53	13.5	12	12	0.5
TP-201	593.7	8	12	12	0.5
TP-202	594.6	14	4	N/A	-
TP-203	595.4	14	12	12	0.5
TP-204	594.2	12	6	N/A	-
TP-205	584.1	10	12	12	0.5
TP-206	588.3	6	12	12	0.5
TP-209	605.7	6	12	12	0.5
TP-210	604.2	6	12	12	0.5
TP-211	607	7	12	12	0.5
TP-212	604.8	9	12	12	0.5
TP-215	614	8	12	12	0.5
TP-216	614	14	12	12	0.5
TP-217	621.3	9	12	12	0.5
TP-218	616.5	9	12	12	0.5
TP-219	589.5	10	12	12	0.5

CLIENT: Weichert Development Company
225 Littleton Road
Morris Plains, NJ 07950

Date: 12/04/2025

PROJECT: Daytop Development
80-88 West Main Street
Mendham, NJ

ATTN: Mr. Mark Calabro

RE: Subsurface investigation

Dear Mr. Calabro,

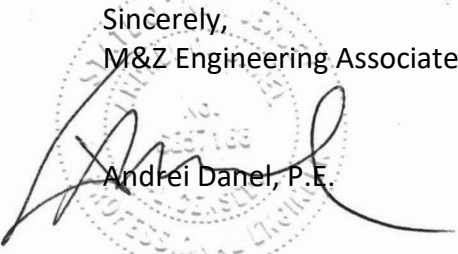
At your request, M&Z engineering has performed a subsurface investigation at the project mentioned above, including excavation, visual inspection and sampling of test pits within the property. The purpose of our investigation was to determine the nature of subsurface materials, allowable bearing capacity, the depth of seasonal high ground water table, and soil permeability.

The soil strata encountered in order from surface to bottom of excavation were top soil, followed by undisturbed natural soils. The surface material was found to be top soil with a varying thickness of approximately 10 to 12 inches, followed by a stratum of silty clay, followed by a stratum of silty sand and clay with varying amounts of gravel and cobbles.

Ground water was not encountered during this investigation. It should be noted that ground water may fluctuate significantly in response to tides, precipitation and other external factors. Mottling was not encountered in any of the test pits. In the absence of redoximorphic features, we have concluded that the seasonal high water table is not present within the depth of exploration.

Soil permeability testing was performed for all test pits, with class ratings varying from K1 to K2. Permeability testing results are presented in the attached table. Please contact us if we can be of further assistance.

Sincerely,
M&Z Engineering Associates, P.C.

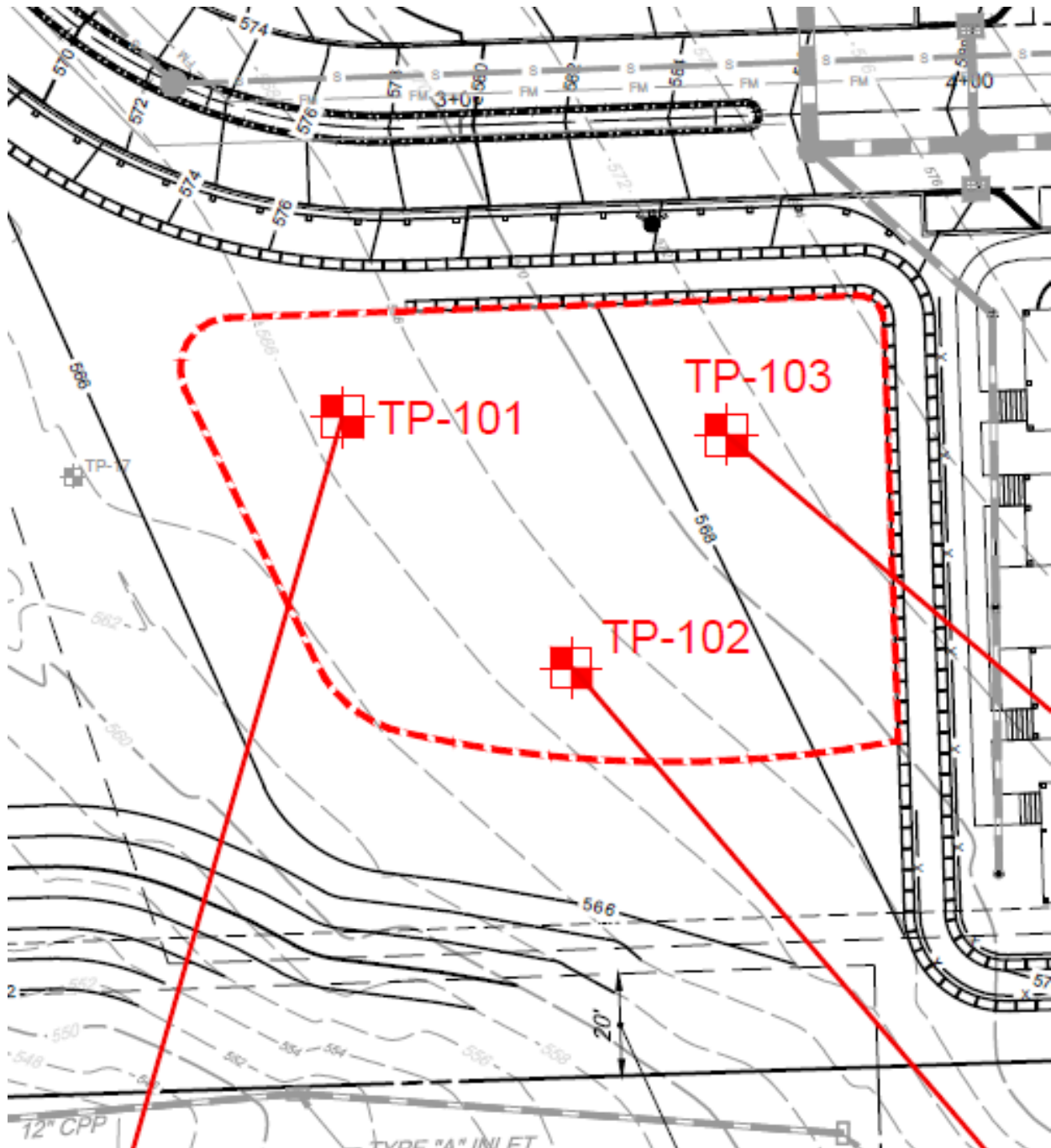
A handwritten signature in black ink, appearing to read 'Andrei Danel', is written over a circular professional seal. The seal contains the text 'STATE OF NEW JERSEY' and 'Professional Engineer' around the perimeter, with 'M&Z ENGINEERING' in the center.

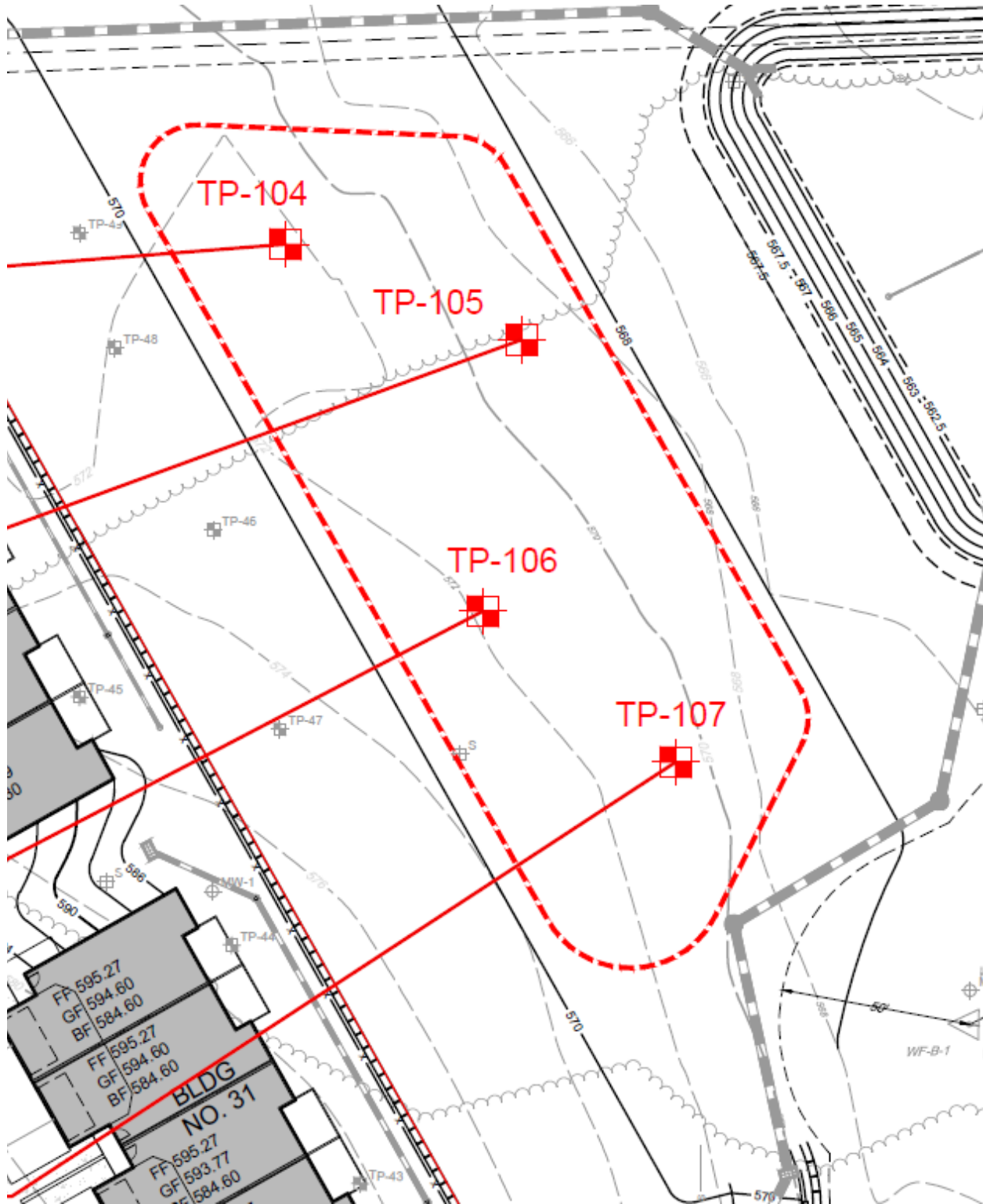
Andrei Danel, P.E.

Permeability Testing Results

Location	Existing Ground Elevation	Depth Below Existing Grade	Test Elevation	Method	Permeability Rate (in/hr)	Permeability Rating
TP-101	566.6	60"	561.6	Single Ring	0.51	K1
TP-102	567.1	96"	559.1	Tube Permeameter	0.26	K1
TP-103	571.4	108"	562.4	Tube Permeameter	0.48	K1
TP-104	572.2	72"	566.2	Tube Permeameter	0.53	K1
TP-105	569.0	60"	564	Tube Permeameter	0.61	K2
TP-106	571.9	72"	565.9	Tube Permeameter	0.06	K1
TP-107	570.6	72"	564.6	Single Ring	0.51	K1

Test Pit Log			
Test Pit ID	Depth	Description	Ground Water
TP-101	0" to 12"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	12" to 43"	Brown silty Clay, some Sand,	
	43" to 60"	Light Brown silty coarse to fine Sand, Gravel, some Clay	
	60" to 102"	Coarse to fine Gravel and Cobble, some clay, decomp rock	
	102" to 156"	Brown Silty coarse to fine Sand, some Clay	
	End of Test Pit at 156" below grade		
TP-102	0" to 10"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 48"	Brown silty Clay	
	48" to 168"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 168" below grade		
TP-103	0" to 12"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 36"	Brown silty Clay	
	48" to 216"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 216" below grade		
TP-104	0" to 10"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 24"	Brown silty Clay	
	24" to 168"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 168" below grade		
TP-105	0" to 10"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 24"	Brown silty Clay	
	24" to 144"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 144" below grade		
TP-106	0" to 10"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 24"	Brown silty Clay	
	24" to 168"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 168" below grade		
TP-107	0" to 10"	Top Soil – Brown silty Clay, some Sand, roots	Not encountered
	10" to 24"	Brown silty Clay	
	24" to 144"	Brown Silty coarse to fine Sand, Gravel, some Clay	
	End of Test Pit at 144" below grade		





Job No. 25-300

Client M&Z Engineering

Project 80-88 West Main Street

Block 1801 Lot 5-6 multiple

Location Mendham, NJ

1. Test Number 1 Replicate (Letter) A & B

2. Sample Depth 96 in. Soil Pit/Boring Number 1 Date Collected 11-20-2025

Specimen Preparation

Date 12-02-2025

Replicate		A	B
a	Total Length of Tube	159	158 mm
b	Diam. of Tube, D	62	62 mm
c	Unfilled Length of Tube:		
	Bottom (ave. 3-4 pts)	4.3	5.7 mm
	Top (ave. 3-4 pts)	117.3	105.7 mm
a - e	Sample Length, L	37.3	46.7 mm
f	Diameter of Standpipe, d ¹	62	62 mm

1 - same as tube if standpipe not used.

Sample Type: Undisturbed

Standpipe Used: N

Test Readings

Date 12-2 to 12-3-2025

$$H_T = 119 \text{ mm}$$

Set Drop = _____ mm (opt.)

Replicate A				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	32	48	0.543
2	1,800	15	30	0.458
3	2,940	30	52	0.511
4	2,160	52	64	0.483
5	4,680	64	83	0.479
6	2,040	7	25	0.454
7	2,820	25	45	0.449

* - next day

$$K \text{ (in/hr)} = 60 \text{ (min/hr)} \cdot L \text{ (in)} / T \text{ (min)} \cdot r^2 / R^2 \cdot \ln (H_1 / H_2)$$

$$H_T = 124 \text{ mm}$$

Set Drop = _____ mm (opt.)

Replicate B				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	21	31	0.341
2	1,800	14	23	0.314
3	2,940	23	35	0.285
4	2,160	35	43	0.288
5	4,680	43	58	0.289
6	2,040	7	16	0.260
7	2,880	16	33	0.393

* - next day

K, in/hr = 0.26

Post-test Sample Defects:

☐ x	☐ None	☐ Worm Channels	☐ Large Gravel	☐ Soil/Tube Contact	☐ Dry Soil
☐	☐ Cracks	☐ Root Channels	☐ Large Roots	☐ Compaction	☐ Smearing
☐	☐ Other -				

Notes: _____

I hereby certify that the information furnished on Form 3b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator

Date _____

Signature of Professional Engineer

Eugene J. Schwarzrock, P.E.

12-4-2025

License No. 24GE04262500

24GE04262500

Form 3b. Tube Permeameter Test Data (ref. N.J.A.C. 7:9A-6.2)

Job No. 25-300Client M&Z EngineeringProject 80-88 West Main StreetBlock 1801 Lot 5-6 multipleLocation Mendham, NJ1. Test Number 2 Replicate (Letter) A & B2. Sample Depth 108 in. Soil Pit/Boring Number 2 Date Collected 11-20-2025**Specimen Preparation** Date 12-02-2025

		Replicate	
		A	B
a	Total Length of Tube	161	156 mm
b	Diam. of Tube, D	61	61 mm
c	Unfilled Length of Tube:		
	Bottom (ave. 3-4 pts)	14	5.3 mm
	Top (ave. 3-4 pts)	123	123 mm
a - e	Sample Length, L	24.0	27.7 mm
f	Diameter of Standpipe, d ¹	61	61 mm

Sample Type: Undisturbed
Standpipe Used: N

1 - same as tube if standpipe not used.

Test Readings Date 12-2 to 12-3-2025H_T = 121 mm

Set Drop = _____ mm (opt.)

Replicate A				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	35	57	0.508
2	1,800	5	32	0.501
3	2,520	10	45	0.511
4	2,160	45	65	0.481
5	4,560	65	93	0.517
6	2,100	3	36	0.531
7	2,880	36	68	0.558

* - next day

$$K \text{ (in/hr)} = 60 \text{ (min/hr)} \cdot L \text{ (in)} / T \text{ (min)} \cdot r^2 / R^2 \cdot \ln (H_1/H_2)$$

H_T = 121 mm

Set Drop = _____ mm (opt.)

Replicate B				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,920	8	63	1.362
2	1,800	6	55	1.210
3	2,520	12	68	1.122
4	2,160	68	92	1.095
5	4,620	92	107	0.618
6	2,100	5	69	1.498
7	2,880	9	79	1.335

* - next day

K, in/hr = 0.48

Post-test Sample Defects:

☒ None ☐ Worm Channels ☐ Large Gravel ☐ Soil/Tube Contact ☐ Dry Soil
☐ Cracks ☐ Root Channels ☐ Large Roots ☐ Compaction ☐ Smearing
 Other - _____

Notes:

I hereby certify that the information furnished on Form 3b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____

Date _____

Signature of Professional Engineer _____

License No. 24GE04262500

Eugene J. Schwarzrock, P.E.

12-4-2025

Job No. 25-300

Project 80-88 West Main Street

Block 1801 Lot 5-6 multiple

Location Mendham, NJ

1. Test Number 3 Replicate (Letter) A & B

2. Sample Depth 72 in. Soil Pit/Boring Number 4 Date Collected 11-20-2025

Date 12-02-2025

Sample Type:	Undisturbed
Standpipe Used:	N

Date 12-2 to 12-3-2025

$$H_T = \overline{124} \text{ mm}$$

Set Drop = _____ mm (opt.)

$$H_T = 127 \text{ mm}$$

Set Drop = _____ mm (opt.)

* - next day

$$K \text{ (in/hr)} = 60 \text{ (min/hr)} \cdot L \text{ (in)} / T \text{ (min)} \cdot r^2 / R^2 \cdot \ln (H_1 / H_2)$$

* - next day

K, in/hr = 0.61

x	None	Worm Channels	Large Gravel	Soil/Tube Contact	Dry Soil
---	------	---------------	--------------	-------------------	----------

Cracks Root Channels Large Roots Compaction Smearing

Other -

Notes:

Signature of Site Evaluator

Date _____

Signature of Professional Engineer

License No. 24GE04262500

Eugene J. Schwarzrock, P.E.

12-4-2025

Job No. 25-300

Client M&Z Engineering

Project 80-88 West Main Street

Block 1801 Lot 5-6 multiple

Location Mendham, NJ

1. Test Number 4 Replicate (Letter) A & B

2. Sample Depth 60 in. Soil Pit/Boring Number 5 Date Collected 11-20-2025

Specimen Preparation

Date 12-02-2025

Replicate		A	B
a	Total Length of Tube	155	154 mm
b	Diam. of Tube, D	62	61 mm
c	Unfilled Length of Tube:		
	Bottom (ave. 3-4 pts)	3	3.3 mm
	Top (ave. 3-4 pts)	107.3	101.7 mm
a - e	Sample Length, L	44.7	49.0 mm
f	Diameter of Standpipe, d ¹	62	61 mm

1 - same as tube if standpipe not used.

Sample Type: Undisturbed

Standpipe Used: N

Test Readings

Date 12-2 to 12-3-2025

$$H_T = \underline{\underline{117 \text{ mm}}}$$

Set Drop = _____ mm (opt.)

Replicate A				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	32	49	0.713
2	1,800	5	26	0.730
3	2,880	26	53	0.774
4	2,220	53	68	0.762
5	4,440	68	94	1.078
6	2,220	7	33	0.769
7	2,820	33	57	0.755

* - next day

$$K \text{ (in/hr)} = 60 \text{ (min/hr)} \cdot L \text{ (in)} / T \text{ (min)} \cdot r^2 / R^2 \cdot \ln (H_1 / H_2)$$

$$H_T = 121 \text{ mm}$$

Set Drop = _____ mm (opt.)

Replicate B				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,740	9	10	0.036
2	1,980	10	13	0.096
3	1,800	5	7	0.067
4	2,880	7	10	0.064
5	2,220	10	14	0.115
6	4,440	14	18	0.060
7	5,160	18	23	0.067

* - next day

K, in/hr = 0.060

Post-test Sample Defects:

☐ x	☐ None	☐ Worm Channels	☐ Large Gravel	☐ Soil/Tube Contact	☐ Dry Soil
	☐ Cracks	☐ Root Channels	☐ Large Roots	☐ Compaction	☐ Smearing
	☐ Other - _____				

Notes: B - a few small roots in bottom of sample

I hereby certify that the information furnished on Form 3b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____

Date _____

Signature of Professional Engineer

Eugene J. Schwarzrock, P.E.

12-4-2025

License No. 24GE04262500

24GE04262500

Form 3b. Tube Permeameter Test Data (ref. N.J.A.C. 7:9A-6.2)

Job No. 25-300Client M&Z EngineeringProject 80-88 West Main StreetBlock 1801 Lot 5-6 multipleLocation Mendham, NJ1. Test Number 5 Replicate (Letter) A & B2. Sample Depth 72 in. Soil Pit/Boring Number 6 Date Collected 11-20-2025

Specimen Preparation

Date 12-02-2025

Replicate		A	B	
a	Total Length of Tube	153	154	mm
b	Diam. of Tube, D	61	61	mm
c	Unfilled Length of Tube:			
	Bottom (ave. 3-4 pts)	0	0	mm
	Top (ave. 3-4 pts)	97.3	96.7	mm
a - e	Sample Length, L	55.7	57.3	mm
f	Diameter of Standpipe, d ¹	61	61	mm

Sample Type: Undisturbed
Standpipe Used: N

1 - same as tube if standpipe not used.

Test Readings

Date 12-2 to 12-3-2025H_T = 116 mm

Set Drop = _____ mm (opt.)

Replicate A				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	44	68	1.616
2	1,860	10	45	1.700
3	2,550	6	52	1.676
4	2,040	52	75	1.722
5	4,440	14	75	1.620
6	2,280	9	46	1.468
7	2,520	10	50	1.483

* - next day

$$K \text{ (in/hr)} = 60 \text{ (min/hr)} \cdot L \text{ (in)} / T \text{ (min)} \cdot r^2 / R^2 \cdot \ln (H_1/H_2)$$

H_T = 119 mm

Set Drop = _____ mm (opt.)

Replicate B				
Interval No.	Elapsed Time, s	D ₁ (mm)	D ₂ (mm)	K (in/hr)
1	1,980	37	47	0.534
2	1,860	8	20	0.500
3	2,550	7	25	0.558
4	2,040	25	37	0.544
5	4,500	4	33	0.525
6	2,340	7	24	0.572
7	2,520	24	39	0.554

* - next day

K, in/hr = 0.53

Post-test Sample Defects:

☒ None ☐ Worm Channels ☐ Large Gravel ☐ Soil/Tube Contact ☐ Dry Soil
☐ Cracks ☐ Root Channels ☐ Large Roots ☐ Compaction ☐ Smearing
 Other - _____

Notes:

I hereby certify that the information furnished on Form 3b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____

Date _____

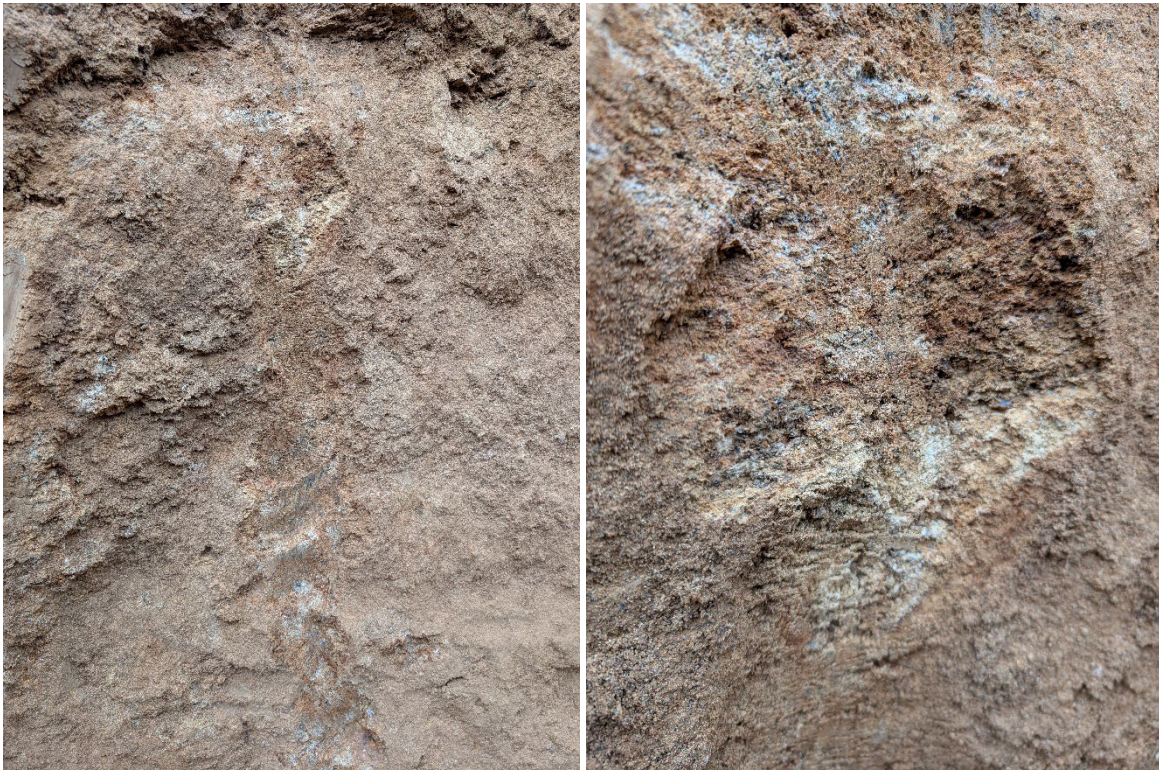
Signature of Professional Engineer _____

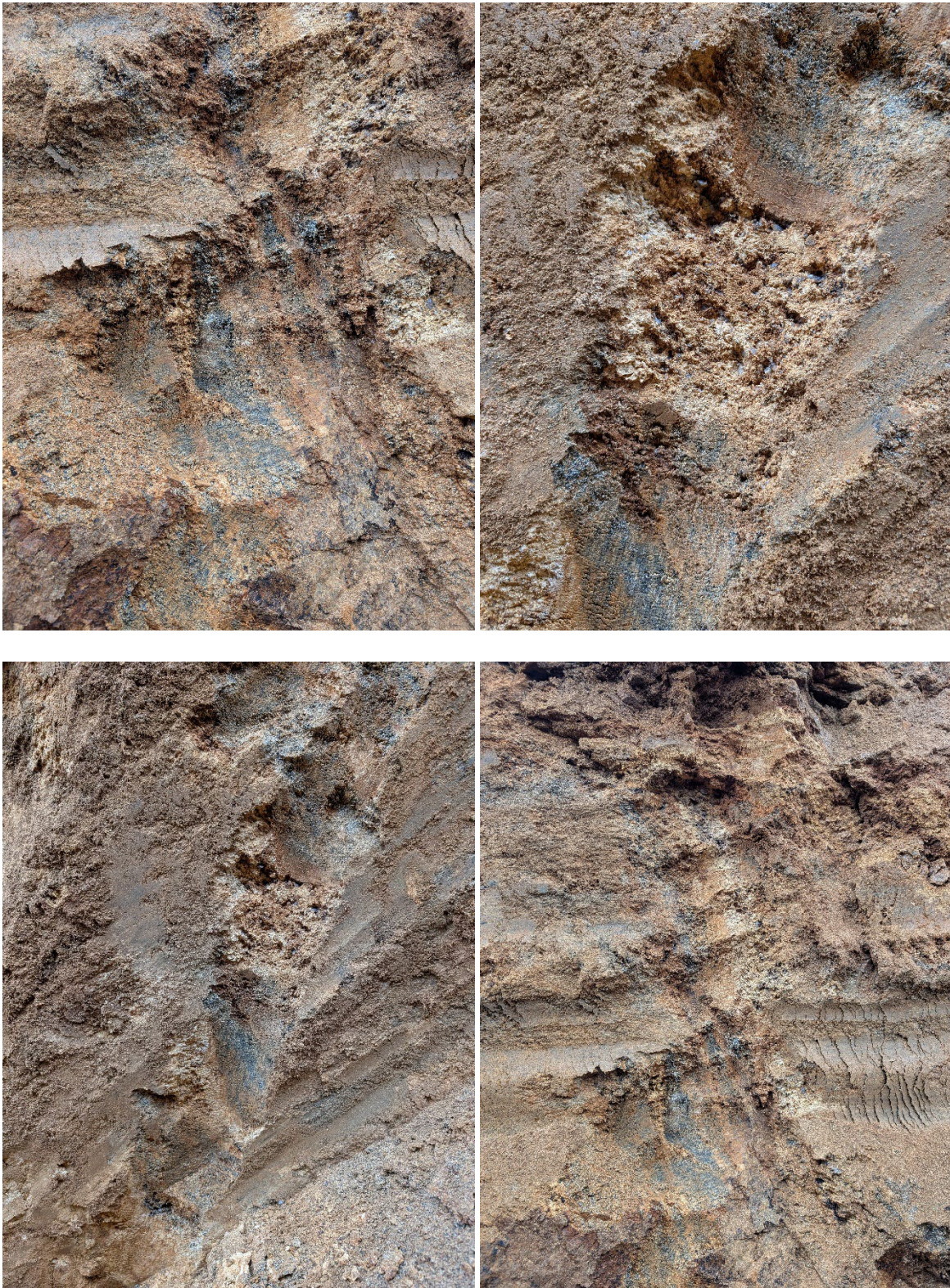
License No. 24GE04262500

Eugene J. Schwarzrock, P.E.

12-4-2025



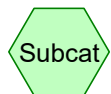
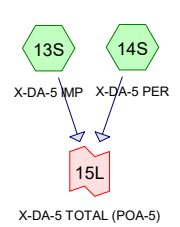
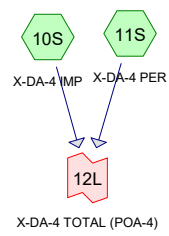
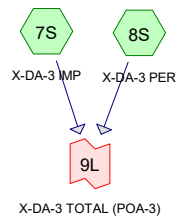
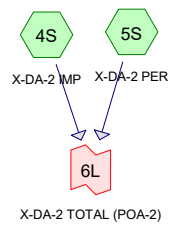
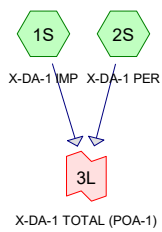






APPENDIX D

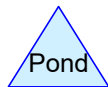
EXISTING CONDITIONS
CALCULATIONS



Subcat



Reach



Pond



Link

Routing Diagram for 081228-SWM

Prepared by Bowman Consulting Group, Printed 2/15/2026
HydroCAD® 10.20-6a s/n 09435 © 2024 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
639,461	61	>75% Grass cover, Good, HSG B (2S, 5S, 8S, 11S, 14S)
12,632	61	Existing Roof Area flowing to drywell (11S)
436	96	Gravel surface, HSG B (10S)
2,178	96	Gravel surfaces, HSG B (13S)
4,792	98	Impervious, conc surfaces, HSG B (10S)
16,553	98	Impervious, concrete surfaces, HSG B (7S, 13S)
60,548	98	Motor Veh Surface, Paved parking, HSG B (1S, 4S, 7S, 13S)
13,504	98	Motor Veh Surface, Paved parking, HSG B (10S)
28,750	98	Unconnected roofs, HSG B (10S, 13S)
214,751	55	Woods, Good, HSG B (2S, 5S, 8S, 11S, 14S)
993,604	64	TOTAL AREA

081228-SWM

NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Prepared by Bowman Consulting Group

Printed 2/15/2026

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Page 3

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: X-DA-1 IMP	Runoff Area=0.440 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=539' Tc=6.6 min CN=98 Runoff=1.42 cfs 5,313 cf
Subcatchment 2S: X-DA-1 PER	Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=0.55" Flow Length=509' Tc=12.3 min CN=WQ Runoff=1.69 cfs 9,368 cf
Subcatchment 4S: X-DA-2 IMP	Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=251' Tc=2.3 min CN=98 Runoff=0.56 cfs 1,811 cf
Subcatchment 5S: X-DA-2 PER	Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=0.57" Flow Length=337' Tc=13.2 min CN=WQ Runoff=0.43 cfs 2,426 cf
Subcatchment 7S: X-DA-3 IMP	Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=252' Tc=11.3 min CN=WQ Runoff=1.53 cfs 6,641 cf
Subcatchment 8S: X-DA-3 PER	Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=0.56" Flow Length=230' Tc=14.1 min CN=WQ Runoff=1.38 cfs 7,942 cf
Subcatchment 10S: X-DA-4 IMP	Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=3.32" Flow Length=749' Tc=7.9 min CN=WQ Runoff=1.87 cfs 7,237 cf
Subcatchment 11S: X-DA-4 PER	Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=0.54" Flow Length=498' Tc=18.5 min CN=WQ Runoff=0.94 cfs 6,383 cf
Subcatchment 13S: X-DA-5 IMP	Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=3.32" Flow Length=687' Tc=16.1 min CN=WQ Runoff=2.85 cfs 14,087 cf
Subcatchment 14S: X-DA-5 PER	Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=0.52" Flow Length=679' Tc=17.0 min CN=WQ Runoff=1.96 cfs 13,036 cf
Link 3L: X-DA-1 TOTAL (POA-1)	Inflow=2.67 cfs 14,681 cf Primary=2.67 cfs 14,681 cf
Link 6L: X-DA-2 TOTAL (POA-2)	Inflow=0.71 cfs 4,237 cf Primary=0.71 cfs 4,237 cf
Link 9L: X-DA-3 TOTAL (POA-3)	Inflow=2.77 cfs 14,583 cf Primary=2.77 cfs 14,583 cf
Link 12L: X-DA-4 TOTAL (POA-4)	Inflow=2.28 cfs 13,620 cf Primary=2.28 cfs 13,620 cf
Link 15L: X-DA-5 TOTAL (POA-5)	Inflow=4.68 cfs 27,123 cf Primary=4.68 cfs 27,123 cf

Total Runoff Area = 993,604 sf Runoff Volume = 74,243 cf Average Runoff Depth = 0.90"
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

Runoff = 1.42 cfs @ 12.13 hrs, Volume= 5,313 cf, Depth= 3.33"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

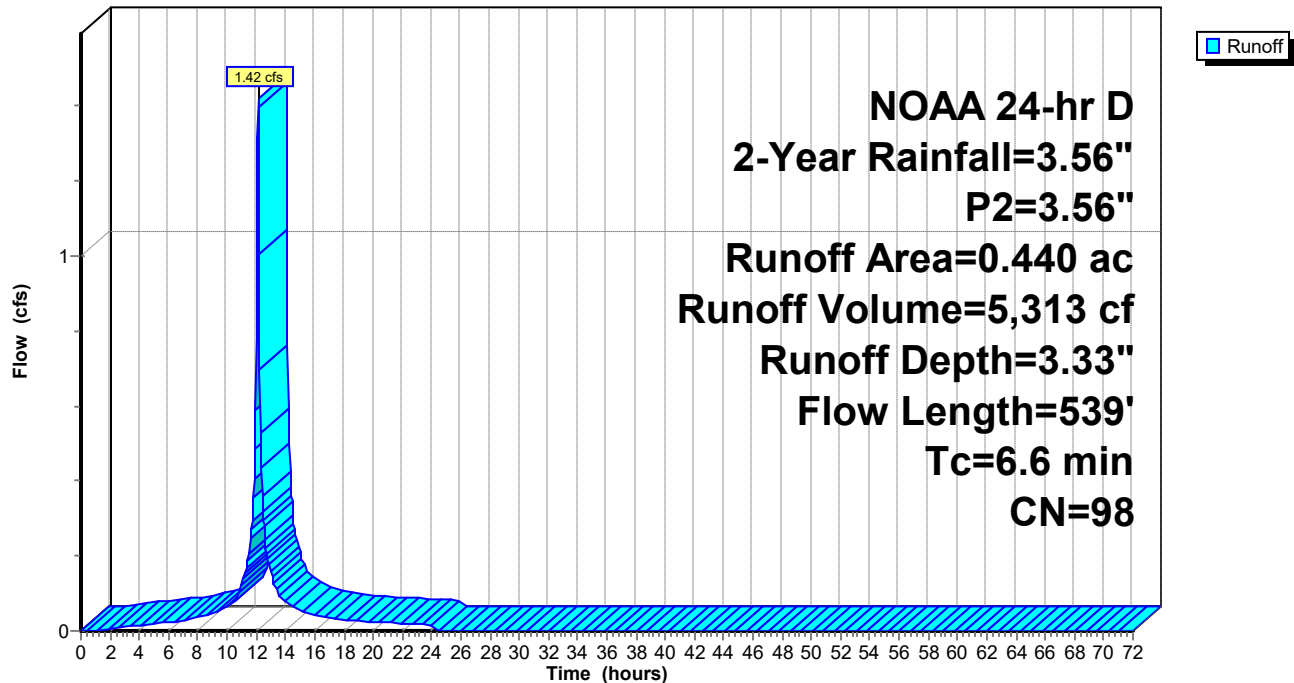
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.63		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
4.2	38	0.0540	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.6	539	Total			

Subcatchment 1S: X-DA-1 IMP

Hydrograph



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 1.69 cfs @ 12.24 hrs, Volume= 9,368 cf, Depth= 0.55"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

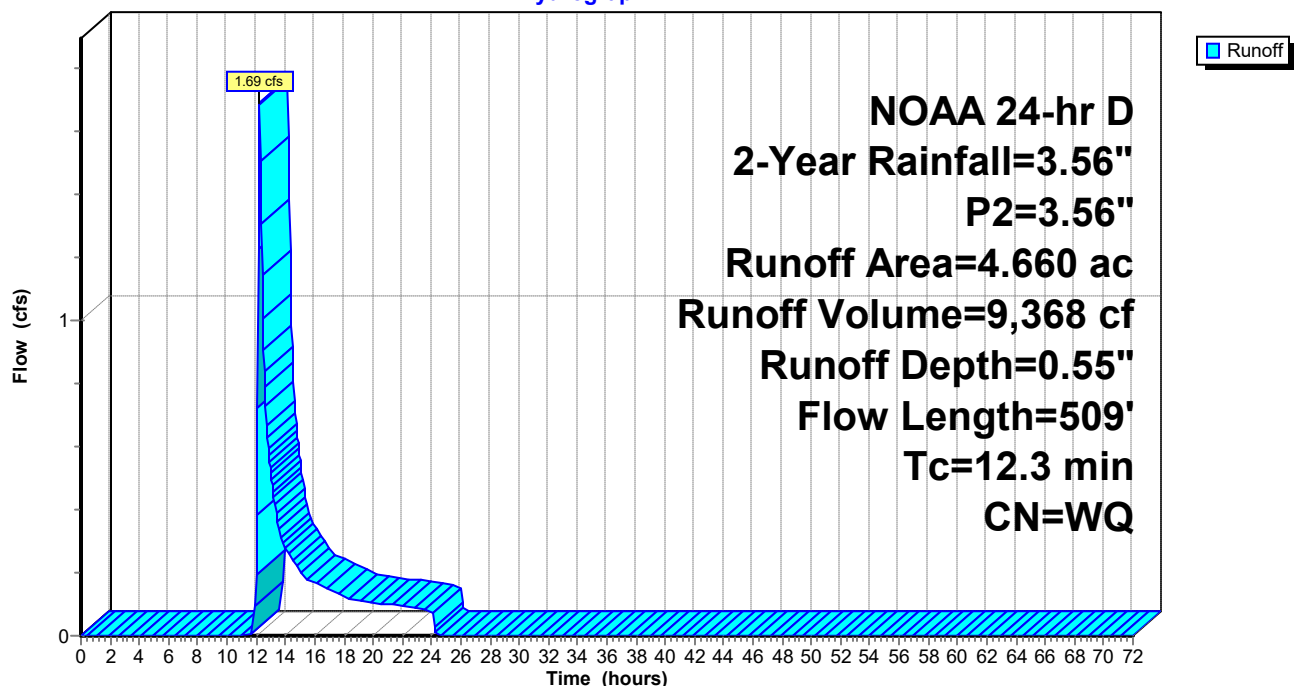
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	52	0.0380	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
4.4	48	0.0770	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
12.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 1,811 cf, Depth= 3.33"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

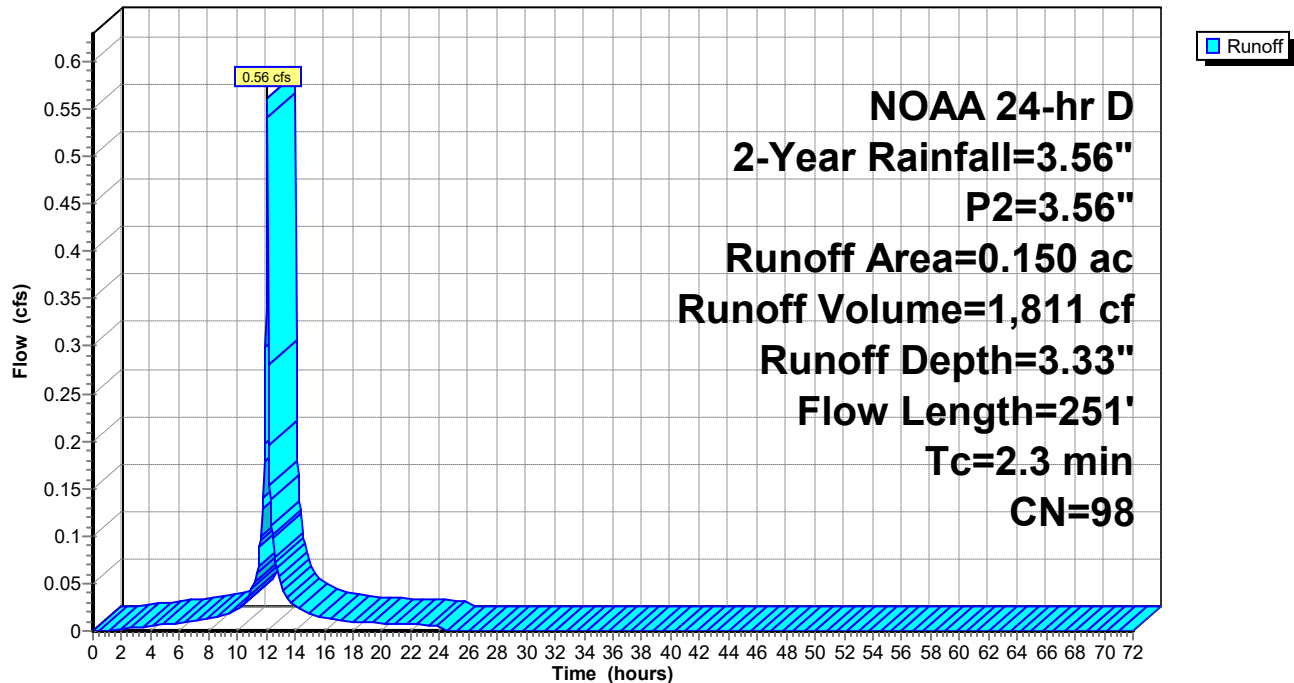
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.3	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

Runoff = 0.43 cfs @ 12.25 hrs, Volume= 2,426 cf, Depth= 0.57"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

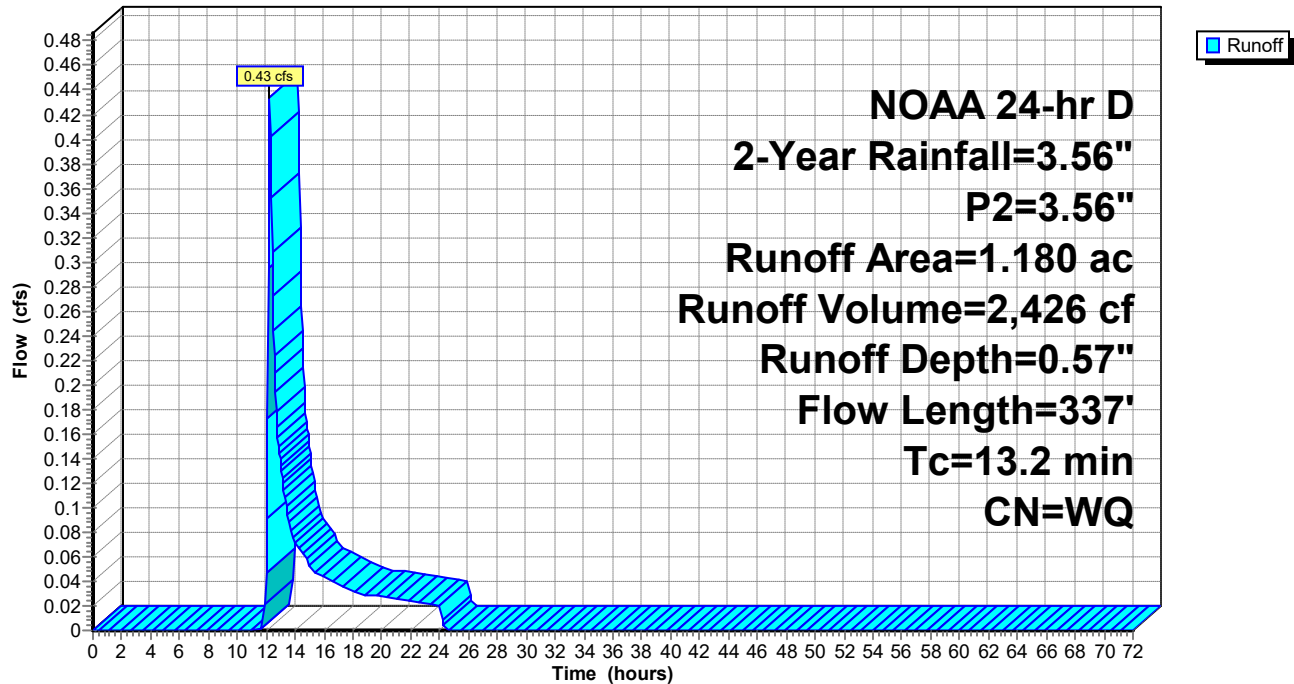
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0300	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
13.2	337	Total			

Subcatchment 5S: X-DA-2 PER

Hydrograph



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 1.53 cfs @ 12.19 hrs, Volume= 6,641 cf, Depth= 3.33"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

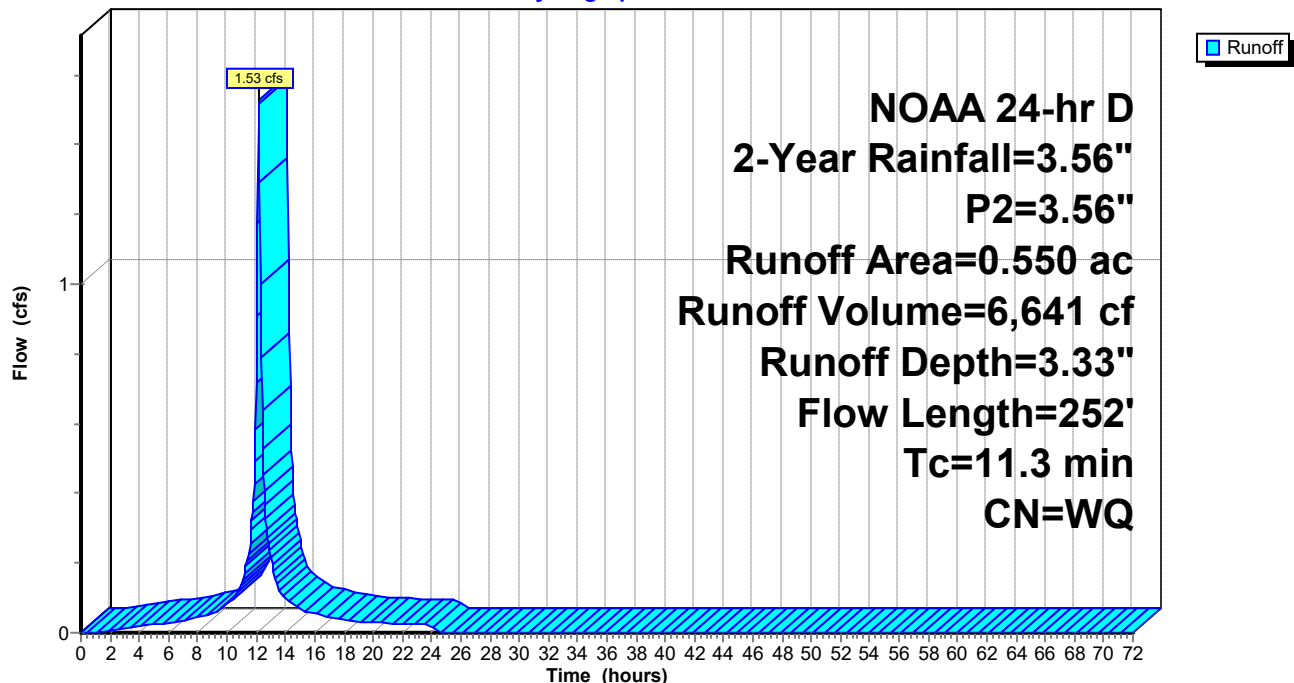
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 1.38 cfs @ 12.26 hrs, Volume= 7,942 cf, Depth= 0.56"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

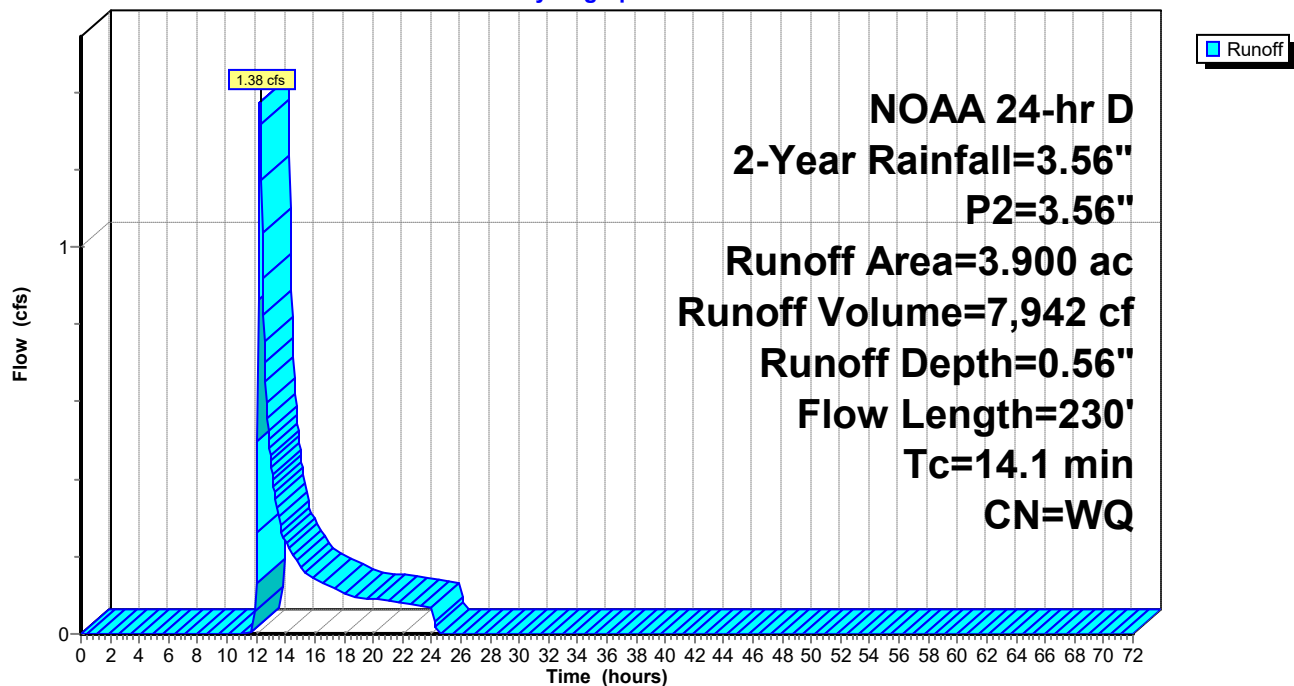
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.2	34	0.0830	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.1	230	Total			

Subcatchment 8S: X-DA-3 PER

Hydrograph



Summary for Subcatchment 10S: X-DA-4 IMP

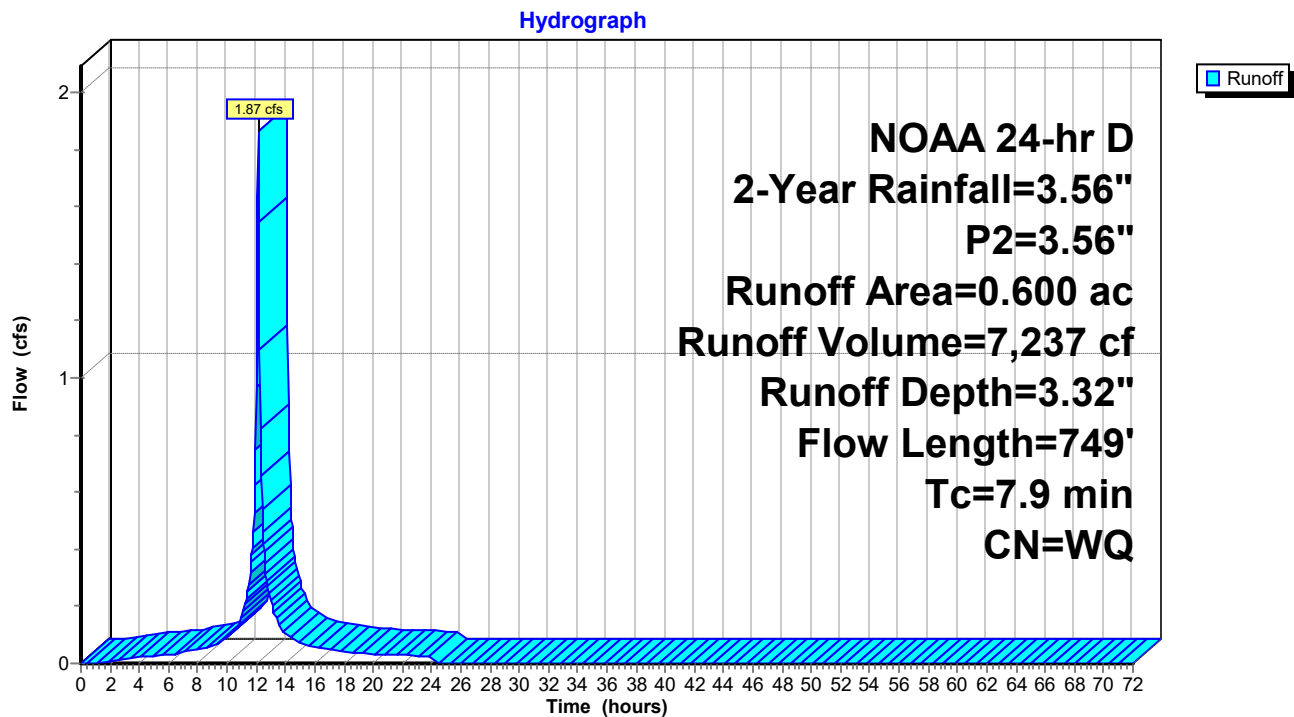
Runoff = 1.87 cfs @ 12.15 hrs, Volume= 7,237 cf, Depth= 3.32"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.45		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.9	749	Total			

Subcatchment 10S: X-DA-4 IMP



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 0.94 cfs @ 12.33 hrs, Volume= 6,383 cf, Depth= 0.54"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

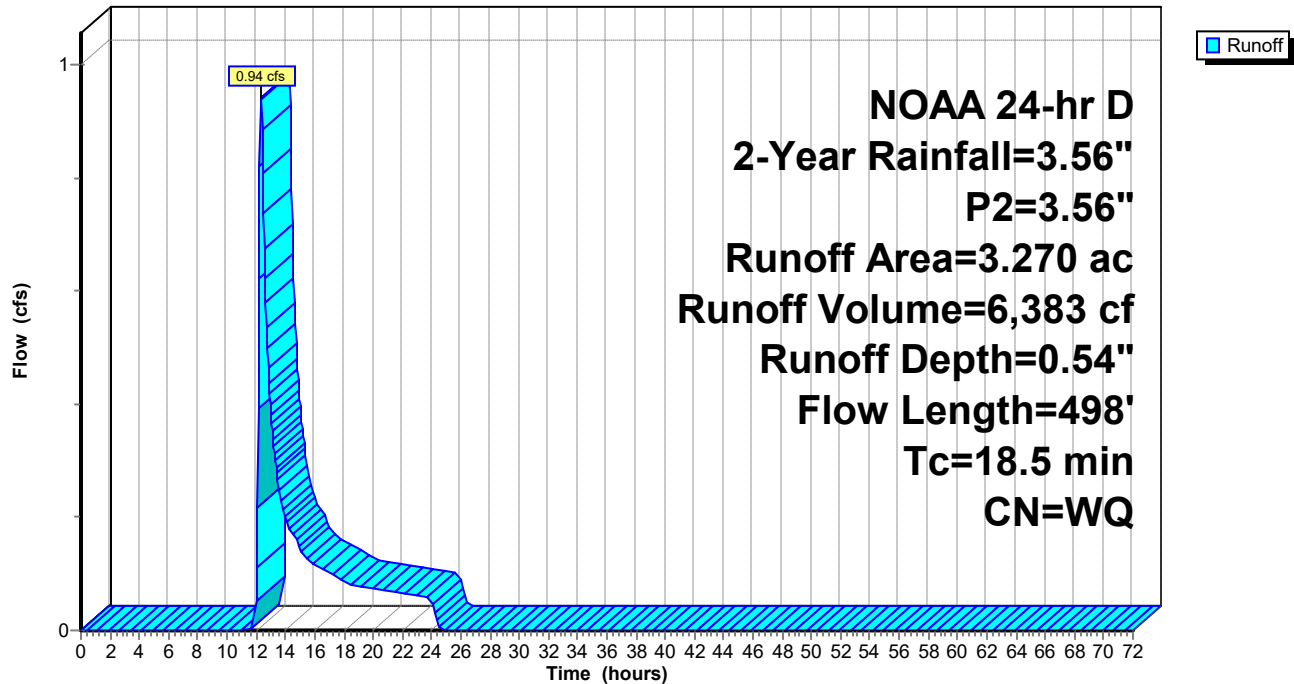
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	89	0.0180	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0180	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
18.5	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 2.85 cfs @ 12.24 hrs, Volume= 14,087 cf, Depth= 3.32"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

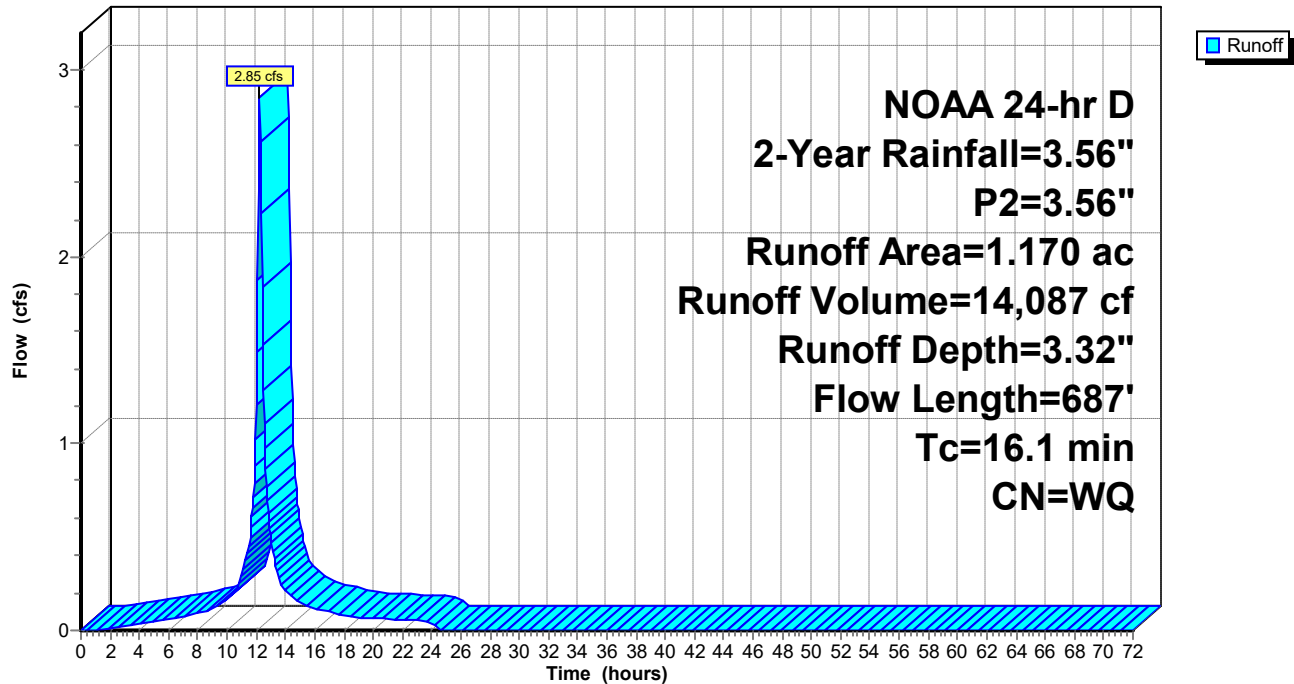
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.95		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.6	15	0.1000	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.1	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 1.96 cfs @ 12.31 hrs, Volume= 13,036 cf, Depth= 0.52"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

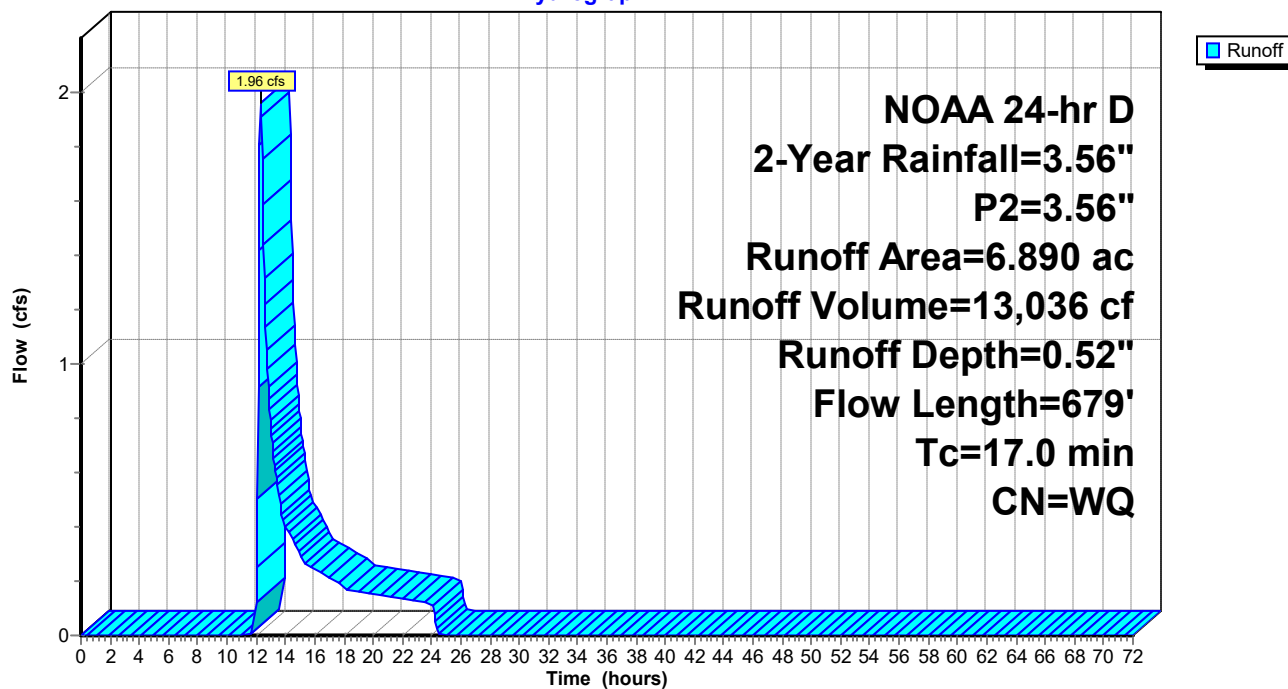
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.9	27	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.0	679	Total			

Subcatchment 14S: X-DA-5 PER

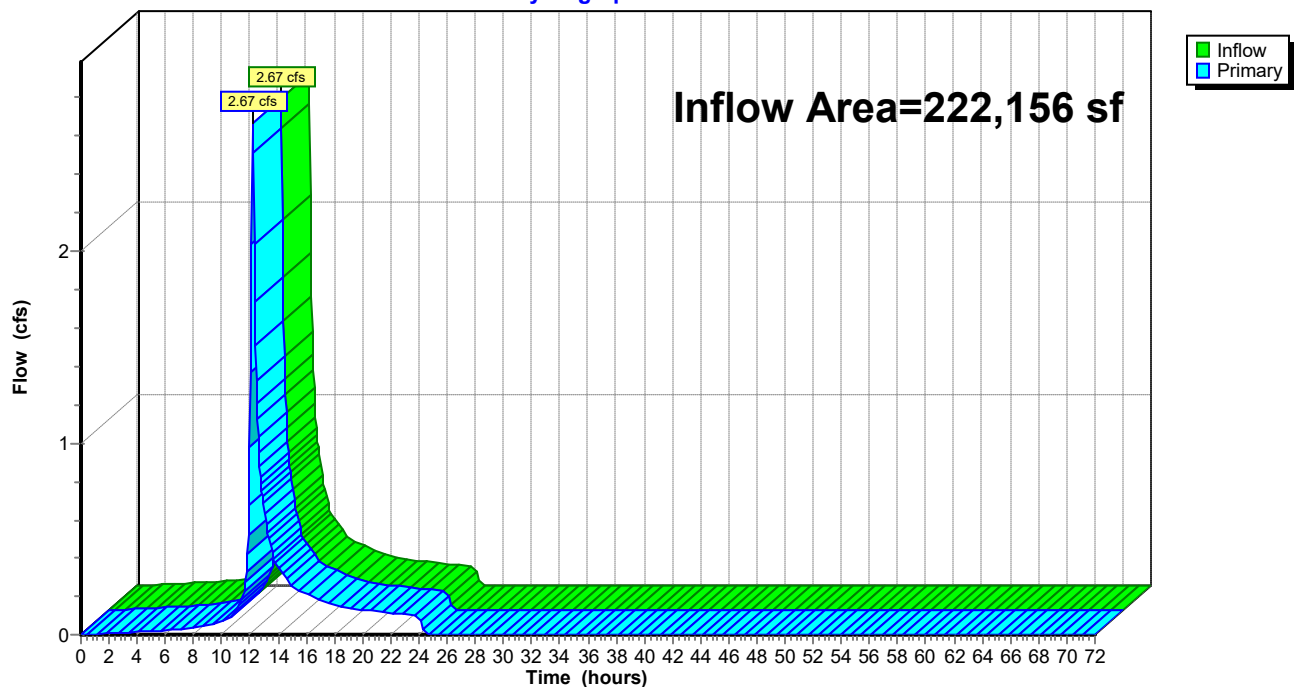
Hydrograph



Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 0.79" for 2-Year event
Inflow = 2.67 cfs @ 12.18 hrs, Volume= 14,681 cf
Primary = 2.67 cfs @ 12.18 hrs, Volume= 14,681 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)**Hydrograph**

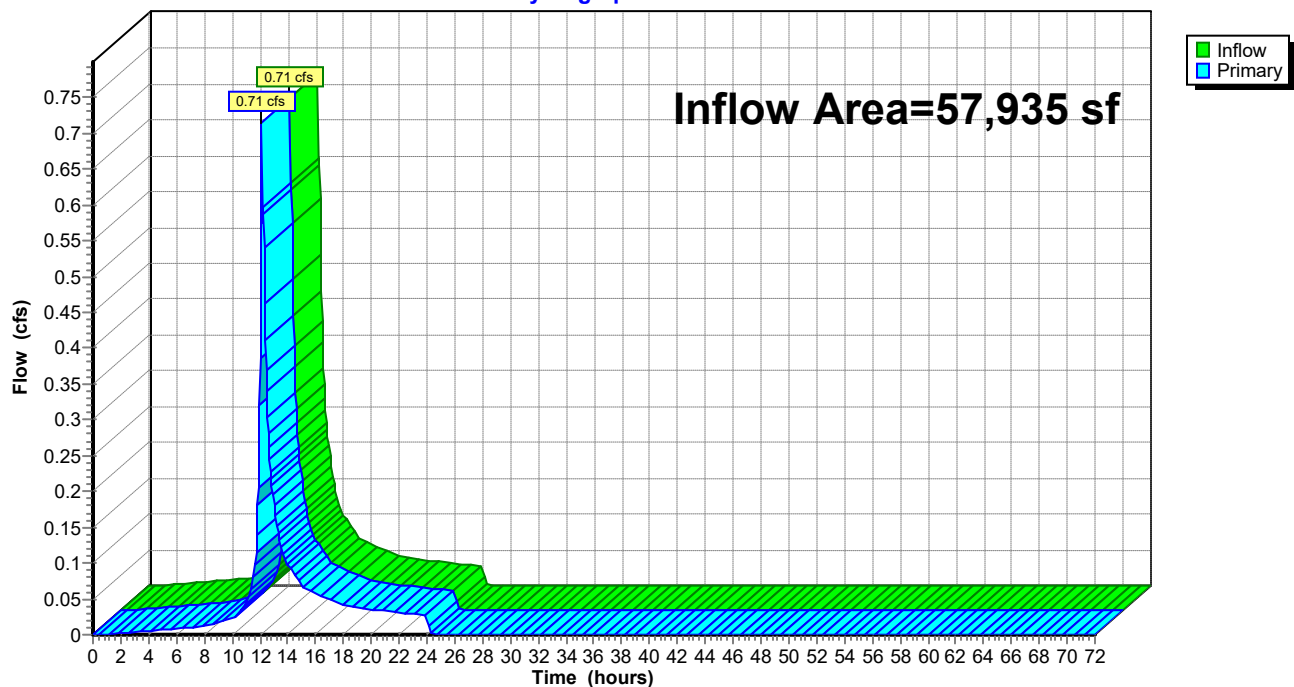
Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 0.71 cfs @ 12.10 hrs, Volume= 4,237 cf
Primary = 0.71 cfs @ 12.10 hrs, Volume= 4,237 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)

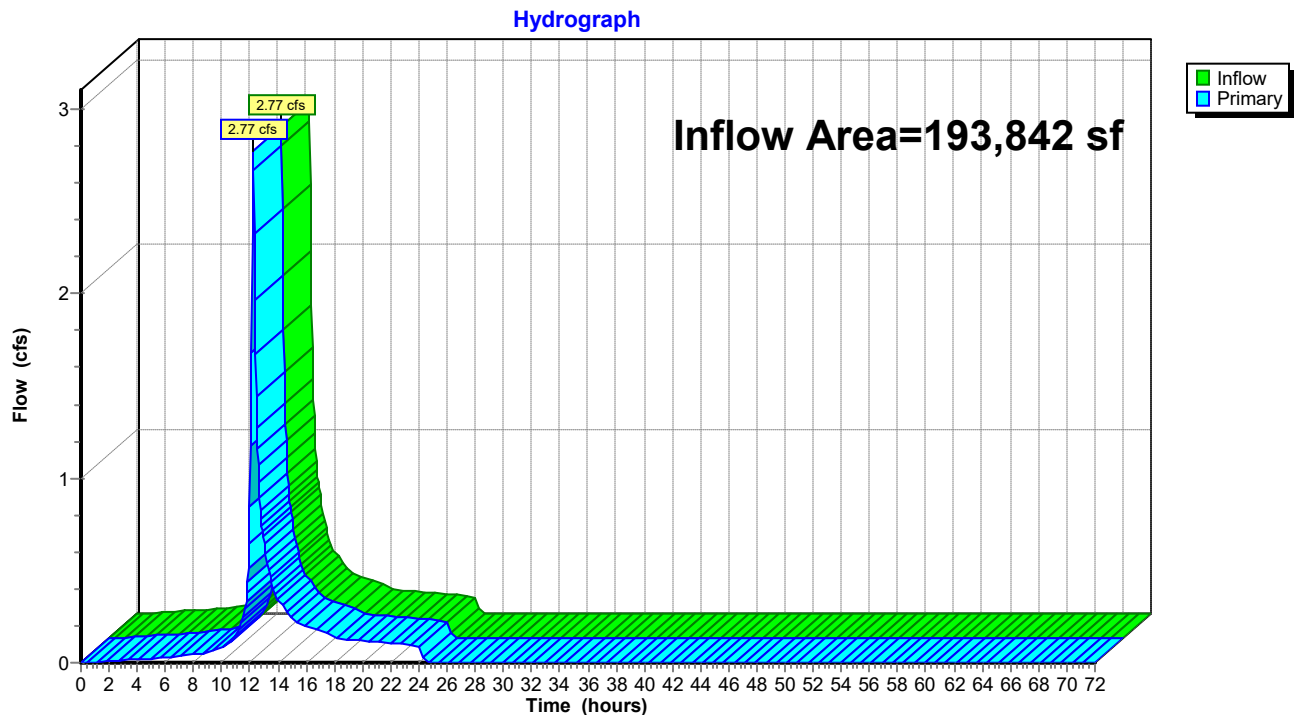
Hydrograph



Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 0.90" for 2-Year event
Inflow = 2.77 cfs @ 12.22 hrs, Volume= 14,583 cf
Primary = 2.77 cfs @ 12.22 hrs, Volume= 14,583 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)

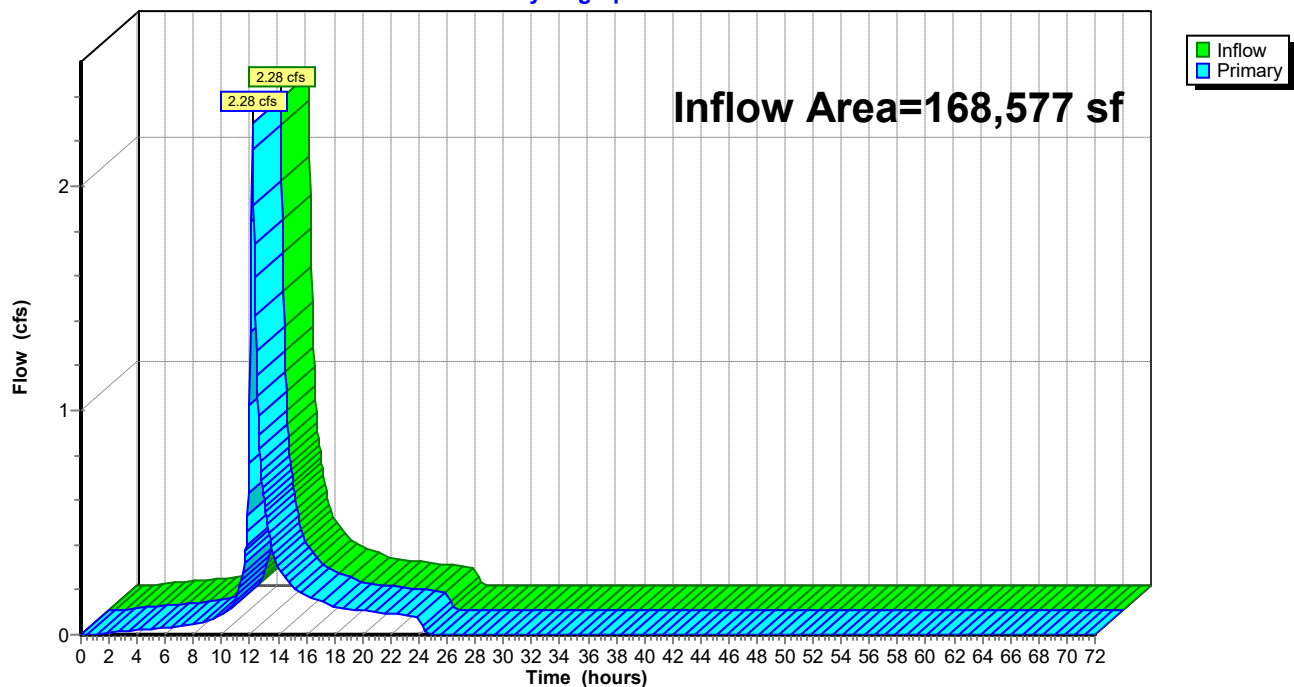
Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 0.97" for 2-Year event
Inflow = 2.28 cfs @ 12.17 hrs, Volume= 13,620 cf
Primary = 2.28 cfs @ 12.17 hrs, Volume= 13,620 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)

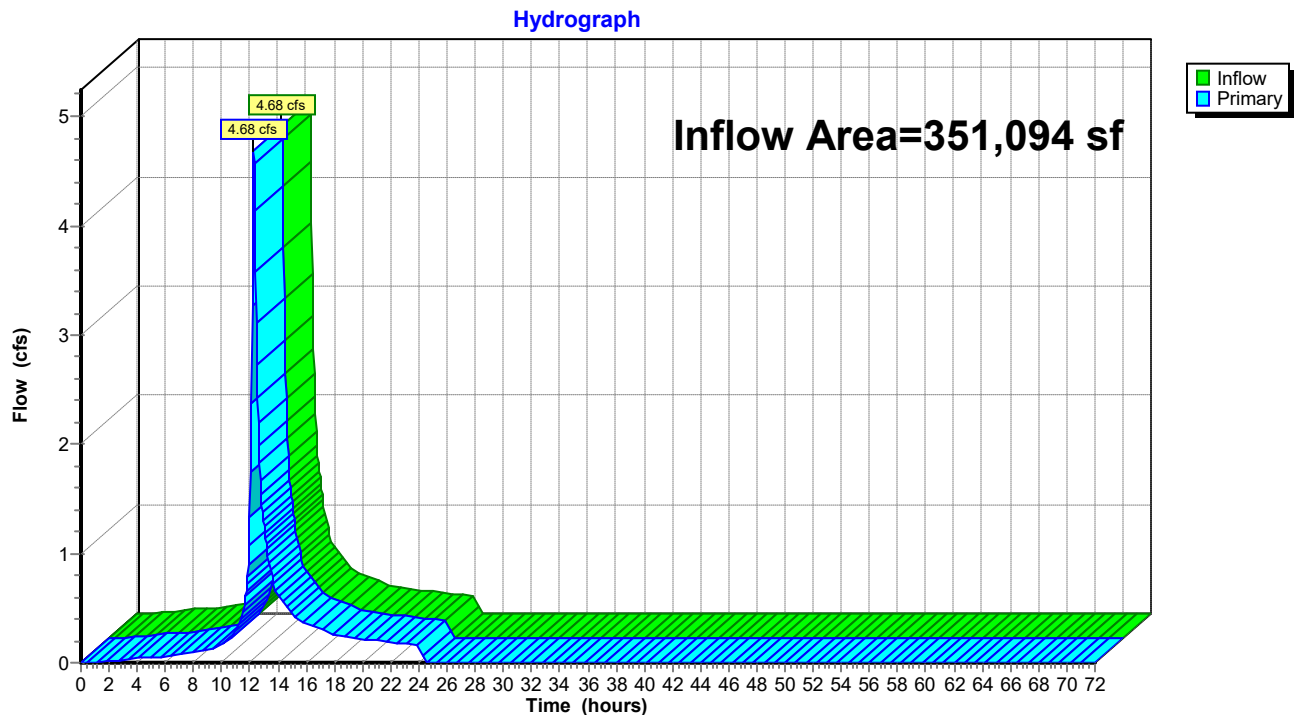
Hydrograph



Summary for Link 15L: X-DA-5 TOTAL (POA-5)

Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 4.68 cfs @ 12.27 hrs, Volume= 27,123 cf
Primary = 4.68 cfs @ 12.27 hrs, Volume= 27,123 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)

081228-SWM

NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Prepared by Bowman Consulting Group

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: X-DA-1 IMP	Runoff Area=0.440 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=539' Tc=6.2 min CN=98 Runoff=1.75 cfs 6,540 cf
Subcatchment 2S: X-DA-1 PER	Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=0.92" Flow Length=509' Tc=11.3 min CN=WQ Runoff=3.52 cfs 15,611 cf
Subcatchment 4S: X-DA-2 IMP	Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=251' Tc=2.2 min CN=98 Runoff=0.69 cfs 2,229 cf
Subcatchment 5S: X-DA-2 PER	Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=0.94" Flow Length=337' Tc=12.1 min CN=WQ Runoff=0.89 cfs 4,026 cf
Subcatchment 7S: X-DA-3 IMP	Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=252' Tc=10.3 min CN=WQ Runoff=1.91 cfs 8,174 cf
Subcatchment 8S: X-DA-3 PER	Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=0.93" Flow Length=230' Tc=12.8 min CN=WQ Runoff=2.80 cfs 13,204 cf
Subcatchment 10S: X-DA-4 IMP	Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=4.09" Flow Length=749' Tc=7.8 min CN=WQ Runoff=2.29 cfs 8,909 cf
Subcatchment 11S: X-DA-4 PER	Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=0.90" Flow Length=498' Tc=17.3 min CN=WQ Runoff=1.97 cfs 10,695 cf
Subcatchment 13S: X-DA-5 IMP	Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=4.08" Flow Length=687' Tc=15.0 min CN=WQ Runoff=3.61 cfs 17,348 cf
Subcatchment 14S: X-DA-5 PER	Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=0.88" Flow Length=679' Tc=15.8 min CN=WQ Runoff=4.17 cfs 21,972 cf
Link 3L: X-DA-1 TOTAL (POA-1)	Inflow=4.81 cfs 22,151 cf Primary=4.81 cfs 22,151 cf
Link 6L: X-DA-2 TOTAL (POA-2)	Inflow=1.15 cfs 6,255 cf Primary=1.15 cfs 6,255 cf
Link 9L: X-DA-3 TOTAL (POA-3)	Inflow=4.61 cfs 21,378 cf Primary=4.61 cfs 21,378 cf
Link 12L: X-DA-4 TOTAL (POA-4)	Inflow=3.48 cfs 19,604 cf Primary=3.48 cfs 19,604 cf
Link 15L: X-DA-5 TOTAL (POA-5)	Inflow=7.66 cfs 39,320 cf Primary=7.66 cfs 39,320 cf

Total Runoff Area = 993,604 sf Runoff Volume = 108,709 cf Average Runoff Depth = 1.31"
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

Runoff = 1.75 cfs @ 12.13 hrs, Volume= 6,540 cf, Depth= 4.09"

Routed to Link 3L : X-DA-1 TOTAL (POA-1)

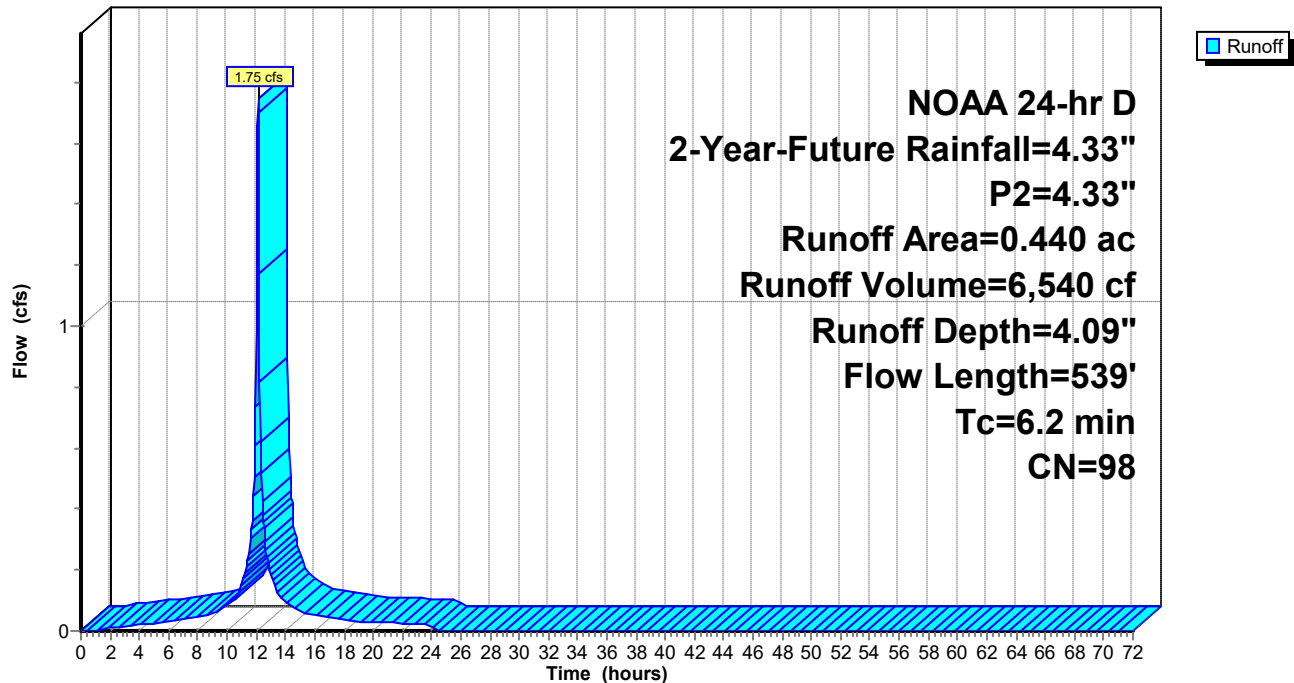
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
3.8	38	0.0540	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.2	539	Total			

Subcatchment 1S: X-DA-1 IMP

Hydrograph



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 3.52 cfs @ 12.21 hrs, Volume= 15,611 cf, Depth= 0.92"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

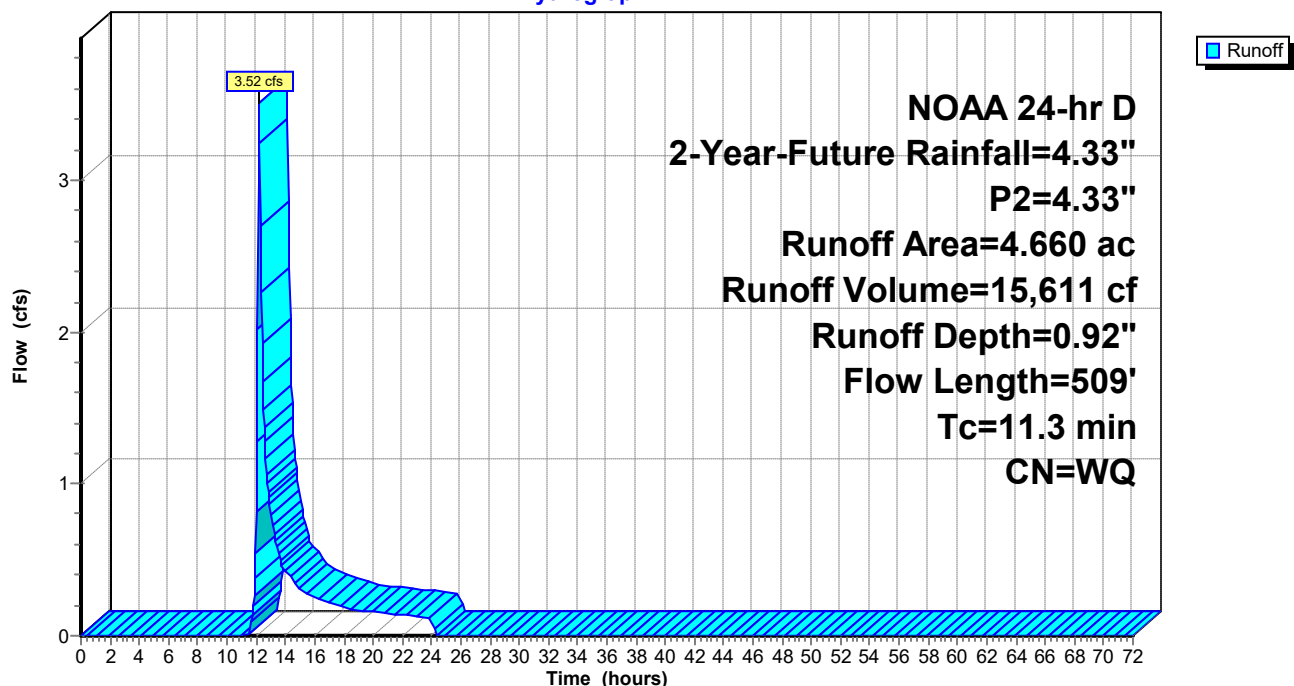
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	52	0.0380	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
4.0	48	0.0770	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
11.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 2,229 cf, Depth= 4.09"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

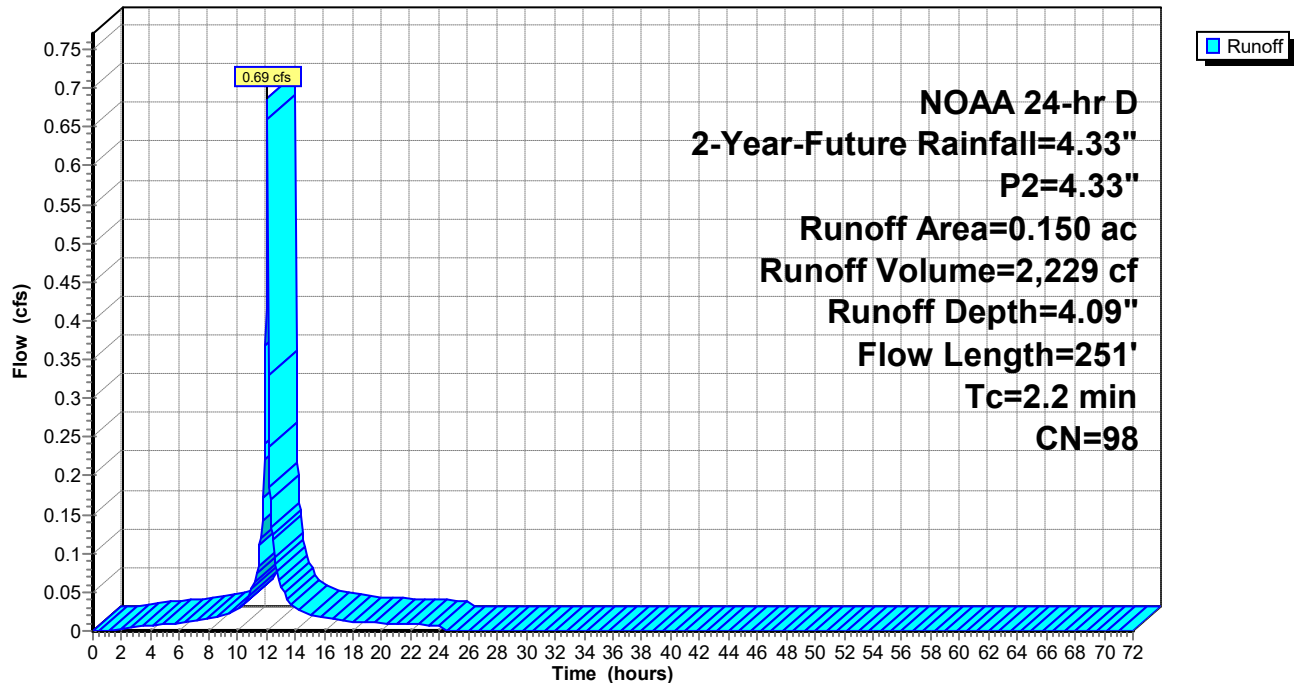
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.2	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

Runoff = 0.89 cfs @ 12.22 hrs, Volume= 4,026 cf, Depth= 0.94"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

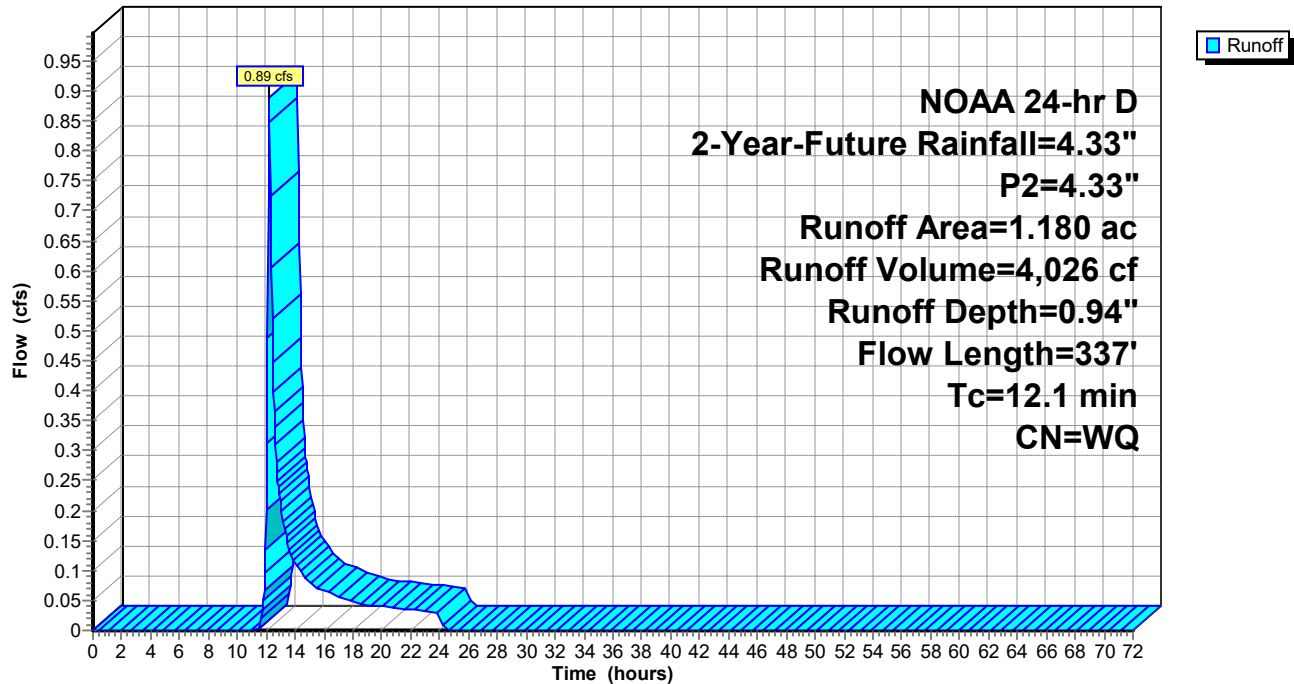
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0300	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
12.1	337	Total			

Subcatchment 5S: X-DA-2 PER

Hydrograph



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 1.91 cfs @ 12.17 hrs, Volume= 8,174 cf, Depth= 4.09"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

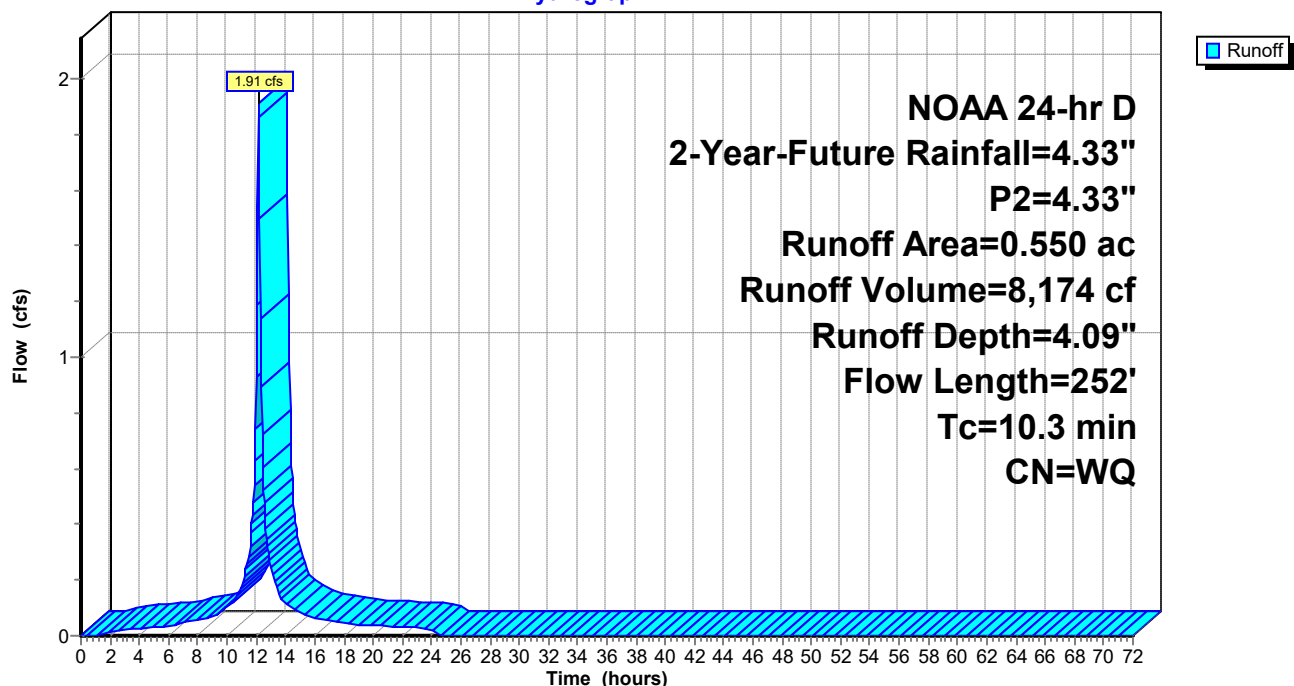
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



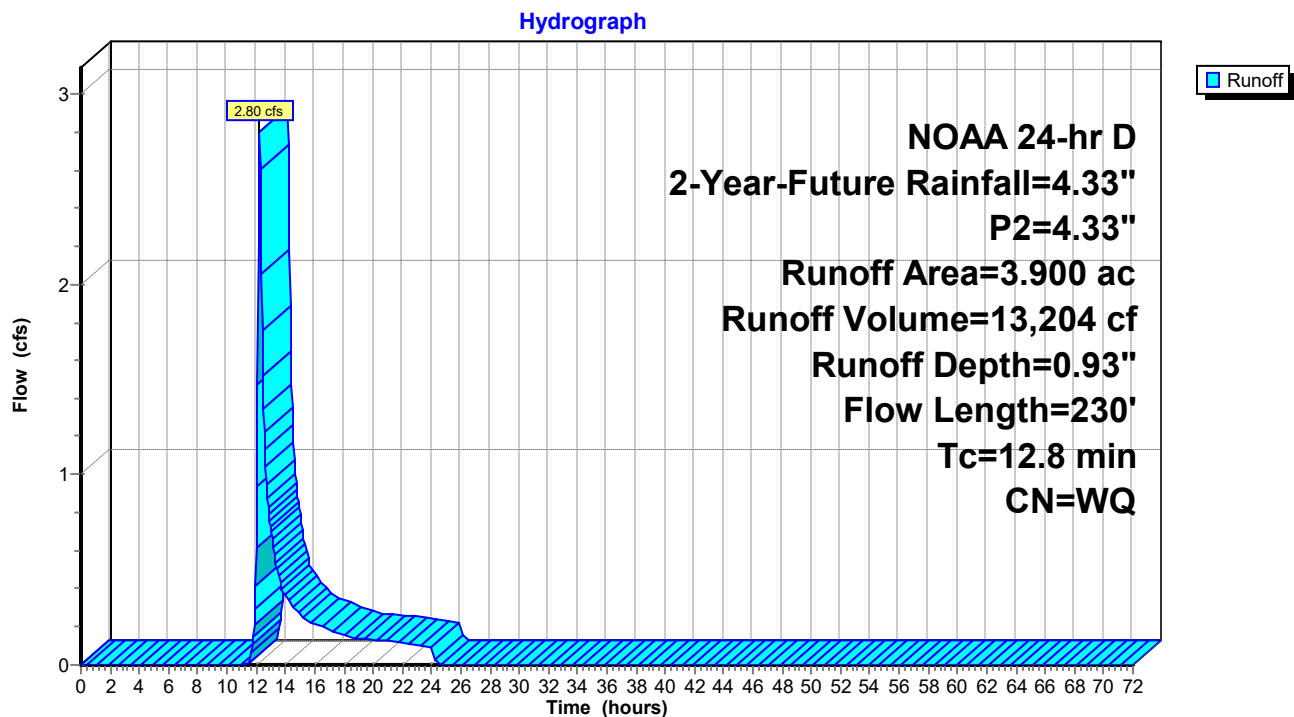
Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 2.80 cfs @ 12.23 hrs, Volume= 13,204 cf, Depth= 0.93"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.9	34	0.0830	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.8	230	Total			

Subcatchment 8S: X-DA-3 PER

Summary for Subcatchment 10S: X-DA-4 IMP

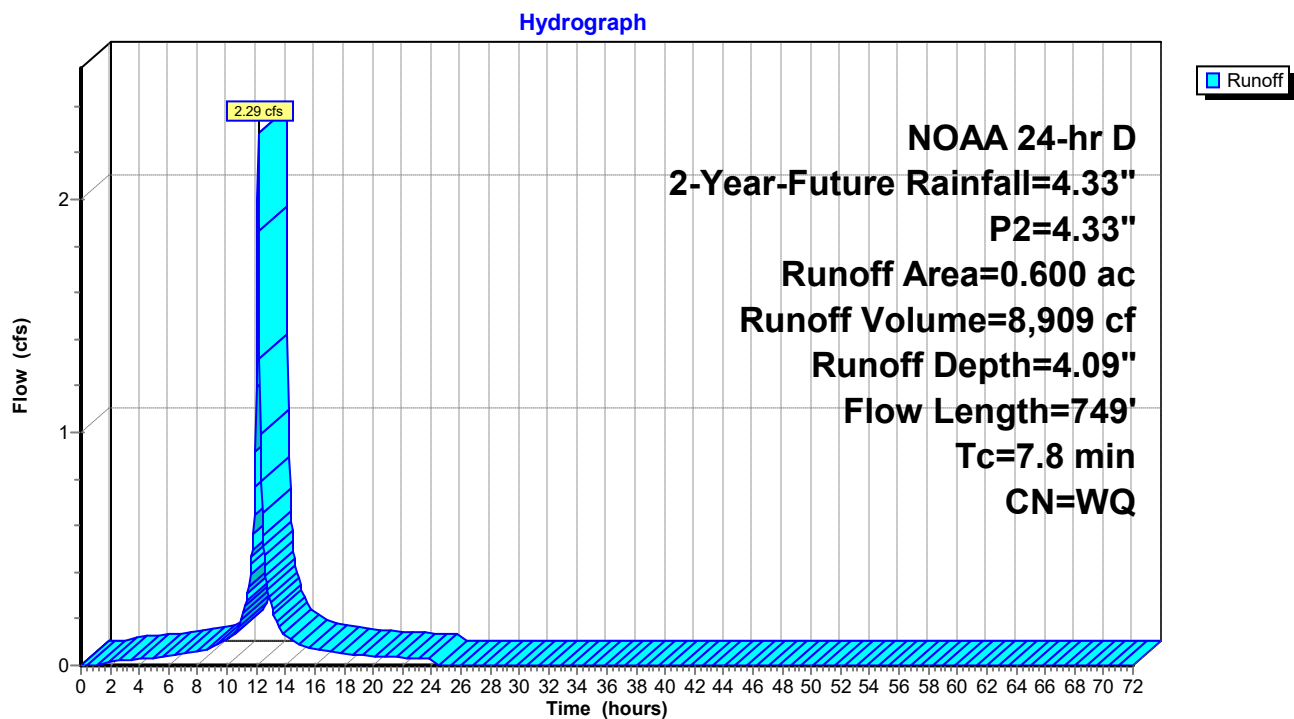
Runoff = 2.29 cfs @ 12.15 hrs, Volume= 8,909 cf, Depth= 4.09"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0200	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.8	749	Total			

Subcatchment 10S: X-DA-4 IMP



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 1.97 cfs @ 12.29 hrs, Volume= 10,695 cf, Depth= 0.90"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

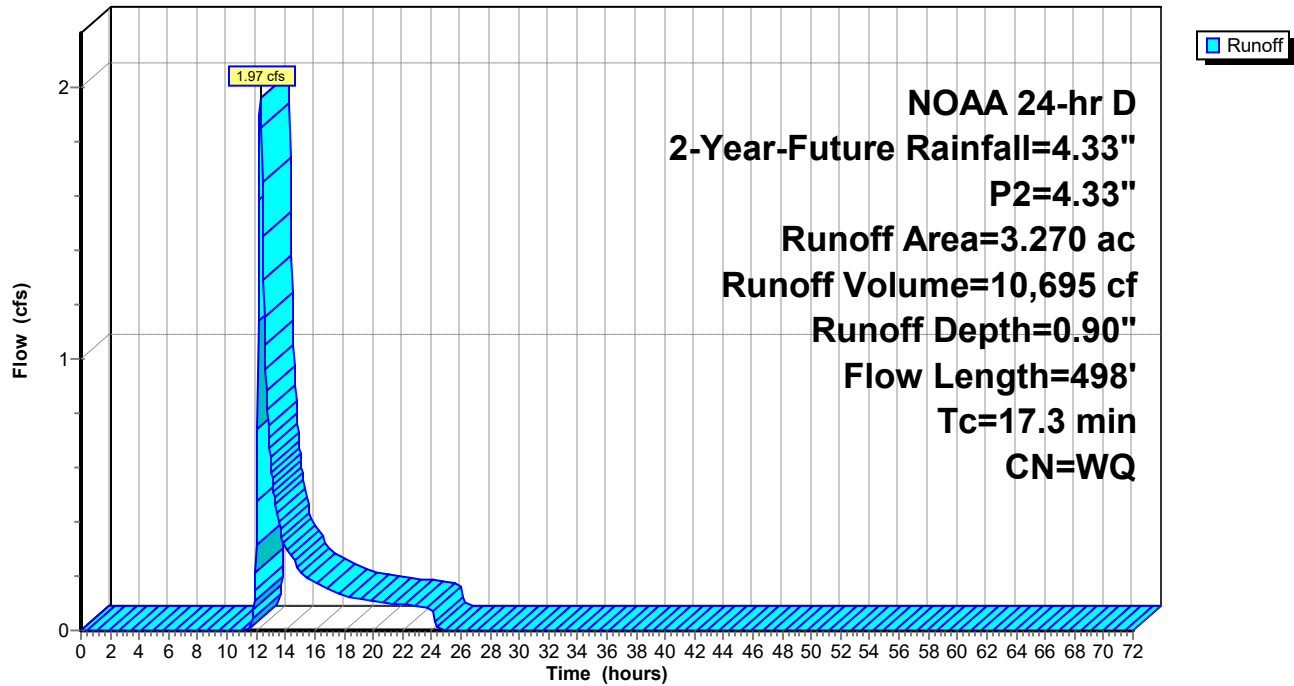
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	89	0.0180	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.2	11	0.0180	0.99		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
17.3	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 3.61 cfs @ 12.22 hrs, Volume= 17,348 cf, Depth= 4.08"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

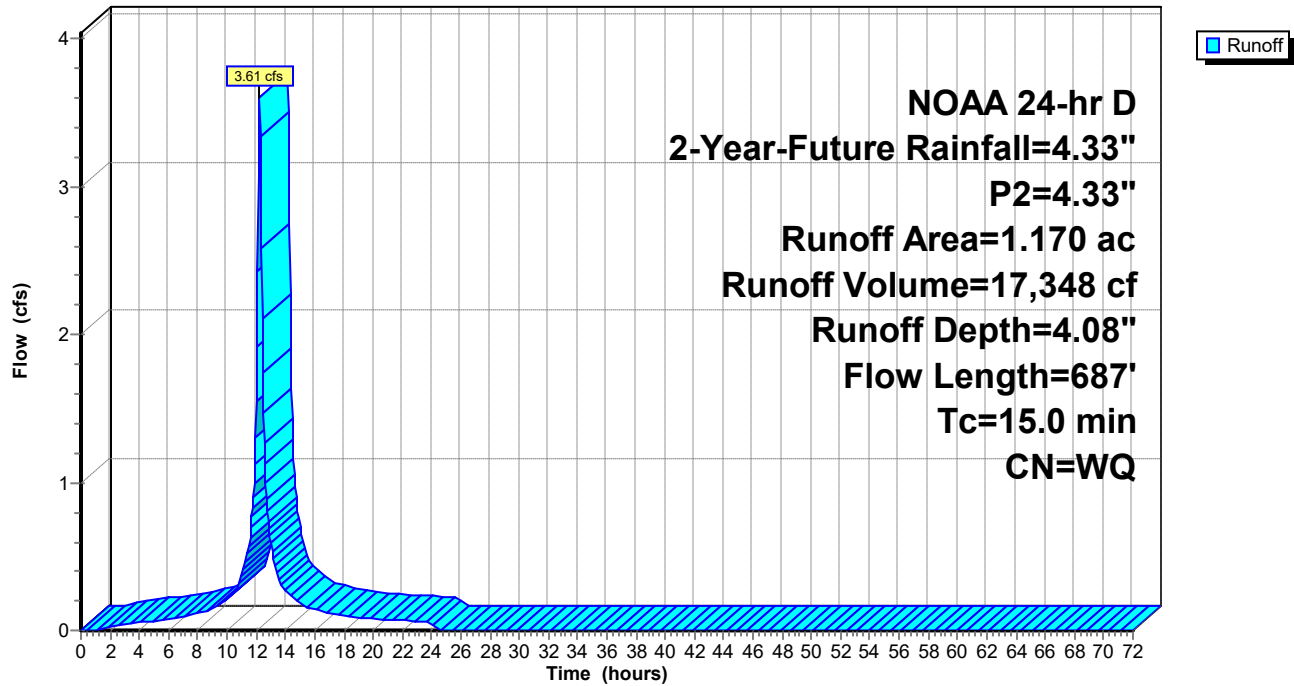
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	15	0.1000	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.0	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 4.17 cfs @ 12.27 hrs, Volume= 21,972 cf, Depth= 0.88"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

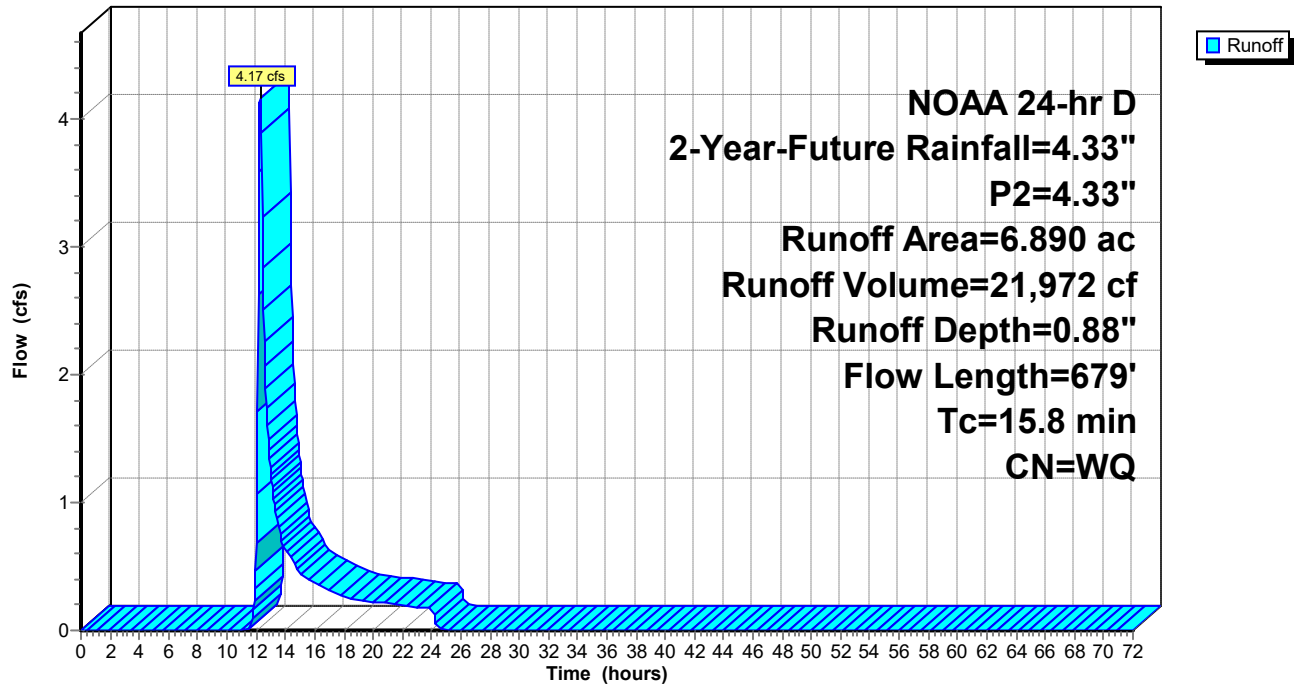
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.6	27	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.8	679	Total			

Subcatchment 14S: X-DA-5 PER

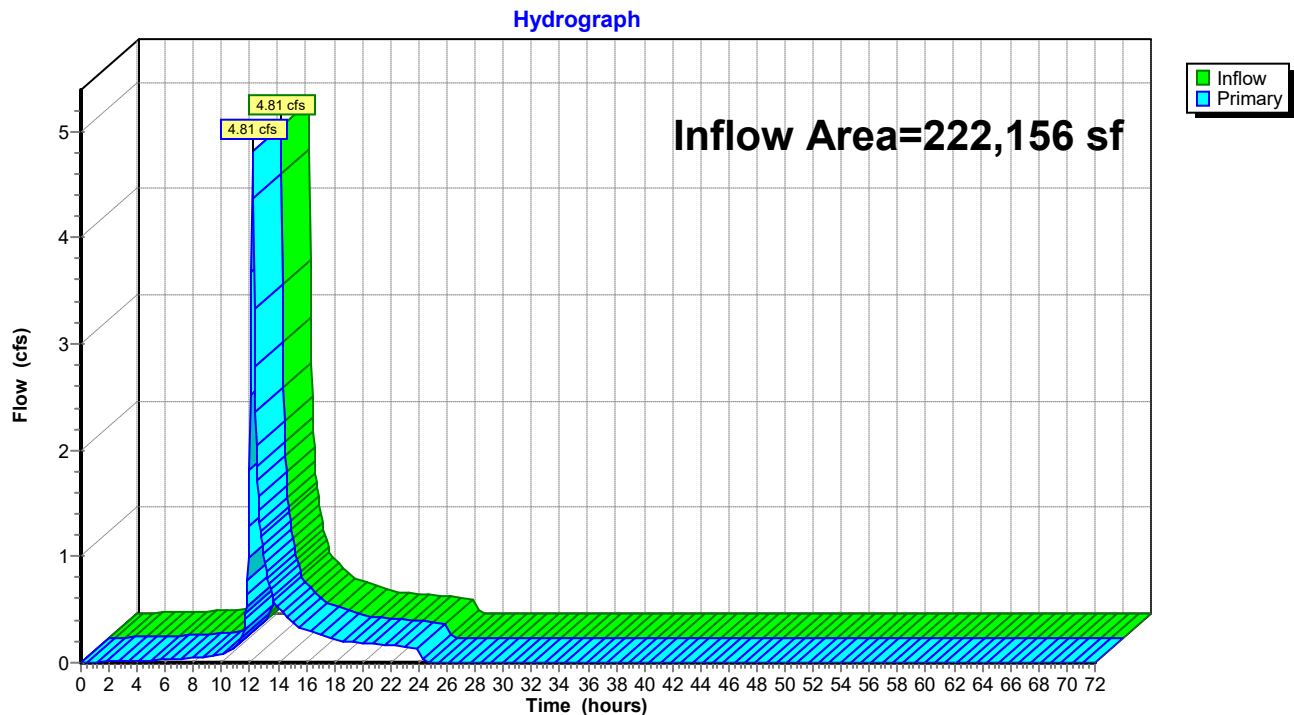
Hydrograph



Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 1.20" for 2-Year-Future event
Inflow = 4.81 cfs @ 12.17 hrs, Volume= 22,151 cf
Primary = 4.81 cfs @ 12.17 hrs, Volume= 22,151 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

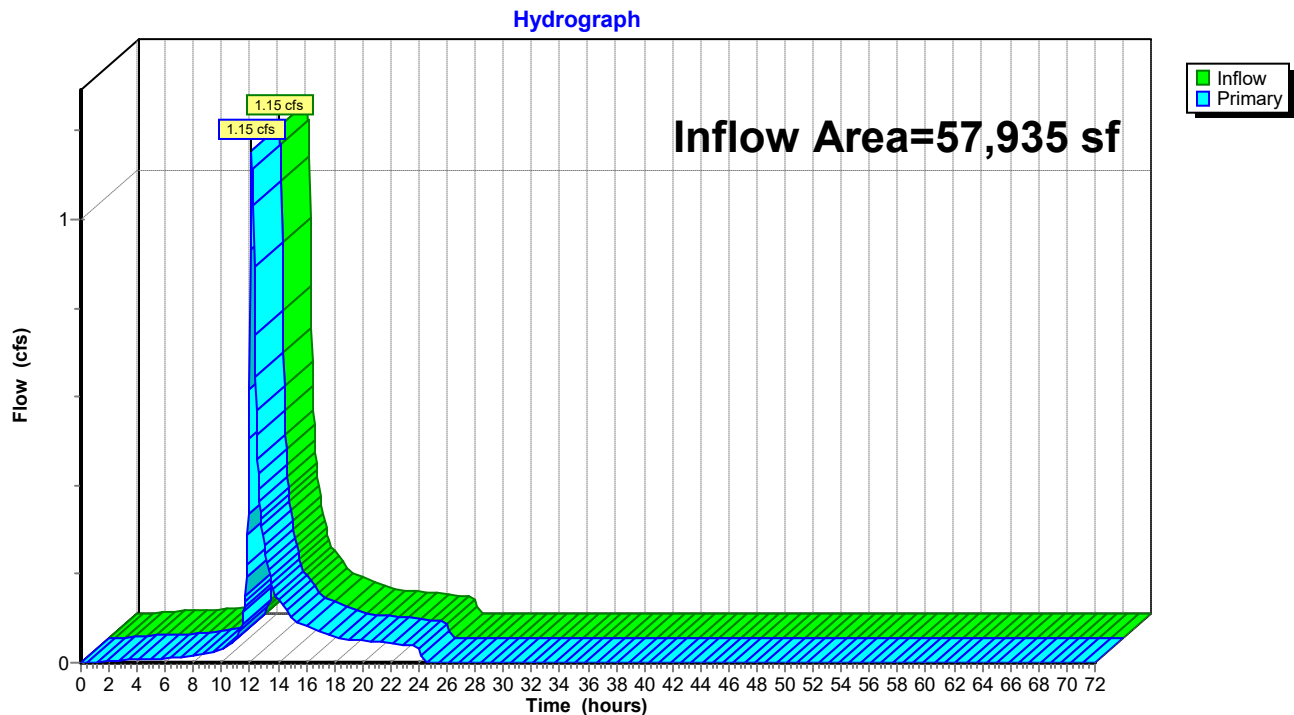
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)

Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 1.30" for 2-Year-Future event
Inflow = 1.15 cfs @ 12.11 hrs, Volume= 6,255 cf
Primary = 1.15 cfs @ 12.11 hrs, Volume= 6,255 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

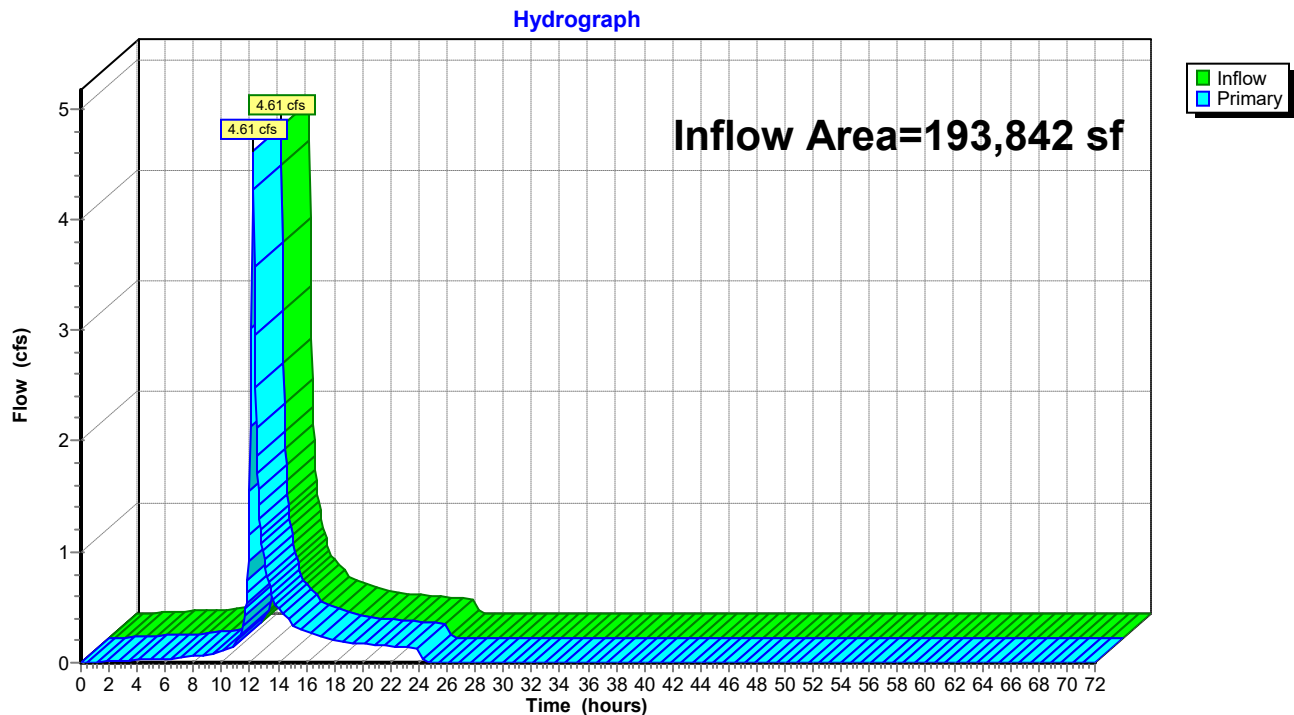
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)

Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 1.32" for 2-Year-Future event
Inflow = 4.61 cfs @ 12.21 hrs, Volume= 21,378 cf
Primary = 4.61 cfs @ 12.21 hrs, Volume= 21,378 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)

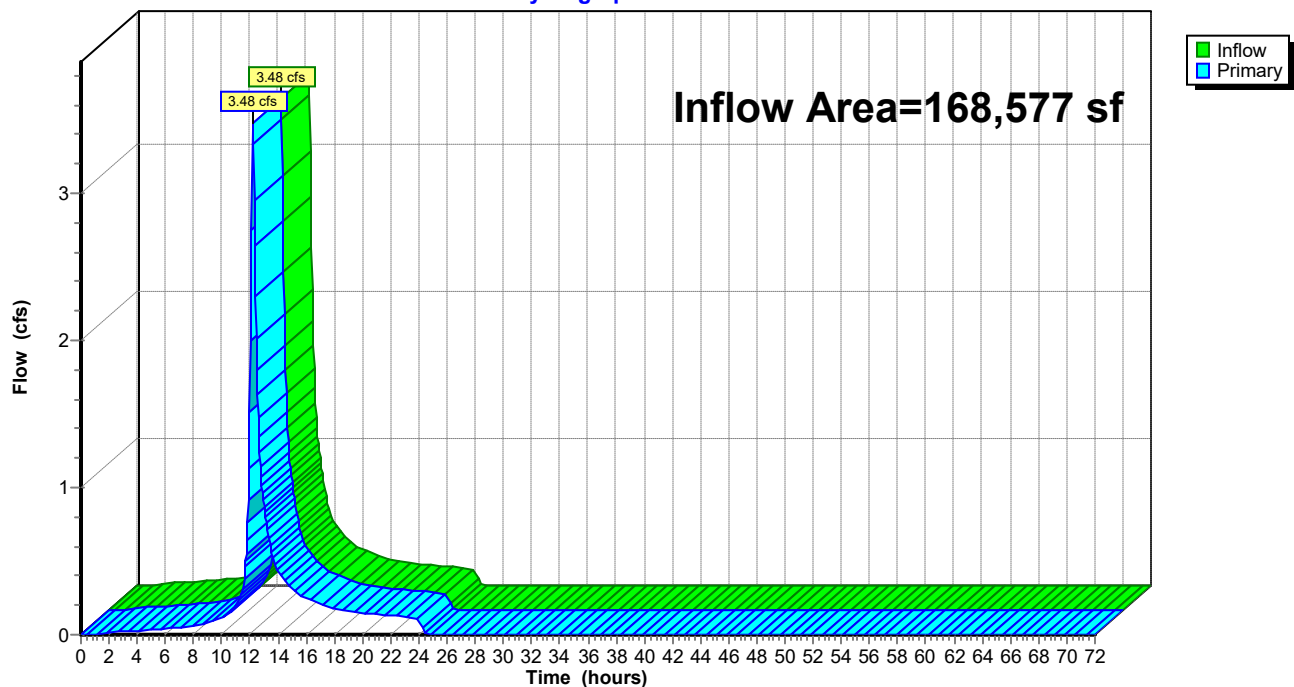
Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 1.40" for 2-Year-Future event
Inflow = 3.48 cfs @ 12.18 hrs, Volume= 19,604 cf
Primary = 3.48 cfs @ 12.18 hrs, Volume= 19,604 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)

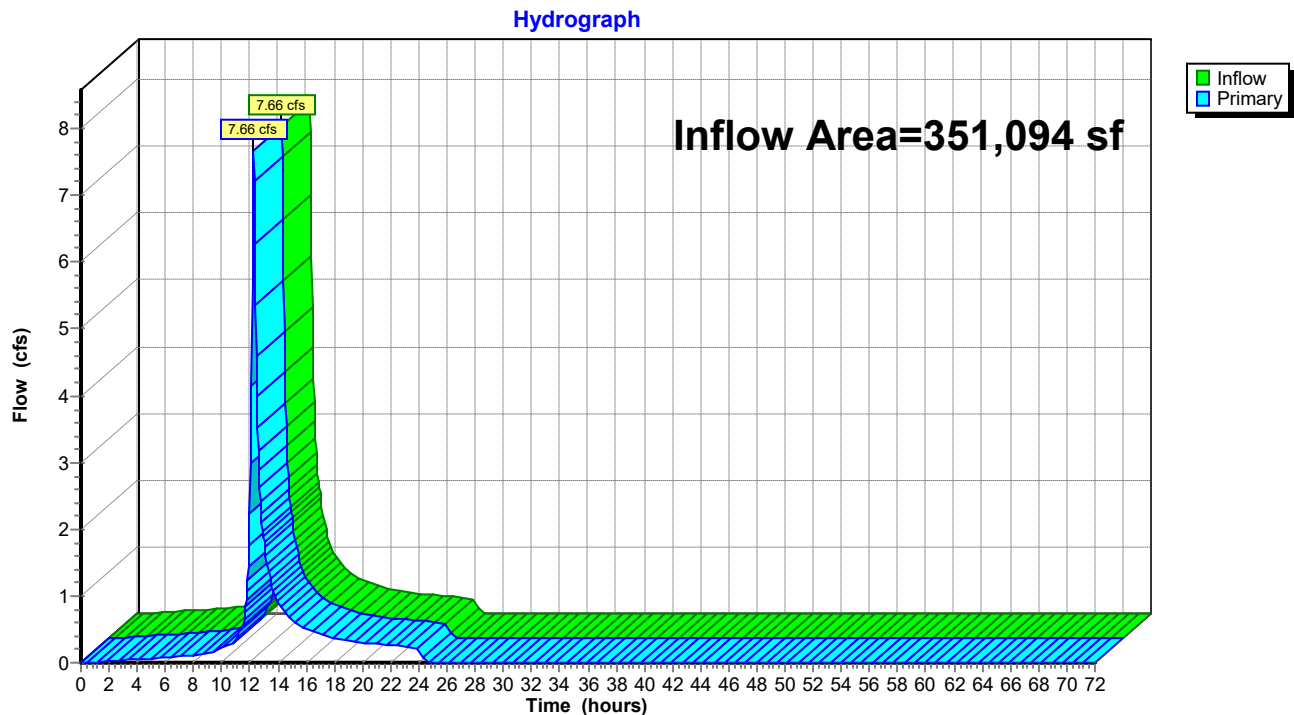
Hydrograph



Summary for Link 15L: X-DA-5 TOTAL (POA-5)

Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 1.34" for 2-Year-Future event
Inflow = 7.66 cfs @ 12.25 hrs, Volume= 39,320 cf
Primary = 7.66 cfs @ 12.25 hrs, Volume= 39,320 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)

081228-SWM

NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Prepared by Bowman Consulting Group

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

Subcatchment 1S: X-DA-1 IMP	Runoff Area=0.440 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=539' Tc=6.6 min CN=98 Runoff=2.17 cfs 8,214 cf
Subcatchment 2S: X-DA-1 PER	Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=509' Tc=12.3 min CN=WQ Runoff=6.10 cfs 25,684 cf
Subcatchment 4S: X-DA-2 IMP	Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=251' Tc=2.3 min CN=98 Runoff=0.85 cfs 2,800 cf
Subcatchment 5S: X-DA-2 PER	Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=1.54" Flow Length=337' Tc=13.2 min CN=WQ Runoff=1.52 cfs 6,601 cf
Subcatchment 7S: X-DA-3 IMP	Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=252' Tc=11.3 min CN=WQ Runoff=2.33 cfs 10,267 cf
Subcatchment 8S: X-DA-3 PER	Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=1.53" Flow Length=230' Tc=14.1 min CN=WQ Runoff=4.85 cfs 21,682 cf
Subcatchment 10S: X-DA-4 IMP	Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=5.14" Flow Length=749' Tc=7.9 min CN=WQ Runoff=2.84 cfs 11,192 cf
Subcatchment 11S: X-DA-4 PER	Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=1.49" Flow Length=498' Tc=18.5 min CN=WQ Runoff=3.48 cfs 17,675 cf
Subcatchment 13S: X-DA-5 IMP	Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=5.13" Flow Length=687' Tc=16.1 min CN=WQ Runoff=4.34 cfs 21,799 cf
Subcatchment 14S: X-DA-5 PER	Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=1.46" Flow Length=679' Tc=17.0 min CN=WQ Runoff=7.40 cfs 36,486 cf
Link 3L: X-DA-1 TOTAL (POA-1)	Inflow=7.61 cfs 33,898 cf Primary=7.61 cfs 33,898 cf
Link 6L: X-DA-2 TOTAL (POA-2)	Inflow=1.79 cfs 9,402 cf Primary=1.79 cfs 9,402 cf
Link 9L: X-DA-3 TOTAL (POA-3)	Inflow=7.05 cfs 31,949 cf Primary=7.05 cfs 31,949 cf
Link 12L: X-DA-4 TOTAL (POA-4)	Inflow=5.17 cfs 28,867 cf Primary=5.17 cfs 28,867 cf
Link 15L: X-DA-5 TOTAL (POA-5)	Inflow=11.69 cfs 58,285 cf Primary=11.69 cfs 58,285 cf

Total Runoff Area = 993,604 sf Runoff Volume = 162,400 cf Average Runoff Depth = 1.96"
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

Runoff = 2.17 cfs @ 12.13 hrs, Volume= 8,214 cf, Depth= 5.14"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

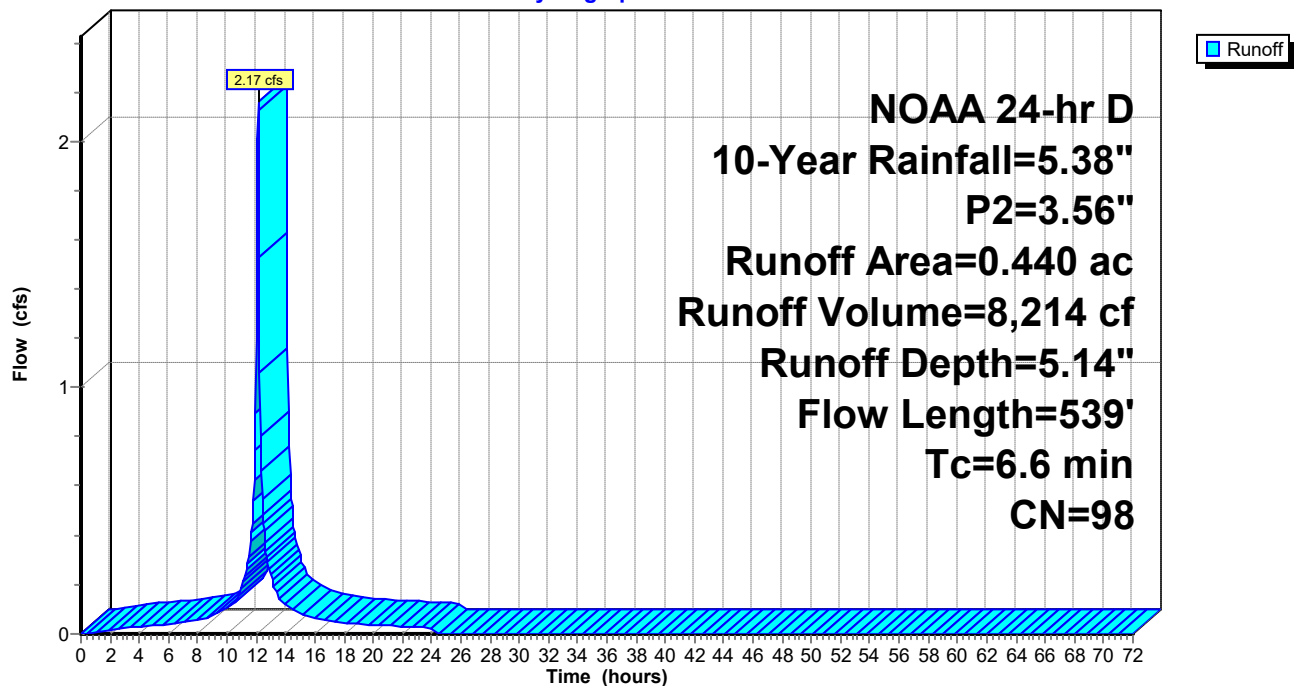
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.63		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
4.2	38	0.0540	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.6	539	Total			

Subcatchment 1S: X-DA-1 IMP

Hydrograph



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 6.10 cfs @ 12.21 hrs, Volume= 25,684 cf, Depth= 1.52"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

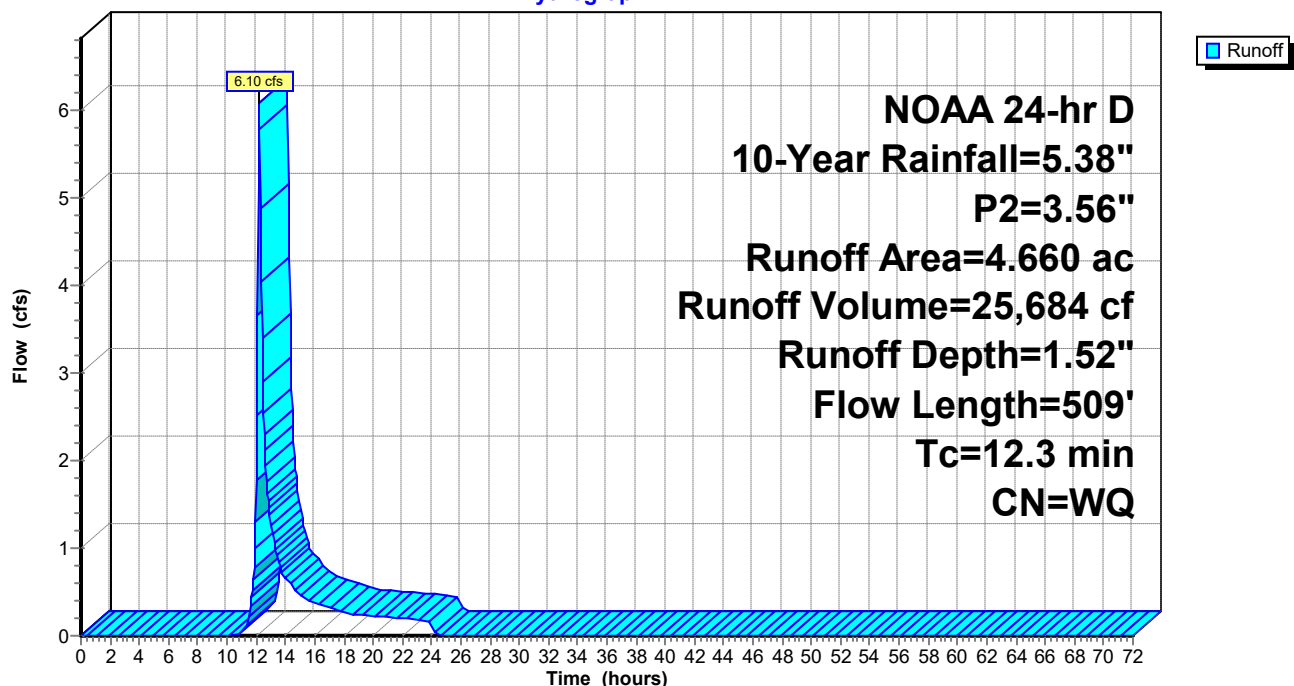
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	52	0.0380	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
4.4	48	0.0770	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
12.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 0.85 cfs @ 12.08 hrs, Volume= 2,800 cf, Depth= 5.14"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

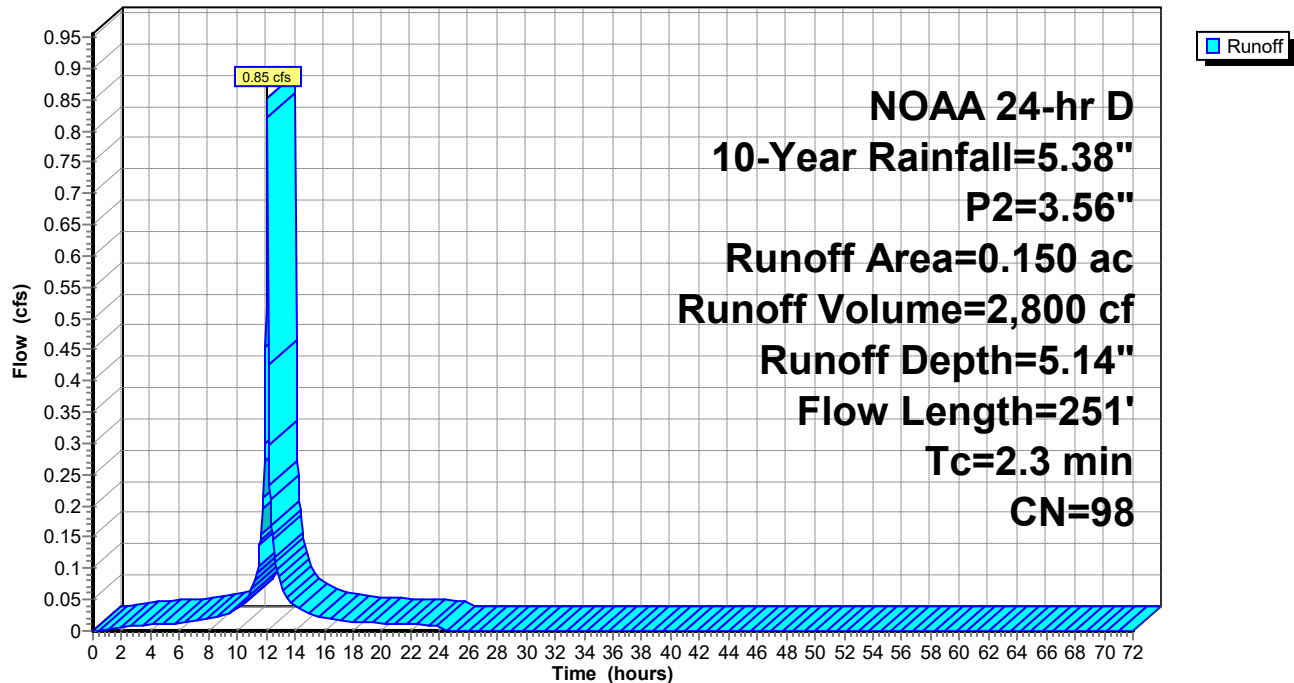
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.3	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

Runoff = 1.52 cfs @ 12.22 hrs, Volume= 6,601 cf, Depth= 1.54"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

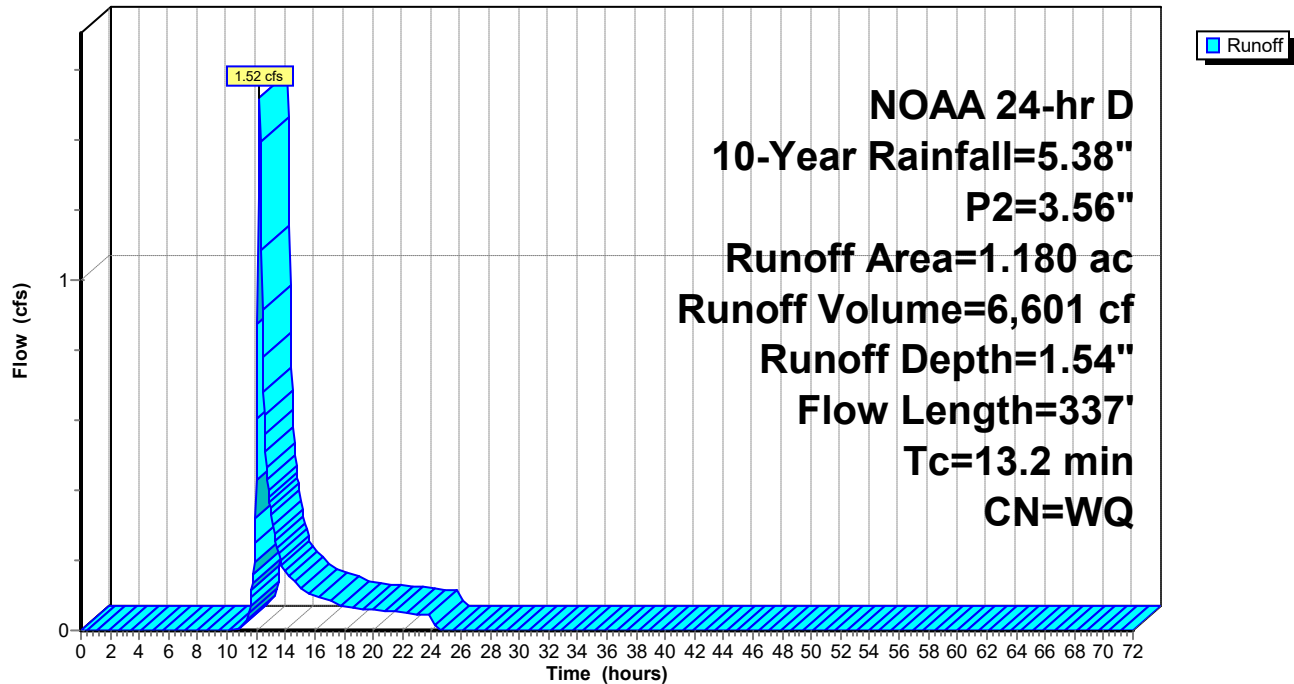
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0300	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
13.2	337	Total			

Subcatchment 5S: X-DA-2 PER

Hydrograph



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 2.33 cfs @ 12.19 hrs, Volume= 10,267 cf, Depth= 5.14"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

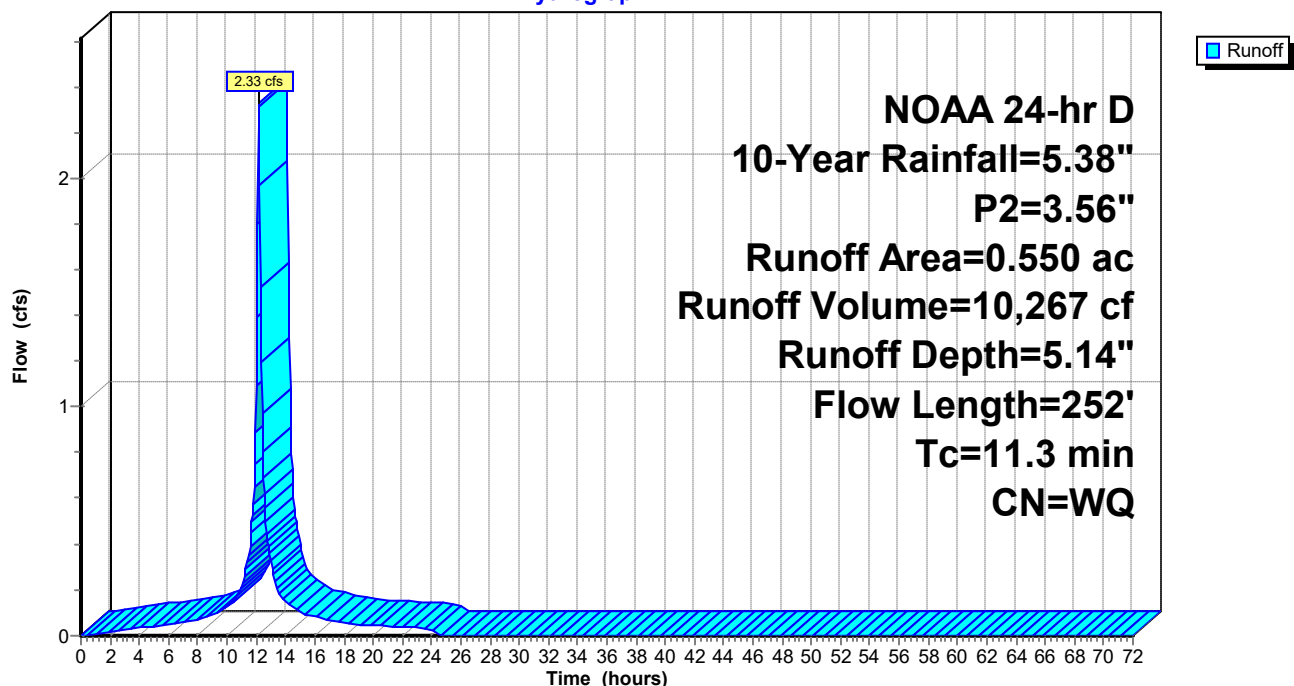
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 4.85 cfs @ 12.24 hrs, Volume= 21,682 cf, Depth= 1.53"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

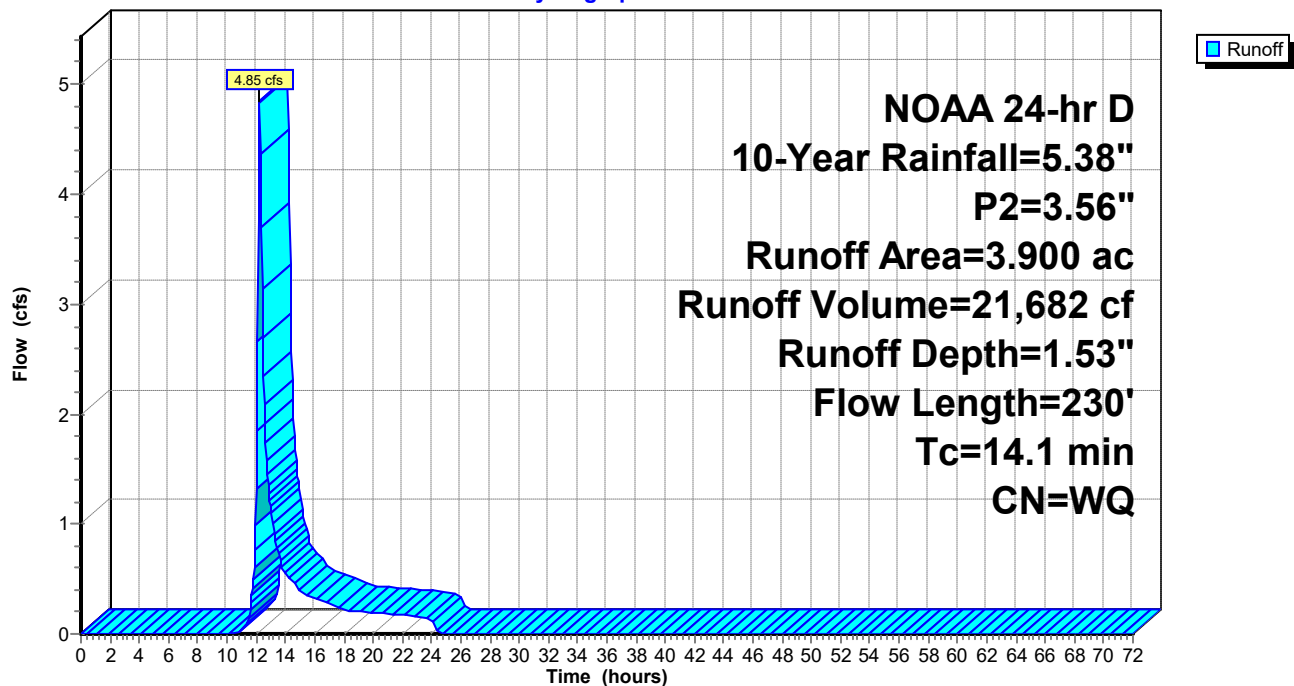
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.2	34	0.0830	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.1	230	Total			

Subcatchment 8S: X-DA-3 PER

Hydrograph



Summary for Subcatchment 10S: X-DA-4 IMP

Runoff = 2.84 cfs @ 12.15 hrs, Volume= 11,192 cf, Depth= 5.14"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

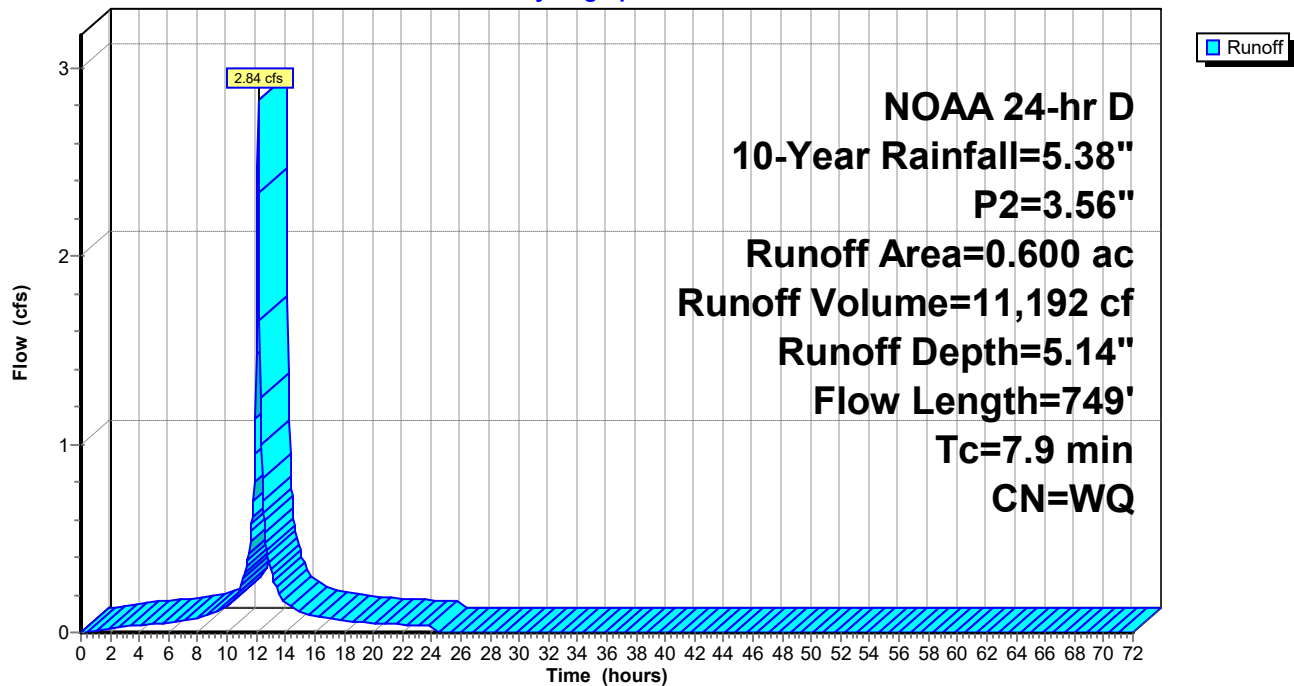
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.45		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.9	749	Total			

Subcatchment 10S: X-DA-4 IMP

Hydrograph



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 3.48 cfs @ 12.30 hrs, Volume= 17,675 cf, Depth= 1.49"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

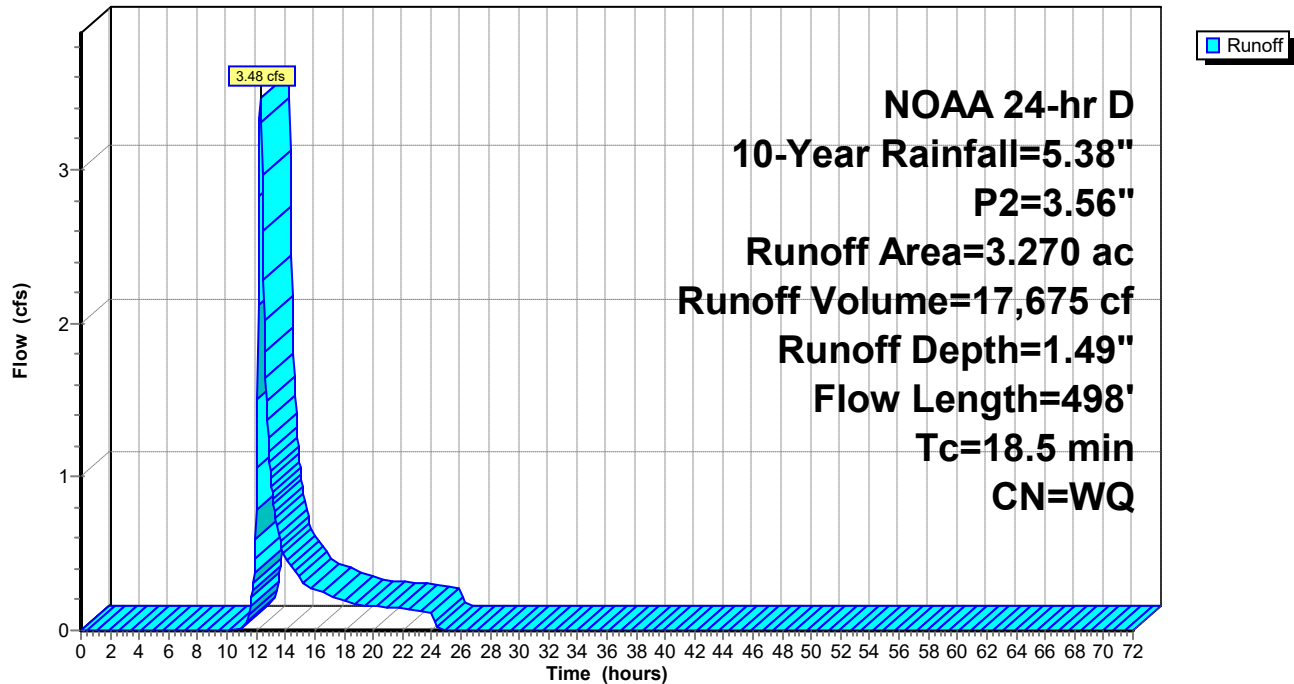
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	89	0.0180	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0180	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
18.5	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 4.34 cfs @ 12.24 hrs, Volume= 21,799 cf, Depth= 5.13"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

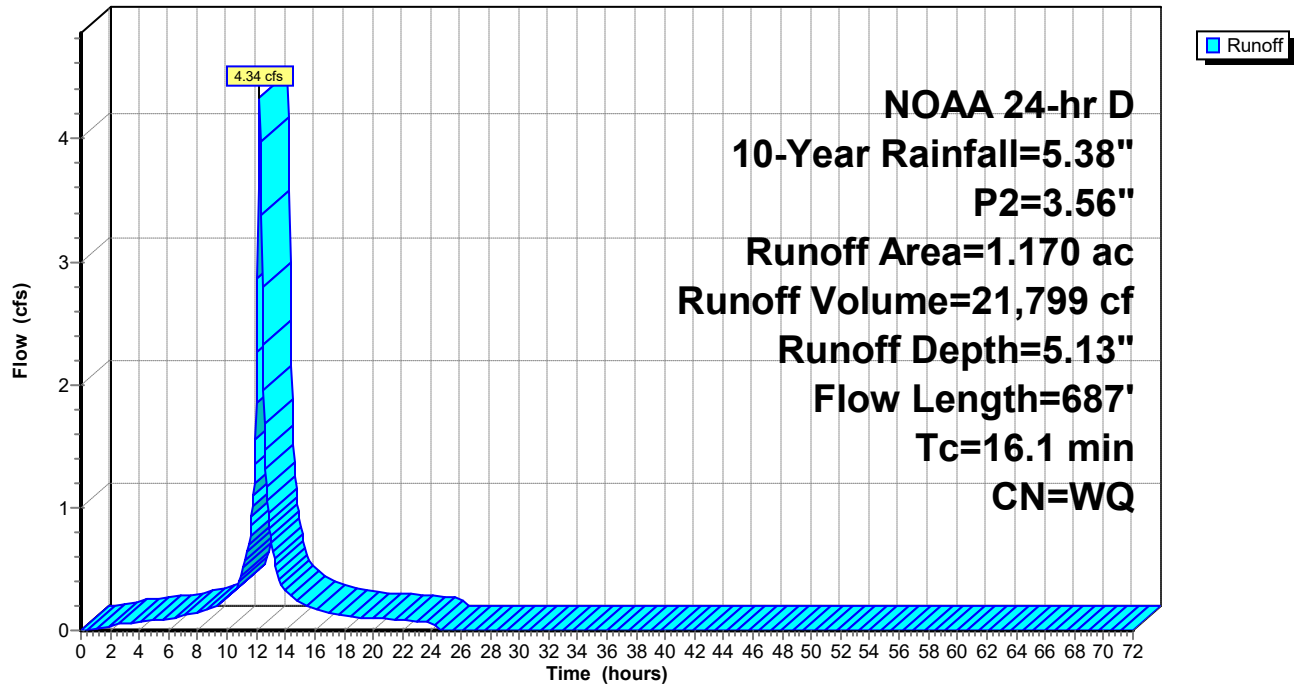
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.95		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.6	15	0.1000	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.1	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 7.40 cfs @ 12.28 hrs, Volume= 36,486 cf, Depth= 1.46"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

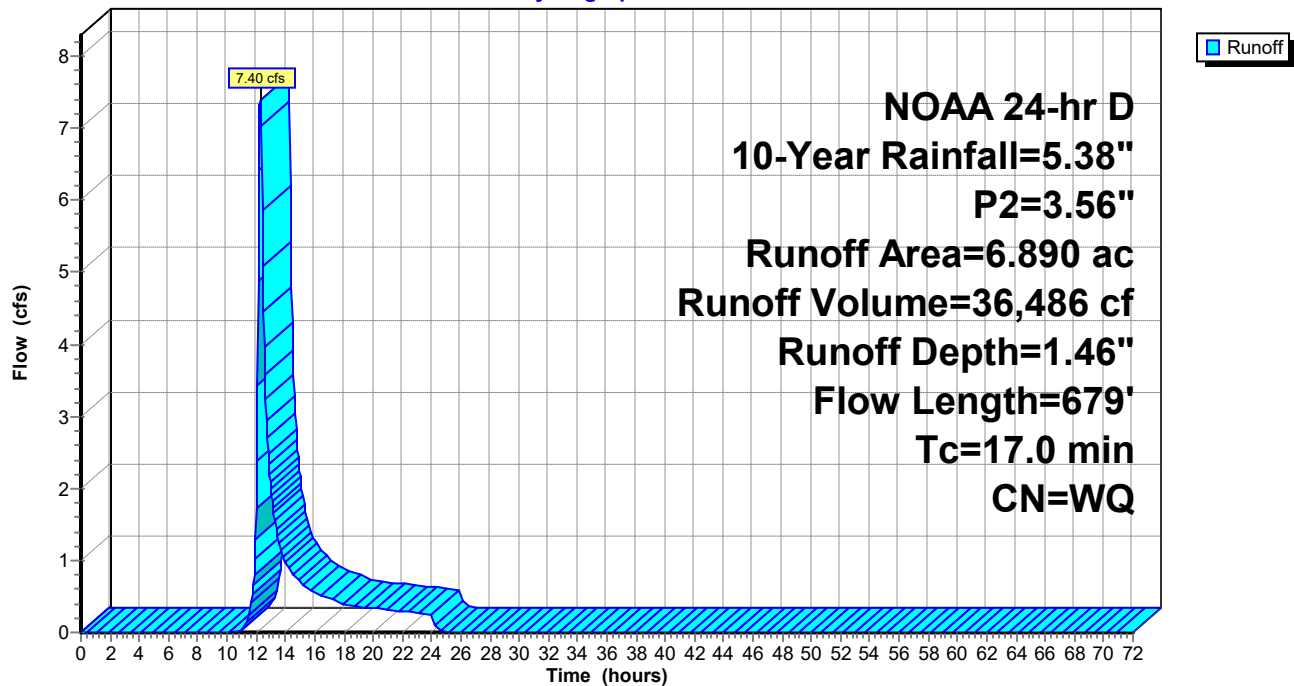
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.9	27	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.0	679	Total			

Subcatchment 14S: X-DA-5 PER

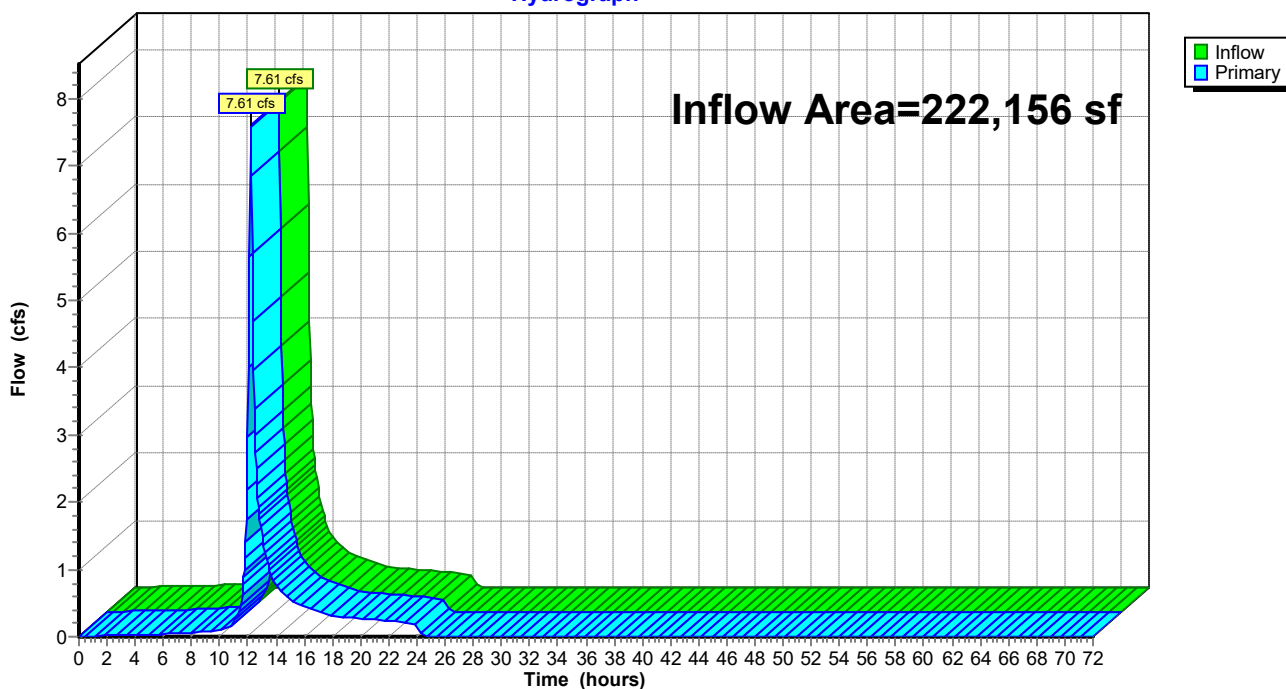
Hydrograph



Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 1.83" for 10-Year event
Inflow = 7.61 cfs @ 12.19 hrs, Volume= 33,898 cf
Primary = 7.61 cfs @ 12.19 hrs, Volume= 33,898 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

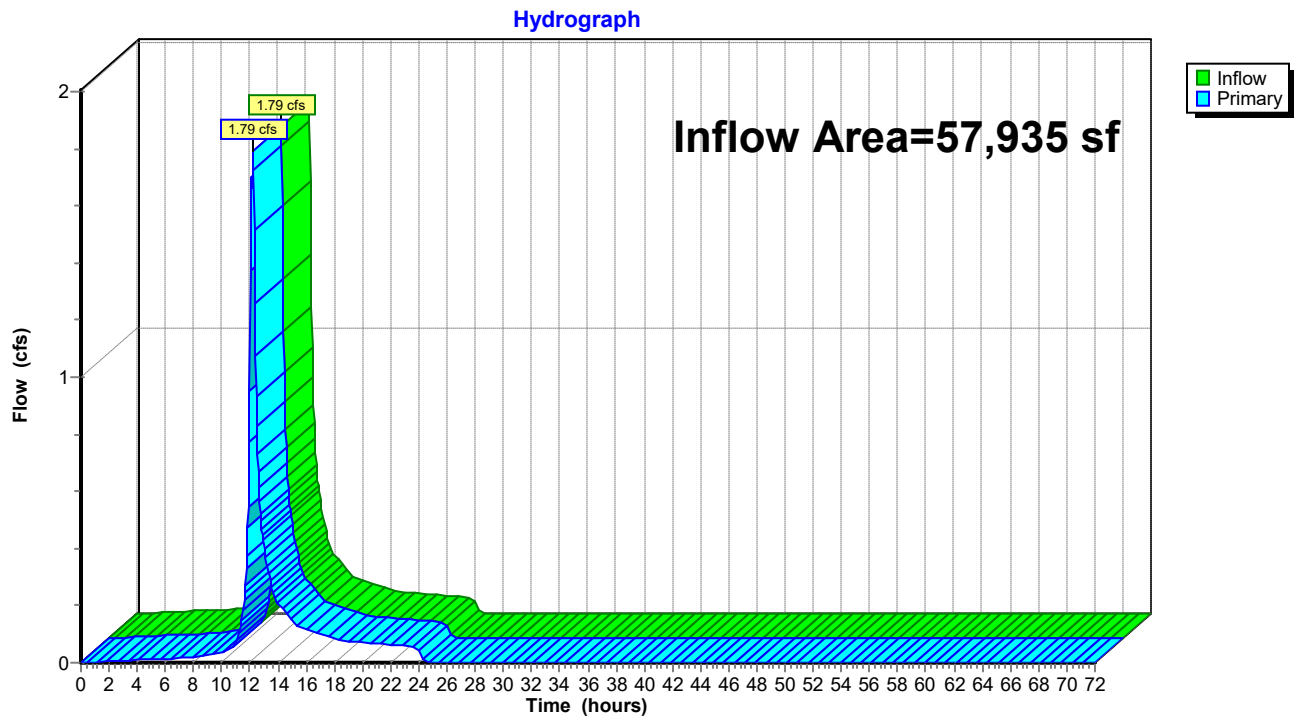
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)**Hydrograph**

Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 1.95" for 10-Year event
Inflow = 1.79 cfs @ 12.21 hrs, Volume= 9,402 cf
Primary = 1.79 cfs @ 12.21 hrs, Volume= 9,402 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)

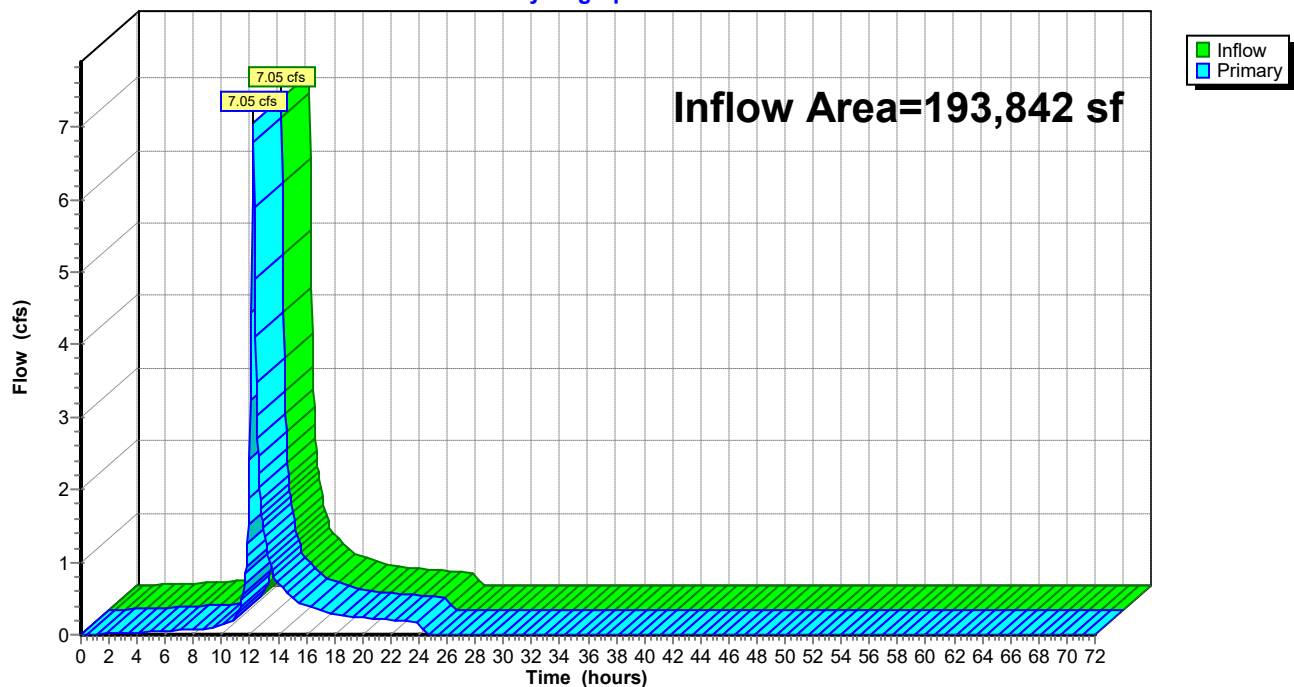
Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 1.98" for 10-Year event
Inflow = 7.05 cfs @ 12.22 hrs, Volume= 31,949 cf
Primary = 7.05 cfs @ 12.22 hrs, Volume= 31,949 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)

Hydrograph



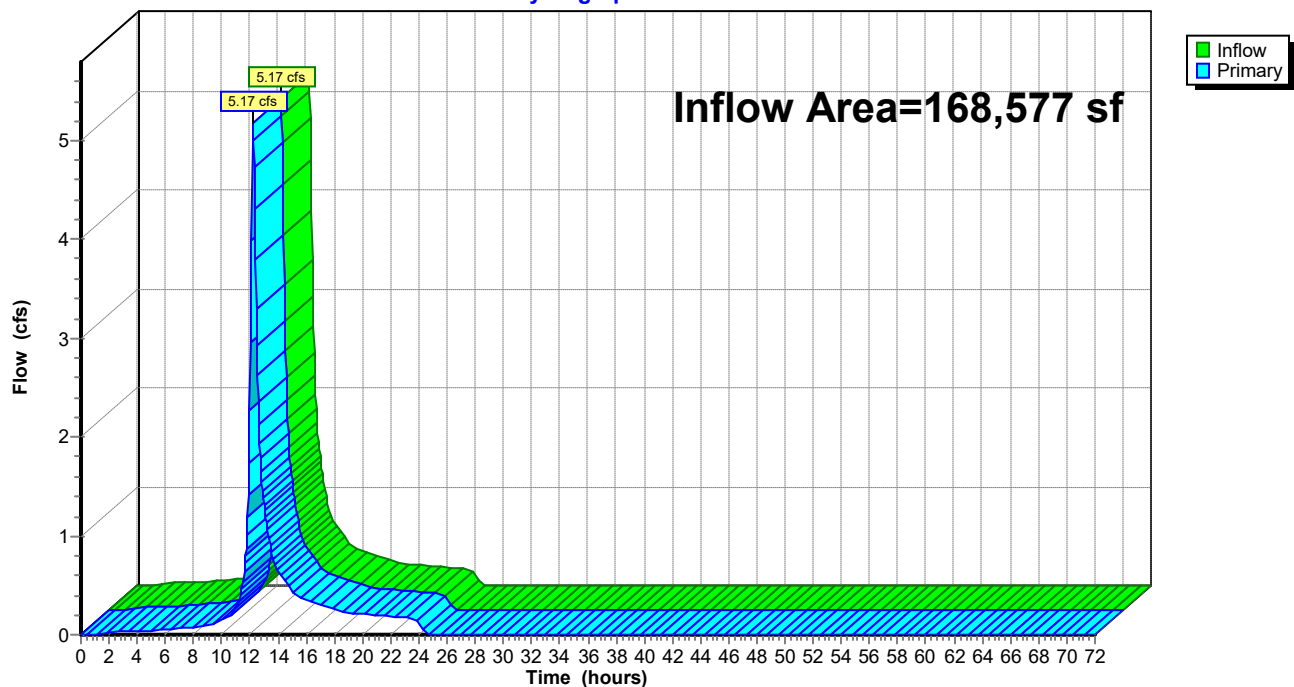
Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 2.05" for 10-Year event
Inflow = 5.17 cfs @ 12.20 hrs, Volume= 28,867 cf
Primary = 5.17 cfs @ 12.20 hrs, Volume= 28,867 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)

Hydrograph



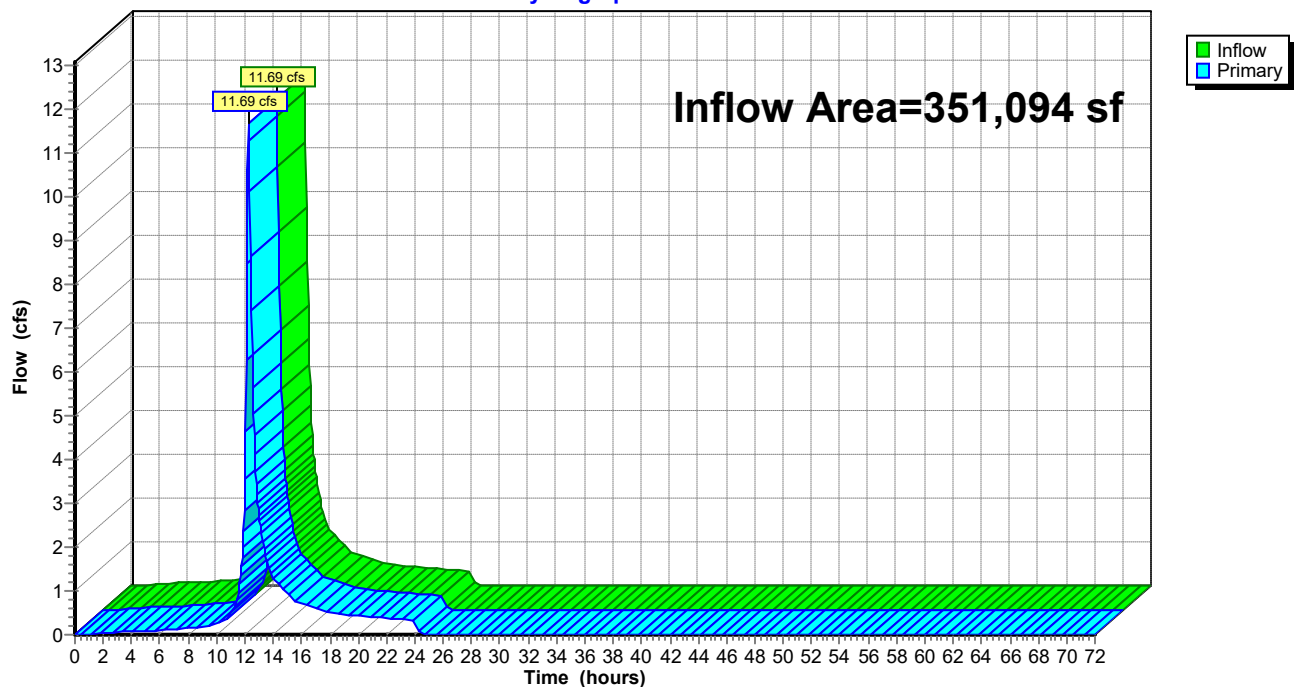
Summary for Link 15L: X-DA-5 TOTAL (POA-5)

Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 1.99" for 10-Year event
Inflow = 11.69 cfs @ 12.26 hrs, Volume= 58,285 cf
Primary = 11.69 cfs @ 12.26 hrs, Volume= 58,285 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)

Hydrograph



081228-SWM

NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Prepared by Bowman Consulting Group

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: X-DA-1 IMPRunoff Area=0.440 ac 100.00% Impervious Runoff Depth=6.44"
Flow Length=539' Tc=6.2 min CN=98 Runoff=2.71 cfs 10,288 cf**Subcatchment 2S: X-DA-1 PER**Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=509' Tc=11.3 min CN=WQ Runoff=10.25 cfs 40,004 cf**Subcatchment 4S: X-DA-2 IMP**Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=6.44"
Flow Length=251' Tc=2.2 min CN=98 Runoff=1.07 cfs 3,507 cf**Subcatchment 5S: X-DA-2 PER**Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=2.39"
Flow Length=337' Tc=12.1 min CN=WQ Runoff=2.57 cfs 10,255 cf**Subcatchment 7S: X-DA-3 IMP**Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=6.44"
Flow Length=252' Tc=10.3 min CN=WQ Runoff=2.97 cfs 12,860 cf**Subcatchment 8S: X-DA-3 PER**Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=230' Tc=12.8 min CN=WQ Runoff=8.22 cfs 33,719 cf**Subcatchment 10S: X-DA-4 IMP**Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=6.44"
Flow Length=749' Tc=7.8 min CN=WQ Runoff=3.55 cfs 14,020 cf**Subcatchment 11S: X-DA-4 PER**Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=2.33"
Flow Length=498' Tc=17.3 min CN=WQ Runoff=5.91 cfs 27,623 cf**Subcatchment 13S: X-DA-5 IMP**Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=6.43"
Flow Length=687' Tc=15.0 min CN=WQ Runoff=5.59 cfs 27,313 cf**Subcatchment 14S: X-DA-5 PER**Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=2.29"
Flow Length=679' Tc=15.8 min CN=WQ Runoff=12.69 cfs 57,231 cf**Link 3L: X-DA-1 TOTAL (POA-1)**Inflow=12.23 cfs 50,292 cf
Primary=12.23 cfs 50,292 cf**Link 6L: X-DA-2 TOTAL (POA-2)**Inflow=2.94 cfs 13,763 cf
Primary=2.94 cfs 13,763 cf**Link 9L: X-DA-3 TOTAL (POA-3)**Inflow=11.04 cfs 46,579 cf
Primary=11.04 cfs 46,579 cf**Link 12L: X-DA-4 TOTAL (POA-4)**Inflow=8.10 cfs 41,644 cf
Primary=8.10 cfs 41,644 cf**Link 15L: X-DA-5 TOTAL (POA-5)**Inflow=18.17 cfs 84,545 cf
Primary=18.17 cfs 84,545 cf**Total Runoff Area = 993,604 sf Runoff Volume = 236,822 cf Average Runoff Depth = 2.86"**
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

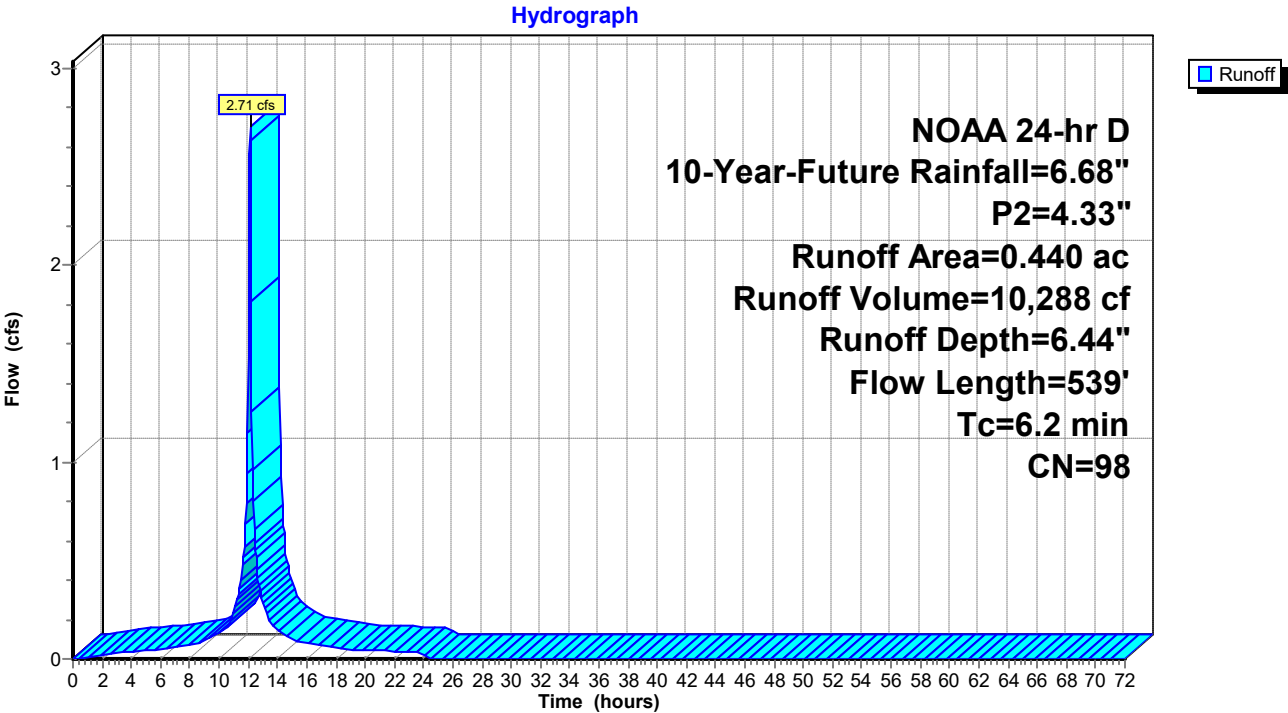
Runoff = 2.71 cfs @ 12.13 hrs, Volume= 10,288 cf, Depth= 6.44"
Routed to Link 3L : X-DA-1 TOTAL (POA-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
3.8	38	0.0540	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.2	539	Total			

Subcatchment 1S: X-DA-1 IMP



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 10.25 cfs @ 12.20 hrs, Volume= 40,004 cf, Depth= 2.36"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

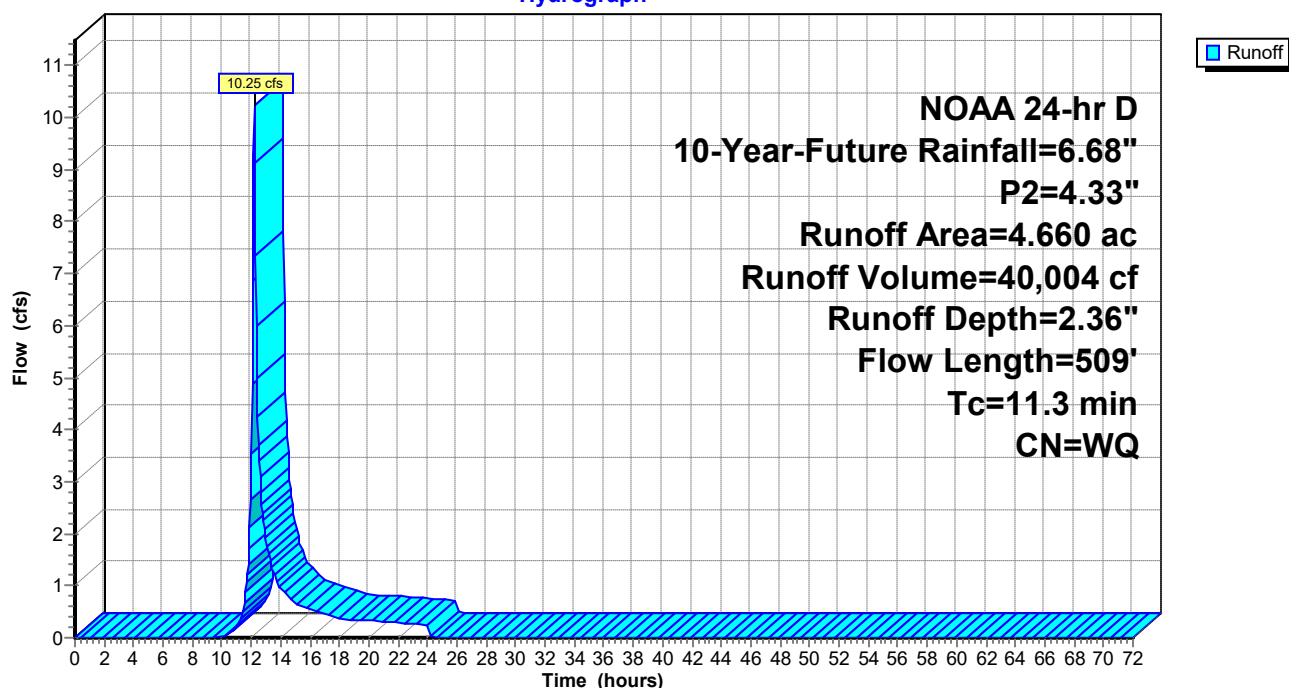
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	52	0.0380	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
4.0	48	0.0770	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
11.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 1.07 cfs @ 12.08 hrs, Volume= 3,507 cf, Depth= 6.44"

Routed to Link 6L : X-DA-2 TOTAL (POA-2)

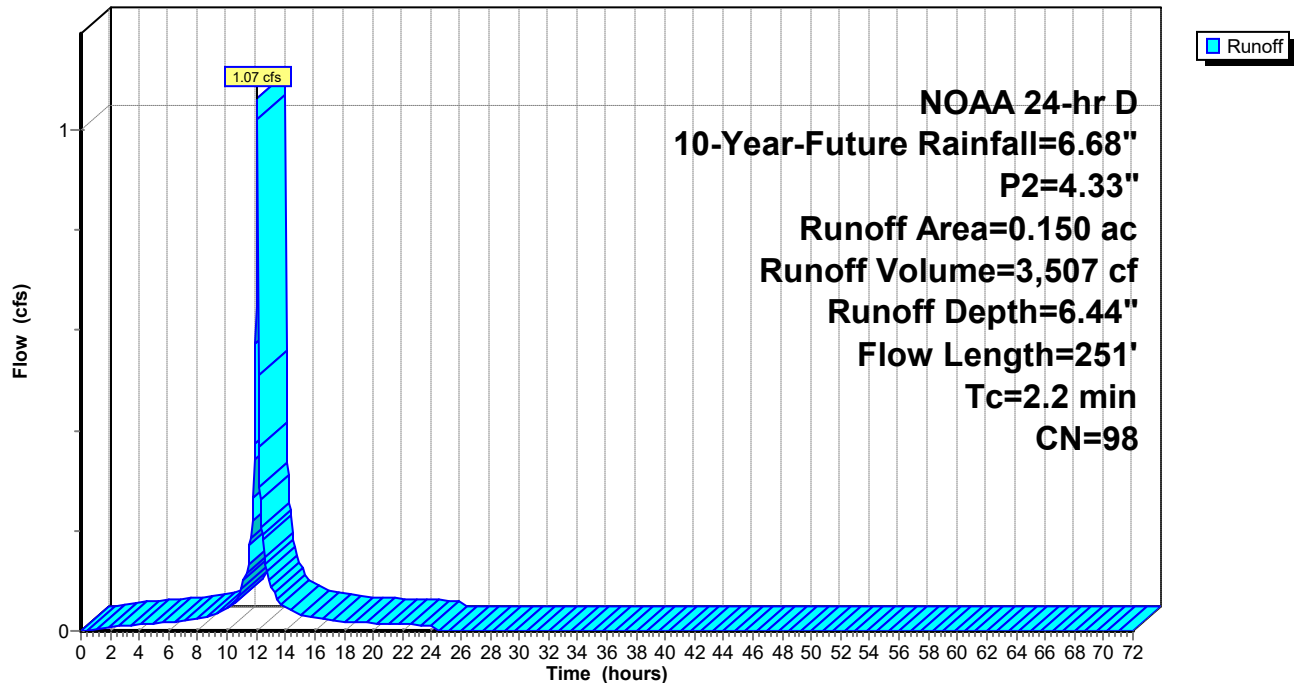
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.2	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

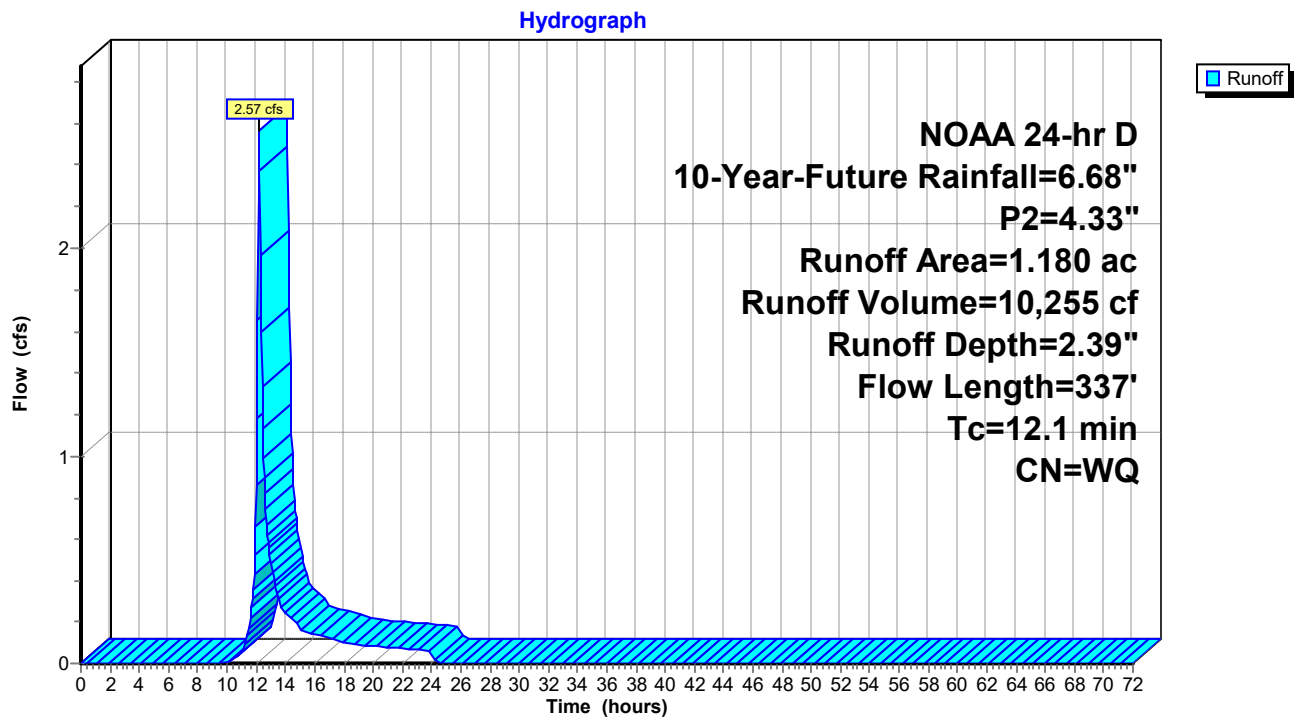
Runoff = 2.57 cfs @ 12.21 hrs, Volume= 10,255 cf, Depth= 2.39"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0300	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
12.1	337	Total			

Subcatchment 5S: X-DA-2 PER



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 2.97 cfs @ 12.17 hrs, Volume= 12,860 cf, Depth= 6.44"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

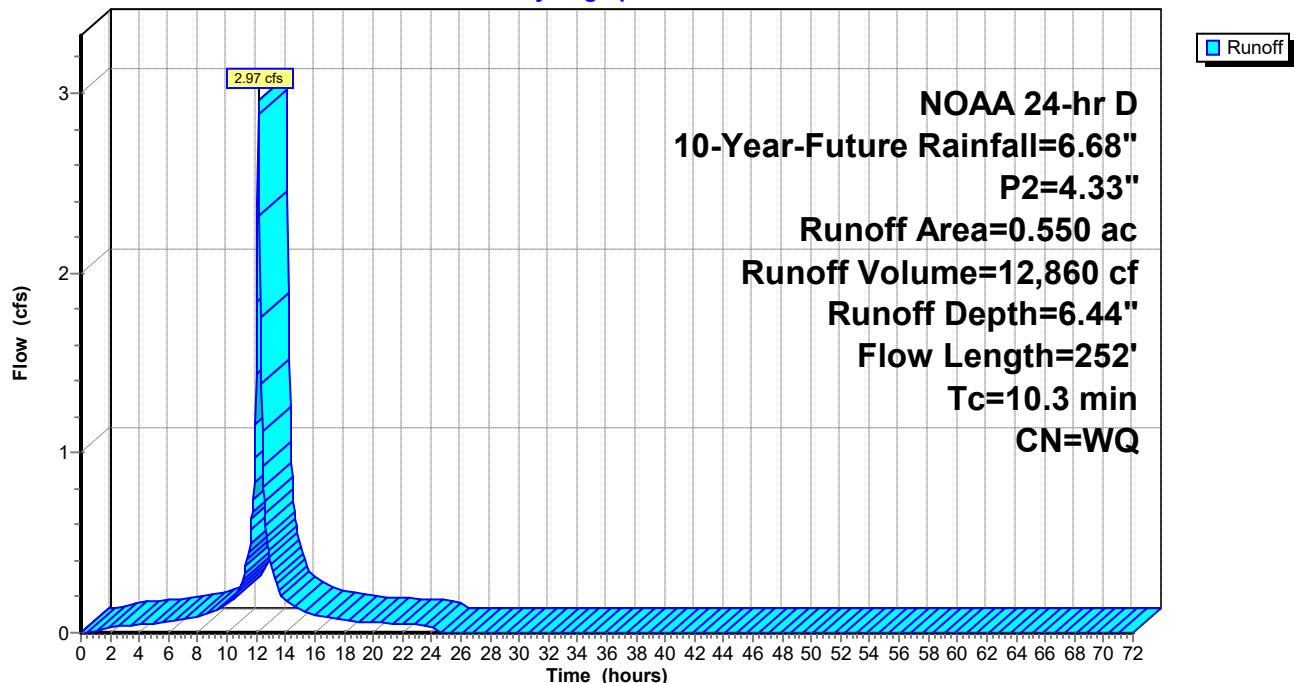
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 8.22 cfs @ 12.22 hrs, Volume= 33,719 cf, Depth= 2.38"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

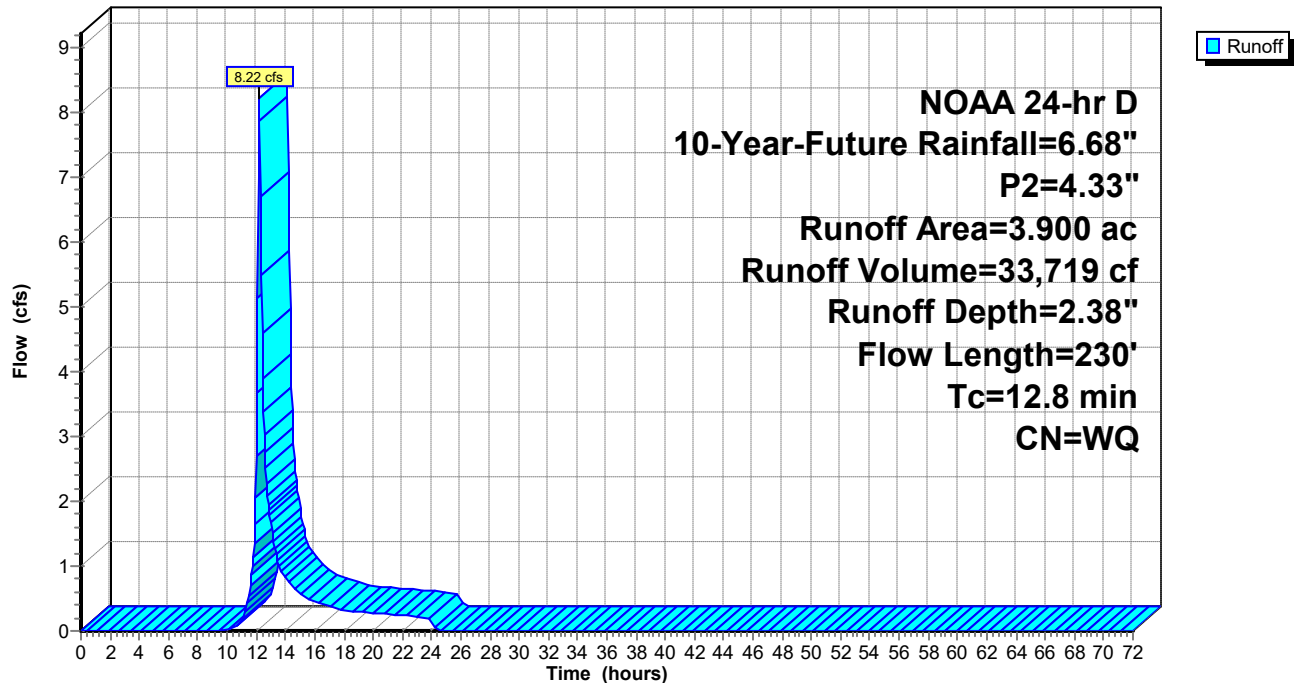
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.9	34	0.0830	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.8	230	Total			

Subcatchment 8S: X-DA-3 PER

Hydrograph



Summary for Subcatchment 10S: X-DA-4 IMP

Runoff = 3.55 cfs @ 12.15 hrs, Volume= 14,020 cf, Depth= 6.44"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

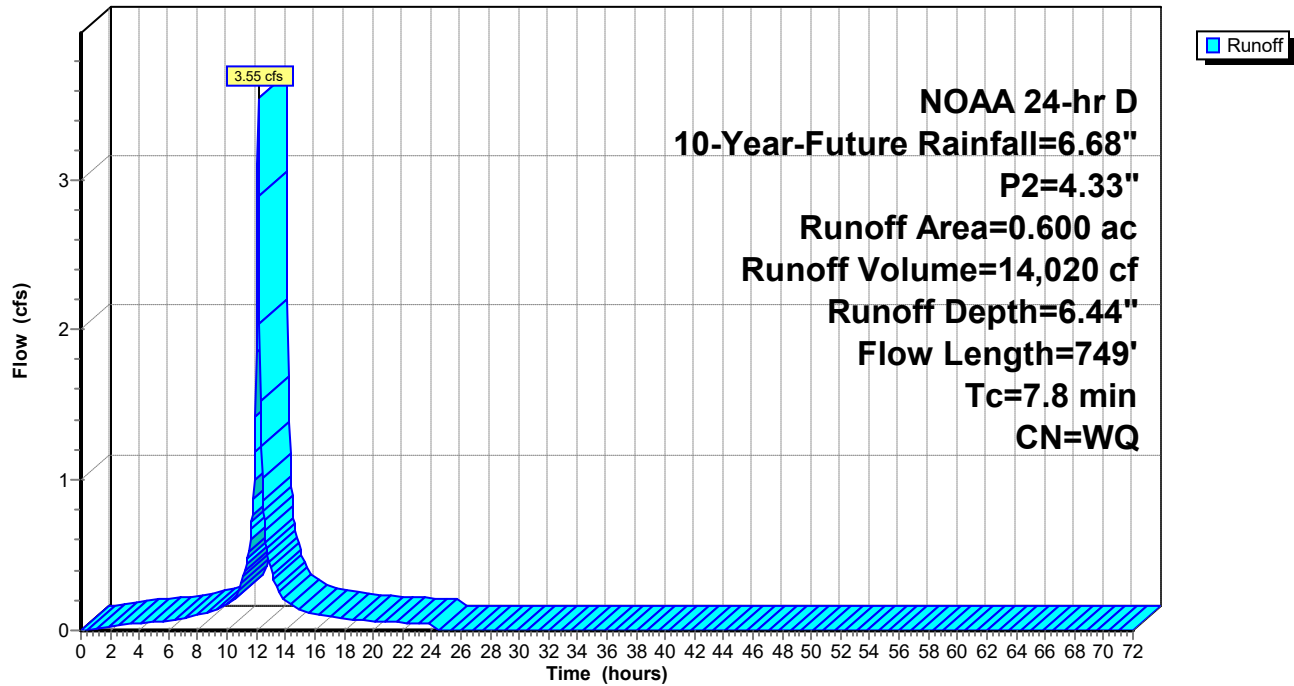
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0200	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.8	749	Total			

Subcatchment 10S: X-DA-4 IMP

Hydrograph



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 5.91 cfs @ 12.27 hrs, Volume= 27,623 cf, Depth= 2.33"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

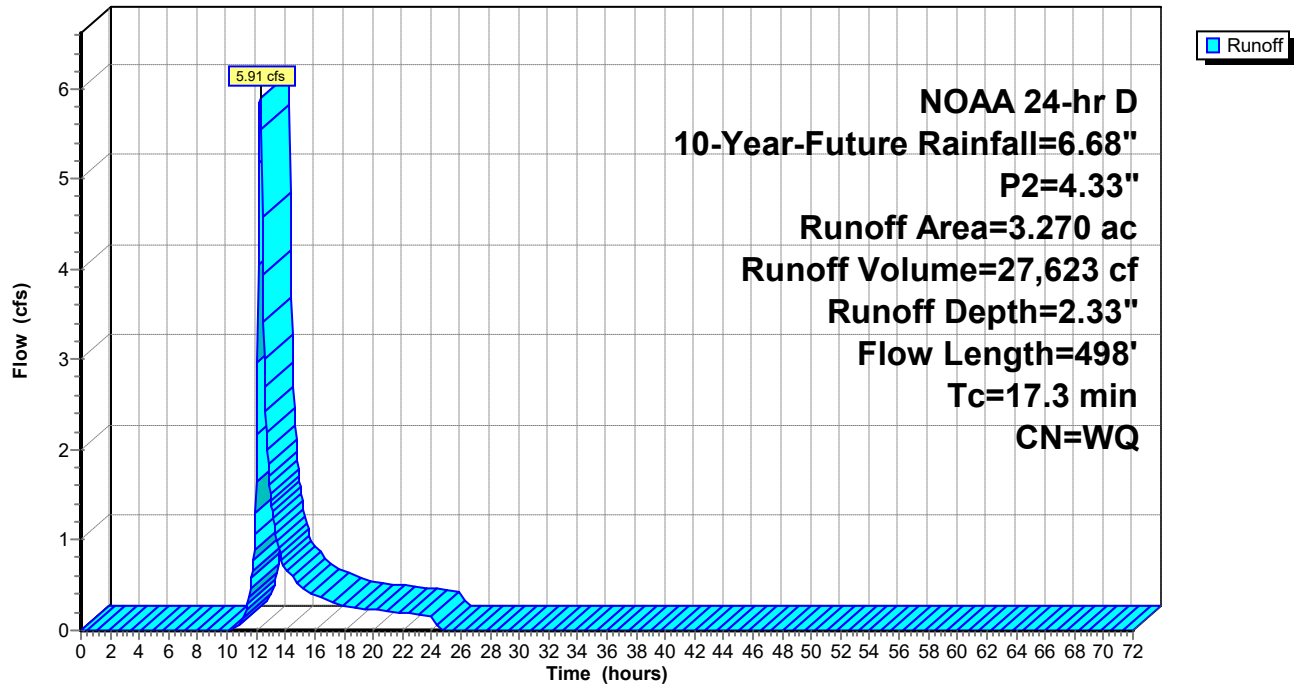
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	89	0.0180	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.2	11	0.0180	0.99		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
17.3	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 5.59 cfs @ 12.22 hrs, Volume= 27,313 cf, Depth= 6.43"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

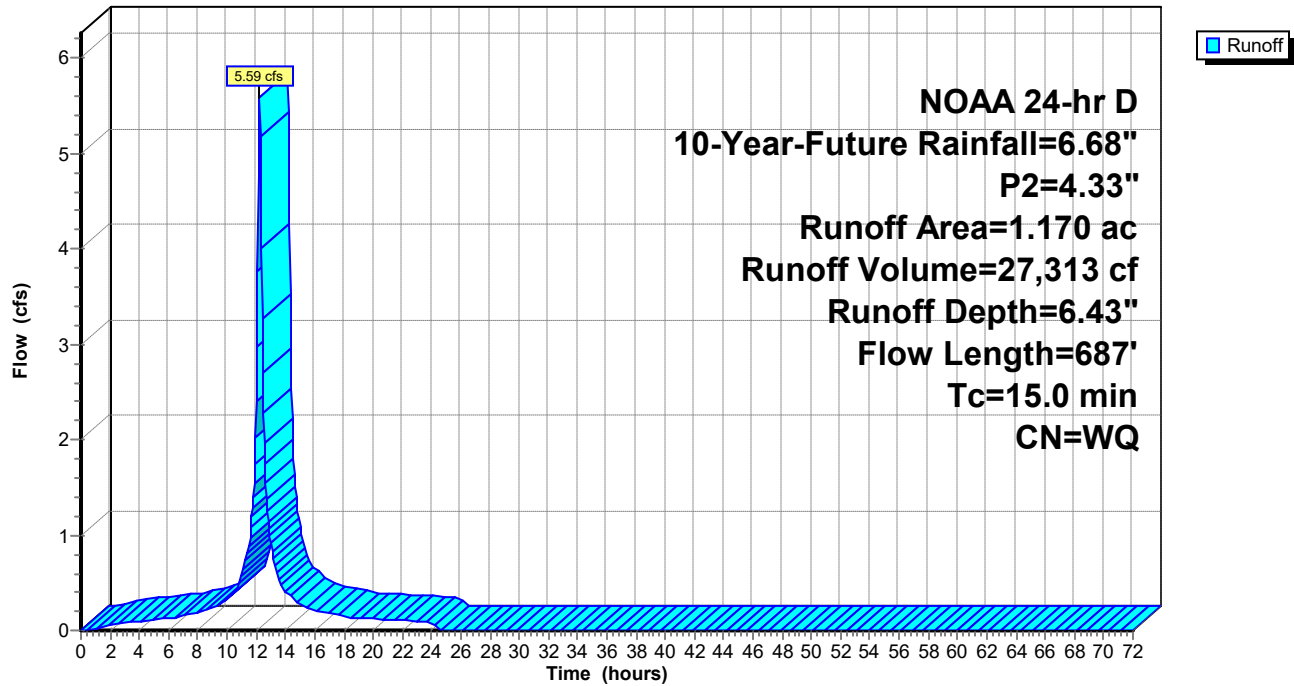
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	15	0.1000	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.0	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 12.69 cfs @ 12.26 hrs, Volume= 57,231 cf, Depth= 2.29"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

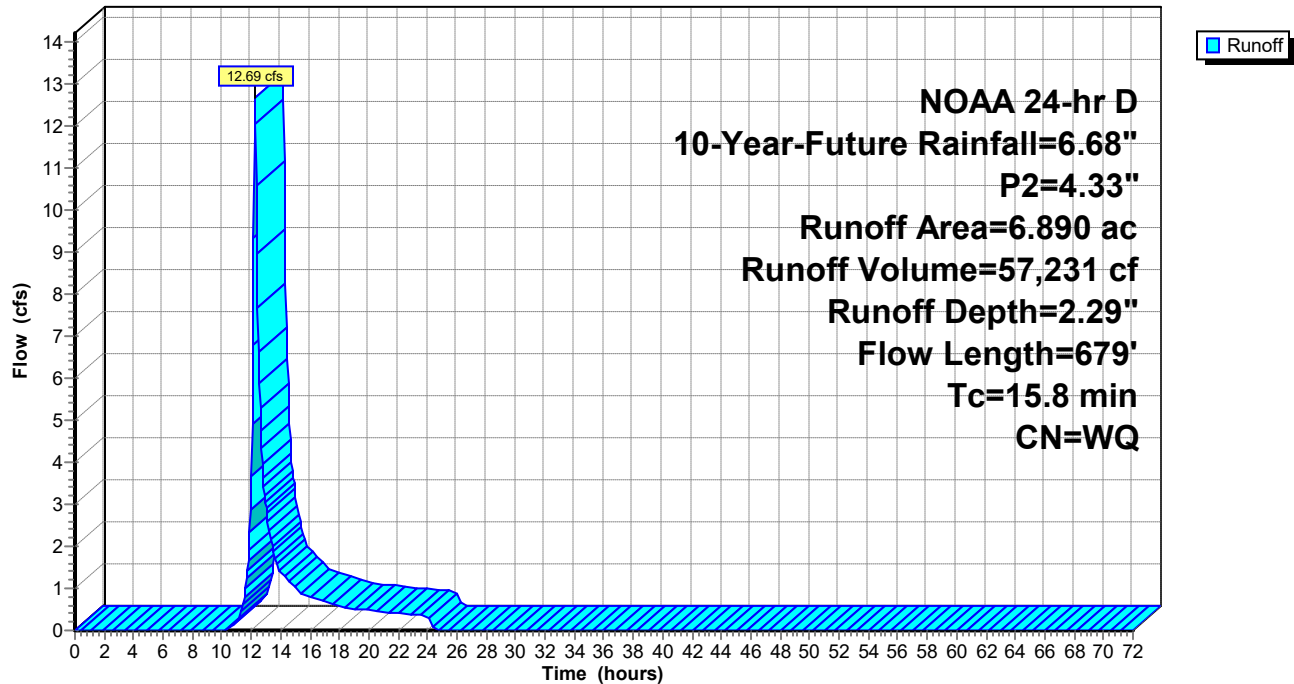
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.6	27	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.8	679	Total			

Subcatchment 14S: X-DA-5 PER

Hydrograph



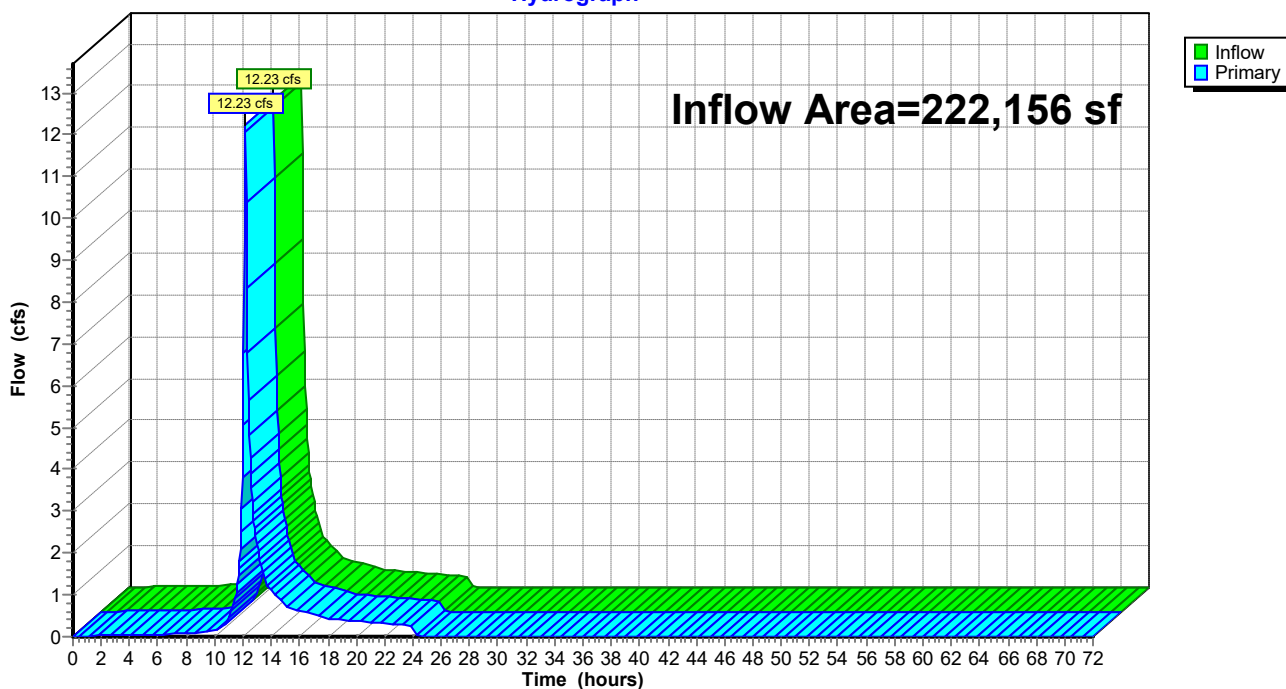
Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 2.72" for 10-Year-Future event
Inflow = 12.23 cfs @ 12.18 hrs, Volume= 50,292 cf
Primary = 12.23 cfs @ 12.18 hrs, Volume= 50,292 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)

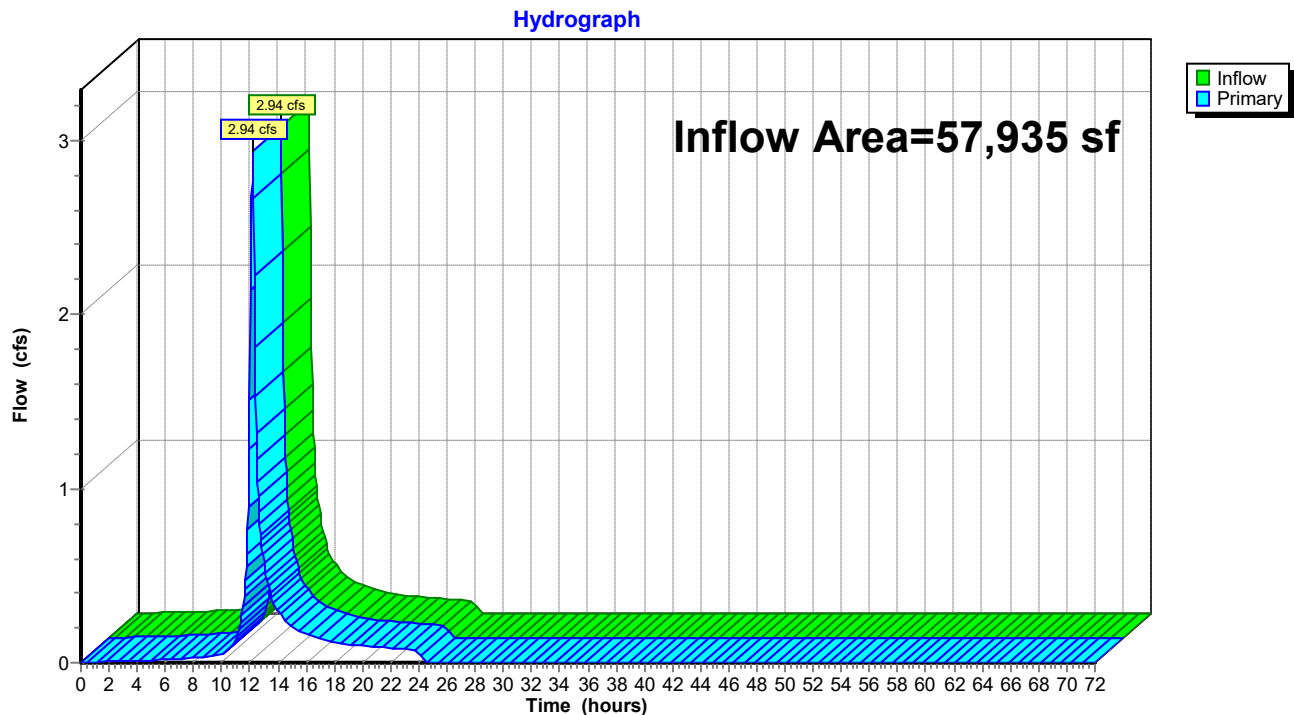
Hydrograph



Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 2.85" for 10-Year-Future event
Inflow = 2.94 cfs @ 12.19 hrs, Volume= 13,763 cf
Primary = 2.94 cfs @ 12.19 hrs, Volume= 13,763 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)

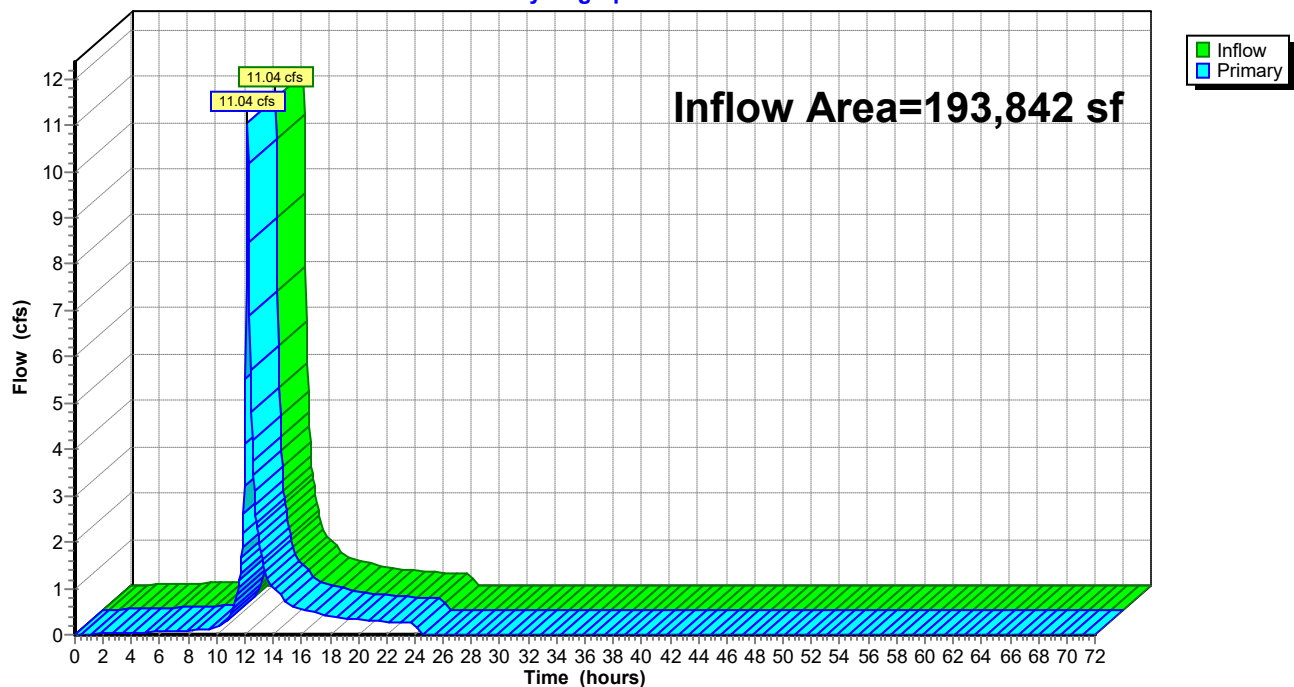
Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 2.88" for 10-Year-Future event
Inflow = 11.04 cfs @ 12.20 hrs, Volume= 46,579 cf
Primary = 11.04 cfs @ 12.20 hrs, Volume= 46,579 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)

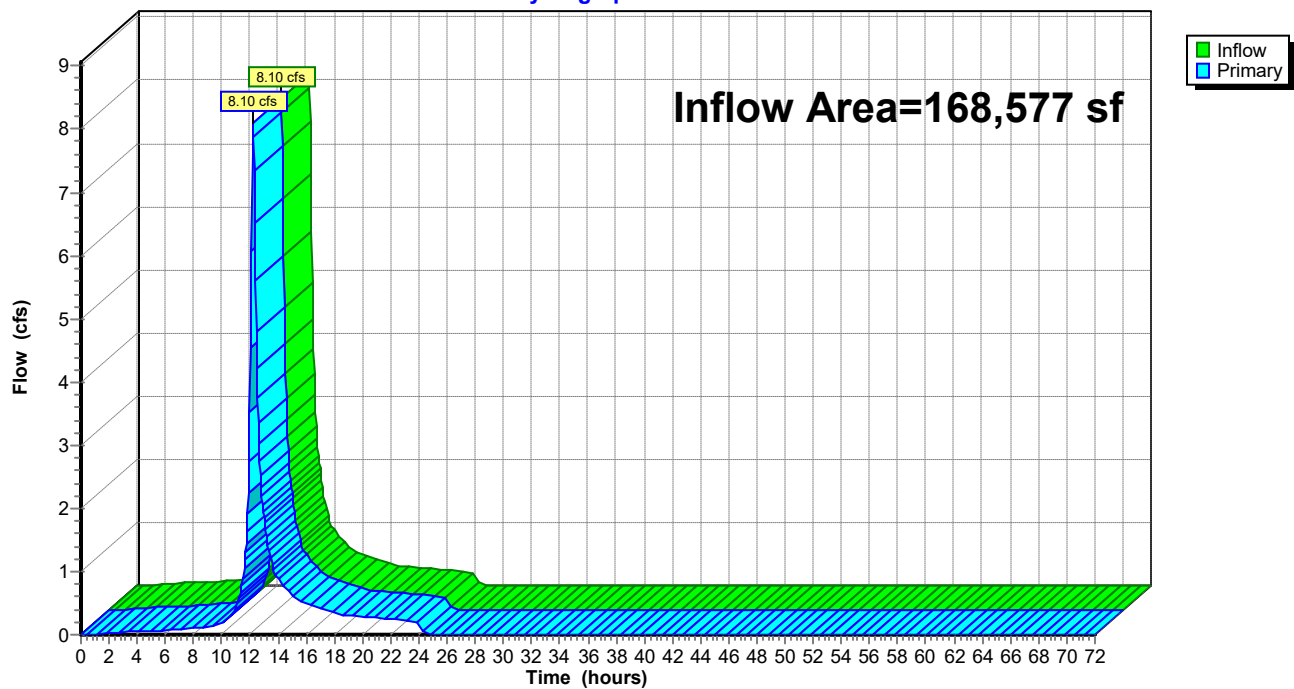
Hydrograph



Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 2.96" for 10-Year-Future event
Inflow = 8.10 cfs @ 12.21 hrs, Volume= 41,644 cf
Primary = 8.10 cfs @ 12.21 hrs, Volume= 41,644 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

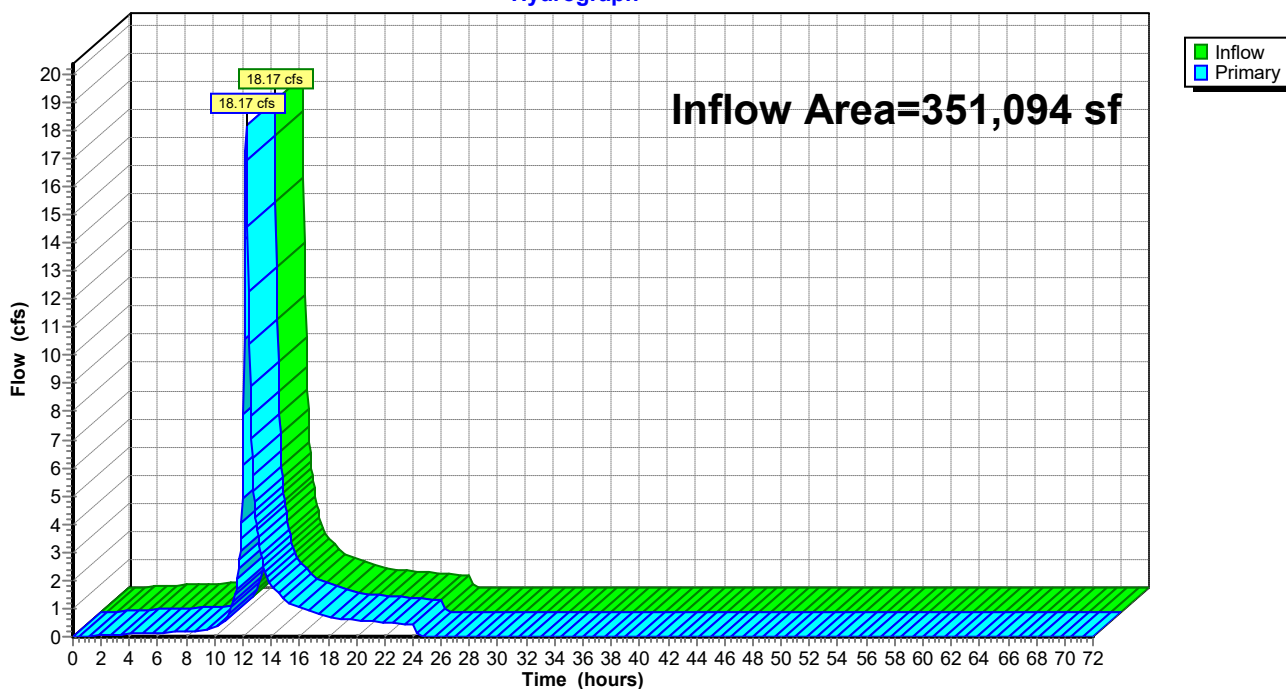
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)**Hydrograph**

Summary for Link 15L: X-DA-5 TOTAL (POA-5)

Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 2.89" for 10-Year-Future event
Inflow = 18.17 cfs @ 12.25 hrs, Volume= 84,545 cf
Primary = 18.17 cfs @ 12.25 hrs, Volume= 84,545 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)**Hydrograph**

081228-SWM

NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Prepared by Bowman Consulting Group

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: X-DA-1 IMP	Runoff Area=0.440 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=539' Tc=6.6 min CN=98 Runoff=3.59 cfs 13,799 cf
Subcatchment 2S: X-DA-1 PER	Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=3.99" Flow Length=509' Tc=12.3 min CN=WQ Runoff=17.11 cfs 67,412 cf
Subcatchment 4S: X-DA-2 IMP	Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=251' Tc=2.3 min CN=98 Runoff=1.41 cfs 4,704 cf
Subcatchment 5S: X-DA-2 PER	Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=4.02" Flow Length=337' Tc=13.2 min CN=WQ Runoff=4.25 cfs 17,236 cf
Subcatchment 7S: X-DA-3 IMP	Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=252' Tc=11.3 min CN=WQ Runoff=3.86 cfs 17,249 cf
Subcatchment 8S: X-DA-3 PER	Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=4.01" Flow Length=230' Tc=14.1 min CN=WQ Runoff=13.59 cfs 56,734 cf
Subcatchment 10S: X-DA-4 IMP	Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=8.64" Flow Length=749' Tc=7.9 min CN=WQ Runoff=4.70 cfs 18,809 cf
Subcatchment 11S: X-DA-4 PER	Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=3.94" Flow Length=498' Tc=18.5 min CN=WQ Runoff=9.94 cfs 46,712 cf
Subcatchment 13S: X-DA-5 IMP	Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=8.63" Flow Length=687' Tc=16.1 min CN=WQ Runoff=7.19 cfs 36,650 cf
Subcatchment 14S: X-DA-5 PER	Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=3.88" Flow Length=679' Tc=17.0 min CN=WQ Runoff=21.50 cfs 97,138 cf
Link 3L: X-DA-1 TOTAL (POA-1)	Inflow=19.67 cfs 81,211 cf Primary=19.67 cfs 81,211 cf
Link 6L: X-DA-2 TOTAL (POA-2)	Inflow=4.71 cfs 21,940 cf Primary=4.71 cfs 21,940 cf
Link 9L: X-DA-3 TOTAL (POA-3)	Inflow=17.32 cfs 73,983 cf Primary=17.32 cfs 73,983 cf
Link 12L: X-DA-4 TOTAL (POA-4)	Inflow=12.57 cfs 65,520 cf Primary=12.57 cfs 65,520 cf
Link 15L: X-DA-5 TOTAL (POA-5)	Inflow=28.61 cfs 133,788 cf Primary=28.61 cfs 133,788 cf

Total Runoff Area = 993,604 sf Runoff Volume = 376,442 cf Average Runoff Depth = 4.55"
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

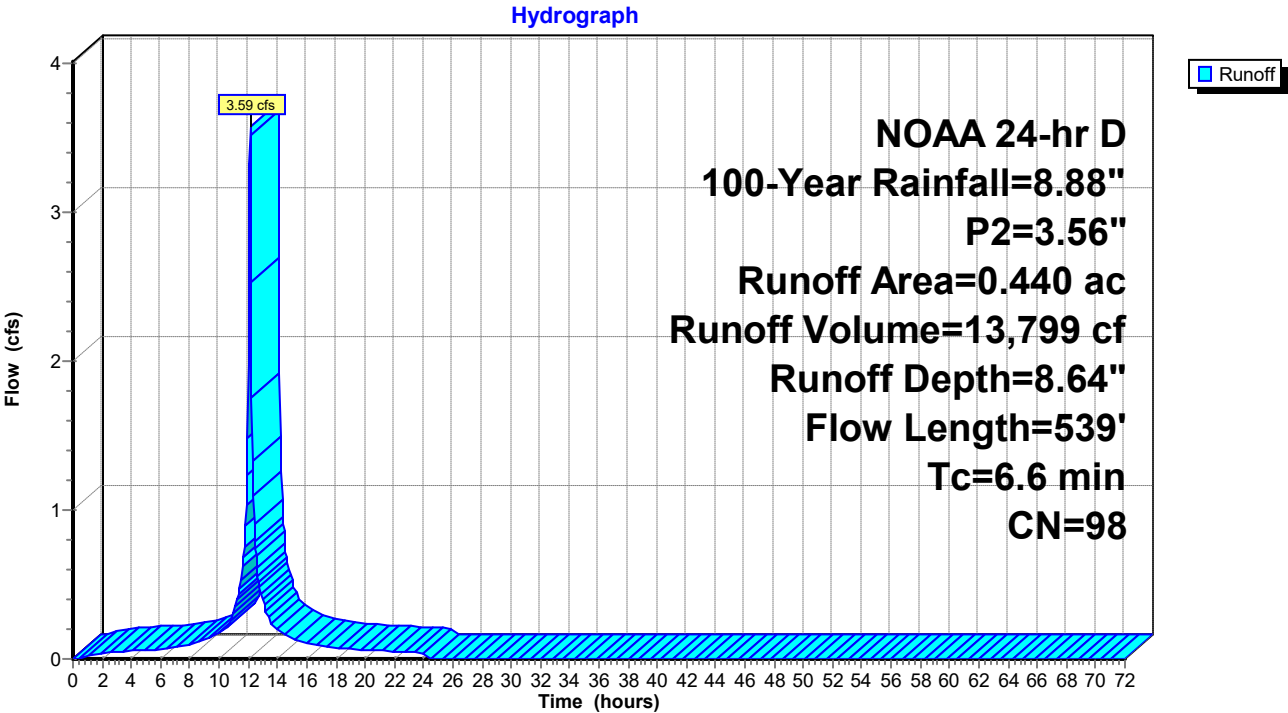
Runoff = 3.59 cfs @ 12.13 hrs, Volume= 13,799 cf, Depth= 8.64"
Routed to Link 3L : X-DA-1 TOTAL (POA-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.63		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
4.2	38	0.0540	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.6	539	Total			

Subcatchment 1S: X-DA-1 IMP



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 17.11 cfs @ 12.21 hrs, Volume= 67,412 cf, Depth= 3.99"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

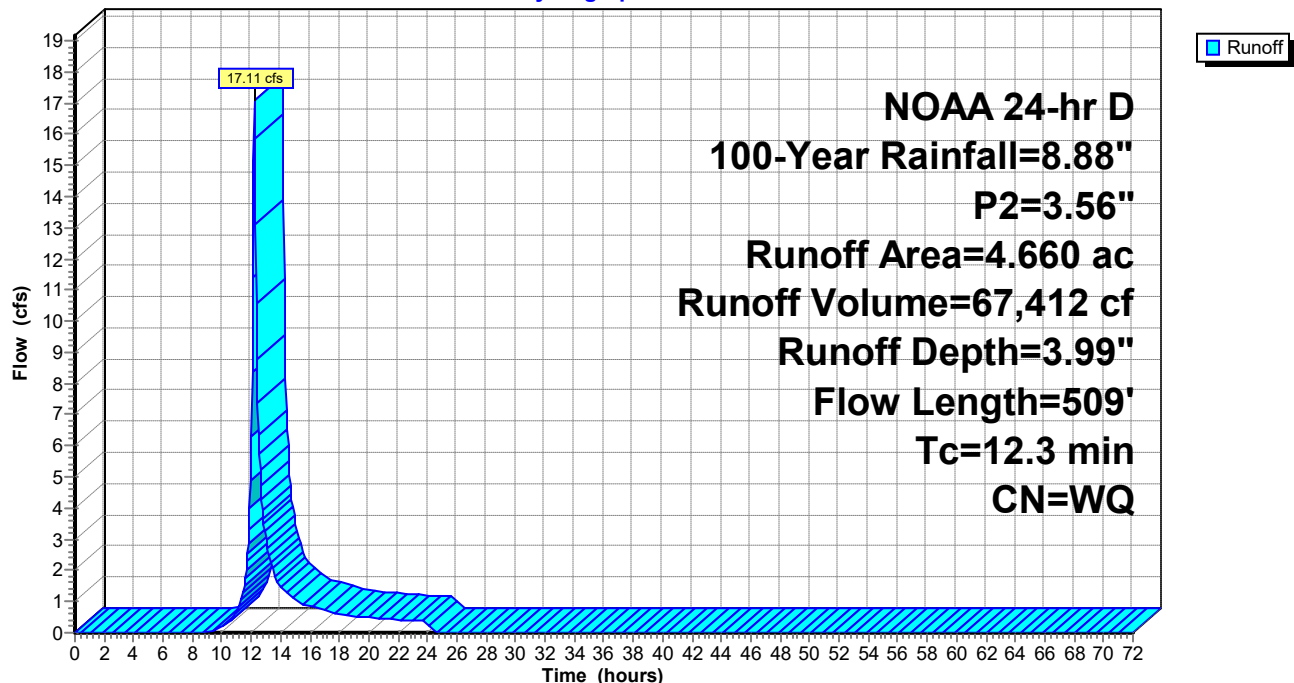
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	52	0.0380	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
4.4	48	0.0770	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
12.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 1.41 cfs @ 12.08 hrs, Volume= 4,704 cf, Depth= 8.64"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

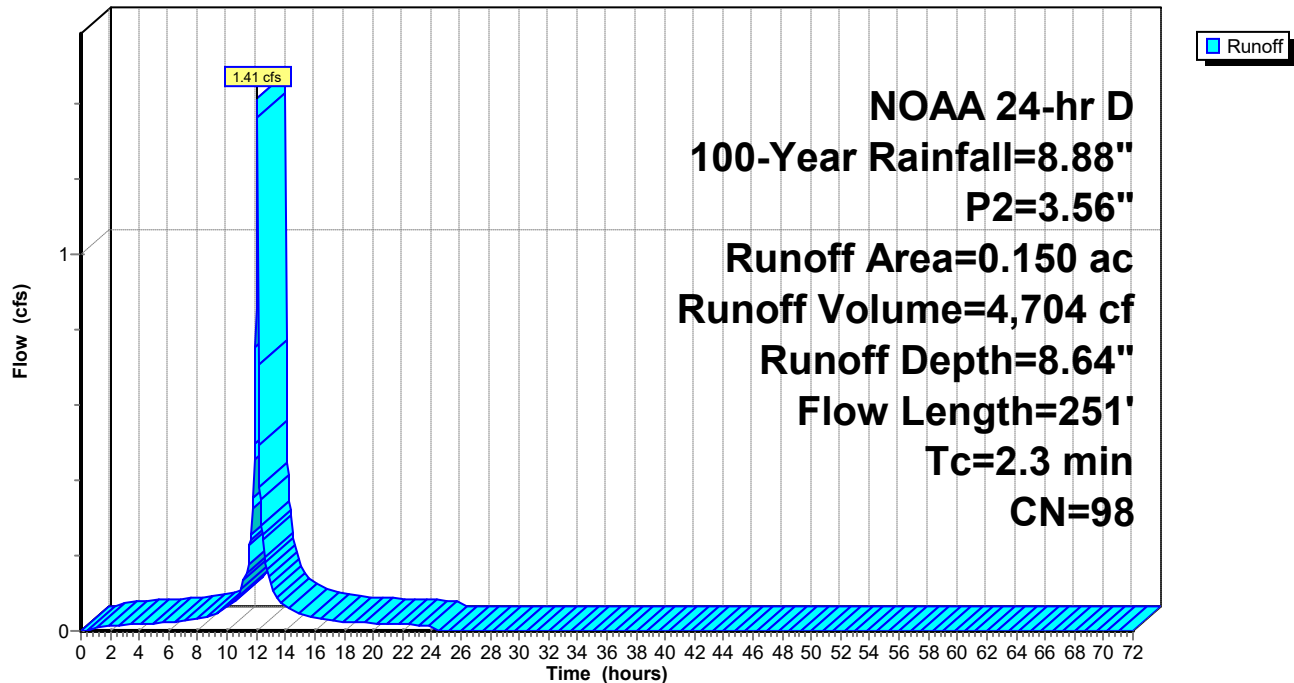
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.3	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

Runoff = 4.25 cfs @ 12.22 hrs, Volume= 17,236 cf, Depth= 4.02"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

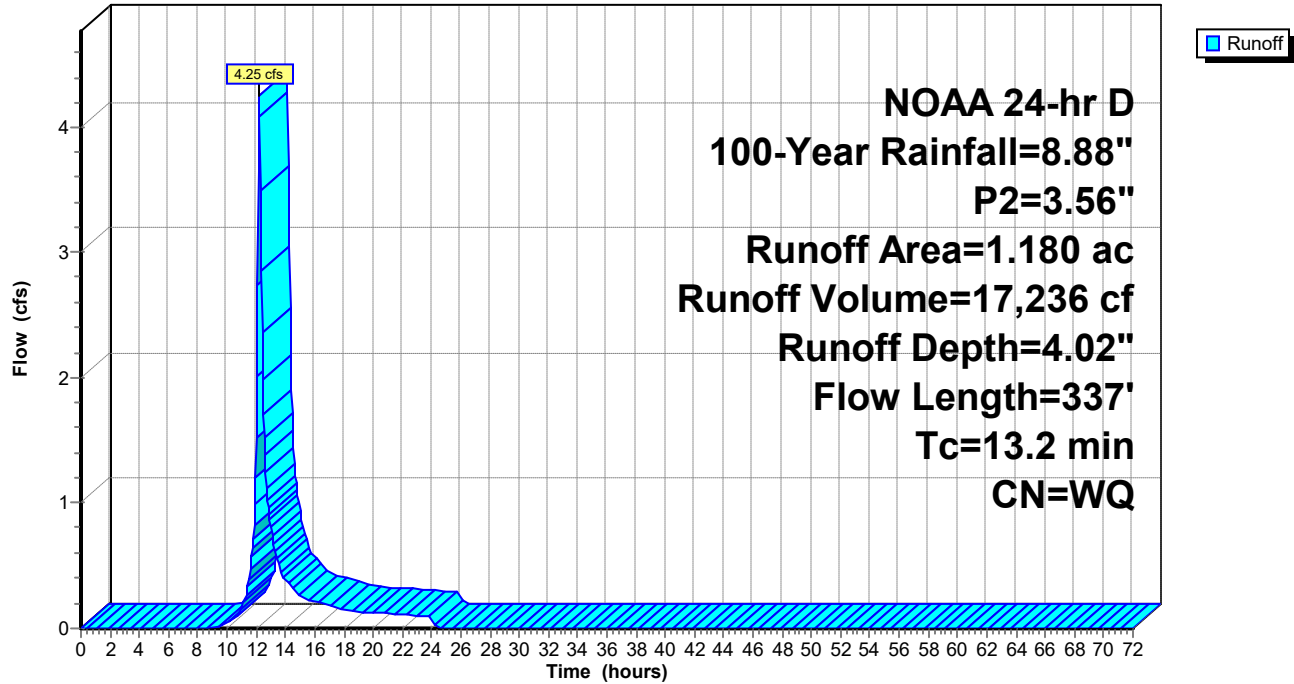
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0300	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
13.2	337	Total			

Subcatchment 5S: X-DA-2 PER

Hydrograph



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 3.86 cfs @ 12.19 hrs, Volume= 17,249 cf, Depth= 8.64"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

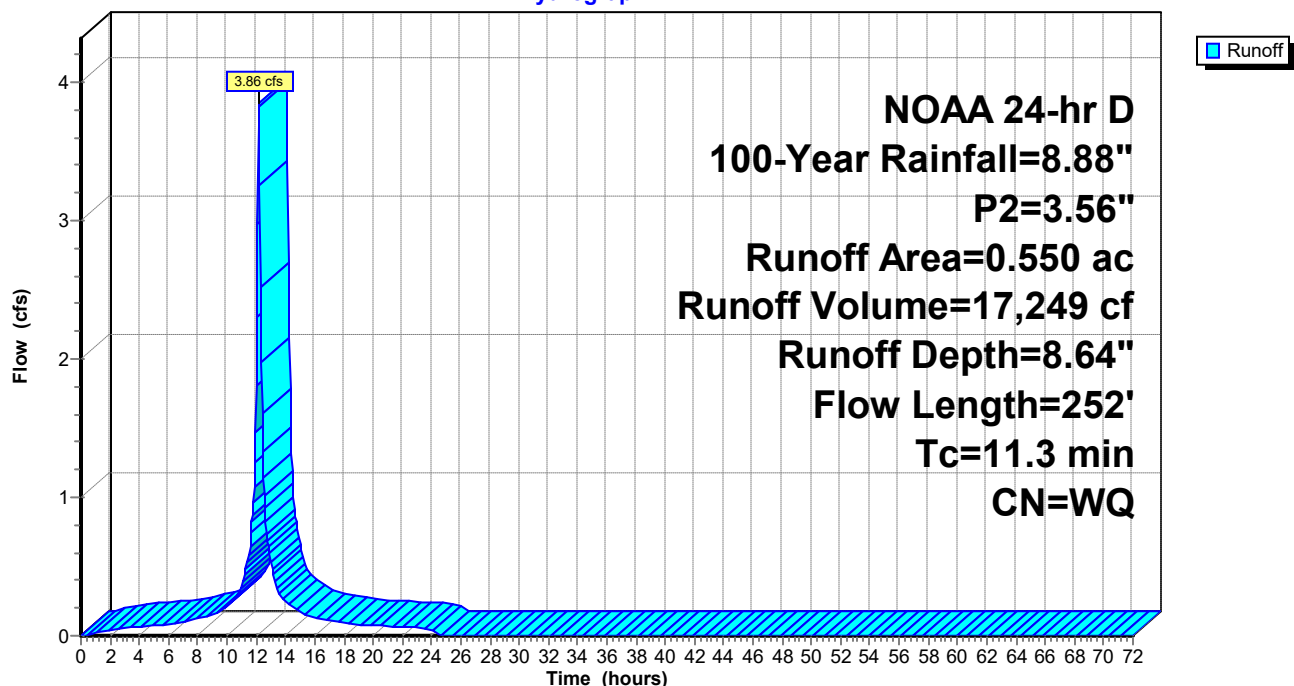
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 13.59 cfs @ 12.23 hrs, Volume= 56,734 cf, Depth= 4.01"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

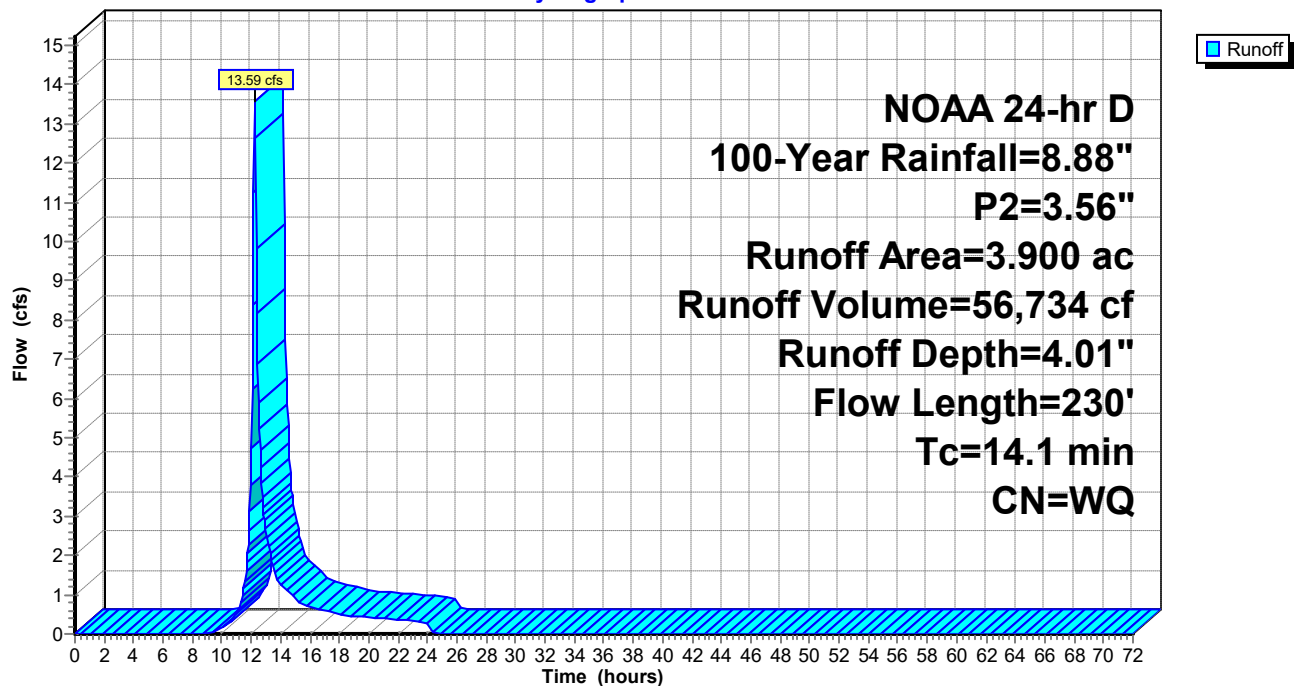
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	64	0.0160	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.2	34	0.0830	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.1	230	Total			

Subcatchment 8S: X-DA-3 PER

Hydrograph



Summary for Subcatchment 10S: X-DA-4 IMP

Runoff = 4.70 cfs @ 12.15 hrs, Volume= 18,809 cf, Depth= 8.64"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

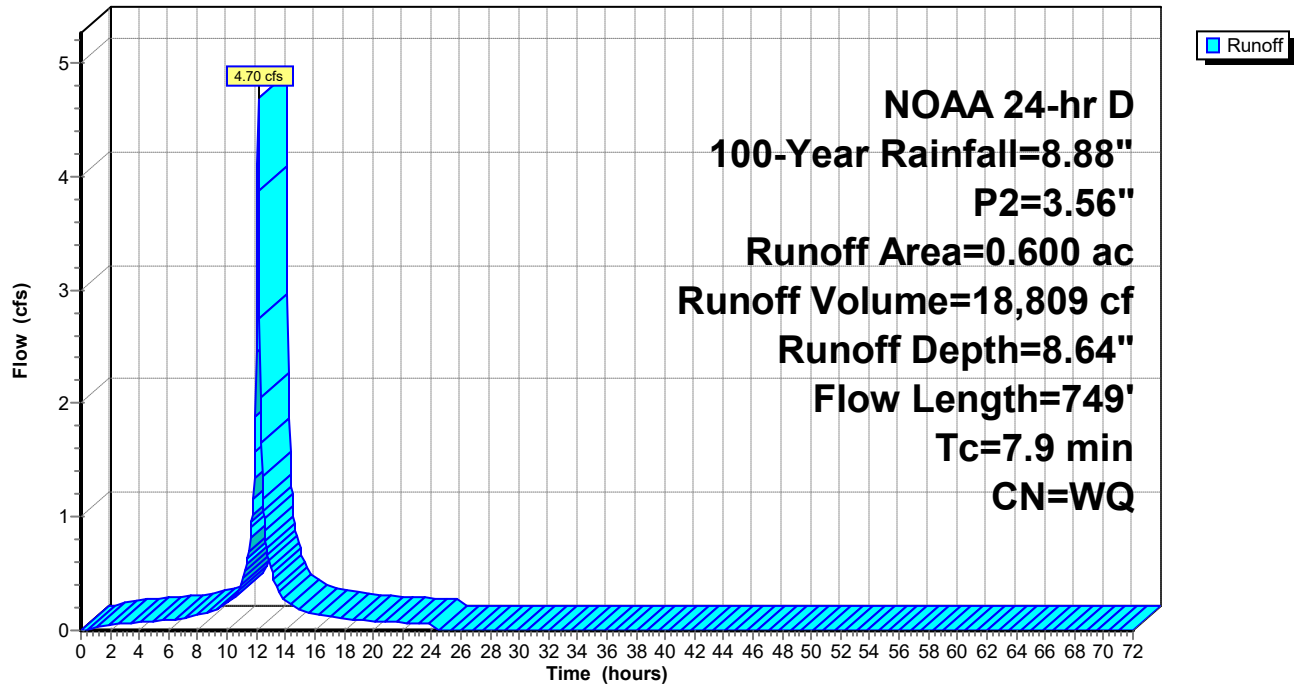
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.45		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.9	749	Total			

Subcatchment 10S: X-DA-4 IMP

Hydrograph



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 9.94 cfs @ 12.28 hrs, Volume= 46,712 cf, Depth= 3.94"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

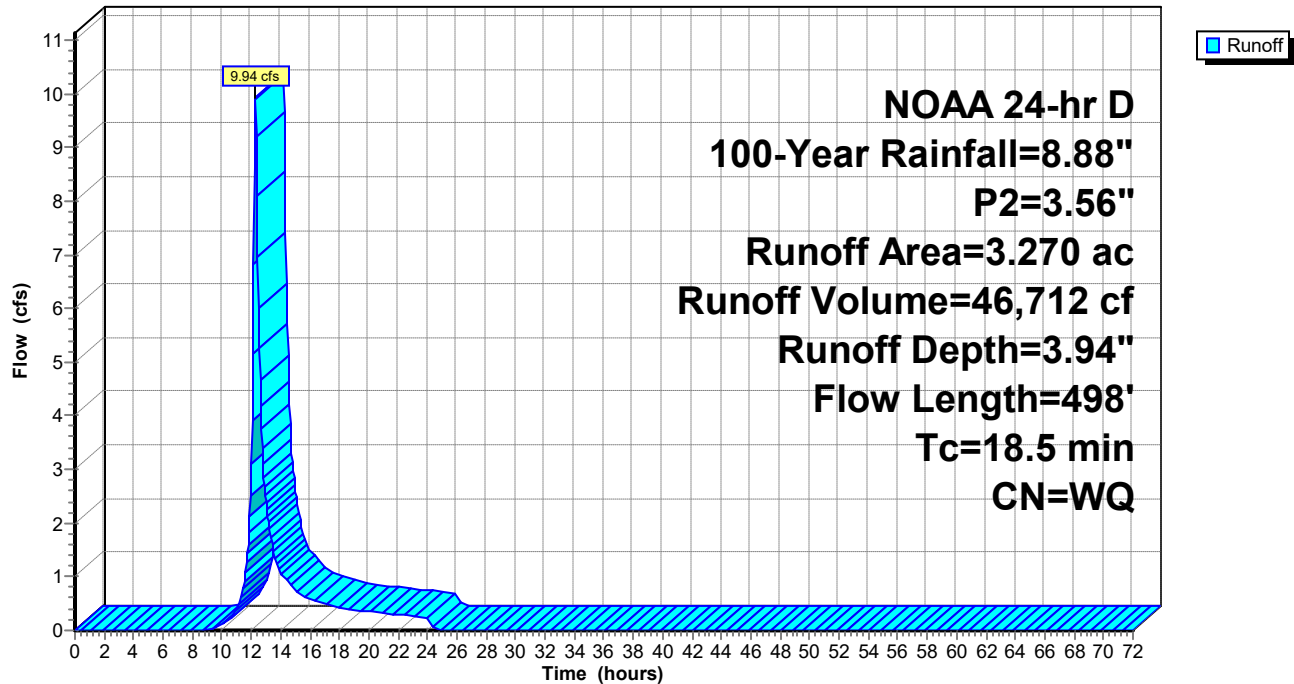
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	89	0.0180	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0180	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
18.5	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 7.19 cfs @ 12.24 hrs, Volume= 36,650 cf, Depth= 8.63"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

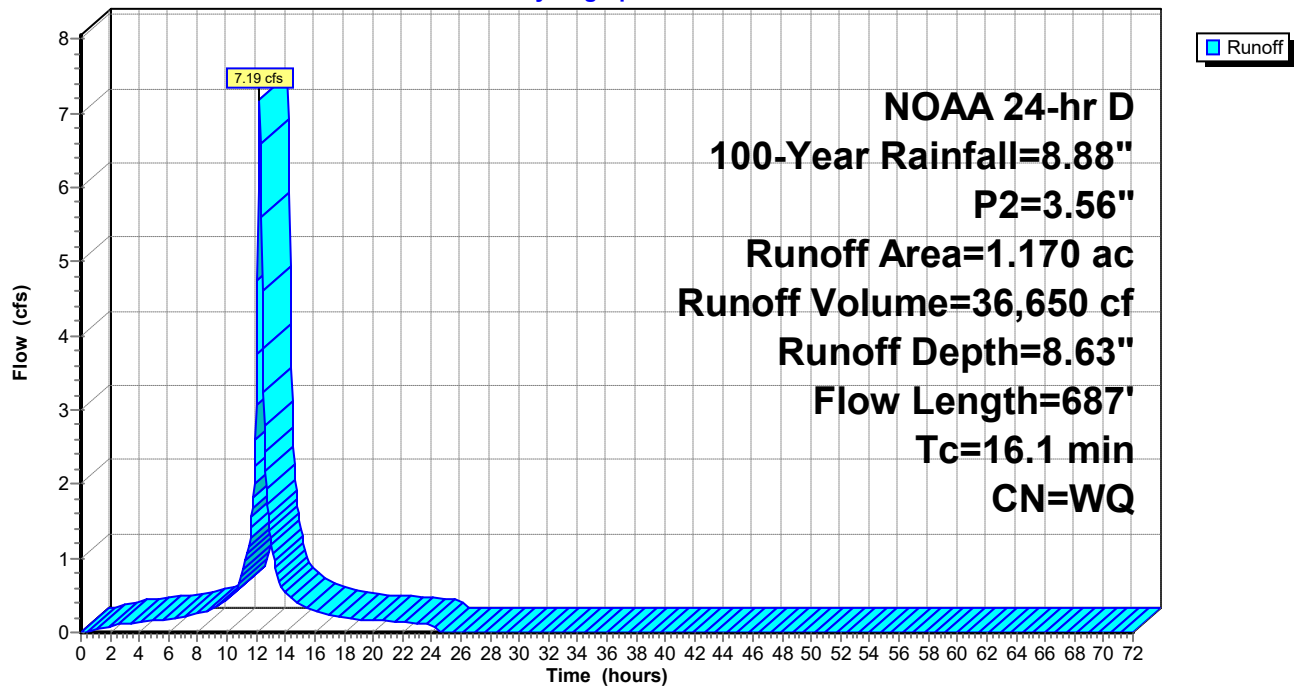
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.95		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
1.6	15	0.1000	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.1	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 21.50 cfs @ 12.26 hrs, Volume= 97,138 cf, Depth= 3.88"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

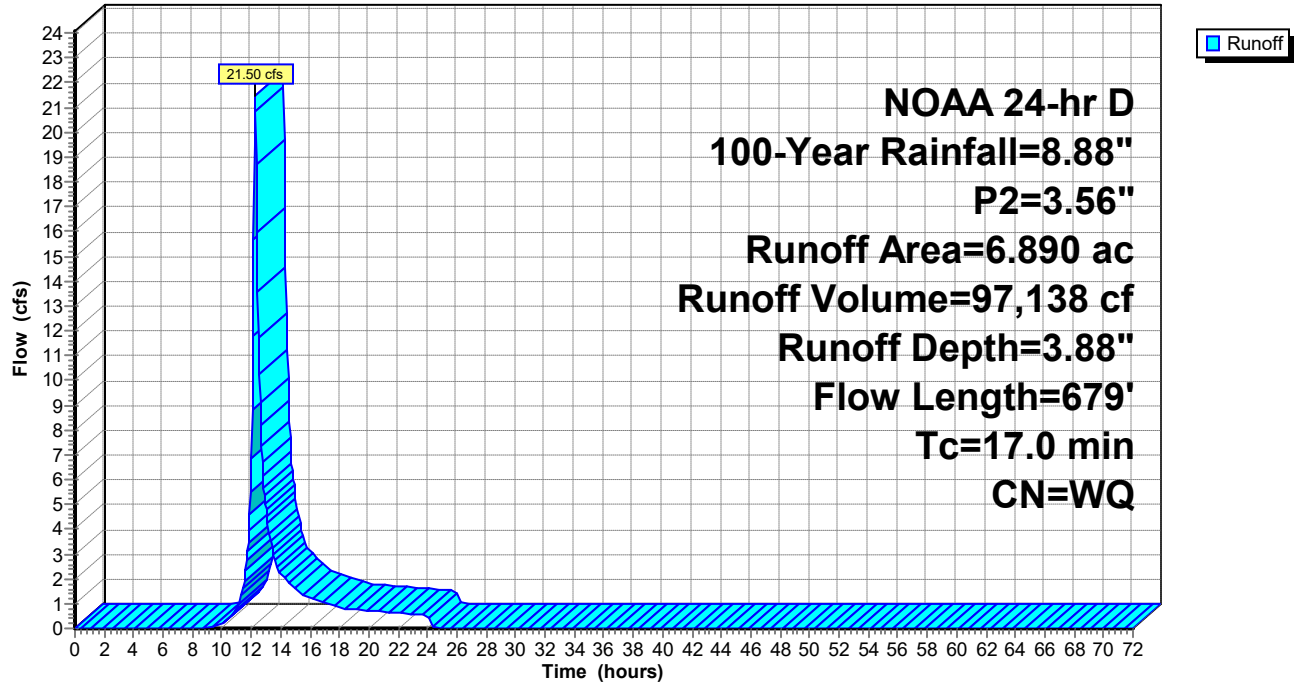
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	42	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.2	11	0.0350	1.17		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
3.0	20	0.0350	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.9	27	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.0	679	Total			

Subcatchment 14S: X-DA-5 PER

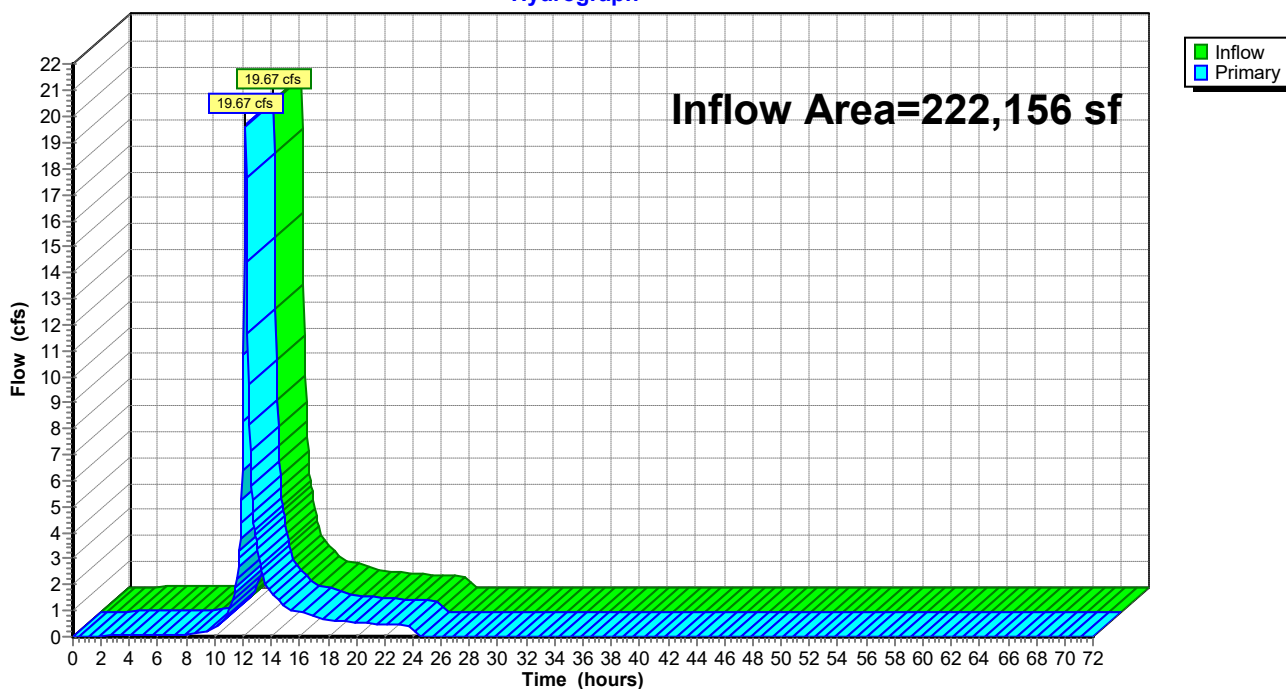
Hydrograph



Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 4.39" for 100-Year event
Inflow = 19.67 cfs @ 12.19 hrs, Volume= 81,211 cf
Primary = 19.67 cfs @ 12.19 hrs, Volume= 81,211 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

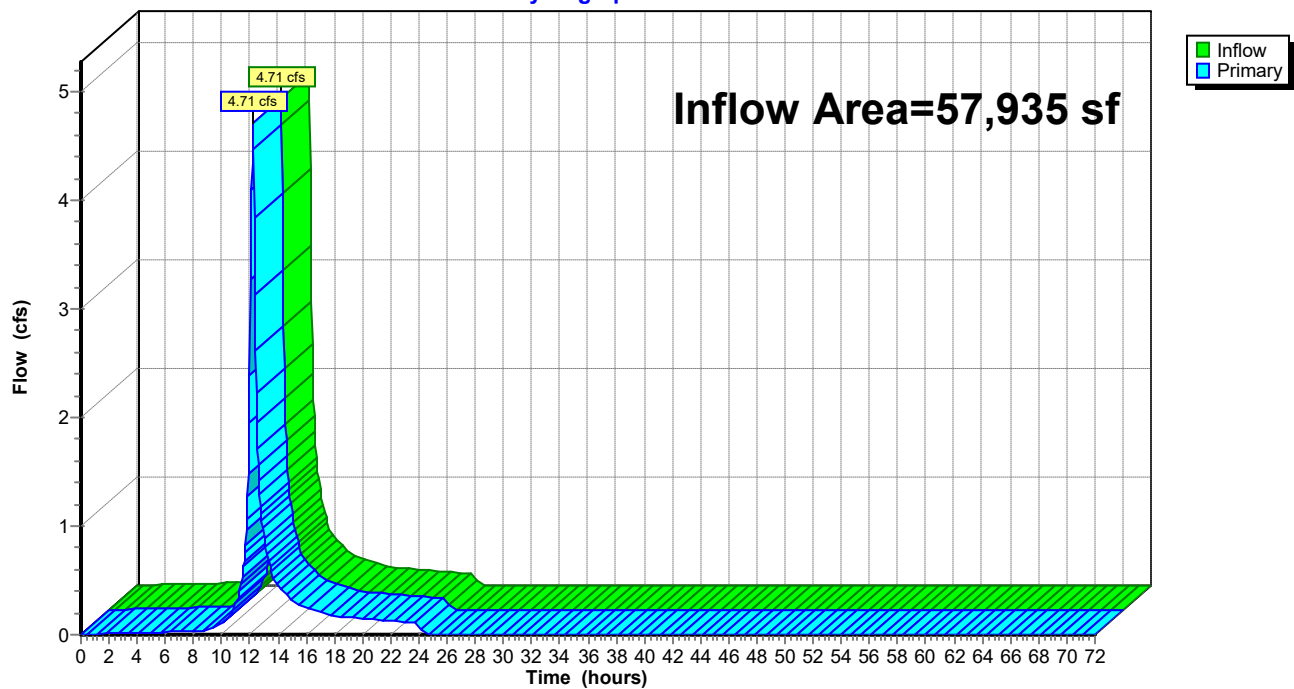
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)**Hydrograph**

Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 4.54" for 100-Year event
Inflow = 4.71 cfs @ 12.21 hrs, Volume= 21,940 cf
Primary = 4.71 cfs @ 12.21 hrs, Volume= 21,940 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

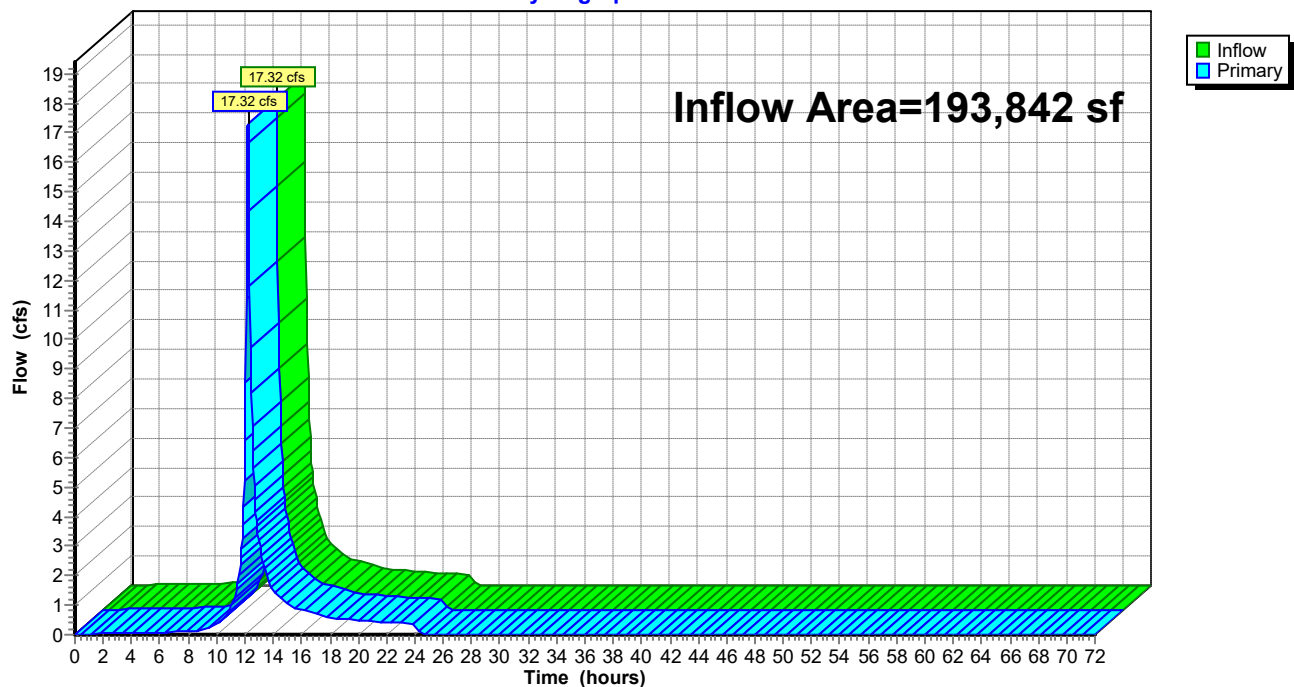
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)**Hydrograph**

Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 4.58" for 100-Year event
Inflow = 17.32 cfs @ 12.22 hrs, Volume= 73,983 cf
Primary = 17.32 cfs @ 12.22 hrs, Volume= 73,983 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)**Hydrograph**

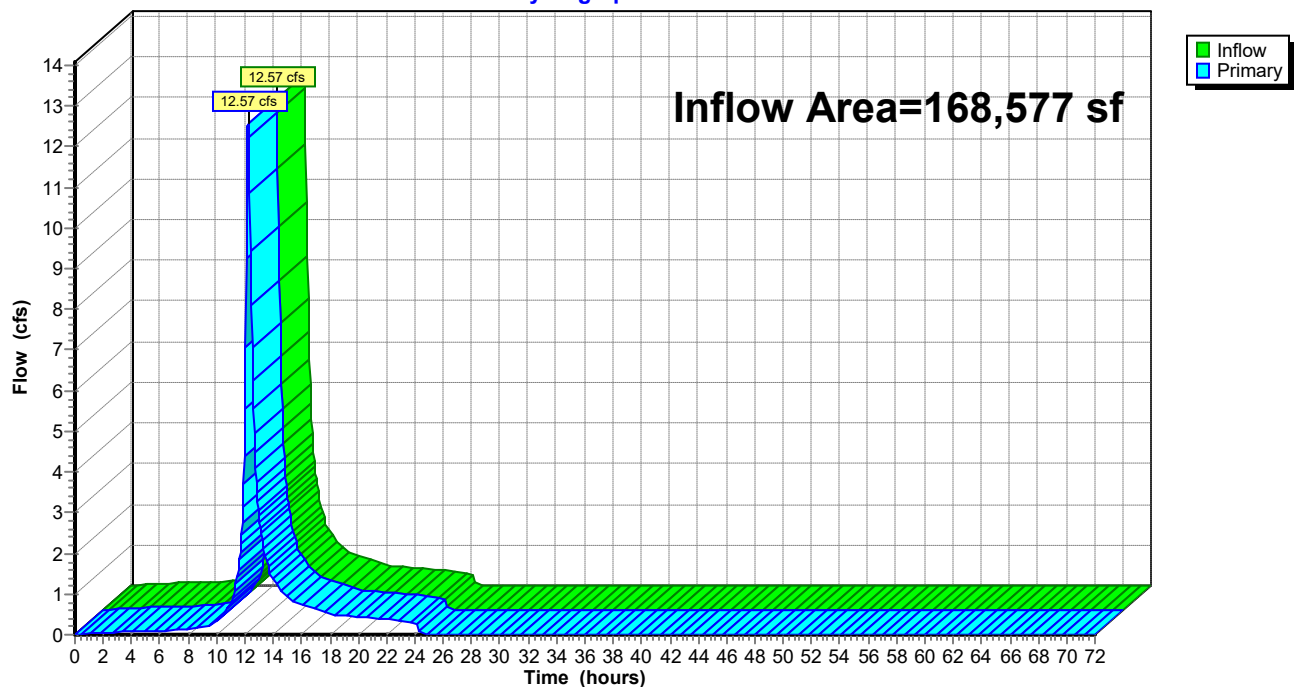
Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 4.66" for 100-Year event
Inflow = 12.57 cfs @ 12.23 hrs, Volume= 65,520 cf
Primary = 12.57 cfs @ 12.23 hrs, Volume= 65,520 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)

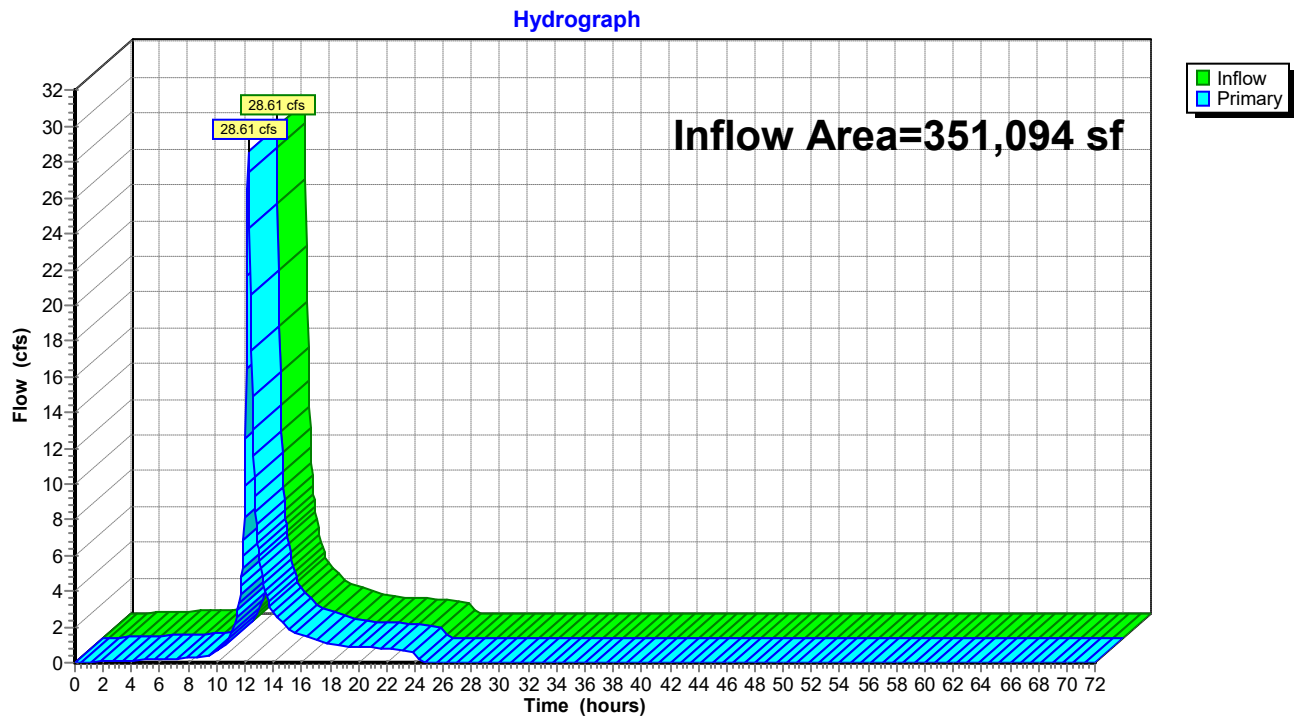
Hydrograph



Summary for Link 15L: X-DA-5 TOTAL (POA-5)

Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 4.57" for 100-Year event
Inflow = 28.61 cfs @ 12.26 hrs, Volume= 133,788 cf
Primary = 28.61 cfs @ 12.26 hrs, Volume= 133,788 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)

081228-SWM

NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Prepared by Bowman Consulting Group

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: X-DA-1 IMP	Runoff Area=0.440 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=539' Tc=6.2 min CN=98 Runoff=4.97 cfs 19,148 cf
Subcatchment 2S: X-DA-1 PER	Runoff Area=4.660 ac 0.00% Impervious Runoff Depth=6.73" Flow Length=509' Tc=11.3 min CN=WQ Runoff=29.93 cfs 113,835 cf
Subcatchment 4S: X-DA-2 IMP	Runoff Area=0.150 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=251' Tc=2.2 min CN=98 Runoff=1.95 cfs 6,528 cf
Subcatchment 5S: X-DA-2 PER	Runoff Area=1.180 ac 0.00% Impervious Runoff Depth=6.78" Flow Length=337' Tc=12.1 min CN=WQ Runoff=7.47 cfs 29,039 cf
Subcatchment 7S: X-DA-3 IMP	Runoff Area=0.550 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=252' Tc=10.3 min CN=WQ Runoff=5.44 cfs 23,935 cf
Subcatchment 8S: X-DA-3 PER	Runoff Area=3.900 ac 0.00% Impervious Runoff Depth=6.76" Flow Length=230' Tc=12.8 min CN=WQ Runoff=23.99 cfs 95,678 cf
Subcatchment 10S: X-DA-4 IMP	Runoff Area=0.600 ac 98.33% Impervious Runoff Depth=11.98" Flow Length=749' Tc=7.8 min CN=WQ Runoff=6.51 cfs 26,102 cf
Subcatchment 11S: X-DA-4 PER	Runoff Area=3.270 ac 0.00% Impervious Runoff Depth=6.67" Flow Length=498' Tc=17.3 min CN=WQ Runoff=17.56 cfs 79,116 cf
Subcatchment 13S: X-DA-5 IMP	Runoff Area=1.170 ac 95.73% Impervious Runoff Depth=11.98" Flow Length=687' Tc=15.0 min CN=WQ Runoff=10.26 cfs 50,872 cf
Subcatchment 14S: X-DA-5 PER	Runoff Area=6.890 ac 0.00% Impervious Runoff Depth=6.60" Flow Length=679' Tc=15.8 min CN=WQ Runoff=37.98 cfs 165,044 cf
Link 3L: X-DA-1 TOTAL (POA-1)	Inflow=33.64 cfs 132,983 cf Primary=33.64 cfs 132,983 cf
Link 6L: X-DA-2 TOTAL (POA-2)	Inflow=8.16 cfs 35,567 cf Primary=8.16 cfs 35,567 cf
Link 9L: X-DA-3 TOTAL (POA-3)	Inflow=29.22 cfs 119,613 cf Primary=29.22 cfs 119,613 cf
Link 12L: X-DA-4 TOTAL (POA-4)	Inflow=21.51 cfs 105,218 cf Primary=21.51 cfs 105,218 cf
Link 15L: X-DA-5 TOTAL (POA-5)	Inflow=48.12 cfs 215,916 cf Primary=48.12 cfs 215,916 cf

Total Runoff Area = 993,604 sf Runoff Volume = 609,297 cf Average Runoff Depth = 7.36"
87.51% Pervious = 869,458 sf 12.49% Impervious = 124,146 sf

Summary for Subcatchment 1S: X-DA-1 IMP

Runoff = 4.97 cfs @ 12.13 hrs, Volume= 19,148 cf, Depth=11.99"
 Routed to Link 3L : X-DA-1 TOTAL (POA-1)

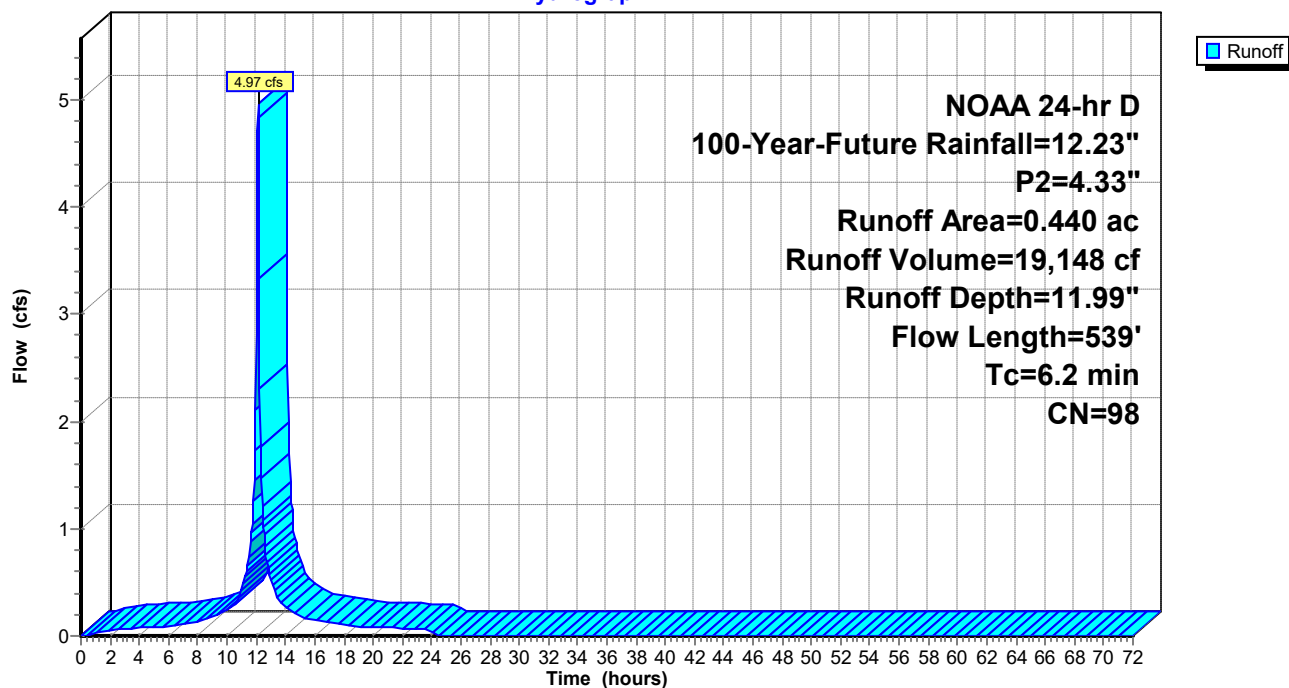
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.440	98	Motor Veh Surface, Paved parking, HSG B
0.440		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	62	0.0340	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
3.8	38	0.0540	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	418	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
6.2	539	Total			

Subcatchment 1S: X-DA-1 IMP

Hydrograph



Summary for Subcatchment 2S: X-DA-1 PER

Runoff = 29.93 cfs @ 12.19 hrs, Volume= 113,835 cf, Depth= 6.73"

Routed to Link 3L : X-DA-1 TOTAL (POA-1)

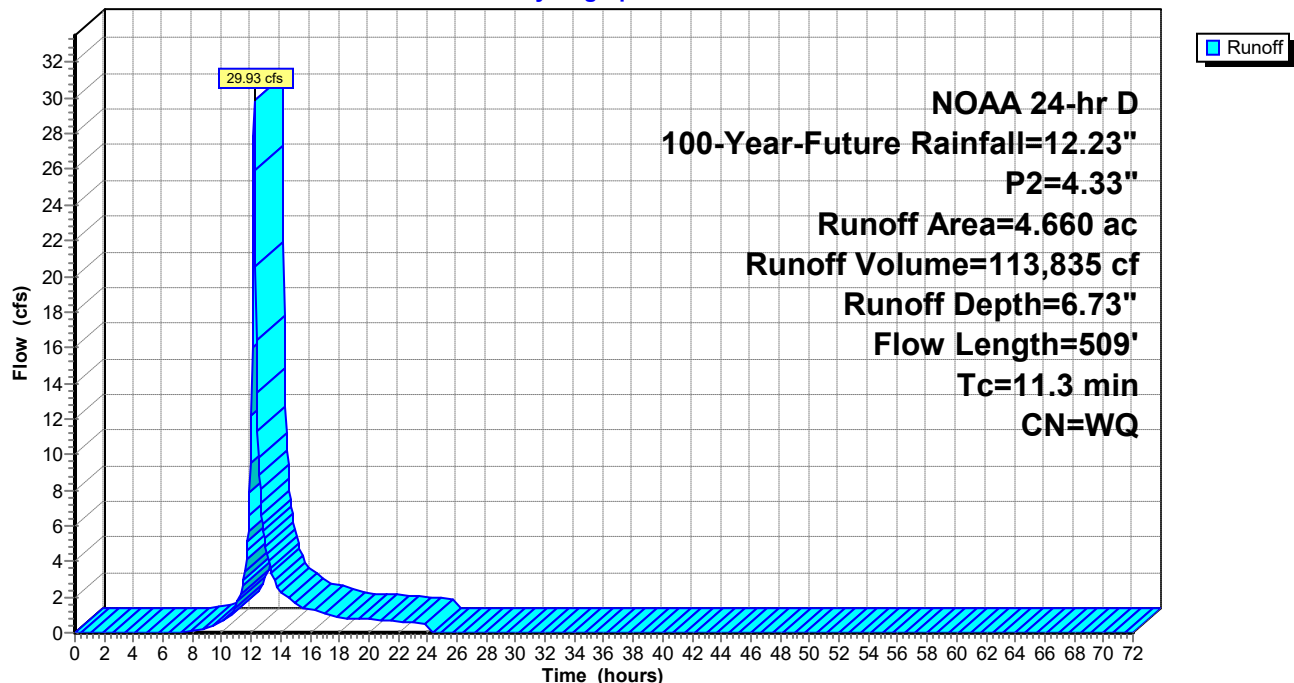
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
3.740	61	>75% Grass cover, Good, HSG B
0.920	55	Woods, Good, HSG B
4.660		Weighted Average
4.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	52	0.0380	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
4.0	48	0.0770	0.20		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.3	388	0.0910	4.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	21	0.1900	0.96		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 2.2 fps
11.3	509	Total			

Subcatchment 2S: X-DA-1 PER

Hydrograph



Summary for Subcatchment 4S: X-DA-2 IMP

Runoff = 1.95 cfs @ 12.08 hrs, Volume= 6,528 cf, Depth=11.99"

Routed to Link 6L : X-DA-2 TOTAL (POA-2)

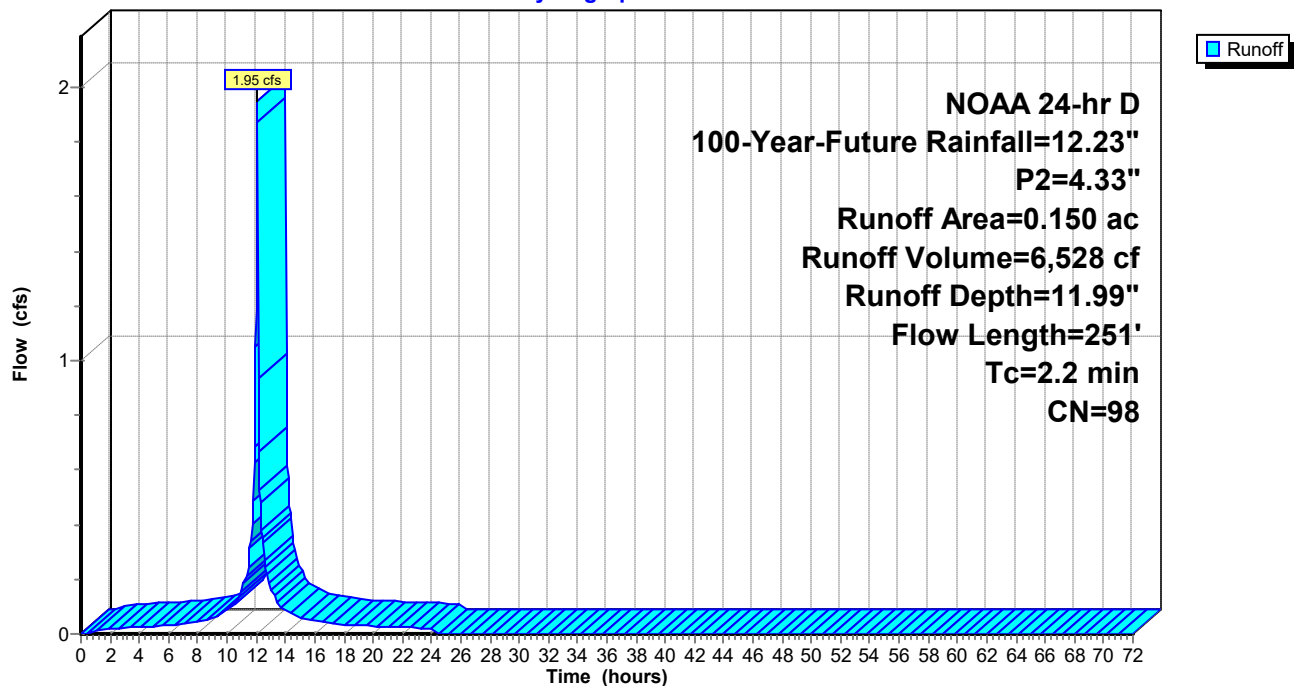
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.150	98	Motor Veh Surface, Paved parking, HSG B
0.150		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.0	14	0.0620	5.05		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
2.2	251	Total			

Subcatchment 4S: X-DA-2 IMP

Hydrograph



Summary for Subcatchment 5S: X-DA-2 PER

Runoff = 7.47 cfs @ 12.20 hrs, Volume= 29,039 cf, Depth= 6.78"
 Routed to Link 6L : X-DA-2 TOTAL (POA-2)

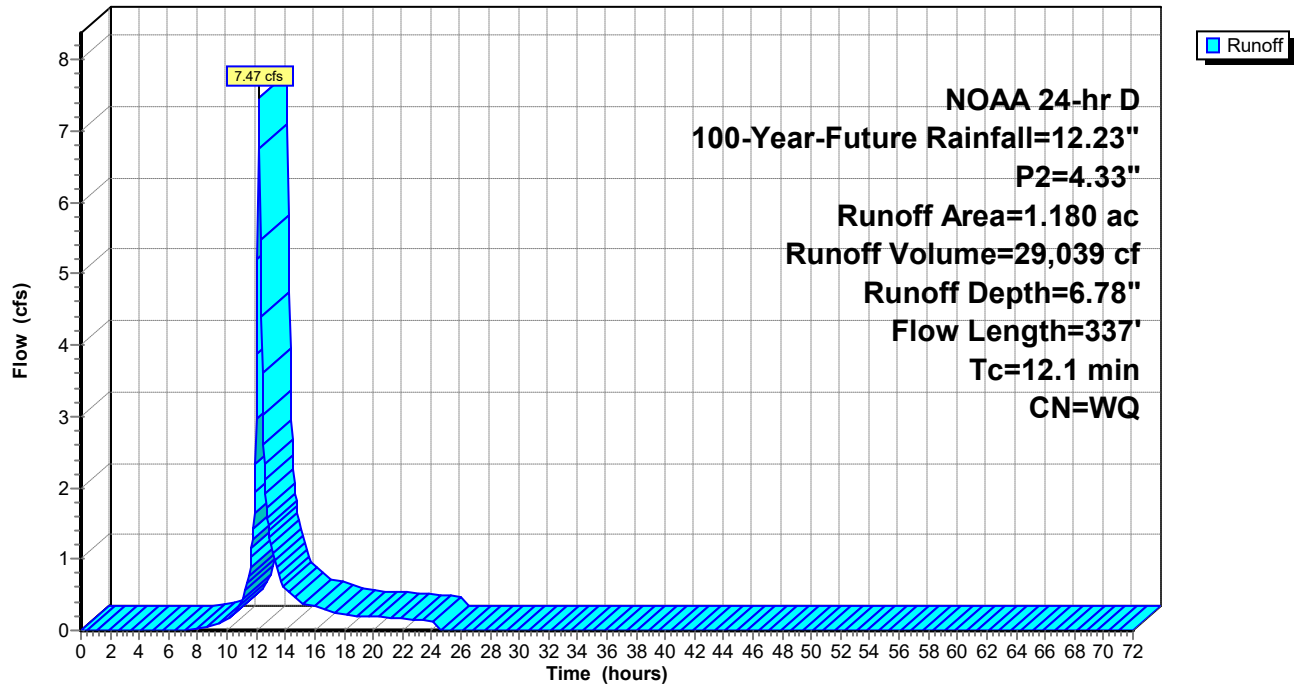
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
1.010	61	>75% Grass cover, Good, HSG B
0.170	55	Woods, Good, HSG B
1.180		Weighted Average
1.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0300	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	23	0.0430	3.34		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	77	0.0520	4.63		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	123	0.0730	4.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.8	14	0.0560	0.28		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
12.1	337	Total			

Subcatchment 5S: X-DA-2 PER

Hydrograph



Summary for Subcatchment 7S: X-DA-3 IMP

Runoff = 5.44 cfs @ 12.17 hrs, Volume= 23,935 cf, Depth=11.99"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

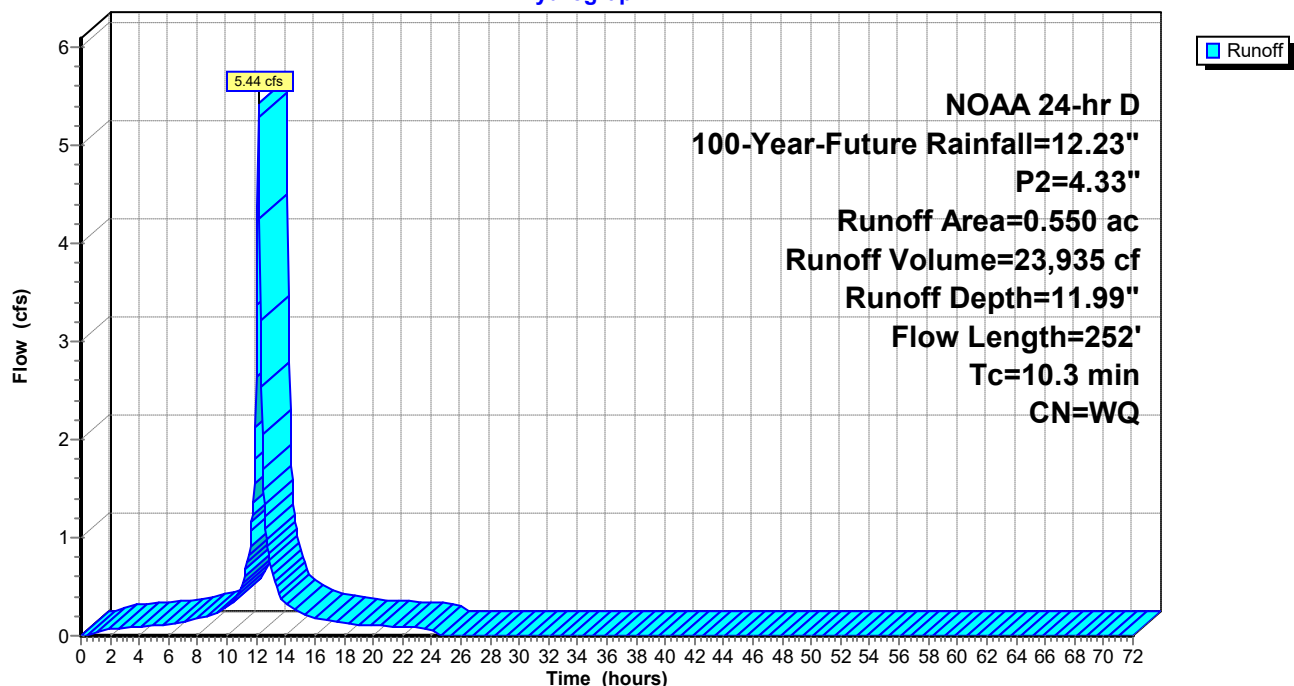
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.540	98	Motor Veh Surface, Paved parking, HSG B
* 0.010	98	Impervious, concrete surfaces, HSG B
0.550		Weighted Average
0.550		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	22	0.0200	1.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	34	0.0830	4.64		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.3	252	Total			

Subcatchment 7S: X-DA-3 IMP

Hydrograph



Summary for Subcatchment 8S: X-DA-3 PER

Runoff = 23.99 cfs @ 12.21 hrs, Volume= 95,678 cf, Depth= 6.76"
 Routed to Link 9L : X-DA-3 TOTAL (POA-3)

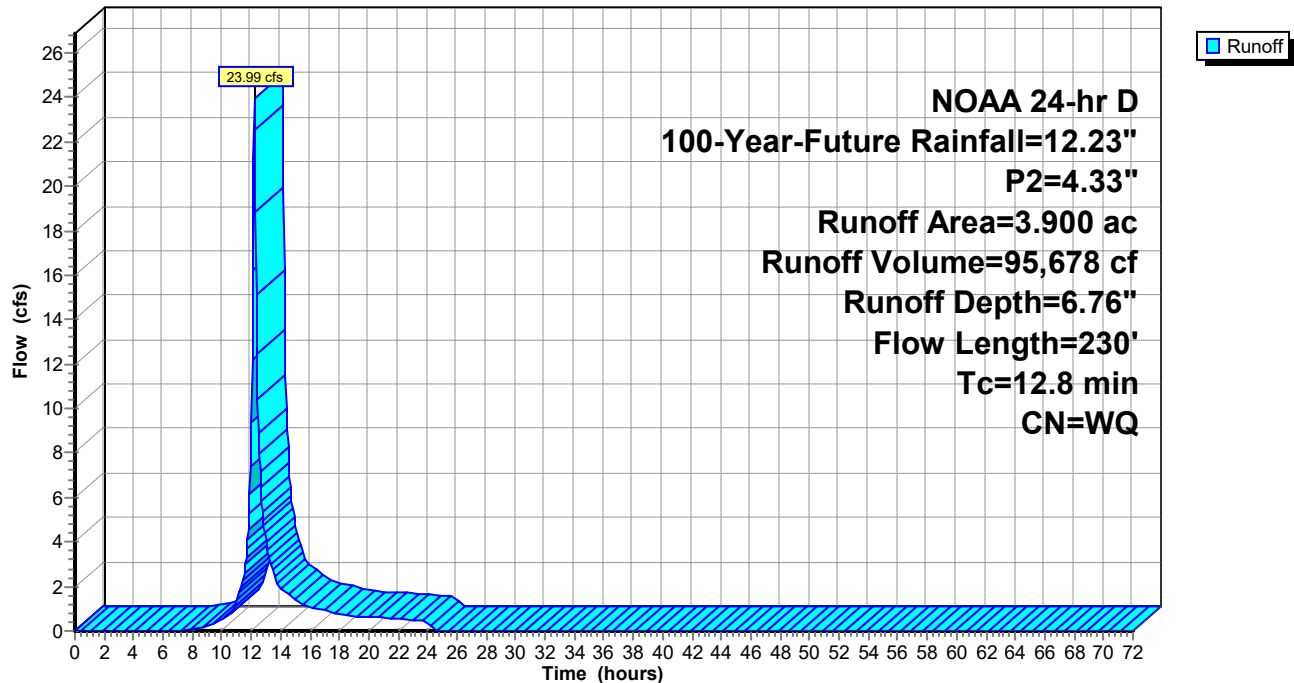
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
3.250	61	>75% Grass cover, Good, HSG B
0.650	55	Woods, Good, HSG B
3.900		Weighted Average
3.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	64	0.0160	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.9	34	0.0830	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.5	132	0.0650	4.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.8	230	Total			

Subcatchment 8S: X-DA-3 PER

Hydrograph



Summary for Subcatchment 10S: X-DA-4 IMP

Runoff = 6.51 cfs @ 12.15 hrs, Volume= 26,102 cf, Depth=11.98"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

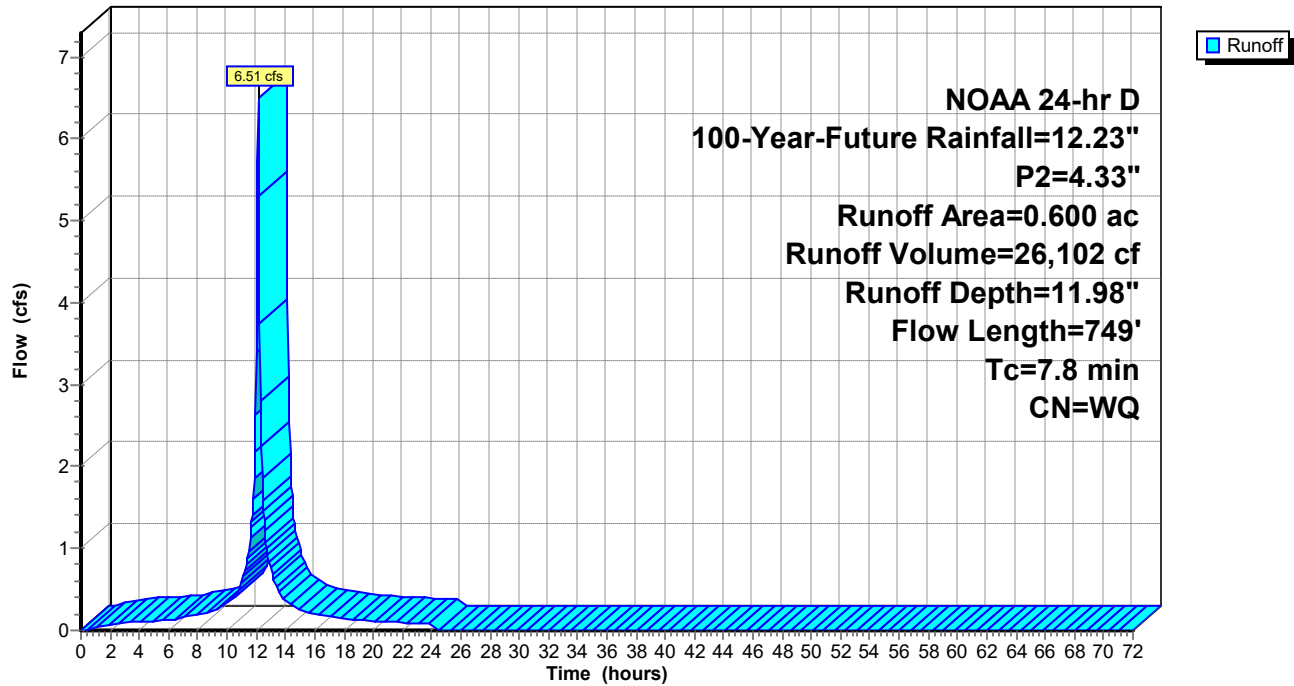
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.170	98	Unconnected roofs, HSG B
* 0.310	98	Motor Veh Surface,Paved parking, HSG B
* 0.110	98	Impervious, conc surfaces, HSG B
0.010	96	Gravel surface, HSG B
0.600		Weighted Average
0.010		1.67% Pervious Area
0.590		98.33% Impervious Area
0.170		28.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0200	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	95	0.0360	3.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	56	0.1300	5.80		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	89	0.0180	2.16		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	11	0.0180	2.72		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
7.8	749	Total			

Subcatchment 10S: X-DA-4 IMP

Hydrograph



Summary for Subcatchment 11S: X-DA-4 PER

Runoff = 17.56 cfs @ 12.26 hrs, Volume= 79,116 cf, Depth= 6.67"
 Routed to Link 12L : X-DA-4 TOTAL (POA-4)

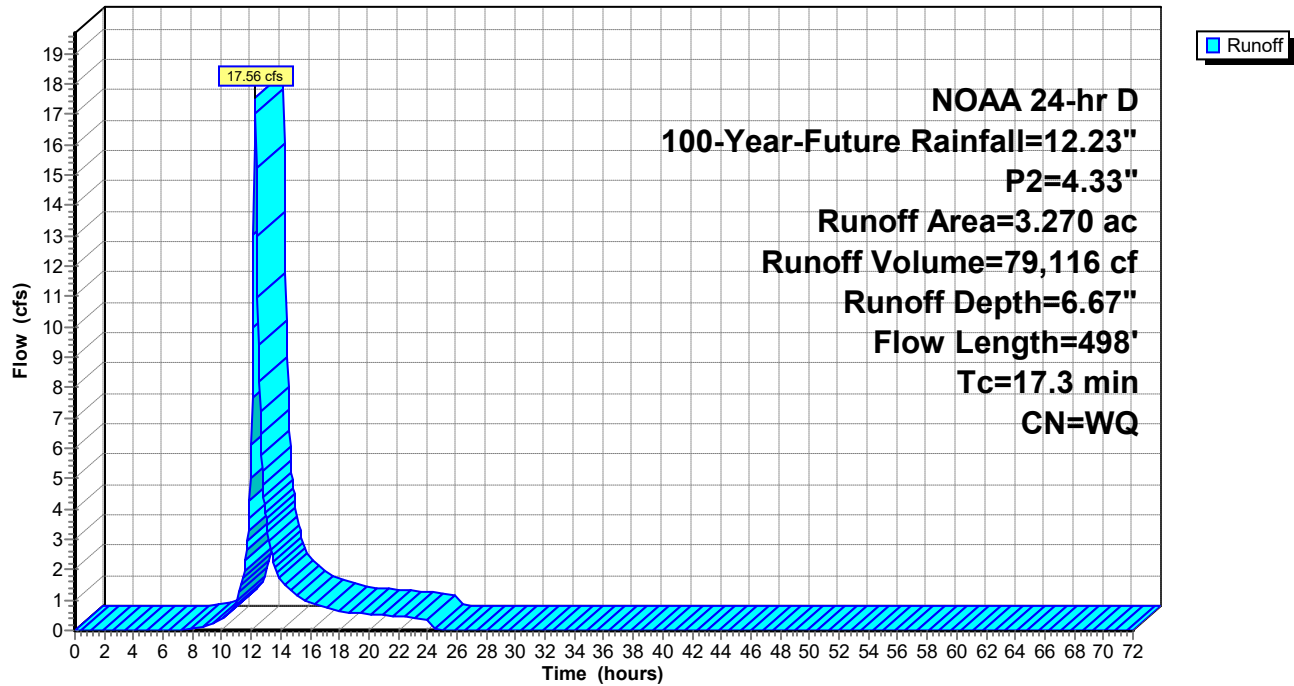
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
2.110	61	>75% Grass cover, Good, HSG B
* 0.290	61	Existing Roof Area flowing to drywell
0.870	55	Woods, Good, HSG B
3.270		Weighted Average
3.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	89	0.0180	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.2	11	0.0180	0.99		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	59	0.0390	4.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	269	0.0970	5.01		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.3	70	0.0510	0.27		Shallow Concentrated Flow, velocity factor taken from NJ BMP Ma Kv= 1.2 fps
17.3	498	Total			

Subcatchment 11S: X-DA-4 PER

Hydrograph



Summary for Subcatchment 13S: X-DA-5 IMP

Runoff = 10.26 cfs @ 12.22 hrs, Volume= 50,872 cf, Depth=11.98"
 Routed to Link 15L : X-DA-5 TOTAL (POA-5)

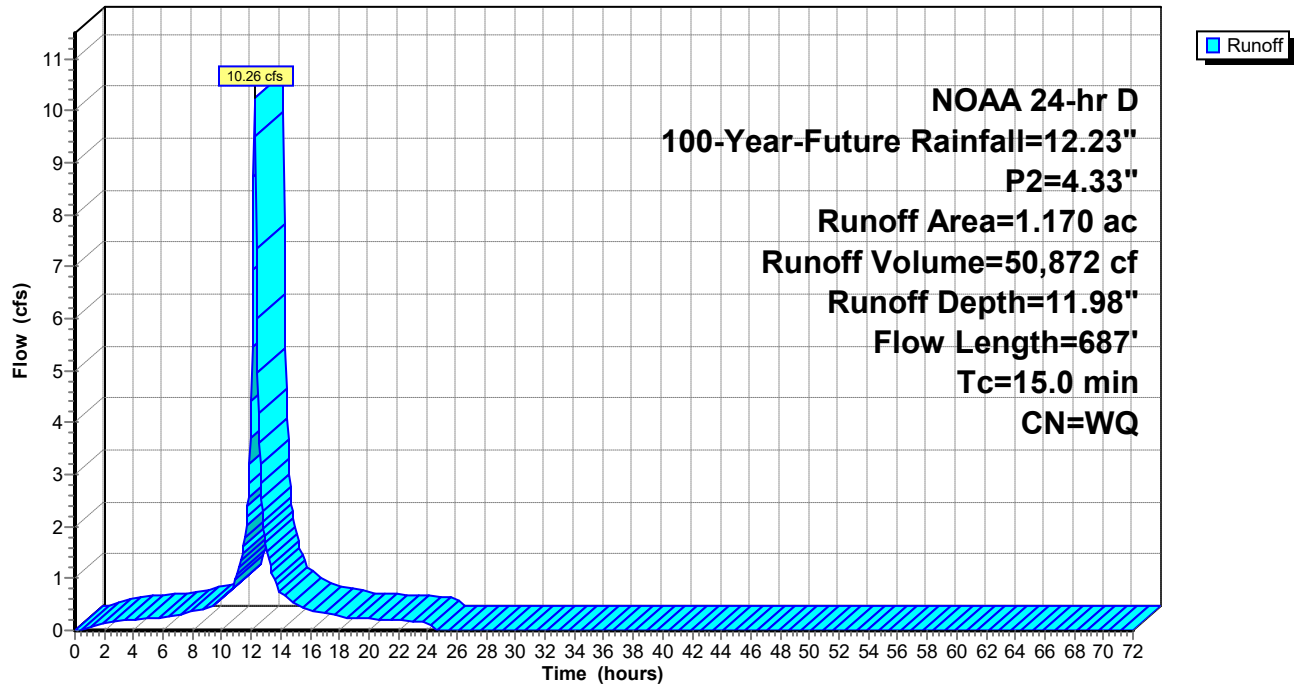
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.490	98	Unconnected roofs, HSG B
* 0.260	98	Motor Veh Surface, Paved parking, HSG B
* 0.370	98	Impervious, concrete surfaces, HSG B
* 0.050	96	Gravel surfaces, HSG B
1.170		Weighted Average
0.050		4.27% Pervious Area
1.120		95.73% Impervious Area
0.490		43.75% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.4	15	0.1000	0.18		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.5	119	0.1100	0.56		Shallow Concentrated Flow, TEXT Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.0	687	Total			

Subcatchment 13S: X-DA-5 IMP

Hydrograph



Summary for Subcatchment 14S: X-DA-5 PER

Runoff = 37.98 cfs @ 12.25 hrs, Volume= 165,044 cf, Depth= 6.60"

Routed to Link 15L : X-DA-5 TOTAL (POA-5)

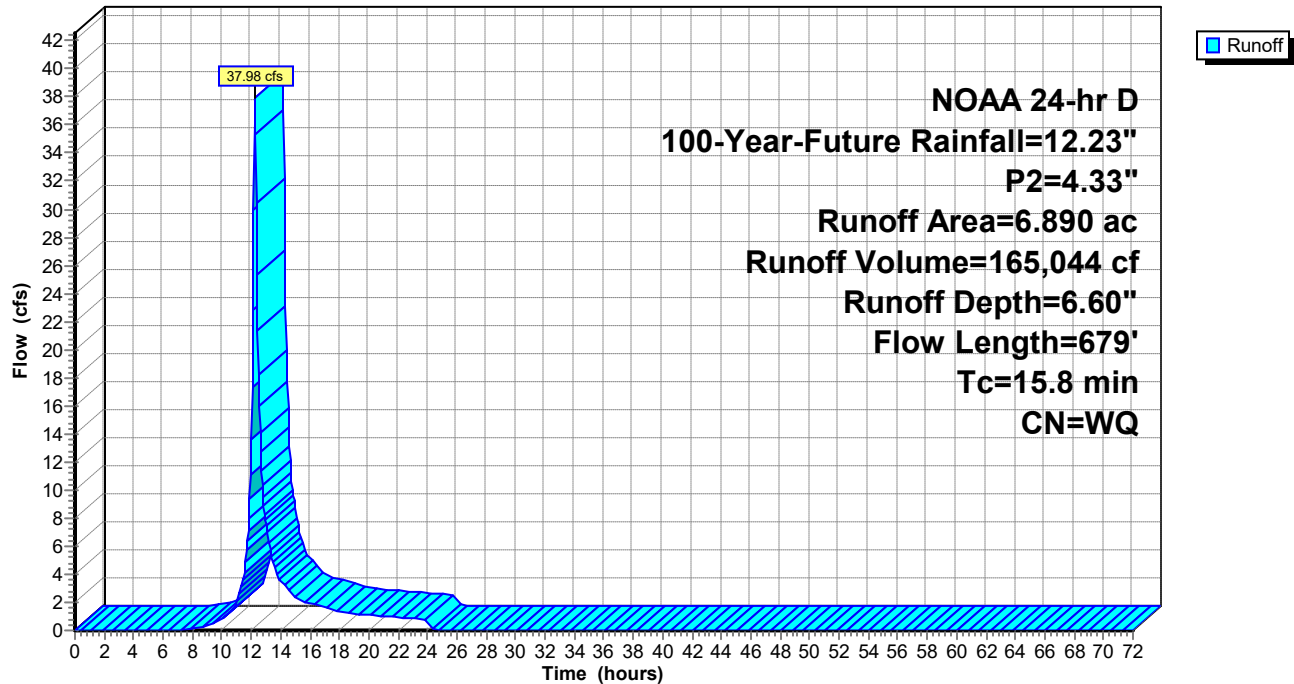
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
4.570	61	>75% Grass cover, Good, HSG B
2.320	55	Woods, Good, HSG B
6.890		Weighted Average
6.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	42	0.0350	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.1	11	0.0350	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
2.7	20	0.0350	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
2.6	27	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
3.3	111	0.1100	0.56		Shallow Concentrated Flow, Kv= 1.7 fps
1.5	352	0.0570	3.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	116	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.8	679	Total			

Subcatchment 14S: X-DA-5 PER

Hydrograph



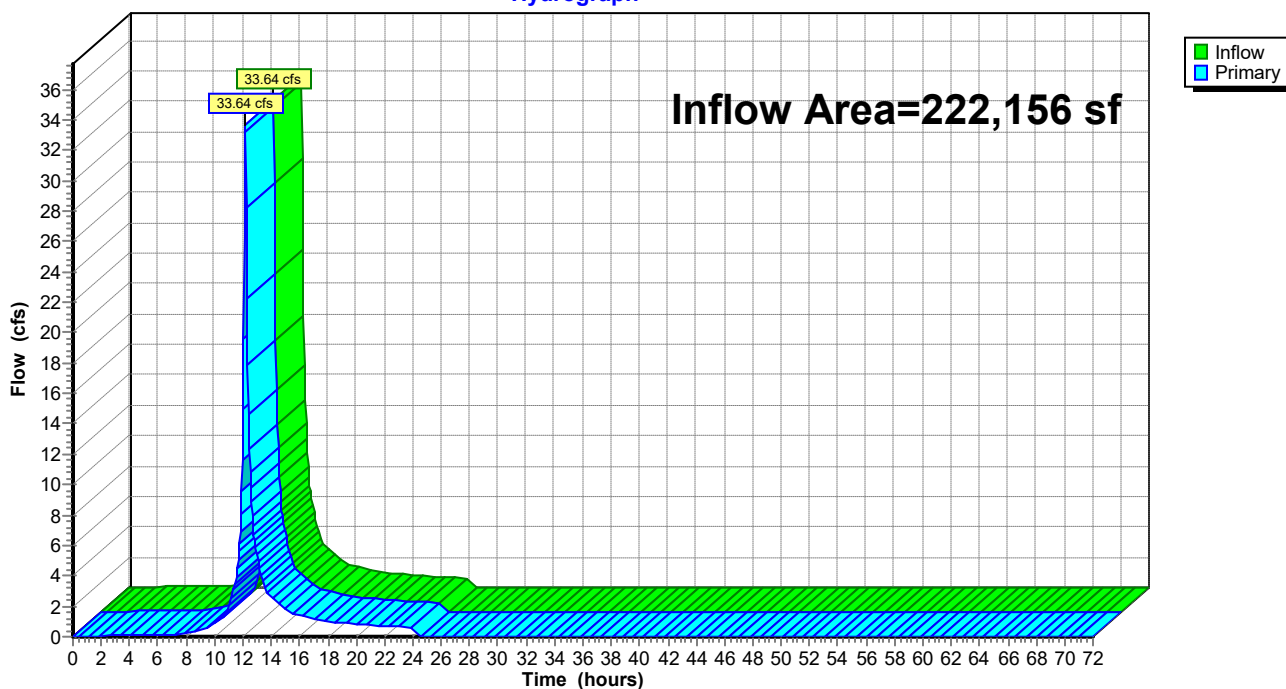
Summary for Link 3L: X-DA-1 TOTAL (POA-1)

Inflow Area = 222,156 sf, 8.63% Impervious, Inflow Depth = 7.18" for 100-Year-Future event
Inflow = 33.64 cfs @ 12.18 hrs, Volume= 132,983 cf
Primary = 33.64 cfs @ 12.18 hrs, Volume= 132,983 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 3L: X-DA-1 TOTAL (POA-1)

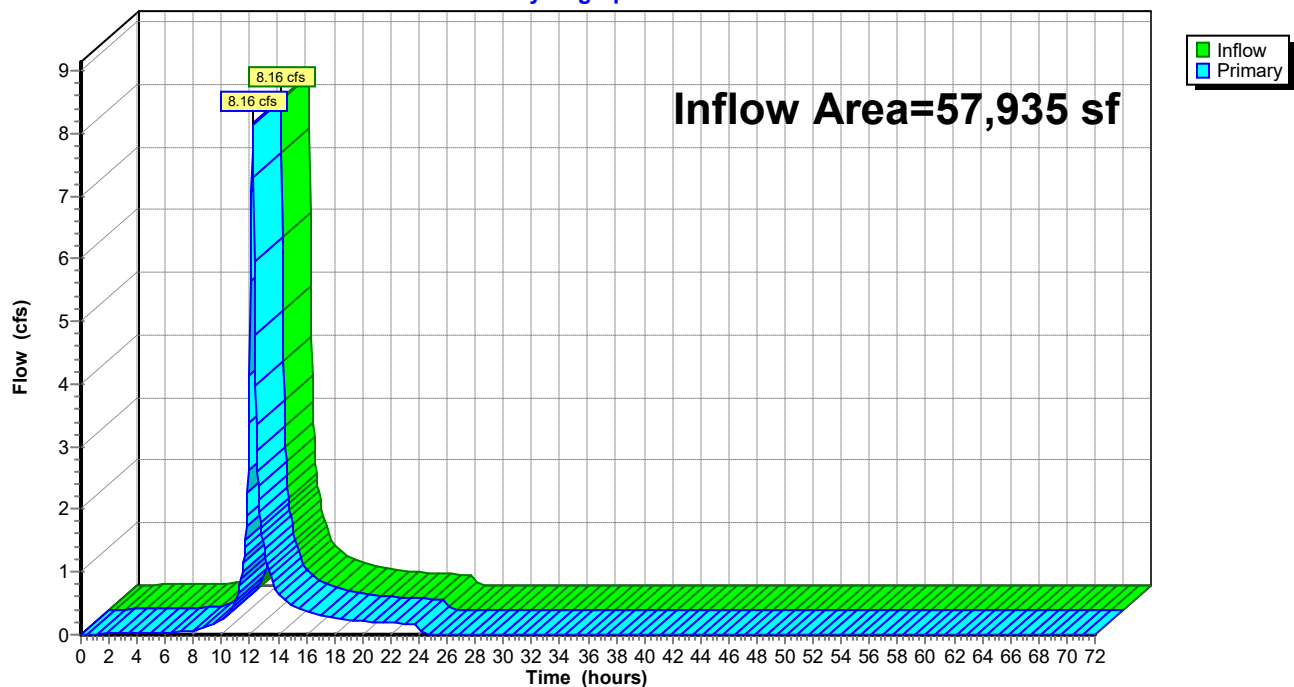
Hydrograph



Summary for Link 6L: X-DA-2 TOTAL (POA-2)

Inflow Area = 57,935 sf, 11.28% Impervious, Inflow Depth = 7.37" for 100-Year-Future event
Inflow = 8.16 cfs @ 12.19 hrs, Volume= 35,567 cf
Primary = 8.16 cfs @ 12.19 hrs, Volume= 35,567 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

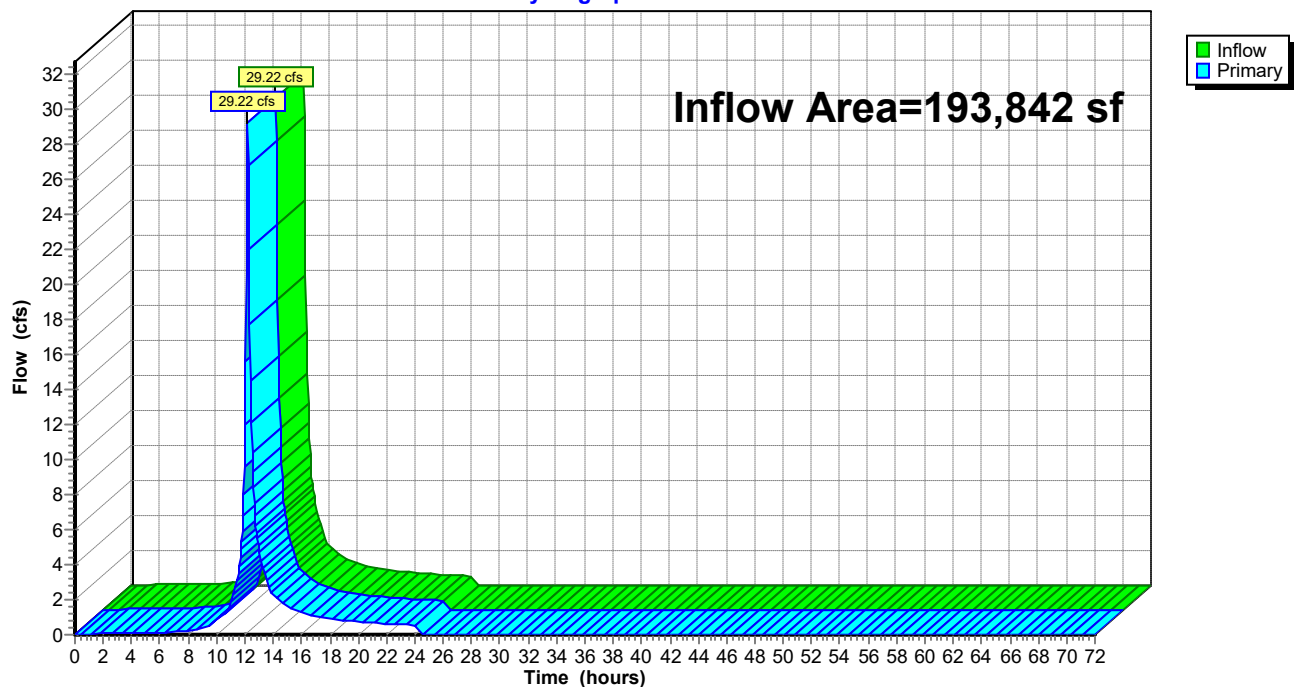
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 6L: X-DA-2 TOTAL (POA-2)**Hydrograph**

Summary for Link 9L: X-DA-3 TOTAL (POA-3)

Inflow Area = 193,842 sf, 12.36% Impervious, Inflow Depth = 7.40" for 100-Year-Future event
Inflow = 29.22 cfs @ 12.20 hrs, Volume= 119,613 cf
Primary = 29.22 cfs @ 12.20 hrs, Volume= 119,613 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

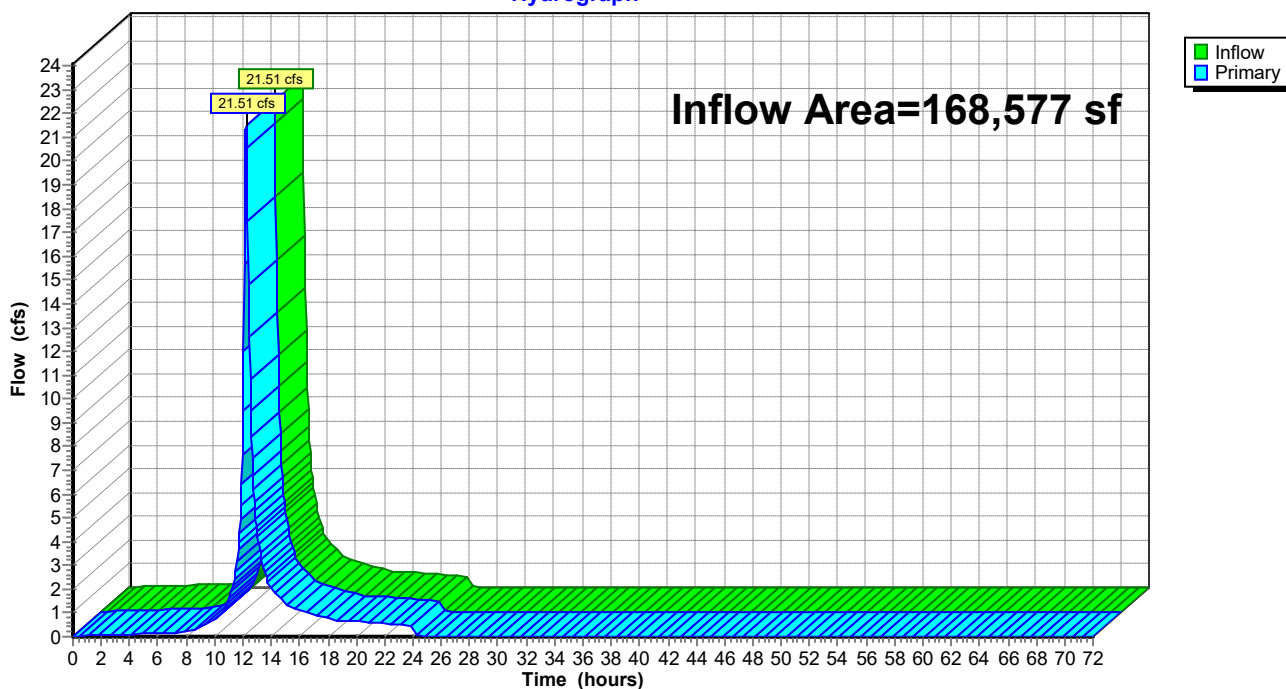
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 9L: X-DA-3 TOTAL (POA-3)**Hydrograph**

Summary for Link 12L: X-DA-4 TOTAL (POA-4)

Inflow Area = 168,577 sf, 15.25% Impervious, Inflow Depth = 7.49" for 100-Year-Future event
Inflow = 21.51 cfs @ 12.22 hrs, Volume= 105,218 cf
Primary = 21.51 cfs @ 12.22 hrs, Volume= 105,218 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

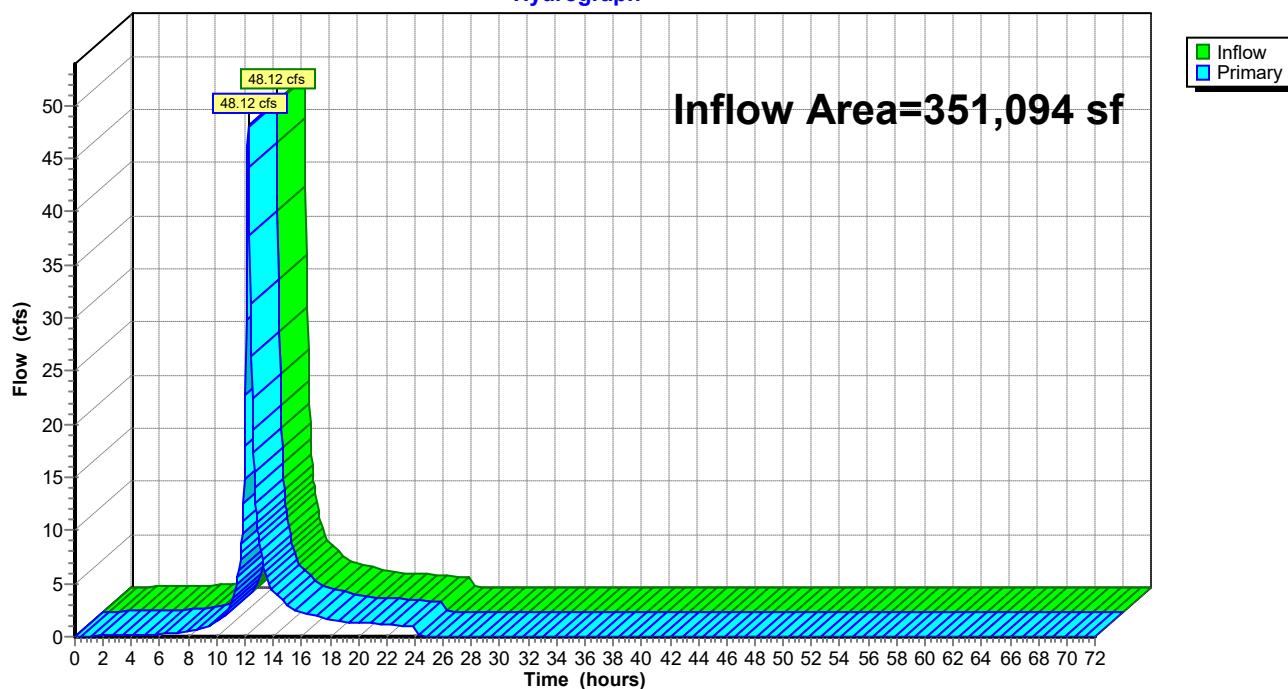
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 12L: X-DA-4 TOTAL (POA-4)**Hydrograph**

Summary for Link 15L: X-DA-5 TOTAL (POA-5)

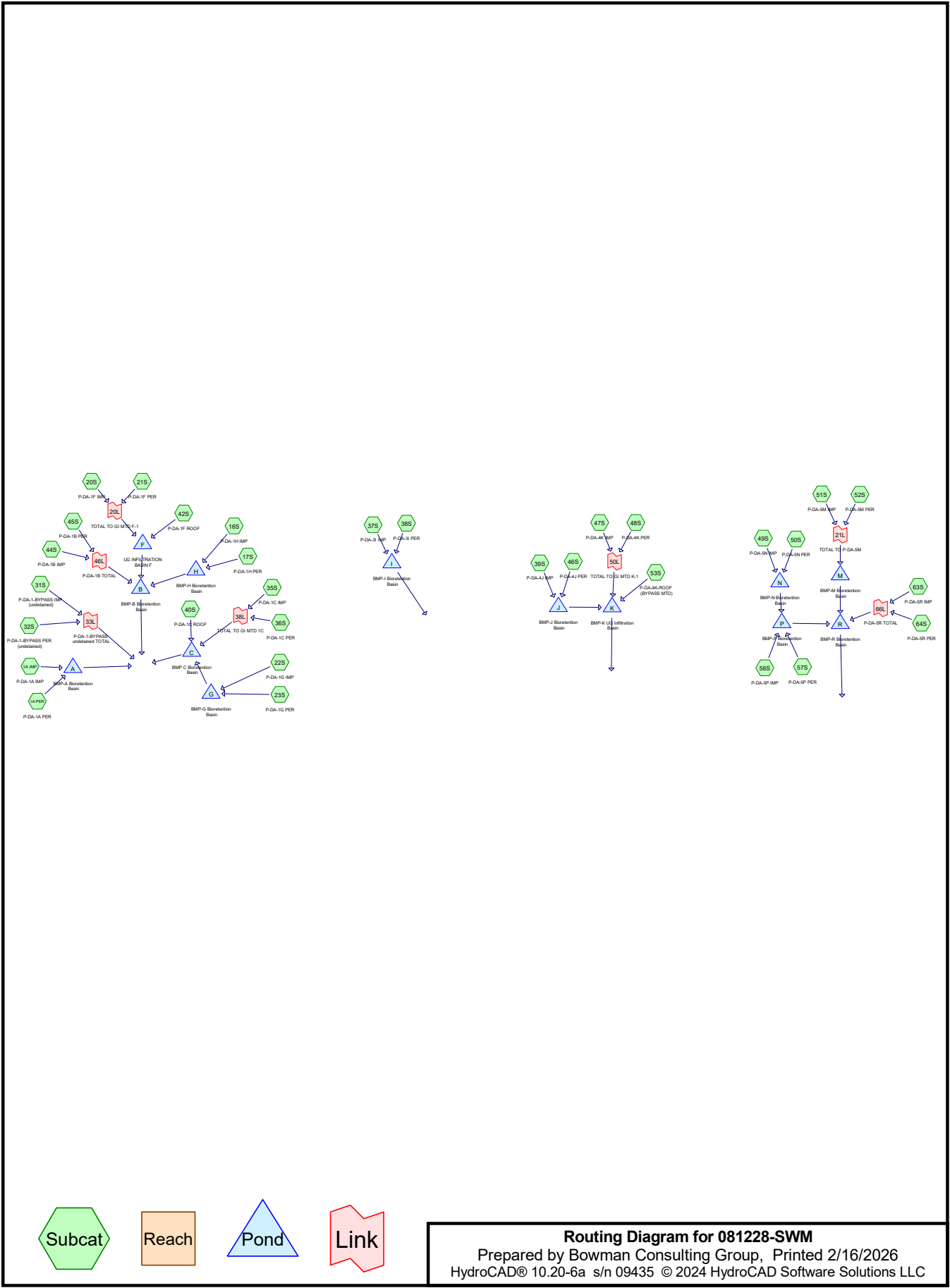
Inflow Area = 351,094 sf, 13.90% Impervious, Inflow Depth = 7.38" for 100-Year-Future event
Inflow = 48.12 cfs @ 12.24 hrs, Volume= 215,916 cf
Primary = 48.12 cfs @ 12.24 hrs, Volume= 215,916 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 27L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 15L: X-DA-5 TOTAL (POA-5)**Hydrograph**

APPENDIX E

PROPOSED CONDITIONS
CALCULATIONS



Routing Diagram for 081228-SWM

Prepared by Bowman Consulting Group, Printed 2/16/2026
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
356,059	61	>75% Grass cover, Good, HSG B (1A PER, 17S, 21S, 23S, 36S, 38S, 45S, 46S, 48S, 50S, 52S, 57S, 64S)
9,148	98	IMPERVIOUS, HSG B (44S)
63,598	98	Impervious, HSG B (16S, 20S, 22S, 35S, 37S, 39S, 47S, 49S, 51S, 56S, 63S)
36,155	98	MOTOR VEH SURFACE, HSG B (31S, 44S)
152,024	98	Motor Veh Surface, Paved parking, HSG B (1A IMP, 16S, 20S, 22S, 35S, 37S, 39S, 47S, 49S, 51S, 56S, 63S)
28,314	61	OPEN SPACE, HSG B (32S)
26,572	98	ROOF, HSG B (44S)
168,142	98	Roofs, HSG B (16S, 20S, 22S, 37S, 39S, 40S, 42S, 47S, 49S, 51S, 53S, 56S, 63S)
840,011	81	TOTAL AREA

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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=299' Tc=0.9 min CN=98 Runoff=0.89 cfs 1,052 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=212' Tc=4.2 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=352' Tc=1.7 min CN=WQ Runoff=1.67 cfs 2,028 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=357' Tc=3.2 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=239' Tc=1.3 min CN=WQ Runoff=0.53 cfs 638 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=114' Tc=2.4 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=223' Tc=1.5 min CN=WQ Runoff=1.09 cfs 1,314 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=62' Tc=1.8 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=414' Tc=1.0 min CN=98 Runoff=0.06 cfs 75 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=356' Tc=4.9 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=524' Tc=1.6 min CN=WQ Runoff=1.08 cfs 1,314 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=546' Tc=2.7 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=295' Tc=1.9 min CN=WQ Runoff=1.72 cfs 2,103 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=242' Tc=1.4 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=376' Tc=2.5 min CN=WQ Runoff=1.60 cfs 1,990 cf
Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=1.03" Tc=5.0 min CN=98 Runoff=2.03 cfs 2,554 cf

081228-SWM

NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

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Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=96' Slope=0.0100 '/' Tc=1.3 min CN=98 Runoff=0.72 cfs 864 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=805' Tc=2.1 min CN=WQ Runoff=4.98 cfs 6,121 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=509' Tc=3.6 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=236' Tc=4.2 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=283' Tc=1.7 min CN=WQ Runoff=2.22 cfs 2,704 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=412' Tc=8.8 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=303' Tc=1.8 min CN=WQ Runoff=1.94 cfs 2,366 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=262' Tc=3.0 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=1,152' Tc=2.5 min CN=WQ Runoff=4.23 cfs 5,258 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=889' Tc=2.8 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.15 cfs 188 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=467' Tc=2.3 min CN=WQ Runoff=4.56 cfs 5,633 cf
Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=532' Tc=1.6 min CN=61 Runoff=0.00 cfs 0 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=634' Tc=1.9 min CN=WQ Runoff=2.52 cfs 3,080 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=655' Tc=4.9 min CN=61 Runoff=0.00 cfs 0 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=552.15' Storage=1,051 cf Inflow=0.89 cfs 1,052 cf Outflow=0.00 cfs 0 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=574.44' Storage=6,121 cf Inflow=4.98 cfs 6,121 cf Outflow=0.00 cfs 0 cf

081228-SWM*NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"*

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Pond C: BMP C Bioretention Basin	Peak Elev=560.53'	Storage=3,868 cf	Inflow=2.99 cfs 3,868 cf	Outflow=0.00 cfs 0 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=599.90'	Storage=1,502 cf	Inflow=1.25 cfs 1,502 cf	Outflow=0.00 cfs 0 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=609.40'	Storage=1,314 cf	Inflow=1.09 cfs 1,314 cf	Outflow=0.00 cfs 0 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=610.31'	Storage=2,028 cf	Inflow=1.67 cfs 2,028 cf	Outflow=0.00 cfs 0 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=614.11'	Storage=2,103 cf	Inflow=1.72 cfs 2,103 cf	Outflow=0.00 cfs 0 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=607.80'	Storage=1,990 cf	Inflow=1.60 cfs 1,990 cf	Outflow=0.00 cfs 0 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=594.33'	Storage=2,892 cf	Inflow=2.37 cfs 2,892 cf	Outflow=0.00 cfs 0 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=568.93'	Storage=5,258 cf	Inflow=4.23 cfs 5,258 cf	Outflow=0.00 cfs 0 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=597.44'	Storage=2,366 cf	Inflow=1.94 cfs 2,366 cf	Outflow=0.00 cfs 0 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=577.00'	Storage=5,633 cf	Inflow=4.56 cfs 5,633 cf	Outflow=0.00 cfs 0 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=562.74'	Storage=3,079 cf	Inflow=2.52 cfs 3,080 cf	Outflow=0.00 cfs 0 cf
Link 20L: TOTAL TO GI MTD F-1			Inflow=0.53 cfs 638 cf	Primary=0.53 cfs 638 cf
Link 21L: TOTAL TO P-DA-5M			Inflow=4.23 cfs 5,258 cf	Primary=4.23 cfs 5,258 cf
Link 33L: P-DA-1-BYPASS undetained TOTAL			Inflow=0.06 cfs 75 cf	Primary=0.06 cfs 75 cf
Link 38L: TOTAL TO GI MTD 1C			Inflow=1.08 cfs 1,314 cf	Primary=1.08 cfs 1,314 cf
Link 46L: P-DA-1B TOTAL			Inflow=4.98 cfs 6,121 cf	Primary=4.98 cfs 6,121 cf
Link 50L: TOTAL TO GI MTD K-1			Inflow=2.22 cfs 2,704 cf	Primary=2.22 cfs 2,704 cf

081228-SWM*NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"*

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Link 66L: P-DA-5R TOTAL

Inflow=2.52 cfs 3,080 cf

Primary=2.52 cfs 3,080 cf

Total Runoff Area = 840,011 sf Runoff Volume = 39,283 cf Average Runoff Depth = 0.56"
45.76% Pervious = 384,373 sf 54.24% Impervious = 455,638 sf

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 0.89 cfs @ 1.03 hrs, Volume= 1,052 cf, Depth= 1.03"
 Routed to Pond A : BMP-A Bioretention Basin

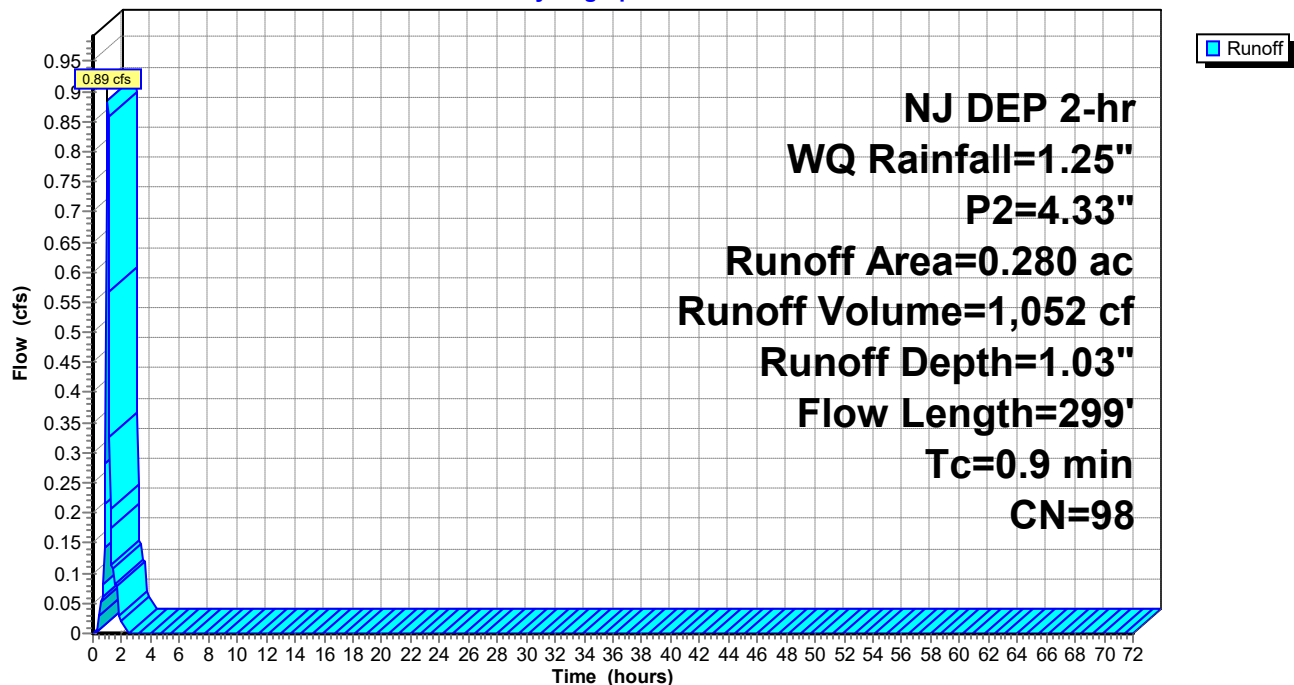
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.9	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



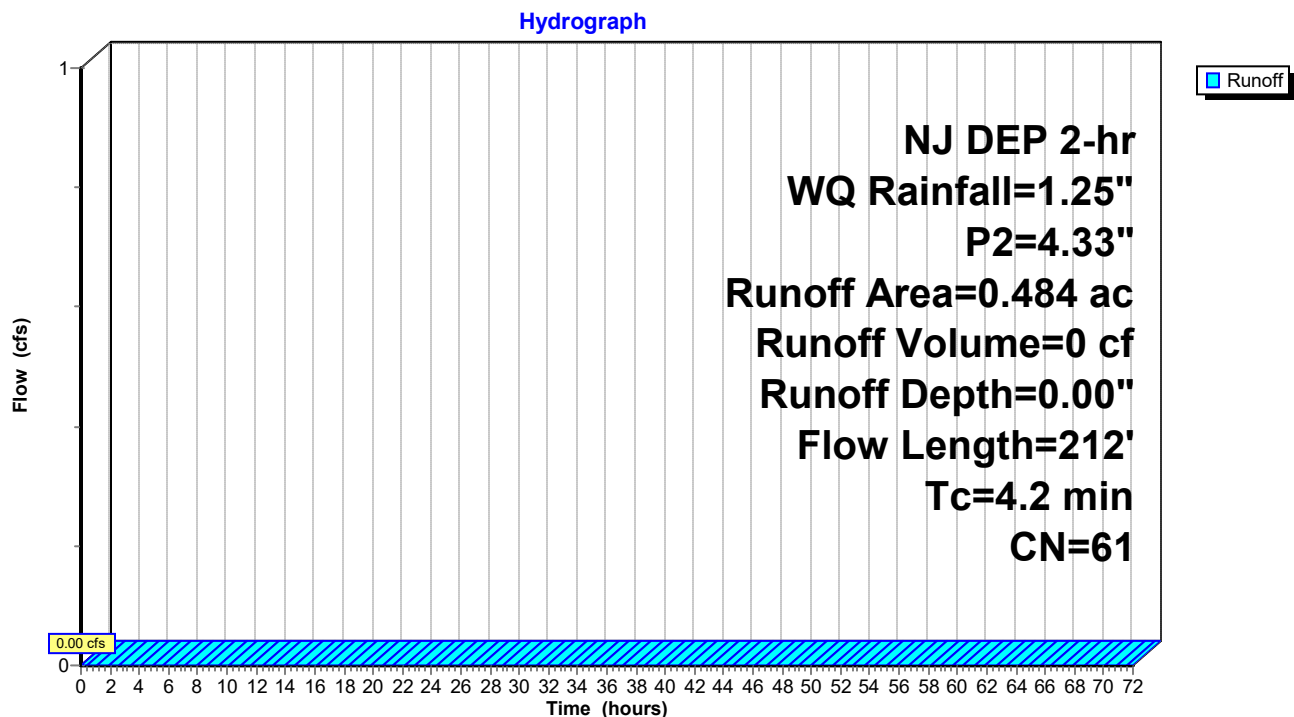
Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond A : BMP-A Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1300	0.42		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.2	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 1.67 cfs @ 1.03 hrs, Volume= 2,028 cf, Depth= 1.03"
 Routed to Pond H : BMP-H Bioretention Basin

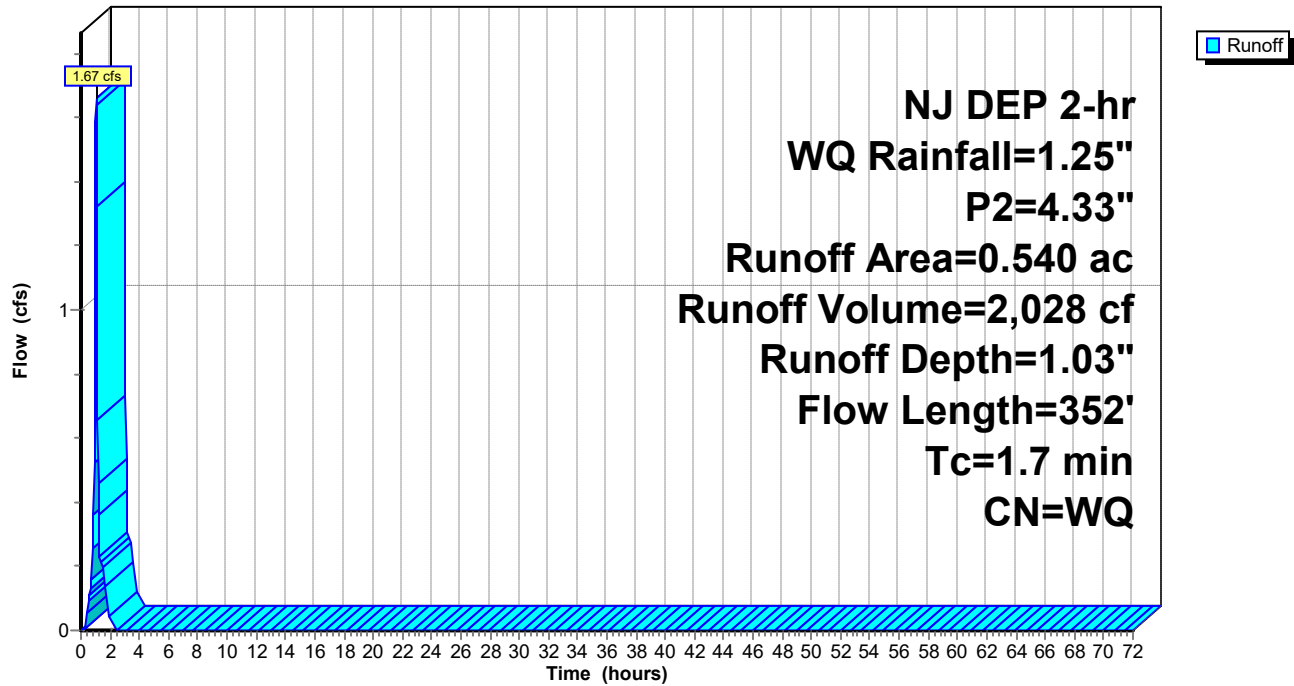
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0310	1.91		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



Summary for Subcatchment 17S: P-DA-1H PER

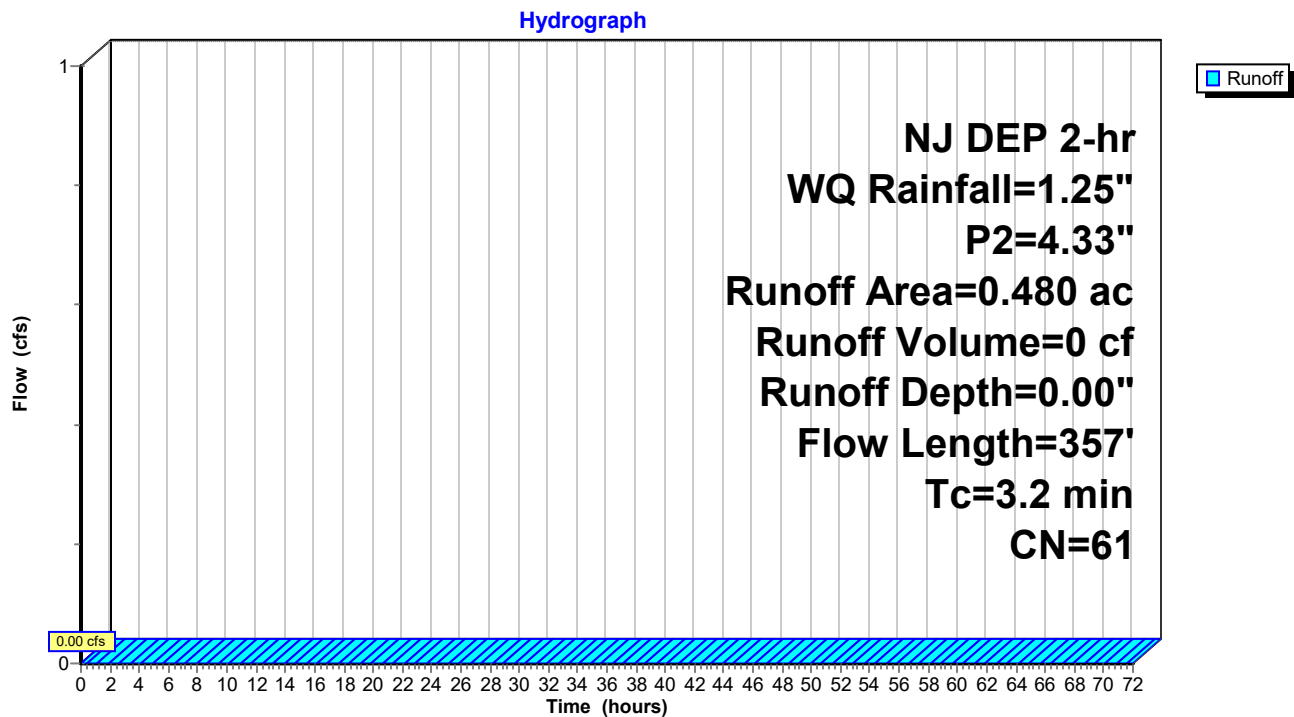
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond H : BMP-H Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	18	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	357	Total			

Subcatchment 17S: P-DA-1H PER



Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 0.53 cfs @ 1.03 hrs, Volume= 638 cf, Depth= 1.03"
 Routed to Link 20L : TOTAL TO GI MTD F-1

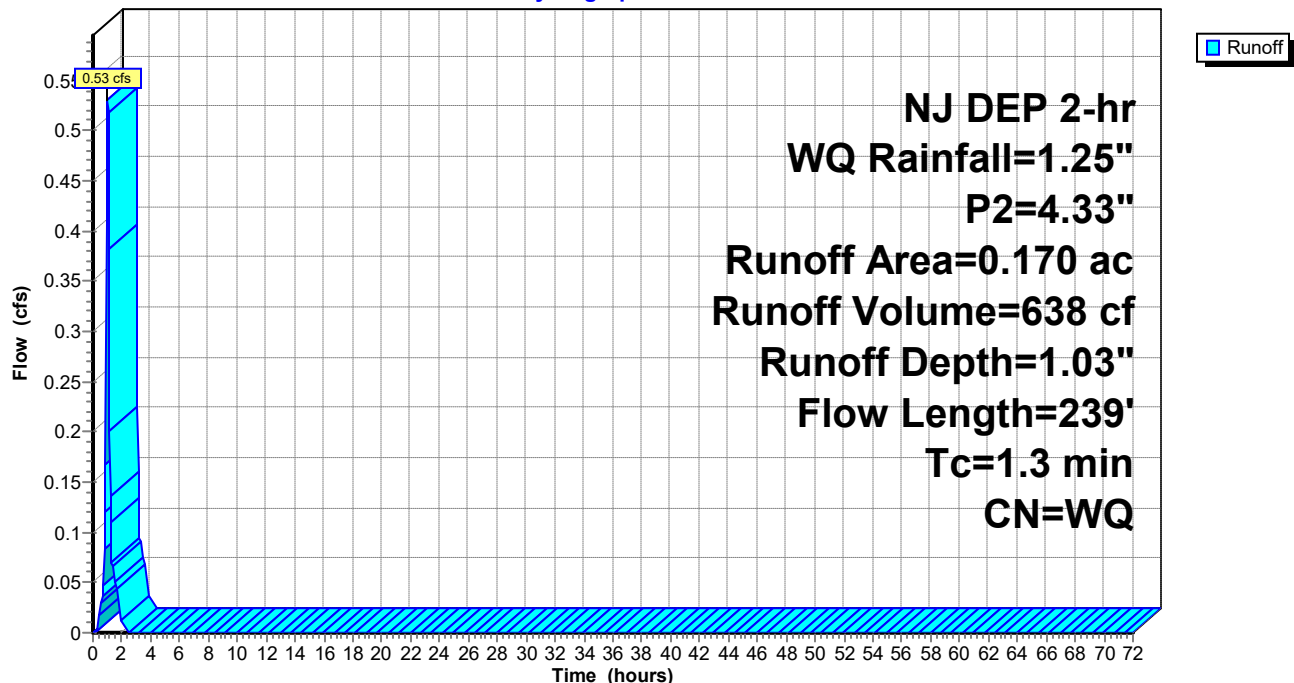
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



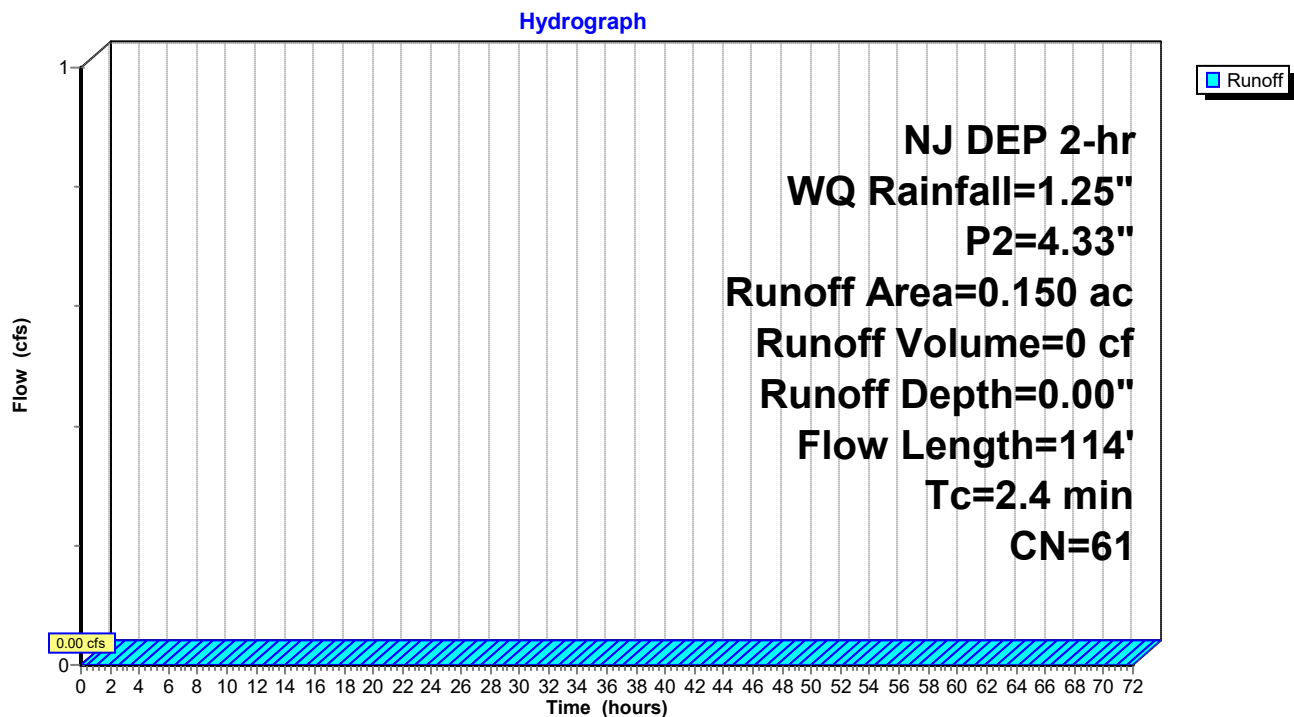
Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 20L : TOTAL TO GI MTD F-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	17	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.4	114	Total			

Subcatchment 21S: P-DA-1F PER

Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 1.09 cfs @ 1.03 hrs, Volume= 1,314 cf, Depth= 1.03"
 Routed to Pond G : BMP-G Bioretention Basin

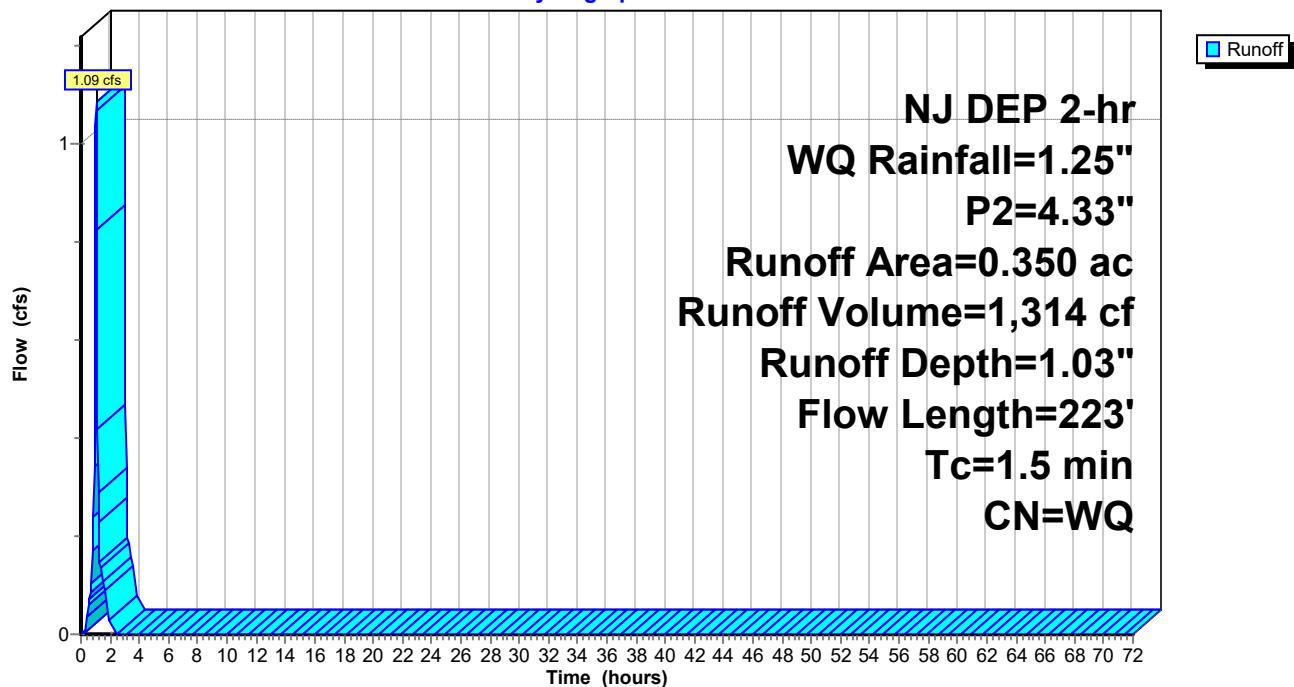
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	113	0.0240	1.76		Sheet Flow , Smooth surfaces n= 0.011 P2= 4.33"
0.3	80	0.0050	4.03	4.95	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.5	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond G : BMP-G Bioretention Basin

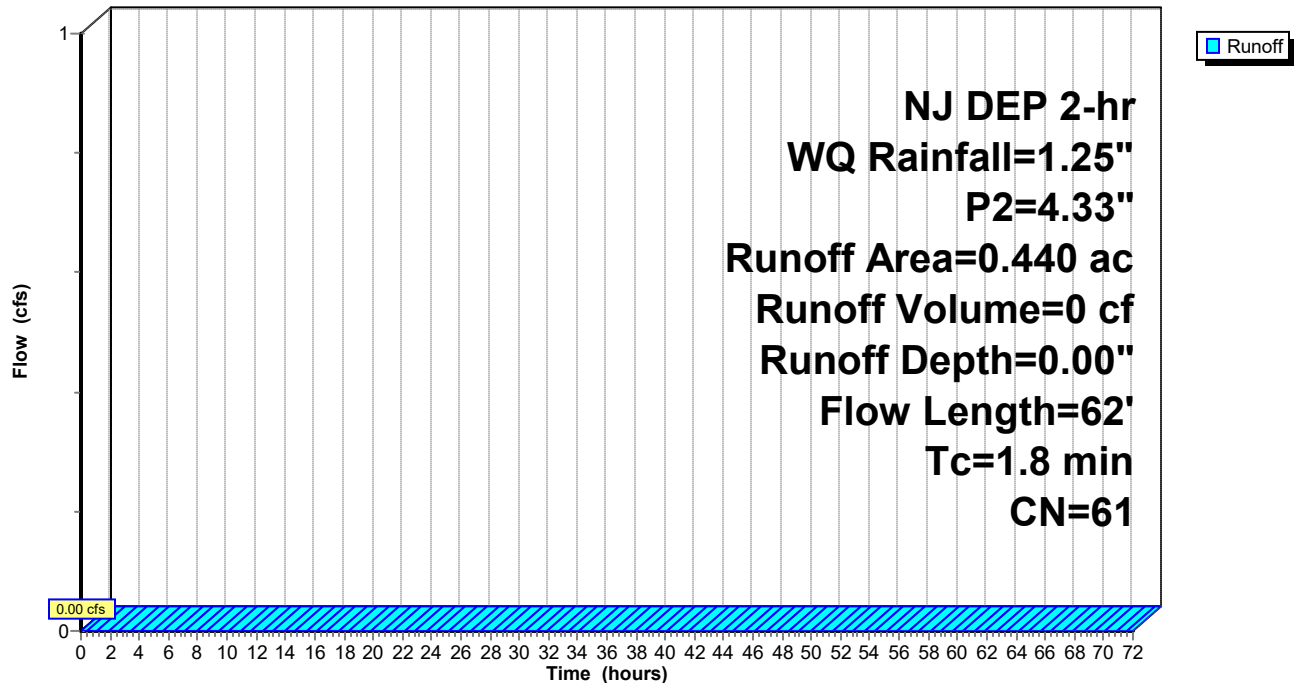
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.8	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.06 cfs @ 1.03 hrs, Volume= 75 cf, Depth= 1.03"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

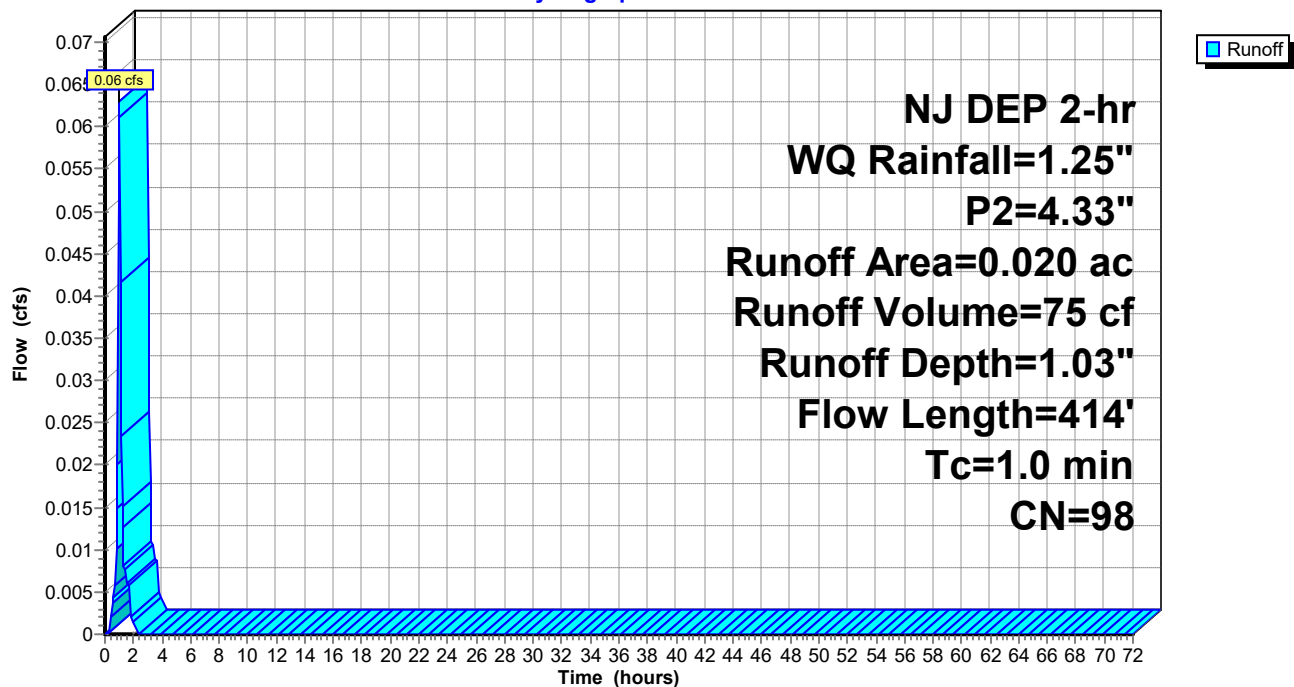
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	43	0.0330	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.0	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

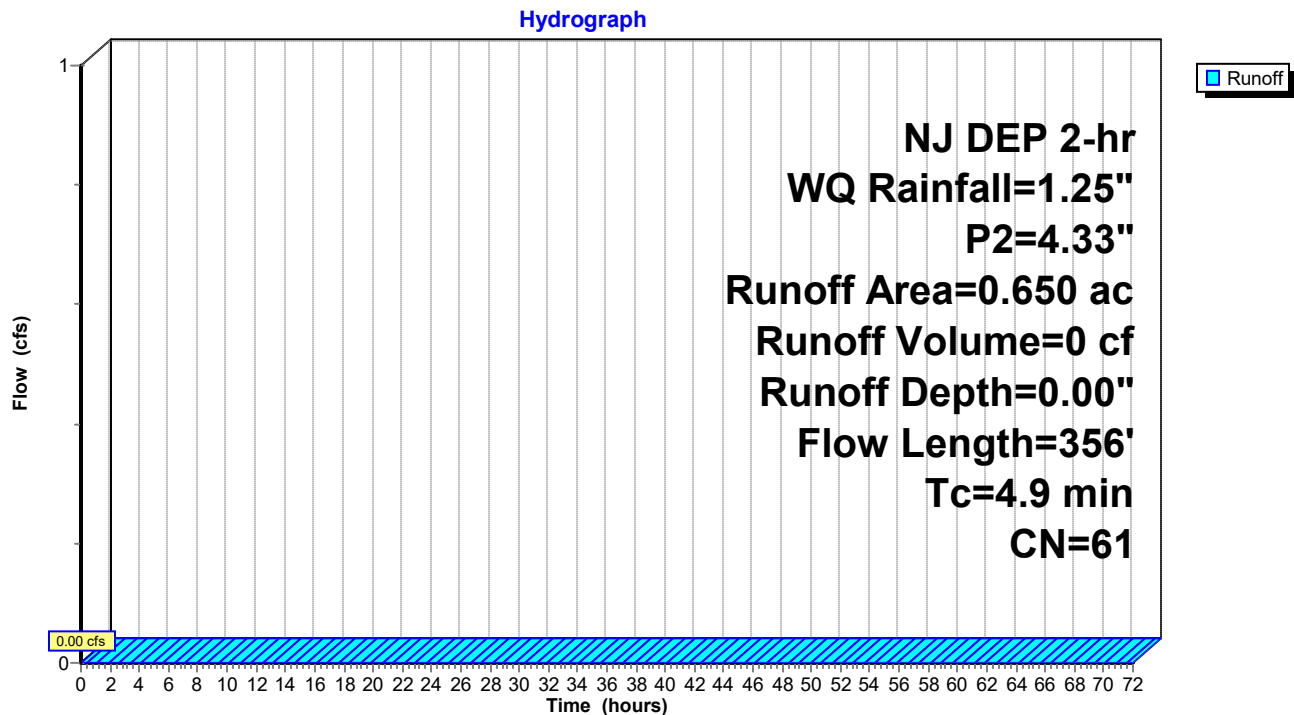
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	67	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.9	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Summary for Subcatchment 35S: P-DA-1C IMP

Runoff = 1.08 cfs @ 1.03 hrs, Volume= 1,314 cf, Depth= 1.03"
 Routed to Link 38L : TOTAL TO GI MTD 1C

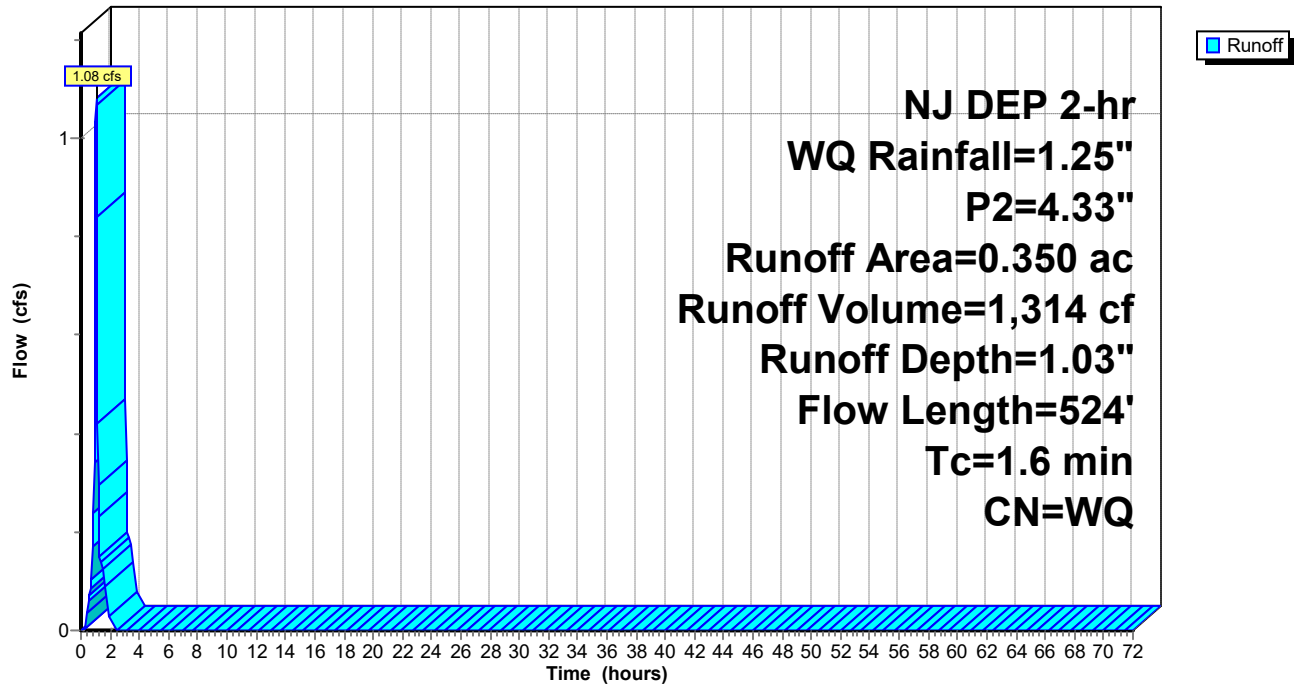
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0200	1.27		Sheet Flow , Smooth surfaces n= 0.011 P2= 4.33"
0.5	130	0.0054	4.19	5.14	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.6	524	Total			

Subcatchment 35S: P-DA-1C IMP

Hydrograph



Summary for Subcatchment 36S: P-DA-1C PER

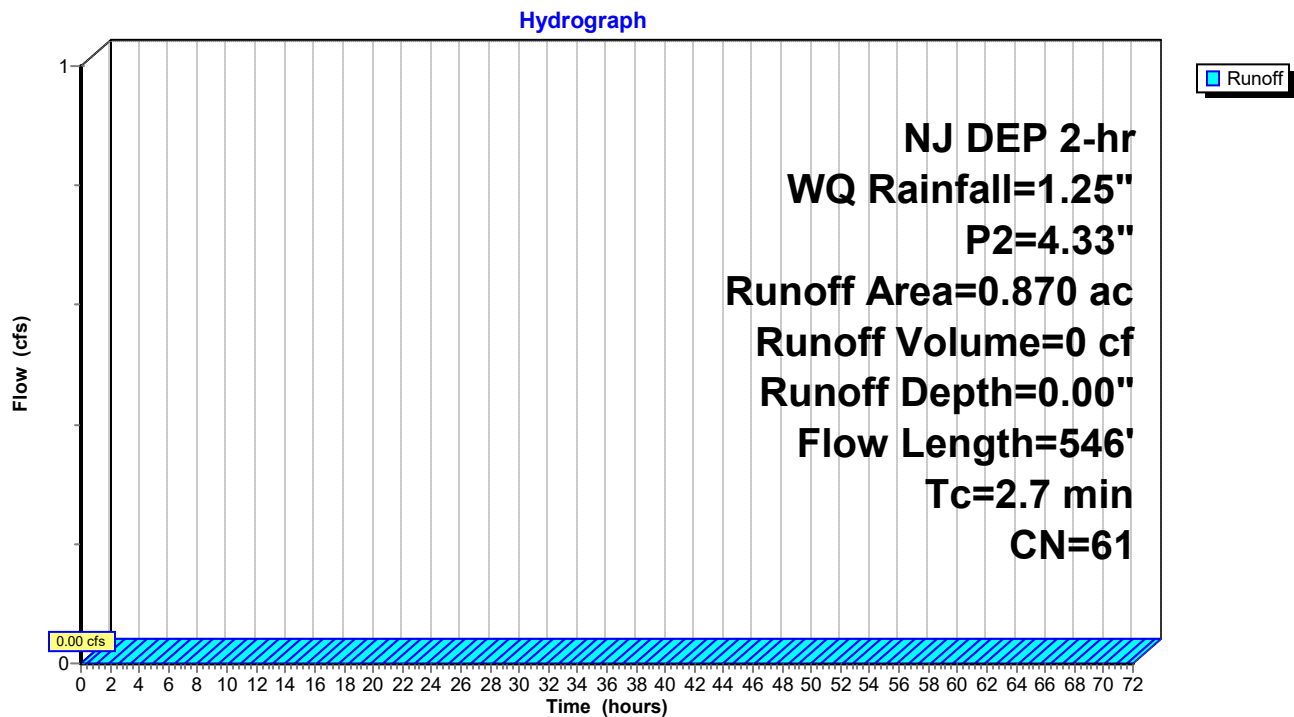
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	38	0.1900	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.7	546	Total			

Subcatchment 36S: P-DA-1C PER



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 1.72 cfs @ 1.03 hrs, Volume= 2,103 cf, Depth= 1.03"
 Routed to Pond I : BMP-I Bioretention Basin

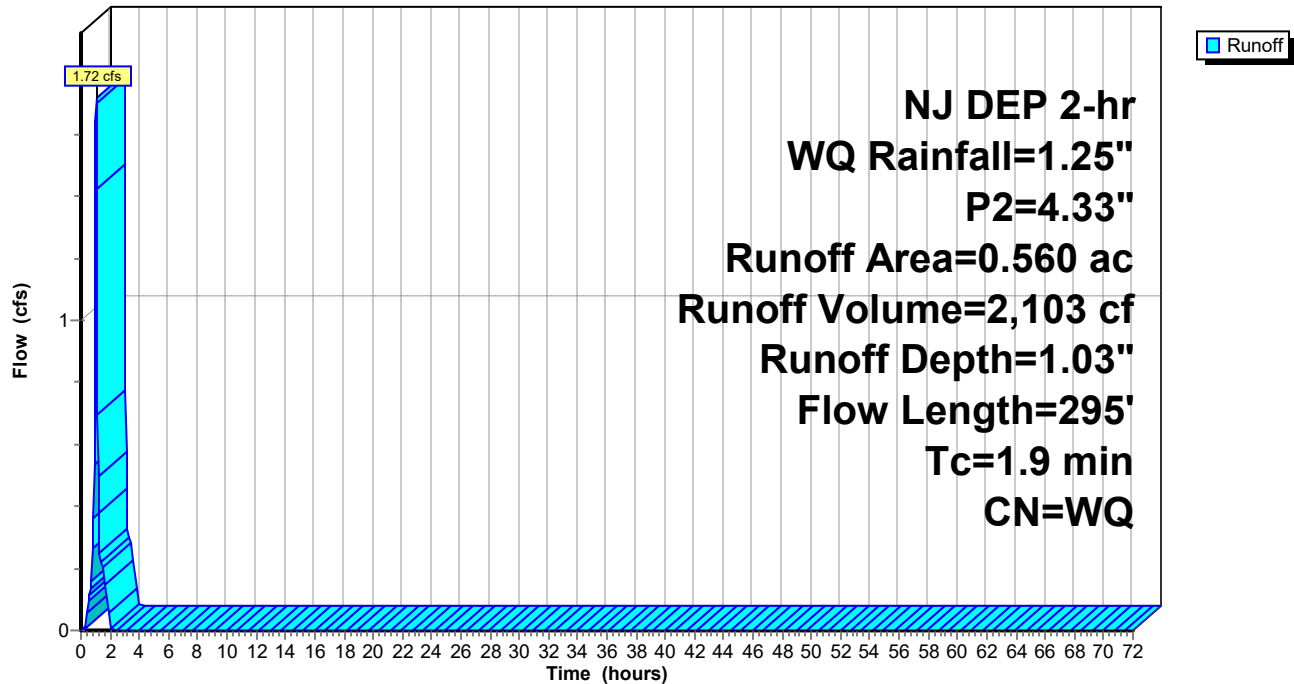
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0170	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.9	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond I : BMP-I Bioretention Basin

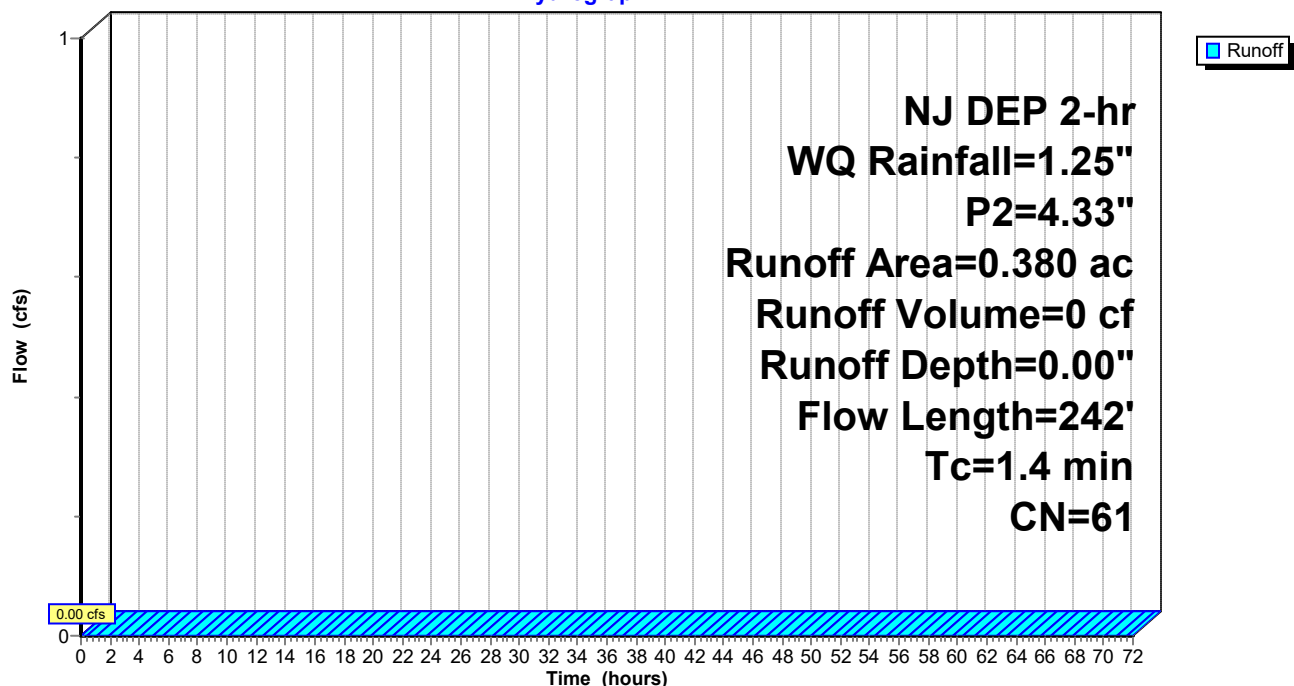
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.24		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	167	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 1.60 cfs @ 1.04 hrs, Volume= 1,990 cf, Depth= 1.03"
 Routed to Pond J : BMP-J Bioretention Basin

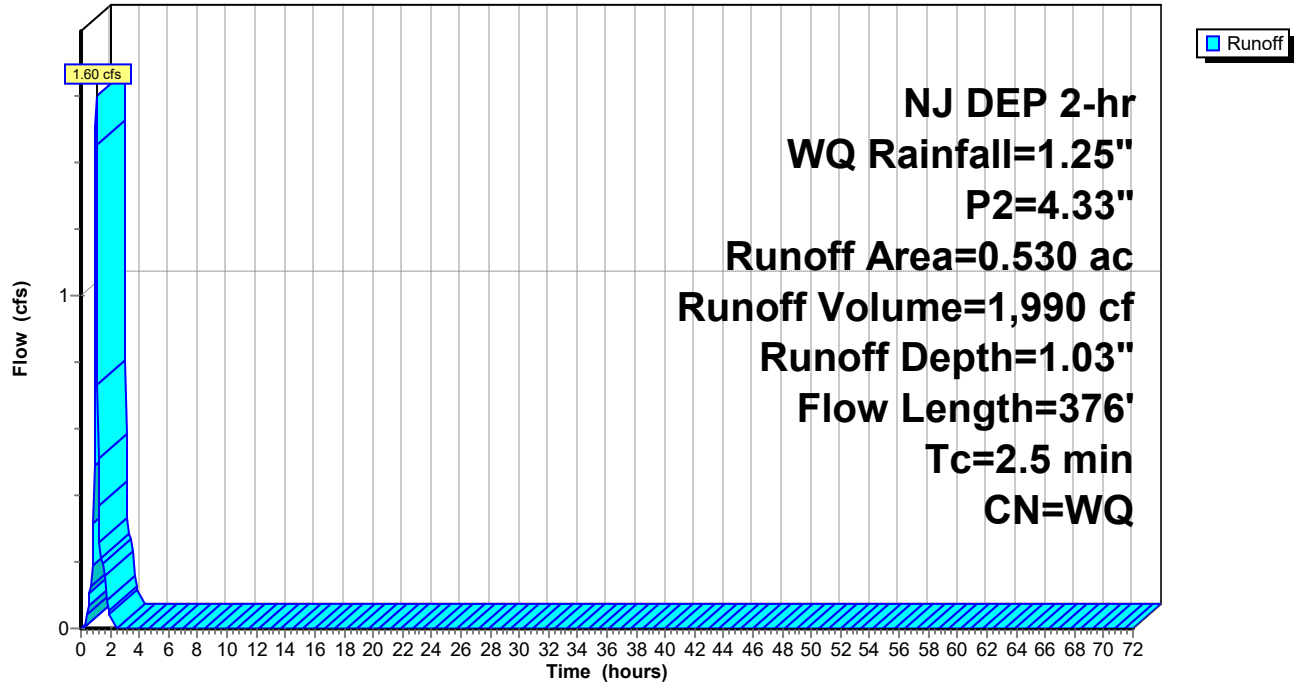
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.5	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 2.03 cfs @ 1.08 hrs, Volume= 2,554 cf, Depth= 1.03"
 Routed to Pond C : BMP C Bioretention Basin

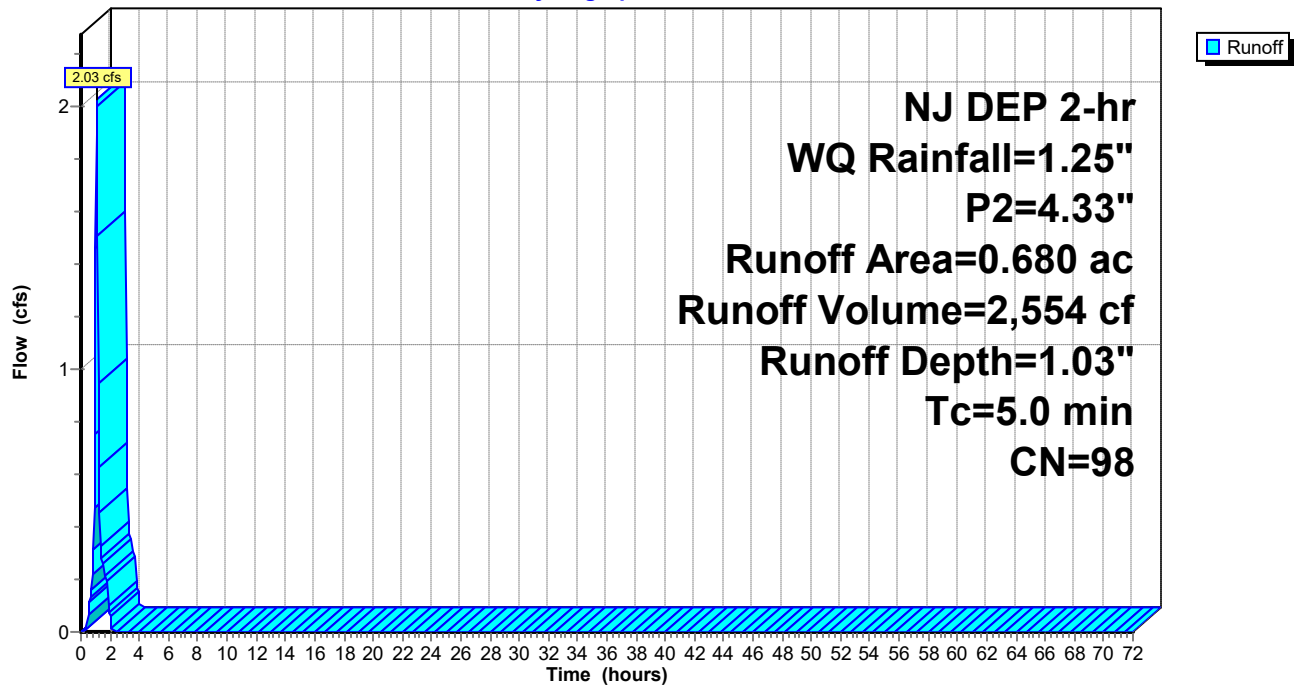
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 0.72 cfs @ 1.03 hrs, Volume= 864 cf, Depth= 1.03"
 Routed to Pond F : UG INFILTRATION BASIN F

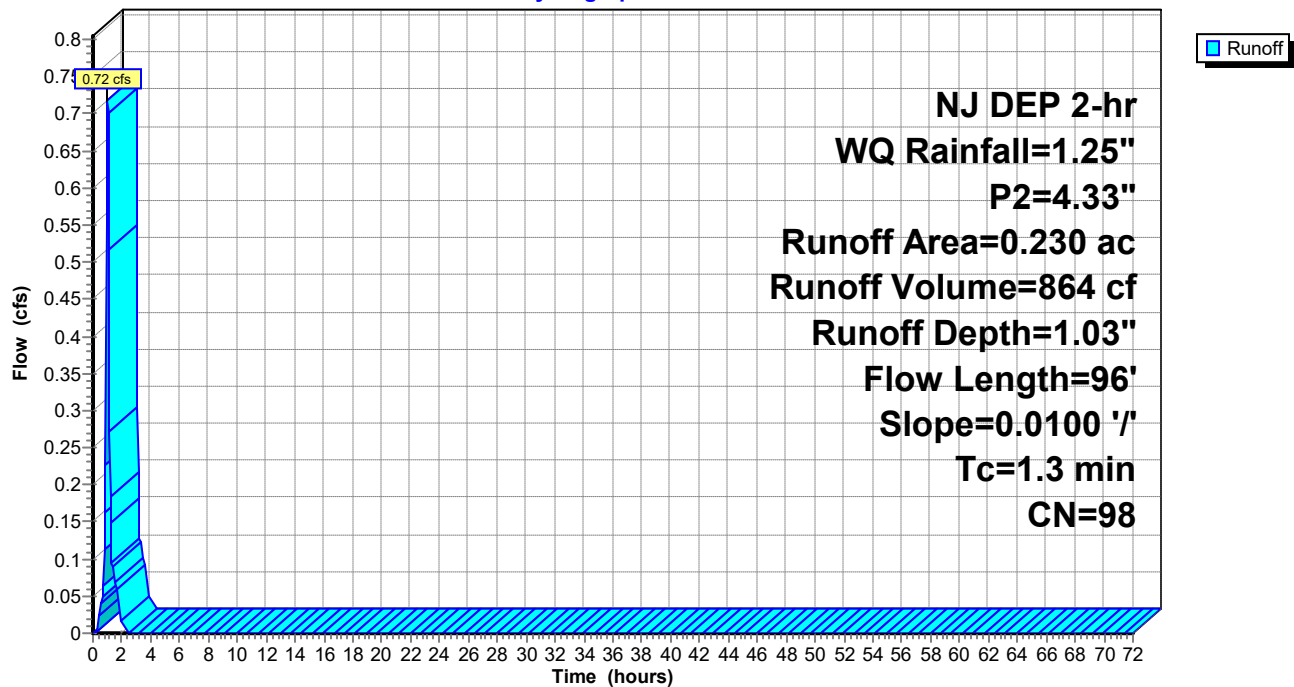
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	96	0.0100	1.20		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 4.98 cfs @ 1.04 hrs, Volume= 6,121 cf, Depth= 1.03"
 Routed to Link 46L : P-DA-1B TOTAL

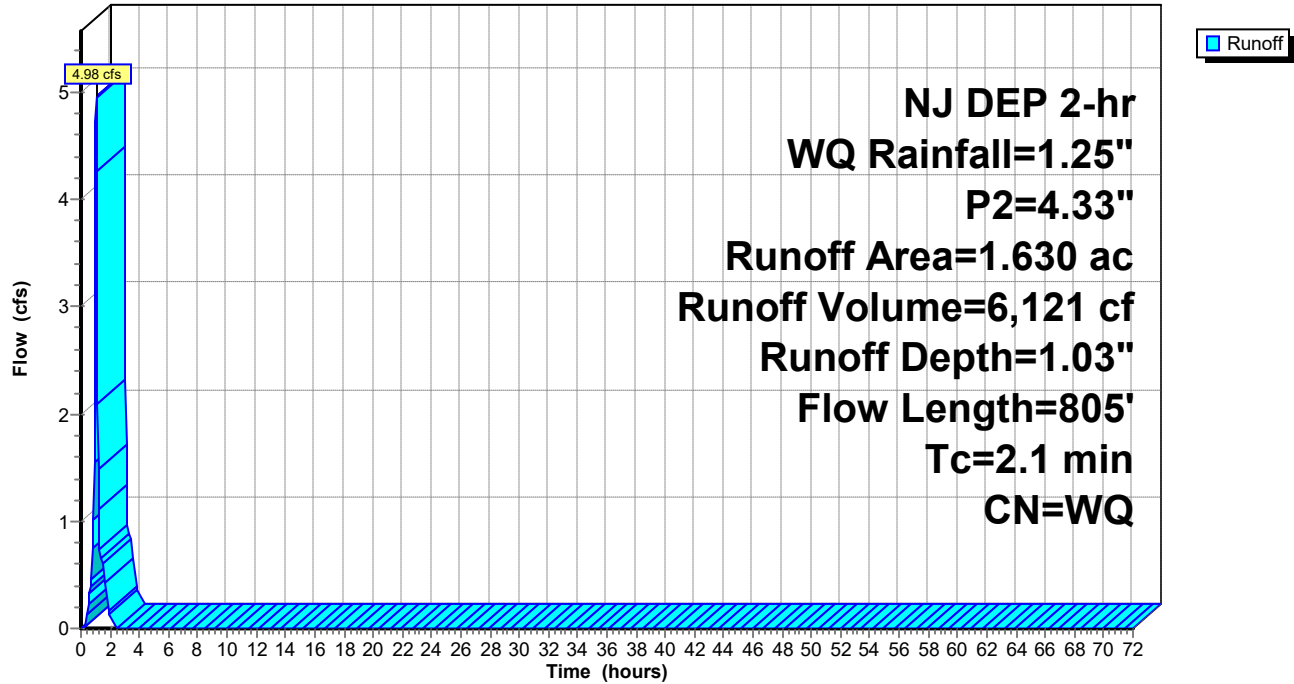
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.1	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

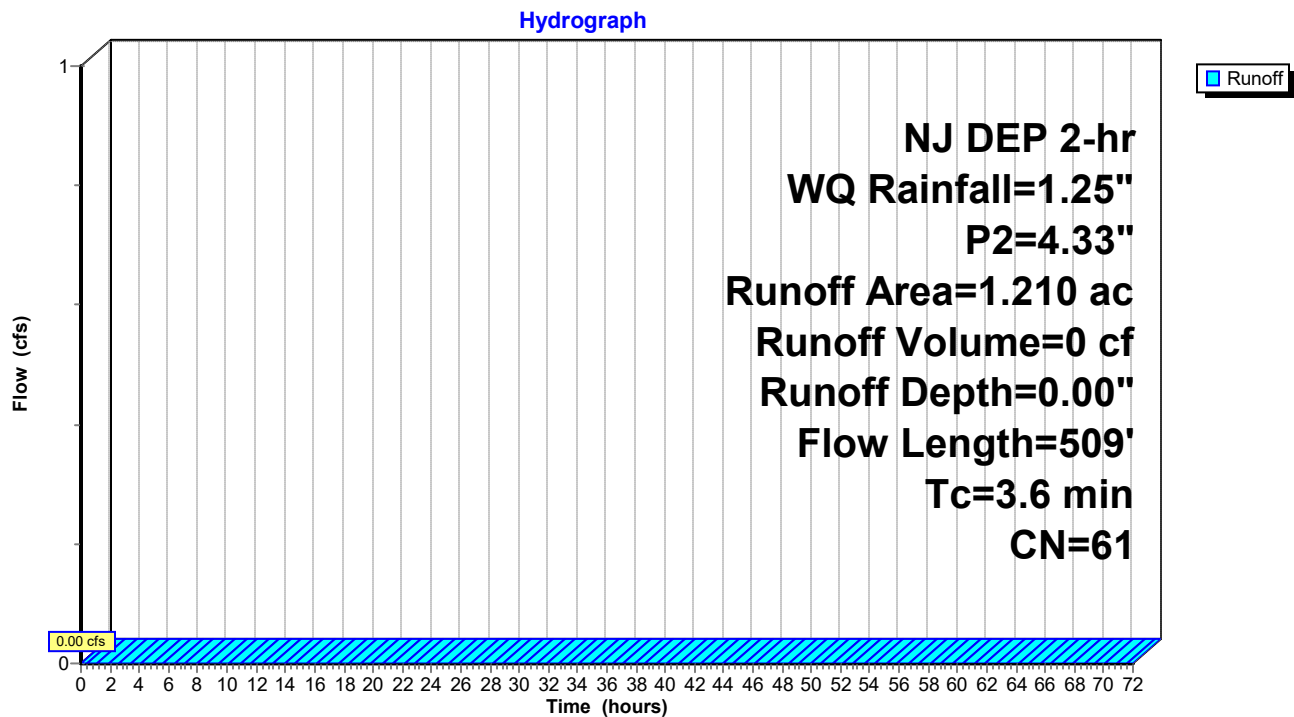
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 46L : P-DA-1B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	12	0.0110	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.1	107	0.0210	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	509	Total			

Subcatchment 45S: P-DA-1B PER



Summary for Subcatchment 46S: P-DA-4J PER

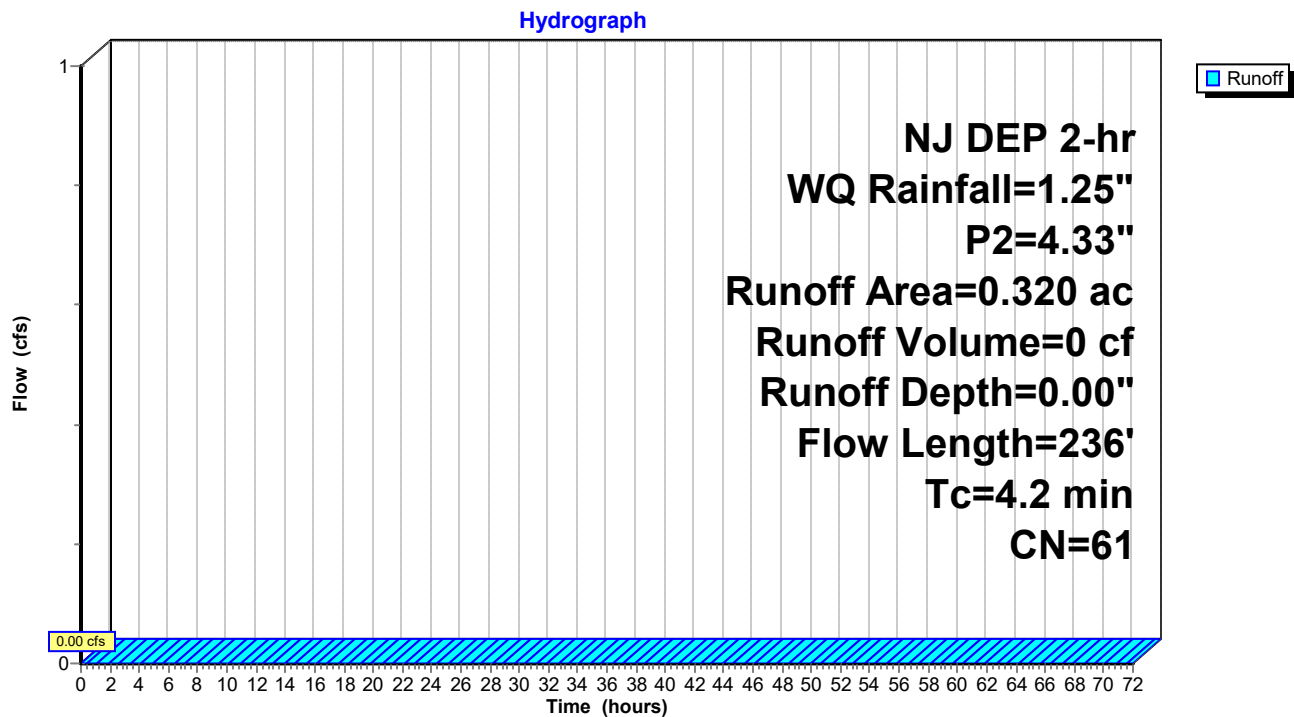
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond J : BMP-J Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	30	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.2	236	Total			

Subcatchment 46S: P-DA-4J PER



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf, Depth= 1.03"
 Routed to Link 50L : TOTAL TO GI MTD K-1

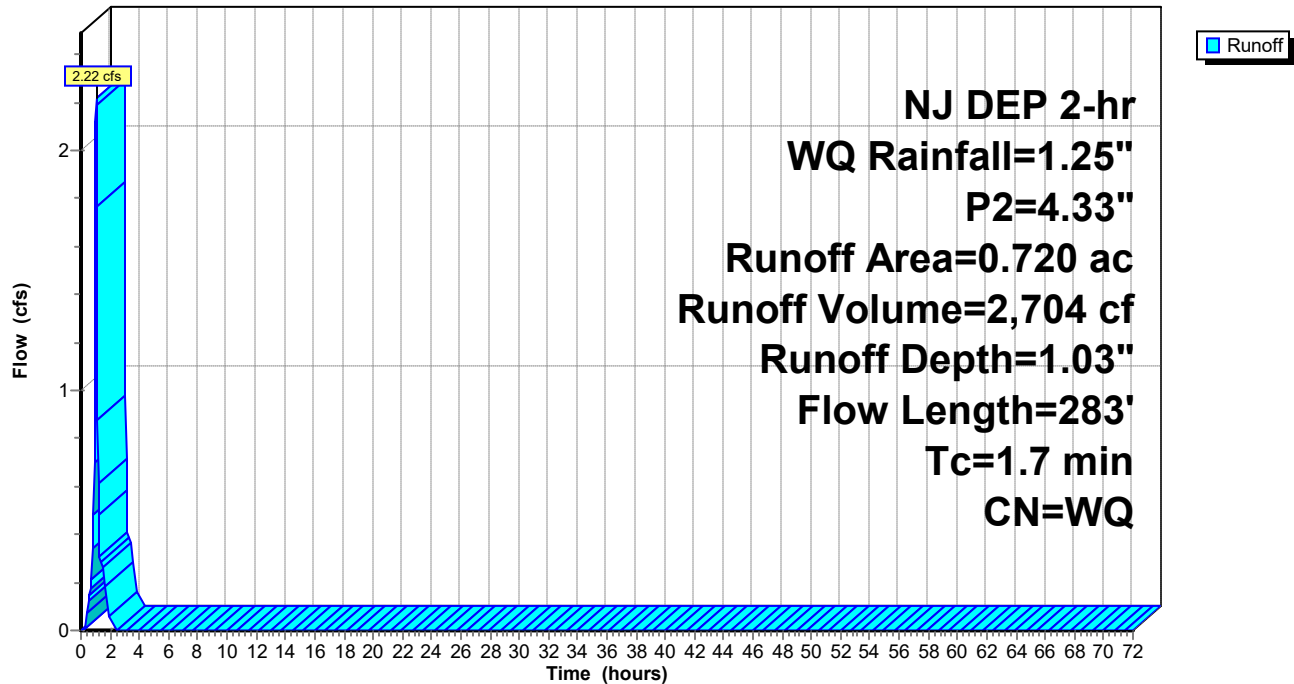
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.7	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

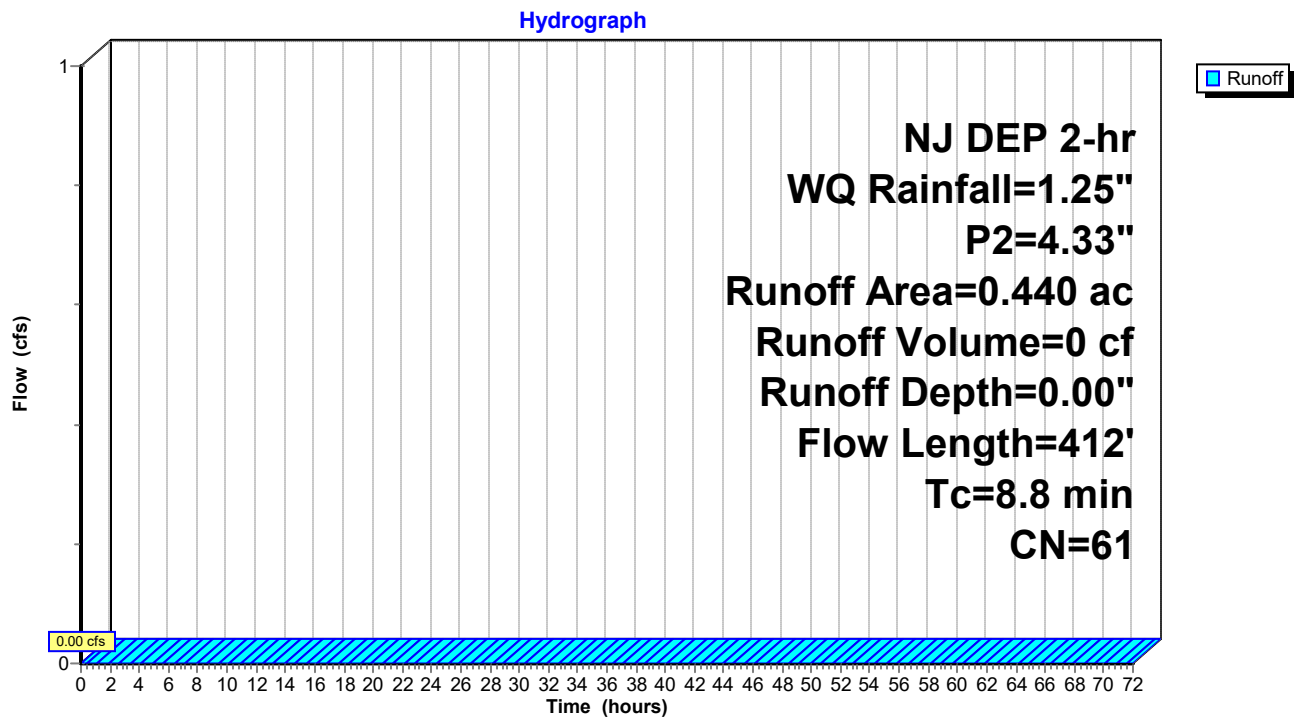
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 50L : TOTAL TO GI MTD K-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	96	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.8	412	Total			

Subcatchment 48S: P-DA-4K PER



Summary for Subcatchment 49S: P-DA-5N IMP

Runoff = 1.94 cfs @ 1.03 hrs, Volume= 2,366 cf, Depth= 1.03"
 Routed to Pond N : BMP-N Bioretention Basin

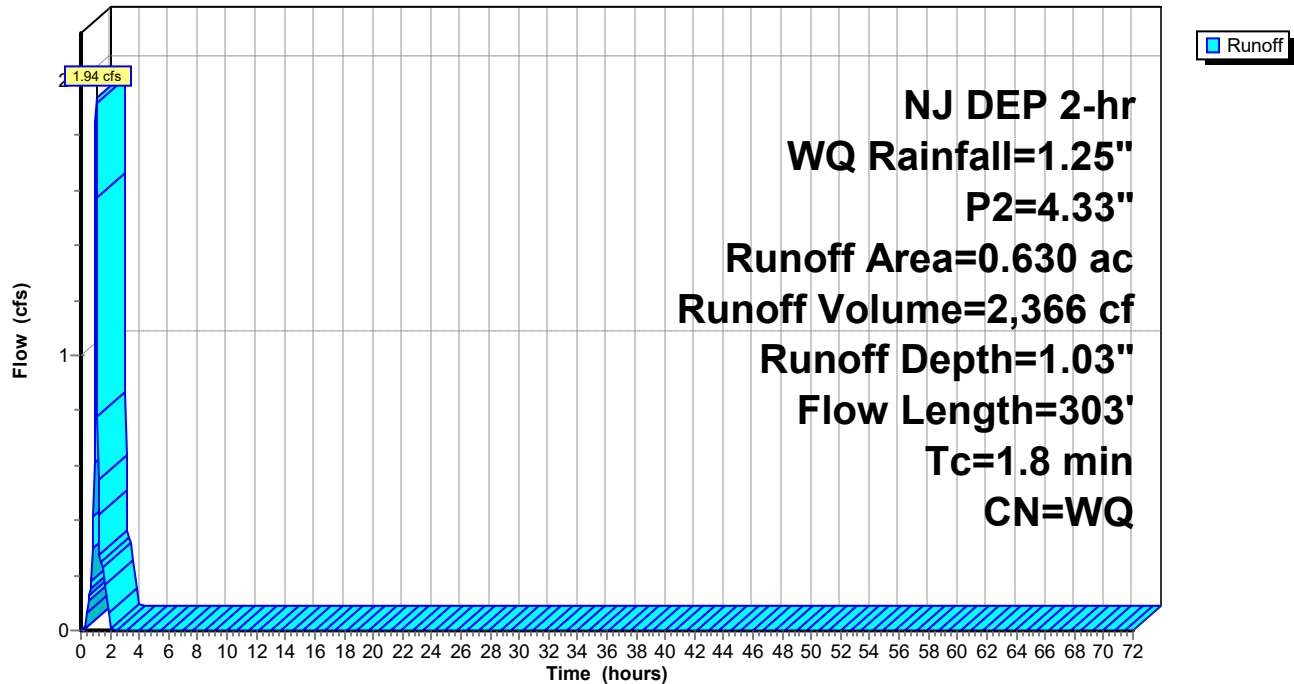
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0270	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	303	Total			

Subcatchment 49S: P-DA-5N IMP

Hydrograph



Summary for Subcatchment 50S: P-DA-5N PER

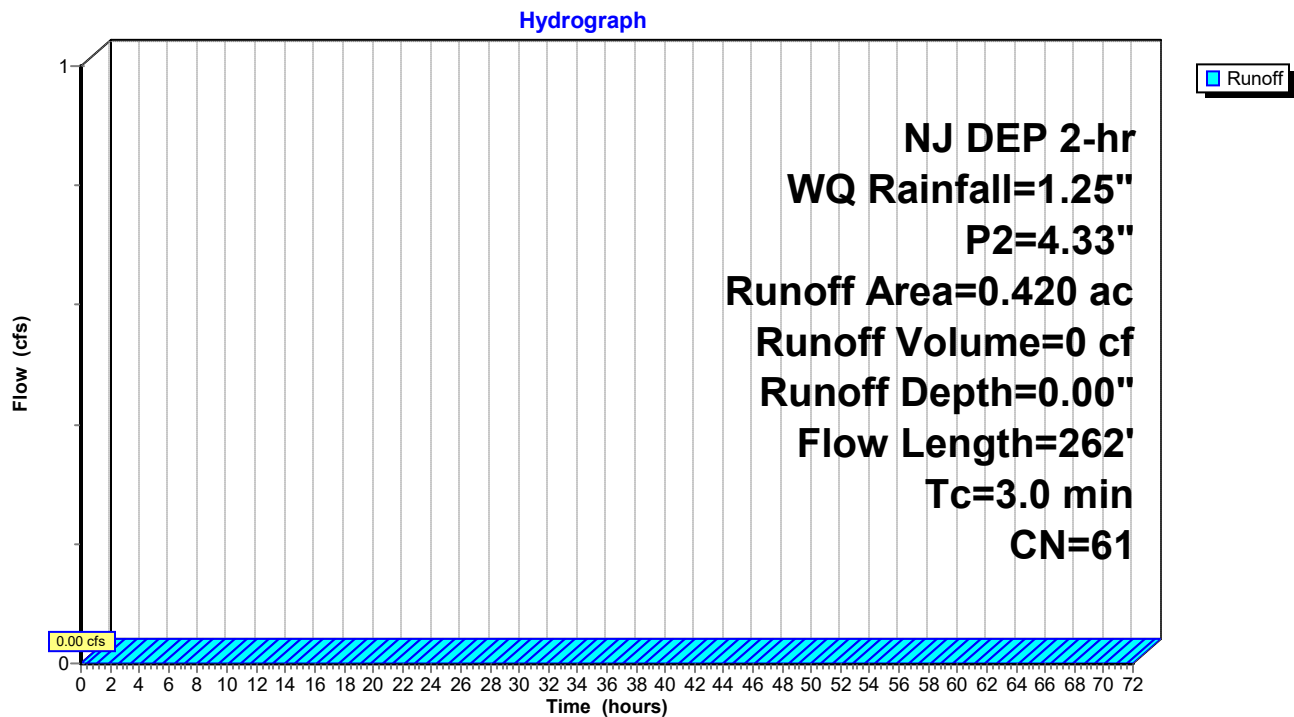
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond N : BMP-N Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	35	0.0570	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.0	262	Total			

Subcatchment 50S: P-DA-5N PER



Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 4.23 cfs @ 1.04 hrs, Volume= 5,258 cf, Depth= 1.03"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	41	0.1200	2.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

081228-SWM

Prepared by Bowman Consulting Group

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NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

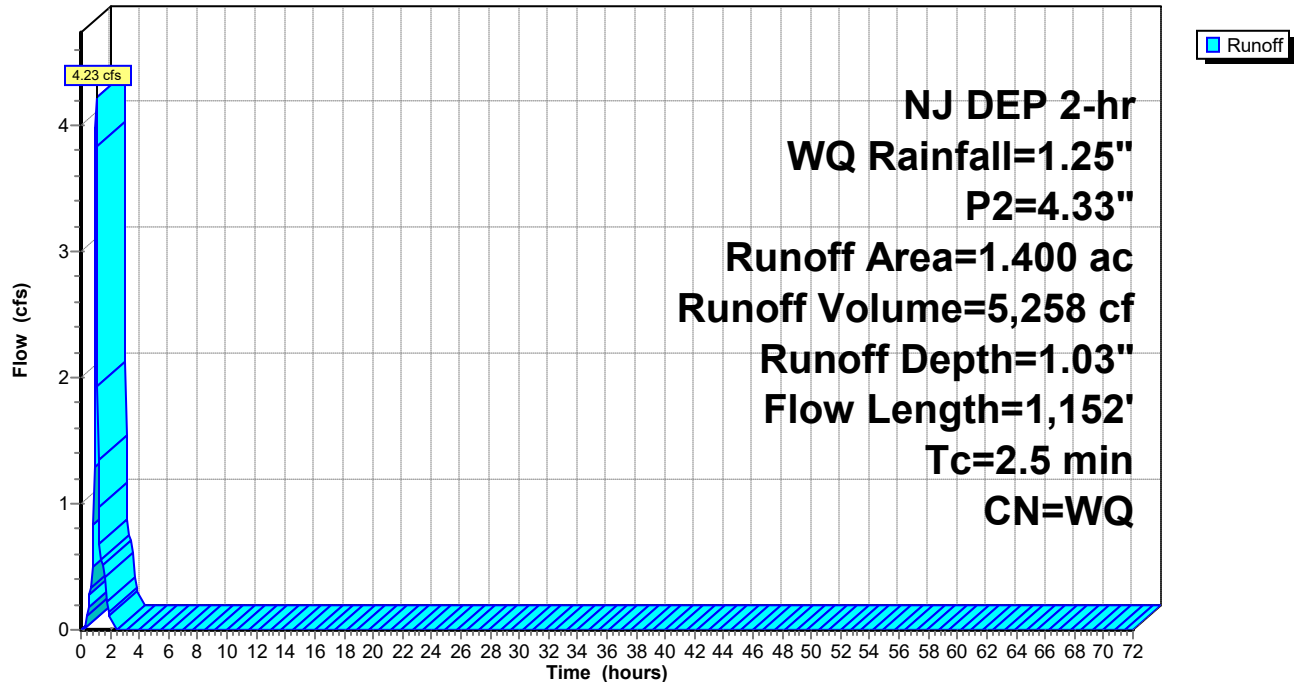
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0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.5	1,152	Total			

Subcatchment 51S: P-DA-5M IMP

Hydrograph



Summary for Subcatchment 52S: P-DA-5M PER

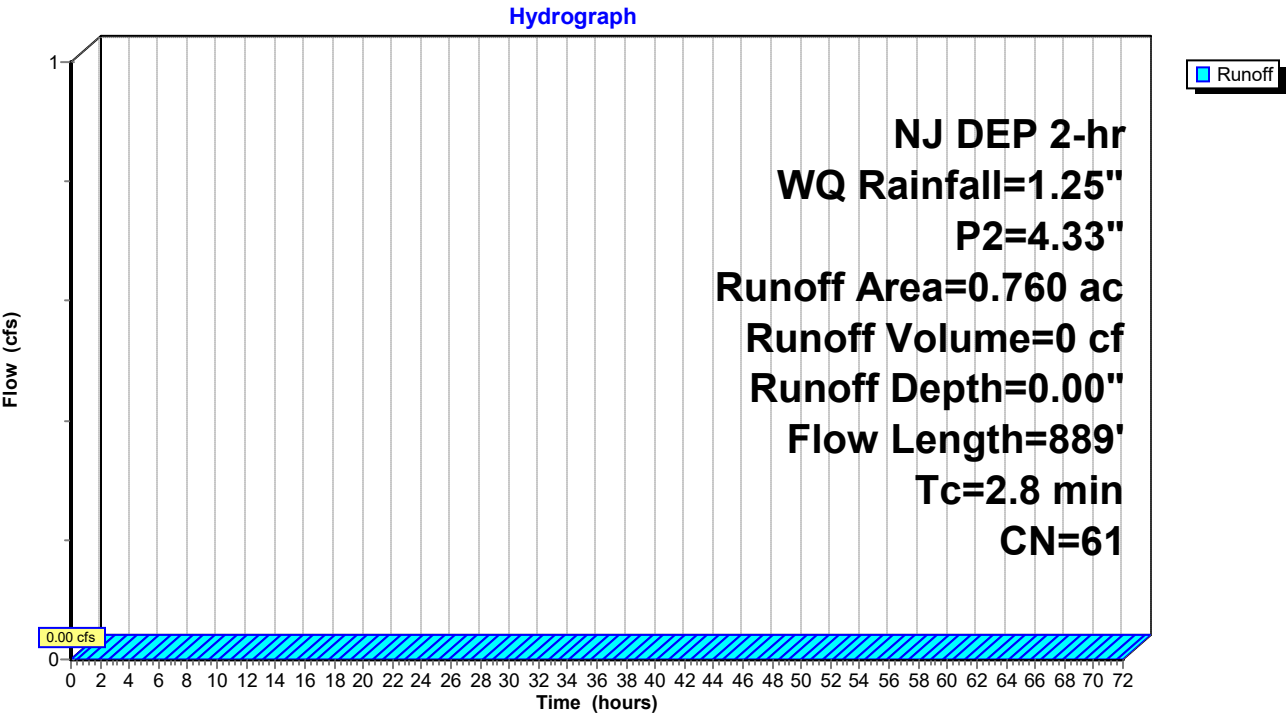
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	20	0.2000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.8	889	Total			

Subcatchment 52S: P-DA-5M PER



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.15 cfs @ 1.04 hrs, Volume= 188 cf, Depth= 1.03"
 Routed to Pond K : BMP-K UG Infiltration Basin

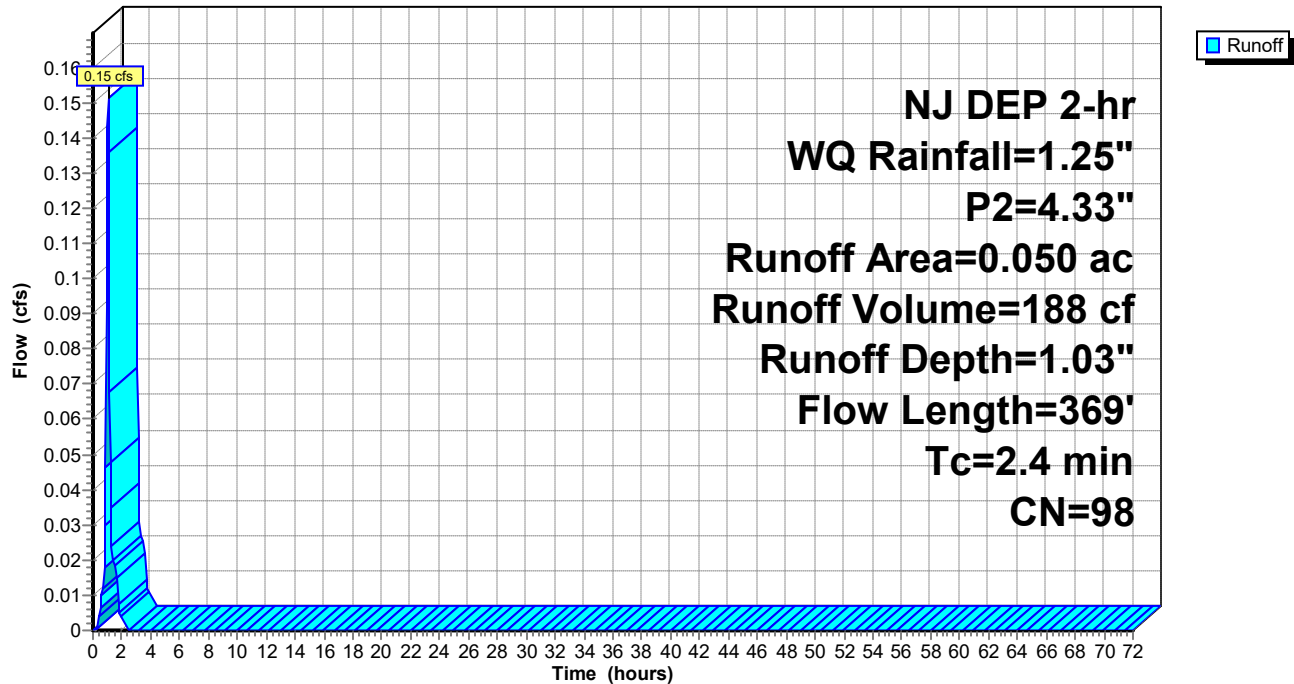
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 4.56 cfs @ 1.04 hrs, Volume= 5,633 cf, Depth= 1.03"
 Routed to Pond P : BMP-P Bioretention Basin

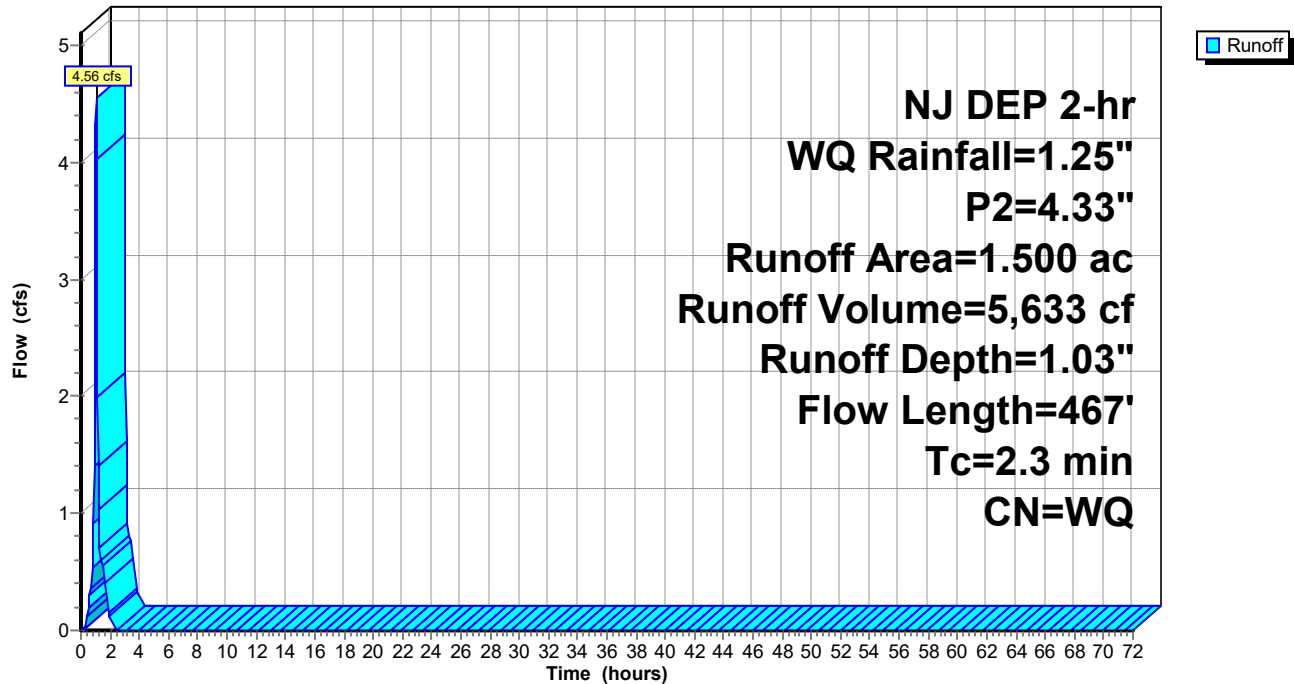
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



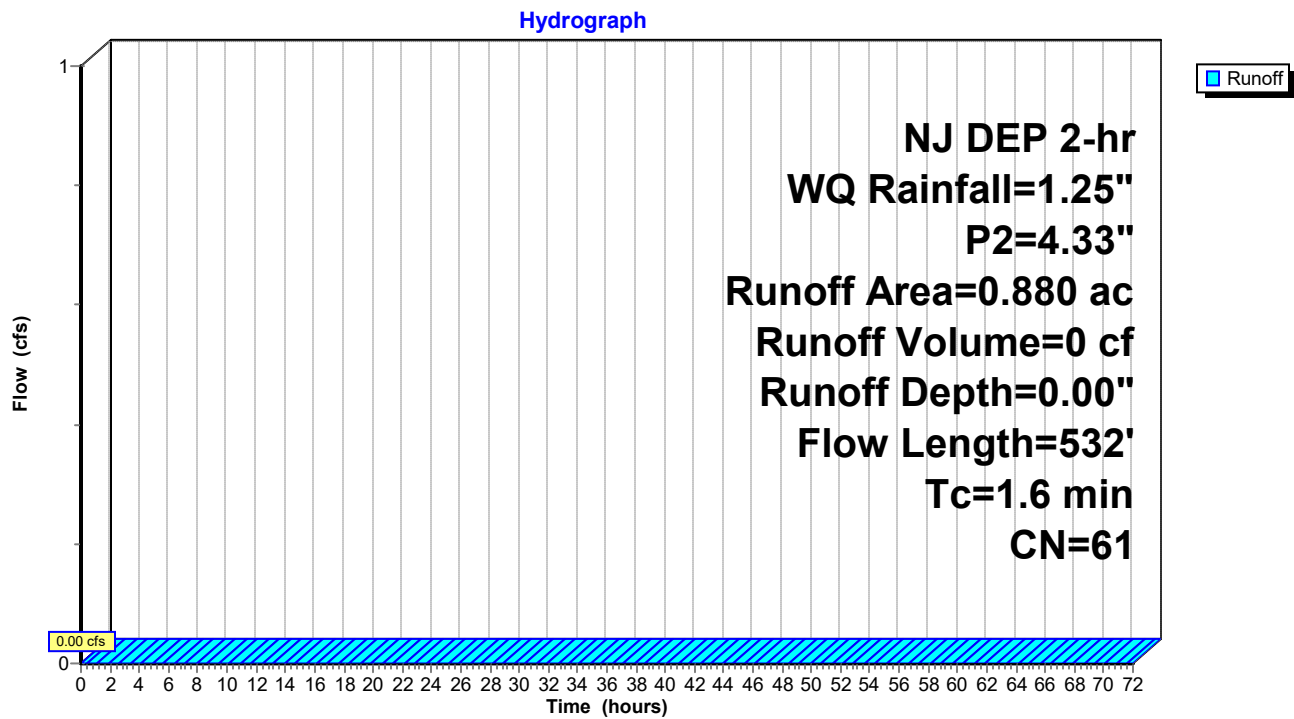
Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond P : BMP-P Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description			
0.880	61	>75% Grass cover, Good, HSG B			
0.880		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 2.52 cfs @ 1.03 hrs, Volume= 3,080 cf, Depth= 1.03"
 Routed to Link 66L : P-DA-5R TOTAL

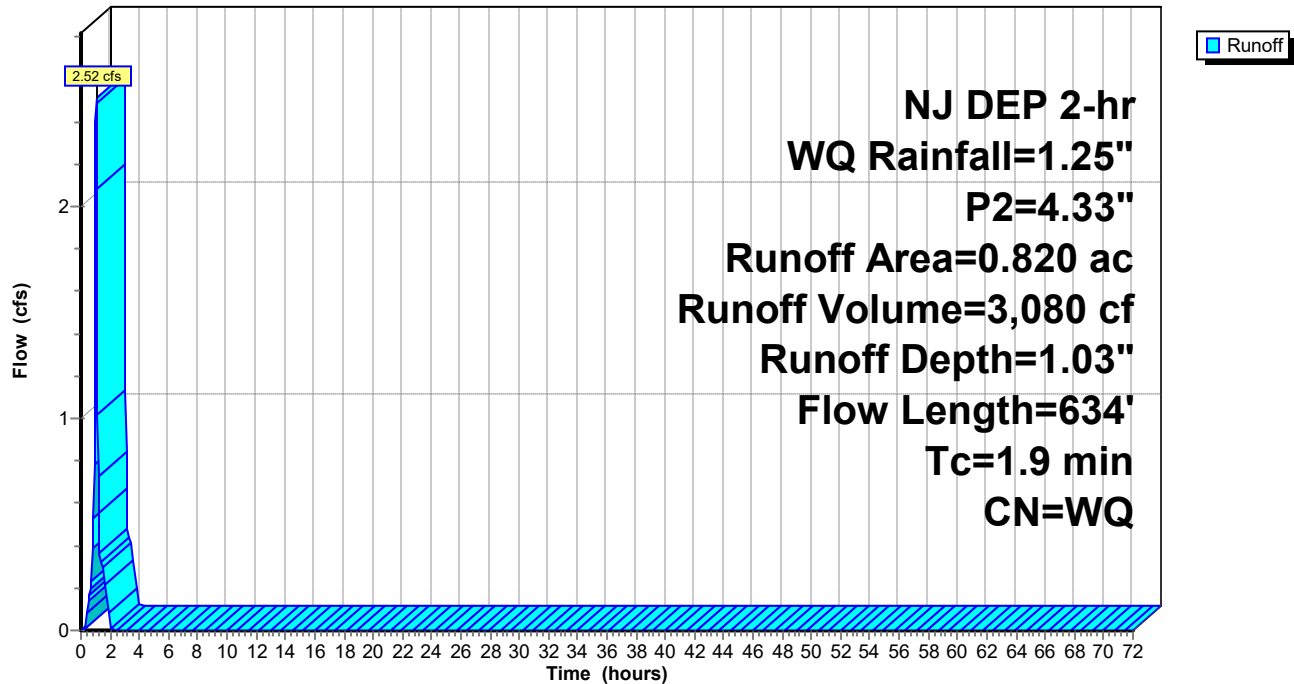
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0370	2.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.9	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

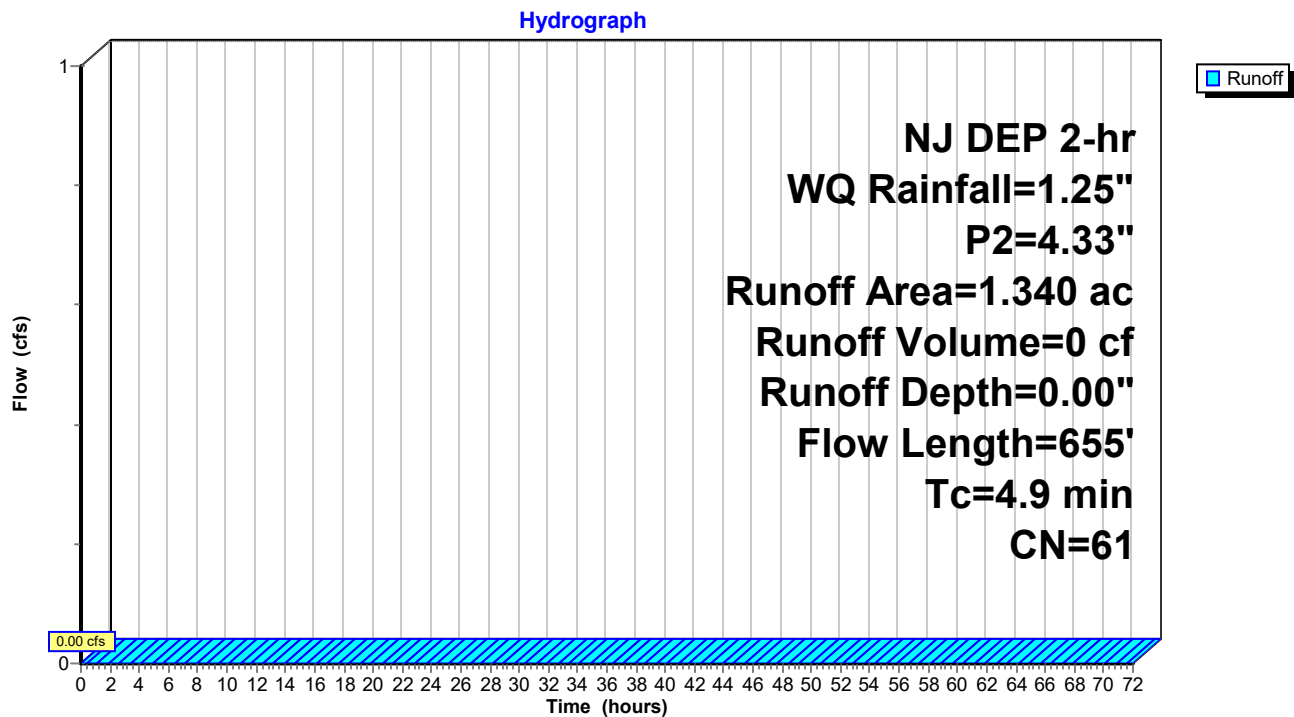
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 66L : P-DA-5R TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	44	0.0500	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
4.9	655	Total			

Subcatchment 64S: P-DA-5R PER



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 0.38" for WQ event
 Inflow = 0.89 cfs @ 1.03 hrs, Volume= 1,052 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 552.15' @ 2.10 hrs Surf.Area= 1,794 sf Storage= 1,051 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

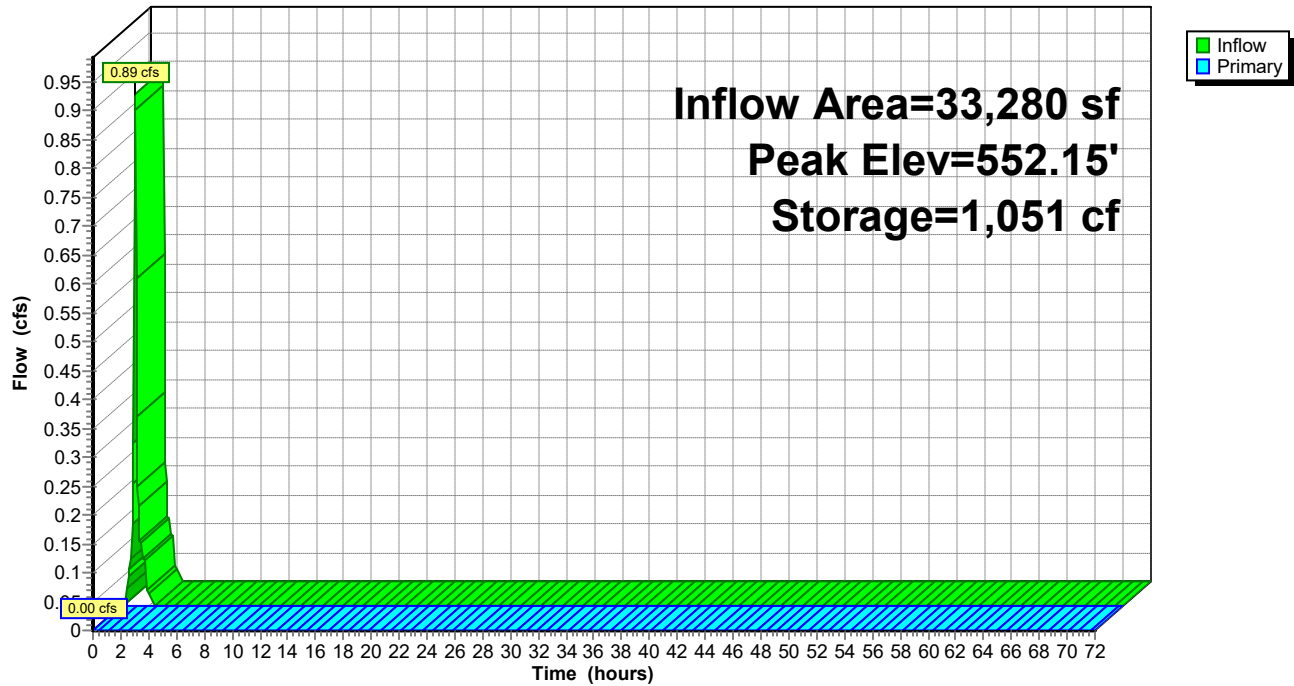
Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.50' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 8.55 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 0.38" for WQ event
 Inflow = 4.98 cfs @ 1.04 hrs, Volume= 6,121 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 574.44' @ 2.15 hrs Surf.Area= 14,100 sf Storage= 6,121 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

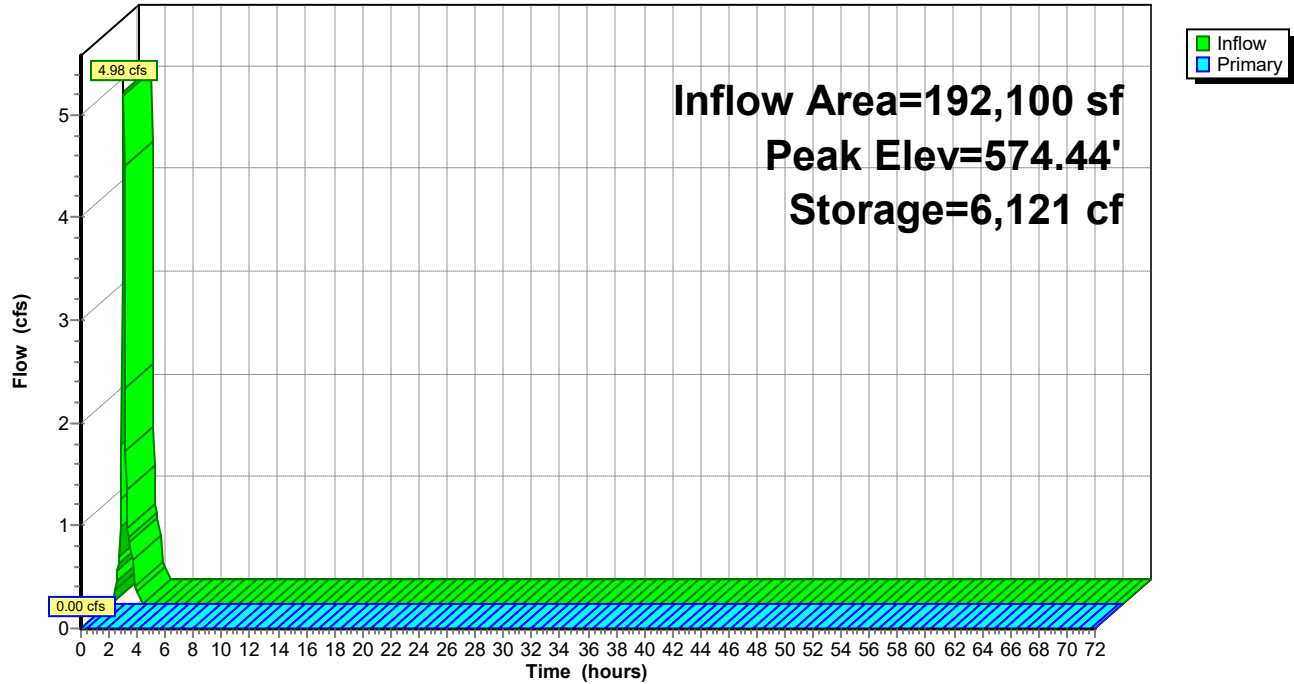
Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=574.00' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 0.40" for WQ event
 Inflow = 2.99 cfs @ 1.06 hrs, Volume= 3,868 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 560.53' @ 2.35 hrs Surf.Area= 7,601 sf Storage= 3,868 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

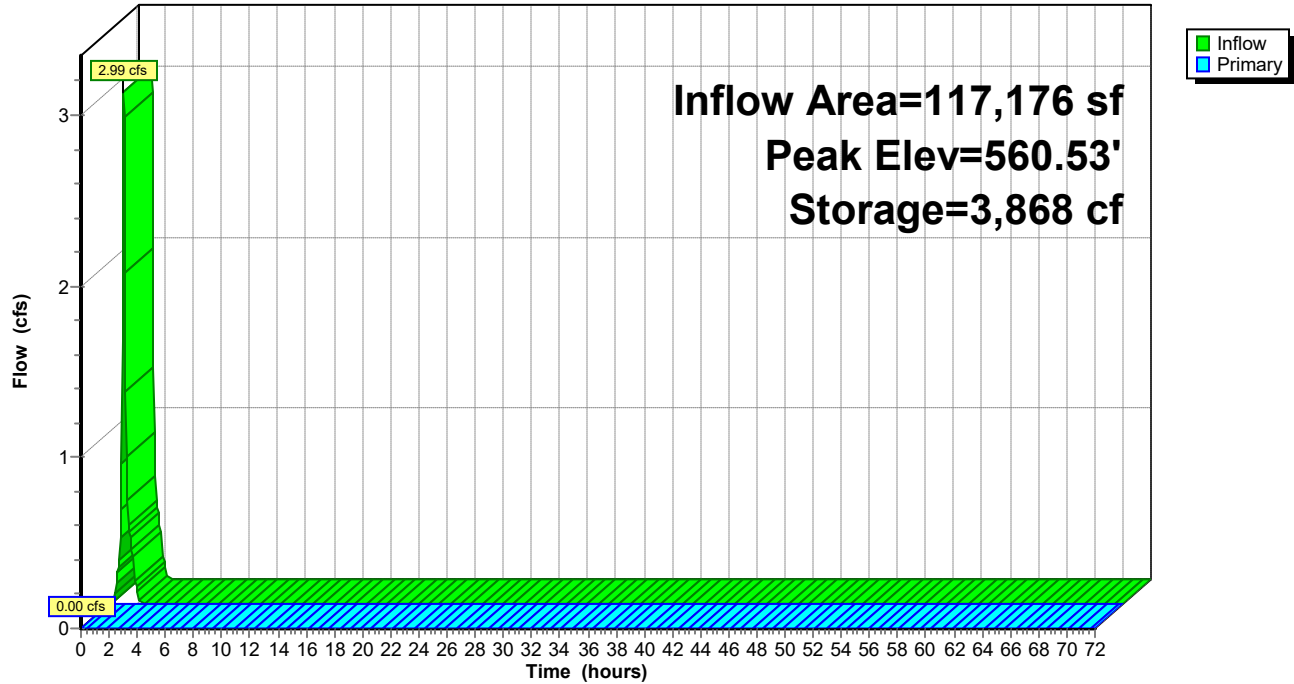
Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=560.00' (Free Discharge)

1=Culvert (Controls 0.00 cfs)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 0.75" for WQ event
 Inflow = 1.25 cfs @ 1.03 hrs, Volume= 1,502 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 599.90' @ 2.10 hrs Surf.Area= 2,230 sf Storage= 1,502 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

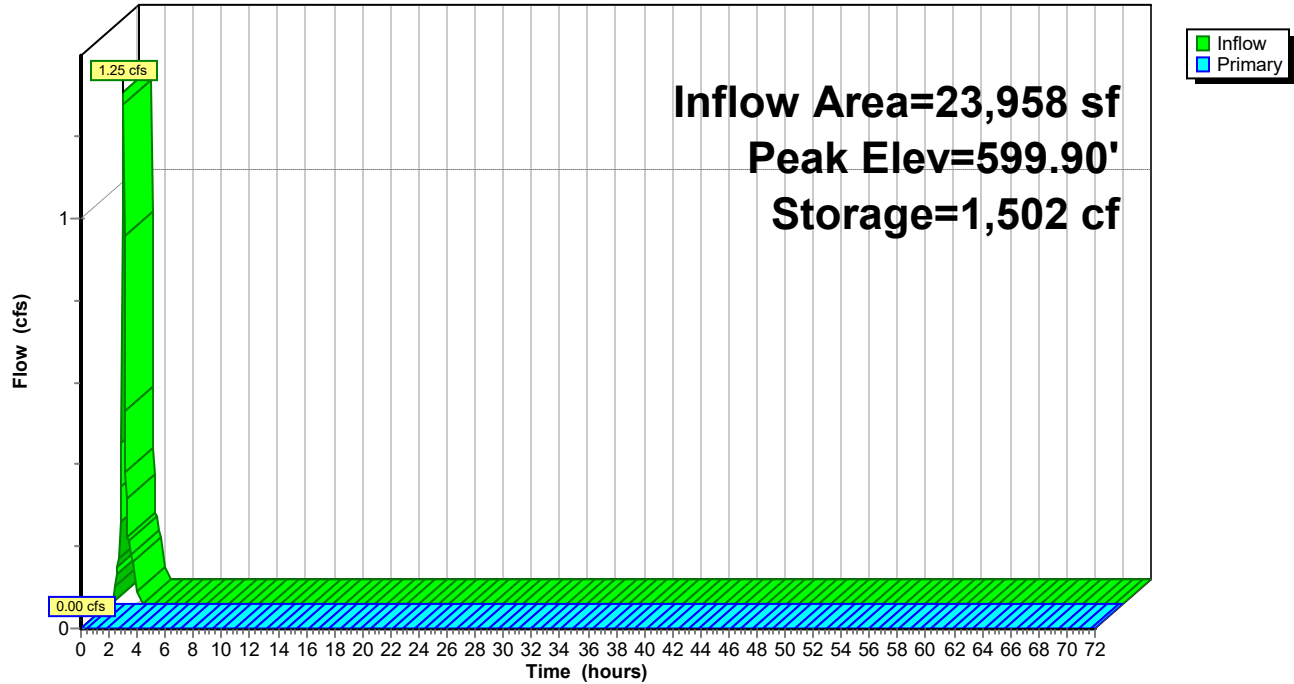
Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=599.20' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 0.05 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: UG INFILTRATION BASIN F

Hydrograph



Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 0.46" for WQ event
 Inflow = 1.09 cfs @ 1.03 hrs, Volume= 1,314 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 609.40' @ 2.15 hrs Surf.Area= 3,408 sf Storage= 1,314 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

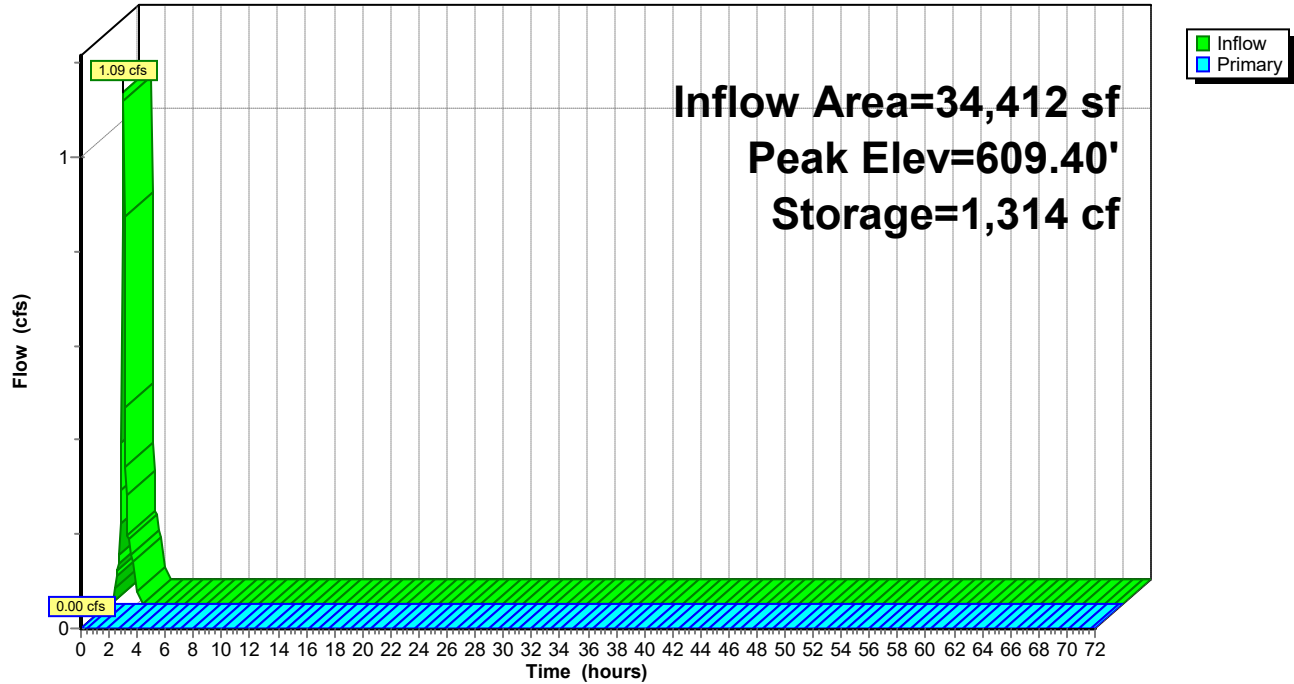
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=609.00' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 0.55" for WQ event
 Inflow = 1.67 cfs @ 1.03 hrs, Volume= 2,028 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.31' @ 2.15 hrs Surf.Area= 6,622 sf Storage= 2,028 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

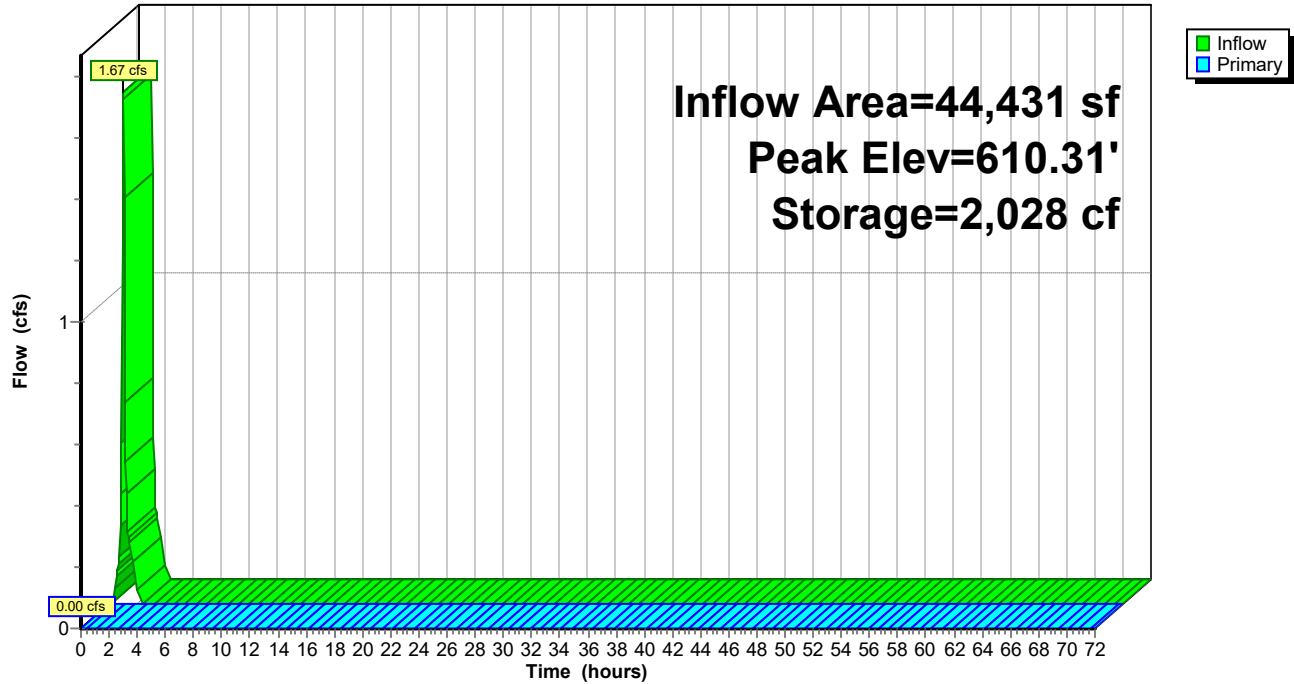
Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=610.00' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 11.45 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 0.62" for WQ event
 Inflow = 1.72 cfs @ 1.03 hrs, Volume= 2,103 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 614.11' @ 2.15 hrs Surf.Area= 2,574 sf Storage= 2,103 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

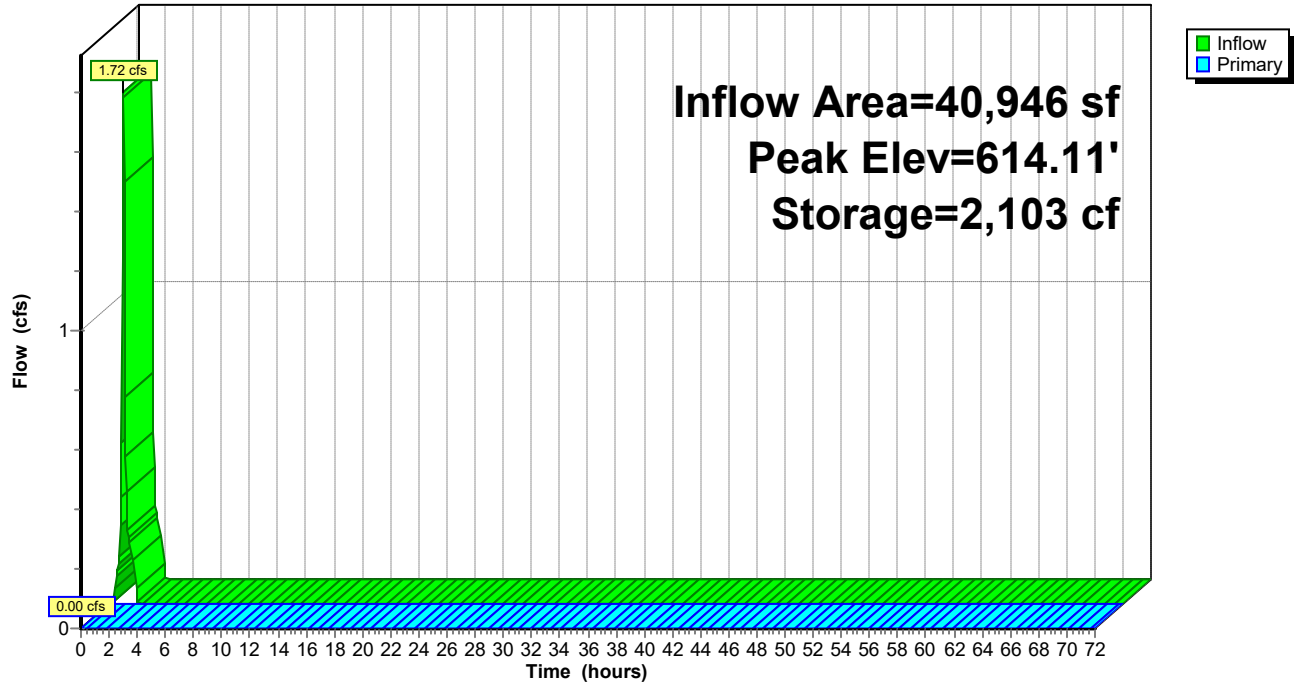
Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=613.20' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 13.32 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 0.65" for WQ event
 Inflow = 1.60 cfs @ 1.04 hrs, Volume= 1,990 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 607.80' @ 2.20 hrs Surf.Area= 2,598 sf Storage= 1,990 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

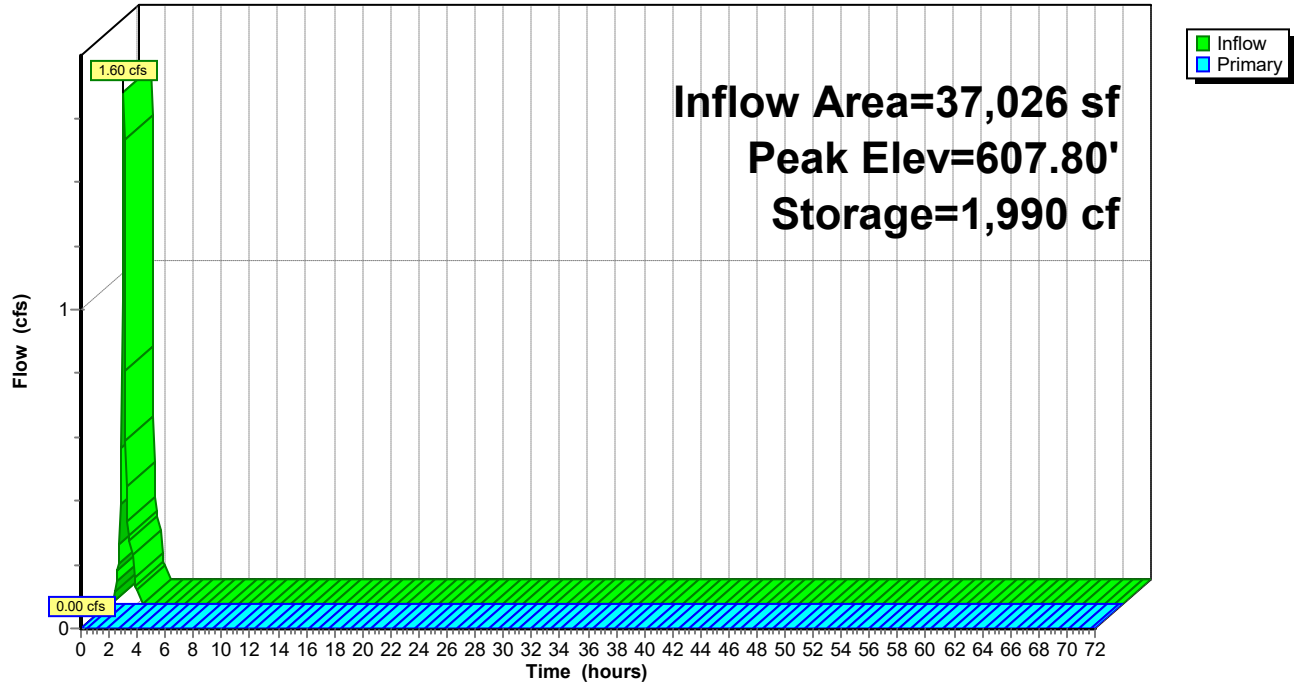
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=607.00' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 14.49 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 0.39" for WQ event
 Inflow = 2.37 cfs @ 1.03 hrs, Volume= 2,892 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 594.33' @ 2.20 hrs Surf.Area= 2,960 sf Storage= 2,892 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

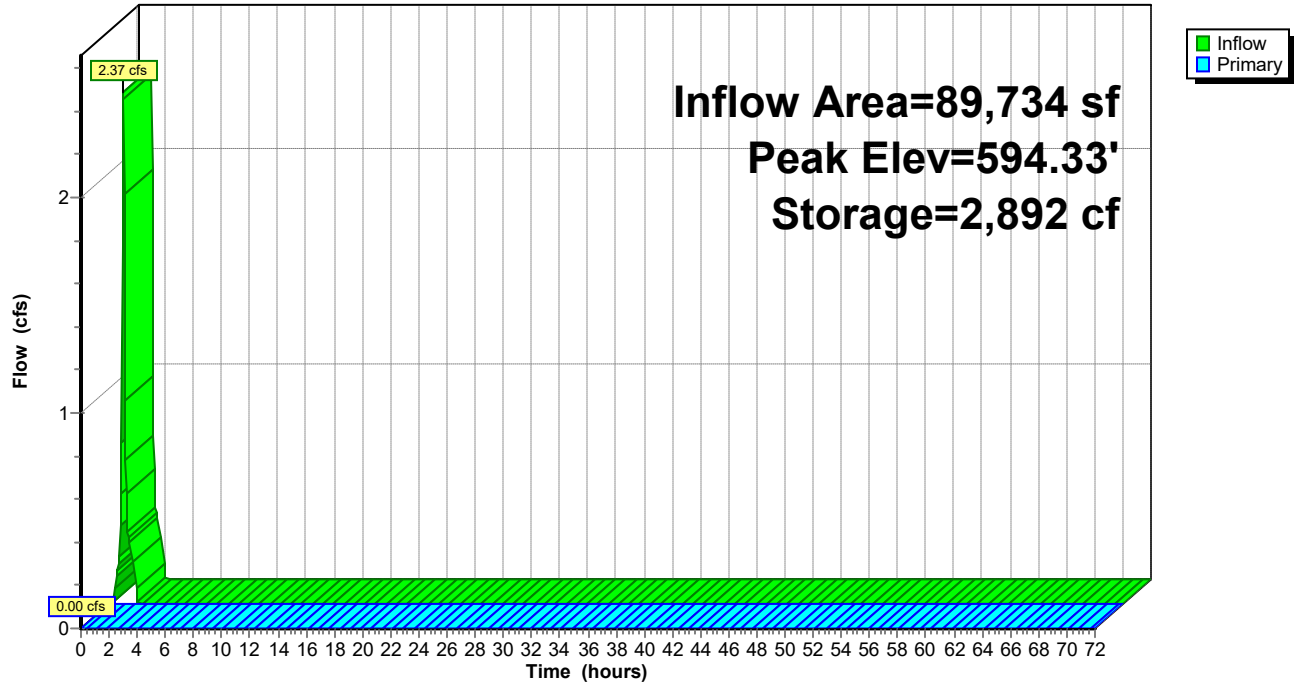
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=593.30' (Free Discharge)

1=Culvert (Passes 0.00 cfs of 0.05 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Orifice/Grate (Controls 0.00 cfs)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 0.67" for WQ event
 Inflow = 4.23 cfs @ 1.04 hrs, Volume= 5,258 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 568.93' @ 2.20 hrs Surf.Area= 5,980 sf Storage= 5,258 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

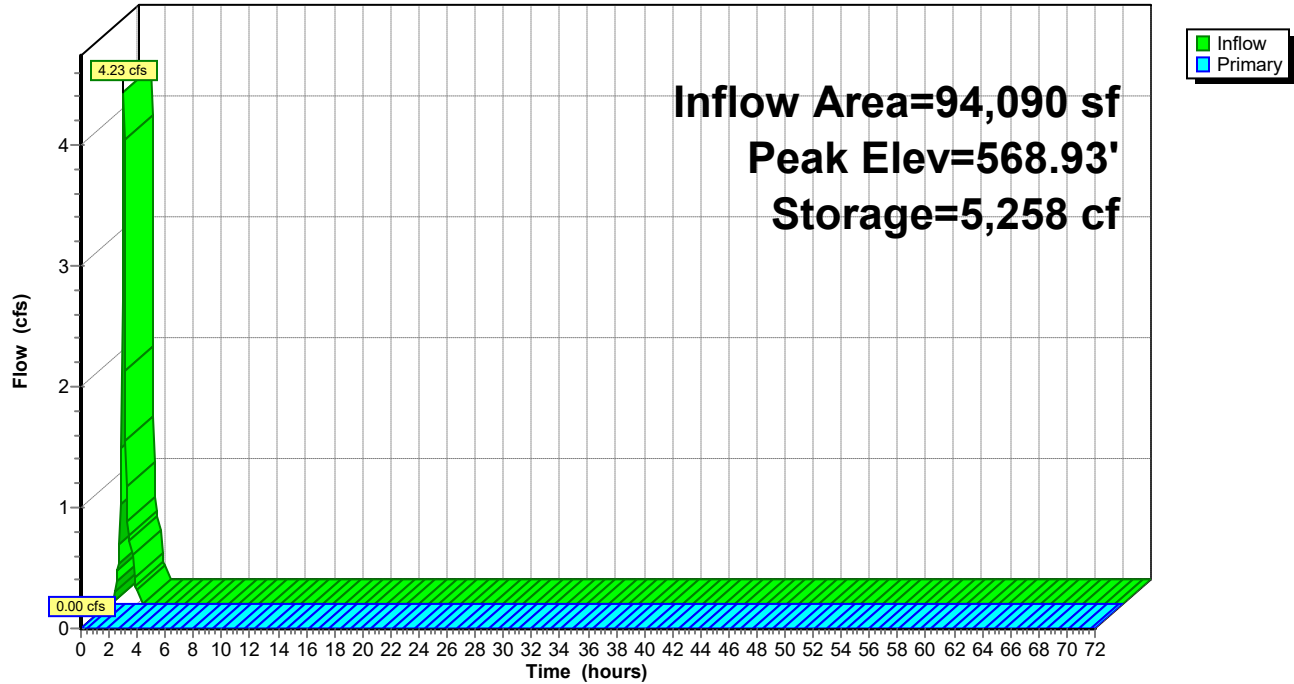
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=568.00' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 0.00 cfs of 16.22 cfs potential flow)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 0.62" for WQ event
 Inflow = 1.94 cfs @ 1.03 hrs, Volume= 2,366 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 597.44' @ 2.15 hrs Surf.Area= 2,568 sf Storage= 2,366 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

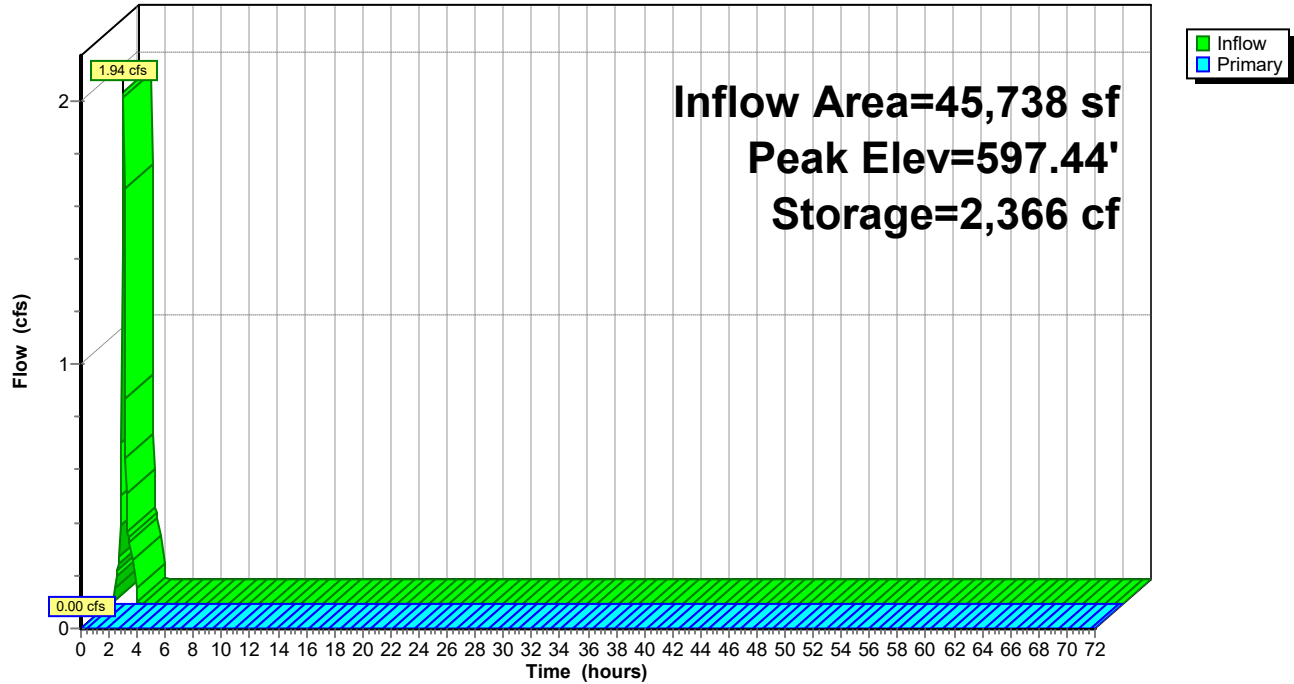
Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=596.50' (Free Discharge)

↑ **1=Culvert** (Passes 0.00 cfs of 0.06 cfs potential flow)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 0.45" for WQ event
 Inflow = 4.56 cfs @ 1.04 hrs, Volume= 5,633 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 577.00' @ 2.20 hrs Surf.Area= 5,877 sf Storage= 5,633 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

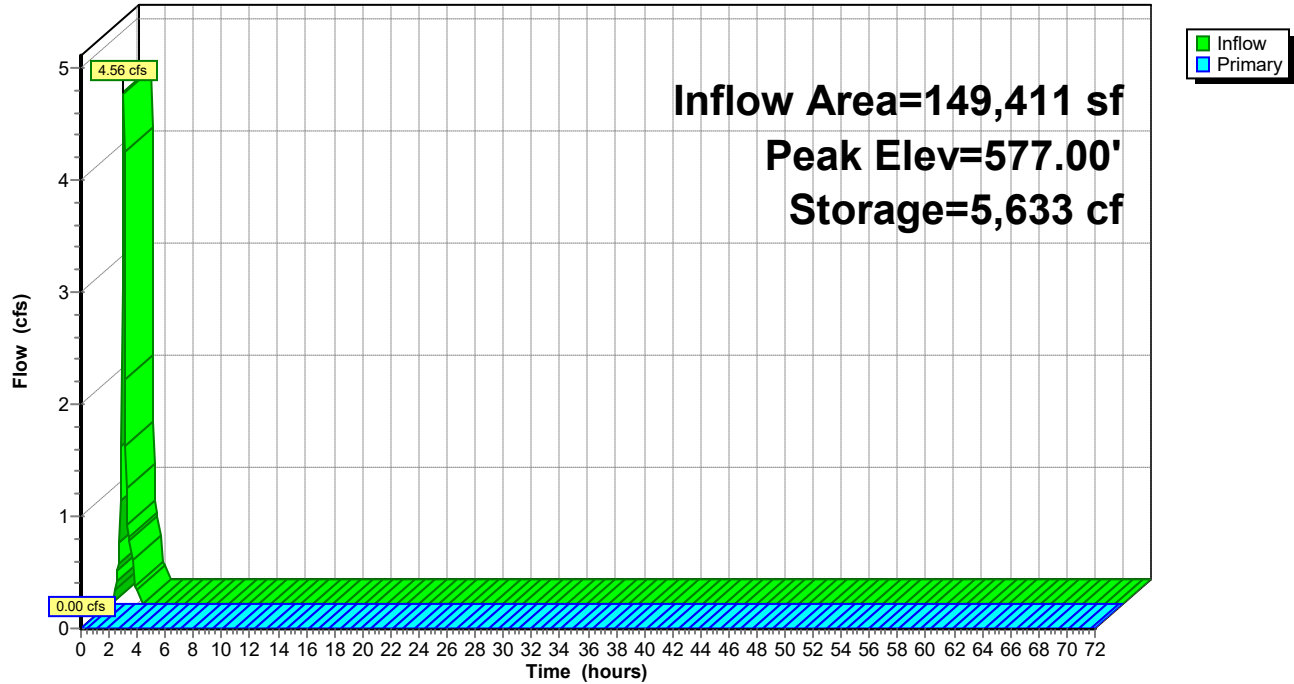
Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=576.00' (Free Discharge)

1=Culvert (Controls 0.00 cfs)
 2=Orifice/Grate (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 0.11" for WQ event
 Inflow = 2.52 cfs @ 1.03 hrs, Volume= 3,080 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 562.74' @ 2.15 hrs Surf.Area= 12,864 sf Storage= 3,079 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

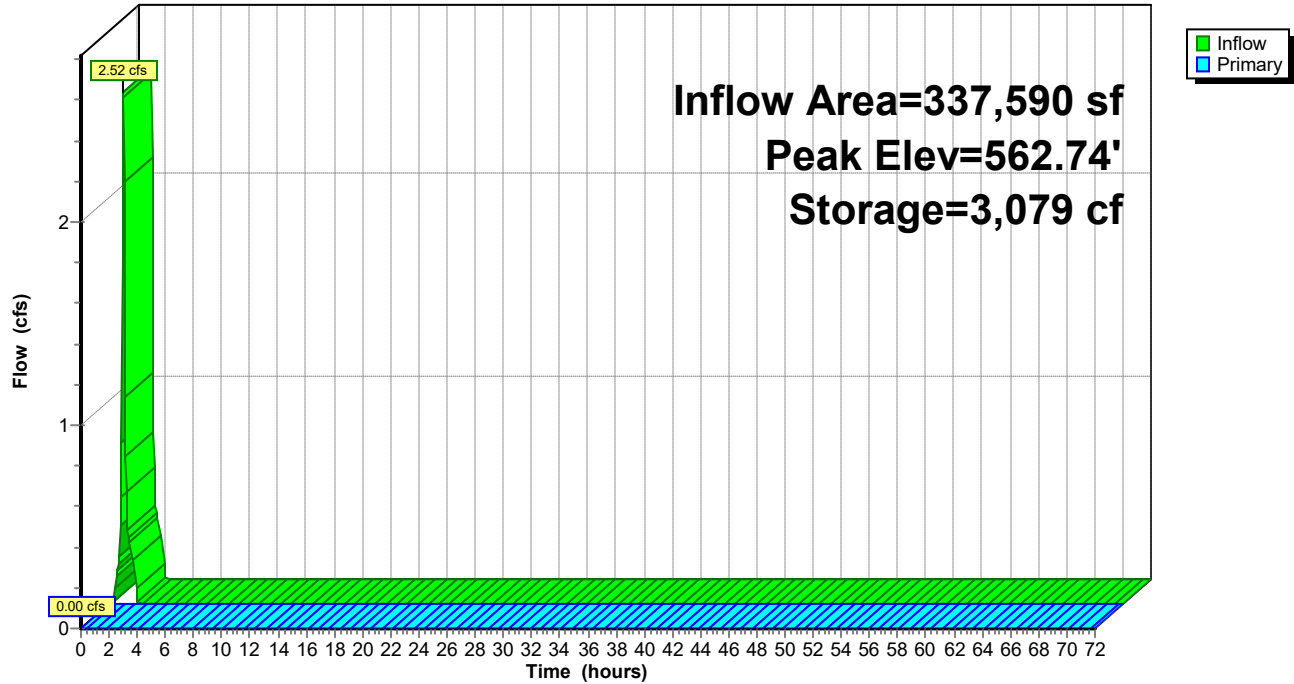
Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.50' (Free Discharge)

- 1=Culvert (Passes 0.00 cfs of 21.05 cfs potential flow)
- 2=Orifice/Grate (Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond R: BMP-R Bioretention Basin

Hydrograph



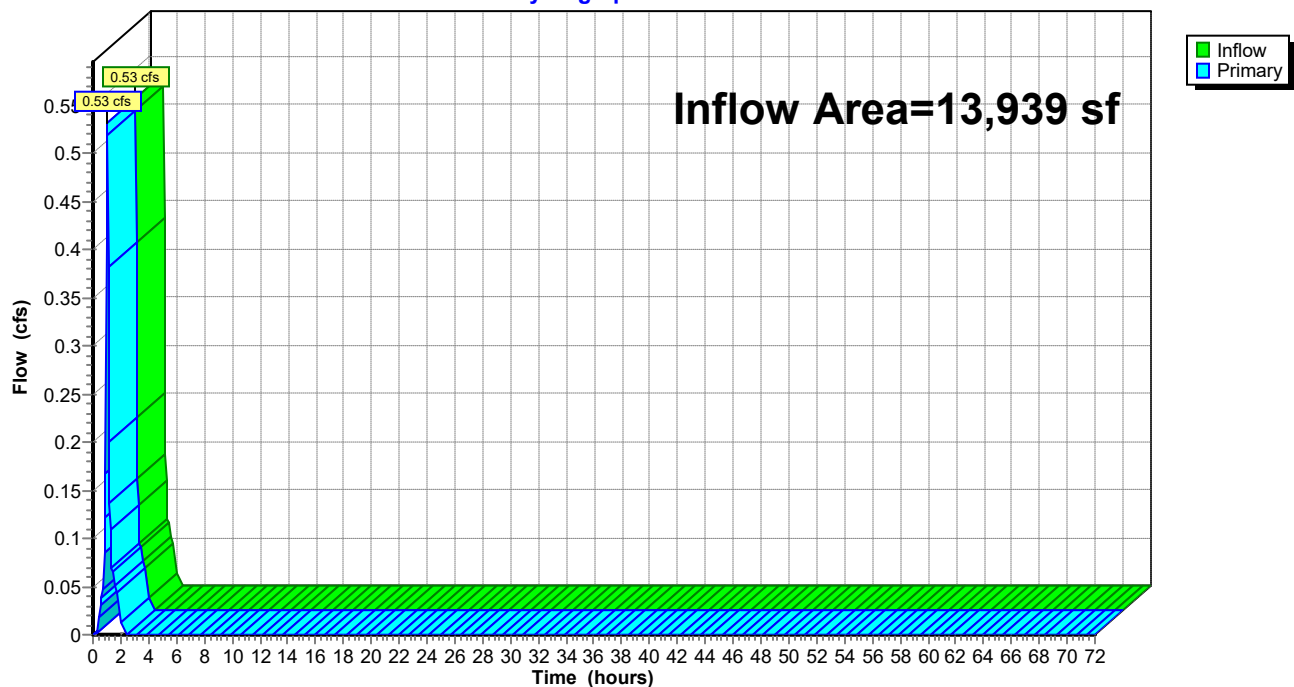
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 0.55" for WQ event
Inflow = 0.53 cfs @ 1.03 hrs, Volume= 638 cf
Primary = 0.53 cfs @ 1.03 hrs, Volume= 638 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

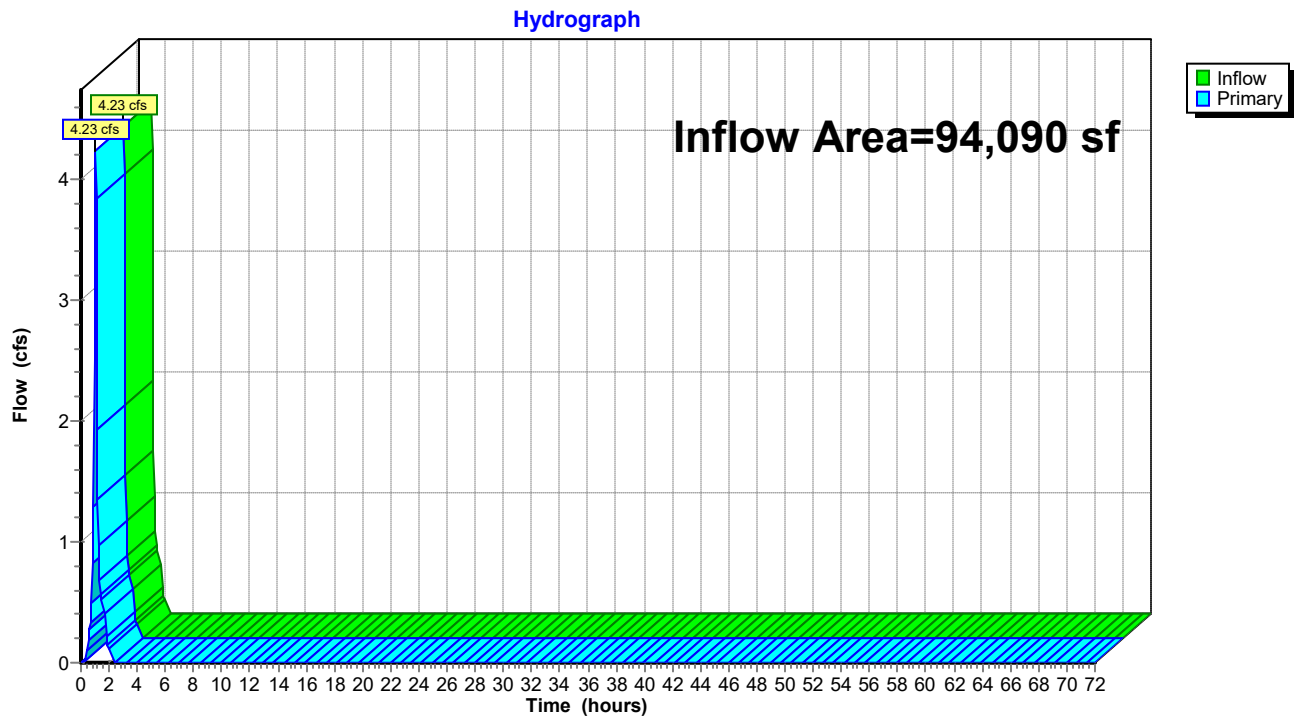
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1**Hydrograph**

Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 0.67" for WQ event
Inflow = 4.23 cfs @ 1.04 hrs, Volume= 5,258 cf
Primary = 4.23 cfs @ 1.04 hrs, Volume= 5,258 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

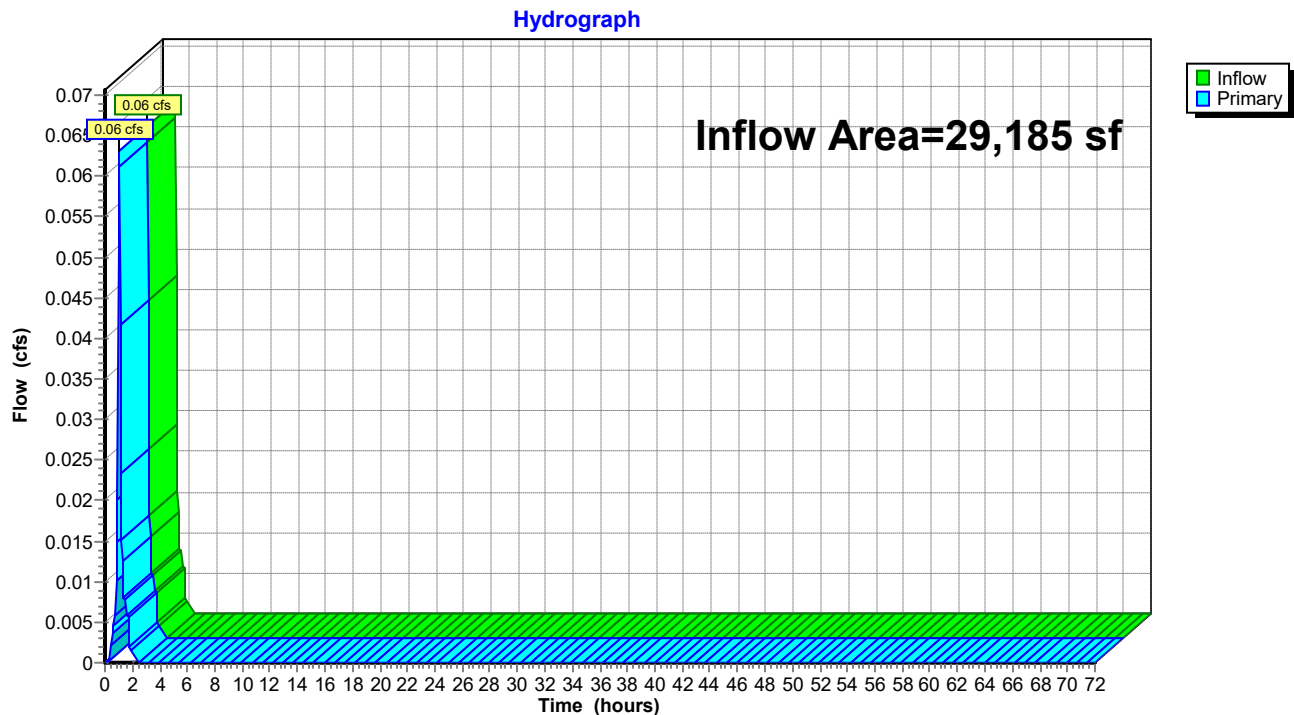
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 0.03" for WQ event
Inflow = 0.06 cfs @ 1.03 hrs, Volume= 75 cf
Primary = 0.06 cfs @ 1.03 hrs, Volume= 75 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

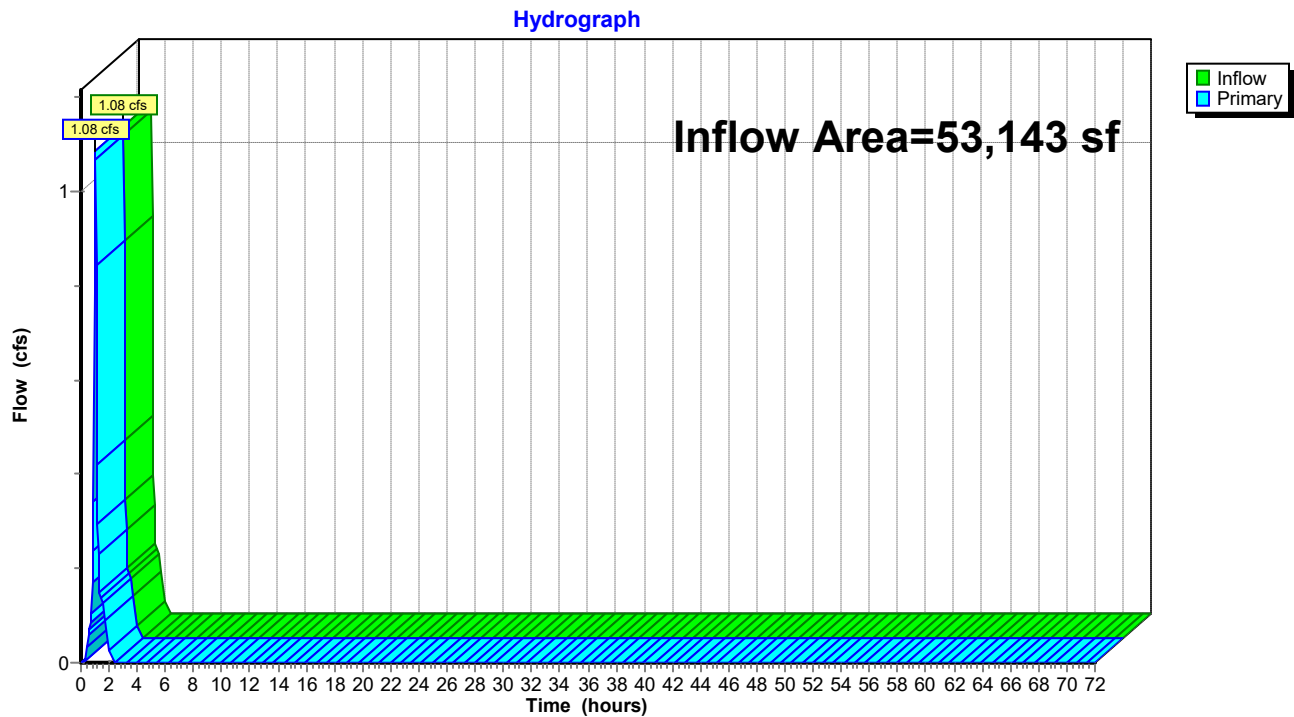
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 0.30" for WQ event
Inflow = 1.08 cfs @ 1.03 hrs, Volume= 1,314 cf
Primary = 1.08 cfs @ 1.03 hrs, Volume= 1,314 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

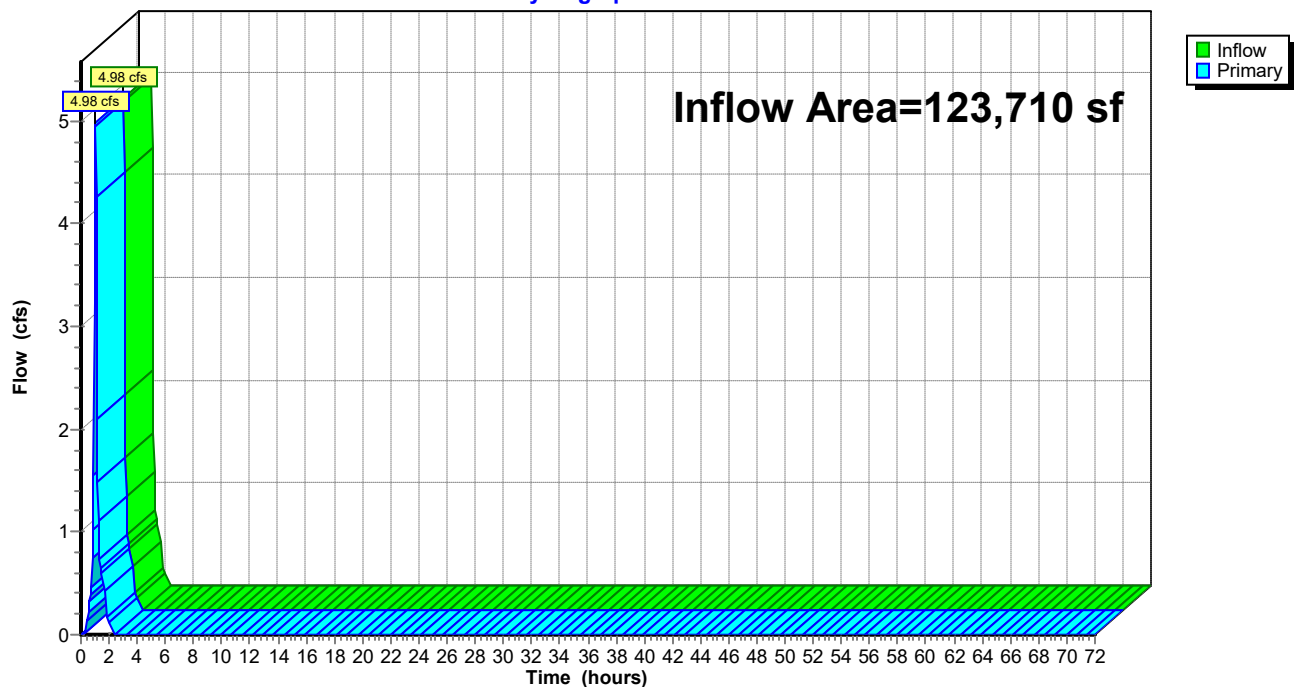
Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 0.59" for WQ event
Inflow = 4.98 cfs @ 1.04 hrs, Volume= 6,121 cf
Primary = 4.98 cfs @ 1.04 hrs, Volume= 6,121 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL

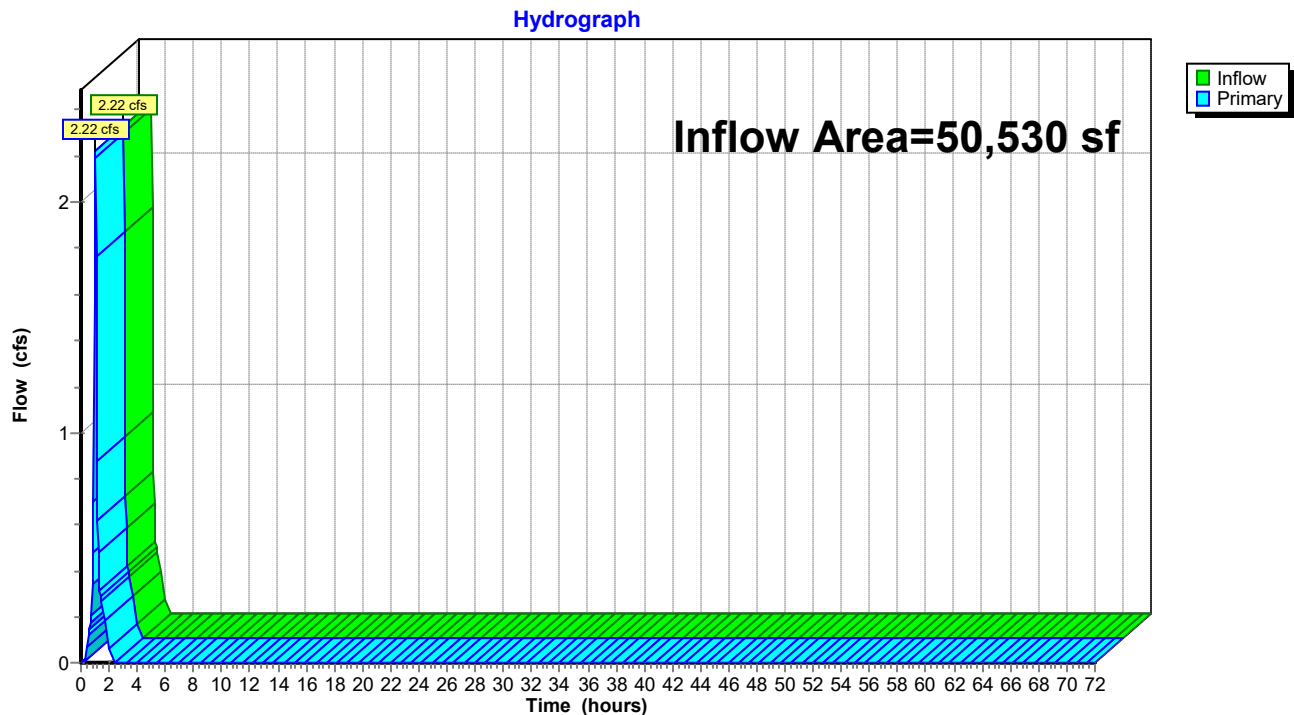
Hydrograph



Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 0.64" for WQ event
Inflow = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf
Primary = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

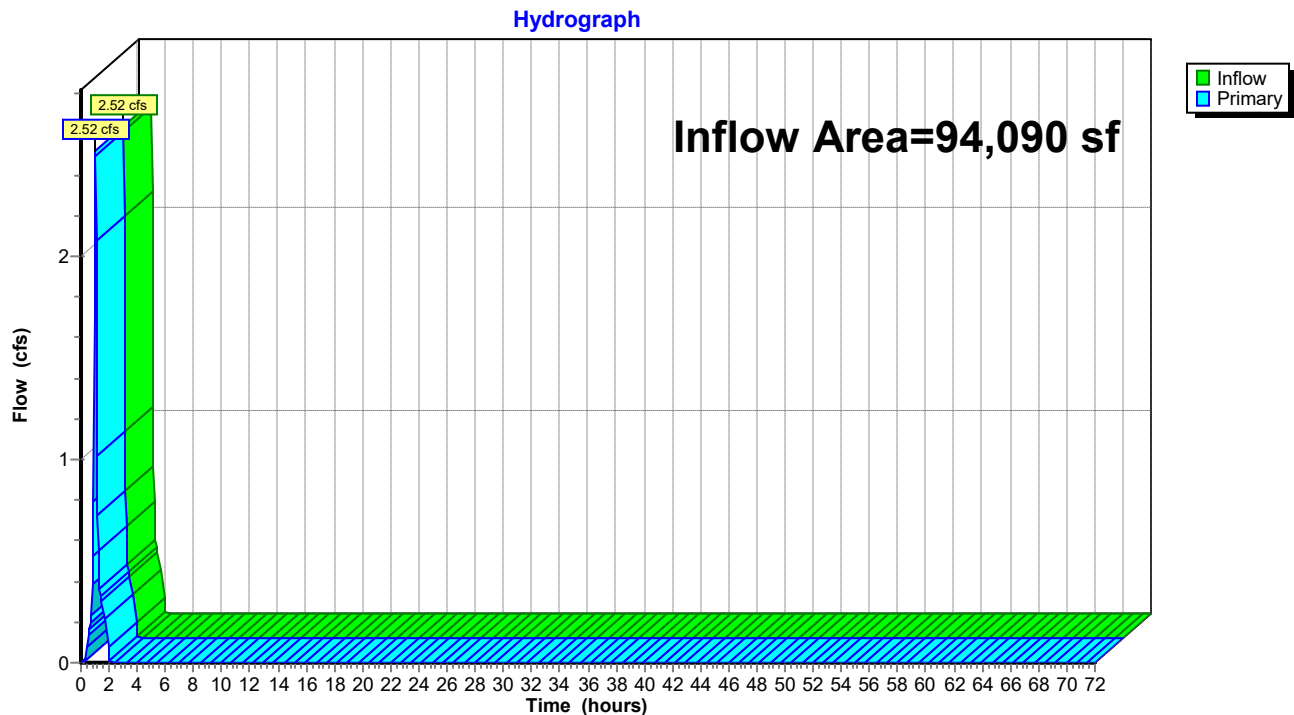
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

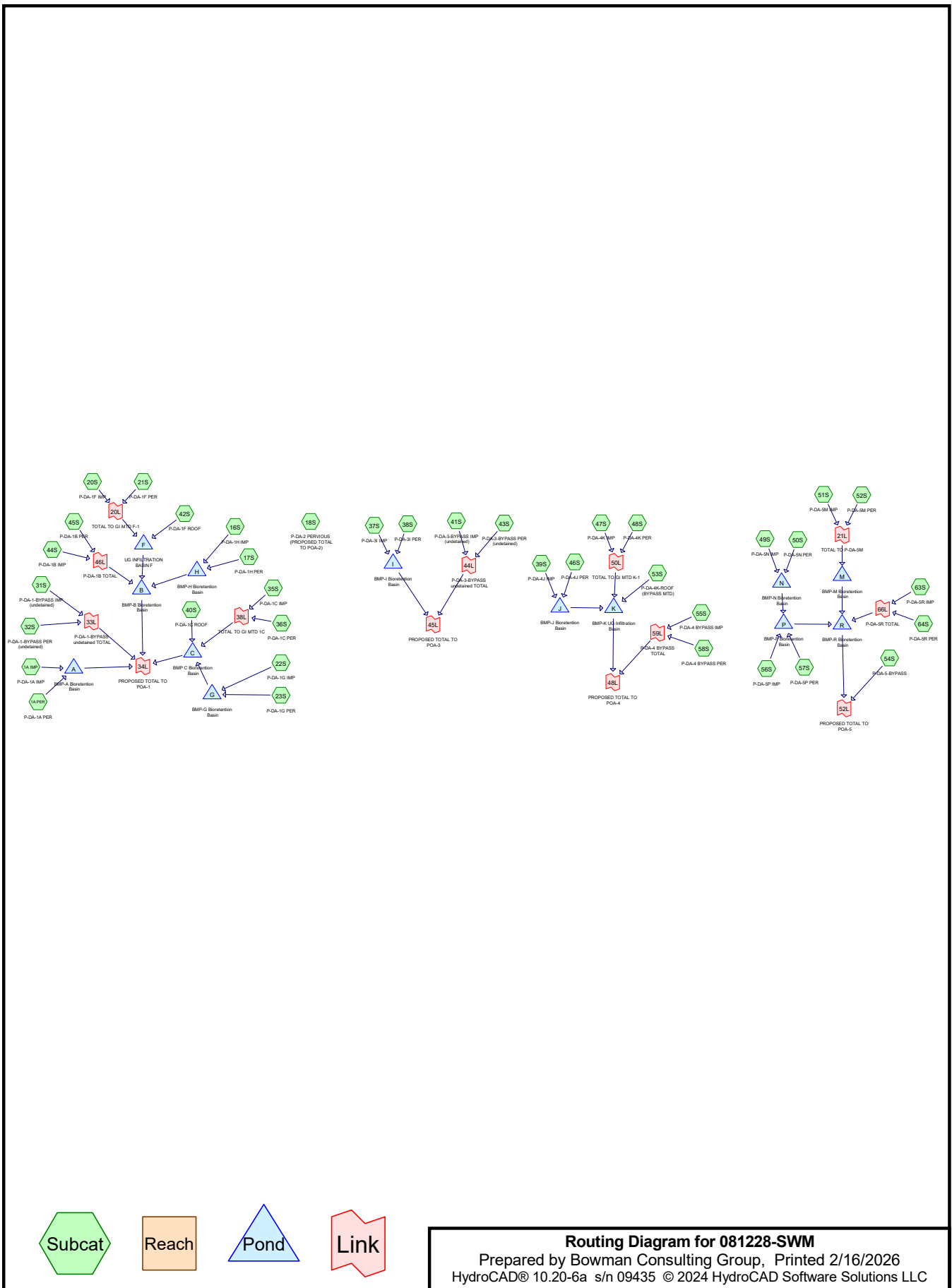
Link 50L: TOTAL TO GI MTD K-1

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 0.39" for WQ event
Inflow = 2.52 cfs @ 1.03 hrs, Volume= 3,080 cf
Primary = 2.52 cfs @ 1.03 hrs, Volume= 3,080 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL



Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
467,573	61	>75% Grass cover, Good, HSG B (1A PER, 17S, 18S, 21S, 23S, 36S, 38S, 45S, 46S, 48S, 50S, 52S, 54S, 57S, 58S, 64S)
10,019	98	IMPERVIOUS, HSG B (41S, 44S)
64,033	98	Impervious, HSG B (16S, 20S, 22S, 35S, 37S, 39S, 47S, 49S, 51S, 55S, 56S, 63S)
38,768	98	MOTOR VEH SURFACE, HSG B (31S, 41S, 44S)
152,024	98	Motor Veh Surface, Paved parking, HSG B (1A IMP, 16S, 20S, 22S, 35S, 37S, 39S, 47S, 49S, 51S, 56S, 63S)
58,806	61	OPEN SPACE, HSG B (32S, 43S)
26,572	98	ROOF, HSG B (44S)
170,320	98	Roofs, HSG B (16S, 20S, 22S, 37S, 39S, 40S, 42S, 47S, 49S, 51S, 53S, 55S, 56S, 63S)
5,227	55	Woods, Good, HSG B (54S, 58S)
993,342	78	TOTAL AREA

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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=299' Tc=1.0 min CN=98 Runoff=1.04 cfs 3,381 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=212' Tc=4.6 min CN=61 Runoff=0.27 cfs 1,054 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=352' Tc=1.8 min CN=WQ Runoff=2.04 cfs 6,520 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=357' Tc=3.5 min CN=61 Runoff=0.29 cfs 1,045 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=32' Tc=5.9 min CN=61 Runoff=0.29 cfs 1,132 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=239' Tc=1.4 min CN=WQ Runoff=0.63 cfs 2,053 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=114' Tc=2.7 min CN=61 Runoff=0.10 cfs 327 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=223' Tc=1.6 min CN=WQ Runoff=1.30 cfs 4,226 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=62' Tc=2.0 min CN=61 Runoff=0.29 cfs 958 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=414' Tc=1.1 min CN=98 Runoff=0.07 cfs 241 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=356' Tc=5.3 min CN=61 Runoff=0.36 cfs 1,416 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=524' Tc=1.7 min CN=WQ Runoff=1.29 cfs 4,226 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=546' Tc=2.8 min CN=61 Runoff=0.55 cfs 1,895 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=295' Tc=2.0 min CN=WQ Runoff=2.11 cfs 6,762 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=242' Tc=1.4 min CN=61 Runoff=0.25 cfs 828 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=376' Tc=2.6 min CN=WQ Runoff=1.97 cfs 6,399 cf

081228-SWM

NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

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Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=3.33" Tc=5.0 min CN=98 Runoff=2.29 cfs 8,211 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=178' Tc=1.3 min CN=WQ Runoff=0.30 cfs 966 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=96' Slope=0.0100 '/' Tc=1.5 min CN=98 Runoff=0.85 cfs 2,777 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=138' Slope=0.0300 '/' Tc=7.9 min CN=61 Runoff=0.35 cfs 1,524 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=805' Tc=2.2 min CN=WQ Runoff=6.13 cfs 19,681 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=509' Tc=3.9 min CN=61 Runoff=0.71 cfs 2,635 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=236' Tc=4.5 min CN=61 Runoff=0.18 cfs 697 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=283' Tc=1.8 min CN=WQ Runoff=2.72 cfs 8,694 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=412' Tc=9.6 min CN=61 Runoff=0.20 cfs 958 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=303' Tc=1.9 min CN=WQ Runoff=2.38 cfs 7,607 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=262' Tc=3.2 min CN=61 Runoff=0.26 cfs 915 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=1,152' Tc=2.6 min CN=WQ Runoff=5.20 cfs 16,904 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=889' Tc=2.9 min CN=61 Runoff=0.48 cfs 1,655 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.19 cfs 604 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=239' Tc=14.4 min CN=WQ Runoff=0.48 cfs 2,670 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=105' Tc=0.5 min CN=WQ Runoff=0.22 cfs 724 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=467' Tc=2.4 min CN=WQ Runoff=5.61 cfs 18,112 cf

081228-SWM

NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=532' Tc=1.6 min CN=61 Runoff=0.59 cfs 1,916 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=0.57" Flow Length=194' Tc=4.8 min CN=WQ Runoff=0.48 cfs 1,932 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=3.33" Flow Length=634' Tc=2.0 min CN=WQ Runoff=3.09 cfs 9,901 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=655' Tc=5.2 min CN=61 Runoff=0.75 cfs 2,918 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=552.72' Storage=2,164 cf Inflow=1.22 cfs 4,435 cf Outflow=0.23 cfs 3,201 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=575.18' Storage=16,639 cf Inflow=7.47 cfs 30,916 cf Outflow=0.80 cfs 23,650 cf
Pond C: BMP C Bioretention Basin	Peak Elev=561.41' Storage=11,023 cf Inflow=4.09 cfs 17,520 cf Outflow=0.20 cfs 13,352 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=600.37' Storage=2,507 cf Inflow=1.56 cfs 5,156 cf Outflow=0.60 cfs 3,636 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=609.86' Storage=2,945 cf Inflow=1.60 cfs 5,184 cf Outflow=0.18 cfs 3,188 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=610.59' Storage=3,863 cf Inflow=2.30 cfs 7,566 cf Outflow=0.51 cfs 4,963 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=614.68' Storage=3,640 cf Inflow=2.36 cfs 7,589 cf Outflow=0.73 cfs 5,262 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=608.62' Storage=4,206 cf Inflow=2.13 cfs 7,096 cf Outflow=0.20 cfs 5,089 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=595.36' Storage=5,805 cf Inflow=3.13 cfs 15,345 cf Outflow=0.57 cfs 12,249 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=569.52' Storage=8,914 cf Inflow=5.66 cfs 18,559 cf Outflow=2.08 cfs 13,191 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=598.17' Storage=4,283 cf Inflow=2.61 cfs 8,522 cf Outflow=0.61 cfs 5,996 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=577.78' Storage=10,399 cf Inflow=6.65 cfs 26,024 cf Outflow=1.99 cfs 20,375 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=563.67' Storage=15,656 cf Inflow=6.48 cfs 46,386 cf Outflow=2.16 cfs 42,554 cf

081228-SWM

NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

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Link 20L: TOTAL TO GI MTD F-1Inflow=0.71 cfs 2,379 cf
Primary=0.71 cfs 2,379 cf**Link 21L: TOTAL TO P-DA-5M**Inflow=5.66 cfs 18,559 cf
Primary=5.66 cfs 18,559 cf**Link 33L: P-DA-1-BYPASS undetained TOTAL**Inflow=0.40 cfs 1,657 cf
Primary=0.40 cfs 1,657 cf**Link 34L: PROPOSED TOTAL TO POA-1**Inflow=1.24 cfs 41,860 cf
Primary=1.24 cfs 41,860 cf**Link 38L: TOTAL TO GI MTD 1C**Inflow=1.84 cfs 6,121 cf
Primary=1.84 cfs 6,121 cf**Link 44L: P-DA-3-BYPASS undetained TOTAL**Inflow=0.51 cfs 2,490 cf
Primary=0.51 cfs 2,490 cf**Link 45L: PROPOSED TOTAL TO POA-3**Inflow=1.17 cfs 7,753 cf
Primary=1.17 cfs 7,753 cf**Link 46L: P-DA-1B TOTAL**Inflow=6.76 cfs 22,316 cf
Primary=6.76 cfs 22,316 cf**Link 48L: PROPOSED TOTAL TO POA-4**Inflow=1.06 cfs 14,905 cf
Primary=1.06 cfs 14,905 cf**Link 50L: TOTAL TO GI MTD K-1**Inflow=2.81 cfs 9,652 cf
Primary=2.81 cfs 9,652 cf**Link 52L: PROPOSED TOTAL TO POA-5**Inflow=2.28 cfs 45,224 cf
Primary=2.28 cfs 45,224 cf**Link 59L: P-DA-4 BYPASS TOTAL**Inflow=0.62 cfs 2,656 cf
Primary=0.62 cfs 2,656 cf**Link 66L: P-DA-5R TOTAL**Inflow=3.67 cfs 12,819 cf
Primary=3.67 cfs 12,819 cf**Total Runoff Area = 993,342 sf Runoff Volume = 154,465 cf Average Runoff Depth = 1.87"**
53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 1.04 cfs @ 12.06 hrs, Volume= 3,381 cf, Depth= 3.33"
 Routed to Pond A : BMP-A Bioretention Basin

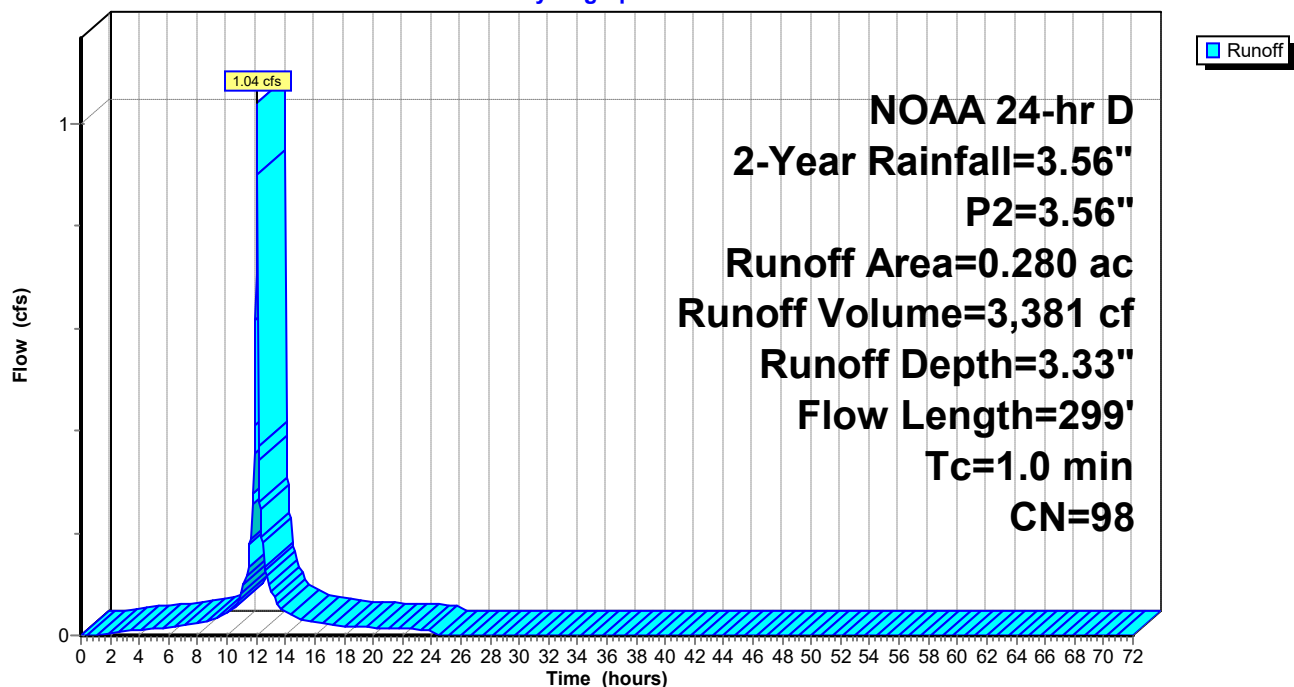
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.0	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 0.27 cfs @ 12.13 hrs, Volume= 1,054 cf, Depth= 0.60"
 Routed to Pond A : BMP-A Bioretention Basin

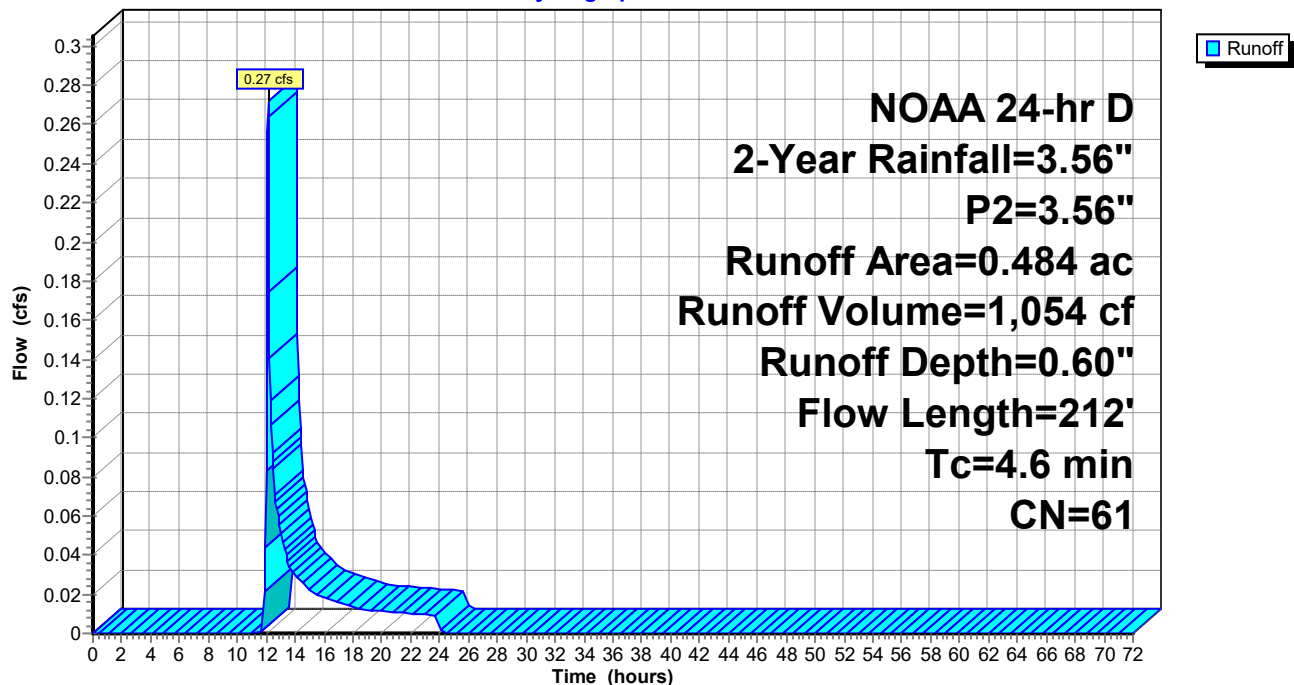
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	100	0.1300	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.6	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 2.04 cfs @ 12.08 hrs, Volume= 6,520 cf, Depth= 3.33"
 Routed to Pond H : BMP-H Bioretention Basin

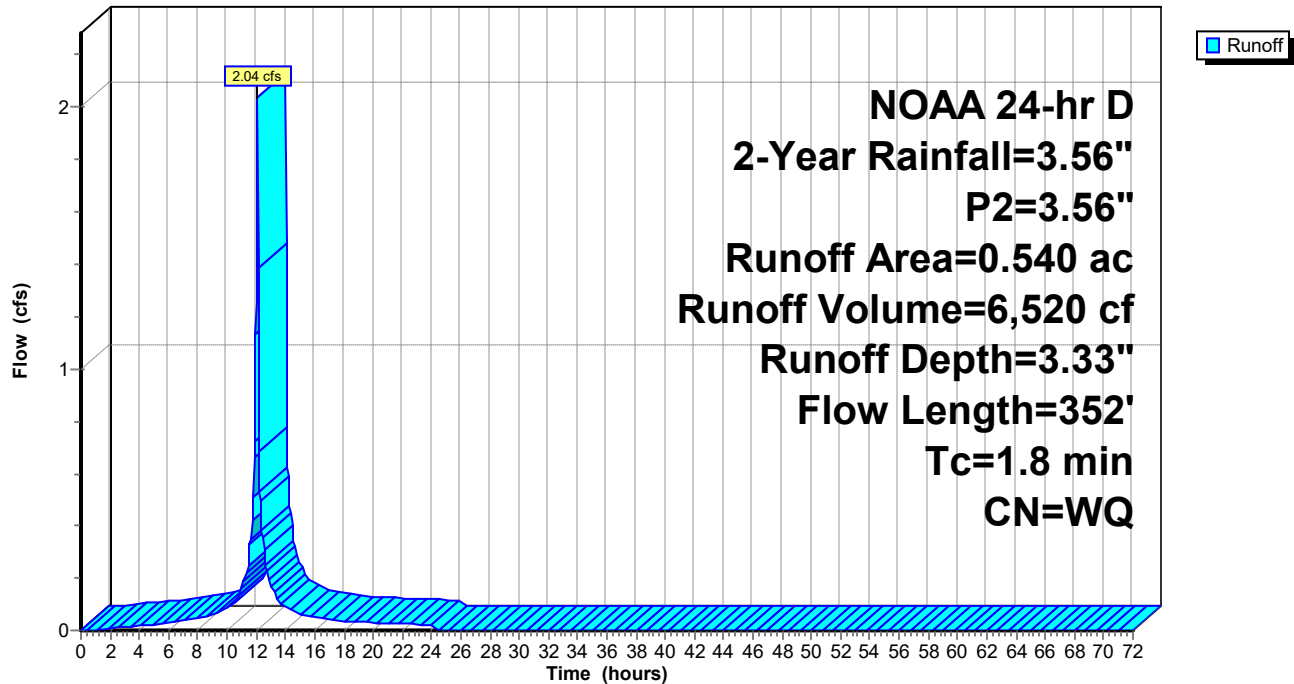
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0310	1.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



Summary for Subcatchment 17S: P-DA-1H PER

Runoff = 0.29 cfs @ 12.11 hrs, Volume= 1,045 cf, Depth= 0.60"
 Routed to Pond H : BMP-H Bioretention Basin

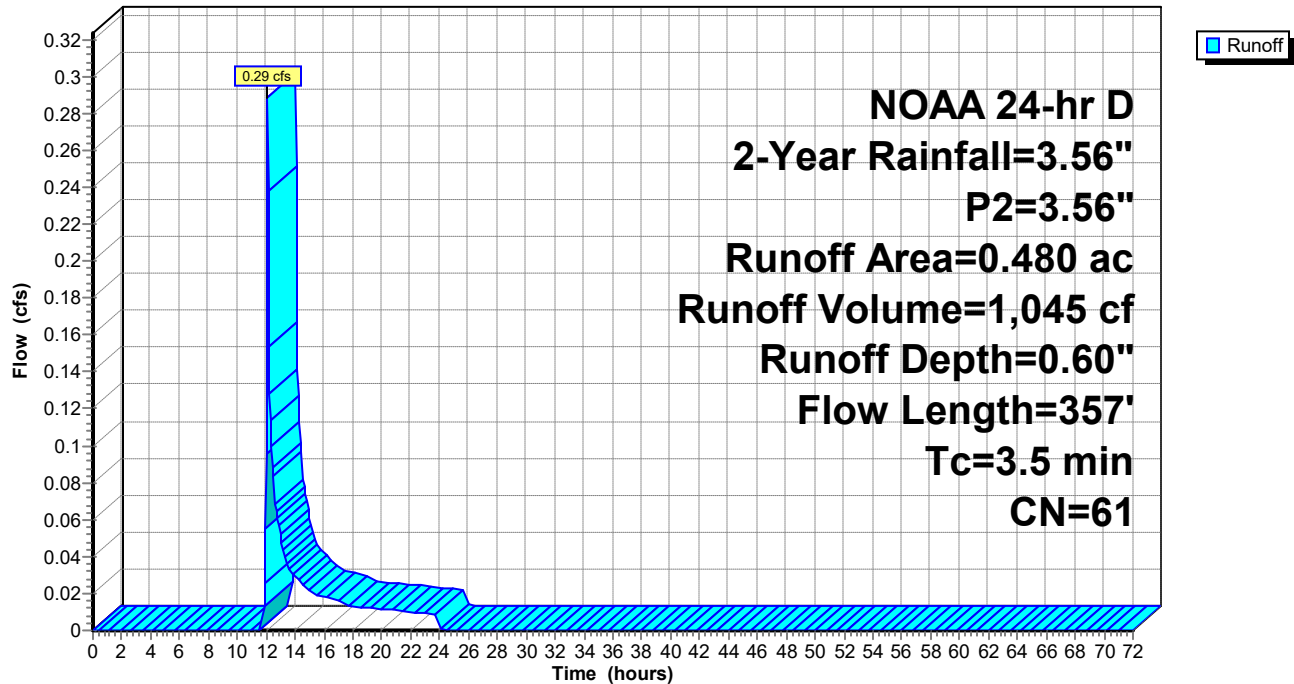
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.5	357	Total			

Subcatchment 17S: P-DA-1H PER

Hydrograph



Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 0.29 cfs @ 12.15 hrs, Volume= 1,132 cf, Depth= 0.60"
 Routed to nonexistent node 26L

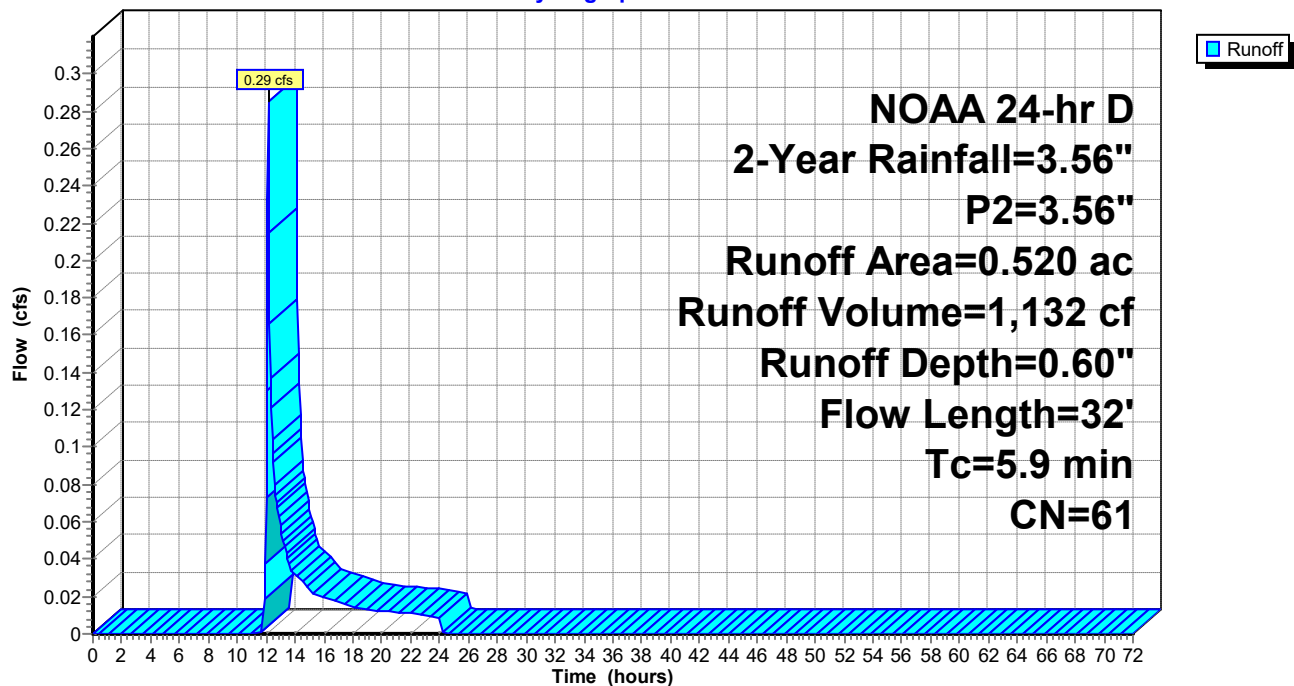
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	15	0.0140	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	6	0.3330	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.0	11	0.0830	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.56"
5.9	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Hydrograph



Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 0.63 cfs @ 12.07 hrs, Volume= 2,053 cf, Depth= 3.33"
 Routed to Link 20L : TOTAL TO GI MTD F-1

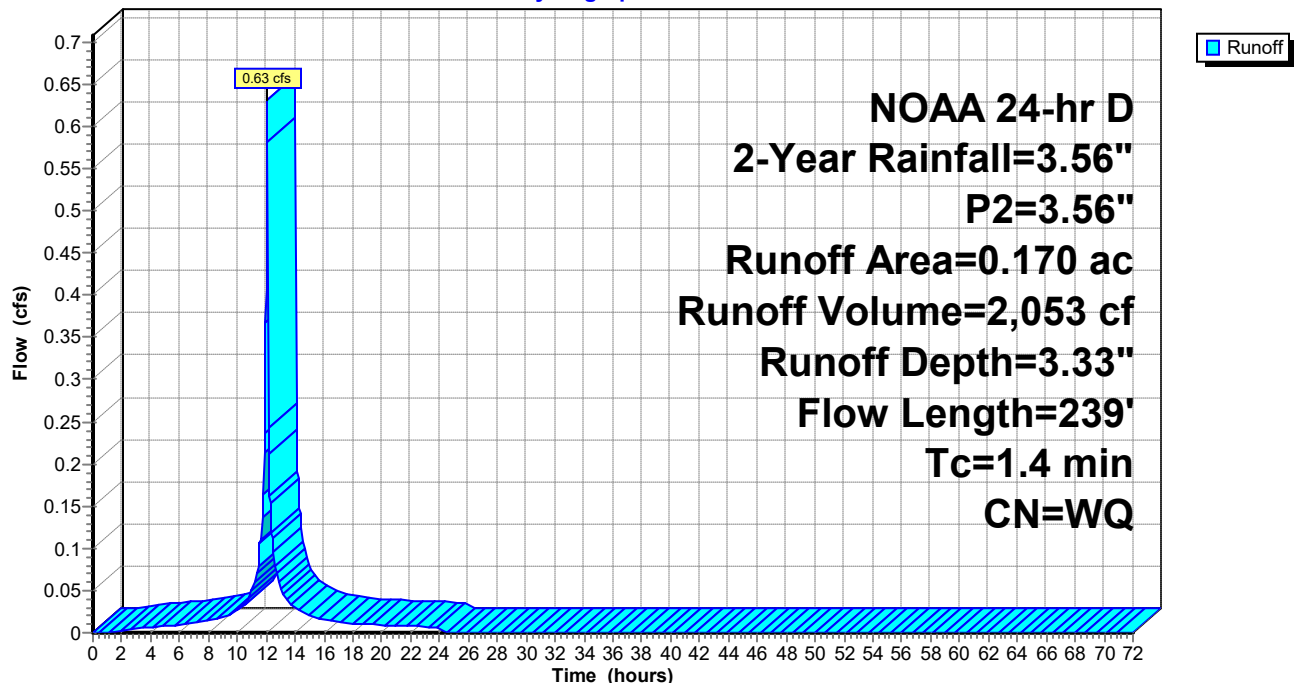
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.10 cfs @ 12.10 hrs, Volume= 327 cf, Depth= 0.60"
 Routed to Link 20L : TOTAL TO GI MTD F-1

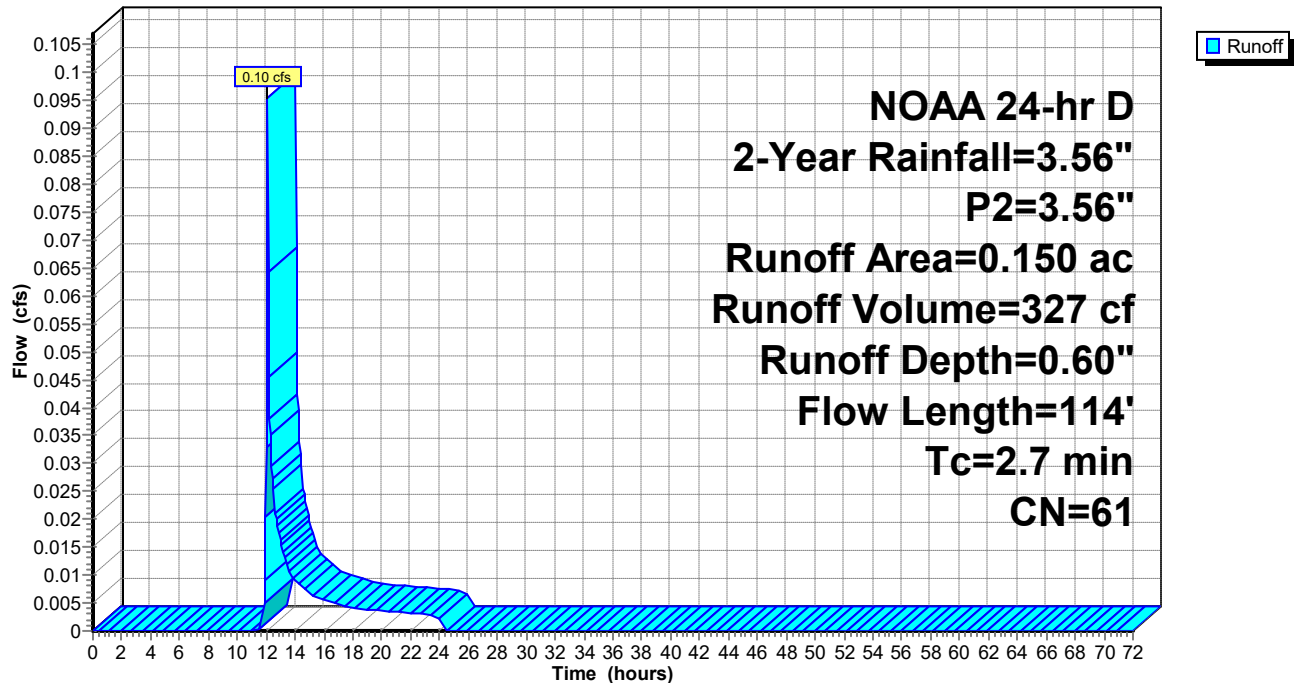
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.7	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 4,226 cf, Depth= 3.33"
 Routed to Pond G : BMP-G Bioretention Basin

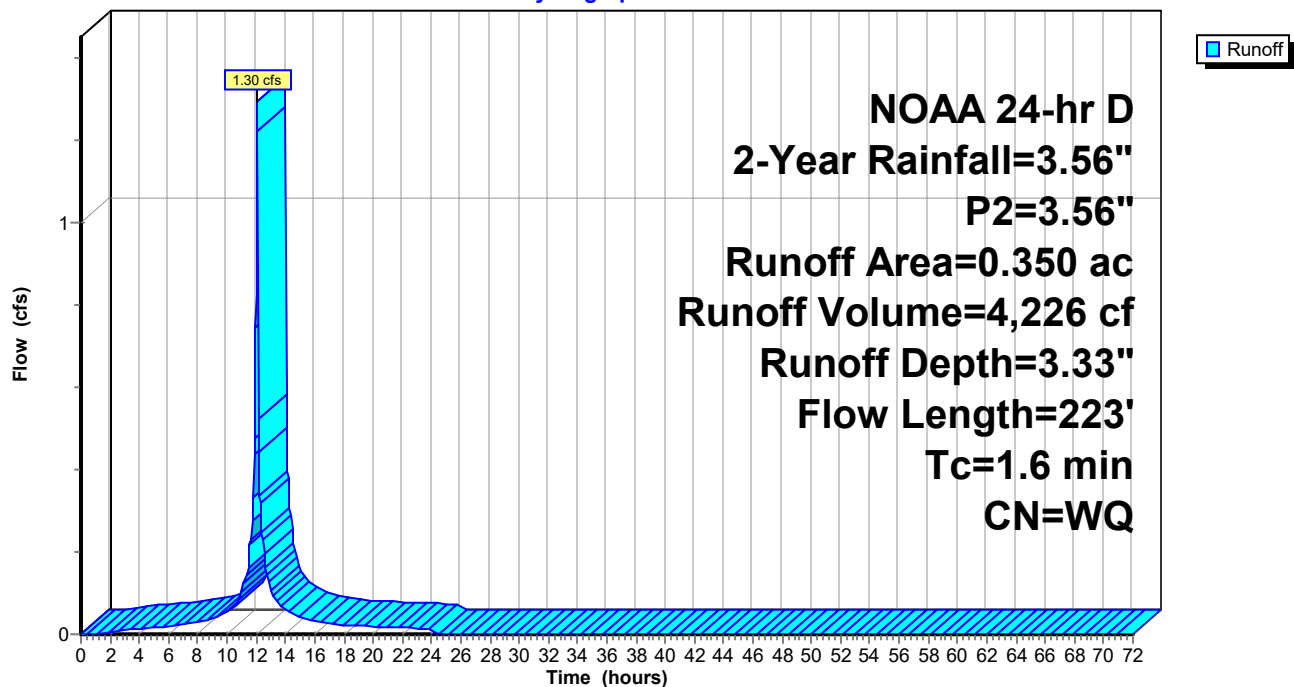
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	113	0.0240	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.6	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 958 cf, Depth= 0.60"
 Routed to Pond G : BMP-G Bioretention Basin

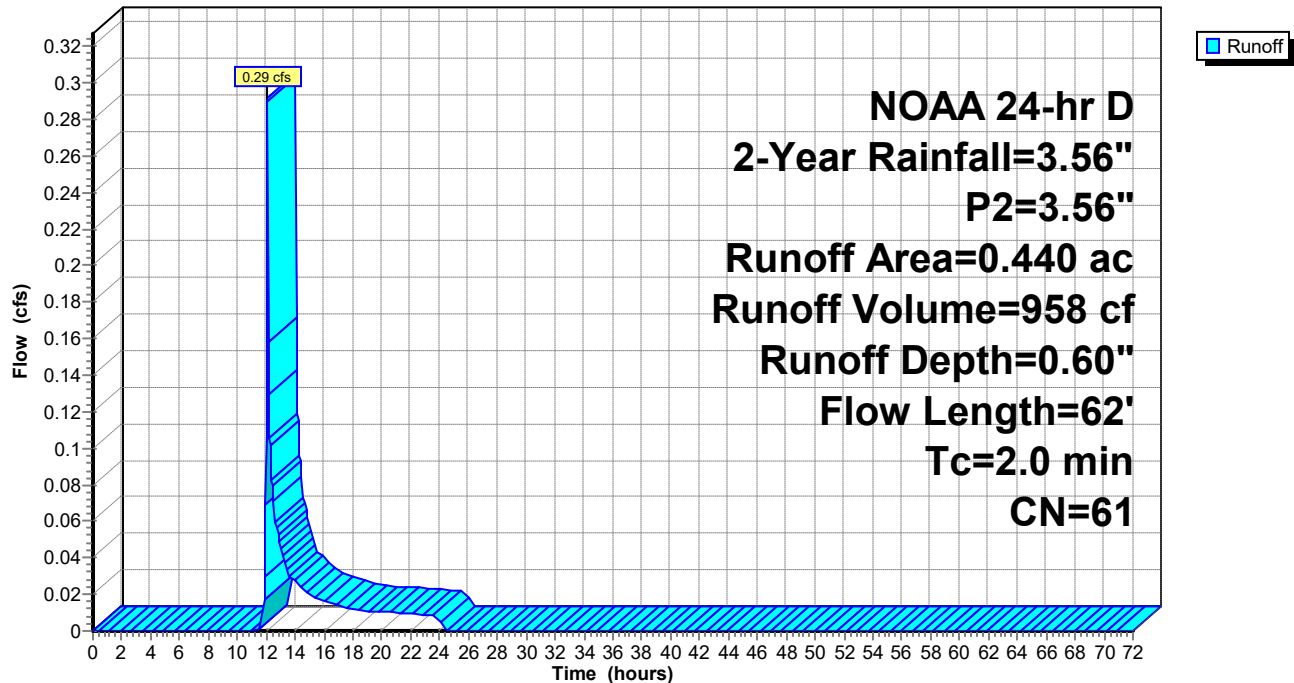
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	13	0.0200	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.07 cfs @ 12.06 hrs, Volume= 241 cf, Depth= 3.33"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

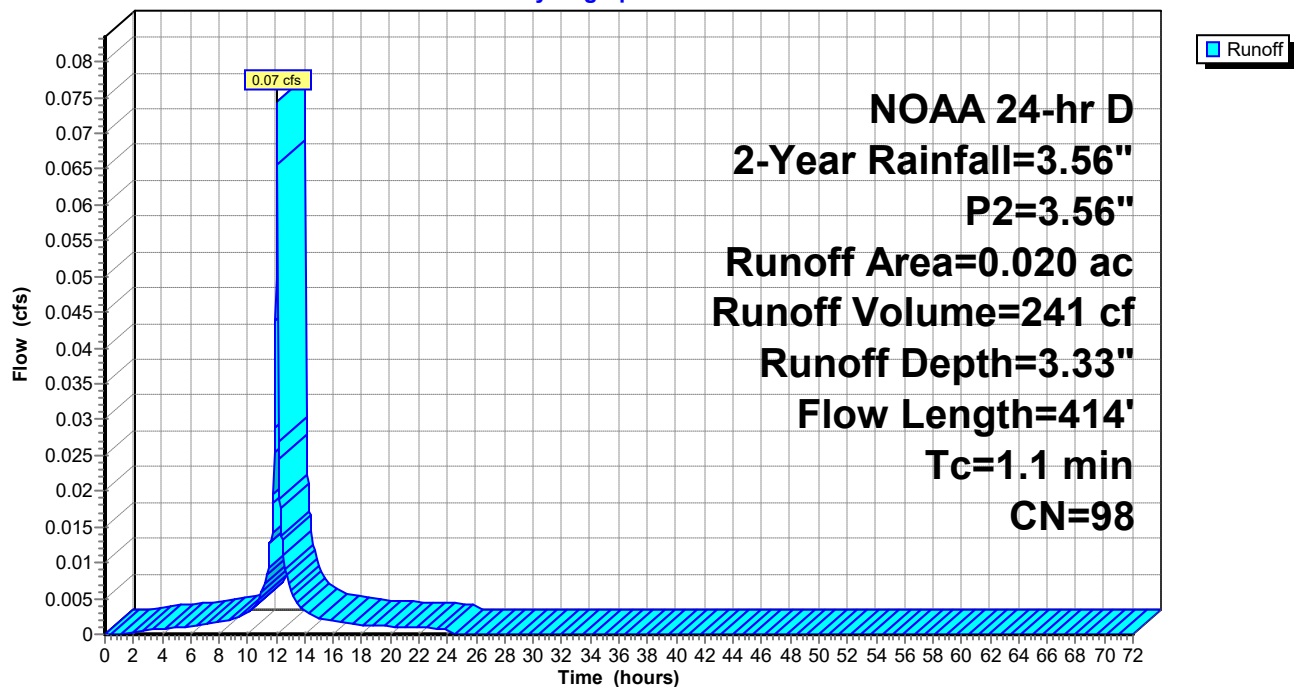
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	43	0.0330	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.1	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Runoff = 0.36 cfs @ 12.14 hrs, Volume= 1,416 cf, Depth= 0.60"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

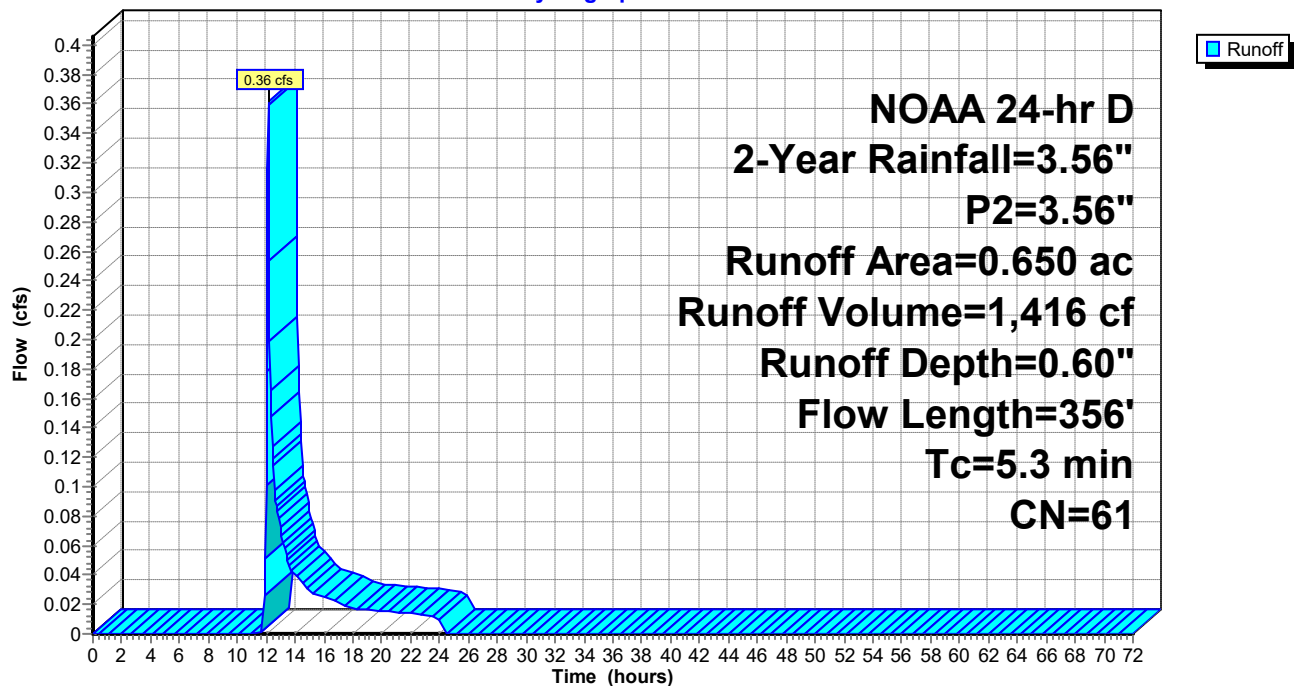
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	67	0.0600	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 35S: P-DA-1C IMP

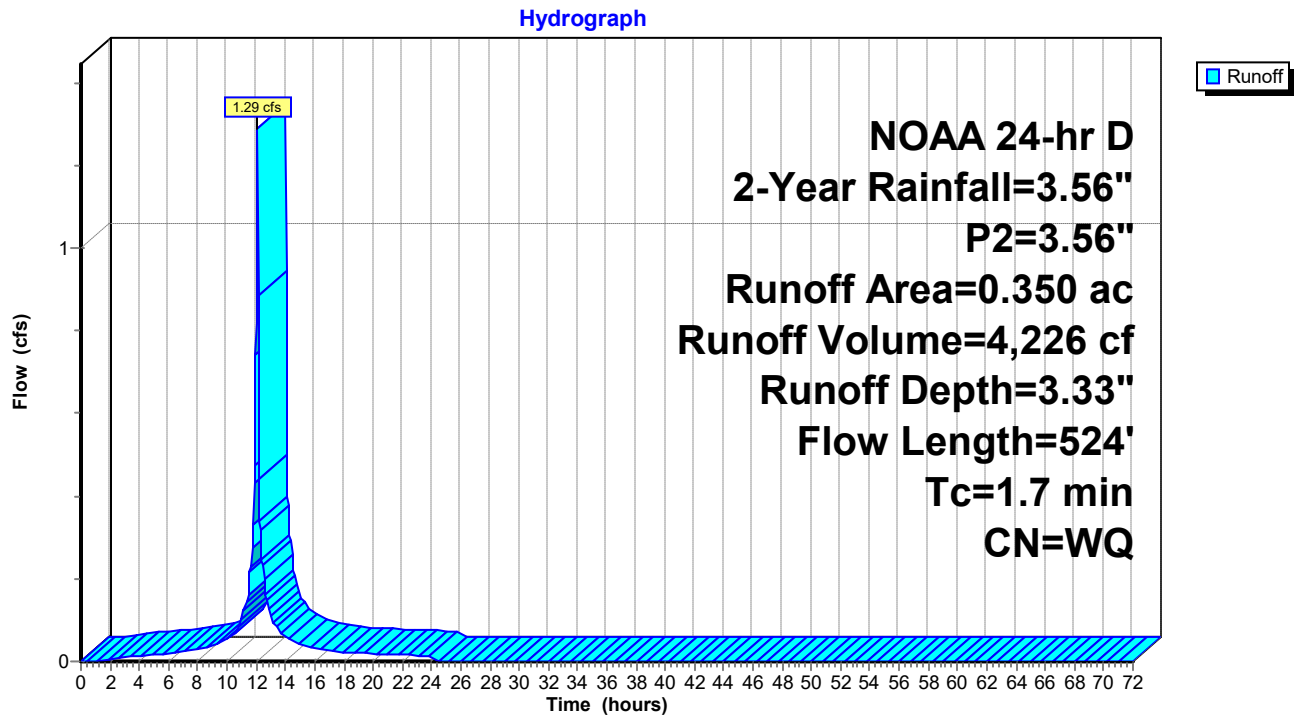
Runoff = 1.29 cfs @ 12.07 hrs, Volume= 4,226 cf, Depth= 3.33"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0200	1.16		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	130	0.0054	4.19	5.14	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	524	Total			

Subcatchment 35S: P-DA-1C IMP



Summary for Subcatchment 36S: P-DA-1C PER

Runoff = 0.55 cfs @ 12.10 hrs, Volume= 1,895 cf, Depth= 0.60"
 Routed to Link 38L : TOTAL TO GI MTD 1C

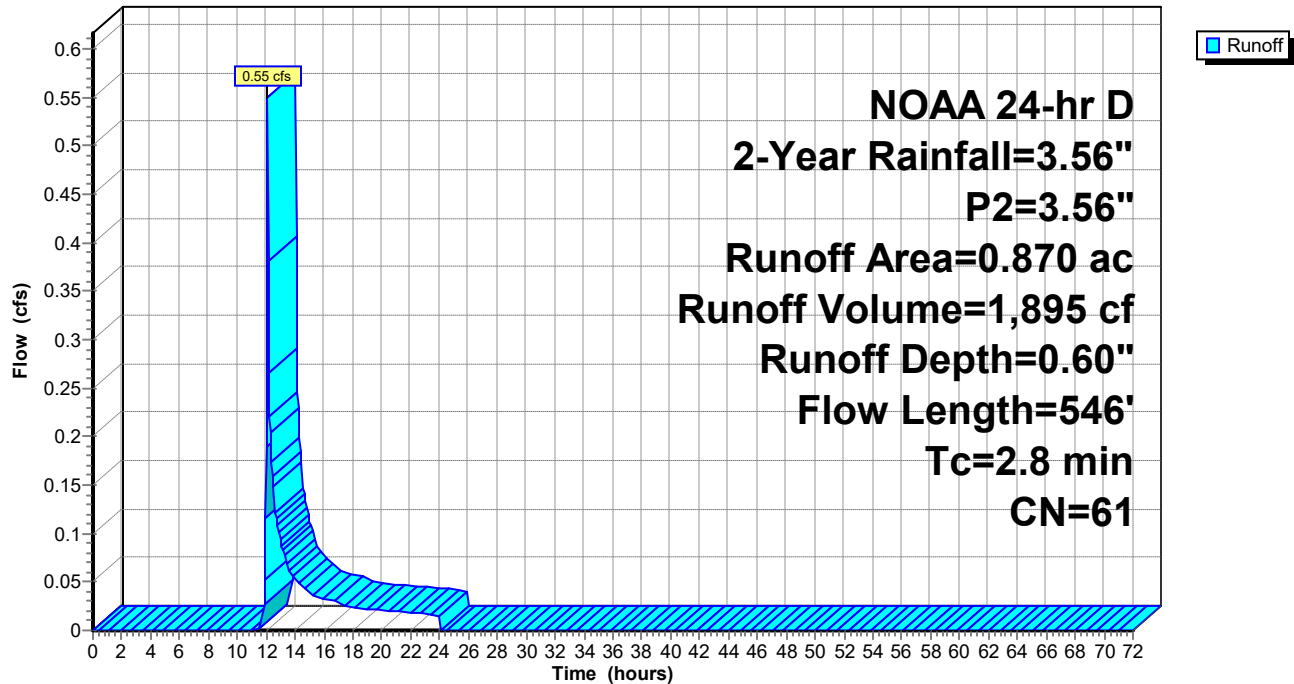
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	38	0.1900	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.8	546	Total			

Subcatchment 36S: P-DA-1C PER

Hydrograph



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 2.11 cfs @ 12.08 hrs, Volume= 6,762 cf, Depth= 3.33"
 Routed to Pond I : BMP-I Bioretention Basin

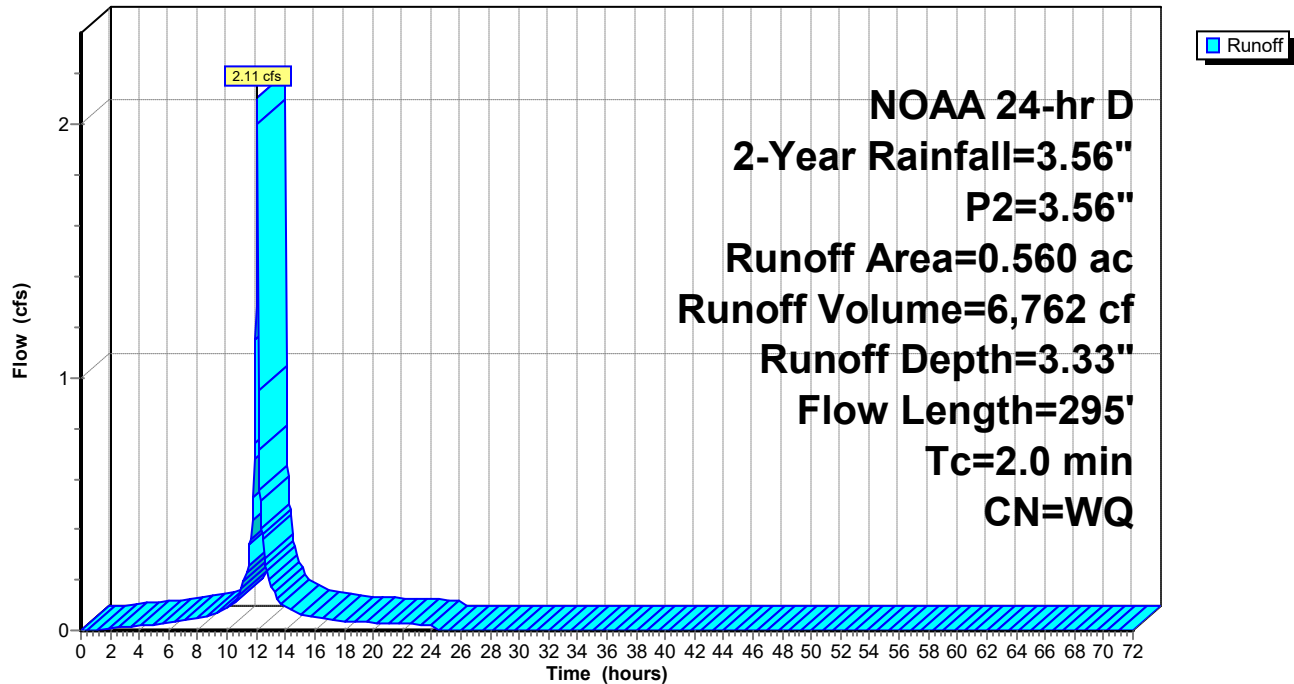
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.36		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 828 cf, Depth= 0.60"
 Routed to Pond I : BMP-I Bioretention Basin

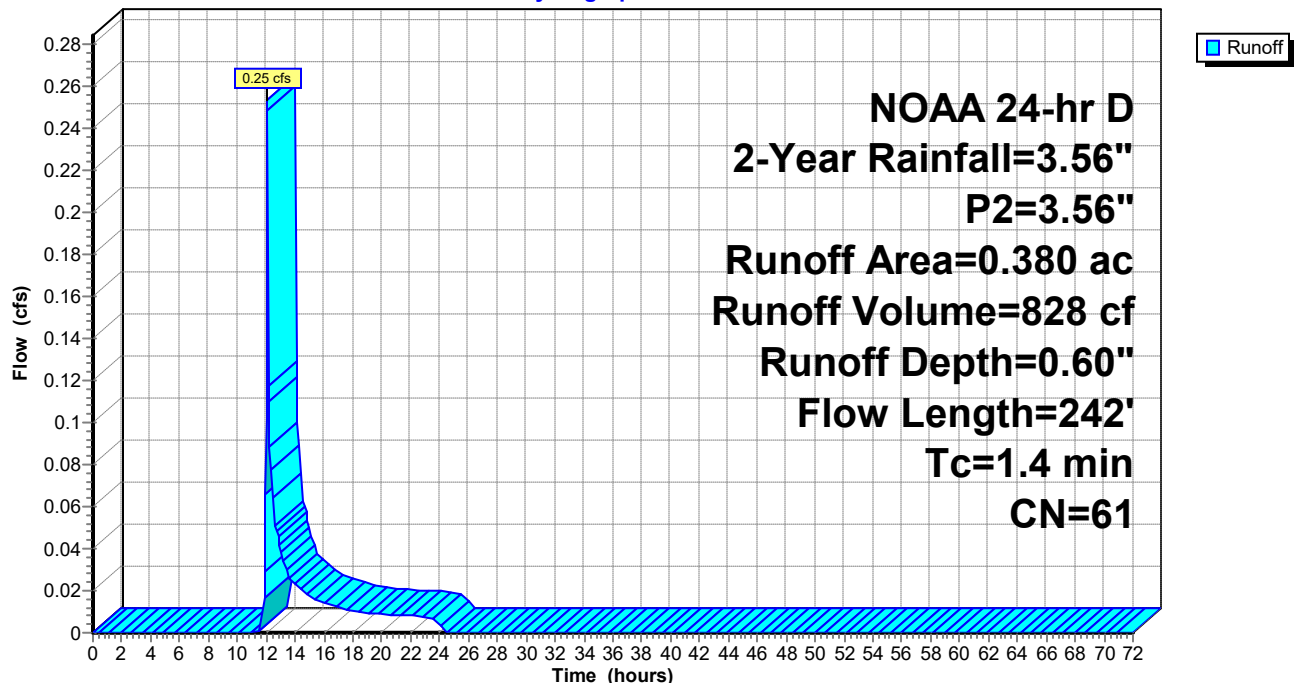
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.8	167	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 1.97 cfs @ 12.08 hrs, Volume= 6,399 cf, Depth= 3.33"
 Routed to Pond J : BMP-J Bioretention Basin

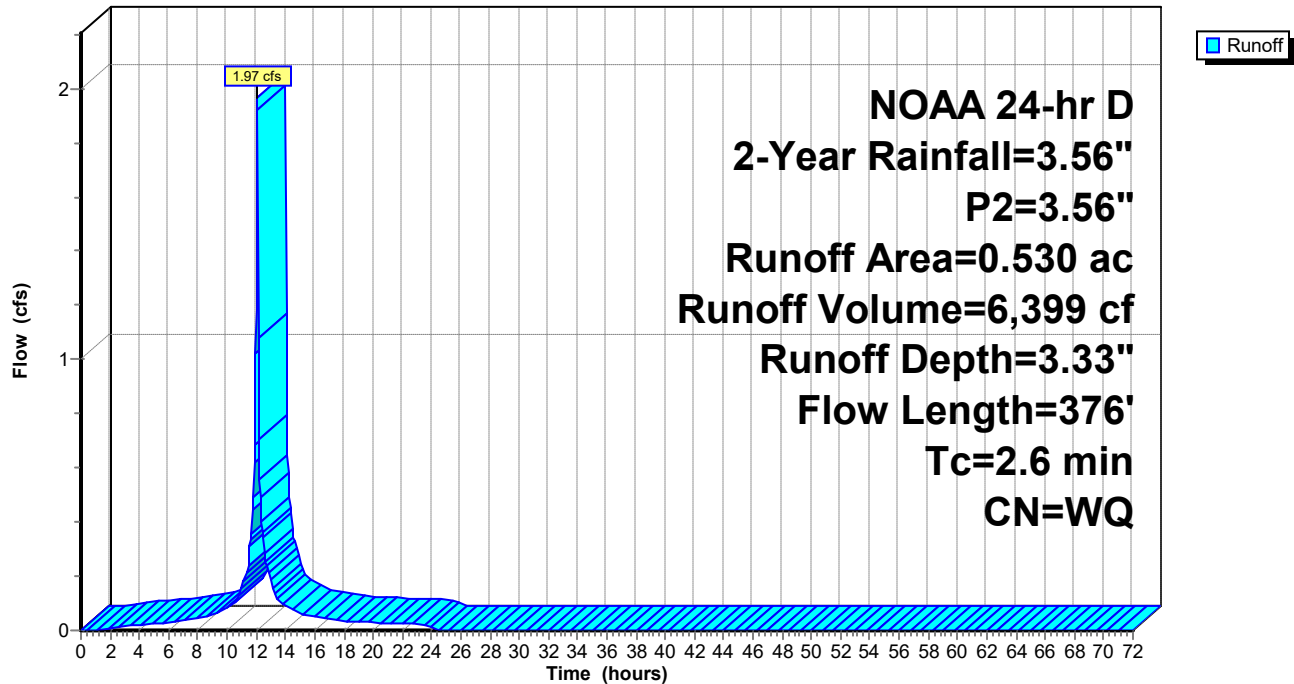
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.6	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 2.29 cfs @ 12.11 hrs, Volume= 8,211 cf, Depth= 3.33"
 Routed to Pond C : BMP C Bioretention Basin

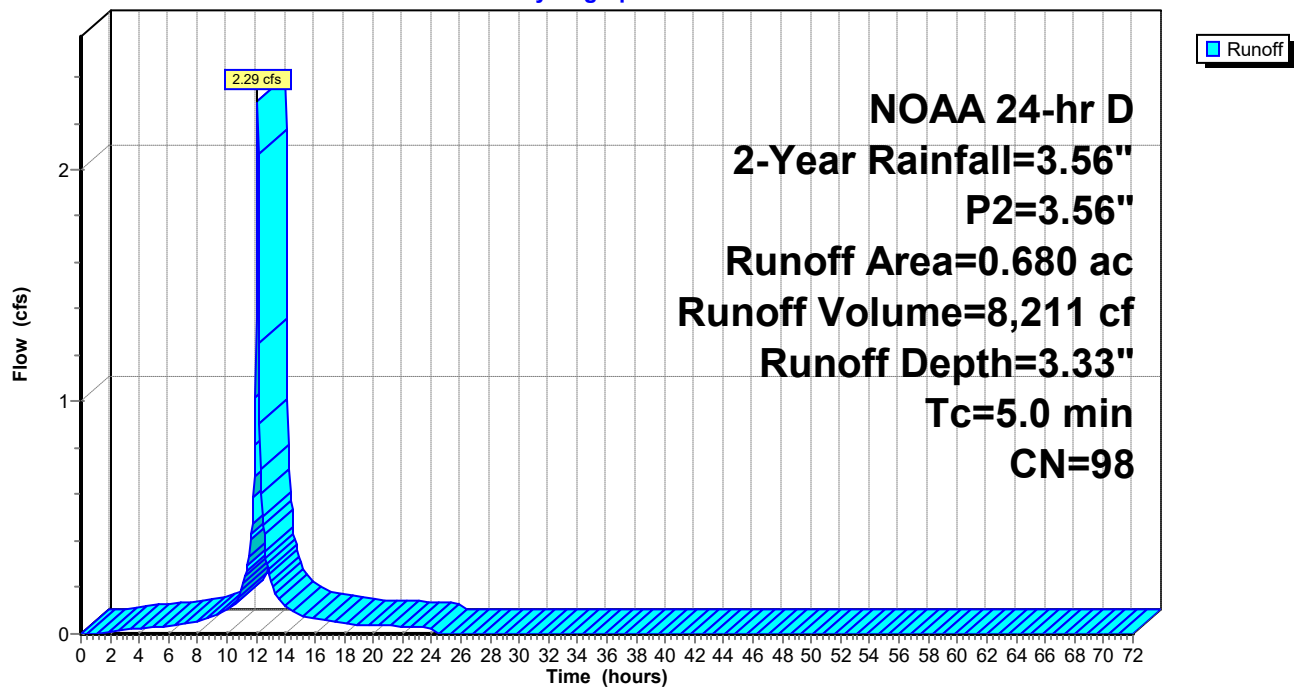
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 0.30 cfs @ 12.07 hrs, Volume= 966 cf, Depth= 3.33"
 Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

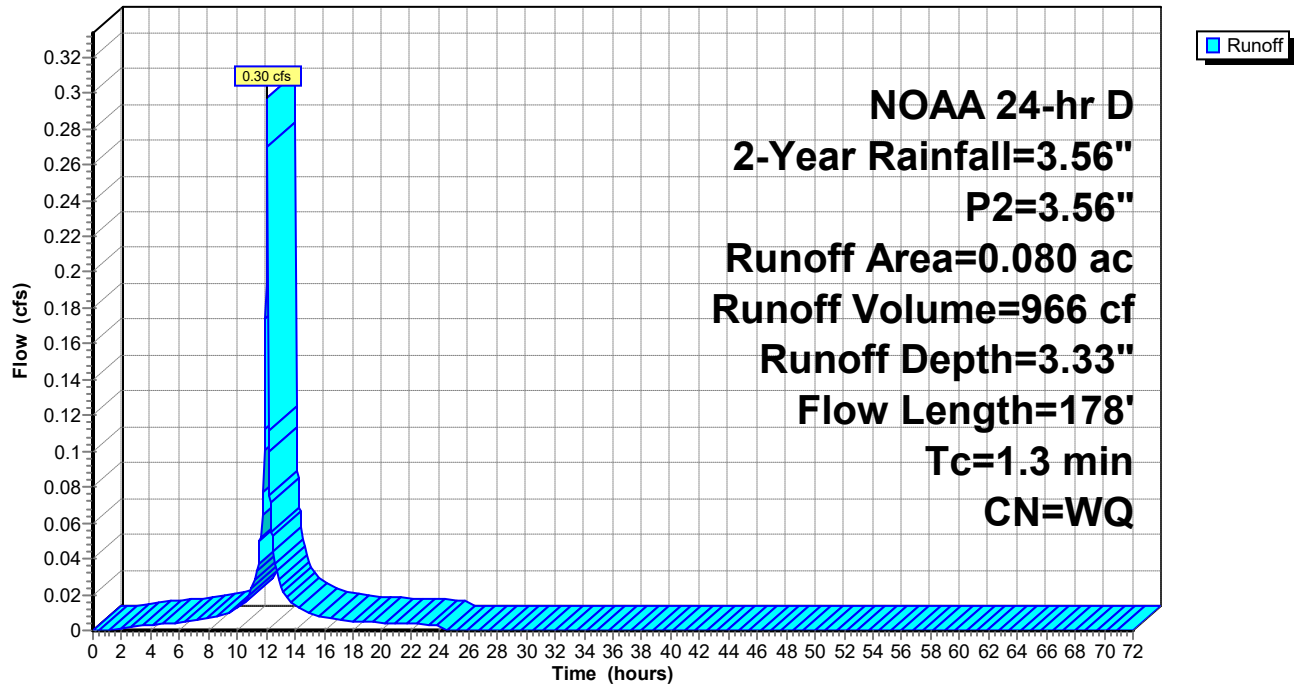
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 0.85 cfs @ 12.07 hrs, Volume= 2,777 cf, Depth= 3.33"
 Routed to Pond F : UG INFILTRATION BASIN F

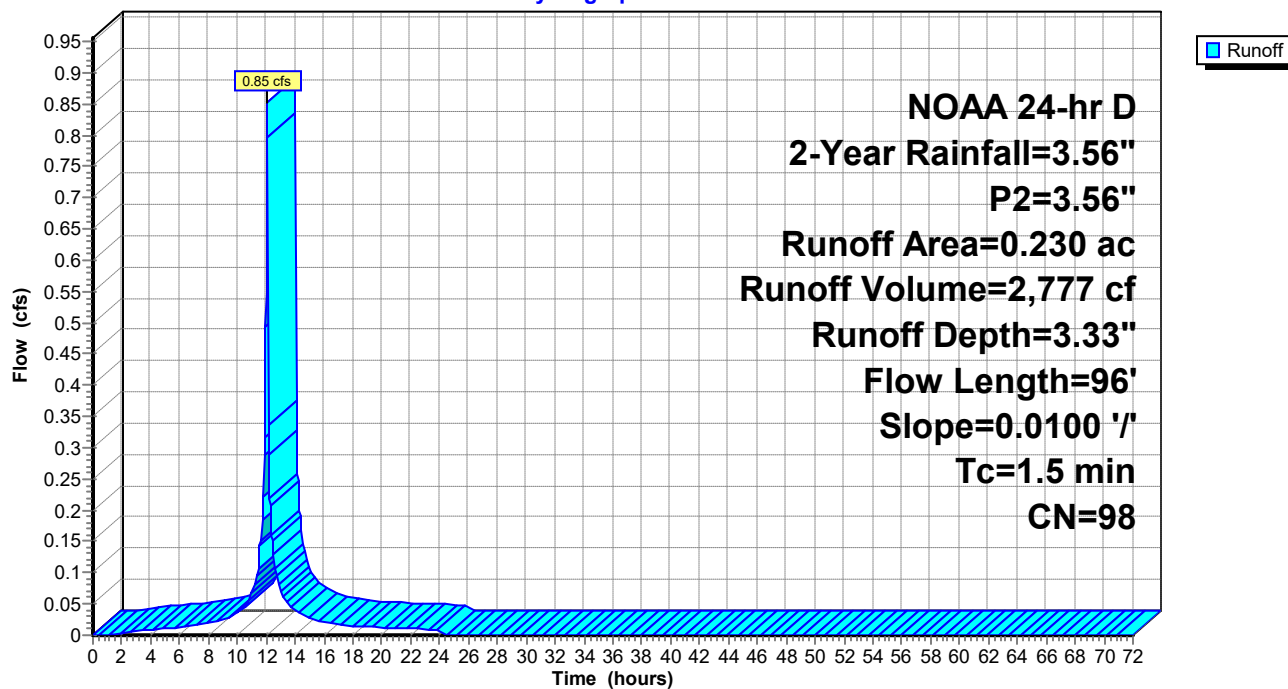
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	96	0.0100	1.09		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Runoff = 0.35 cfs @ 12.17 hrs, Volume= 1,524 cf, Depth= 0.60"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

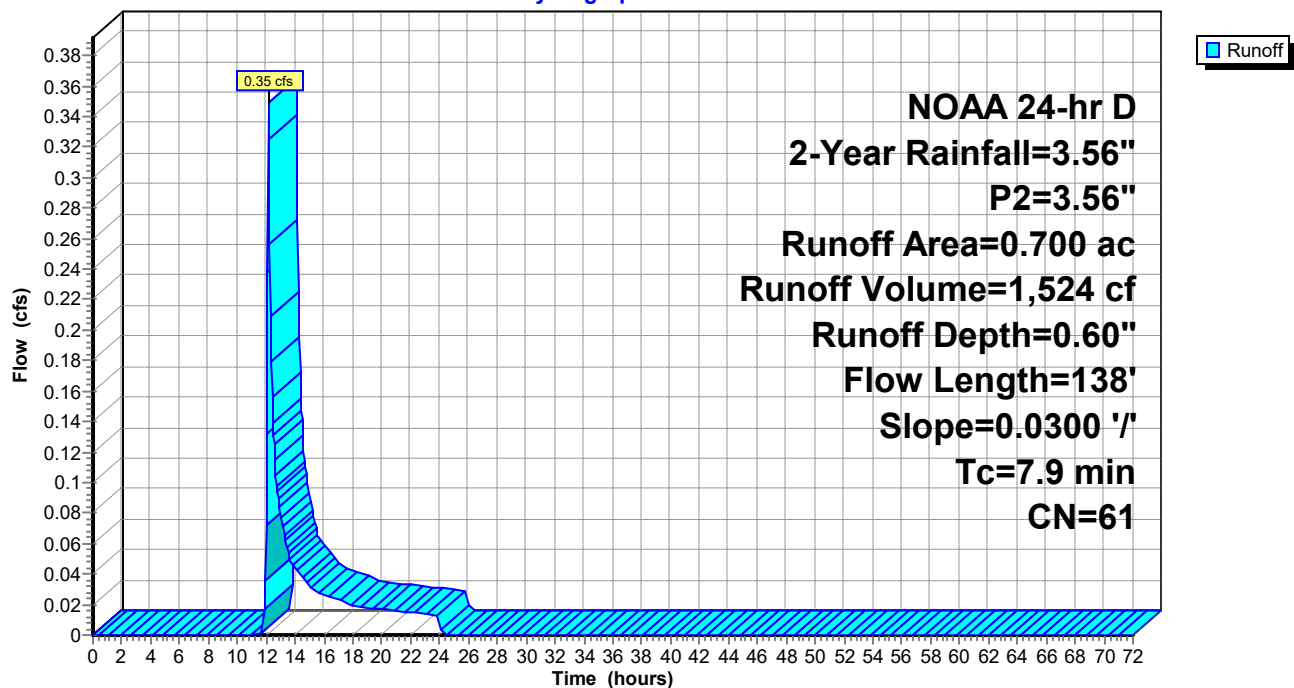
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	84	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.0	54	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 6.13 cfs @ 12.08 hrs, Volume= 19,681 cf, Depth= 3.33"
 Routed to Link 46L : P-DA-1B TOTAL

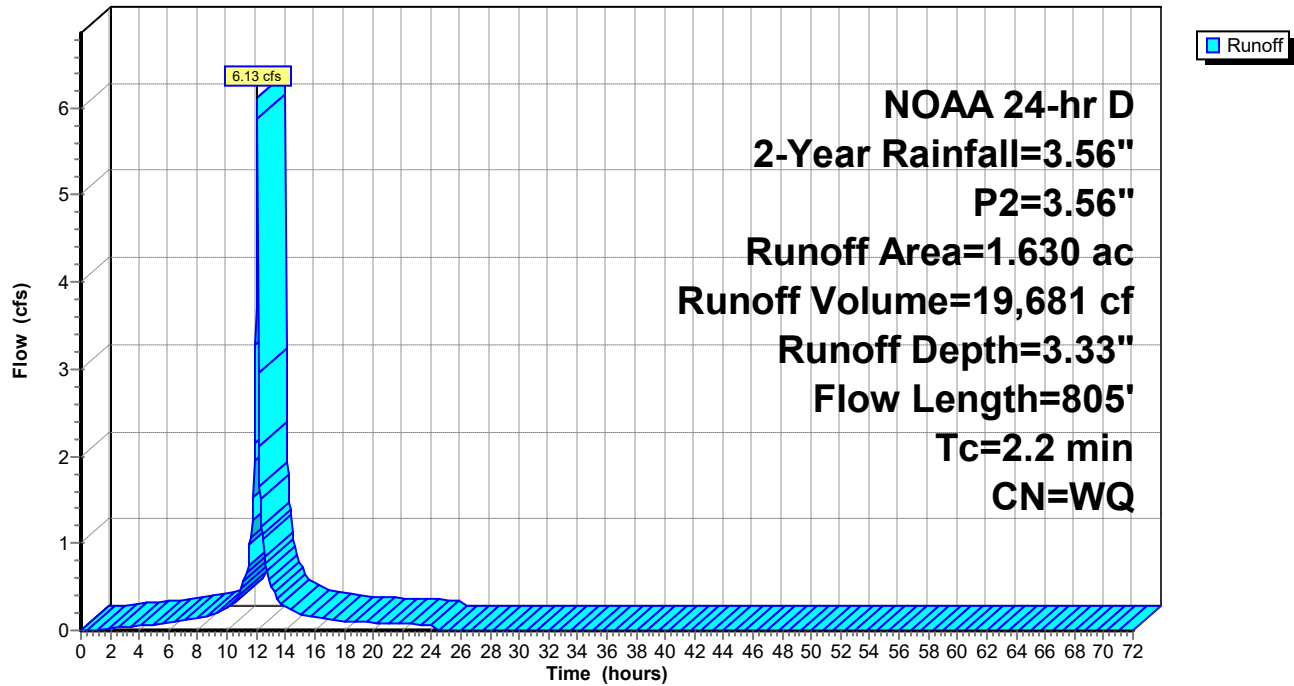
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.2	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 0.71 cfs @ 12.12 hrs, Volume= 2,635 cf, Depth= 0.60"
 Routed to Link 46L : P-DA-1B TOTAL

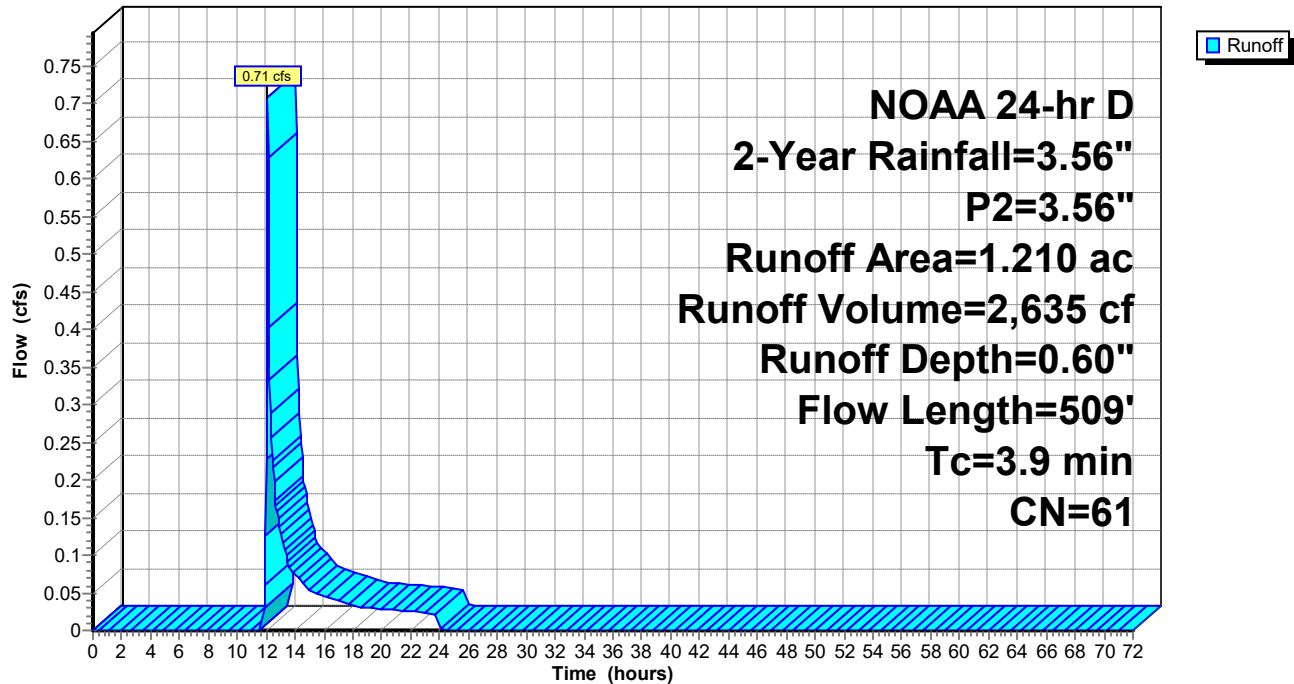
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	12	0.0110	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.2	107	0.0210	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.9	509	Total			

Subcatchment 45S: P-DA-1B PER

Hydrograph



Summary for Subcatchment 46S: P-DA-4J PER

Runoff = 0.18 cfs @ 12.13 hrs, Volume= 697 cf, Depth= 0.60"
 Routed to Pond J : BMP-J Bioretention Basin

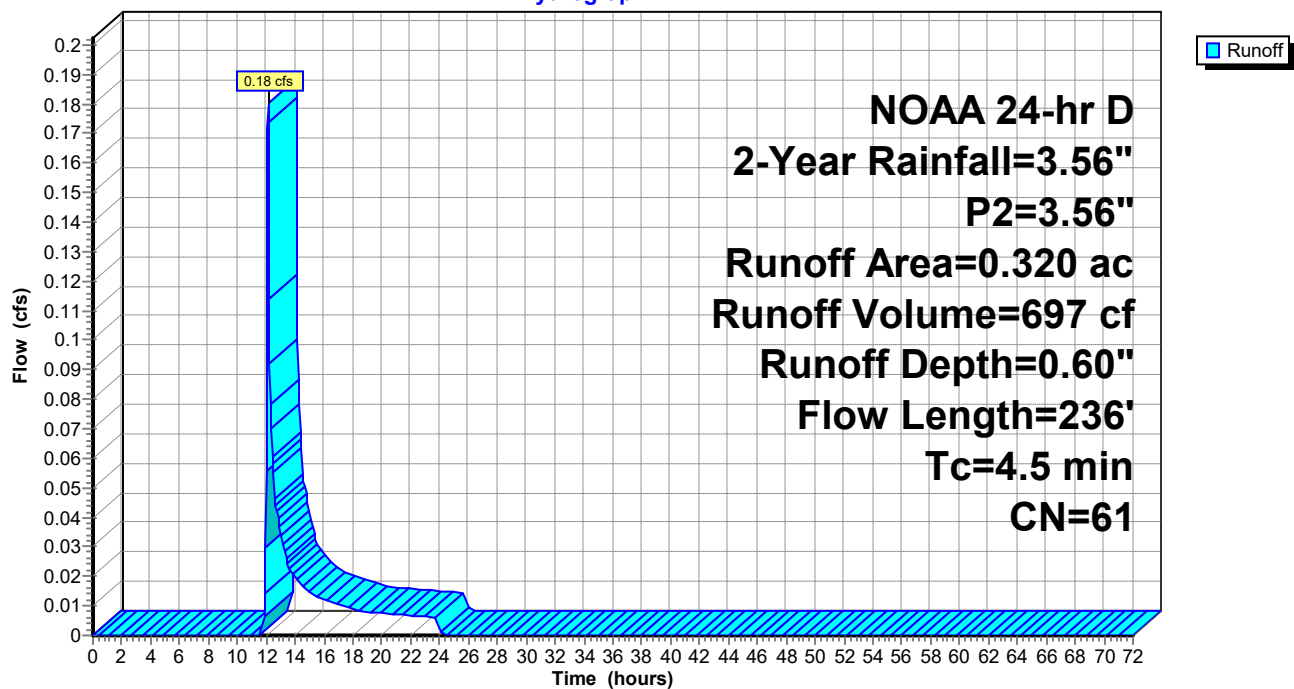
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	30	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.5	236	Total			

Subcatchment 46S: P-DA-4J PER

Hydrograph



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 2.72 cfs @ 12.08 hrs, Volume= 8,694 cf, Depth= 3.33"
 Routed to Link 50L : TOTAL TO GI MTD K-1

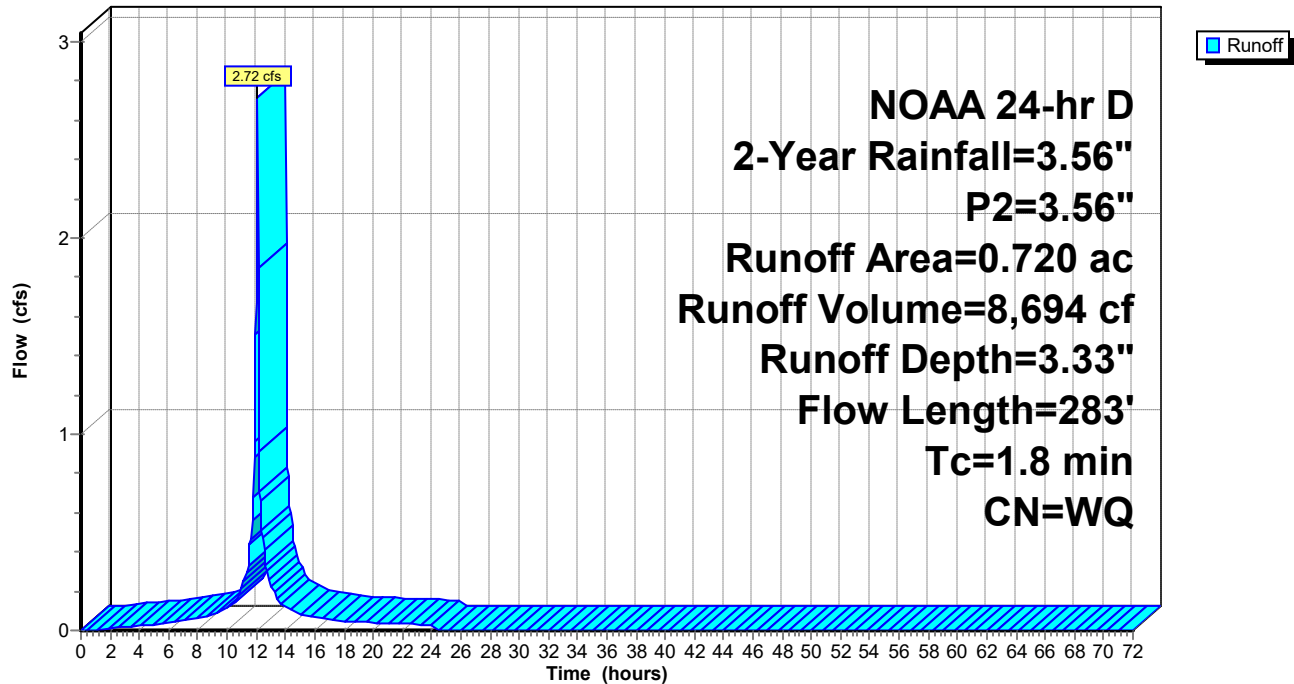
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.8	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

Runoff = 0.20 cfs @ 12.20 hrs, Volume= 958 cf, Depth= 0.60"
 Routed to Link 50L : TOTAL TO GI MTD K-1

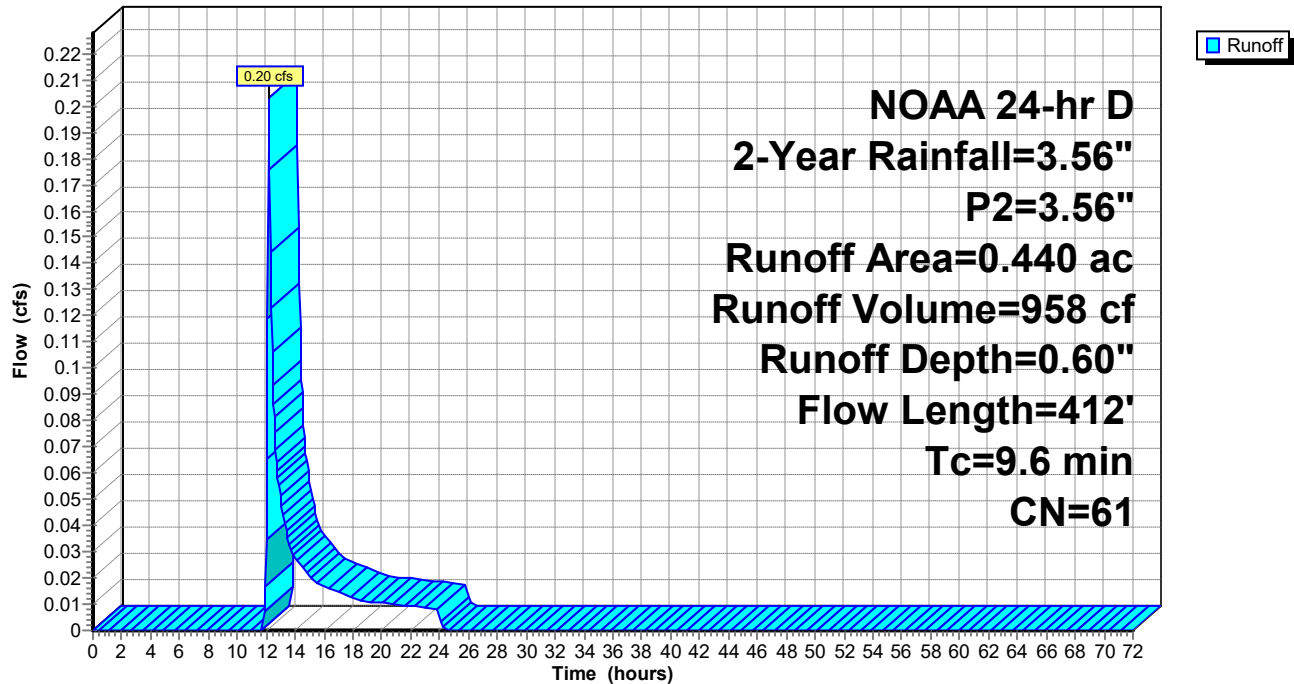
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	96	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
9.6	412	Total			

Subcatchment 48S: P-DA-4K PER

Hydrograph



Summary for Subcatchment 49S: P-DA-5N IMP

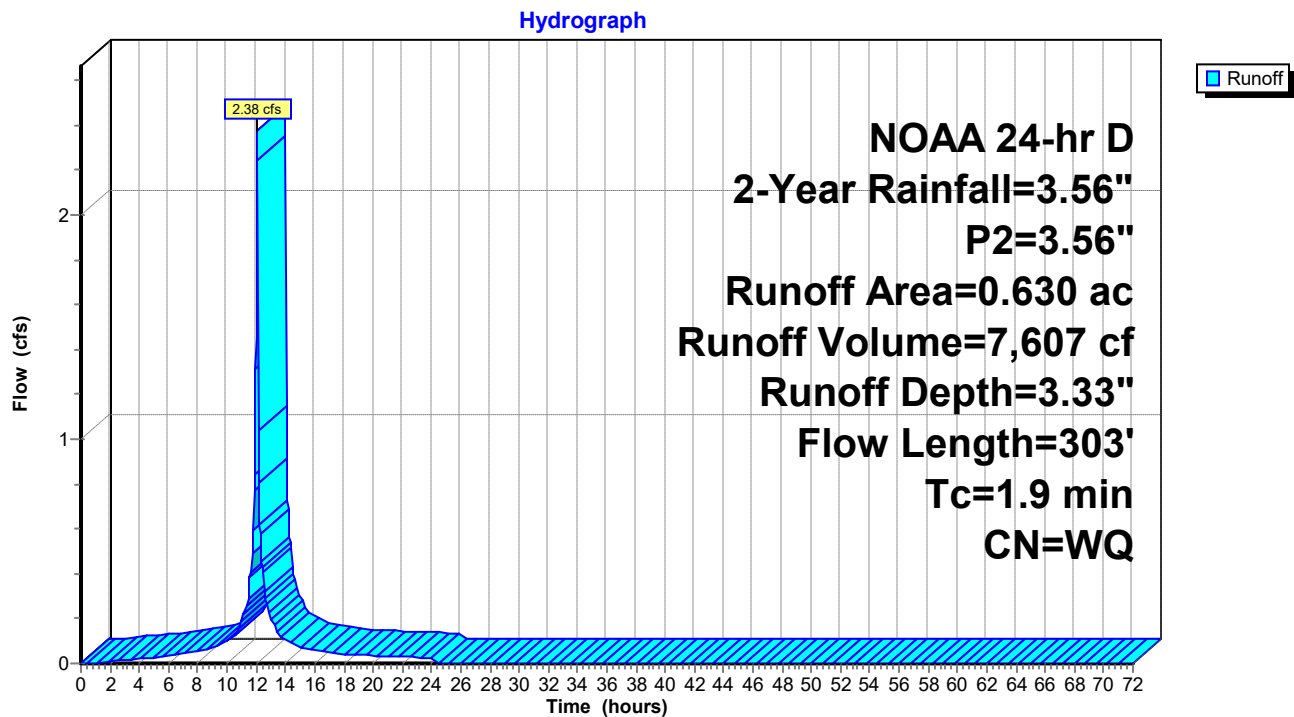
Runoff = 2.38 cfs @ 12.08 hrs, Volume= 7,607 cf, Depth= 3.33"
 Routed to Pond N : BMP-N Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0270	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.9	303	Total			

Subcatchment 49S: P-DA-5N IMP



Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 0.26 cfs @ 12.11 hrs, Volume= 915 cf, Depth= 0.60"
 Routed to Pond N : BMP-N Bioretention Basin

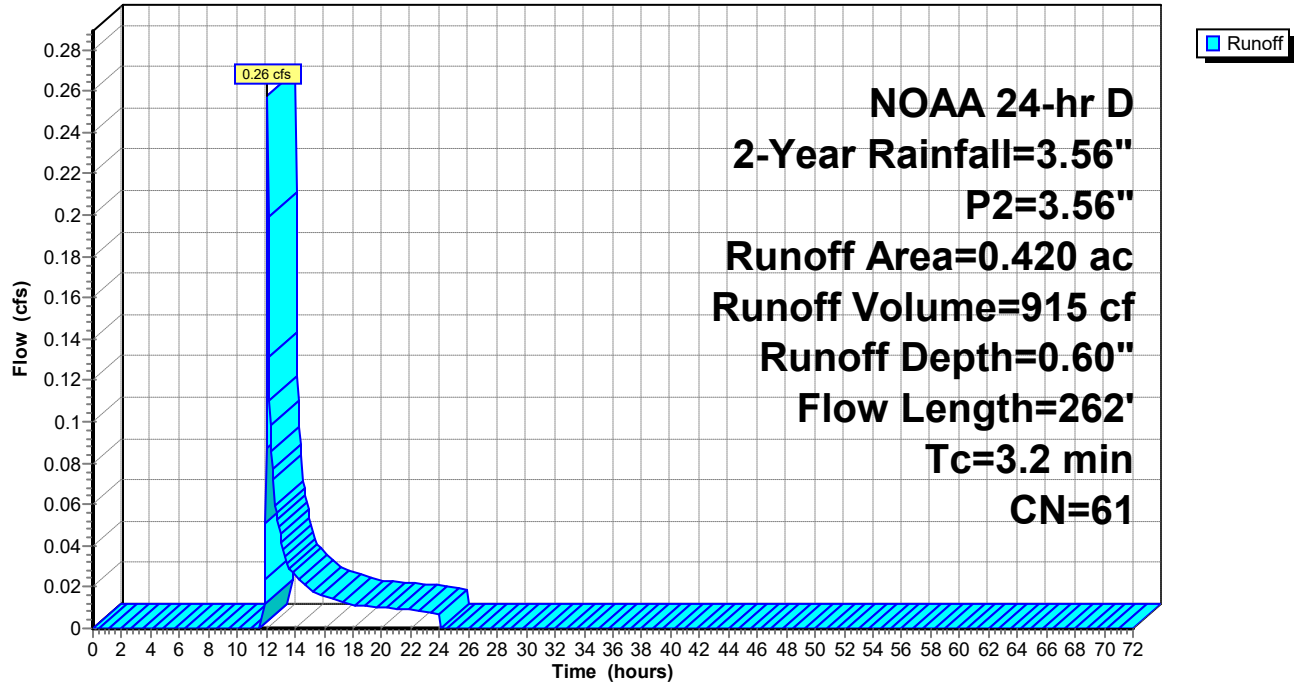
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	35	0.0570	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	262	Total			

Subcatchment 50S: P-DA-5N PER

Hydrograph



Summary for Subcatchment 51S: P-DA-5M IMP

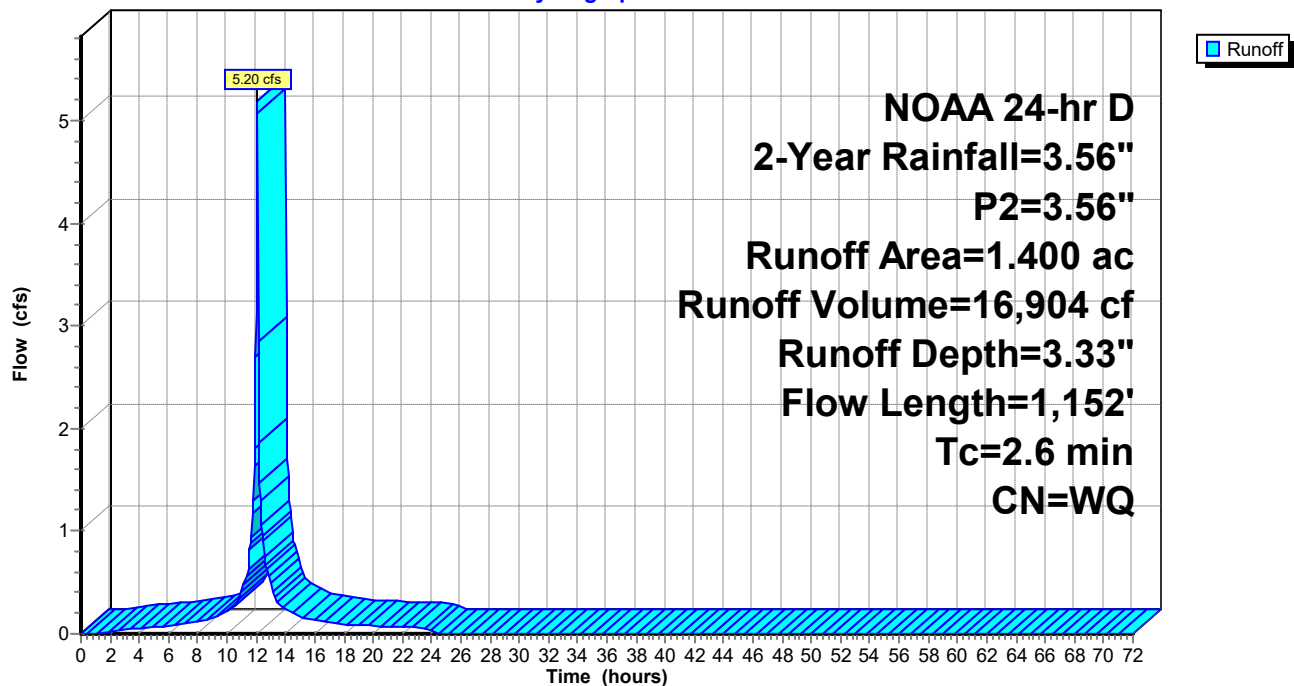
Runoff = 5.20 cfs @ 12.08 hrs, Volume= 16,904 cf, Depth= 3.33"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	41	0.1200	2.49		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.6	1,152	Total			

Subcatchment 51S: P-DA-5M IMP**Hydrograph**

Summary for Subcatchment 52S: P-DA-5M PER

Runoff = 0.48 cfs @ 12.10 hrs, Volume= 1,655 cf, Depth= 0.60"
 Routed to Link 21L : TOTAL TO P-DA-5M

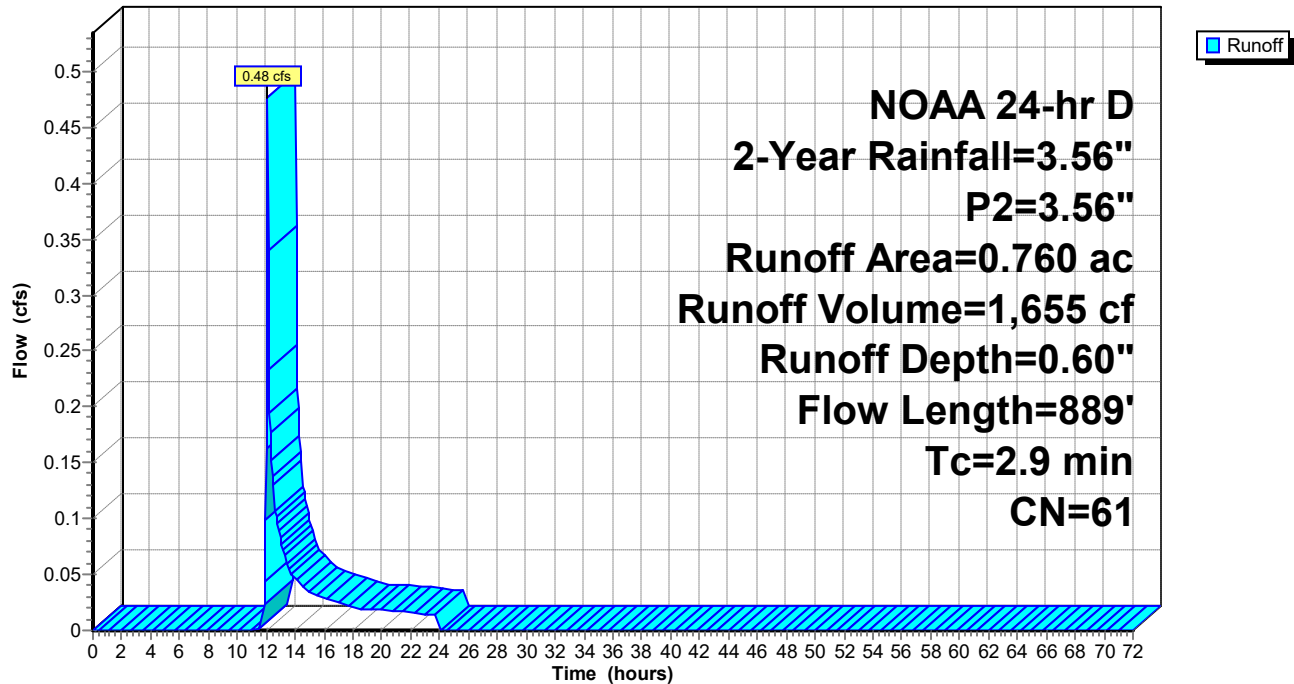
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	20	0.2000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.9	889	Total			

Subcatchment 52S: P-DA-5M PER

Hydrograph



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 604 cf, Depth= 3.33"
 Routed to Pond K : BMP-K UG Infiltration Basin

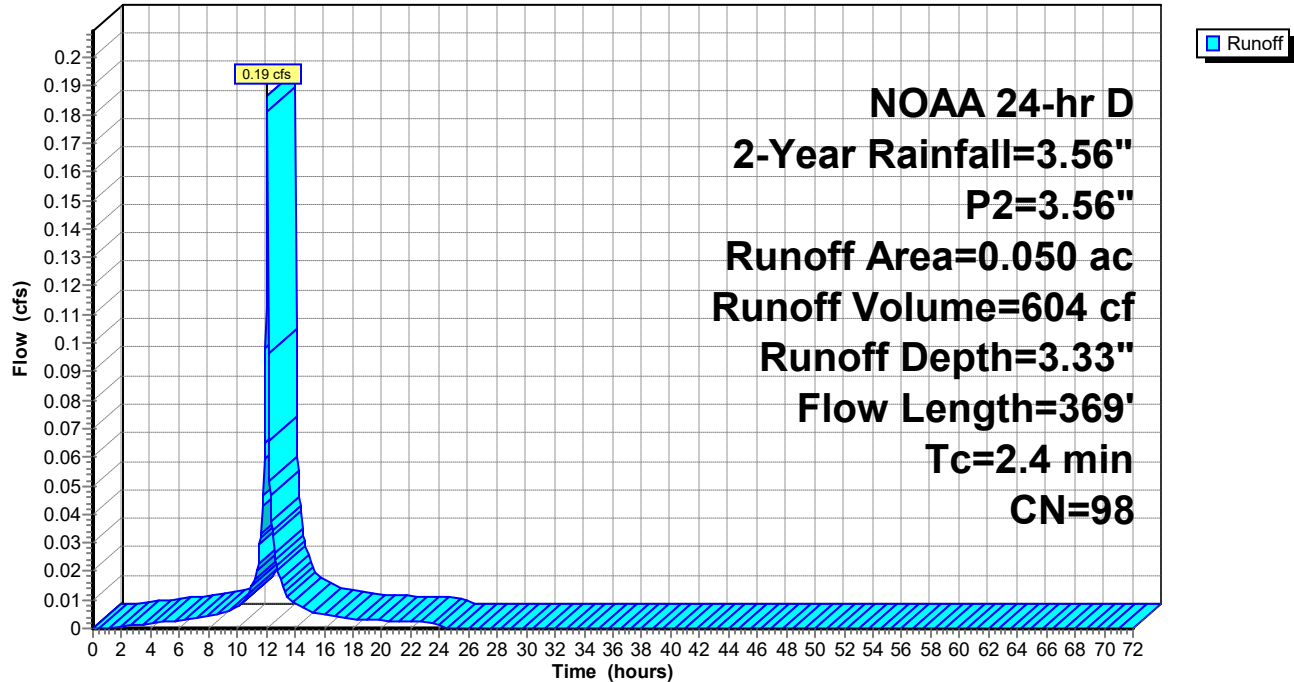
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 0.48 cfs @ 12.26 hrs, Volume= 2,670 cf, Depth= 0.60"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

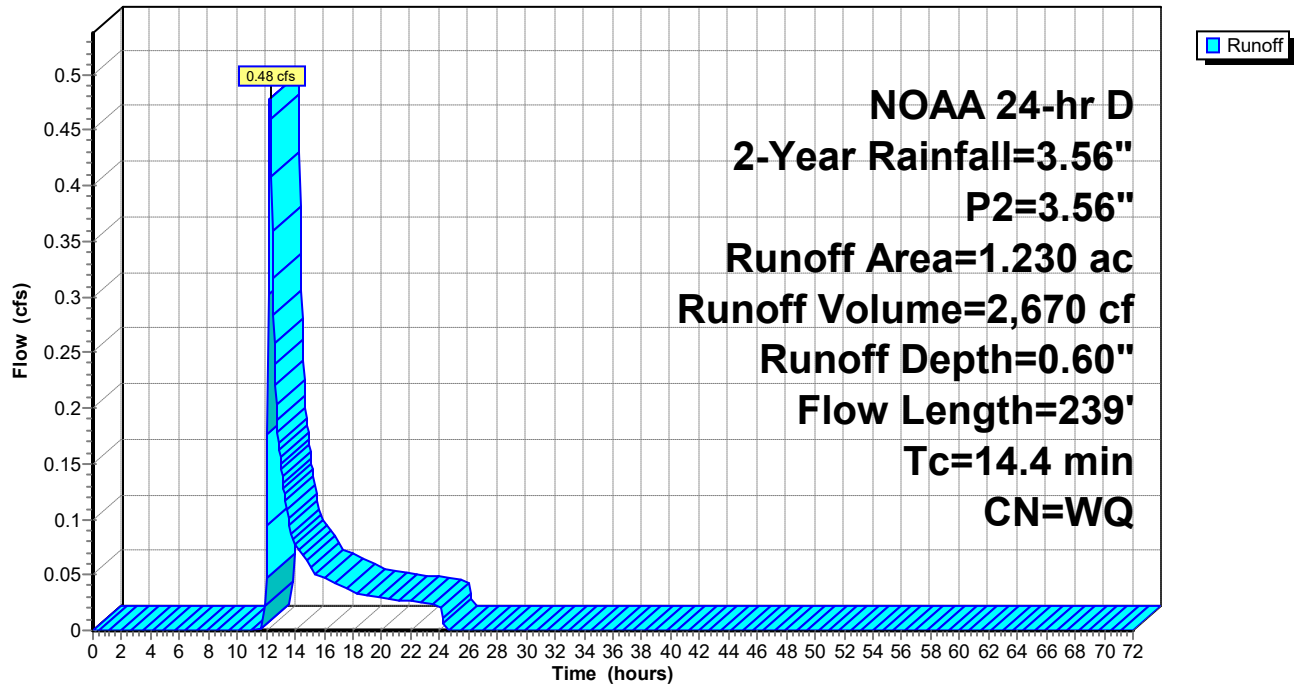
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.4	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.22 cfs @ 12.05 hrs, Volume= 724 cf, Depth= 3.33"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

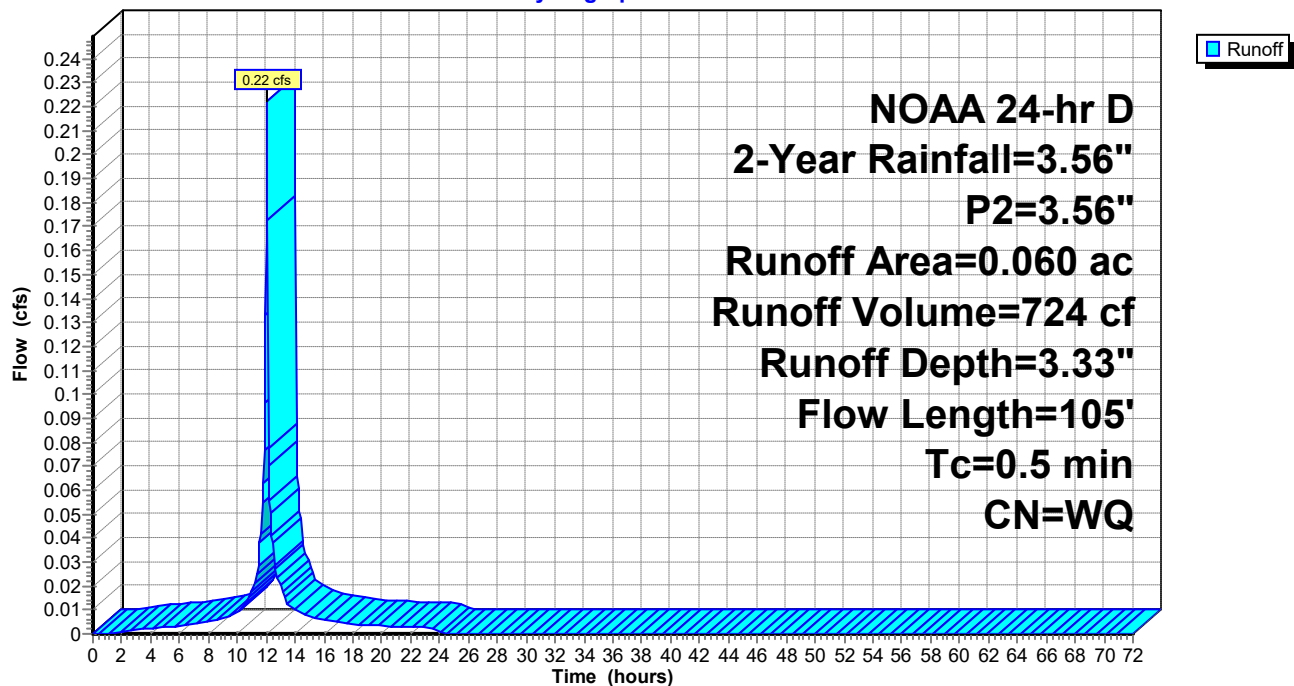
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 5.61 cfs @ 12.08 hrs, Volume= 18,112 cf, Depth= 3.33"
 Routed to Pond P : BMP-P Bioretention Basin

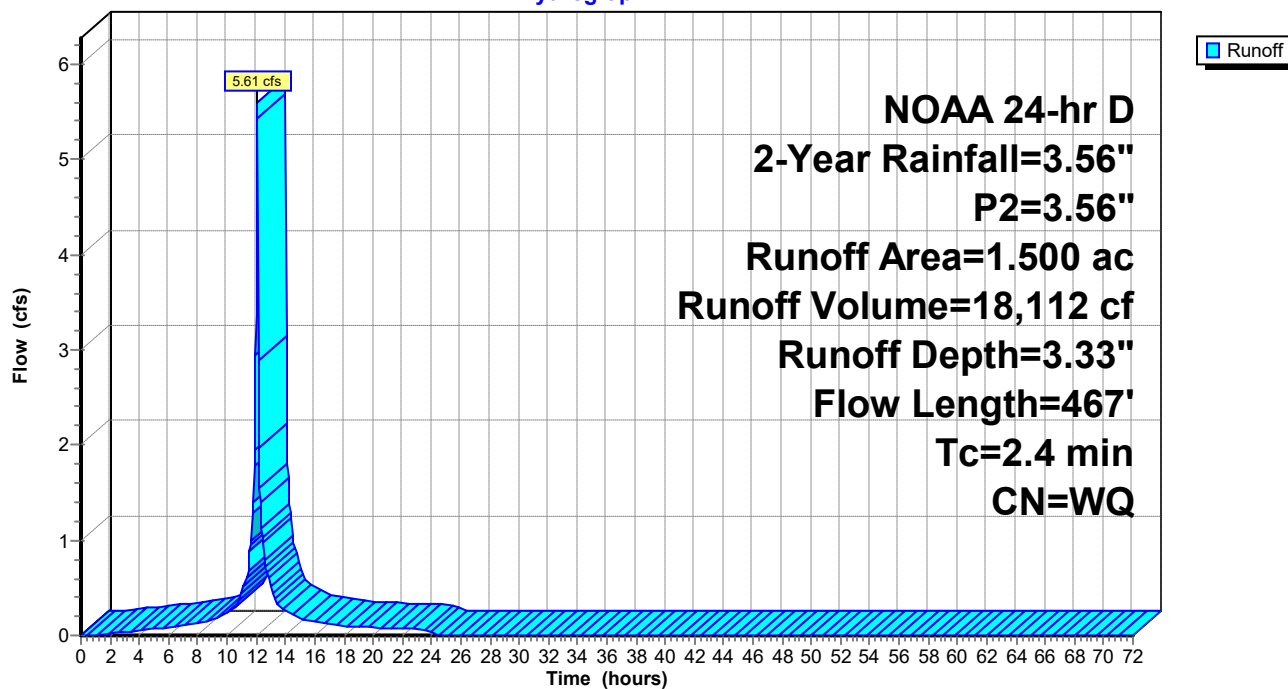
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.10		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.4	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 1,916 cf, Depth= 0.60"
 Routed to Pond P : BMP-P Bioretention Basin

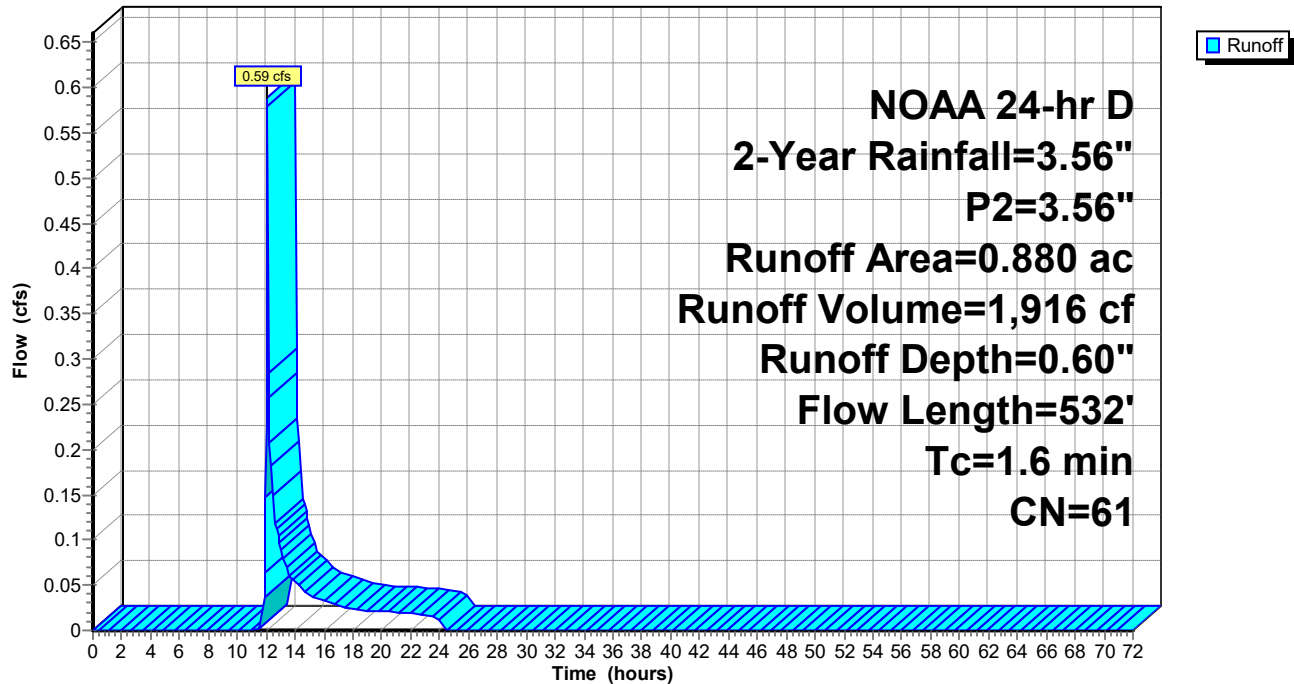
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER

Hydrograph



Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 0.48 cfs @ 12.13 hrs, Volume= 1,932 cf, Depth= 0.57"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

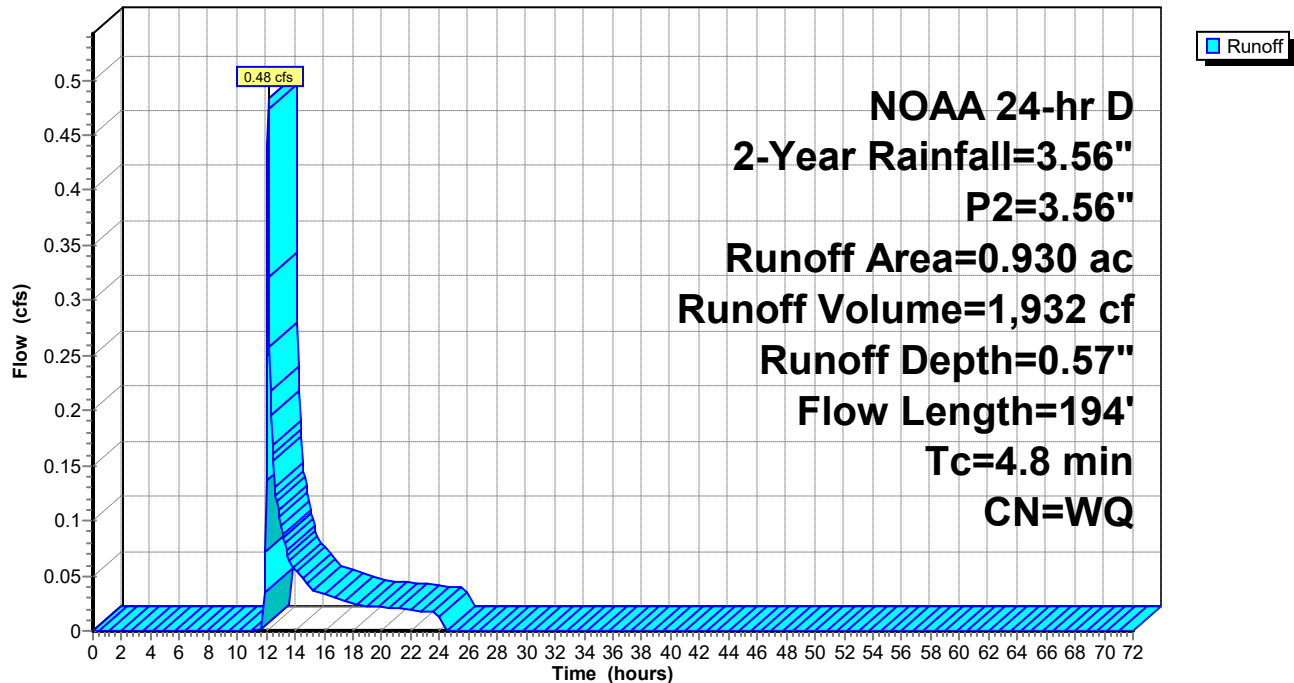
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.8	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Hydrograph



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 3.09 cfs @ 12.08 hrs, Volume= 9,901 cf, Depth= 3.33"
 Routed to Link 66L : P-DA-5R TOTAL

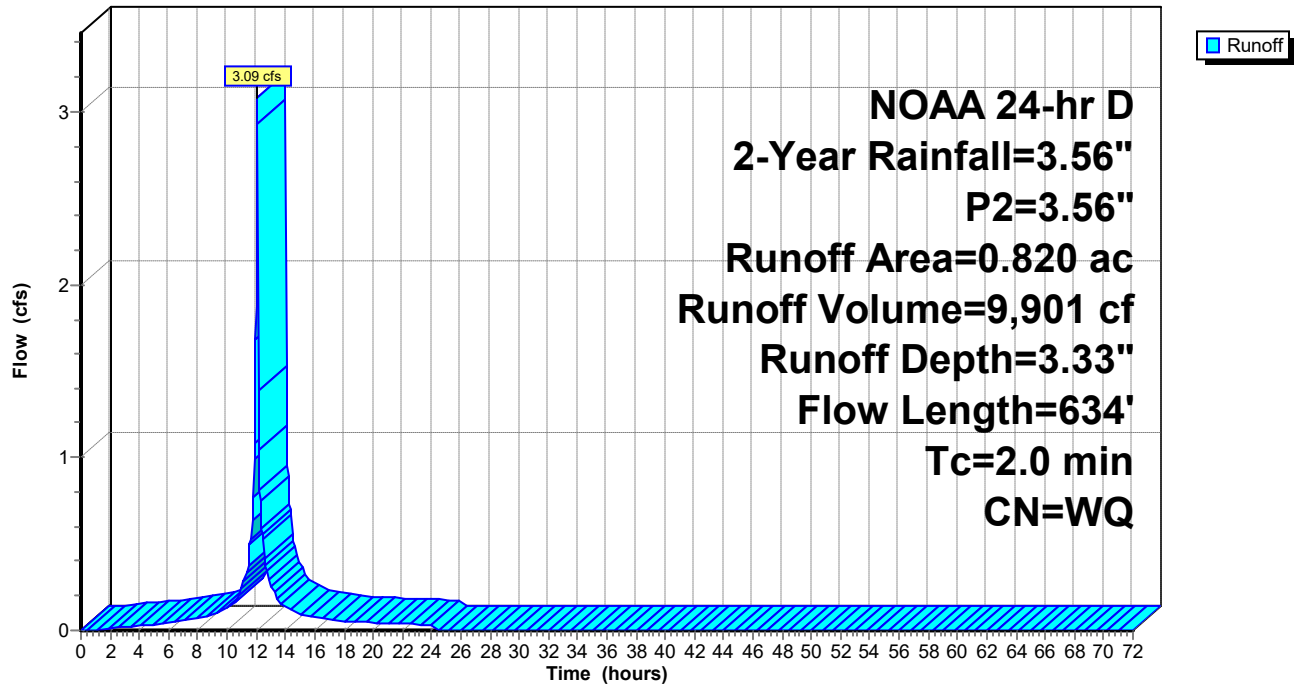
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0370	1.86		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.0	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

Runoff = 0.75 cfs @ 12.14 hrs, Volume= 2,918 cf, Depth= 0.60"
 Routed to Link 66L : P-DA-5R TOTAL

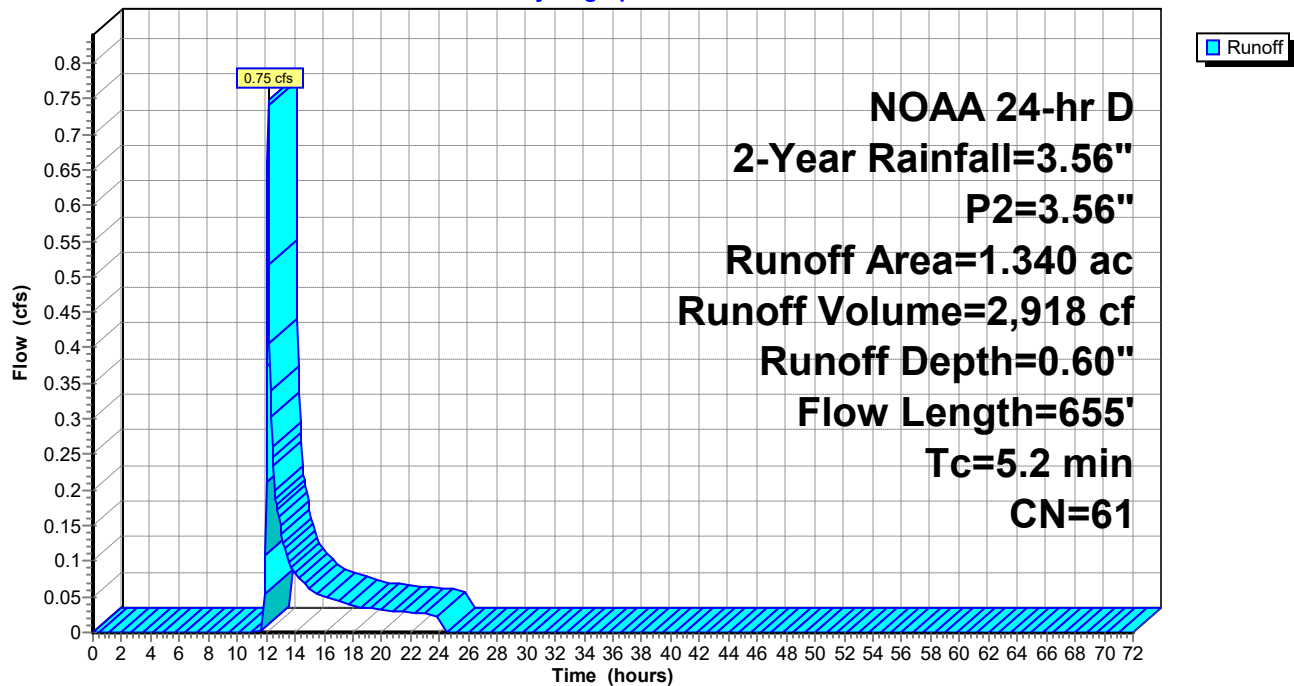
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year Rainfall=3.56", P2=3.56"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	44	0.0500	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
5.2	655	Total			

Subcatchment 64S: P-DA-5R PER

Hydrograph



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 1.60" for 2-Year event
 Inflow = 1.22 cfs @ 12.07 hrs, Volume= 4,435 cf
 Outflow = 0.23 cfs @ 12.54 hrs, Volume= 3,201 cf, Atten= 81%, Lag= 27.9 min
 Primary = 0.23 cfs @ 12.54 hrs, Volume= 3,201 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 552.72' @ 12.54 hrs Surf.Area= 2,121 sf Storage= 2,164 cf

Plug-Flow detention time= 286.7 min calculated for 3,199 cf (72% of inflow)
 Center-of-Mass det. time= 178.2 min (969.0 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

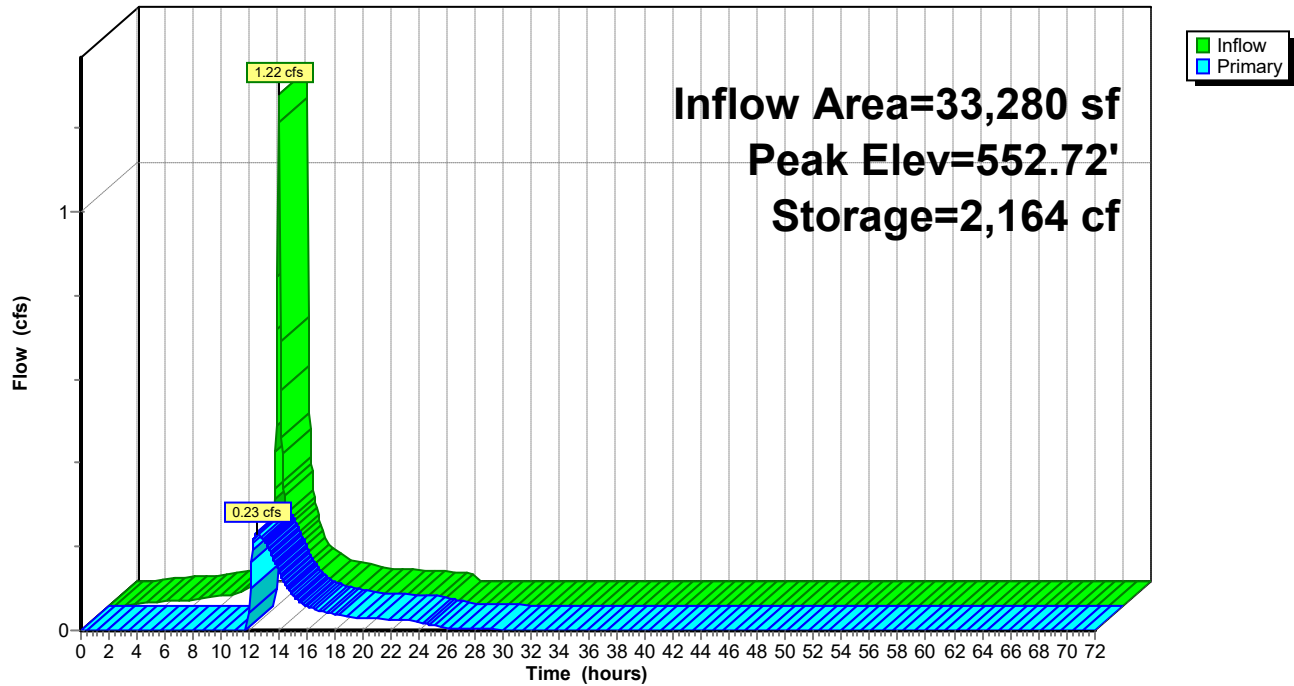
Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.23 cfs @ 12.54 hrs HW=552.72' (Free Discharge)

1=Culvert (Passes 0.23 cfs of 10.70 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 2.64 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 1.93" for 2-Year event
 Inflow = 7.47 cfs @ 12.09 hrs, Volume= 30,916 cf
 Outflow = 0.80 cfs @ 13.56 hrs, Volume= 23,650 cf, Atten= 89%, Lag= 88.3 min
 Primary = 0.80 cfs @ 13.56 hrs, Volume= 23,650 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 575.18' @ 13.56 hrs Surf.Area= 14,372 sf Storage= 16,639 cf

Plug-Flow detention time= 431.4 min calculated for 23,634 cf (76% of inflow)
 Center-of-Mass det. time= 328.2 min (1,144.2 - 816.1)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

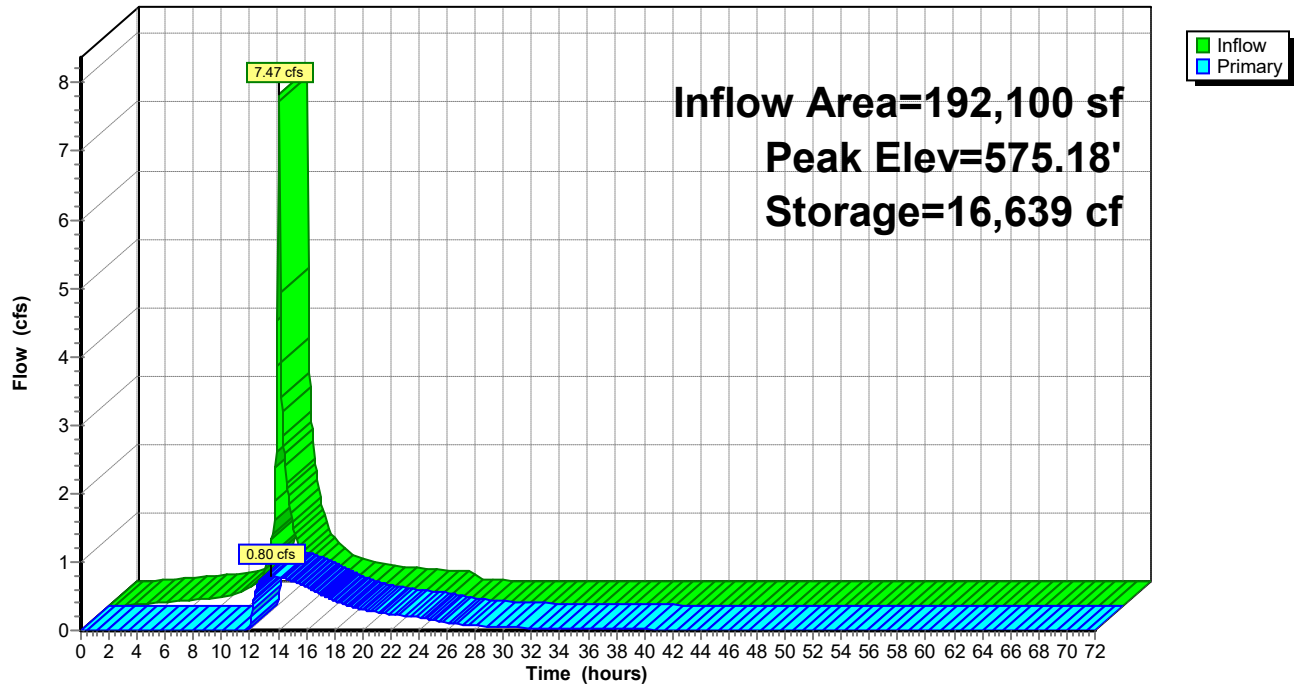
Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.80 cfs @ 13.56 hrs HW=575.18' (Free Discharge)

1=Culvert (Passes 0.80 cfs of 8.37 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.80 cfs @ 2.98 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 1.79" for 2-Year event
 Inflow = 4.09 cfs @ 12.10 hrs, Volume= 17,520 cf
 Outflow = 0.20 cfs @ 15.98 hrs, Volume= 13,352 cf, Atten= 95%, Lag= 233.3 min
 Primary = 0.20 cfs @ 15.98 hrs, Volume= 13,352 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 561.41' @ 15.98 hrs Surf.Area= 8,650 sf Storage= 11,023 cf

Plug-Flow detention time= 690.3 min calculated for 13,342 cf (76% of inflow)
 Center-of-Mass det. time= 575.5 min (1,400.3 - 824.9)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

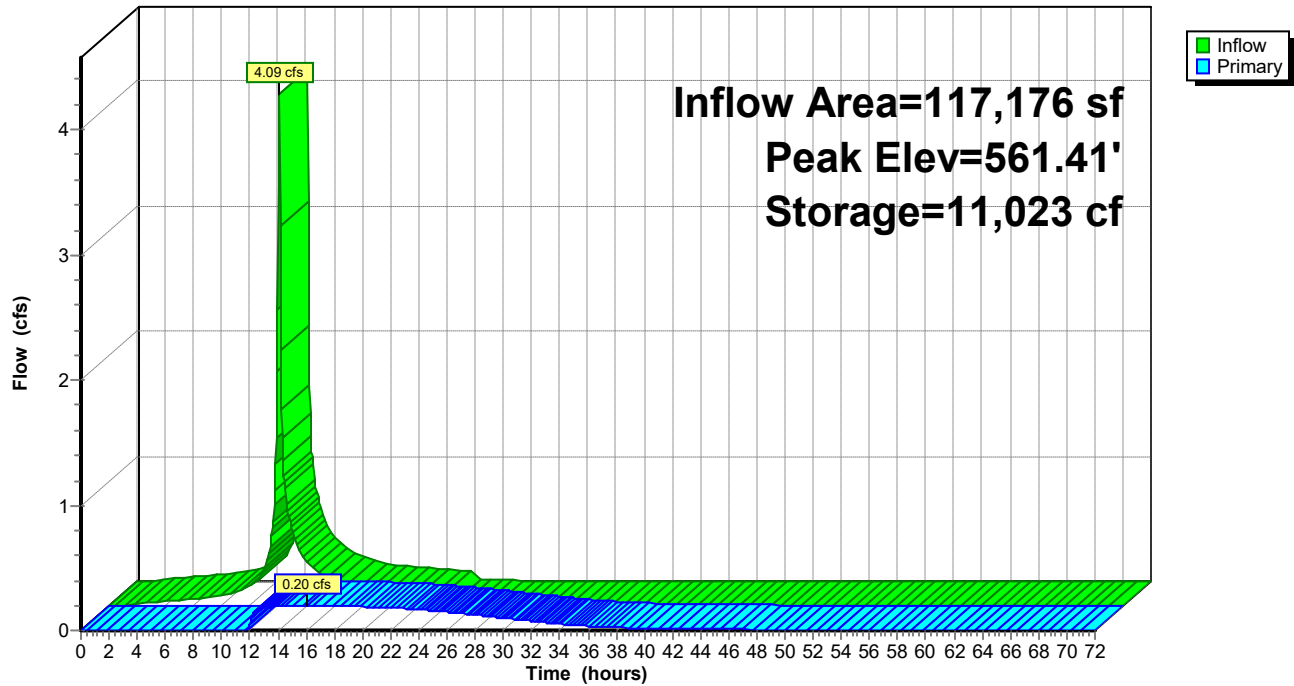
Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.20 cfs @ 15.98 hrs HW=561.41' (Free Discharge)

↑ **1=Culvert** (Passes 0.20 cfs of 9.59 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 4.13 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 2.58" for 2-Year event
 Inflow = 1.56 cfs @ 12.07 hrs, Volume= 5,156 cf
 Outflow = 0.60 cfs @ 12.18 hrs, Volume= 3,636 cf, Atten= 62%, Lag= 6.2 min
 Primary = 0.60 cfs @ 12.18 hrs, Volume= 3,636 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 600.37' @ 12.18 hrs Surf.Area= 2,230 sf Storage= 2,507 cf

Plug-Flow detention time= 264.3 min calculated for 3,636 cf (71% of inflow)
 Center-of-Mass det. time= 158.2 min (920.4 - 762.2)

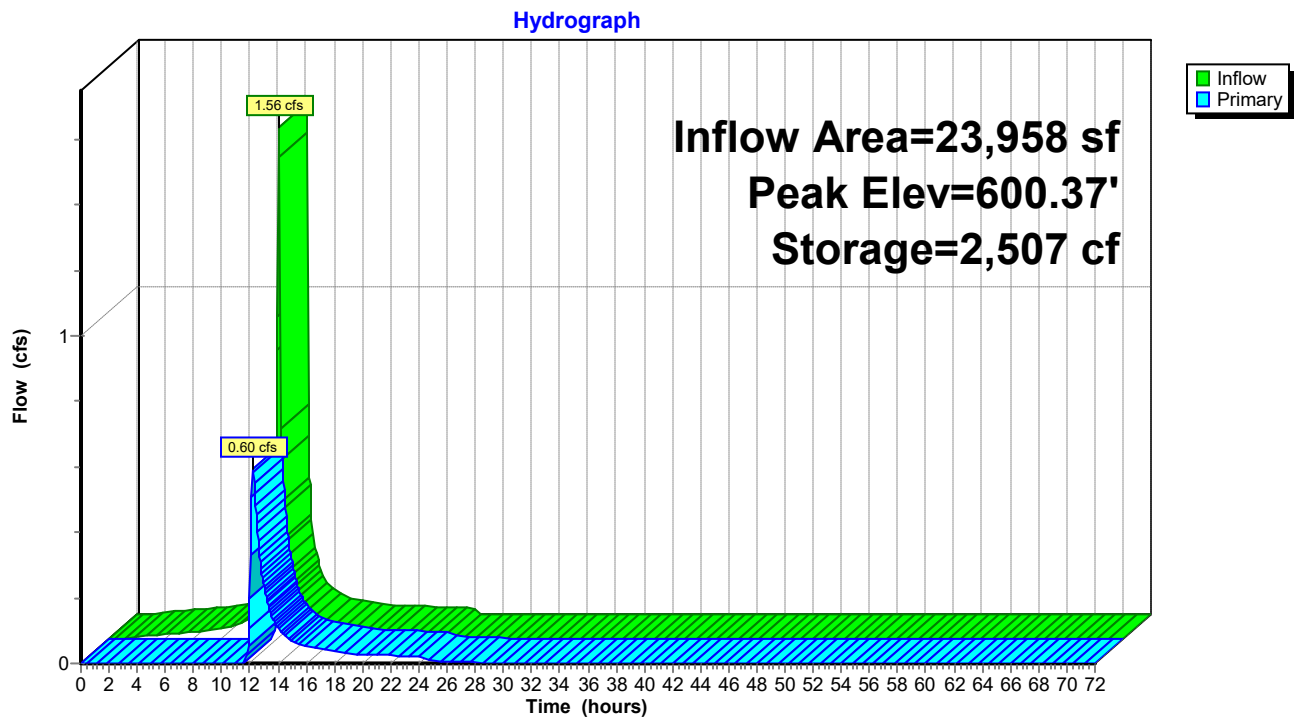
Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.59 cfs @ 12.18 hrs HW=600.37' (Free Discharge)

1=Culvert (Passes 0.59 cfs of 6.12 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.59 cfs @ 2.31 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: UG INFILTRATION BASIN F

Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 1.81" for 2-Year event
 Inflow = 1.60 cfs @ 12.08 hrs, Volume= 5,184 cf
 Outflow = 0.18 cfs @ 12.89 hrs, Volume= 3,188 cf, Atten= 89%, Lag= 48.8 min
 Primary = 0.18 cfs @ 12.89 hrs, Volume= 3,188 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 609.86' @ 12.89 hrs Surf.Area= 3,768 sf Storage= 2,945 cf

Plug-Flow detention time= 391.3 min calculated for 3,186 cf (61% of inflow)
 Center-of-Mass det. time= 265.1 min (1,047.2 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

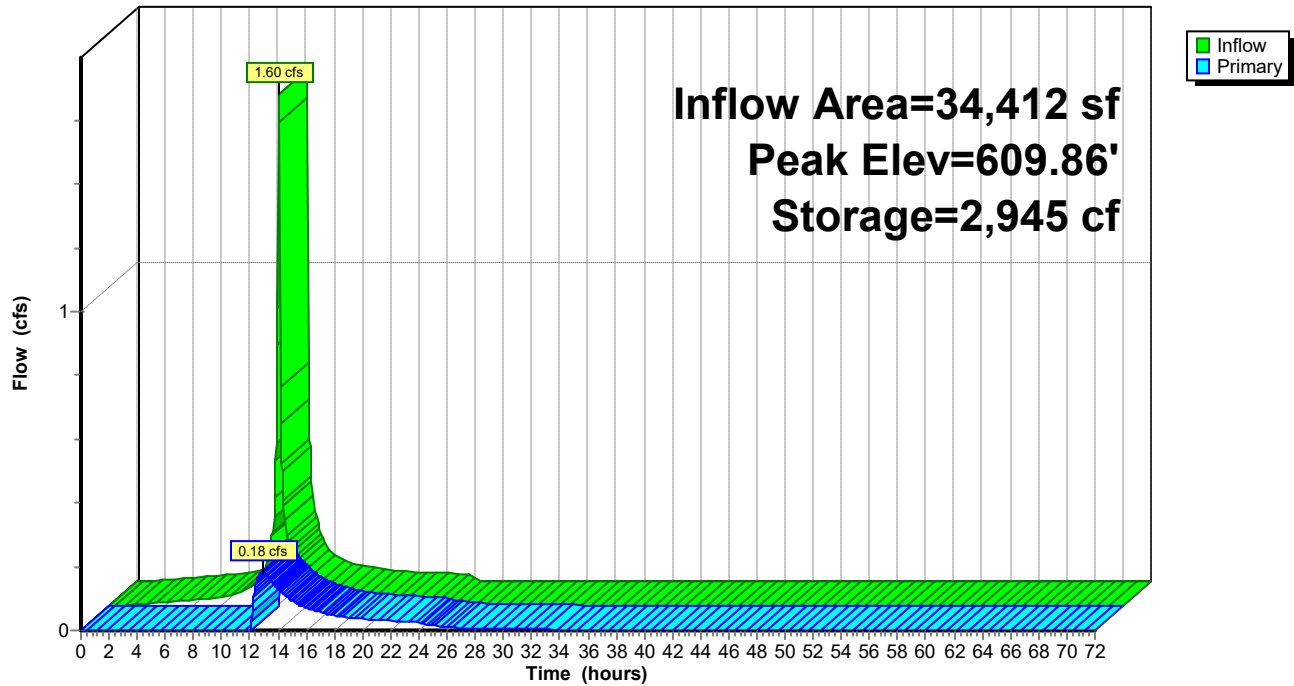
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.18 cfs @ 12.89 hrs HW=609.86' (Free Discharge)

↑ **1=Culvert** (Passes 0.18 cfs of 3.30 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.73 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 2.04" for 2-Year event
 Inflow = 2.30 cfs @ 12.08 hrs, Volume= 7,566 cf
 Outflow = 0.51 cfs @ 12.35 hrs, Volume= 4,963 cf, Atten= 78%, Lag= 16.1 min
 Primary = 0.51 cfs @ 12.35 hrs, Volume= 4,963 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.59' @ 12.35 hrs Surf.Area= 6,898 sf Storage= 3,863 cf

Plug-Flow detention time= 281.5 min calculated for 4,960 cf (66% of inflow)
 Center-of-Mass det. time= 163.6 min (938.4 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

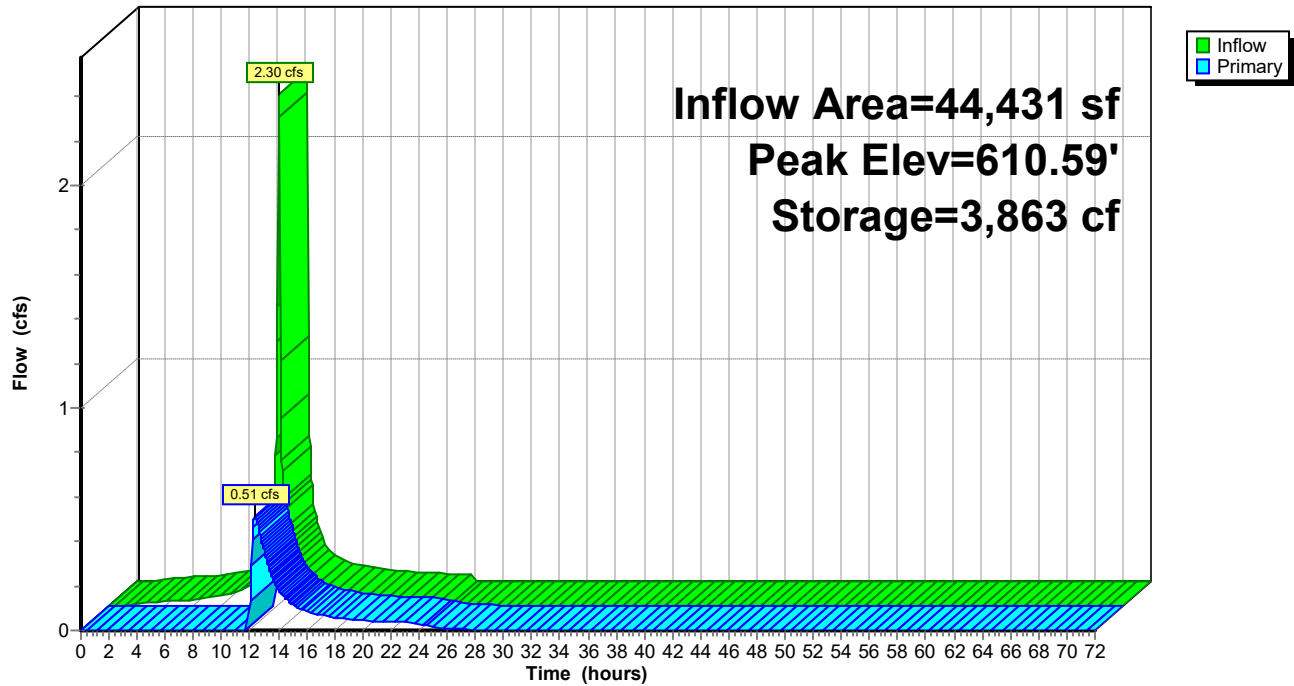
Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.51 cfs @ 12.35 hrs HW=610.59' (Free Discharge)

1=Culvert (Passes 0.51 cfs of 12.95 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.51 cfs @ 1.38 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 2.22" for 2-Year event
 Inflow = 2.36 cfs @ 12.08 hrs, Volume= 7,589 cf
 Outflow = 0.73 cfs @ 12.23 hrs, Volume= 5,262 cf, Atten= 69%, Lag= 8.8 min
 Primary = 0.73 cfs @ 12.23 hrs, Volume= 5,262 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 614.68' @ 12.23 hrs Surf.Area= 2,897 sf Storage= 3,640 cf

Plug-Flow detention time= 245.5 min calculated for 5,262 cf (69% of inflow)
 Center-of-Mass det. time= 134.3 min (904.3 - 770.0)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

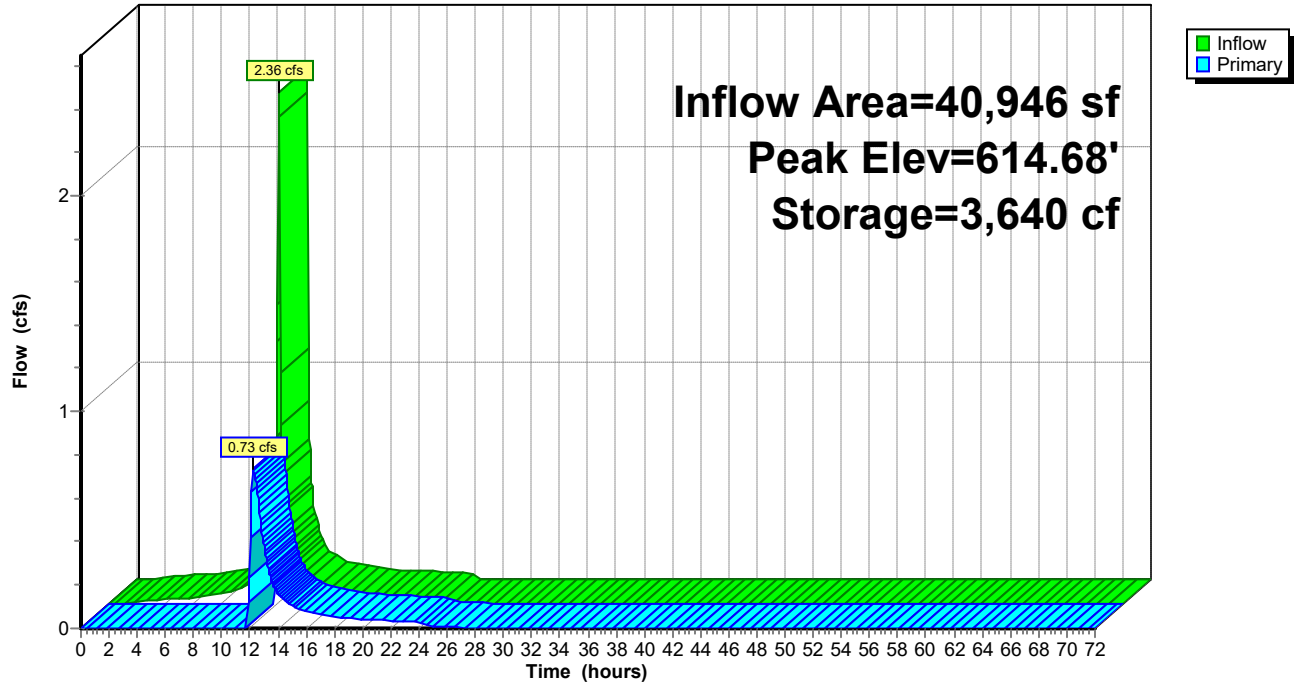
Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.73 cfs @ 12.23 hrs HW=614.67' (Free Discharge)

↑ **1=Culvert** (Passes 0.73 cfs of 16.86 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.73 cfs @ 2.64 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 2.30" for 2-Year event
 Inflow = 2.13 cfs @ 12.09 hrs, Volume= 7,096 cf
 Outflow = 0.20 cfs @ 13.07 hrs, Volume= 5,089 cf, Atten= 91%, Lag= 58.8 min
 Primary = 0.20 cfs @ 13.07 hrs, Volume= 5,089 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 608.62' @ 13.07 hrs Surf.Area= 2,857 sf Storage= 4,206 cf

Plug-Flow detention time= 365.2 min calculated for 5,089 cf (72% of inflow)
 Center-of-Mass det. time= 259.6 min (1,028.6 - 769.0)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

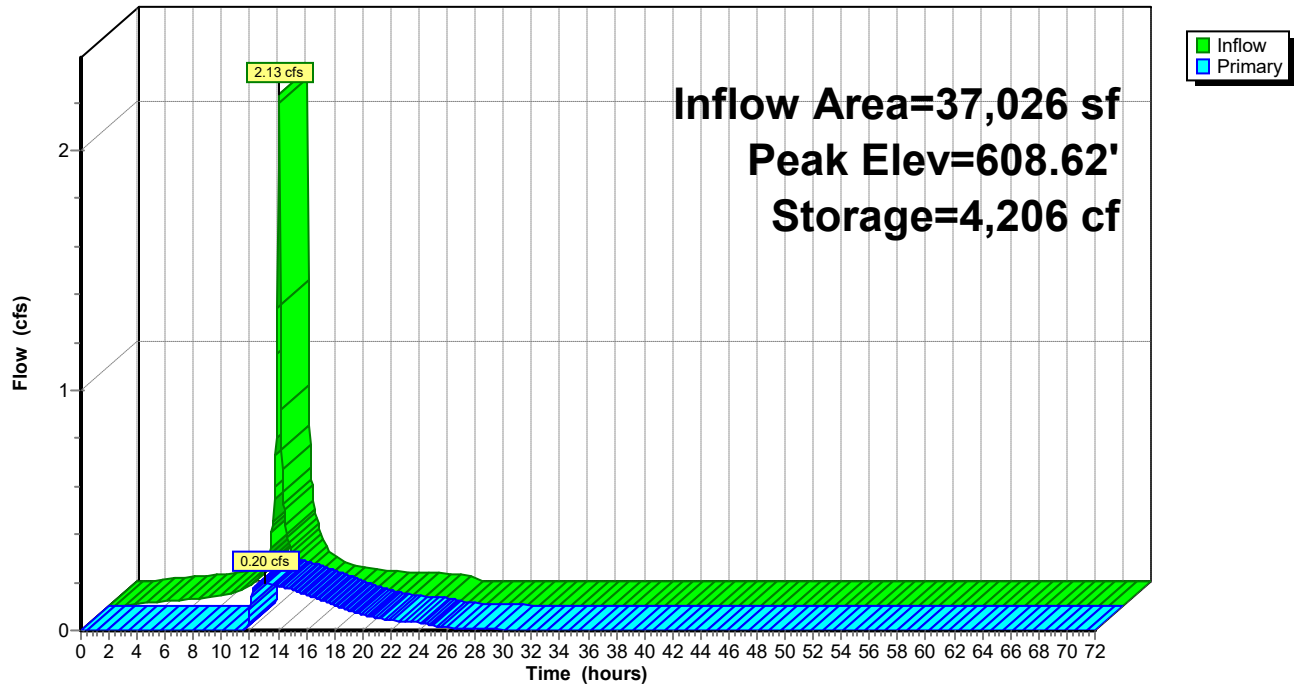
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.20 cfs @ 13.07 hrs HW=608.62' (Free Discharge)

1=Culvert (Passes 0.20 cfs of 17.31 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 3.98 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 2.05" for 2-Year event
 Inflow = 3.13 cfs @ 12.08 hrs, Volume= 15,345 cf
 Outflow = 0.57 cfs @ 12.77 hrs, Volume= 12,249 cf, Atten= 82%, Lag= 41.2 min
 Primary = 0.57 cfs @ 12.77 hrs, Volume= 12,249 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 595.36' @ 12.77 hrs Surf.Area= 2,960 sf Storage= 5,805 cf

Plug-Flow detention time= 264.2 min calculated for 12,249 cf (80% of inflow)
 Center-of-Mass det. time= 158.8 min (1,013.3 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

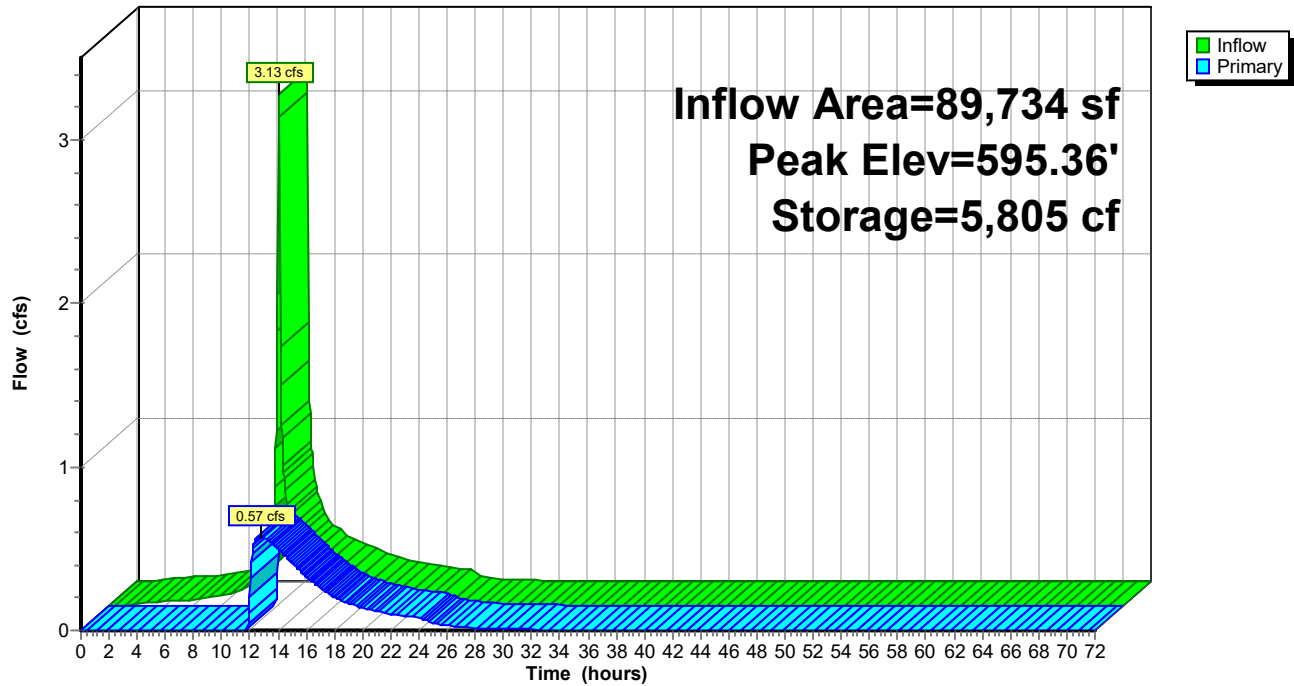
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.57 cfs @ 12.77 hrs HW=595.36' (Free Discharge)

1=Culvert (Passes 0.57 cfs of 9.65 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.57 cfs @ 4.19 fps)
 3=Orifice/Grate (Controls 0.00 cfs)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 2.37" for 2-Year event
 Inflow = 5.66 cfs @ 12.09 hrs, Volume= 18,559 cf
 Outflow = 2.08 cfs @ 12.21 hrs, Volume= 13,191 cf, Atten= 63%, Lag= 7.6 min
 Primary = 2.08 cfs @ 12.21 hrs, Volume= 13,191 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 569.52' @ 12.21 hrs Surf.Area= 6,418 sf Storage= 8,914 cf

Plug-Flow detention time= 261.3 min calculated for 13,182 cf (71% of inflow)
 Center-of-Mass det. time= 156.6 min (924.0 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

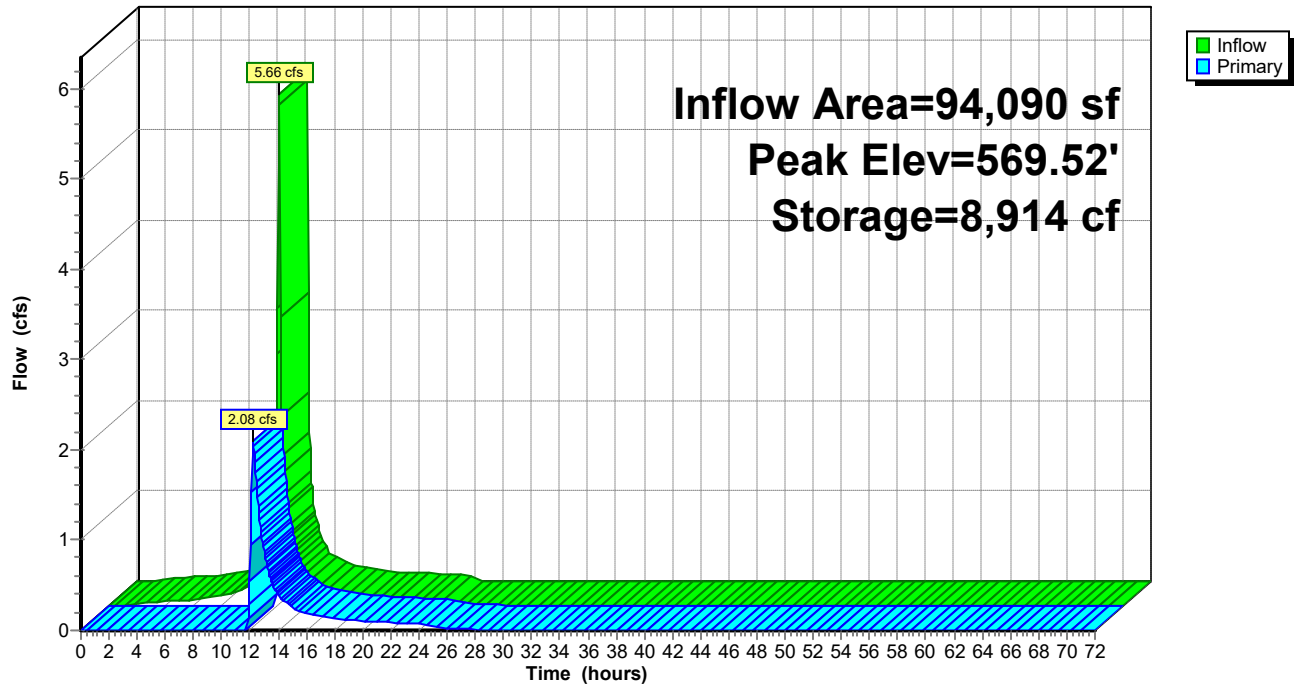
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.06 cfs @ 12.21 hrs HW=569.52' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 2.06 cfs of 24.71 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.04 cfs @ 2.57 fps)
 3=Broad-Crested Rectangular Weir (Weir Controls 0.02 cfs @ 0.39 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 2.24" for 2-Year event
 Inflow = 2.61 cfs @ 12.08 hrs, Volume= 8,522 cf
 Outflow = 0.61 cfs @ 12.32 hrs, Volume= 5,996 cf, Atten= 76%, Lag= 14.5 min
 Primary = 0.61 cfs @ 12.32 hrs, Volume= 5,996 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 598.17' @ 12.32 hrs Surf.Area= 2,646 sf Storage= 4,283 cf

Plug-Flow detention time= 274.2 min calculated for 5,996 cf (70% of inflow)
 Center-of-Mass det. time= 165.5 min (935.3 - 769.8)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

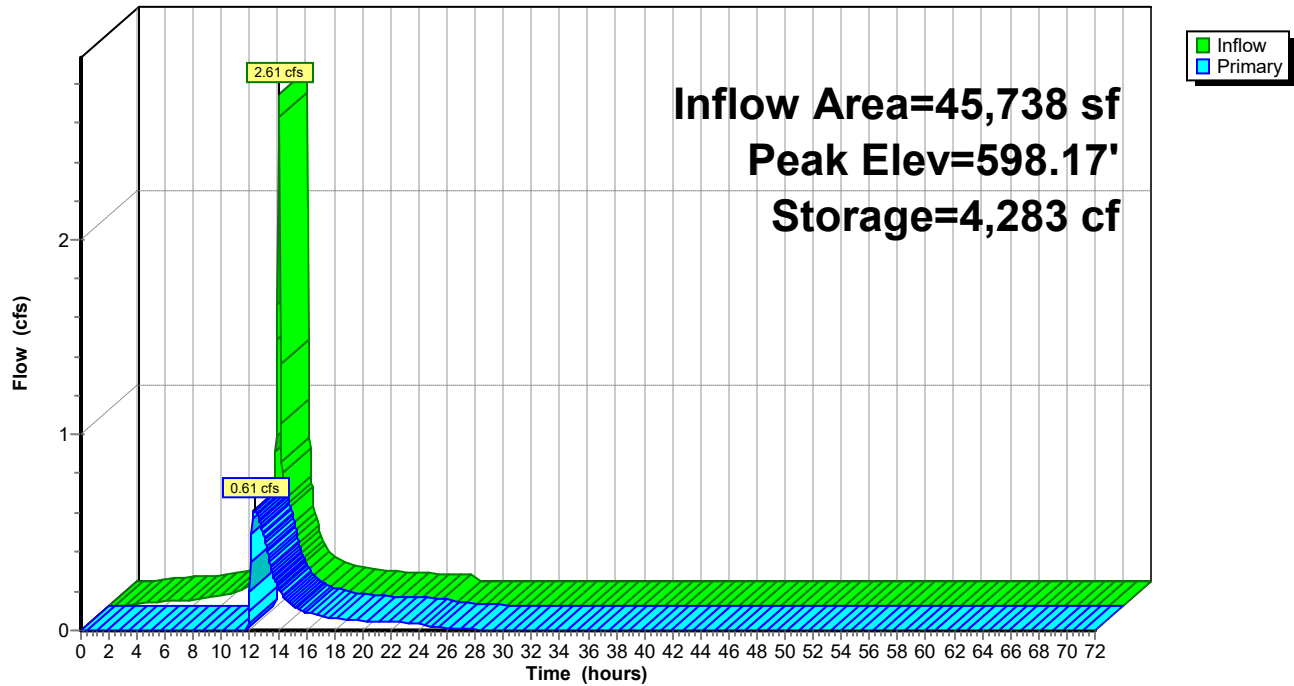
Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.61 cfs @ 12.32 hrs HW=598.17' (Free Discharge)

1=Culvert (Passes 0.61 cfs of 13.28 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.61 cfs @ 3.13 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 2.09" for 2-Year event
 Inflow = 6.65 cfs @ 12.09 hrs, Volume= 26,024 cf
 Outflow = 1.99 cfs @ 12.34 hrs, Volume= 20,375 cf, Atten= 70%, Lag= 15.3 min
 Primary = 1.99 cfs @ 12.34 hrs, Volume= 20,375 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 577.78' @ 12.34 hrs Surf.Area= 6,244 sf Storage= 10,399 cf

Plug-Flow detention time= 252.9 min calculated for 20,375 cf (78% of inflow)
 Center-of-Mass det. time= 153.1 min (959.8 - 806.7)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

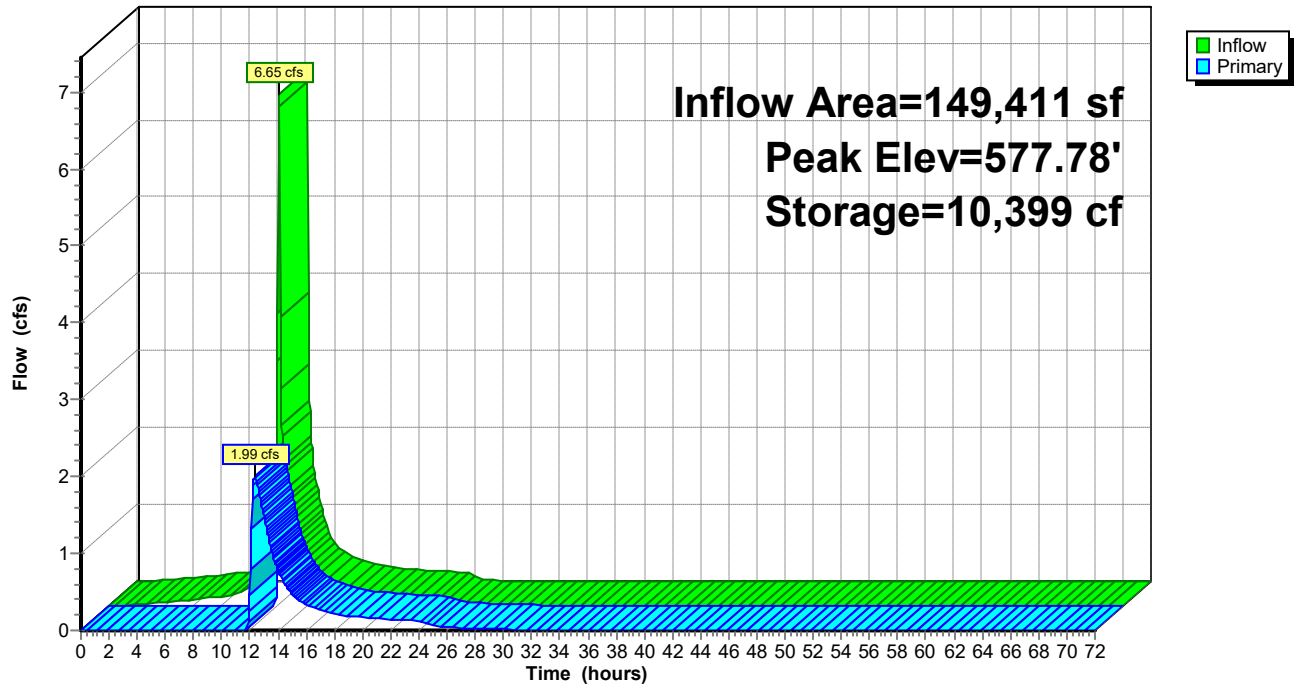
Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.99 cfs @ 12.34 hrs HW=577.78' (Free Discharge)

1=Culvert (Passes 1.99 cfs of 10.15 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.99 cfs @ 3.01 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 1.65" for 2-Year event
 Inflow = 6.48 cfs @ 12.11 hrs, Volume= 46,386 cf
 Outflow = 2.16 cfs @ 13.33 hrs, Volume= 42,554 cf, Atten= 67%, Lag= 73.2 min
 Primary = 2.16 cfs @ 13.33 hrs, Volume= 42,554 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 563.67' @ 13.33 hrs Surf.Area= 14,153 sf Storage= 15,656 cf

Plug-Flow detention time= 218.1 min calculated for 42,554 cf (92% of inflow)
 Center-of-Mass det. time= 158.5 min (1,061.2 - 902.7)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

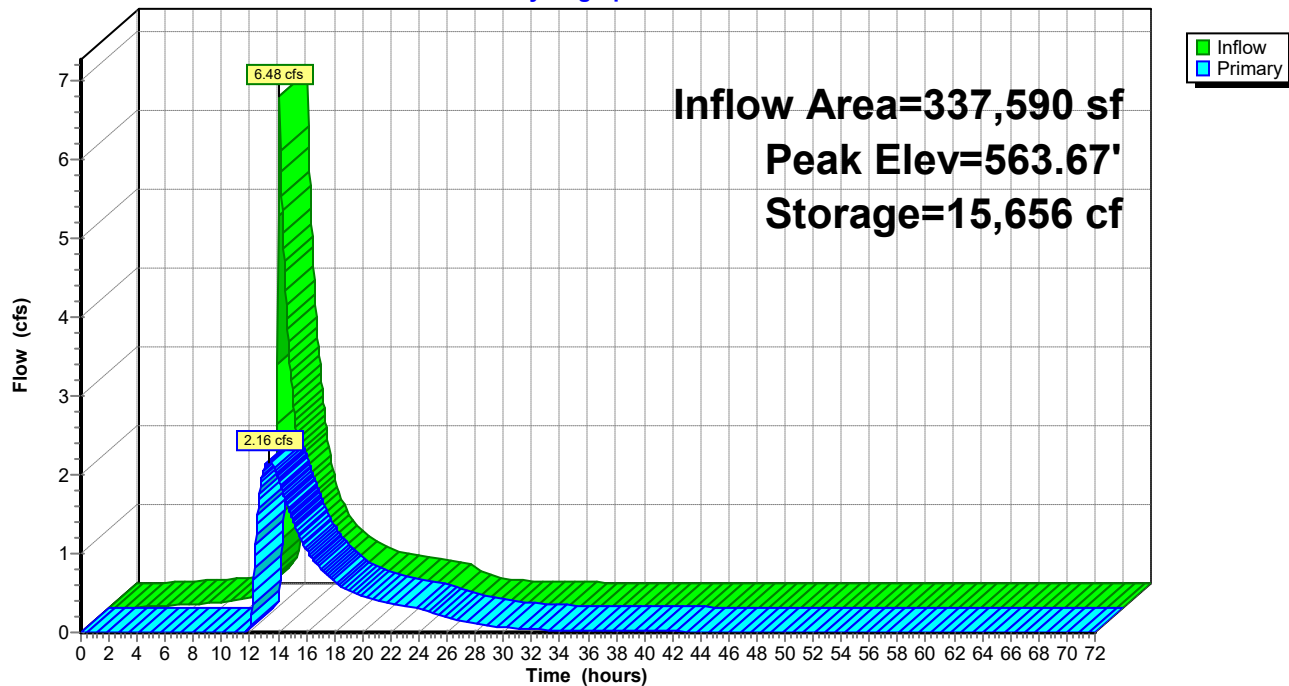
Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 ' / Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.16 cfs @ 13.33 hrs HW=563.67' (Free Discharge)

- 1=Culvert (Passes 2.16 cfs of 40.83 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.16 cfs @ 3.11 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond R: BMP-R Bioretention Basin

Hydrograph



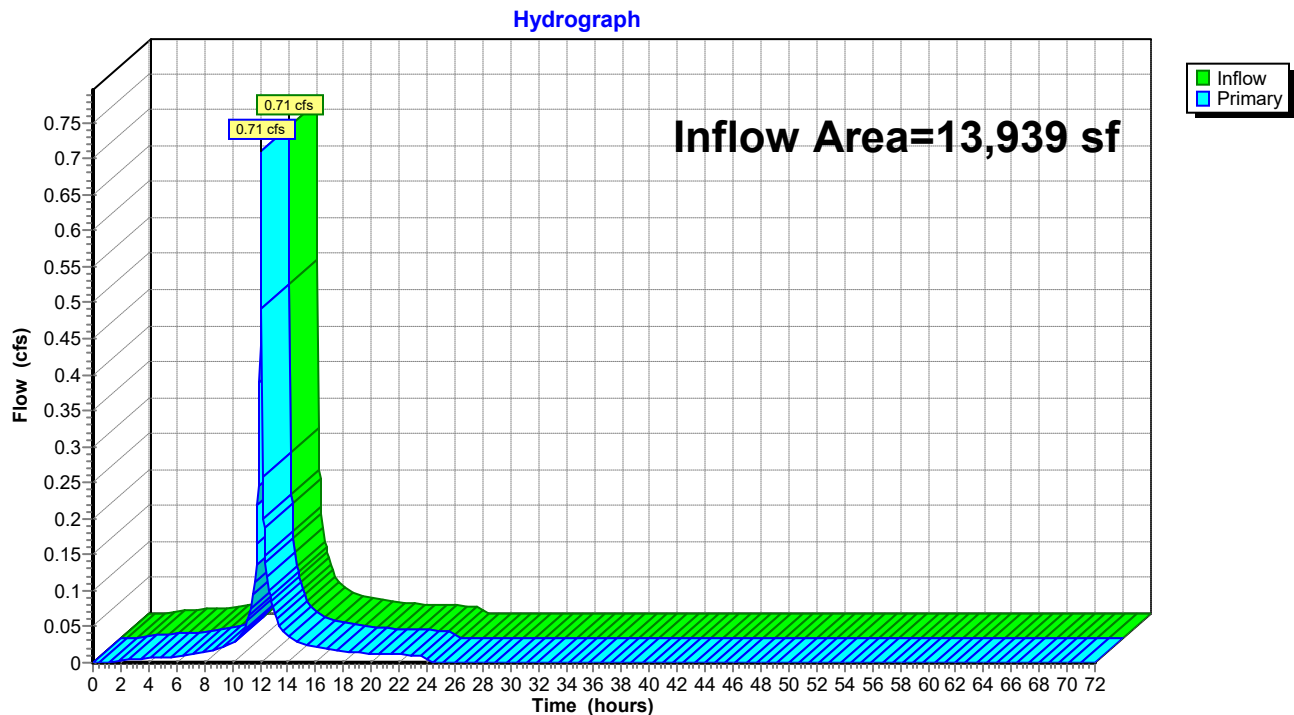
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 2.05" for 2-Year event
Inflow = 0.71 cfs @ 12.07 hrs, Volume= 2,379 cf
Primary = 0.71 cfs @ 12.07 hrs, Volume= 2,379 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

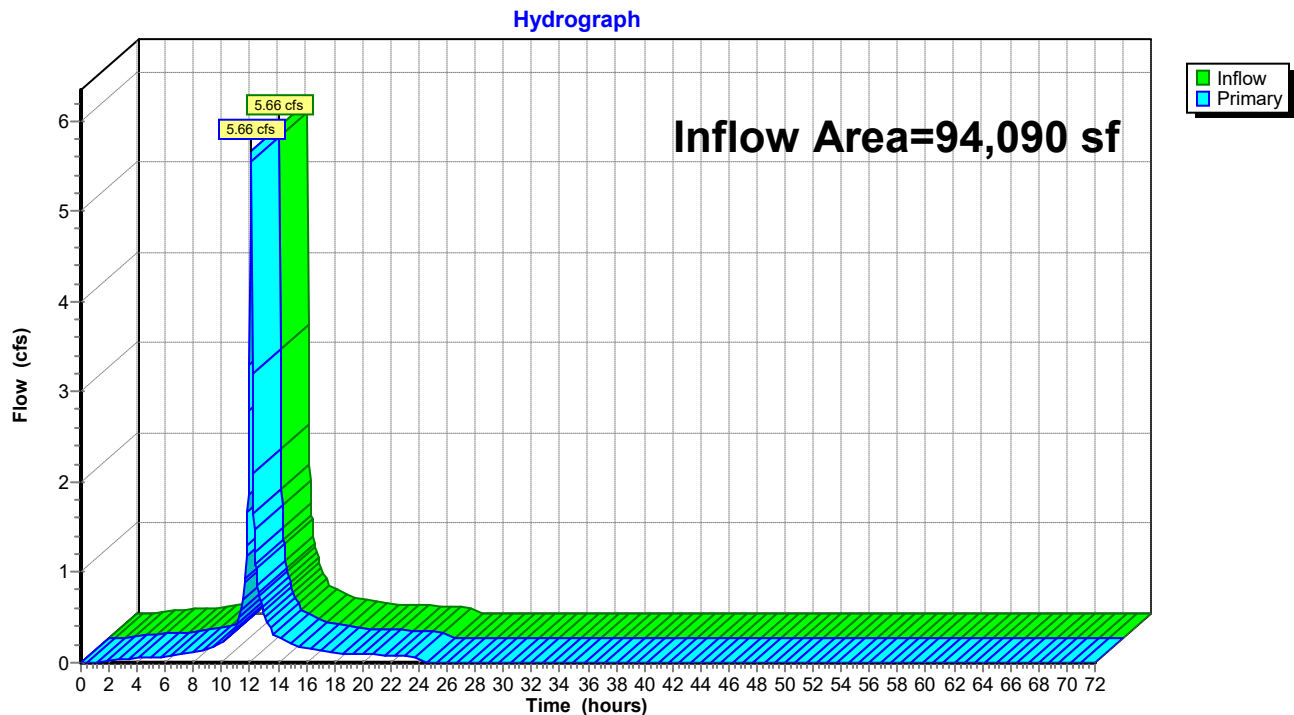
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 2.37" for 2-Year event
Inflow = 5.66 cfs @ 12.09 hrs, Volume= 18,559 cf
Primary = 5.66 cfs @ 12.09 hrs, Volume= 18,559 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

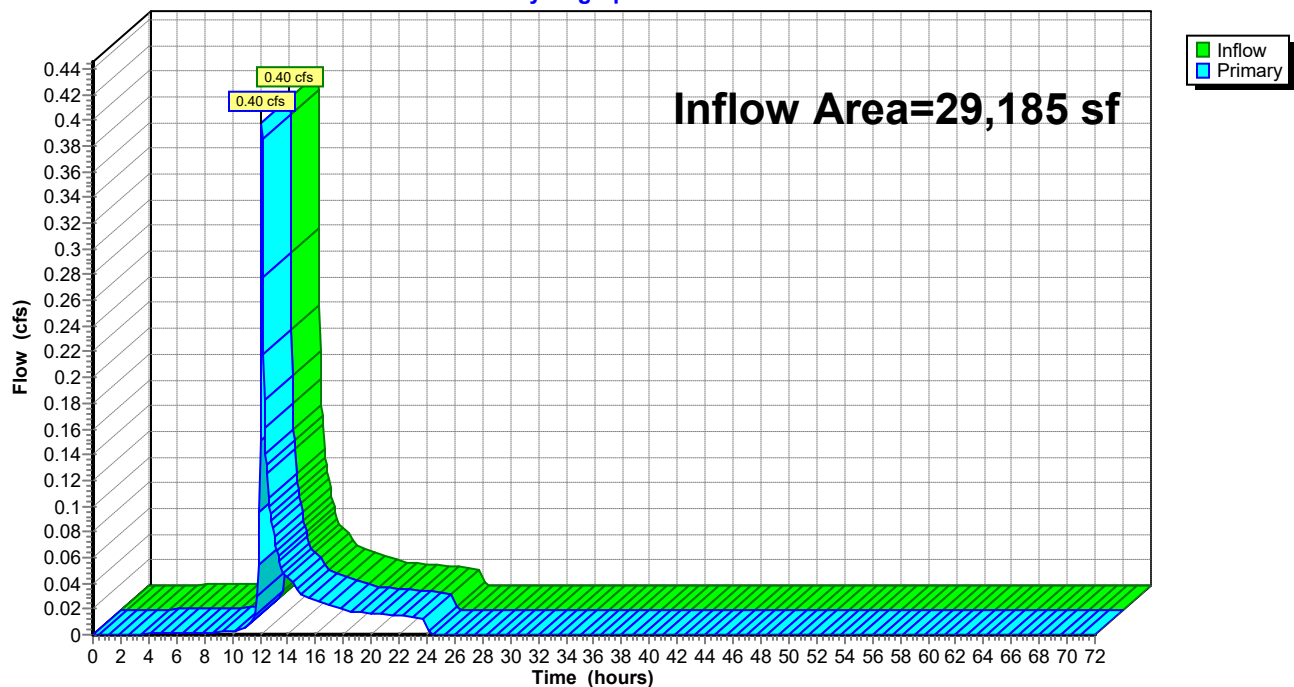
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 0.68" for 2-Year event
Inflow = 0.40 cfs @ 12.13 hrs, Volume= 1,657 cf
Primary = 0.40 cfs @ 12.13 hrs, Volume= 1,657 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

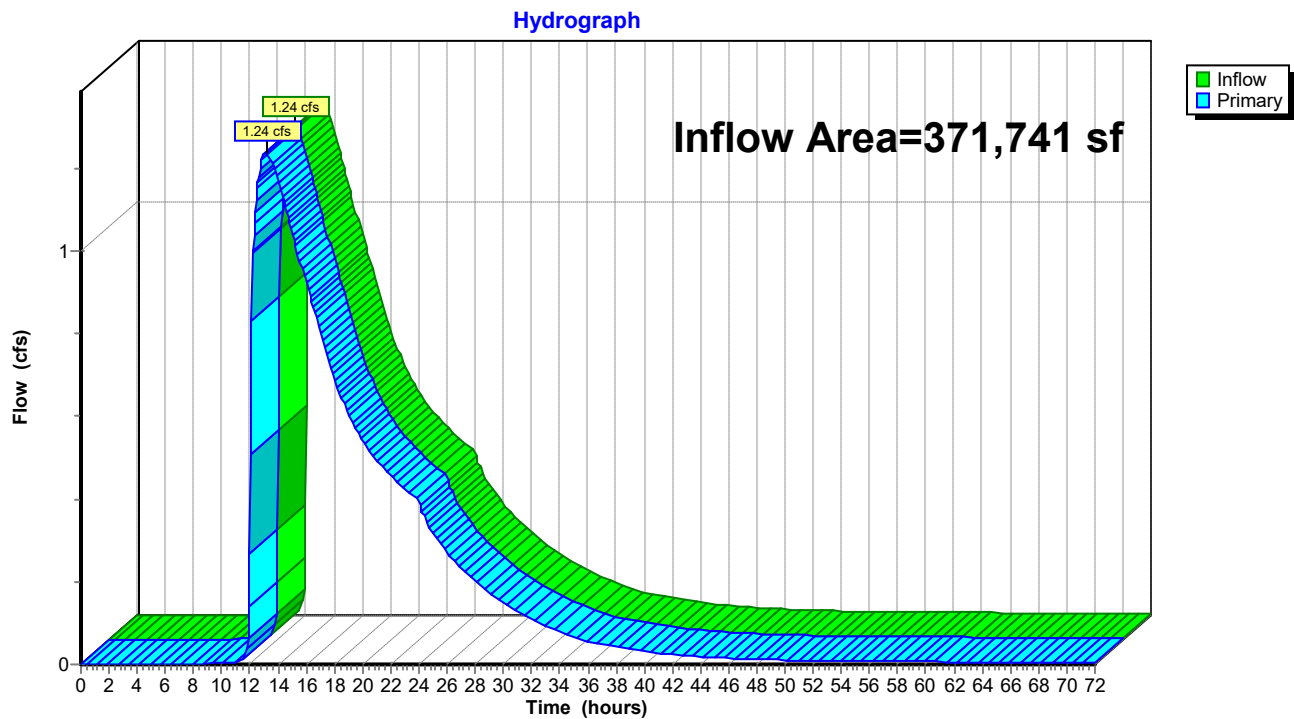
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL**Hydrograph**

Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 1.35" for 2-Year event
Inflow = 1.24 cfs @ 13.16 hrs, Volume= 41,860 cf
Primary = 1.24 cfs @ 13.16 hrs, Volume= 41,860 cf, Atten= 0%, Lag= 0.0 min

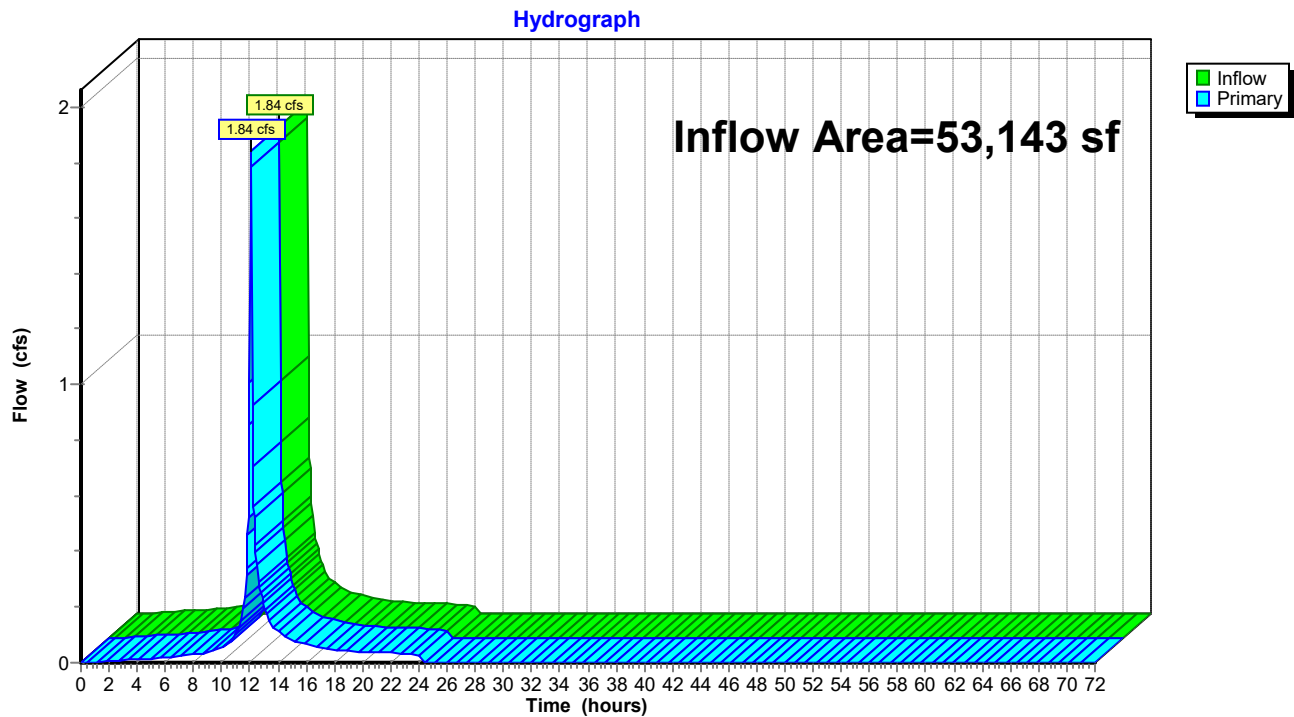
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 1.38" for 2-Year event
Inflow = 1.84 cfs @ 12.08 hrs, Volume= 6,121 cf
Primary = 1.84 cfs @ 12.08 hrs, Volume= 6,121 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

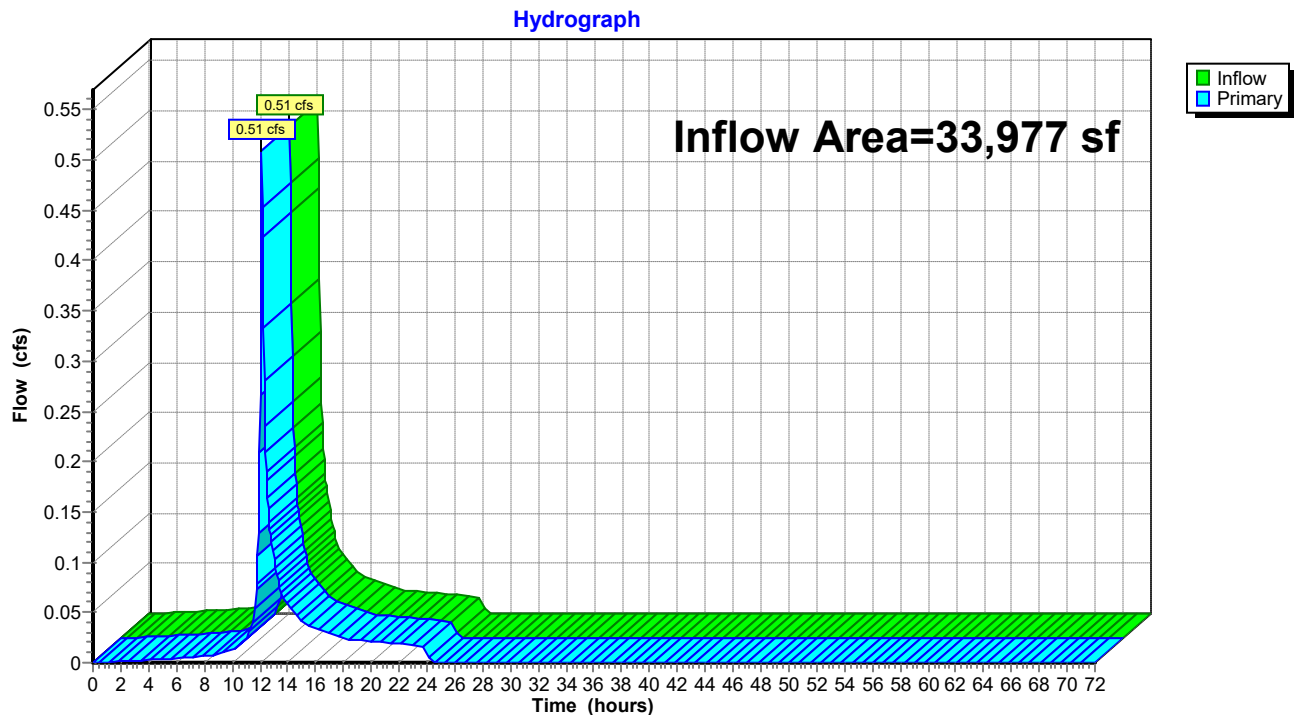
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 0.51 cfs @ 12.11 hrs, Volume= 2,490 cf
Primary = 0.51 cfs @ 12.11 hrs, Volume= 2,490 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

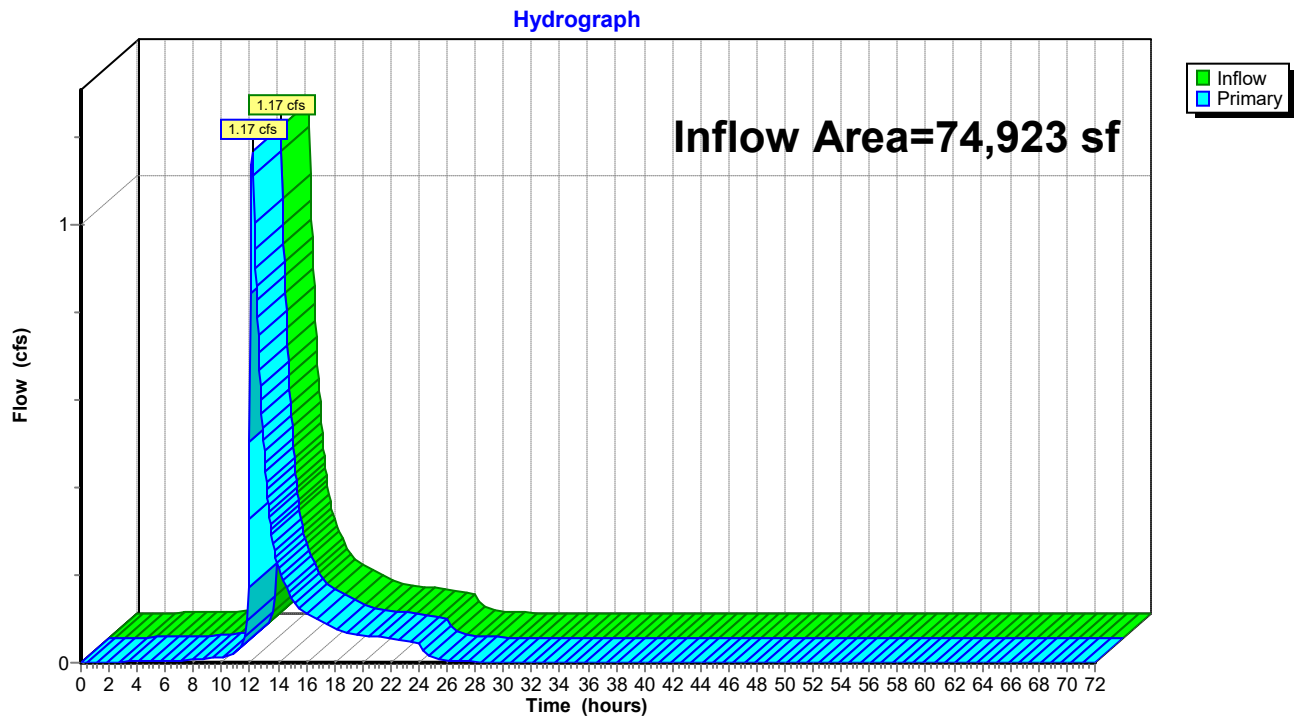
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 1.17 cfs @ 12.16 hrs, Volume= 7,753 cf
Primary = 1.17 cfs @ 12.16 hrs, Volume= 7,753 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

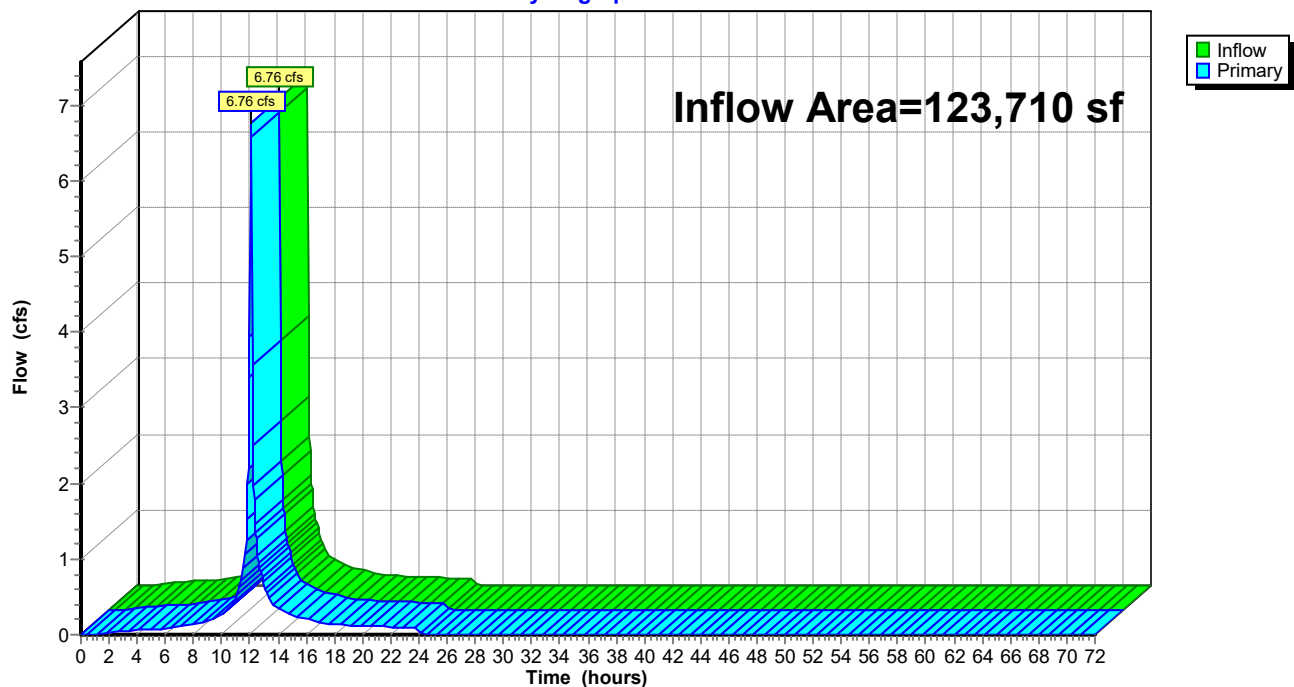
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 2.16" for 2-Year event
Inflow = 6.76 cfs @ 12.08 hrs, Volume= 22,316 cf
Primary = 6.76 cfs @ 12.08 hrs, Volume= 22,316 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

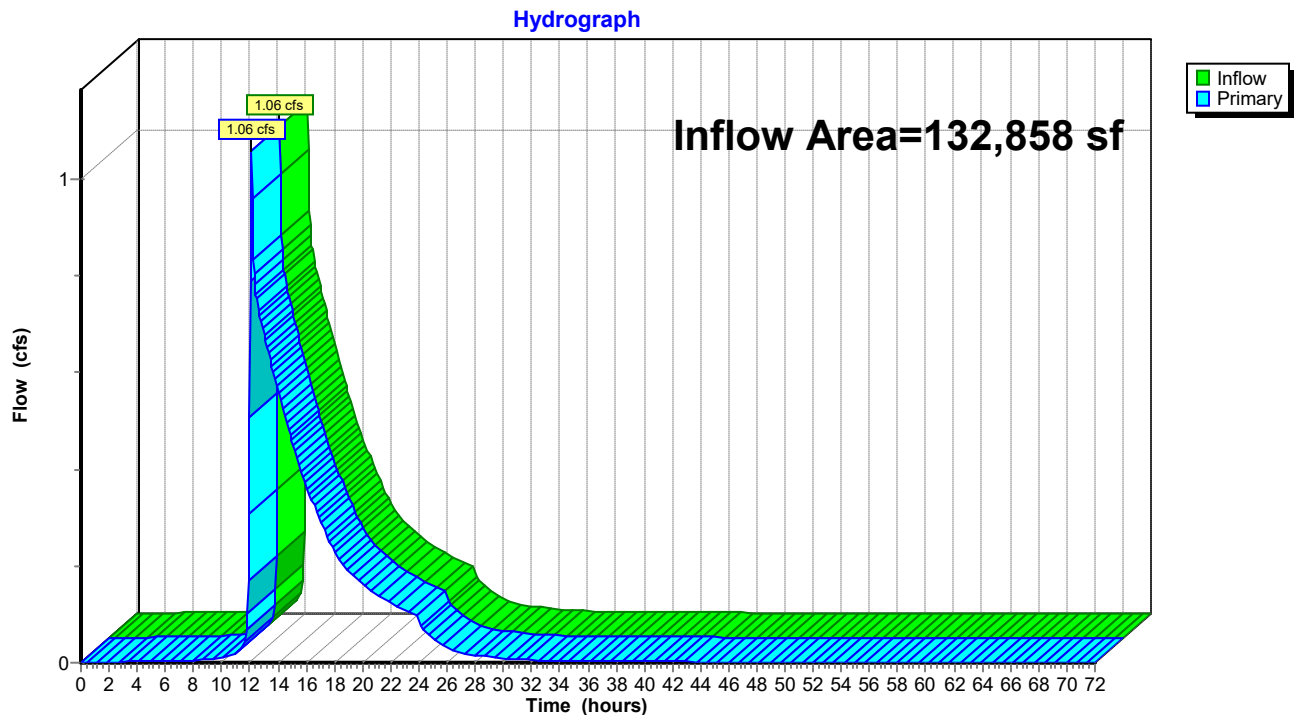
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL**Hydrograph**

Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth > 1.35" for 2-Year event
Inflow = 1.06 cfs @ 12.12 hrs, Volume= 14,905 cf
Primary = 1.06 cfs @ 12.12 hrs, Volume= 14,905 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

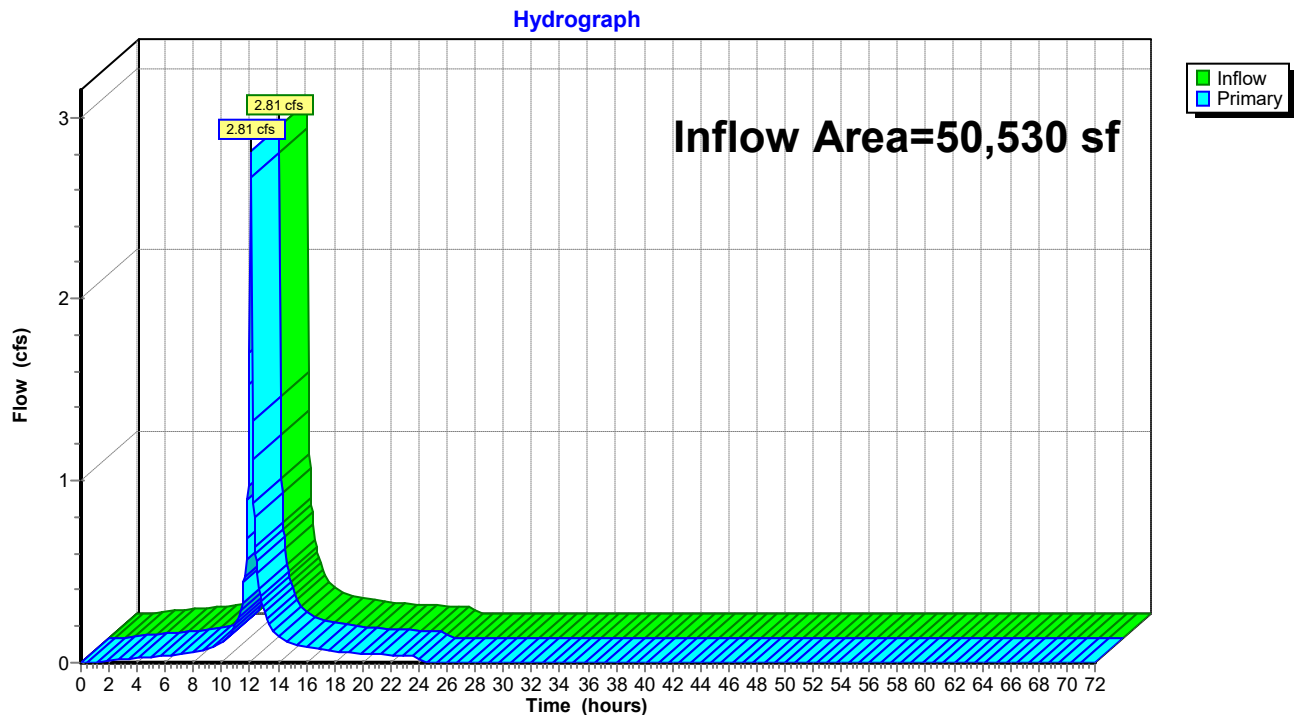
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 2.81 cfs @ 12.08 hrs, Volume= 9,652 cf
Primary = 2.81 cfs @ 12.08 hrs, Volume= 9,652 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

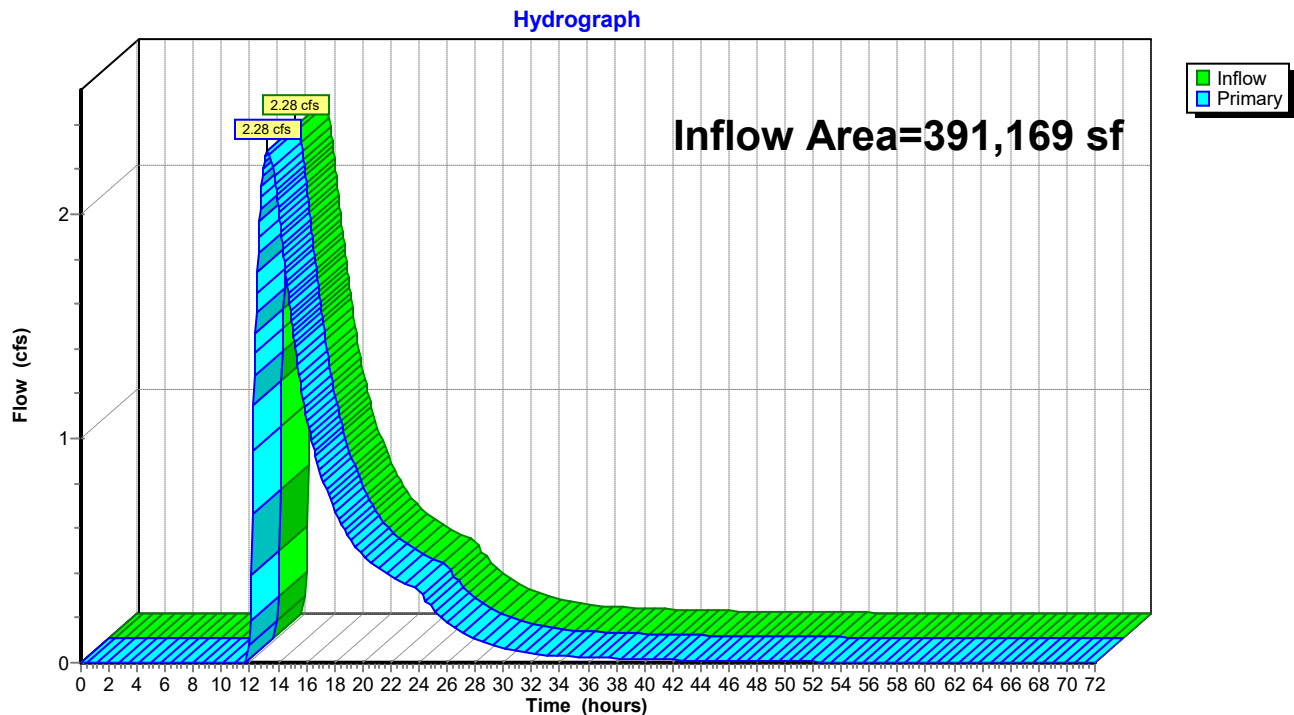
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth > 1.39" for 2-Year event
Inflow = 2.28 cfs @ 13.26 hrs, Volume= 45,224 cf
Primary = 2.28 cfs @ 13.26 hrs, Volume= 45,224 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

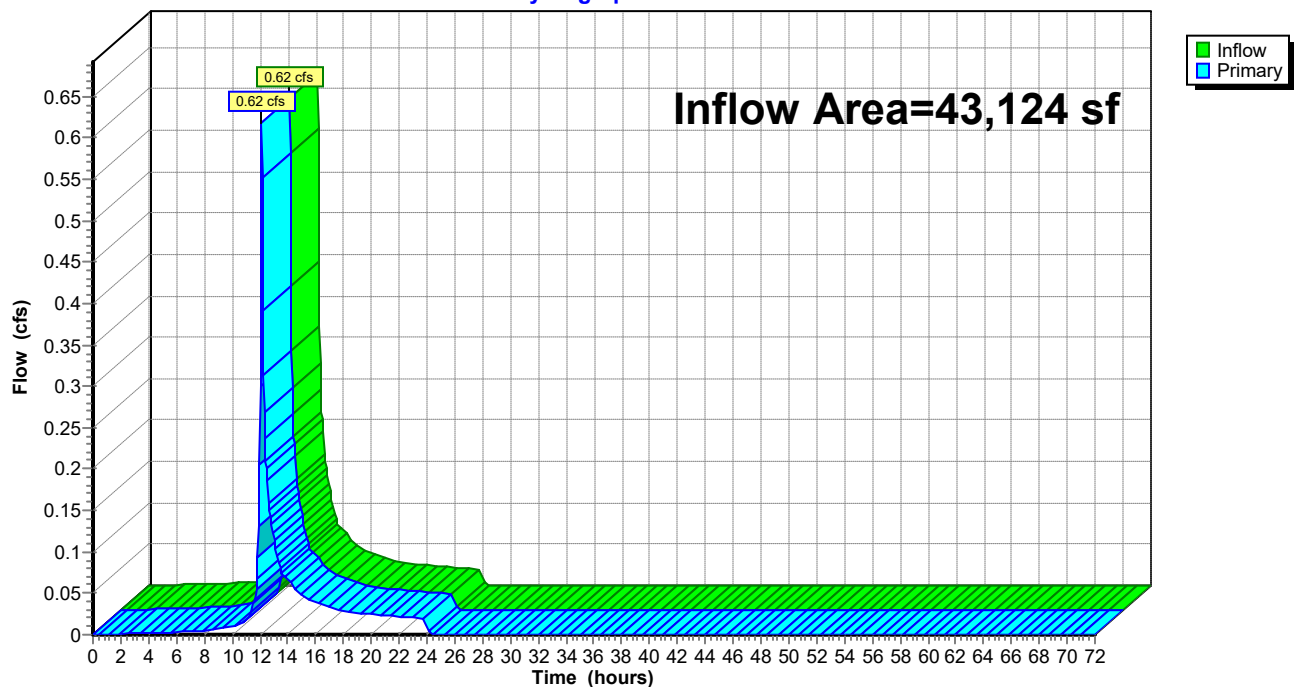
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 0.74" for 2-Year event
Inflow = 0.62 cfs @ 12.11 hrs, Volume= 2,656 cf
Primary = 0.62 cfs @ 12.11 hrs, Volume= 2,656 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

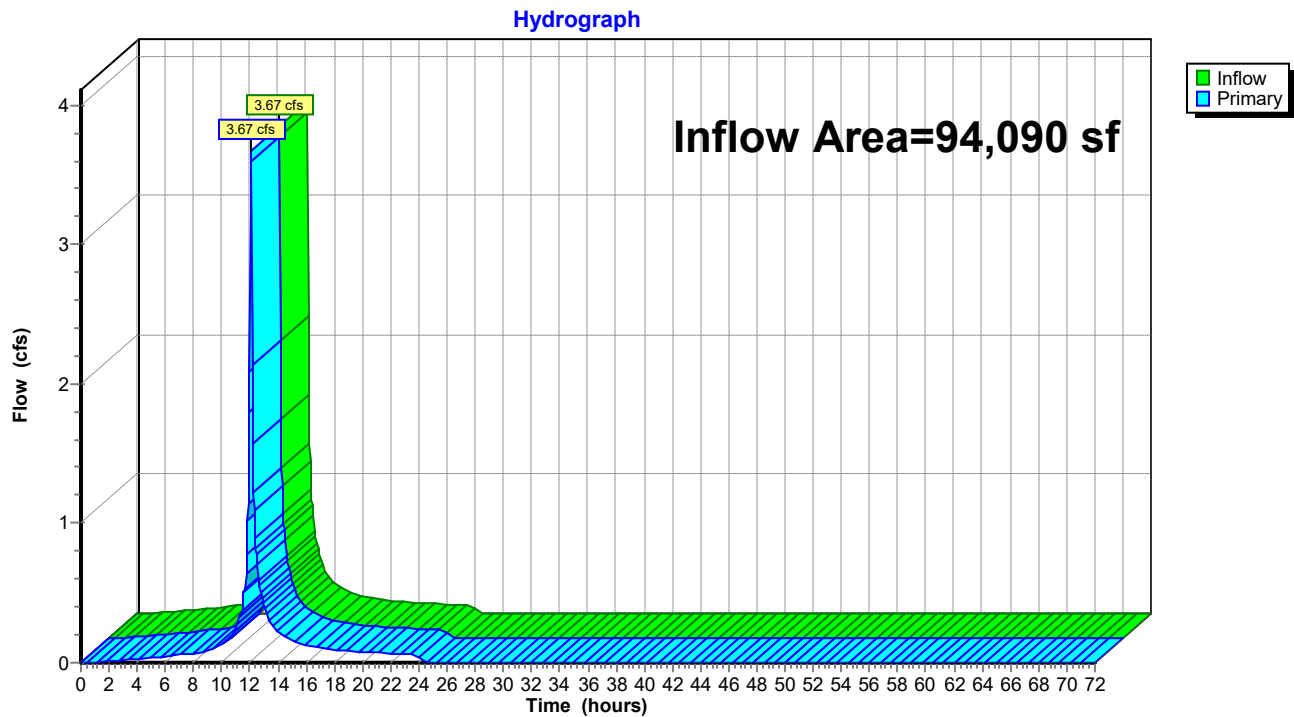
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL**Hydrograph**

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 1.63" for 2-Year event
Inflow = 3.67 cfs @ 12.09 hrs, Volume= 12,819 cf
Primary = 3.67 cfs @ 12.09 hrs, Volume= 12,819 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL

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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=299' Tc=0.9 min CN=98 Runoff=1.27 cfs 4,162 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=212' Tc=4.2 min CN=61 Runoff=0.52 cfs 1,732 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=352' Tc=1.7 min CN=WQ Runoff=2.43 cfs 8,026 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=357' Tc=3.2 min CN=61 Runoff=0.55 cfs 1,718 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=32' Tc=5.3 min CN=61 Runoff=0.54 cfs 1,861 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=239' Tc=1.3 min CN=WQ Runoff=0.77 cfs 2,527 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=114' Tc=2.4 min CN=61 Runoff=0.18 cfs 537 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=223' Tc=1.5 min CN=WQ Runoff=1.58 cfs 5,202 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=62' Tc=1.8 min CN=61 Runoff=0.54 cfs 1,574 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=414' Tc=1.0 min CN=98 Runoff=0.09 cfs 297 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=356' Tc=4.9 min CN=61 Runoff=0.68 cfs 2,326 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=524' Tc=1.6 min CN=WQ Runoff=1.58 cfs 5,202 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=546' Tc=2.7 min CN=61 Runoff=1.02 cfs 3,113 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=295' Tc=1.9 min CN=WQ Runoff=2.58 cfs 8,323 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=242' Tc=1.4 min CN=61 Runoff=0.46 cfs 1,360 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=376' Tc=2.5 min CN=WQ Runoff=2.41 cfs 7,877 cf

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NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

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Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=4.09" Tc=5.0 min CN=98 Runoff=2.80 cfs 10,107 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=178' Tc=1.2 min CN=WQ Runoff=0.36 cfs 1,189 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=96' Slope=0.0100 '/' Tc=1.3 min CN=98 Runoff=1.04 cfs 3,418 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=138' Slope=0.0300 '/' Tc=7.2 min CN=61 Runoff=0.68 cfs 2,505 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=805' Tc=2.1 min CN=WQ Runoff=7.48 cfs 24,226 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=509' Tc=3.6 min CN=61 Runoff=1.35 cfs 4,330 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=236' Tc=4.2 min CN=61 Runoff=0.34 cfs 1,145 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=283' Tc=1.7 min CN=WQ Runoff=3.24 cfs 10,701 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=412' Tc=8.8 min CN=61 Runoff=0.40 cfs 1,574 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=303' Tc=1.8 min CN=WQ Runoff=2.90 cfs 9,363 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=262' Tc=3.0 min CN=61 Runoff=0.49 cfs 1,503 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=1,152' Tc=2.5 min CN=WQ Runoff=6.37 cfs 20,808 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=889' Tc=2.8 min CN=61 Runoff=0.89 cfs 2,720 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.23 cfs 743 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=0.98" Flow Length=239' Tc=13.2 min CN=WQ Runoff=0.94 cfs 4,390 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=105' Tc=0.5 min CN=WQ Runoff=0.27 cfs 892 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=467' Tc=2.3 min CN=WQ Runoff=6.85 cfs 22,294 cf

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=532' Tc=1.6 min CN=61 Runoff=1.08 cfs 3,149 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=0.95" Flow Length=194' Tc=4.5 min CN=WQ Runoff=0.93 cfs 3,201 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=4.09" Flow Length=634' Tc=1.9 min CN=WQ Runoff=3.77 cfs 12,187 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=0.99" Flow Length=655' Tc=4.9 min CN=61 Runoff=1.39 cfs 4,795 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=552.99' Storage=2,753 cf Inflow=1.66 cfs 5,893 cf Outflow=0.32 cfs 4,660 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=575.52' Storage=21,670 cf Inflow=10.22 cfs 40,658 cf Outflow=1.10 cfs 33,387 cf
Pond C: BMP C Bioretention Basin	Peak Elev=561.84' Storage=14,881 cf Inflow=5.49 cfs 23,202 cf Outflow=0.26 cfs 19,011 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=600.53' Storage=2,846 cf Inflow=1.97 cfs 6,482 cf Outflow=0.91 cfs 4,961 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=610.00' Storage=3,477 cf Inflow=2.13 cfs 6,776 cf Outflow=0.36 cfs 4,780 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=610.68' Storage=4,528 cf Inflow=3.00 cfs 9,743 cf Outflow=0.96 cfs 7,141 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=614.89' Storage=4,287 cf Inflow=3.04 cfs 9,683 cf Outflow=0.97 cfs 7,356 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=608.98' Storage=5,268 cf Inflow=2.73 cfs 9,022 cf Outflow=0.24 cfs 7,015 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=595.85' Storage=7,161 cf Inflow=3.95 cfs 20,034 cf Outflow=0.73 cfs 16,938 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=569.69' Storage=10,024 cf Inflow=7.24 cfs 23,527 cf Outflow=3.72 cfs 18,159 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=598.50' Storage=5,141 cf Inflow=3.36 cfs 10,866 cf Outflow=0.82 cfs 8,341 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=578.08' Storage=12,287 cf Inflow=8.61 cfs 33,784 cf Outflow=2.89 cfs 28,135 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=564.07' Storage=21,423 cf Inflow=10.46 cfs 63,276 cf Outflow=3.06 cfs 59,444 cf

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Link 20L: TOTAL TO GI MTD F-1

Inflow=0.93 cfs 3,063 cf

Primary=0.93 cfs 3,063 cf

Link 21L: TOTAL TO P-DA-5M

Inflow=7.24 cfs 23,527 cf

Primary=7.24 cfs 23,527 cf

Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow=0.74 cfs 2,623 cf

Primary=0.74 cfs 2,623 cf

Link 34L: PROPOSED TOTAL TO POA-1

Inflow=1.82 cfs 59,680 cf

Primary=1.82 cfs 59,680 cf

Link 38L: TOTAL TO GI MTD 1C

Inflow=2.60 cfs 8,315 cf

Primary=2.60 cfs 8,315 cf

Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow=0.87 cfs 3,694 cf

Primary=0.87 cfs 3,694 cf

Link 45L: PROPOSED TOTAL TO POA-3

Inflow=1.77 cfs 11,050 cf

Primary=1.77 cfs 11,050 cf

Link 46L: P-DA-1B TOTAL

Inflow=8.75 cfs 28,556 cf

Primary=8.75 cfs 28,556 cf

Link 48L: PROPOSED TOTAL TO POA-4

Inflow=1.72 cfs 21,030 cf

Primary=1.72 cfs 21,030 cf

Link 50L: TOTAL TO GI MTD K-1

Inflow=3.55 cfs 12,276 cf

Primary=3.55 cfs 12,276 cf

Link 52L: PROPOSED TOTAL TO POA-5

Inflow=3.26 cfs 63,834 cf

Primary=3.26 cfs 63,834 cf

Link 59L: P-DA-4 BYPASS TOTAL

Inflow=1.12 cfs 4,092 cf

Primary=1.12 cfs 4,092 cf

Link 66L: P-DA-5R TOTAL

Inflow=4.98 cfs 16,982 cf

Primary=4.98 cfs 16,982 cf

Total Runoff Area = 993,342 sf Runoff Volume = 201,075 cf Average Runoff Depth = 2.43"
53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 1.27 cfs @ 12.06 hrs, Volume= 4,162 cf, Depth= 4.09"
 Routed to Pond A : BMP-A Bioretention Basin

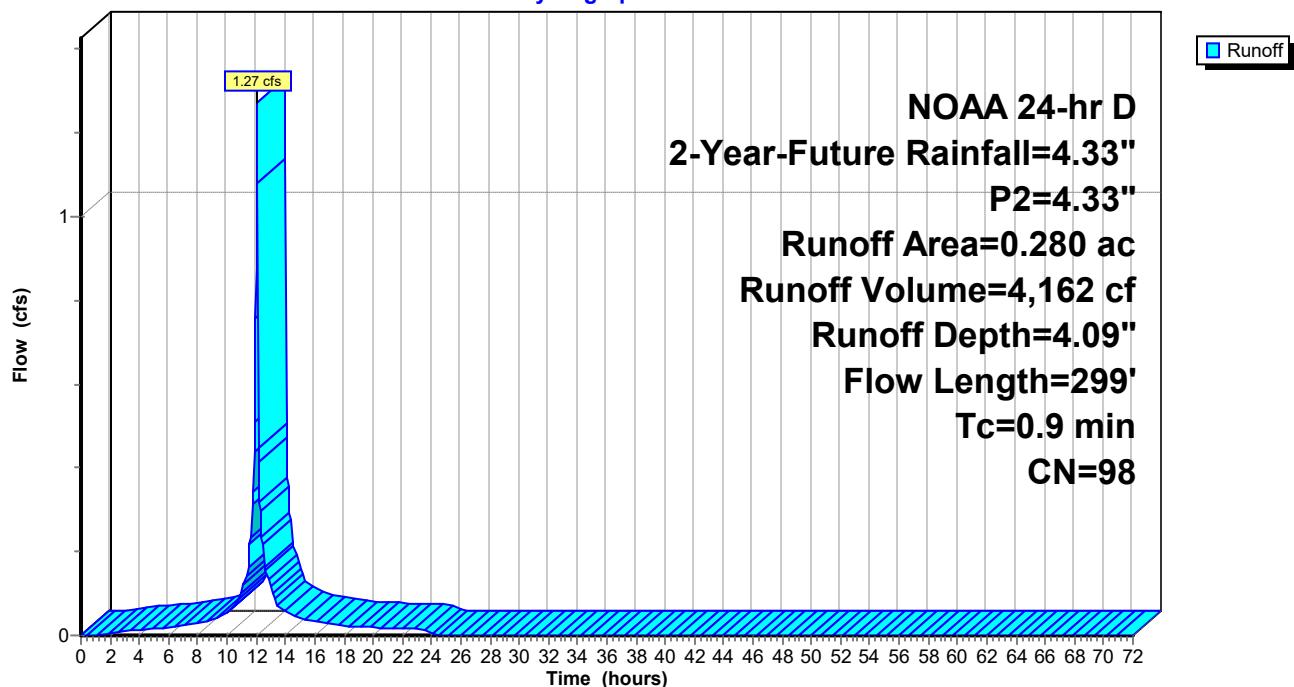
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.9	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 0.52 cfs @ 12.11 hrs, Volume= 1,732 cf, Depth= 0.99"
 Routed to Pond A : BMP-A Bioretention Basin

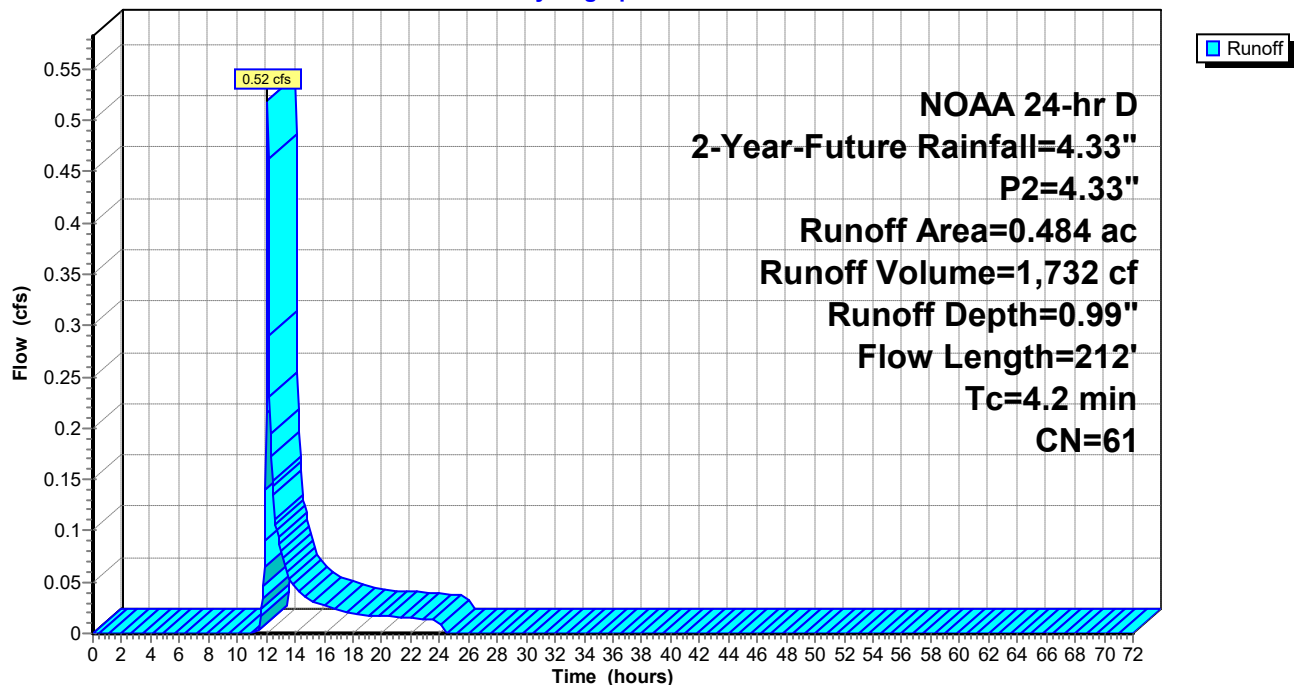
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1300	0.42		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.2	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

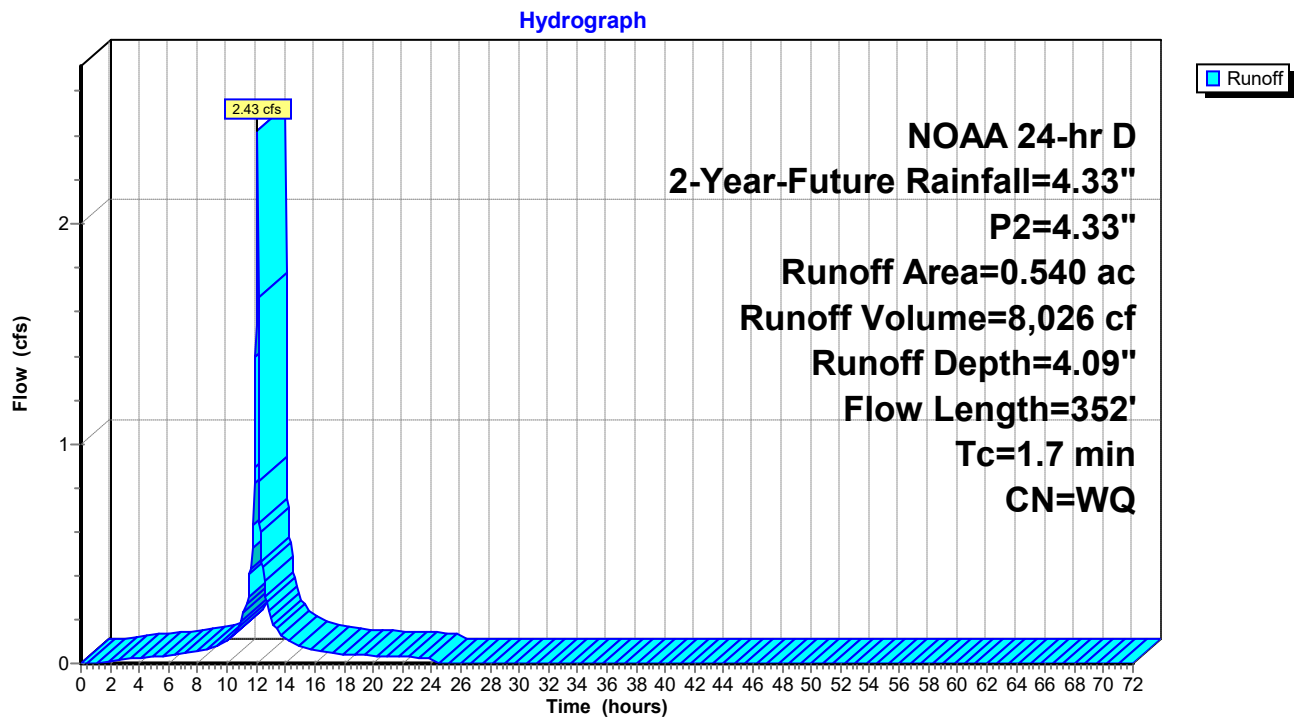
Runoff = 2.43 cfs @ 12.07 hrs, Volume= 8,026 cf, Depth= 4.09"
 Routed to Pond H : BMP-H Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0310	1.91		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	352	Total			

Subcatchment 16S: P-DA-1H IMP



Summary for Subcatchment 17S: P-DA-1H PER

Runoff = 0.55 cfs @ 12.10 hrs, Volume= 1,718 cf, Depth= 0.99"
 Routed to Pond H : BMP-H Bioretention Basin

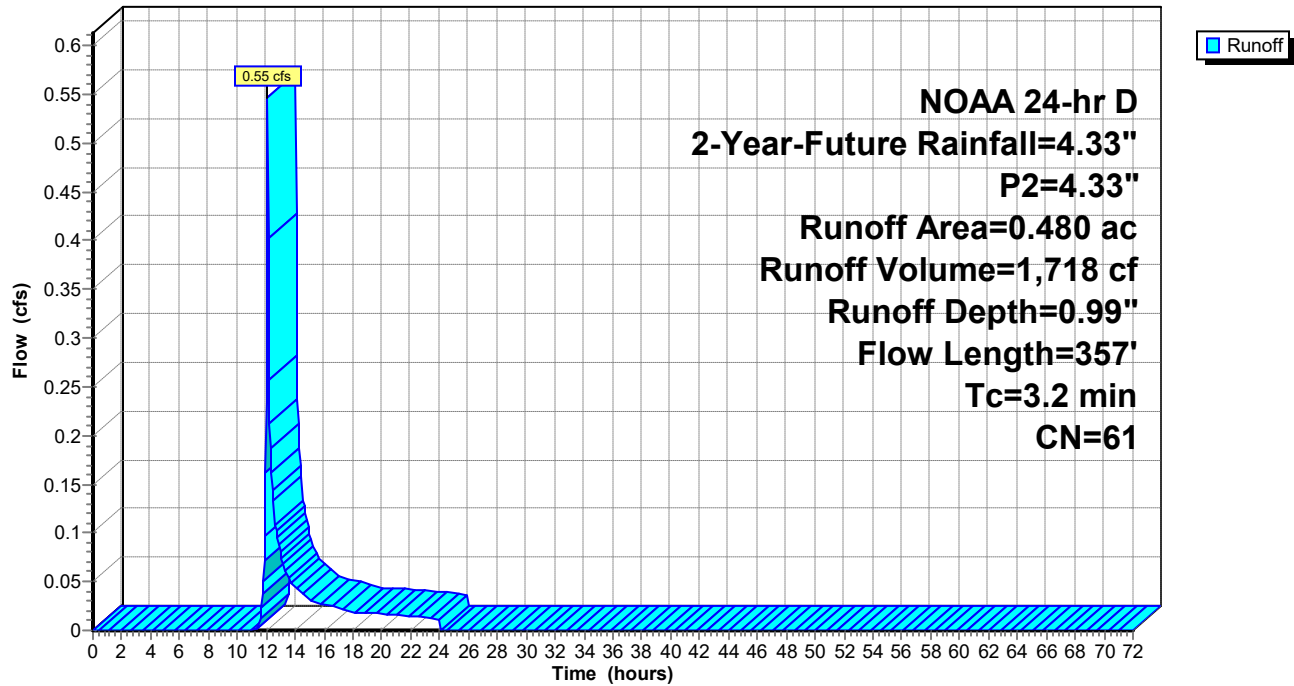
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	18	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	357	Total			

Subcatchment 17S: P-DA-1H PER

Hydrograph



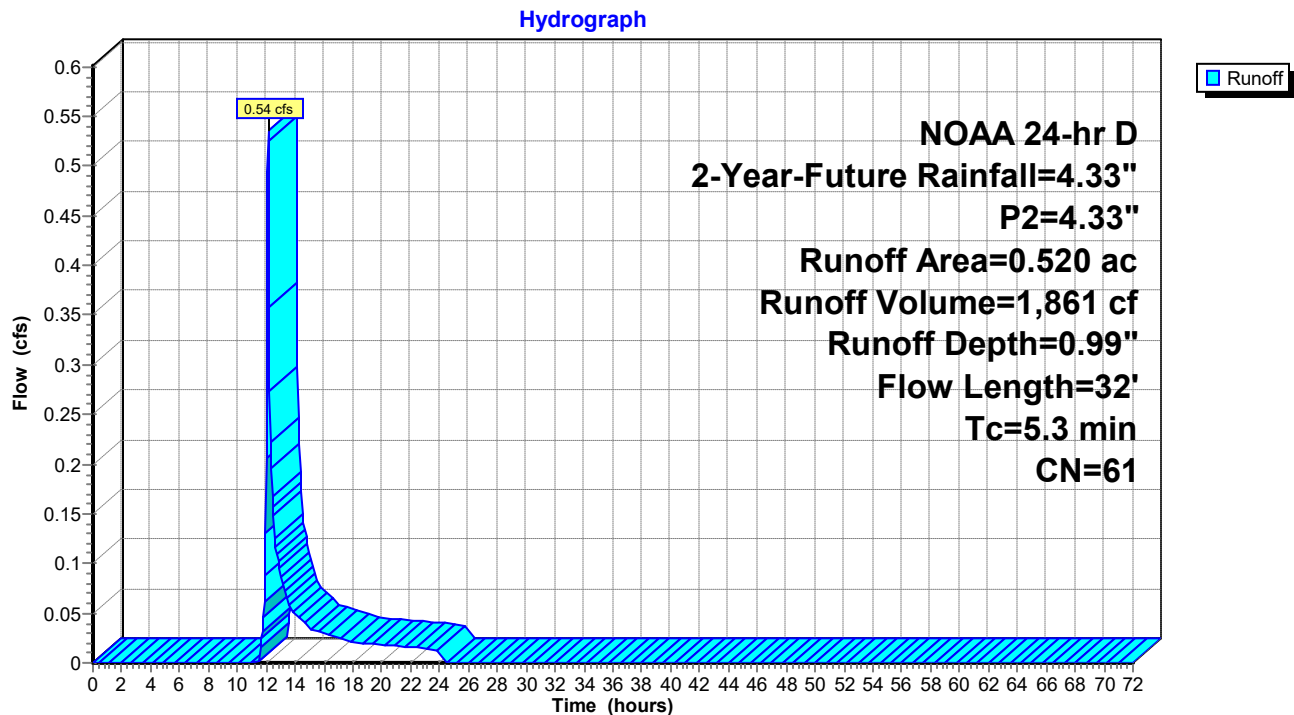
Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 0.54 cfs @ 12.13 hrs, Volume= 1,861 cf, Depth= 0.99"
 Routed to nonexistent node 26L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	15	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.4	6	0.3330	0.24		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.8	11	0.0830	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.33"
5.3	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 0.77 cfs @ 12.07 hrs, Volume= 2,527 cf, Depth= 4.09"
 Routed to Link 20L : TOTAL TO GI MTD F-1

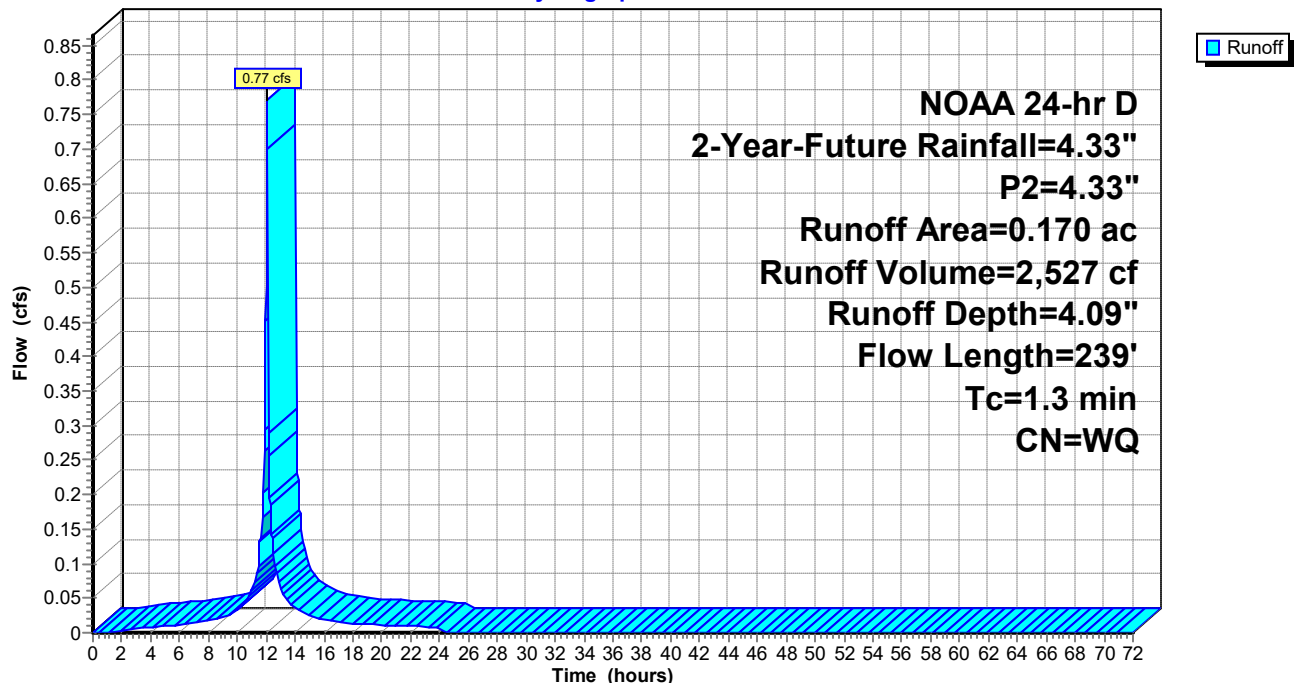
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 537 cf, Depth= 0.99"
 Routed to Link 20L : TOTAL TO GI MTD F-1

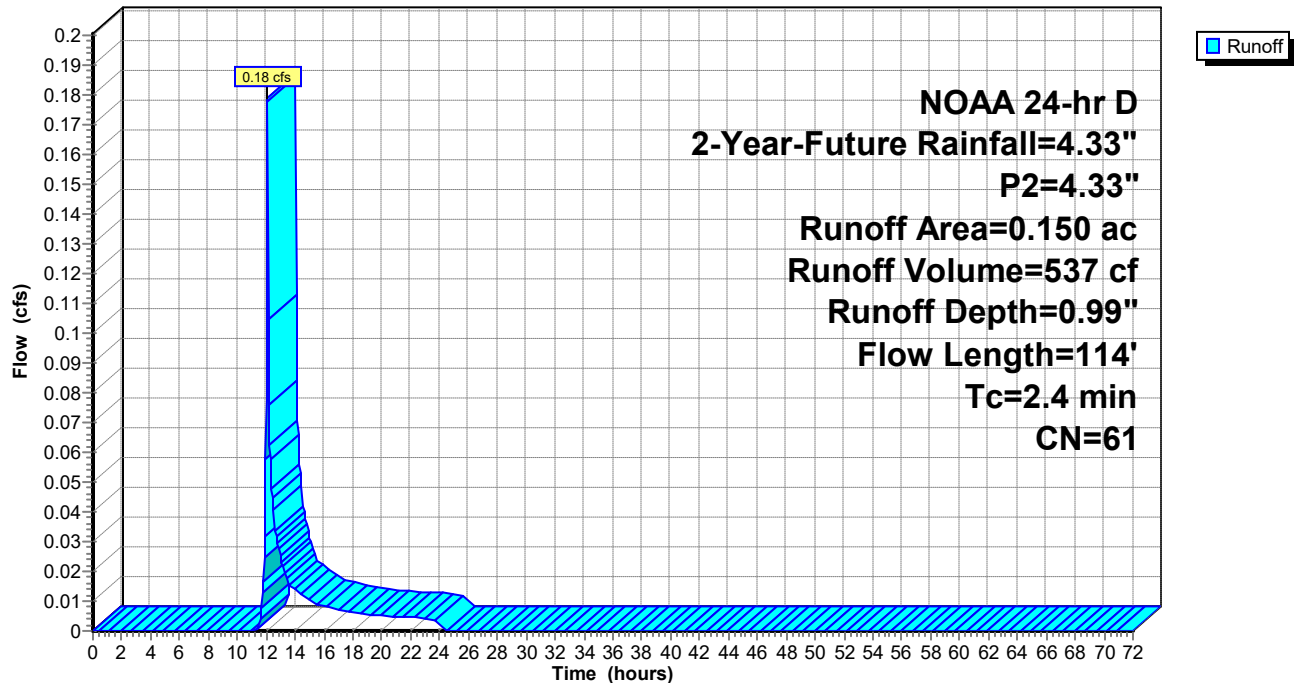
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	17	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.4	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 1.58 cfs @ 12.07 hrs, Volume= 5,202 cf, Depth= 4.09"
 Routed to Pond G : BMP-G Bioretention Basin

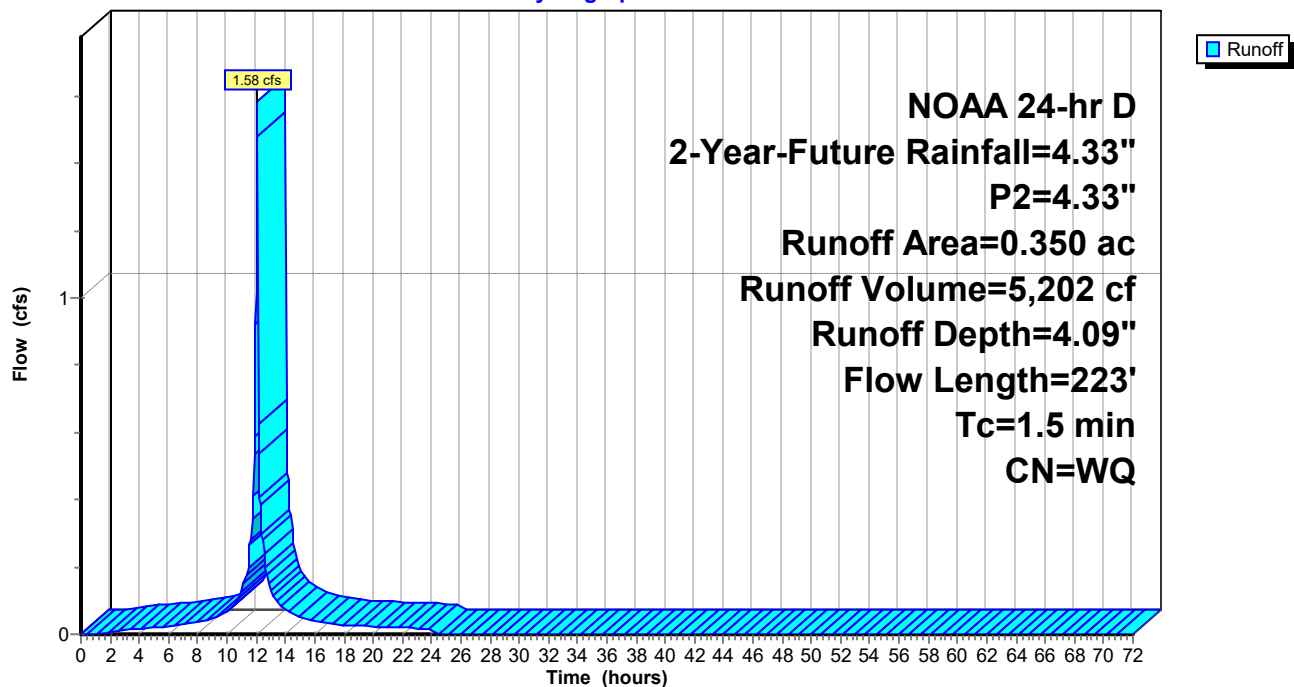
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	113	0.0240	1.76		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.5	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 1,574 cf, Depth= 0.99"
 Routed to Pond G : BMP-G Bioretention Basin

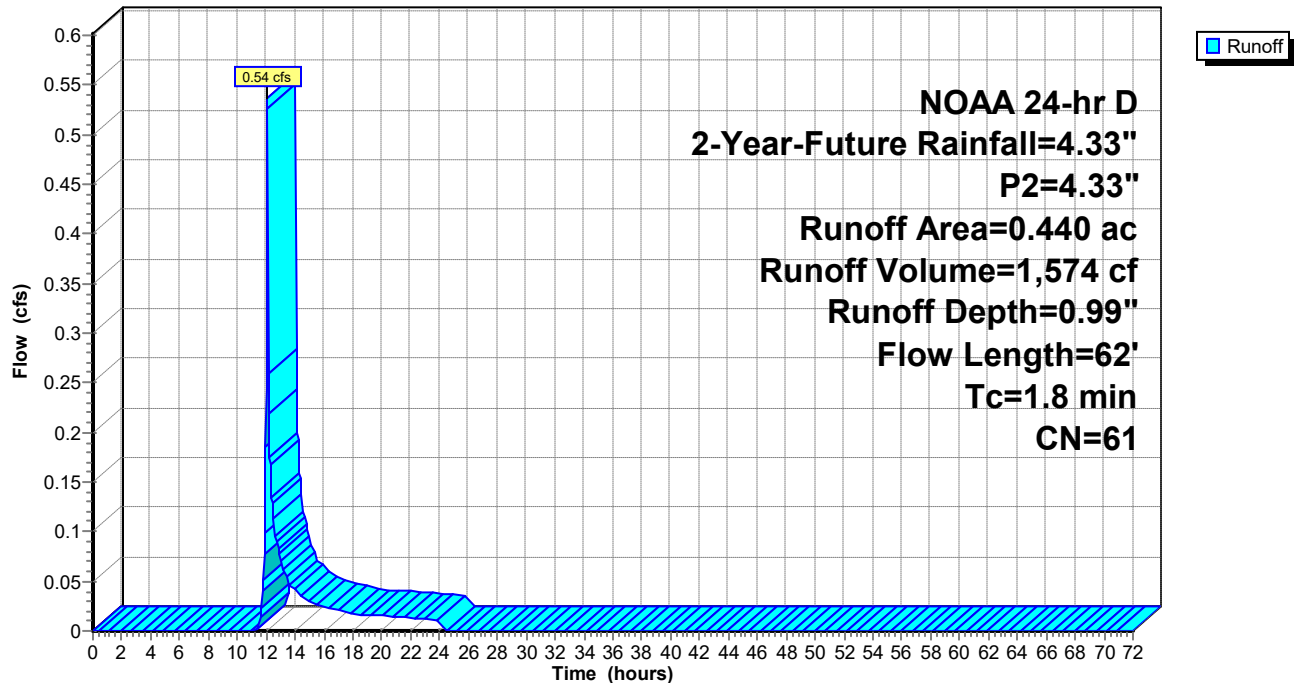
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.8	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.09 cfs @ 12.06 hrs, Volume= 297 cf, Depth= 4.09"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

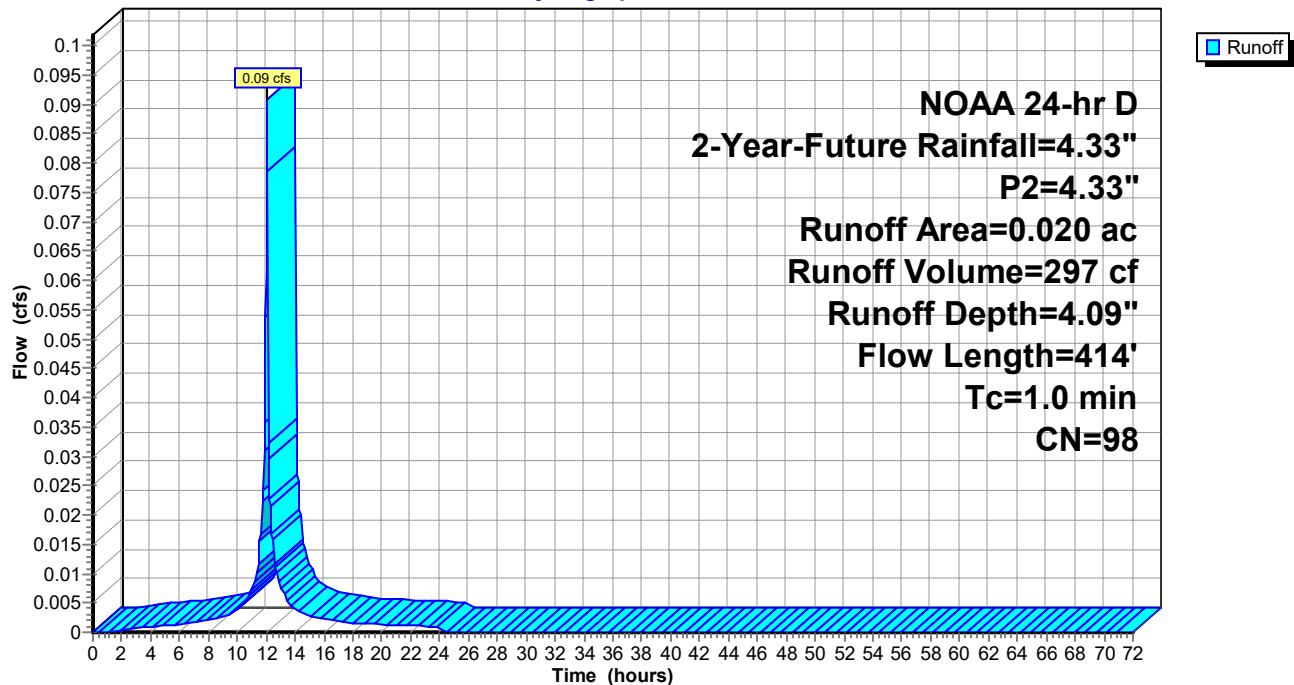
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	43	0.0330	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.0	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Runoff = 0.68 cfs @ 12.13 hrs, Volume= 2,326 cf, Depth= 0.99"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

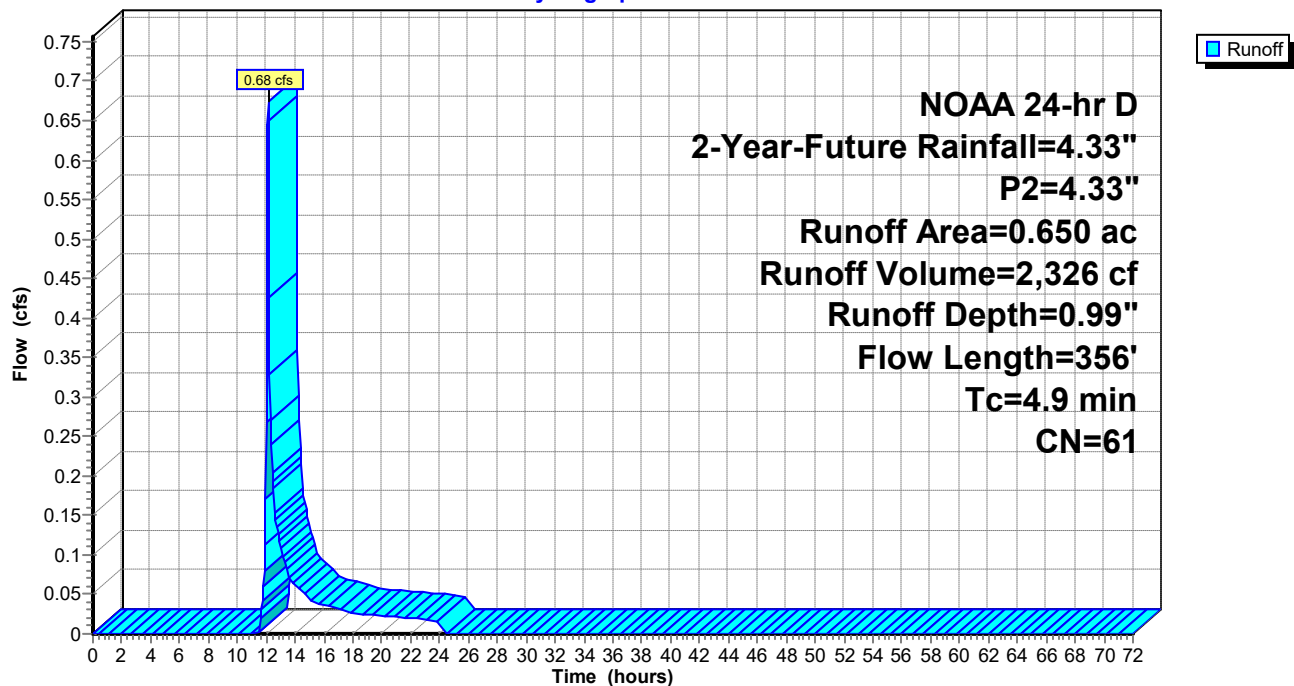
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	67	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.9	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 35S: P-DA-1C IMP

Runoff = 1.58 cfs @ 12.07 hrs, Volume= 5,202 cf, Depth= 4.09"
 Routed to Link 38L : TOTAL TO GI MTD 1C

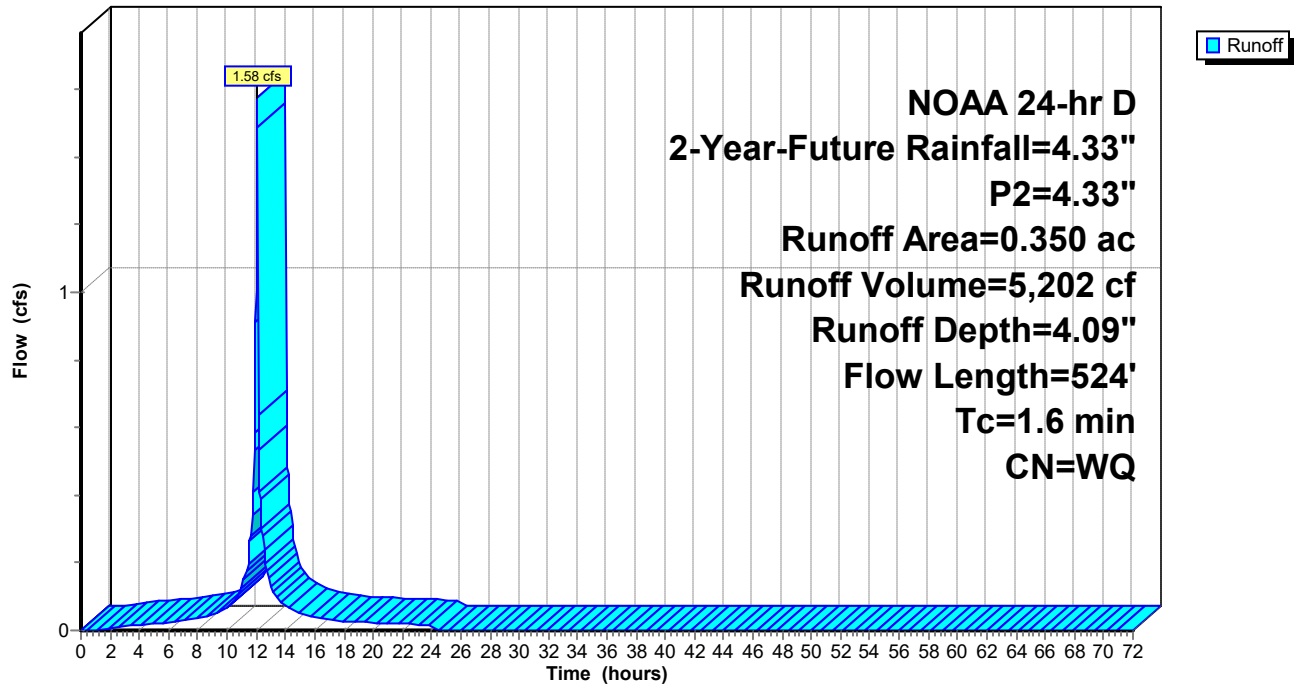
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0200	1.27		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	130	0.0054	4.19	5.14	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.6	524	Total			

Subcatchment 35S: P-DA-1C IMP

Hydrograph



Summary for Subcatchment 36S: P-DA-1C PER

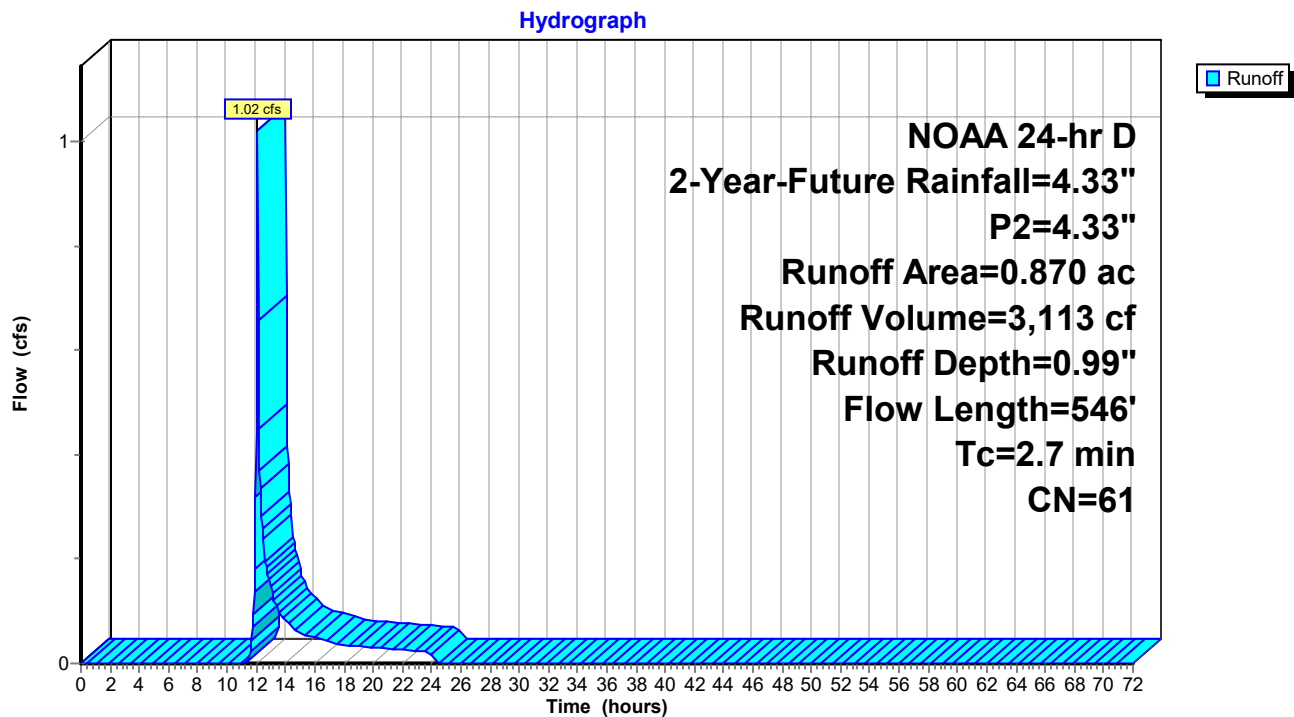
Runoff = 1.02 cfs @ 12.10 hrs, Volume= 3,113 cf, Depth= 0.99"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	38	0.1900	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.7	546	Total			

Subcatchment 36S: P-DA-1C PER



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 2.58 cfs @ 12.08 hrs, Volume= 8,323 cf, Depth= 4.09"
 Routed to Pond I : BMP-I Bioretention Basin

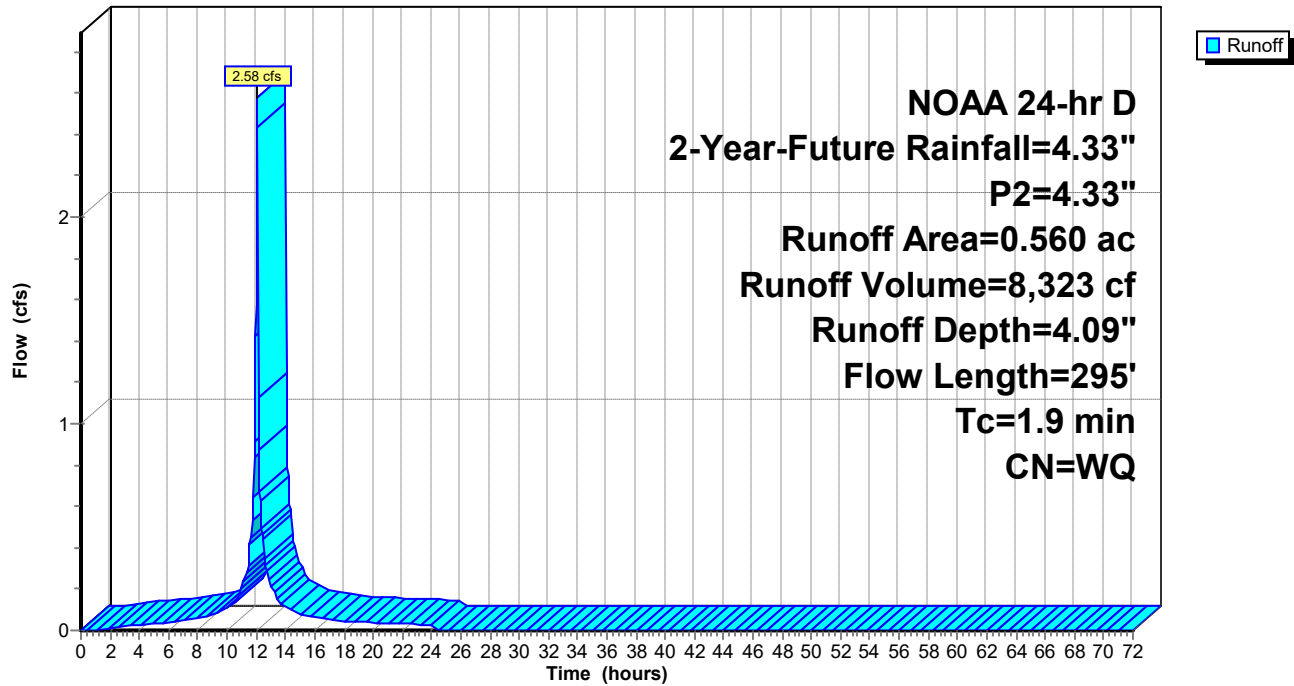
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0170	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.9	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 0.46 cfs @ 12.08 hrs, Volume= 1,360 cf, Depth= 0.99"
 Routed to Pond I : BMP-I Bioretention Basin

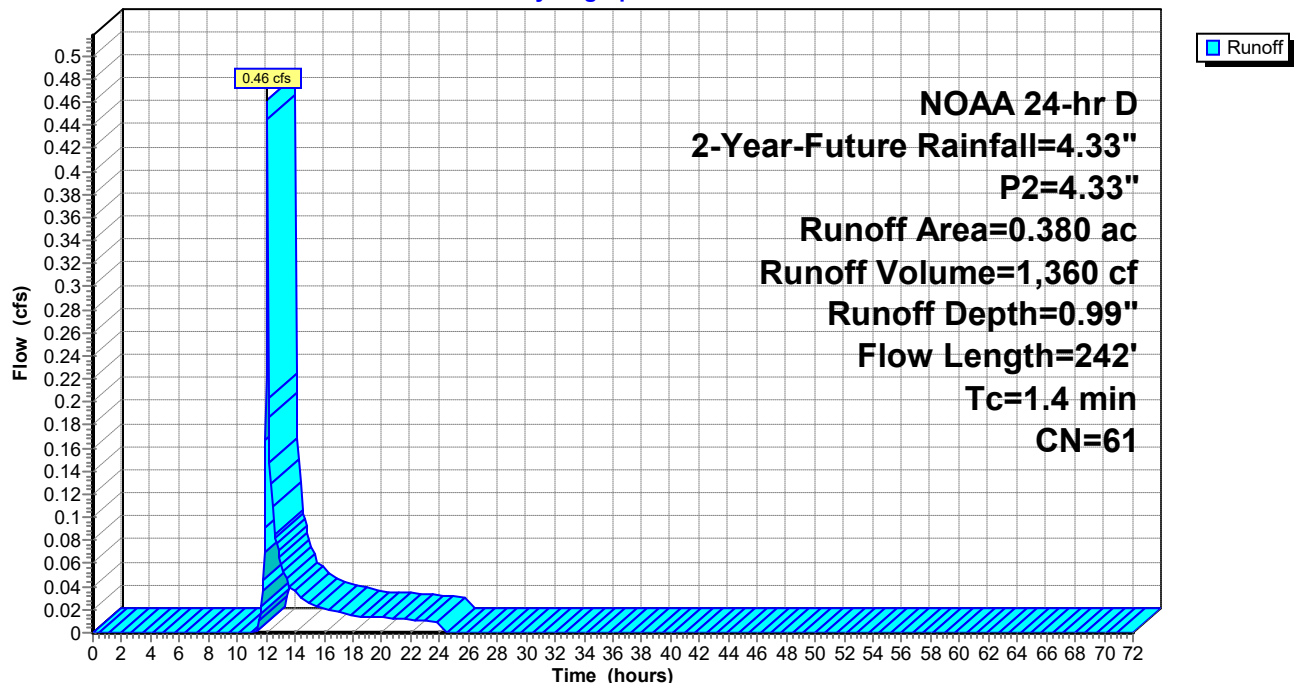
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.24		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	167	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 2.41 cfs @ 12.08 hrs, Volume= 7,877 cf, Depth= 4.09"
 Routed to Pond J : BMP-J Bioretention Basin

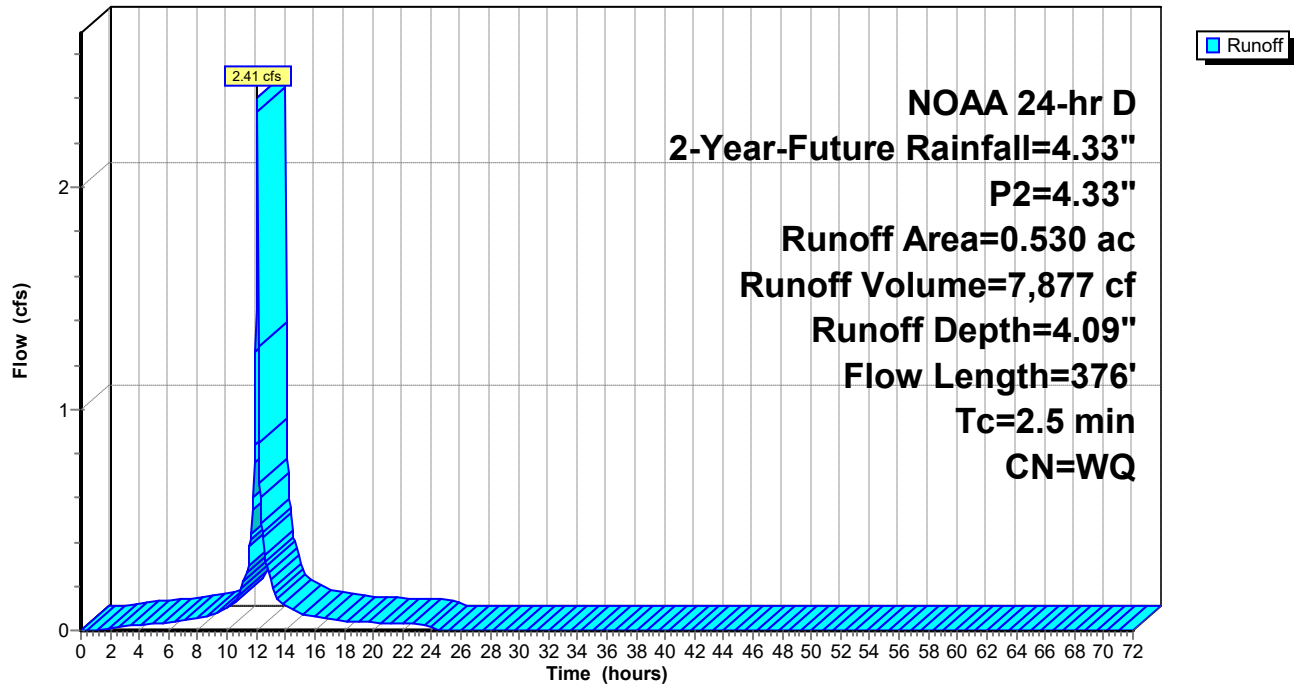
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.5	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 2.80 cfs @ 12.11 hrs, Volume= 10,107 cf, Depth= 4.09"
 Routed to Pond C : BMP C Bioretention Basin

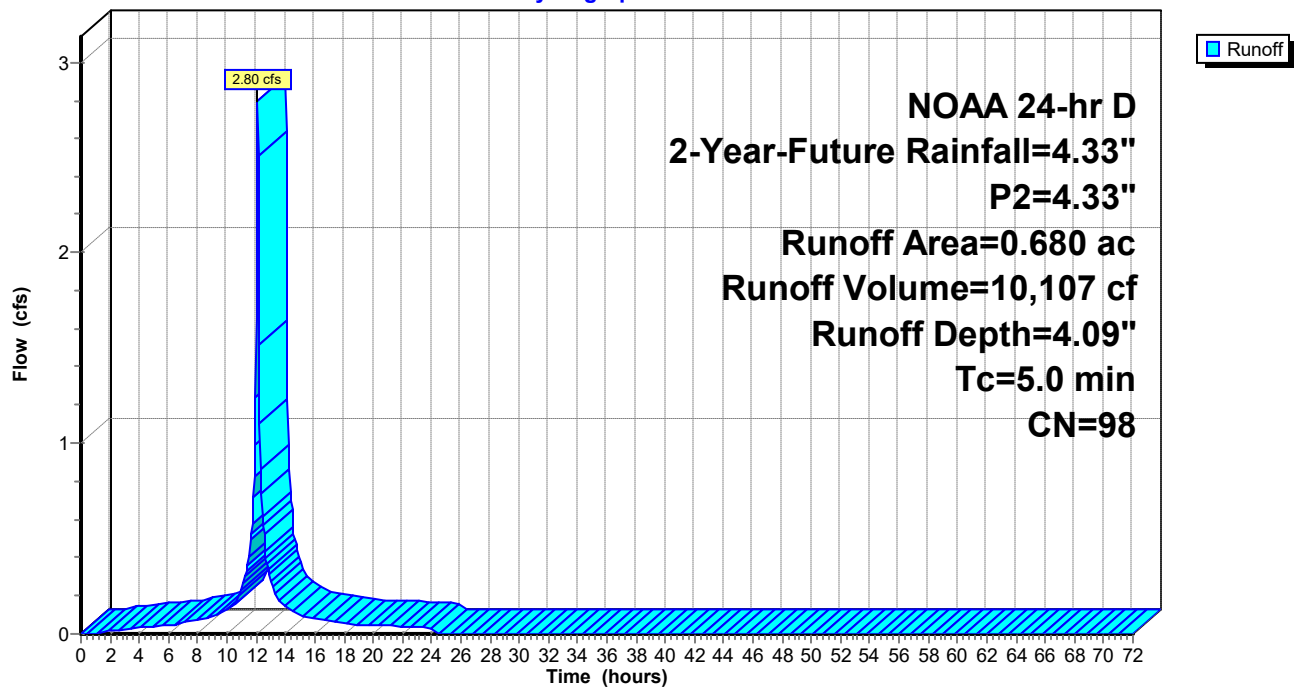
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 0.36 cfs @ 12.06 hrs, Volume= 1,189 cf, Depth= 4.09"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

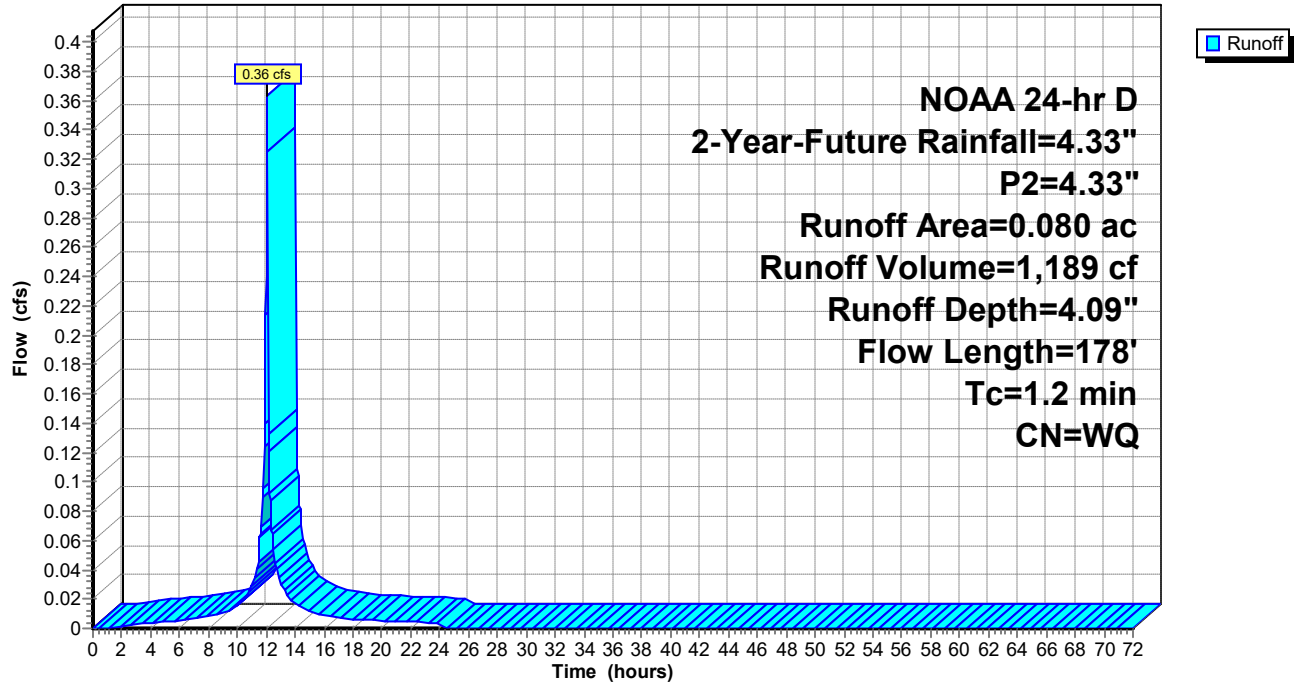
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.2	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 1.04 cfs @ 12.07 hrs, Volume= 3,418 cf, Depth= 4.09"
 Routed to Pond F : UG INFILTRATION BASIN F

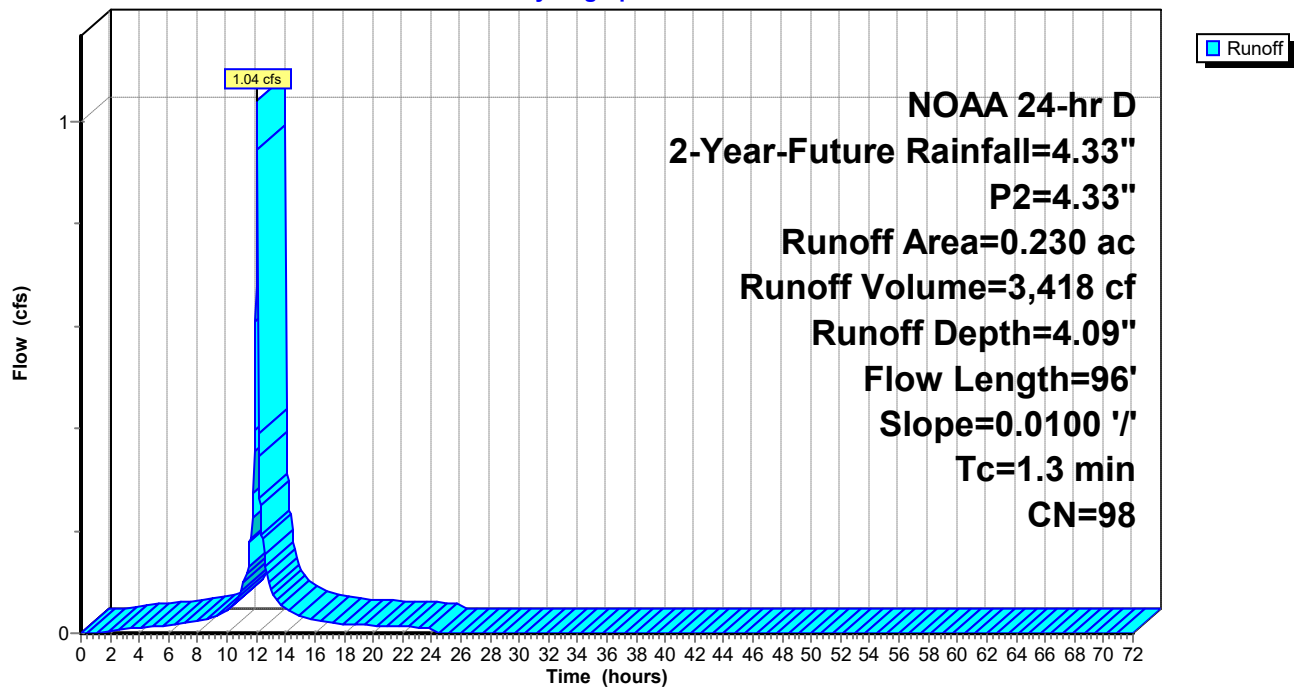
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	96	0.0100	1.20		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Runoff = 0.68 cfs @ 12.15 hrs, Volume= 2,505 cf, Depth= 0.99"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

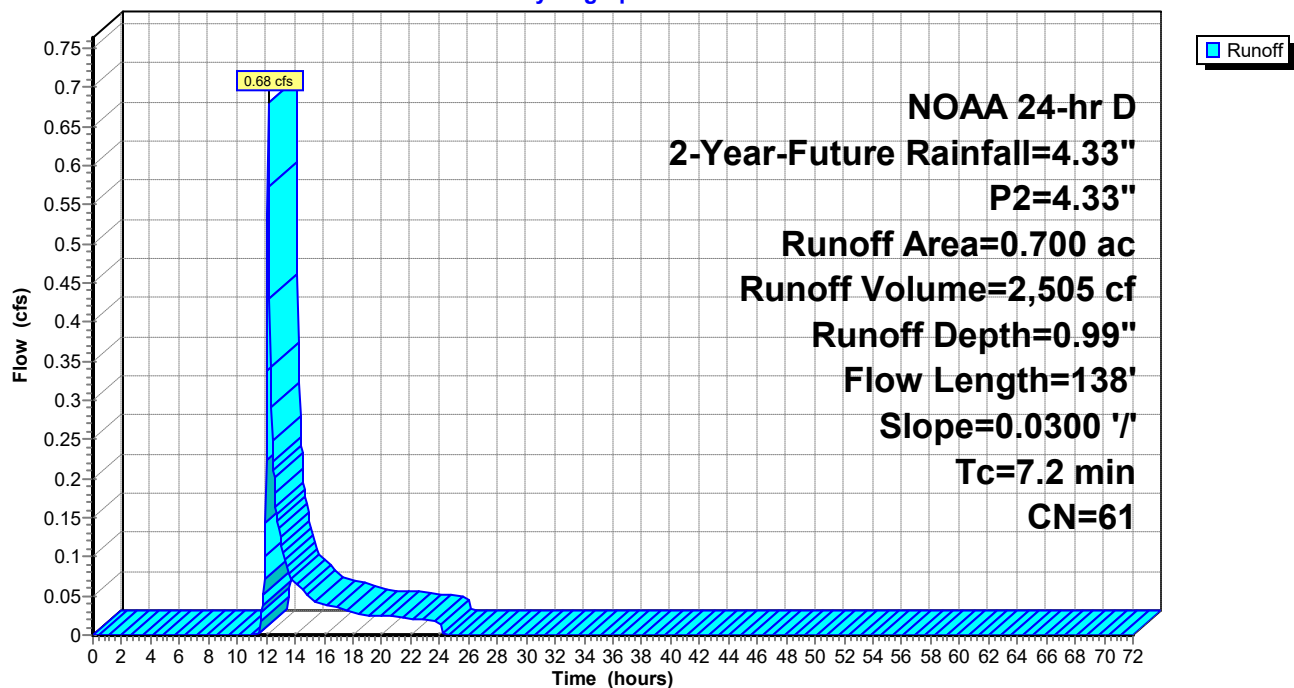
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	84	0.0300	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.0	54	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.2	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 7.48 cfs @ 12.08 hrs, Volume= 24,226 cf, Depth= 4.09"
 Routed to Link 46L : P-DA-1B TOTAL

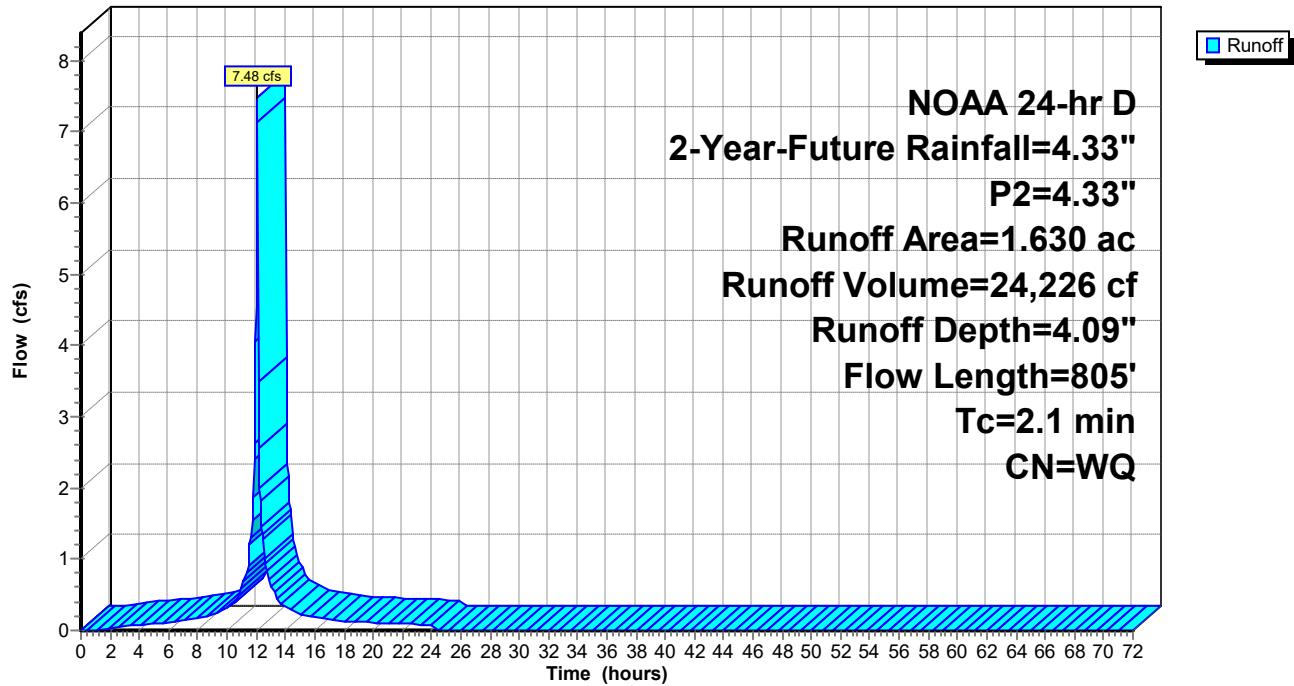
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.1	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



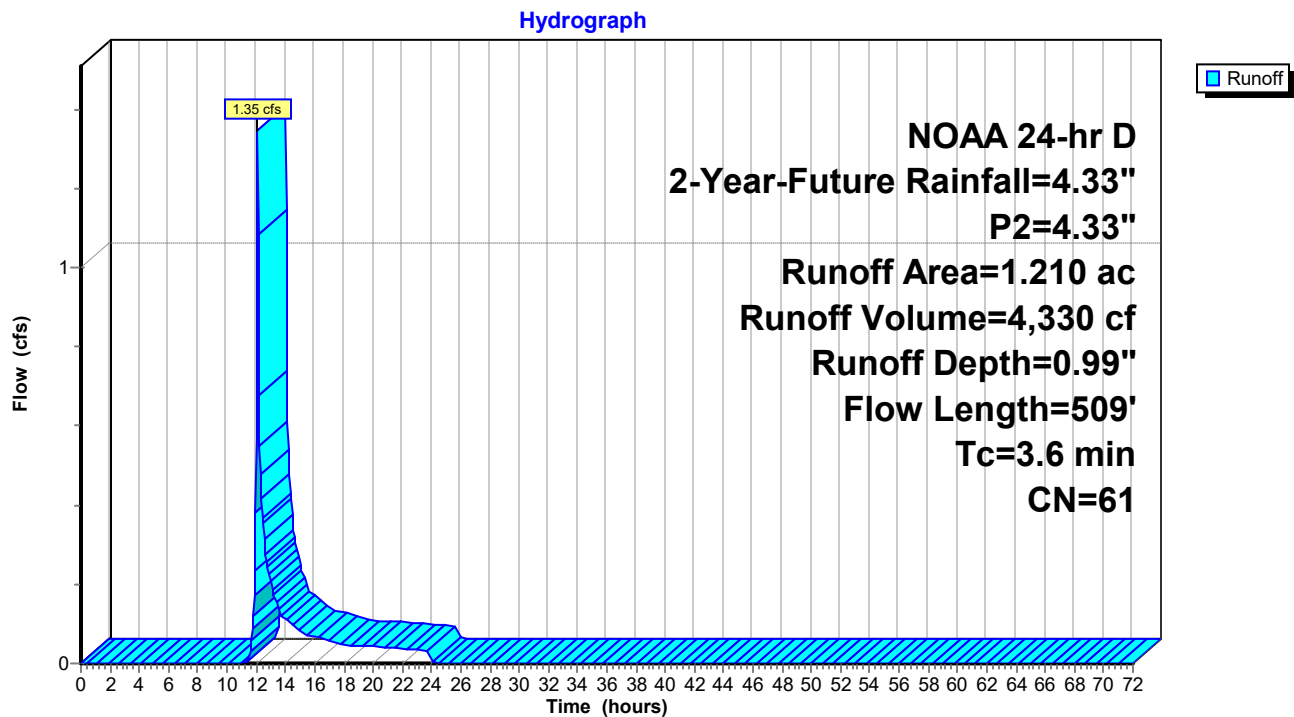
Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 1.35 cfs @ 12.11 hrs, Volume= 4,330 cf, Depth= 0.99"
 Routed to Link 46L : P-DA-1B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	12	0.0110	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.1	107	0.0210	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	509	Total			

Subcatchment 45S: P-DA-1B PER

Summary for Subcatchment 46S: P-DA-4J PER

Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,145 cf, Depth= 0.99"
 Routed to Pond J : BMP-J Bioretention Basin

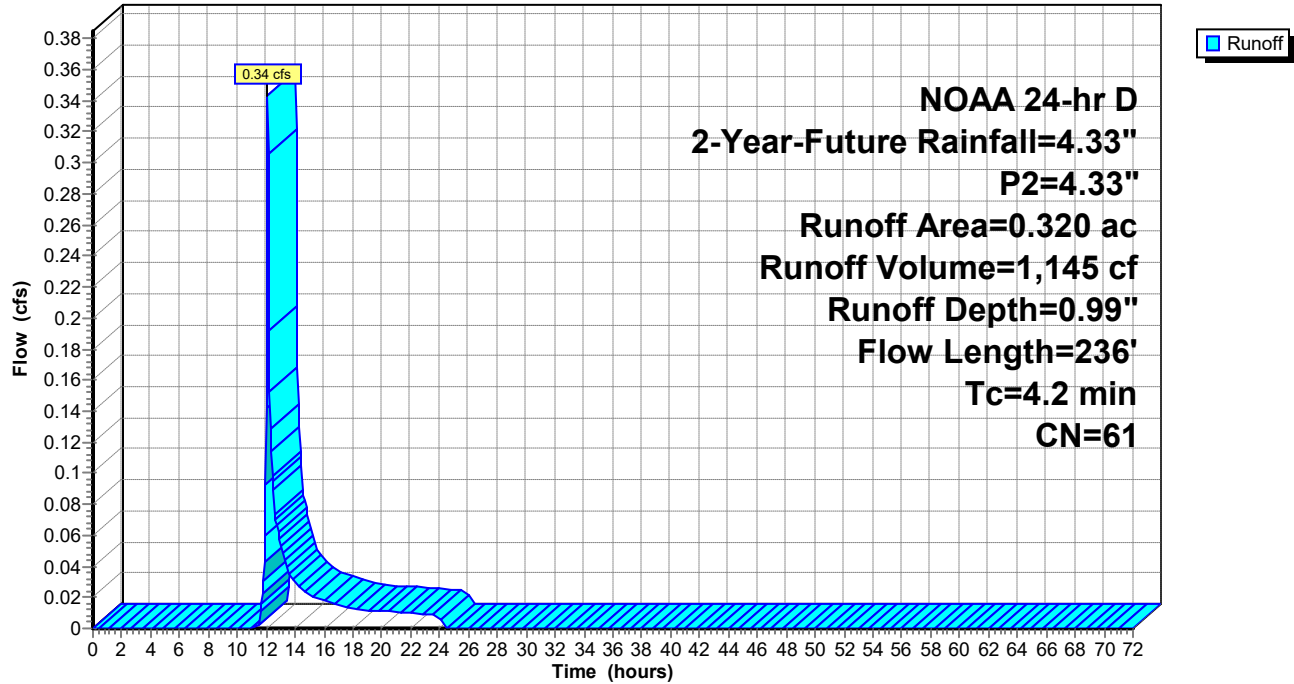
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	30	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.2	236	Total			

Subcatchment 46S: P-DA-4J PER

Hydrograph



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 3.24 cfs @ 12.07 hrs, Volume= 10,701 cf, Depth= 4.09"
 Routed to Link 50L : TOTAL TO GI MTD K-1

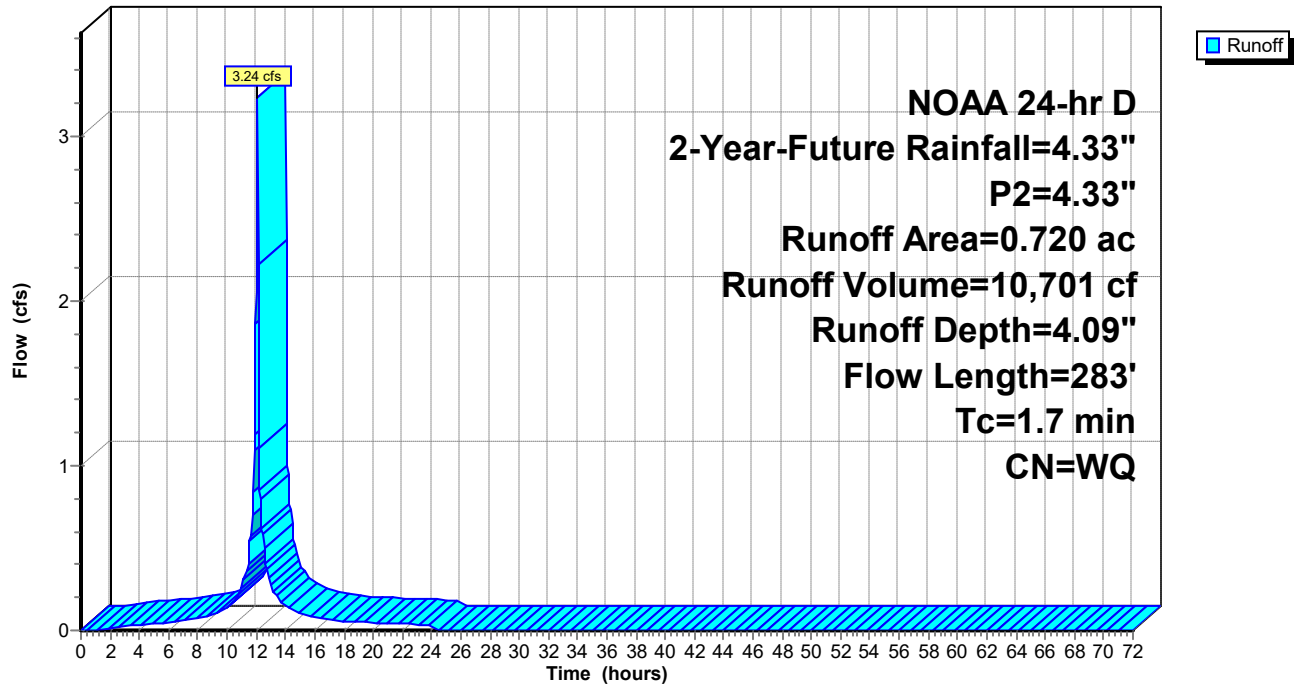
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.7	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

Runoff = 0.40 cfs @ 12.17 hrs, Volume= 1,574 cf, Depth= 0.99"
 Routed to Link 50L : TOTAL TO GI MTD K-1

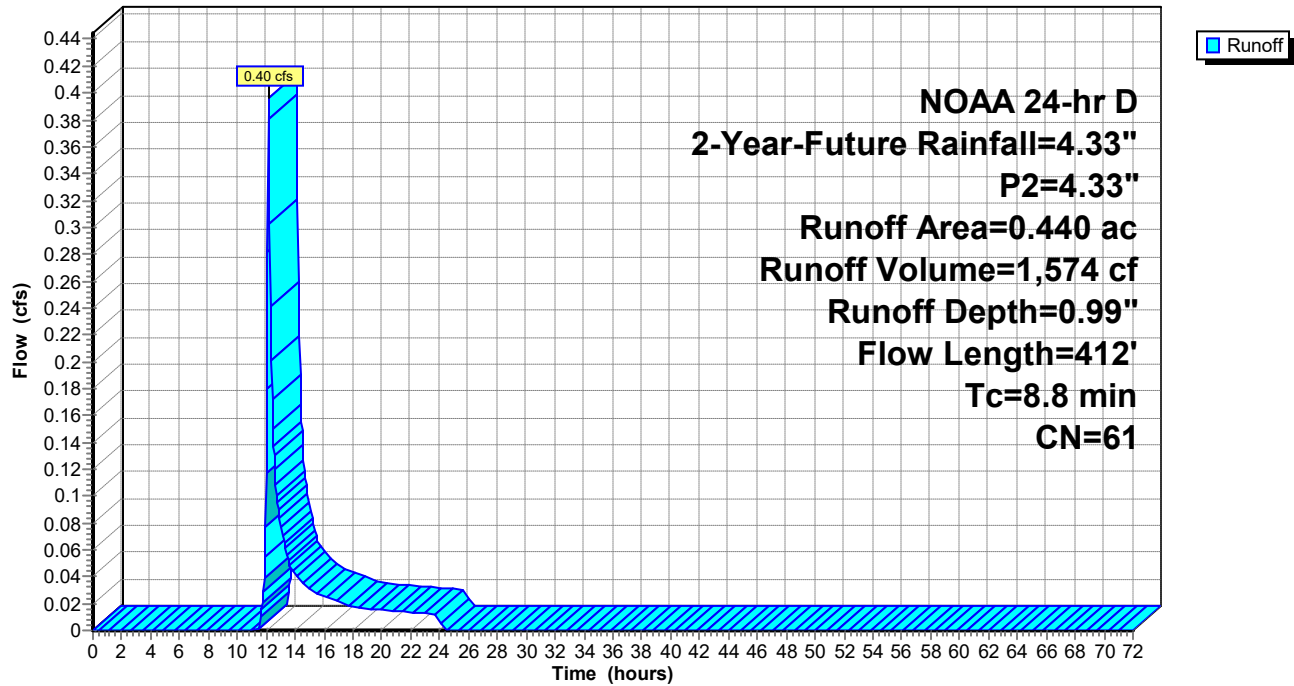
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	96	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.8	412	Total			

Subcatchment 48S: P-DA-4K PER

Hydrograph



Summary for Subcatchment 49S: P-DA-5N IMP

Runoff = 2.90 cfs @ 12.08 hrs, Volume= 9,363 cf, Depth= 4.09"
 Routed to Pond N : BMP-N Bioretention Basin

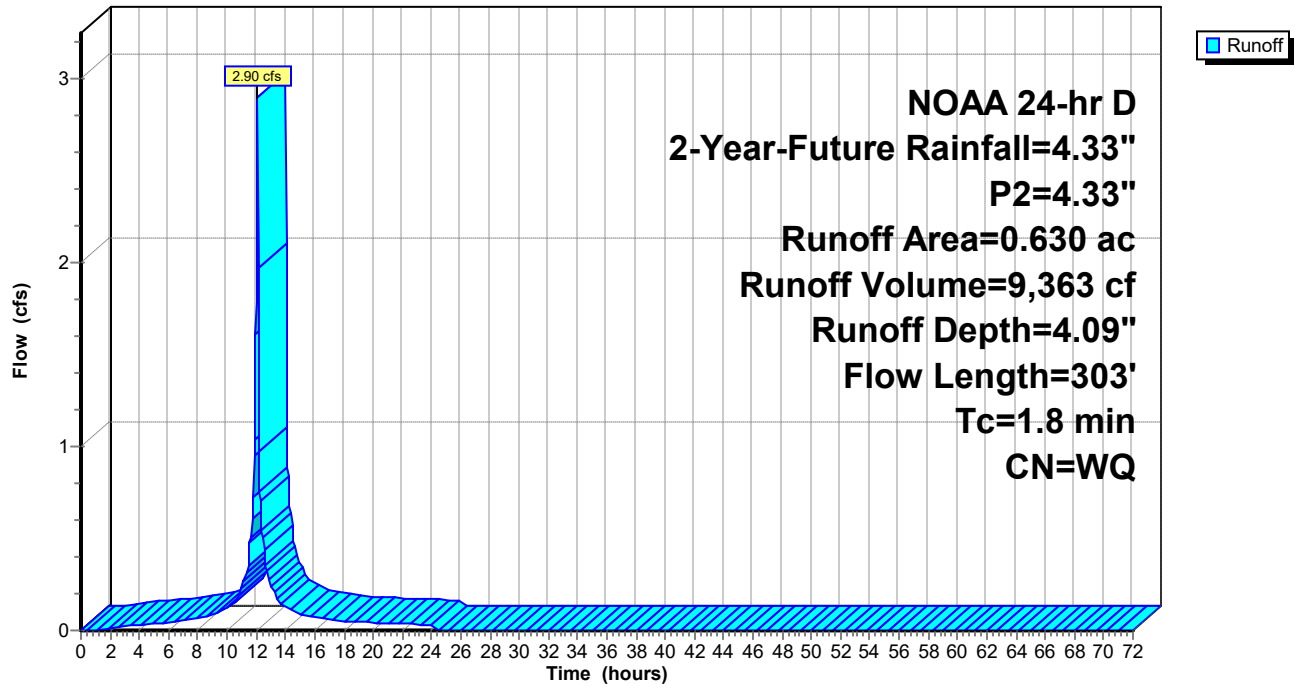
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0270	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	303	Total			

Subcatchment 49S: P-DA-5N IMP

Hydrograph



Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 0.49 cfs @ 12.10 hrs, Volume= 1,503 cf, Depth= 0.99"
 Routed to Pond N : BMP-N Bioretention Basin

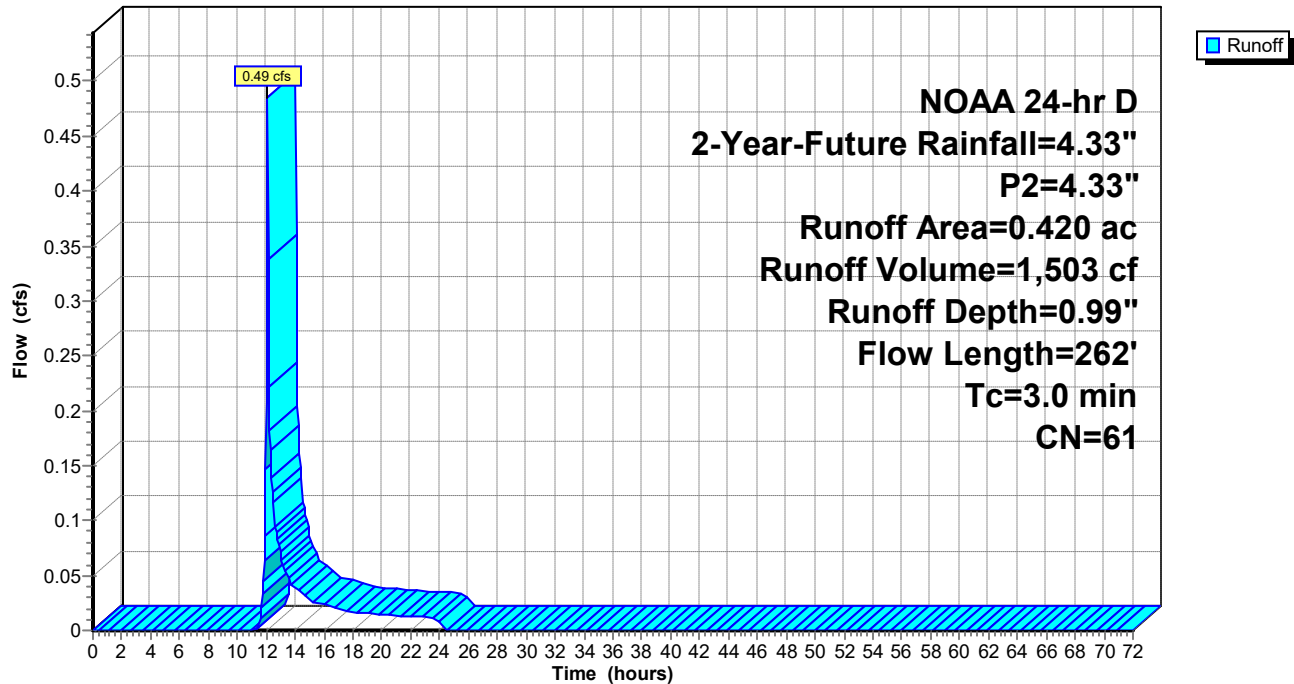
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	35	0.0570	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.0	262	Total			

Subcatchment 50S: P-DA-5N PER

Hydrograph



Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 6.37 cfs @ 12.08 hrs, Volume= 20,808 cf, Depth= 4.09"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

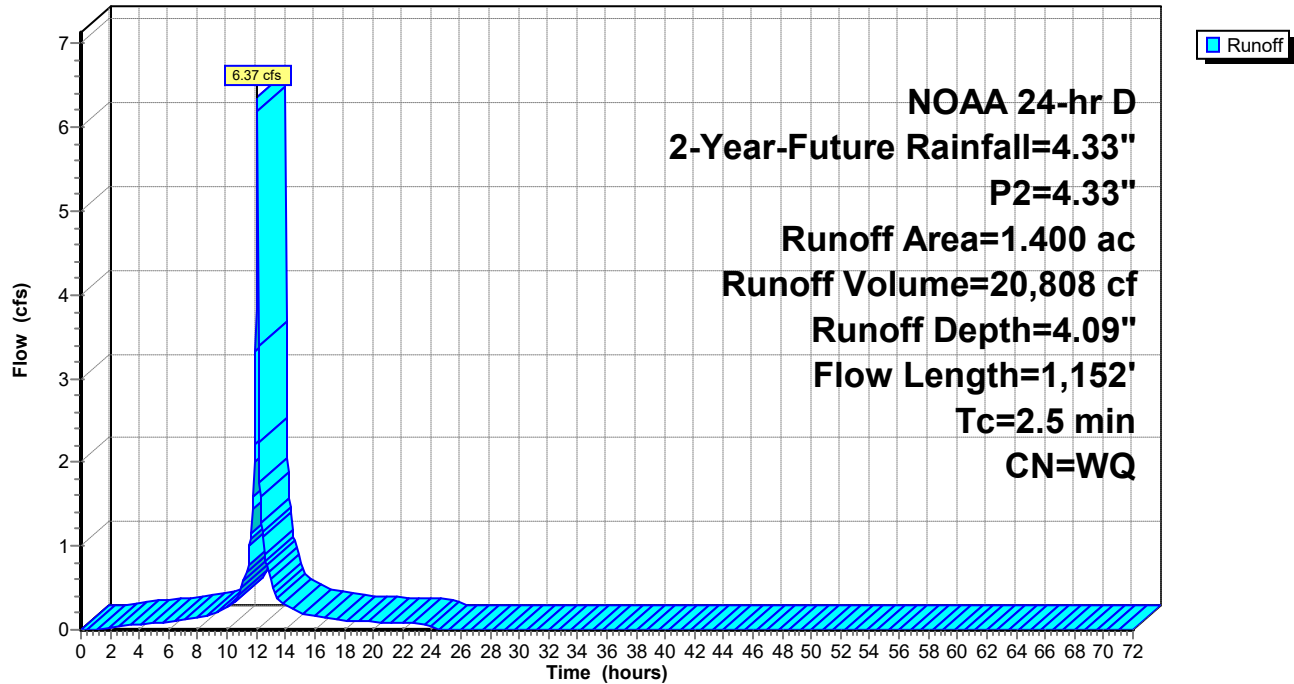
Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	41	0.1200	2.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.5	1,152	Total			

Subcatchment 51S: P-DA-5M IMP

Hydrograph



Summary for Subcatchment 52S: P-DA-5M PER

Runoff = 0.89 cfs @ 12.10 hrs, Volume= 2,720 cf, Depth= 0.99"
 Routed to Link 21L : TOTAL TO P-DA-5M

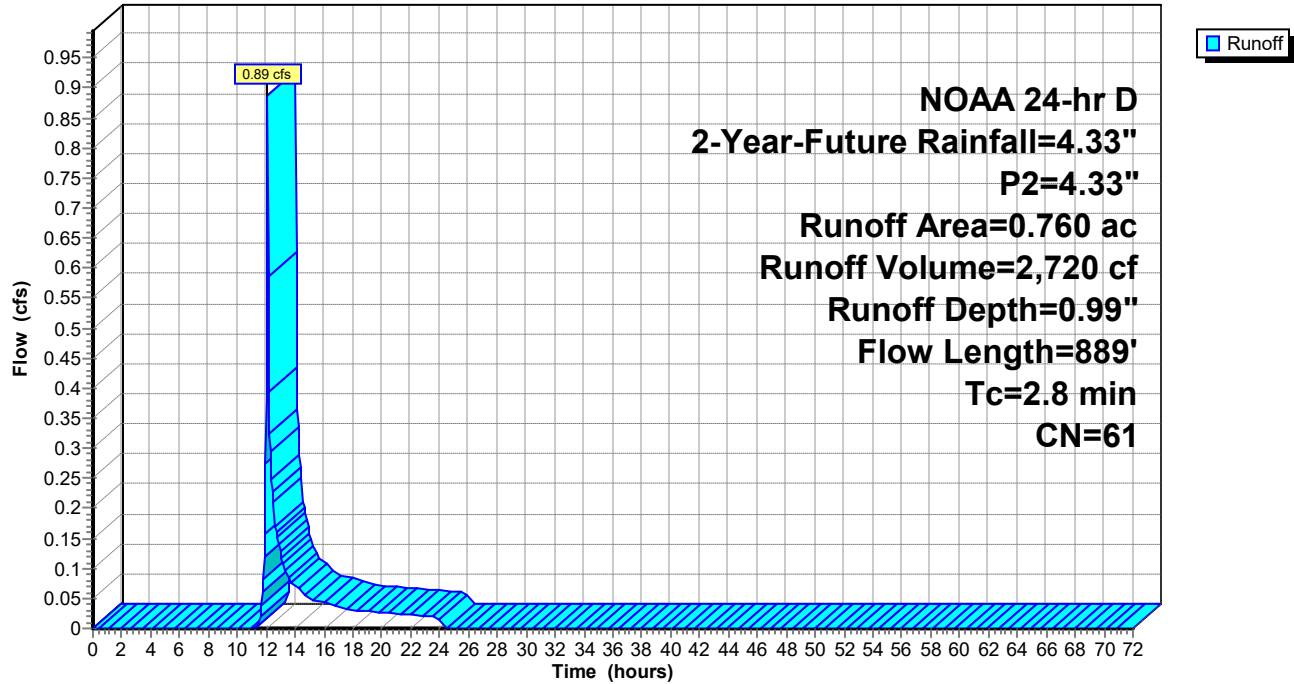
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	20	0.2000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.8	889	Total			

Subcatchment 52S: P-DA-5M PER

Hydrograph



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 743 cf, Depth= 4.09"
 Routed to Pond K : BMP-K UG Infiltration Basin

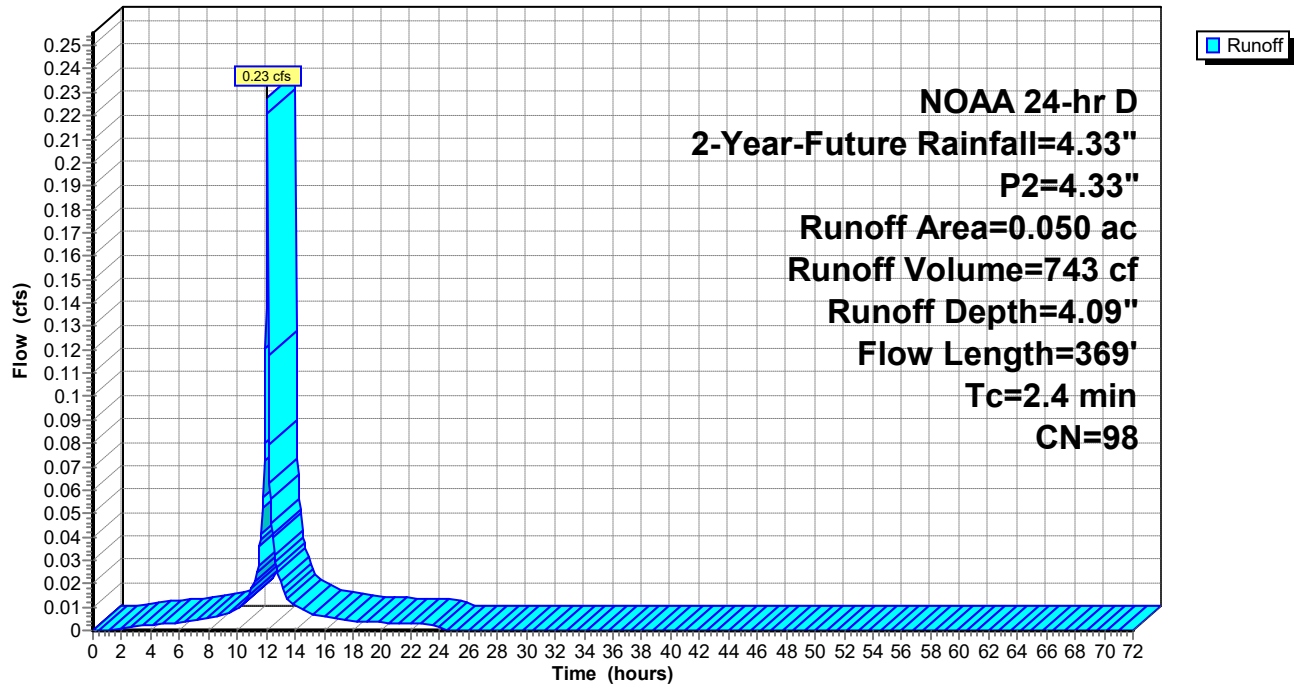
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 0.94 cfs @ 12.23 hrs, Volume= 4,390 cf, Depth= 0.98"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

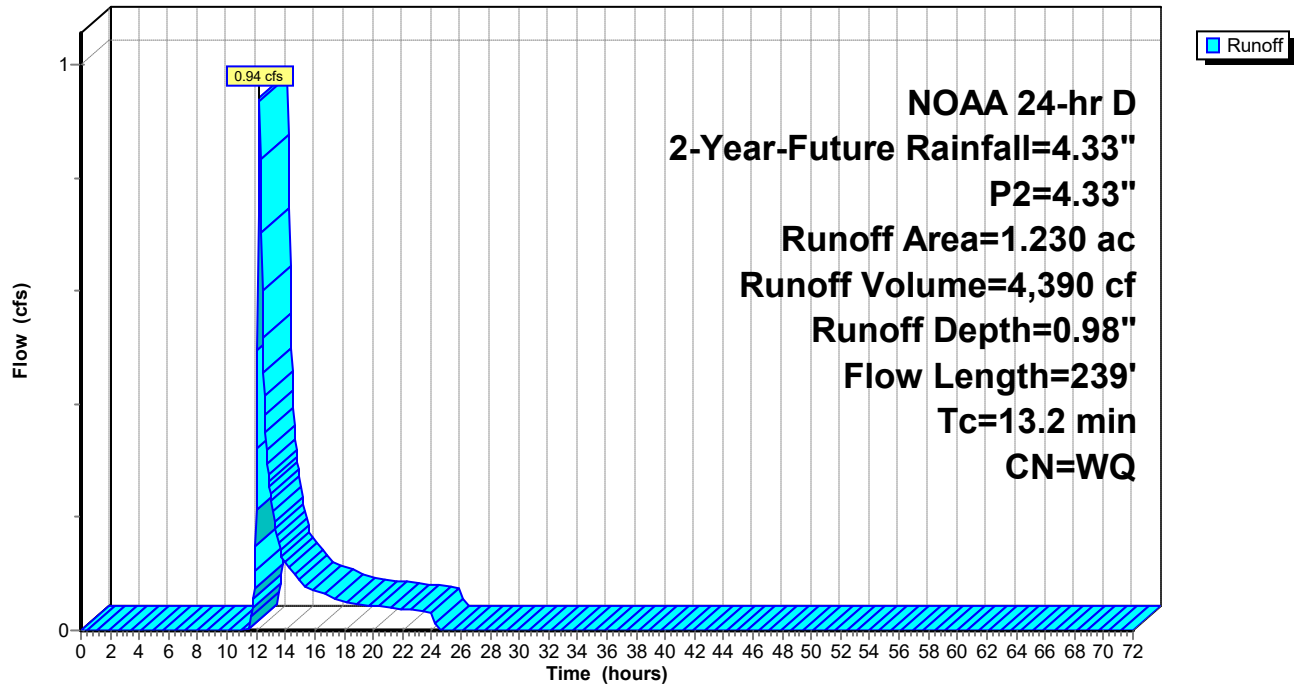
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0200	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.27 cfs @ 12.05 hrs, Volume= 892 cf, Depth= 4.09"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

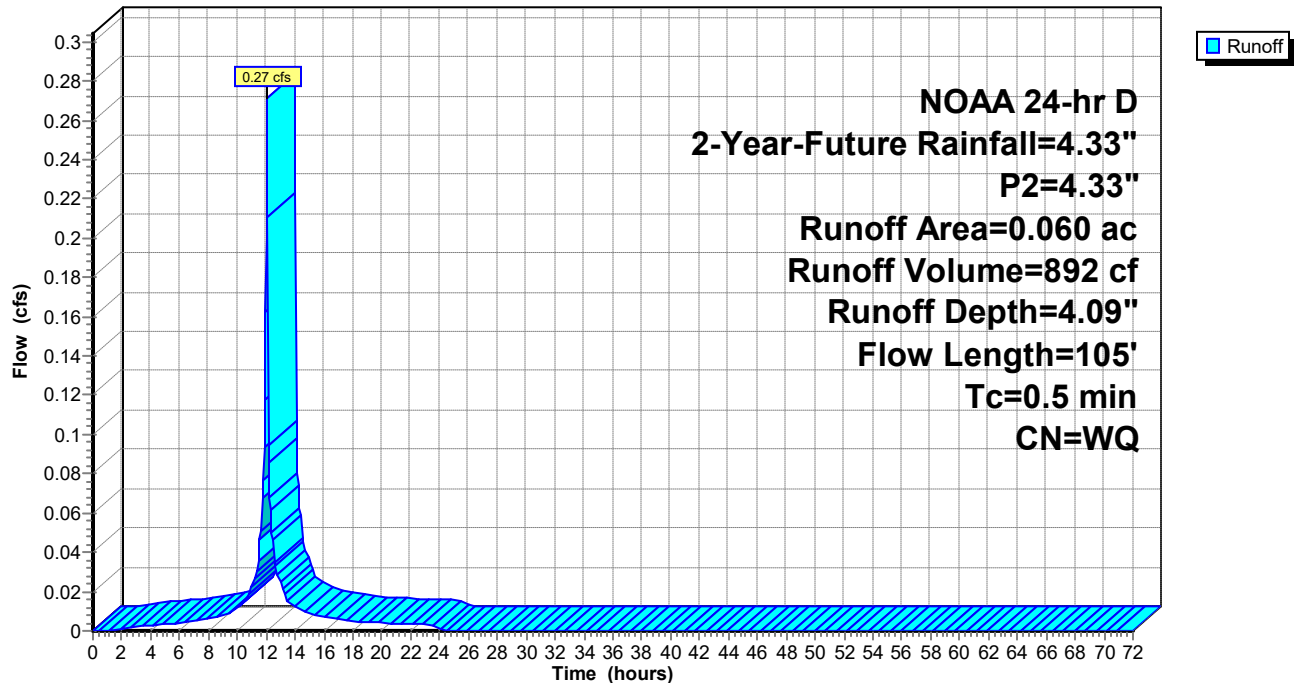
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 6.85 cfs @ 12.08 hrs, Volume= 22,294 cf, Depth= 4.09"
 Routed to Pond P : BMP-P Bioretention Basin

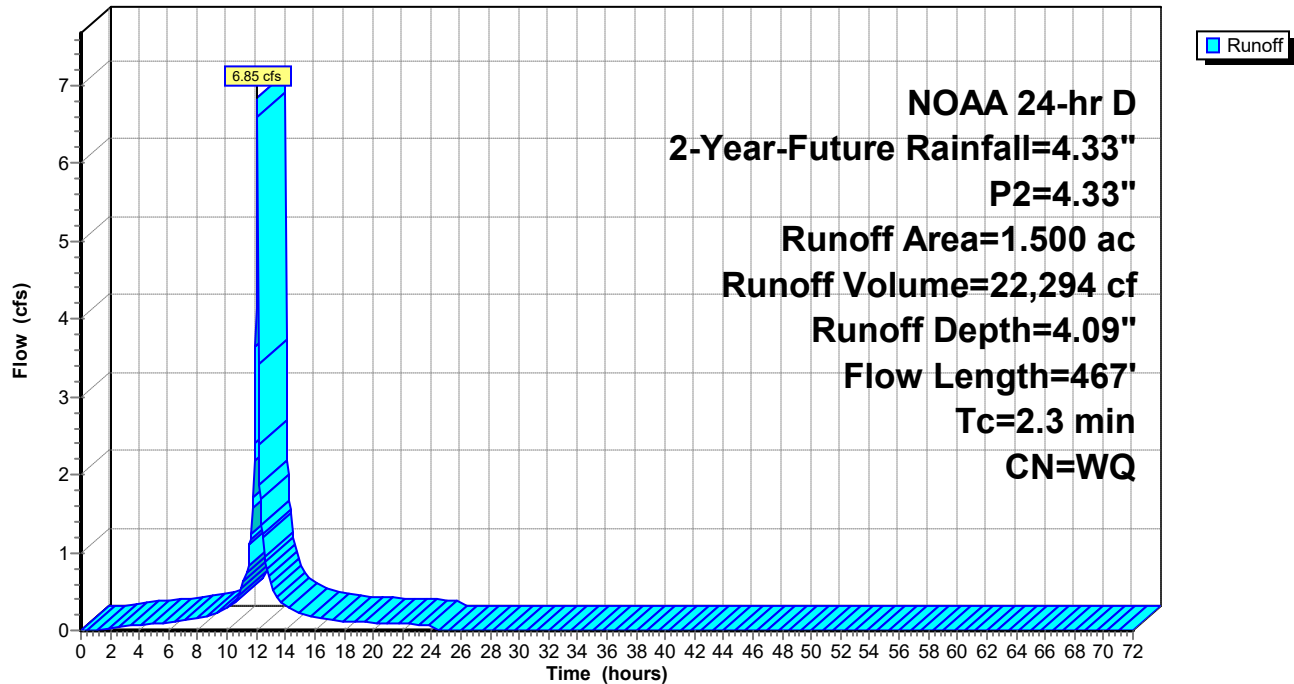
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



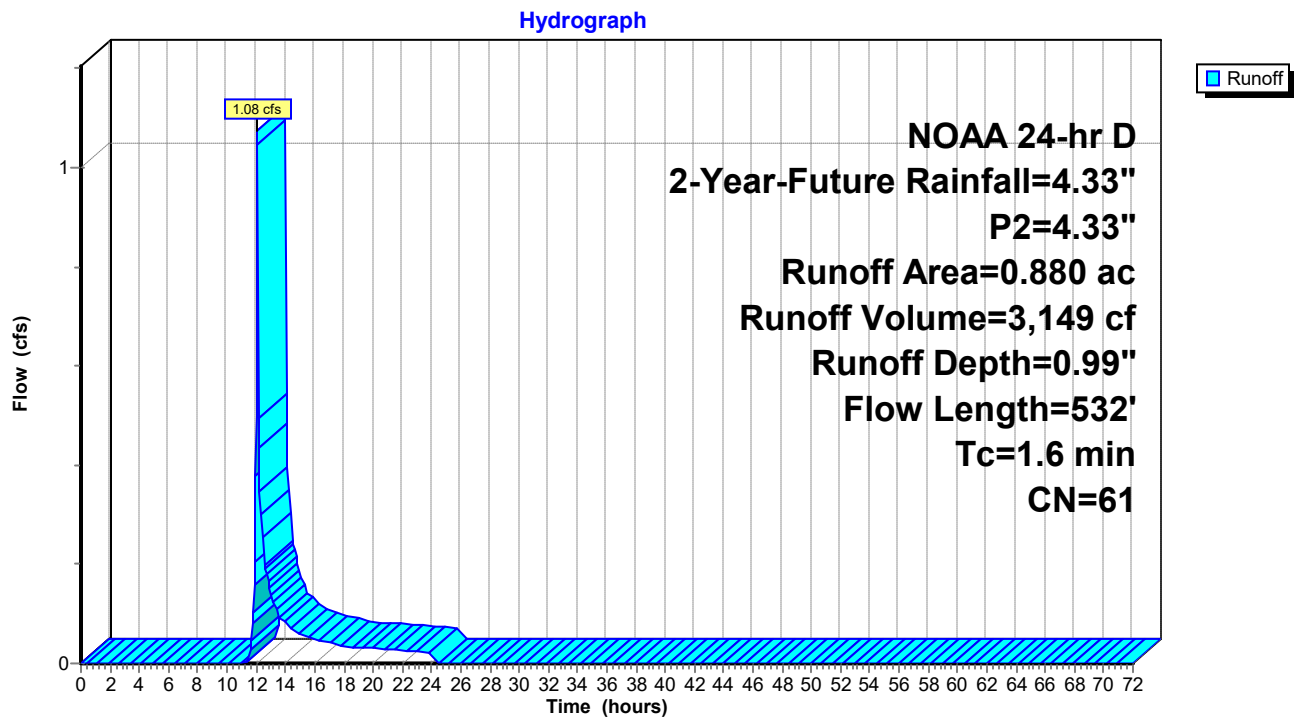
Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 1.08 cfs @ 12.08 hrs, Volume= 3,149 cf, Depth= 0.99"
 Routed to Pond P : BMP-P Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER

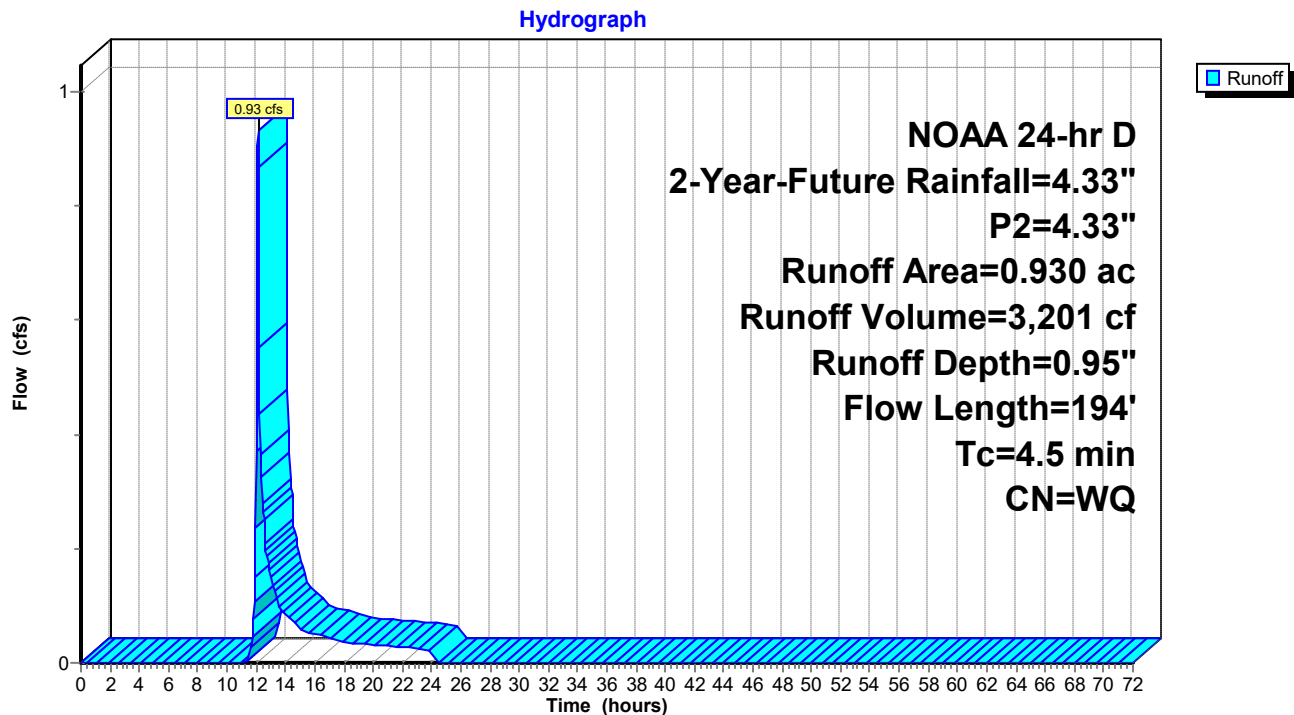
Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 3,201 cf, Depth= 0.95"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.5	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 3.77 cfs @ 12.08 hrs, Volume= 12,187 cf, Depth= 4.09"
 Routed to Link 66L : P-DA-5R TOTAL

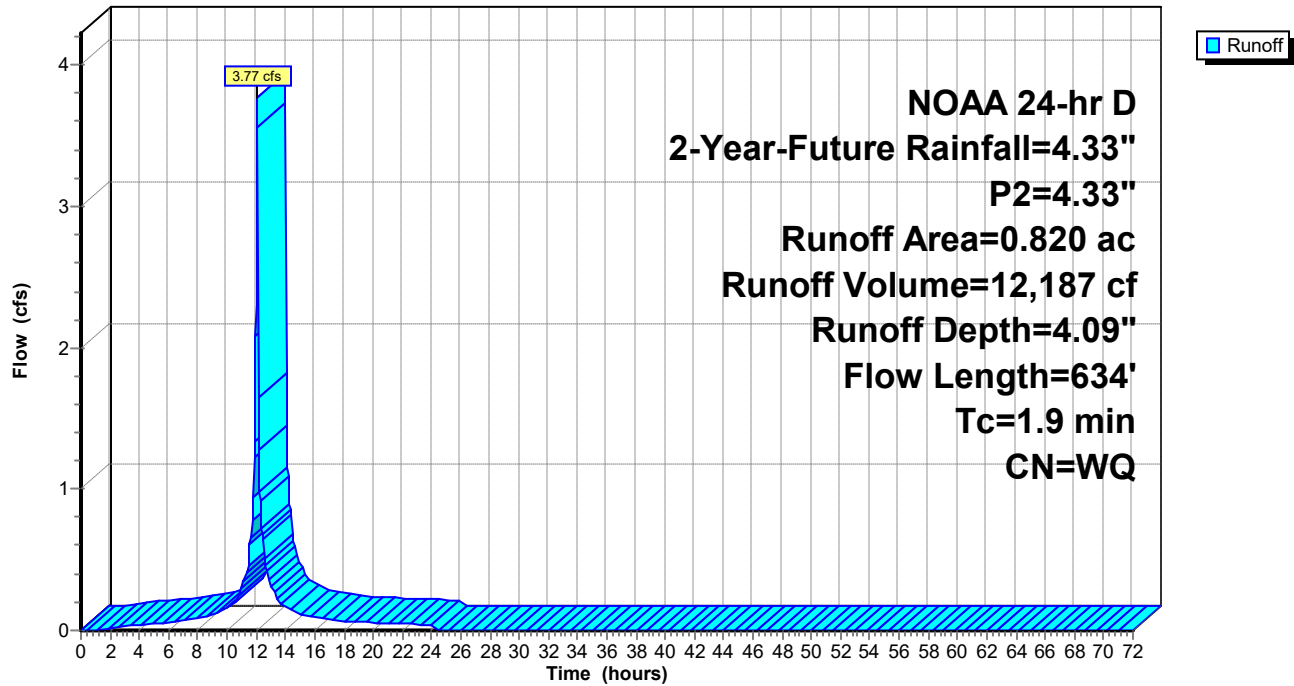
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0370	2.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.9	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

Runoff = 1.39 cfs @ 12.13 hrs, Volume= 4,795 cf, Depth= 0.99"
 Routed to Link 66L : P-DA-5R TOTAL

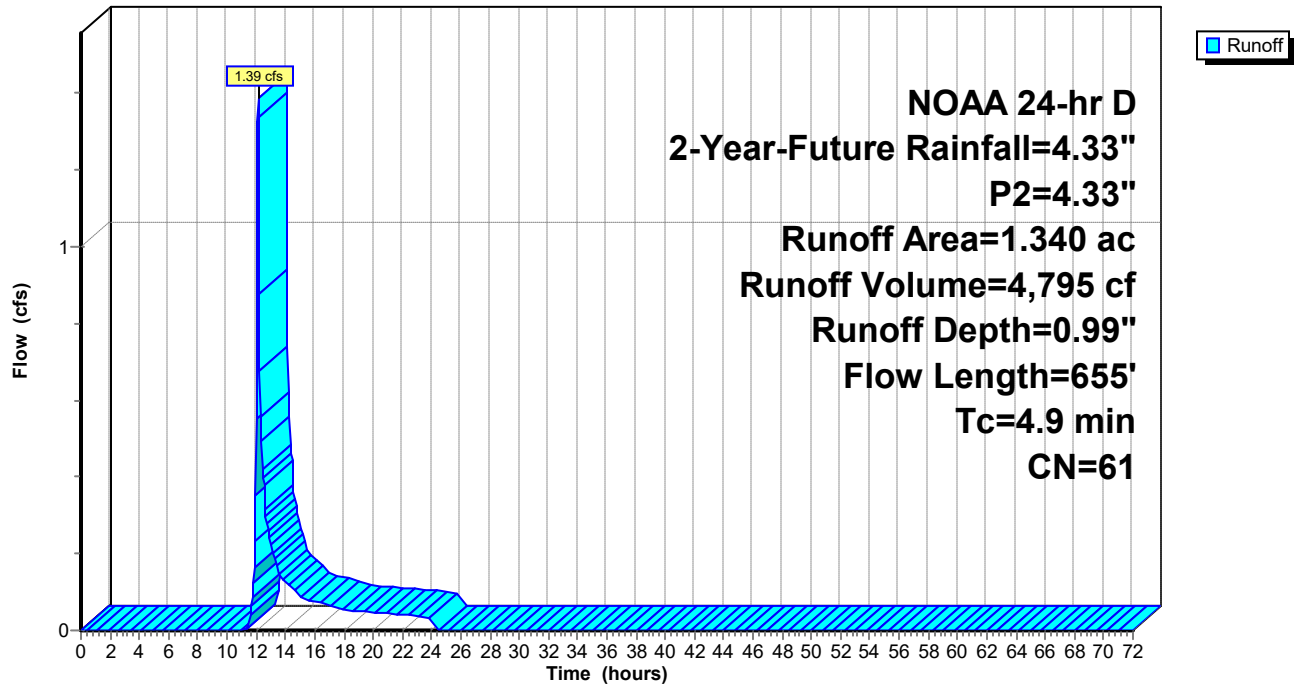
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 2-Year-Future Rainfall=4.33", P2=4.33"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	44	0.0500	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
4.9	655	Total			

Subcatchment 64S: P-DA-5R PER

Hydrograph



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 2.13" for 2-Year-Future event
 Inflow = 1.66 cfs @ 12.07 hrs, Volume= 5,893 cf
 Outflow = 0.32 cfs @ 12.53 hrs, Volume= 4,660 cf, Atten= 81%, Lag= 27.3 min
 Primary = 0.32 cfs @ 12.53 hrs, Volume= 4,660 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 552.99' @ 12.53 hrs Surf.Area= 2,275 sf Storage= 2,753 cf

Plug-Flow detention time= 250.0 min calculated for 4,660 cf (79% of inflow)
 Center-of-Mass det. time= 157.1 min (948.4 - 791.2)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

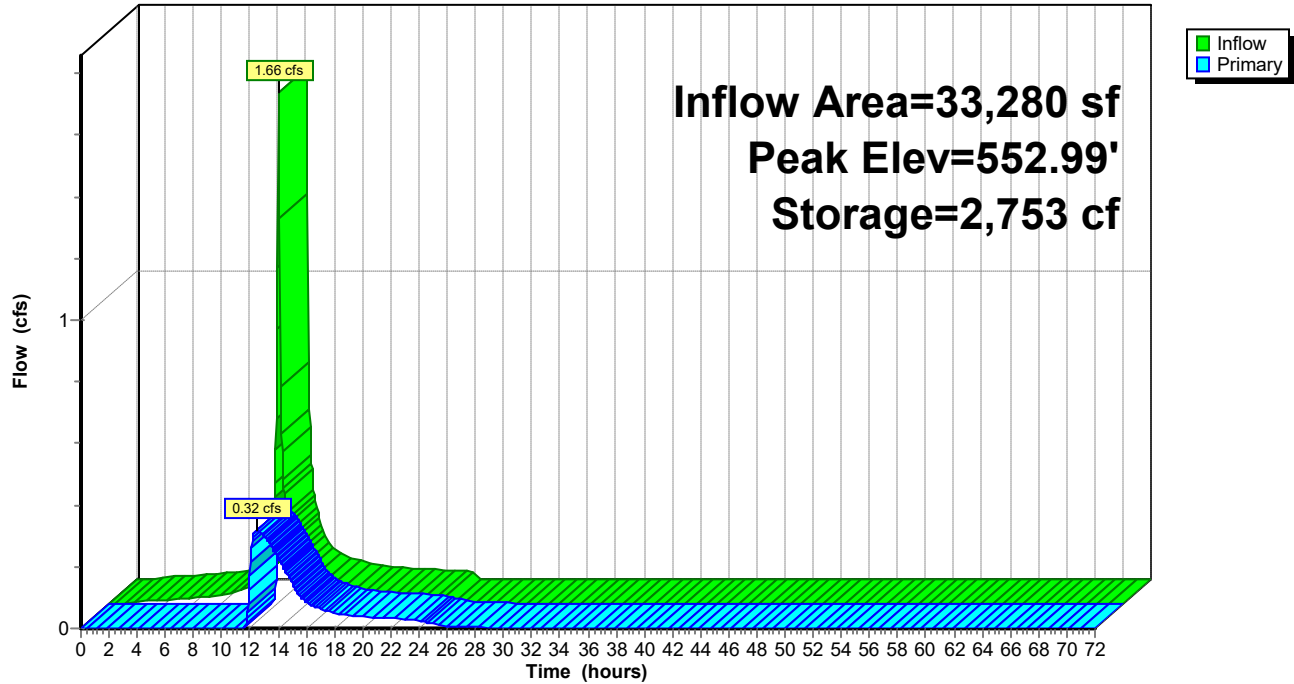
Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.32 cfs @ 12.53 hrs HW=552.99' (Free Discharge)

1=Culvert (Passes 0.32 cfs of 11.12 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.32 cfs @ 3.63 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 2.54" for 2-Year-Future event
 Inflow = 10.22 cfs @ 12.09 hrs, Volume= 40,658 cf
 Outflow = 1.10 cfs @ 13.47 hrs, Volume= 33,387 cf, Atten= 89%, Lag= 83.0 min
 Primary = 1.10 cfs @ 13.47 hrs, Volume= 33,387 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 575.52' @ 13.47 hrs Surf.Area= 14,492 sf Storage= 21,670 cf

Plug-Flow detention time= 385.8 min calculated for 33,364 cf (82% of inflow)
 Center-of-Mass det. time= 301.0 min (1,112.2 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

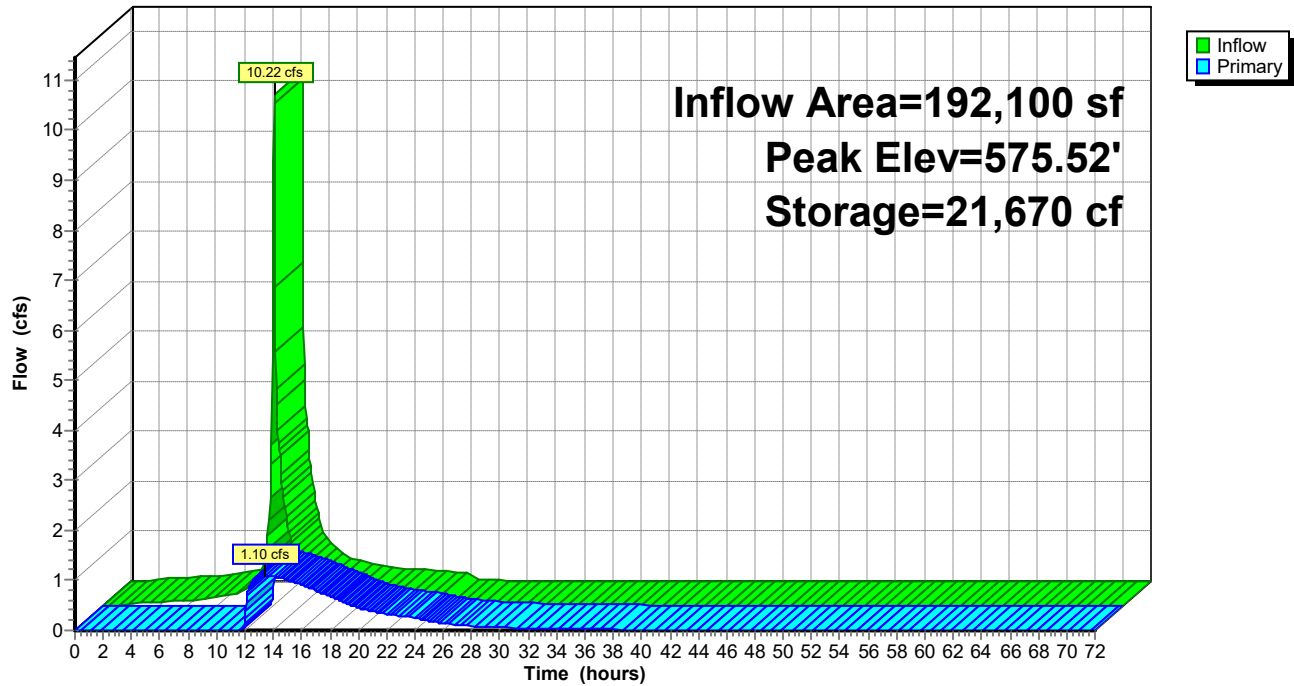
Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.10 cfs @ 13.47 hrs HW=575.52' (Free Discharge)

1=Culvert (Passes 1.10 cfs of 13.04 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.10 cfs @ 4.12 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 2.38" for 2-Year-Future event
 Inflow = 5.49 cfs @ 12.10 hrs, Volume= 23,202 cf
 Outflow = 0.26 cfs @ 16.11 hrs, Volume= 19,011 cf, Atten= 95%, Lag= 241.0 min
 Primary = 0.26 cfs @ 16.11 hrs, Volume= 19,011 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 561.84' @ 16.11 hrs Surf.Area= 9,180 sf Storage= 14,881 cf

Plug-Flow detention time= 735.3 min calculated for 18,998 cf (82% of inflow)
 Center-of-Mass det. time= 642.2 min (1,462.1 - 820.0)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

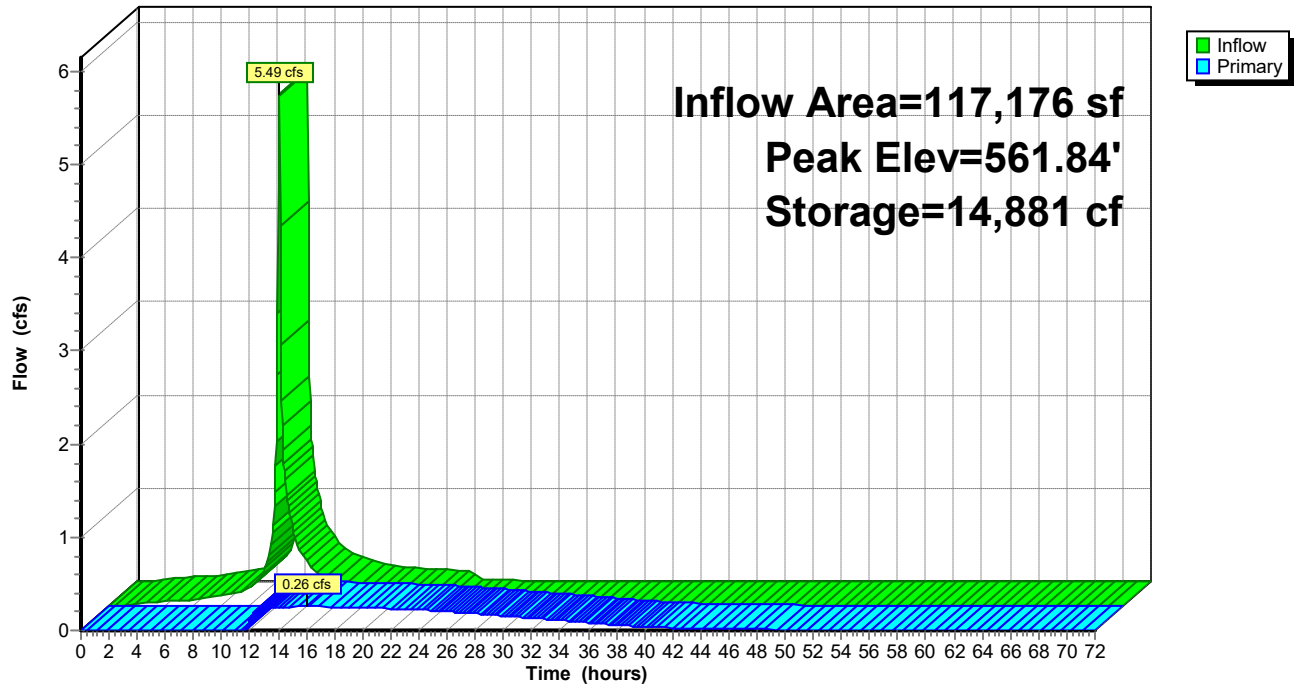
Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.26 cfs @ 16.11 hrs HW=561.84' (Free Discharge)

1=Culvert (Passes 0.26 cfs of 14.00 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.26 cfs @ 5.21 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 3.25" for 2-Year-Future event
 Inflow = 1.97 cfs @ 12.07 hrs, Volume= 6,482 cf
 Outflow = 0.91 cfs @ 12.16 hrs, Volume= 4,961 cf, Atten= 54%, Lag= 5.6 min
 Primary = 0.91 cfs @ 12.16 hrs, Volume= 4,961 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 600.53' @ 12.16 hrs Surf.Area= 2,230 sf Storage= 2,846 cf

Plug-Flow detention time= 231.8 min calculated for 4,961 cf (77% of inflow)
 Center-of-Mass det. time= 137.2 min (897.1 - 759.8)

Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

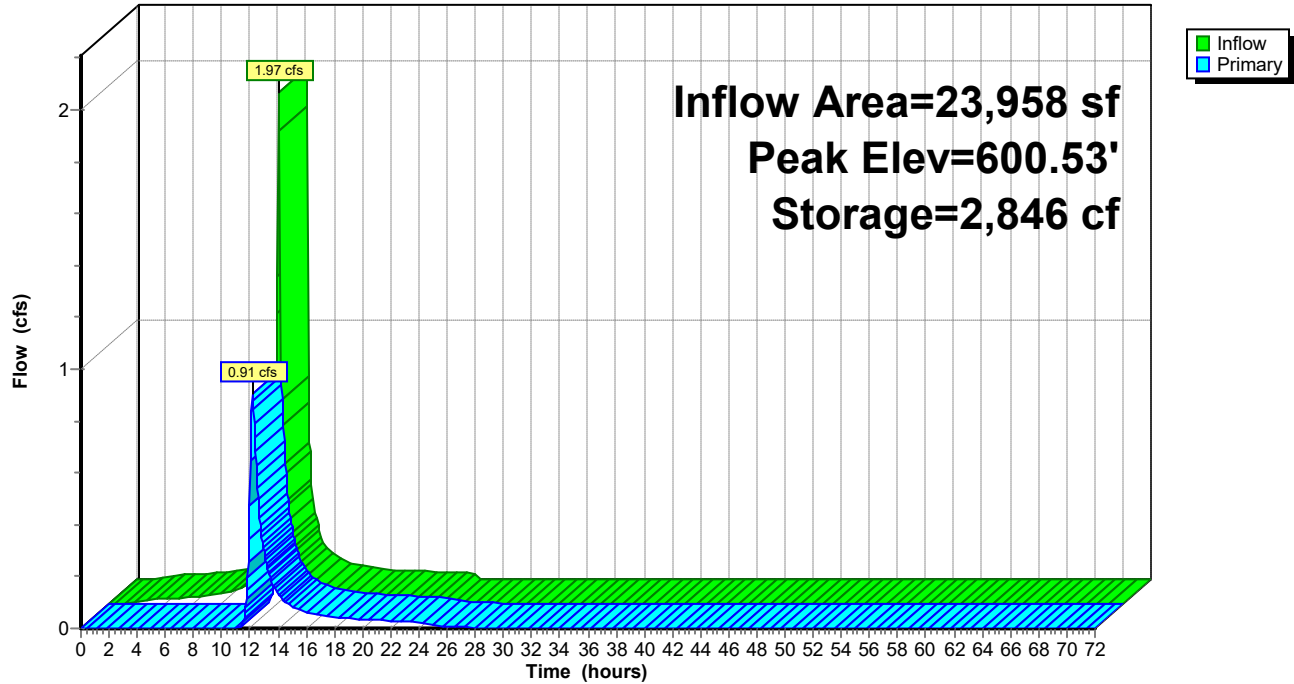
Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.90 cfs @ 12.16 hrs HW=600.52' (Free Discharge)

1=Culvert (Passes 0.90 cfs of 7.05 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.90 cfs @ 2.67 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: UG INFILTRATION BASIN F

Hydrograph



Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 2.36" for 2-Year-Future event
 Inflow = 2.13 cfs @ 12.08 hrs, Volume= 6,776 cf
 Outflow = 0.36 cfs @ 12.52 hrs, Volume= 4,780 cf, Atten= 83%, Lag= 26.5 min
 Primary = 0.36 cfs @ 12.52 hrs, Volume= 4,780 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.00' @ 12.52 hrs Surf.Area= 3,879 sf Storage= 3,477 cf

Plug-Flow detention time= 324.4 min calculated for 4,780 cf (71% of inflow)
 Center-of-Mass det. time= 212.9 min (994.9 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

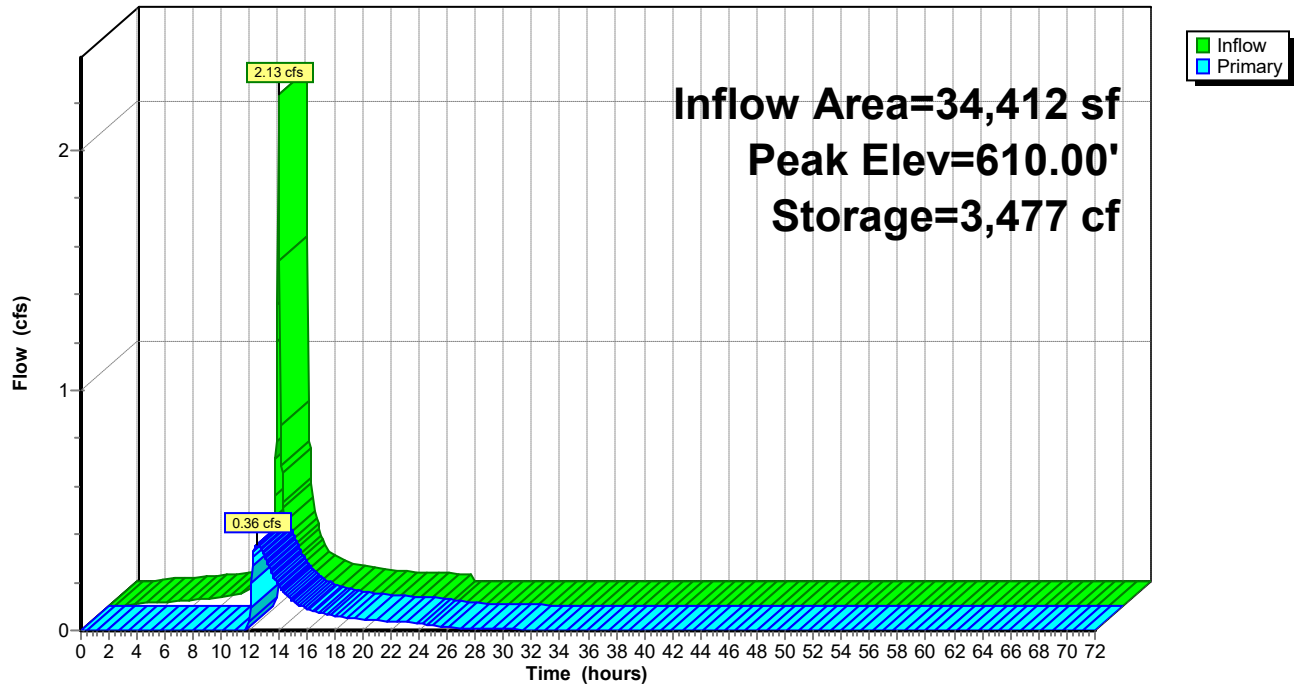
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 12.52 hrs HW=610.00' (Free Discharge)

↑ **1=Culvert** (Passes 0.36 cfs of 4.25 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 2.15 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 2.63" for 2-Year-Future event
 Inflow = 3.00 cfs @ 12.08 hrs, Volume= 9,743 cf
 Outflow = 0.96 cfs @ 12.23 hrs, Volume= 7,141 cf, Atten= 68%, Lag= 9.1 min
 Primary = 0.96 cfs @ 12.23 hrs, Volume= 7,141 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.68' @ 12.23 hrs Surf.Area= 6,996 sf Storage= 4,528 cf

Plug-Flow detention time= 242.5 min calculated for 7,136 cf (73% of inflow)
 Center-of-Mass det. time= 139.0 min (913.1 - 774.1)

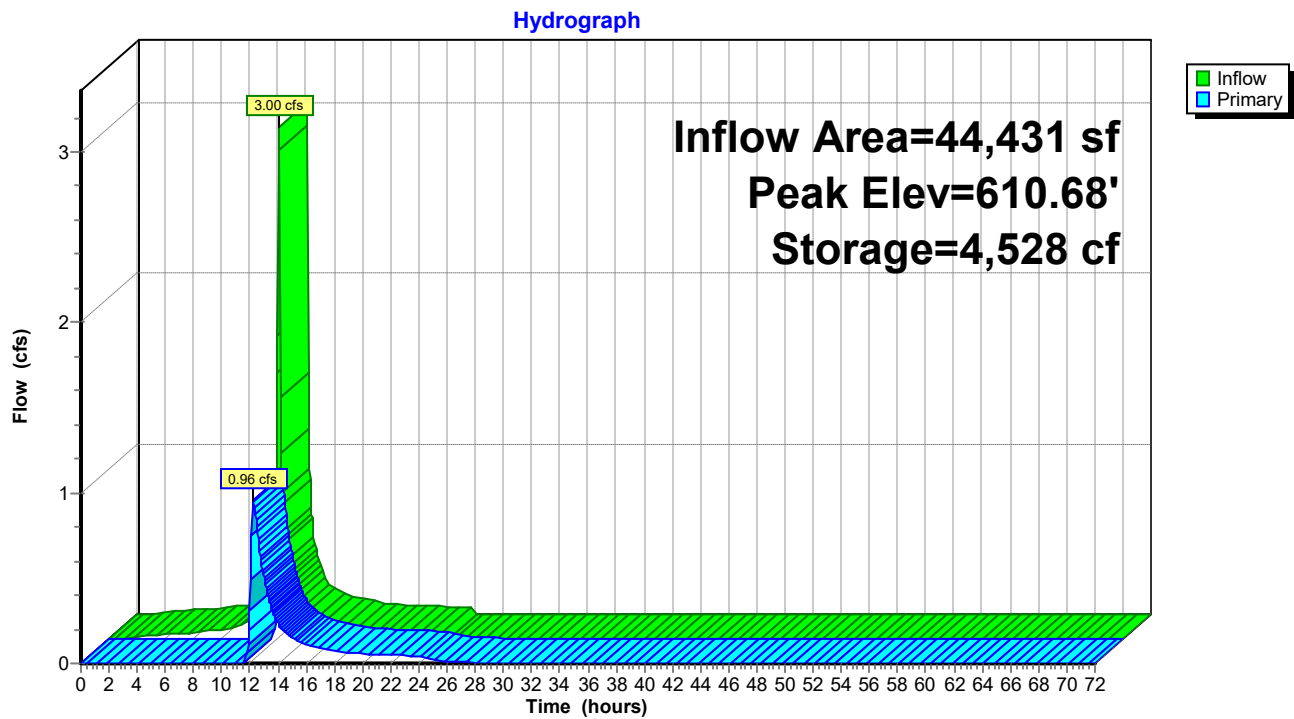
Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.95 cfs @ 12.23 hrs HW=610.68' (Free Discharge)

1=Culvert (Passes 0.95 cfs of 13.18 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.95 cfs @ 1.70 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 2.84" for 2-Year-Future event
 Inflow = 3.04 cfs @ 12.08 hrs, Volume= 9,683 cf
 Outflow = 0.97 cfs @ 12.22 hrs, Volume= 7,356 cf, Atten= 68%, Lag= 8.5 min
 Primary = 0.97 cfs @ 12.22 hrs, Volume= 7,356 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 614.89' @ 12.22 hrs Surf.Area= 3,023 sf Storage= 4,287 cf

Plug-Flow detention time= 215.7 min calculated for 7,351 cf (76% of inflow)
 Center-of-Mass det. time= 118.9 min (887.6 - 768.7)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

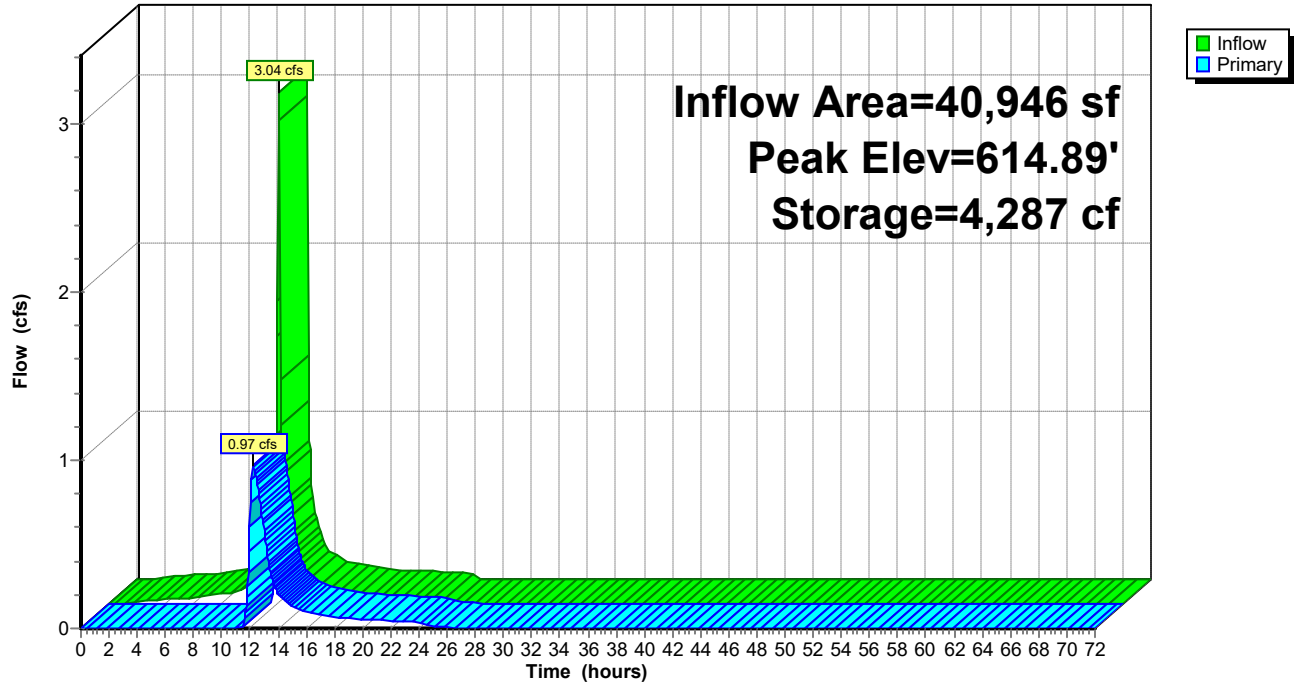
Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.97 cfs @ 12.22 hrs HW=614.89' (Free Discharge)

1=Culvert (Passes 0.97 cfs of 17.32 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.97 cfs @ 3.48 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 2.92" for 2-Year-Future event
 Inflow = 2.73 cfs @ 12.09 hrs, Volume= 9,022 cf
 Outflow = 0.24 cfs @ 13.10 hrs, Volume= 7,015 cf, Atten= 91%, Lag= 60.6 min
 Primary = 0.24 cfs @ 13.10 hrs, Volume= 7,015 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 608.98' @ 13.10 hrs Surf.Area= 2,975 sf Storage= 5,268 cf

Plug-Flow detention time= 355.5 min calculated for 7,010 cf (78% of inflow)
 Center-of-Mass det. time= 264.4 min (1,031.9 - 767.5)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

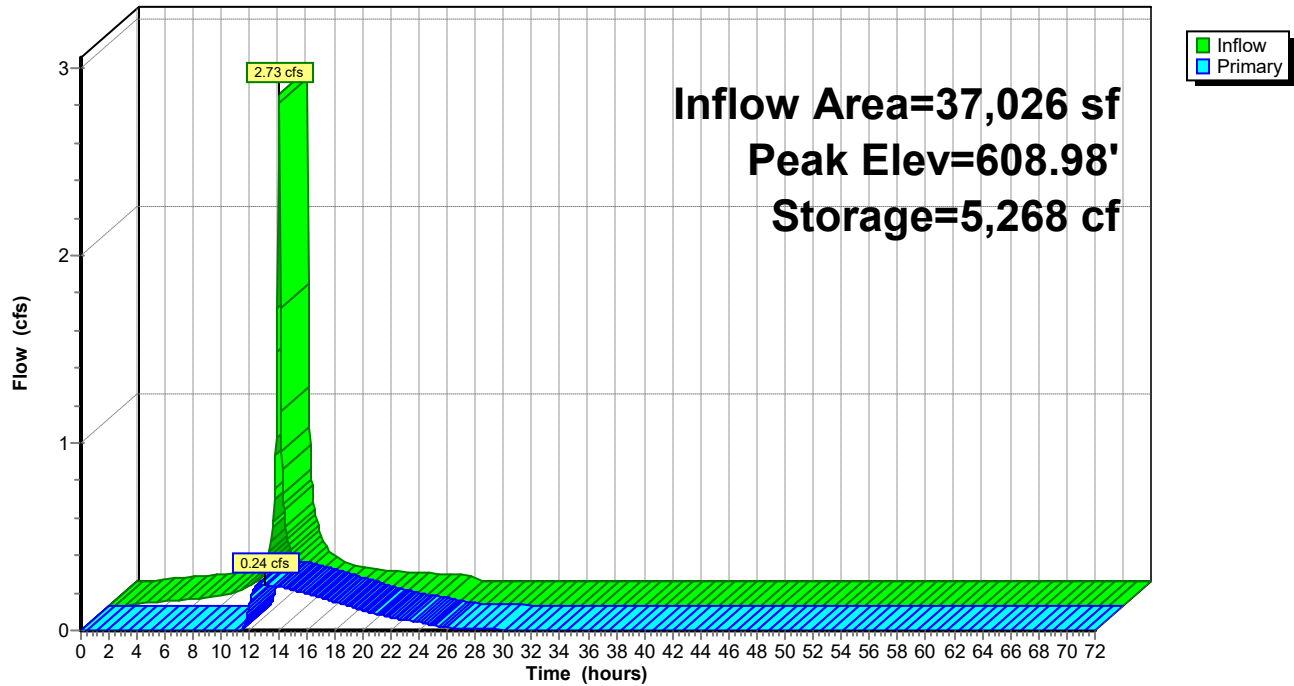
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.24 cfs @ 13.10 hrs HW=608.98' (Free Discharge)

1=Culvert (Passes 0.24 cfs of 17.89 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 4.92 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 2.68" for 2-Year-Future event
 Inflow = 3.95 cfs @ 12.08 hrs, Volume= 20,034 cf
 Outflow = 0.73 cfs @ 12.74 hrs, Volume= 16,938 cf, Atten= 82%, Lag= 39.7 min
 Primary = 0.73 cfs @ 12.74 hrs, Volume= 16,938 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 595.85' @ 12.74 hrs Surf.Area= 2,960 sf Storage= 7,161 cf

Plug-Flow detention time= 232.6 min calculated for 16,926 cf (84% of inflow)
 Center-of-Mass det. time= 148.2 min (1,007.7 - 859.5)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

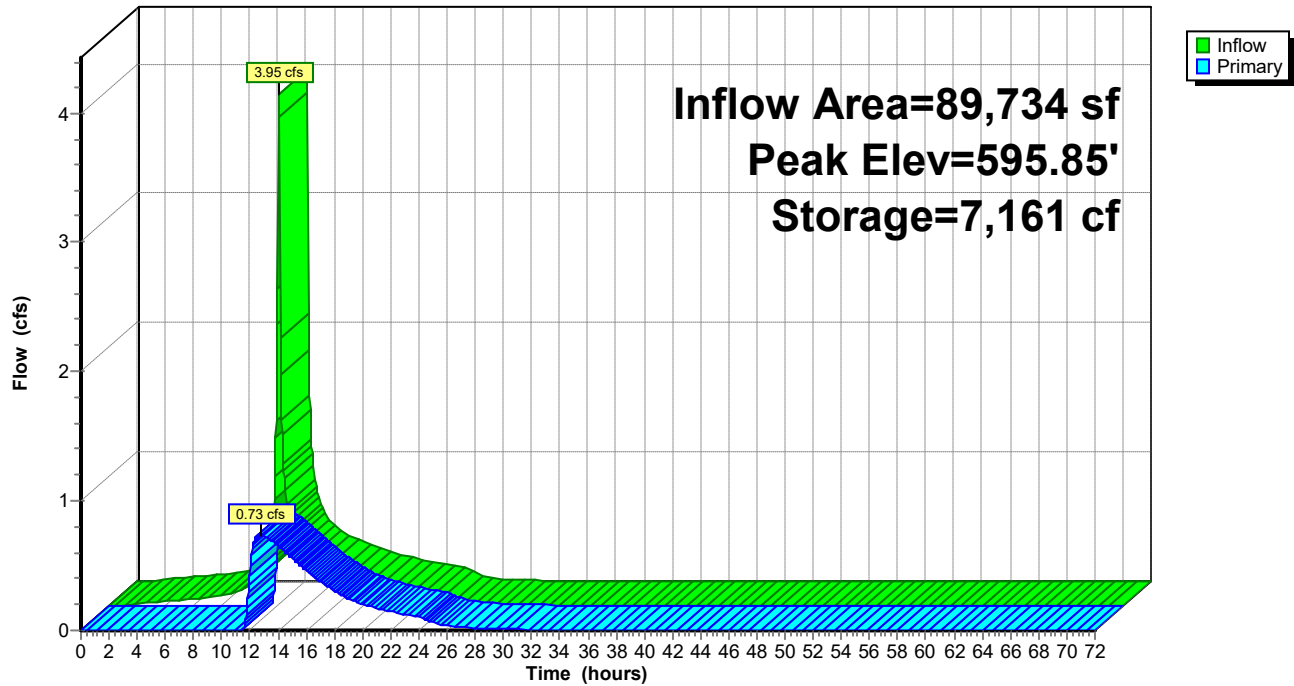
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.73 cfs @ 12.74 hrs HW=595.85' (Free Discharge)

1=Culvert (Passes 0.73 cfs of 11.72 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.73 cfs @ 5.36 fps)
 3=Orifice/Grate (Controls 0.00 cfs)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 3.00" for 2-Year-Future event
 Inflow = 7.24 cfs @ 12.09 hrs, Volume= 23,527 cf
 Outflow = 3.72 cfs @ 12.17 hrs, Volume= 18,159 cf, Atten= 49%, Lag= 5.0 min
 Primary = 3.72 cfs @ 12.17 hrs, Volume= 18,159 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 569.69' @ 12.17 hrs Surf.Area= 6,546 sf Storage= 10,024 cf

Plug-Flow detention time= 228.6 min calculated for 18,159 cf (77% of inflow)
 Center-of-Mass det. time= 134.4 min (900.1 - 765.7)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

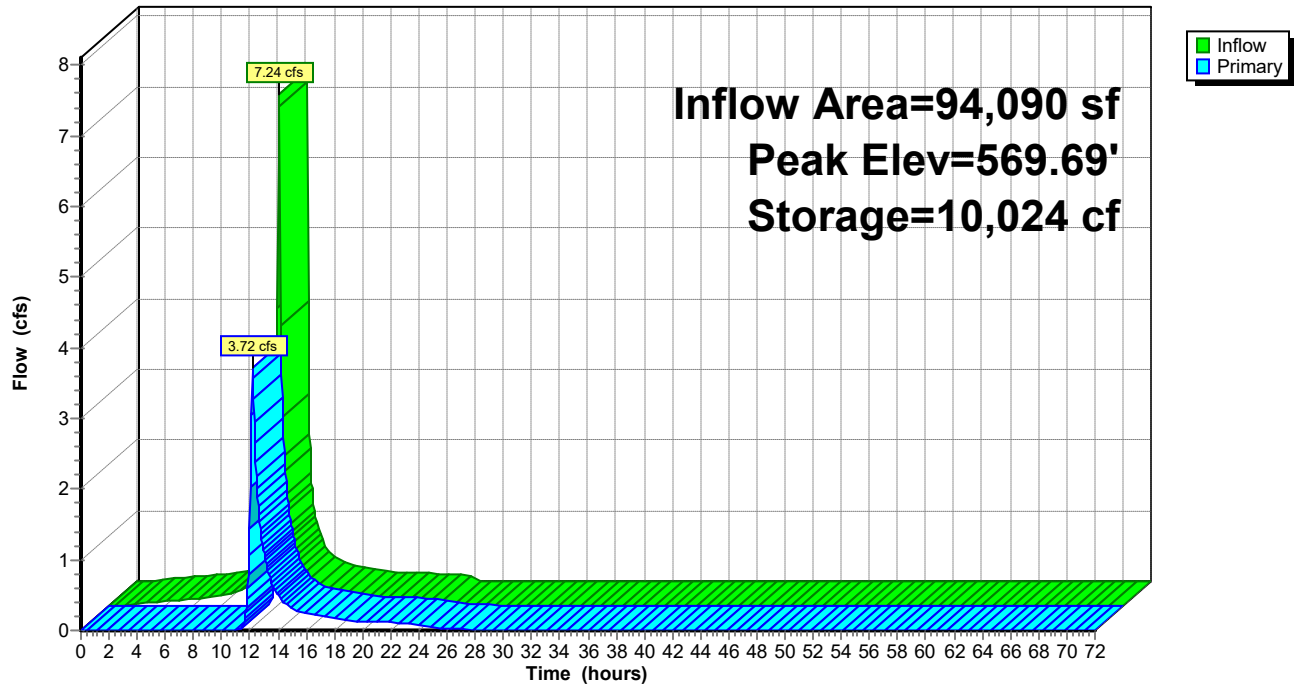
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.64 cfs @ 12.17 hrs HW=569.68' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 3.64 cfs of 25.47 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.97 cfs @ 2.92 fps)
 3=Broad-Crested Rectangular Weir (Weir Controls 0.67 cfs @ 1.20 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 2.85" for 2-Year-Future event
 Inflow = 3.36 cfs @ 12.08 hrs, Volume= 10,866 cf
 Outflow = 0.82 cfs @ 12.31 hrs, Volume= 8,341 cf, Atten= 76%, Lag= 13.8 min
 Primary = 0.82 cfs @ 12.31 hrs, Volume= 8,341 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 598.50' @ 12.31 hrs Surf.Area= 2,676 sf Storage= 5,141 cf

Plug-Flow detention time= 242.3 min calculated for 8,341 cf (77% of inflow)
 Center-of-Mass det. time= 146.5 min (915.0 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

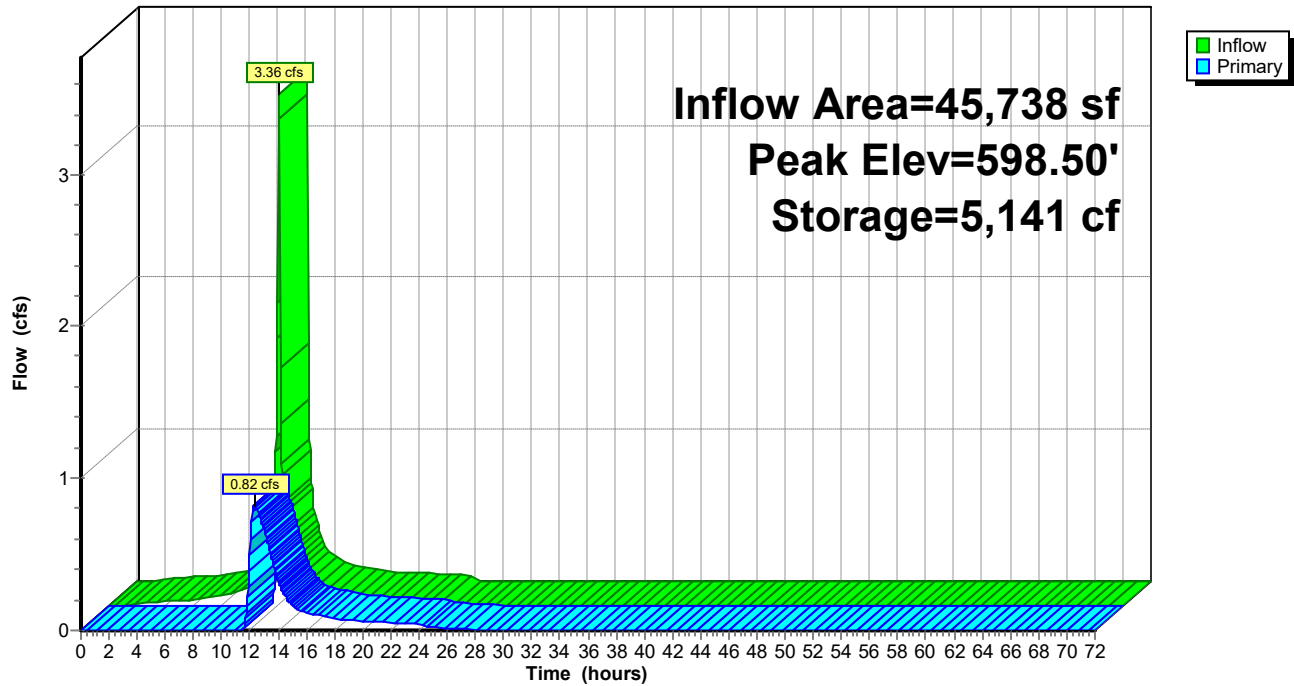
Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.82 cfs @ 12.31 hrs HW=598.50' (Free Discharge)

1=Culvert (Passes 0.82 cfs of 15.83 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.82 cfs @ 4.16 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 2.71" for 2-Year-Future event
 Inflow = 8.61 cfs @ 12.08 hrs, Volume= 33,784 cf
 Outflow = 2.89 cfs @ 12.28 hrs, Volume= 28,135 cf, Atten= 66%, Lag= 12.0 min
 Primary = 2.89 cfs @ 12.28 hrs, Volume= 28,135 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 578.08' @ 12.28 hrs Surf.Area= 6,391 sf Storage= 12,287 cf

Plug-Flow detention time= 213.2 min calculated for 28,135 cf (83% of inflow)
 Center-of-Mass det. time= 130.2 min (933.4 - 803.2)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

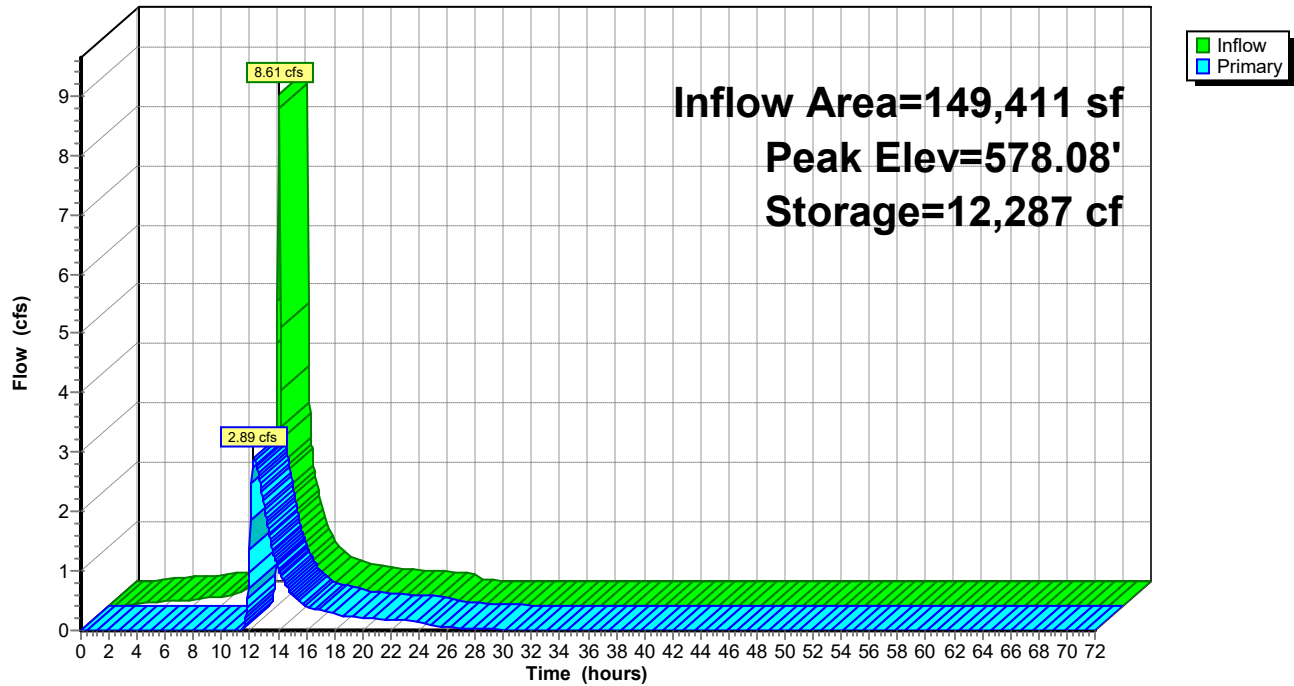
Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.89 cfs @ 12.28 hrs HW=578.08' (Free Discharge)

1=Culvert (Passes 2.89 cfs of 12.79 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.89 cfs @ 3.68 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 2.25" for 2-Year-Future event
 Inflow = 10.46 cfs @ 12.11 hrs, Volume= 63,276 cf
 Outflow = 3.06 cfs @ 13.25 hrs, Volume= 59,444 cf, Atten= 71%, Lag= 68.4 min
 Primary = 3.06 cfs @ 13.25 hrs, Volume= 59,444 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 564.07' @ 13.25 hrs Surf.Area= 14,716 sf Storage= 21,423 cf

Plug-Flow detention time= 185.7 min calculated for 59,444 cf (94% of inflow)
 Center-of-Mass det. time= 140.6 min (1,026.1 - 885.5)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

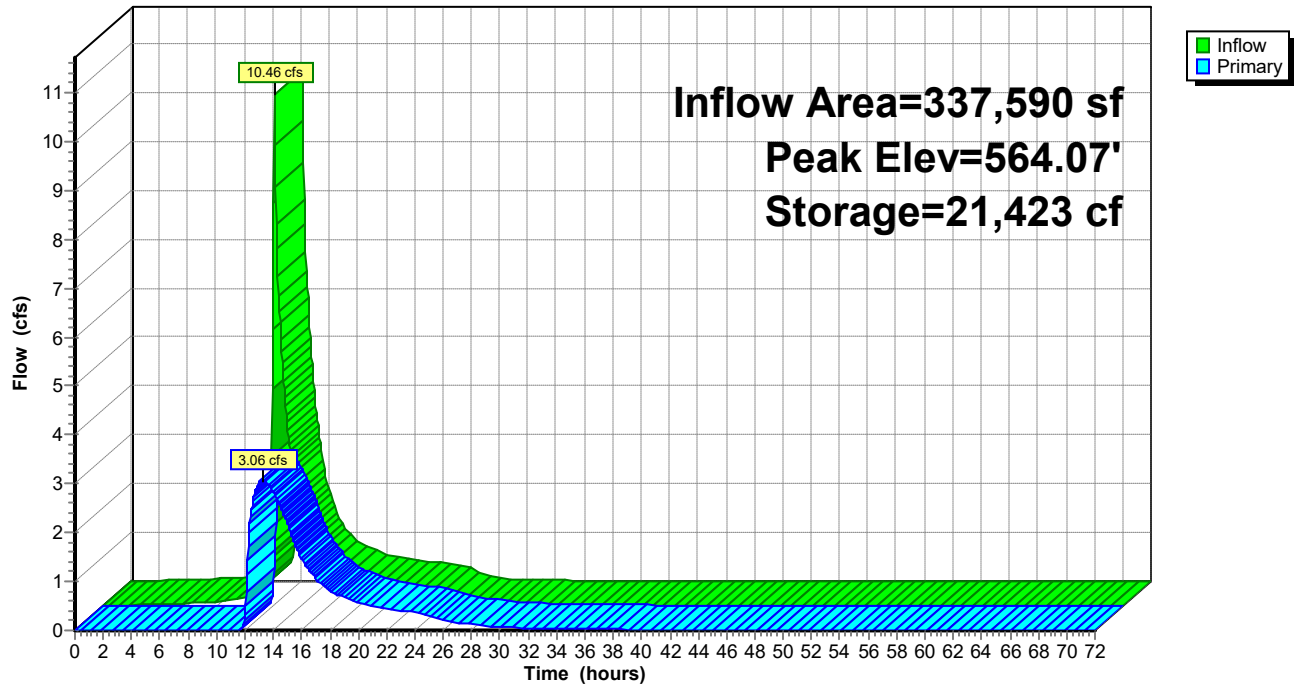
Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 ' / Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.06 cfs @ 13.25 hrs HW=564.07' (Free Discharge)

- 1=Culvert (Passes 3.06 cfs of 46.67 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 3.06 cfs @ 4.41 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond R: BMP-R Bioretention Basin

Hydrograph



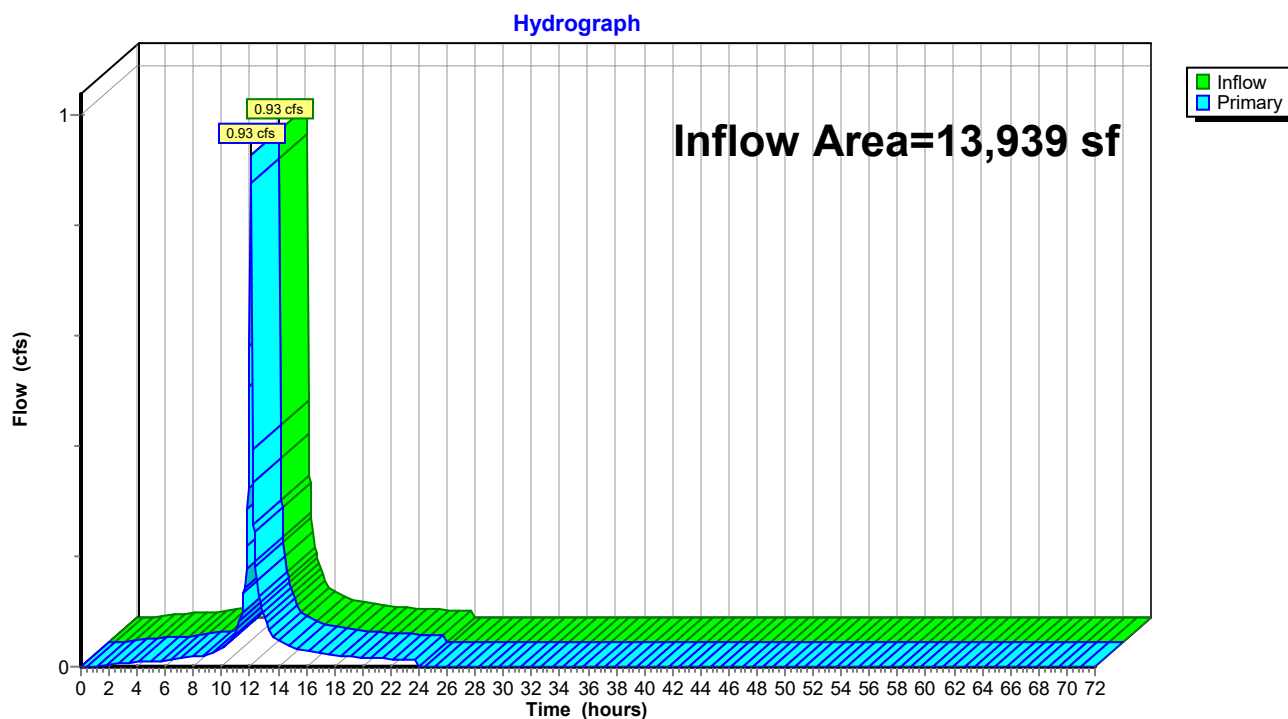
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 2.64" for 2-Year-Future event
Inflow = 0.93 cfs @ 12.07 hrs, Volume= 3,063 cf
Primary = 0.93 cfs @ 12.07 hrs, Volume= 3,063 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

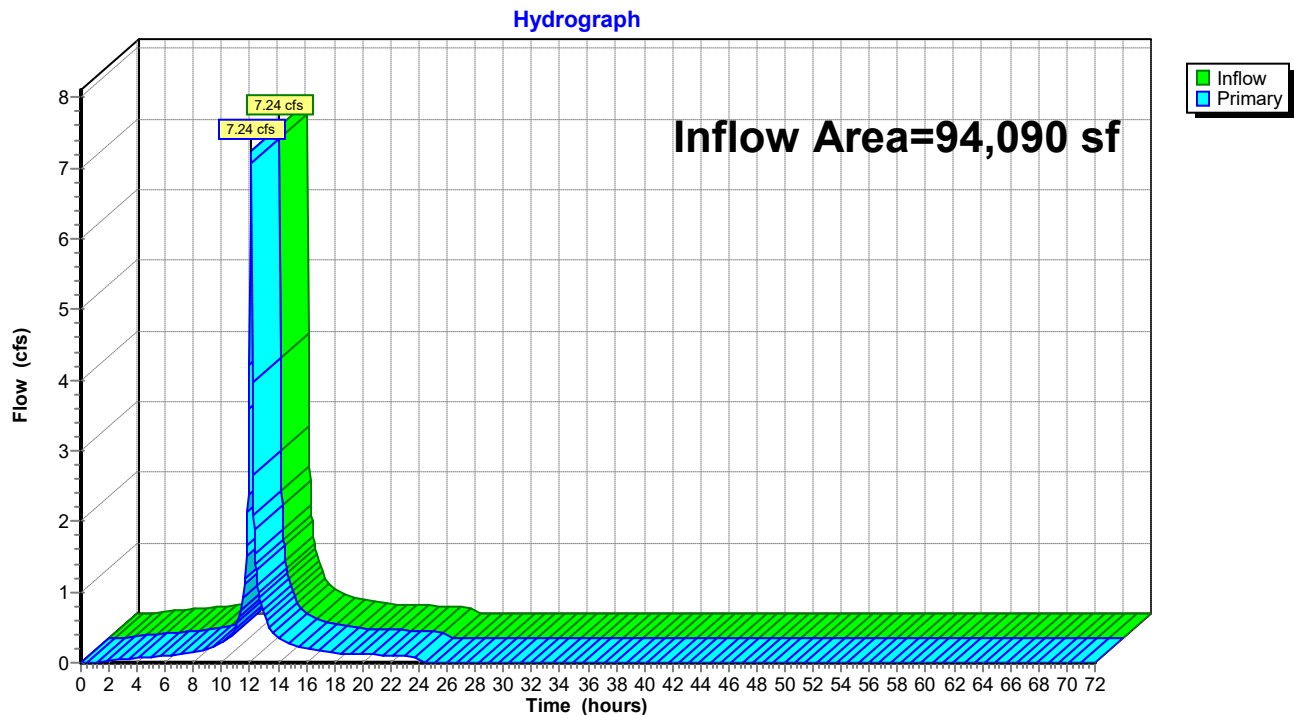
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 3.00" for 2-Year-Future event
Inflow = 7.24 cfs @ 12.09 hrs, Volume= 23,527 cf
Primary = 7.24 cfs @ 12.09 hrs, Volume= 23,527 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

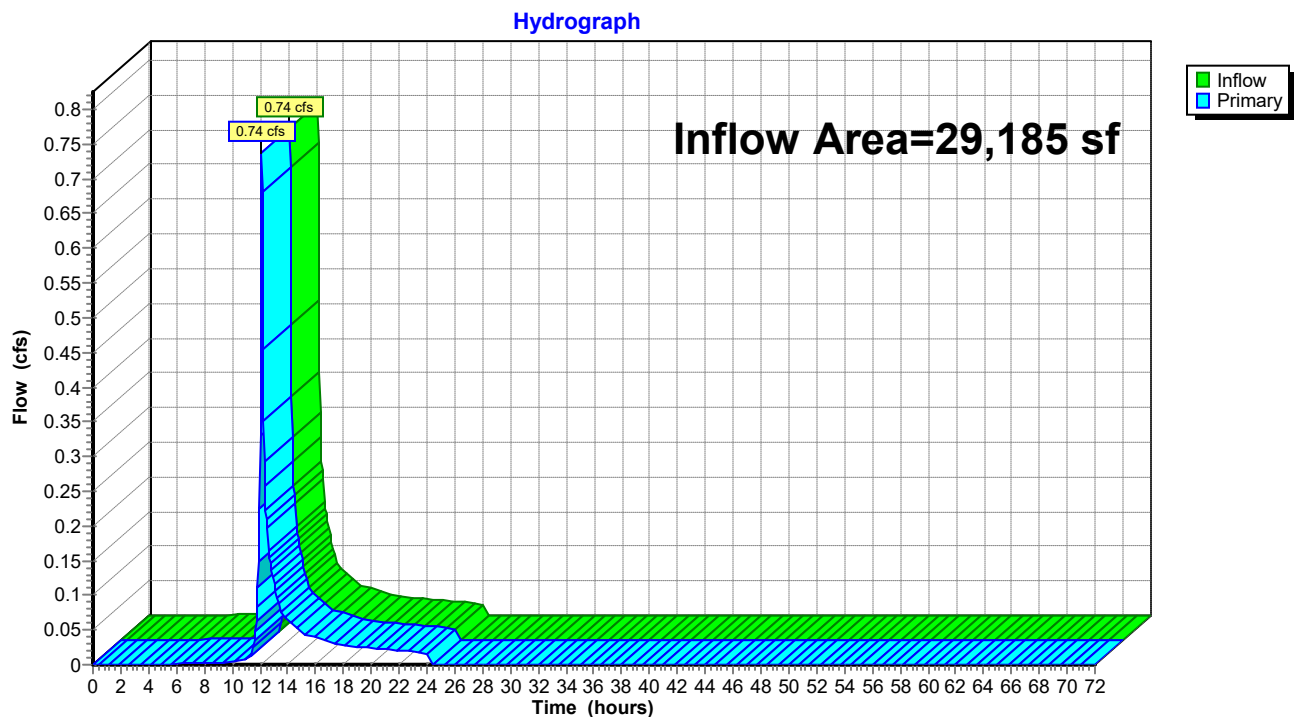
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 1.08" for 2-Year-Future event
Inflow = 0.74 cfs @ 12.12 hrs, Volume= 2,623 cf
Primary = 0.74 cfs @ 12.12 hrs, Volume= 2,623 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

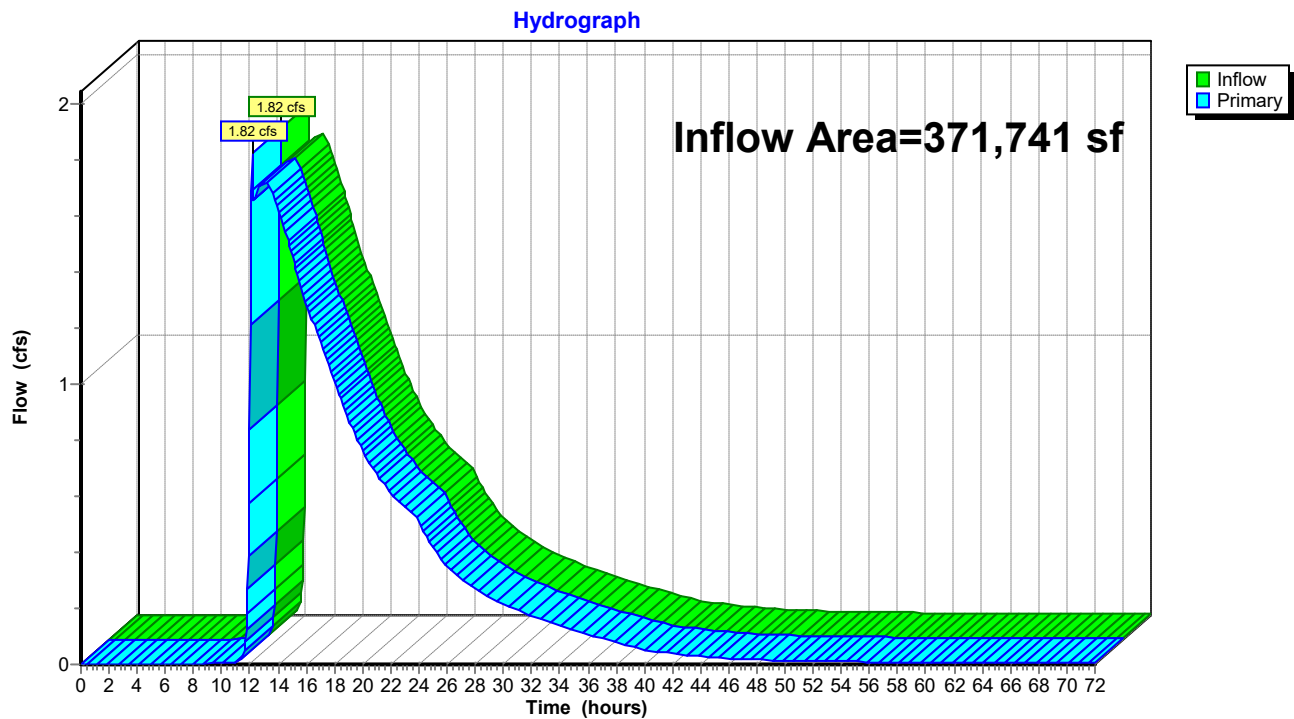
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 1.93" for 2-Year-Future event
Inflow = 1.82 cfs @ 12.15 hrs, Volume= 59,680 cf
Primary = 1.82 cfs @ 12.15 hrs, Volume= 59,680 cf, Atten= 0%, Lag= 0.0 min

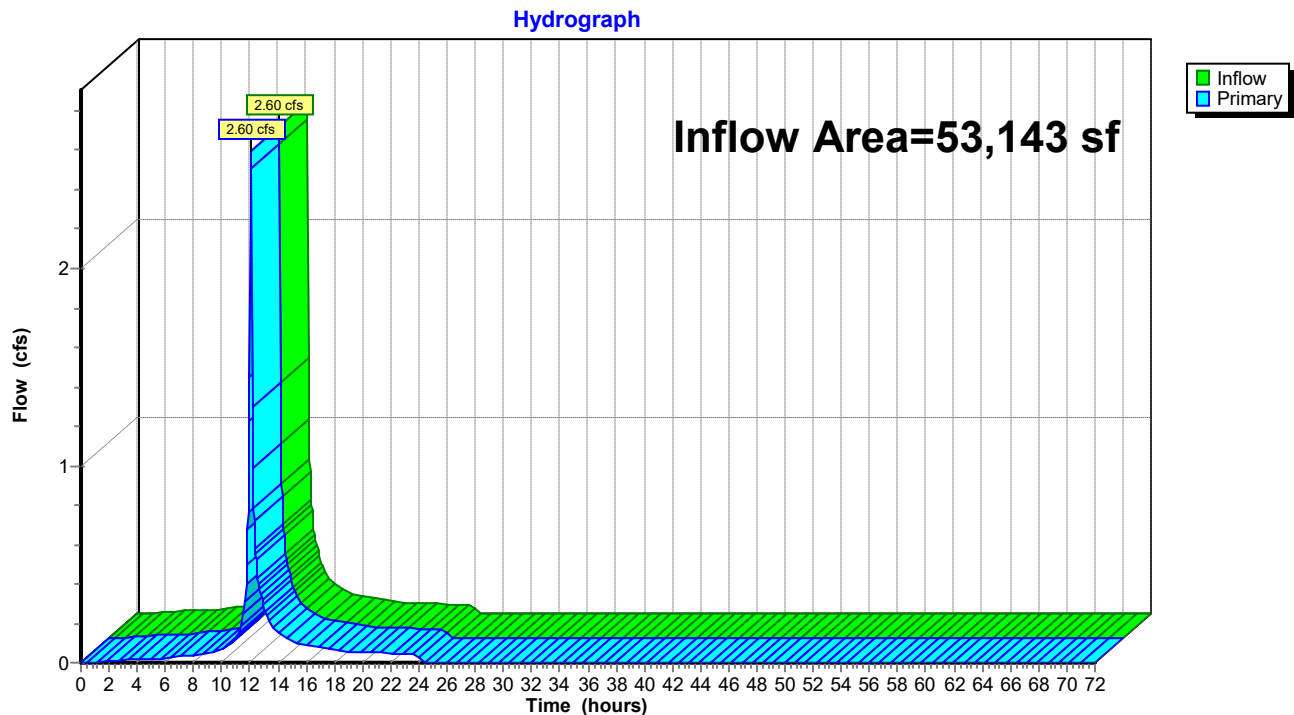
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 1.88" for 2-Year-Future event
Inflow = 2.60 cfs @ 12.08 hrs, Volume= 8,315 cf
Primary = 2.60 cfs @ 12.08 hrs, Volume= 8,315 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

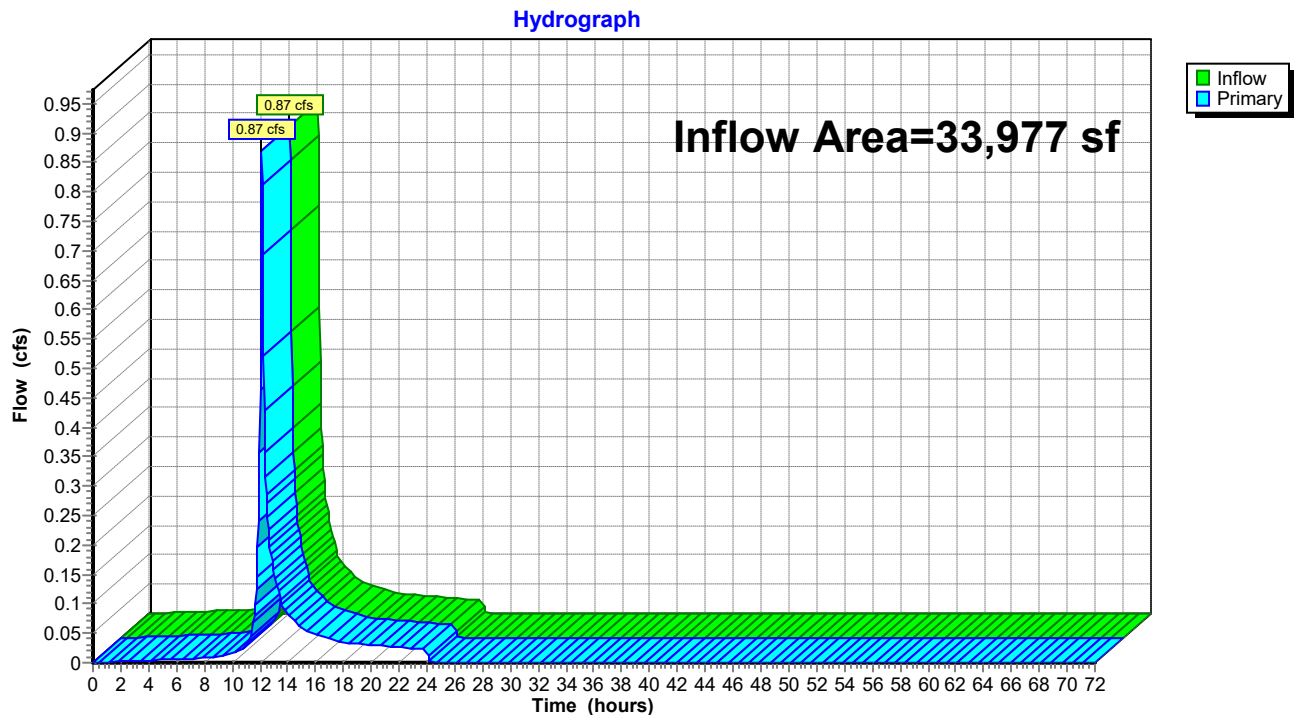
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 1.30" for 2-Year-Future event
Inflow = 0.87 cfs @ 12.11 hrs, Volume= 3,694 cf
Primary = 0.87 cfs @ 12.11 hrs, Volume= 3,694 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

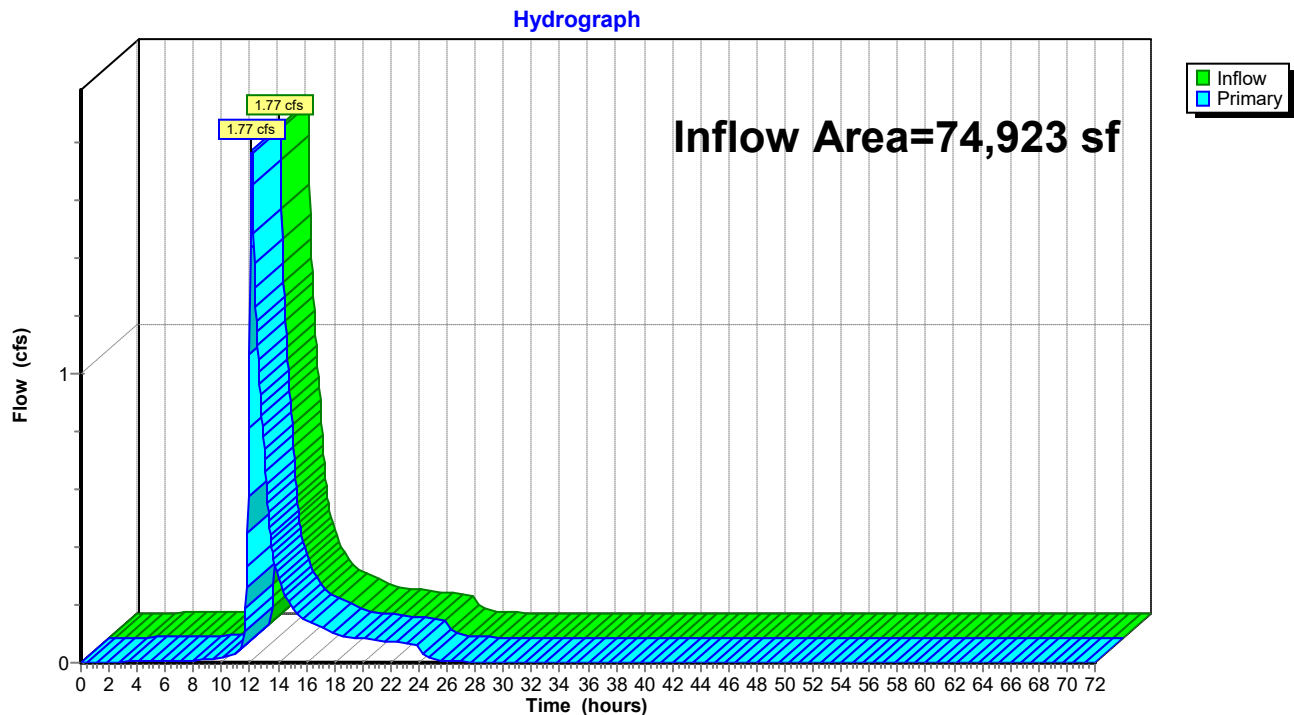
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 1.77" for 2-Year-Future event
Inflow = 1.77 cfs @ 12.13 hrs, Volume= 11,050 cf
Primary = 1.77 cfs @ 12.13 hrs, Volume= 11,050 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

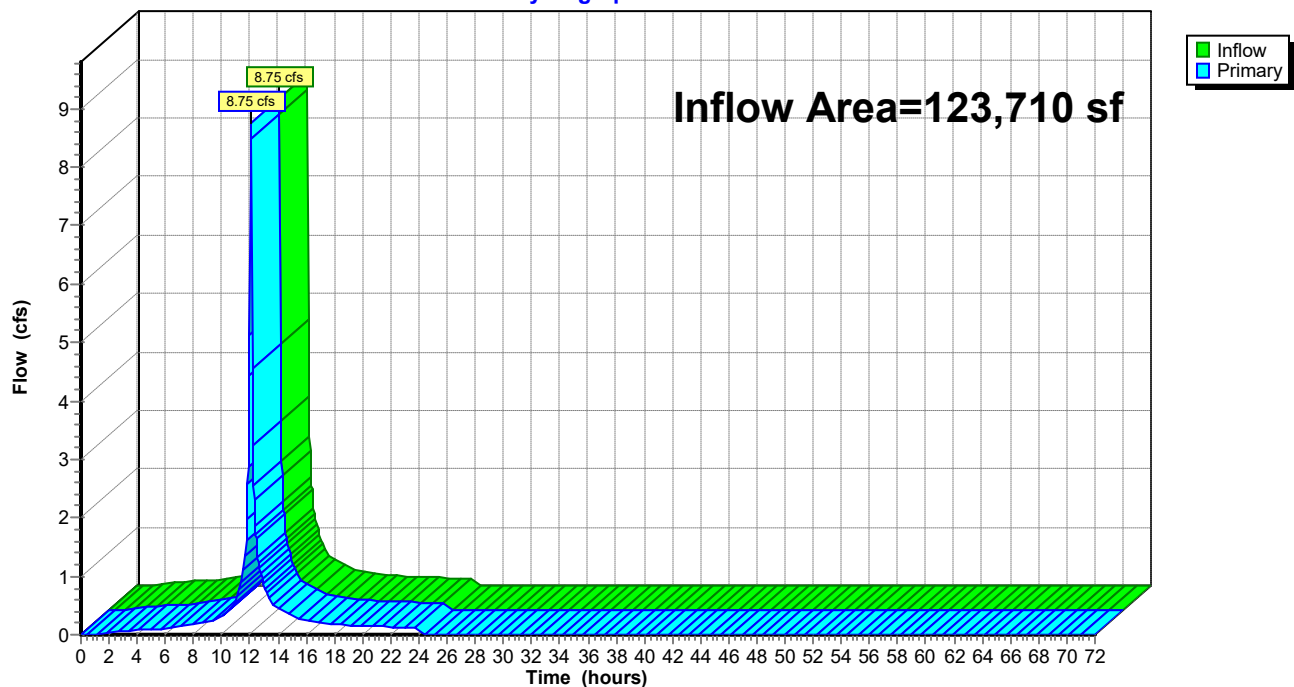
Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 2.77" for 2-Year-Future event
Inflow = 8.75 cfs @ 12.08 hrs, Volume= 28,556 cf
Primary = 8.75 cfs @ 12.08 hrs, Volume= 28,556 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL

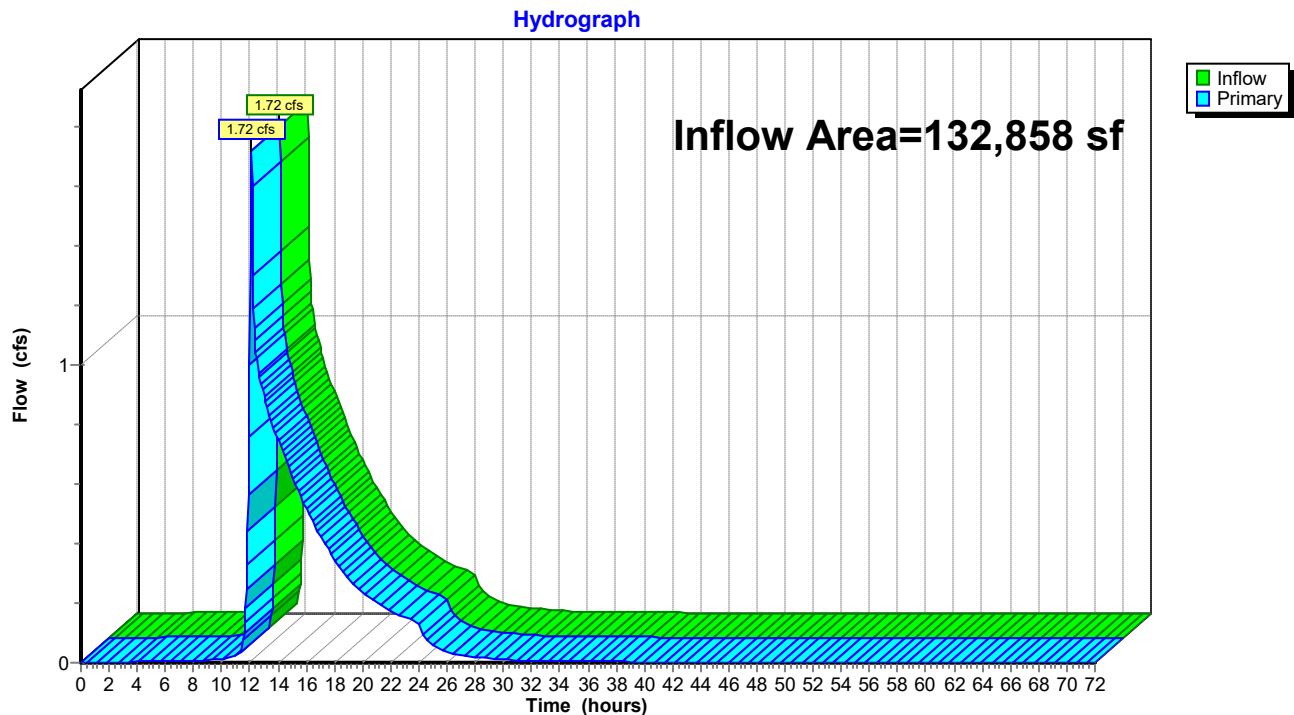
Hydrograph



Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth = 1.90" for 2-Year-Future event
Inflow = 1.72 cfs @ 12.11 hrs, Volume= 21,030 cf
Primary = 1.72 cfs @ 12.11 hrs, Volume= 21,030 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

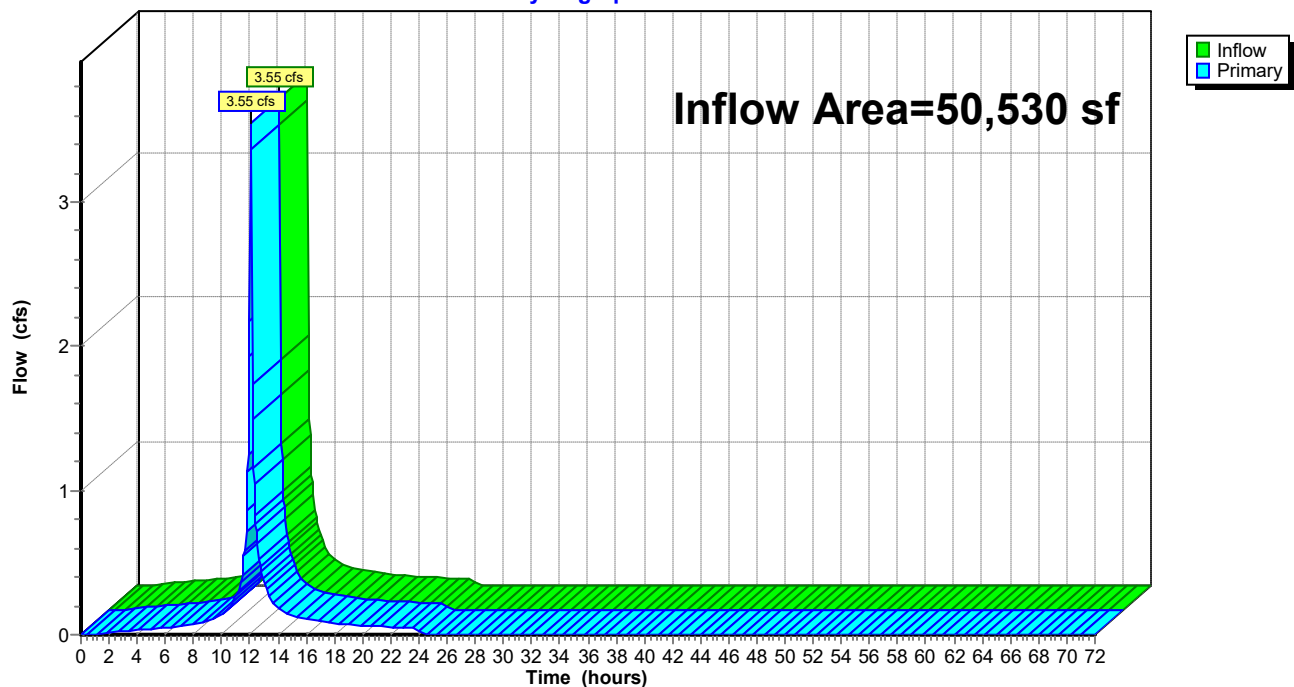
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 2.92" for 2-Year-Future event
Inflow = 3.55 cfs @ 12.08 hrs, Volume= 12,276 cf
Primary = 3.55 cfs @ 12.08 hrs, Volume= 12,276 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

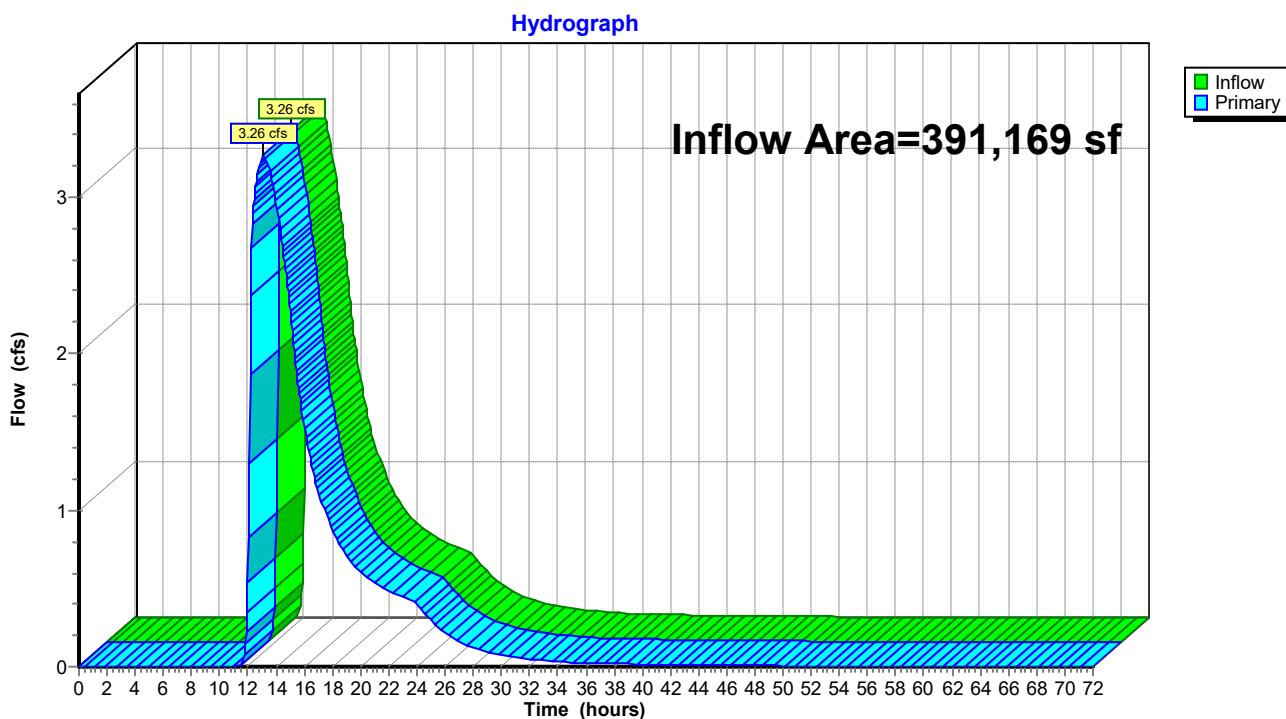
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1**Hydrograph**

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth > 1.96" for 2-Year-Future event
Inflow = 3.26 cfs @ 13.09 hrs, Volume= 63,834 cf
Primary = 3.26 cfs @ 13.09 hrs, Volume= 63,834 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

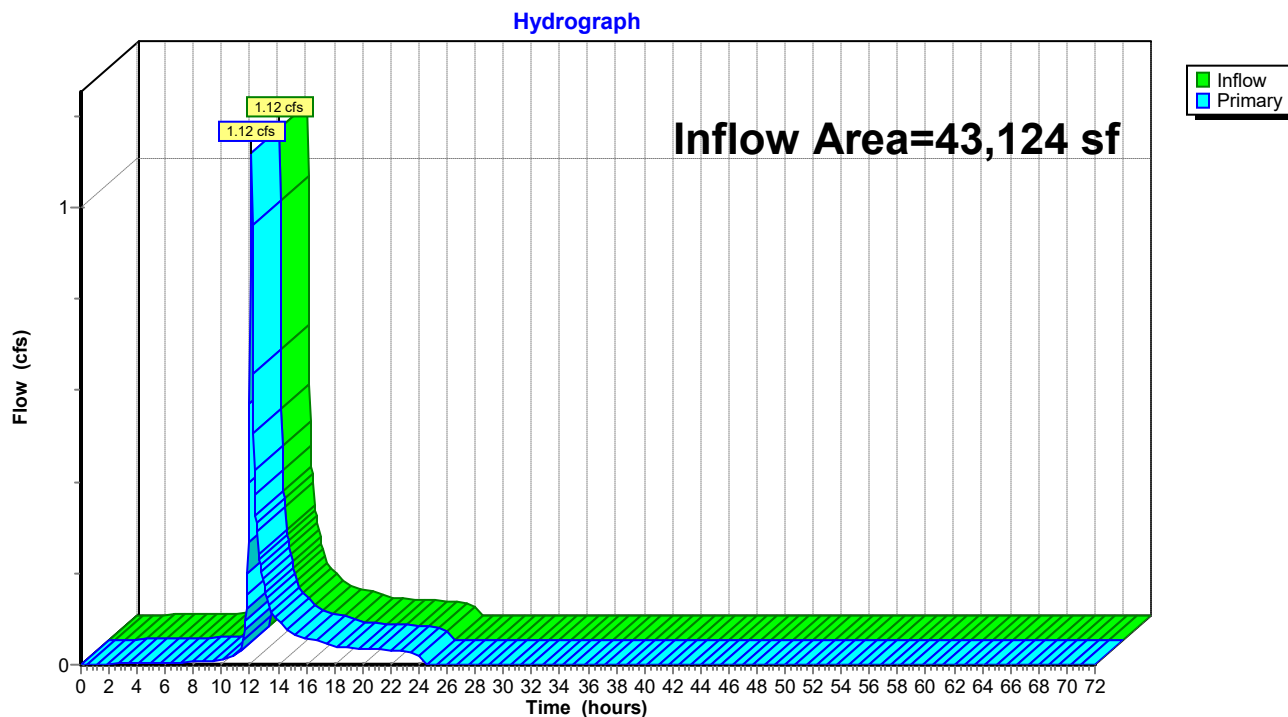
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 1.14" for 2-Year-Future event
Inflow = 1.12 cfs @ 12.11 hrs, Volume= 4,092 cf
Primary = 1.12 cfs @ 12.11 hrs, Volume= 4,092 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

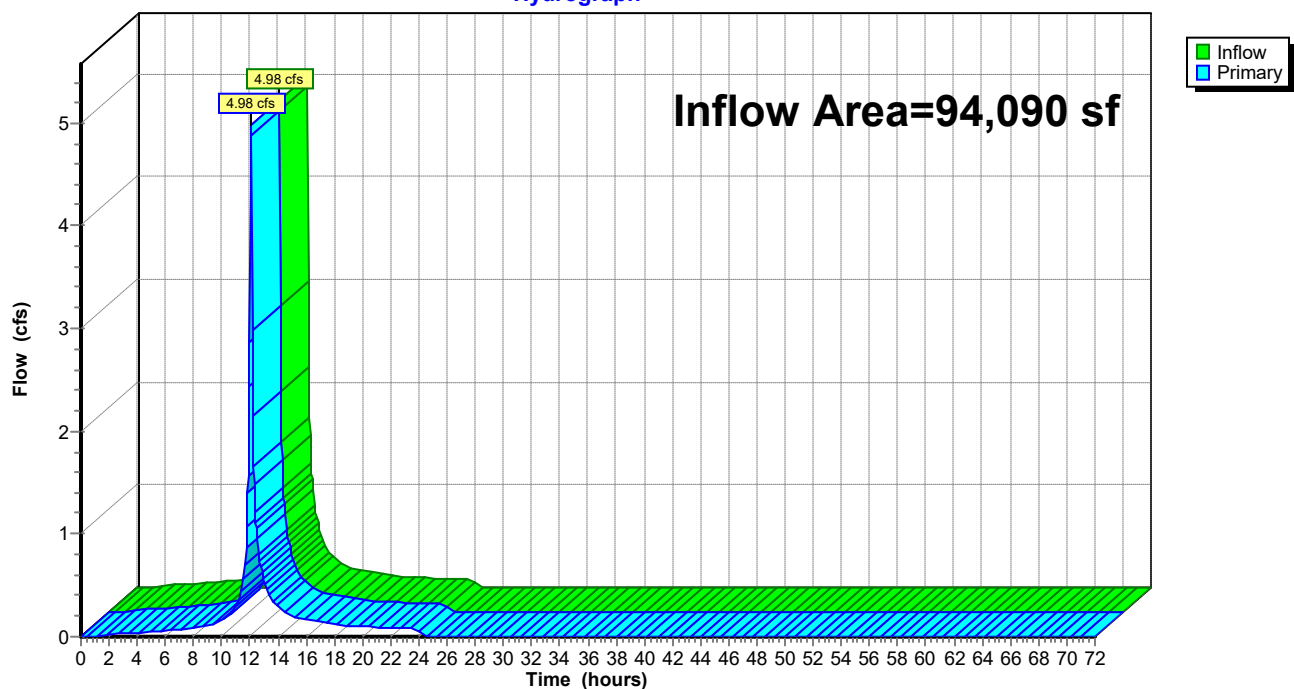
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 2.17" for 2-Year-Future event
Inflow = 4.98 cfs @ 12.09 hrs, Volume= 16,982 cf
Primary = 4.98 cfs @ 12.09 hrs, Volume= 16,982 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL**Hydrograph**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=299' Tc=1.0 min CN=98 Runoff=1.59 cfs 5,227 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=212' Tc=4.6 min CN=61 Runoff=0.88 cfs 2,816 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=352' Tc=1.8 min CN=WQ Runoff=3.10 cfs 10,081 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=357' Tc=3.5 min CN=61 Runoff=0.93 cfs 2,793 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=32' Tc=5.9 min CN=61 Runoff=0.92 cfs 3,025 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=239' Tc=1.4 min CN=WQ Runoff=0.96 cfs 3,174 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=114' Tc=2.7 min CN=61 Runoff=0.30 cfs 873 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=223' Tc=1.6 min CN=WQ Runoff=1.97 cfs 6,534 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=62' Tc=2.0 min CN=61 Runoff=0.92 cfs 2,560 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=414' Tc=1.1 min CN=98 Runoff=0.11 cfs 373 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=356' Tc=5.3 min CN=61 Runoff=1.16 cfs 3,782 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=524' Tc=1.7 min CN=WQ Runoff=1.96 cfs 6,534 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=546' Tc=2.8 min CN=61 Runoff=1.75 cfs 5,062 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=295' Tc=2.0 min CN=WQ Runoff=3.21 cfs 10,454 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=242' Tc=1.4 min CN=61 Runoff=0.79 cfs 2,211 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=376' Tc=2.6 min CN=WQ Runoff=2.99 cfs 9,894 cf

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NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

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Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=5.14" Tc=5.0 min CN=98 Runoff=3.49 cfs 12,694 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=178' Tc=1.3 min CN=WQ Runoff=0.45 cfs 1,493 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=96' Slope=0.0100 '/' Tc=1.5 min CN=98 Runoff=1.30 cfs 4,294 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=138' Slope=0.0300 '/' Tc=7.9 min CN=61 Runoff=1.15 cfs 4,073 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=805' Tc=2.2 min CN=WQ Runoff=9.31 cfs 30,428 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=509' Tc=3.9 min CN=61 Runoff=2.29 cfs 7,040 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=236' Tc=4.5 min CN=61 Runoff=0.59 cfs 1,862 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=283' Tc=1.8 min CN=WQ Runoff=4.13 cfs 13,441 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=412' Tc=9.6 min CN=61 Runoff=0.67 cfs 2,560 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=303' Tc=1.9 min CN=WQ Runoff=3.61 cfs 11,761 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=262' Tc=3.2 min CN=61 Runoff=0.83 cfs 2,444 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=1,152' Tc=2.6 min CN=WQ Runoff=7.90 cfs 26,135 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=889' Tc=2.9 min CN=61 Runoff=1.52 cfs 4,422 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.28 cfs 933 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=239' Tc=14.4 min CN=WQ Runoff=1.61 cfs 7,141 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=105' Tc=0.5 min CN=WQ Runoff=0.34 cfs 1,120 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=467' Tc=2.4 min CN=WQ Runoff=8.52 cfs 28,002 cf

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NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=532' Tc=1.6 min CN=61 Runoff=1.84 cfs 5,120 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=1.55" Flow Length=194' Tc=4.8 min CN=WQ Runoff=1.62 cfs 5,240 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=5.14" Flow Length=634' Tc=2.0 min CN=WQ Runoff=4.69 cfs 15,308 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=1.60" Flow Length=655' Tc=5.2 min CN=61 Runoff=2.39 cfs 7,796 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=553.36' Storage=3,634 cf Inflow=2.32 cfs 8,043 cf Outflow=0.41 cfs 6,809 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=576.05' Storage=29,310 cf Inflow=13.79 cfs 54,558 cf Outflow=1.44 cfs 47,280 cf
Pond C: BMP C Bioretention Basin	Peak Elev=562.35' Storage=19,672 cf Inflow=7.56 cfs 31,387 cf Outflow=0.49 cfs 27,166 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=600.71' Storage=3,229 cf Inflow=2.52 cfs 8,340 cf Outflow=1.15 cfs 6,819 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=610.22' Storage=4,354 cf Inflow=2.91 cfs 9,094 cf Outflow=0.58 cfs 7,098 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=610.80' Storage=5,335 cf Inflow=3.98 cfs 12,873 cf Outflow=1.60 cfs 10,271 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=615.16' Storage=5,105 cf Inflow=4.00 cfs 12,665 cf Outflow=1.19 cfs 10,338 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=609.47' Storage=6,776 cf Inflow=3.54 cfs 11,756 cf Outflow=0.29 cfs 9,748 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=596.21' Storage=8,183 cf Inflow=5.05 cfs 26,682 cf Outflow=1.66 cfs 23,586 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=569.86' Storage=11,106 cf Inflow=9.41 cfs 30,557 cf Outflow=5.52 cfs 25,188 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=598.79' Storage=5,927 cf Inflow=4.40 cfs 14,204 cf Outflow=1.69 cfs 11,679 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=578.45' Storage=14,655 cf Inflow=11.41 cfs 44,800 cf Outflow=4.88 cfs 39,151 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=564.58' Storage=29,018 cf Inflow=15.23 cfs 87,443 cf Outflow=5.05 cfs 83,611 cf

081228-SWM

NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

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Link 20L: TOTAL TO GI MTD F-1Inflow=1.26 cfs 4,046 cf
Primary=1.26 cfs 4,046 cf**Link 21L: TOTAL TO P-DA-5M**Inflow=9.41 cfs 30,557 cf
Primary=9.41 cfs 30,557 cf**Link 33L: P-DA-1-BYPASS undetained TOTAL**Inflow=1.23 cfs 4,155 cf
Primary=1.23 cfs 4,155 cf**Link 34L: PROPOSED TOTAL TO POA-1**Inflow=2.79 cfs 85,410 cf
Primary=2.79 cfs 85,410 cf**Link 38L: TOTAL TO GI MTD 1C**Inflow=3.72 cfs 11,595 cf
Primary=3.72 cfs 11,595 cf**Link 44L: P-DA-3-BYPASS undetained TOTAL**Inflow=1.35 cfs 5,566 cf
Primary=1.35 cfs 5,566 cf**Link 45L: PROPOSED TOTAL TO POA-3**Inflow=2.48 cfs 15,904 cf
Primary=2.48 cfs 15,904 cf**Link 46L: P-DA-1B TOTAL**Inflow=11.48 cfs 37,468 cf
Primary=11.48 cfs 37,468 cf**Link 48L: PROPOSED TOTAL TO POA-4**Inflow=2.76 cfs 29,946 cf
Primary=2.76 cfs 29,946 cf**Link 50L: TOTAL TO GI MTD K-1**Inflow=4.54 cfs 16,001 cf
Primary=4.54 cfs 16,001 cf**Link 52L: PROPOSED TOTAL TO POA-5**Inflow=5.45 cfs 90,751 cf
Primary=5.45 cfs 90,751 cf**Link 59L: P-DA-4 BYPASS TOTAL**Inflow=1.84 cfs 6,360 cf
Primary=1.84 cfs 6,360 cf**Link 66L: P-DA-5R TOTAL**Inflow=6.80 cfs 23,104 cf
Primary=6.80 cfs 23,104 cf**Total Runoff Area = 993,342 sf Runoff Volume = 268,695 cf Average Runoff Depth = 3.25"**
53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 1.59 cfs @ 12.06 hrs, Volume= 5,227 cf, Depth= 5.14"
 Routed to Pond A : BMP-A Bioretention Basin

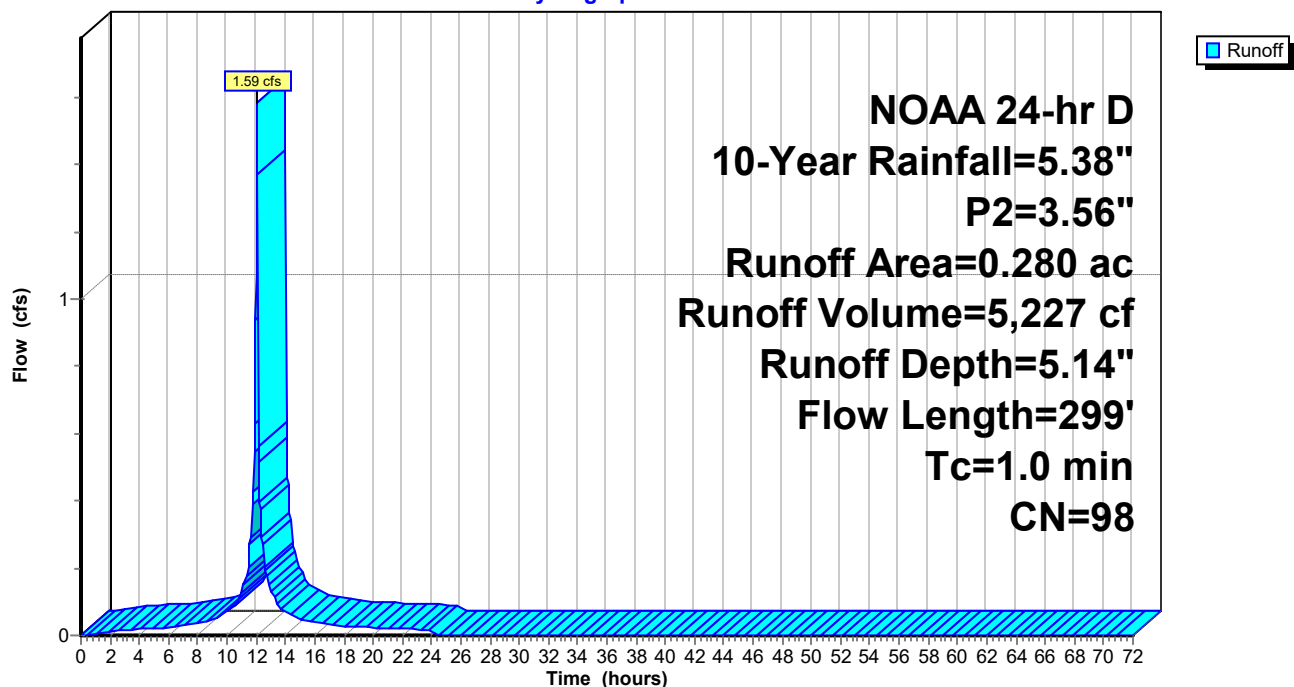
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.0	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 0.88 cfs @ 12.12 hrs, Volume= 2,816 cf, Depth= 1.60"
 Routed to Pond A : BMP-A Bioretention Basin

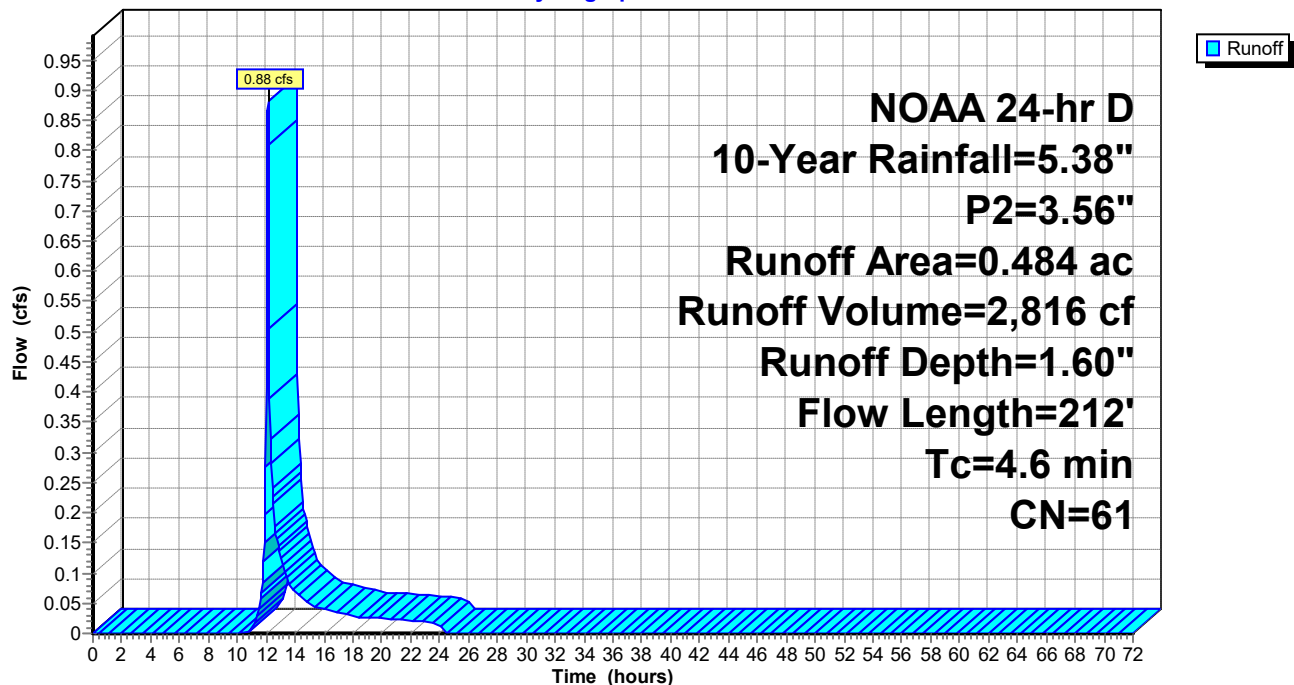
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	100	0.1300	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.6	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 3.10 cfs @ 12.08 hrs, Volume= 10,081 cf, Depth= 5.14"
 Routed to Pond H : BMP-H Bioretention Basin

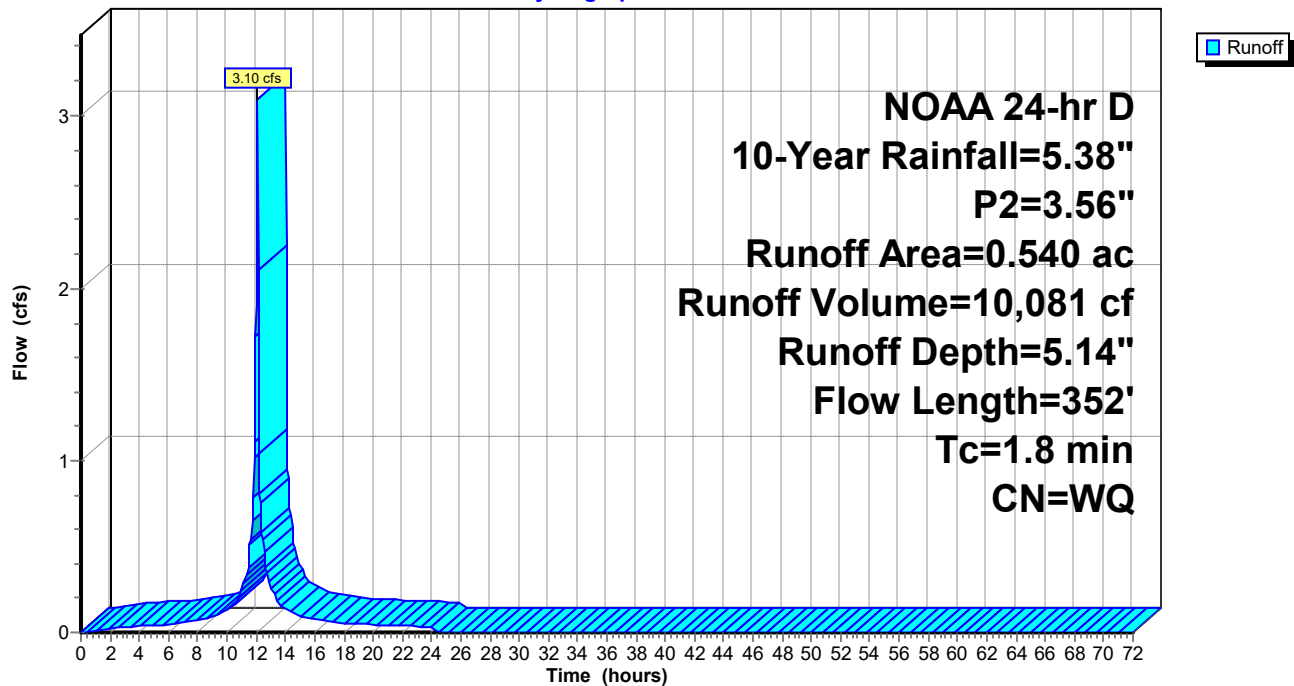
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0310	1.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



Summary for Subcatchment 17S: P-DA-1H PER

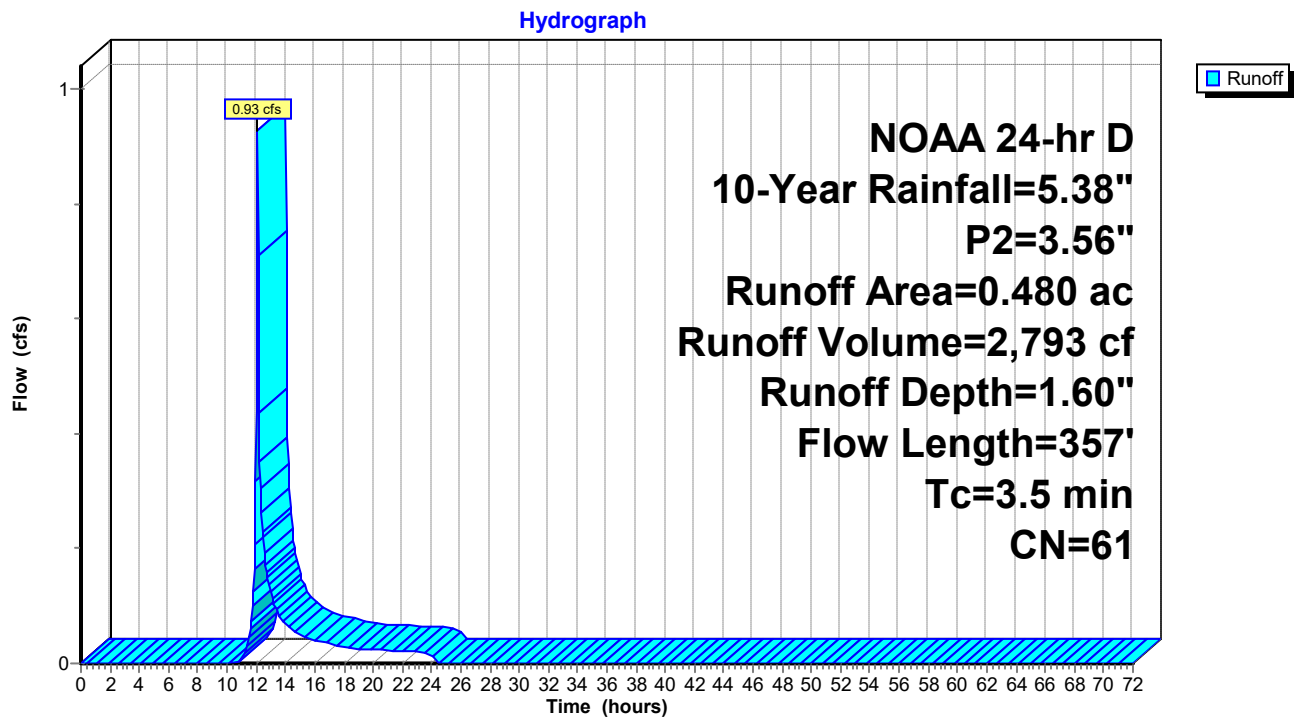
Runoff = 0.93 cfs @ 12.10 hrs, Volume= 2,793 cf, Depth= 1.60"
 Routed to Pond H : BMP-H Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.5	357	Total			

Subcatchment 17S: P-DA-1H PER



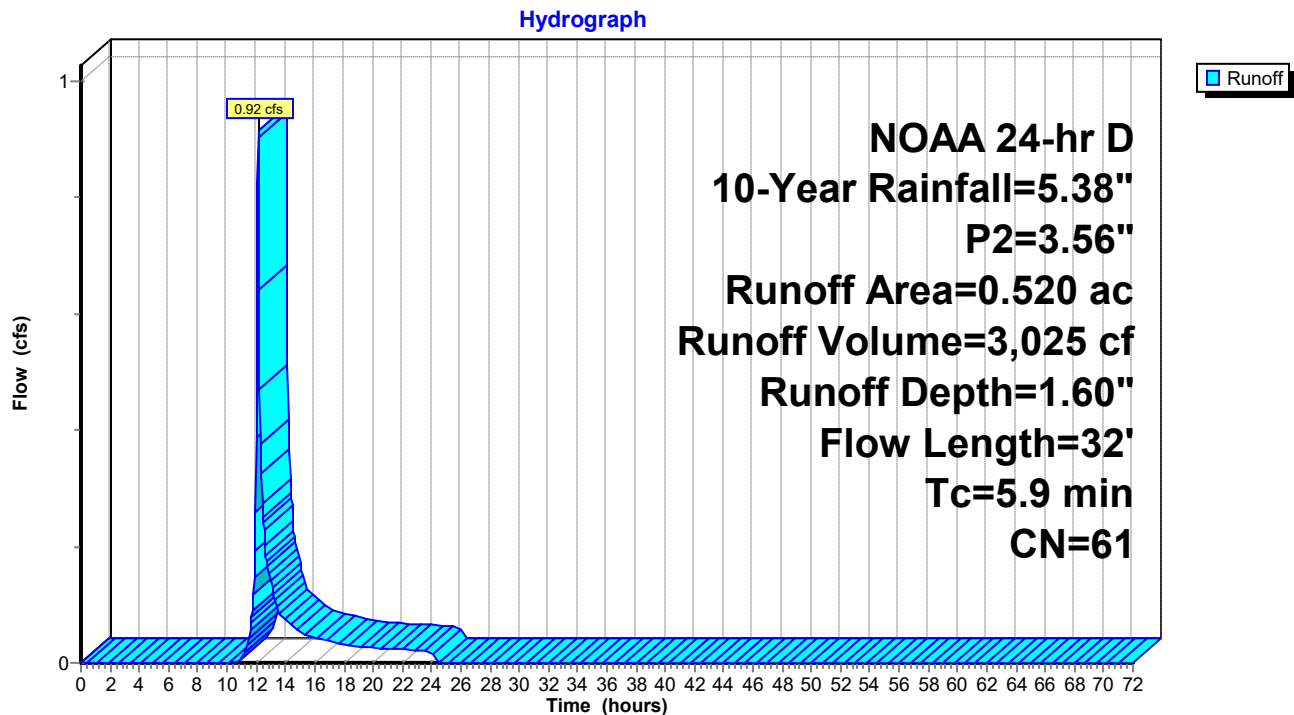
Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 0.92 cfs @ 12.14 hrs, Volume= 3,025 cf, Depth= 1.60"
 Routed to nonexistent node 26L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	15	0.0140	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	6	0.3330	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.0	11	0.0830	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.56"
5.9	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 0.96 cfs @ 12.07 hrs, Volume= 3,174 cf, Depth= 5.14"
 Routed to Link 20L : TOTAL TO GI MTD F-1

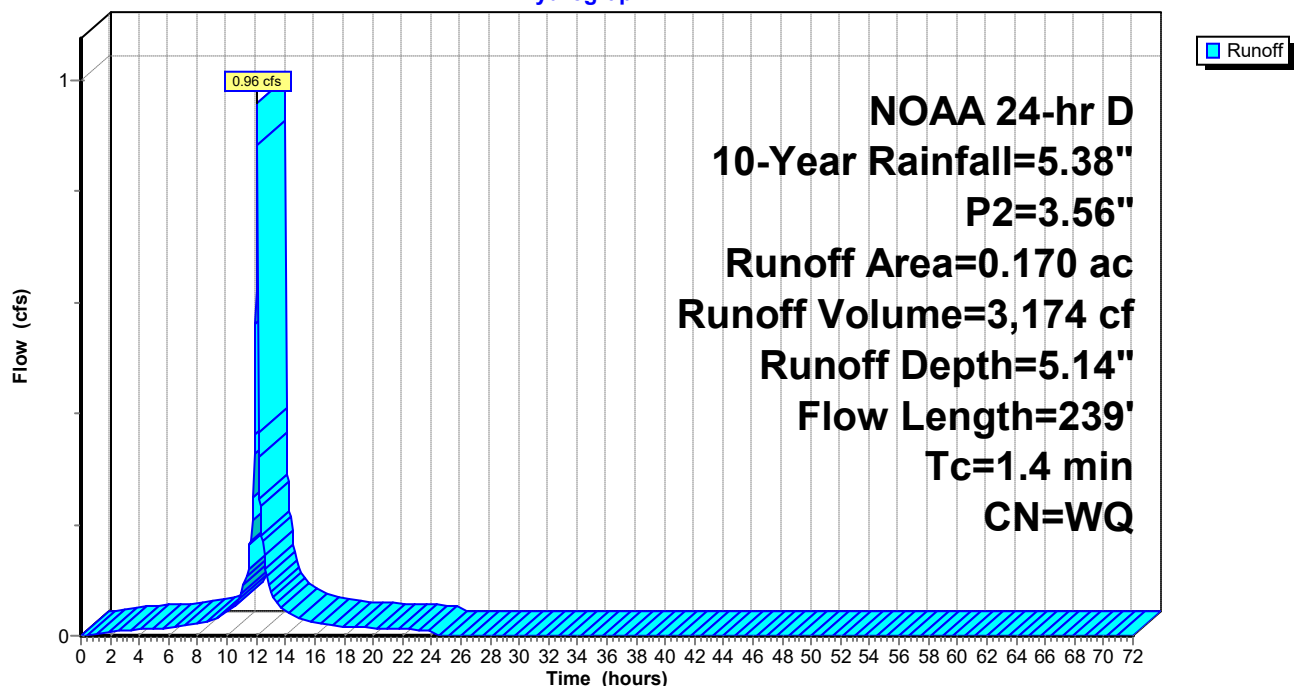
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 873 cf, Depth= 1.60"
 Routed to Link 20L : TOTAL TO GI MTD F-1

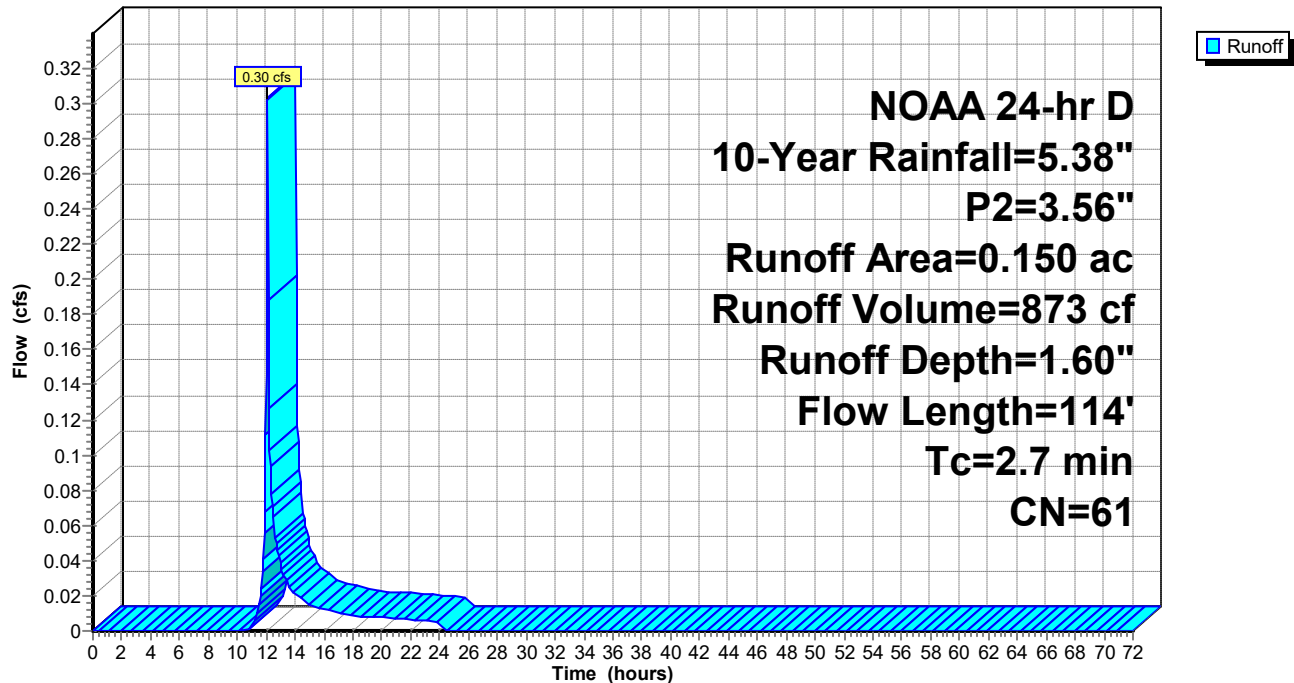
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.7	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 1.97 cfs @ 12.07 hrs, Volume= 6,534 cf, Depth= 5.14"
 Routed to Pond G : BMP-G Bioretention Basin

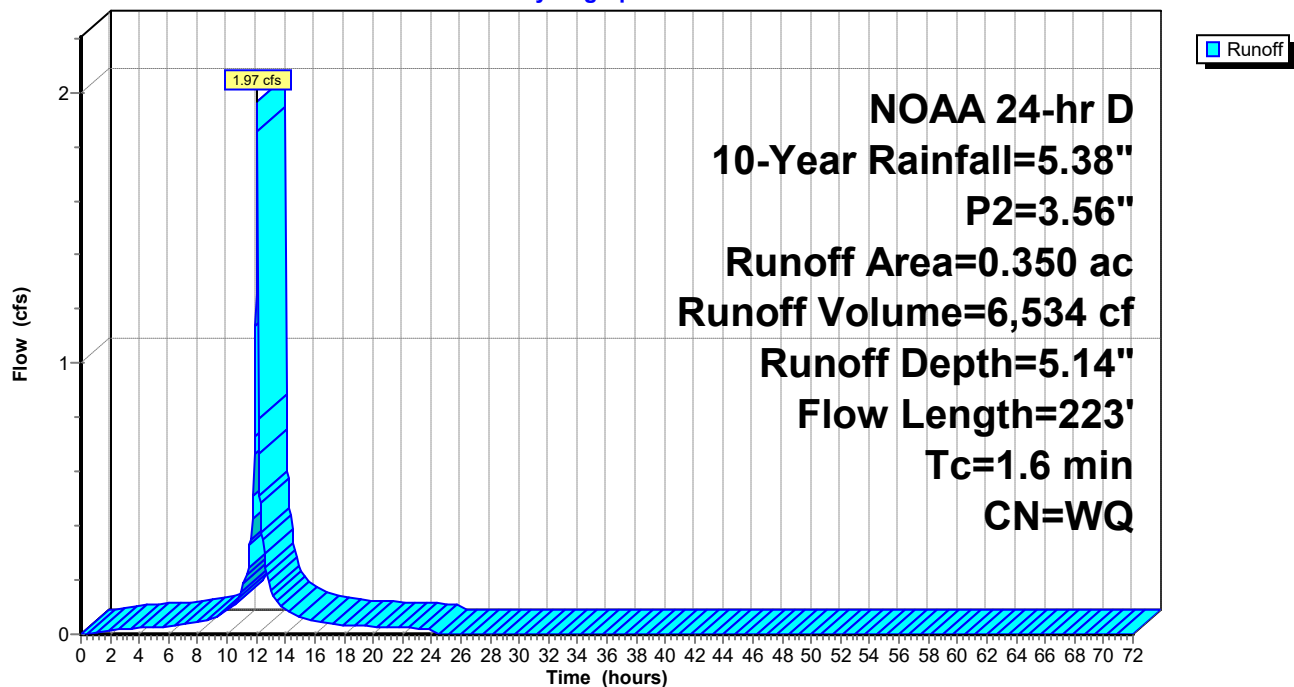
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	113	0.0240	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.6	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 0.92 cfs @ 12.09 hrs, Volume= 2,560 cf, Depth= 1.60"
 Routed to Pond G : BMP-G Bioretention Basin

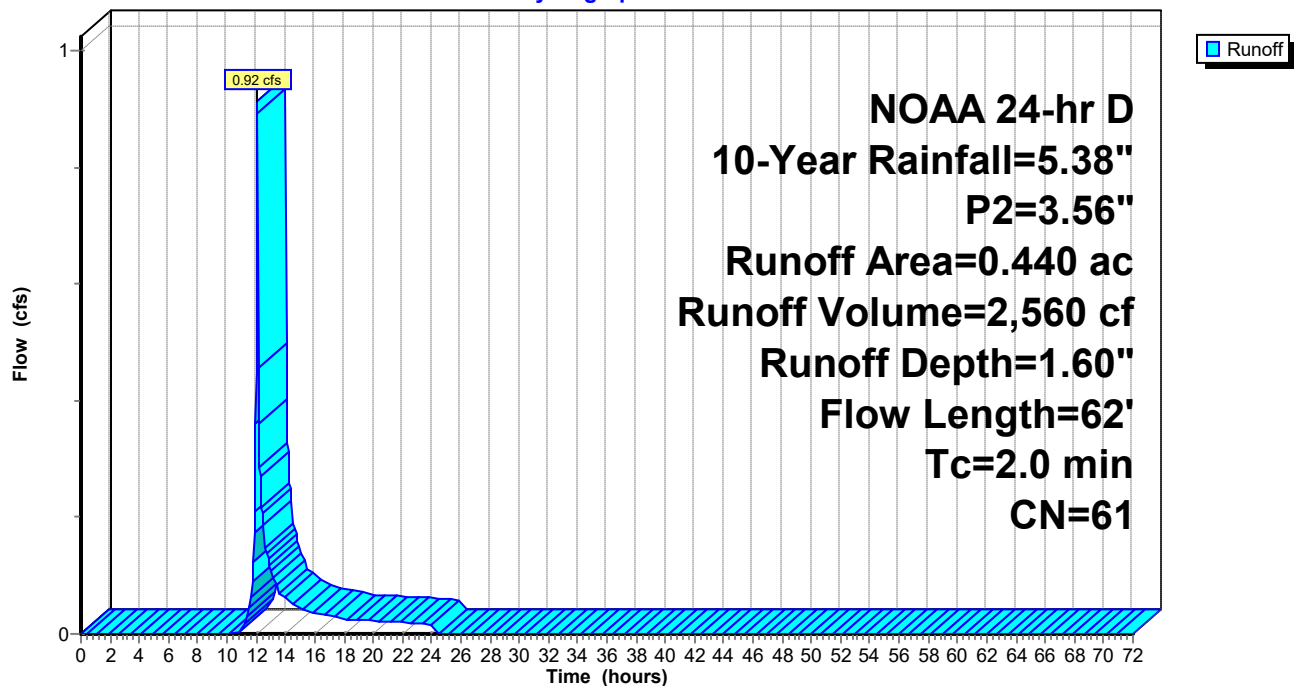
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	13	0.0200	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.11 cfs @ 12.06 hrs, Volume= 373 cf, Depth= 5.14"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

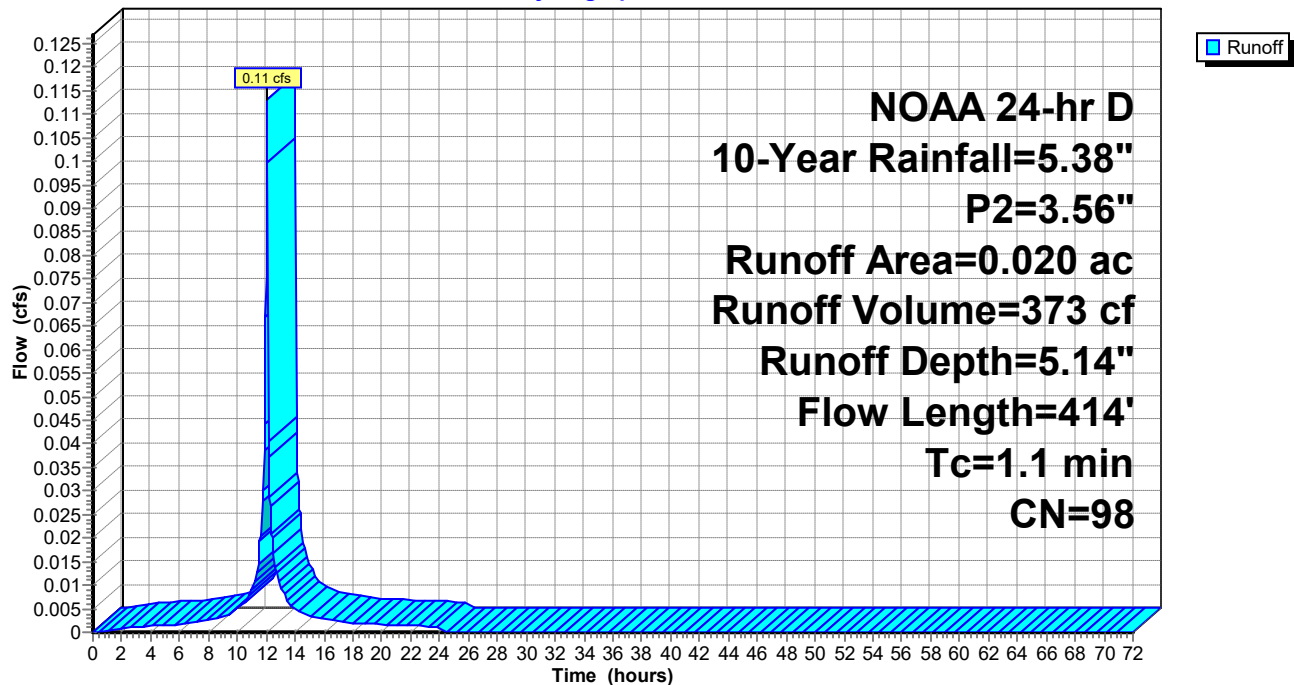
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	43	0.0330	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.1	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

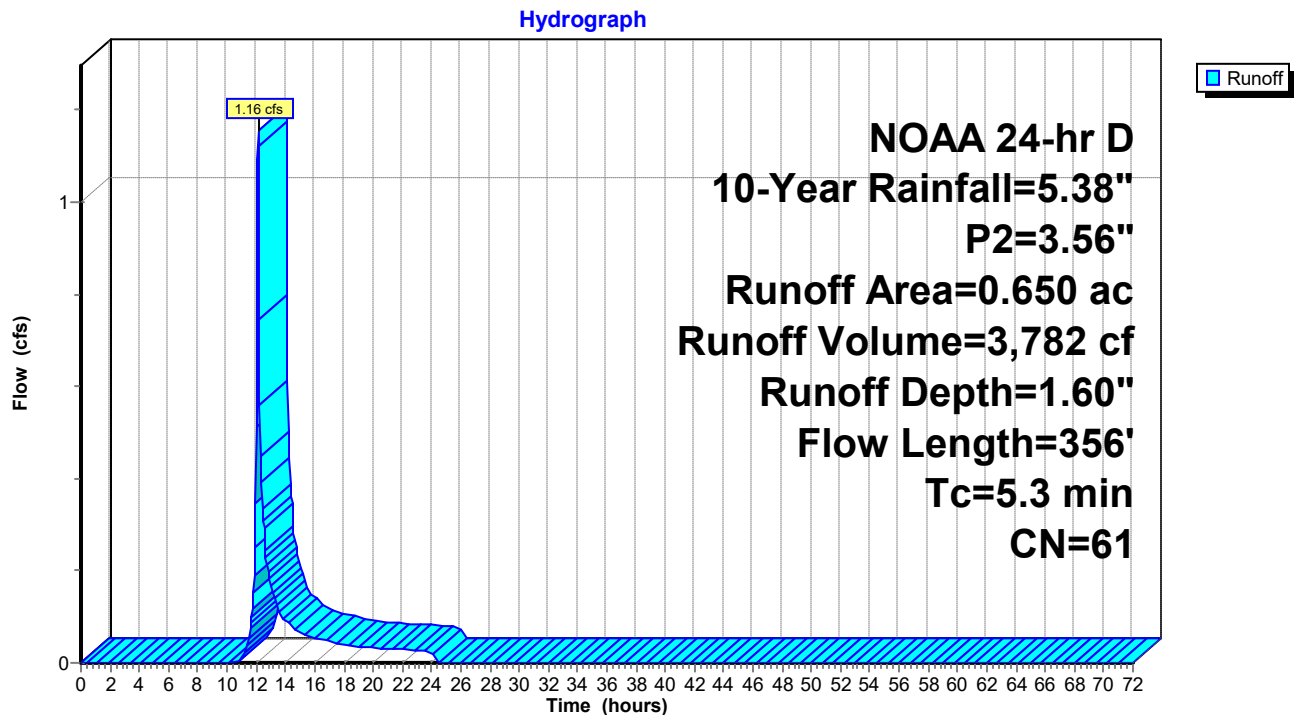
Runoff = 1.16 cfs @ 12.13 hrs, Volume= 3,782 cf, Depth= 1.60"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	67	0.0600	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Summary for Subcatchment 35S: P-DA-1C IMP

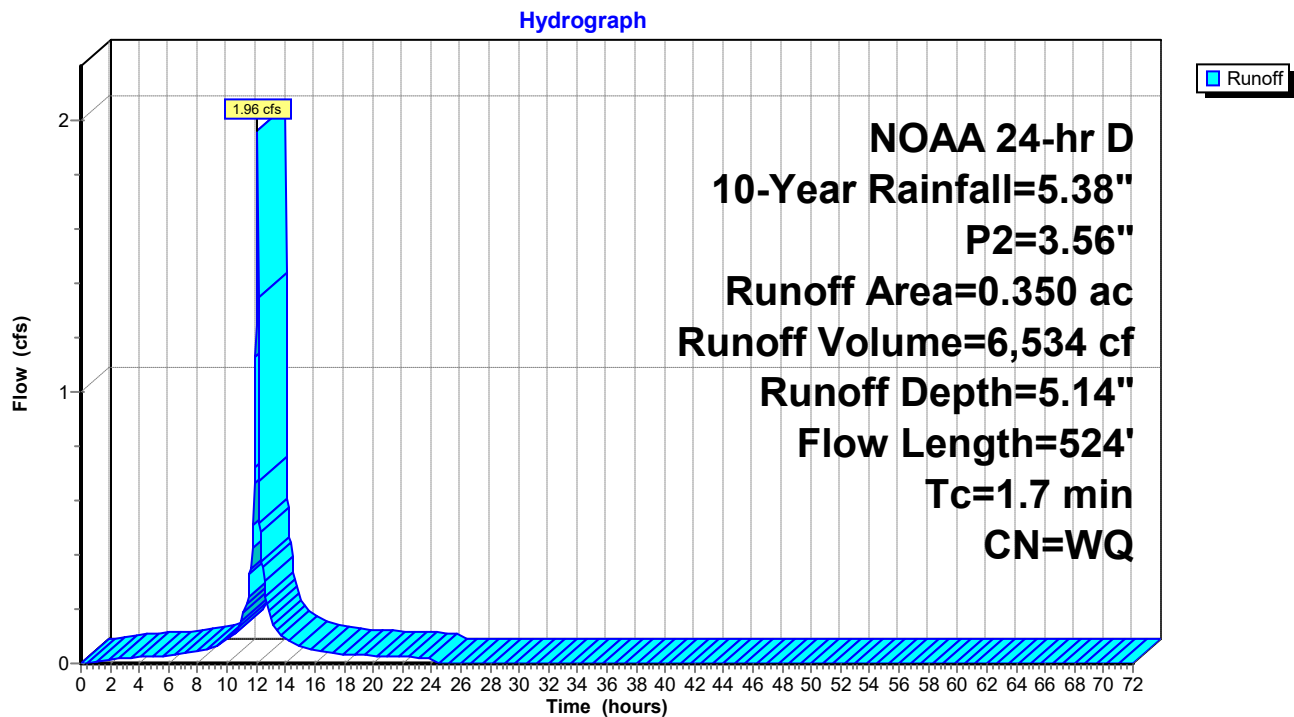
Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,534 cf, Depth= 5.14"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0200	1.16		Sheet Flow , Smooth surfaces n= 0.011 P2= 3.56"
0.5	130	0.0054	4.19	5.14	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel , 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	524	Total			

Subcatchment 35S: P-DA-1C IMP



Summary for Subcatchment 36S: P-DA-1C PER

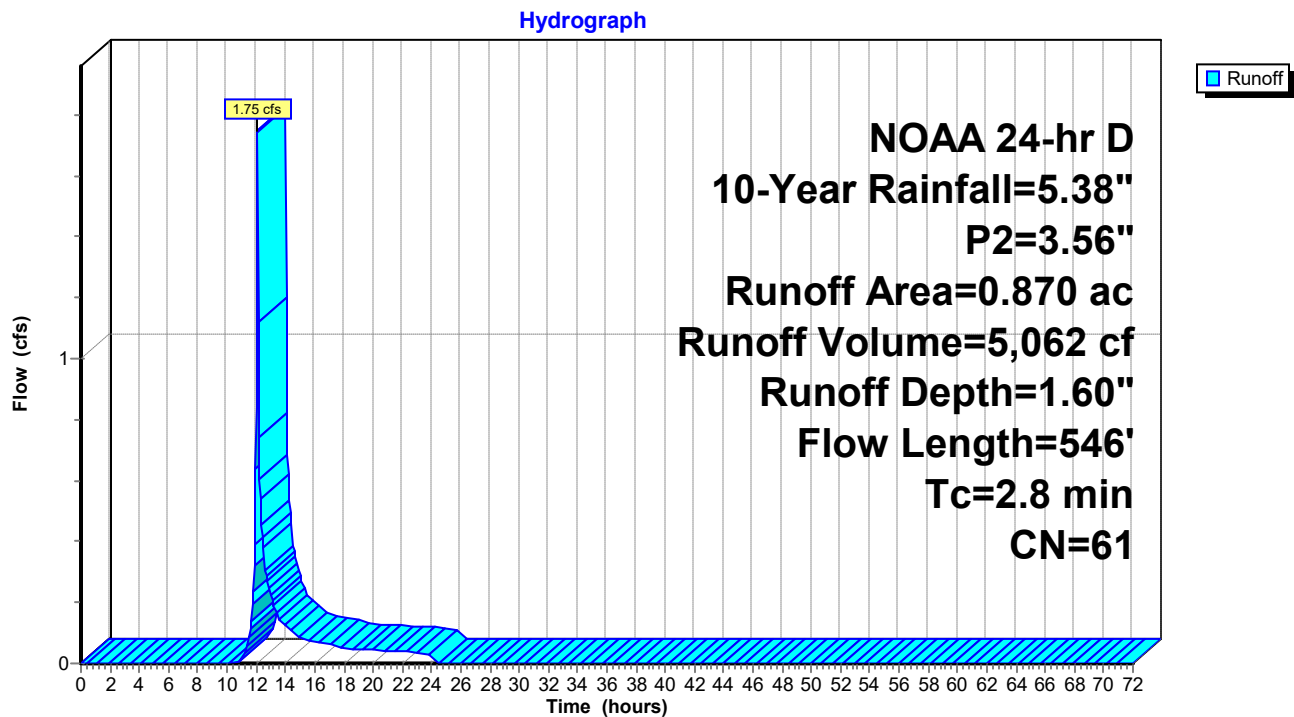
Runoff = 1.75 cfs @ 12.09 hrs, Volume= 5,062 cf, Depth= 1.60"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	38	0.1900	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.8	546	Total			

Subcatchment 36S: P-DA-1C PER



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 3.21 cfs @ 12.08 hrs, Volume= 10,454 cf, Depth= 5.14"
 Routed to Pond I : BMP-I Bioretention Basin

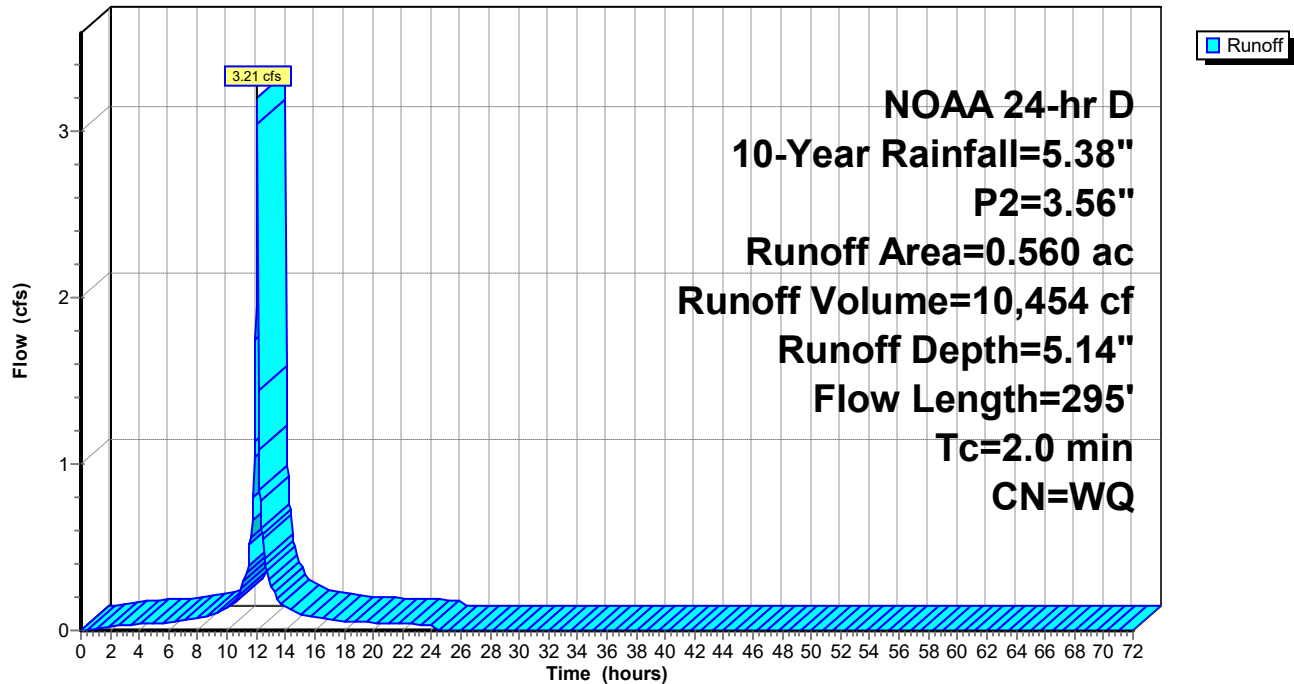
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.36		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 0.79 cfs @ 12.08 hrs, Volume= 2,211 cf, Depth= 1.60"
 Routed to Pond I : BMP-I Bioretention Basin

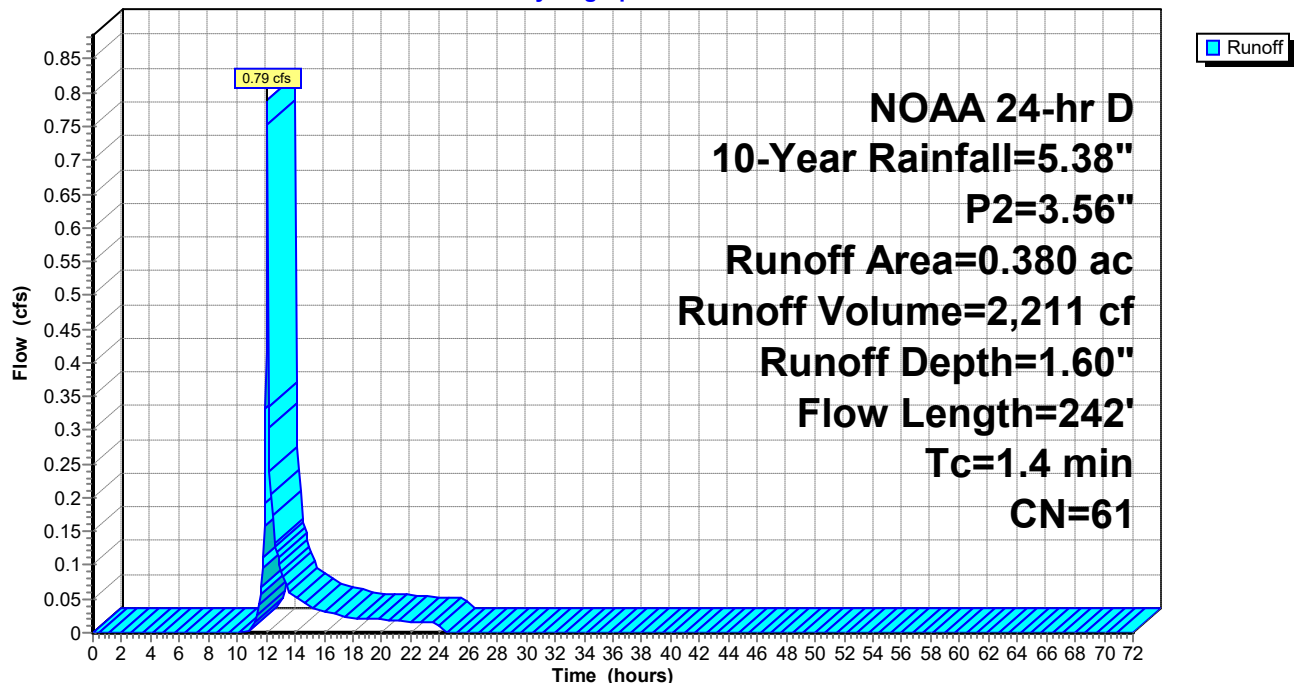
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.12		Sheet Flow , Smooth surfaces n= 0.011 P2= 3.56"
0.8	167	0.0300	3.52		Shallow Concentrated Flow , Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel , 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 2.99 cfs @ 12.08 hrs, Volume= 9,894 cf, Depth= 5.14"
 Routed to Pond J : BMP-J Bioretention Basin

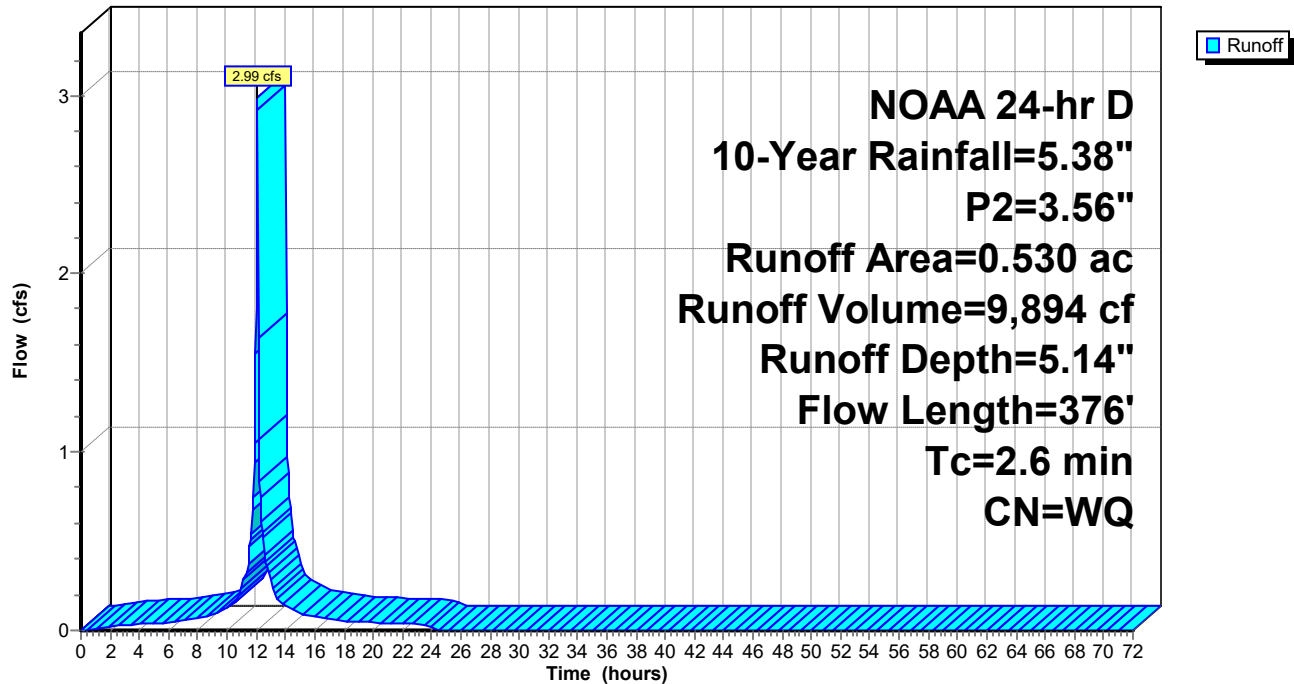
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.6	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 3.49 cfs @ 12.11 hrs, Volume= 12,694 cf, Depth= 5.14"
 Routed to Pond C : BMP C Bioretention Basin

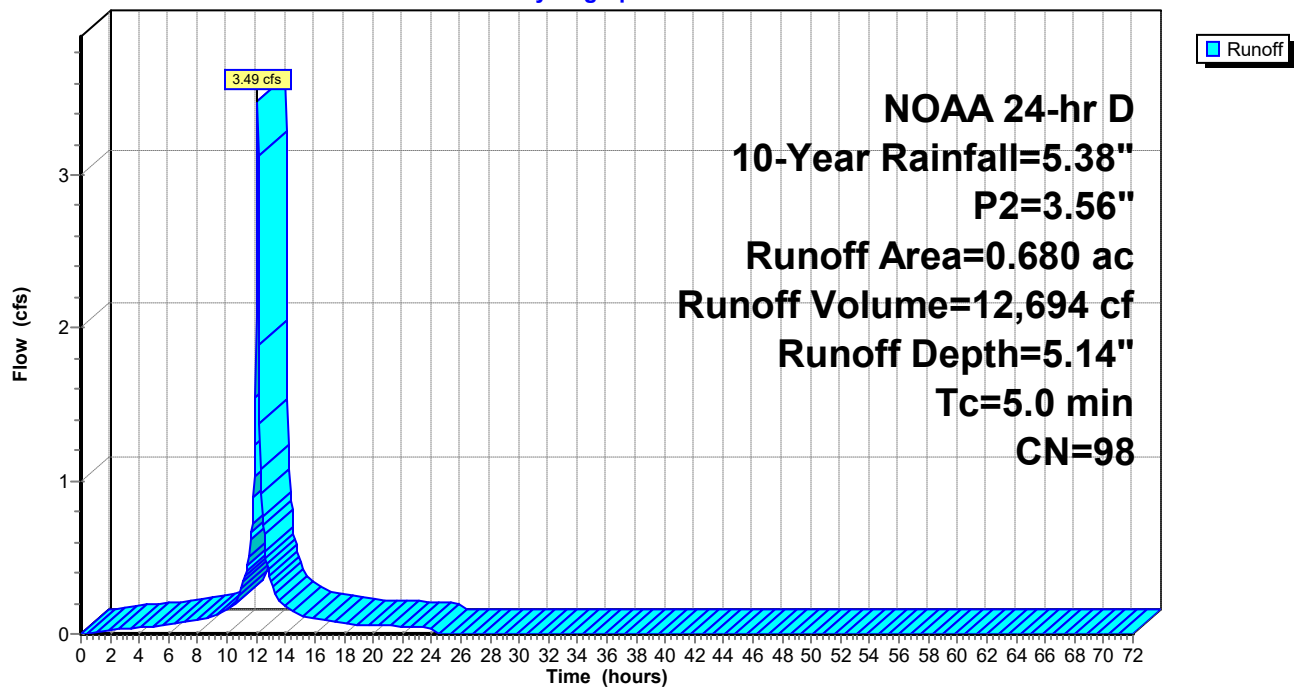
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 0.45 cfs @ 12.07 hrs, Volume= 1,493 cf, Depth= 5.14"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

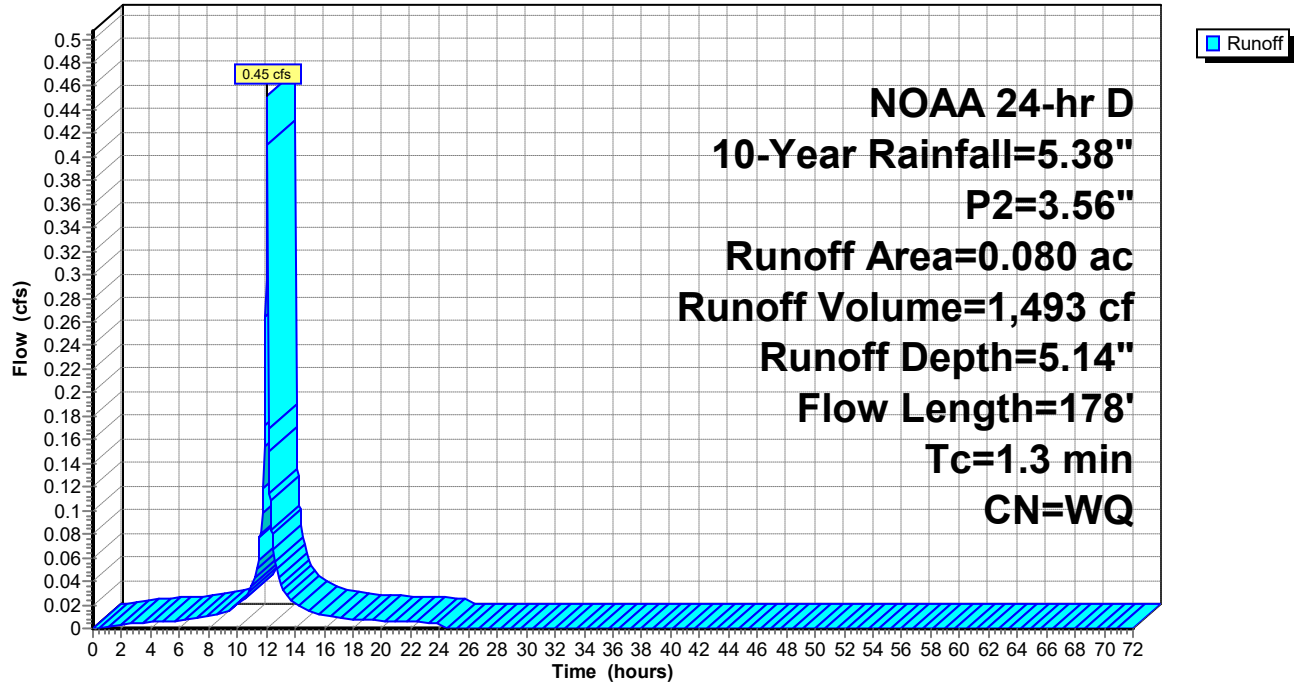
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 4,294 cf, Depth= 5.14"
 Routed to Pond F : UG INFILTRATION BASIN F

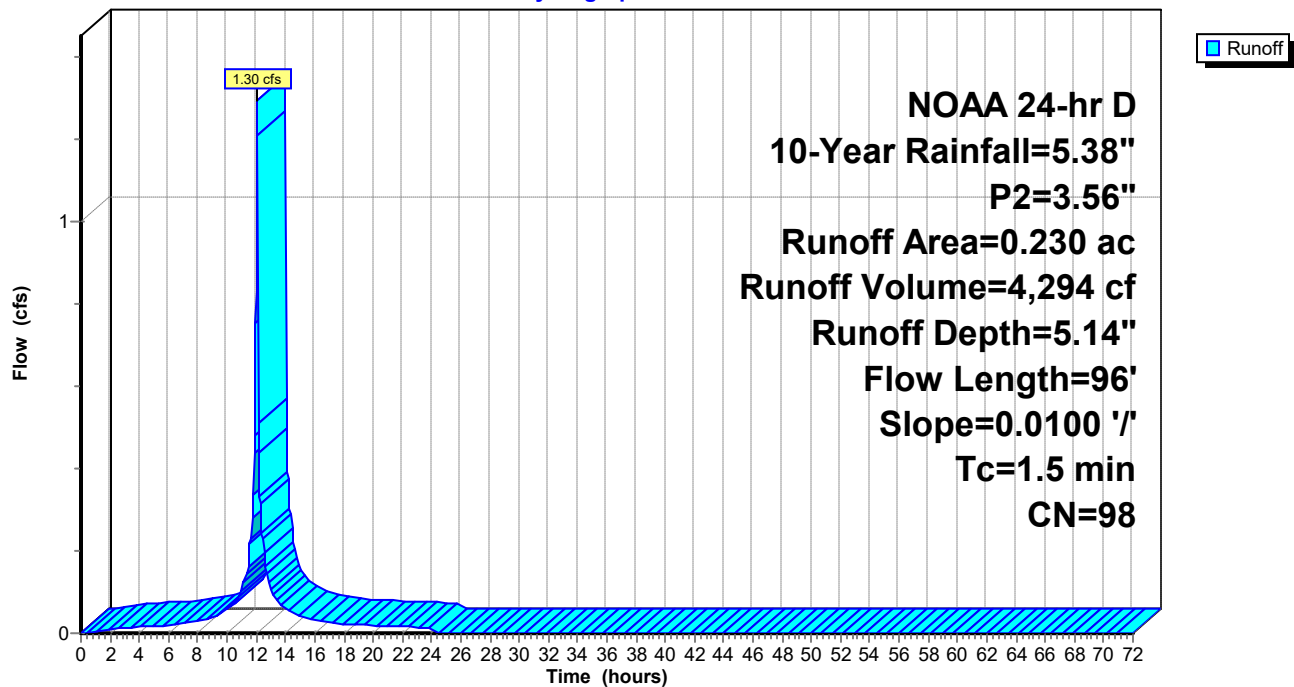
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	96	0.0100	1.09		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

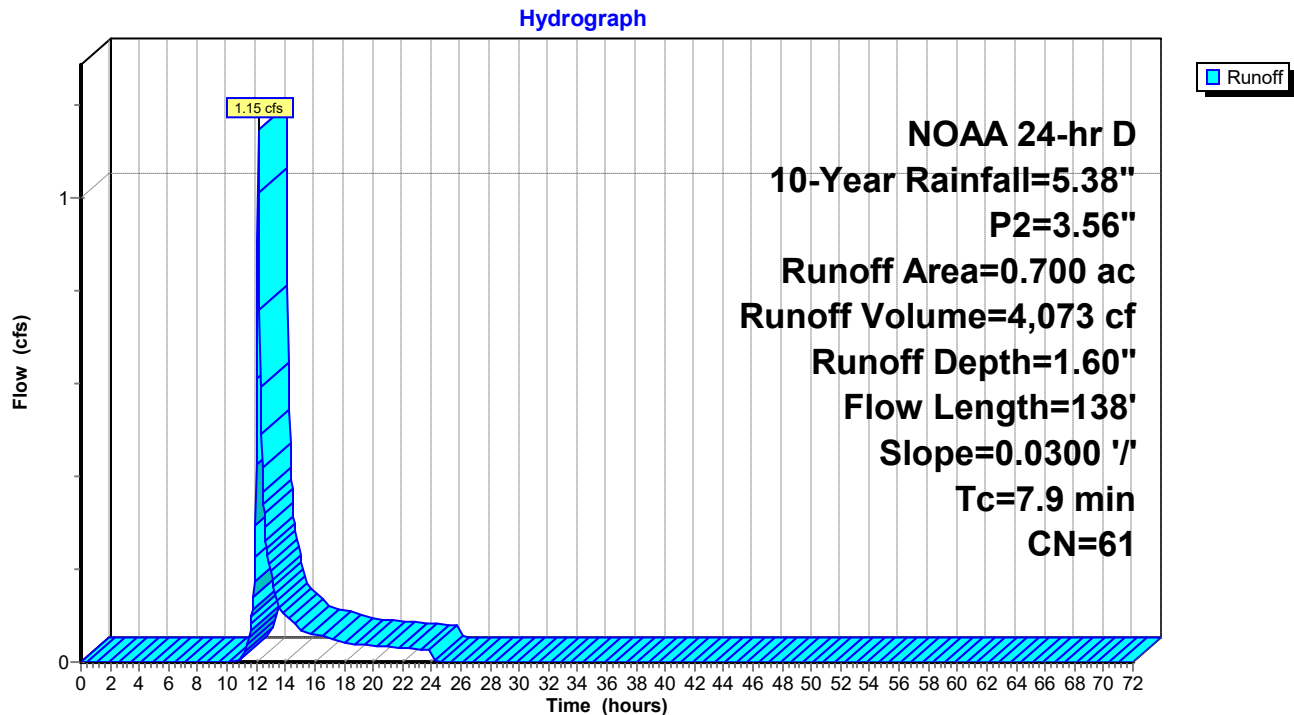
Runoff = 1.15 cfs @ 12.16 hrs, Volume= 4,073 cf, Depth= 1.60"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	84	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.0	54	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 9.31 cfs @ 12.08 hrs, Volume= 30,428 cf, Depth= 5.14"
 Routed to Link 46L : P-DA-1B TOTAL

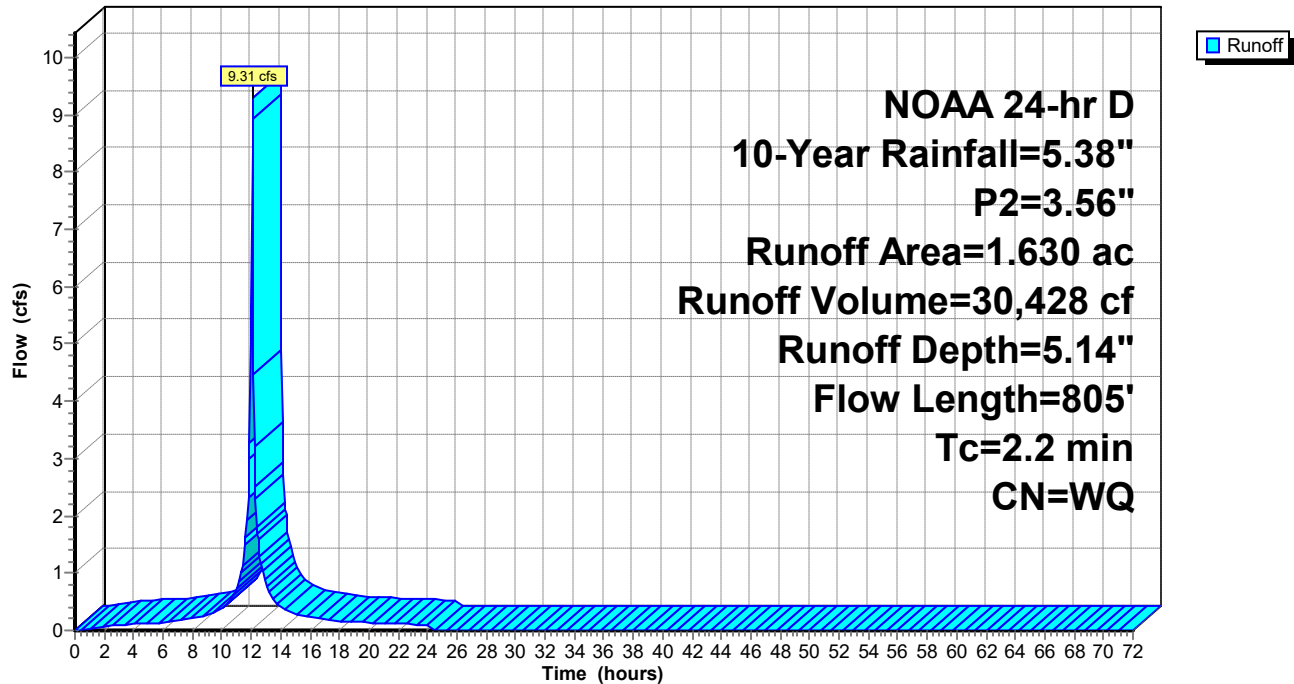
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.2	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 2.29 cfs @ 12.11 hrs, Volume= 7,040 cf, Depth= 1.60"
 Routed to Link 46L : P-DA-1B TOTAL

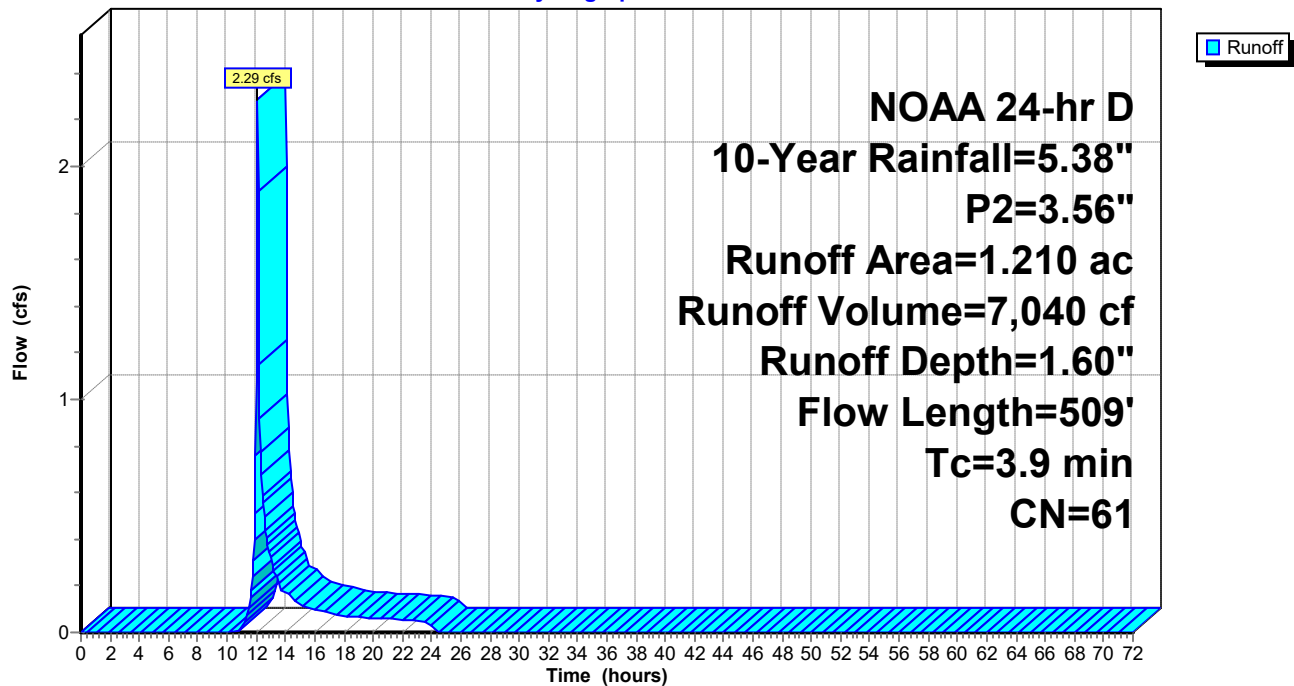
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	12	0.0110	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.2	107	0.0210	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.9	509	Total			

Subcatchment 45S: P-DA-1B PER

Hydrograph



Summary for Subcatchment 46S: P-DA-4J PER

Runoff = 0.59 cfs @ 12.12 hrs, Volume= 1,862 cf, Depth= 1.60"
 Routed to Pond J : BMP-J Bioretention Basin

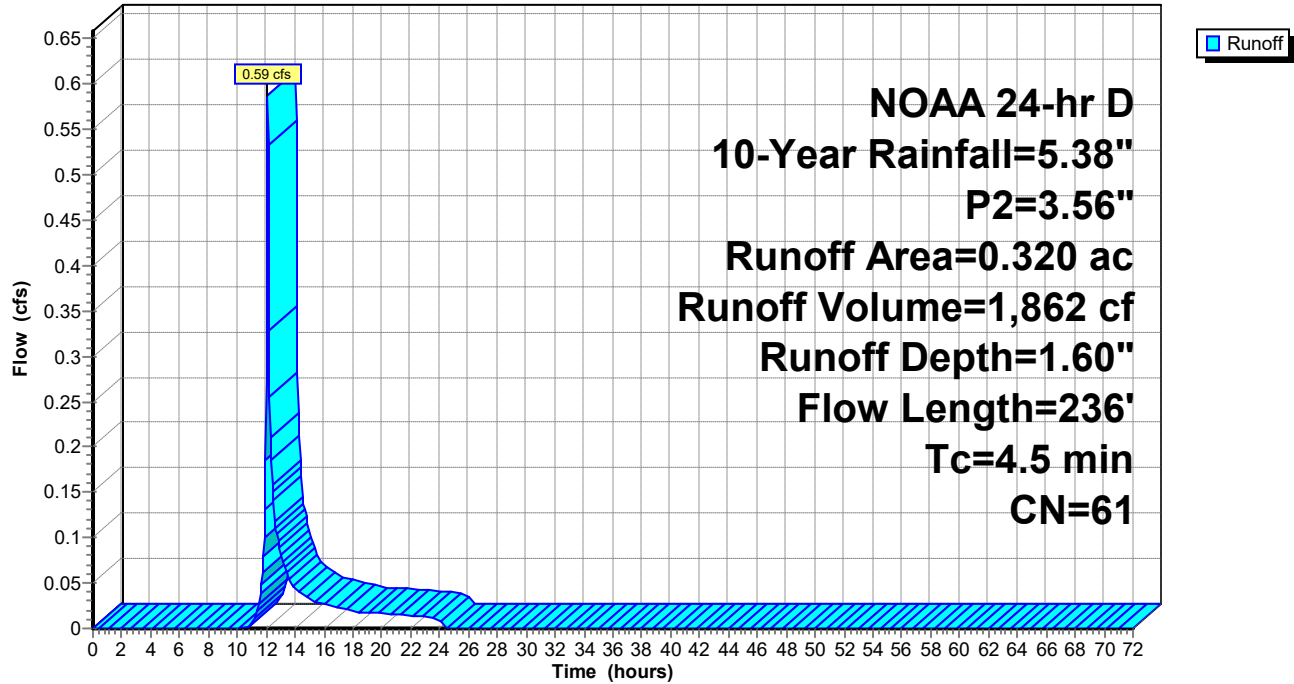
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	30	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.5	236	Total			

Subcatchment 46S: P-DA-4J PER

Hydrograph



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 4.13 cfs @ 12.08 hrs, Volume= 13,441 cf, Depth= 5.14"
 Routed to Link 50L : TOTAL TO GI MTD K-1

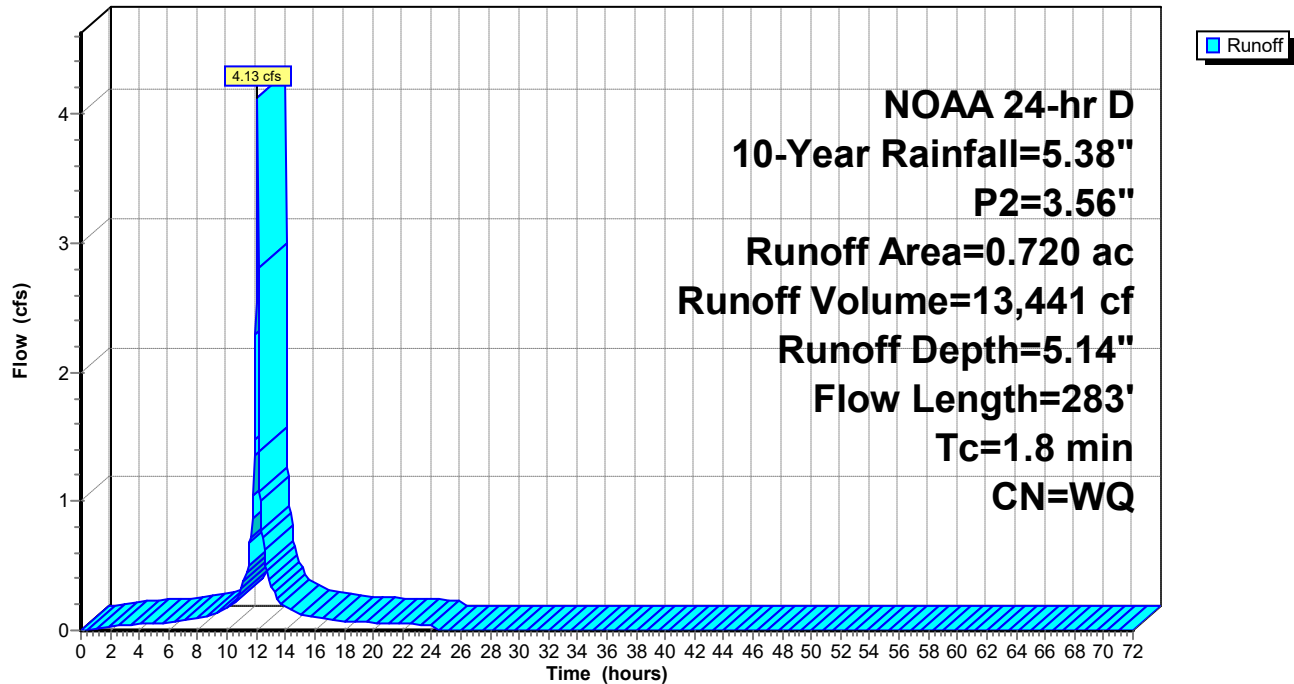
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.8	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

Runoff = 0.67 cfs @ 12.18 hrs, Volume= 2,560 cf, Depth= 1.60"
 Routed to Link 50L : TOTAL TO GI MTD K-1

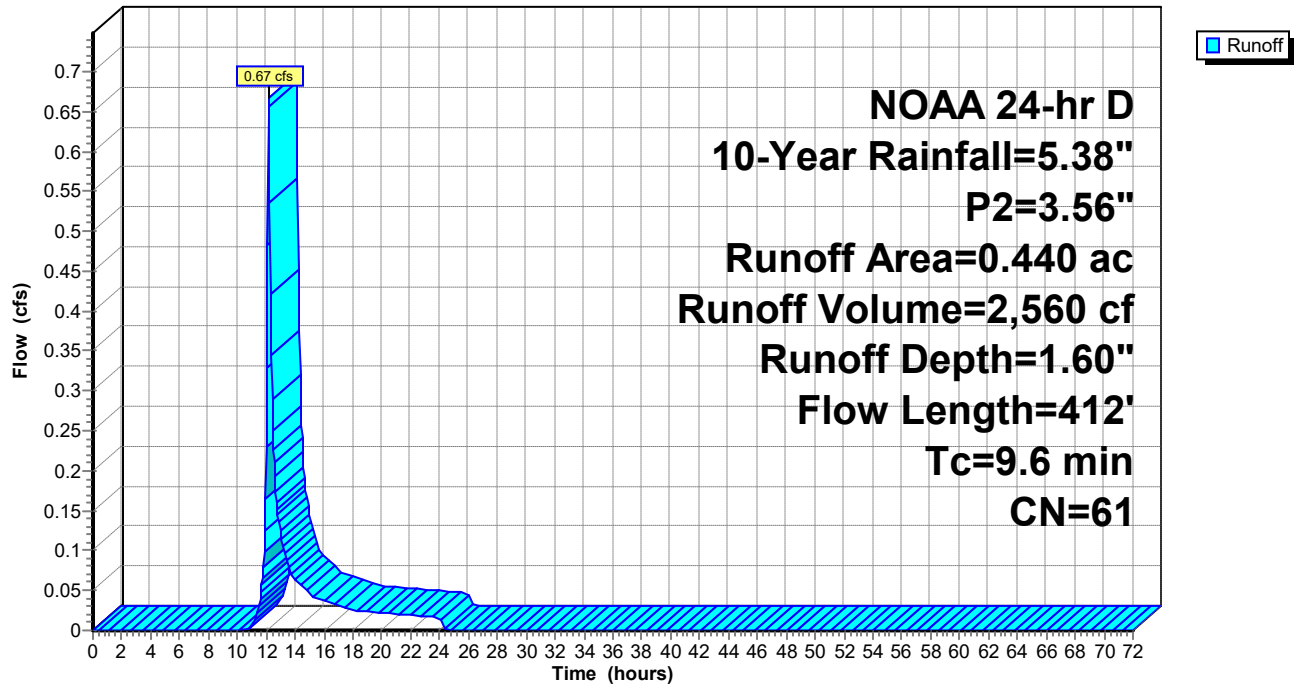
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	96	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
9.6	412	Total			

Subcatchment 48S: P-DA-4K PER

Hydrograph



Summary for Subcatchment 49S: P-DA-5N IMP

Runoff = 3.61 cfs @ 12.08 hrs, Volume= 11,761 cf, Depth= 5.14"
 Routed to Pond N : BMP-N Bioretention Basin

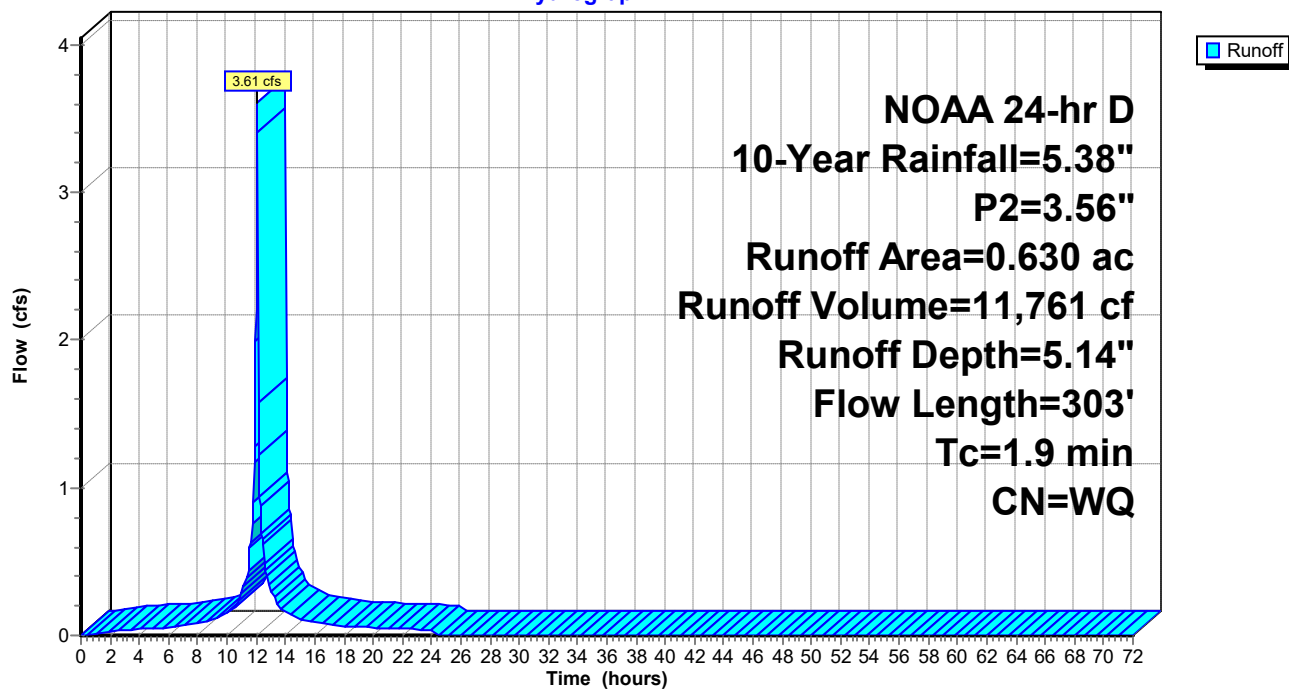
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0270	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.9	303	Total			

Subcatchment 49S: P-DA-5N IMP

Hydrograph



Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 0.83 cfs @ 12.10 hrs, Volume= 2,444 cf, Depth= 1.60"
 Routed to Pond N : BMP-N Bioretention Basin

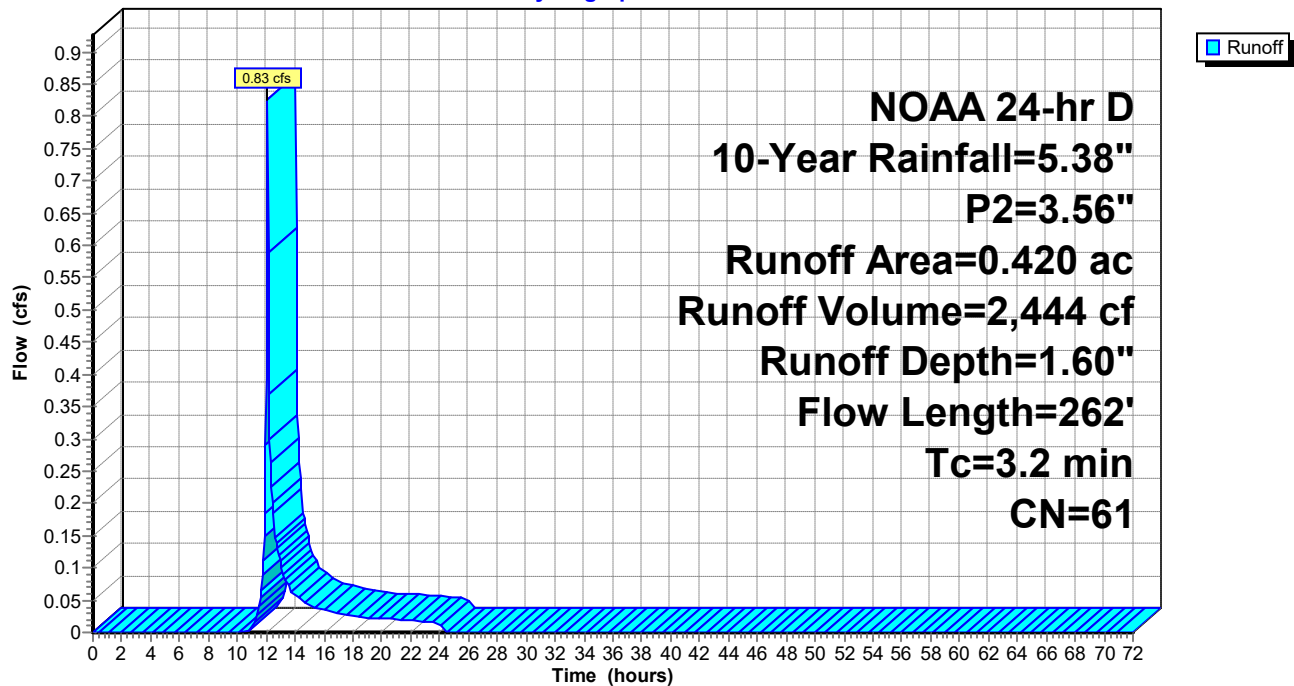
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	35	0.0570	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	262	Total			

Subcatchment 50S: P-DA-5N PER

Hydrograph



Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 7.90 cfs @ 12.08 hrs, Volume= 26,135 cf, Depth= 5.14"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	41	0.1200	2.49		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

081228-SWM

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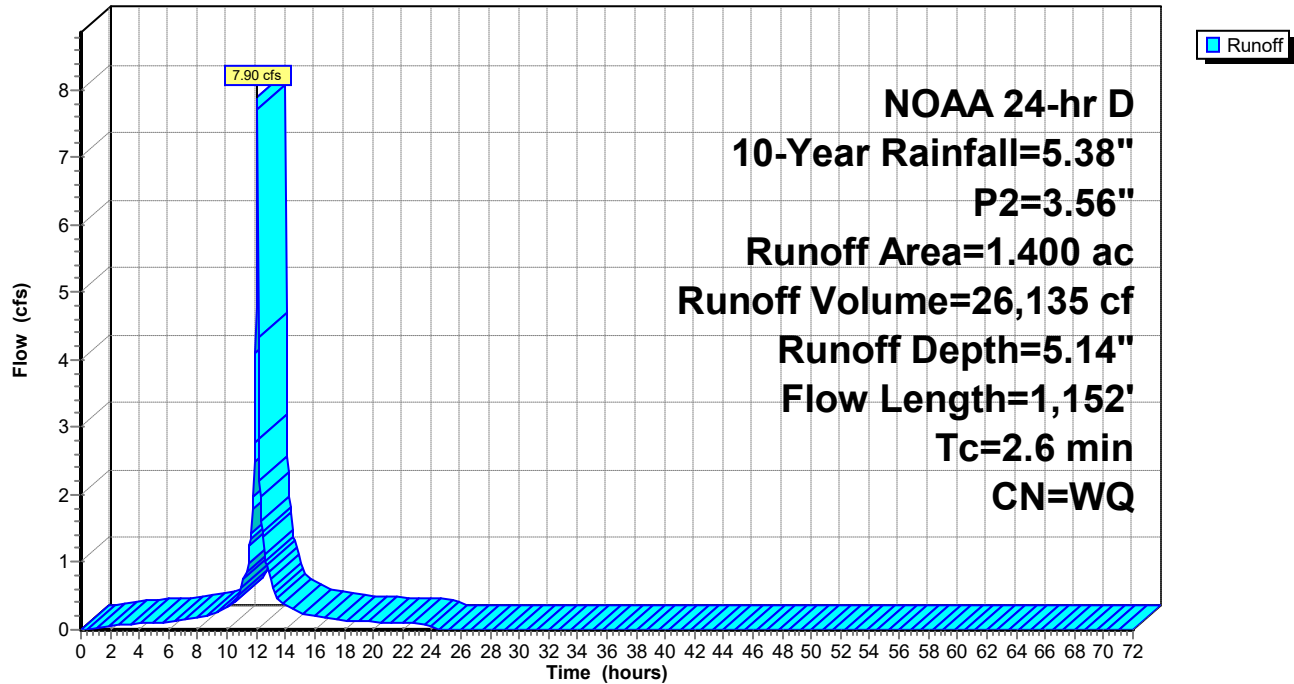
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NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

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0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.6	1,152	Total			

Subcatchment 51S: P-DA-5M IMP**Hydrograph**

Summary for Subcatchment 52S: P-DA-5M PER

Runoff = 1.52 cfs @ 12.10 hrs, Volume= 4,422 cf, Depth= 1.60"
 Routed to Link 21L : TOTAL TO P-DA-5M

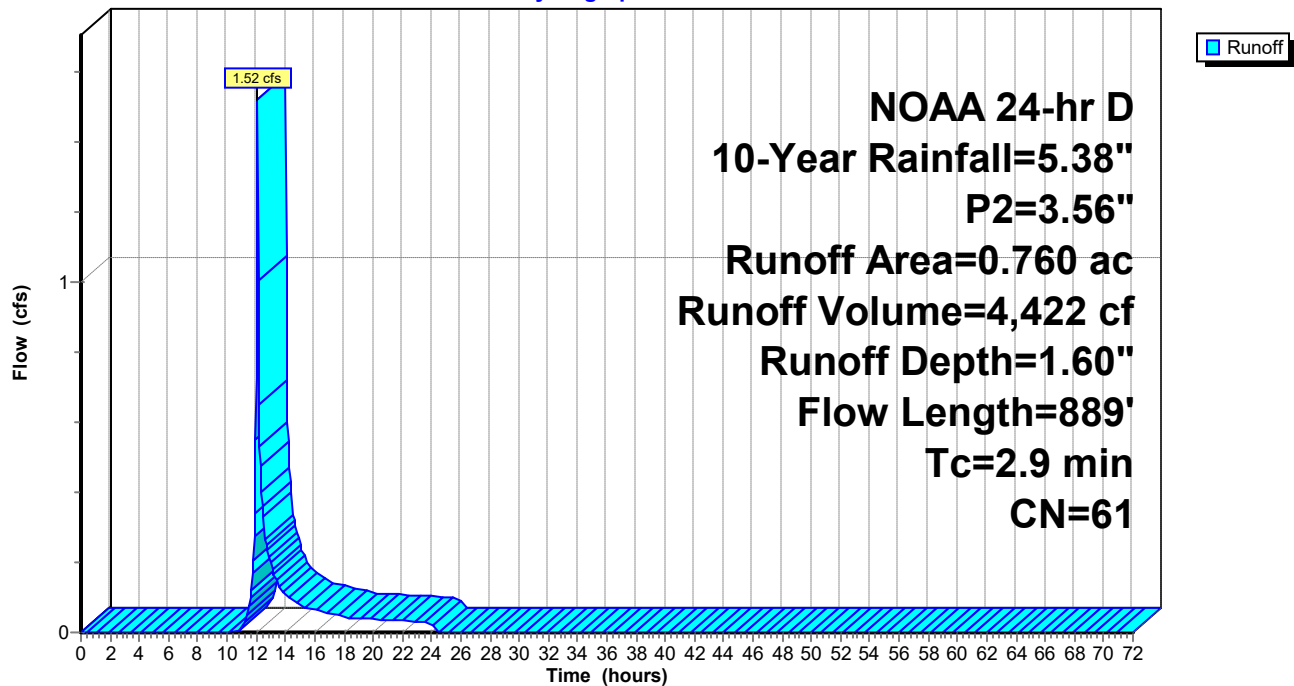
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	20	0.2000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.9	889	Total			

Subcatchment 52S: P-DA-5M PER

Hydrograph



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

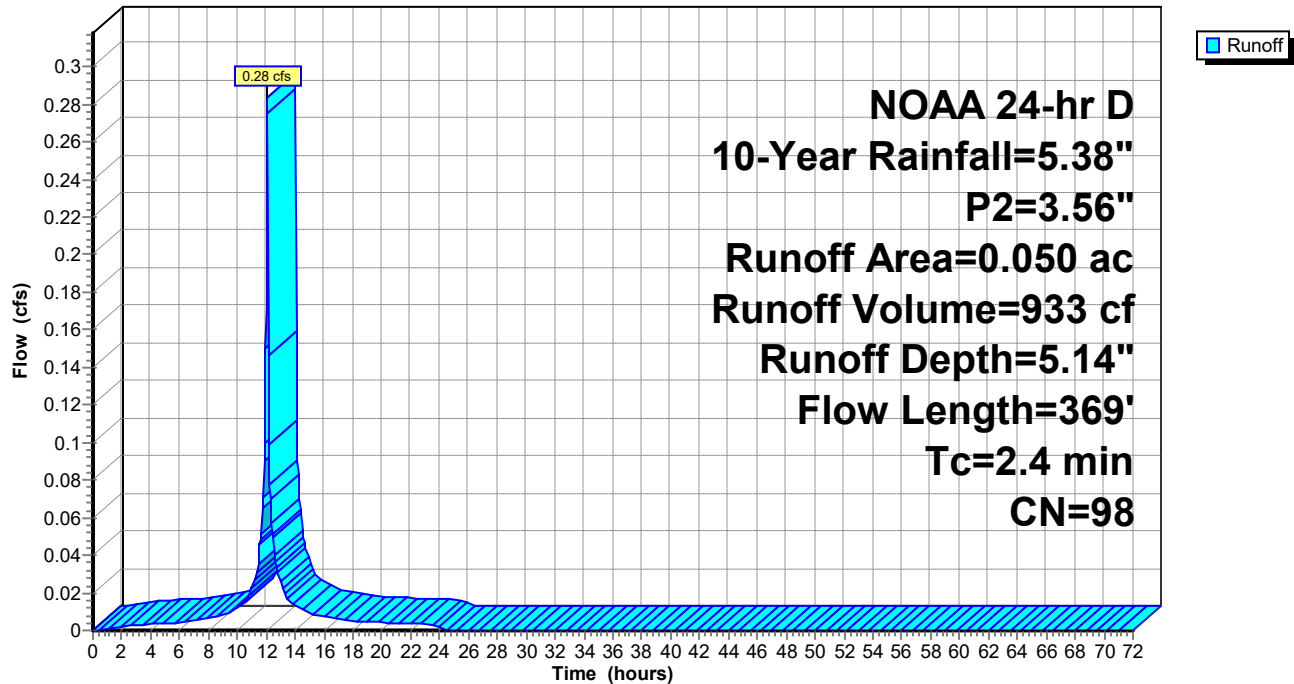
Runoff = 0.28 cfs @ 12.08 hrs, Volume= 933 cf, Depth= 5.14"
 Routed to Pond K : BMP-K UG Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description			
0.050	98	Roofs, HSG B			
0.050		100.00% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 1.61 cfs @ 12.24 hrs, Volume= 7,141 cf, Depth= 1.60"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

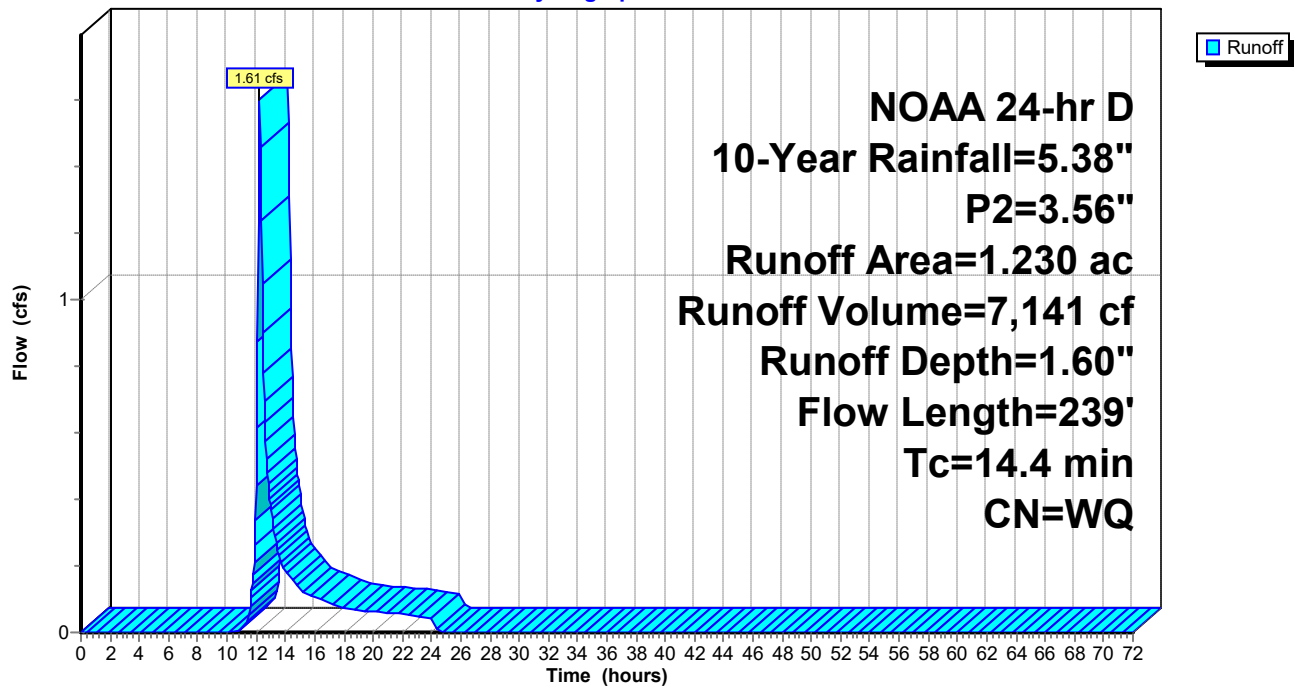
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.4	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.34 cfs @ 12.05 hrs, Volume= 1,120 cf, Depth= 5.14"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

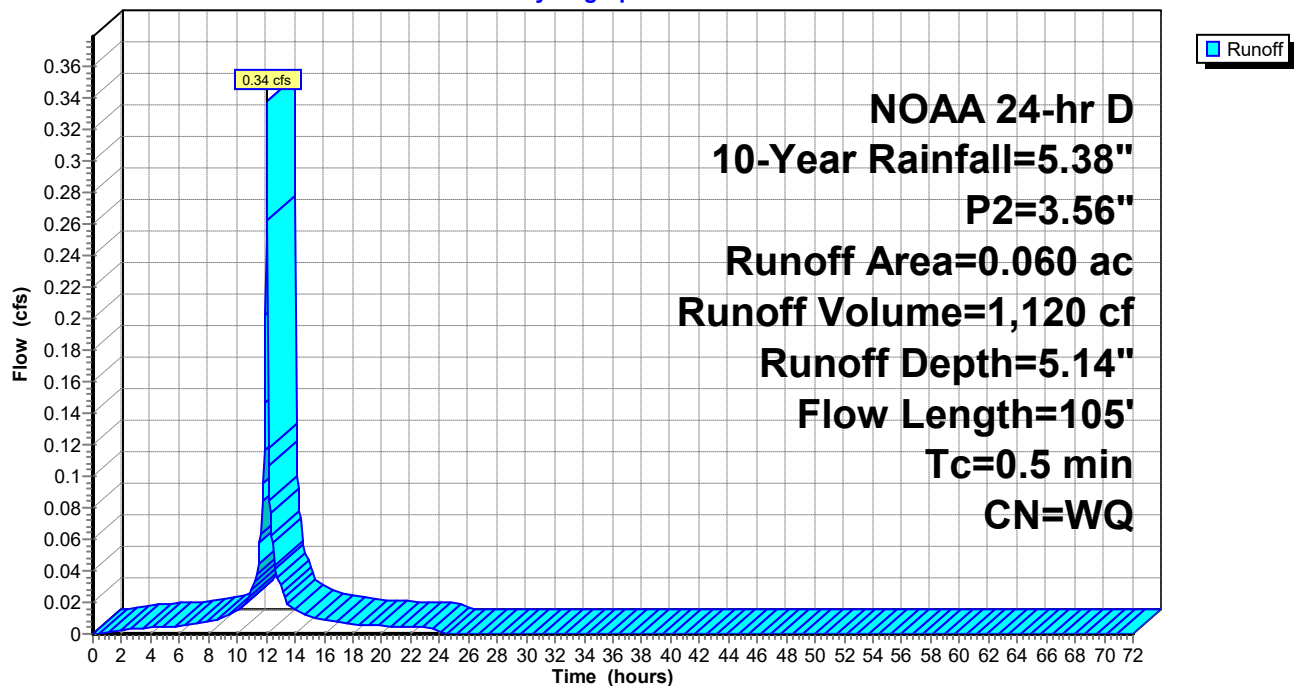
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 8.52 cfs @ 12.08 hrs, Volume= 28,002 cf, Depth= 5.14"
 Routed to Pond P : BMP-P Bioretention Basin

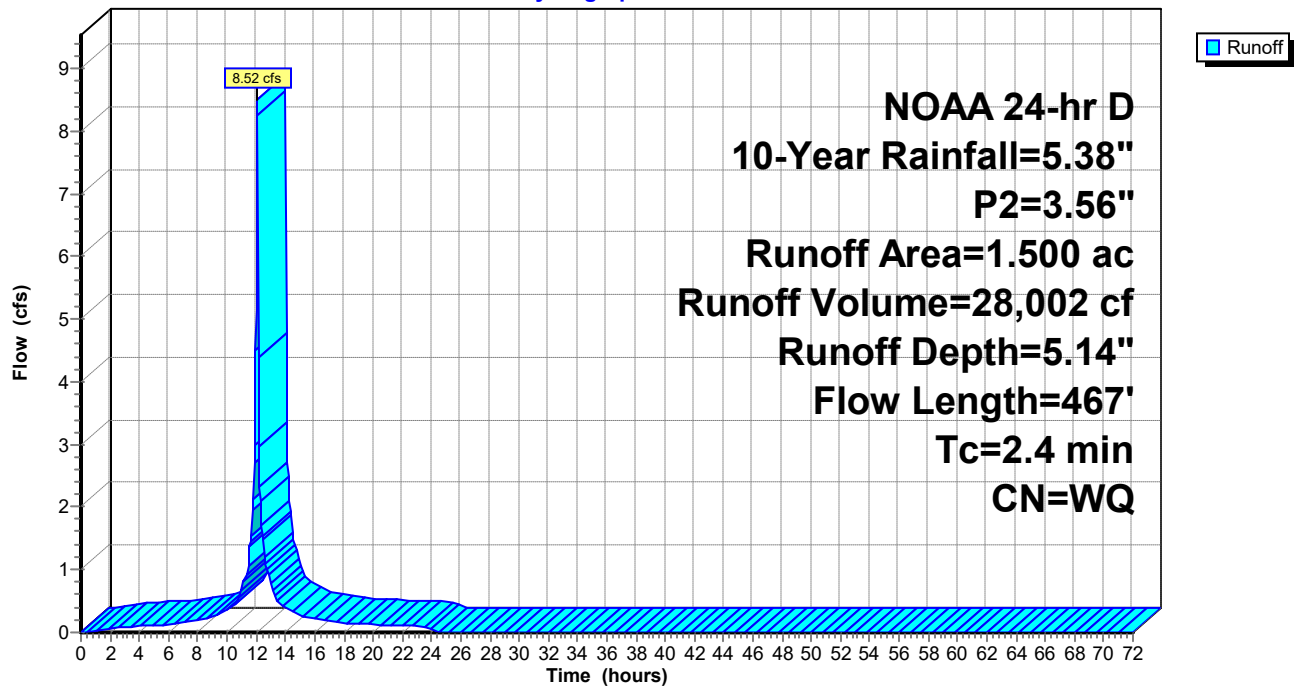
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.10		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.4	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



Summary for Subcatchment 57S: P-DA-5P PER

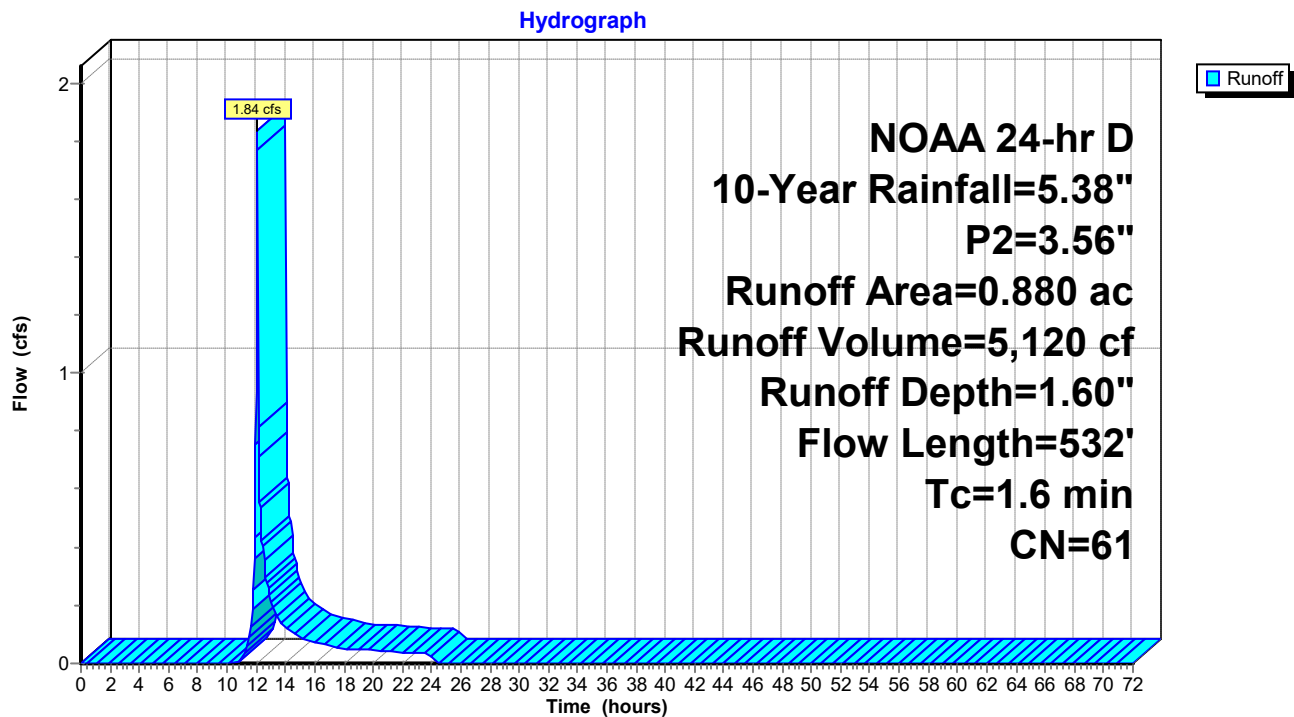
Runoff = 1.84 cfs @ 12.08 hrs, Volume= 5,120 cf, Depth= 1.60"
 Routed to Pond P : BMP-P Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER



Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 1.62 cfs @ 12.12 hrs, Volume= 5,240 cf, Depth= 1.55"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

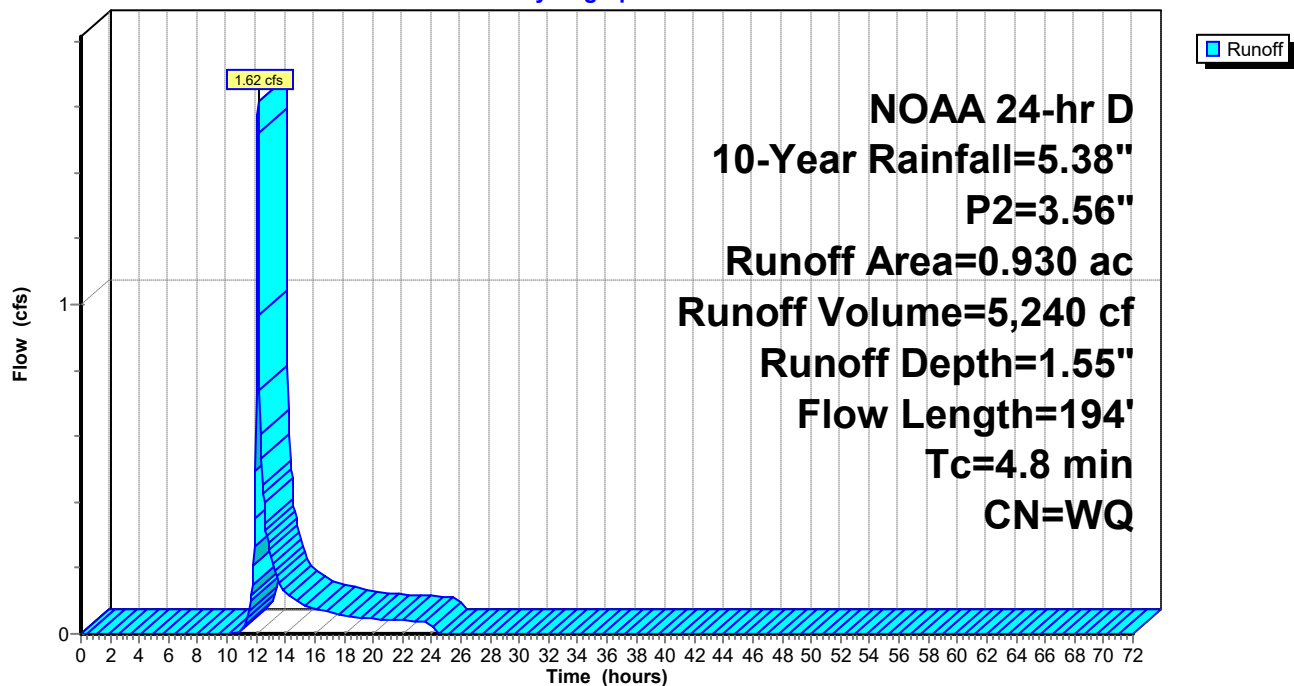
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.8	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Hydrograph



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 4.69 cfs @ 12.08 hrs, Volume= 15,308 cf, Depth= 5.14"
 Routed to Link 66L : P-DA-5R TOTAL

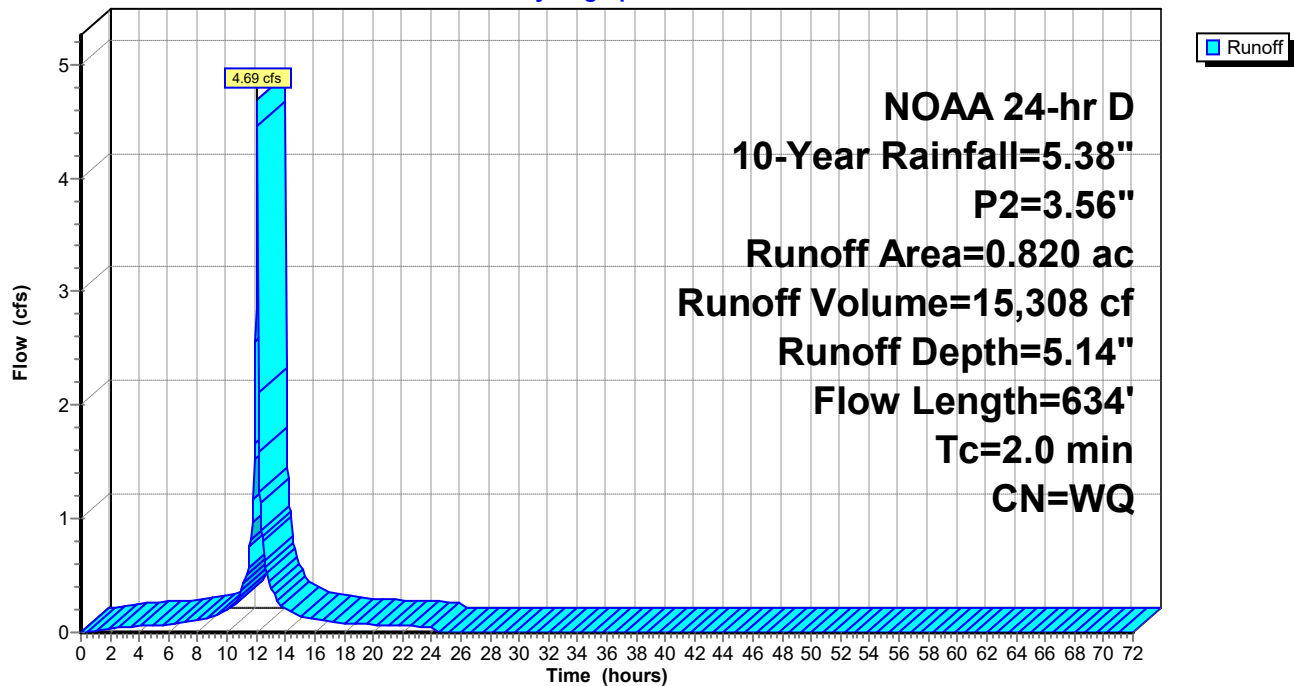
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0370	1.86		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.0	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

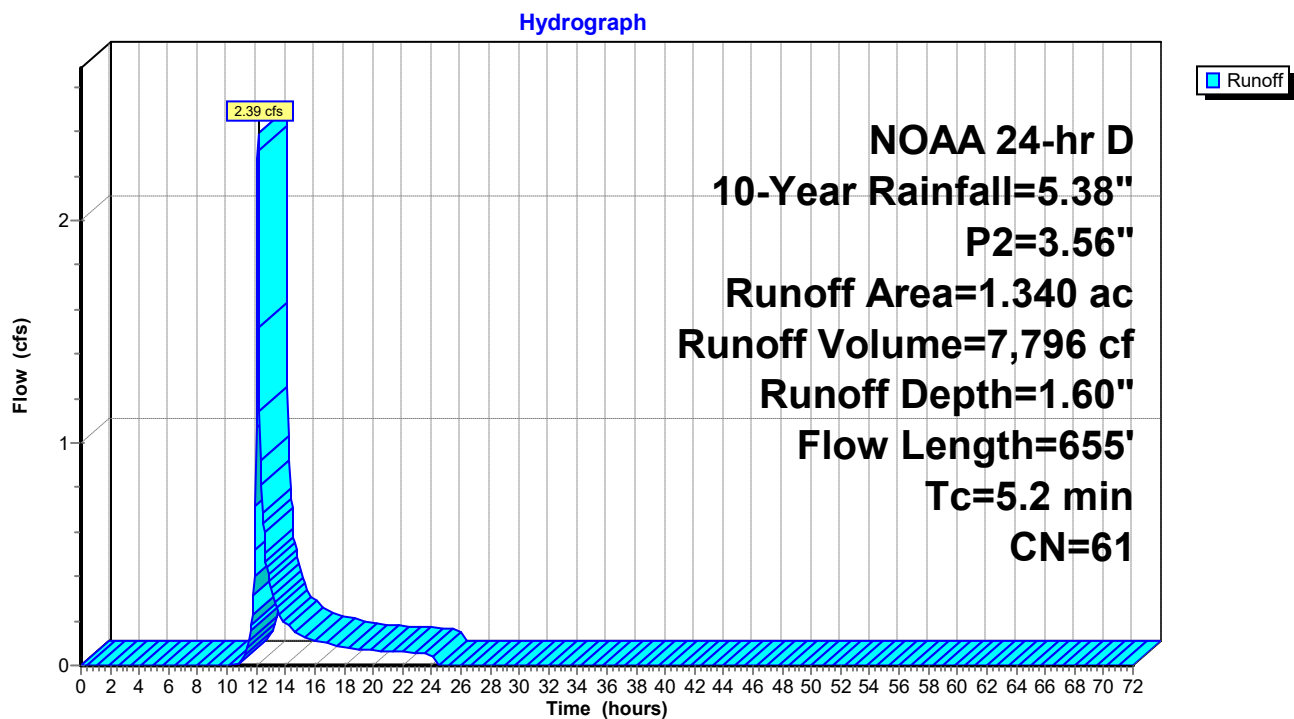
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 7,796 cf, Depth= 1.60"
 Routed to Link 66L : P-DA-5R TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year Rainfall=5.38", P2=3.56"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	44	0.0500	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
5.2	655	Total			

Subcatchment 64S: P-DA-5R PER



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 2.90" for 10-Year event
 Inflow = 2.32 cfs @ 12.08 hrs, Volume= 8,043 cf
 Outflow = 0.41 cfs @ 12.56 hrs, Volume= 6,809 cf, Atten= 82%, Lag= 29.0 min
 Primary = 0.41 cfs @ 12.56 hrs, Volume= 6,809 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 553.36' @ 12.56 hrs Surf.Area= 2,507 sf Storage= 3,634 cf

Plug-Flow detention time= 218.9 min calculated for 6,804 cf (85% of inflow)
 Center-of-Mass det. time= 145.9 min (936.9 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

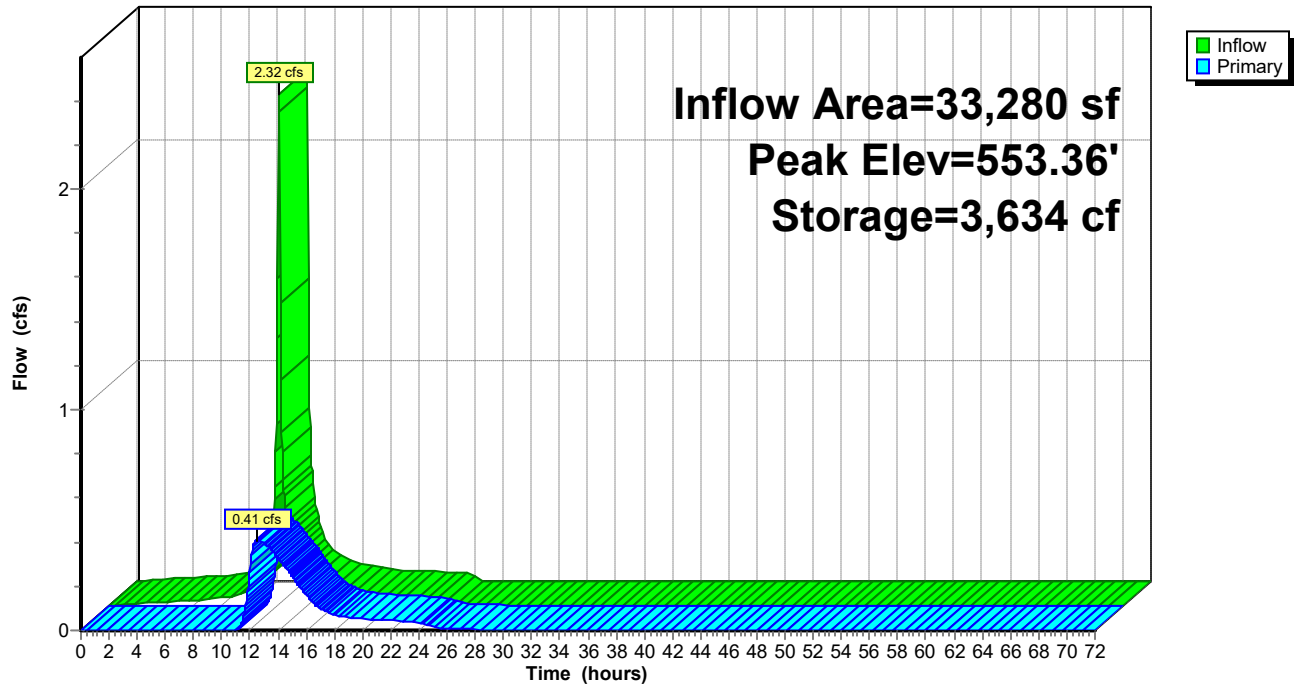
Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.41 cfs @ 12.56 hrs HW=553.35' (Free Discharge)

1=Culvert (Passes 0.41 cfs of 11.67 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.41 cfs @ 4.66 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 3.41" for 10-Year event
 Inflow = 13.79 cfs @ 12.09 hrs, Volume= 54,558 cf
 Outflow = 1.44 cfs @ 13.46 hrs, Volume= 47,280 cf, Atten= 90%, Lag= 82.5 min
 Primary = 1.44 cfs @ 13.46 hrs, Volume= 47,280 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 576.05' @ 13.46 hrs Surf.Area= 14,671 sf Storage= 29,310 cf

Plug-Flow detention time= 362.7 min calculated for 47,247 cf (87% of inflow)
 Center-of-Mass det. time= 294.8 min (1,101.1 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

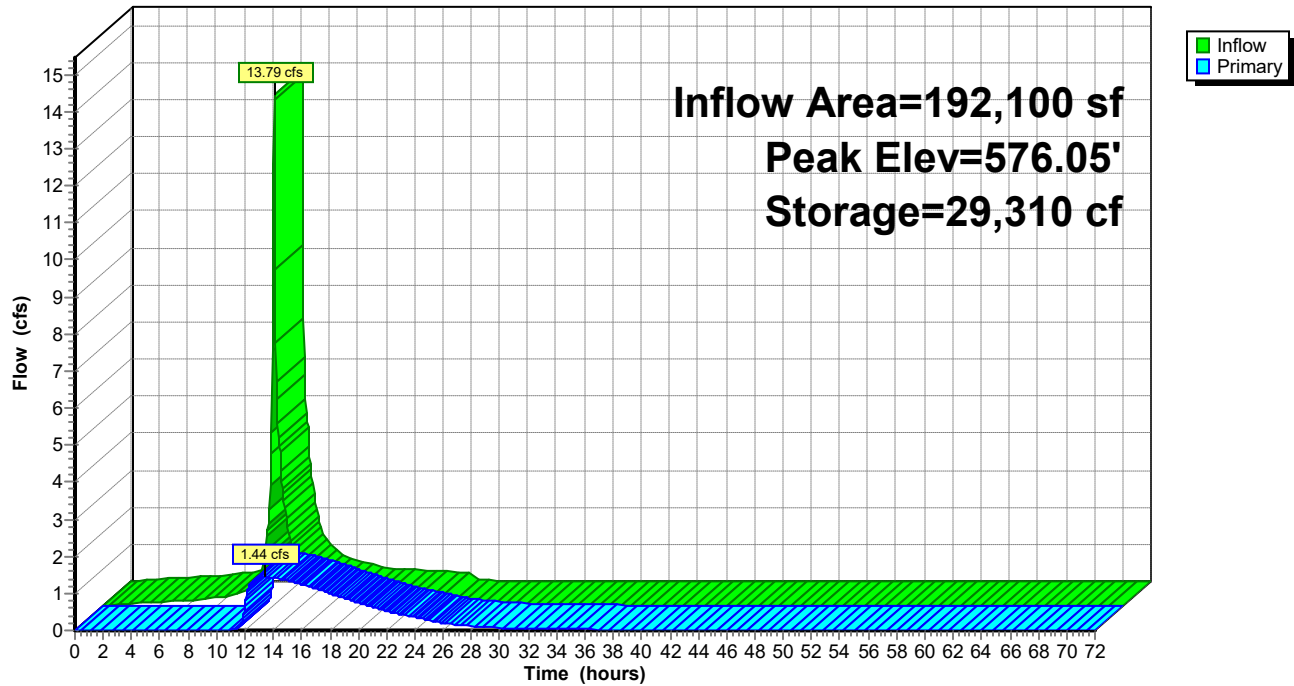
Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.44 cfs @ 13.46 hrs HW=576.05' (Free Discharge)

1=Culvert (Passes 1.44 cfs of 20.61 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.44 cfs @ 5.40 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 3.21" for 10-Year event
 Inflow = 7.56 cfs @ 12.10 hrs, Volume= 31,387 cf
 Outflow = 0.49 cfs @ 14.78 hrs, Volume= 27,166 cf, Atten= 94%, Lag= 161.2 min
 Primary = 0.49 cfs @ 14.78 hrs, Volume= 27,166 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 562.35' @ 14.78 hrs Surf.Area= 9,833 sf Storage= 19,672 cf

Plug-Flow detention time= 741.3 min calculated for 27,147 cf (86% of inflow)
 Center-of-Mass det. time= 667.7 min (1,483.2 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.49 cfs @ 14.78 hrs HW=562.35' (Free Discharge)

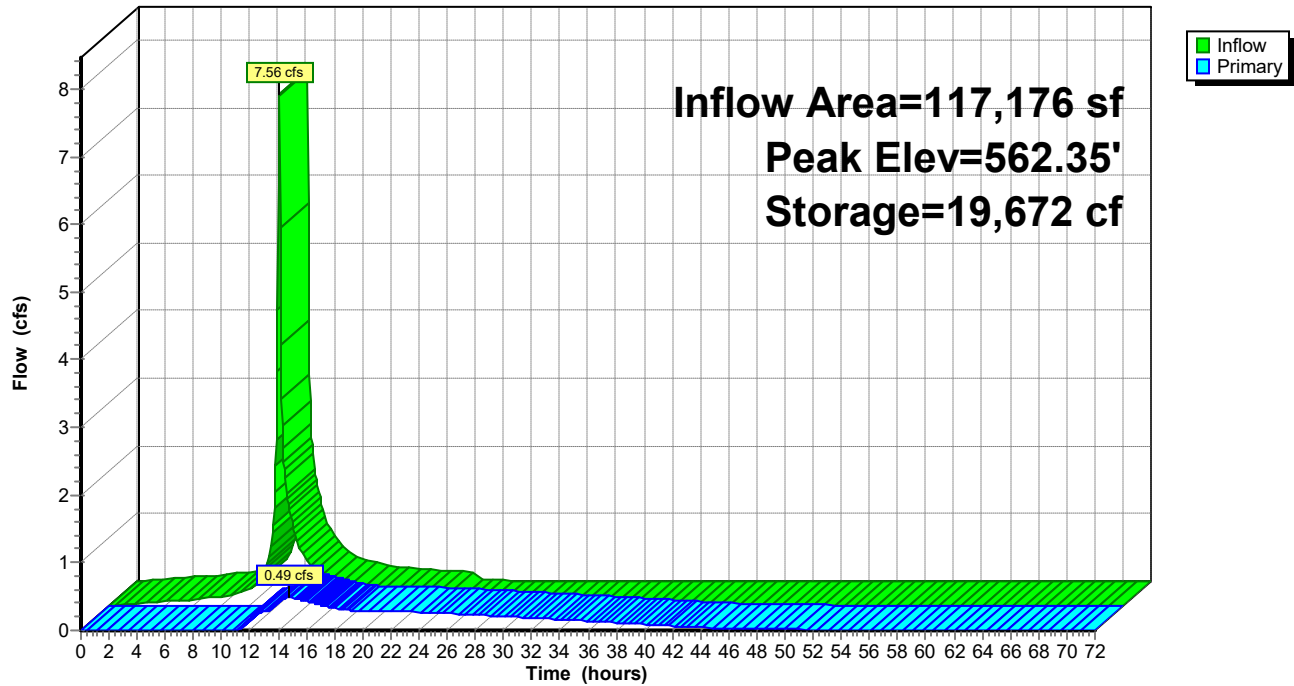
1=Culvert (Passes 0.49 cfs of 17.57 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.31 cfs @ 6.23 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 1.26 fps)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 4.18" for 10-Year event
 Inflow = 2.52 cfs @ 12.07 hrs, Volume= 8,340 cf
 Outflow = 1.15 cfs @ 12.17 hrs, Volume= 6,819 cf, Atten= 55%, Lag= 5.5 min
 Primary = 1.15 cfs @ 12.17 hrs, Volume= 6,819 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 600.71' @ 12.16 hrs Surf.Area= 2,230 sf Storage= 3,229 cf

Plug-Flow detention time= 200.1 min calculated for 6,815 cf (82% of inflow)
 Center-of-Mass det. time= 119.9 min (877.7 - 757.8)

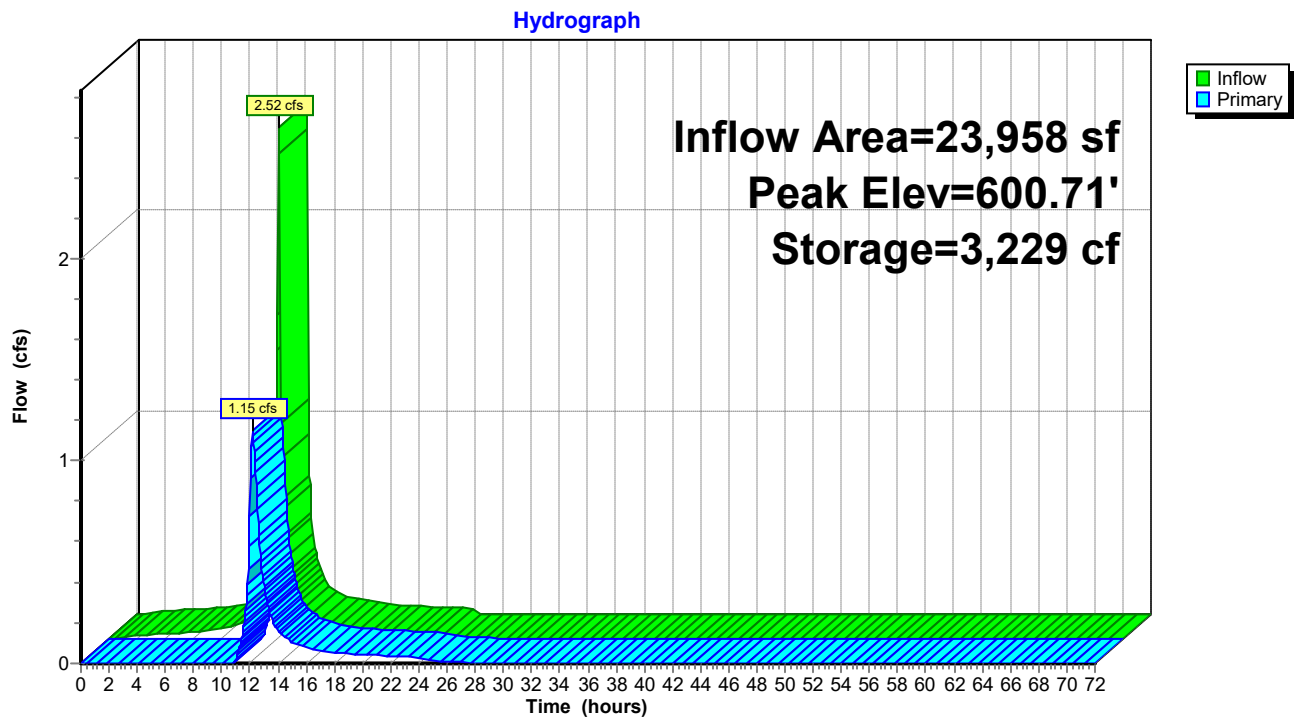
Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.14 cfs @ 12.17 hrs HW=600.70' (Free Discharge)

↑ **1=Culvert** (Passes 1.14 cfs of 7.85 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.14 cfs @ 3.26 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond F: UG INFILTRATION BASIN F

Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 3.17" for 10-Year event
 Inflow = 2.91 cfs @ 12.08 hrs, Volume= 9,094 cf
 Outflow = 0.58 cfs @ 12.38 hrs, Volume= 7,098 cf, Atten= 80%, Lag= 18.1 min
 Primary = 0.58 cfs @ 12.38 hrs, Volume= 7,098 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.22' @ 12.38 hrs Surf.Area= 4,001 sf Storage= 4,354 cf

Plug-Flow detention time= 271.5 min calculated for 7,098 cf (78% of inflow)
 Center-of-Mass det. time= 177.5 min (958.9 - 781.4)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

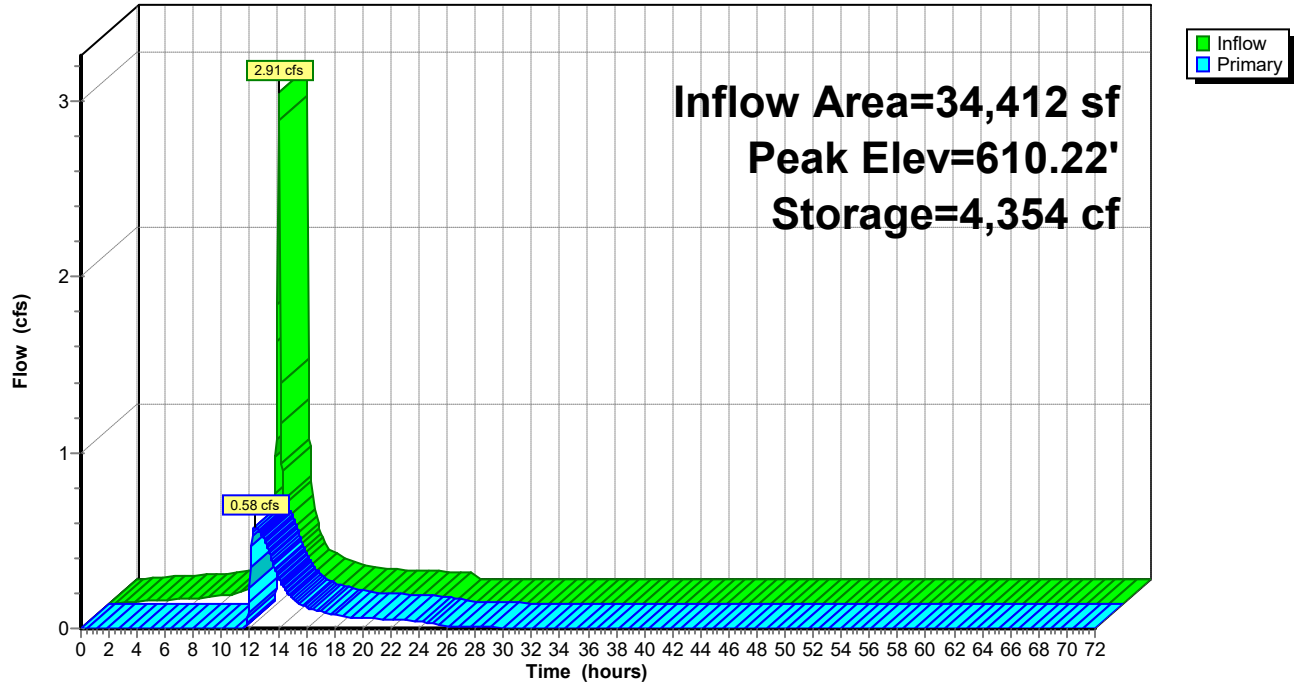
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.58 cfs @ 12.38 hrs HW=610.22' (Free Discharge)

↑ **1=Culvert** (Passes 0.58 cfs of 5.79 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.58 cfs @ 2.93 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 3.48" for 10-Year event
 Inflow = 3.98 cfs @ 12.08 hrs, Volume= 12,873 cf
 Outflow = 1.60 cfs @ 12.19 hrs, Volume= 10,271 cf, Atten= 60%, Lag= 6.8 min
 Primary = 1.60 cfs @ 12.19 hrs, Volume= 10,271 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.80' @ 12.19 hrs Surf.Area= 7,112 sf Storage= 5,335 cf

Plug-Flow detention time= 207.3 min calculated for 10,264 cf (80% of inflow)
 Center-of-Mass det. time= 119.3 min (892.6 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

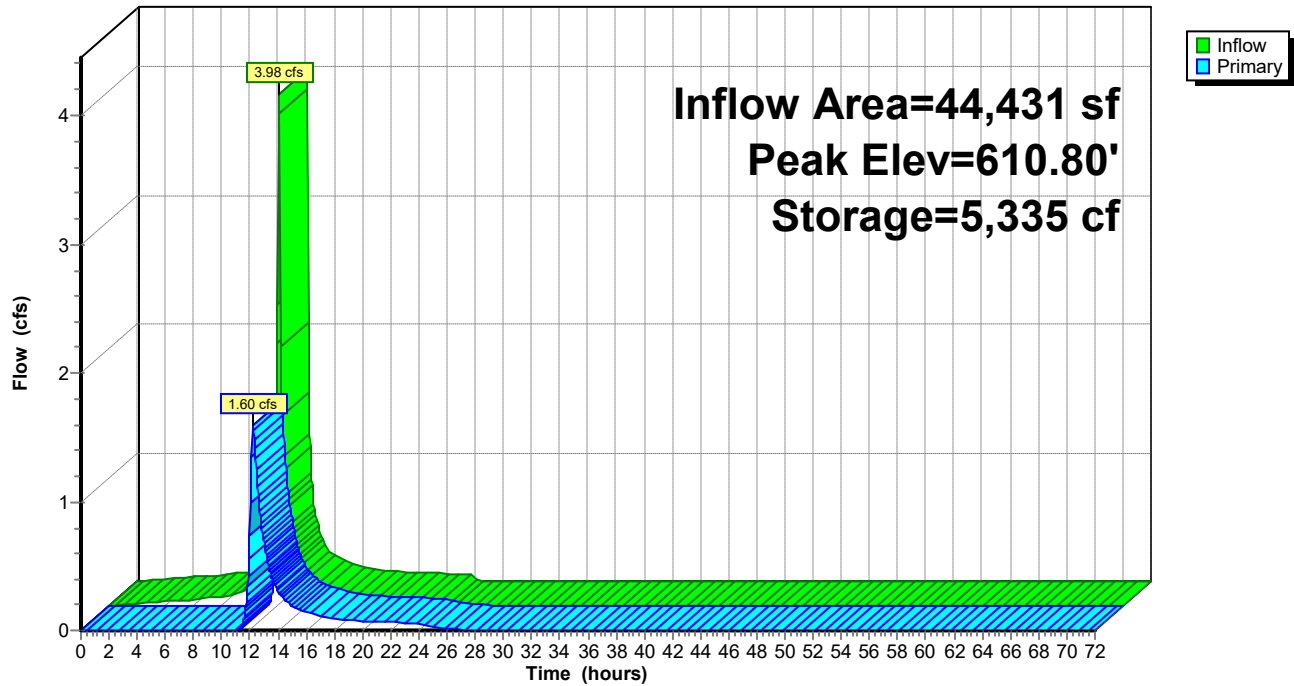
Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.59 cfs @ 12.19 hrs HW=610.79' (Free Discharge)

1=Culvert (Passes 1.59 cfs of 13.45 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.59 cfs @ 2.02 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 3.71" for 10-Year event
 Inflow = 4.00 cfs @ 12.08 hrs, Volume= 12,665 cf
 Outflow = 1.19 cfs @ 12.24 hrs, Volume= 10,338 cf, Atten= 70%, Lag= 9.6 min
 Primary = 1.19 cfs @ 12.24 hrs, Volume= 10,338 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 615.16' @ 12.24 hrs Surf.Area= 3,175 sf Storage= 5,105 cf

Plug-Flow detention time= 189.3 min calculated for 10,330 cf (82% of inflow)
 Center-of-Mass det. time= 106.8 min (874.1 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

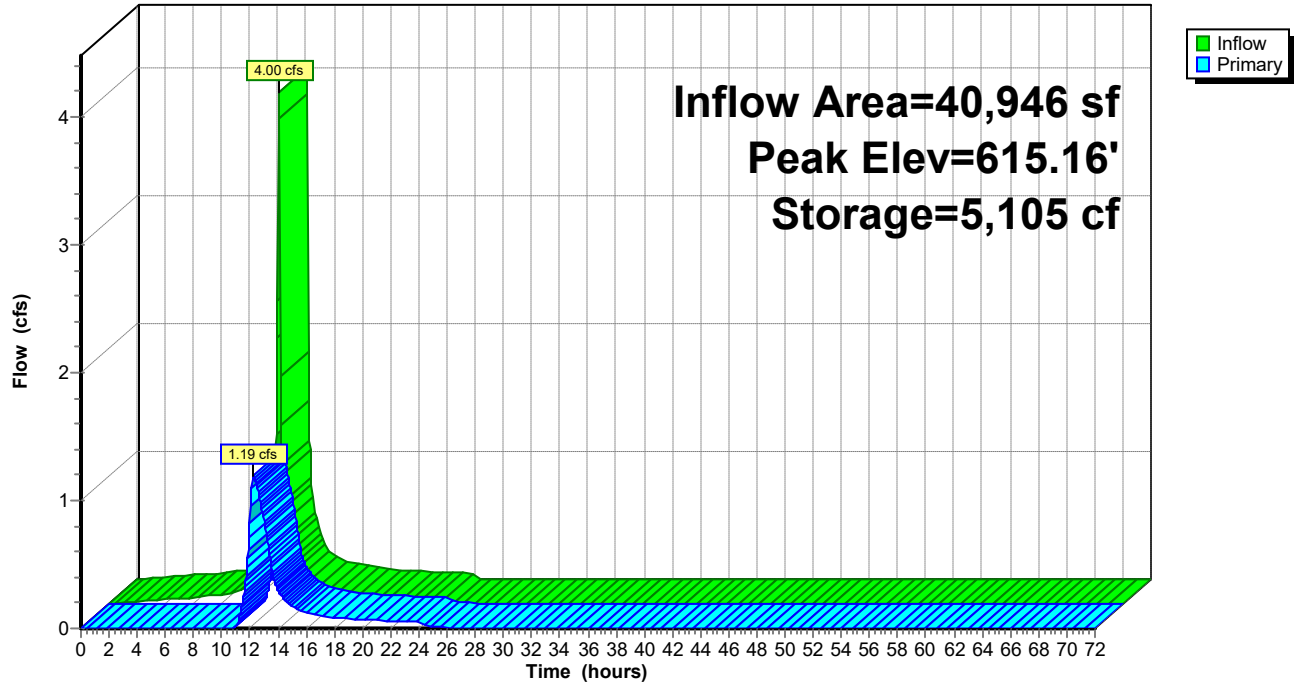
Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.19 cfs @ 12.24 hrs HW=615.16' (Free Discharge)

↑ **1=Culvert** (Passes 1.19 cfs of 17.86 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.19 cfs @ 4.27 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 3.81" for 10-Year event
 Inflow = 3.54 cfs @ 12.09 hrs, Volume= 11,756 cf
 Outflow = 0.29 cfs @ 13.19 hrs, Volume= 9,748 cf, Atten= 92%, Lag= 66.3 min
 Primary = 0.29 cfs @ 13.19 hrs, Volume= 9,748 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 609.47' @ 13.19 hrs Surf.Area= 3,142 sf Storage= 6,776 cf

Plug-Flow detention time= 357.7 min calculated for 9,742 cf (83% of inflow)
 Center-of-Mass det. time= 280.3 min (1,046.5 - 766.2)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

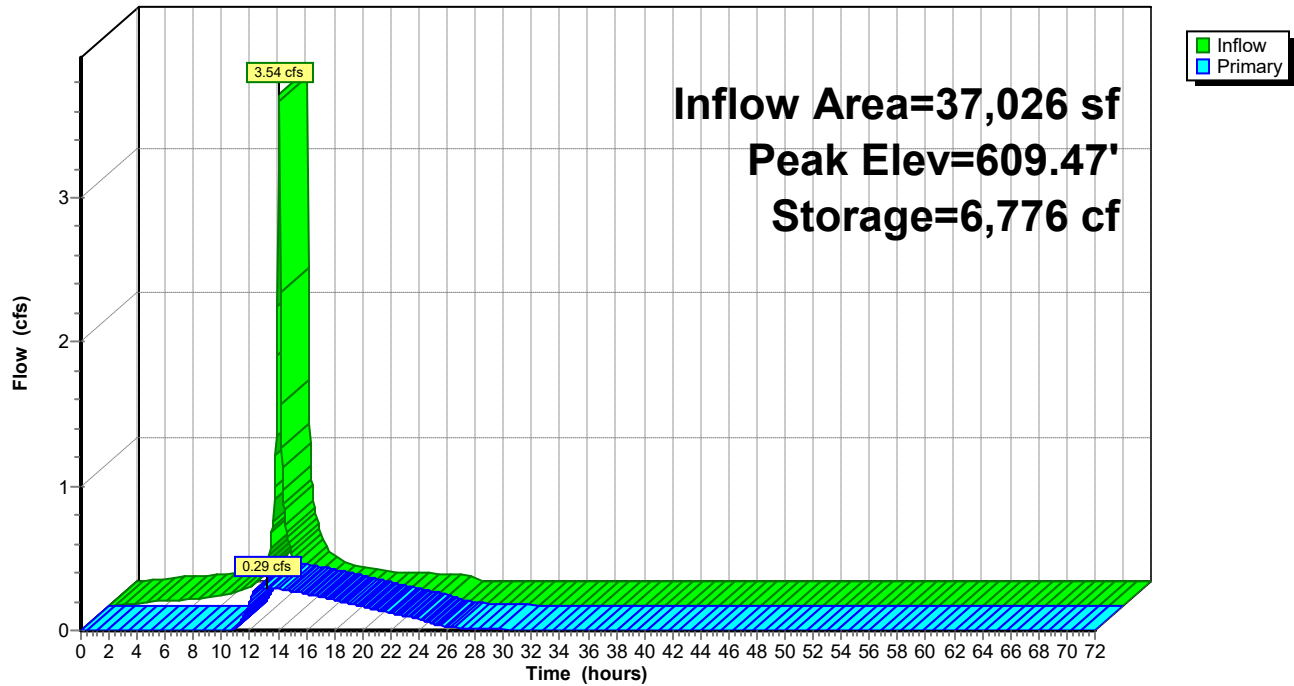
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.29 cfs @ 13.19 hrs HW=609.47' (Free Discharge)

1=Culvert (Passes 0.29 cfs of 18.64 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.29 cfs @ 5.97 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 3.57" for 10-Year event
 Inflow = 5.05 cfs @ 12.08 hrs, Volume= 26,682 cf
 Outflow = 1.66 cfs @ 12.32 hrs, Volume= 23,586 cf, Atten= 67%, Lag= 14.2 min
 Primary = 1.66 cfs @ 12.32 hrs, Volume= 23,586 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 596.21' @ 12.32 hrs Surf.Area= 2,960 sf Storage= 8,183 cf

Plug-Flow detention time= 202.5 min calculated for 23,586 cf (88% of inflow)
 Center-of-Mass det. time= 132.6 min (1,000.7 - 868.0)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

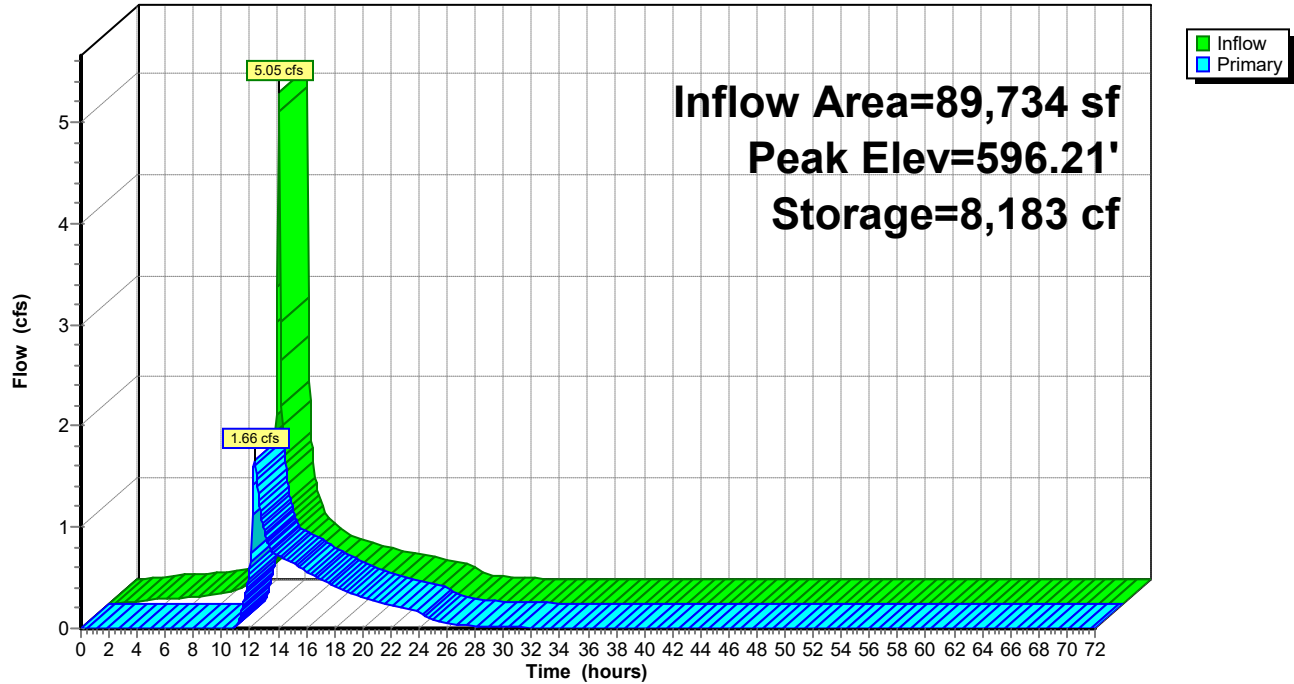
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.65 cfs @ 12.32 hrs HW=596.21' (Free Discharge)

- 1=Culvert (Passes 1.65 cfs of 12.79 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.83 cfs @ 6.09 fps)
- 3=Orifice/Grate (Orifice Controls 0.82 cfs @ 1.78 fps)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 3.90" for 10-Year event
 Inflow = 9.41 cfs @ 12.09 hrs, Volume= 30,557 cf
 Outflow = 5.52 cfs @ 12.16 hrs, Volume= 25,188 cf, Atten= 41%, Lag= 4.4 min
 Primary = 5.52 cfs @ 12.16 hrs, Volume= 25,188 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 569.86' @ 12.16 hrs Surf.Area= 6,669 sf Storage= 11,106 cf

Plug-Flow detention time= 196.5 min calculated for 25,188 cf (82% of inflow)
 Center-of-Mass det. time= 115.8 min (879.9 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

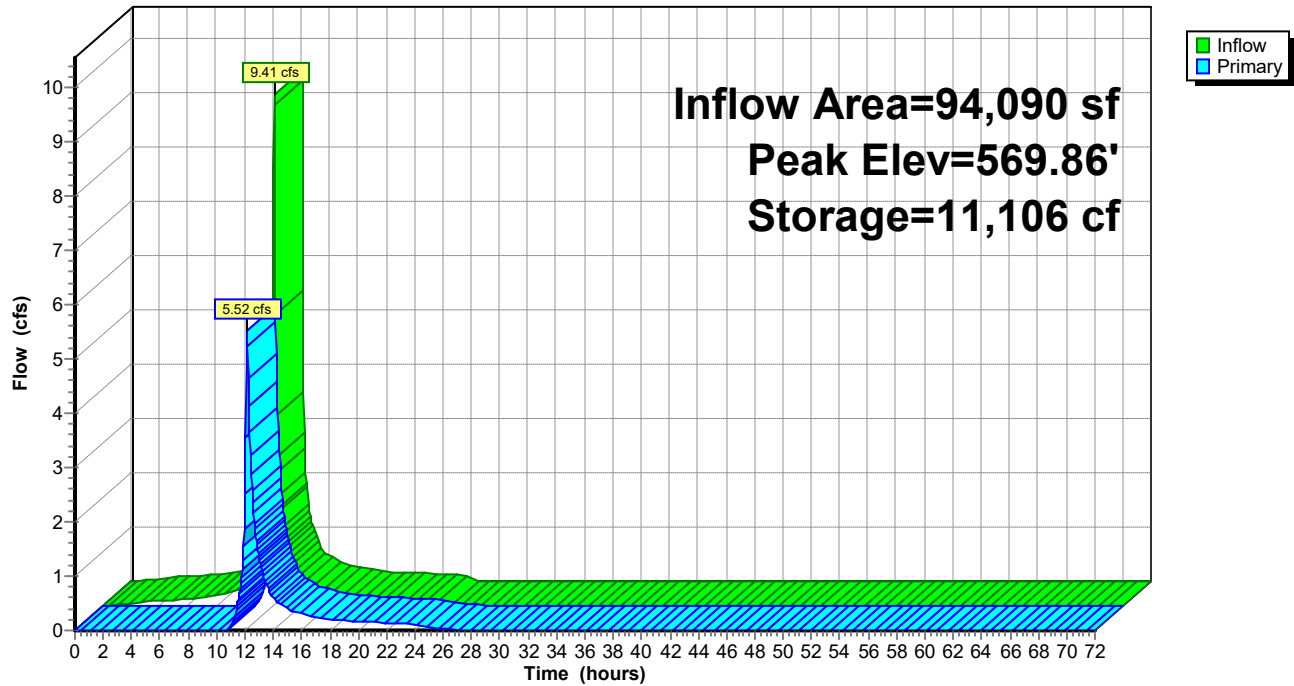
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.45 cfs @ 12.16 hrs HW=569.85' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 5.45 cfs of 26.20 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 3.65 cfs @ 3.35 fps)
 3=Broad-Crested Rectangular Weir (Weir Controls 1.80 cfs @ 1.71 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 3.73" for 10-Year event
 Inflow = 4.40 cfs @ 12.08 hrs, Volume= 14,204 cf
 Outflow = 1.69 cfs @ 12.20 hrs, Volume= 11,679 cf, Atten= 62%, Lag= 7.0 min
 Primary = 1.69 cfs @ 12.20 hrs, Volume= 11,679 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 598.79' @ 12.20 hrs Surf.Area= 2,702 sf Storage= 5,927 cf

Plug-Flow detention time= 207.3 min calculated for 11,671 cf (82% of inflow)
 Center-of-Mass det. time= 127.3 min (894.5 - 767.3)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.69 cfs @ 12.20 hrs HW=598.79' (Free Discharge)

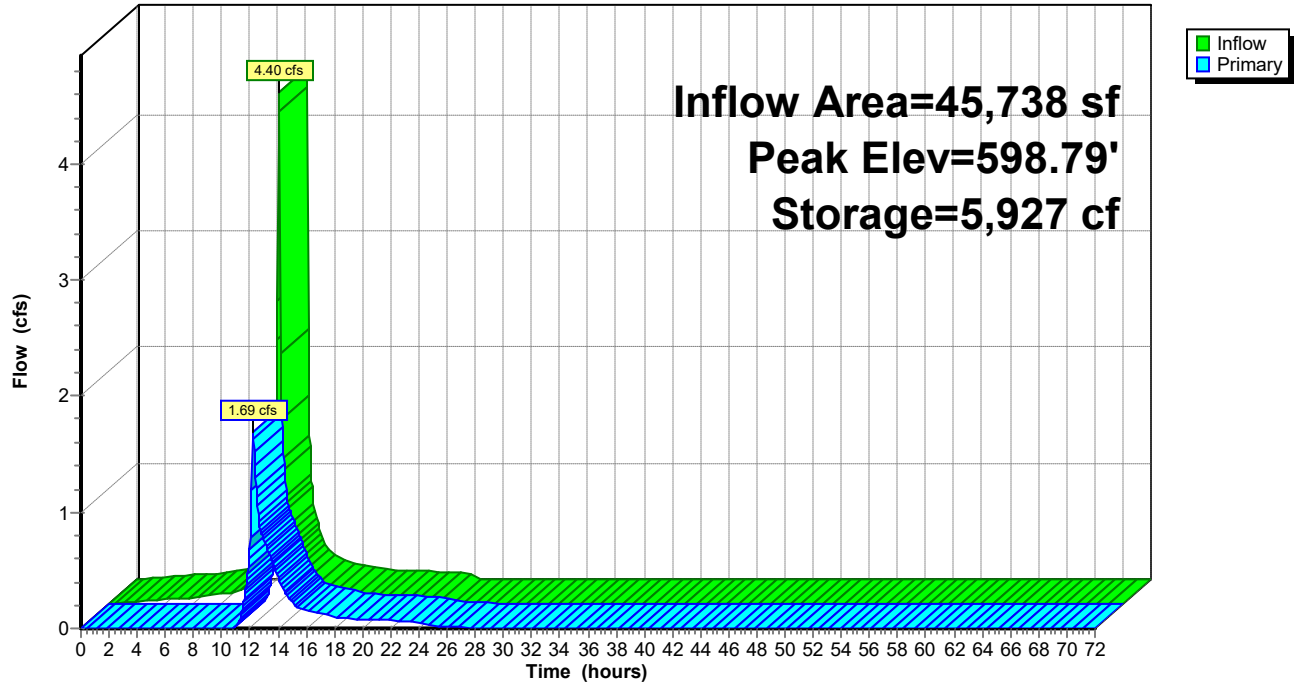
1=Culvert (Passes 1.69 cfs of 17.82 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.96 cfs @ 4.90 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.73 cfs @ 1.75 fps)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 3.60" for 10-Year event
 Inflow = 11.41 cfs @ 12.09 hrs, Volume= 44,800 cf
 Outflow = 4.88 cfs @ 12.23 hrs, Volume= 39,151 cf, Atten= 57%, Lag= 8.8 min
 Primary = 4.88 cfs @ 12.23 hrs, Volume= 39,151 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 578.45' @ 12.23 hrs Surf.Area= 6,598 sf Storage= 14,655 cf

Plug-Flow detention time= 178.5 min calculated for 39,151 cf (87% of inflow)
 Center-of-Mass det. time= 111.2 min (910.0 - 798.8)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.86 cfs @ 12.23 hrs HW=578.45' (Free Discharge)

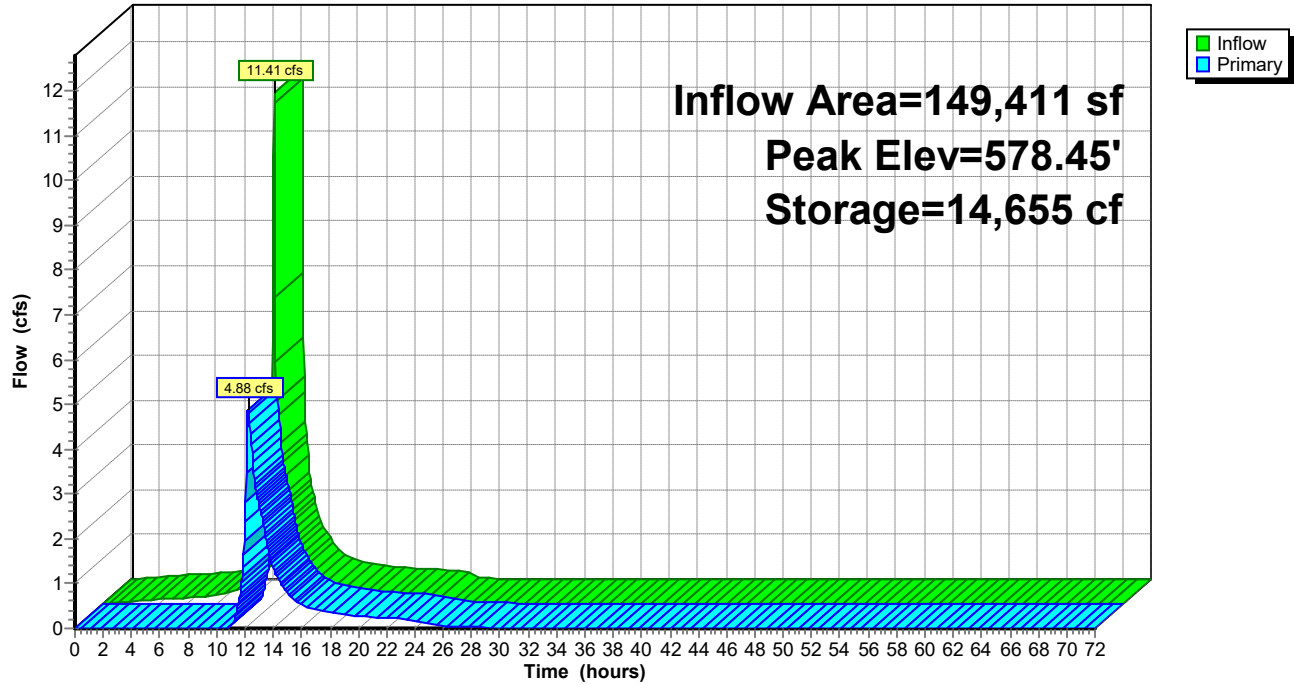
1=Culvert (Passes 4.86 cfs of 15.67 cfs potential flow)

2=Orifice/Grate (Orifice Controls 3.68 cfs @ 4.68 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.18 cfs @ 1.62 fps)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 3.11" for 10-Year event
 Inflow = 15.23 cfs @ 12.12 hrs, Volume= 87,443 cf
 Outflow = 5.05 cfs @ 12.95 hrs, Volume= 83,611 cf, Atten= 67%, Lag= 50.1 min
 Primary = 5.05 cfs @ 12.95 hrs, Volume= 83,611 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 564.58' @ 12.95 hrs Surf.Area= 15,447 sf Storage= 29,018 cf

Plug-Flow detention time= 161.1 min calculated for 83,611 cf (96% of inflow)
 Center-of-Mass det. time= 127.5 min (997.1 - 869.7)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

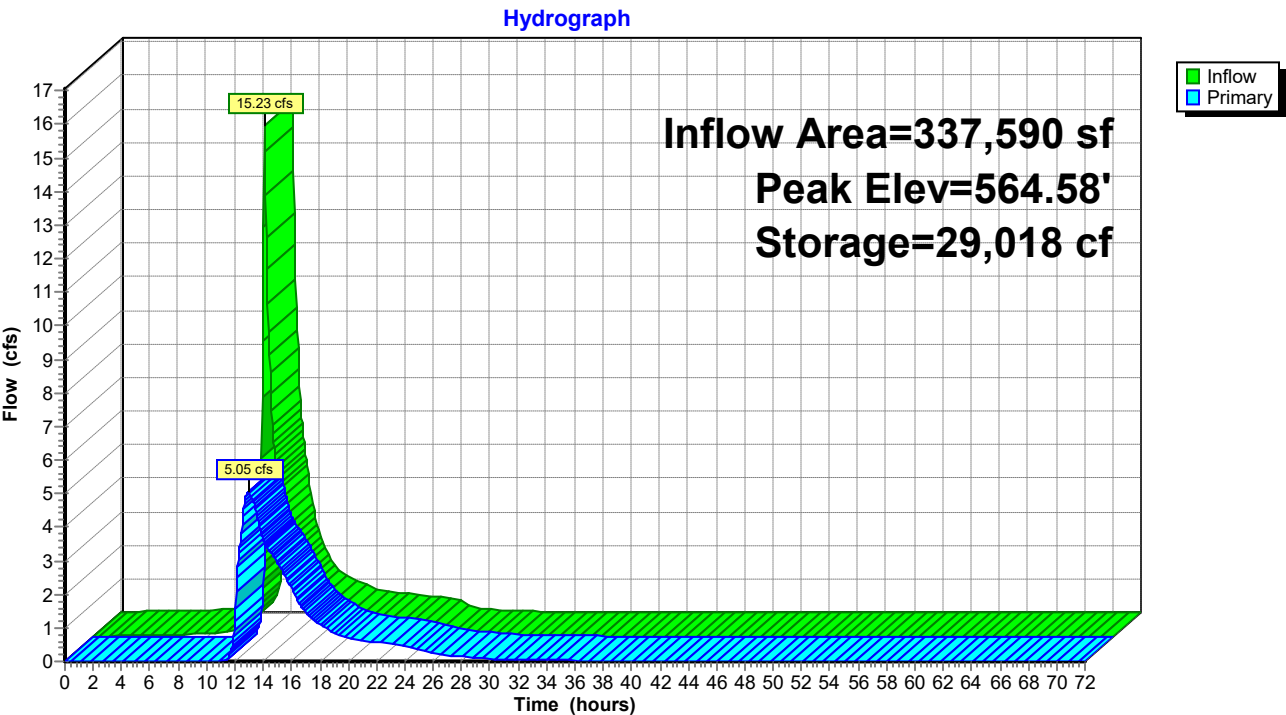
Primary OutFlow Max=5.05 cfs @ 12.95 hrs HW=564.58' (Free Discharge)

1=Culvert (Passes 5.05 cfs of 52.82 cfs potential flow)

2=Orifice/Grate (Orifice Controls 3.88 cfs @ 5.59 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.16 cfs @ 1.72 fps)

Pond R: BMP-R Bioretention Basin



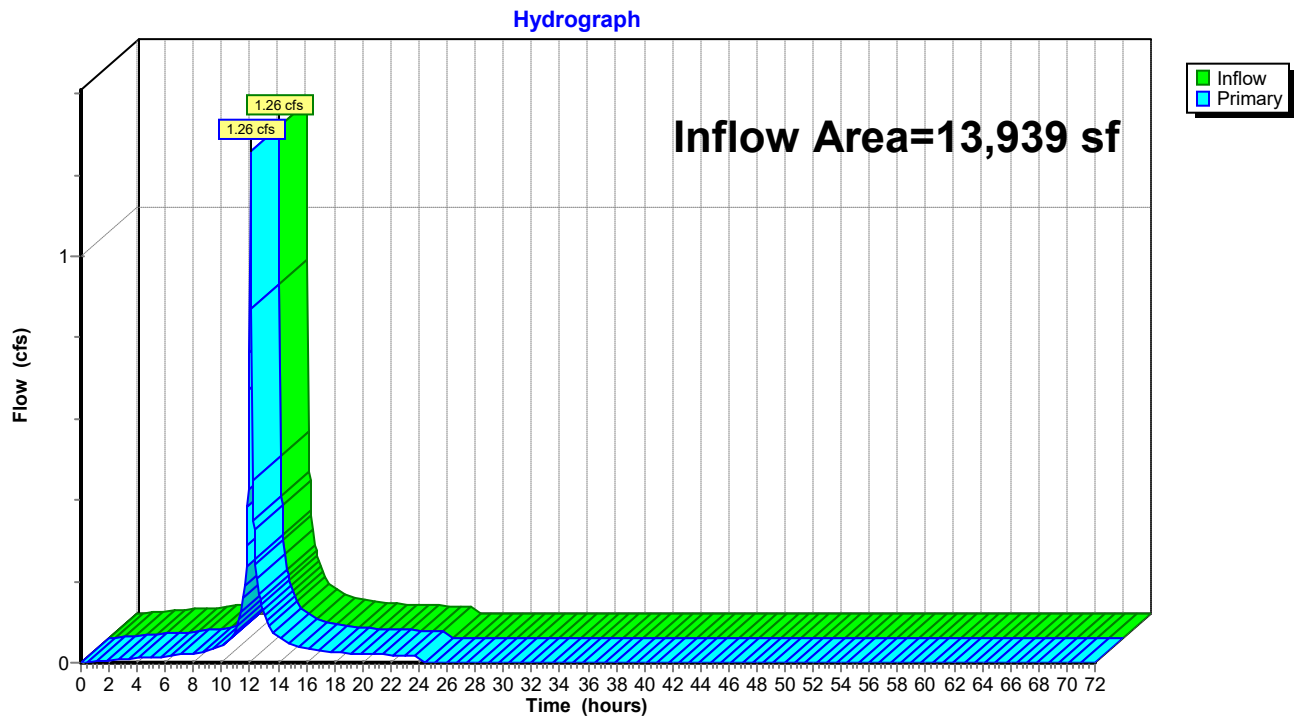
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 3.48" for 10-Year event
Inflow = 1.26 cfs @ 12.08 hrs, Volume= 4,046 cf
Primary = 1.26 cfs @ 12.08 hrs, Volume= 4,046 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

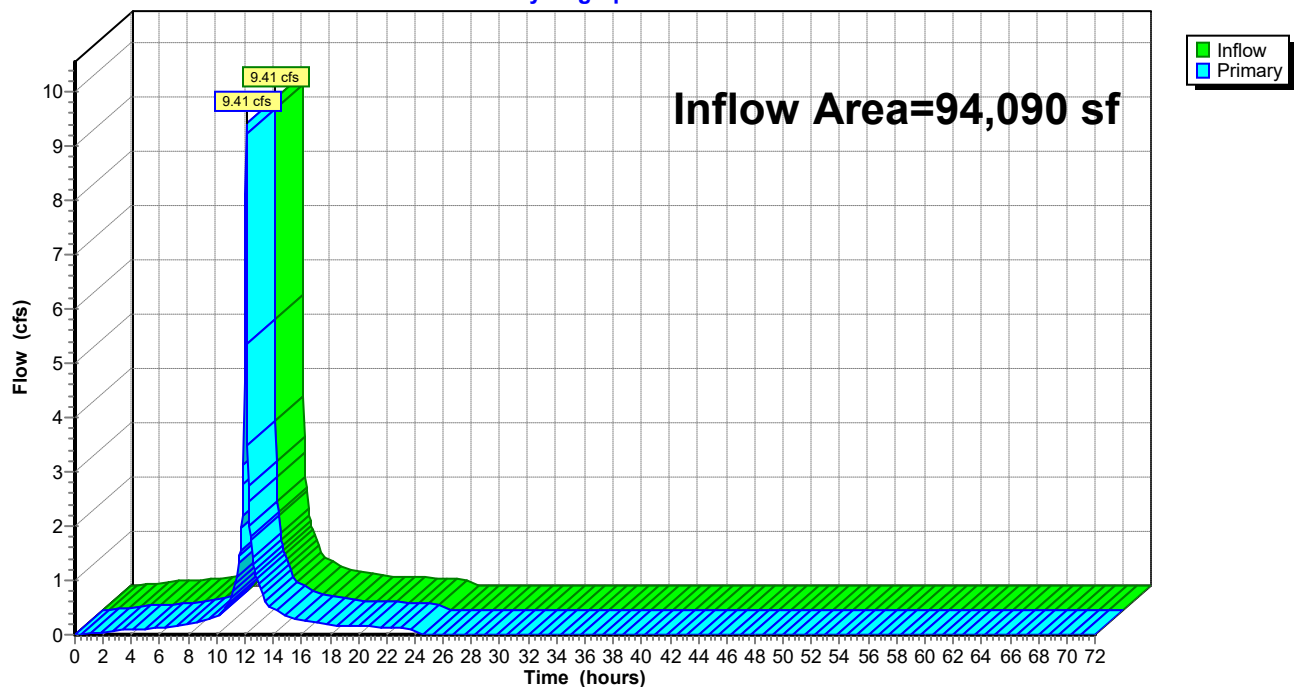
Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 3.90" for 10-Year event
Inflow = 9.41 cfs @ 12.09 hrs, Volume= 30,557 cf
Primary = 9.41 cfs @ 12.09 hrs, Volume= 30,557 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

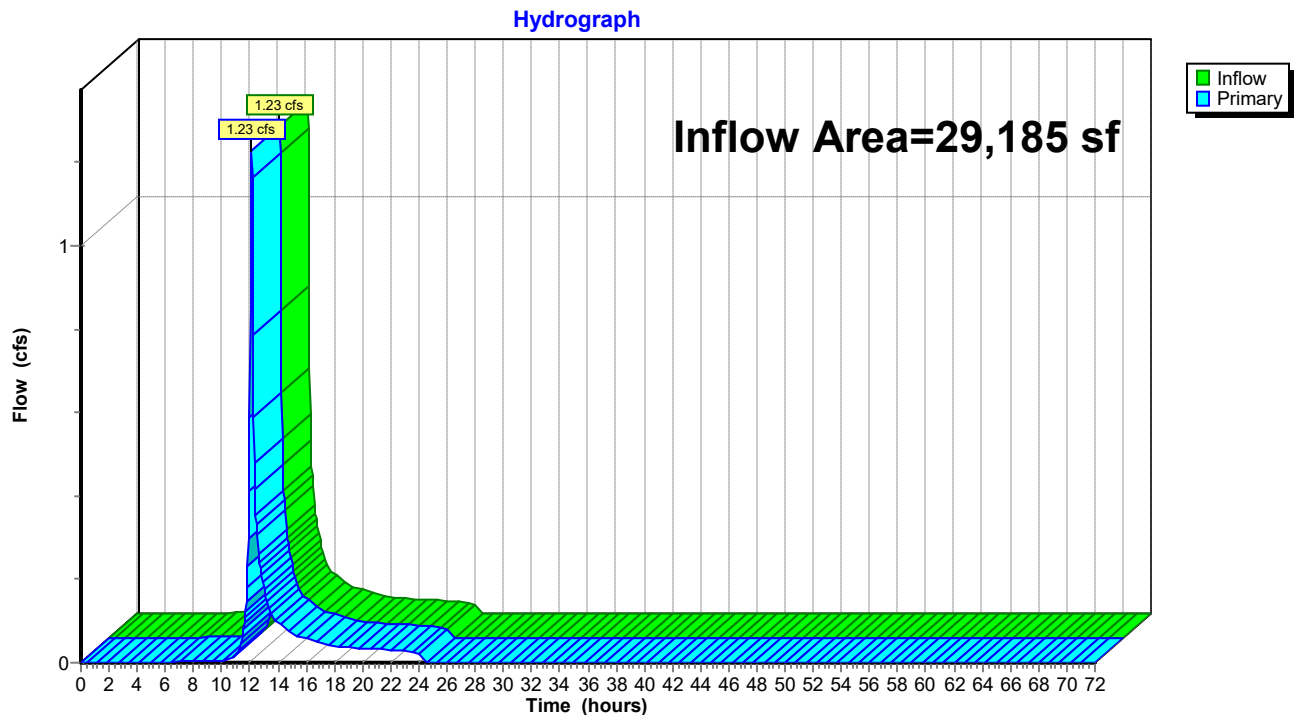
Hydrograph



Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 1.71" for 10-Year event
Inflow = 1.23 cfs @ 12.12 hrs, Volume= 4,155 cf
Primary = 1.23 cfs @ 12.12 hrs, Volume= 4,155 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

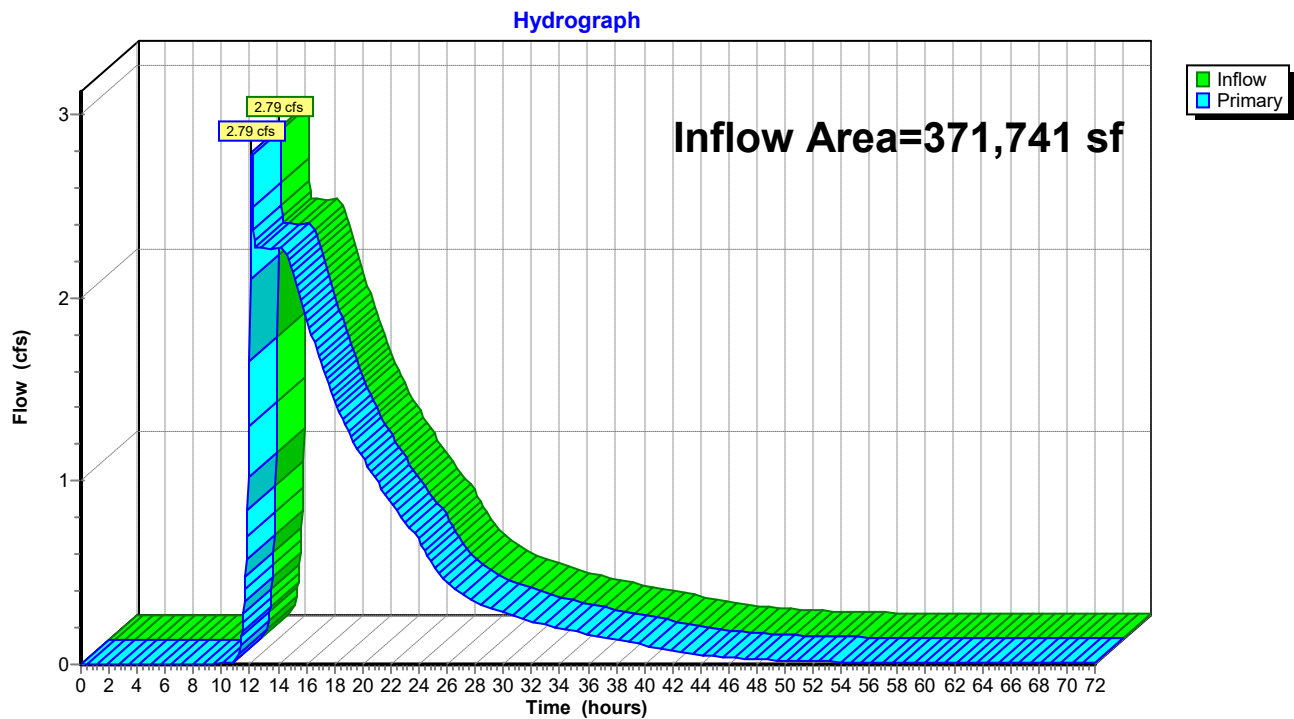
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 2.76" for 10-Year event
Inflow = 2.79 cfs @ 12.14 hrs, Volume= 85,410 cf
Primary = 2.79 cfs @ 12.14 hrs, Volume= 85,410 cf, Atten= 0%, Lag= 0.0 min

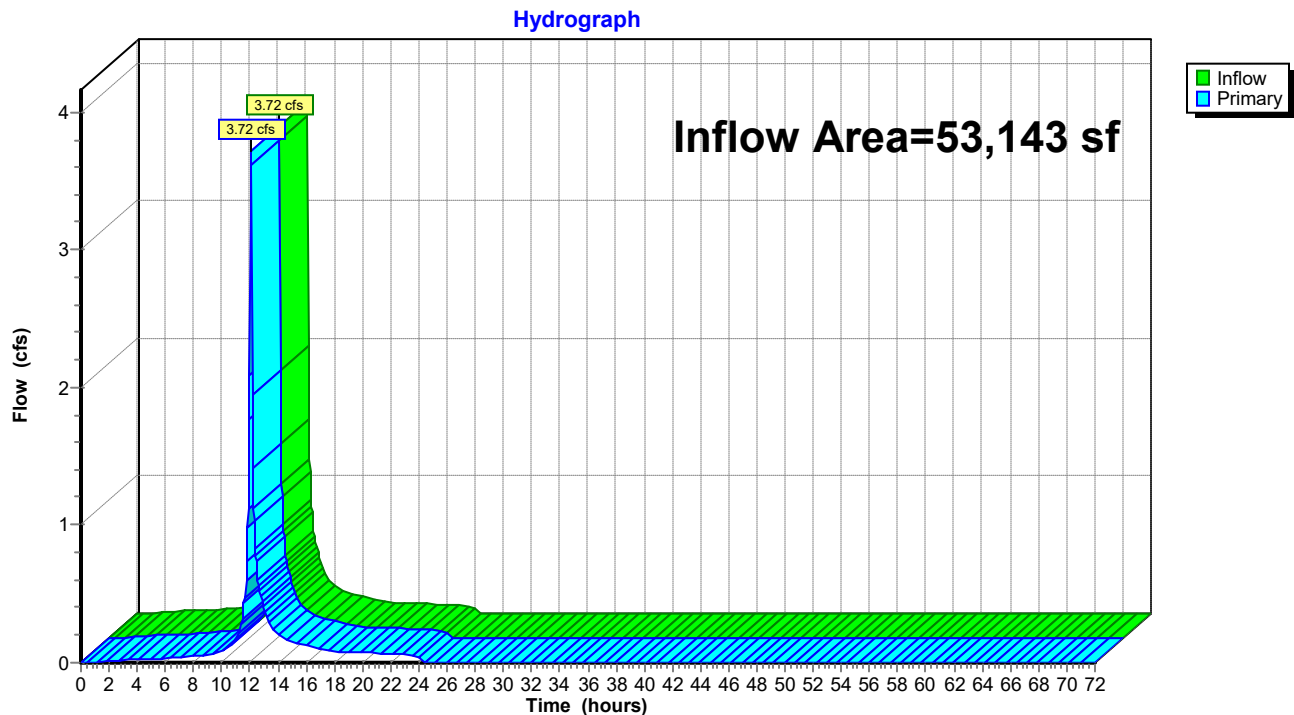
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 2.62" for 10-Year event
Inflow = 3.72 cfs @ 12.08 hrs, Volume= 11,595 cf
Primary = 3.72 cfs @ 12.08 hrs, Volume= 11,595 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

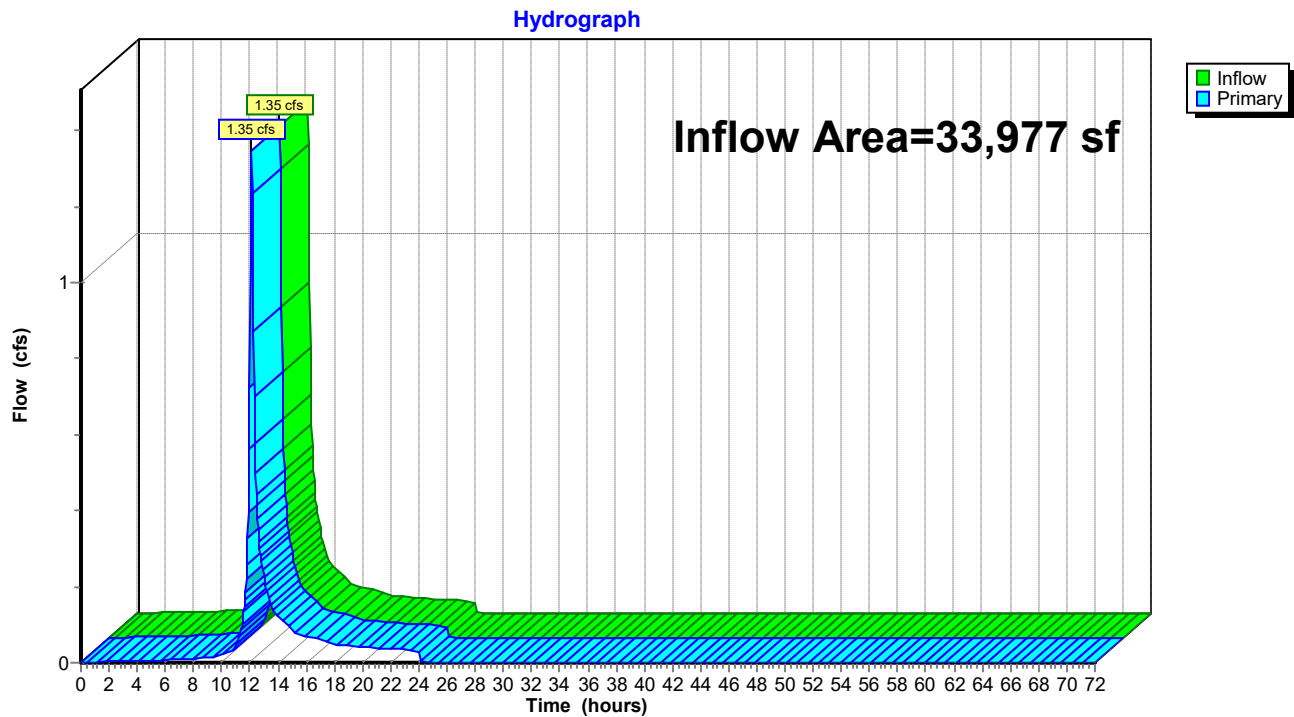
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 1.97" for 10-Year event
Inflow = 1.35 cfs @ 12.12 hrs, Volume= 5,566 cf
Primary = 1.35 cfs @ 12.12 hrs, Volume= 5,566 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

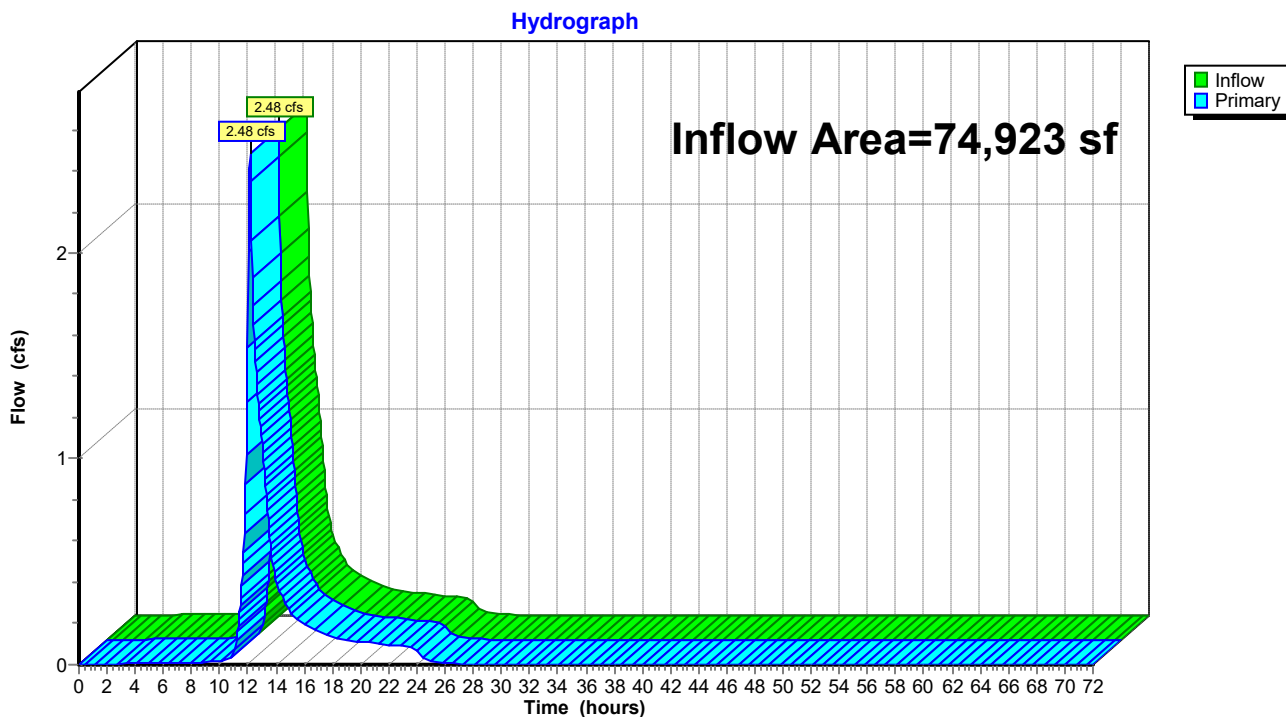
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 2.55" for 10-Year event
Inflow = 2.48 cfs @ 12.14 hrs, Volume= 15,904 cf
Primary = 2.48 cfs @ 12.14 hrs, Volume= 15,904 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

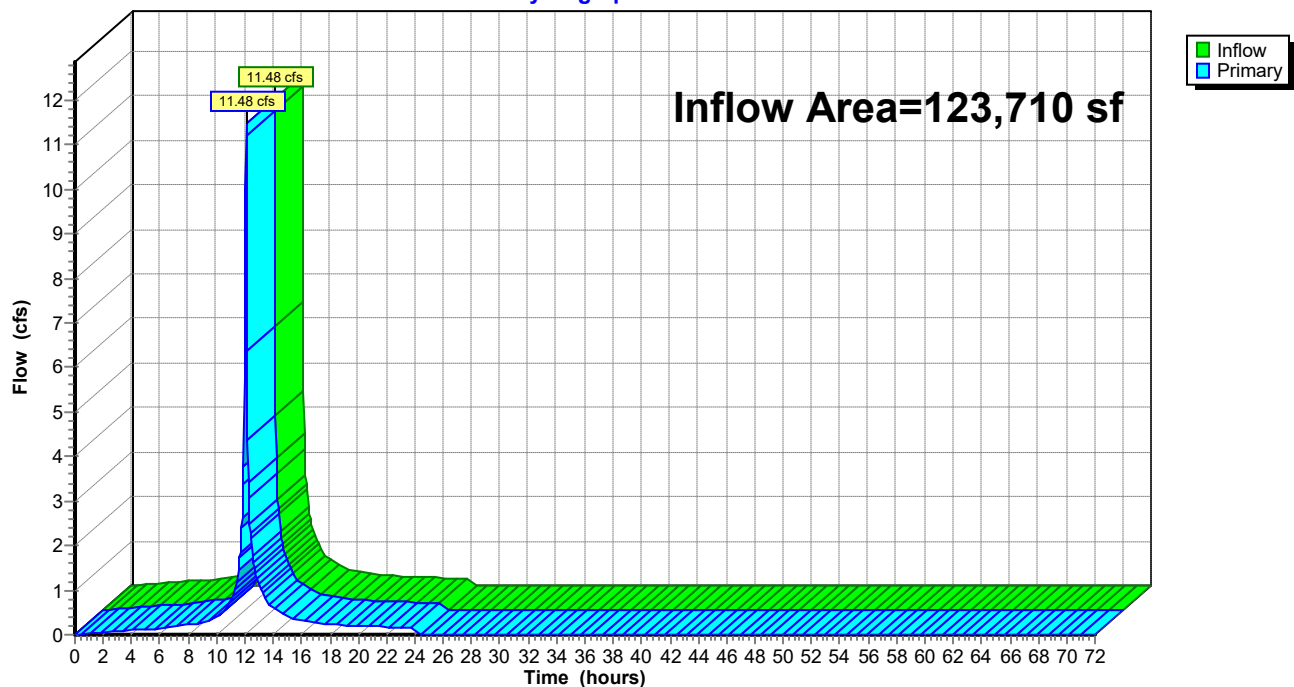
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 3.63" for 10-Year event
Inflow = 11.48 cfs @ 12.08 hrs, Volume= 37,468 cf
Primary = 11.48 cfs @ 12.08 hrs, Volume= 37,468 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

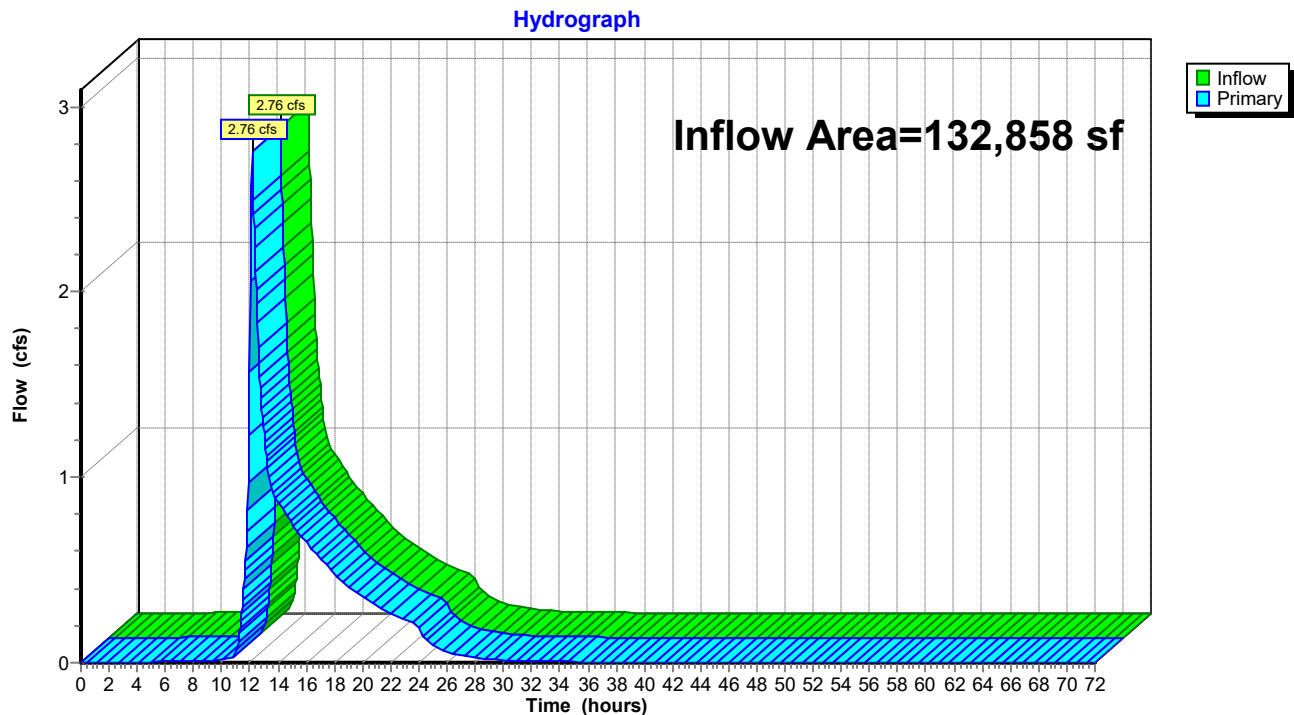
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL**Hydrograph**

Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 2.76 cfs @ 12.15 hrs, Volume= 29,946 cf
Primary = 2.76 cfs @ 12.15 hrs, Volume= 29,946 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

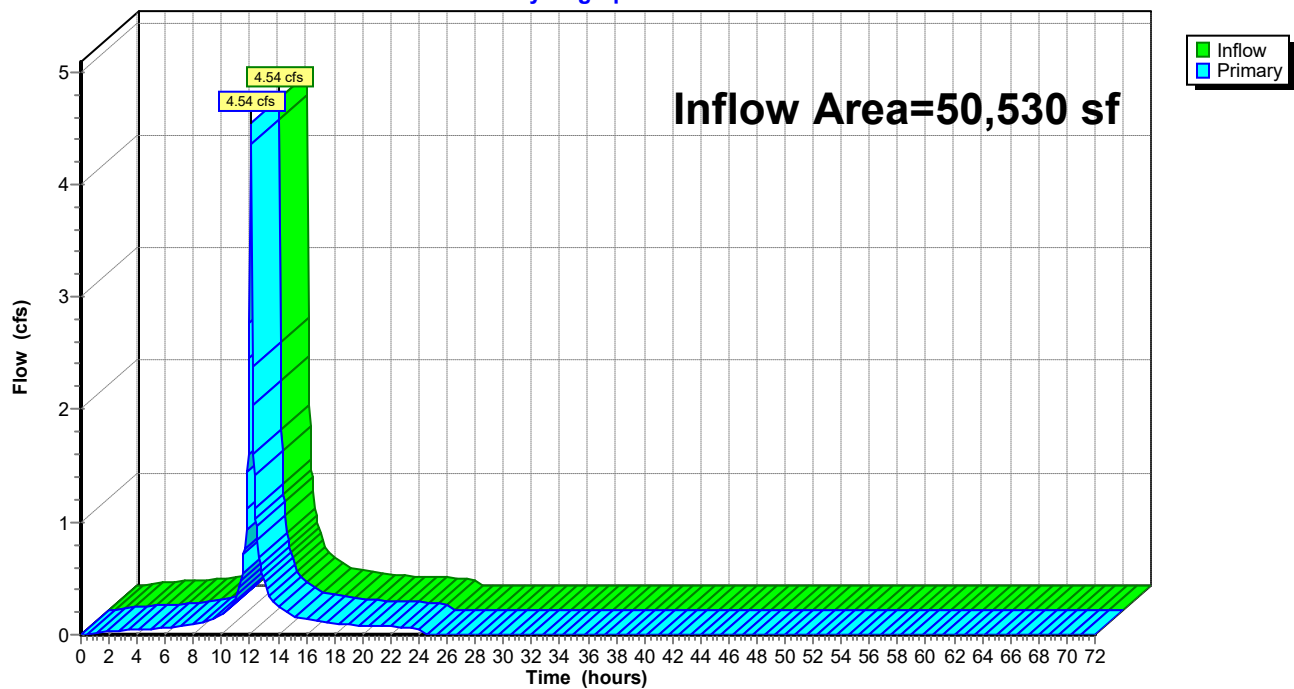
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 3.80" for 10-Year event
Inflow = 4.54 cfs @ 12.08 hrs, Volume= 16,001 cf
Primary = 4.54 cfs @ 12.08 hrs, Volume= 16,001 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

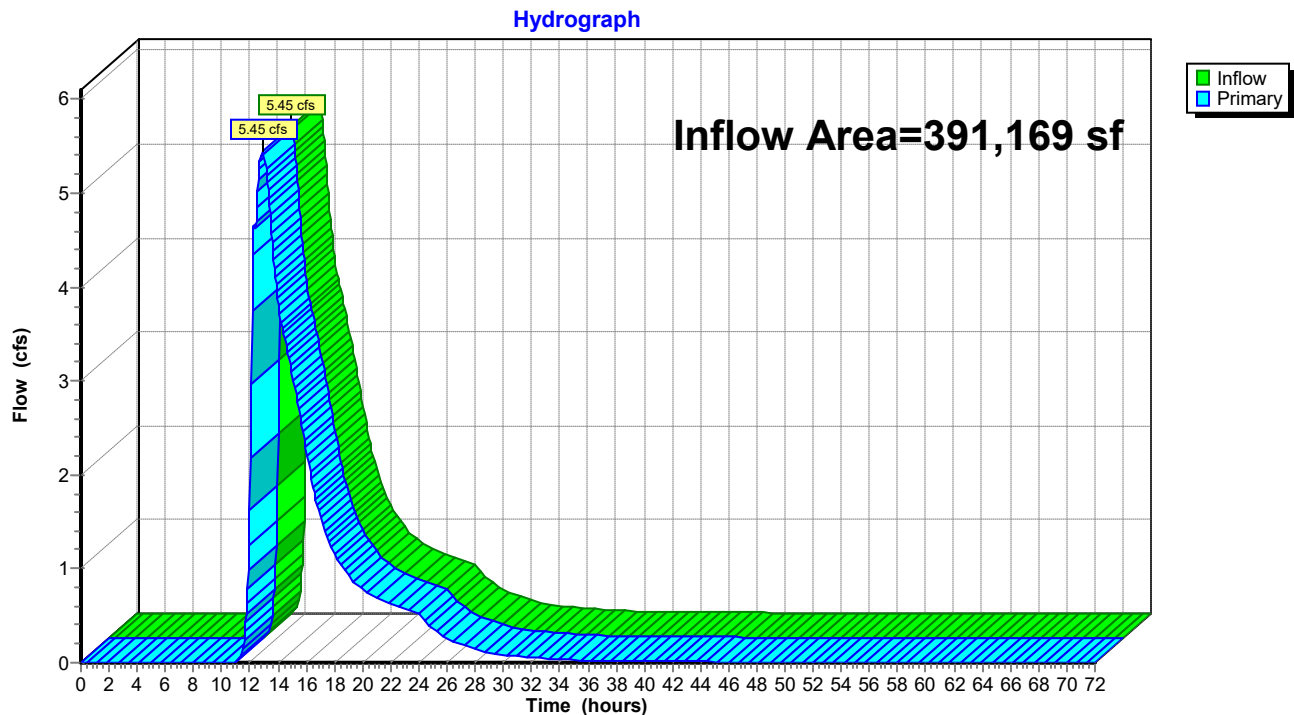
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1**Hydrograph**

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth = 2.78" for 10-Year event
Inflow = 5.45 cfs @ 12.90 hrs, Volume= 90,751 cf
Primary = 5.45 cfs @ 12.90 hrs, Volume= 90,751 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

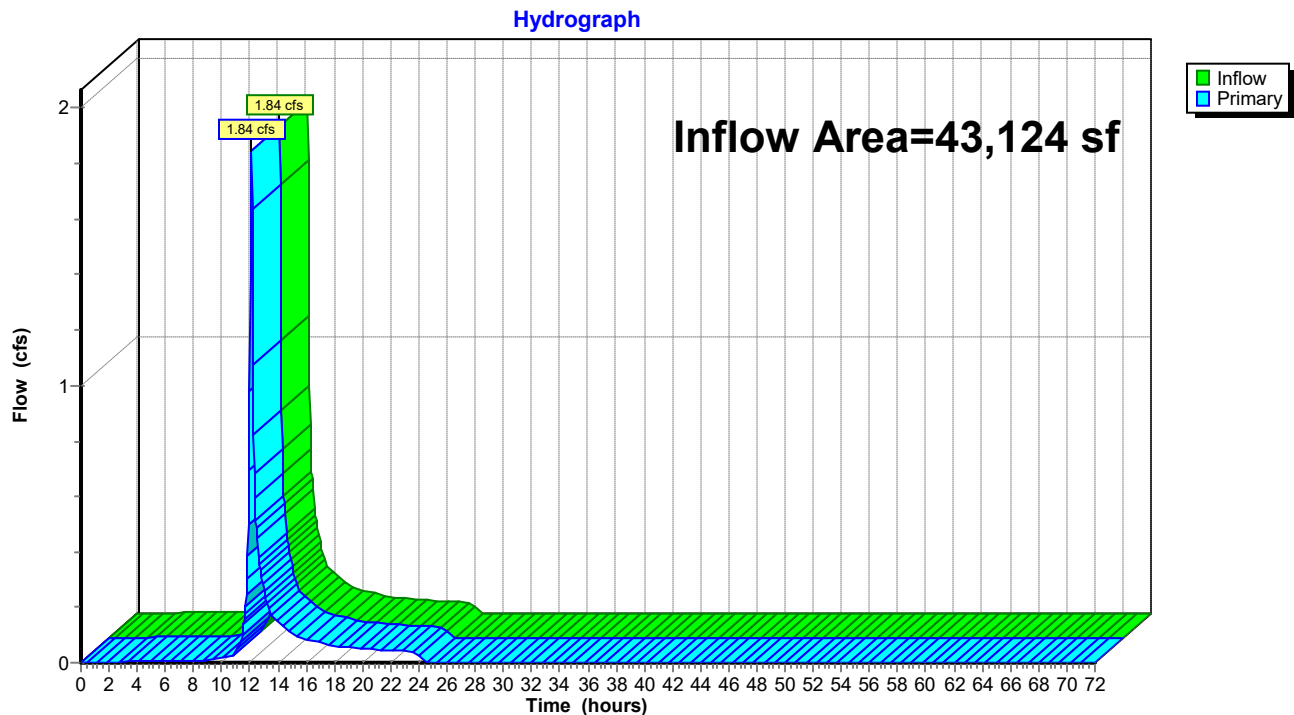
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 1.77" for 10-Year event
Inflow = 1.84 cfs @ 12.11 hrs, Volume= 6,360 cf
Primary = 1.84 cfs @ 12.11 hrs, Volume= 6,360 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

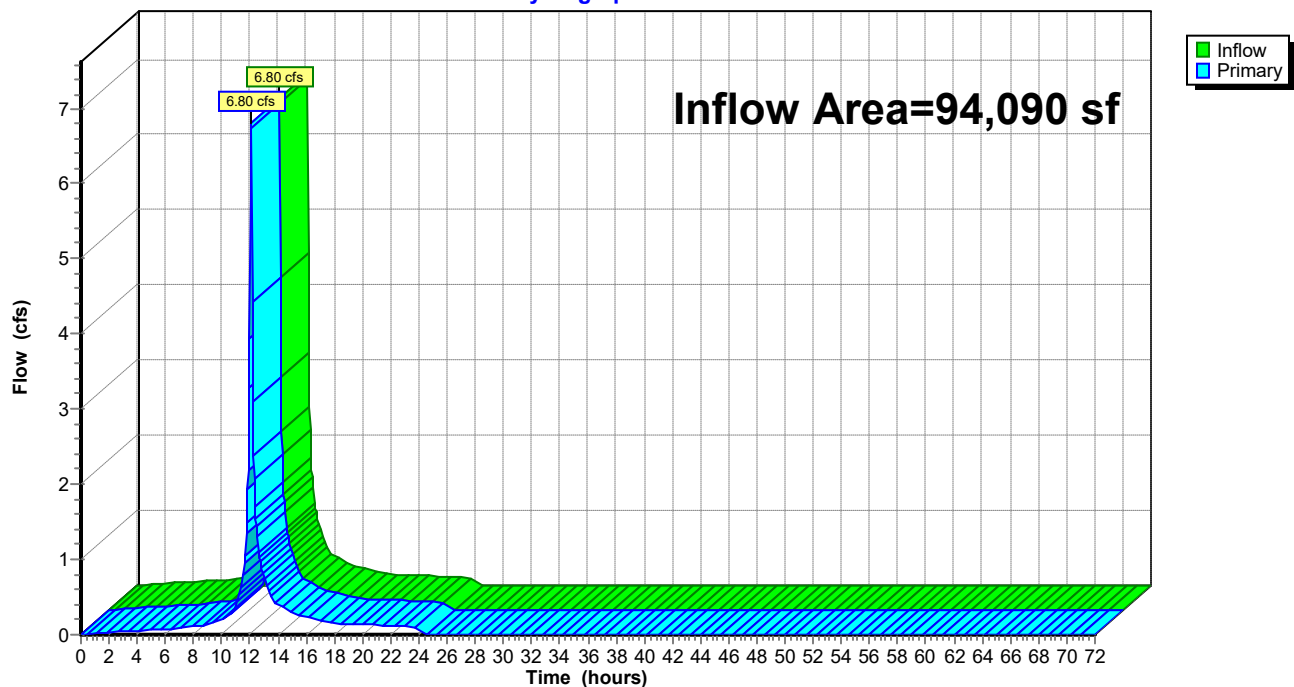
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 2.95" for 10-Year event
Inflow = 6.80 cfs @ 12.09 hrs, Volume= 23,104 cf
Primary = 6.80 cfs @ 12.09 hrs, Volume= 23,104 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL**Hydrograph**

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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=299' Tc=0.9 min CN=98 Runoff=1.97 cfs 6,547 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=212' Tc=4.2 min CN=61 Runoff=1.43 cfs 4,346 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=352' Tc=1.7 min CN=WQ Runoff=3.76 cfs 12,626 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=357' Tc=3.2 min CN=61 Runoff=1.50 cfs 4,310 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=32' Tc=5.3 min CN=61 Runoff=1.47 cfs 4,669 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=239' Tc=1.3 min CN=WQ Runoff=1.20 cfs 3,975 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=114' Tc=2.4 min CN=61 Runoff=0.49 cfs 1,347 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=223' Tc=1.5 min CN=WQ Runoff=2.45 cfs 8,184 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=62' Tc=1.8 min CN=61 Runoff=1.45 cfs 3,951 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=414' Tc=1.0 min CN=98 Runoff=0.14 cfs 468 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=356' Tc=4.9 min CN=61 Runoff=1.86 cfs 5,836 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=524' Tc=1.6 min CN=WQ Runoff=2.45 cfs 8,184 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=546' Tc=2.7 min CN=61 Runoff=2.78 cfs 7,812 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=295' Tc=1.9 min CN=WQ Runoff=3.99 cfs 13,094 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=242' Tc=1.4 min CN=61 Runoff=1.24 cfs 3,412 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=376' Tc=2.5 min CN=WQ Runoff=3.73 cfs 12,392 cf

Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=6.44" Tc=5.0 min CN=98 Runoff=4.34 cfs 15,899 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=178' Tc=1.2 min CN=WQ Runoff=0.56 cfs 1,871 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=96' Slope=0.0100 '/' Tc=1.3 min CN=98 Runoff=1.62 cfs 5,378 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=138' Slope=0.0300 '/' Tc=7.2 min CN=61 Runoff=1.88 cfs 6,285 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=805' Tc=2.1 min CN=WQ Runoff=11.59 cfs 38,112 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=509' Tc=3.6 min CN=61 Runoff=3.70 cfs 10,864 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=236' Tc=4.2 min CN=61 Runoff=0.95 cfs 2,873 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=283' Tc=1.7 min CN=WQ Runoff=5.02 cfs 16,835 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=412' Tc=8.8 min CN=61 Runoff=1.11 cfs 3,951 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=303' Tc=1.8 min CN=WQ Runoff=4.50 cfs 14,730 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=262' Tc=3.0 min CN=61 Runoff=1.33 cfs 3,771 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=1,152' Tc=2.5 min CN=WQ Runoff=9.87 cfs 32,734 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=889' Tc=2.8 min CN=61 Runoff=2.42 cfs 6,824 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.35 cfs 1,169 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=239' Tc=13.2 min CN=WQ Runoff=2.67 cfs 11,024 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=105' Tc=0.5 min CN=WQ Runoff=0.42 cfs 1,403 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=467' Tc=2.3 min CN=WQ Runoff=10.62 cfs 35,072 cf

081228-SWM

NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=532' Tc=1.6 min CN=61 Runoff=2.89 cfs 7,901 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=2.41" Flow Length=194' Tc=4.5 min CN=WQ Runoff=2.64 cfs 8,131 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=6.44" Flow Length=634' Tc=1.9 min CN=WQ Runoff=5.85 cfs 19,173 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=2.47" Flow Length=655' Tc=4.9 min CN=61 Runoff=3.84 cfs 12,032 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=553.77' Storage=4,730 cf Inflow=3.20 cfs 10,893 cf Outflow=0.61 cfs 9,659 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=576.73' Storage=39,386 cf Inflow=18.39 cfs 72,489 cf Outflow=1.79 cfs 65,200 cf
Pond C: BMP C Bioretention Basin	Peak Elev=562.64' Storage=22,579 cf Inflow=10.07 cfs 42,033 cf Outflow=1.20 cfs 37,802 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=600.92' Storage=3,691 cf Inflow=3.25 cfs 10,699 cf Outflow=1.39 cfs 9,179 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=610.51' Storage=5,539 cf Inflow=3.93 cfs 12,134 cf Outflow=0.77 cfs 10,138 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=610.92' Storage=6,208 cf Inflow=5.29 cfs 16,936 cf Outflow=2.37 cfs 14,333 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=615.46' Storage=6,083 cf Inflow=5.24 cfs 16,506 cf Outflow=1.58 cfs 14,178 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=610.08' Storage=8,730 cf Inflow=4.64 cfs 15,265 cf Outflow=0.35 cfs 13,258 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=596.57' Storage=9,182 cf Inflow=6.50 cfs 35,212 cf Outflow=3.12 cfs 32,115 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=570.02' Storage=12,222 cf Inflow=12.27 cfs 39,558 cf Outflow=7.67 cfs 34,190 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=599.07' Storage=6,700 cf Inflow=5.78 cfs 18,501 cf Outflow=3.05 cfs 15,976 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=578.78' Storage=16,848 cf Inflow=15.83 cfs 58,950 cf Outflow=8.40 cfs 53,300 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=565.04' Storage=36,286 cf Inflow=23.32 cfs 118,694 cf Outflow=9.38 cfs 114,862 cf

081228-SWM

NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

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Link 20L: TOTAL TO GI MTD F-1

Inflow=1.64 cfs 5,322 cf

Primary=1.64 cfs 5,322 cf

Link 21L: TOTAL TO P-DA-5M

Inflow=12.27 cfs 39,558 cf

Primary=12.27 cfs 39,558 cf

Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow=1.96 cfs 6,304 cf

Primary=1.96 cfs 6,304 cf

Link 34L: PROPOSED TOTAL TO POA-1

Inflow=3.93 cfs 118,965 cf

Primary=3.93 cfs 118,965 cf

Link 38L: TOTAL TO GI MTD 1C

Inflow=5.23 cfs 15,995 cf

Primary=5.23 cfs 15,995 cf

Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow=2.14 cfs 8,156 cf

Primary=2.14 cfs 8,156 cf

Link 45L: PROPOSED TOTAL TO POA-3

Inflow=3.54 cfs 22,334 cf

Primary=3.54 cfs 22,334 cf

Link 46L: P-DA-1B TOTAL

Inflow=15.15 cfs 48,976 cf

Primary=15.15 cfs 48,976 cf

Link 48L: PROPOSED TOTAL TO POA-4

Inflow=5.59 cfs 41,649 cf

Primary=5.59 cfs 41,649 cf

Link 50L: TOTAL TO GI MTD K-1

Inflow=5.88 cfs 20,785 cf

Primary=5.88 cfs 20,785 cf

Link 52L: PROPOSED TOTAL TO POA-5

Inflow=10.41 cfs 125,886 cf

Primary=10.41 cfs 125,886 cf

Link 59L: P-DA-4 BYPASS TOTAL

Inflow=2.94 cfs 9,533 cf

Primary=2.94 cfs 9,533 cf

Link 66L: P-DA-5R TOTAL

Inflow=9.36 cfs 31,204 cf

Primary=9.36 cfs 31,204 cf

Total Runoff Area = 993,342 sf Runoff Volume = 357,181 cf Average Runoff Depth = 4.31"**53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf**

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 1.97 cfs @ 12.06 hrs, Volume= 6,547 cf, Depth= 6.44"
 Routed to Pond A : BMP-A Bioretention Basin

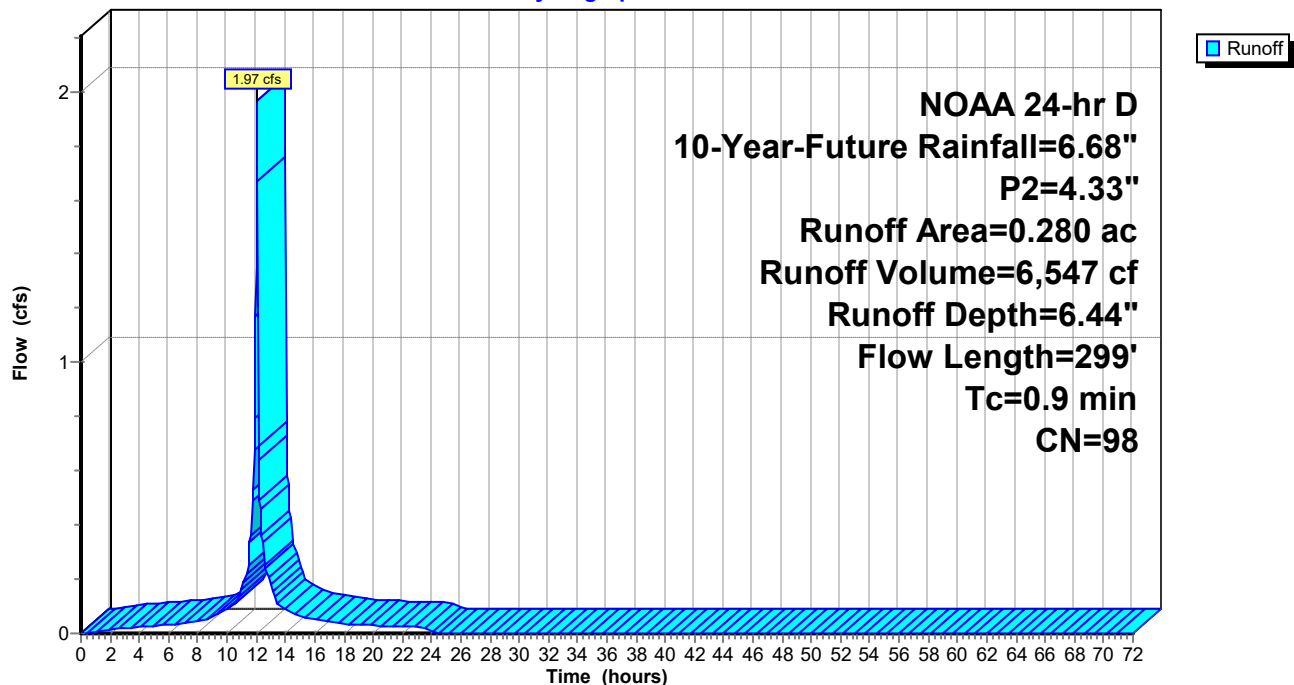
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.9	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 1.43 cfs @ 12.11 hrs, Volume= 4,346 cf, Depth= 2.47"
 Routed to Pond A : BMP-A Bioretention Basin

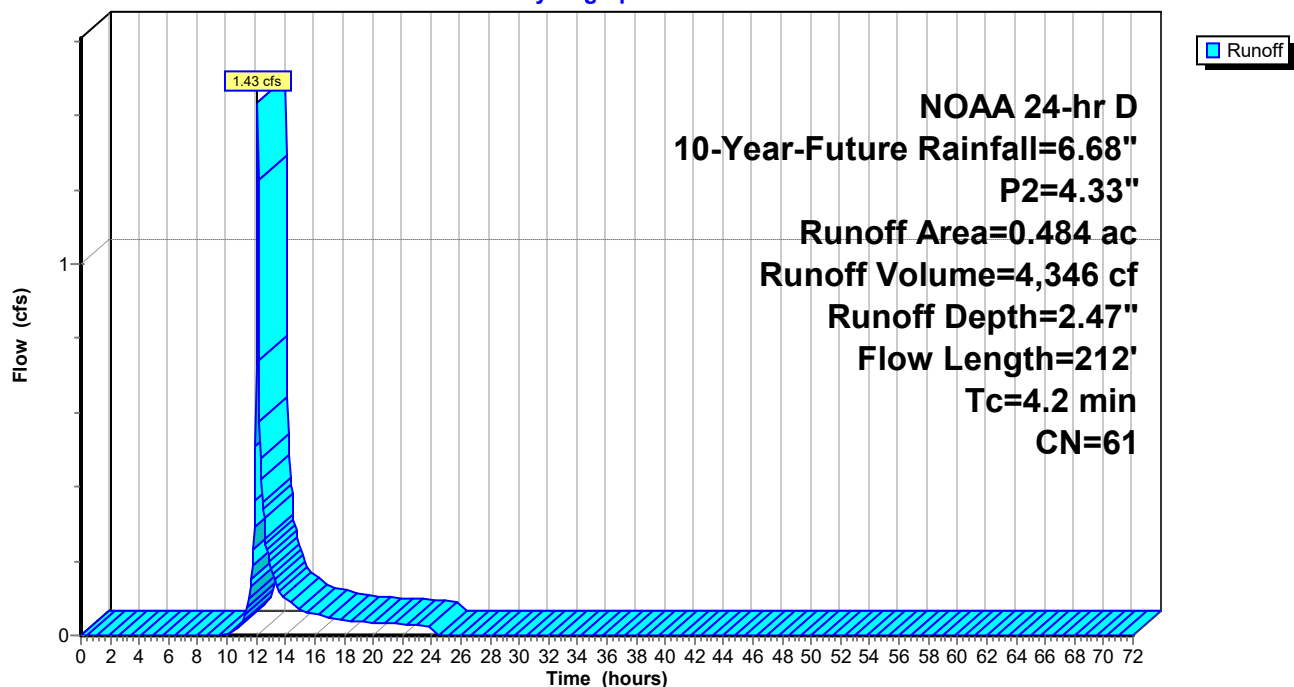
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1300	0.42		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.2	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 3.76 cfs @ 12.07 hrs, Volume= 12,626 cf, Depth= 6.44"
 Routed to Pond H : BMP-H Bioretention Basin

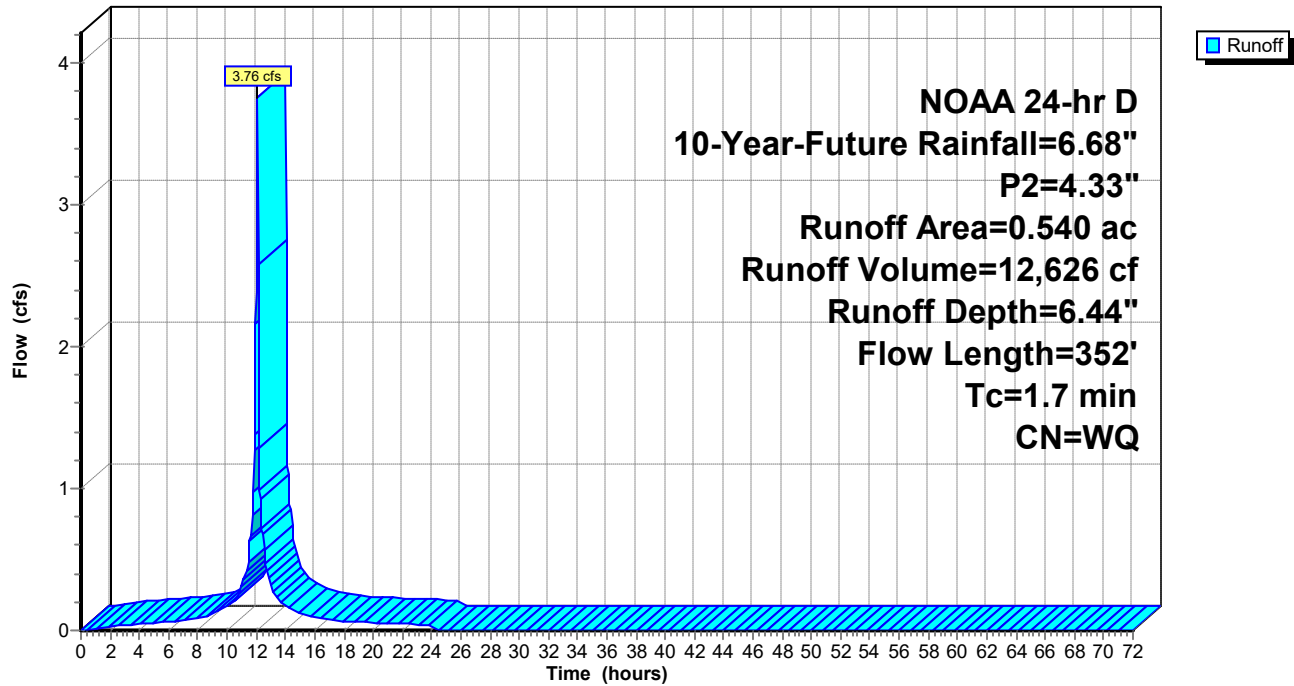
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0310	1.91		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



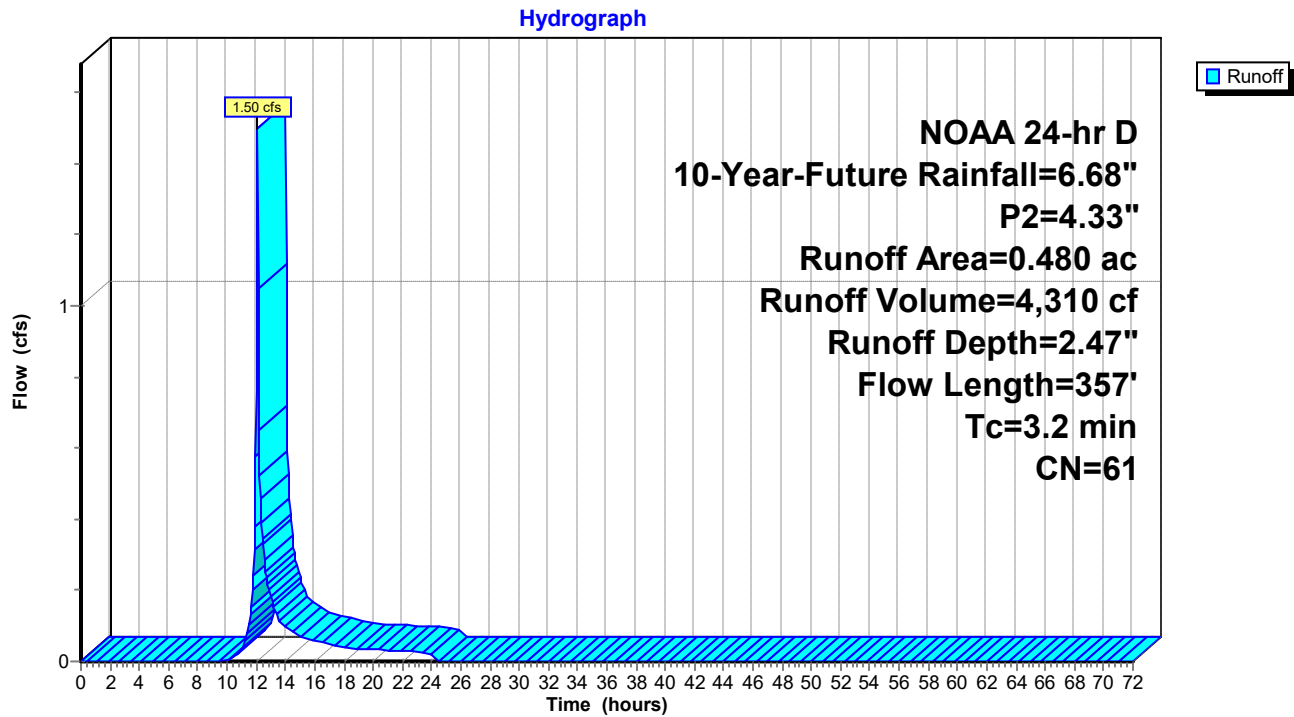
Summary for Subcatchment 17S: P-DA-1H PER

Runoff = 1.50 cfs @ 12.10 hrs, Volume= 4,310 cf, Depth= 2.47"
 Routed to Pond H : BMP-H Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	18	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	357	Total			

Subcatchment 17S: P-DA-1H PER

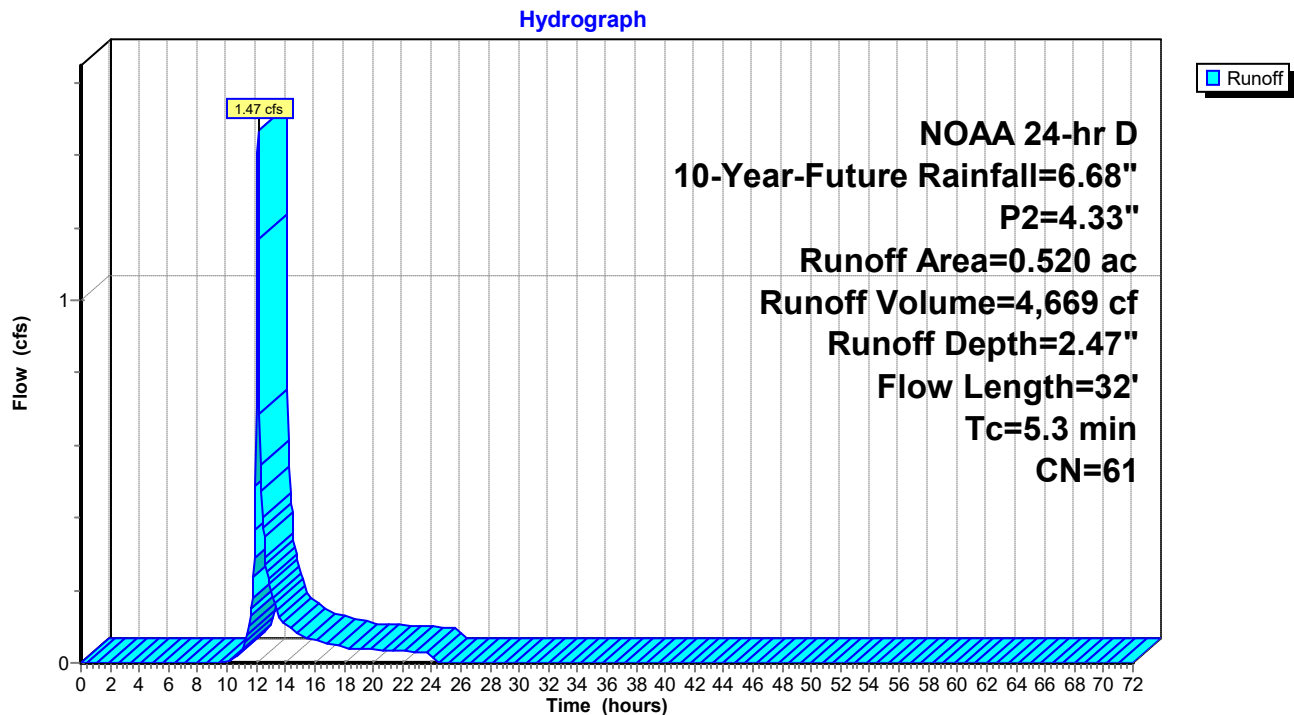
Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 1.47 cfs @ 12.13 hrs, Volume= 4,669 cf, Depth= 2.47"
 Routed to nonexistent node 26L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	15	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.4	6	0.3330	0.24		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.8	11	0.0830	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.33"
5.3	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 1.20 cfs @ 12.07 hrs, Volume= 3,975 cf, Depth= 6.44"
 Routed to Link 20L : TOTAL TO GI MTD F-1

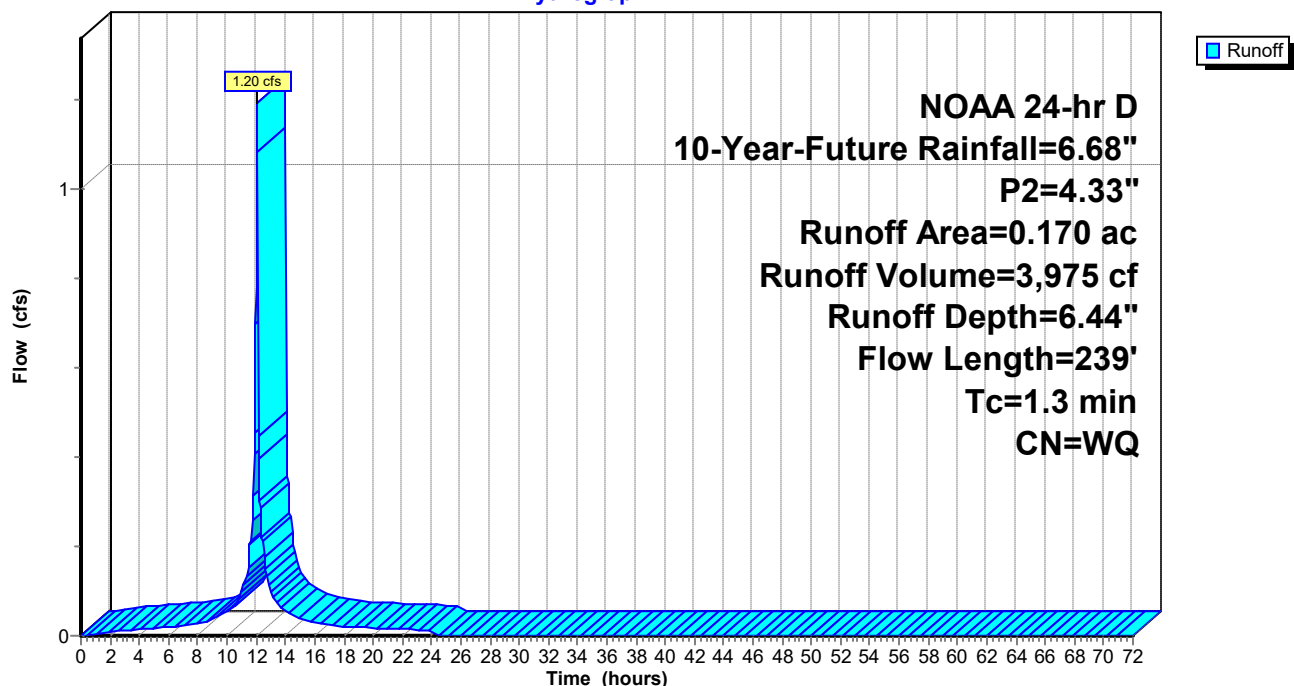
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 1,347 cf, Depth= 2.47"
 Routed to Link 20L : TOTAL TO GI MTD F-1

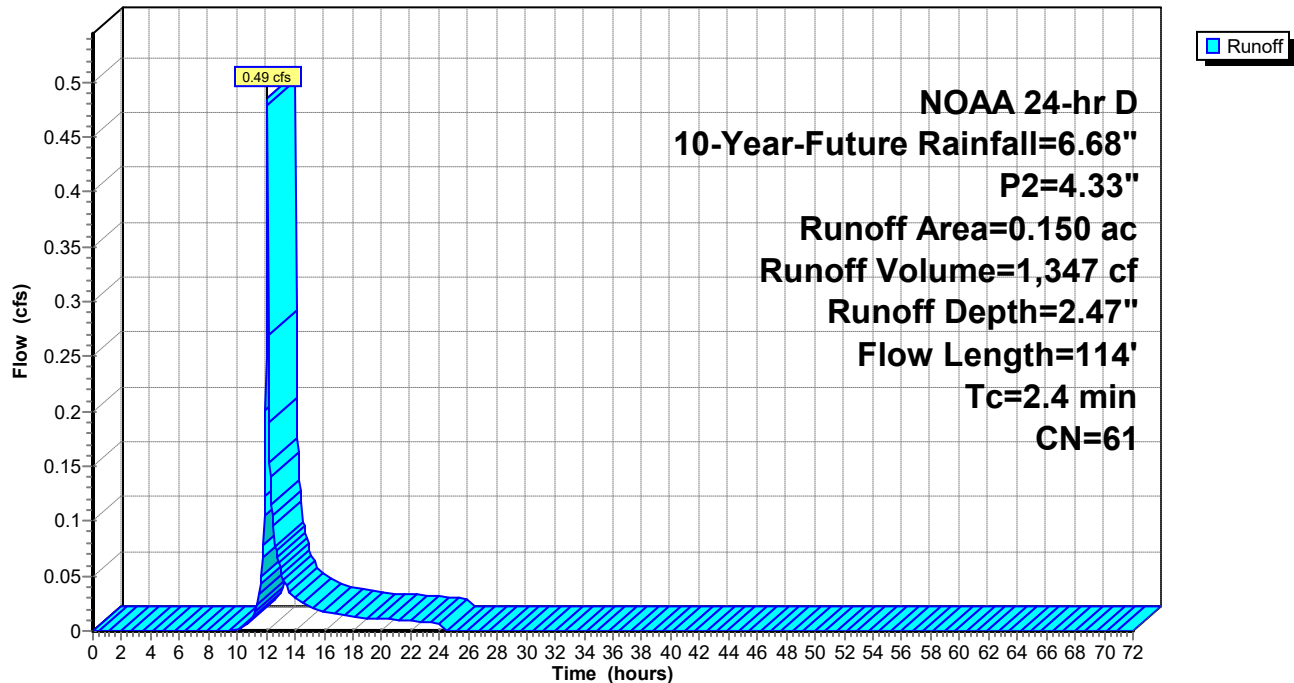
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	17	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.4	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 2.45 cfs @ 12.07 hrs, Volume= 8,184 cf, Depth= 6.44"
 Routed to Pond G : BMP-G Bioretention Basin

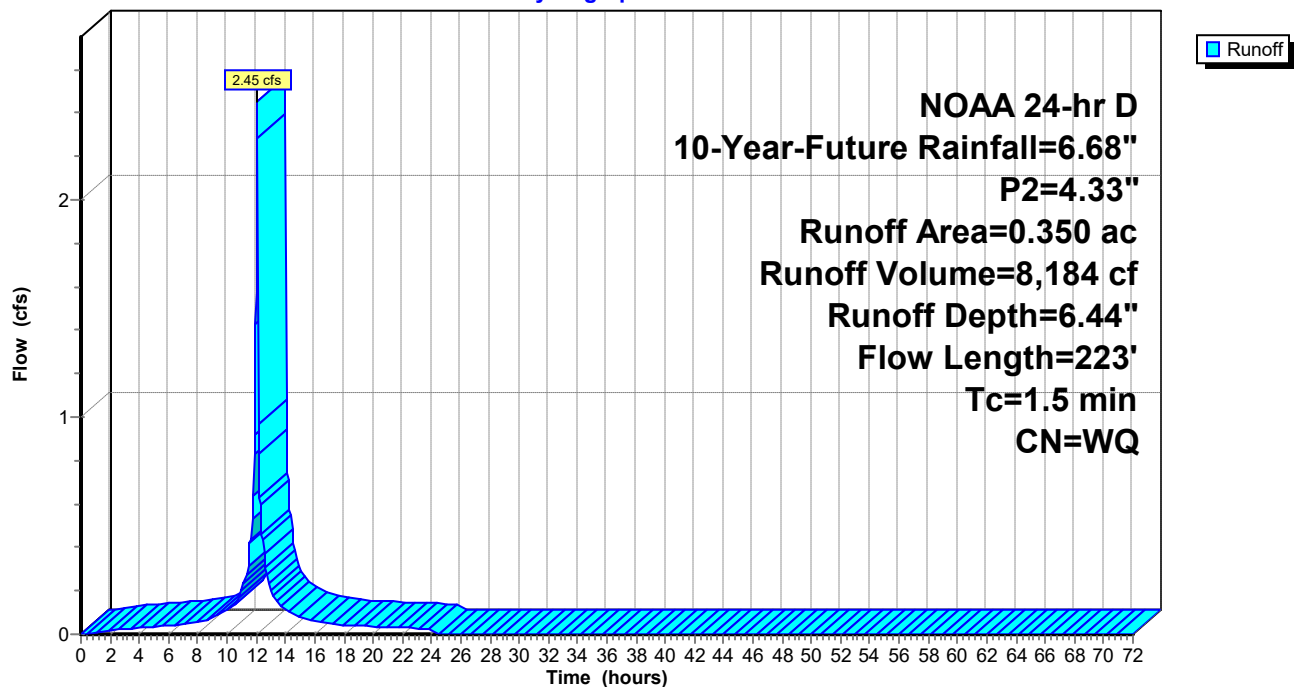
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	113	0.0240	1.76		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.5	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 1.45 cfs @ 12.08 hrs, Volume= 3,951 cf, Depth= 2.47"
 Routed to Pond G : BMP-G Bioretention Basin

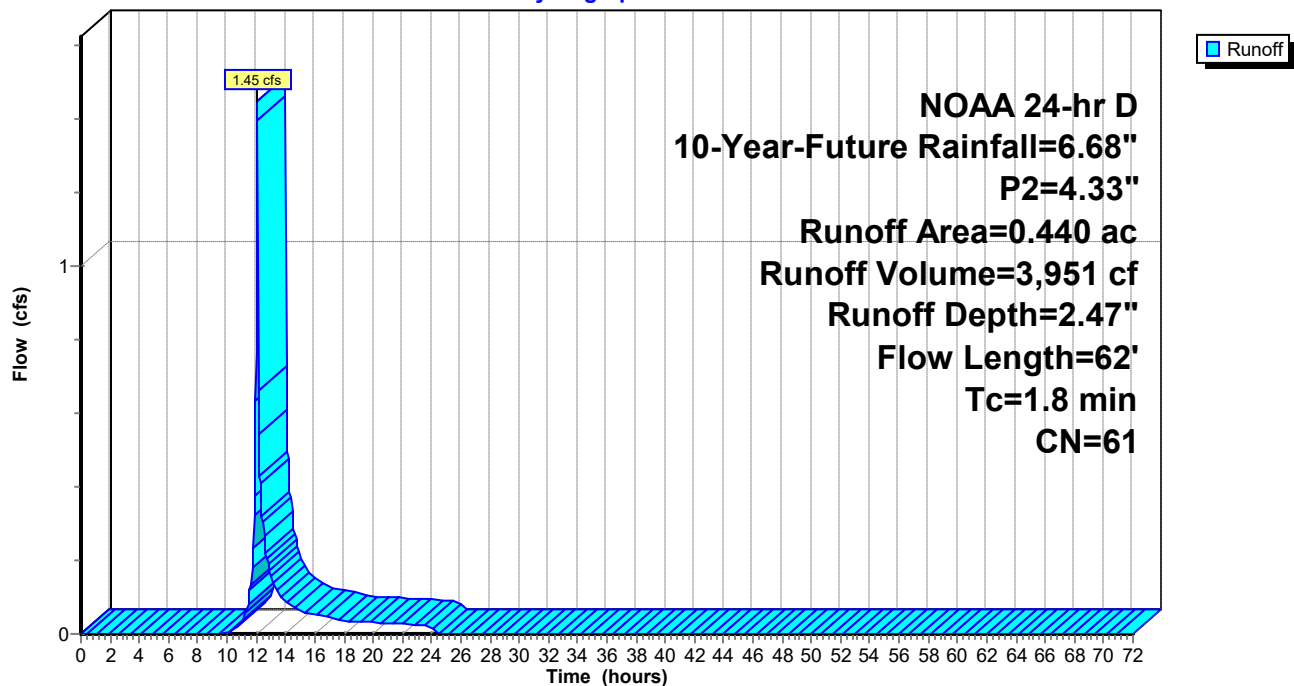
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.8	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.14 cfs @ 12.06 hrs, Volume= 468 cf, Depth= 6.44"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

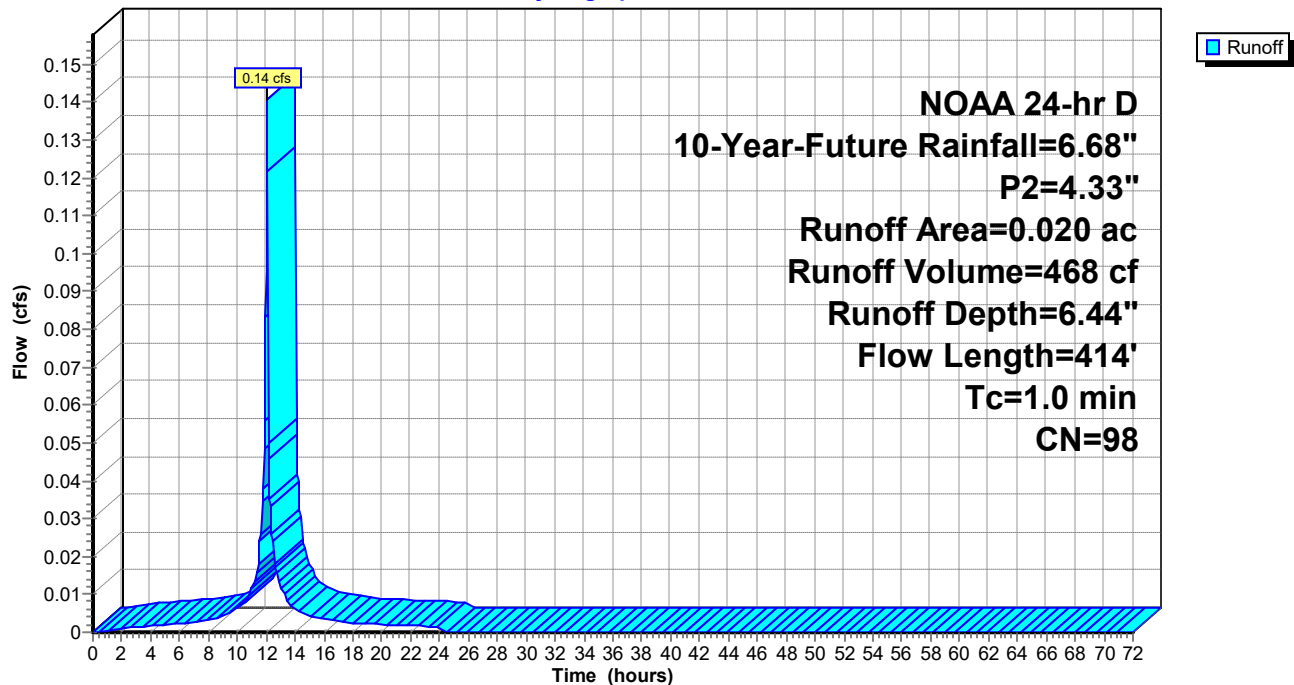
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	43	0.0330	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.0	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

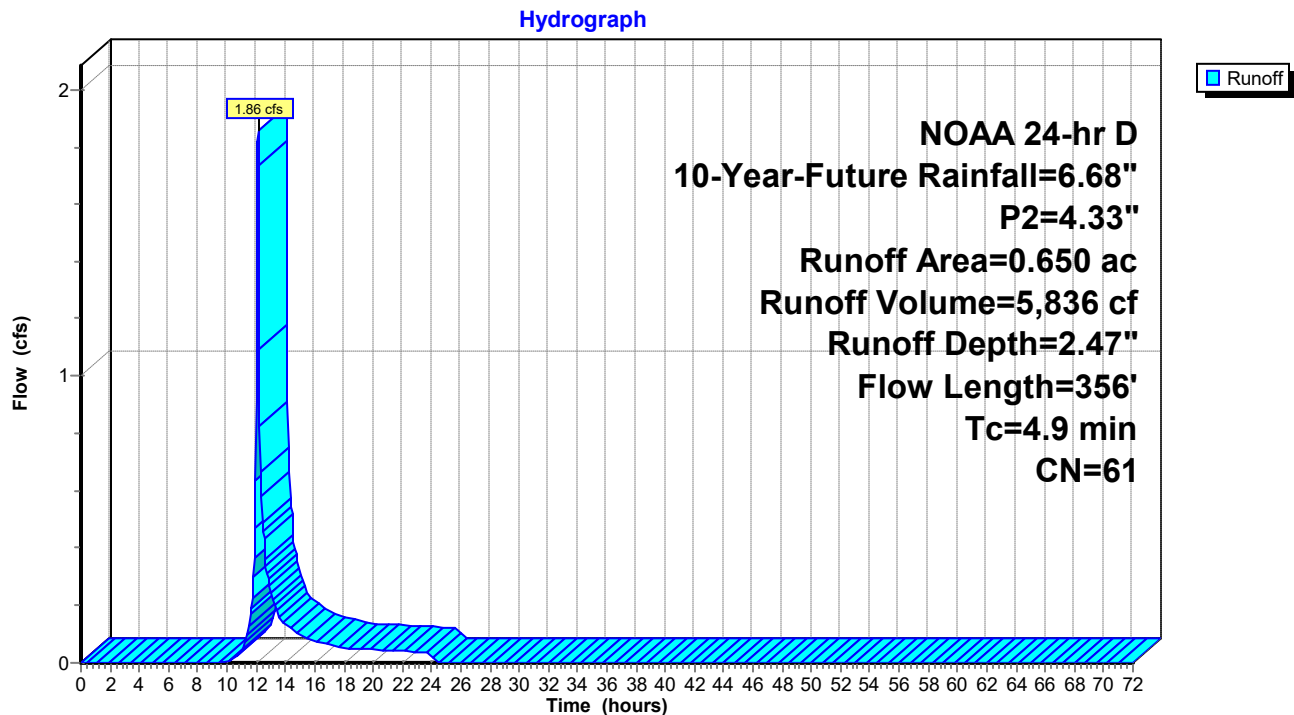
Runoff = 1.86 cfs @ 12.12 hrs, Volume= 5,836 cf, Depth= 2.47"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	67	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.9	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Summary for Subcatchment 35S: P-DA-1C IMP

Runoff = 2.45 cfs @ 12.07 hrs, Volume= 8,184 cf, Depth= 6.44"
 Routed to Link 38L : TOTAL TO GI MTD 1C

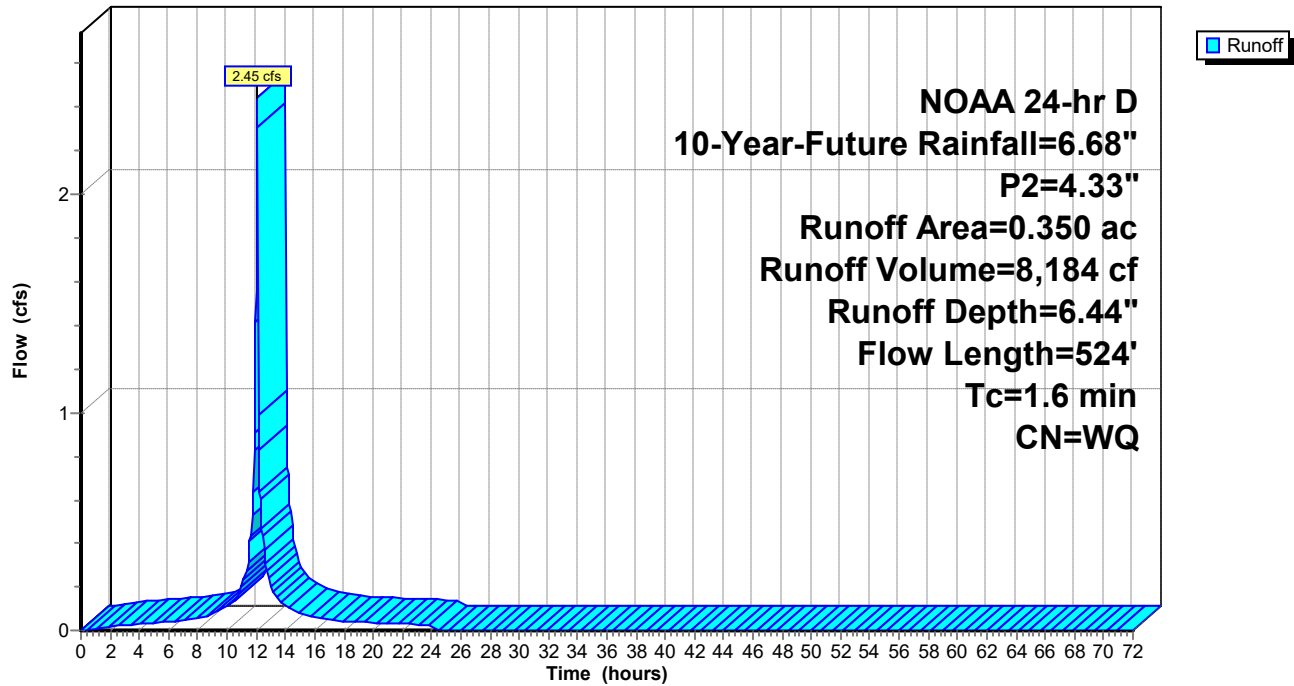
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0200	1.27		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	130	0.0054	4.19	5.14	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.6	524	Total			

Subcatchment 35S: P-DA-1C IMP

Hydrograph



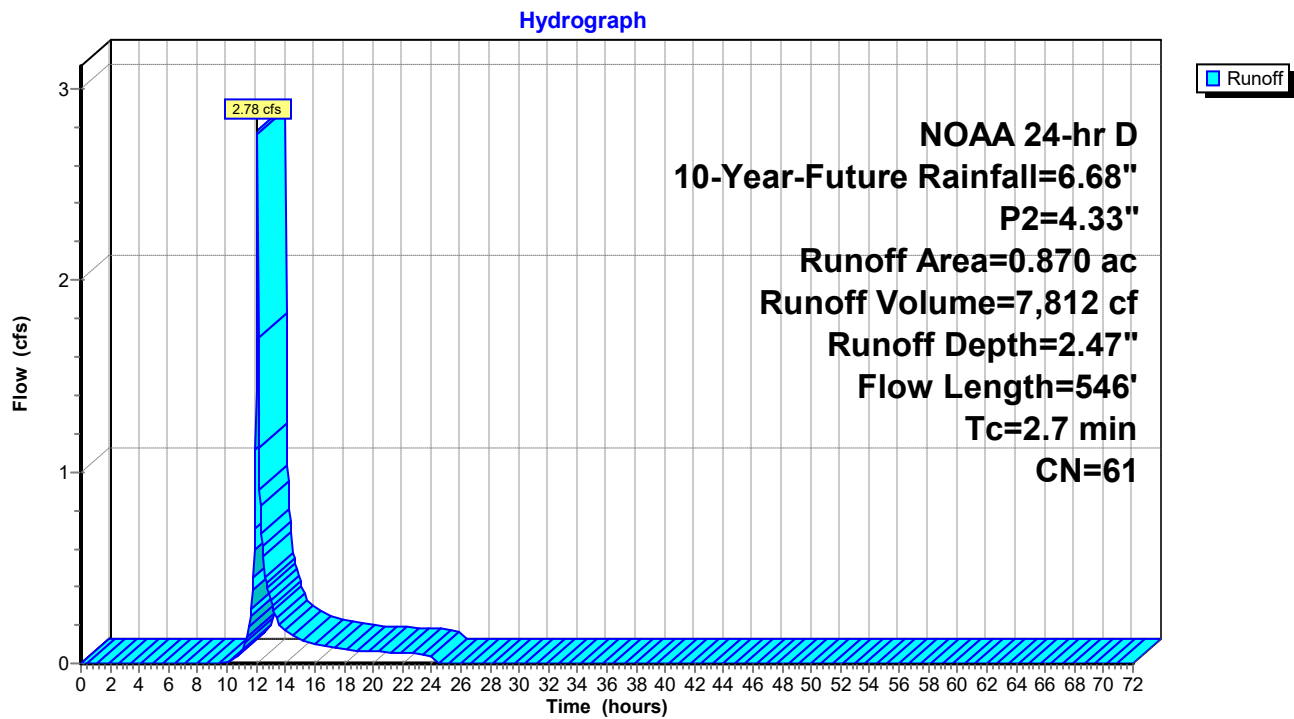
Summary for Subcatchment 36S: P-DA-1C PER

Runoff = 2.78 cfs @ 12.09 hrs, Volume= 7,812 cf, Depth= 2.47"
 Routed to Link 38L : TOTAL TO GI MTD 1C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	38	0.1900	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.7	546	Total			

Subcatchment 36S: P-DA-1C PER

Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 3.99 cfs @ 12.08 hrs, Volume= 13,094 cf, Depth= 6.44"
 Routed to Pond I : BMP-I Bioretention Basin

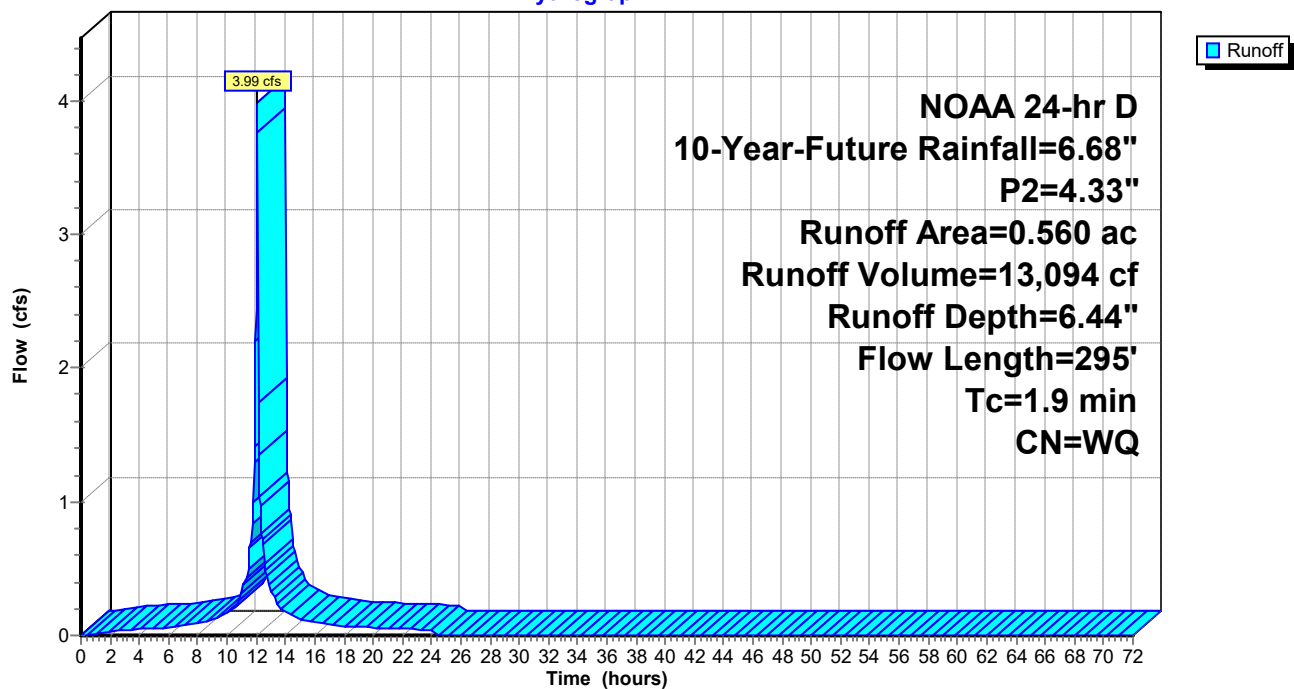
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0170	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.9	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 1.24 cfs @ 12.08 hrs, Volume= 3,412 cf, Depth= 2.47"
 Routed to Pond I : BMP-I Bioretention Basin

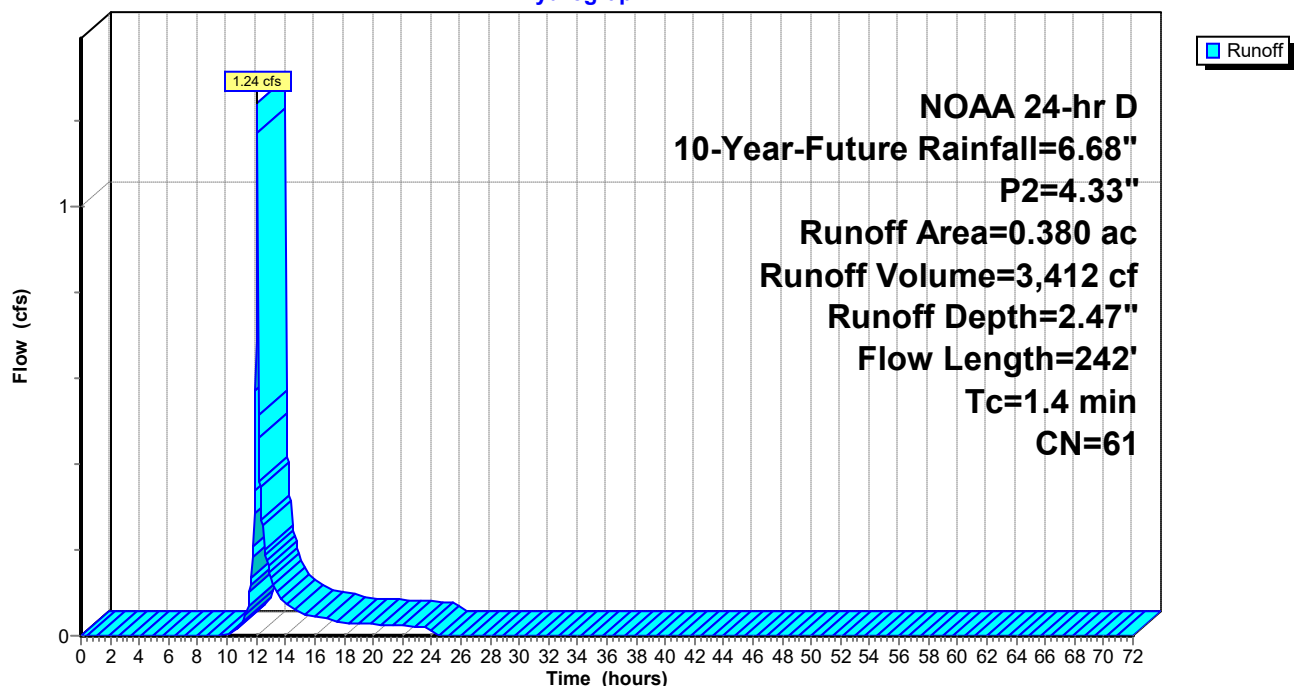
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.24		Sheet Flow , Smooth surfaces n= 0.011 P2= 4.33"
0.8	167	0.0300	3.52		Shallow Concentrated Flow , Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel , 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 3.73 cfs @ 12.08 hrs, Volume= 12,392 cf, Depth= 6.44"
 Routed to Pond J : BMP-J Bioretention Basin

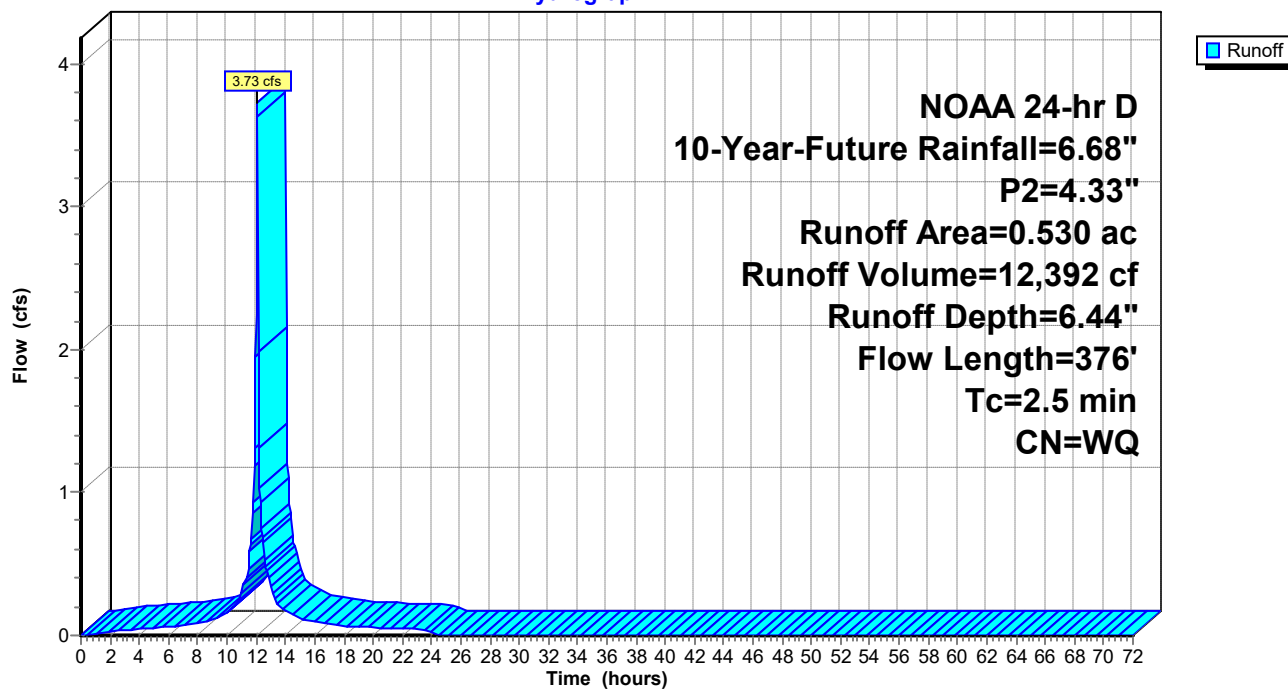
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.5	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 4.34 cfs @ 12.11 hrs, Volume= 15,899 cf, Depth= 6.44"
 Routed to Pond C : BMP C Bioretention Basin

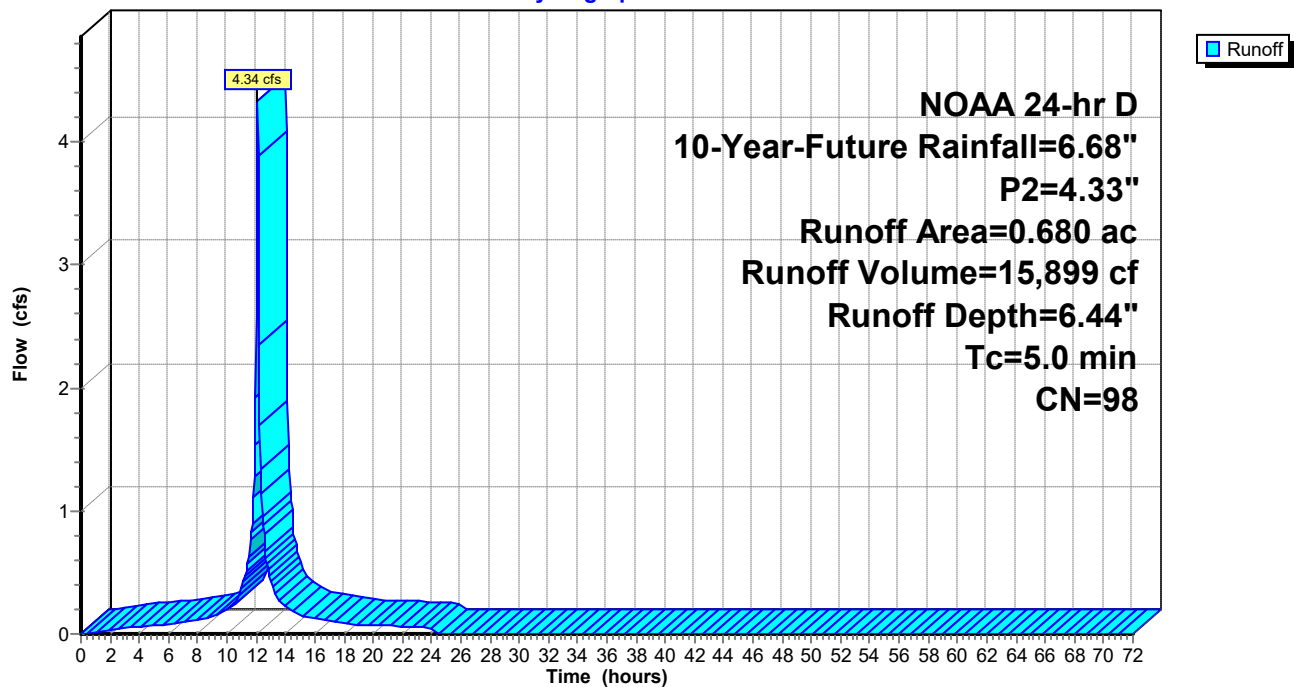
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 0.56 cfs @ 12.06 hrs, Volume= 1,871 cf, Depth= 6.44"
 Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

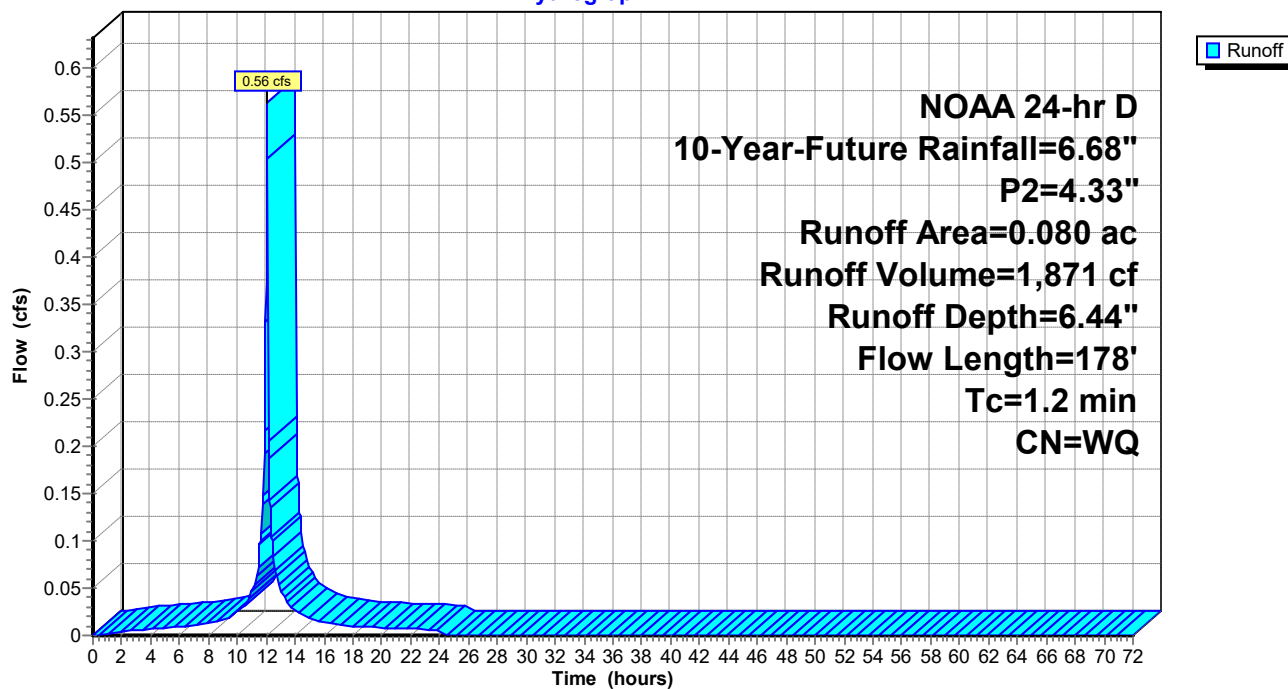
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.2	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 1.62 cfs @ 12.07 hrs, Volume= 5,378 cf, Depth= 6.44"
 Routed to Pond F : UG INFILTRATION BASIN F

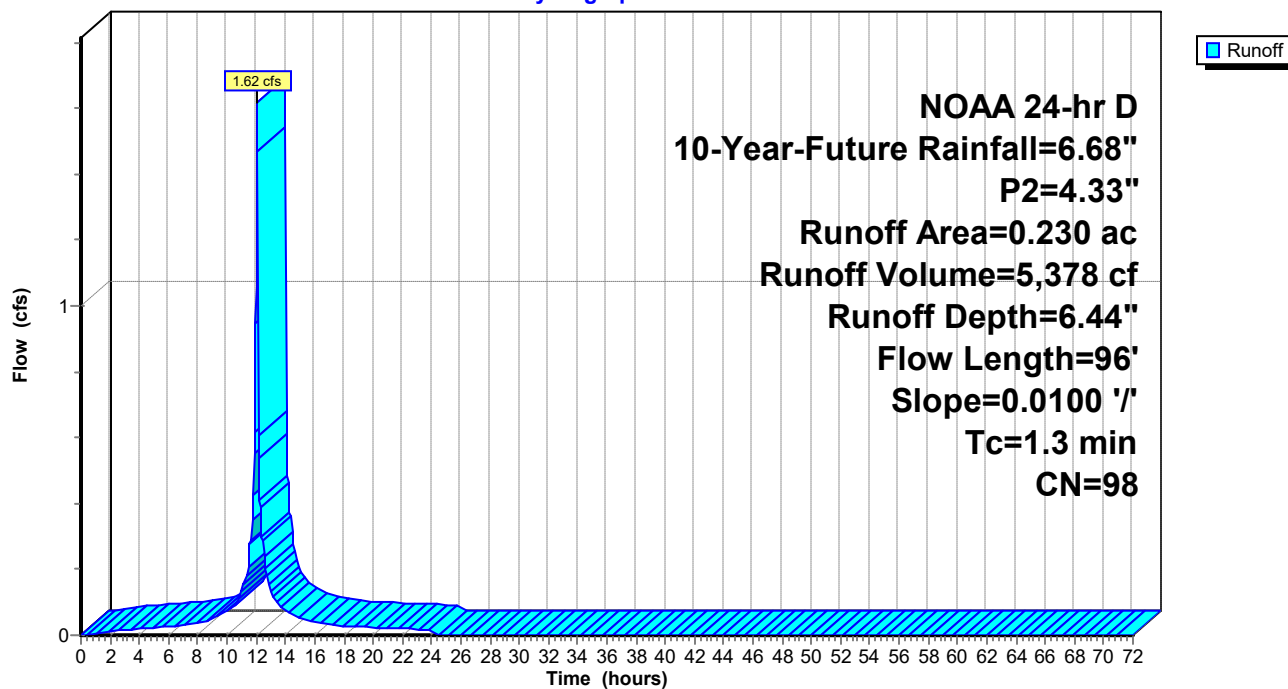
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	96	0.0100	1.20		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Runoff = 1.88 cfs @ 12.15 hrs, Volume= 6,285 cf, Depth= 2.47"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

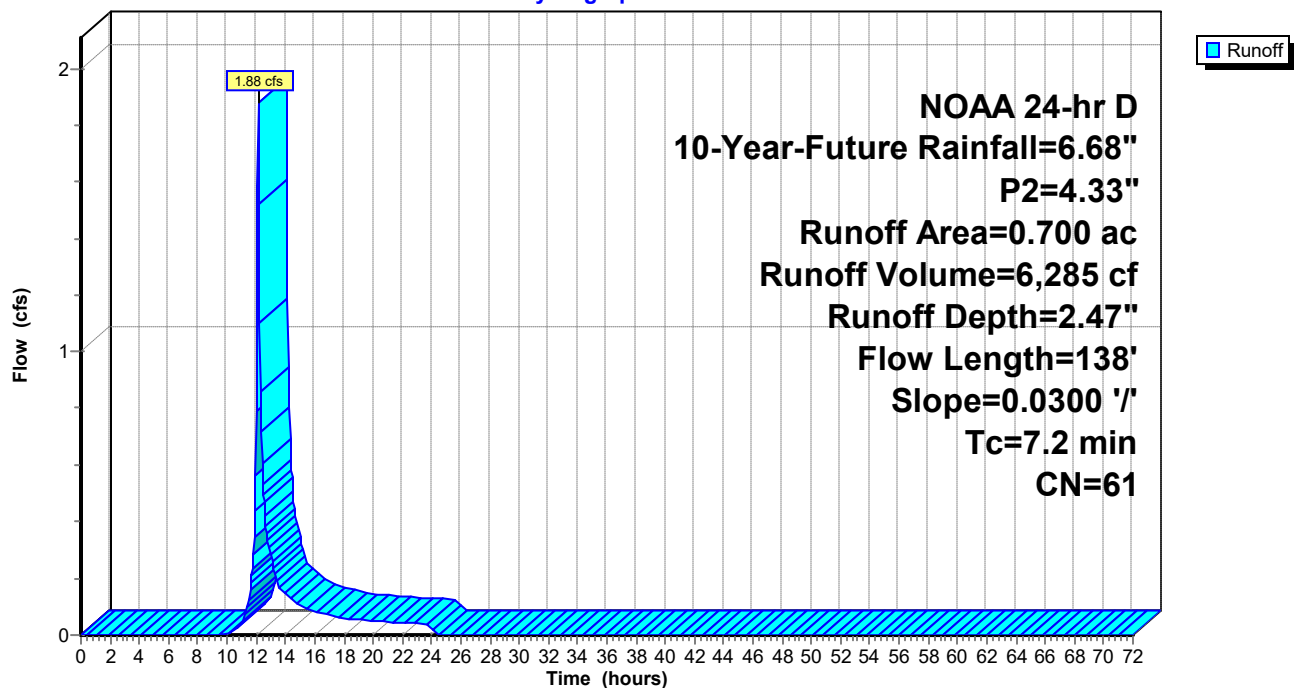
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	84	0.0300	0.22		Sheet Flow,
					Grass: Short n= 0.150 P2= 4.33"
1.0	54	0.0300	0.87		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
7.2	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 11.59 cfs @ 12.08 hrs, Volume= 38,112 cf, Depth= 6.44"
 Routed to Link 46L : P-DA-1B TOTAL

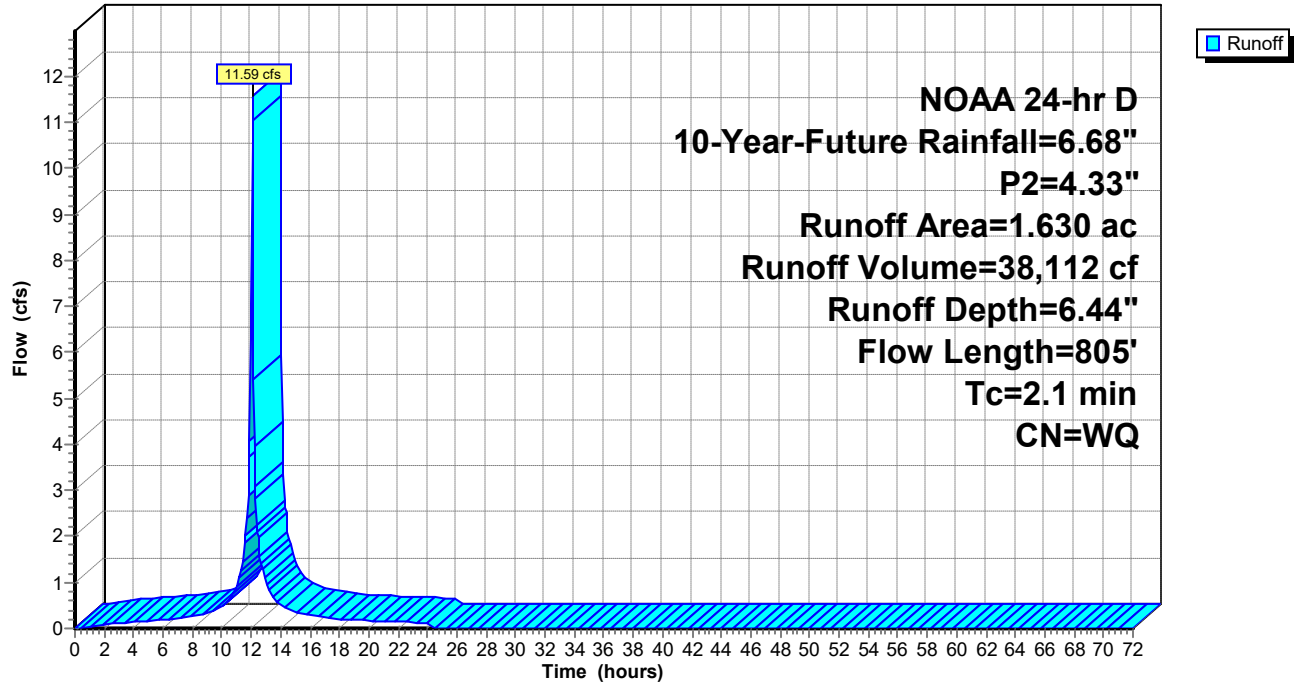
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.1	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 3.70 cfs @ 12.10 hrs, Volume= 10,864 cf, Depth= 2.47"
 Routed to Link 46L : P-DA-1B TOTAL

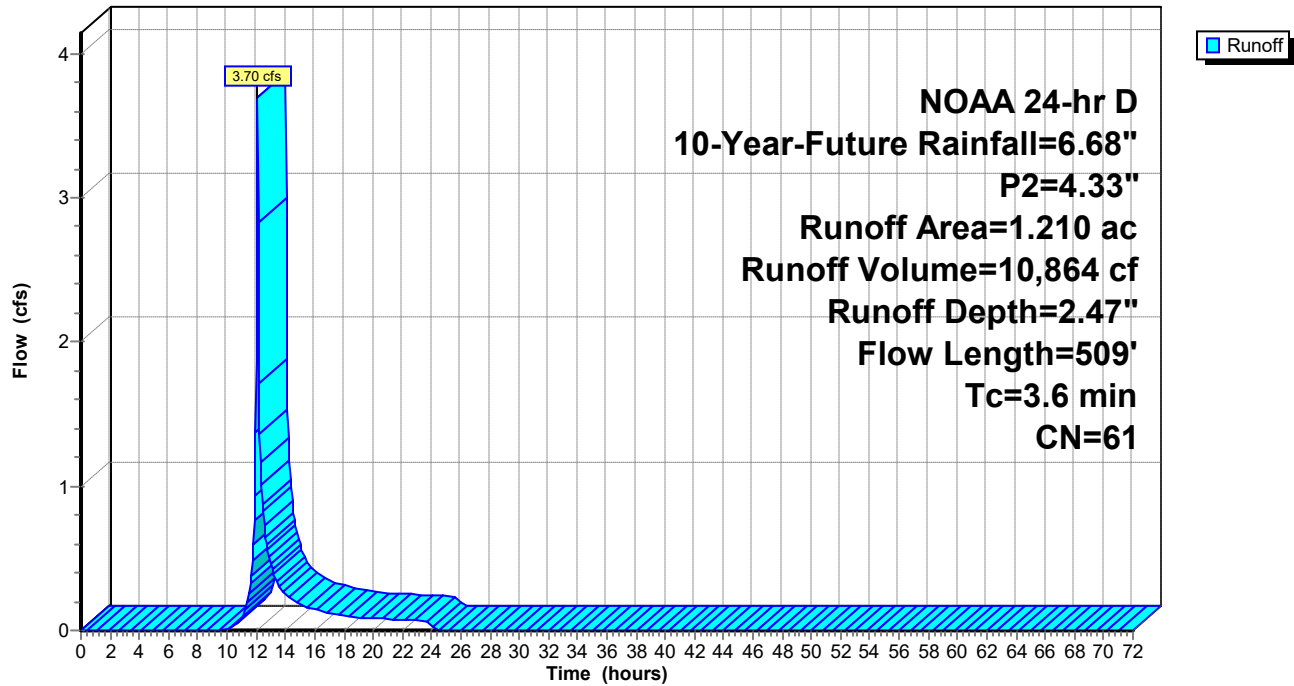
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	12	0.0110	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.1	107	0.0210	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	509	Total			

Subcatchment 45S: P-DA-1B PER

Hydrograph



Summary for Subcatchment 46S: P-DA-4J PER

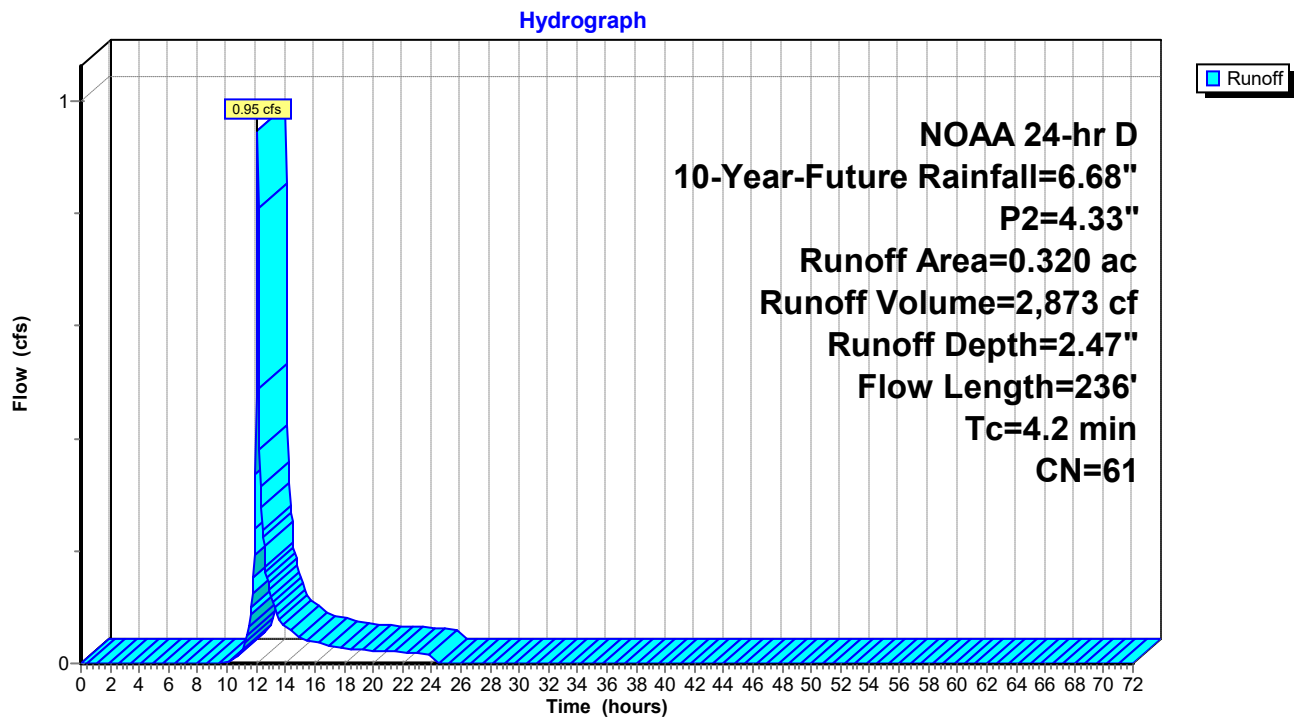
Runoff = 0.95 cfs @ 12.11 hrs, Volume= 2,873 cf, Depth= 2.47"
 Routed to Pond J : BMP-J Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	30	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.2	236	Total			

Subcatchment 46S: P-DA-4J PER



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 5.02 cfs @ 12.07 hrs, Volume= 16,835 cf, Depth= 6.44"
 Routed to Link 50L : TOTAL TO GI MTD K-1

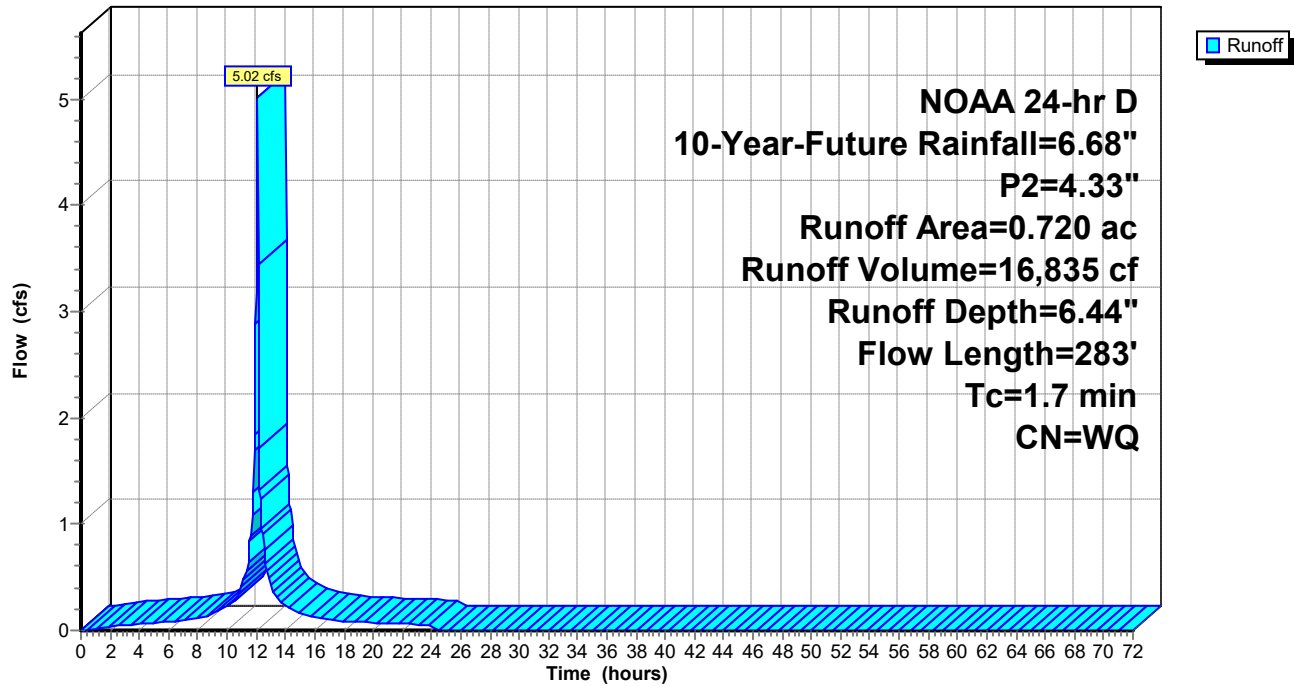
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.7	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

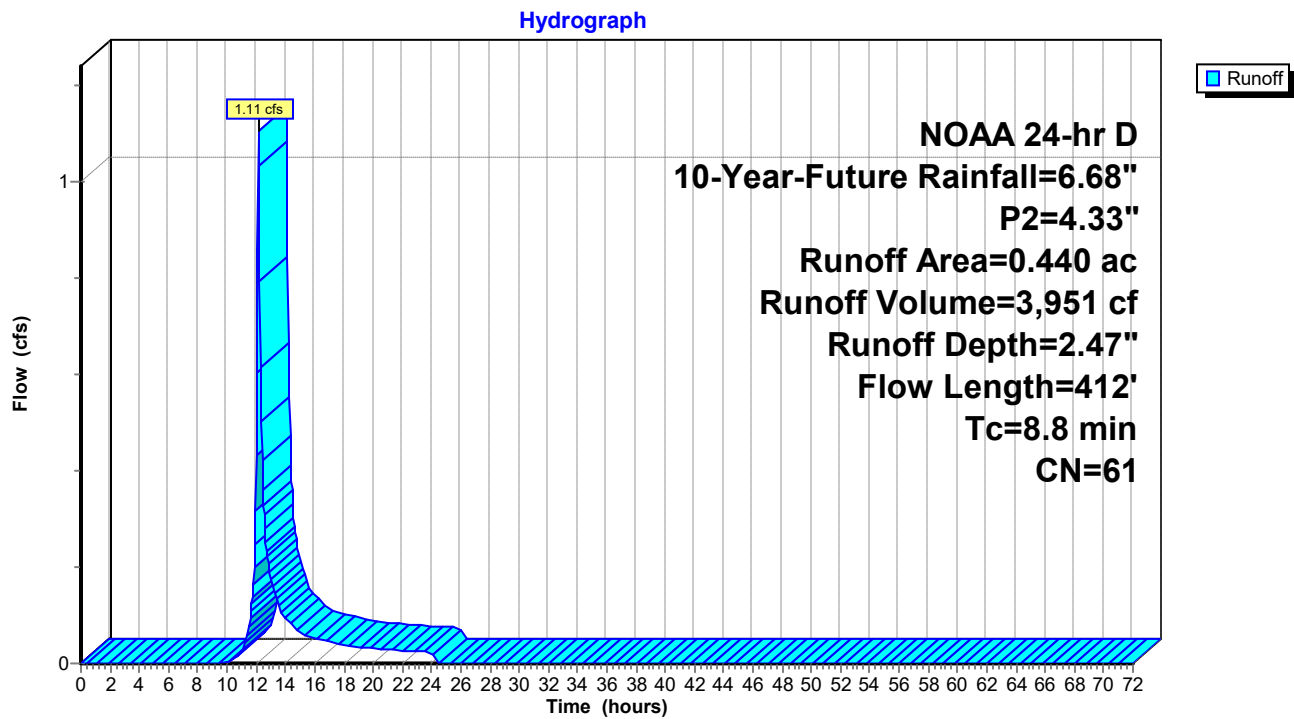
Runoff = 1.11 cfs @ 12.16 hrs, Volume= 3,951 cf, Depth= 2.47"
 Routed to Link 50L : TOTAL TO GI MTD K-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	96	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.8	412	Total			

Subcatchment 48S: P-DA-4K PER



Summary for Subcatchment 49S: P-DA-5N IMP

Runoff = 4.50 cfs @ 12.08 hrs, Volume= 14,730 cf, Depth= 6.44"
 Routed to Pond N : BMP-N Bioretention Basin

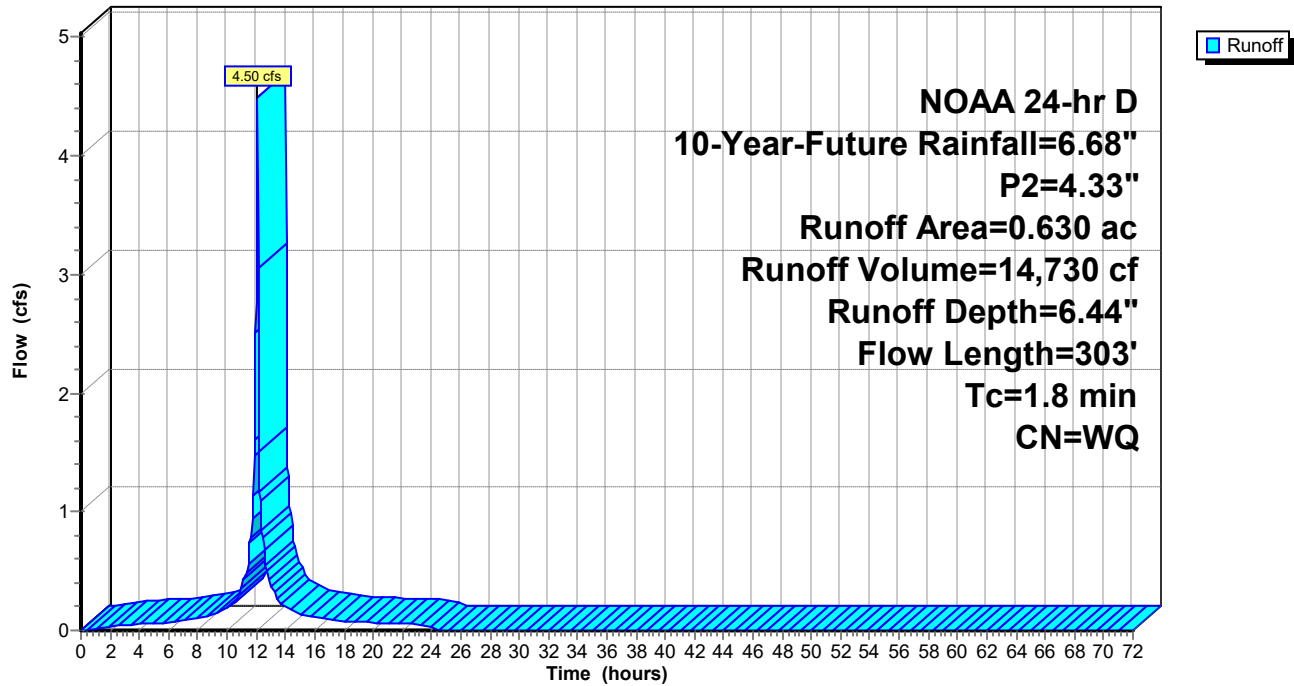
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0270	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	303	Total			

Subcatchment 49S: P-DA-5N IMP

Hydrograph



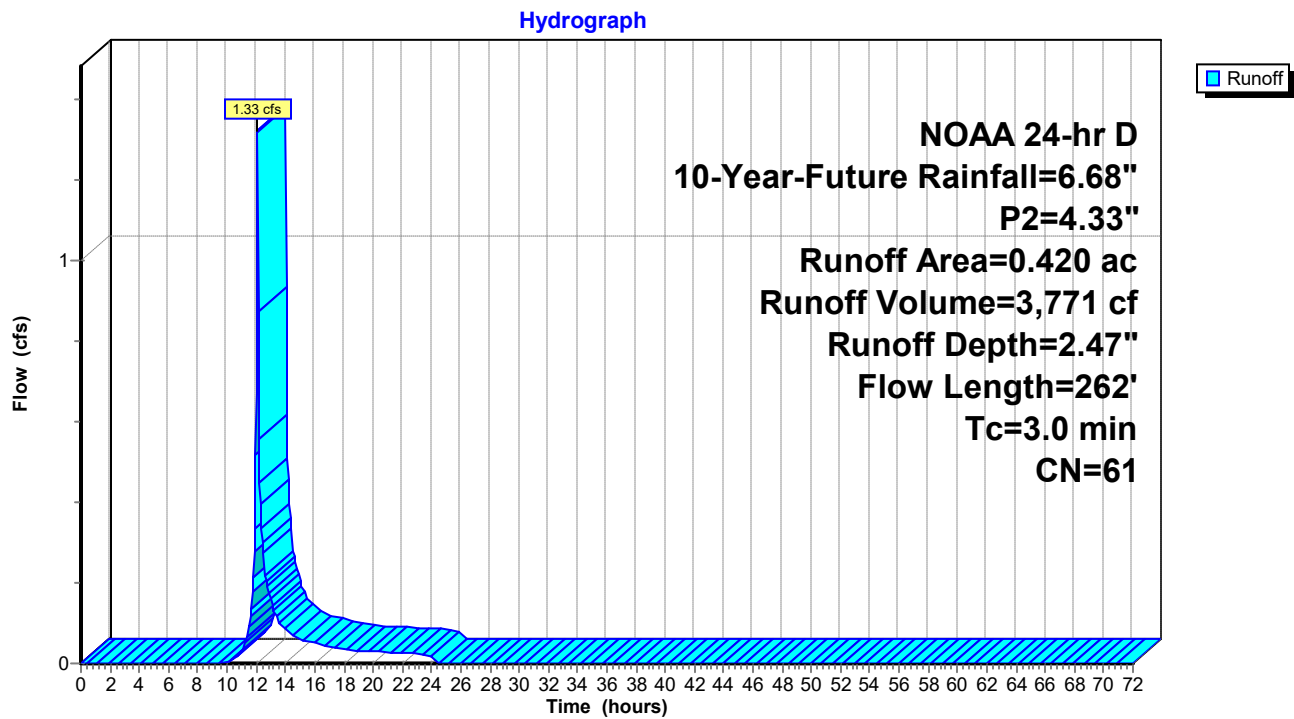
Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 1.33 cfs @ 12.09 hrs, Volume= 3,771 cf, Depth= 2.47"
 Routed to Pond N : BMP-N Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	35	0.0570	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.0	262	Total			

Subcatchment 50S: P-DA-5N PER

Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 9.87 cfs @ 12.08 hrs, Volume= 32,734 cf, Depth= 6.44"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

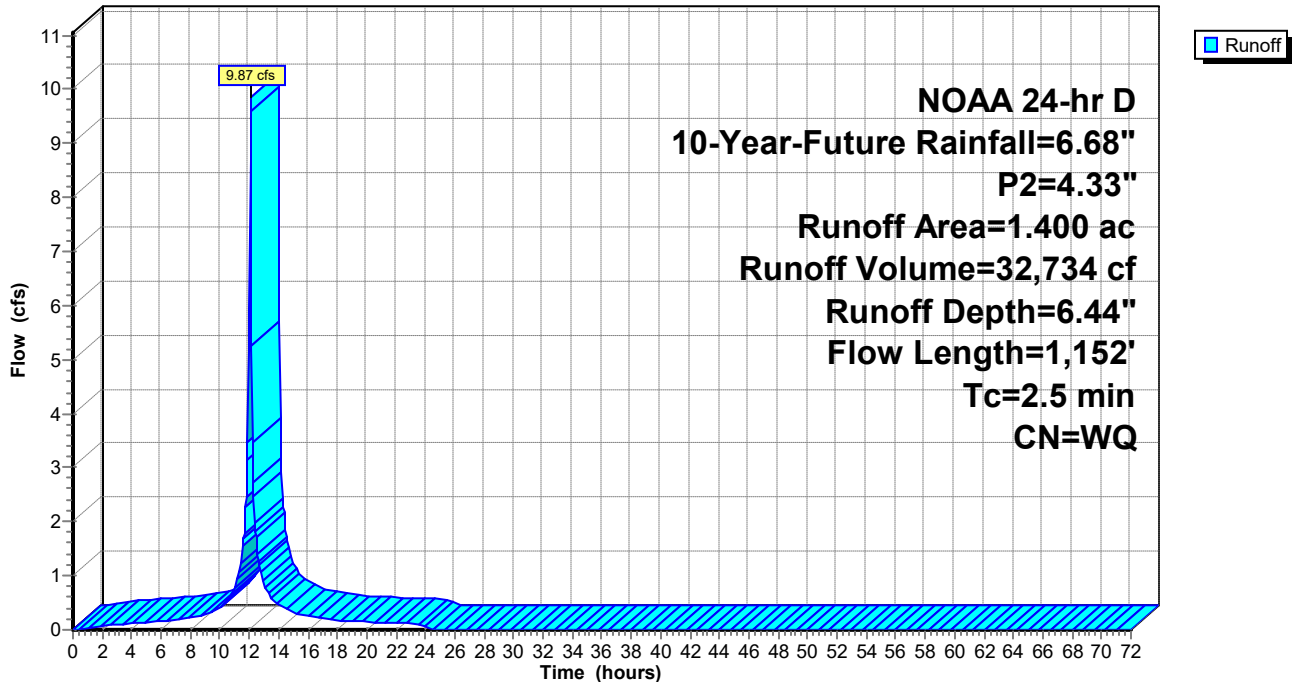
Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	41	0.1200	2.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.5	1,152	Total			

Subcatchment 51S: P-DA-5M IMP

Hydrograph



Summary for Subcatchment 52S: P-DA-5M PER

Runoff = 2.42 cfs @ 12.09 hrs, Volume= 6,824 cf, Depth= 2.47"
 Routed to Link 21L : TOTAL TO P-DA-5M

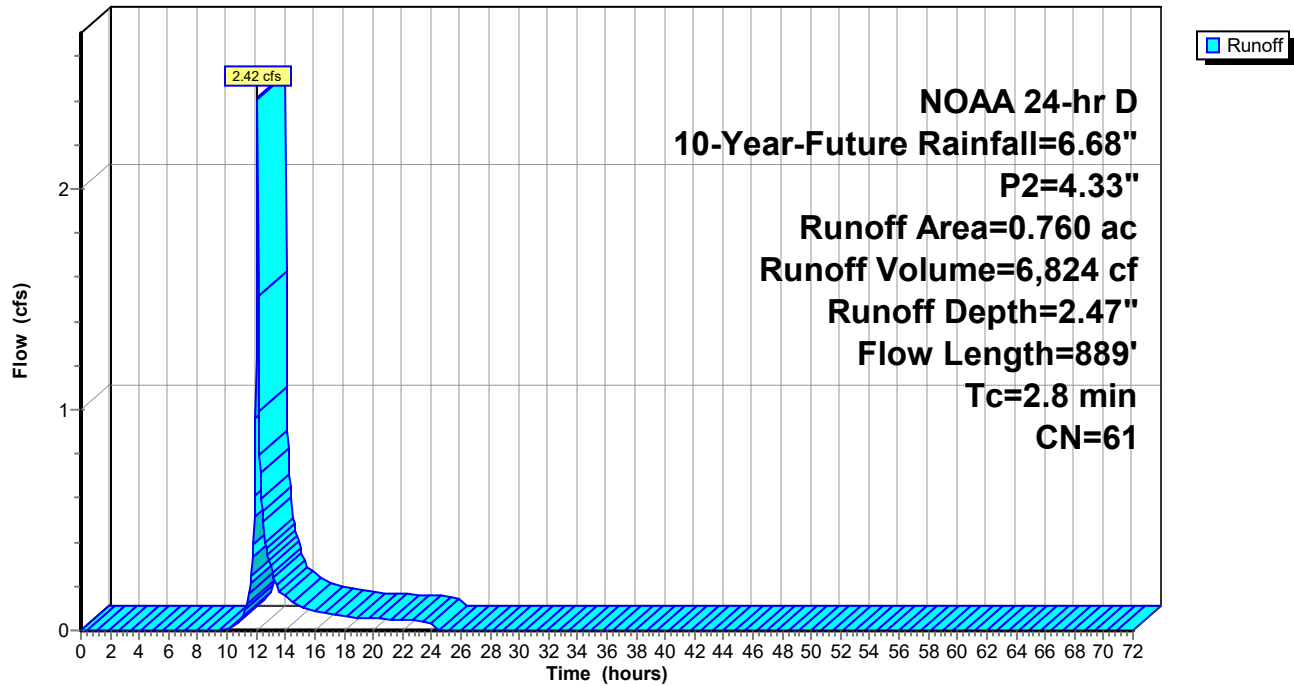
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	20	0.2000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.8	889	Total			

Subcatchment 52S: P-DA-5M PER

Hydrograph



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 1,169 cf, Depth= 6.44"
 Routed to Pond K : BMP-K UG Infiltration Basin

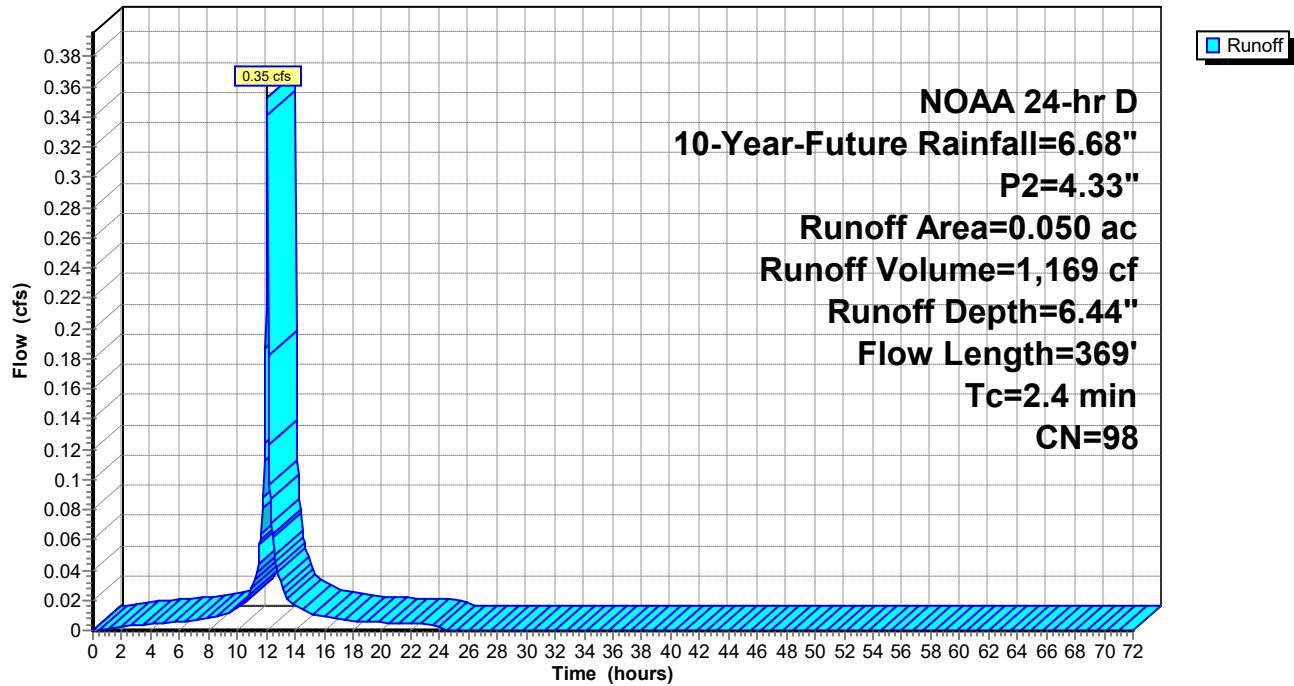
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 2.67 cfs @ 12.22 hrs, Volume= 11,024 cf, Depth= 2.47"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

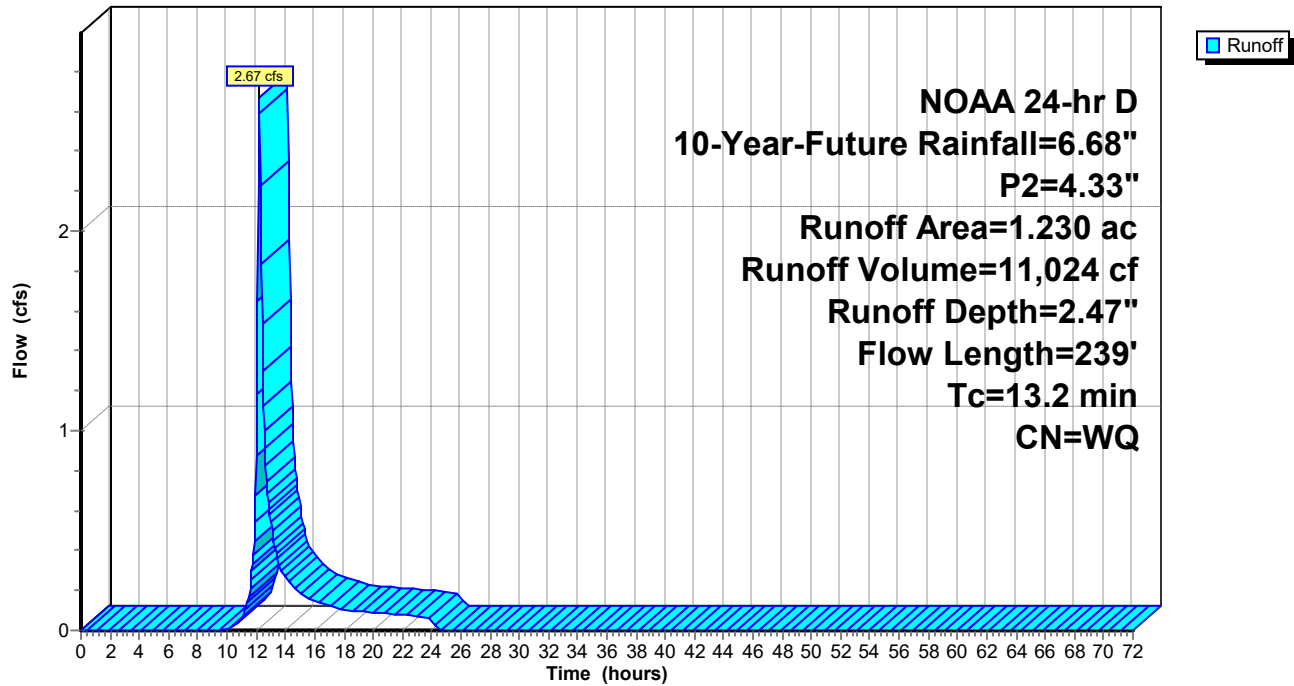
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0200	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.42 cfs @ 12.05 hrs, Volume= 1,403 cf, Depth= 6.44"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

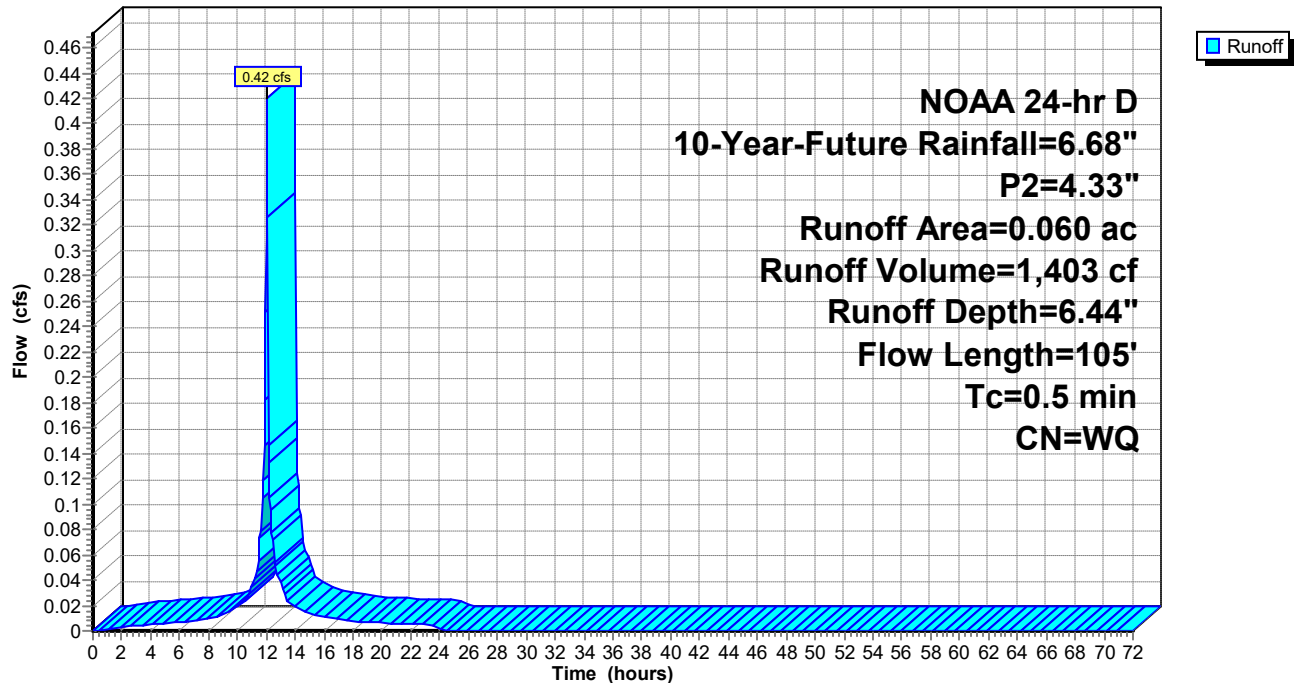
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 10.62 cfs @ 12.08 hrs, Volume= 35,072 cf, Depth= 6.44"
 Routed to Pond P : BMP-P Bioretention Basin

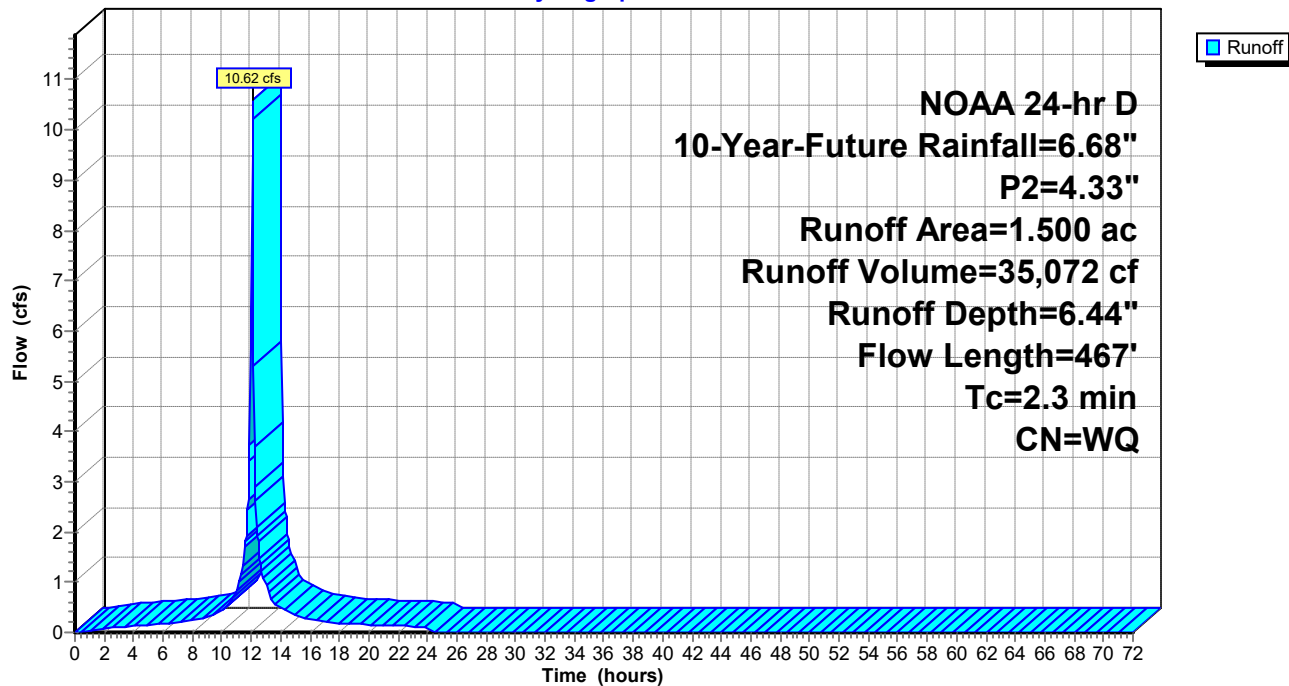
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 2.89 cfs @ 12.08 hrs, Volume= 7,901 cf, Depth= 2.47"
 Routed to Pond P : BMP-P Bioretention Basin

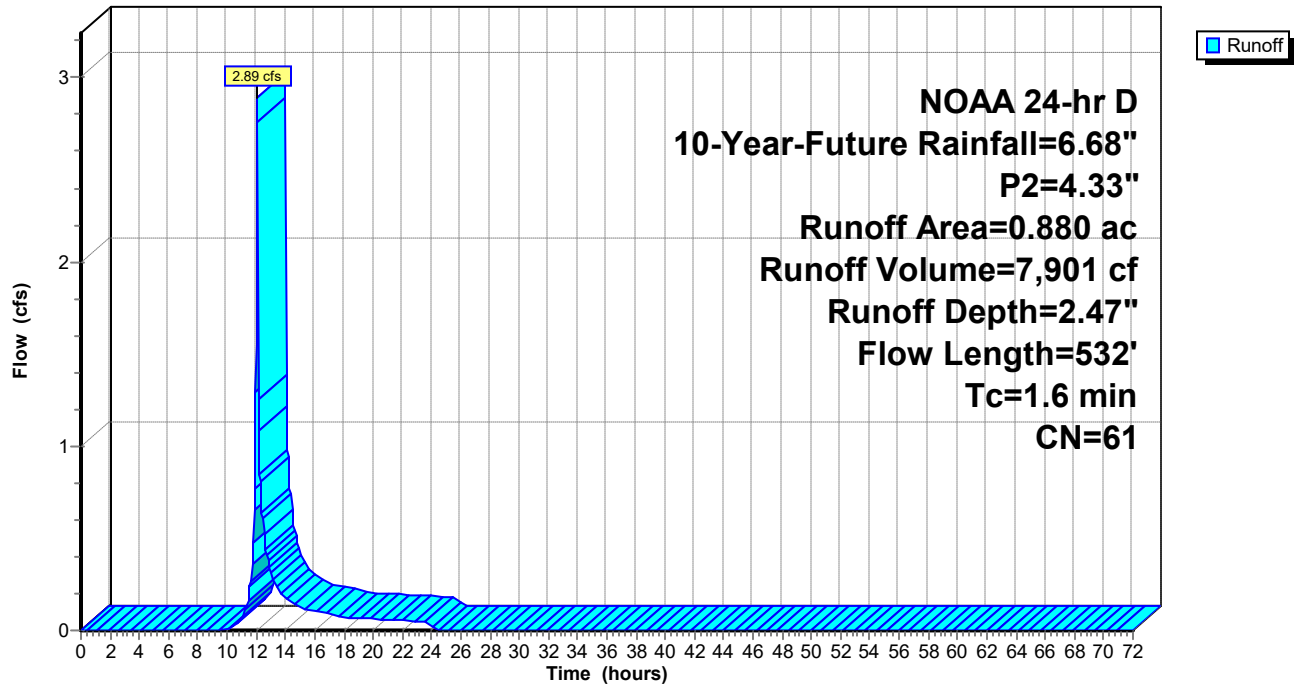
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER

Hydrograph



Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 2.64 cfs @ 12.11 hrs, Volume= 8,131 cf, Depth= 2.41"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

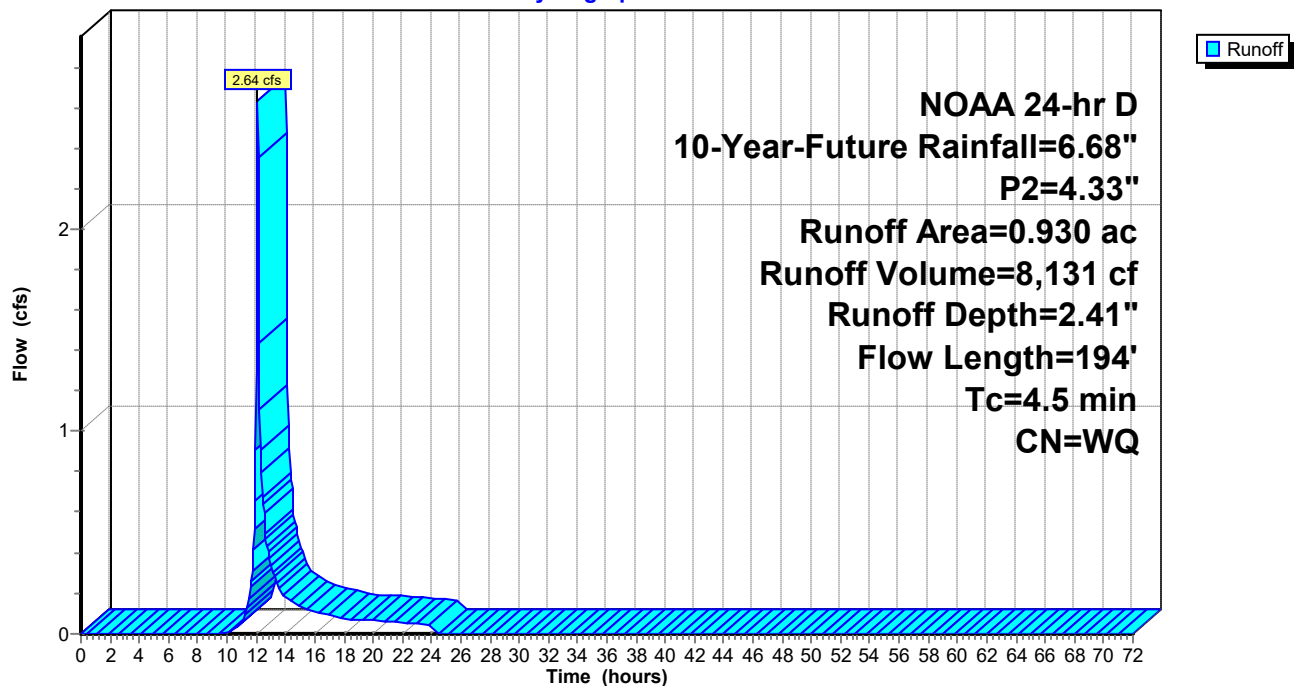
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.5	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Hydrograph



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 5.85 cfs @ 12.08 hrs, Volume= 19,173 cf, Depth= 6.44"
 Routed to Link 66L : P-DA-5R TOTAL

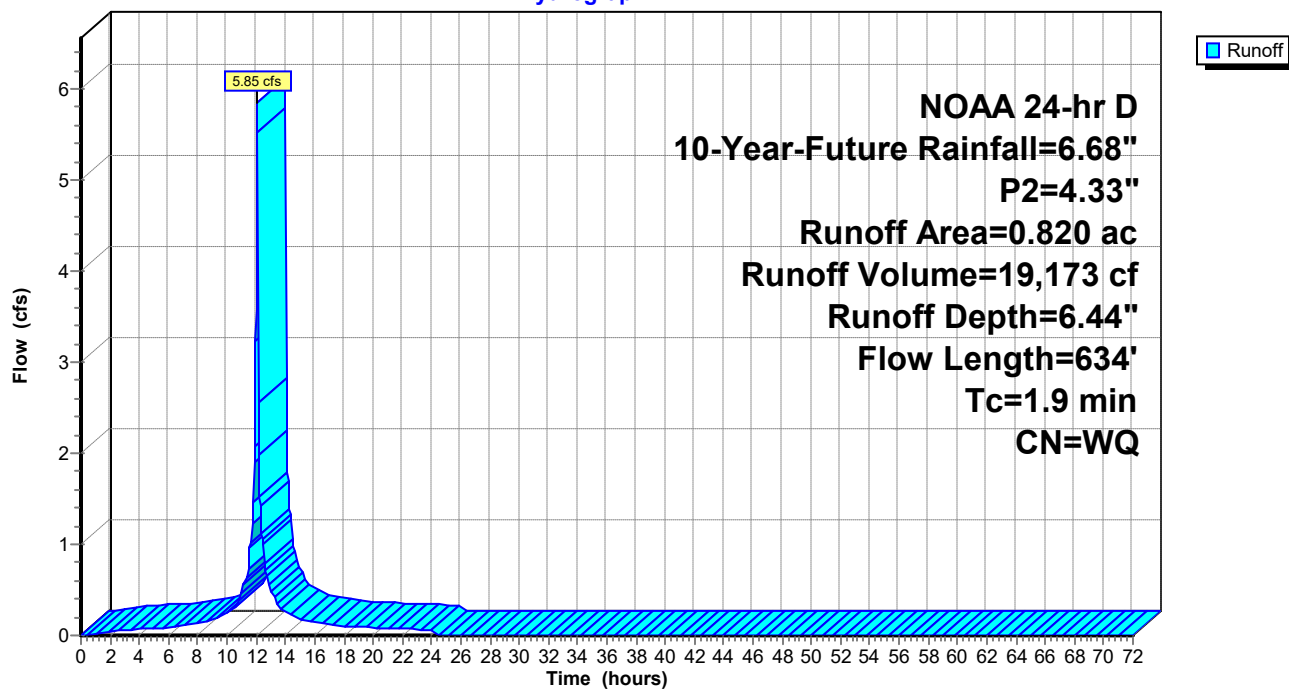
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0370	2.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.9	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

Runoff = 3.84 cfs @ 12.12 hrs, Volume= 12,032 cf, Depth= 2.47"
 Routed to Link 66L : P-DA-5R TOTAL

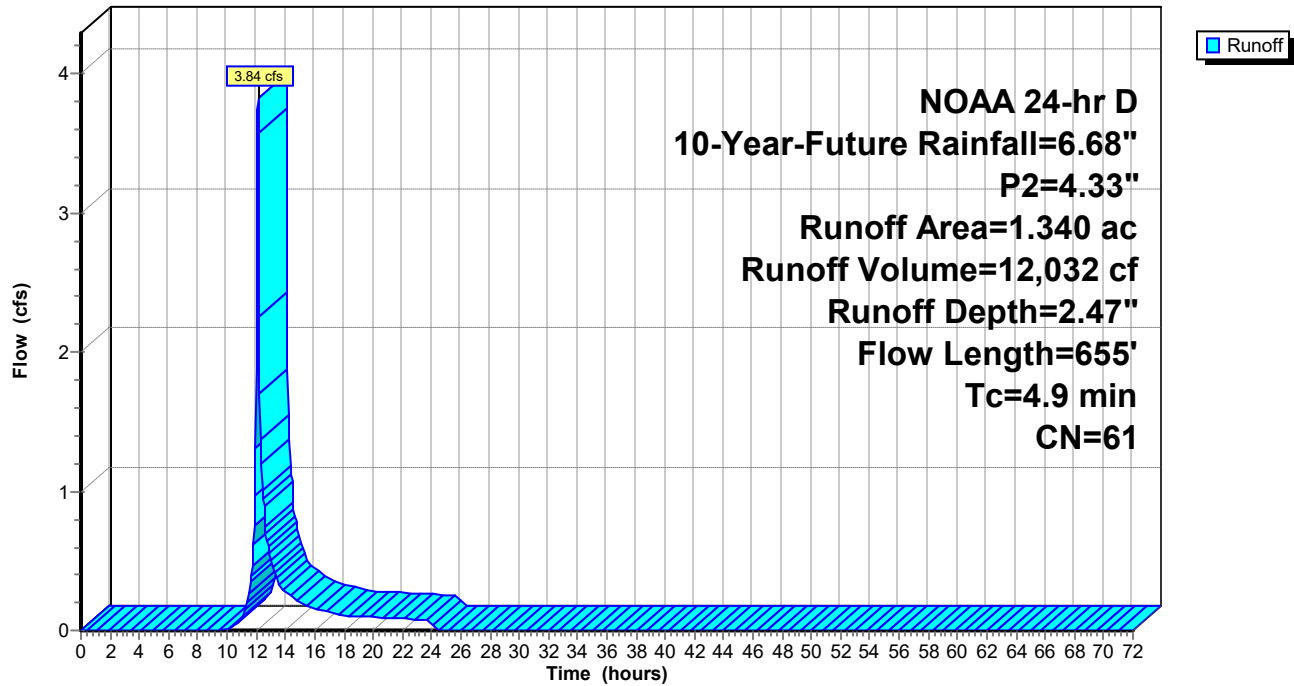
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 10-Year-Future Rainfall=6.68", P2=4.33"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	44	0.0500	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
4.9	655	Total			

Subcatchment 64S: P-DA-5R PER

Hydrograph



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 3.93" for 10-Year-Future event
 Inflow = 3.20 cfs @ 12.08 hrs, Volume= 10,893 cf
 Outflow = 0.61 cfs @ 12.52 hrs, Volume= 9,659 cf, Atten= 81%, Lag= 26.4 min
 Primary = 0.61 cfs @ 12.52 hrs, Volume= 9,659 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 553.77' @ 12.52 hrs Surf.Area= 2,769 sf Storage= 4,730 cf

Plug-Flow detention time= 197.8 min calculated for 9,652 cf (89% of inflow)
 Center-of-Mass det. time= 140.1 min (929.6 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.61 cfs @ 12.52 hrs HW=553.77' (Free Discharge)

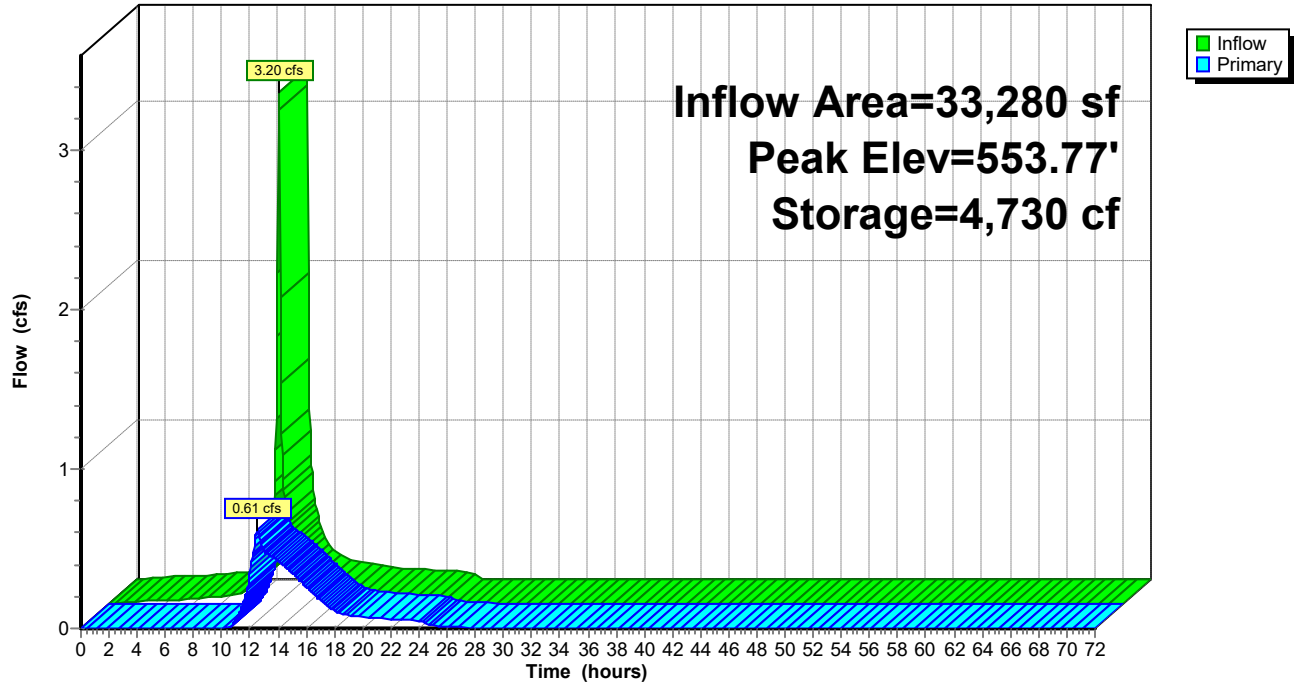
1=Culvert (Passes 0.61 cfs of 12.26 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.49 cfs @ 5.60 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.12 cfs @ 0.86 fps)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 4.53" for 10-Year-Future event
 Inflow = 18.39 cfs @ 12.09 hrs, Volume= 72,489 cf
 Outflow = 1.79 cfs @ 13.50 hrs, Volume= 65,200 cf, Atten= 90%, Lag= 84.7 min
 Primary = 1.79 cfs @ 13.50 hrs, Volume= 65,200 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 576.73' @ 13.50 hrs Surf.Area= 14,884 sf Storage= 39,386 cf

Plug-Flow detention time= 360.4 min calculated for 65,200 cf (90% of inflow)
 Center-of-Mass det. time= 304.6 min (1,105.9 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

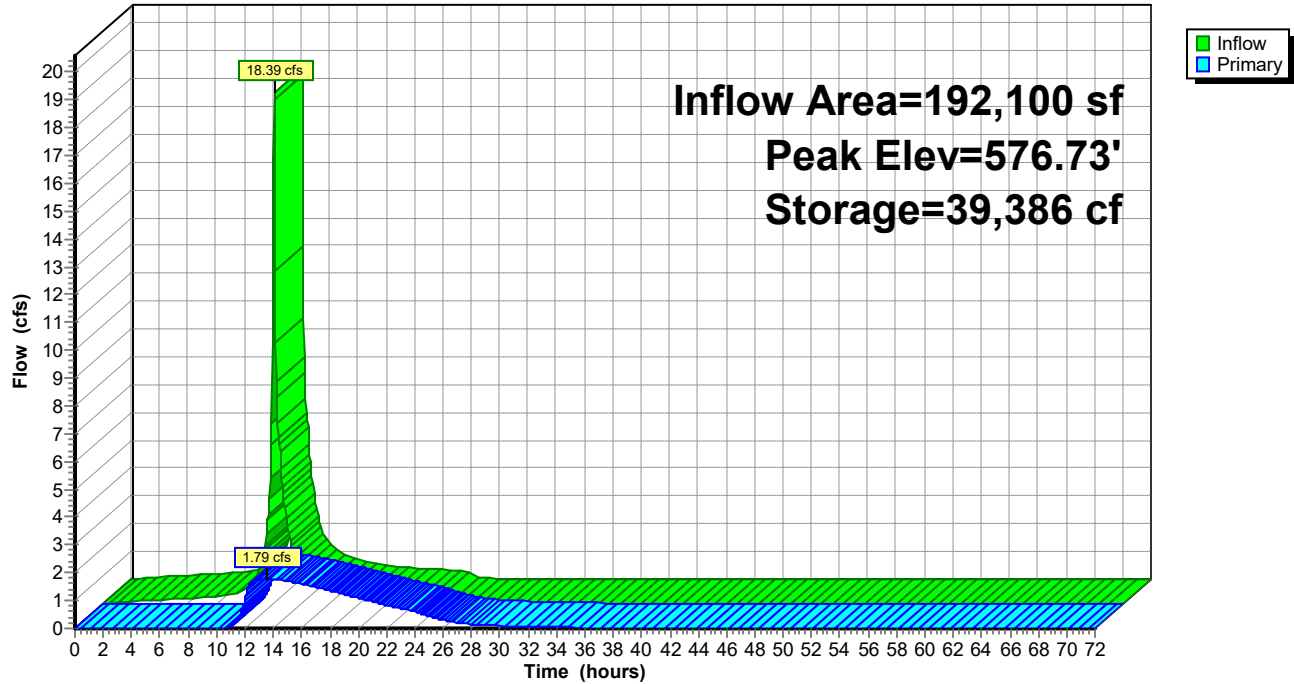
Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.79 cfs @ 13.50 hrs HW=576.73' (Free Discharge)

1=Culvert (Passes 1.79 cfs of 28.75 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.79 cfs @ 6.70 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 4.30" for 10-Year-Future event
 Inflow = 10.07 cfs @ 12.09 hrs, Volume= 42,033 cf
 Outflow = 1.20 cfs @ 13.54 hrs, Volume= 37,802 cf, Atten= 88%, Lag= 86.8 min
 Primary = 1.20 cfs @ 13.54 hrs, Volume= 37,802 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 562.64' @ 13.54 hrs Surf.Area= 10,217 sf Storage= 22,579 cf

Plug-Flow detention time= 601.6 min calculated for 37,802 cf (90% of inflow)
 Center-of-Mass det. time= 542.4 min (1,354.1 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.20 cfs @ 13.54 hrs HW=562.64' (Free Discharge)

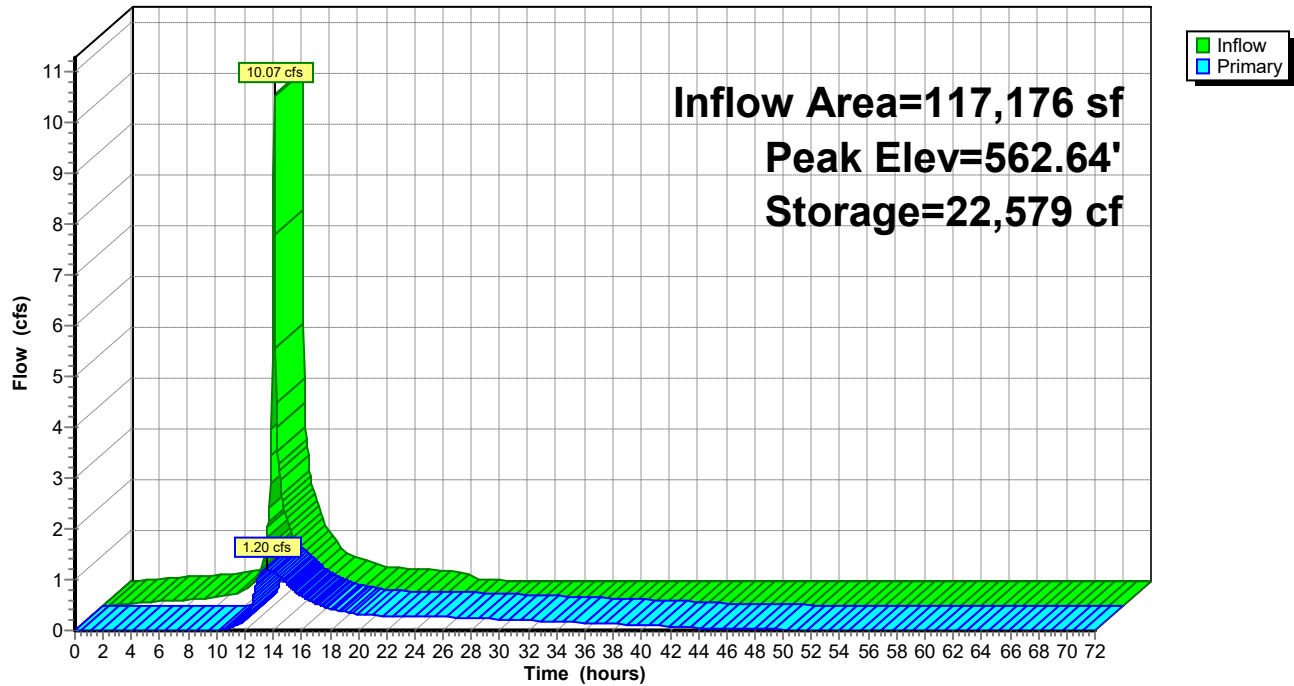
1=Culvert (Passes 1.20 cfs of 19.36 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.33 cfs @ 6.75 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.87 cfs @ 2.17 fps)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 5.36" for 10-Year-Future event
 Inflow = 3.25 cfs @ 12.07 hrs, Volume= 10,699 cf
 Outflow = 1.39 cfs @ 12.17 hrs, Volume= 9,179 cf, Atten= 57%, Lag= 5.9 min
 Primary = 1.39 cfs @ 12.17 hrs, Volume= 9,179 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 600.92' @ 12.17 hrs Surf.Area= 2,230 sf Storage= 3,691 cf

Plug-Flow detention time= 174.2 min calculated for 9,173 cf (86% of inflow)
 Center-of-Mass det. time= 106.0 min (861.6 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

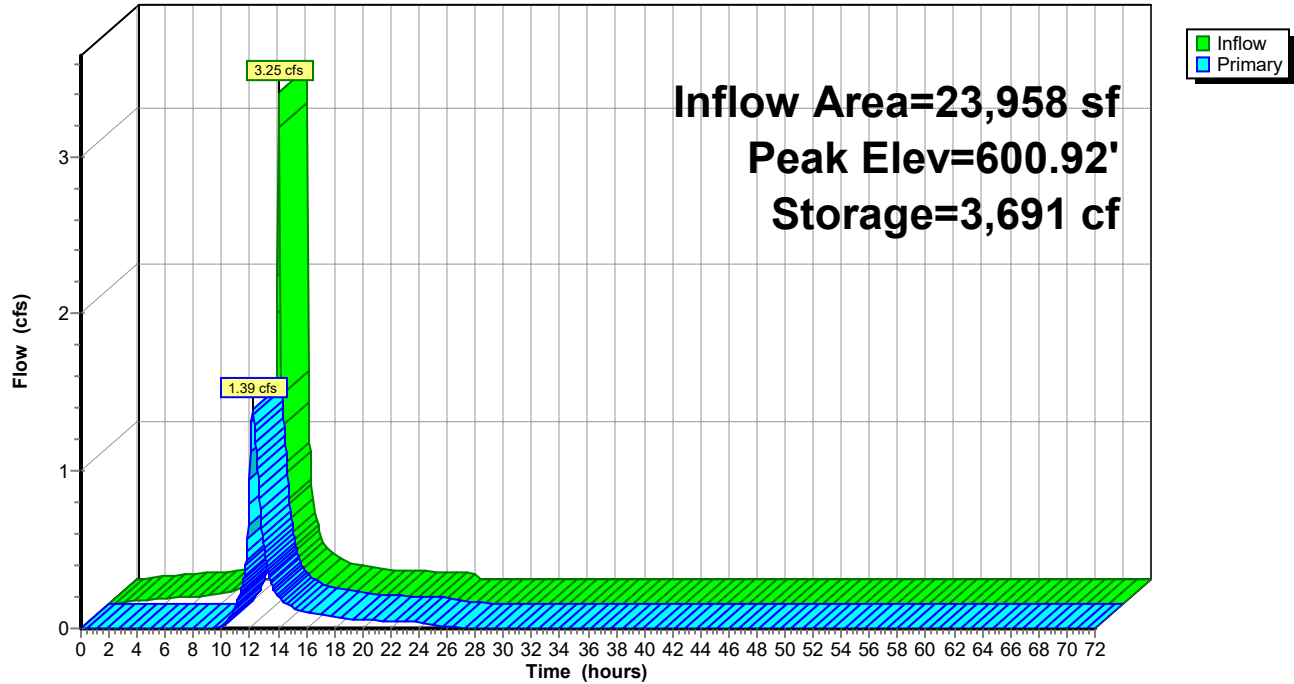
Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.38 cfs @ 12.17 hrs HW=600.91' (Free Discharge)

- 1=Culvert (Passes 1.38 cfs of 8.78 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.38 cfs @ 3.95 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: UG INFILTRATION BASIN F

Hydrograph



Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 4.23" for 10-Year-Future event
 Inflow = 3.93 cfs @ 12.08 hrs, Volume= 12,134 cf
 Outflow = 0.77 cfs @ 12.37 hrs, Volume= 10,138 cf, Atten= 80%, Lag= 17.9 min
 Primary = 0.77 cfs @ 12.37 hrs, Volume= 10,138 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.51' @ 12.37 hrs Surf.Area= 4,159 sf Storage= 5,539 cf

Plug-Flow detention time= 232.4 min calculated for 10,131 cf (83% of inflow)
 Center-of-Mass det. time= 156.4 min (936.4 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

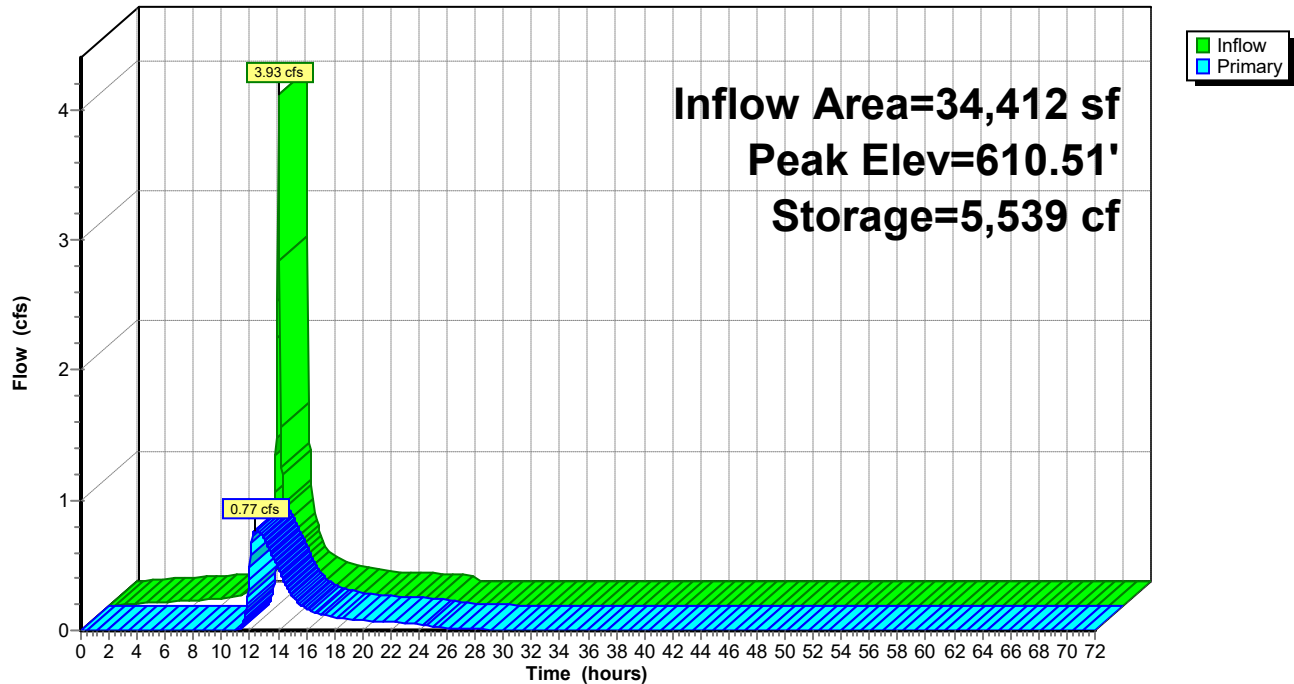
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.77 cfs @ 12.37 hrs HW=610.51' (Free Discharge)

↑ **1=Culvert** (Passes 0.77 cfs of 7.42 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.77 cfs @ 3.91 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 4.57" for 10-Year-Future event
 Inflow = 5.29 cfs @ 12.08 hrs, Volume= 16,936 cf
 Outflow = 2.37 cfs @ 12.17 hrs, Volume= 14,333 cf, Atten= 55%, Lag= 5.6 min
 Primary = 2.37 cfs @ 12.17 hrs, Volume= 14,333 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.92' @ 12.17 hrs Surf.Area= 7,236 sf Storage= 6,208 cf

Plug-Flow detention time= 178.8 min calculated for 14,333 cf (85% of inflow)
 Center-of-Mass det. time= 104.1 min (876.0 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

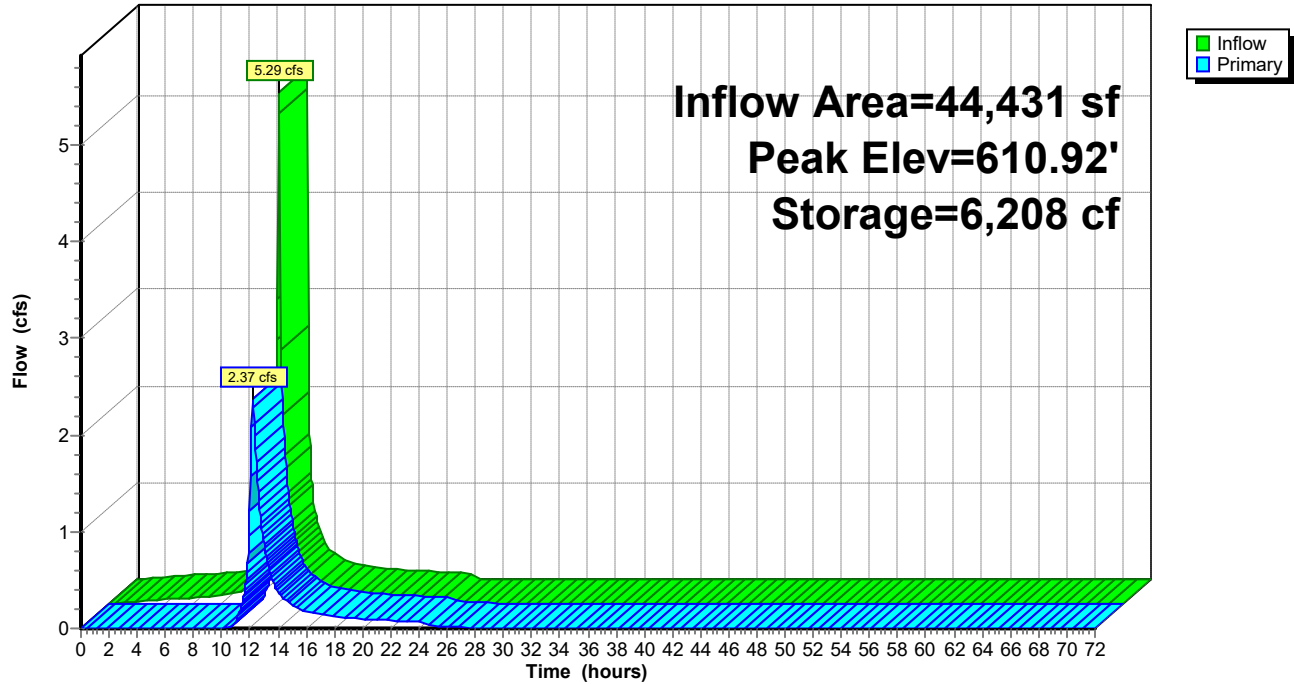
Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.34 cfs @ 12.17 hrs HW=610.91' (Free Discharge)

1=Culvert (Passes 2.34 cfs of 13.72 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.34 cfs @ 2.34 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 4.84" for 10-Year-Future event
 Inflow = 5.24 cfs @ 12.08 hrs, Volume= 16,506 cf
 Outflow = 1.58 cfs @ 12.23 hrs, Volume= 14,178 cf, Atten= 70%, Lag= 9.4 min
 Primary = 1.58 cfs @ 12.23 hrs, Volume= 14,178 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 615.46' @ 12.23 hrs Surf.Area= 3,348 sf Storage= 6,083 cf

Plug-Flow detention time= 167.6 min calculated for 14,178 cf (86% of inflow)
 Center-of-Mass det. time= 97.3 min (863.0 - 765.8)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.57 cfs @ 12.23 hrs HW=615.46' (Free Discharge)

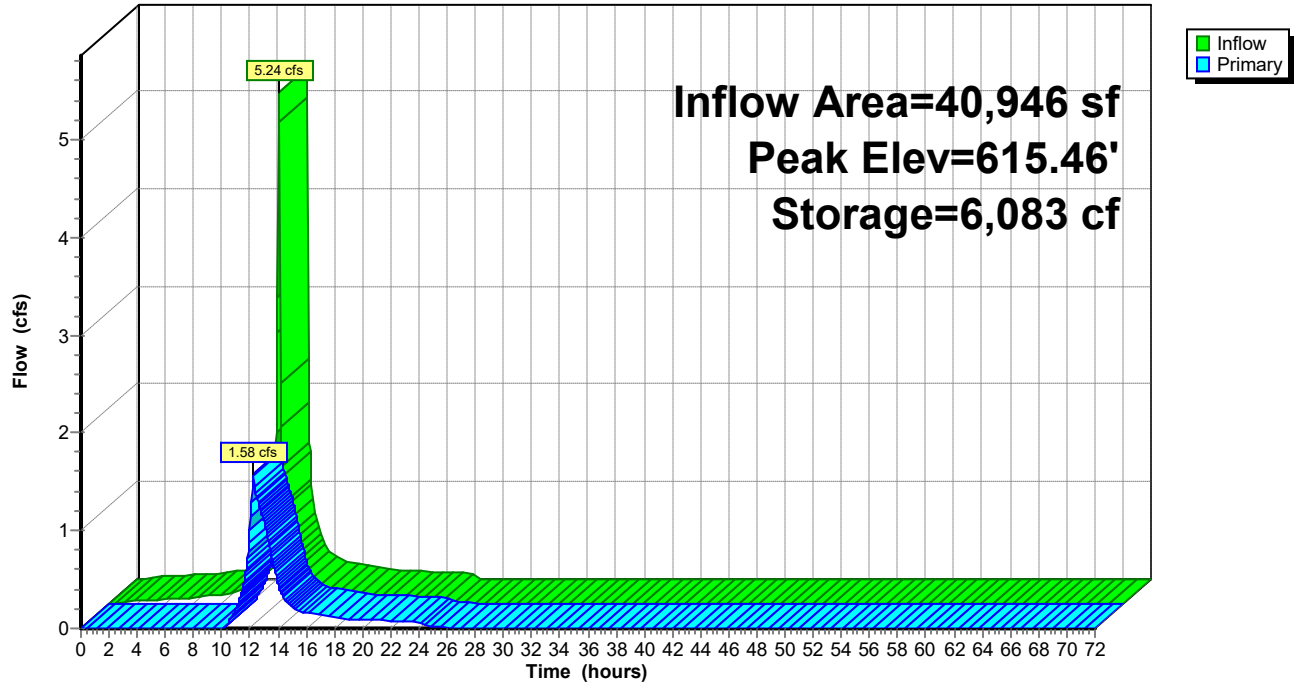
1=Culvert (Passes 1.57 cfs of 18.46 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.40 cfs @ 5.02 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.78 fps)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 4.95" for 10-Year-Future event
 Inflow = 4.64 cfs @ 12.09 hrs, Volume= 15,265 cf
 Outflow = 0.35 cfs @ 13.31 hrs, Volume= 13,258 cf, Atten= 93%, Lag= 73.5 min
 Primary = 0.35 cfs @ 13.31 hrs, Volume= 13,258 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.08' @ 13.31 hrs Surf.Area= 3,347 sf Storage= 8,730 cf

Plug-Flow detention time= 369.3 min calculated for 13,249 cf (87% of inflow)
 Center-of-Mass det. time= 304.7 min (1,069.2 - 764.5)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

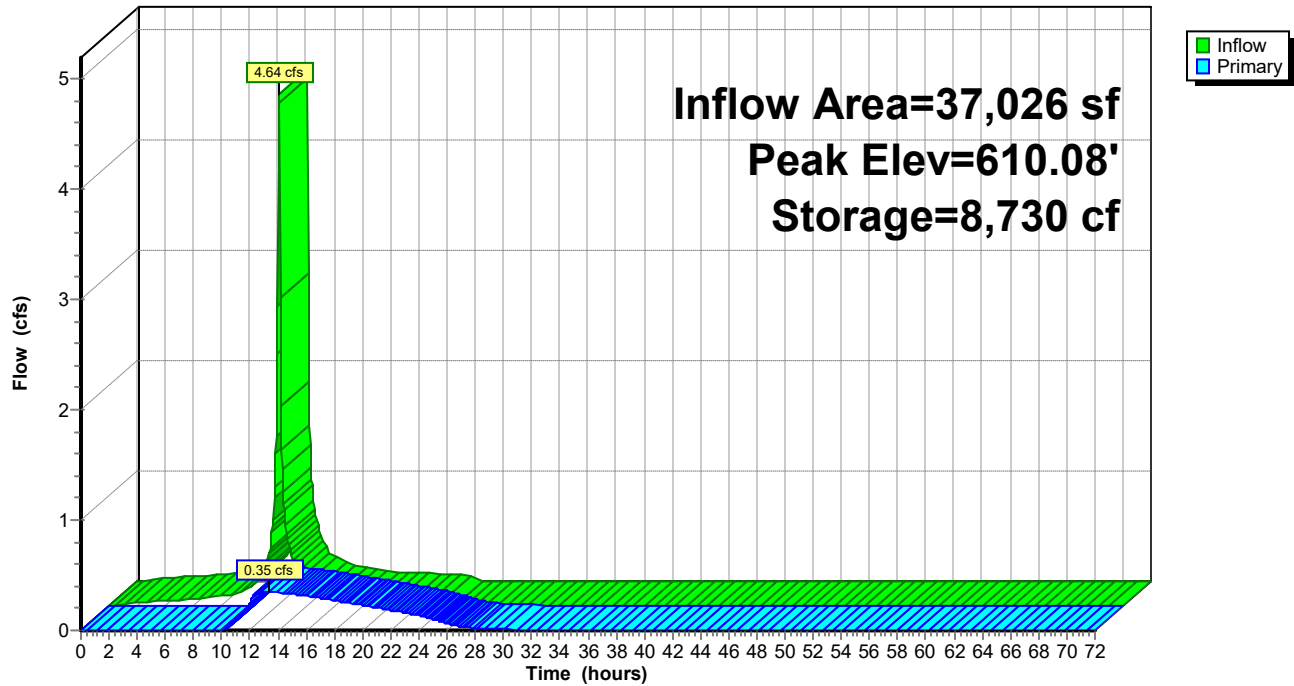
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.35 cfs @ 13.31 hrs HW=610.08' (Free Discharge)

1=Culvert (Passes 0.35 cfs of 19.51 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.35 cfs @ 7.05 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 4.71" for 10-Year-Future event
 Inflow = 6.50 cfs @ 12.08 hrs, Volume= 35,212 cf
 Outflow = 3.12 cfs @ 12.20 hrs, Volume= 32,115 cf, Atten= 52%, Lag= 7.5 min
 Primary = 3.12 cfs @ 12.20 hrs, Volume= 32,115 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 596.57' @ 12.21 hrs Surf.Area= 2,960 sf Storage= 9,182 cf

Plug-Flow detention time= 175.5 min calculated for 32,093 cf (91% of inflow)
 Center-of-Mass det. time= 119.1 min (997.8 - 878.7)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

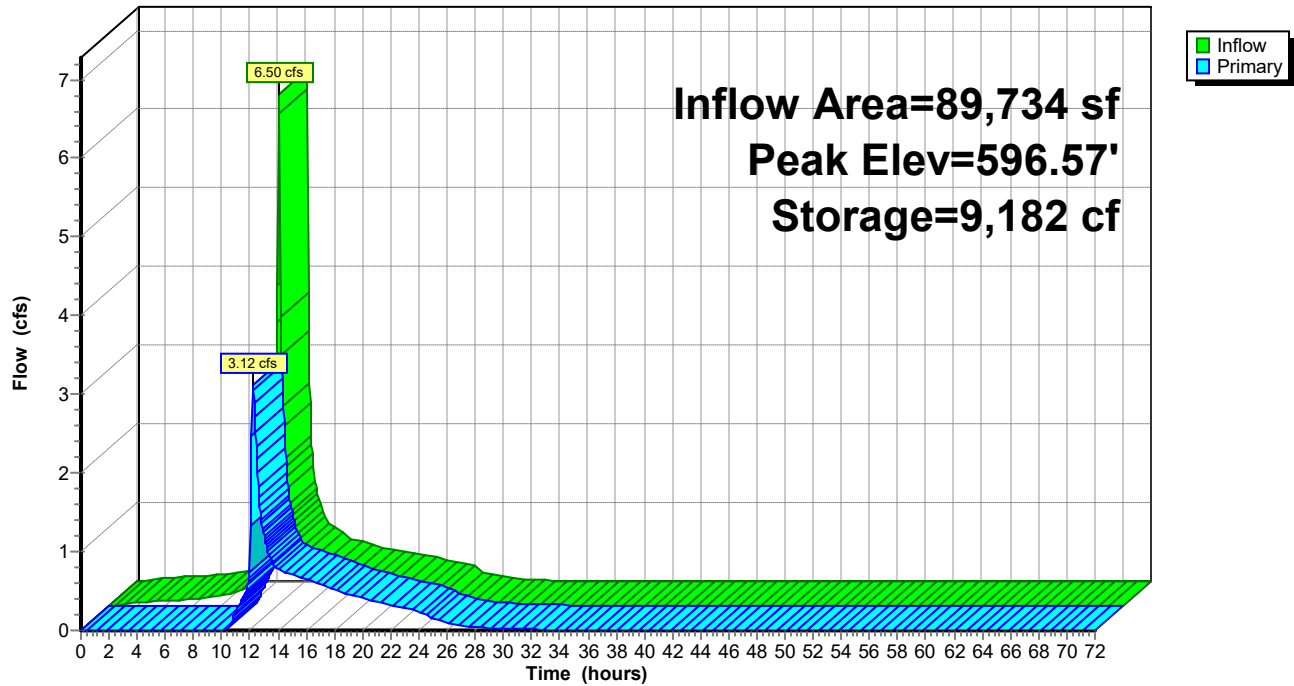
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.11 cfs @ 12.20 hrs HW=596.56' (Free Discharge)

1=Culvert (Passes 3.11 cfs of 13.76 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.92 cfs @ 6.73 fps)
 3=Orifice/Grate (Orifice Controls 2.01 cfs @ 3.22 fps)
 4=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 1.13 fps)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 5.05" for 10-Year-Future event
 Inflow = 12.27 cfs @ 12.09 hrs, Volume= 39,558 cf
 Outflow = 7.67 cfs @ 12.15 hrs, Volume= 34,190 cf, Atten= 37%, Lag= 4.0 min
 Primary = 7.67 cfs @ 12.15 hrs, Volume= 34,190 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 570.02' @ 12.15 hrs Surf.Area= 6,793 sf Storage= 12,222 cf

Plug-Flow detention time= 167.1 min calculated for 34,166 cf (86% of inflow)
 Center-of-Mass det. time= 100.7 min (863.0 - 762.3)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

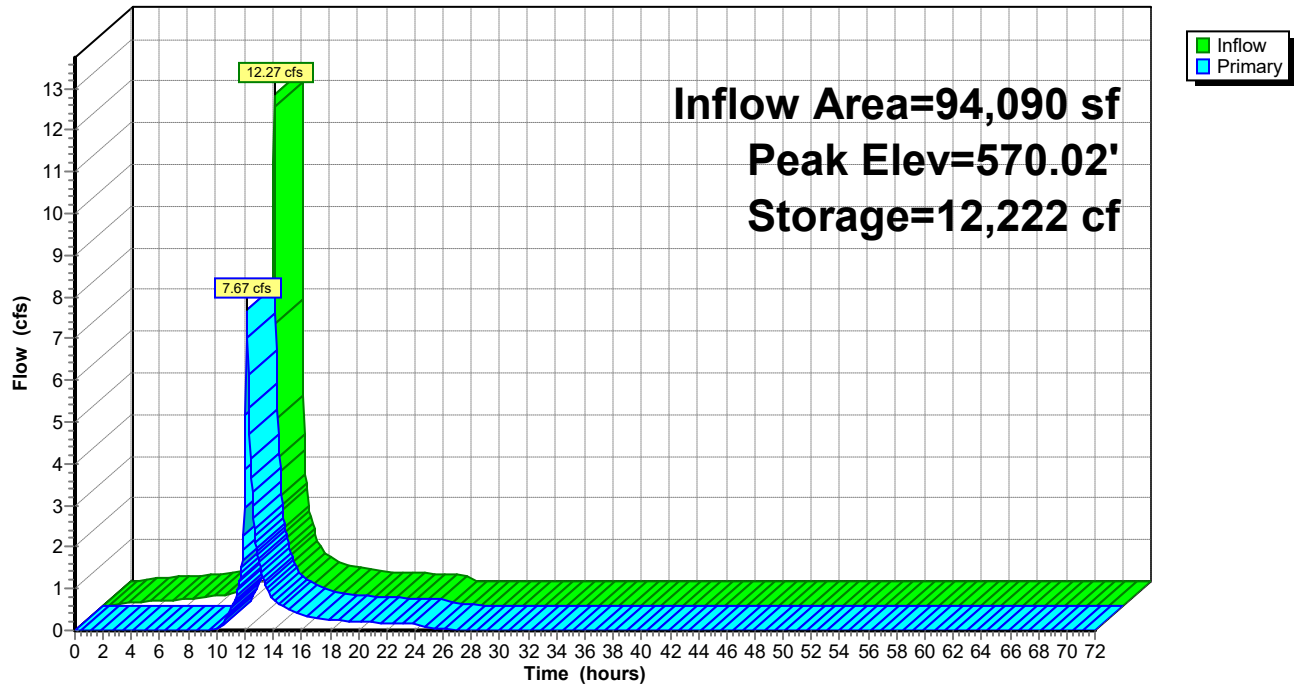
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.64 cfs @ 12.15 hrs HW=570.02' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 7.64 cfs of 26.93 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 4.25 cfs @ 3.89 fps)
 3=Broad-Crested Rectangular Weir (Weir Controls 3.39 cfs @ 2.18 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 4.85" for 10-Year-Future event
 Inflow = 5.78 cfs @ 12.08 hrs, Volume= 18,501 cf
 Outflow = 3.05 cfs @ 12.16 hrs, Volume= 15,976 cf, Atten= 47%, Lag= 4.9 min
 Primary = 3.05 cfs @ 12.16 hrs, Volume= 15,976 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 599.07' @ 12.16 hrs Surf.Area= 2,727 sf Storage= 6,700 cf

Plug-Flow detention time= 179.0 min calculated for 15,976 cf (86% of inflow)
 Center-of-Mass det. time= 110.6 min (876.3 - 765.7)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.99 cfs @ 12.16 hrs HW=599.06' (Free Discharge)

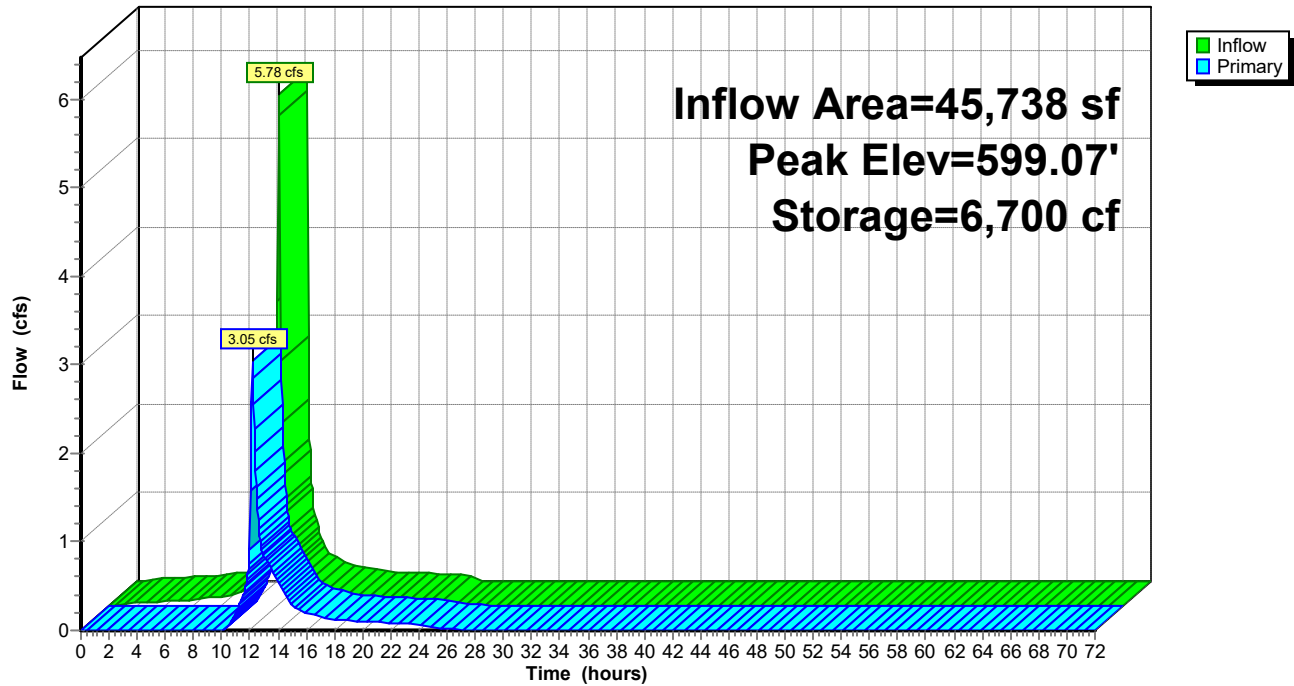
1=Culvert (Passes 2.99 cfs of 19.50 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.08 cfs @ 5.52 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.91 cfs @ 2.45 fps)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 4.73" for 10-Year-Future event
 Inflow = 15.83 cfs @ 12.09 hrs, Volume= 58,950 cf
 Outflow = 8.40 cfs @ 12.18 hrs, Volume= 53,300 cf, Atten= 47%, Lag= 5.8 min
 Primary = 8.40 cfs @ 12.18 hrs, Volume= 53,300 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 578.78' @ 12.18 hrs Surf.Area= 6,783 sf Storage= 16,848 cf

Plug-Flow detention time= 147.9 min calculated for 53,263 cf (90% of inflow)
 Center-of-Mass det. time= 95.3 min (889.3 - 793.9)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=8.34 cfs @ 12.18 hrs HW=578.77' (Free Discharge)

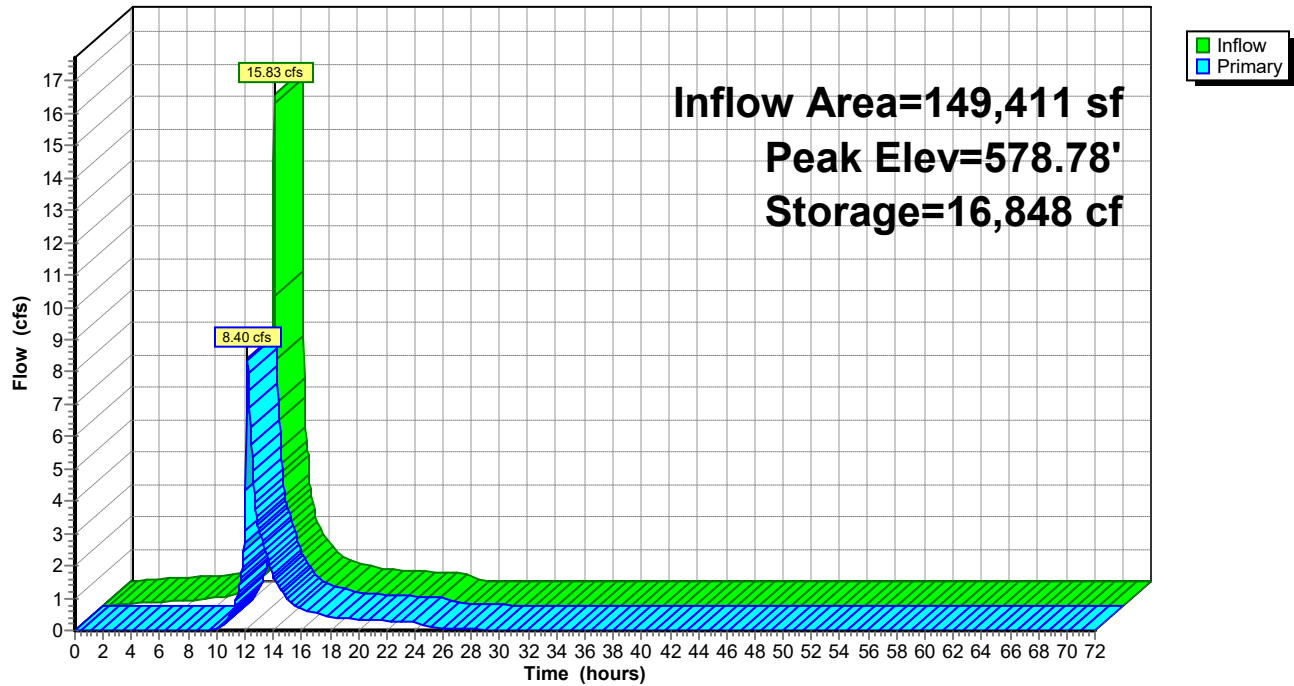
1=Culvert (Passes 8.34 cfs of 17.80 cfs potential flow)

2=Orifice/Grate (Orifice Controls 4.26 cfs @ 5.43 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 4.08 cfs @ 2.47 fps)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 4.22" for 10-Year-Future event
 Inflow = 23.32 cfs @ 12.12 hrs, Volume= 118,694 cf
 Outflow = 9.38 cfs @ 12.56 hrs, Volume= 114,862 cf, Atten= 60%, Lag= 26.7 min
 Primary = 9.38 cfs @ 12.56 hrs, Volume= 114,862 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 565.04' @ 12.56 hrs Surf.Area= 16,119 sf Storage= 36,286 cf

Plug-Flow detention time= 135.9 min calculated for 114,862 cf (97% of inflow)
 Center-of-Mass det. time= 110.4 min (965.7 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=9.36 cfs @ 12.56 hrs HW=565.04' (Free Discharge)

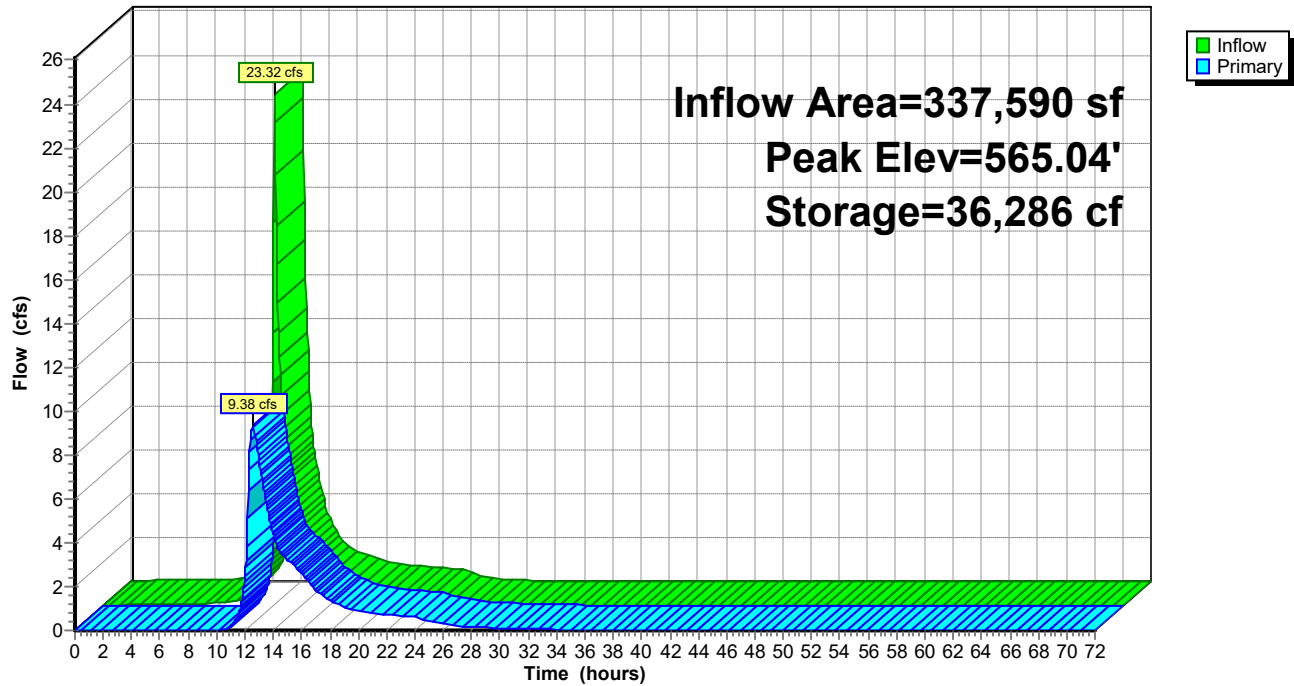
1=Culvert (Passes 9.36 cfs of 60.28 cfs potential flow)

2=Orifice/Grate (Orifice Controls 4.50 cfs @ 6.48 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 4.86 cfs @ 2.81 fps)

Pond R: BMP-R Bioretention Basin

Hydrograph



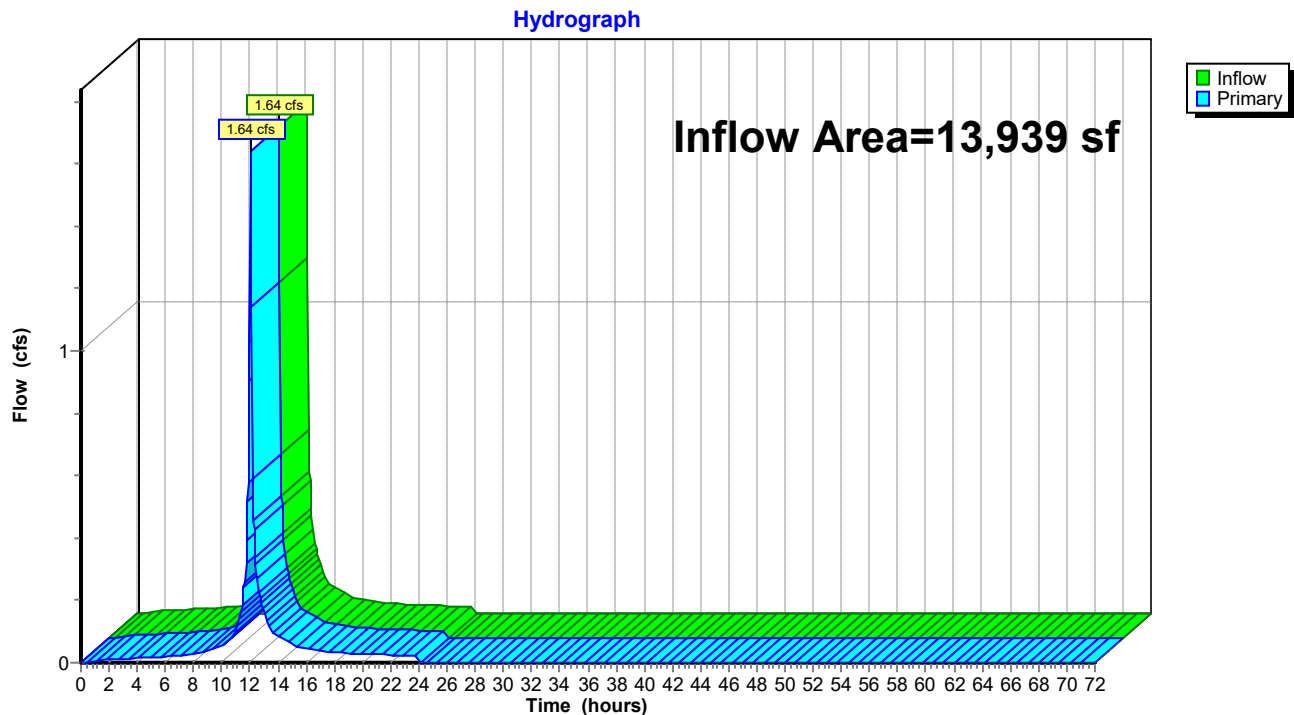
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 4.58" for 10-Year-Future event
Inflow = 1.64 cfs @ 12.07 hrs, Volume= 5,322 cf
Primary = 1.64 cfs @ 12.07 hrs, Volume= 5,322 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

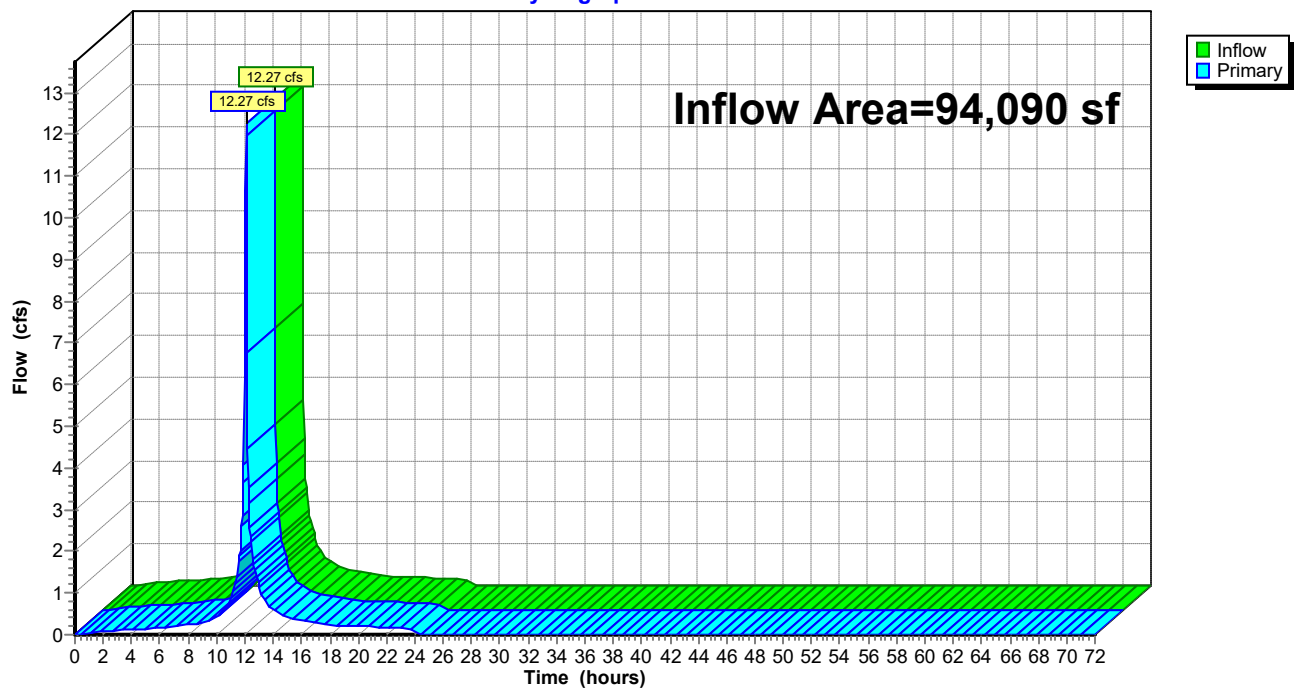
Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 5.05" for 10-Year-Future event
Inflow = 12.27 cfs @ 12.09 hrs, Volume= 39,558 cf
Primary = 12.27 cfs @ 12.09 hrs, Volume= 39,558 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

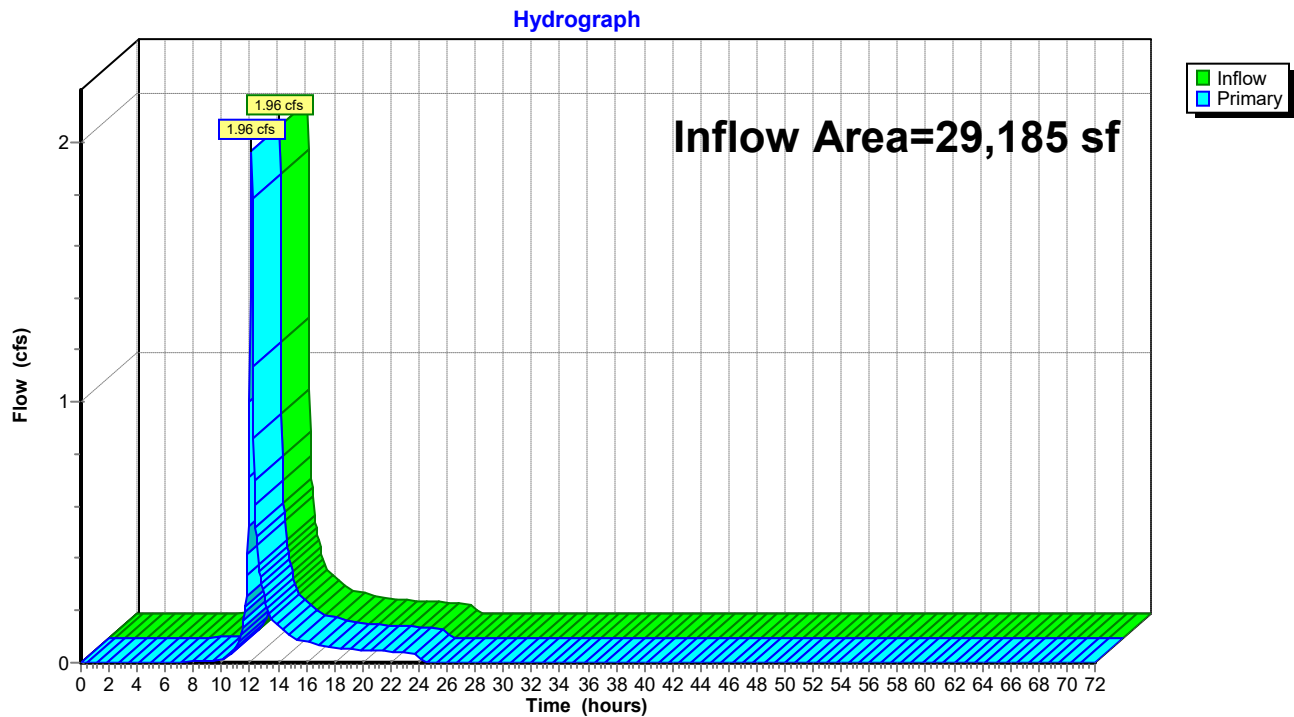
Hydrograph



Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 2.59" for 10-Year-Future event
Inflow = 1.96 cfs @ 12.11 hrs, Volume= 6,304 cf
Primary = 1.96 cfs @ 12.11 hrs, Volume= 6,304 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

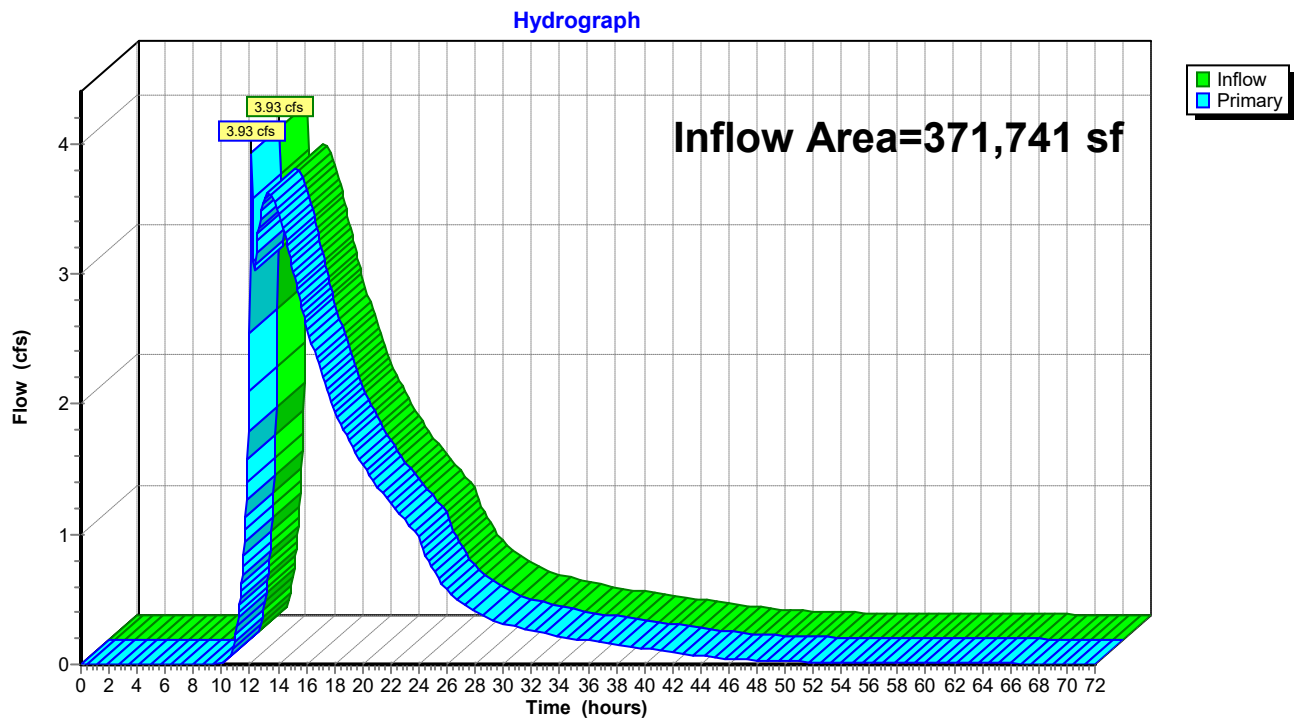
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 3.84" for 10-Year-Future event
Inflow = 3.93 cfs @ 12.13 hrs, Volume= 118,965 cf
Primary = 3.93 cfs @ 12.13 hrs, Volume= 118,965 cf, Atten= 0%, Lag= 0.0 min

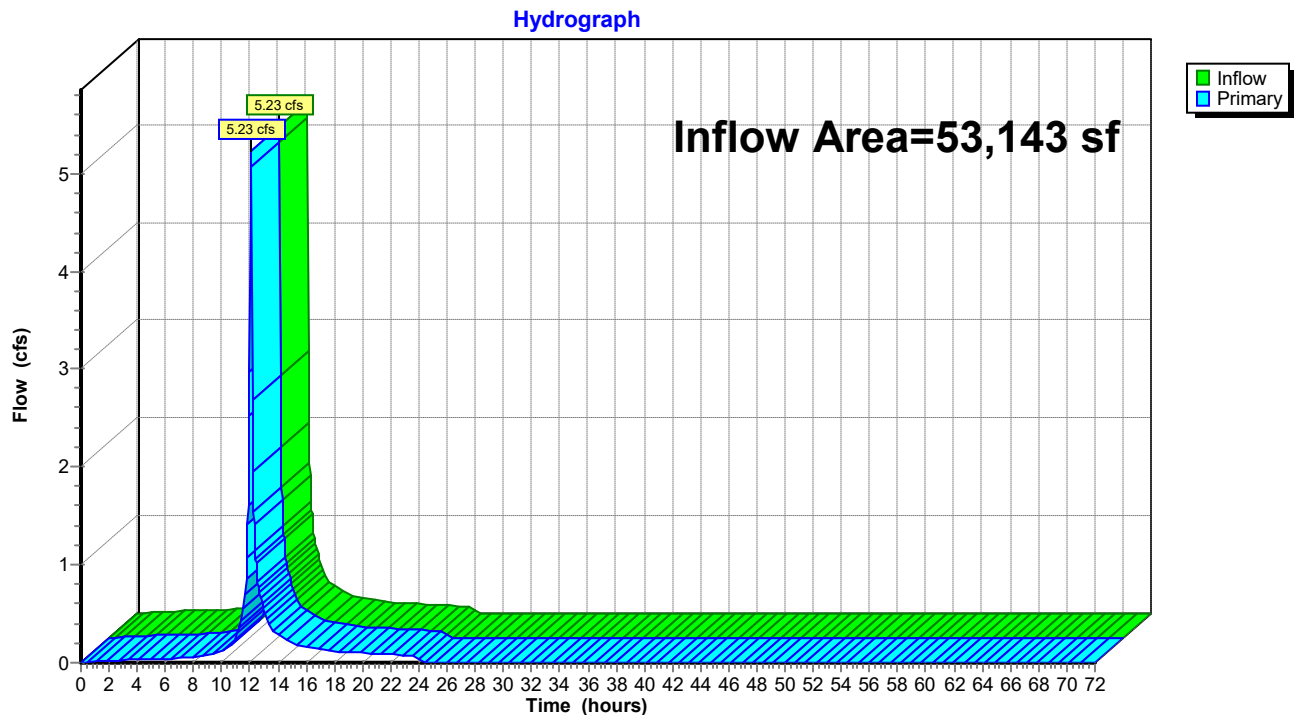
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 3.61" for 10-Year-Future event
Inflow = 5.23 cfs @ 12.08 hrs, Volume= 15,995 cf
Primary = 5.23 cfs @ 12.08 hrs, Volume= 15,995 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

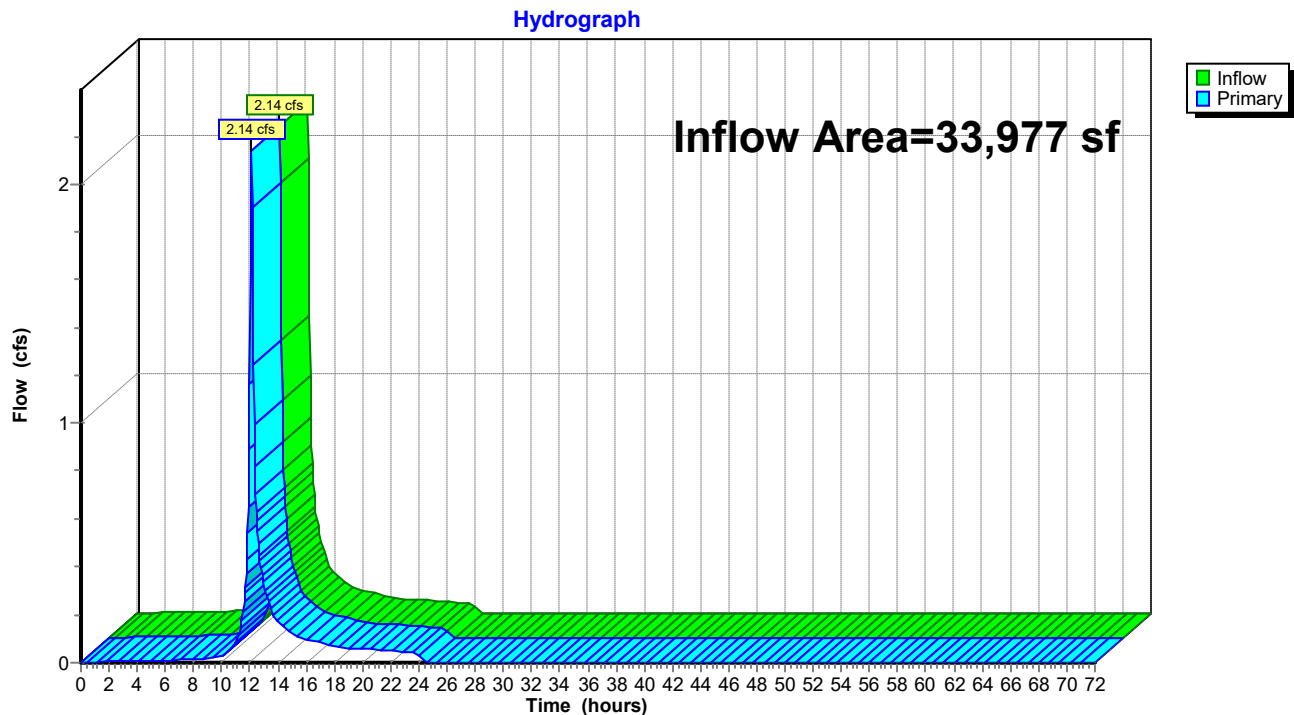
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 2.88" for 10-Year-Future event
Inflow = 2.14 cfs @ 12.13 hrs, Volume= 8,156 cf
Primary = 2.14 cfs @ 12.13 hrs, Volume= 8,156 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

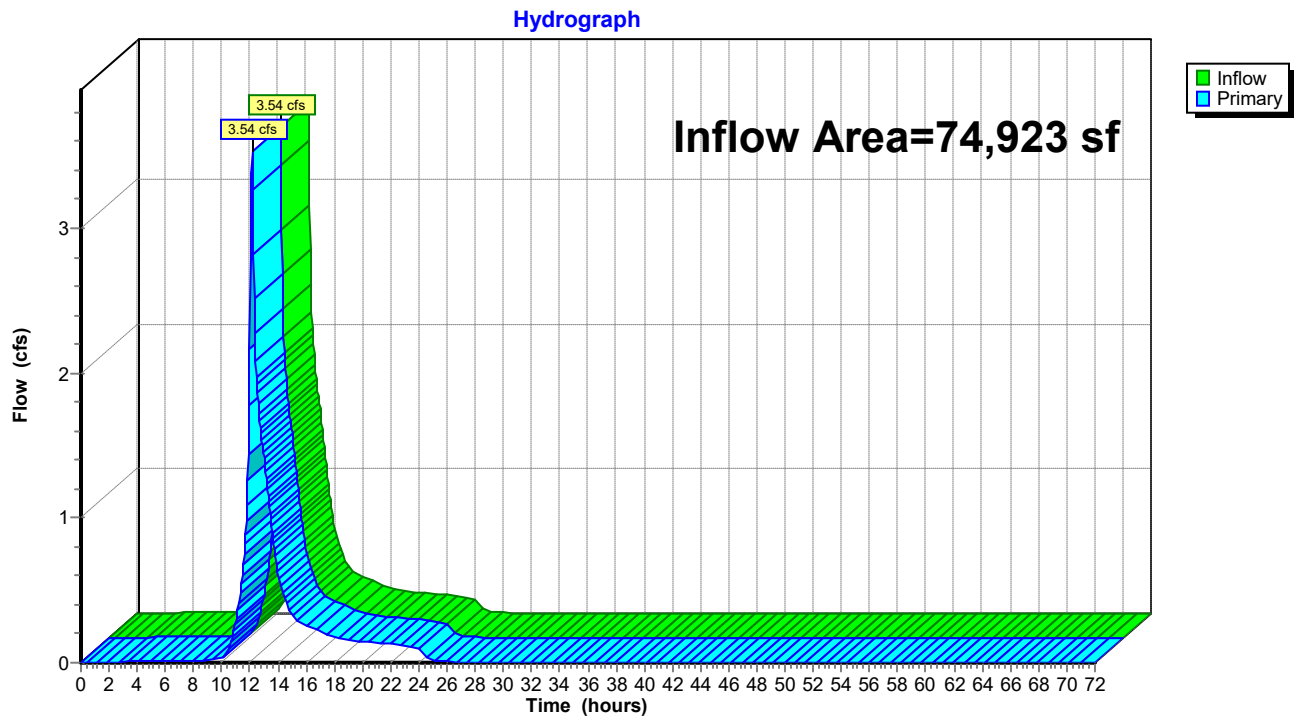
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 3.58" for 10-Year-Future event
Inflow = 3.54 cfs @ 12.14 hrs, Volume= 22,334 cf
Primary = 3.54 cfs @ 12.14 hrs, Volume= 22,334 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

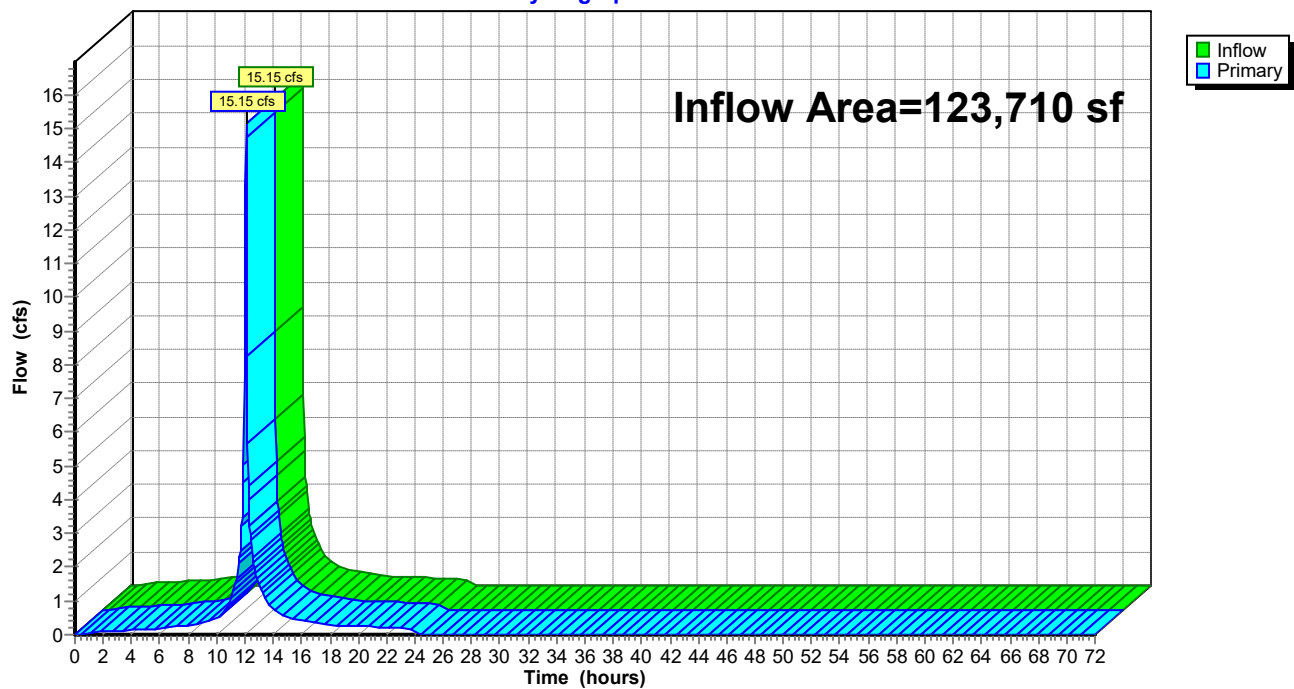
Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 4.75" for 10-Year-Future event
Inflow = 15.15 cfs @ 12.08 hrs, Volume= 48,976 cf
Primary = 15.15 cfs @ 12.08 hrs, Volume= 48,976 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL

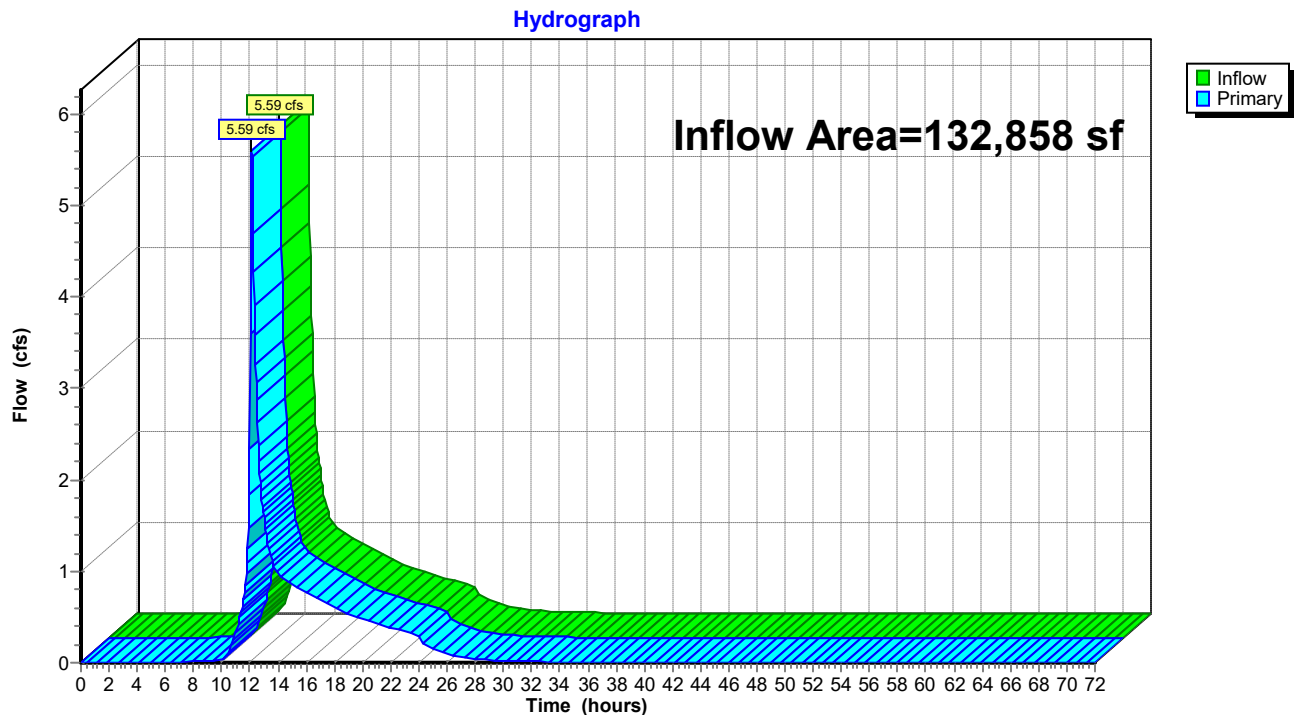
Hydrograph



Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth = 3.76" for 10-Year-Future event
Inflow = 5.59 cfs @ 12.13 hrs, Volume= 41,649 cf
Primary = 5.59 cfs @ 12.13 hrs, Volume= 41,649 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

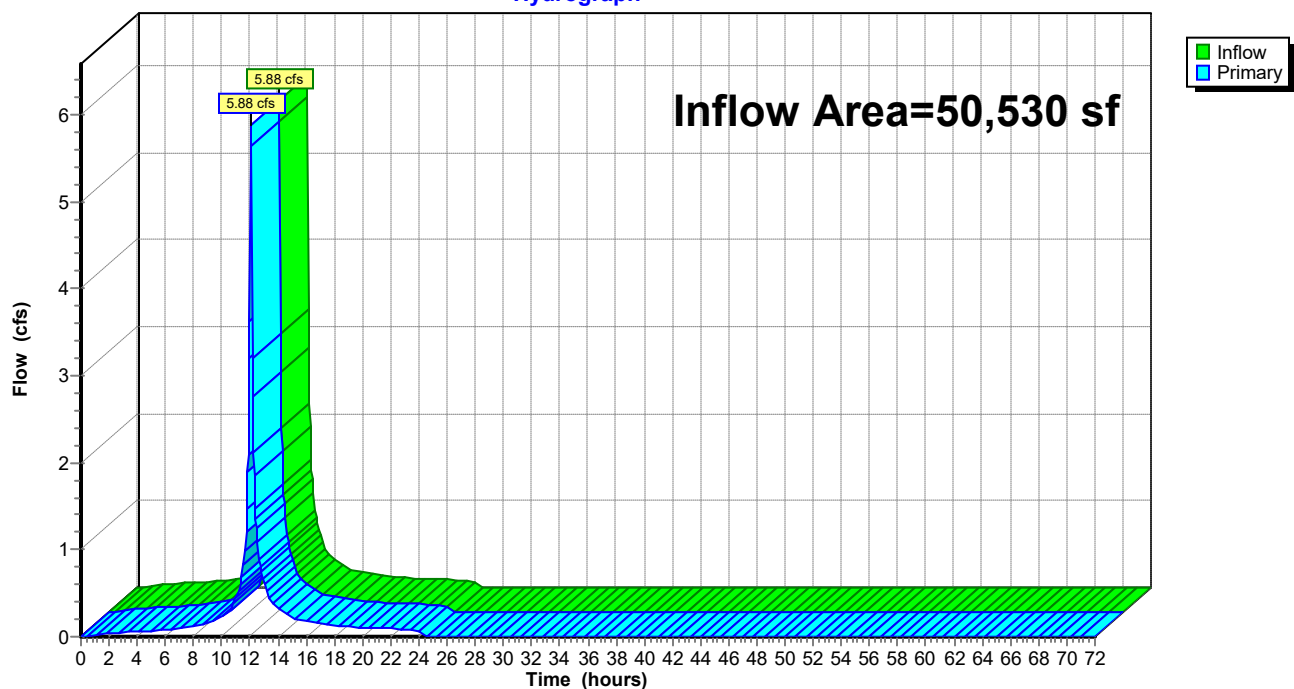
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 4.94" for 10-Year-Future event
Inflow = 5.88 cfs @ 12.08 hrs, Volume= 20,785 cf
Primary = 5.88 cfs @ 12.08 hrs, Volume= 20,785 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

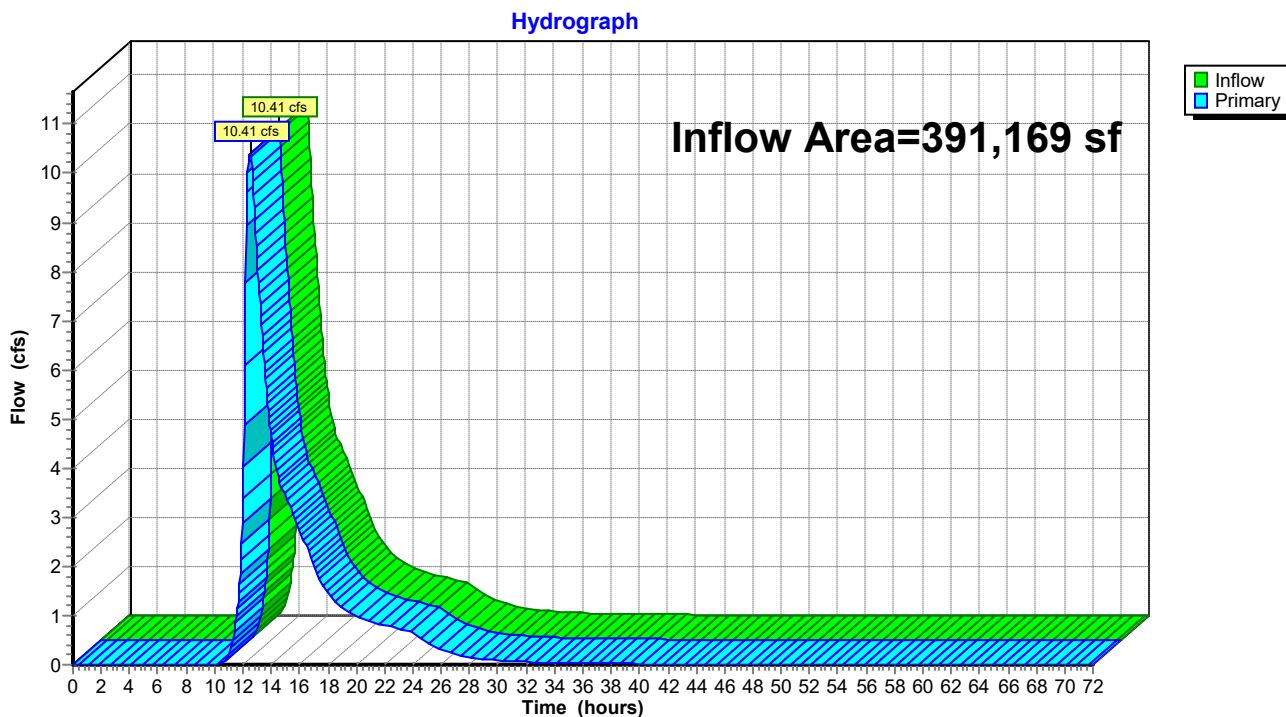
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1**Hydrograph**

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth = 3.86" for 10-Year-Future event
Inflow = 10.41 cfs @ 12.50 hrs, Volume= 125,886 cf
Primary = 10.41 cfs @ 12.50 hrs, Volume= 125,886 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

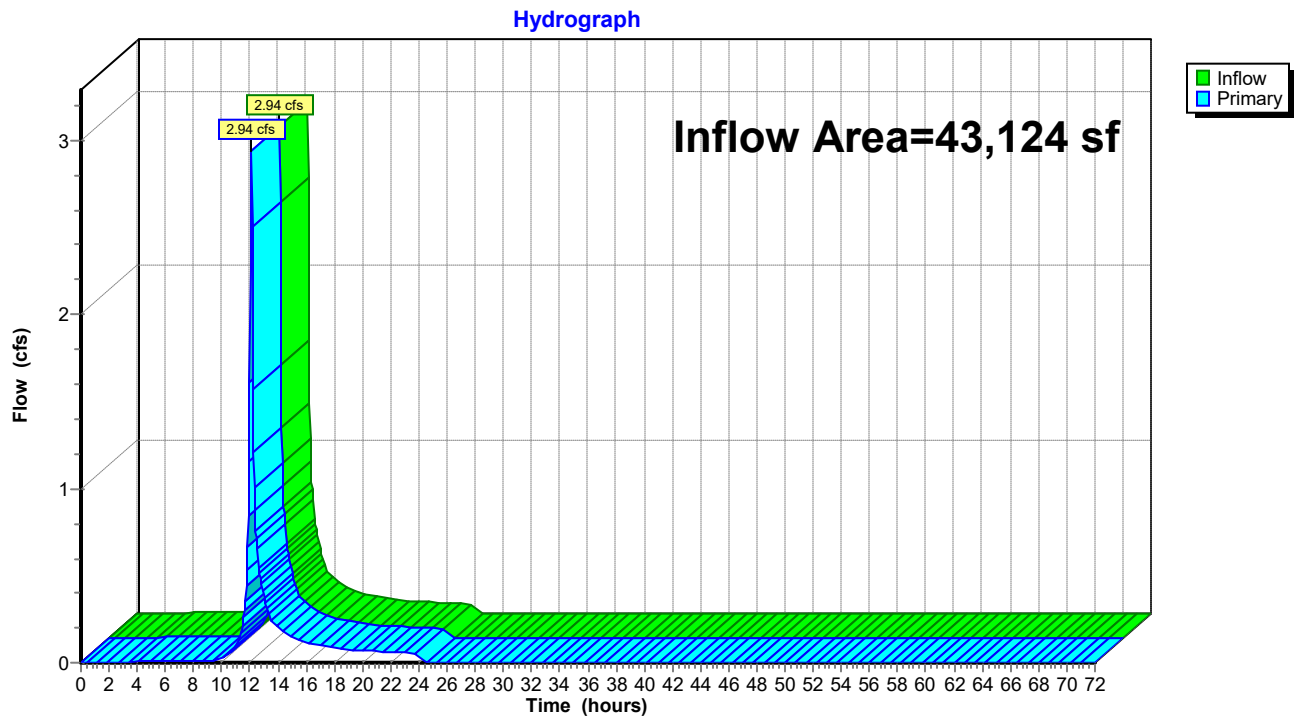
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 2.65" for 10-Year-Future event
Inflow = 2.94 cfs @ 12.11 hrs, Volume= 9,533 cf
Primary = 2.94 cfs @ 12.11 hrs, Volume= 9,533 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL

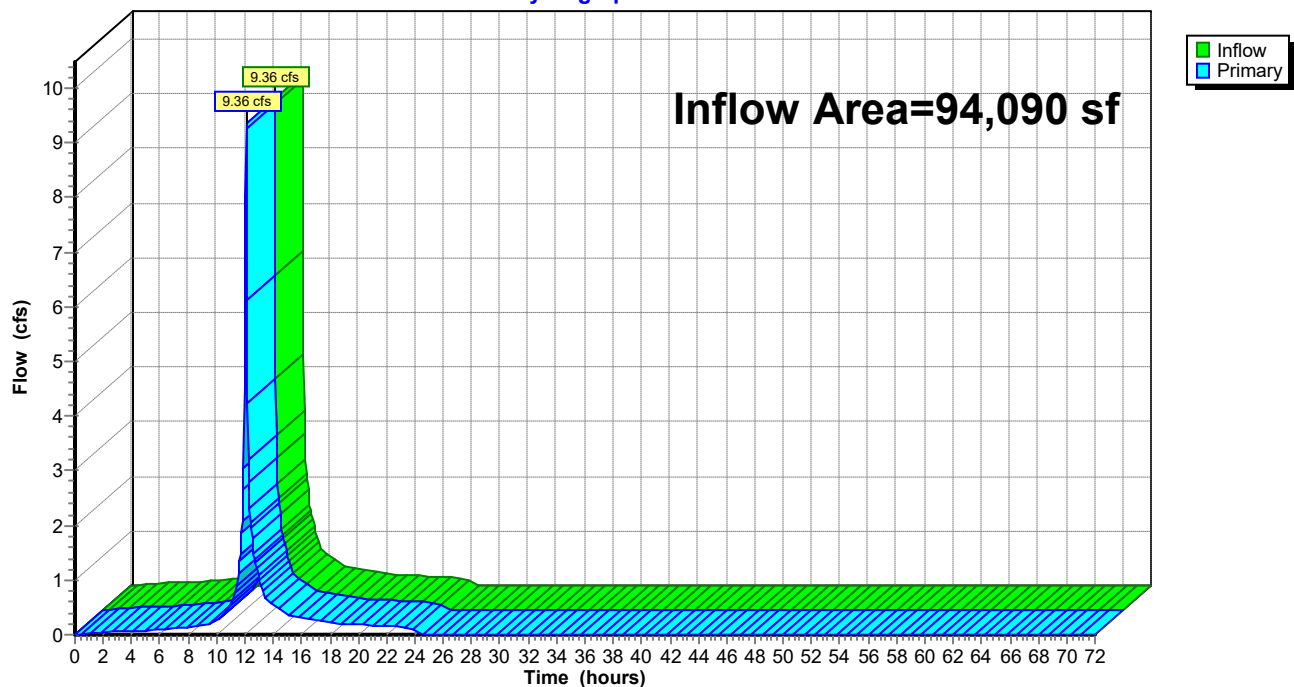
Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 3.98" for 10-Year-Future event
Inflow = 9.36 cfs @ 12.09 hrs, Volume= 31,204 cf
Primary = 9.36 cfs @ 12.09 hrs, Volume= 31,204 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL

Hydrograph



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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=299' Tc=1.0 min CN=98 Runoff=2.62 cfs 8,781 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=212' Tc=4.6 min CN=61 Runoff=2.38 cfs 7,254 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=352' Tc=1.8 min CN=WQ Runoff=5.13 cfs 16,936 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=357' Tc=3.5 min CN=61 Runoff=2.49 cfs 7,194 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=32' Tc=5.9 min CN=61 Runoff=2.46 cfs 7,793 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=239' Tc=1.4 min CN=WQ Runoff=1.59 cfs 5,332 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=114' Tc=2.7 min CN=61 Runoff=0.81 cfs 2,248 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=223' Tc=1.6 min CN=WQ Runoff=3.26 cfs 10,977 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=62' Tc=2.0 min CN=61 Runoff=2.42 cfs 6,594 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=414' Tc=1.1 min CN=98 Runoff=0.19 cfs 627 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=356' Tc=5.3 min CN=61 Runoff=3.09 cfs 9,742 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=524' Tc=1.7 min CN=WQ Runoff=3.25 cfs 10,977 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=546' Tc=2.8 min CN=61 Runoff=4.66 cfs 13,039 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=295' Tc=2.0 min CN=WQ Runoff=5.31 cfs 17,563 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=242' Tc=1.4 min CN=61 Runoff=2.09 cfs 5,695 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=376' Tc=2.6 min CN=WQ Runoff=4.95 cfs 16,622 cf

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NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

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Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Runoff Depth=8.64" Tc=5.0 min CN=98 Runoff=5.77 cfs 21,326 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=178' Tc=1.3 min CN=WQ Runoff=0.75 cfs 2,509 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=96' Slope=0.0100 '/' Tc=1.5 min CN=98 Runoff=2.15 cfs 7,213 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=138' Slope=0.0300 '/' Tc=7.9 min CN=61 Runoff=3.10 cfs 10,491 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=805' Tc=2.2 min CN=WQ Runoff=15.41 cfs 51,120 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=509' Tc=3.9 min CN=61 Runoff=6.15 cfs 18,134 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=236' Tc=4.5 min CN=61 Runoff=1.58 cfs 4,796 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=283' Tc=1.8 min CN=WQ Runoff=6.84 cfs 22,581 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=412' Tc=9.6 min CN=61 Runoff=1.82 cfs 6,594 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=303' Tc=1.9 min CN=WQ Runoff=5.98 cfs 19,758 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=262' Tc=3.2 min CN=61 Runoff=2.21 cfs 6,295 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=1,152' Tc=2.6 min CN=WQ Runoff=13.08 cfs 43,907 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=889' Tc=2.9 min CN=61 Runoff=4.05 cfs 11,390 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=369' Tc=2.4 min CN=98 Runoff=0.47 cfs 1,568 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=4.12" Flow Length=239' Tc=14.4 min CN=WQ Runoff=4.39 cfs 18,408 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=105' Tc=0.5 min CN=WQ Runoff=0.56 cfs 1,882 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=467' Tc=2.4 min CN=WQ Runoff=14.10 cfs 47,043 cf

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NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=532' Tc=1.6 min CN=61 Runoff=4.86 cfs 13,189 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=4.04" Flow Length=194' Tc=4.8 min CN=WQ Runoff=4.43 cfs 13,648 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=8.64" Flow Length=634' Tc=2.0 min CN=WQ Runoff=7.77 cfs 25,717 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=4.13" Flow Length=655' Tc=5.2 min CN=61 Runoff=6.40 cfs 20,083 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=554.10' Storage=5,677 cf Inflow=4.72 cfs 16,035 cf Outflow=2.13 cfs 14,801 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=577.44' Storage=50,083 cf Inflow=25.74 cfs 104,054 cf Outflow=4.91 cfs 96,755 cf
Pond C: BMP C Bioretention Basin	Peak Elev=563.08' Storage=27,176 cf Inflow=14.39 cfs 60,917 cf Outflow=2.58 cfs 56,677 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=601.29' Storage=4,475 cf Inflow=4.47 cfs 14,793 cf Outflow=2.05 cfs 13,273 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=610.99' Storage=7,598 cf Inflow=5.73 cfs 17,571 cf Outflow=1.01 cfs 15,575 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=611.11' Storage=7,591 cf Inflow=7.53 cfs 24,129 cf Outflow=3.21 cfs 21,527 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=615.75' Storage=7,093 cf Inflow=7.39 cfs 23,258 cf Outflow=4.26 cfs 20,931 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=611.07' Storage=12,232 cf Inflow=6.47 cfs 21,418 cf Outflow=0.42 cfs 19,409 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=597.06' Storage=10,563 cf Inflow=8.87 cfs 50,153 cf Outflow=5.62 cfs 47,055 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=570.26' Storage=13,883 cf Inflow=17.11 cfs 55,297 cf Outflow=11.50 cfs 49,929 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=599.44' Storage=7,702 cf Inflow=8.13 cfs 26,053 cf Outflow=5.13 cfs 23,527 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=579.24' Storage=20,078 cf Inflow=23.34 cfs 83,759 cf Outflow=14.71 cfs 78,110 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=565.75' Storage=48,108 cf Inflow=37.54 cfs 173,838 cf Outflow=17.90 cfs 170,005 cf

081228-SWM

NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Prepared by Bowman Consulting Group

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Link 20L: TOTAL TO GI MTD F-1

Inflow=2.39 cfs 7,580 cf

Primary=2.39 cfs 7,580 cf

Link 21L: TOTAL TO P-DA-5M

Inflow=17.11 cfs 55,297 cf

Primary=17.11 cfs 55,297 cf

Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow=3.23 cfs 10,369 cf

Primary=3.23 cfs 10,369 cf

Link 34L: PROPOSED TOTAL TO POA-1

Inflow=8.82 cfs 178,602 cf

Primary=8.82 cfs 178,602 cf

Link 38L: TOTAL TO GI MTD 1C

Inflow=7.92 cfs 24,016 cf

Primary=7.92 cfs 24,016 cf

Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow=3.41 cfs 13,000 cf

Primary=3.41 cfs 13,000 cf

Link 45L: PROPOSED TOTAL TO POA-3

Inflow=7.65 cfs 33,931 cf

Primary=7.65 cfs 33,931 cf

Link 46L: P-DA-1B TOTAL

Inflow=21.35 cfs 69,255 cf

Primary=21.35 cfs 69,255 cf

Link 48L: PROPOSED TOTAL TO POA-4

Inflow=10.03 cfs 62,584 cf

Primary=10.03 cfs 62,584 cf

Link 50L: TOTAL TO GI MTD K-1

Inflow=8.07 cfs 29,175 cf

Primary=8.07 cfs 29,175 cf

Link 52L: PROPOSED TOTAL TO POA-5

Inflow=21.08 cfs 188,413 cf

Primary=21.08 cfs 188,413 cf

Link 59L: P-DA-4 BYPASS TOTAL

Inflow=4.82 cfs 15,529 cf

Primary=4.82 cfs 15,529 cf

Link 66L: P-DA-5R TOTAL

Inflow=13.68 cfs 45,800 cf

Primary=13.68 cfs 45,800 cf

Total Runoff Area = 993,342 sf Runoff Volume = 515,025 cf Average Runoff Depth = 6.22"**53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf**

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 2.62 cfs @ 12.06 hrs, Volume= 8,781 cf, Depth= 8.64"
 Routed to Pond A : BMP-A Bioretention Basin

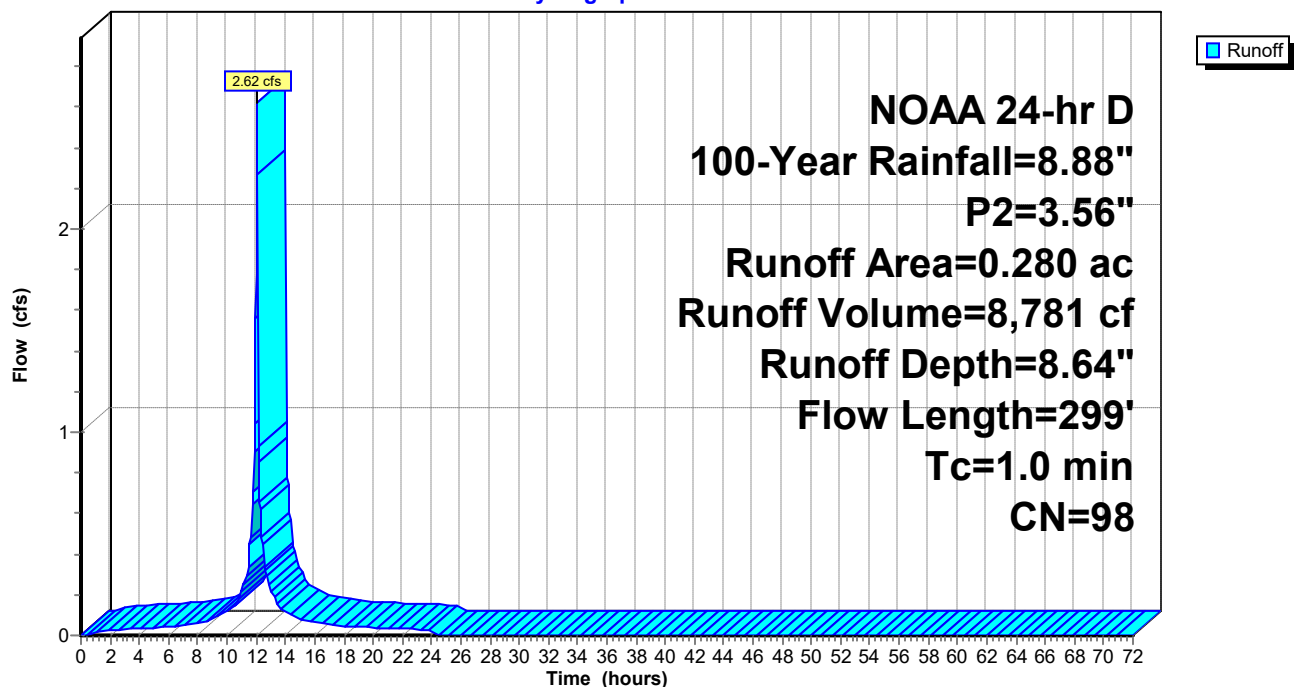
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.0	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 2.38 cfs @ 12.11 hrs, Volume= 7,254 cf, Depth= 4.13"
 Routed to Pond A : BMP-A Bioretention Basin

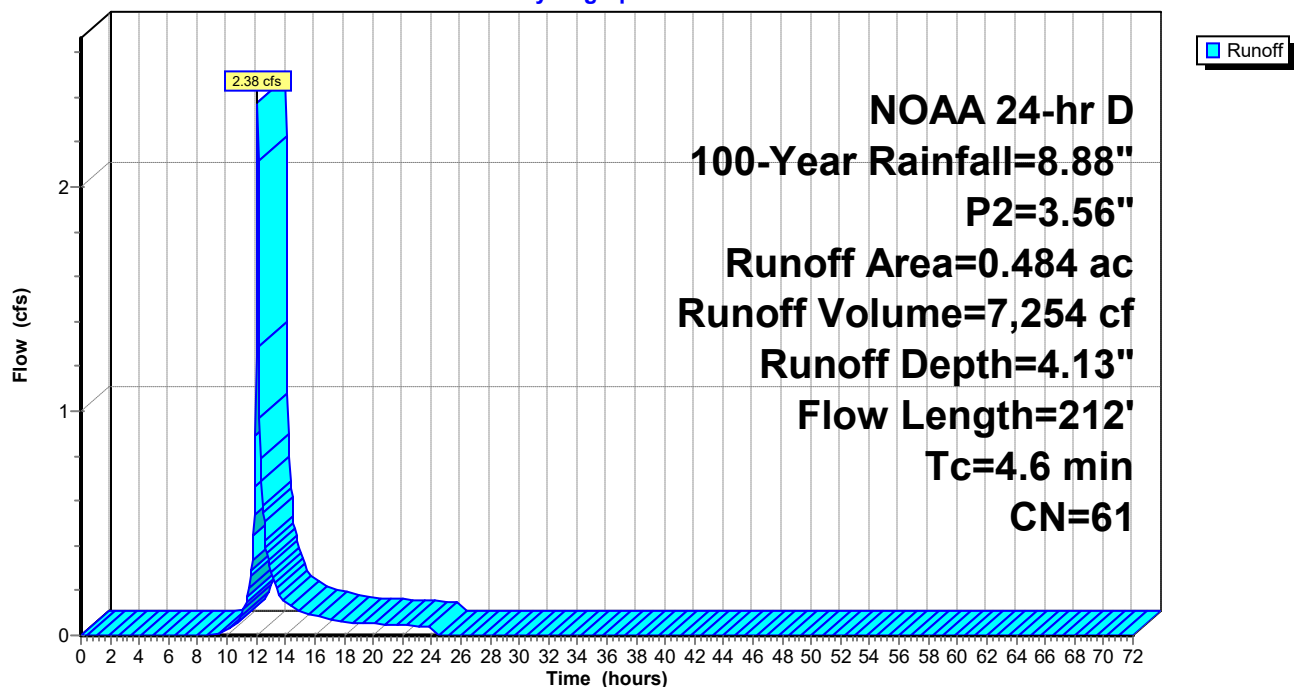
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	100	0.1300	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.6	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 5.13 cfs @ 12.08 hrs, Volume= 16,936 cf, Depth= 8.64"
 Routed to Pond H : BMP-H Bioretention Basin

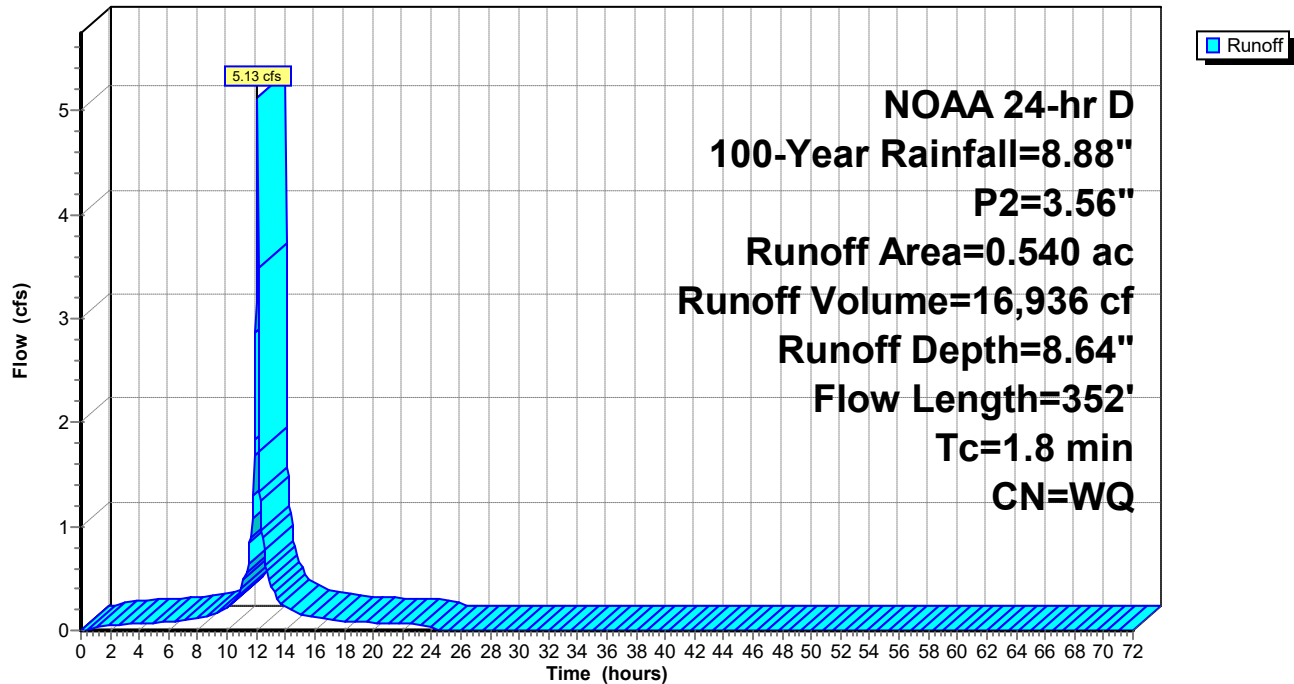
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0310	1.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



Summary for Subcatchment 17S: P-DA-1H PER

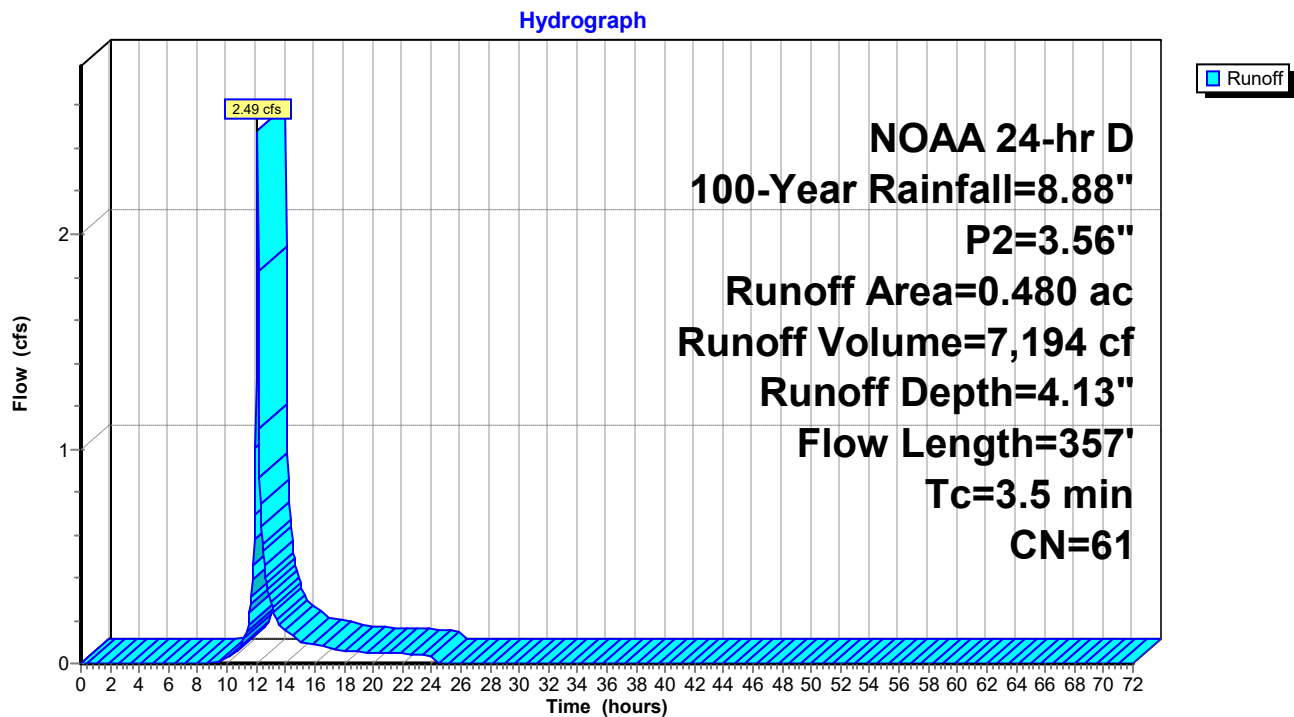
Runoff = 2.49 cfs @ 12.10 hrs, Volume= 7,194 cf, Depth= 4.13"
 Routed to Pond H : BMP-H Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.5	357	Total			

Subcatchment 17S: P-DA-1H PER



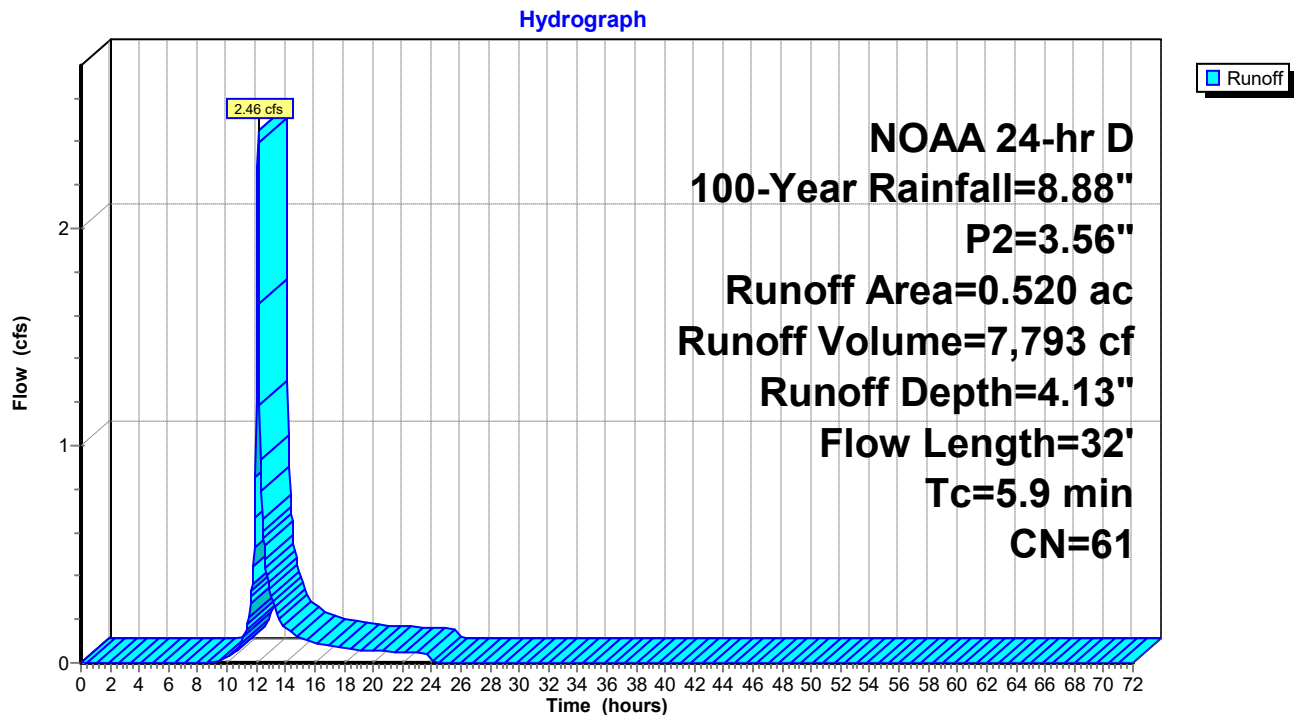
Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 2.46 cfs @ 12.13 hrs, Volume= 7,793 cf, Depth= 4.13"
 Routed to nonexistent node 26L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	15	0.0140	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.5	6	0.3330	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
2.0	11	0.0830	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.56"
5.9	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 1.59 cfs @ 12.07 hrs, Volume= 5,332 cf, Depth= 8.64"
 Routed to Link 20L : TOTAL TO GI MTD F-1

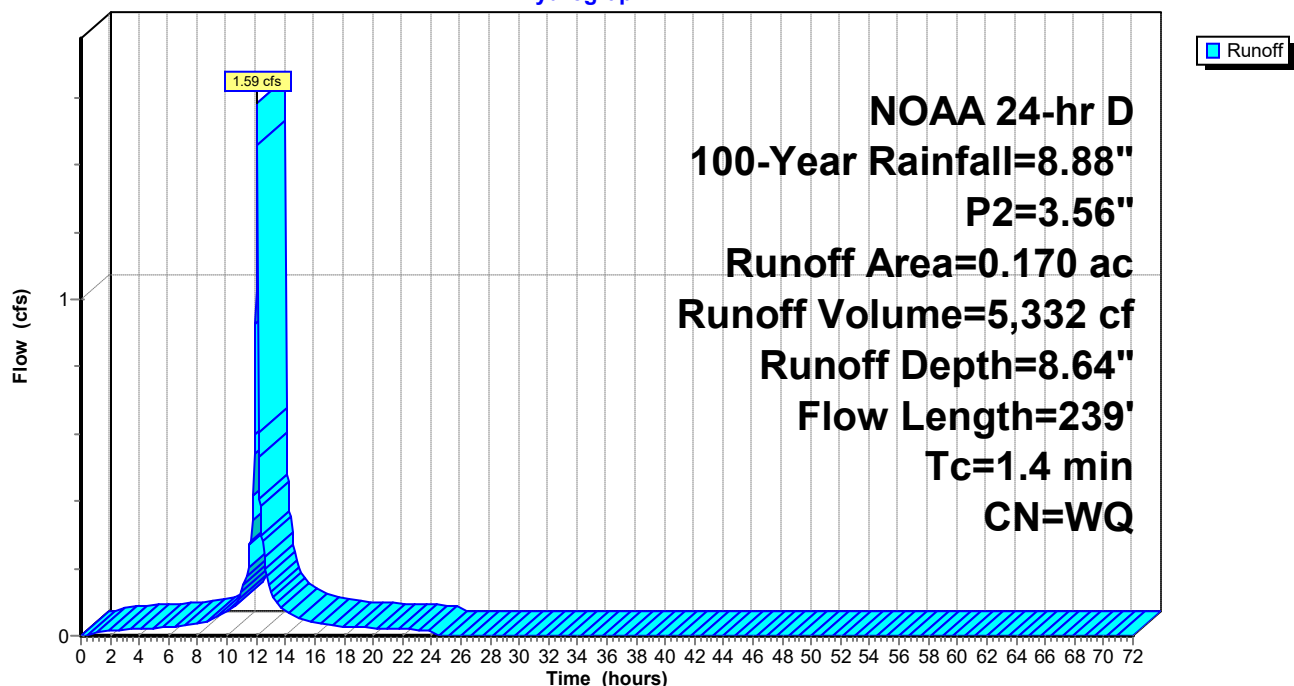
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 2,248 cf, Depth= 4.13"
 Routed to Link 20L : TOTAL TO GI MTD F-1

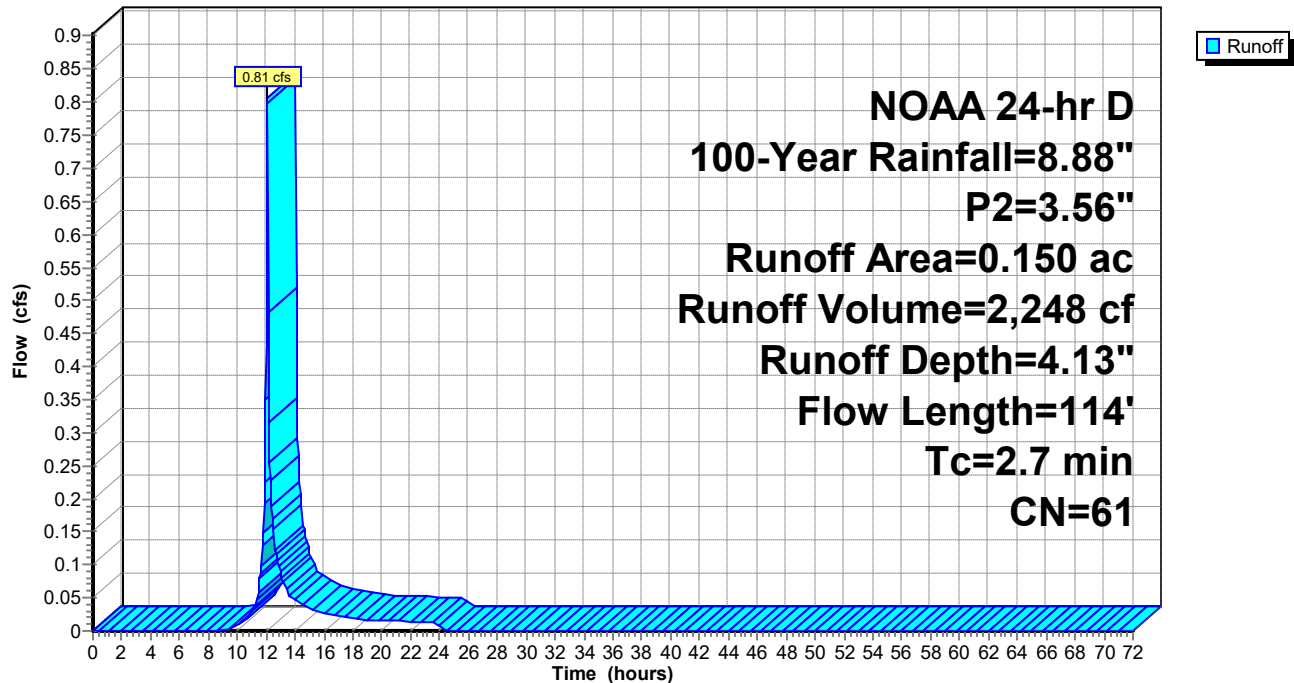
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	17	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.7	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 3.26 cfs @ 12.07 hrs, Volume= 10,977 cf, Depth= 8.64"
 Routed to Pond G : BMP-G Bioretention Basin

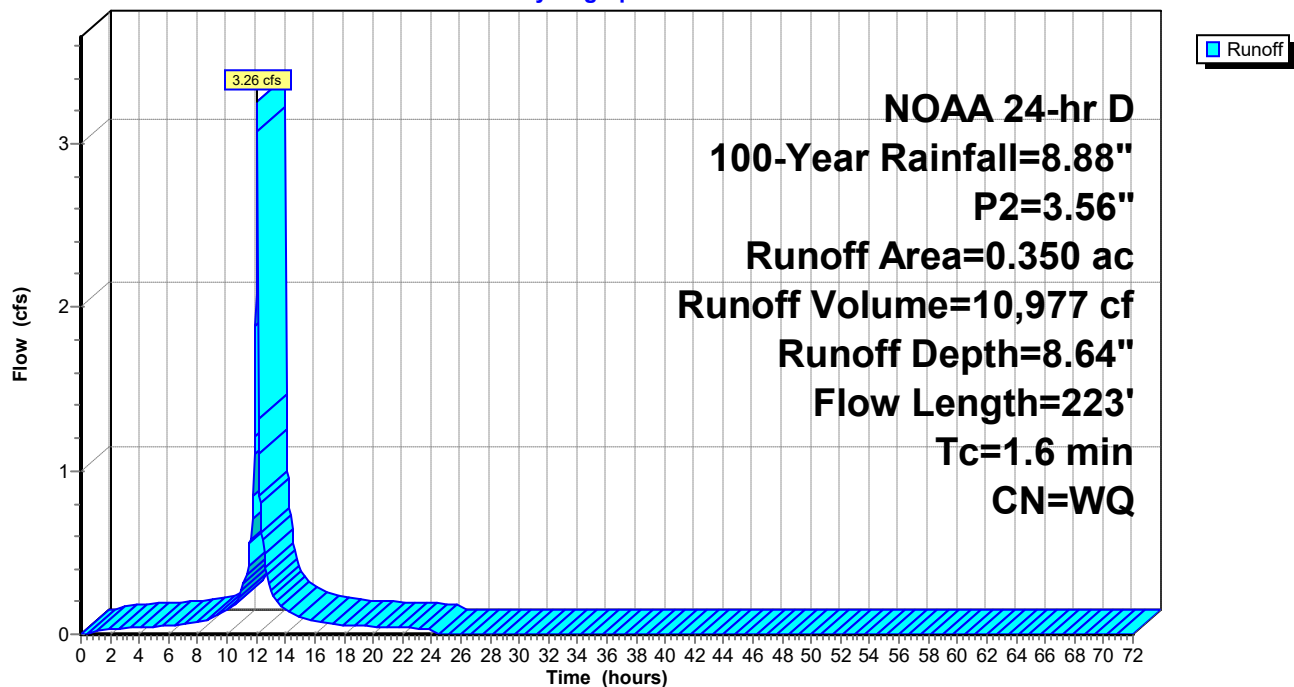
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	113	0.0240	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.6	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 2.42 cfs @ 12.08 hrs, Volume= 6,594 cf, Depth= 4.13"
 Routed to Pond G : BMP-G Bioretention Basin

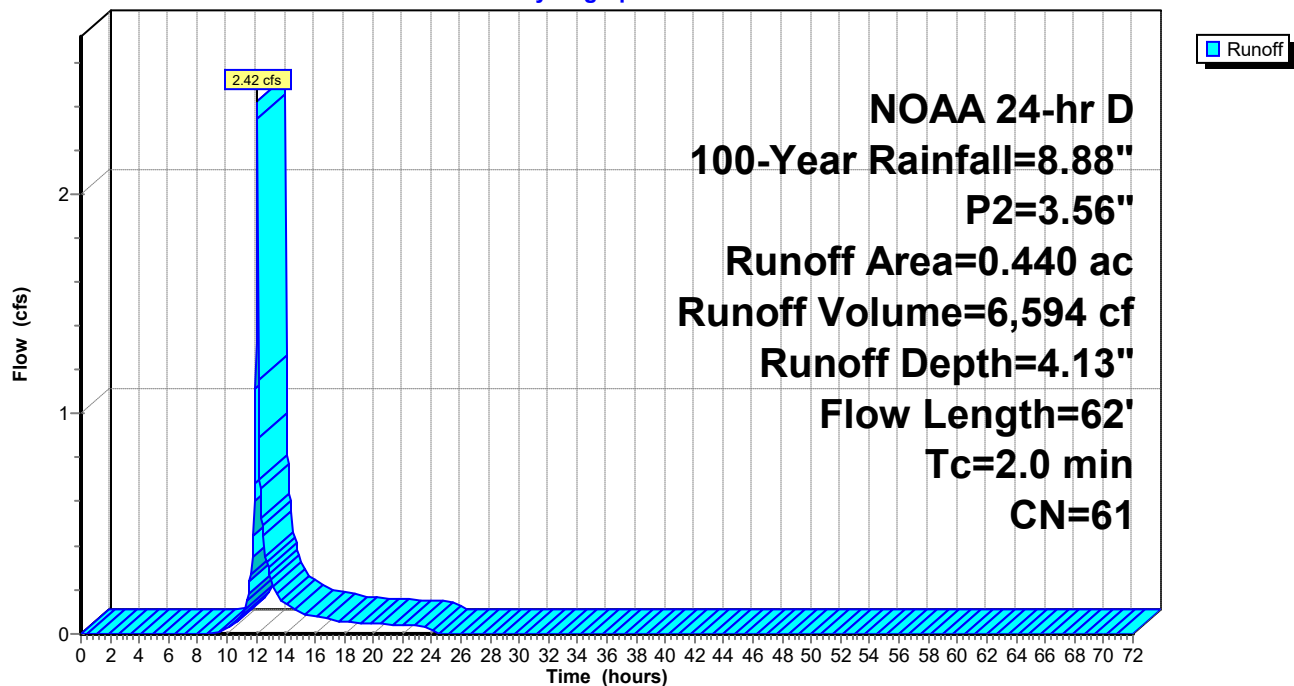
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	13	0.0200	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.19 cfs @ 12.06 hrs, Volume= 627 cf, Depth= 8.64"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

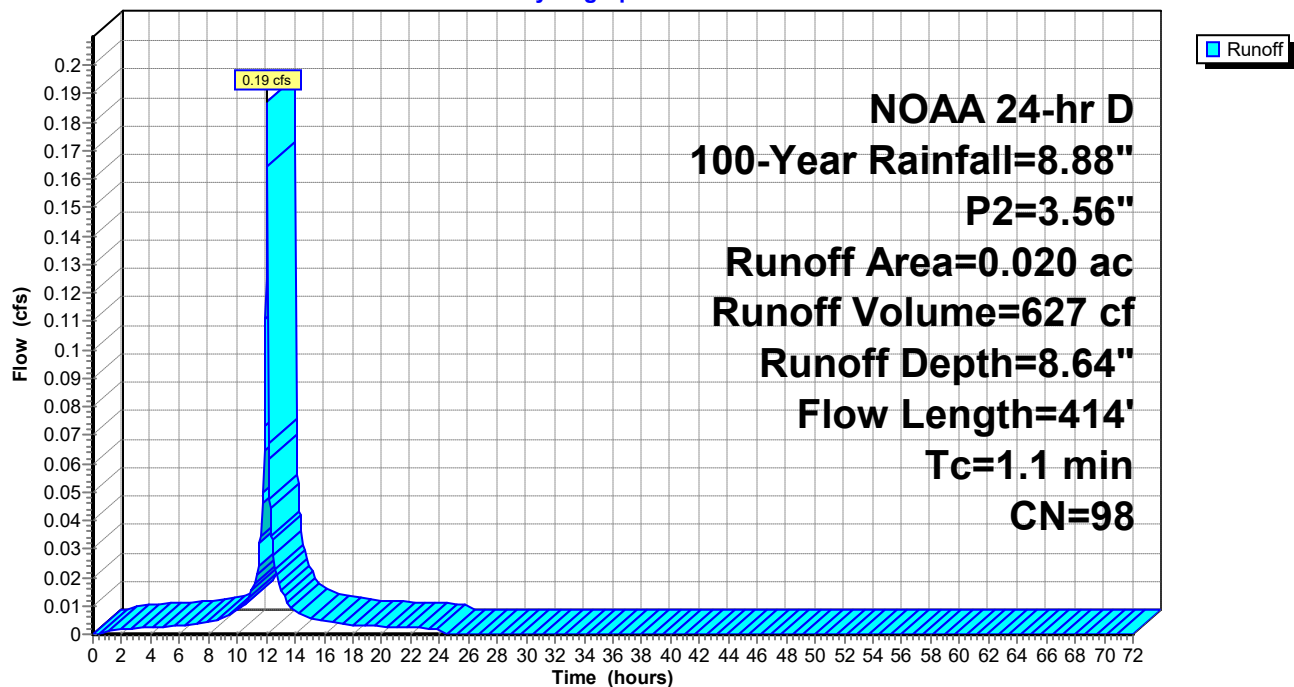
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	43	0.0330	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.1	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Runoff = 3.09 cfs @ 12.12 hrs, Volume= 9,742 cf, Depth= 4.13"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

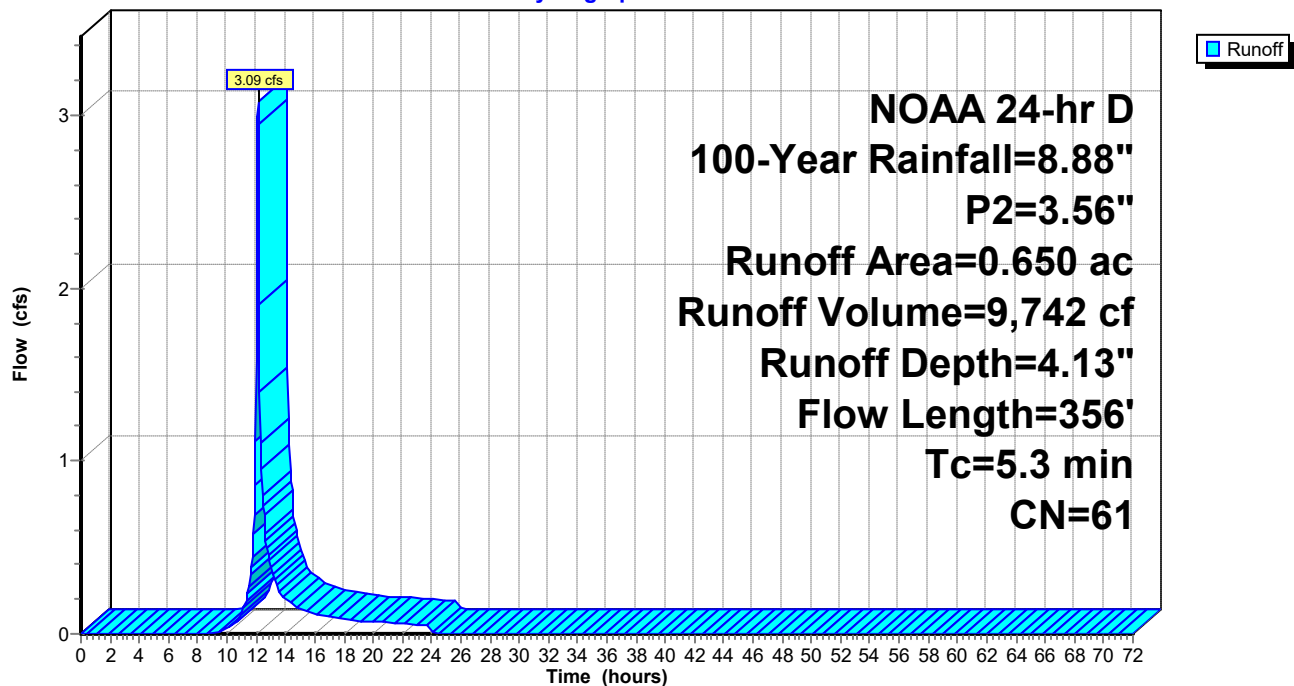
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	67	0.0600	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 35S: P-DA-1C IMP

Runoff = 3.25 cfs @ 12.07 hrs, Volume= 10,977 cf, Depth= 8.64"
 Routed to Link 38L : TOTAL TO GI MTD 1C

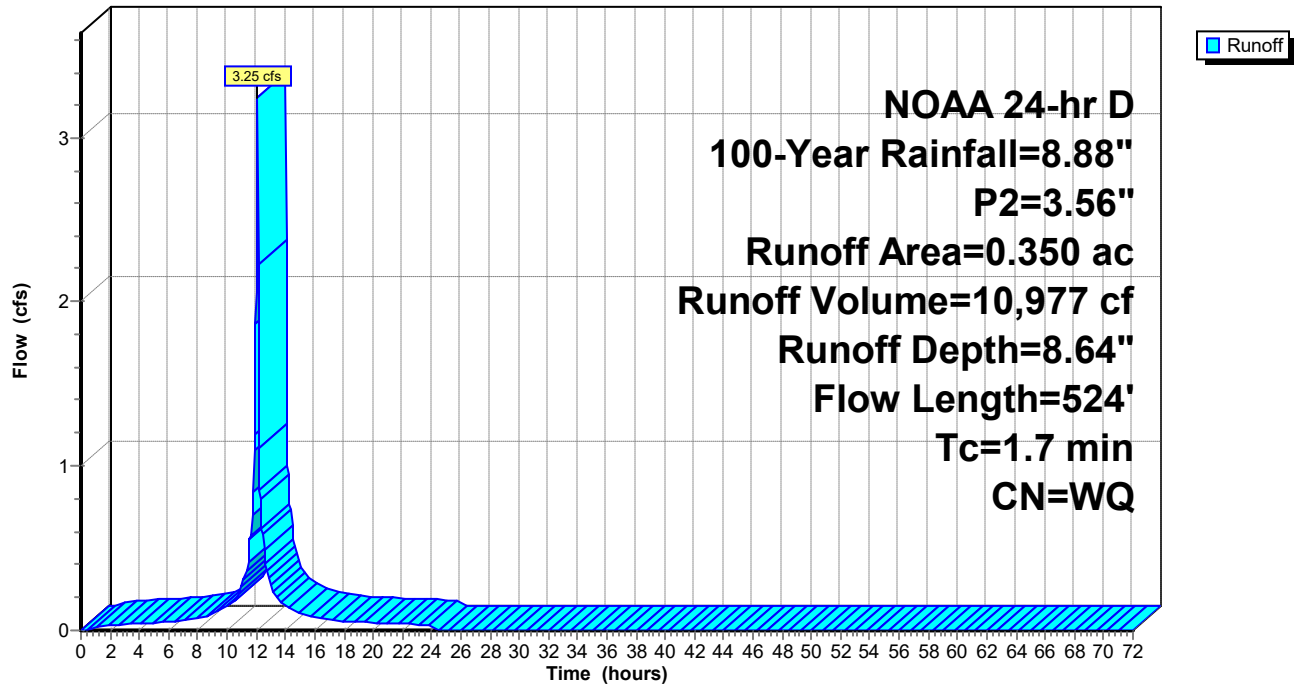
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0200	1.16		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	130	0.0054	4.19	5.14	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	524	Total			

Subcatchment 35S: P-DA-1C IMP

Hydrograph



Summary for Subcatchment 36S: P-DA-1C PER

Runoff = 4.66 cfs @ 12.09 hrs, Volume= 13,039 cf, Depth= 4.13"
 Routed to Link 38L : TOTAL TO GI MTD 1C

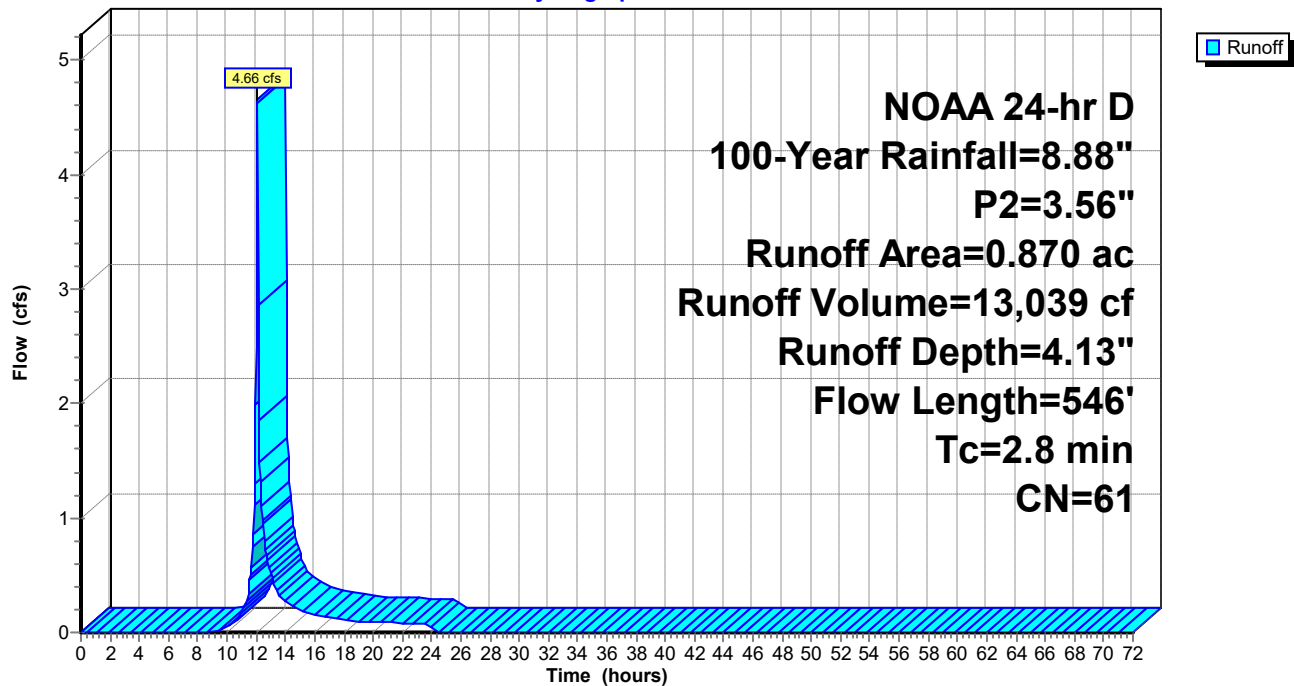
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	38	0.1900	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.8	546	Total			

Subcatchment 36S: P-DA-1C PER

Hydrograph



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 5.31 cfs @ 12.08 hrs, Volume= 17,563 cf, Depth= 8.64"
 Routed to Pond I : BMP-I Bioretention Basin

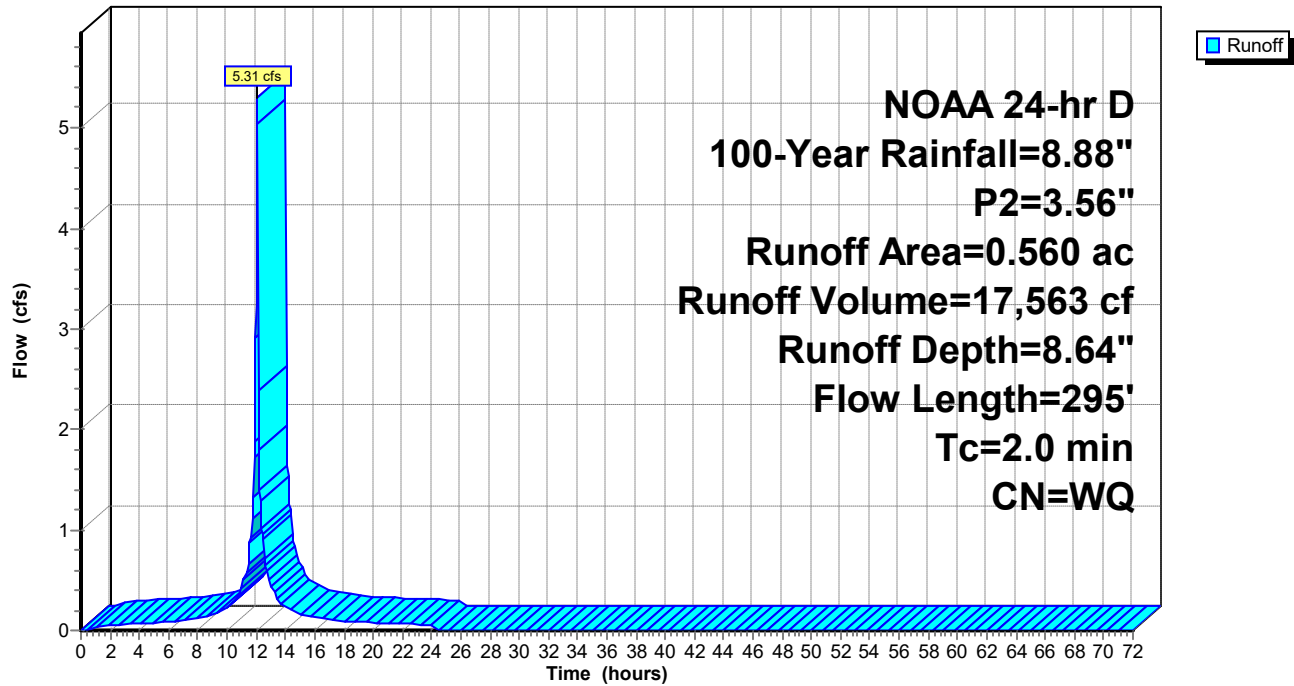
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.36		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
2.0	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 2.09 cfs @ 12.08 hrs, Volume= 5,695 cf, Depth= 4.13"
 Routed to Pond I : BMP-I Bioretention Basin

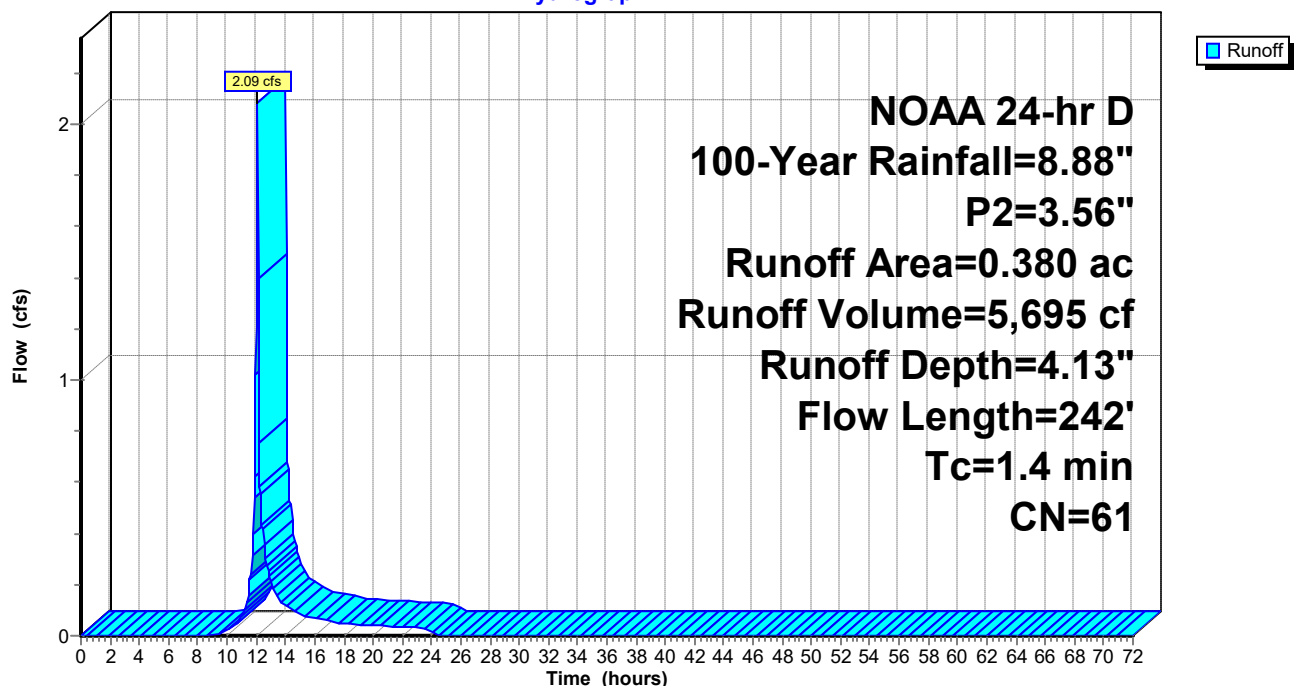
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.8	167	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 4.95 cfs @ 12.08 hrs, Volume= 16,622 cf, Depth= 8.64"
 Routed to Pond J : BMP-J Bioretention Basin

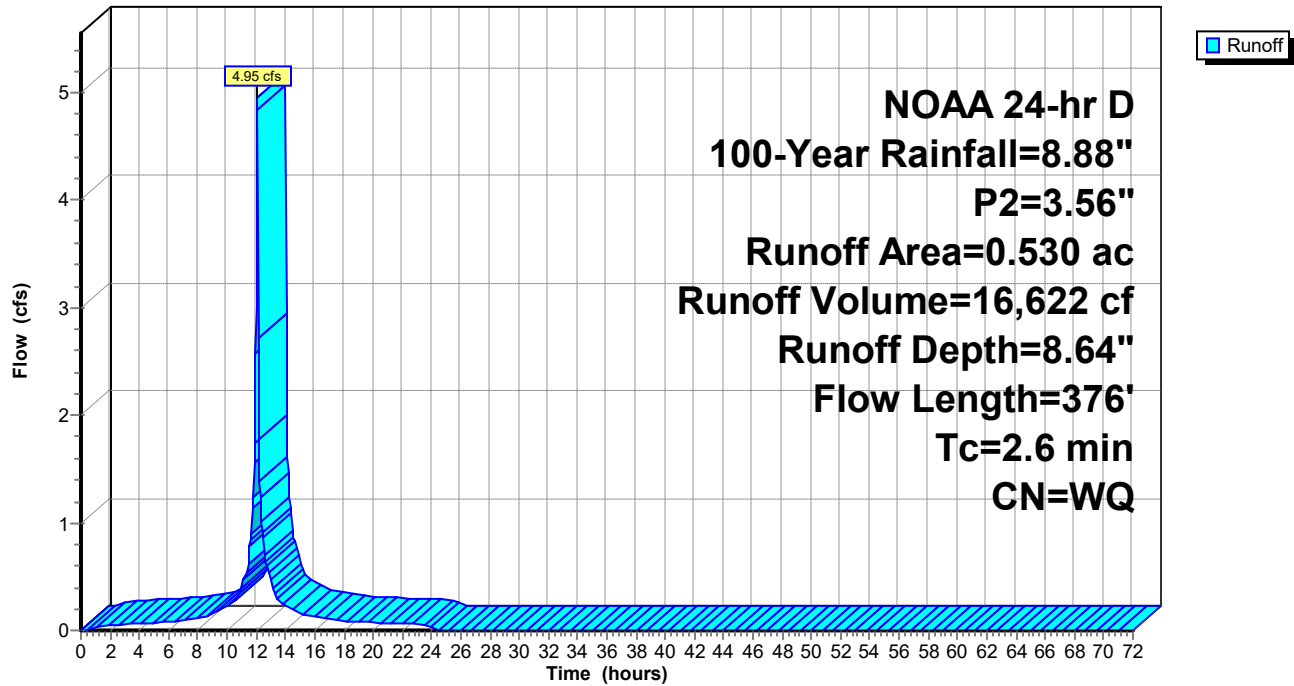
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.6	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

Runoff = 5.77 cfs @ 12.11 hrs, Volume= 21,326 cf, Depth= 8.64"
 Routed to Pond C : BMP C Bioretention Basin

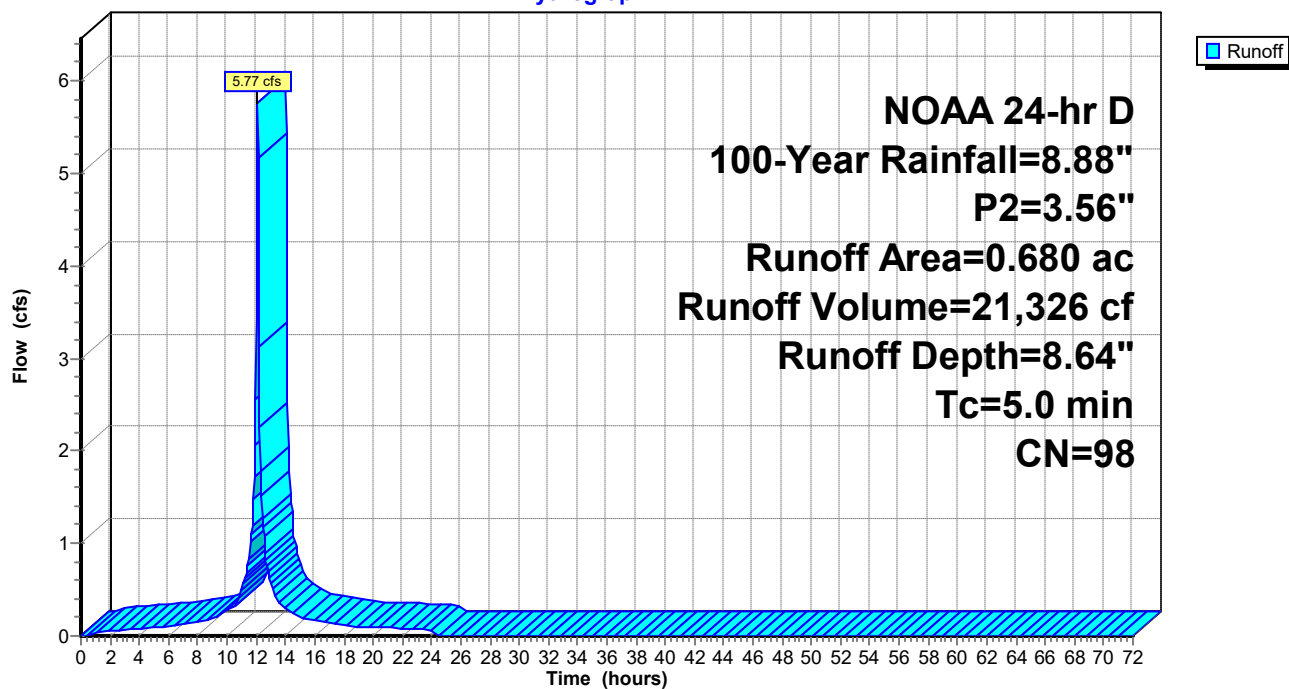
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF

Hydrograph



Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 2,509 cf, Depth= 8.64"
 Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

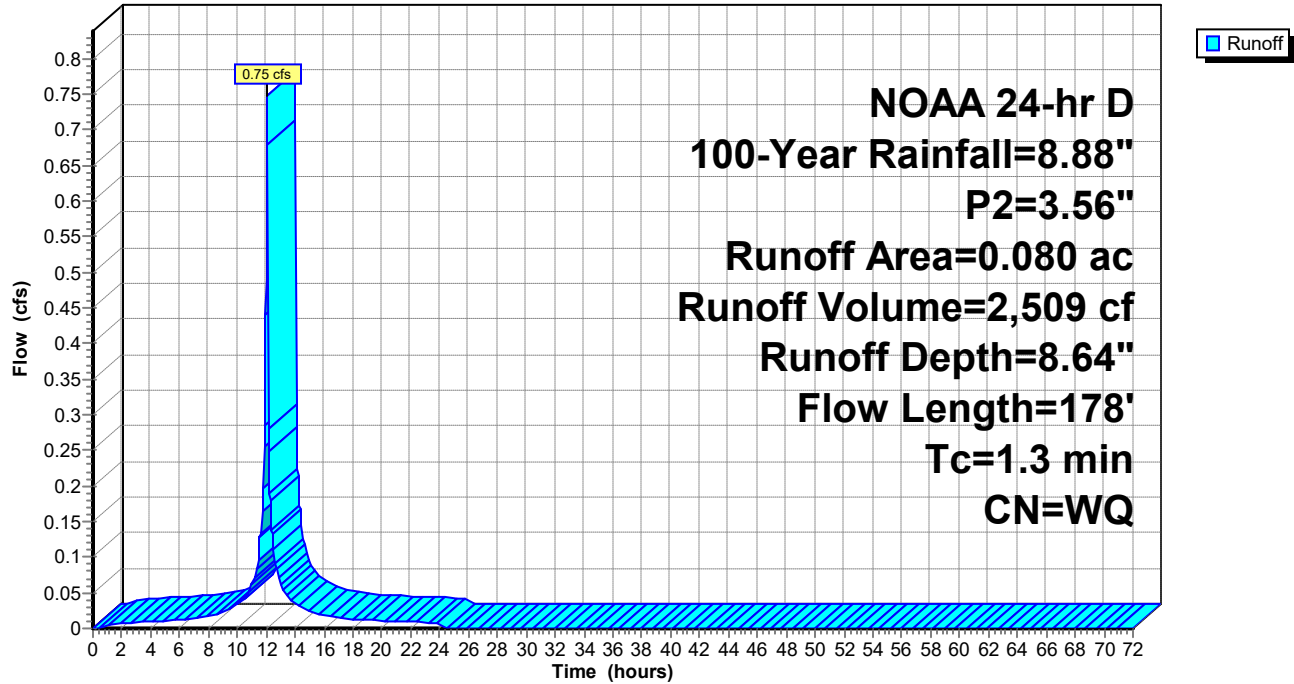
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0300	1.71		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Hydrograph



Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 2.15 cfs @ 12.07 hrs, Volume= 7,213 cf, Depth= 8.64"
 Routed to Pond F : UG INFILTRATION BASIN F

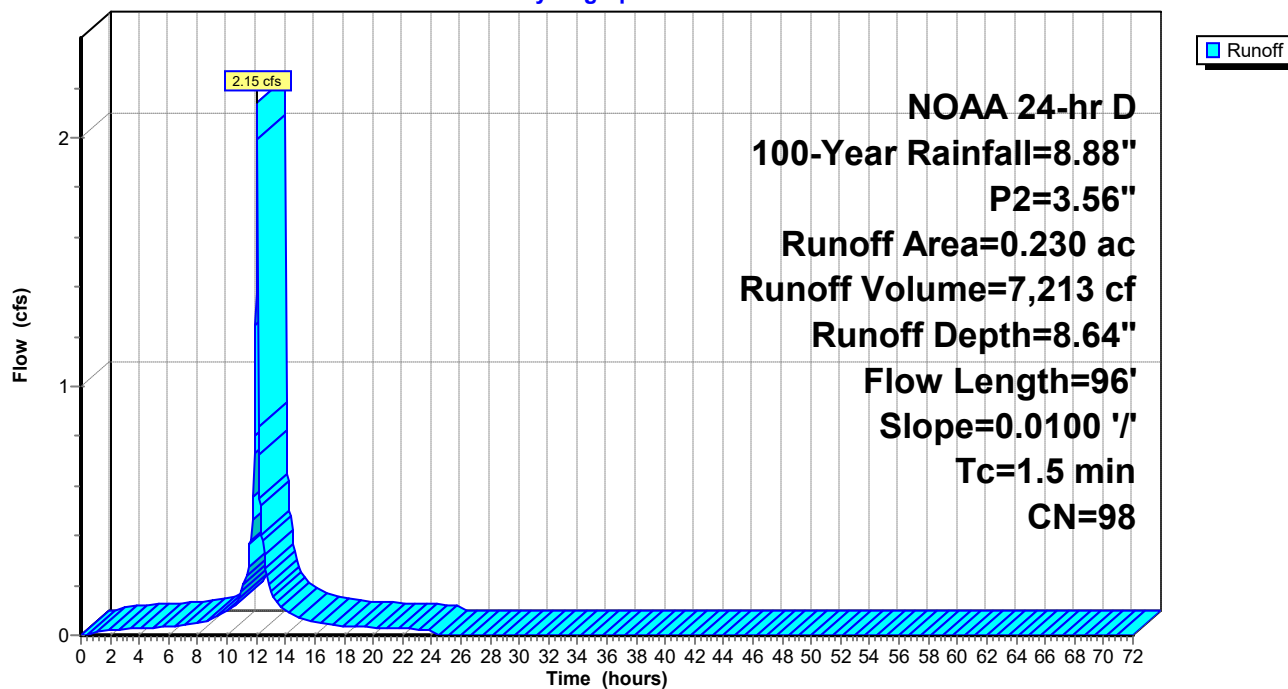
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	96	0.0100	1.09		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Runoff = 3.10 cfs @ 12.15 hrs, Volume= 10,491 cf, Depth= 4.13"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

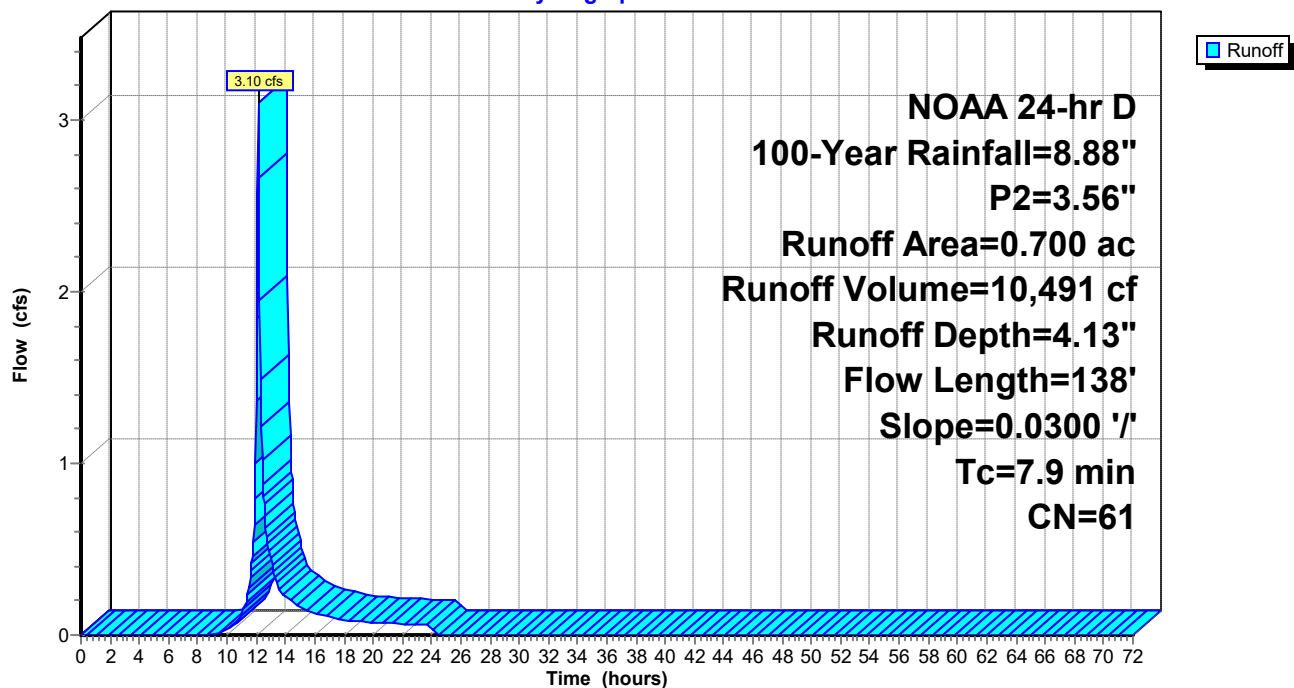
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	84	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.0	54	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 15.41 cfs @ 12.08 hrs, Volume= 51,120 cf, Depth= 8.64"
 Routed to Link 46L : P-DA-1B TOTAL

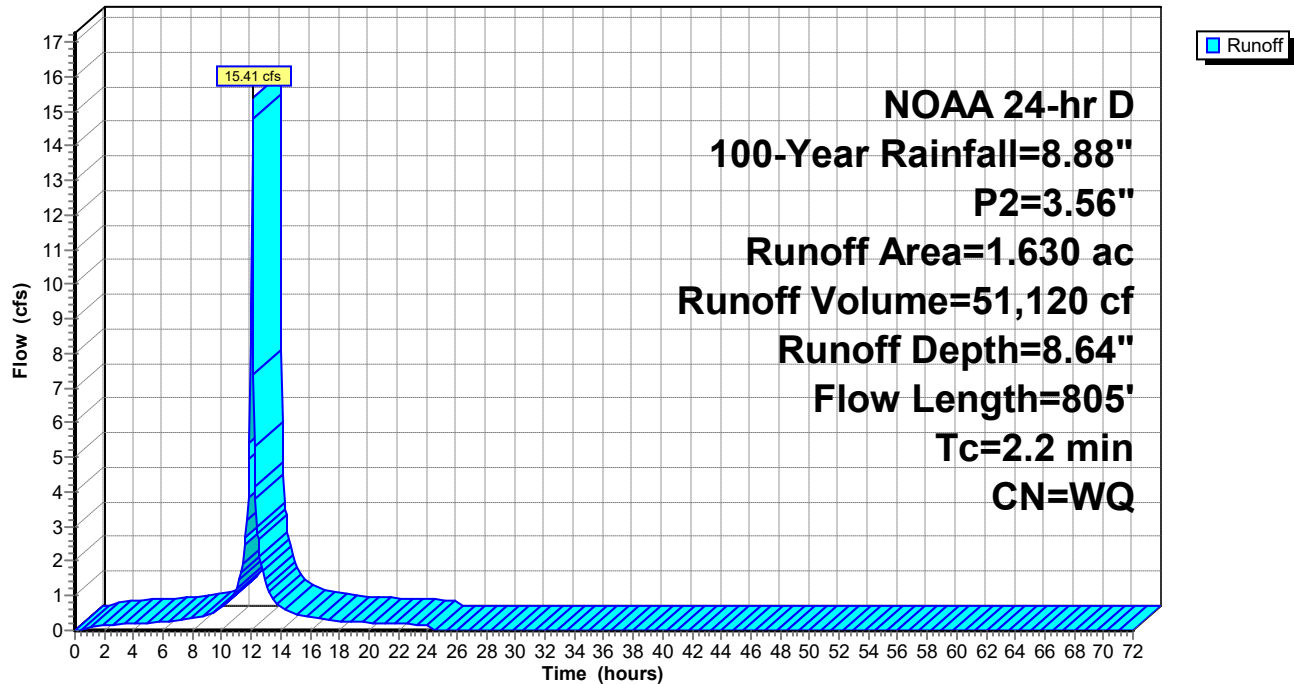
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.2	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 6.15 cfs @ 12.10 hrs, Volume= 18,134 cf, Depth= 4.13"
 Routed to Link 46L : P-DA-1B TOTAL

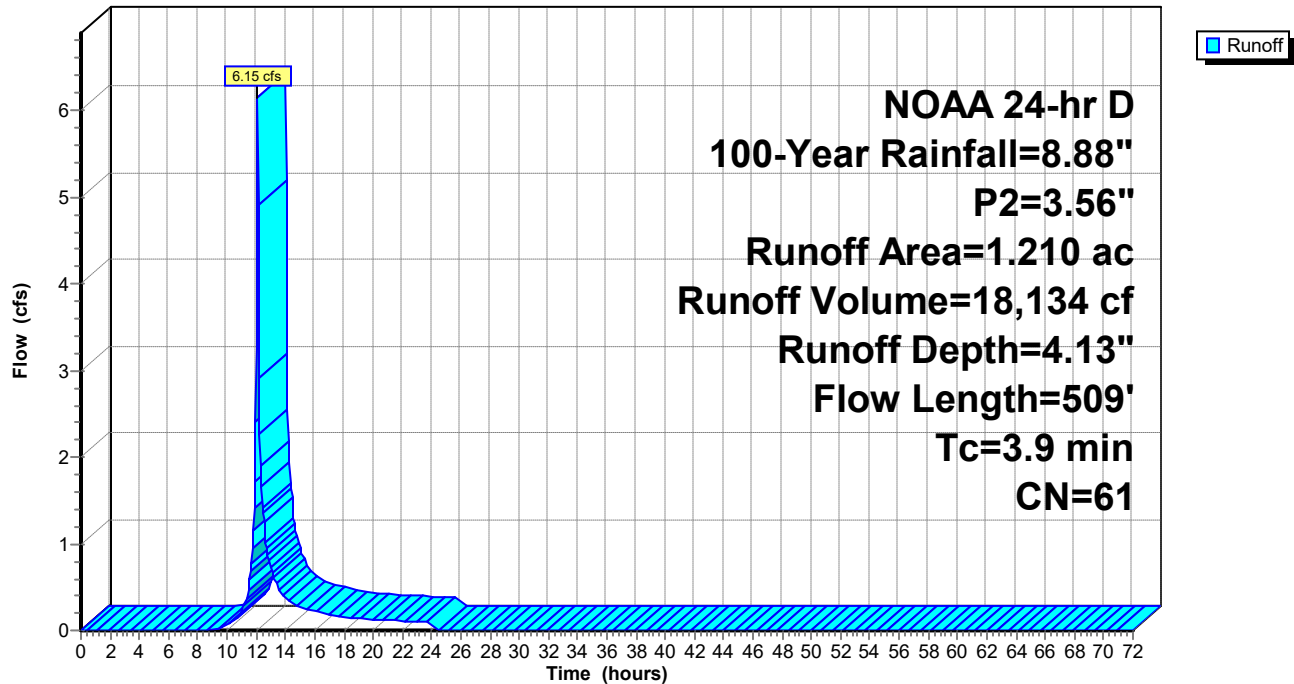
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	12	0.0110	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.2	107	0.0210	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.9	509	Total			

Subcatchment 45S: P-DA-1B PER

Hydrograph



Summary for Subcatchment 46S: P-DA-4J PER

Runoff = 1.58 cfs @ 12.11 hrs, Volume= 4,796 cf, Depth= 4.13"
 Routed to Pond J : BMP-J Bioretention Basin

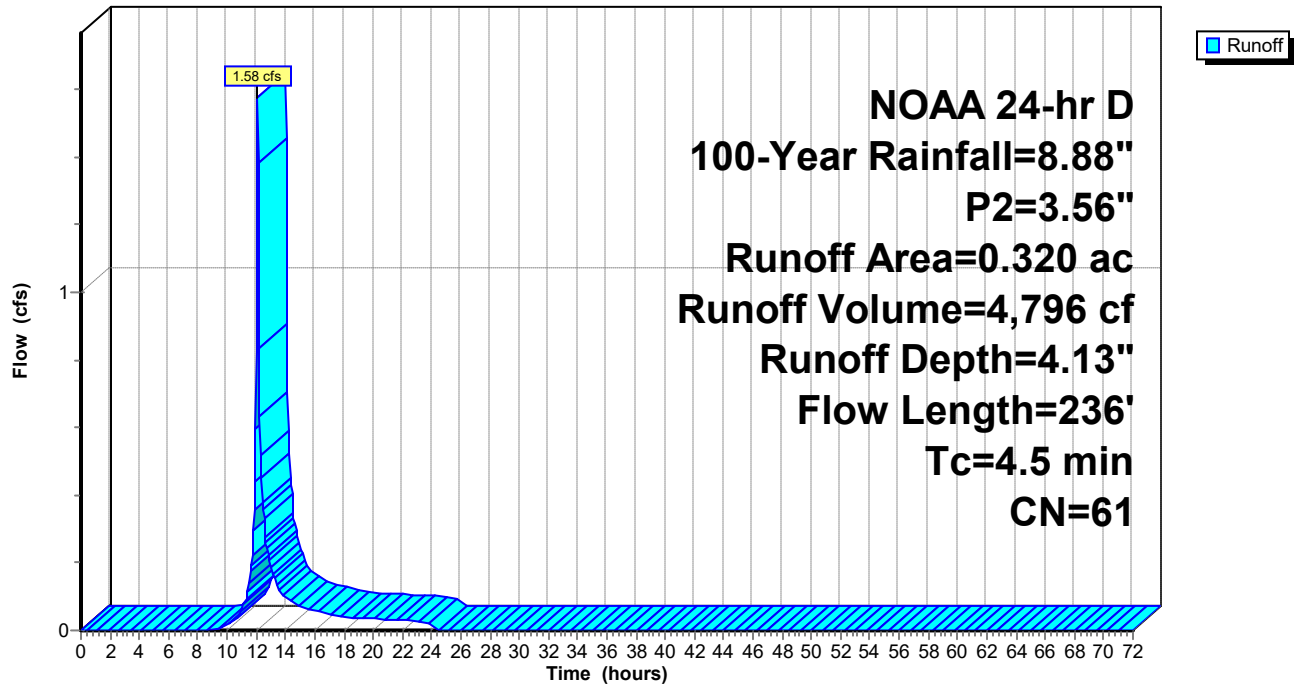
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	30	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.5	236	Total			

Subcatchment 46S: P-DA-4J PER

Hydrograph



Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 6.84 cfs @ 12.08 hrs, Volume= 22,581 cf, Depth= 8.64"
 Routed to Link 50L : TOTAL TO GI MTD K-1

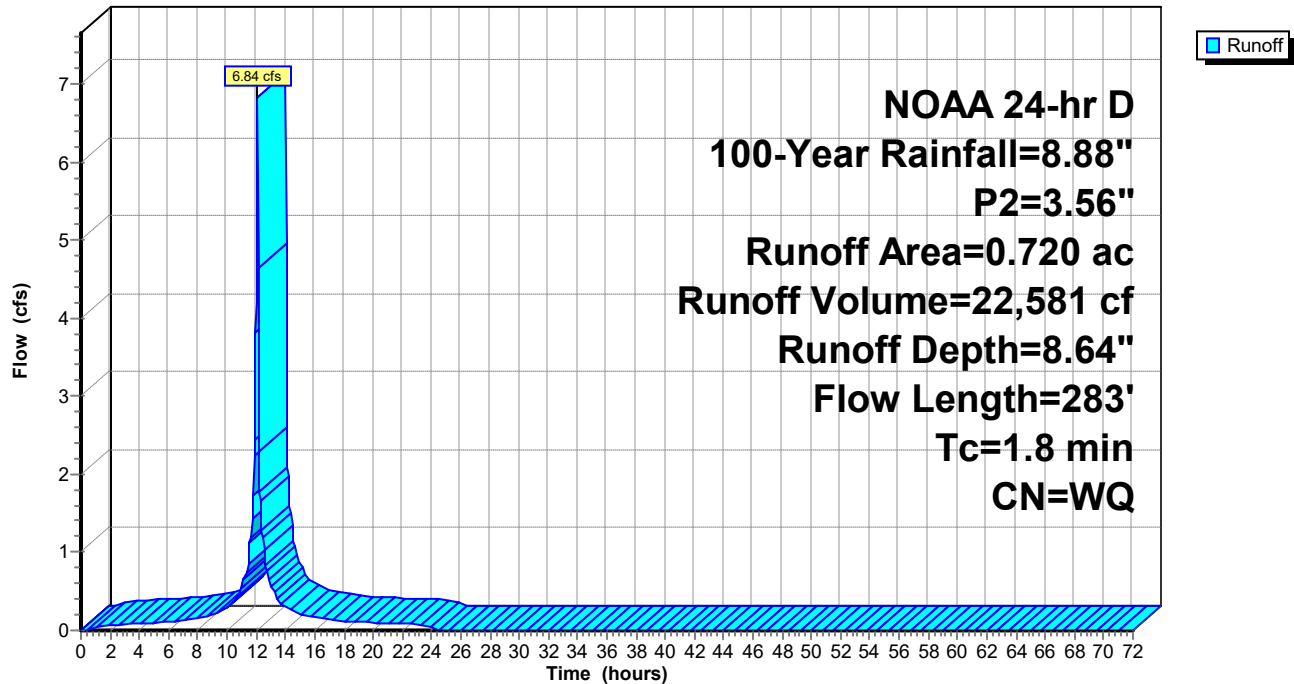
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0220	1.51		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.8	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

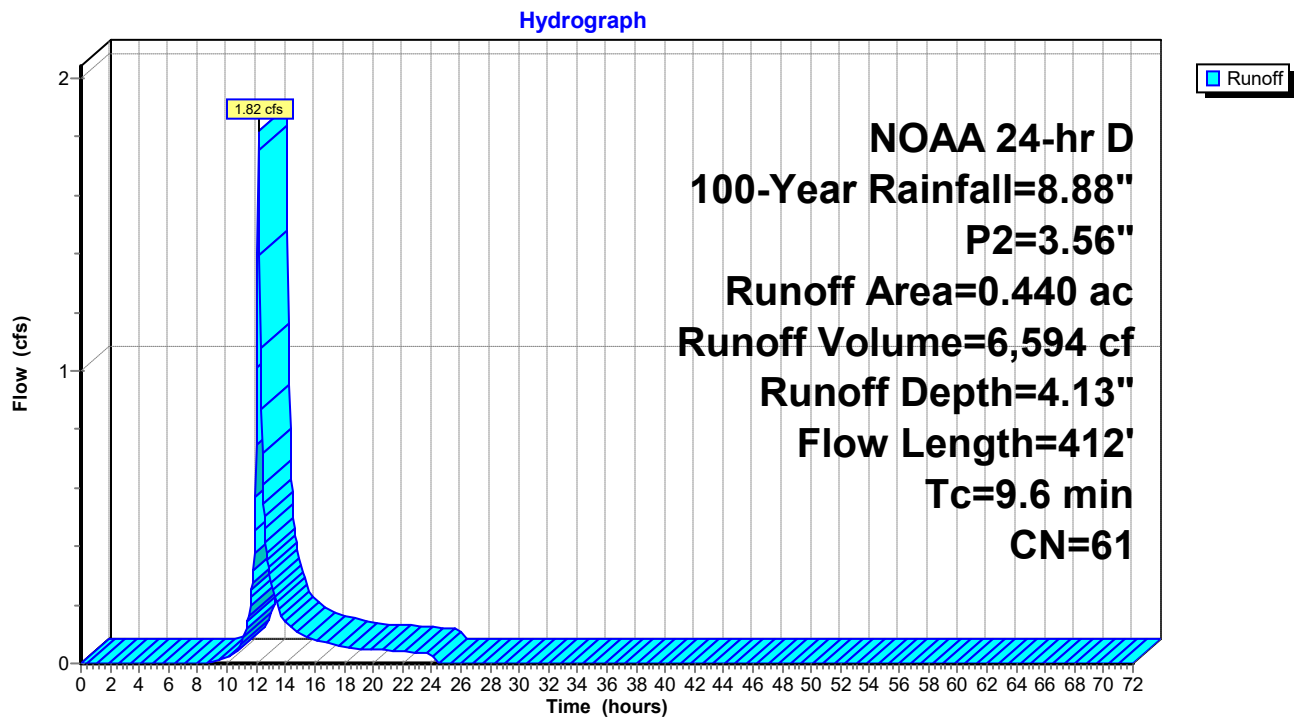
Runoff = 1.82 cfs @ 12.17 hrs, Volume= 6,594 cf, Depth= 4.13"
 Routed to Link 50L : TOTAL TO GI MTD K-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	96	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
9.6	412	Total			

Subcatchment 48S: P-DA-4K PER



Summary for Subcatchment 49S: P-DA-5N IMP

Runoff = 5.98 cfs @ 12.08 hrs, Volume= 19,758 cf, Depth= 8.64"
 Routed to Pond N : BMP-N Bioretention Basin

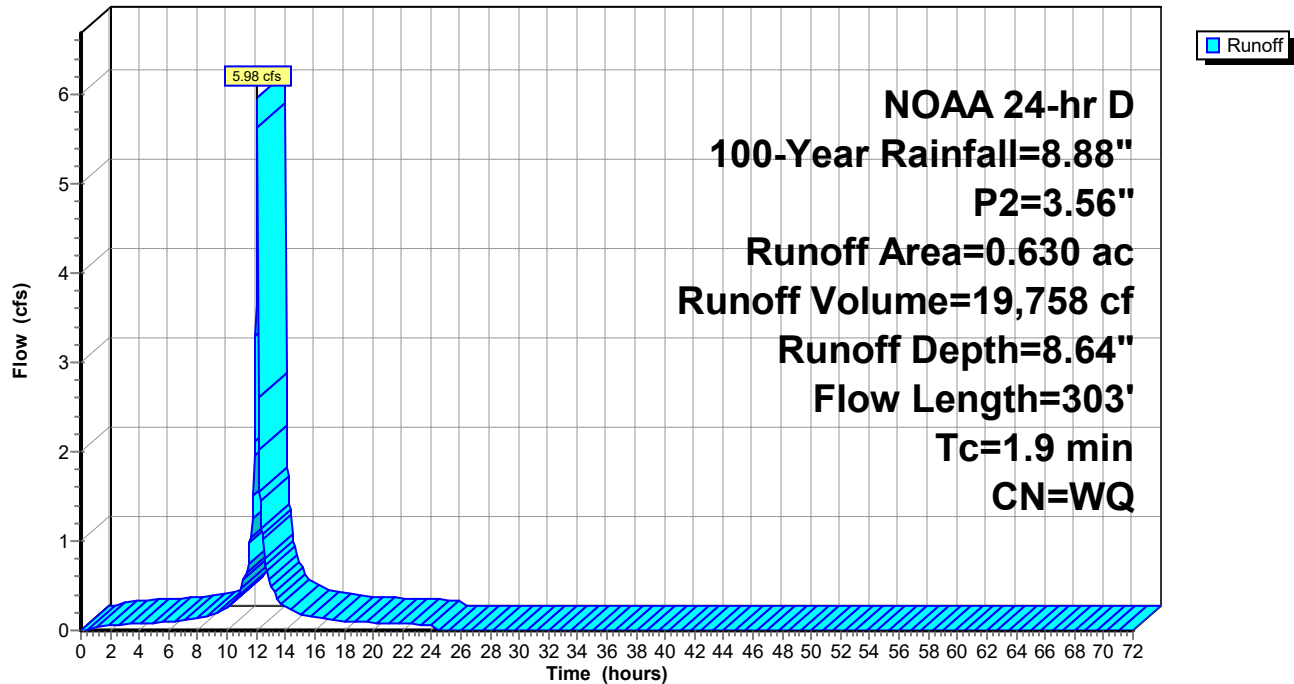
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0270	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.9	303	Total			

Subcatchment 49S: P-DA-5N IMP

Hydrograph



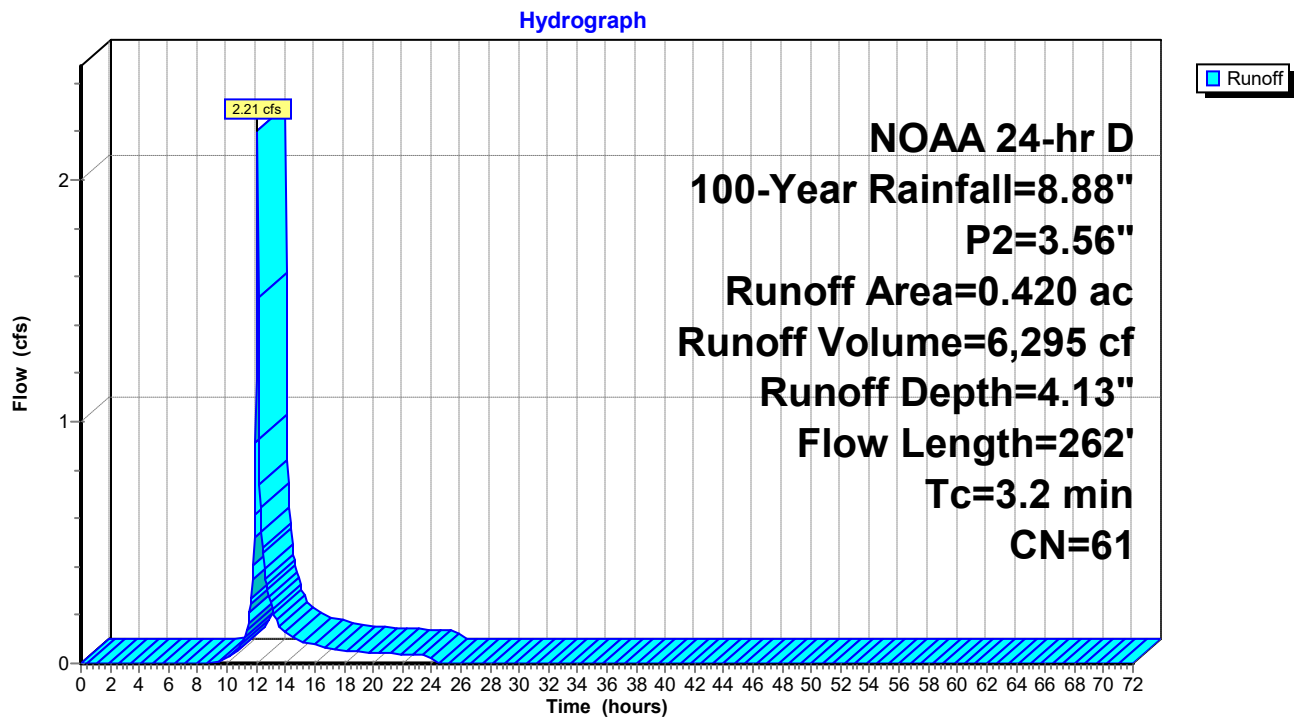
Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 2.21 cfs @ 12.10 hrs, Volume= 6,295 cf, Depth= 4.13"
 Routed to Pond N : BMP-N Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	35	0.0570	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	262	Total			

Subcatchment 50S: P-DA-5N PER

Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 13.08 cfs @ 12.08 hrs, Volume= 43,907 cf, Depth= 8.64"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

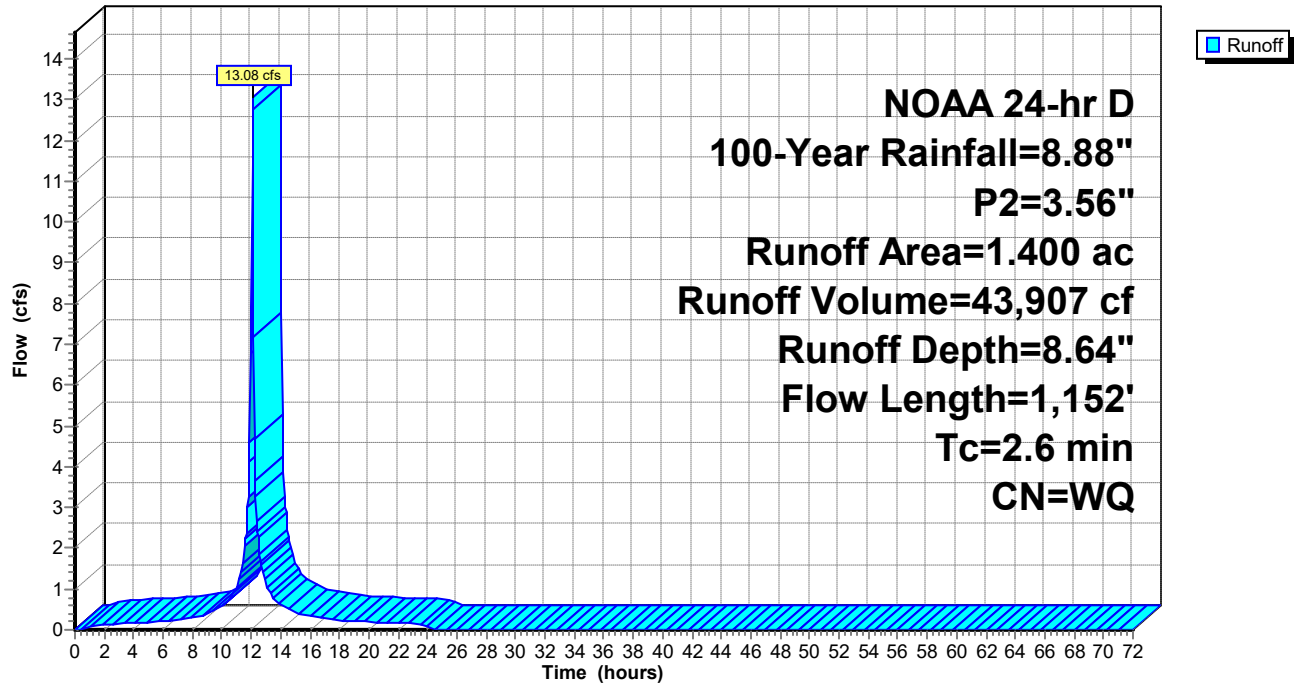
Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	41	0.1200	2.49		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.6	1,152	Total			

Subcatchment 51S: P-DA-5M IMP

Hydrograph



Summary for Subcatchment 52S: P-DA-5M PER

Runoff = 4.05 cfs @ 12.09 hrs, Volume= 11,390 cf, Depth= 4.13"
 Routed to Link 21L : TOTAL TO P-DA-5M

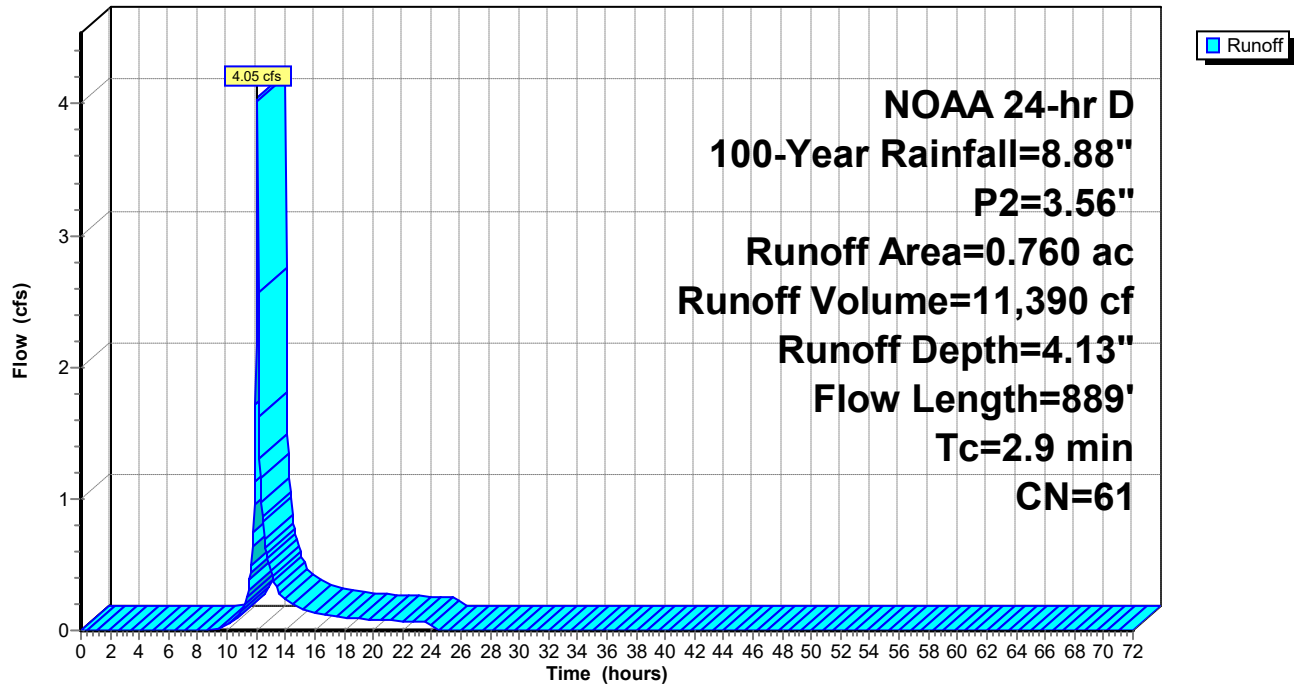
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	20	0.2000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.9	889	Total			

Subcatchment 52S: P-DA-5M PER

Hydrograph



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 1,568 cf, Depth= 8.64"
 Routed to Pond K : BMP-K UG Infiltration Basin

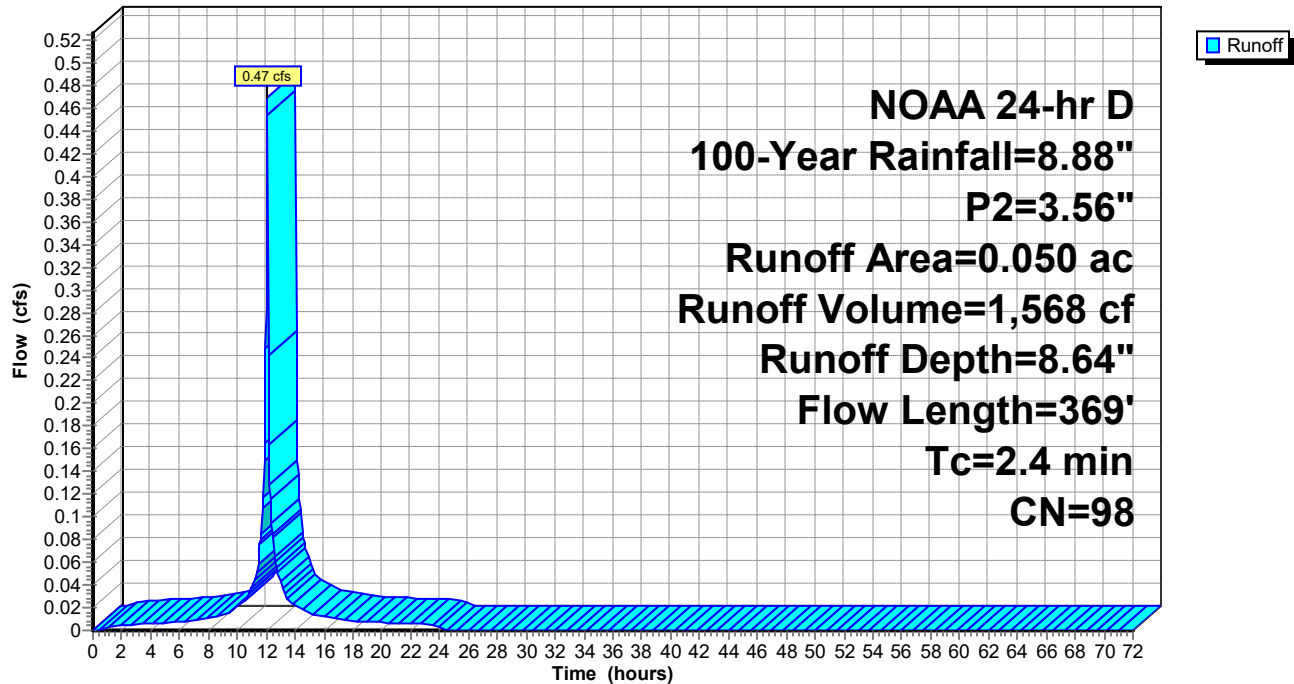
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 4.39 cfs @ 12.23 hrs, Volume= 18,408 cf, Depth= 4.12"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

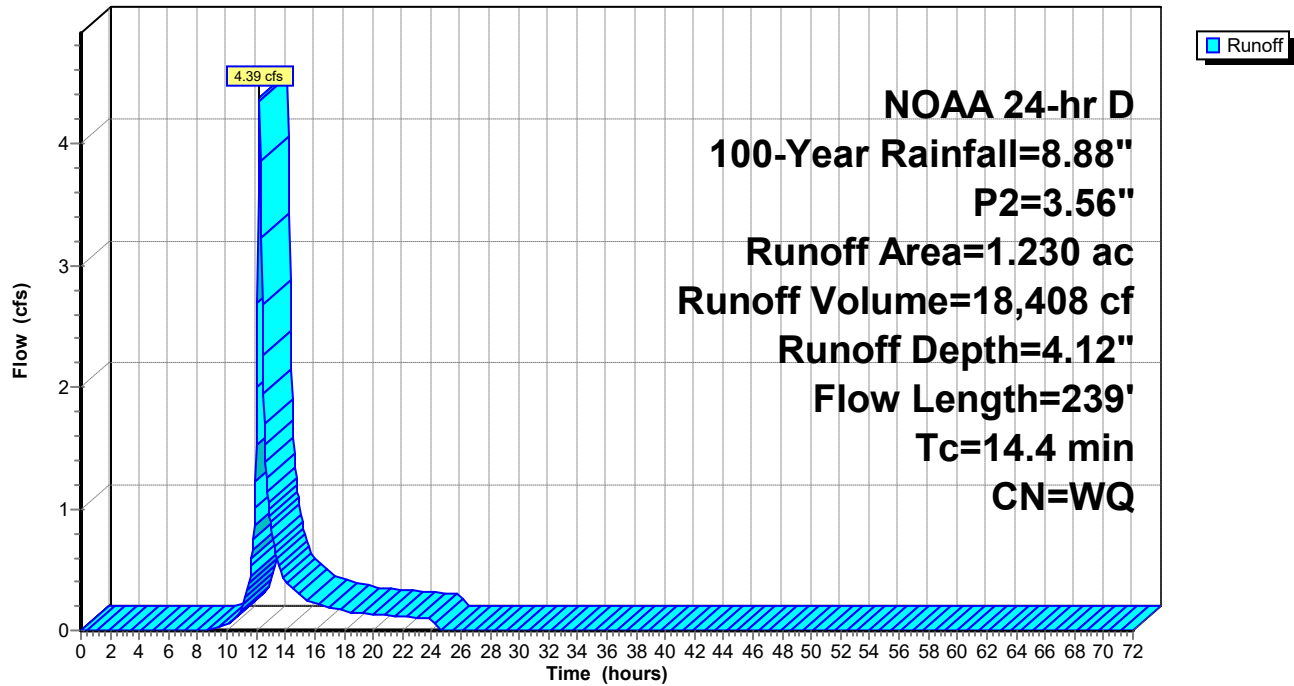
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.56"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.4	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.56 cfs @ 12.05 hrs, Volume= 1,882 cf, Depth= 8.64"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

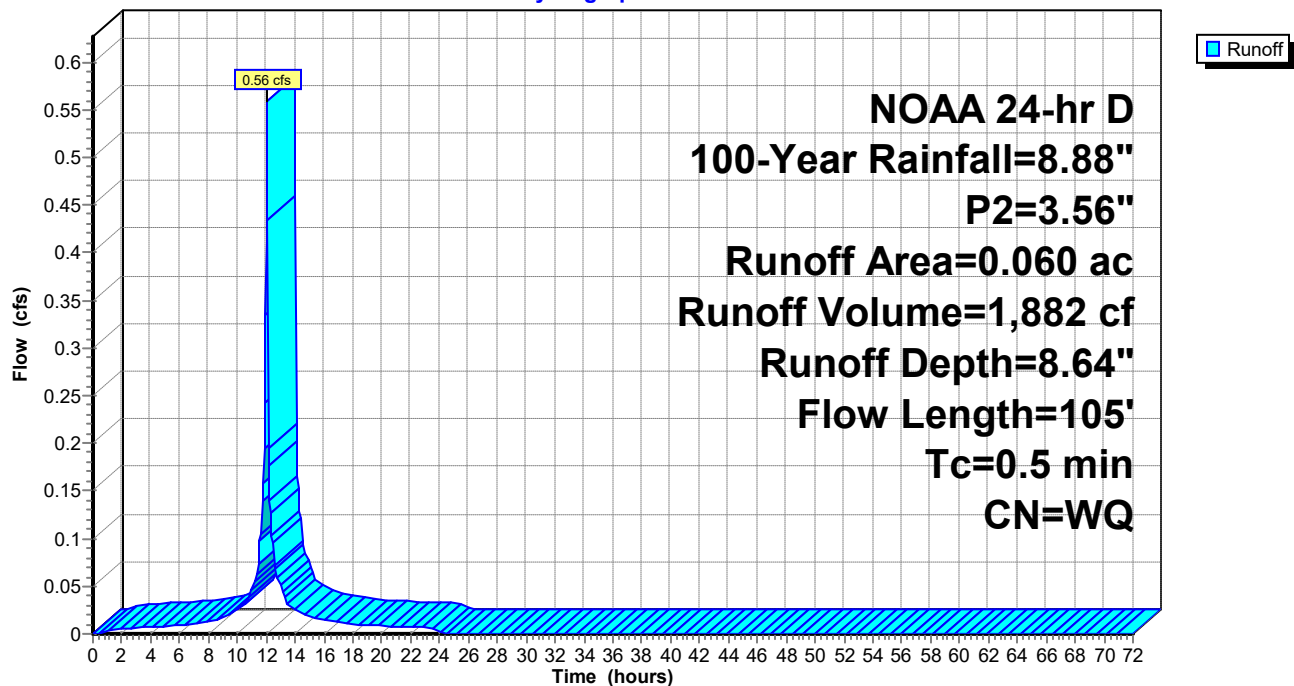
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.73		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 14.10 cfs @ 12.08 hrs, Volume= 47,043 cf, Depth= 8.64"
 Routed to Pond P : BMP-P Bioretention Basin

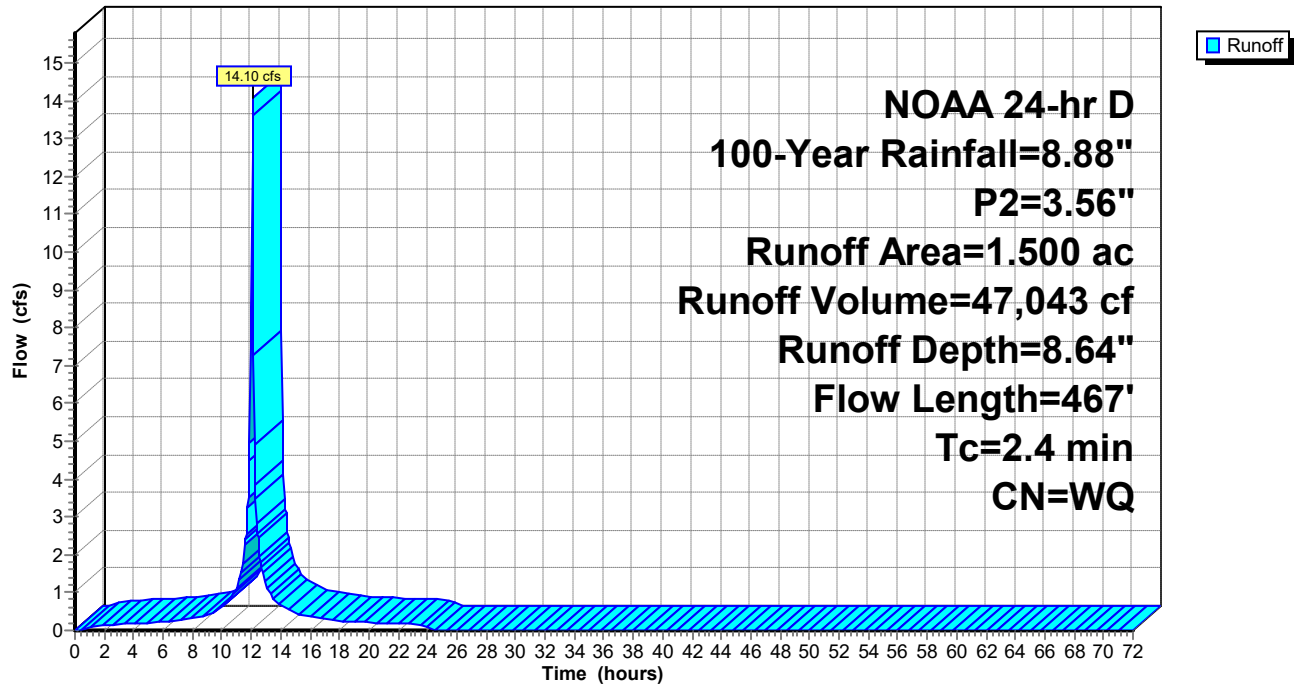
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.10		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.4	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 4.86 cfs @ 12.08 hrs, Volume= 13,189 cf, Depth= 4.13"
 Routed to Pond P : BMP-P Bioretention Basin

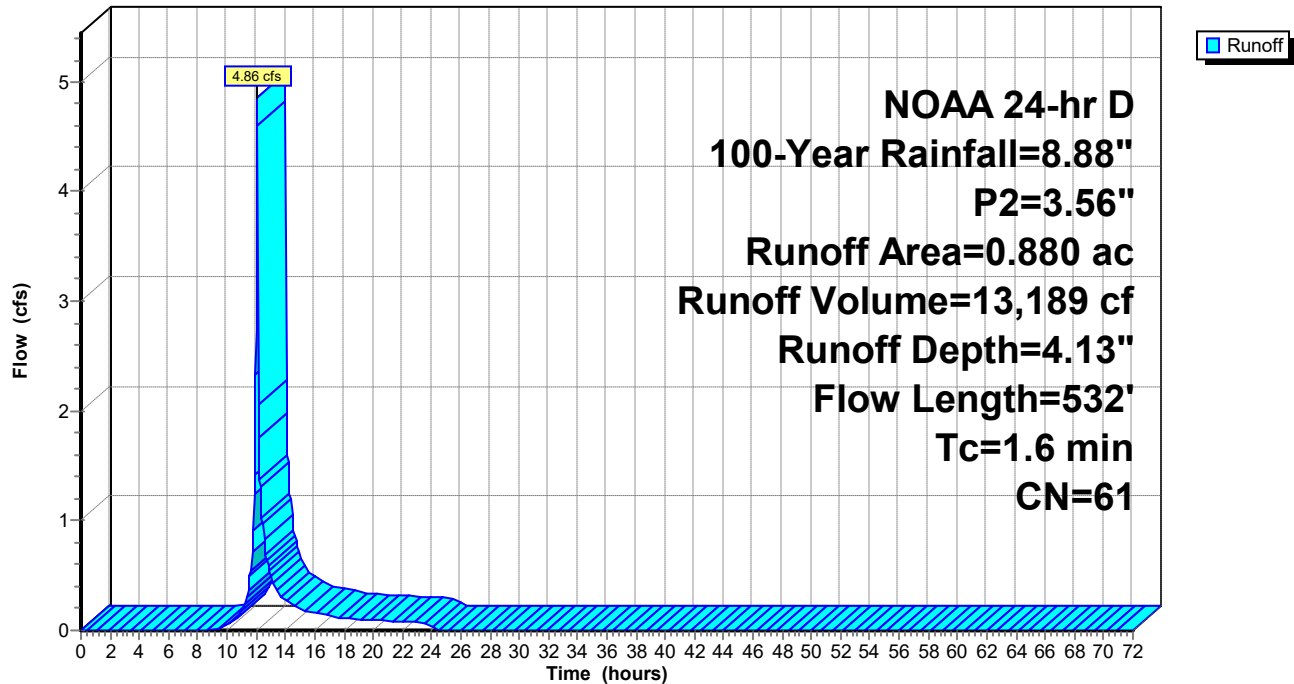
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER

Hydrograph



Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 4.43 cfs @ 12.11 hrs, Volume= 13,648 cf, Depth= 4.04"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

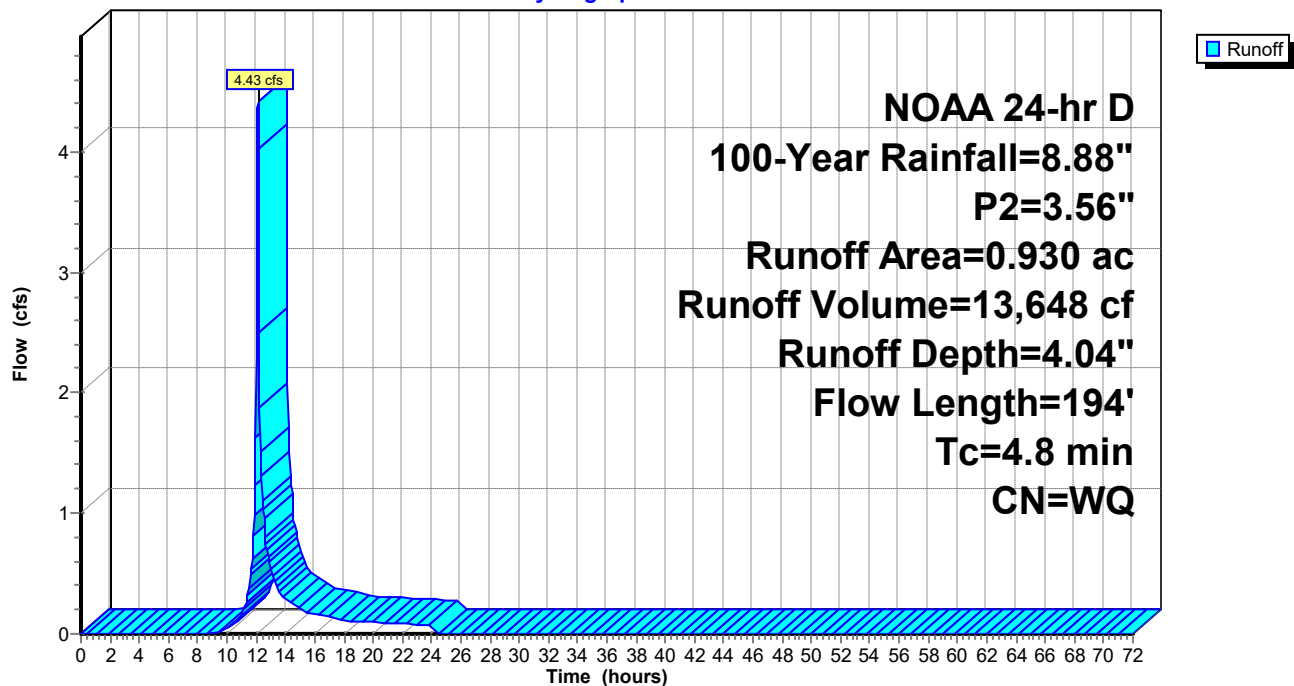
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.8	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Hydrograph



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 7.77 cfs @ 12.08 hrs, Volume= 25,717 cf, Depth= 8.64"
 Routed to Link 66L : P-DA-5R TOTAL

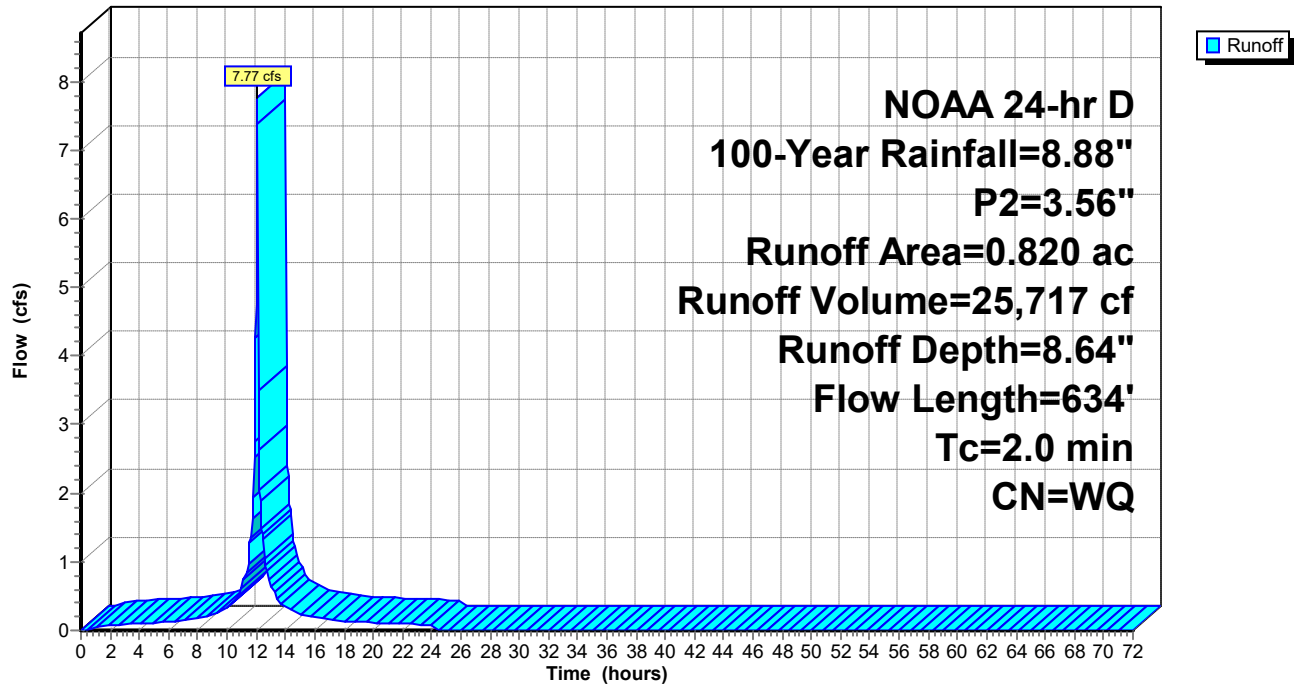
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0370	1.86		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.56"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.0	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

Runoff = 6.40 cfs @ 12.12 hrs, Volume= 20,083 cf, Depth= 4.13"
 Routed to Link 66L : P-DA-5R TOTAL

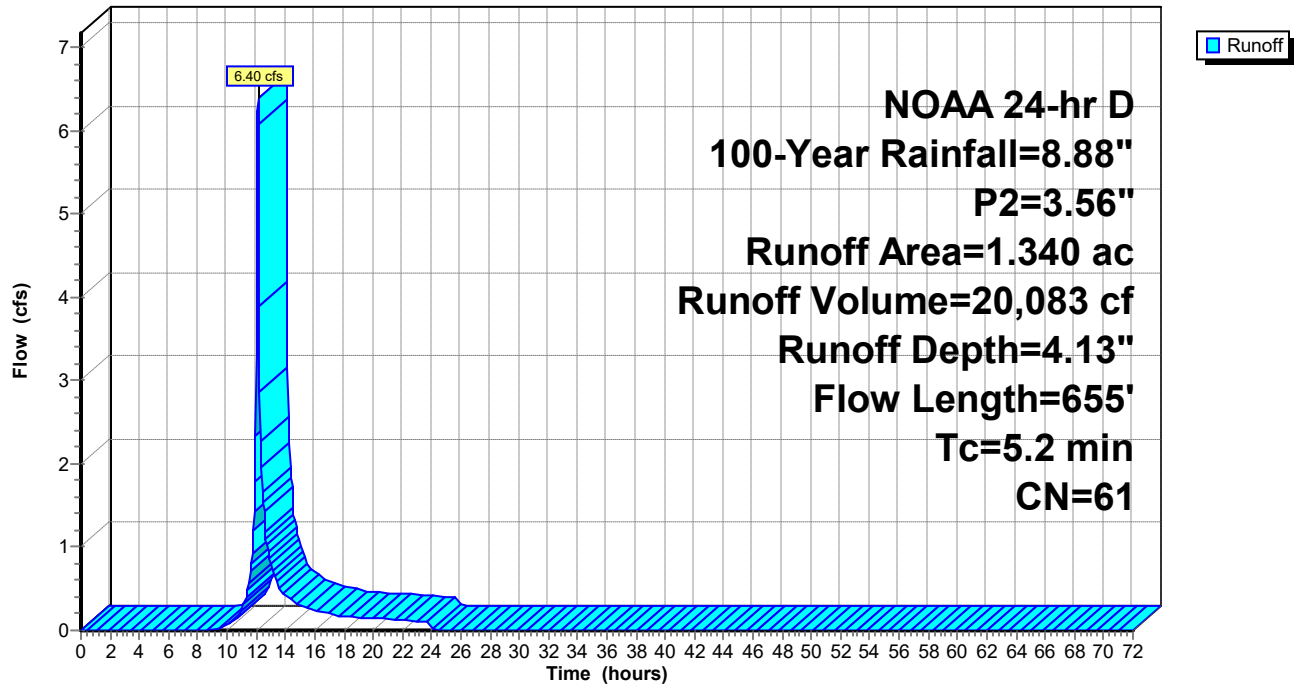
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year Rainfall=8.88", P2=3.56"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	44	0.0500	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 3.56"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
5.2	655	Total			

Subcatchment 64S: P-DA-5R PER

Hydrograph



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 5.78" for 100-Year event
 Inflow = 4.72 cfs @ 12.08 hrs, Volume= 16,035 cf
 Outflow = 2.13 cfs @ 12.21 hrs, Volume= 14,801 cf, Atten= 55%, Lag= 7.7 min
 Primary = 2.13 cfs @ 12.21 hrs, Volume= 14,801 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 554.10' @ 12.21 hrs Surf.Area= 2,983 sf Storage= 5,677 cf

Plug-Flow detention time= 158.2 min calculated for 14,801 cf (92% of inflow)
 Center-of-Mass det. time= 114.9 min (901.7 - 786.7)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 ' / Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.11 cfs @ 12.21 hrs HW=554.10' (Free Discharge)

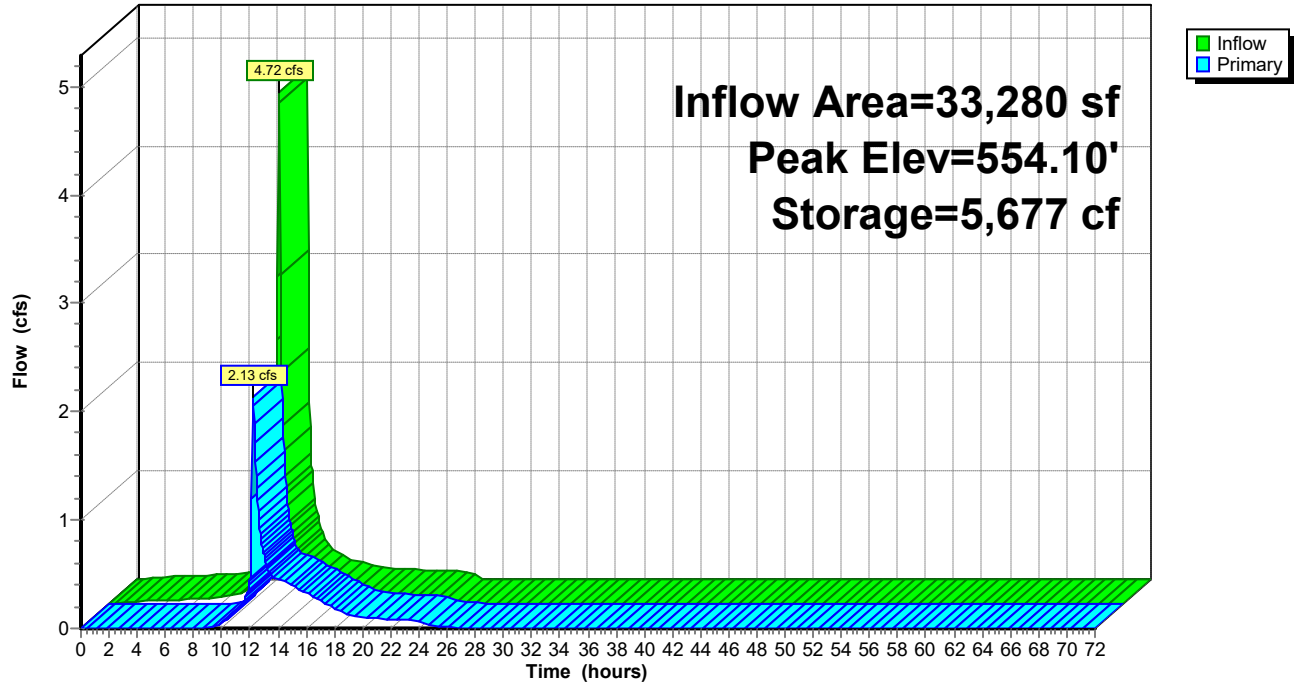
1=Culvert (Passes 2.11 cfs of 12.70 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.54 cfs @ 6.24 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.56 cfs @ 2.06 fps)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 6.50" for 100-Year event
 Inflow = 25.74 cfs @ 12.09 hrs, Volume= 104,054 cf
 Outflow = 4.91 cfs @ 12.84 hrs, Volume= 96,755 cf, Atten= 81%, Lag= 45.2 min
 Primary = 4.91 cfs @ 12.84 hrs, Volume= 96,755 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 577.44' @ 12.84 hrs Surf.Area= 15,095 sf Storage= 50,083 cf

Plug-Flow detention time= 311.0 min calculated for 96,755 cf (93% of inflow)
 Center-of-Mass det. time= 269.6 min (1,064.6 - 795.0)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.91 cfs @ 12.84 hrs HW=577.44' (Free Discharge)

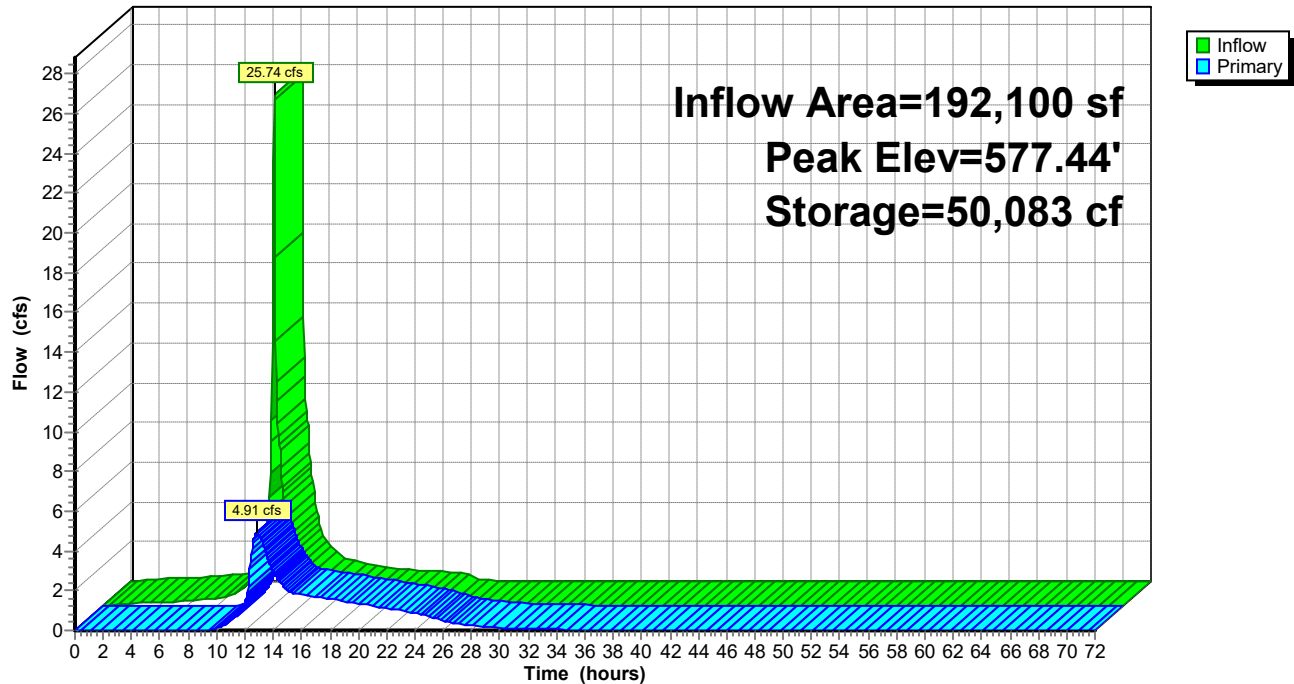
1=Culvert (Passes 4.91 cfs of 35.00 cfs potential flow)

2=Orifice/Grate (Orifice Controls 2.10 cfs @ 7.84 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 2.81 cfs @ 2.52 fps)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 6.24" for 100-Year event
 Inflow = 14.39 cfs @ 12.09 hrs, Volume= 60,917 cf
 Outflow = 2.58 cfs @ 12.85 hrs, Volume= 56,677 cf, Atten= 82%, Lag= 45.3 min
 Primary = 2.58 cfs @ 12.85 hrs, Volume= 56,677 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 563.08' @ 12.85 hrs Surf.Area= 10,805 sf Storage= 27,176 cf

Plug-Flow detention time= 453.4 min calculated for 56,677 cf (93% of inflow)
 Center-of-Mass det. time= 410.4 min (1,218.1 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.58 cfs @ 12.85 hrs HW=563.08' (Free Discharge)

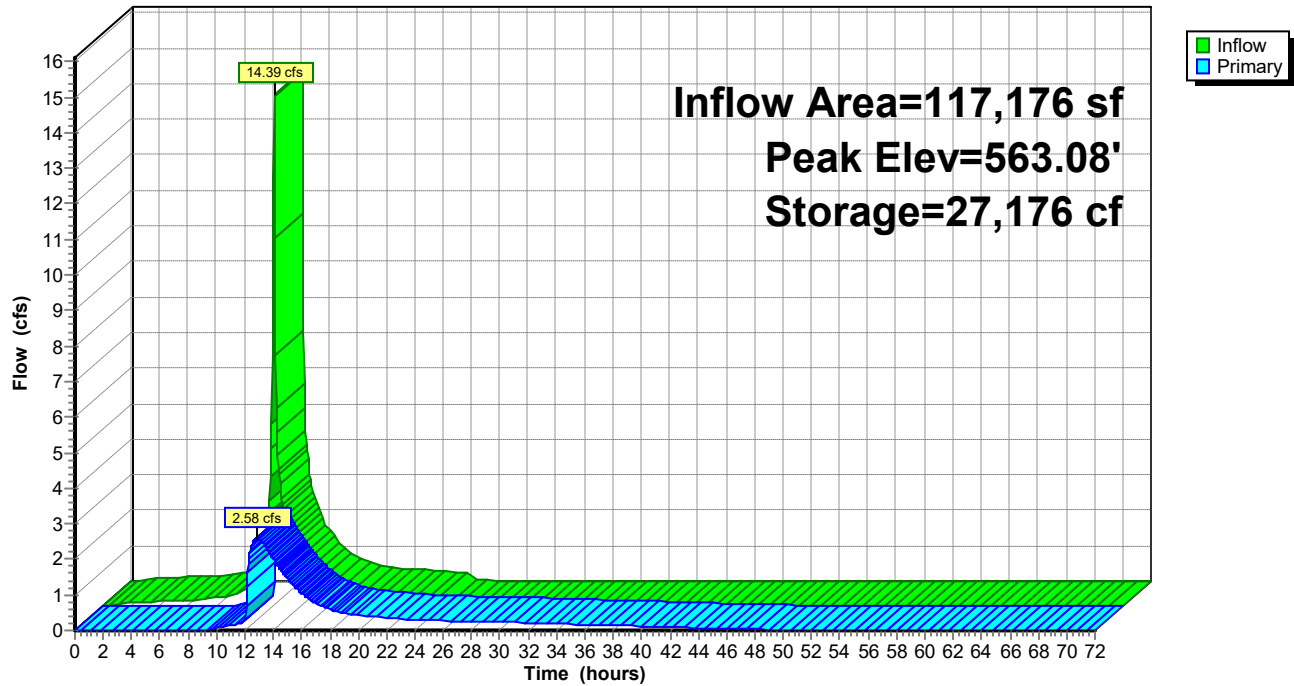
1=Culvert (Passes 2.58 cfs of 21.80 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.37 cfs @ 7.46 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 2.21 cfs @ 3.06 fps)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 7.41" for 100-Year event
 Inflow = 4.47 cfs @ 12.07 hrs, Volume= 14,793 cf
 Outflow = 2.05 cfs @ 12.16 hrs, Volume= 13,273 cf, Atten= 54%, Lag= 5.5 min
 Primary = 2.05 cfs @ 12.16 hrs, Volume= 13,273 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 601.29' @ 12.17 hrs Surf.Area= 2,230 sf Storage= 4,475 cf

Plug-Flow detention time= 146.1 min calculated for 13,273 cf (90% of inflow)
 Center-of-Mass det. time= 90.6 min (843.8 - 753.2)

Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

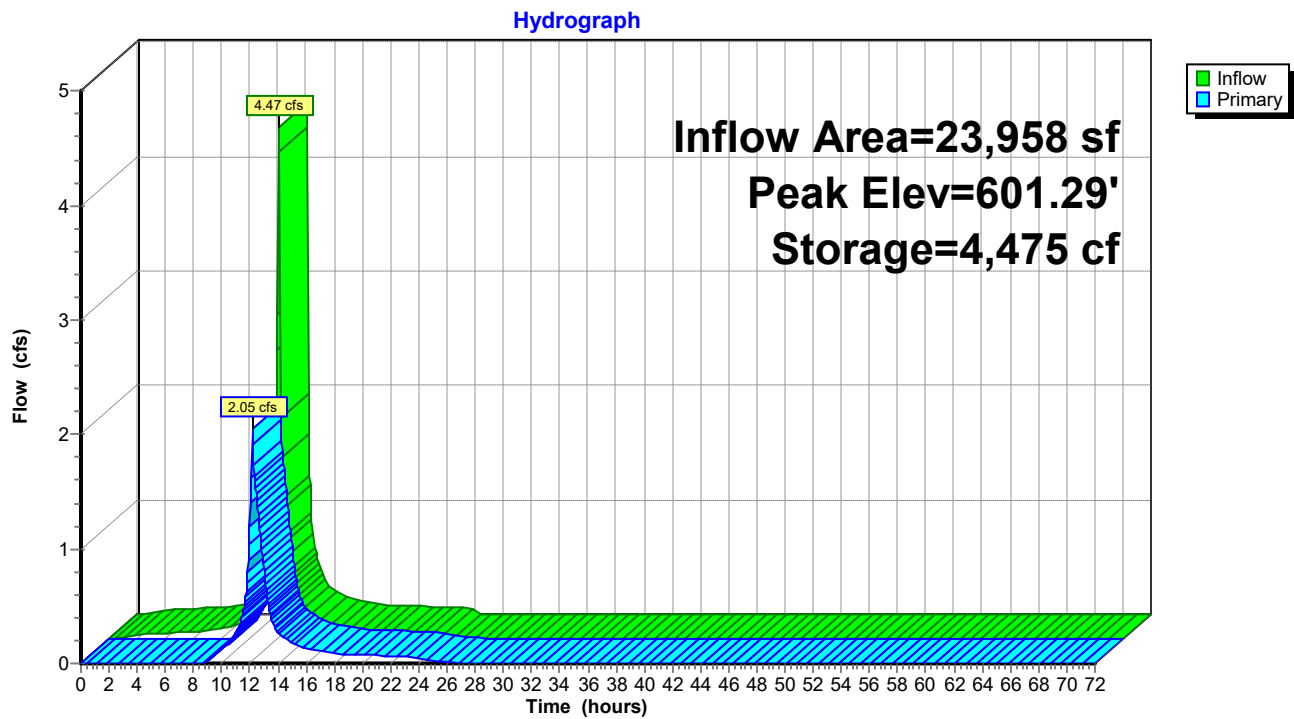
Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.99 cfs @ 12.16 hrs HW=601.28' (Free Discharge)

1=Culvert (Passes 1.99 cfs of 10.07 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.71 cfs @ 4.90 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.28 cfs @ 0.91 fps)

Pond F: UG INFILTRATION BASIN F

Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 6.13" for 100-Year event
 Inflow = 5.73 cfs @ 12.08 hrs, Volume= 17,571 cf
 Outflow = 1.01 cfs @ 12.49 hrs, Volume= 15,575 cf, Atten= 82%, Lag= 24.5 min
 Primary = 1.01 cfs @ 12.49 hrs, Volume= 15,575 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.99' @ 12.49 hrs Surf.Area= 4,421 sf Storage= 7,598 cf

Plug-Flow detention time= 198.4 min calculated for 15,564 cf (89% of inflow)
 Center-of-Mass det. time= 140.7 min (918.3 - 777.6)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

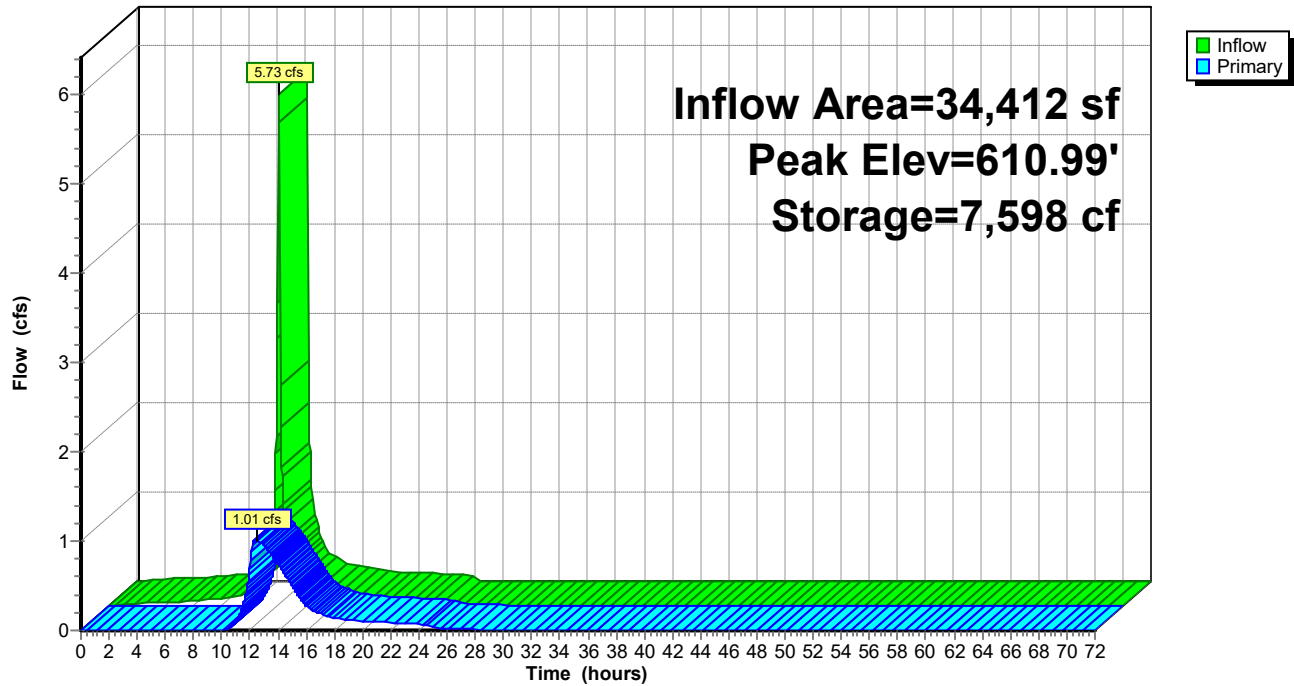
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.01 cfs @ 12.49 hrs HW=610.99' (Free Discharge)

↑ **1=Culvert** (Passes 1.01 cfs of 9.48 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.01 cfs @ 5.14 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 6.52" for 100-Year event
 Inflow = 7.53 cfs @ 12.08 hrs, Volume= 24,129 cf
 Outflow = 3.21 cfs @ 12.19 hrs, Volume= 21,527 cf, Atten= 57%, Lag= 6.2 min
 Primary = 3.21 cfs @ 12.19 hrs, Volume= 21,527 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 611.11' @ 12.19 hrs Surf.Area= 7,433 sf Storage= 7,591 cf

Plug-Flow detention time= 146.2 min calculated for 21,527 cf (89% of inflow)
 Center-of-Mass det. time= 88.4 min (858.0 - 769.7)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

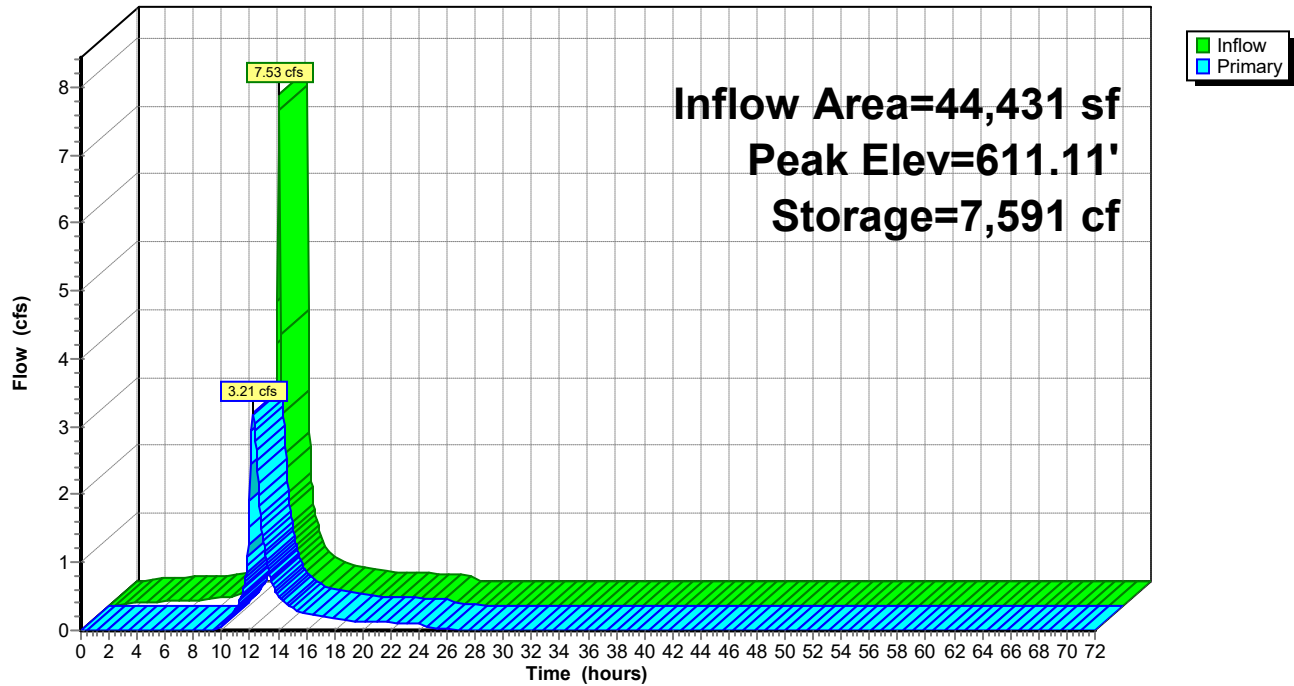
Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.20 cfs @ 12.19 hrs HW=611.10' (Free Discharge)

1=Culvert (Passes 3.20 cfs of 14.15 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 3.20 cfs @ 3.20 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 6.82" for 100-Year event
 Inflow = 7.39 cfs @ 12.08 hrs, Volume= 23,258 cf
 Outflow = 4.26 cfs @ 12.15 hrs, Volume= 20,931 cf, Atten= 42%, Lag= 4.5 min
 Primary = 4.26 cfs @ 12.15 hrs, Volume= 20,931 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 615.75' @ 12.15 hrs Surf.Area= 3,517 sf Storage= 7,093 cf

Plug-Flow detention time= 137.0 min calculated for 20,931 cf (90% of inflow)
 Center-of-Mass det. time= 82.3 min (845.8 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.24 cfs @ 12.15 hrs HW=615.75' (Free Discharge)

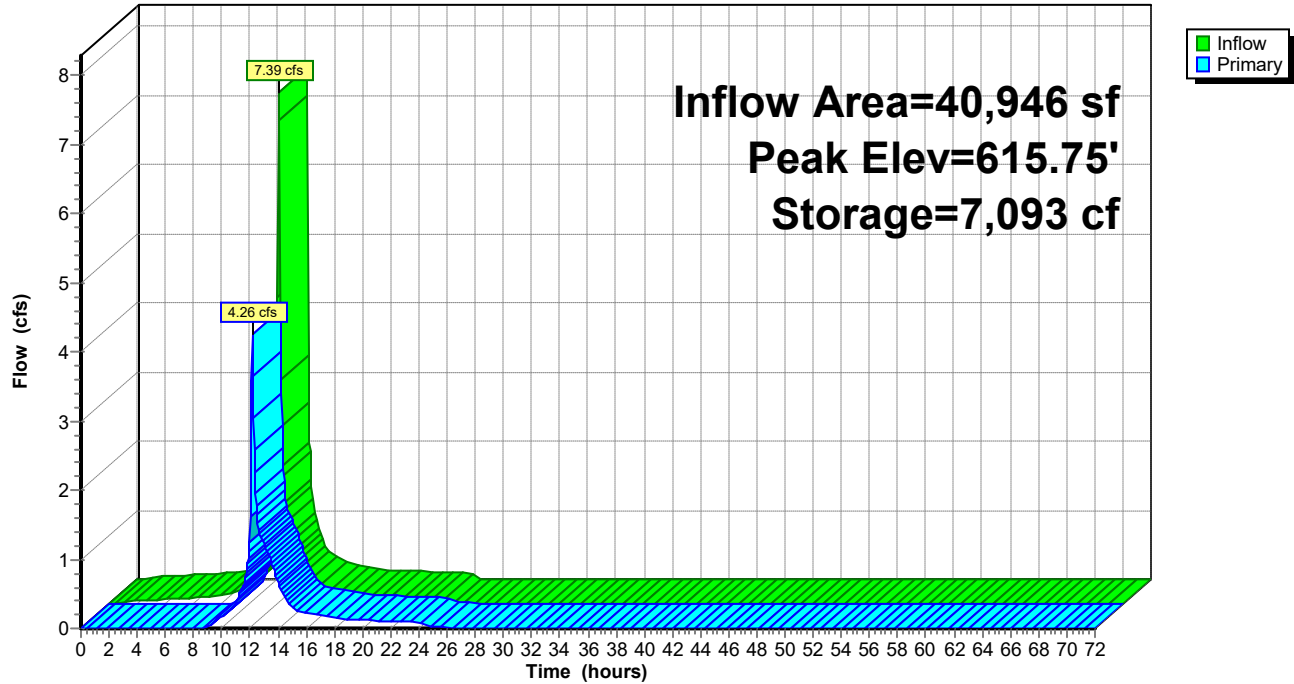
1=Culvert (Passes 4.24 cfs of 19.03 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.57 cfs @ 5.66 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 2.67 cfs @ 1.94 fps)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 6.94" for 100-Year event
 Inflow = 6.47 cfs @ 12.09 hrs, Volume= 21,418 cf
 Outflow = 0.42 cfs @ 13.48 hrs, Volume= 19,409 cf, Atten= 94%, Lag= 83.3 min
 Primary = 0.42 cfs @ 13.48 hrs, Volume= 19,409 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 611.07' @ 13.48 hrs Surf.Area= 3,701 sf Storage= 12,232 cf

Plug-Flow detention time= 398.1 min calculated for 19,396 cf (91% of inflow)
 Center-of-Mass det. time= 348.2 min (1,110.5 - 762.3)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

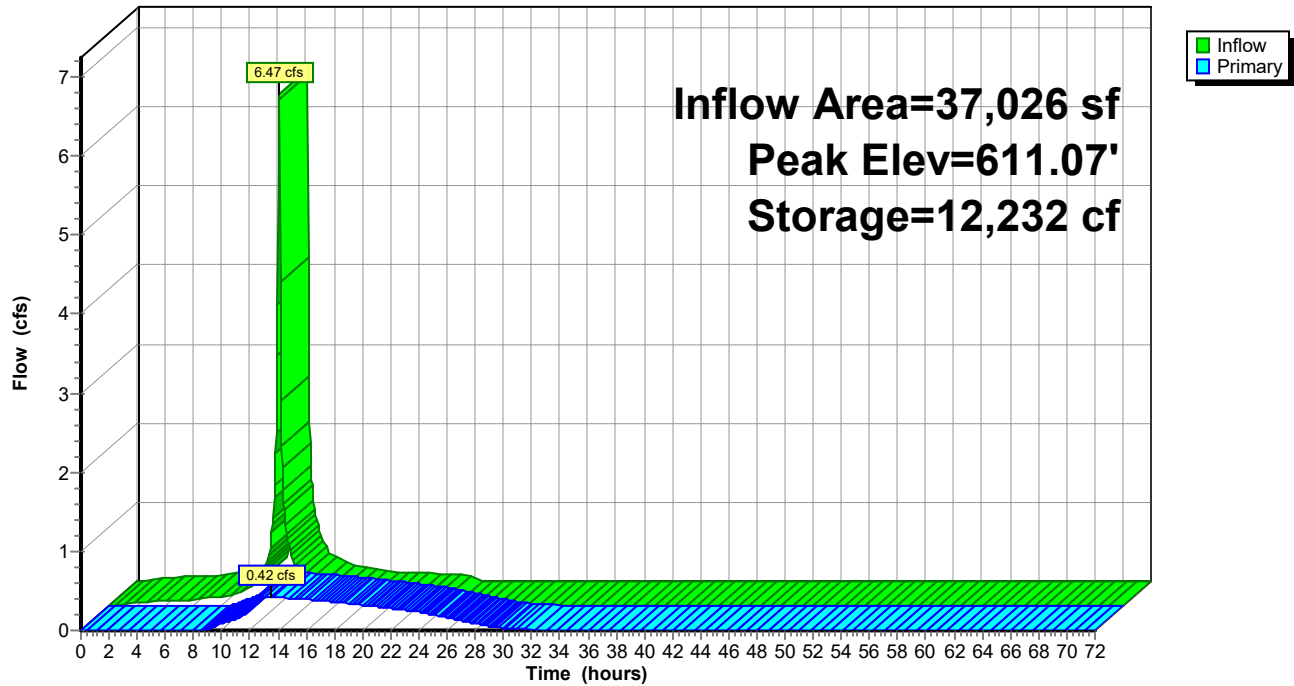
Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.42 cfs @ 13.48 hrs HW=611.07' (Free Discharge)

1=Culvert (Passes 0.42 cfs of 20.88 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.53 fps)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 6.71" for 100-Year event
 Inflow = 8.87 cfs @ 12.08 hrs, Volume= 50,153 cf
 Outflow = 5.62 cfs @ 12.16 hrs, Volume= 47,055 cf, Atten= 37%, Lag= 4.8 min
 Primary = 5.62 cfs @ 12.16 hrs, Volume= 47,055 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 597.06' @ 12.16 hrs Surf.Area= 2,960 sf Storage= 10,563 cf

Plug-Flow detention time= 153.5 min calculated for 47,055 cf (94% of inflow)
 Center-of-Mass det. time= 105.6 min (1,002.3 - 896.7)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

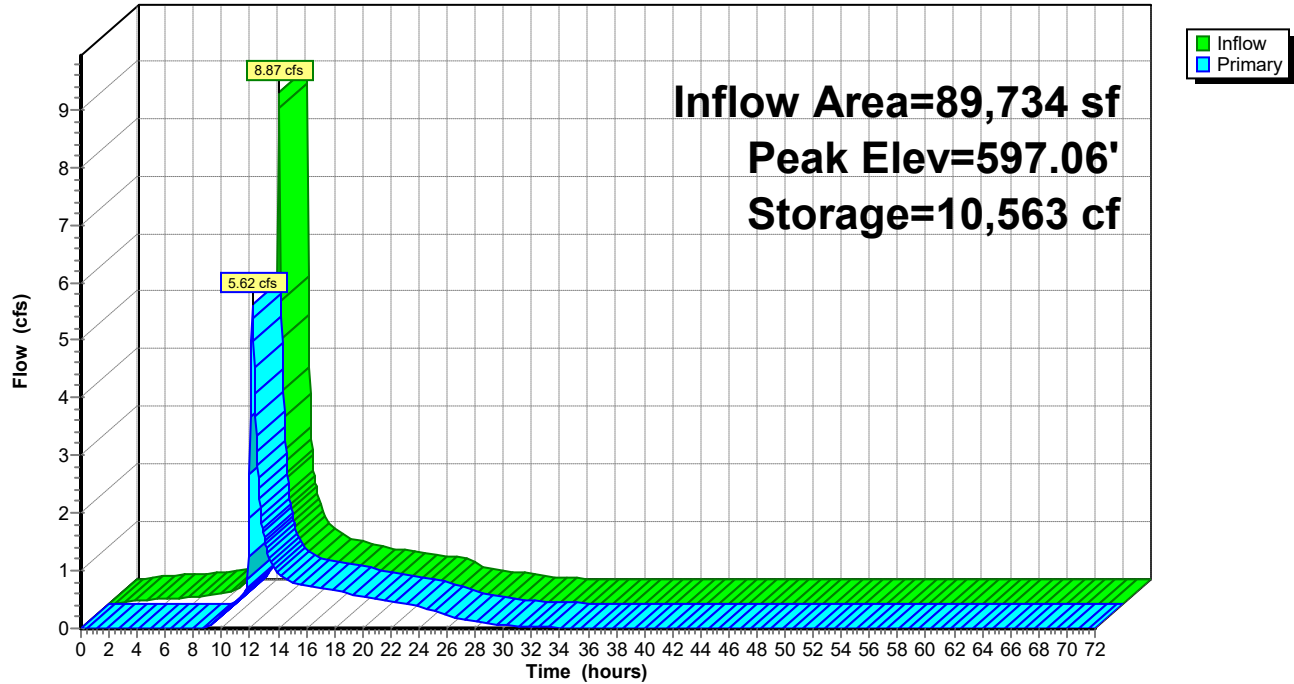
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.54 cfs @ 12.16 hrs HW=597.04' (Free Discharge)

1=Culvert (Passes 5.54 cfs of 14.97 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.02 cfs @ 7.51 fps)
 3=Orifice/Grate (Orifice Controls 2.90 cfs @ 4.65 fps)
 4=Broad-Crested Rectangular Weir (Weir Controls 1.61 cfs @ 2.51 fps)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 7.05" for 100-Year event
 Inflow = 17.11 cfs @ 12.09 hrs, Volume= 55,297 cf
 Outflow = 11.50 cfs @ 12.15 hrs, Volume= 49,929 cf, Atten= 33%, Lag= 3.7 min
 Primary = 11.50 cfs @ 12.15 hrs, Volume= 49,929 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 570.26' @ 12.15 hrs Surf.Area= 6,980 sf Storage= 13,883 cf

Plug-Flow detention time= 137.1 min calculated for 49,929 cf (90% of inflow)
 Center-of-Mass det. time= 83.9 min (843.9 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

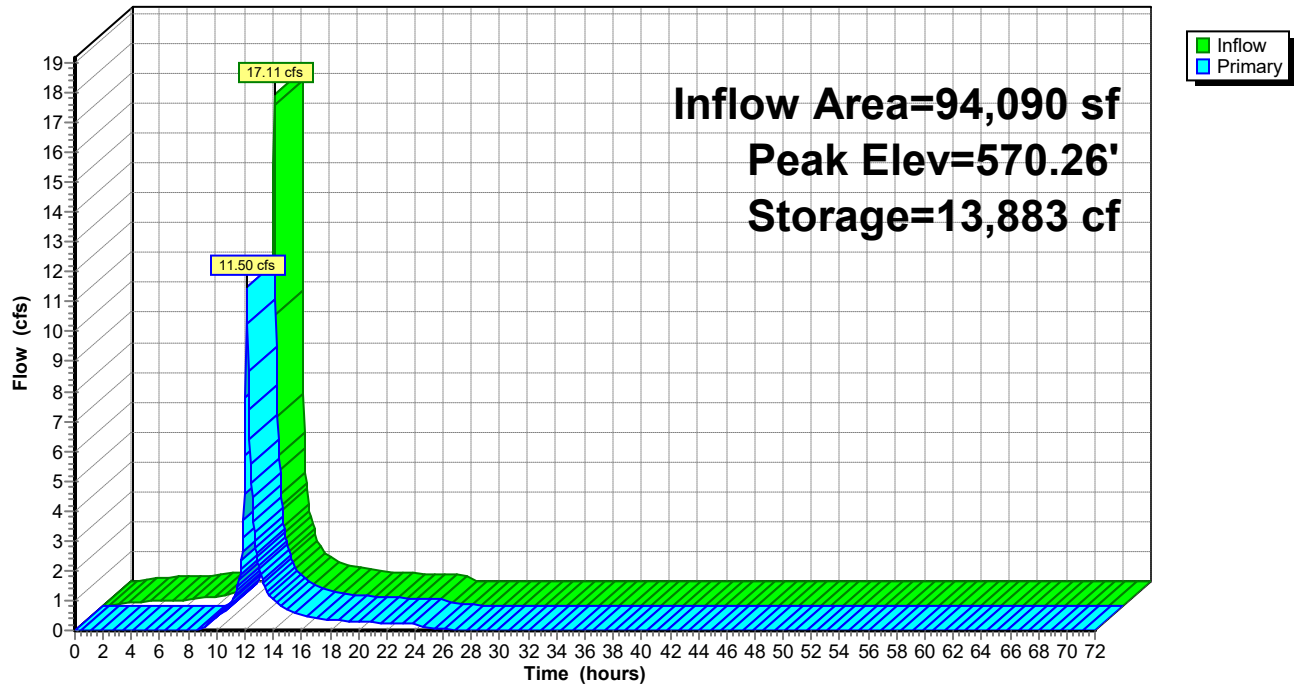
Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=11.44 cfs @ 12.15 hrs HW=570.26' TW=566.85' (Fixed TW Elev= 566.85')

1=Culvert (Passes 11.44 cfs of 27.93 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 4.96 cfs @ 4.55 fps)
 3=Broad-Crested Rectangular Weir (Weir Controls 6.47 cfs @ 2.84 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 6.84" for 100-Year event
 Inflow = 8.13 cfs @ 12.08 hrs, Volume= 26,053 cf
 Outflow = 5.13 cfs @ 12.15 hrs, Volume= 23,527 cf, Atten= 37%, Lag= 3.9 min
 Primary = 5.13 cfs @ 12.15 hrs, Volume= 23,527 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 599.44' @ 12.15 hrs Surf.Area= 2,754 sf Storage= 7,702 cf

Plug-Flow detention time= 144.0 min calculated for 23,511 cf (90% of inflow)
 Center-of-Mass det. time= 92.4 min (855.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.10 cfs @ 12.15 hrs HW=599.43' (Free Discharge)

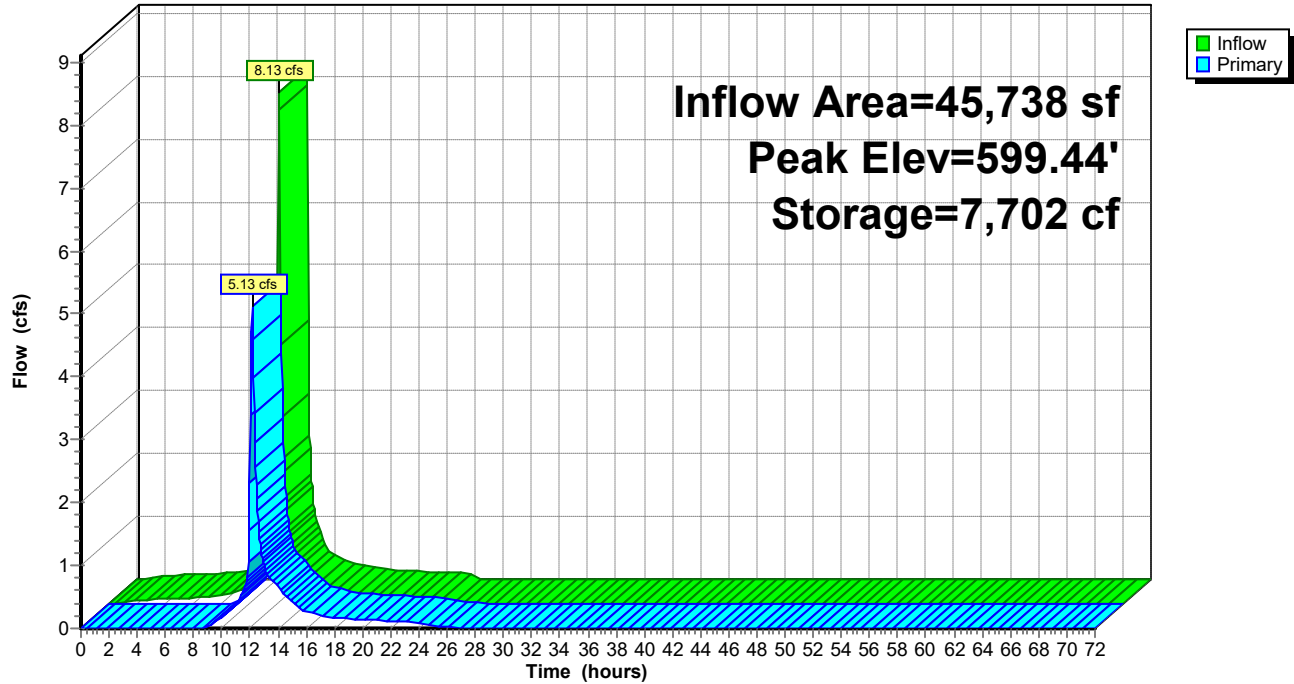
↑ **1=Culvert** (Passes 5.10 cfs of 21.57 cfs potential flow)

↑ **2=Orifice/Grate** (Orifice Controls 1.23 cfs @ 6.25 fps)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 3.16 fps)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 6.73" for 100-Year event
 Inflow = 23.34 cfs @ 12.09 hrs, Volume= 83,759 cf
 Outflow = 14.71 cfs @ 12.16 hrs, Volume= 78,110 cf, Atten= 37%, Lag= 4.6 min
 Primary = 14.71 cfs @ 12.16 hrs, Volume= 78,110 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 579.24' @ 12.16 hrs Surf.Area= 7,048 sf Storage= 20,078 cf

Plug-Flow detention time= 119.1 min calculated for 78,110 cf (93% of inflow)
 Center-of-Mass det. time= 78.6 min (866.2 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=14.48 cfs @ 12.16 hrs HW=579.23' (Free Discharge)

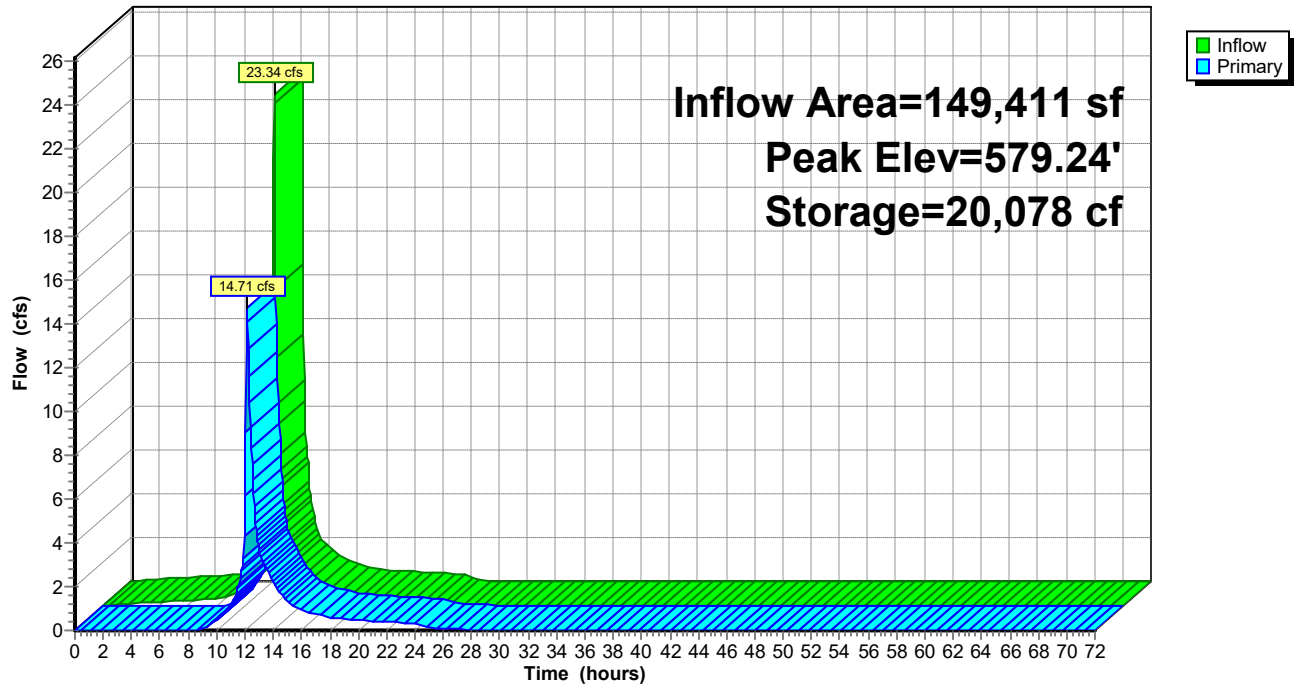
1=Culvert (Passes 14.48 cfs of 21.96 cfs potential flow)

2=Orifice/Grate (Orifice Controls 4.97 cfs @ 6.33 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 9.51 cfs @ 3.31 fps)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 6.18" for 100-Year event
 Inflow = 37.54 cfs @ 12.12 hrs, Volume= 173,838 cf
 Outflow = 17.90 cfs @ 12.40 hrs, Volume= 170,005 cf, Atten= 52%, Lag= 17.1 min
 Primary = 17.90 cfs @ 12.40 hrs, Volume= 170,005 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 565.75' @ 12.40 hrs Surf.Area= 17,190 sf Storage= 48,108 cf

Plug-Flow detention time= 109.5 min calculated for 169,887 cf (98% of inflow)
 Center-of-Mass det. time= 93.0 min (931.7 - 838.7)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=17.89 cfs @ 12.40 hrs HW=565.75' (Free Discharge)

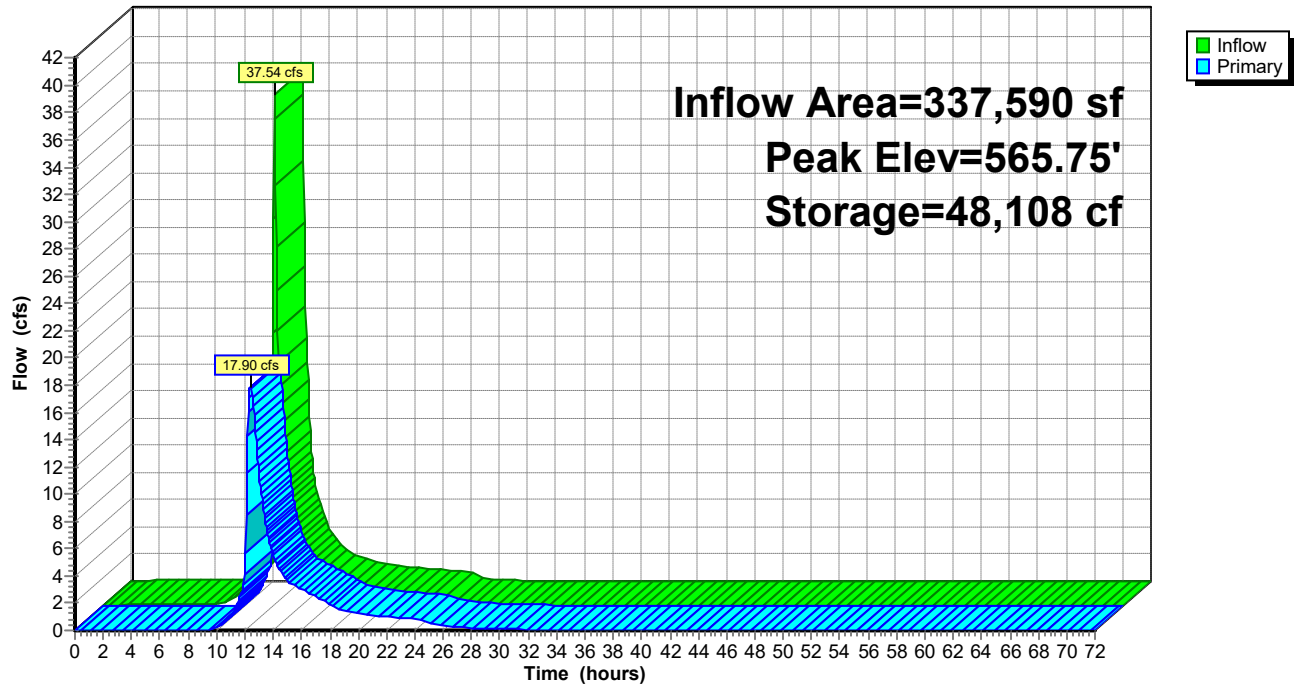
1=Culvert (Passes 17.89 cfs of 66.75 cfs potential flow)

2=Orifice/Grate (Orifice Controls 5.31 cfs @ 7.65 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 12.58 cfs @ 3.93 fps)

Pond R: BMP-R Bioretention Basin

Hydrograph



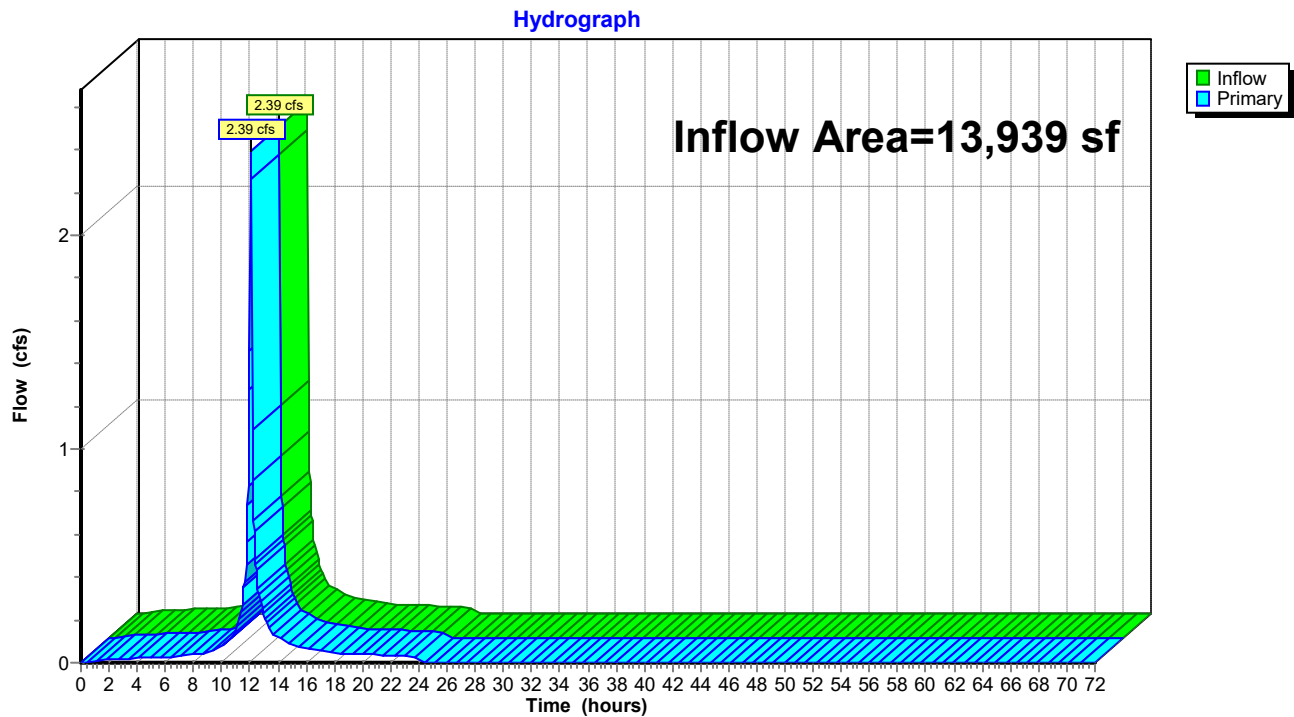
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 6.53" for 100-Year event
Inflow = 2.39 cfs @ 12.08 hrs, Volume= 7,580 cf
Primary = 2.39 cfs @ 12.08 hrs, Volume= 7,580 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

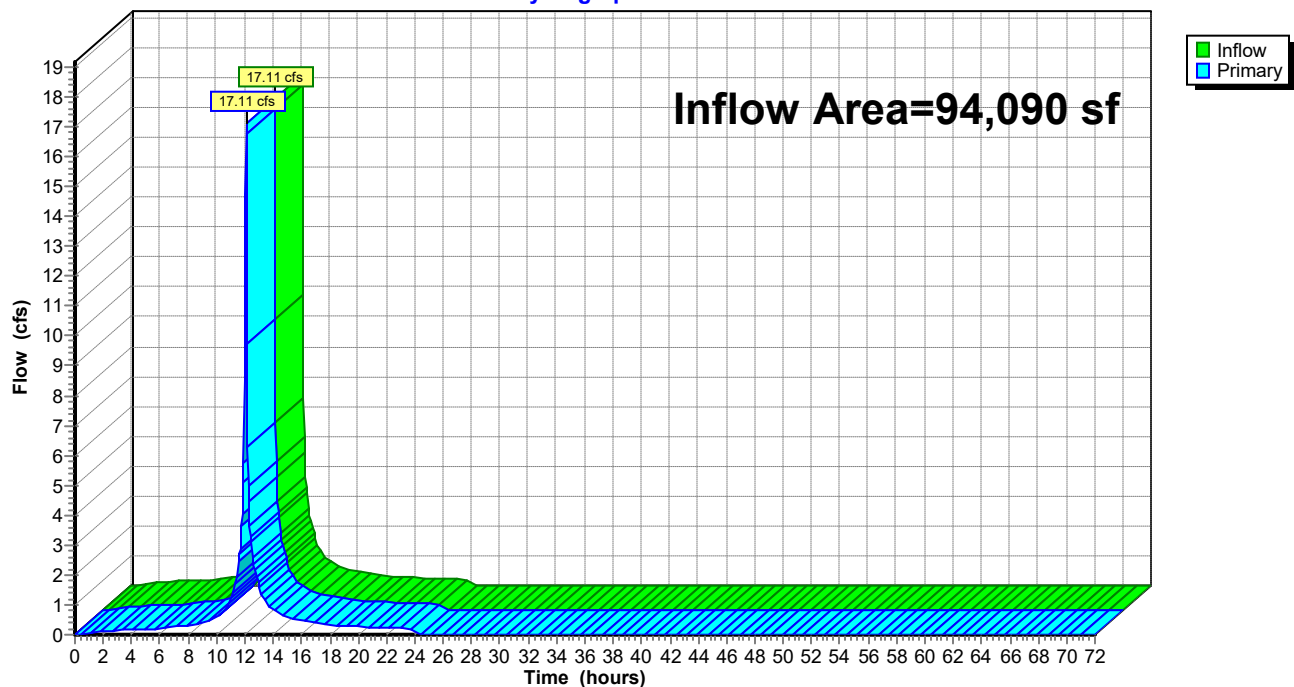
Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 7.05" for 100-Year event
Inflow = 17.11 cfs @ 12.09 hrs, Volume= 55,297 cf
Primary = 17.11 cfs @ 12.09 hrs, Volume= 55,297 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M

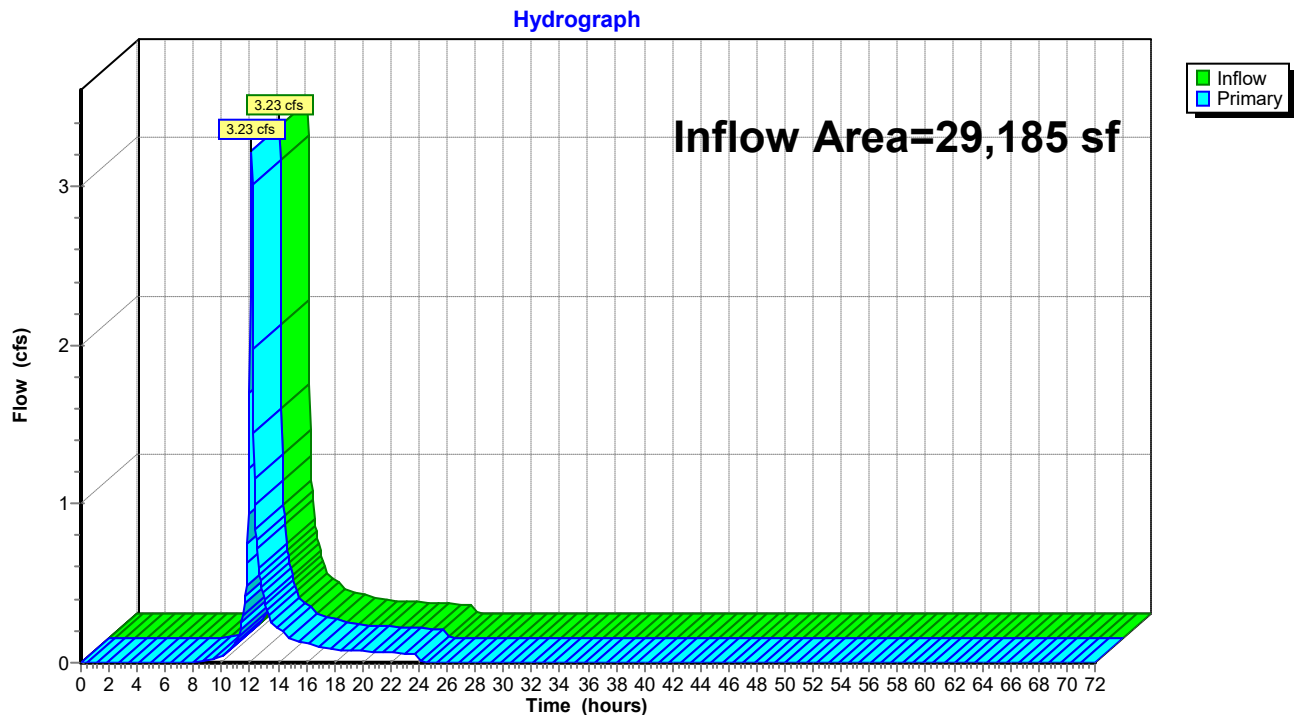
Hydrograph



Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 4.26" for 100-Year event
Inflow = 3.23 cfs @ 12.12 hrs, Volume= 10,369 cf
Primary = 3.23 cfs @ 12.12 hrs, Volume= 10,369 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

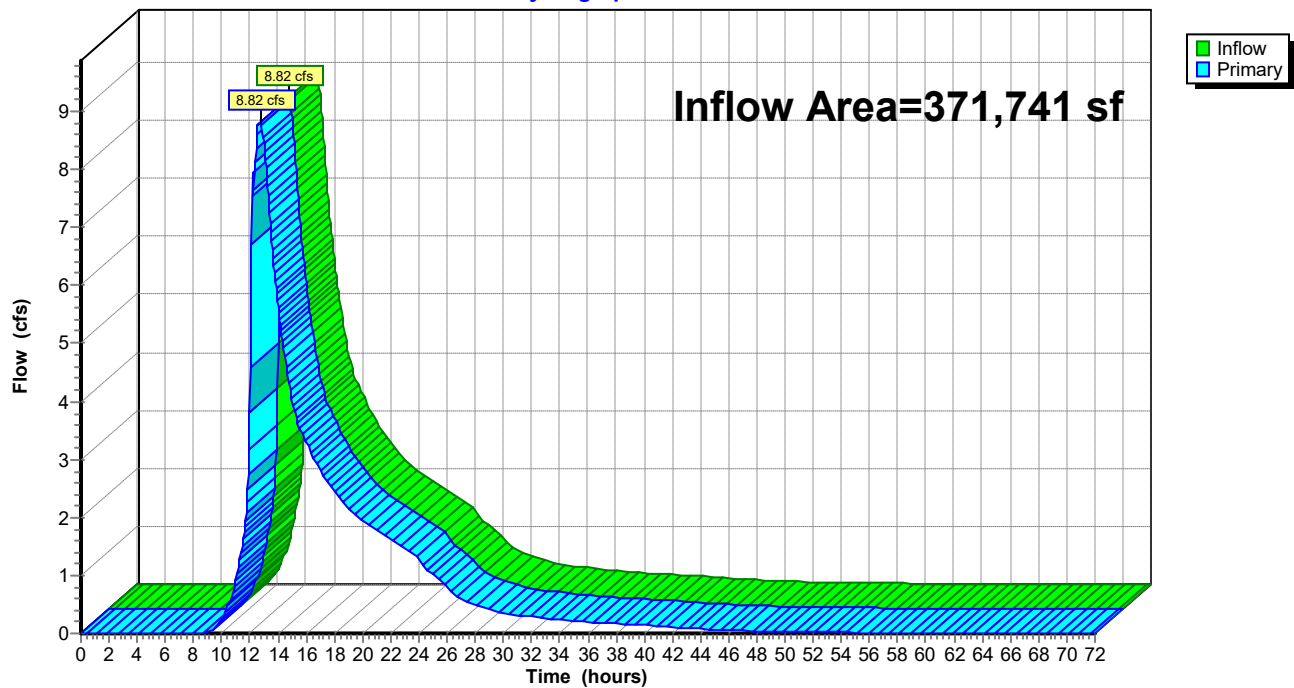
Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 5.77" for 100-Year event
Inflow = 8.82 cfs @ 12.72 hrs, Volume= 178,602 cf
Primary = 8.82 cfs @ 12.72 hrs, Volume= 178,602 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

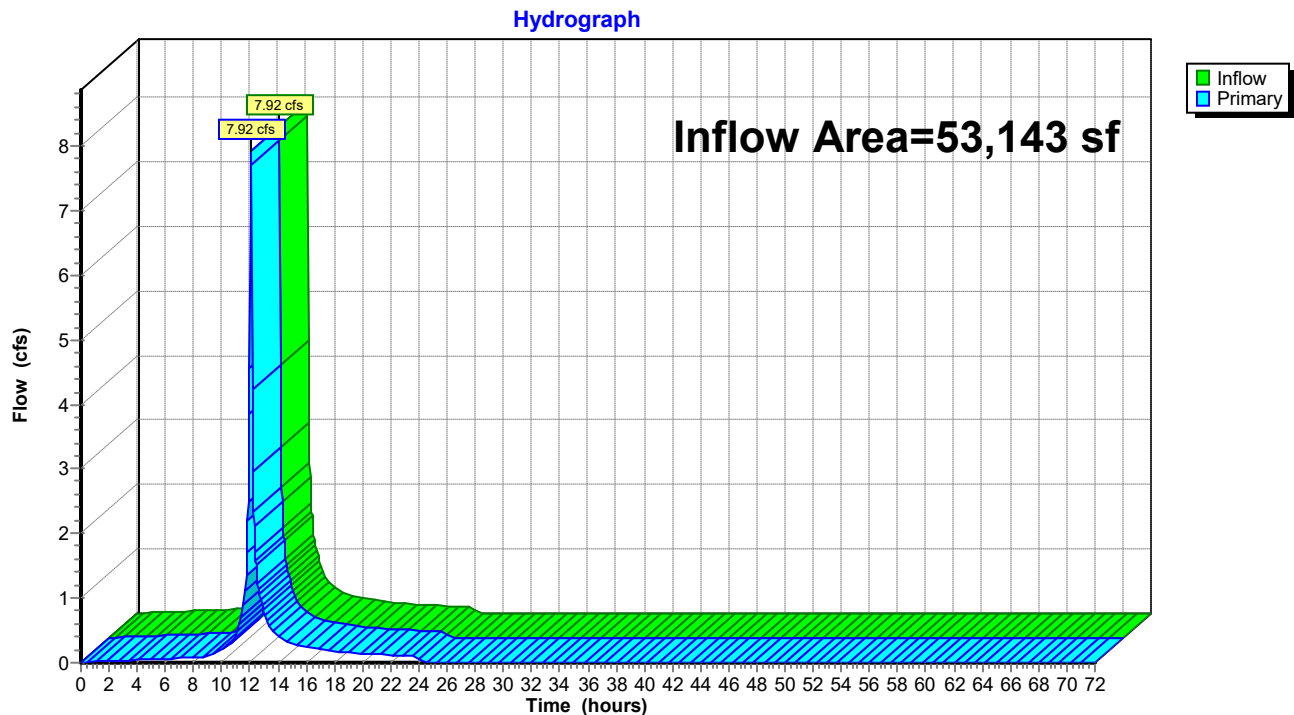
Hydrograph



Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 5.42" for 100-Year event
Inflow = 7.92 cfs @ 12.08 hrs, Volume= 24,016 cf
Primary = 7.92 cfs @ 12.08 hrs, Volume= 24,016 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

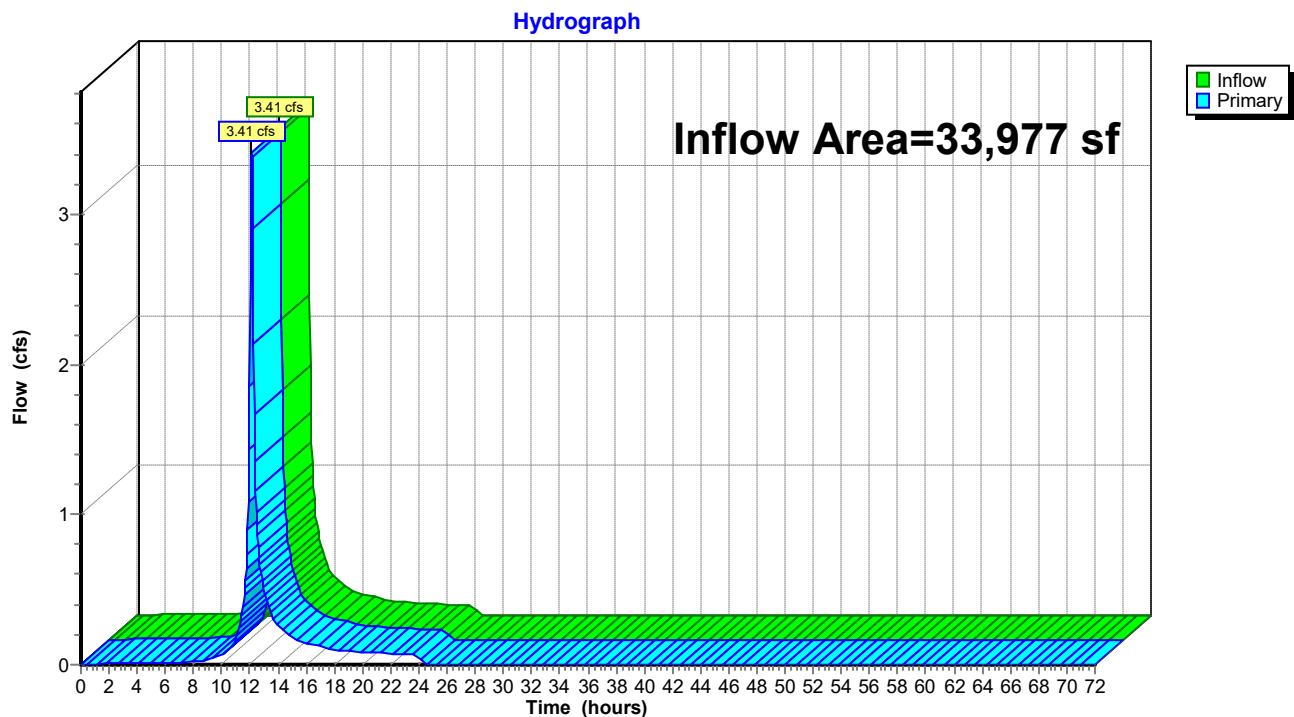
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 4.59" for 100-Year event
Inflow = 3.41 cfs @ 12.14 hrs, Volume= 13,000 cf
Primary = 3.41 cfs @ 12.14 hrs, Volume= 13,000 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

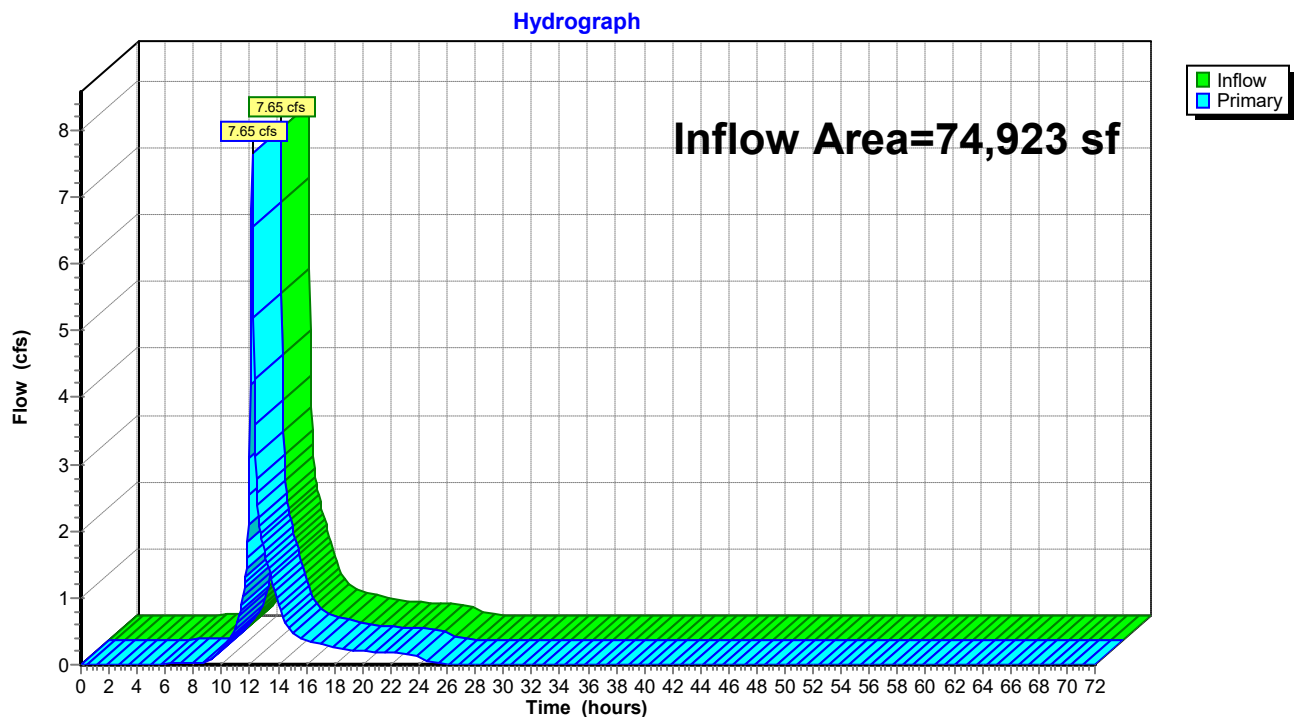
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 5.43" for 100-Year event
Inflow = 7.65 cfs @ 12.15 hrs, Volume= 33,931 cf
Primary = 7.65 cfs @ 12.15 hrs, Volume= 33,931 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

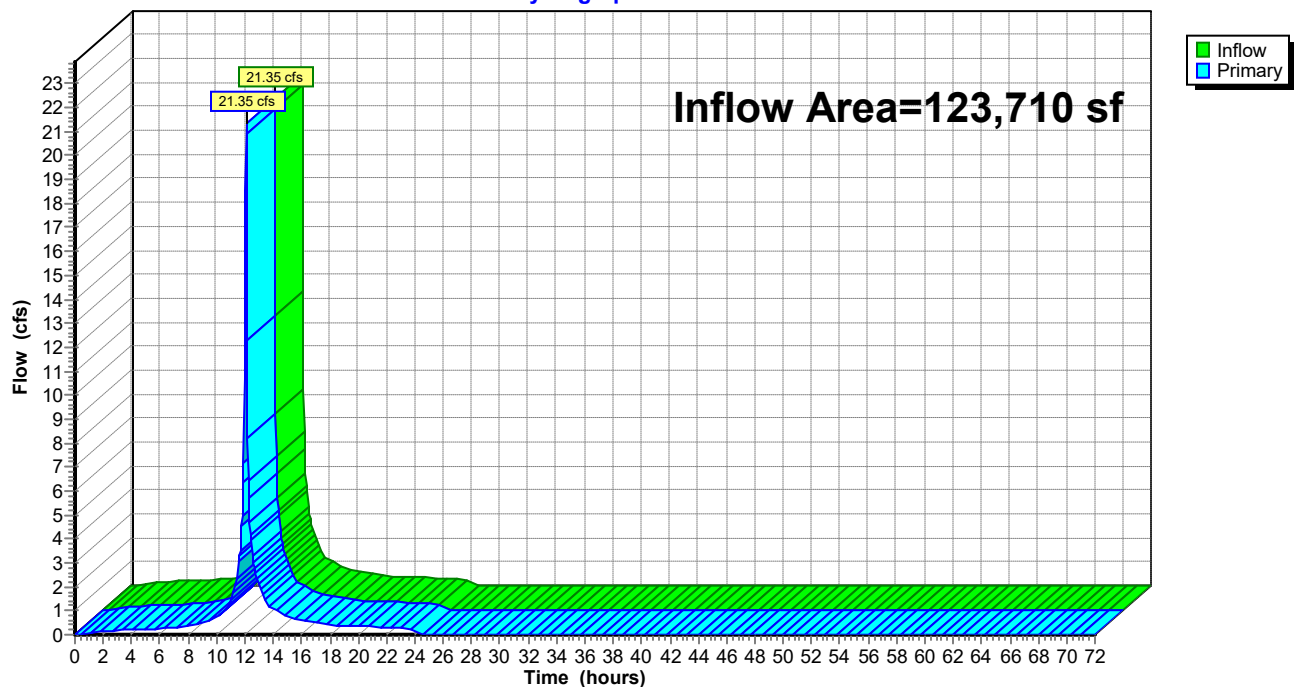
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 6.72" for 100-Year event
Inflow = 21.35 cfs @ 12.09 hrs, Volume= 69,255 cf
Primary = 21.35 cfs @ 12.09 hrs, Volume= 69,255 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

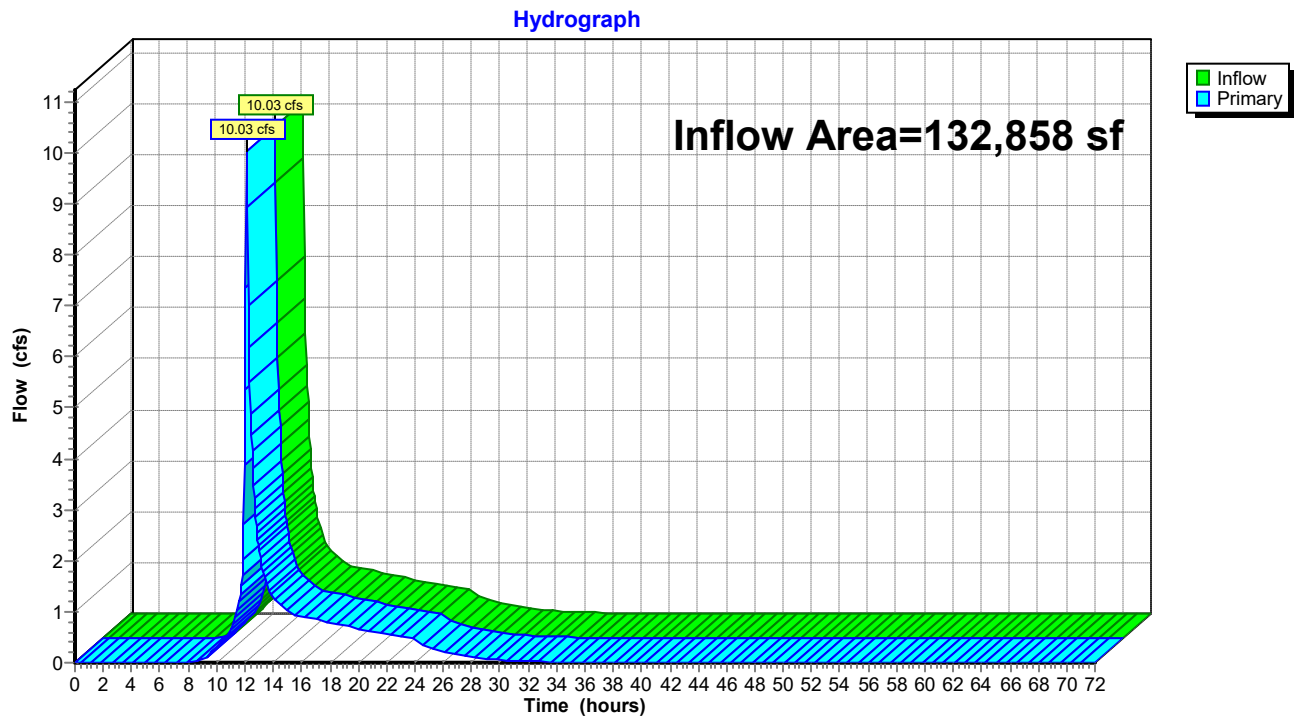
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL**Hydrograph**

Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth = 5.65" for 100-Year event
Inflow = 10.03 cfs @ 12.13 hrs, Volume= 62,584 cf
Primary = 10.03 cfs @ 12.13 hrs, Volume= 62,584 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

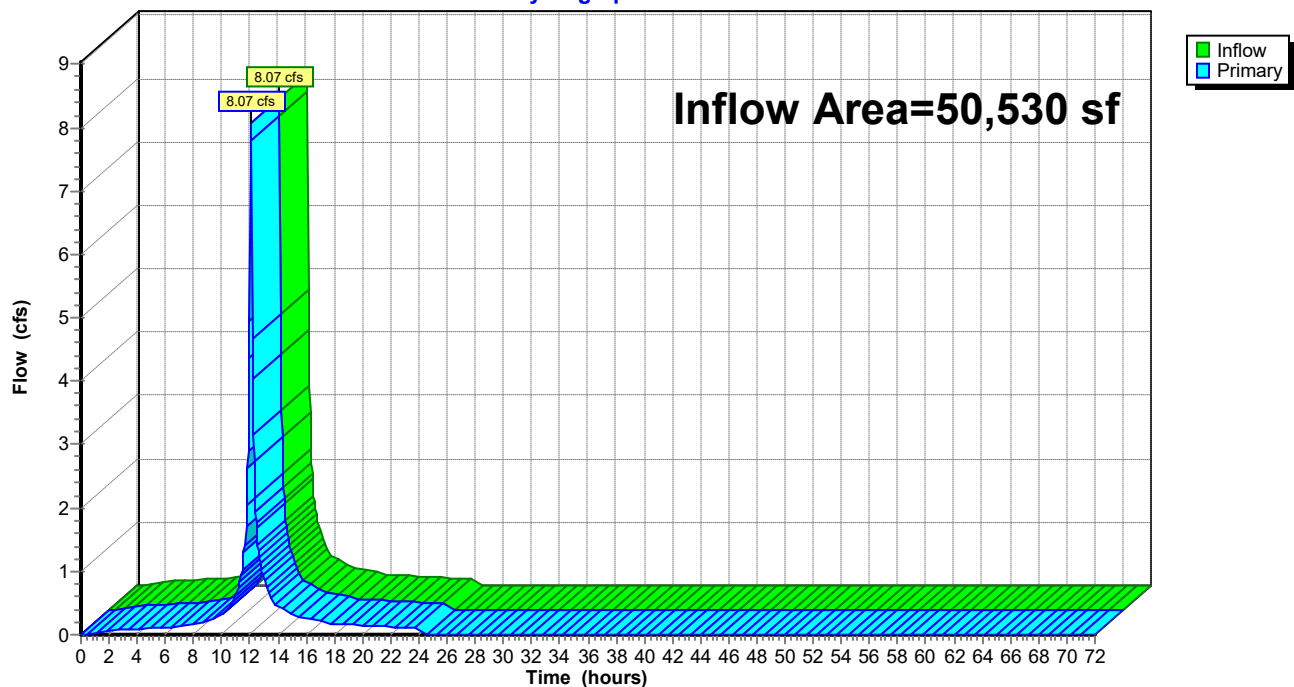
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 6.93" for 100-Year event
Inflow = 8.07 cfs @ 12.08 hrs, Volume= 29,175 cf
Primary = 8.07 cfs @ 12.08 hrs, Volume= 29,175 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

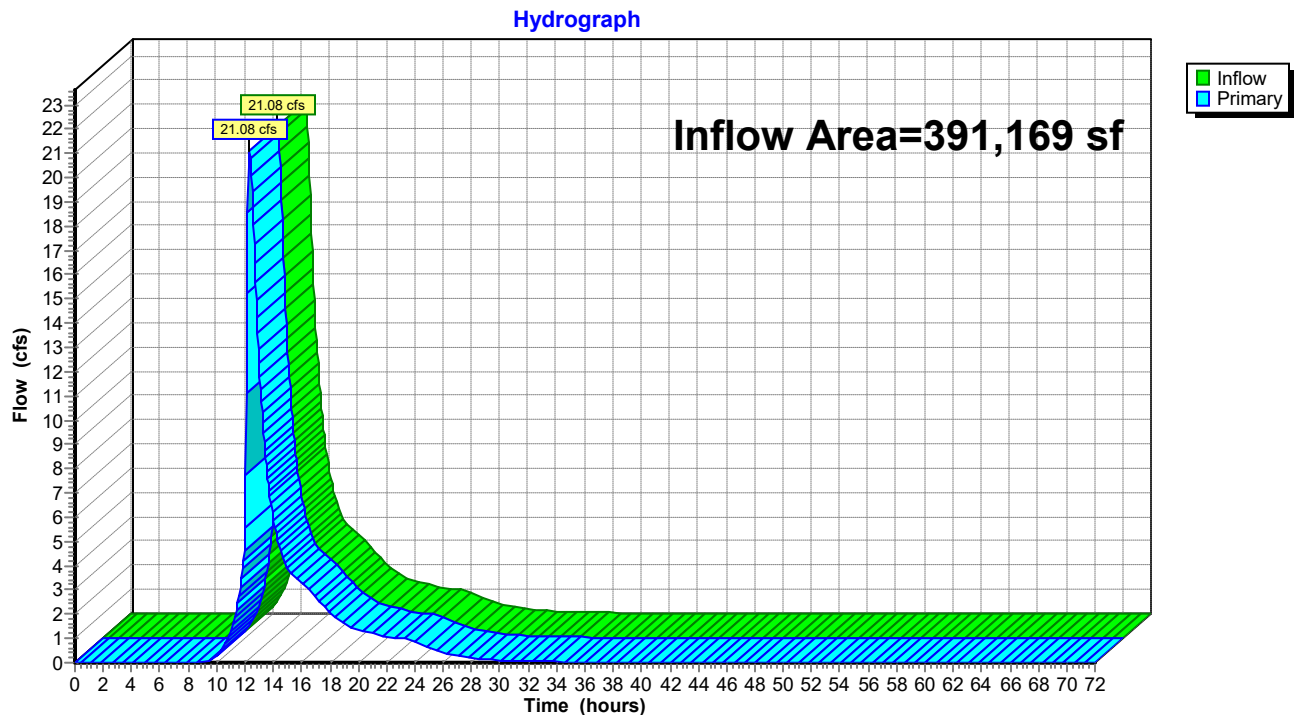
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1**Hydrograph**

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth = 5.78" for 100-Year event
Inflow = 21.08 cfs @ 12.32 hrs, Volume= 188,413 cf
Primary = 21.08 cfs @ 12.32 hrs, Volume= 188,413 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

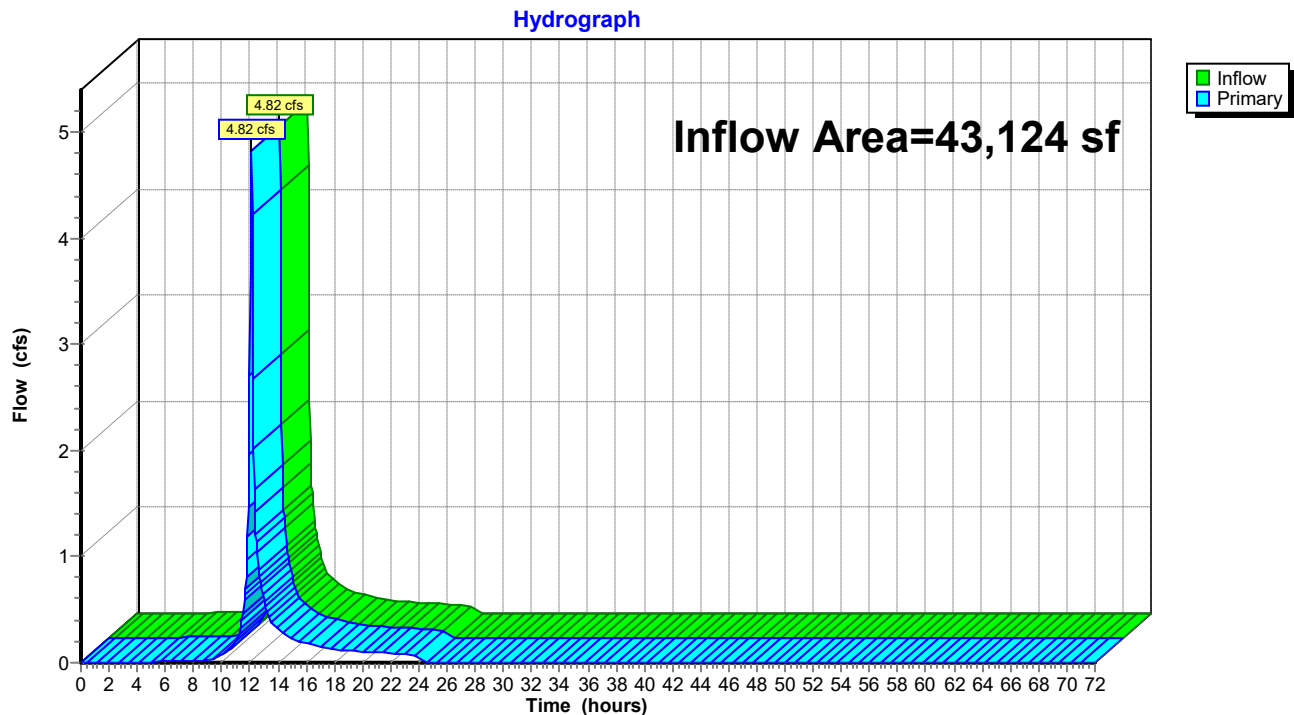
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 4.32" for 100-Year event
Inflow = 4.82 cfs @ 12.11 hrs, Volume= 15,529 cf
Primary = 4.82 cfs @ 12.11 hrs, Volume= 15,529 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

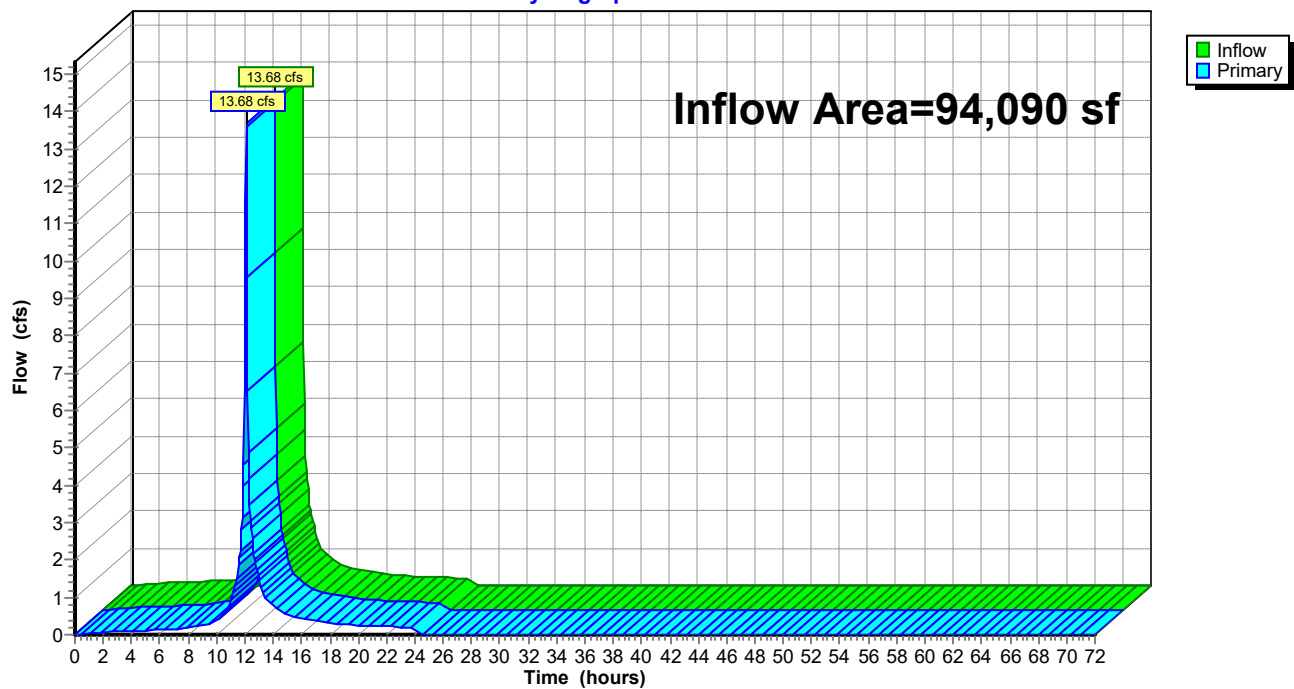
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 5.84" for 100-Year event
Inflow = 13.68 cfs @ 12.09 hrs, Volume= 45,800 cf
Primary = 13.68 cfs @ 12.09 hrs, Volume= 45,800 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL**Hydrograph**

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

Subcatchment 1A IMP: P-DA-1A IMP	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=299' Tc=0.9 min CN=98 Runoff=3.61 cfs 12,185 cf
Subcatchment 1A PER: P-DA-1A PER	Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=212' Tc=4.2 min CN=61 Runoff=4.04 cfs 12,148 cf
Subcatchment 16S: P-DA-1H IMP	Runoff Area=0.540 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=352' Tc=1.7 min CN=WQ Runoff=6.91 cfs 23,500 cf
Subcatchment 17S: P-DA-1H PER	Runoff Area=0.480 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=357' Tc=3.2 min CN=61 Runoff=4.20 cfs 12,048 cf
Subcatchment 18S: P-DA-2 PERVIOUS	Runoff Area=0.520 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=32' Tc=5.3 min CN=61 Runoff=4.13 cfs 13,052 cf
Subcatchment 20S: P-DA-1F IMP	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=239' Tc=1.3 min CN=WQ Runoff=2.19 cfs 7,398 cf
Subcatchment 21S: P-DA-1F PER	Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=114' Tc=2.4 min CN=61 Runoff=1.36 cfs 3,765 cf
Subcatchment 22S: P-DA-1G IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=223' Tc=1.5 min CN=WQ Runoff=4.50 cfs 15,231 cf
Subcatchment 23S: P-DA-1G PER	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=62' Tc=1.8 min CN=61 Runoff=4.03 cfs 11,044 cf
Subcatchment 31S: P-DA-1-BYPASS IMP	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=414' Tc=1.0 min CN=98 Runoff=0.26 cfs 870 cf
Subcatchment 32S: P-DA-1-BYPASS PER	Runoff Area=0.650 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=356' Tc=4.9 min CN=61 Runoff=5.26 cfs 16,315 cf
Subcatchment 35S: P-DA-1C IMP	Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=524' Tc=1.6 min CN=WQ Runoff=4.49 cfs 15,231 cf
Subcatchment 36S: P-DA-1C PER	Runoff Area=0.870 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=546' Tc=2.7 min CN=61 Runoff=7.78 cfs 21,837 cf
Subcatchment 37S: P-DA-3I IMP	Runoff Area=0.560 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=295' Tc=1.9 min CN=WQ Runoff=7.32 cfs 24,370 cf
Subcatchment 38S: P-DA-3I PER	Runoff Area=0.380 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=242' Tc=1.4 min CN=61 Runoff=3.40 cfs 9,538 cf
Subcatchment 39S: P-DA-4J IMP	Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=376' Tc=2.5 min CN=WQ Runoff=6.85 cfs 23,065 cf

Subcatchment 40S: P-DA-1C ROOF	Runoff Area=0.680 ac 100.00% Impervious Tc=5.0 min CN=98	Runoff Depth=11.99" Runoff=7.96 cfs 29,592 cf
Subcatchment 41S: P-DA-3-BYPASS IMP	Runoff Area=0.080 ac 100.00% Impervious Flow Length=178' Tc=1.2 min CN=WQ	Runoff Depth=11.99" Runoff=1.03 cfs 3,481 cf
Subcatchment 42S: P-DA-1F ROOF	Runoff Area=0.230 ac 100.00% Impervious Flow Length=96' Slope=0.0100 '/' Tc=1.3 min CN=98	Runoff Depth=11.99" Runoff=2.97 cfs 10,009 cf
Subcatchment 43S: P-DA-3-BYPASS PER	Runoff Area=0.700 ac 0.00% Impervious Flow Length=138' Slope=0.0300 '/' Tc=7.2 min CN=61	Runoff Depth=6.91" Runoff=5.33 cfs 17,570 cf
Subcatchment 44S: P-DA-1B IMP	Runoff Area=1.630 ac 100.00% Impervious Flow Length=805' Tc=2.1 min CN=WQ	Runoff Depth=11.99" Runoff=21.26 cfs 70,935 cf
Subcatchment 45S: P-DA-1B PER	Runoff Area=1.210 ac 0.00% Impervious Flow Length=509' Tc=3.6 min CN=61	Runoff Depth=6.91" Runoff=10.40 cfs 30,371 cf
Subcatchment 46S: P-DA-4J PER	Runoff Area=0.320 ac 0.00% Impervious Flow Length=236' Tc=4.2 min CN=61	Runoff Depth=6.91" Runoff=2.67 cfs 8,032 cf
Subcatchment 47S: P-DA-4K IMP	Runoff Area=0.720 ac 100.00% Impervious Flow Length=283' Tc=1.7 min CN=WQ	Runoff Depth=11.99" Runoff=9.21 cfs 31,333 cf
Subcatchment 48S: P-DA-4K PER	Runoff Area=0.440 ac 0.00% Impervious Flow Length=412' Tc=8.8 min CN=61	Runoff Depth=6.91" Runoff=3.15 cfs 11,044 cf
Subcatchment 49S: P-DA-5N IMP	Runoff Area=0.630 ac 100.00% Impervious Flow Length=303' Tc=1.8 min CN=WQ	Runoff Depth=11.99" Runoff=8.25 cfs 27,416 cf
Subcatchment 50S: P-DA-5N PER	Runoff Area=0.420 ac 0.00% Impervious Flow Length=262' Tc=3.0 min CN=61	Runoff Depth=6.91" Runoff=3.71 cfs 10,542 cf
Subcatchment 51S: P-DA-5M IMP	Runoff Area=1.400 ac 100.00% Impervious Flow Length=1,152' Tc=2.5 min CN=WQ	Runoff Depth=11.99" Runoff=18.10 cfs 60,925 cf
Subcatchment 52S: P-DA-5M PER	Runoff Area=0.760 ac 0.00% Impervious Flow Length=889' Tc=2.8 min CN=61	Runoff Depth=6.91" Runoff=6.77 cfs 19,076 cf
Subcatchment 53S: P-DA-4K-ROOF	Runoff Area=0.050 ac 100.00% Impervious Flow Length=369' Tc=2.4 min CN=98	Runoff Depth=11.99" Runoff=0.65 cfs 2,176 cf
Subcatchment 54S: P-DA-5-BYPASS	Runoff Area=1.230 ac 0.00% Impervious Flow Length=239' Tc=13.2 min CN=WQ	Runoff Depth=6.91" Runoff=7.64 cfs 30,839 cf
Subcatchment 55S: P-DA-4 BYPASS IMP	Runoff Area=0.060 ac 100.00% Impervious Flow Length=105' Tc=0.5 min CN=WQ	Runoff Depth=11.99" Runoff=0.77 cfs 2,611 cf
Subcatchment 56S: P-DA-5P IMP	Runoff Area=1.500 ac 100.00% Impervious Flow Length=467' Tc=2.3 min CN=WQ	Runoff Depth=11.99" Runoff=19.48 cfs 65,277 cf

081228-SWM

NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

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Subcatchment 57S: P-DA-5P PER	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=532' Tc=1.6 min CN=61 Runoff=8.05 cfs 22,088 cf
Subcatchment 58S: P-DA-4 BYPASS PER	Runoff Area=0.930 ac 0.00% Impervious Runoff Depth=6.80" Flow Length=194' Tc=4.5 min CN=WQ Runoff=7.55 cfs 22,969 cf
Subcatchment 63S: P-DA-5R IMP	Runoff Area=0.820 ac 100.00% Impervious Runoff Depth=11.99" Flow Length=634' Tc=1.9 min CN=WQ Runoff=10.73 cfs 35,685 cf
Subcatchment 64S: P-DA-5R PER	Runoff Area=1.340 ac 0.00% Impervious Runoff Depth=6.91" Flow Length=655' Tc=4.9 min CN=61 Runoff=10.84 cfs 33,634 cf
Pond A: BMP-A Bioretention Basin	Peak Elev=554.50' Storage=6,914 cf Inflow=7.27 cfs 24,333 cf Outflow=4.89 cfs 23,099 cf
Pond B: BMP-B Bioretention Basin	Peak Elev=578.20' Storage=61,623 cf Inflow=39.66 cfs 153,902 cf Outflow=11.27 cfs 146,592 cf
Pond C: BMP C Bioretention Basin	Peak Elev=563.84' Storage=35,857 cf Inflow=21.07 cfs 90,940 cf Outflow=5.04 cfs 86,693 cf
Pond F: UG INFILTRATION BASIN F	Peak Elev=601.58' Storage=5,100 cf Inflow=6.41 cfs 21,172 cf Outflow=4.94 cfs 19,652 cf
Pond G: BMP-G Bioretention Basin	Peak Elev=611.72' Storage=10,973 cf Inflow=8.38 cfs 26,275 cf Outflow=1.29 cfs 24,279 cf
Pond H: BMP-H Bioretention Basin	Peak Elev=611.42' Storage=9,996 cf Inflow=11.16 cfs 35,548 cf Outflow=4.26 cfs 32,945 cf
Pond I: BMP-I Bioretention Basin	Peak Elev=616.04' Storage=8,126 cf Inflow=10.78 cfs 33,908 cf Outflow=8.18 cfs 31,581 cf
Pond J: BMP-J Bioretention Basin	Peak Elev=611.99' Storage=15,794 cf Inflow=9.45 cfs 31,097 cf Outflow=1.55 cfs 29,087 cf
Pond K: BMP-K UG Infiltration Basin	Peak Elev=597.58' Storage=12,024 cf Inflow=12.74 cfs 73,640 cf Outflow=9.01 cfs 70,541 cf
Pond M: BMP-M Bioretention Basin	Peak Elev=570.59' Storage=16,236 cf Inflow=24.85 cfs 80,001 cf Outflow=17.22 cfs 74,633 cf
Pond N: BMP-N Bioretention Basin	Peak Elev=599.90' Storage=8,988 cf Inflow=11.89 cfs 37,958 cf Outflow=8.01 cfs 35,433 cf
Pond P: BMP-P Bioretention Basin	Peak Elev=579.81' Storage=24,186 cf Inflow=34.69 cfs 122,798 cf Outflow=23.68 cfs 117,148 cf
Pond R: BMP-R Bioretention Basin	Peak Elev=566.71' Storage=65,430 cf Inflow=59.33 cfs 261,100 cf Outflow=30.98 cfs 257,267 cf

081228-SWM

NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

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Link 20L: TOTAL TO GI MTD F-1Inflow=3.45 cfs 11,163 cf
Primary=3.45 cfs 11,163 cf**Link 21L: TOTAL TO P-DA-5M**Inflow=24.85 cfs 80,001 cf
Primary=24.85 cfs 80,001 cf**Link 33L: P-DA-1-BYPASS undetained TOTAL**Inflow=5.46 cfs 17,185 cf
Primary=5.46 cfs 17,185 cf**Link 34L: PROPOSED TOTAL TO POA-1**Inflow=22.45 cfs 273,569 cf
Primary=22.45 cfs 273,569 cf**Link 38L: TOTAL TO GI MTD 1C**Inflow=12.28 cfs 37,068 cf
Primary=12.28 cfs 37,068 cf**Link 44L: P-DA-3-BYPASS undetained TOTAL**Inflow=5.79 cfs 21,051 cf
Primary=5.79 cfs 21,051 cf**Link 45L: PROPOSED TOTAL TO POA-3**Inflow=13.93 cfs 52,632 cf
Primary=13.93 cfs 52,632 cf**Link 46L: P-DA-1B TOTAL**Inflow=31.42 cfs 101,305 cf
Primary=31.42 cfs 101,305 cf**Link 48L: PROPOSED TOTAL TO POA-4**Inflow=16.78 cfs 96,121 cf
Primary=16.78 cfs 96,121 cf**Link 50L: TOTAL TO GI MTD K-1**Inflow=11.68 cfs 42,377 cf
Primary=11.68 cfs 42,377 cf**Link 52L: PROPOSED TOTAL TO POA-5**Inflow=37.41 cfs 288,105 cf
Primary=37.41 cfs 288,105 cf**Link 59L: P-DA-4 BYPASS TOTAL**Inflow=8.12 cfs 25,580 cf
Primary=8.12 cfs 25,580 cf**Link 66L: P-DA-5R TOTAL**Inflow=20.94 cfs 69,319 cf
Primary=20.94 cfs 69,319 cf**Total Runoff Area = 993,342 sf Runoff Volume = 767,202 cf Average Runoff Depth = 9.27"**
53.52% Pervious = 531,606 sf 46.48% Impervious = 461,736 sf

Summary for Subcatchment 1A IMP: P-DA-1A IMP

Runoff = 3.61 cfs @ 12.06 hrs, Volume= 12,185 cf, Depth=11.99"
 Routed to Pond A : BMP-A Bioretention Basin

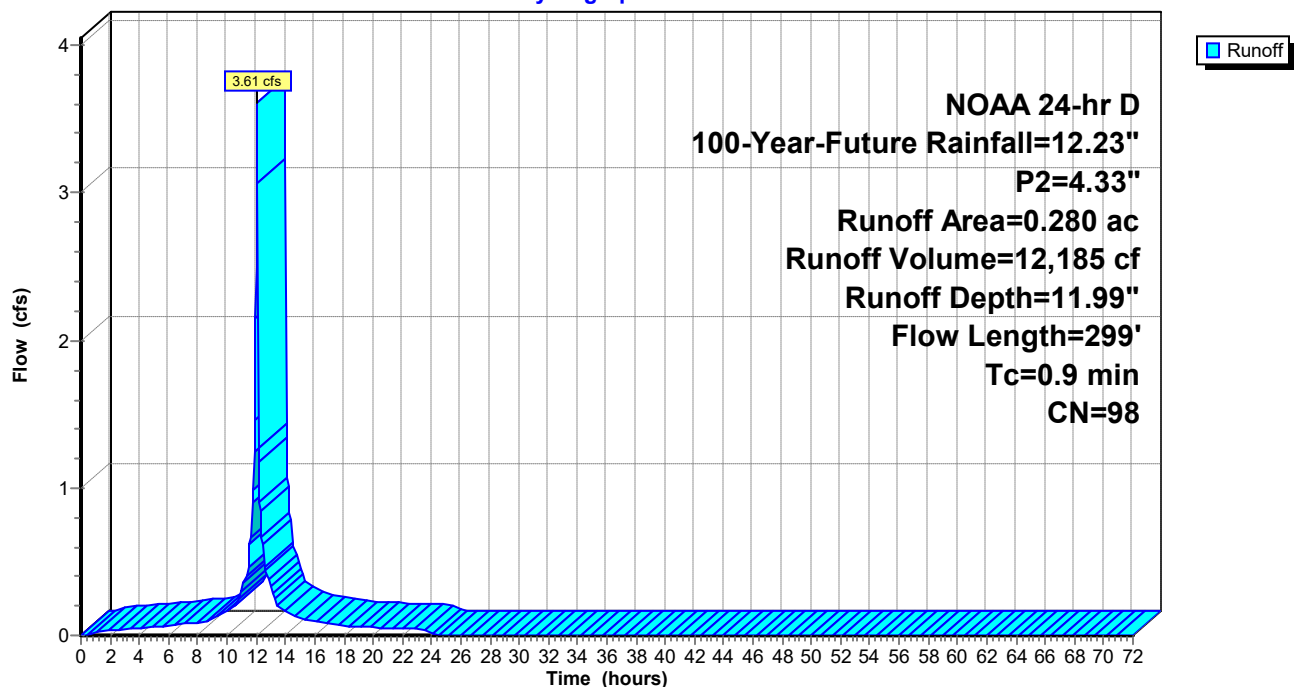
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.280	98	Motor Veh Surface, Paved parking, HSG B
0.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	145	0.1300	7.32		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.9	299	Total			

Subcatchment 1A IMP: P-DA-1A IMP

Hydrograph



Summary for Subcatchment 1A PER: P-DA-1A PER

Runoff = 4.04 cfs @ 12.10 hrs, Volume= 12,148 cf, Depth= 6.91"
 Routed to Pond A : BMP-A Bioretention Basin

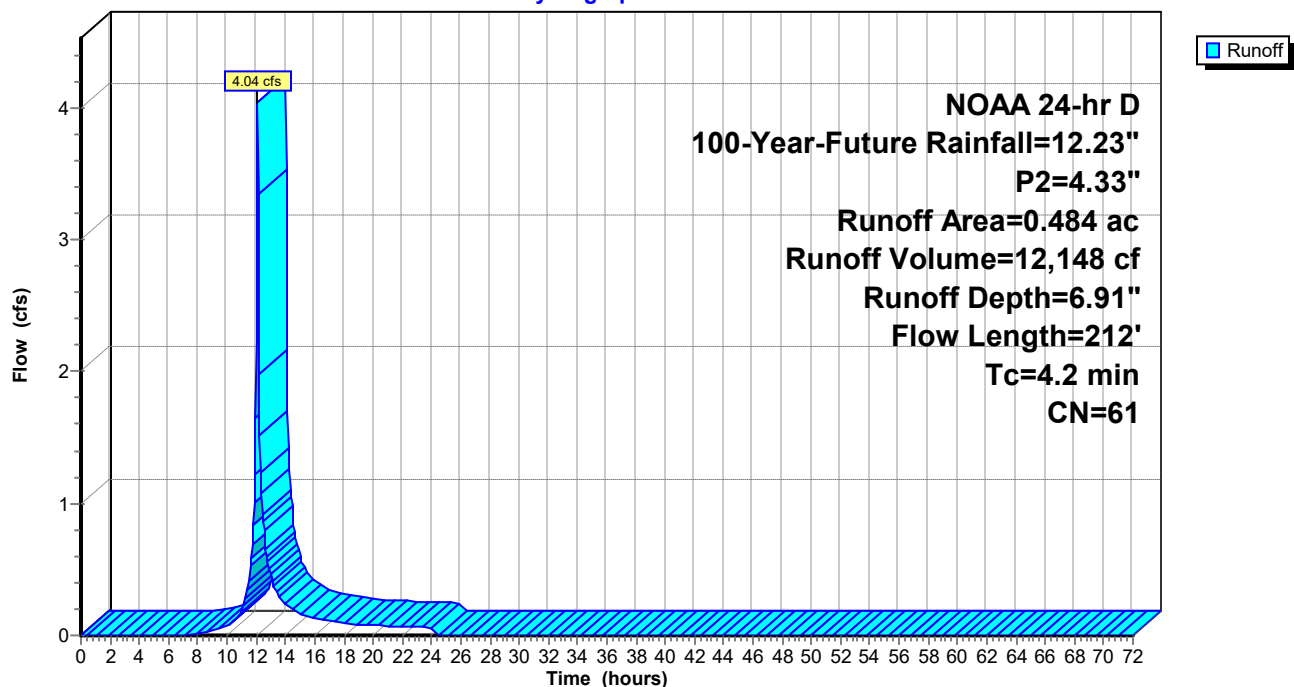
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.484	61	>75% Grass cover, Good, HSG B
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	100	0.1300	0.42		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	58	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.0	54	0.1400	21.34	26.18	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.2	212	Total			

Subcatchment 1A PER: P-DA-1A PER

Hydrograph



Summary for Subcatchment 16S: P-DA-1H IMP

Runoff = 6.91 cfs @ 12.07 hrs, Volume= 23,500 cf, Depth=11.99"
 Routed to Pond H : BMP-H Bioretention Basin

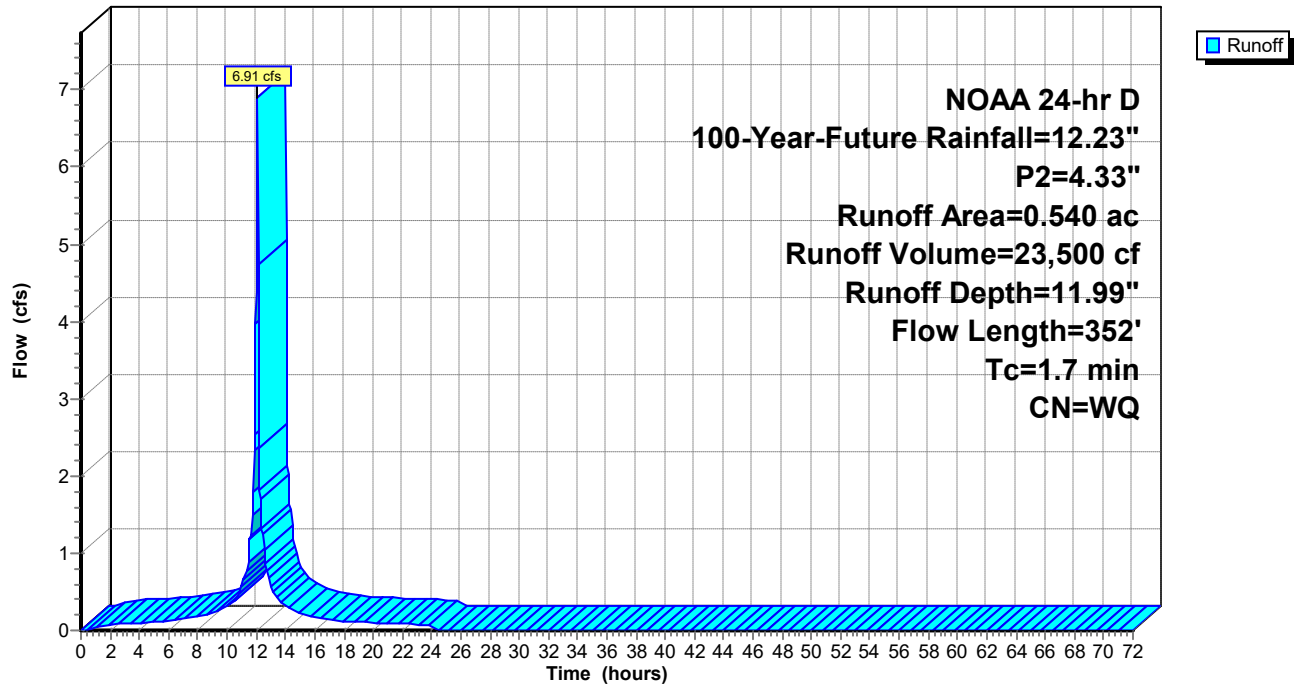
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.160	98	Motor Veh Surface, Paved parking, HSG B
* 0.110	98	Impervious, HSG B
0.540		Weighted Average
0.540		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0310	1.91		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	63	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0207	8.20	10.07	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.7	352	Total			

Subcatchment 16S: P-DA-1H IMP

Hydrograph



Summary for Subcatchment 17S: P-DA-1H PER

Runoff = 4.20 cfs @ 12.09 hrs, Volume= 12,048 cf, Depth= 6.91"
 Routed to Pond H : BMP-H Bioretention Basin

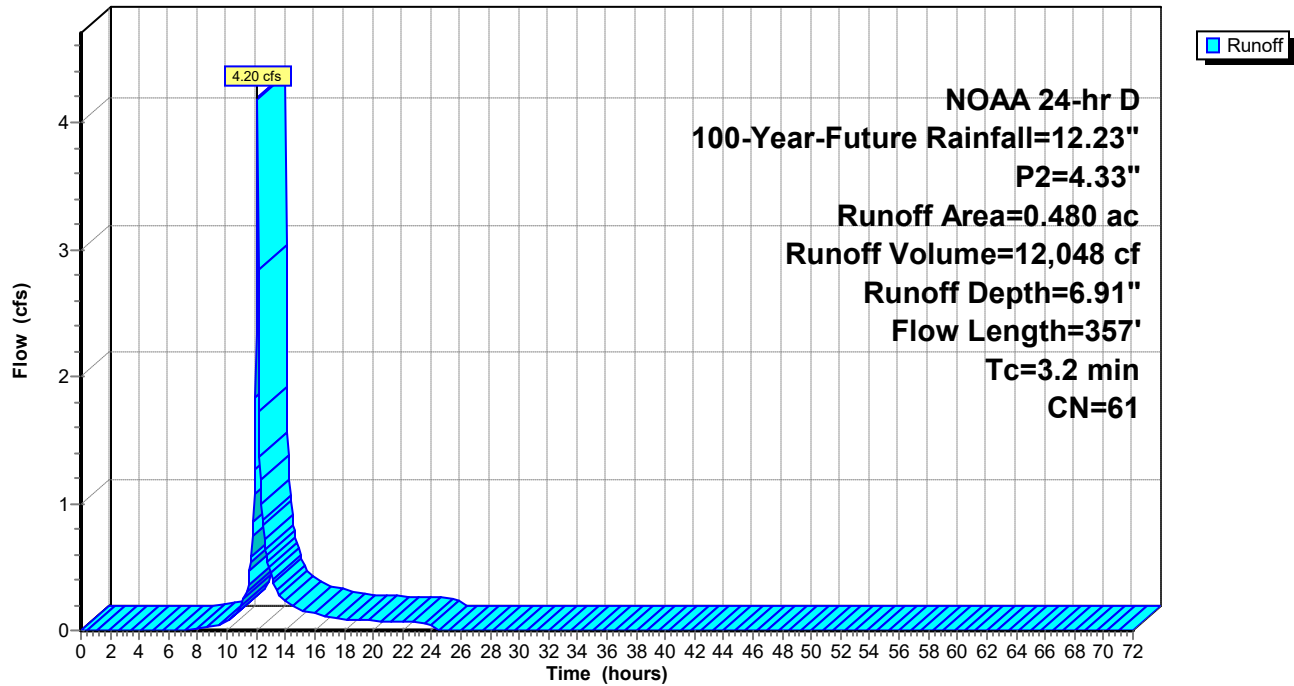
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.480	61	>75% Grass cover, Good, HSG B
0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	18	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.6	150	0.0370	3.90		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	16	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	58	0.0086	5.97	10.55	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	50	0.0087	6.01	10.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	41	0.0066	5.23	9.24	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.2	357	Total			

Subcatchment 17S: P-DA-1H PER

Hydrograph



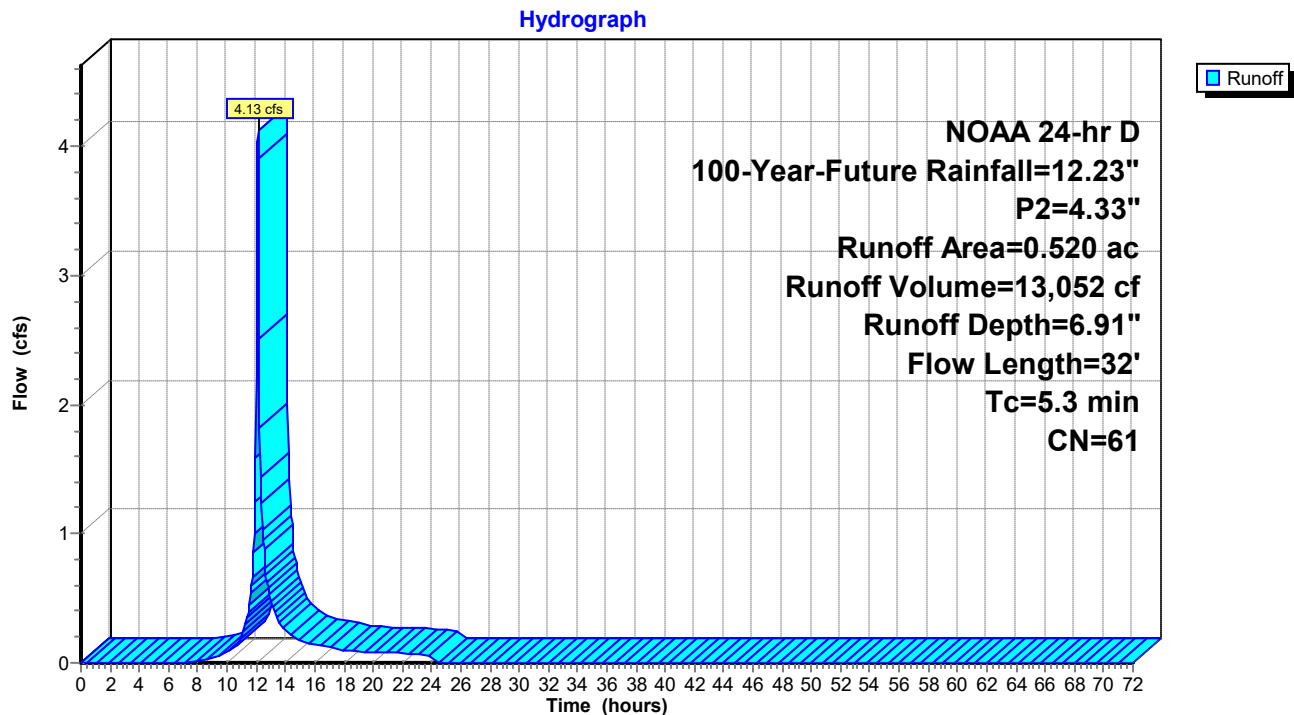
Summary for Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Runoff = 4.13 cfs @ 12.12 hrs, Volume= 13,052 cf, Depth= 6.91"
 Routed to nonexistent node 26L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.520	61	>75% Grass cover, Good, HSG B
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	15	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.4	6	0.3330	0.24		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
1.8	11	0.0830	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.33"
5.3	32	Total			

Subcatchment 18S: P-DA-2 PERVIOUS (PROPOSED TOTAL TO POA-2)

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 2.19 cfs @ 12.07 hrs, Volume= 7,398 cf, Depth=11.99"
 Routed to Link 20L : TOTAL TO GI MTD F-1

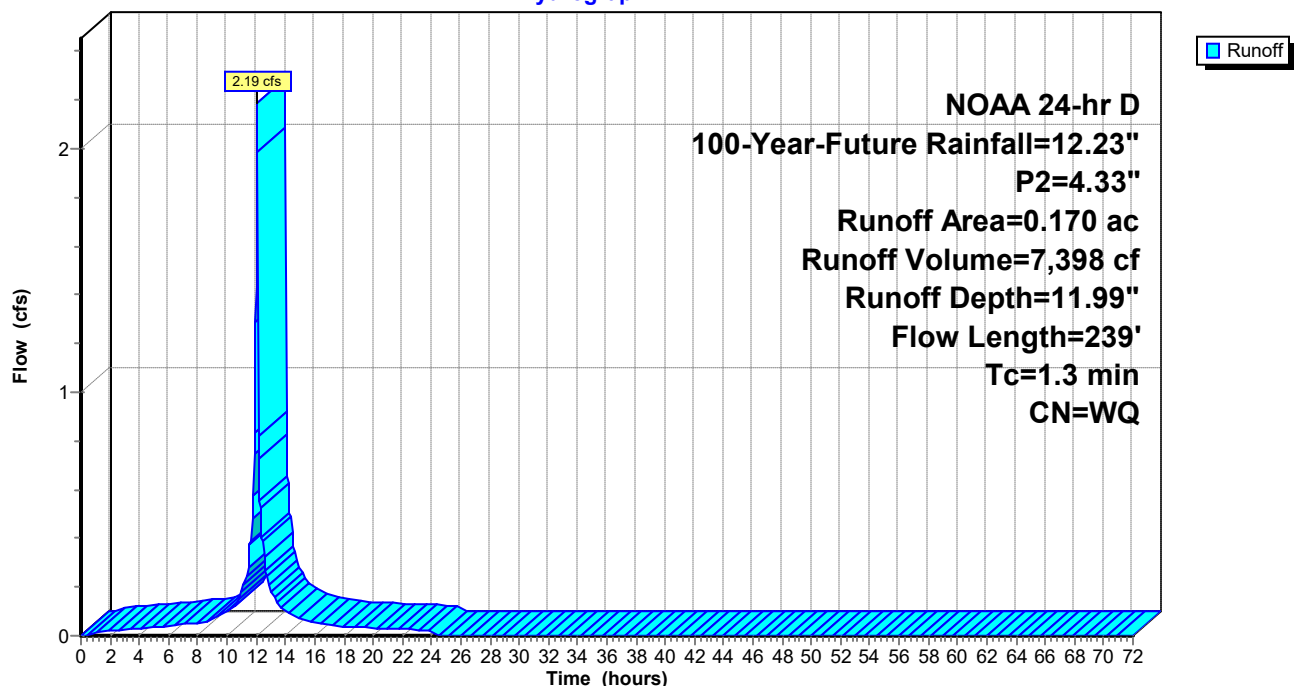
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 1.36 cfs @ 12.09 hrs, Volume= 3,765 cf, Depth= 6.91"
 Routed to Link 20L : TOTAL TO GI MTD F-1

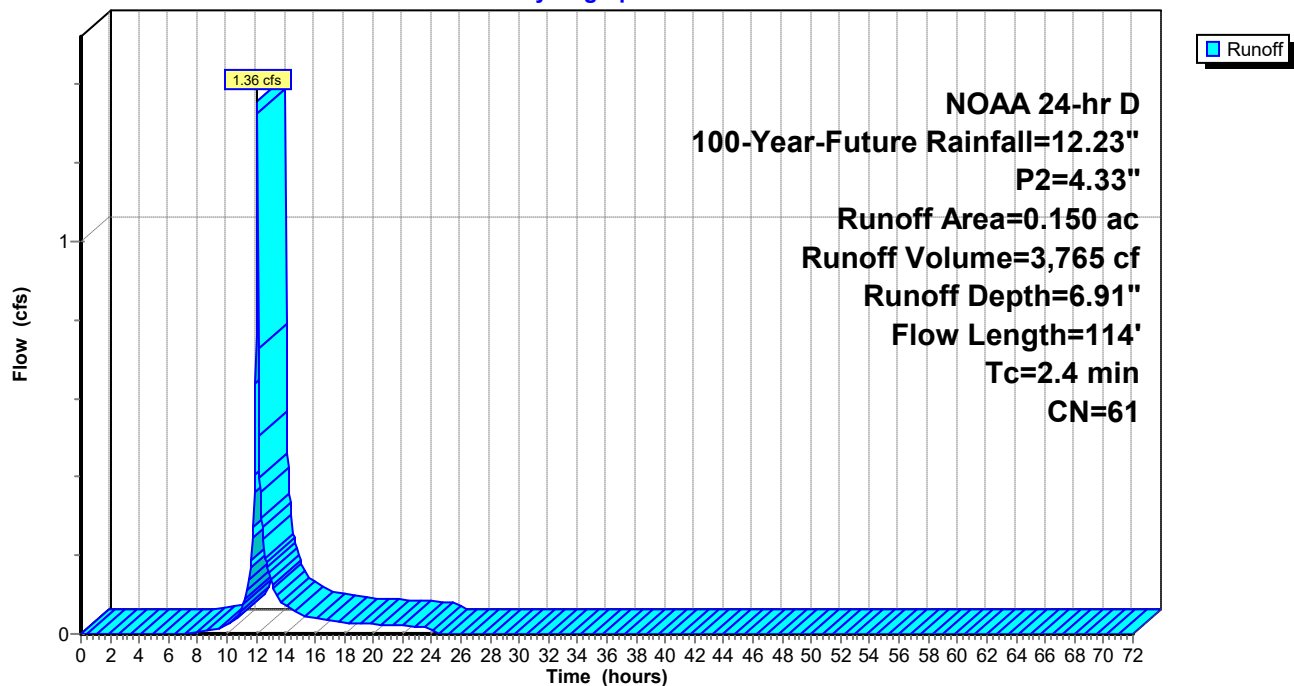
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	17	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.4	114	Total			

Subcatchment 21S: P-DA-1F PER

Hydrograph



Summary for Subcatchment 22S: P-DA-1G IMP

Runoff = 4.50 cfs @ 12.07 hrs, Volume= 15,231 cf, Depth=11.99"
 Routed to Pond G : BMP-G Bioretention Basin

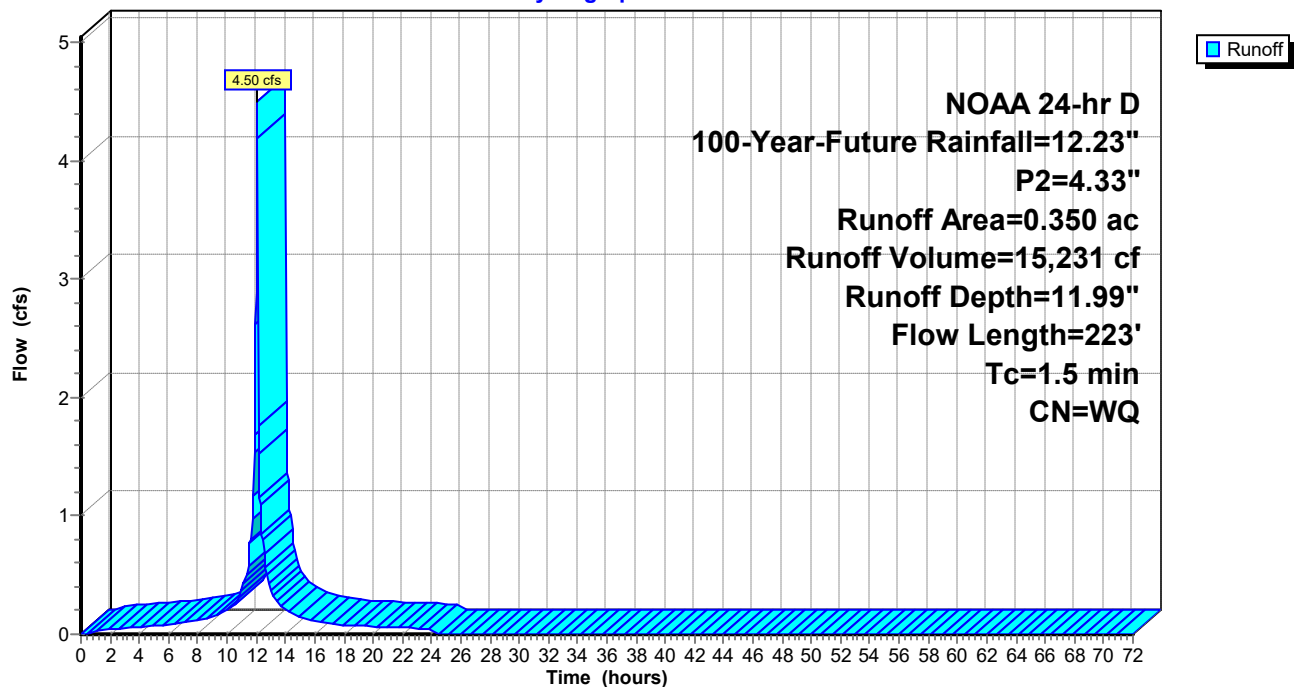
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	113	0.0240	1.76		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	80	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.5	223	Total			

Subcatchment 22S: P-DA-1G IMP

Hydrograph



Summary for Subcatchment 23S: P-DA-1G PER

Runoff = 4.03 cfs @ 12.08 hrs, Volume= 11,044 cf, Depth= 6.91"
 Routed to Pond G : BMP-G Bioretention Basin

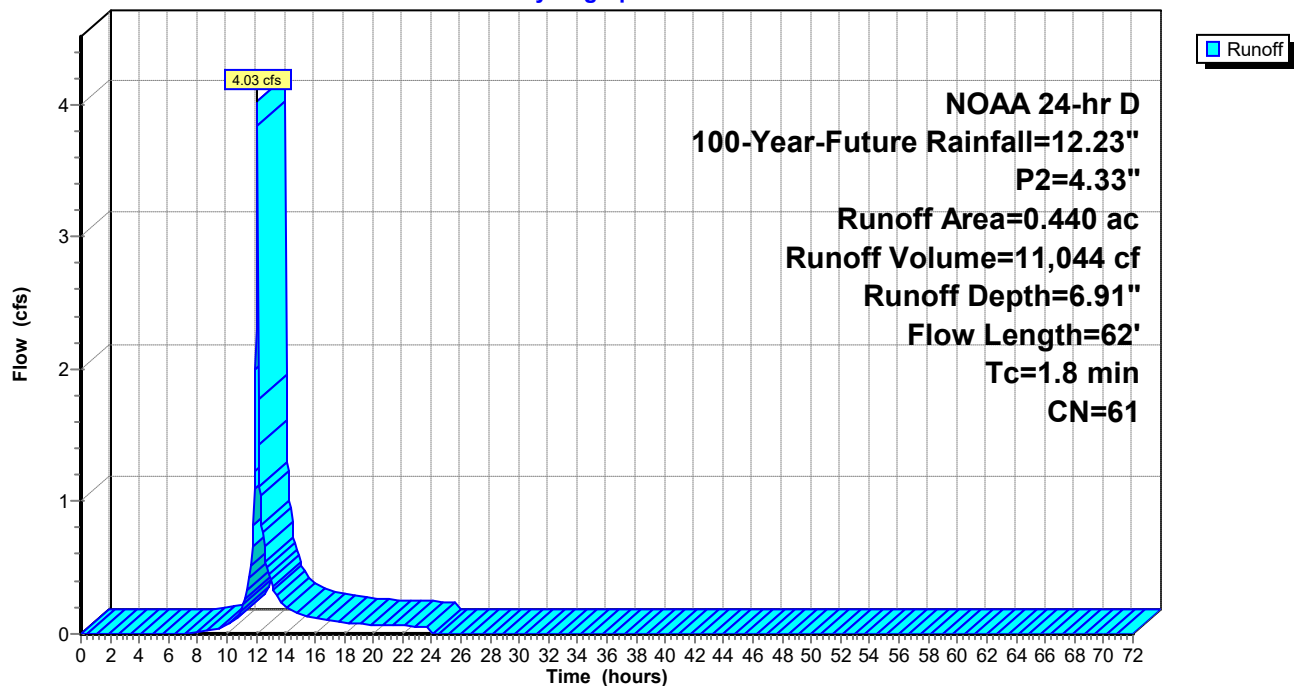
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	19	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0067	4.67	5.73	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.8	62	Total			

Subcatchment 23S: P-DA-1G PER

Hydrograph



Summary for Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Runoff = 0.26 cfs @ 12.06 hrs, Volume= 870 cf, Depth=11.99"

Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

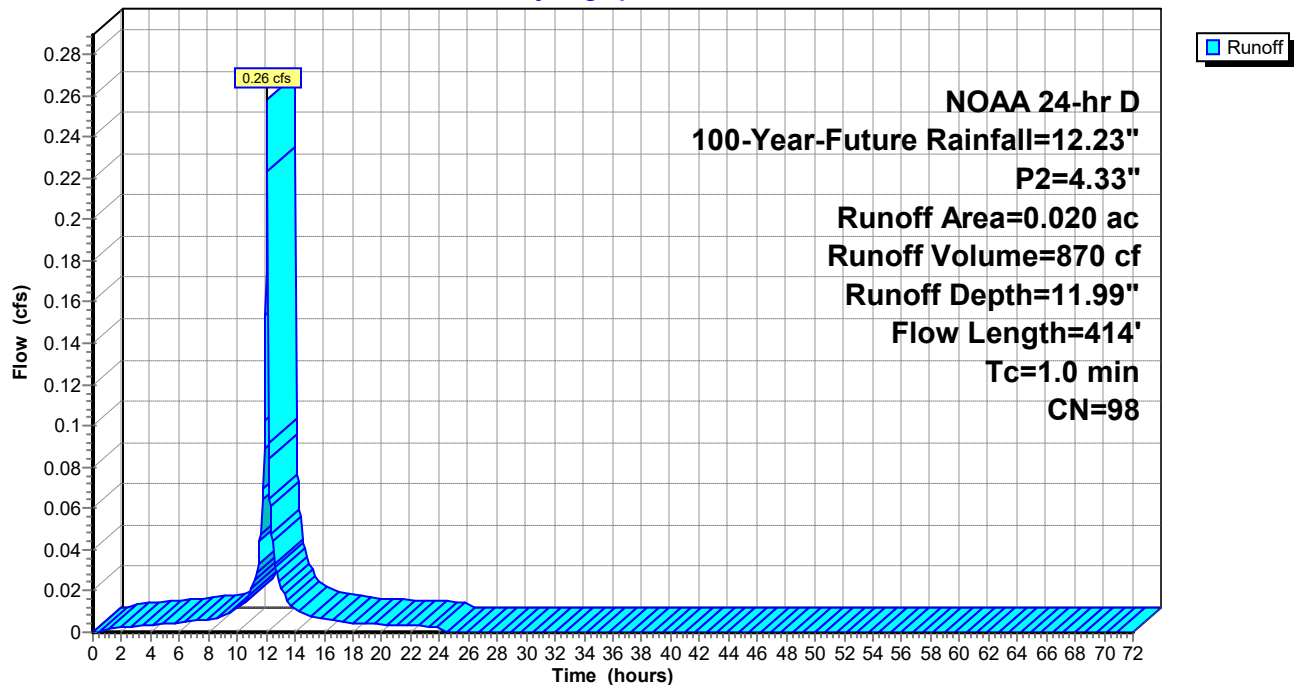
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.020	98	MOTOR VEH SURFACE, HSG B
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	43	0.0330	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	117	0.0250	8.32	10.21	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	36	0.0167	6.80	8.35	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.3	218	0.0420	12.18	21.53	Pipe Channel, downstream inv unkown; roadway slope used for a 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.0	414	Total			

Subcatchment 31S: P-DA-1-BYPASS IMP (undetained)

Hydrograph



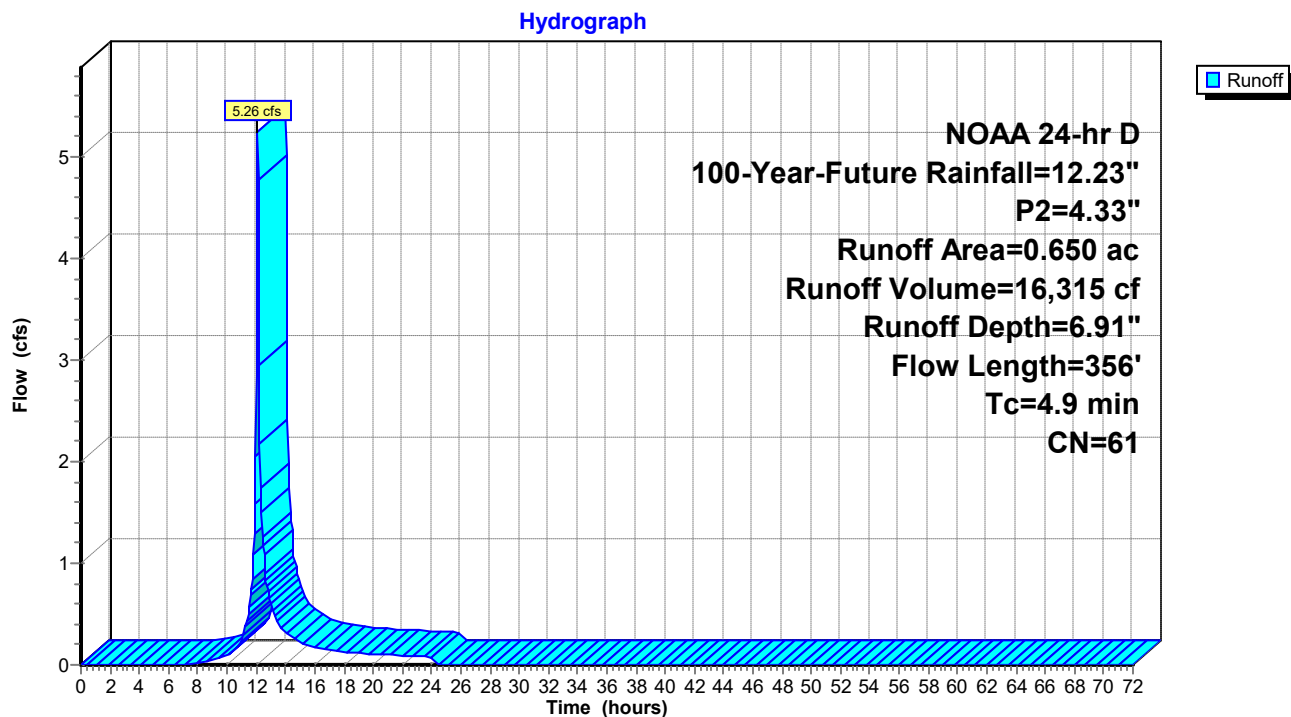
Summary for Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Runoff = 5.26 cfs @ 12.11 hrs, Volume= 16,315 cf, Depth= 6.91"
 Routed to Link 33L : P-DA-1-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.650	61	OPEN SPACE, HSG B
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	67	0.0600	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	127	0.1100	4.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	162	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.9	356	Total			

Subcatchment 32S: P-DA-1-BYPASS PER (undetained)

Summary for Subcatchment 35S: P-DA-1C IMP

Runoff = 4.49 cfs @ 12.07 hrs, Volume= 15,231 cf, Depth=11.99"
 Routed to Link 38L : TOTAL TO GI MTD 1C

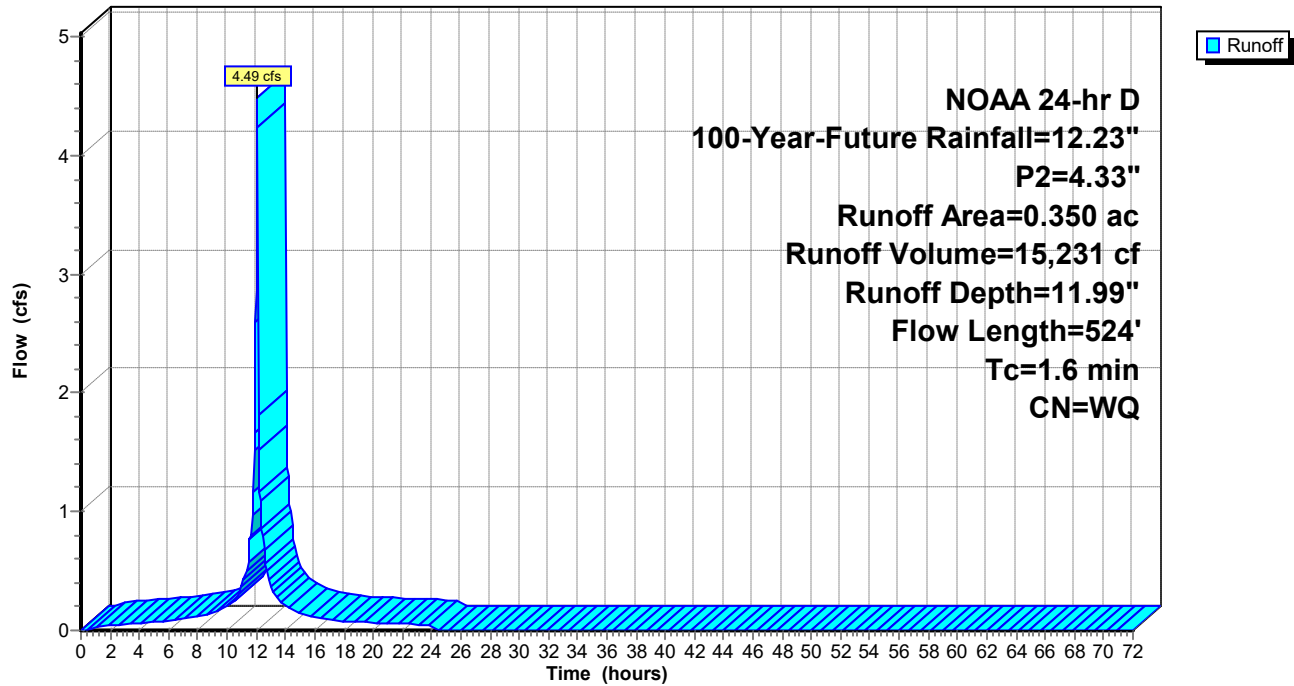
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.140	98	Motor Veh Surface, Paved parking, HSG B
* 0.210	98	Impervious, HSG B
0.350		Weighted Average
0.350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0200	1.27		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	130	0.0054	4.19	5.14	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0833	18.59	32.84	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0846	18.73	33.10	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.6	524	Total			

Subcatchment 35S: P-DA-1C IMP

Hydrograph



Summary for Subcatchment 36S: P-DA-1C PER

Runoff = 7.78 cfs @ 12.09 hrs, Volume= 21,837 cf, Depth= 6.91"
 Routed to Link 38L : TOTAL TO GI MTD 1C

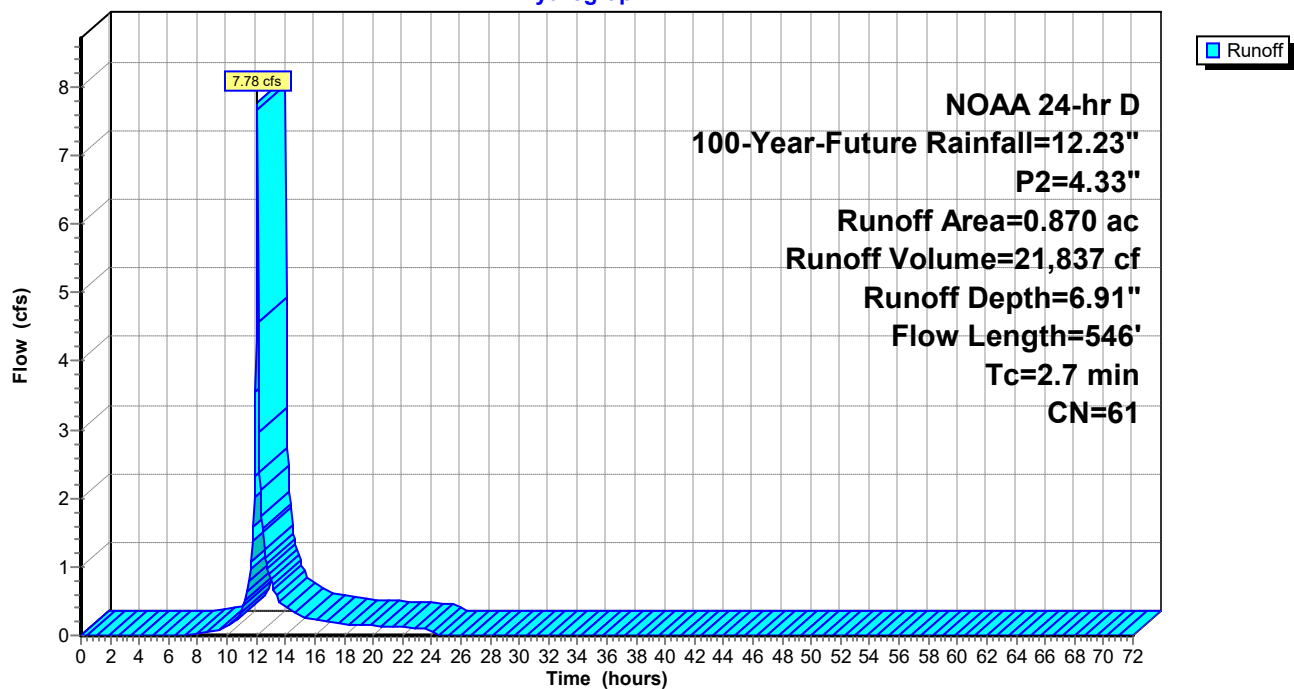
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.870	61	>75% Grass cover, Good, HSG B
0.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	38	0.1900	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	63	0.0080	5.32	7.43	Pipe Channel, 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Concrete pipe, finished
0.2	83	0.0146	7.78	13.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	85	0.0095	6.28	11.09	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	61	0.0830	18.55	32.78	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	80	0.0100	6.44	11.38	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	83	0.0121	7.08	12.52	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	18	0.0814	18.37	32.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	35	0.0840	18.66	32.98	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.7	546	Total			

Subcatchment 36S: P-DA-1C PER

Hydrograph



Summary for Subcatchment 37S: P-DA-3I IMP

Runoff = 7.32 cfs @ 12.08 hrs, Volume= 24,370 cf, Depth=11.99"
 Routed to Pond I : BMP-I Bioretention Basin

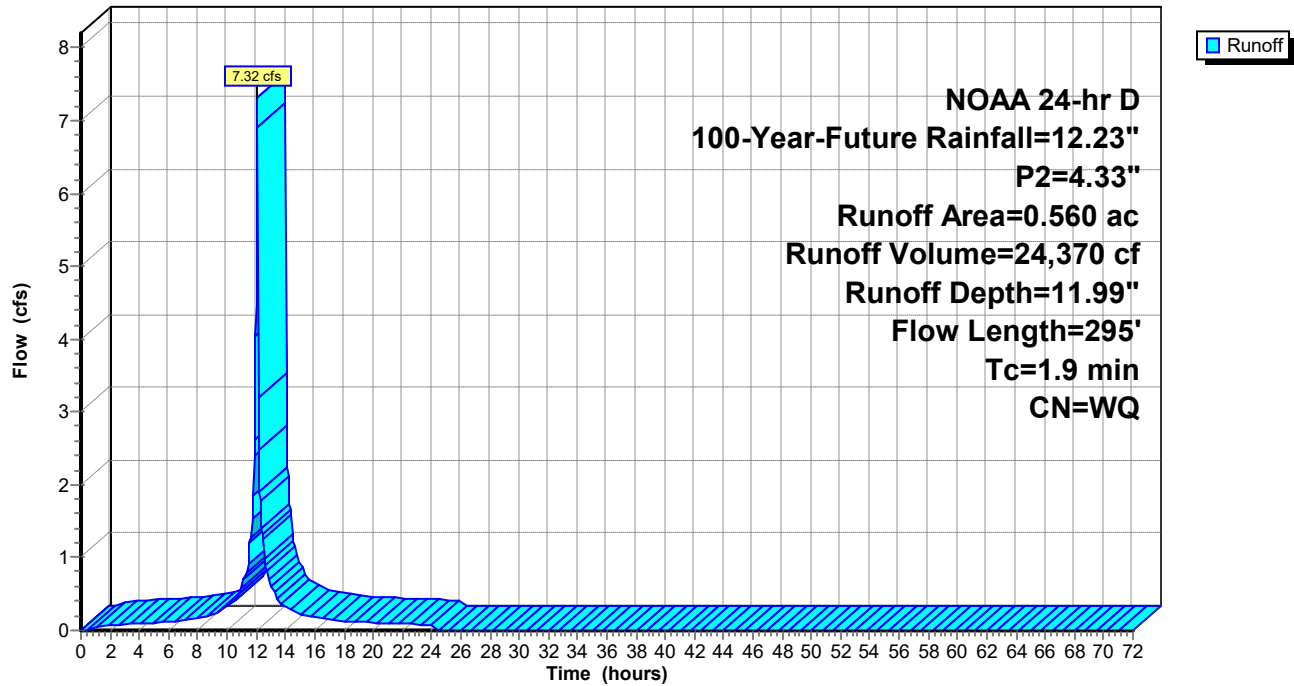
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.270	98	Motor Veh Surface, Paved parking, HSG B
* 0.060	98	Impervious, HSG B
0.560		Weighted Average
0.560		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0170	1.50		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	18	0.0166	2.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	82	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.3	68	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	27	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.9	295	Total			

Subcatchment 37S: P-DA-3I IMP

Hydrograph



Summary for Subcatchment 38S: P-DA-3I PER

Runoff = 3.40 cfs @ 12.07 hrs, Volume= 9,538 cf, Depth= 6.91"
 Routed to Pond I : BMP-I Bioretention Basin

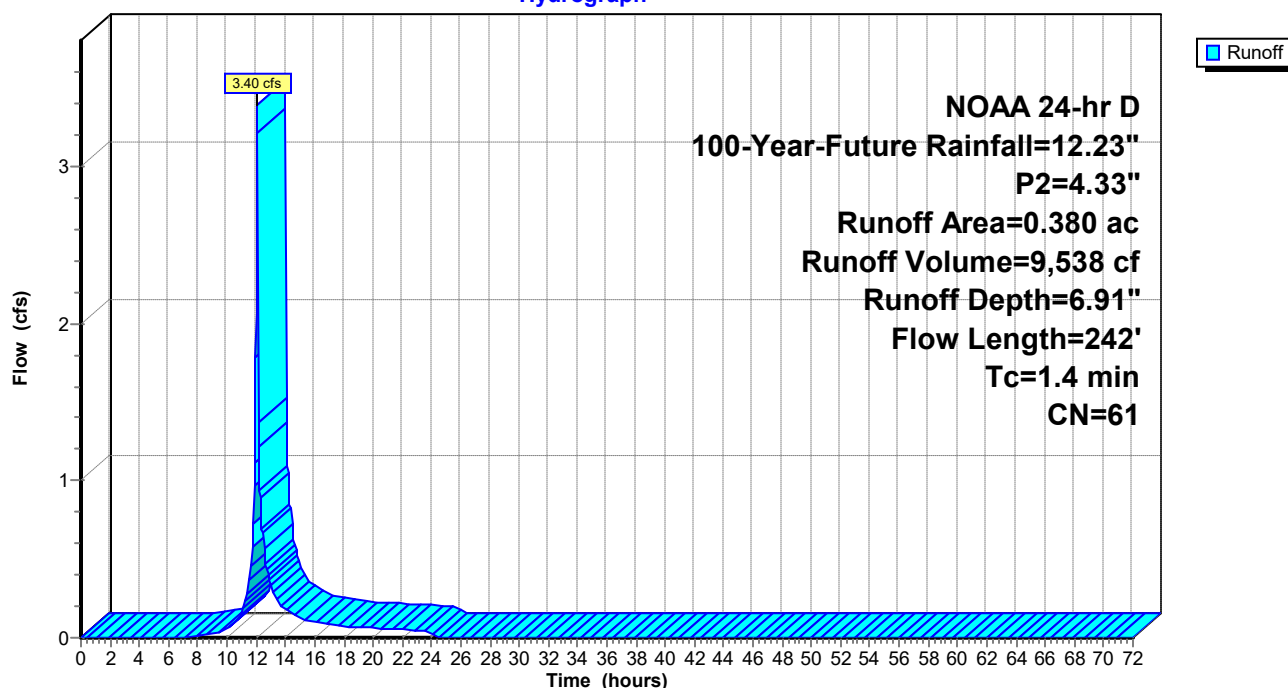
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.380	61	>75% Grass cover, Good, HSG B
0.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.24		Sheet Flow , Smooth surfaces n= 0.011 P2= 4.33"
0.8	167	0.0300	3.52		Shallow Concentrated Flow , Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel , 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	23	0.0050	4.03	4.95	Pipe Channel , 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.4	242	Total			

Subcatchment 38S: P-DA-3I PER

Hydrograph



Summary for Subcatchment 39S: P-DA-4J IMP

Runoff = 6.85 cfs @ 12.08 hrs, Volume= 23,065 cf, Depth=11.99"
 Routed to Pond J : BMP-J Bioretention Basin

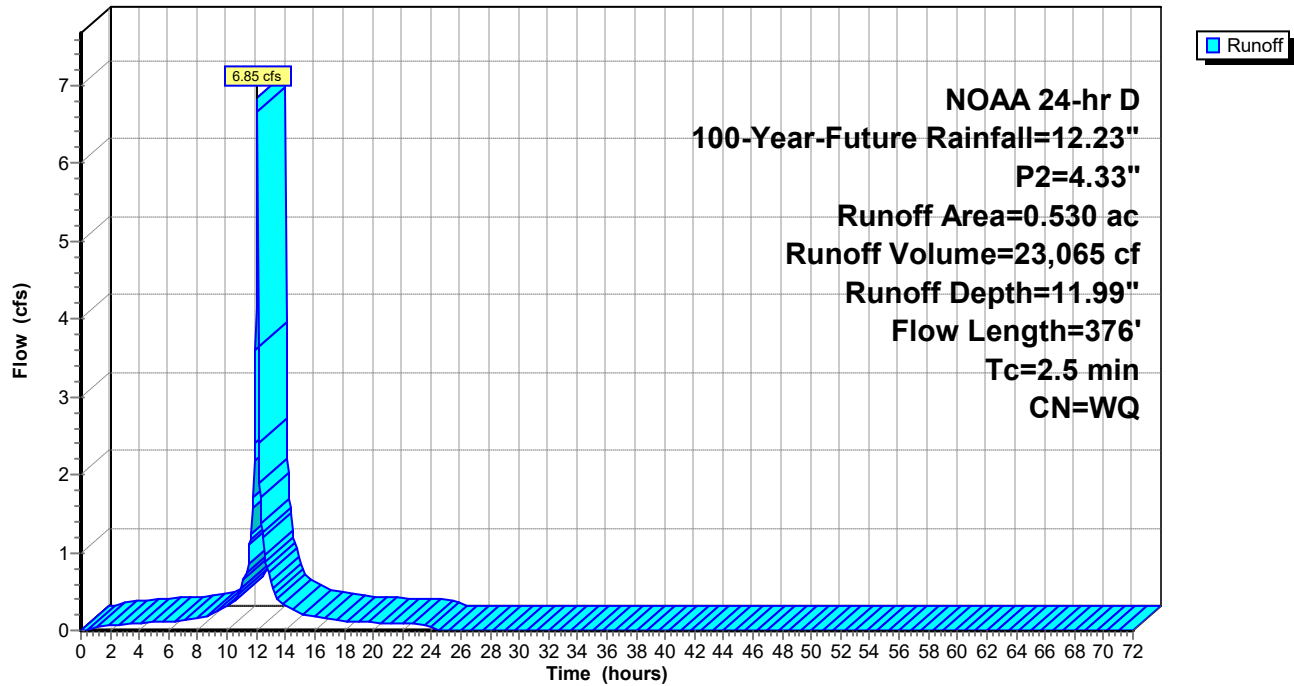
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
* 0.200	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.530		Weighted Average
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	80	0.0310	3.57		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	45	0.0049	3.68	4.52	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	121	0.0030	3.26	5.75	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
2.5	376	Total			

Subcatchment 39S: P-DA-4J IMP

Hydrograph



Summary for Subcatchment 40S: P-DA-1C ROOF

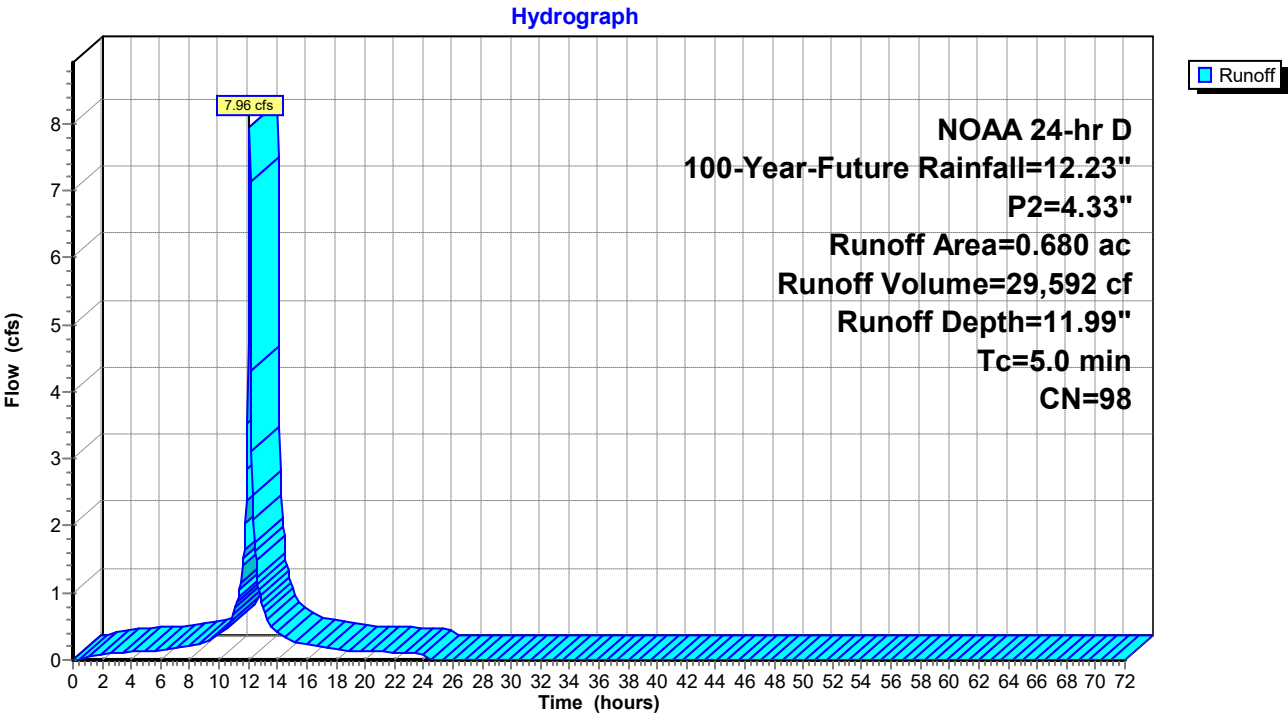
Runoff = 7.96 cfs @ 12.11 hrs, Volume= 29,592 cf, Depth=11.99"
Routed to Pond C : BMP C Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.680	98	Roofs, HSG B
0.680		100.00% Impervious Area

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

Subcatchment 40S: P-DA-1C ROOF



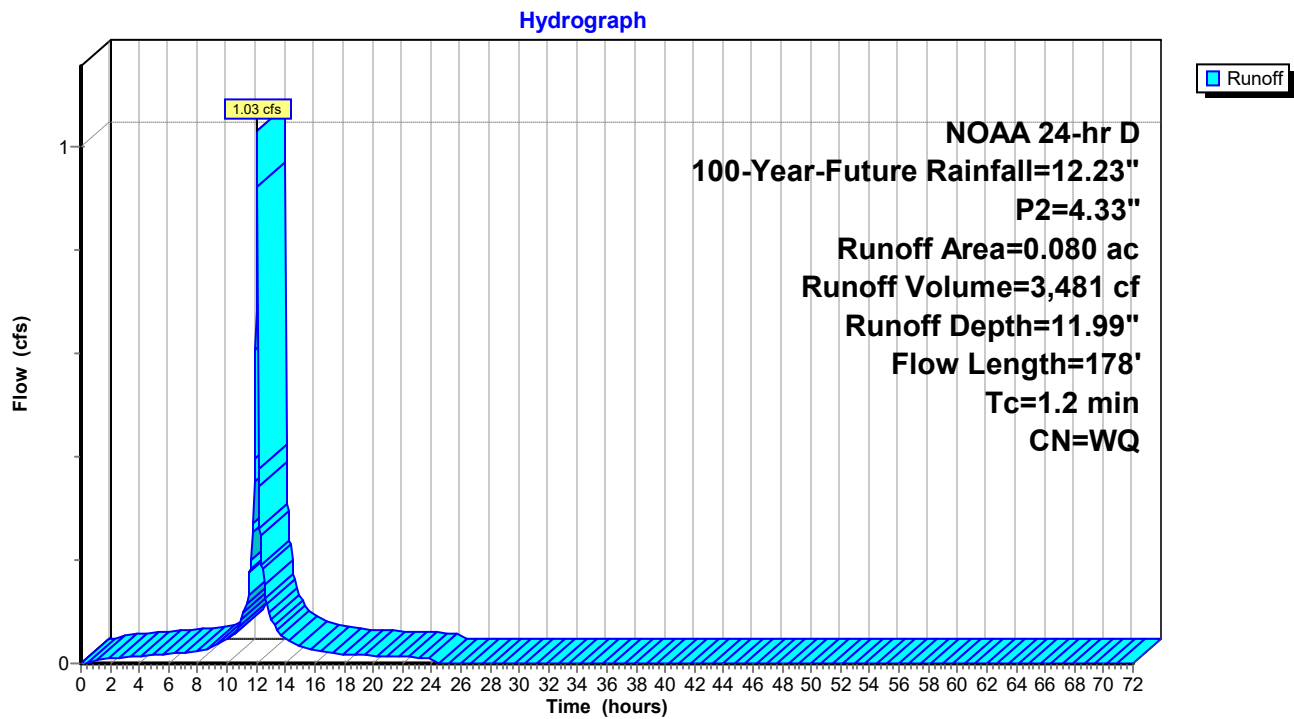
Summary for Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Runoff = 1.03 cfs @ 12.06 hrs, Volume= 3,481 cf, Depth=11.99"
 Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.060	98	MOTOR VEH SURFACE, HSG B
* 0.020	98	IMPERVIOUS, HSG B
0.080		Weighted Average
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	14	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	42	0.0053	3.58	2.81	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.0	22	0.0341	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.2	178	Total			

Subcatchment 41S: P-DA-3-BYPASS IMP (undetained)

Summary for Subcatchment 42S: P-DA-1F ROOF

Runoff = 2.97 cfs @ 12.07 hrs, Volume= 10,009 cf, Depth=11.99"
 Routed to Pond F : UG INFILTRATION BASIN F

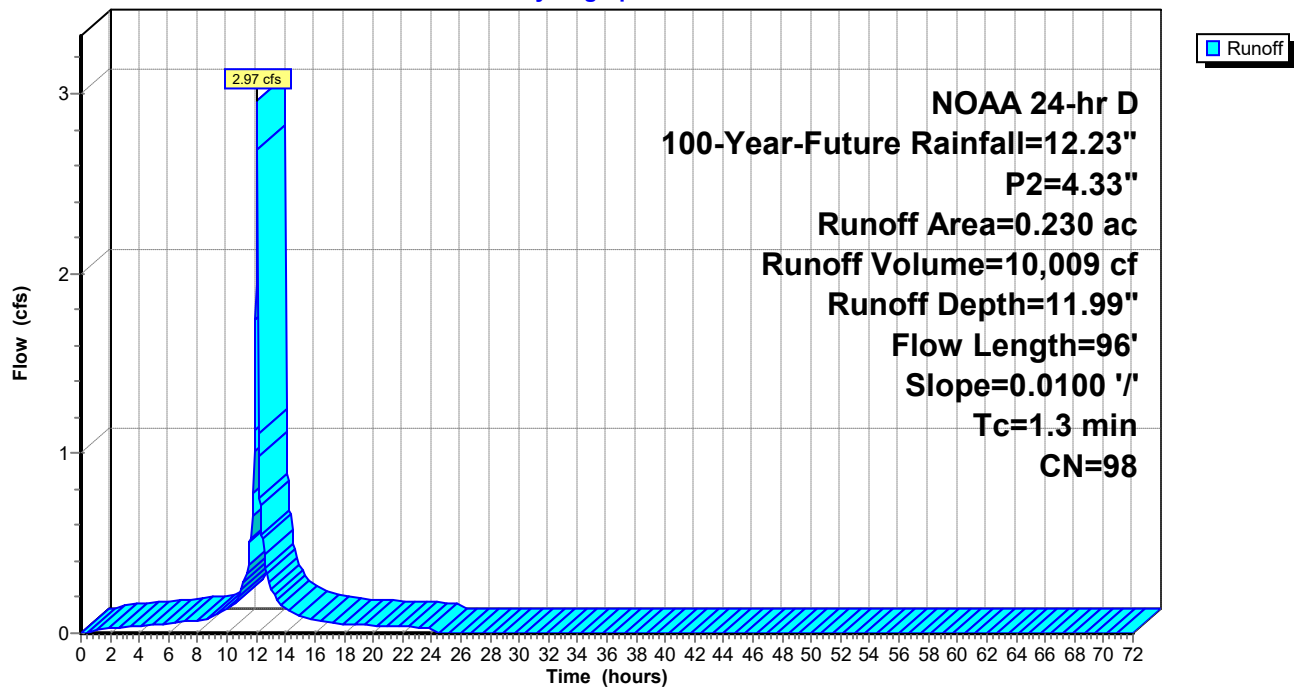
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.230	98	Roofs, HSG B
0.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	96	0.0100	1.20		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"

Subcatchment 42S: P-DA-1F ROOF

Hydrograph



Summary for Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Runoff = 5.33 cfs @ 12.14 hrs, Volume= 17,570 cf, Depth= 6.91"

Routed to Link 44L : P-DA-3-BYPASS undetained TOTAL

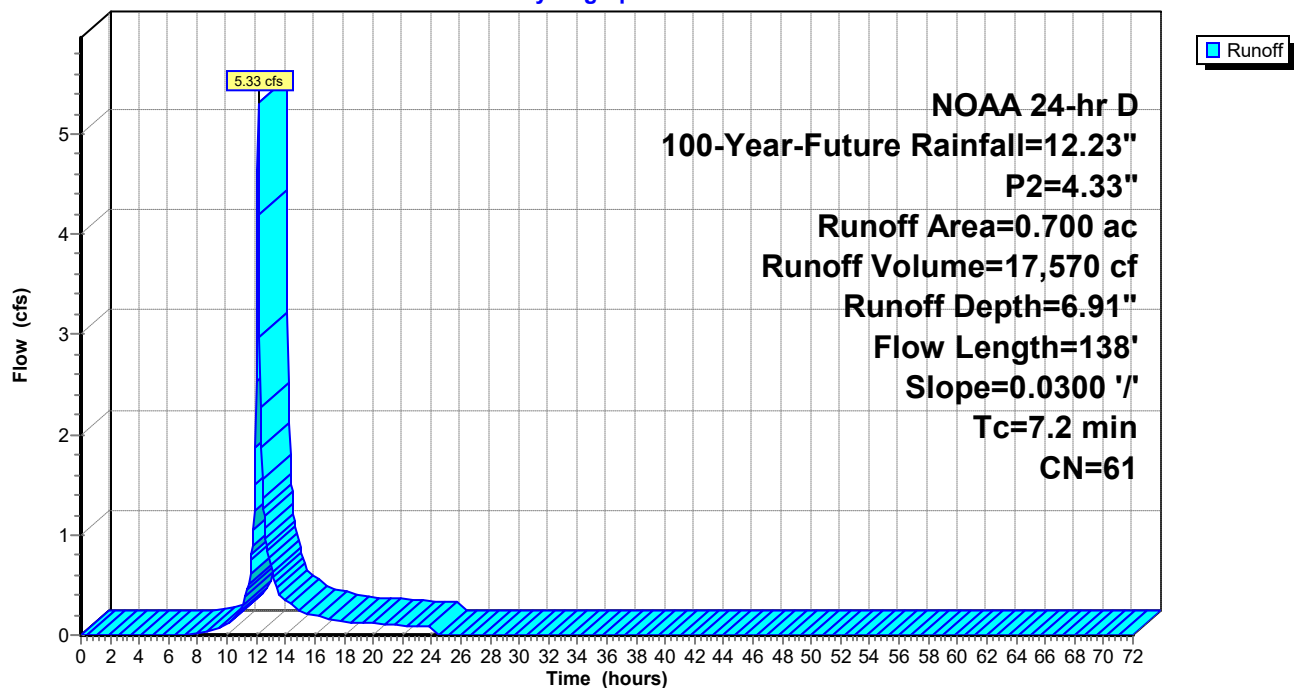
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.700	61	OPEN SPACE, HSG B
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	84	0.0300	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.0	54	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.2	138	Total			

Subcatchment 43S: P-DA-3-BYPASS PER (undetained)

Hydrograph



Summary for Subcatchment 44S: P-DA-1B IMP

Runoff = 21.26 cfs @ 12.08 hrs, Volume= 70,935 cf, Depth=11.99"
 Routed to Link 46L : P-DA-1B TOTAL

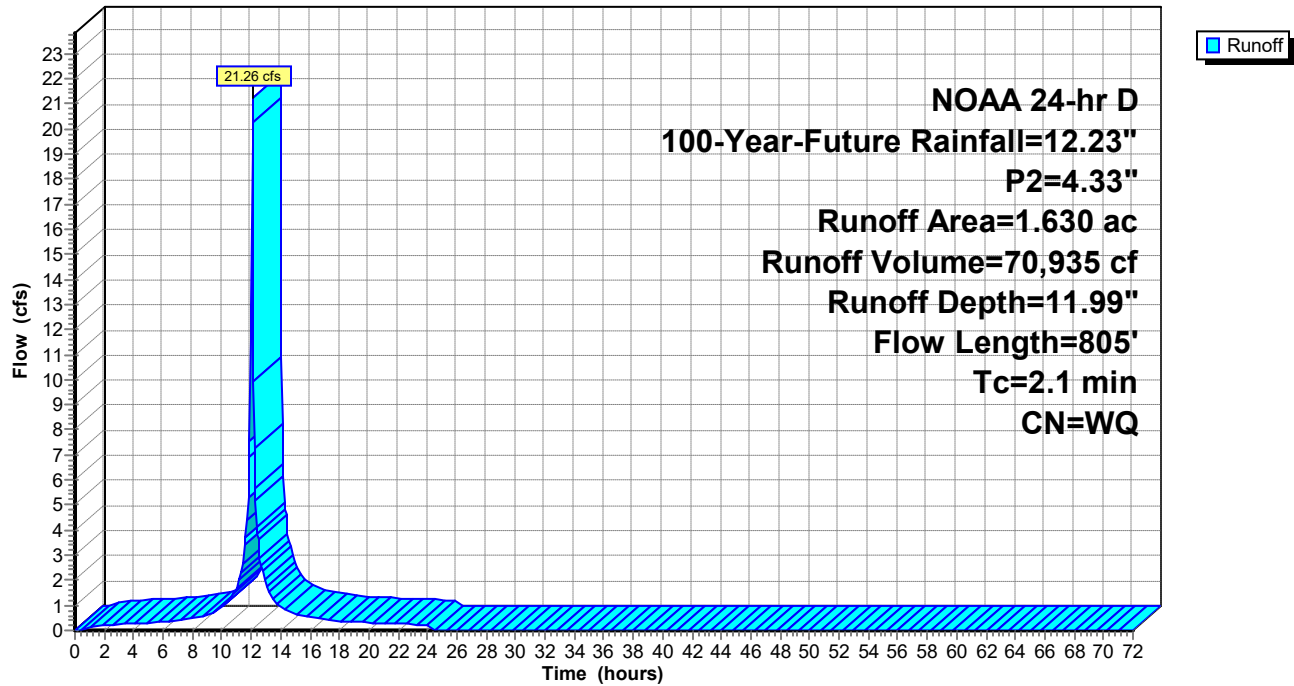
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
* 0.610	98	ROOF, HSG B
* 0.810	98	MOTOR VEH SURFACE, HSG B
* 0.210	98	IMPERVIOUS, HSG B
1.630		Weighted Average
1.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	123	0.0430	4.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	23	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.0	16	0.0100	6.69	21.01	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	209	0.0191	9.95	31.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.2	219	0.0365	17.29	84.89	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.0	32	0.0373	17.48	85.82	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
0.1	83	0.0360	17.18	84.31	Pipe Channel, 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
2.1	805	Total			

Subcatchment 44S: P-DA-1B IMP

Hydrograph



Summary for Subcatchment 45S: P-DA-1B PER

Runoff = 10.40 cfs @ 12.10 hrs, Volume= 30,371 cf, Depth= 6.91"
 Routed to Link 46L : P-DA-1B TOTAL

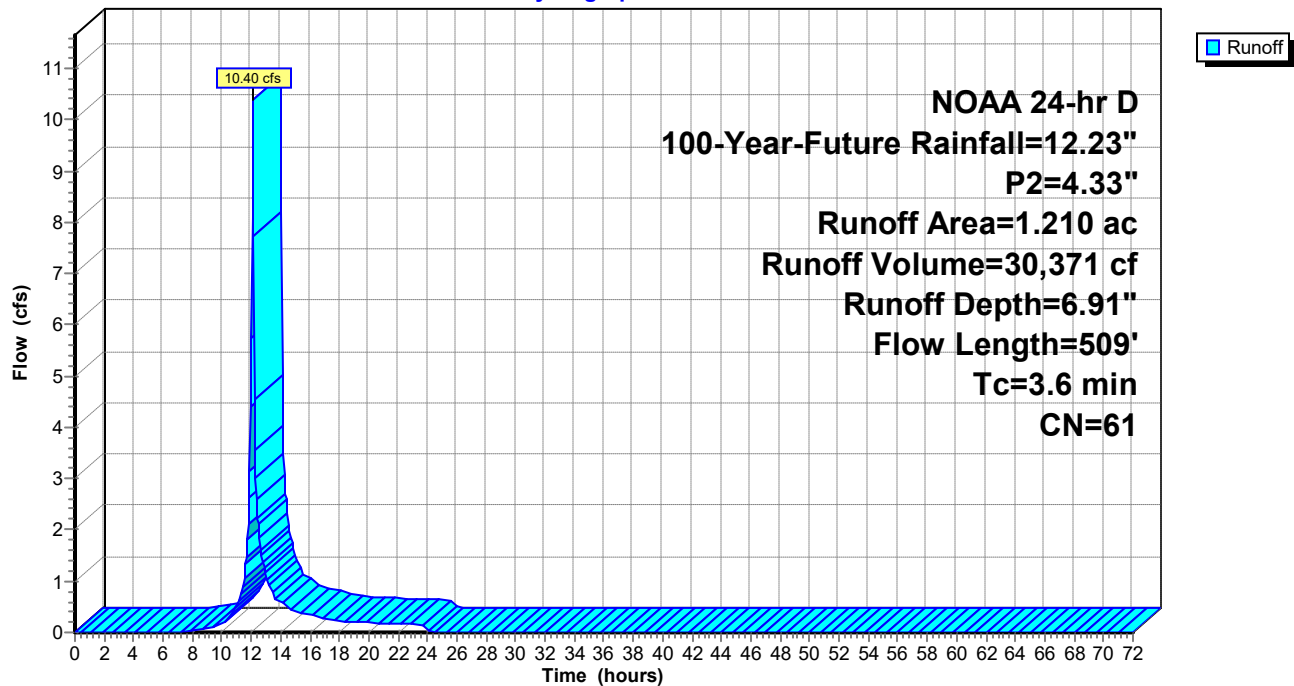
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
1.210	61	>75% Grass cover, Good, HSG B
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	12	0.0110	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.1	107	0.0210	1.65		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	84	0.0300	9.12	11.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	40	0.0400	10.53	12.92	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	21	0.0449	11.15	13.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.1	81	0.0200	9.11	16.09	Pipe Channel, RCP_Round 18" 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	84	0.0298	12.43	39.05	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	80	0.1840	30.89	97.04	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	509	Total			

Subcatchment 45S: P-DA-1B PER

Hydrograph



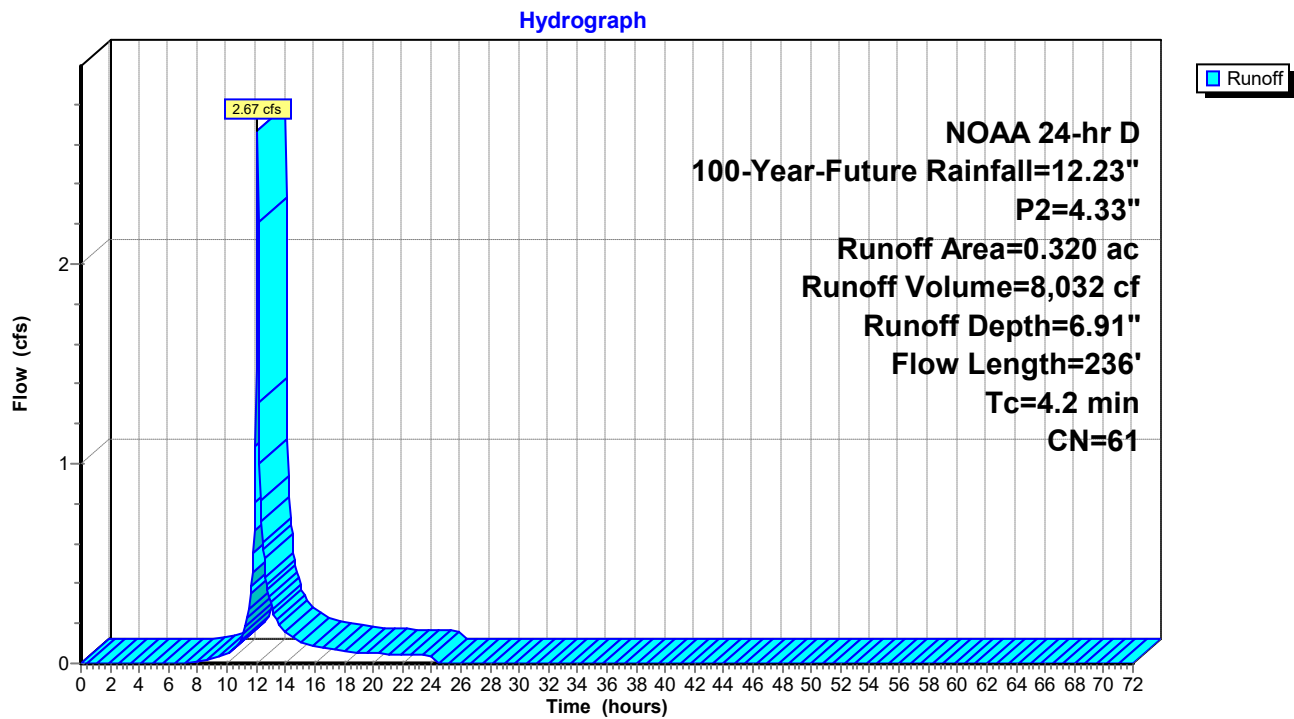
Summary for Subcatchment 46S: P-DA-4J PER

Runoff = 2.67 cfs @ 12.10 hrs, Volume= 8,032 cf, Depth= 6.91"
 Routed to Pond J : BMP-J Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.320	61	>75% Grass cover, Good, HSG B
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	30	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	131	0.0244	3.17		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	45	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0327	11.64	20.58	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
4.2	236	Total			

Subcatchment 46S: P-DA-4J PER

Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 9.21 cfs @ 12.07 hrs, Volume= 31,333 cf, Depth=11.99"
 Routed to Link 50L : TOTAL TO GI MTD K-1

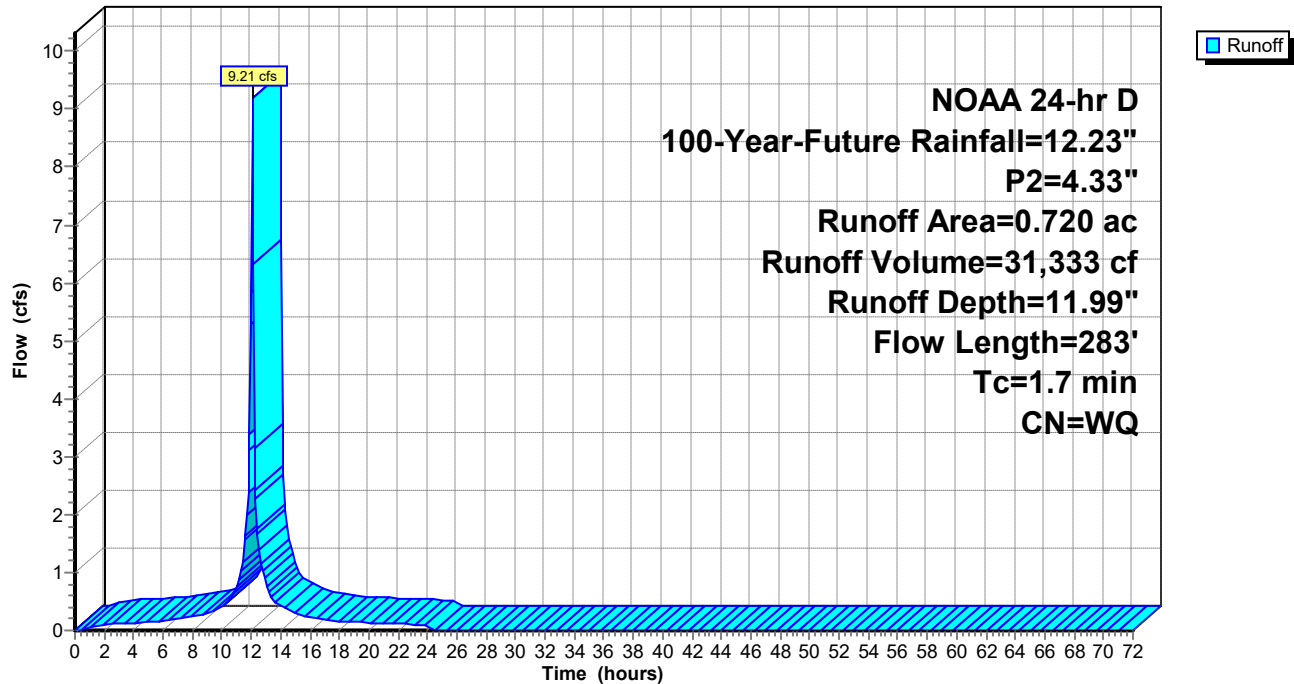
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.7	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

Runoff = 3.15 cfs @ 12.16 hrs, Volume= 11,044 cf, Depth= 6.91"
 Routed to Link 50L : TOTAL TO GI MTD K-1

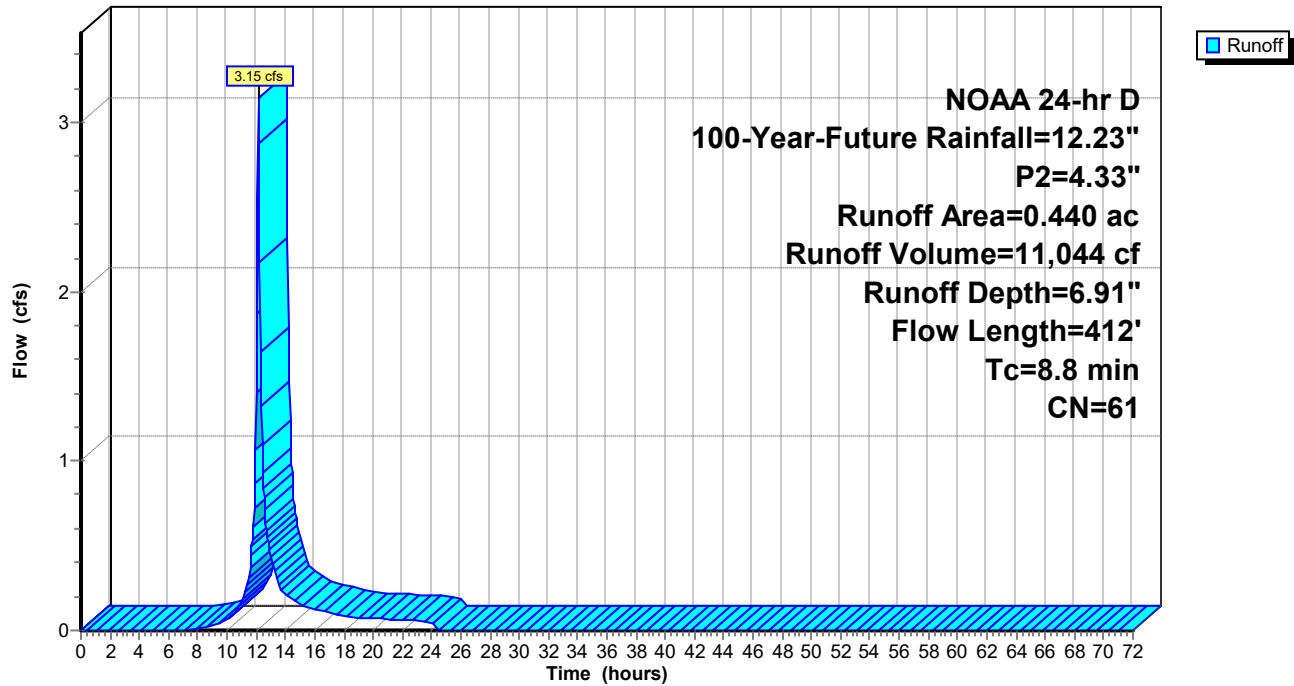
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	96	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.8	412	Total			

Subcatchment 48S: P-DA-4K PER

Hydrograph



Summary for Subcatchment 49S: P-DA-5N IMP

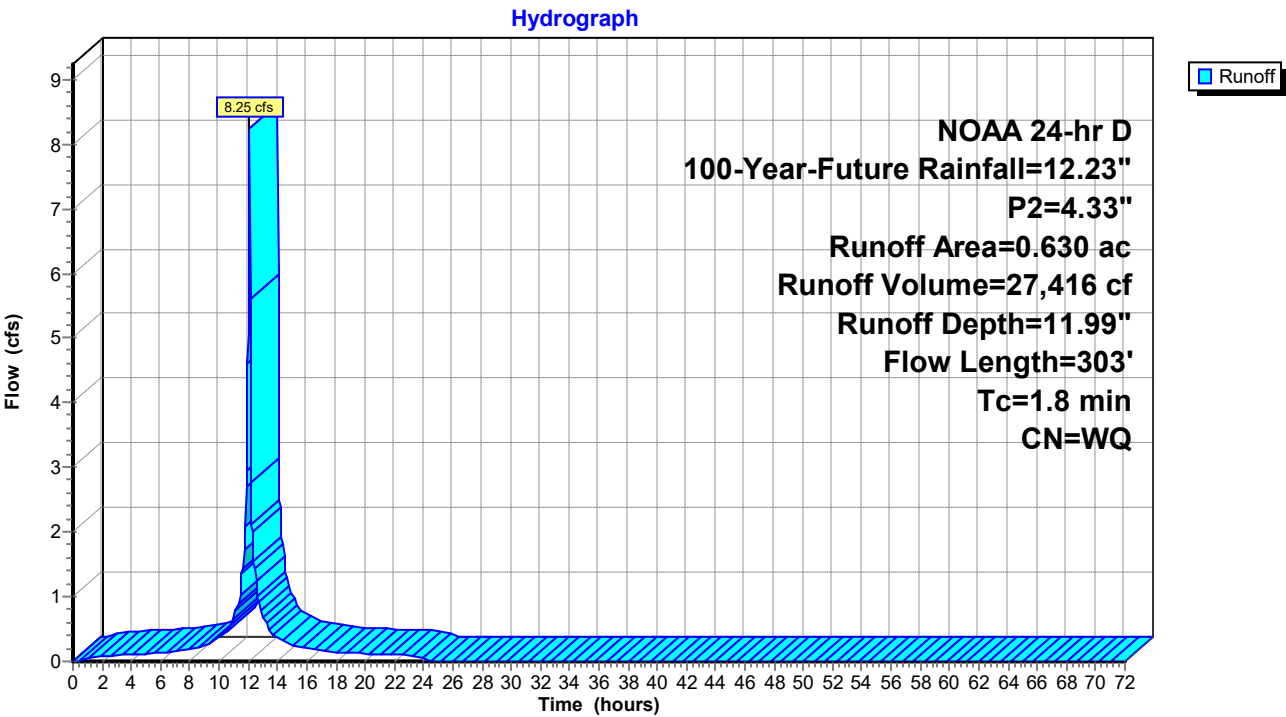
Runoff = 8.25 cfs @ 12.08 hrs, Volume= 27,416 cf, Depth=11.99"
 Routed to Pond N : BMP-N Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.140	98	Roofs, HSG B
* 0.390	98	Motor Veh Surface, Paved parking, HSG B
* 0.100	98	Impervious, HSG B
0.630		Weighted Average
0.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0270	1.80		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.8	144	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	53	0.0150	6.98	8.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
1.8	303	Total			

Subcatchment 49S: P-DA-5N IMP



Summary for Subcatchment 50S: P-DA-5N PER

Runoff = 3.71 cfs @ 12.09 hrs, Volume= 10,542 cf, Depth= 6.91"
 Routed to Pond N : BMP-N Bioretention Basin

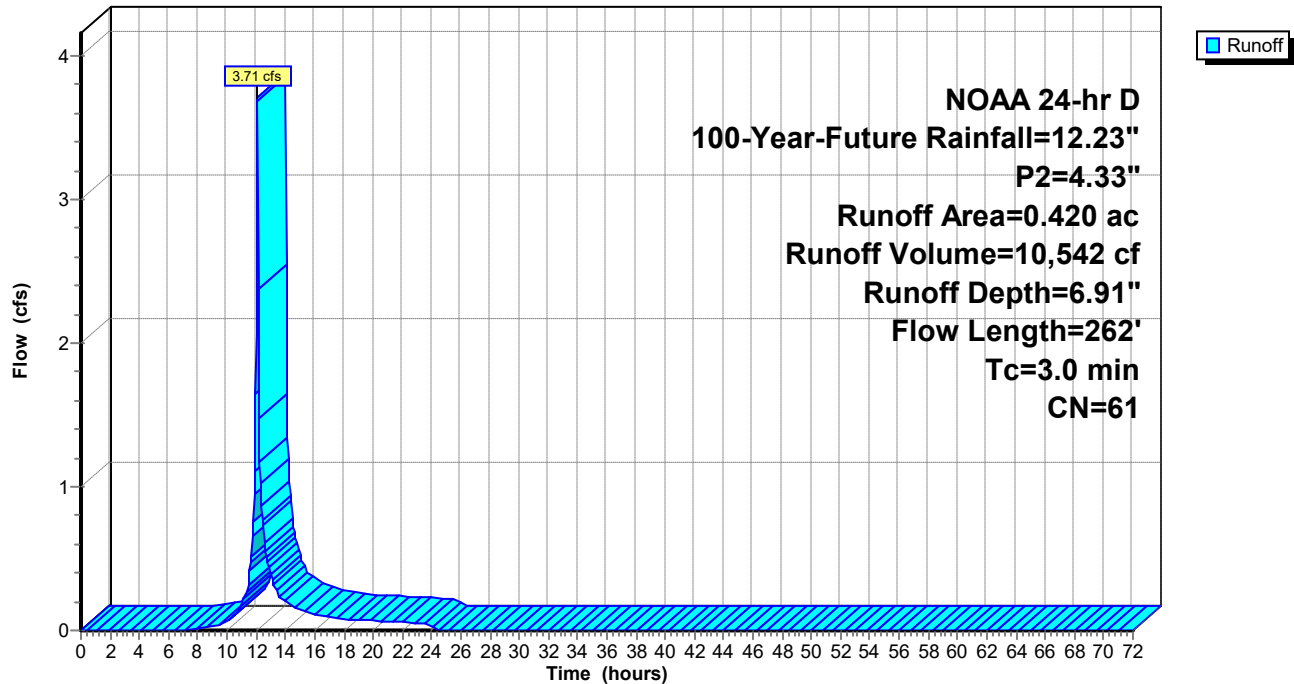
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.420	61	>75% Grass cover, Good, HSG B
0.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	35	0.0570	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.1	46	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	43	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	44	0.0050	4.55	8.05	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	88	0.0157	8.07	14.26	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	6	0.0500	14.40	25.45	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
3.0	262	Total			

Subcatchment 50S: P-DA-5N PER

Hydrograph



Summary for Subcatchment 51S: P-DA-5M IMP

Runoff = 18.10 cfs @ 12.08 hrs, Volume= 60,925 cf, Depth=11.99"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

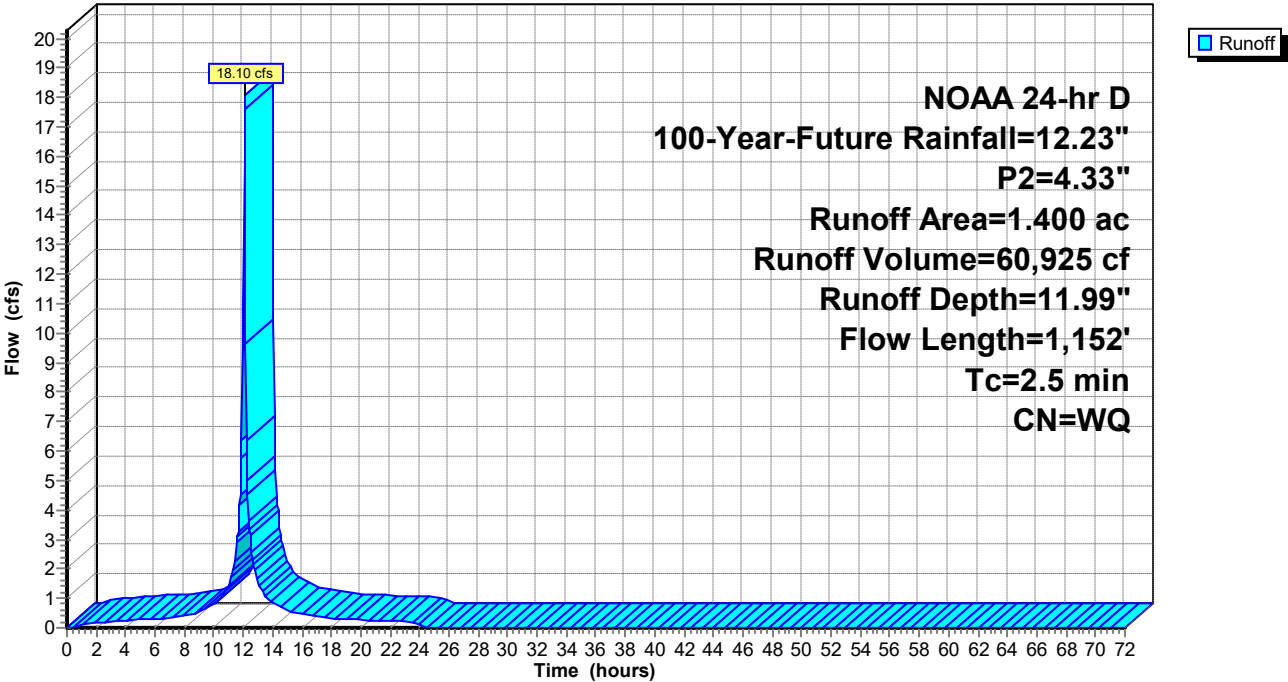
Area (ac)	CN	Description
0.530	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.240	98	Impervious, HSG B
1.400		Weighted Average
1.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	41	0.1200	2.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.4	97	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished

0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.5	1,152	Total			

Subcatchment 51S: P-DA-5M IMP

Hydrograph



Summary for Subcatchment 52S: P-DA-5M PER

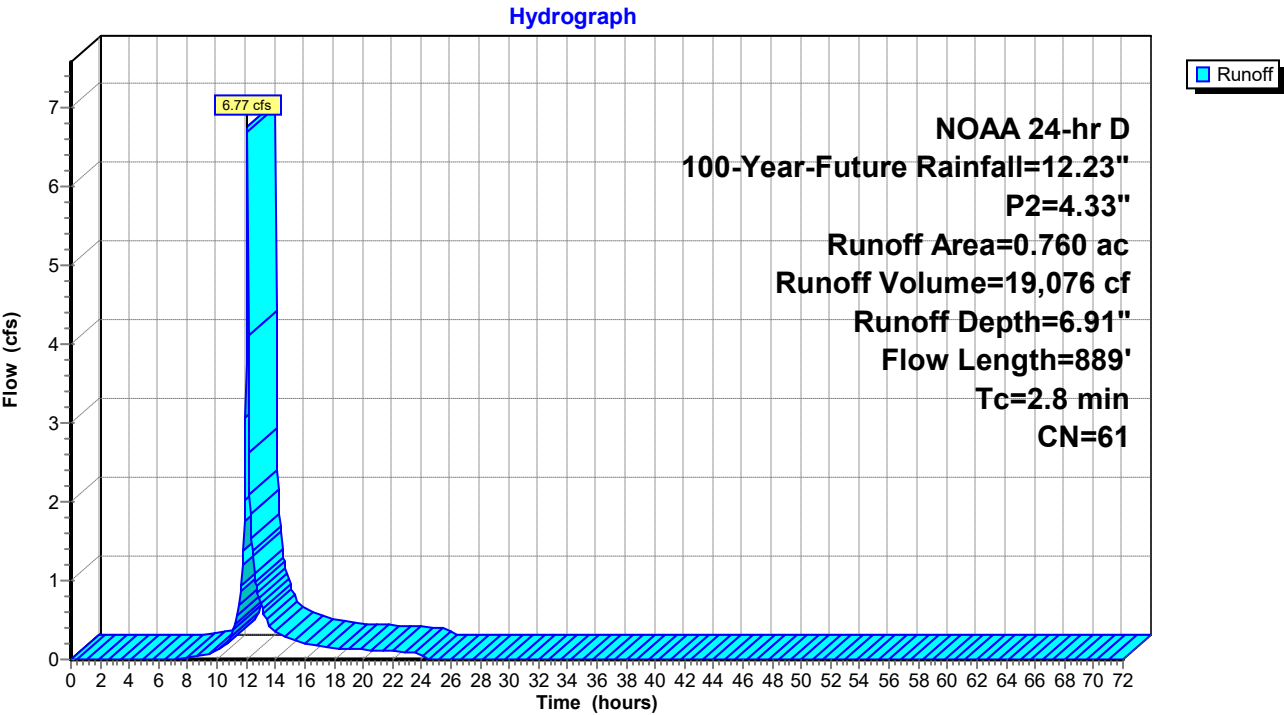
Runoff = 6.77 cfs @ 12.09 hrs, Volume= 19,076 cf, Depth= 6.91"
 Routed to Link 21L : TOTAL TO P-DA-5M

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.760	61	>75% Grass cover, Good, HSG B
0.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	20	0.2000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.3	77	0.0530	4.67		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	24	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	141	0.0438	11.93	14.65	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	55	0.0137	6.67	8.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.2	132	0.0471	12.38	15.19	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	42	0.0095	5.56	6.82	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.6	151	0.0060	4.42	5.42	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	141	0.0709	20.77	65.26	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	106	0.0189	10.72	33.69	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.8	889	Total			

Subcatchment 52S: P-DA-5M PER



Summary for Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Runoff = 0.65 cfs @ 12.08 hrs, Volume= 2,176 cf, Depth=11.99"
 Routed to Pond K : BMP-K UG Infiltration Basin

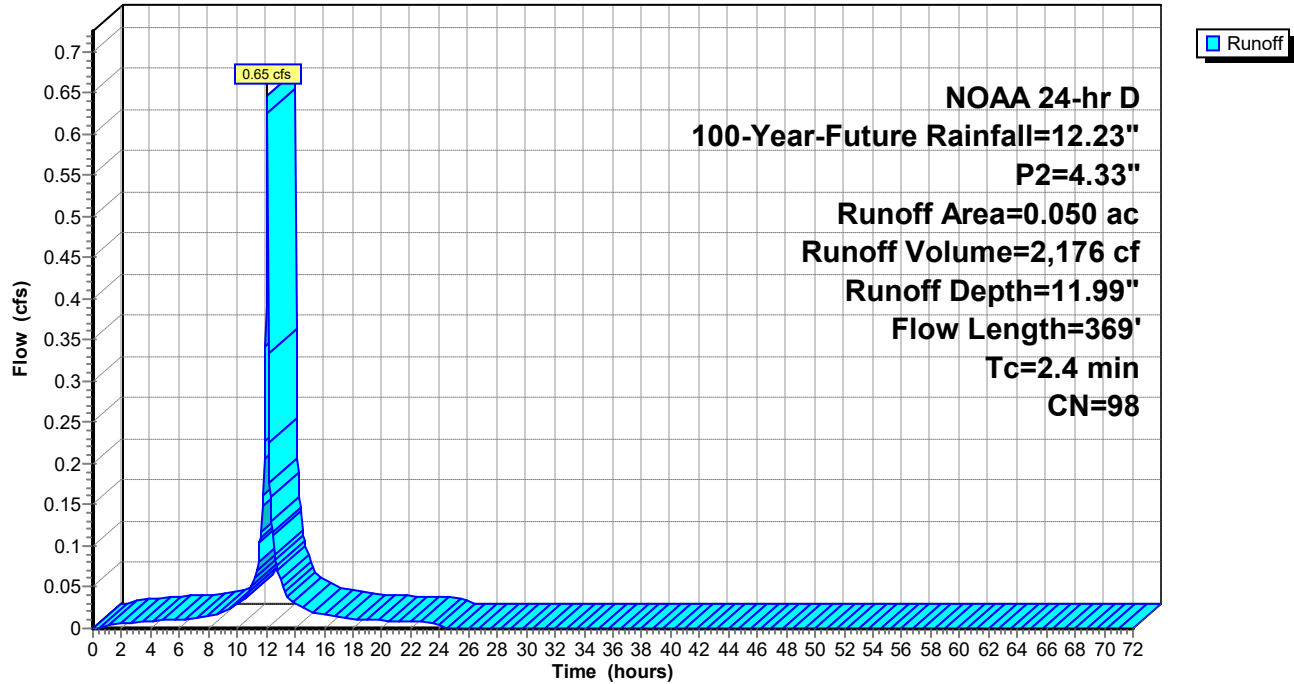
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
1.0	172	0.0100	2.86	0.56	Pipe Channel, 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Concrete pipe, bends & connections
0.6	124	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.1	30	0.0581	9.04	3.16	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	3	0.0342	6.94	2.42	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
2.4	369	Total			

Subcatchment 53S: P-DA-4K-ROOF (BYPASS MTD)

Hydrograph



Summary for Subcatchment 54S: P-DA-5-BYPASS

Runoff = 7.64 cfs @ 12.21 hrs, Volume= 30,839 cf, Depth= 6.91"
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

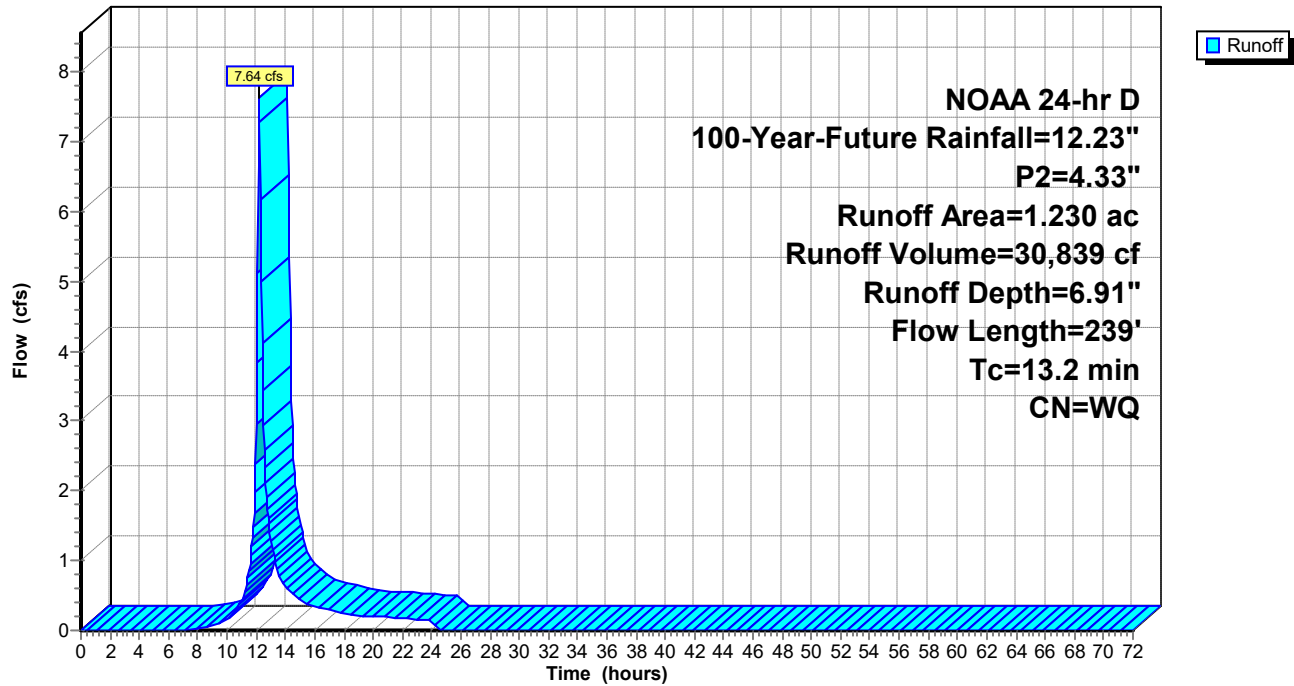
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
1.220	61	>75% Grass cover, Good, HSG B
0.010	55	Woods, Good, HSG B
1.230		Weighted Average
1.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0200	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 4.33"
0.6	78	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	24	0.1600	6.44		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	25	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	12	0.3333	9.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	239	Total			

Subcatchment 54S: P-DA-5-BYPASS

Hydrograph



Summary for Subcatchment 55S: P-DA-4 BYPASS IMP

Runoff = 0.77 cfs @ 12.05 hrs, Volume= 2,611 cf, Depth=11.99"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

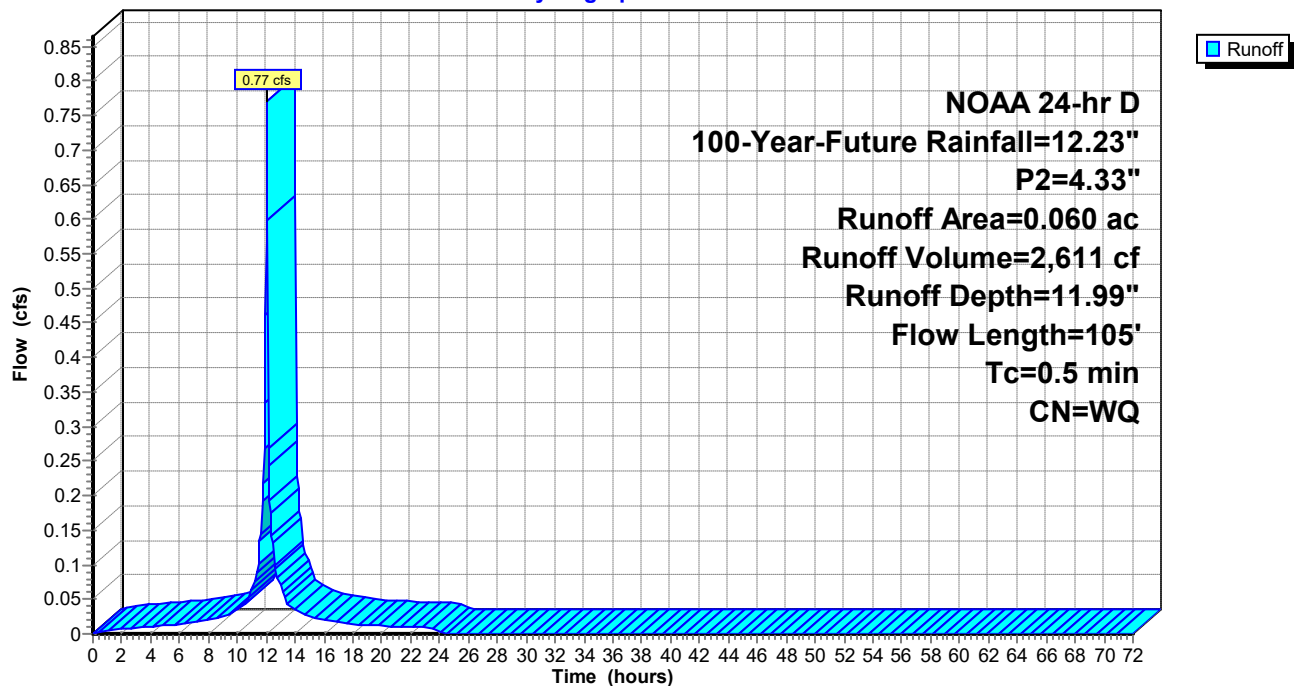
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
* 0.010	98	Impervious, HSG B
0.060		Weighted Average
0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	13	0.0100	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.2	92	0.1700	6.18		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	105	Total			

Subcatchment 55S: P-DA-4 BYPASS IMP

Hydrograph



Summary for Subcatchment 56S: P-DA-5P IMP

Runoff = 19.48 cfs @ 12.08 hrs, Volume= 65,277 cf, Depth=11.99"
 Routed to Pond P : BMP-P Bioretention Basin

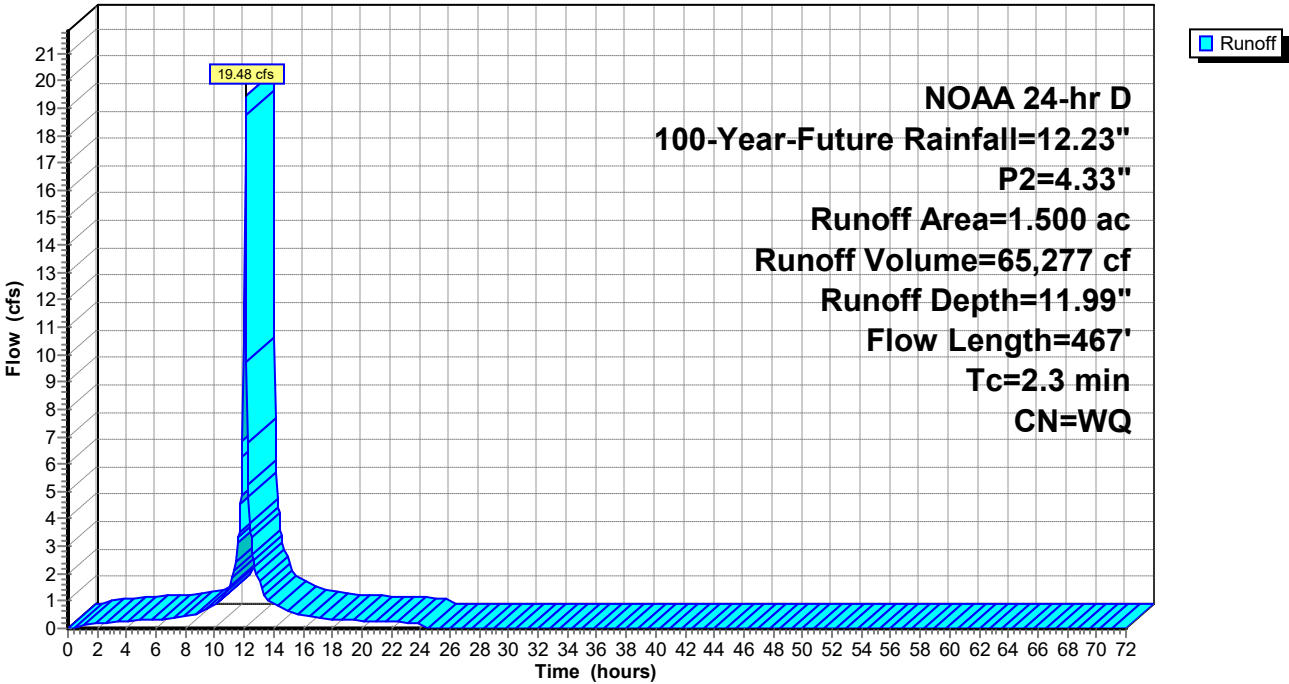
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.620	98	Roofs, HSG B
* 0.630	98	Motor Veh Surface, Paved parking, HSG B
* 0.250	98	Impervious, HSG B
1.500		Weighted Average
1.500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.3	27	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	14	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	467	Total			

Subcatchment 56S: P-DA-5P IMP

Hydrograph



Summary for Subcatchment 57S: P-DA-5P PER

Runoff = 8.05 cfs @ 12.08 hrs, Volume= 22,088 cf, Depth= 6.91"
 Routed to Pond P : BMP-P Bioretention Basin

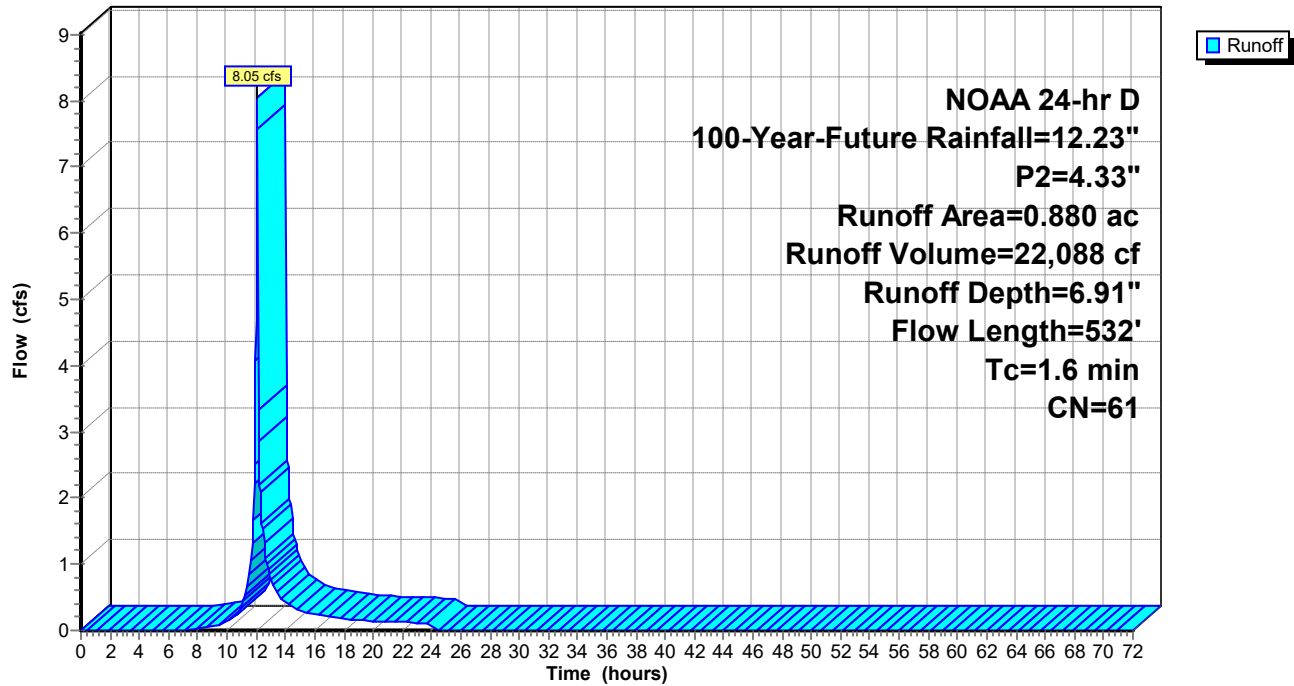
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.880	61	>75% Grass cover, Good, HSG B
0.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1900	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.2	80	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	23	0.0534	13.18	16.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.4	97	0.0050	4.03	4.95	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	57	0.0211	8.28	10.17	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	59	0.0120	7.05	12.47	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.2	117	0.0266	10.50	18.56	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	42	0.0207	9.26	16.37	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.1	39	0.0388	12.68	22.42	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012 Concrete pipe, finished
0.0	12	0.0342	14.43	45.32	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.6	532	Total			

Subcatchment 57S: P-DA-5P PER

Hydrograph



Summary for Subcatchment 58S: P-DA-4 BYPASS PER

Runoff = 7.55 cfs @ 12.11 hrs, Volume= 22,969 cf, Depth= 6.80"
 Routed to Link 59L : P-DA-4 BYPASS TOTAL

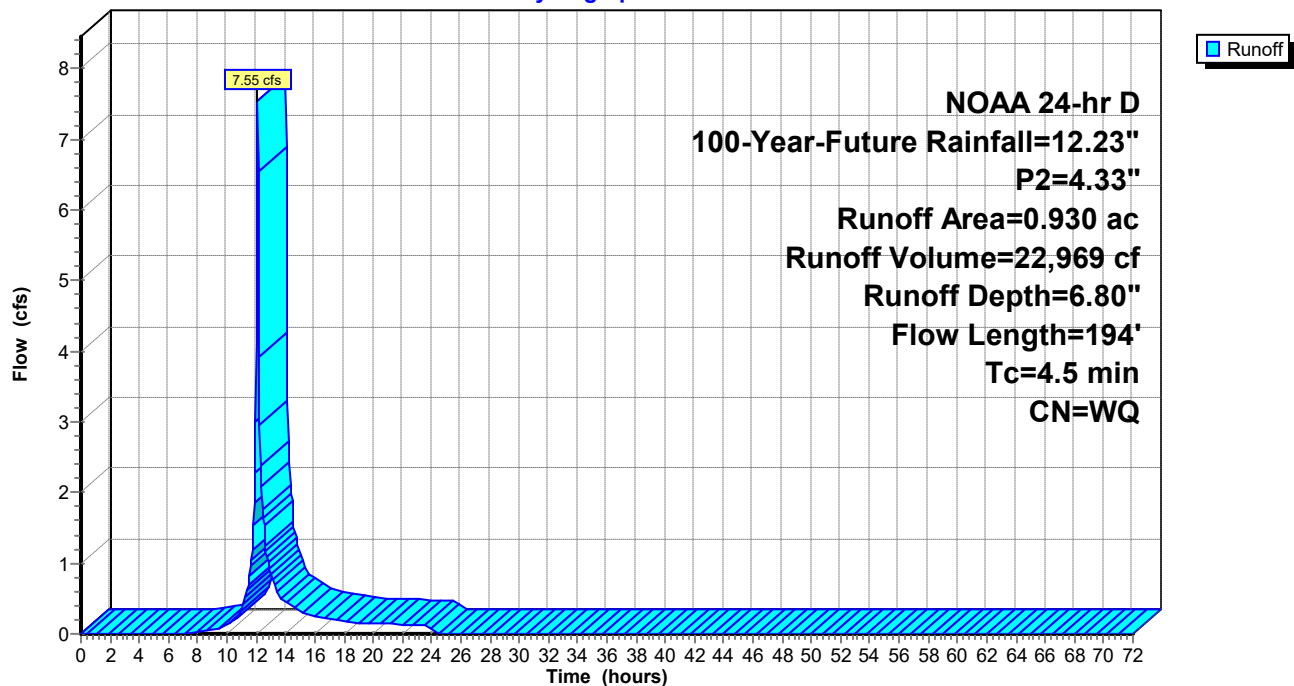
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.820	61	>75% Grass cover, Good, HSG B
0.110	55	Woods, Good, HSG B
0.930		Weighted Average
0.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.7	94	0.0210	2.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.5	194	Total			

Subcatchment 58S: P-DA-4 BYPASS PER

Hydrograph



Summary for Subcatchment 63S: P-DA-5R IMP

Runoff = 10.73 cfs @ 12.08 hrs, Volume= 35,685 cf, Depth=11.99"
 Routed to Link 66L : P-DA-5R TOTAL

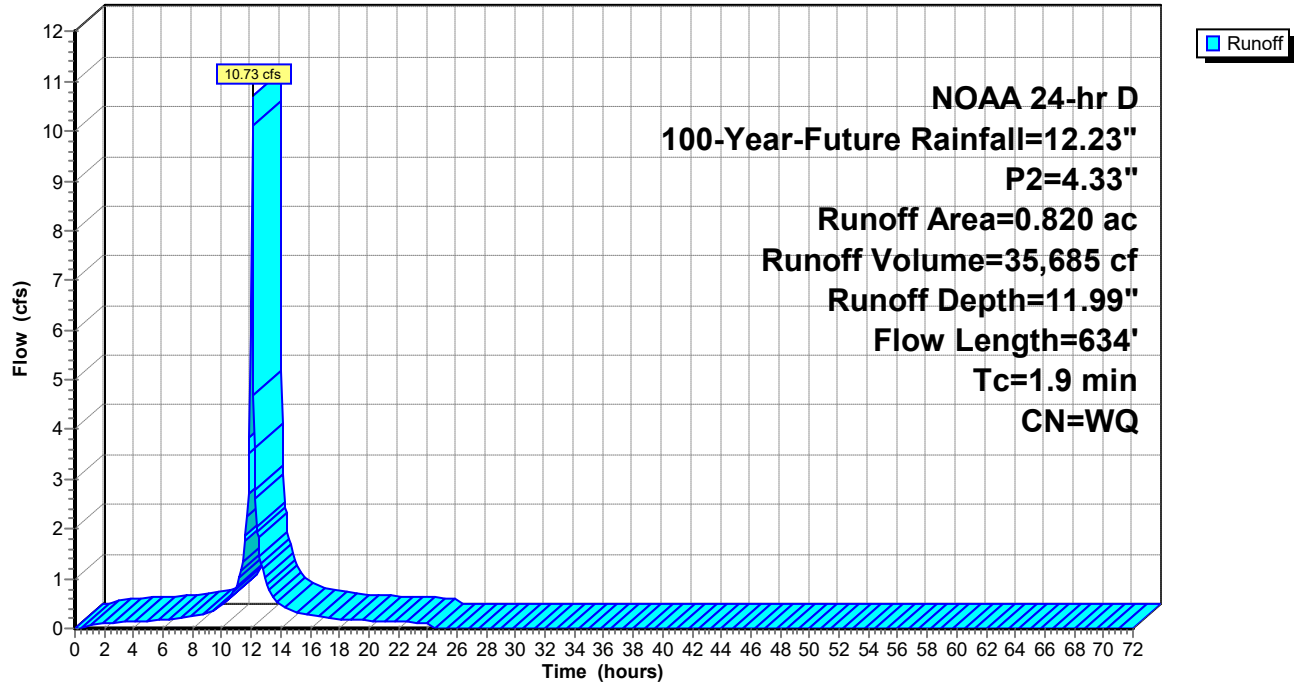
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
0.270	98	Roofs, HSG B
* 0.420	98	Motor Veh Surface, Paved parking, HSG B
* 0.130	98	Impervious, HSG B
0.820		Weighted Average
0.820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0370	2.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.5	133	0.0440	4.26		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
1.9	634	Total			

Subcatchment 63S: P-DA-5R IMP

Hydrograph



Summary for Subcatchment 64S: P-DA-5R PER

Runoff = 10.84 cfs @ 12.11 hrs, Volume= 33,634 cf, Depth= 6.91"
 Routed to Link 66L : P-DA-5R TOTAL

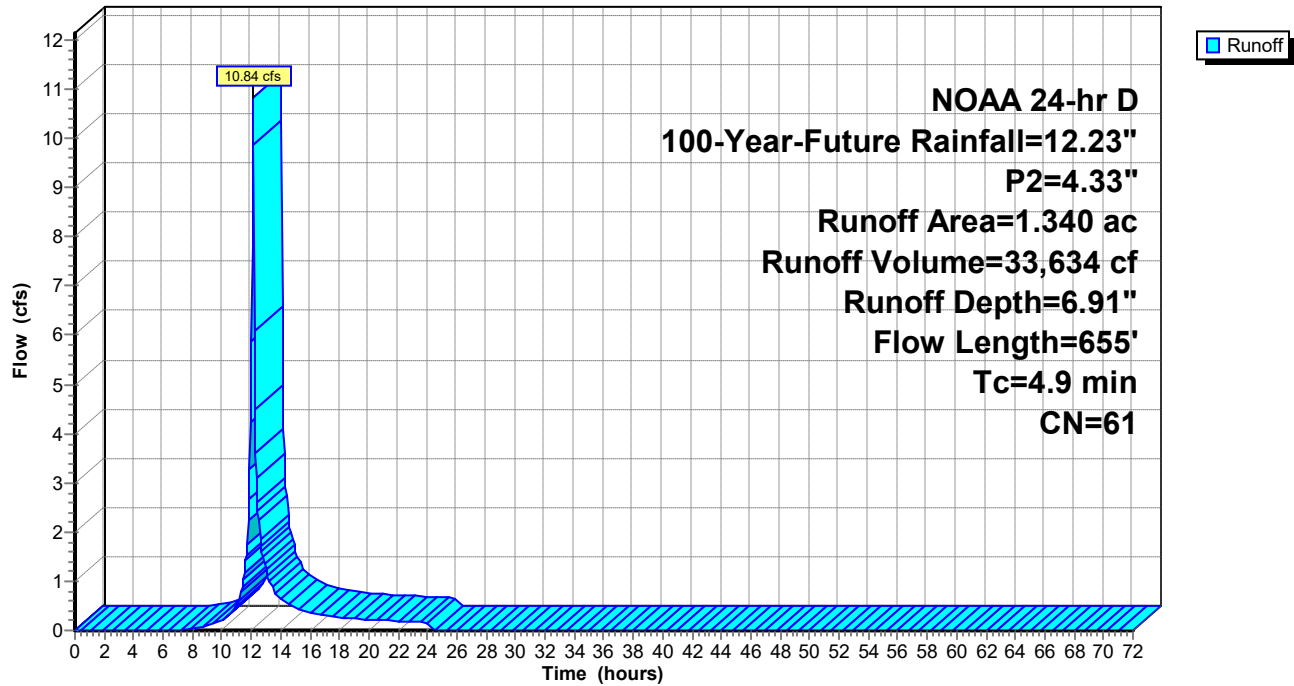
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr D 100-Year-Future Rainfall=12.23", P2=4.33"

Area (ac)	CN	Description
1.340	61	>75% Grass cover, Good, HSG B
1.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	44	0.0500	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
1.3	198	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	12	0.0200	8.06	9.90	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
0.1	73	0.0687	20.45	64.24	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	85	0.0260	12.58	39.52	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	52	0.0290	13.28	41.73	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.2	138	0.0174	10.29	32.33	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
0.1	53	0.0112	8.26	25.94	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
4.9	655	Total			

Subcatchment 64S: P-DA-5R PER

Hydrograph



Summary for Pond A: BMP-A Bioretention Basin

Inflow Area = 33,280 sf, 36.65% Impervious, Inflow Depth = 8.77" for 100-Year-Future event
 Inflow = 7.27 cfs @ 12.08 hrs, Volume= 24,333 cf
 Outflow = 4.89 cfs @ 12.16 hrs, Volume= 23,099 cf, Atten= 33%, Lag= 4.3 min
 Primary = 4.89 cfs @ 12.16 hrs, Volume= 23,099 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 554.50' @ 12.16 hrs Surf.Area= 3,255 sf Storage= 6,914 cf

Plug-Flow detention time= 123.9 min calculated for 23,099 cf (95% of inflow)
 Center-of-Mass det. time= 93.7 min (875.5 - 781.8)

Volume	Invert	Avail.Storage	Storage Description
#1	551.50'	8,640 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
551.50	1,445	0	0
552.00	1,708	788	788
553.00	2,283	1,996	2,784
554.00	2,914	2,599	5,382
555.00	3,601	3,258	8,640

Device	Routing	Invert	Outlet Devices
#1	Primary	548.70'	15.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 548.70' / 548.10' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	552.25'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	553.70'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.85 cfs @ 12.16 hrs HW=554.49' (Free Discharge)

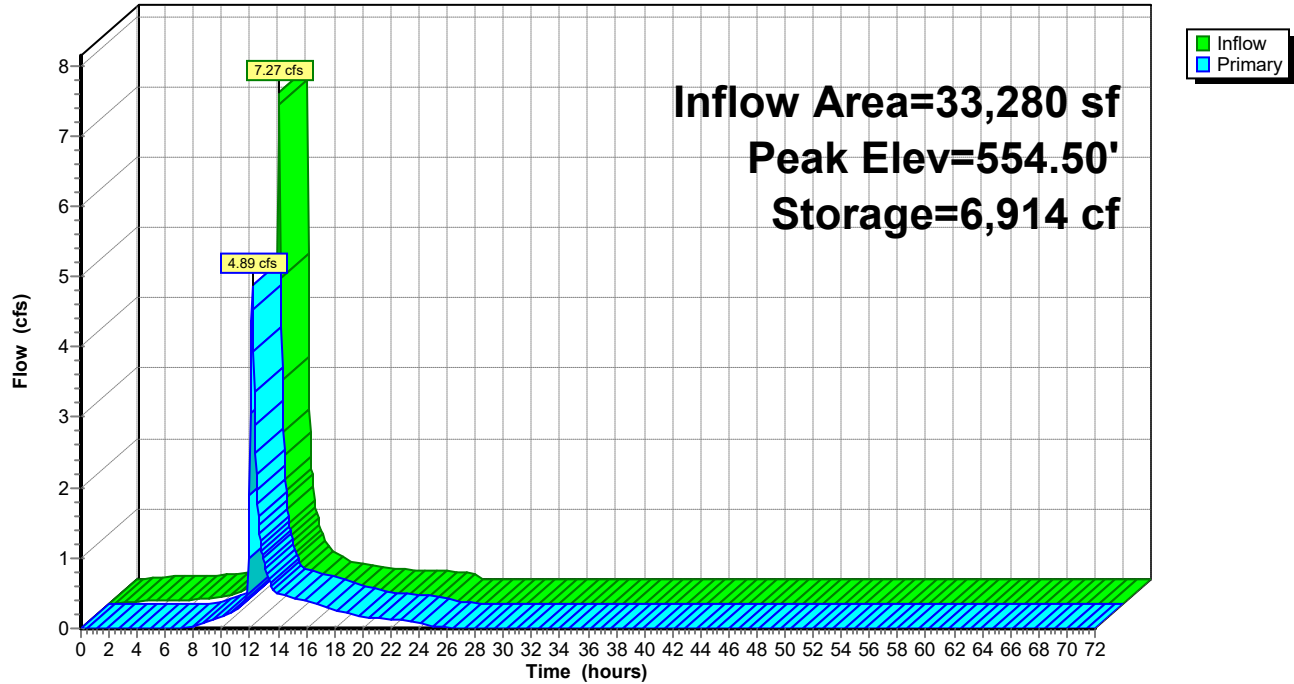
1=Culvert (Passes 4.85 cfs of 13.22 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.61 cfs @ 6.94 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 4.24 cfs @ 2.91 fps)

Pond A: BMP-A Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond A: BMP-A Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
551.50	1,445	0	554.10	2,983	5,677
551.55	1,471	73	554.15	3,017	5,827
551.60	1,498	147	554.20	3,051	5,979
551.65	1,524	223	554.25	3,086	6,132
551.70	1,550	300	554.30	3,120	6,287
551.75	1,577	378	554.35	3,154	6,444
551.80	1,603	457	554.40	3,189	6,603
551.85	1,629	538	554.45	3,223	6,763
551.90	1,655	620	554.50	3,258	6,925
551.95	1,682	704	554.55	3,292	7,089
552.00	1,708	788	554.60	3,326	7,254
552.05	1,737	874	554.65	3,361	7,421
552.10	1,766	962	554.70	3,395	7,590
552.15	1,794	1,051	554.75	3,429	7,761
552.20	1,823	1,141	554.80	3,464	7,933
552.25	1,852	1,233	554.85	3,498	8,107
552.30	1,880	1,327	554.90	3,532	8,283
552.35	1,909	1,421	554.95	3,567	8,461
552.40	1,938	1,517	555.00	3,601	8,640
552.45	1,967	1,615			
552.50	1,996	1,714			
552.55	2,024	1,815			
552.60	2,053	1,917			
552.65	2,082	2,020			
552.70	2,111	2,125			
552.75	2,139	2,231			
552.80	2,168	2,339			
552.85	2,197	2,448			
552.90	2,225	2,558			
552.95	2,254	2,670			
553.00	2,283	2,784			
553.05	2,315	2,899			
553.10	2,346	3,015			
553.15	2,378	3,133			
553.20	2,409	3,253			
553.25	2,441	3,374			
553.30	2,472	3,497			
553.35	2,504	3,621			
553.40	2,535	3,747			
553.45	2,567	3,875			
553.50	2,599	4,004			
553.55	2,630	4,135			
553.60	2,662	4,267			
553.65	2,693	4,401			
553.70	2,725	4,536			
553.75	2,756	4,673			
553.80	2,788	4,812			
553.85	2,819	4,952			
553.90	2,851	5,094			
553.95	2,882	5,237			
554.00	2,914	5,382			
554.05	2,948	5,529			

Summary for Pond B: BMP-B Bioretention Basin

Inflow Area = 192,100 sf, 58.28% Impervious, Inflow Depth = 9.61" for 100-Year-Future event
 Inflow = 39.66 cfs @ 12.09 hrs, Volume= 153,902 cf
 Outflow = 11.27 cfs @ 12.44 hrs, Volume= 146,592 cf, Atten= 72%, Lag= 21.1 min
 Primary = 11.27 cfs @ 12.44 hrs, Volume= 146,592 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 578.20' @ 12.44 hrs Surf.Area= 15,332 sf Storage= 61,623 cf

Plug-Flow detention time= 249.2 min calculated for 146,592 cf (95% of inflow)
 Center-of-Mass det. time= 219.8 min (1,007.0 - 787.3)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	89,710 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	13,937	0	0
575.00	14,311	14,124	14,124
576.00	14,656	14,484	28,608
577.00	14,969	14,813	43,420
578.00	15,253	15,111	58,531
579.00	15,644	15,449	73,980
580.00	15,817	15,731	89,710

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	30.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	574.50'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	576.85'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=11.27 cfs @ 12.44 hrs HW=578.20' (Free Discharge)

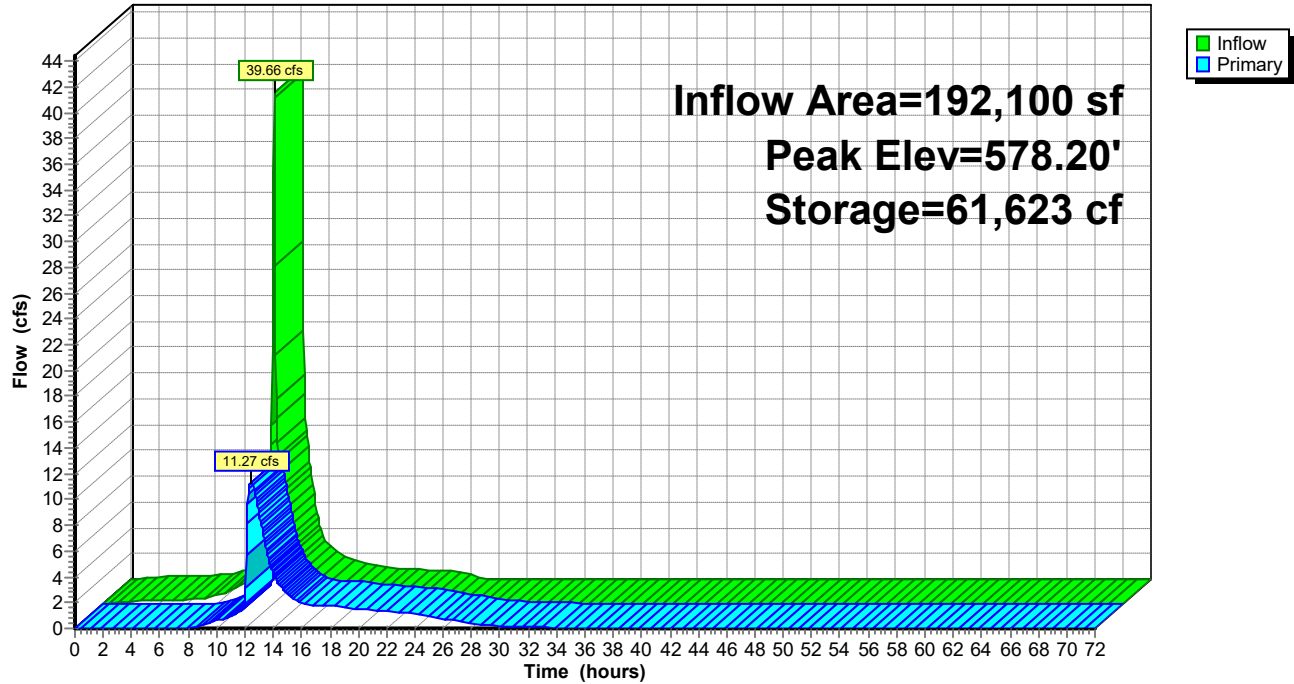
1=Culvert (Passes 11.27 cfs of 40.61 cfs potential flow)

2=Orifice/Grate (Orifice Controls 2.38 cfs @ 8.89 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 8.89 cfs @ 3.80 fps)

Pond B: BMP-B Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond B: BMP-B Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	13,937	0	579.20	15,679	77,112
574.10	13,974	1,396	579.30	15,696	78,680
574.20	14,012	2,795	579.40	15,713	80,251
574.30	14,049	4,198	579.50	15,731	81,823
574.40	14,087	5,605	579.60	15,748	83,397
574.50	14,124	7,015	579.70	15,765	84,973
574.60	14,161	8,430	579.80	15,782	86,550
574.70	14,199	9,848	579.90	15,800	88,129
574.80	14,236	11,269	580.00	15,817	89,710
574.90	14,274	12,695			
575.00	14,311	14,124			
575.10	14,346	15,557			
575.20	14,380	16,993			
575.30	14,414	18,433			
575.40	14,449	19,876			
575.50	14,484	21,323			
575.60	14,518	22,773			
575.70	14,553	24,226			
575.80	14,587	25,683			
575.90	14,621	27,144			
576.00	14,656	28,608			
576.10	14,687	30,075			
576.20	14,719	31,545			
576.30	14,750	33,018			
576.40	14,781	34,495			
576.50	14,813	35,975			
576.60	14,844	37,457			
576.70	14,875	38,943			
576.80	14,906	40,432			
576.90	14,938	41,925			
577.00	14,969	43,420			
577.10	14,997	44,918			
577.20	15,026	46,419			
577.30	15,054	47,923			
577.40	15,083	49,430			
577.50	15,111	50,940			
577.60	15,139	52,453			
577.70	15,168	53,968			
577.80	15,196	55,486			
577.90	15,225	57,007			
578.00	15,253	58,531			
578.10	15,292	60,058			
578.20	15,331	61,589			
578.30	15,370	63,124			
578.40	15,409	64,663			
578.50	15,449	66,206			
578.60	15,488	67,753			
578.70	15,527	69,304			
578.80	15,566	70,859			
578.90	15,605	72,417			
579.00	15,644	73,980			
579.10	15,661	75,545			

Summary for Pond C: BMP C Bioretention Basin

Inflow Area = 117,176 sf, 51.30% Impervious, Inflow Depth = 9.31" for 100-Year-Future event
 Inflow = 21.07 cfs @ 12.09 hrs, Volume= 90,940 cf
 Outflow = 5.04 cfs @ 12.49 hrs, Volume= 86,693 cf, Atten= 76%, Lag= 24.0 min
 Primary = 5.04 cfs @ 12.49 hrs, Volume= 86,693 cf
 Routed to Link 34L : PROPOSED TOTAL TO POA-1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 563.84' @ 12.49 hrs Surf.Area= 11,894 sf Storage= 35,857 cf

Plug-Flow detention time= 335.4 min calculated for 86,633 cf (95% of inflow)
 Center-of-Mass det. time= 307.1 min (1,111.0 - 803.8)

Volume	Invert	Avail.Storage	Storage Description
#1	560.00'	37,766 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
560.00	6,986	0	0
561.00	8,145	7,566	7,566
562.00	9,371	8,758	16,324
563.00	10,696	10,034	26,357
564.00	12,121	11,409	37,766

Device	Routing	Invert	Outlet Devices
#1	Primary	560.00'	24.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 560.00' / 559.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	560.55'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	562.20'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.04 cfs @ 12.49 hrs HW=563.84' (Free Discharge)

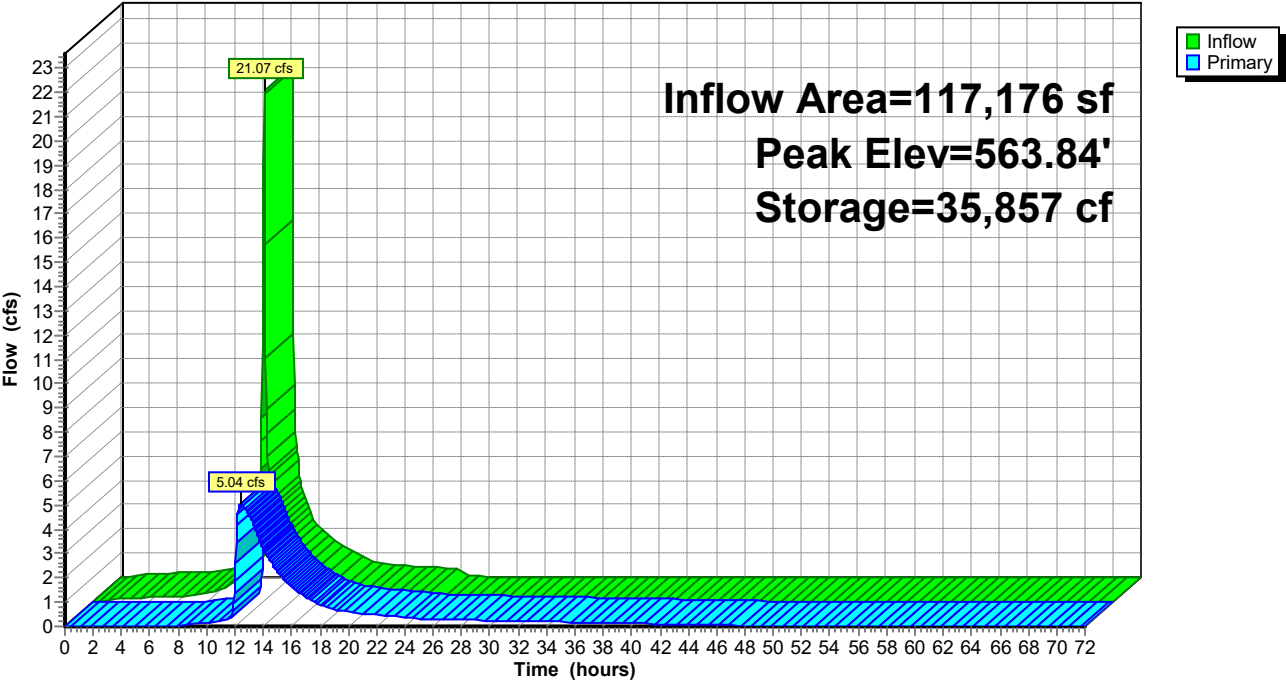
1=Culvert (Passes 5.04 cfs of 25.50 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.42 cfs @ 8.57 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 4.62 cfs @ 4.19 fps)

Pond C: BMP C Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond C: BMP C Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
560.00	6,986	0	562.60	10,166	22,185
560.05	7,044	351	562.65	10,232	22,695
560.10	7,102	704	562.70	10,299	23,208
560.15	7,160	1,061	562.75	10,365	23,724
560.20	7,218	1,420	562.80	10,431	24,244
560.25	7,276	1,783	562.85	10,497	24,768
560.30	7,334	2,148	562.90	10,563	25,294
560.35	7,392	2,516	562.95	10,630	25,824
560.40	7,450	2,887	563.00	10,696	26,357
560.45	7,508	3,261	563.05	10,767	26,894
560.50	7,566	3,638	563.10	10,839	27,434
560.55	7,623	4,018	563.15	10,910	27,977
560.60	7,681	4,400	563.20	10,981	28,525
560.65	7,739	4,786	563.25	11,052	29,076
560.70	7,797	5,174	563.30	11,123	29,630
560.75	7,855	5,565	563.35	11,195	30,188
560.80	7,913	5,960	563.40	11,266	30,749
560.85	7,971	6,357	563.45	11,337	31,314
560.90	8,029	6,757	563.50	11,409	31,883
560.95	8,087	7,160	563.55	11,480	32,455
561.00	8,145	7,566	563.60	11,551	33,031
561.05	8,206	7,974	563.65	11,622	33,610
561.10	8,268	8,386	563.70	11,694	34,193
561.15	8,329	8,801	563.75	11,765	34,780
561.20	8,390	9,219	563.80	11,836	35,370
561.25	8,452	9,640	563.85	11,907	35,963
561.30	8,513	10,064	563.90	11,978	36,561
561.35	8,574	10,491	563.95	12,050	37,161
561.40	8,635	10,922	564.00	12,121	37,766
561.45	8,697	11,355			
561.50	8,758	11,791			
561.55	8,819	12,231			
561.60	8,881	12,673			
561.65	8,942	13,119			
561.70	9,003	13,567			
561.75	9,065	14,019			
561.80	9,126	14,474			
561.85	9,187	14,932			
561.90	9,248	15,393			
561.95	9,310	15,856			
562.00	9,371	16,324			
562.05	9,437	16,794			
562.10	9,504	17,267			
562.15	9,570	17,744			
562.20	9,636	18,224			
562.25	9,702	18,708			
562.30	9,768	19,194			
562.35	9,835	19,685			
562.40	9,901	20,178			
562.45	9,967	20,675			
562.50	10,034	21,175			
562.55	10,100	21,678			

Summary for Pond F: UG INFILTRATION BASIN F

Inflow Area = 23,958 sf, 72.73% Impervious, Inflow Depth = 10.60" for 100-Year-Future event
 Inflow = 6.41 cfs @ 12.07 hrs, Volume= 21,172 cf
 Outflow = 4.94 cfs @ 12.12 hrs, Volume= 19,652 cf, Atten= 23%, Lag= 2.9 min
 Primary = 4.94 cfs @ 12.12 hrs, Volume= 19,652 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 601.58' @ 12.12 hrs Surf.Area= 2,230 sf Storage= 5,100 cf

Plug-Flow detention time= 114.7 min calculated for 19,638 cf (93% of inflow)
 Center-of-Mass det. time= 74.2 min (824.2 - 750.0)

Volume	Invert	Avail.Storage	Storage Description
#1	599.20'	7,086 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 7,381 cf Overall x 96.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
599.20	2,230	0	0
602.51	2,230	7,381	7,381

Device	Routing	Invert	Outlet Devices
#1	Primary	599.10'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 599.10' / 598.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	599.91'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	601.20'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.65 cfs @ 12.12 hrs HW=601.56' (Free Discharge)

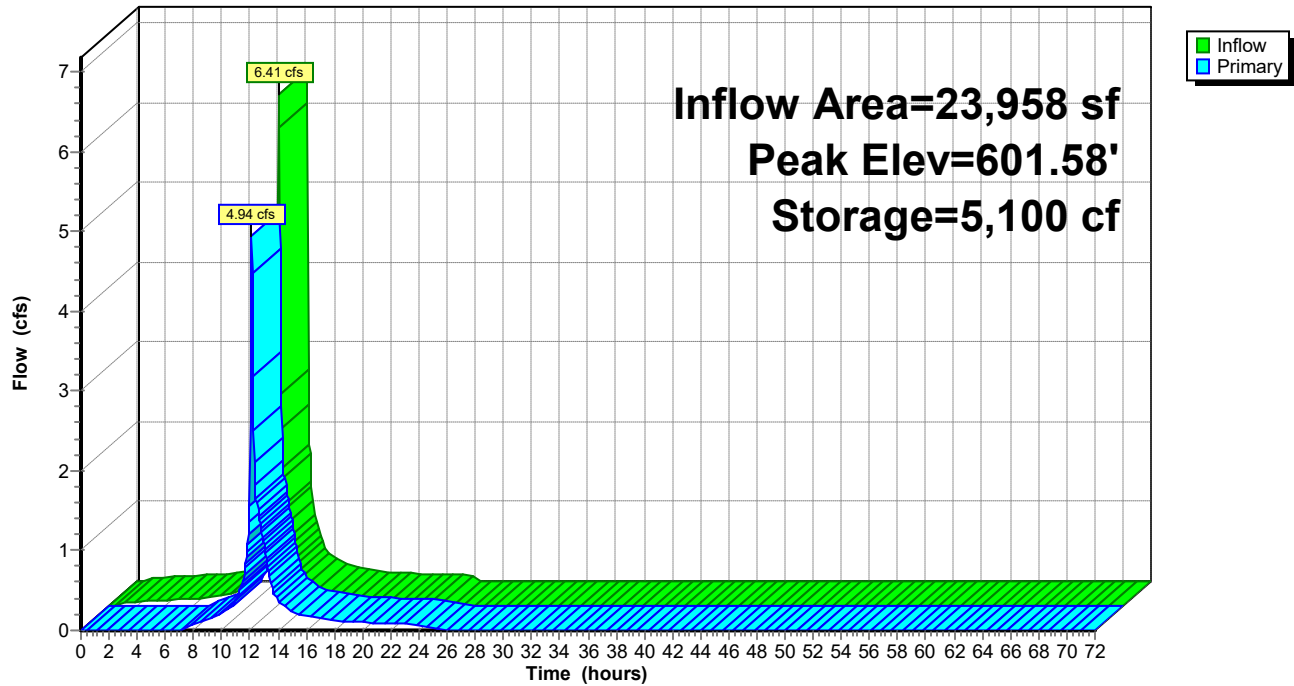
1=Culvert (Passes 4.65 cfs of 10.87 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.93 cfs @ 5.52 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 2.72 cfs @ 1.95 fps)

Pond F: UG INFILTRATION BASIN F

Hydrograph



Stage-Area-Storage for Pond F: UG INFILTRATION BASIN F

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
599.20	2,230	0	601.80	2,230	5,566
599.25	2,230	107	601.85	2,230	5,673
599.30	2,230	214	601.90	2,230	5,780
599.35	2,230	321	601.95	2,230	5,887
599.40	2,230	428	602.00	2,230	5,994
599.45	2,230	535	602.05	2,230	6,101
599.50	2,230	642	602.10	2,230	6,208
599.55	2,230	749	602.15	2,230	6,315
599.60	2,230	856	602.20	2,230	6,422
599.65	2,230	963	602.25	2,230	6,529
599.70	2,230	1,070	602.30	2,230	6,636
599.75	2,230	1,177	602.35	2,230	6,744
599.80	2,230	1,284	602.40	2,230	6,851
599.85	2,230	1,392	602.45	2,230	6,958
599.90	2,230	1,499	602.50	2,230	7,065
599.95	2,230	1,606			
600.00	2,230	1,713			
600.05	2,230	1,820			
600.10	2,230	1,927			
600.15	2,230	2,034			
600.20	2,230	2,141			
600.25	2,230	2,248			
600.30	2,230	2,355			
600.35	2,230	2,462			
600.40	2,230	2,569			
600.45	2,230	2,676			
600.50	2,230	2,783			
600.55	2,230	2,890			
600.60	2,230	2,997			
600.65	2,230	3,104			
600.70	2,230	3,211			
600.75	2,230	3,318			
600.80	2,230	3,425			
600.85	2,230	3,532			
600.90	2,230	3,639			
600.95	2,230	3,746			
601.00	2,230	3,853			
601.05	2,230	3,960			
601.10	2,230	4,068			
601.15	2,230	4,175			
601.20	2,230	4,282			
601.25	2,230	4,389			
601.30	2,230	4,496			
601.35	2,230	4,603			
601.40	2,230	4,710			
601.45	2,230	4,817			
601.50	2,230	4,924			
601.55	2,230	5,031			
601.60	2,230	5,138			
601.65	2,230	5,245			
601.70	2,230	5,352			
601.75	2,230	5,459			

Summary for Pond G: BMP-G Bioretention Basin

Inflow Area = 34,412 sf, 44.30% Impervious, Inflow Depth = 9.16" for 100-Year-Future event
 Inflow = 8.38 cfs @ 12.07 hrs, Volume= 26,275 cf
 Outflow = 1.29 cfs @ 12.54 hrs, Volume= 24,279 cf, Atten= 85%, Lag= 27.9 min
 Primary = 1.29 cfs @ 12.54 hrs, Volume= 24,279 cf
 Routed to Pond C : BMP C Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 611.72' @ 12.54 hrs Surf.Area= 4,835 sf Storage= 10,973 cf

Plug-Flow detention time= 175.1 min calculated for 24,262 cf (92% of inflow)
 Center-of-Mass det. time= 133.7 min (907.1 - 773.4)

Volume	Invert	Avail.Storage	Storage Description
#1	609.00'	17,634 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
609.00	3,088	0	0
610.00	3,880	3,484	3,484
611.00	4,426	4,153	7,637
612.00	4,993	4,710	12,347
613.00	5,582	5,288	17,634

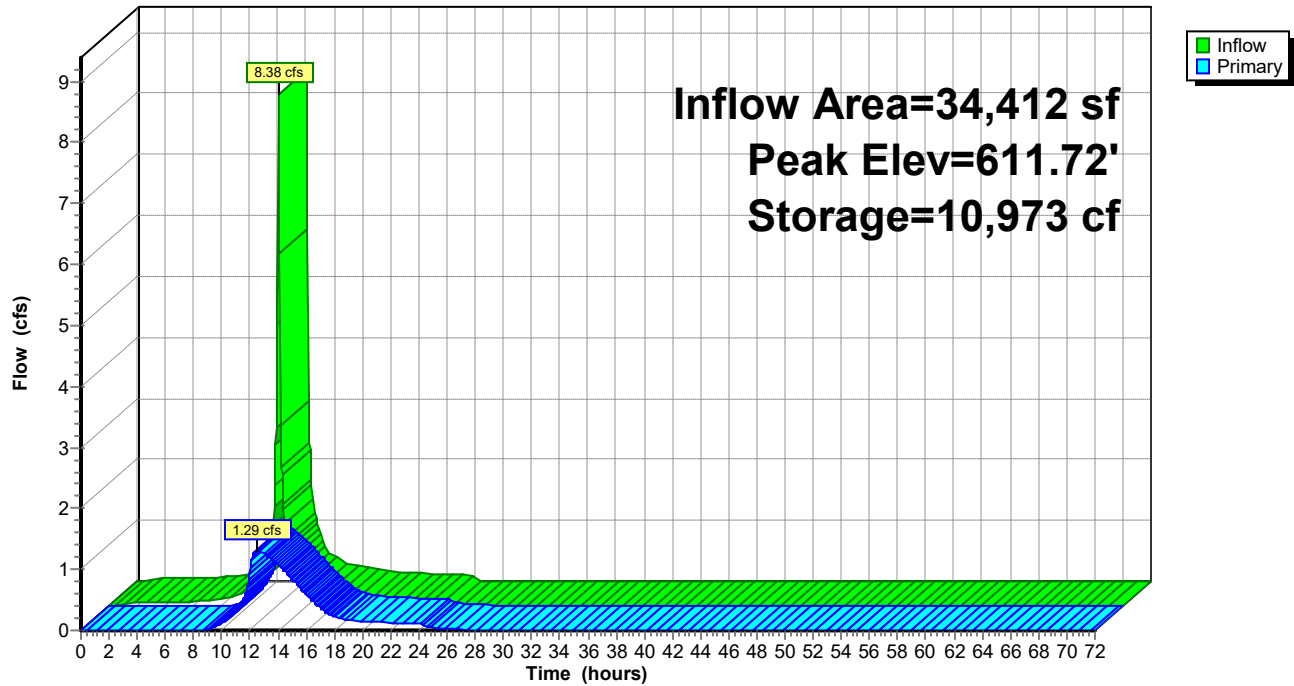
Device	Routing	Invert	Outlet Devices
#1	Primary	609.00'	18.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 609.00' / 608.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	609.60'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.29 cfs @ 12.54 hrs HW=611.72' (Free Discharge)

↑ **1=Culvert** (Passes 1.29 cfs of 11.58 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.29 cfs @ 6.58 fps)

Pond G: BMP-G Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond G: BMP-G Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
609.00	3,088	0	611.60	4,766	10,395
609.05	3,128	155	611.65	4,795	10,634
609.10	3,167	313	611.70	4,823	10,874
609.15	3,207	472	611.75	4,851	11,116
609.20	3,246	633	611.80	4,880	11,359
609.25	3,286	797	611.85	4,908	11,604
609.30	3,326	962	611.90	4,936	11,850
609.35	3,365	1,129	611.95	4,965	12,098
609.40	3,405	1,299	612.00	4,993	12,347
609.45	3,444	1,470	612.05	5,022	12,597
609.50	3,484	1,643	612.10	5,052	12,849
609.55	3,524	1,818	612.15	5,081	13,102
609.60	3,563	1,995	612.20	5,111	13,357
609.65	3,603	2,175	612.25	5,140	13,613
609.70	3,642	2,356	612.30	5,170	13,871
609.75	3,682	2,539	612.35	5,199	14,130
609.80	3,722	2,724	612.40	5,229	14,391
609.85	3,761	2,911	612.45	5,258	14,653
609.90	3,801	3,100	612.50	5,288	14,917
609.95	3,840	3,291	612.55	5,317	15,182
610.00	3,880	3,484	612.60	5,346	15,448
610.05	3,907	3,679	612.65	5,376	15,716
610.10	3,935	3,875	612.70	5,405	15,986
610.15	3,962	4,072	612.75	5,435	16,257
610.20	3,989	4,271	612.80	5,464	16,529
610.25	4,017	4,471	612.85	5,494	16,803
610.30	4,044	4,673	612.90	5,523	17,079
610.35	4,071	4,875	612.95	5,553	17,356
610.40	4,098	5,080	613.00	5,582	17,634
610.45	4,126	5,285			
610.50	4,153	5,492			
610.55	4,180	5,701			
610.60	4,208	5,910			
610.65	4,235	6,121			
610.70	4,262	6,334			
610.75	4,290	6,548			
610.80	4,317	6,763			
610.85	4,344	6,979			
610.90	4,371	7,197			
610.95	4,399	7,416			
611.00	4,426	7,637			
611.05	4,454	7,859			
611.10	4,483	8,082			
611.15	4,511	8,307			
611.20	4,539	8,534			
611.25	4,568	8,761			
611.30	4,596	8,990			
611.35	4,624	9,221			
611.40	4,653	9,453			
611.45	4,681	9,686			
611.50	4,710	9,921			
611.55	4,738	10,157			

Summary for Pond H: BMP-H Bioretention Basin

Inflow Area = 44,431 sf, 52.94% Impervious, Inflow Depth = 9.60" for 100-Year-Future event
 Inflow = 11.16 cfs @ 12.08 hrs, Volume= 35,548 cf
 Outflow = 4.26 cfs @ 12.20 hrs, Volume= 32,945 cf, Atten= 62%, Lag= 7.2 min
 Primary = 4.26 cfs @ 12.20 hrs, Volume= 32,945 cf
 Routed to Pond B : BMP-B Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 611.42' @ 12.20 hrs Surf.Area= 7,773 sf Storage= 9,996 cf

Plug-Flow detention time= 117.1 min calculated for 32,945 cf (93% of inflow)
 Center-of-Mass det. time= 74.6 min (840.7 - 766.1)

Volume	Invert	Avail.Storage	Storage Description
#1	610.00'	14,668 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
610.00	6,303	0	0
611.00	7,320	6,812	6,812
612.00	8,393	7,857	14,668

Device	Routing	Invert	Outlet Devices
#1	Primary	606.90'	18.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 606.90' / 606.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	610.40'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.25 cfs @ 12.20 hrs HW=611.42' (Free Discharge)

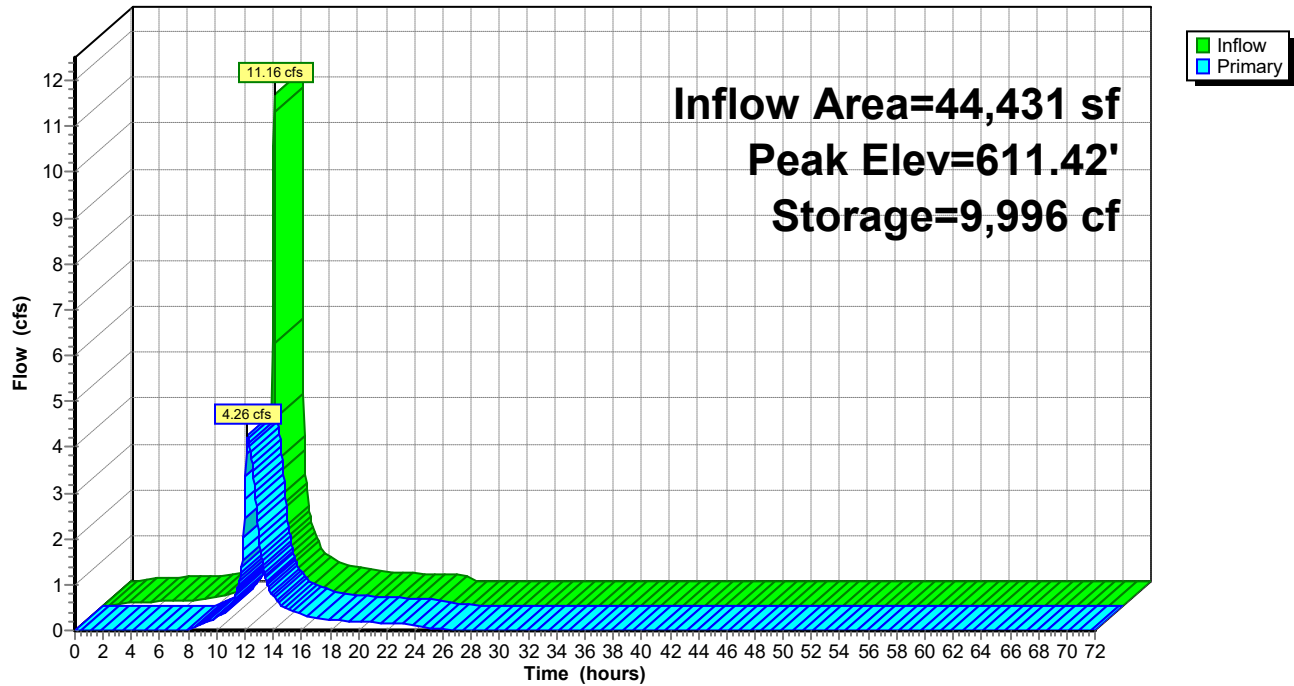
1=Culvert (Passes 4.25 cfs of 14.83 cfs potential flow)

2=Orifice/Grate (Orifice Controls 4.21 cfs @ 4.21 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.04 cfs @ 0.48 fps)

Pond H: BMP-H Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond H: BMP-H Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
610.00	6,303	0	611.04	7,363	7,105
610.02	6,323	126	611.06	7,384	7,253
610.04	6,344	253	611.08	7,406	7,401
610.06	6,364	380	611.10	7,427	7,549
610.08	6,384	507	611.12	7,449	7,698
610.10	6,405	635	611.14	7,470	7,847
610.12	6,425	764	611.16	7,492	7,996
610.14	6,445	892	611.18	7,513	8,146
610.16	6,466	1,021	611.20	7,535	8,297
610.18	6,486	1,151	611.22	7,556	8,448
610.20	6,506	1,281	611.24	7,578	8,599
610.22	6,527	1,411	611.26	7,599	8,751
610.24	6,547	1,542	611.28	7,620	8,903
610.26	6,567	1,673	611.30	7,642	9,056
610.28	6,588	1,805	611.32	7,663	9,209
610.30	6,608	1,937	611.34	7,685	9,362
610.32	6,628	2,069	611.36	7,706	9,516
610.34	6,649	2,202	611.38	7,728	9,671
610.36	6,669	2,335	611.40	7,749	9,825
610.38	6,689	2,469	611.42	7,771	9,981
610.40	6,710	2,603	611.44	7,792	10,136
610.42	6,730	2,737	611.46	7,814	10,292
610.44	6,750	2,872	611.48	7,835	10,449
610.46	6,771	3,007	611.50	7,857	10,606
610.48	6,791	3,143	611.52	7,878	10,763
610.50	6,812	3,279	611.54	7,899	10,921
610.52	6,832	3,415	611.56	7,921	11,079
610.54	6,852	3,552	611.58	7,942	11,238
610.56	6,873	3,689	611.60	7,964	11,397
610.58	6,893	3,827	611.62	7,985	11,556
610.60	6,913	3,965	611.64	8,007	11,716
610.62	6,934	4,103	611.66	8,028	11,876
610.64	6,954	4,242	611.68	8,050	12,037
610.66	6,974	4,381	611.70	8,071	12,198
610.68	6,995	4,521	611.72	8,093	12,360
610.70	7,015	4,661	611.74	8,114	12,522
610.72	7,035	4,802	611.76	8,135	12,685
610.74	7,056	4,943	611.78	8,157	12,848
610.76	7,076	5,084	611.80	8,178	13,011
610.78	7,096	5,226	611.82	8,200	13,175
610.80	7,117	5,368	611.84	8,221	13,339
610.82	7,137	5,510	611.86	8,243	13,503
610.84	7,157	5,653	611.88	8,264	13,669
610.86	7,178	5,797	611.90	8,286	13,834
610.88	7,198	5,940	611.92	8,307	14,000
610.90	7,218	6,085	611.94	8,329	14,166
610.92	7,239	6,229	611.96	8,350	14,333
610.94	7,259	6,374	611.98	8,372	14,500
610.96	7,279	6,520	612.00	8,393	14,668
610.98	7,300	6,665			
611.00	7,320	6,812			
611.02	7,341	6,958			

Summary for Pond I: BMP-I Bioretention Basin

Inflow Area = 40,946 sf, 59.57% Impervious, Inflow Depth = 9.94" for 100-Year-Future event
 Inflow = 10.78 cfs @ 12.08 hrs, Volume= 33,908 cf
 Outflow = 8.18 cfs @ 12.12 hrs, Volume= 31,581 cf, Atten= 24%, Lag= 2.6 min
 Primary = 8.18 cfs @ 12.12 hrs, Volume= 31,581 cf
 Routed to Link 45L : PROPOSED TOTAL TO POA-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 616.04' @ 12.12 hrs Surf.Area= 3,685 sf Storage= 8,126 cf

Plug-Flow detention time= 108.2 min calculated for 31,581 cf (93% of inflow)
 Center-of-Mass det. time= 67.7 min (827.9 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	613.20'	13,272 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
613.20	2,027	0	0
614.00	2,508	1,814	1,814
616.00	3,660	6,168	7,982
617.30	4,479	5,290	13,272

Device	Routing	Invert	Outlet Devices
#1	Primary	610.00'	18.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 610.00' / 608.50' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.20'	10.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	615.40'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=7.88 cfs @ 12.12 hrs HW=616.02' (Free Discharge)

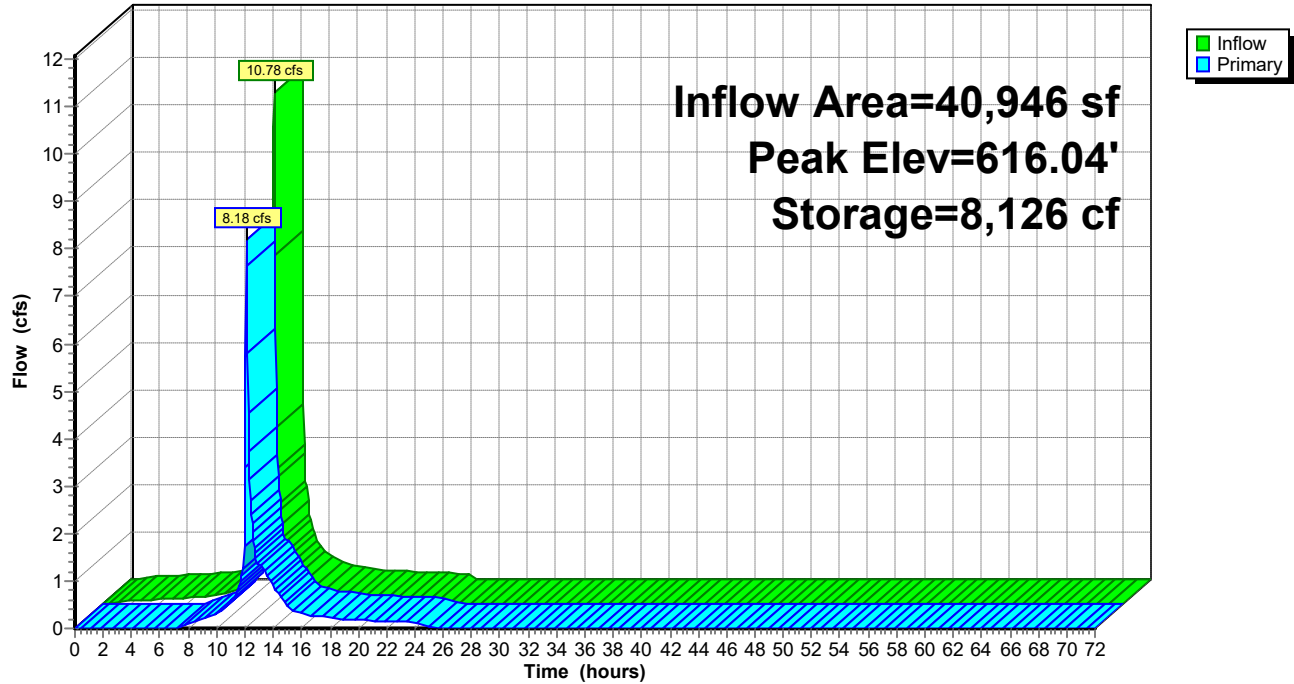
1=Culvert (Passes 7.88 cfs of 19.53 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.72 cfs @ 6.18 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 6.16 cfs @ 2.57 fps)

Pond I: BMP-I Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond I: BMP-I Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
613.20	2,027	0	615.80	3,545	7,262
613.25	2,057	102	615.85	3,574	7,439
613.30	2,087	206	615.90	3,602	7,619
613.35	2,117	311	615.95	3,631	7,800
613.40	2,147	417	616.00	3,660	7,982
613.45	2,177	526	616.05	3,692	8,166
613.50	2,207	635	616.10	3,723	8,351
613.55	2,237	746	616.15	3,755	8,538
613.60	2,268	859	616.20	3,786	8,727
613.65	2,298	973	616.25	3,817	8,917
613.70	2,328	1,089	616.30	3,849	9,108
613.75	2,358	1,206	616.35	3,881	9,302
613.80	2,388	1,324	616.40	3,912	9,496
613.85	2,418	1,445	616.45	3,944	9,693
613.90	2,448	1,566	616.50	3,975	9,891
613.95	2,478	1,689	616.55	4,007	10,090
614.00	2,508	1,814	616.60	4,038	10,291
614.05	2,537	1,940	616.65	4,070	10,494
614.10	2,566	2,068	616.70	4,101	10,698
614.15	2,594	2,197	616.75	4,132	10,904
614.20	2,623	2,327	616.80	4,164	11,112
614.25	2,652	2,459	616.85	4,195	11,321
614.30	2,681	2,592	616.90	4,227	11,531
614.35	2,710	2,727	616.95	4,258	11,743
614.40	2,738	2,863	617.00	4,290	11,957
614.45	2,767	3,001	617.05	4,322	12,172
614.50	2,796	3,140	617.10	4,353	12,389
614.55	2,825	3,281	617.15	4,385	12,608
614.60	2,854	3,422	617.20	4,416	12,828
614.65	2,882	3,566	617.25	4,447	13,049
614.70	2,911	3,711	617.30	4,479	13,272
614.75	2,940	3,857			
614.80	2,969	4,005			
614.85	2,998	4,154			
614.90	3,026	4,304			
614.95	3,055	4,457			
615.00	3,084	4,610			
615.05	3,113	4,765			
615.10	3,142	4,921			
615.15	3,170	5,079			
615.20	3,199	5,238			
615.25	3,228	5,399			
615.30	3,257	5,561			
615.35	3,286	5,725			
615.40	3,314	5,890			
615.45	3,343	6,056			
615.50	3,372	6,224			
615.55	3,401	6,393			
615.60	3,430	6,564			
615.65	3,458	6,736			
615.70	3,487	6,910			
615.75	3,516	7,085			

Summary for Pond J: BMP-J Bioretention Basin

Inflow Area = 37,026 sf, 62.35% Impervious, Inflow Depth = 10.08" for 100-Year-Future event
 Inflow = 9.45 cfs @ 12.09 hrs, Volume= 31,097 cf
 Outflow = 1.55 cfs @ 12.54 hrs, Volume= 29,087 cf, Atten= 84%, Lag= 27.0 min
 Primary = 1.55 cfs @ 12.54 hrs, Volume= 29,087 cf
 Routed to Pond K : BMP-K UG Infiltration Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 611.99' @ 12.54 hrs Surf.Area= 4,042 sf Storage= 15,794 cf

Plug-Flow detention time= 383.6 min calculated for 29,067 cf (93% of inflow)
 Center-of-Mass det. time= 347.2 min (1,106.3 - 759.1)

Volume	Invert	Avail.Storage	Storage Description
#1	607.00'	20,072 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
607.00	2,351	0	0
608.00	2,658	2,505	2,505
609.00	2,981	2,820	5,324
610.00	3,320	3,151	8,475
611.00	3,675	3,498	11,972
612.00	4,046	3,861	15,833
613.00	4,433	4,240	20,072

Device	Routing	Invert	Outlet Devices
#1	Primary	602.30'	18.0" Round Culvert L= 116.0' Ke= 0.500 Inlet / Outlet Invert= 602.30' / 601.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	607.81'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	611.80'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.55 cfs @ 12.54 hrs HW=611.99' (Free Discharge)

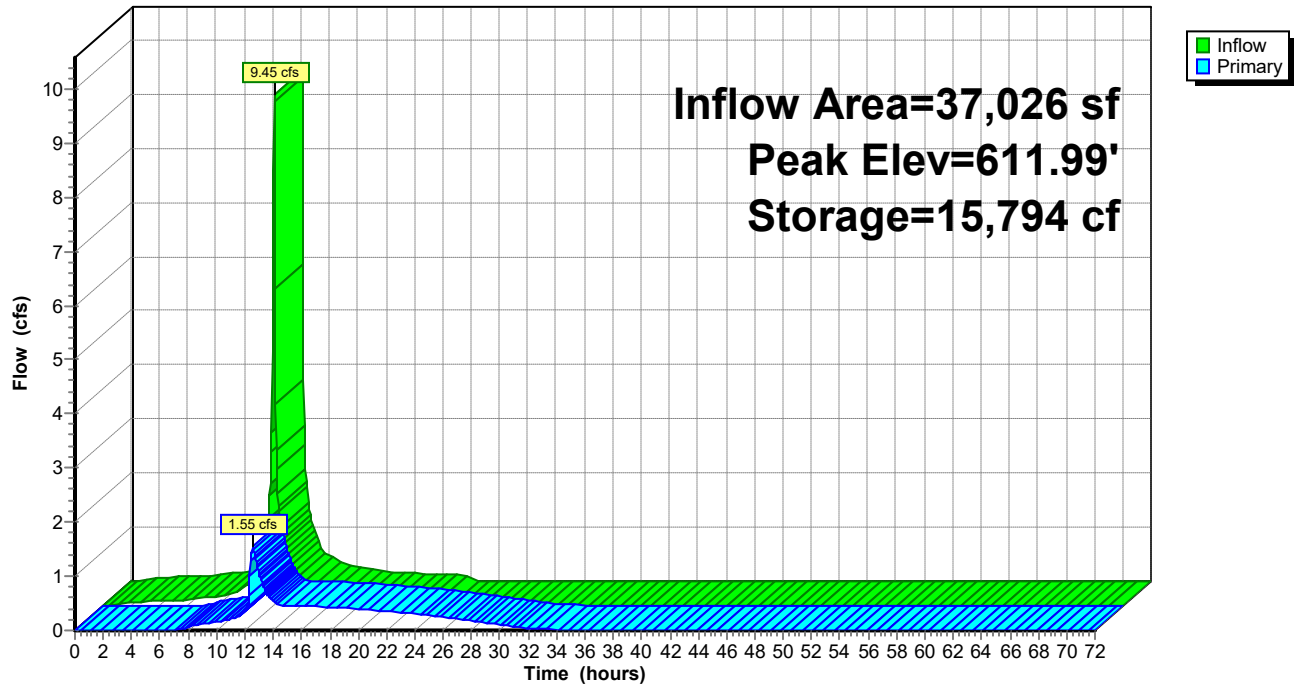
1=Culvert (Passes 1.55 cfs of 22.07 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.48 cfs @ 9.70 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.07 cfs @ 1.42 fps)

Pond J: BMP-J Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond J: BMP-J Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
607.00	2,351	0	612.20	4,123	16,649
607.10	2,382	237	612.30	4,162	17,064
607.20	2,412	476	612.40	4,201	17,482
607.30	2,443	719	612.50	4,240	17,904
607.40	2,474	965	612.60	4,278	18,330
607.50	2,505	1,214	612.70	4,317	18,760
607.60	2,535	1,466	612.80	4,356	19,193
607.70	2,566	1,721	612.90	4,394	19,631
607.80	2,597	1,979	613.00	4,433	20,072
607.90	2,627	2,240			
608.00	2,658	2,505			
608.10	2,690	2,772			
608.20	2,723	3,043			
608.30	2,755	3,316			
608.40	2,787	3,594			
608.50	2,820	3,874			
608.60	2,852	4,157			
608.70	2,884	4,444			
608.80	2,916	4,734			
608.90	2,949	5,028			
609.00	2,981	5,324			
609.10	3,015	5,624			
609.20	3,049	5,927			
609.30	3,083	6,234			
609.40	3,117	6,544			
609.50	3,151	6,857			
609.60	3,184	7,174			
609.70	3,218	7,494			
609.80	3,252	7,817			
609.90	3,286	8,144			
610.00	3,320	8,475			
610.10	3,356	8,808			
610.20	3,391	9,146			
610.30	3,426	9,486			
610.40	3,462	9,831			
610.50	3,498	10,179			
610.60	3,533	10,530			
610.70	3,569	10,885			
610.80	3,604	11,244			
610.90	3,639	11,606			
611.00	3,675	11,972			
611.10	3,712	12,341			
611.20	3,749	12,714			
611.30	3,786	13,091			
611.40	3,823	13,472			
611.50	3,861	13,856			
611.60	3,898	14,244			
611.70	3,935	14,635			
611.80	3,972	15,031			
611.90	4,009	15,430			
612.00	4,046	15,833			
612.10	4,085	16,239			

Summary for Pond K: BMP-K UG Infiltration Basin

Inflow Area = 89,734 sf, 63.11% Impervious, Inflow Depth = 9.85" for 100-Year-Future event
 Inflow = 12.74 cfs @ 12.08 hrs, Volume= 73,640 cf
 Outflow = 9.01 cfs @ 12.15 hrs, Volume= 70,541 cf, Atten= 29%, Lag= 4.1 min
 Primary = 9.01 cfs @ 12.15 hrs, Volume= 70,541 cf
 Routed to Link 48L : PROPOSED TOTAL TO POA-4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 597.58' @ 12.15 hrs Surf.Area= 2,960 sf Storage= 12,024 cf

Plug-Flow detention time= 127.5 min calculated for 70,541 cf (96% of inflow)
 Center-of-Mass det. time= 88.7 min (984.6 - 895.9)

Volume	Invert	Avail.Storage	Storage Description
#1	593.30'	12,373 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,024 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
593.30	2,960	0	0
597.70	2,960	13,024	13,024

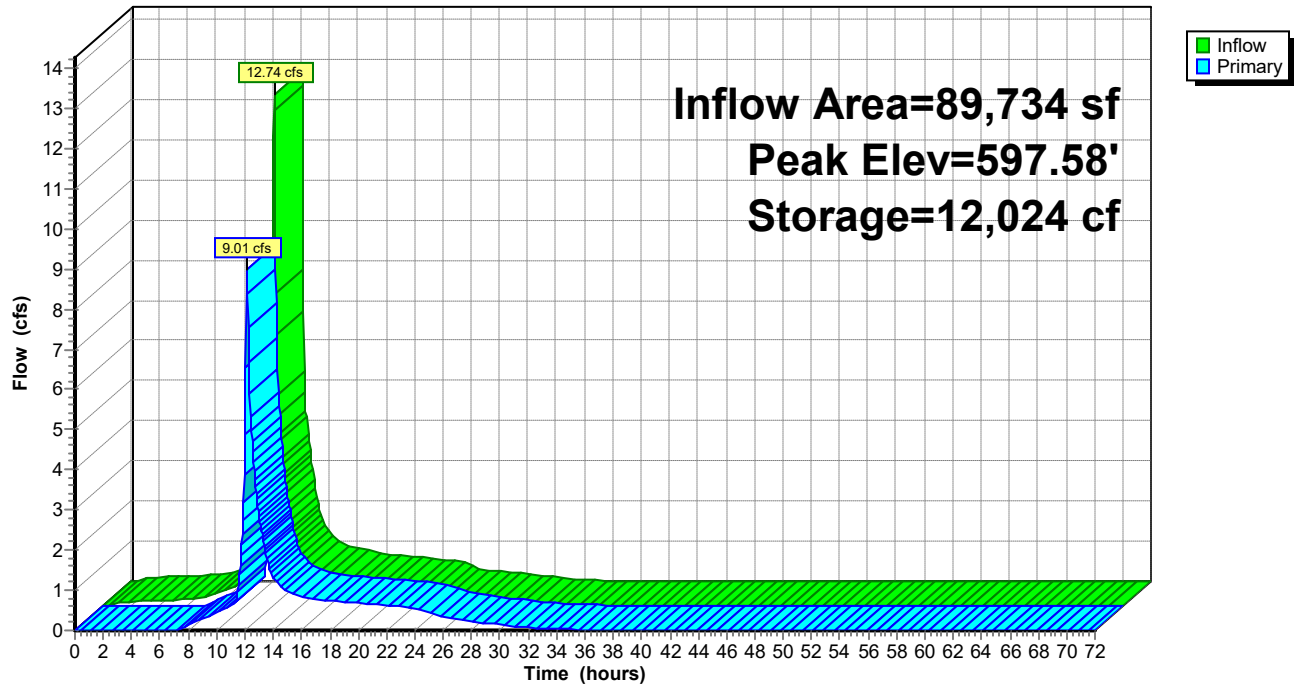
Device	Routing	Invert	Outlet Devices
#1	Primary	593.20'	18.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 593.20' / 593.00' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	594.40'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	595.90'	18.0" W x 5.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	596.40'	1.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=8.99 cfs @ 12.15 hrs HW=597.57' (Free Discharge)

1=Culvert (Passes 8.99 cfs of 16.20 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.13 cfs @ 8.29 fps)
 3=Orifice/Grate (Orifice Controls 3.64 cfs @ 5.82 fps)
 4=Broad-Crested Rectangular Weir (Weir Controls 4.22 cfs @ 3.60 fps)

Pond K: BMP-K UG Infiltration Basin

Hydrograph



Stage-Area-Storage for Pond K: BMP-K UG Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.30	2,960	0	595.90	2,960	7,311
593.35	2,960	141	595.95	2,960	7,452
593.40	2,960	281	596.00	2,960	7,592
593.45	2,960	422	596.05	2,960	7,733
593.50	2,960	562	596.10	2,960	7,874
593.55	2,960	703	596.15	2,960	8,014
593.60	2,960	844	596.20	2,960	8,155
593.65	2,960	984	596.25	2,960	8,295
593.70	2,960	1,125	596.30	2,960	8,436
593.75	2,960	1,265	596.35	2,960	8,577
593.80	2,960	1,406	596.40	2,960	8,717
593.85	2,960	1,547	596.45	2,960	8,858
593.90	2,960	1,687	596.50	2,960	8,998
593.95	2,960	1,828	596.55	2,960	9,139
594.00	2,960	1,968	596.60	2,960	9,280
594.05	2,960	2,109	596.65	2,960	9,420
594.10	2,960	2,250	596.70	2,960	9,561
594.15	2,960	2,390	596.75	2,960	9,701
594.20	2,960	2,531	596.80	2,960	9,842
594.25	2,960	2,671	596.85	2,960	9,983
594.30	2,960	2,812	596.90	2,960	10,123
594.35	2,960	2,953	596.95	2,960	10,264
594.40	2,960	3,093	597.00	2,960	10,404
594.45	2,960	3,234	597.05	2,960	10,545
594.50	2,960	3,374	597.10	2,960	10,686
594.55	2,960	3,515	597.15	2,960	10,826
594.60	2,960	3,656	597.20	2,960	10,967
594.65	2,960	3,796	597.25	2,960	11,107
594.70	2,960	3,937	597.30	2,960	11,248
594.75	2,960	4,077	597.35	2,960	11,389
594.80	2,960	4,218	597.40	2,960	11,529
594.85	2,960	4,359	597.45	2,960	11,670
594.90	2,960	4,499	597.50	2,960	11,810
594.95	2,960	4,640	597.55	2,960	11,951
595.00	2,960	4,780	597.60	2,960	12,092
595.05	2,960	4,921	597.65	2,960	12,232
595.10	2,960	5,062	597.70	2,960	12,373
595.15	2,960	5,202			
595.20	2,960	5,343			
595.25	2,960	5,483			
595.30	2,960	5,624			
595.35	2,960	5,765			
595.40	2,960	5,905			
595.45	2,960	6,046			
595.50	2,960	6,186			
595.55	2,960	6,327			
595.60	2,960	6,468			
595.65	2,960	6,608			
595.70	2,960	6,749			
595.75	2,960	6,889			
595.80	2,960	7,030			
595.85	2,960	7,171			

Summary for Pond M: BMP-M Bioretention Basin

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 10.20" for 100-Year-Future event
 Inflow = 24.85 cfs @ 12.09 hrs, Volume= 80,001 cf
 Outflow = 17.22 cfs @ 12.14 hrs, Volume= 74,633 cf, Atten= 31%, Lag= 3.4 min
 Primary = 17.22 cfs @ 12.14 hrs, Volume= 74,633 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 570.59' @ 12.14 hrs Surf.Area= 7,237 sf Storage= 16,236 cf

Plug-Flow detention time= 106.1 min calculated for 74,581 cf (93% of inflow)
 Center-of-Mass det. time= 68.0 min (824.9 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	568.00'	23,109 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
568.00	5,308	0	0
569.00	6,029	5,669	5,669
570.00	6,776	6,403	12,071
571.00	7,551	7,164	19,235
571.50	7,948	3,875	23,109

Device	Routing	Invert	Outlet Devices
#1	Primary	564.50'	24.0" Round Culvert L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 564.50' / 562.50' S= 0.0625 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	568.95'	10.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	569.50'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=17.00 cfs @ 12.14 hrs HW=570.58' TW=566.85' (Fixed TW Elev= 566.85')

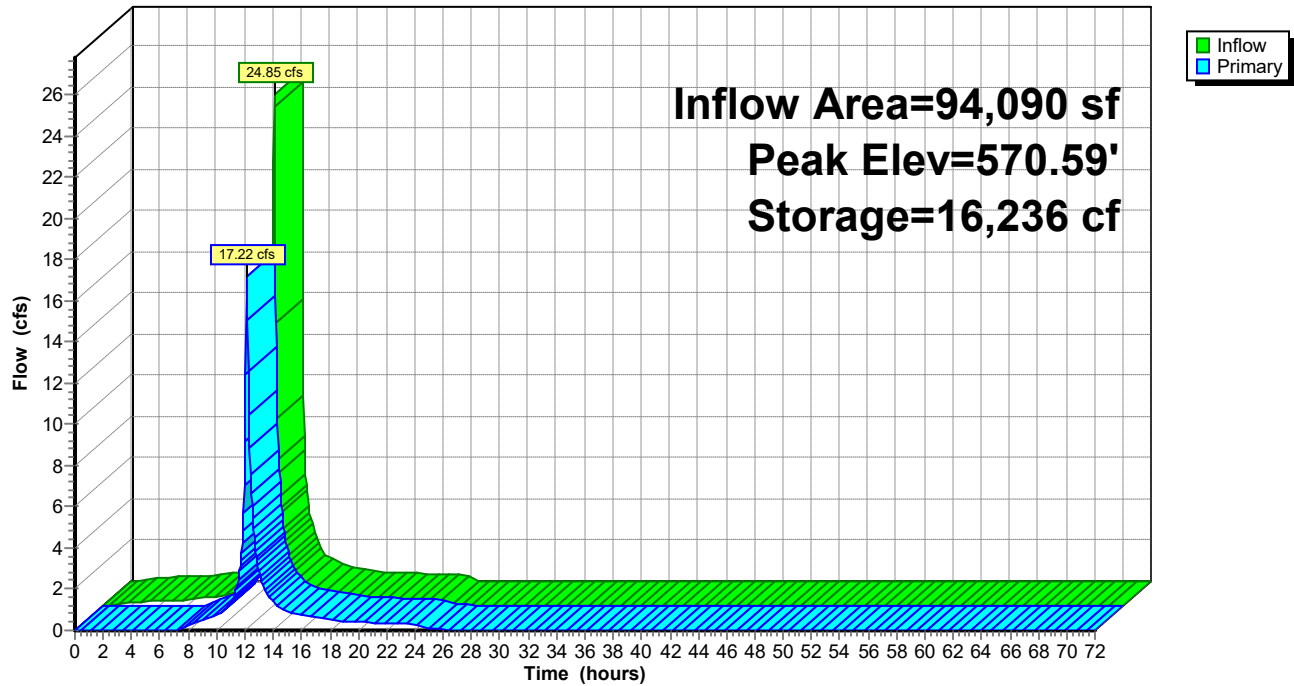
1=Culvert (Passes 17.00 cfs of 29.22 cfs potential flow)

2=Orifice/Grate (Orifice Controls 5.79 cfs @ 5.31 fps)

3=Broad-Crested Rectangular Weir (Weir Controls 11.21 cfs @ 3.45 fps)

Pond M: BMP-M Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond M: BMP-M Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
568.00	5,308	0	570.60	7,241	16,276
568.05	5,344	266	570.65	7,280	16,639
568.10	5,380	534	570.70	7,319	17,004
568.15	5,416	804	570.75	7,357	17,371
568.20	5,452	1,076	570.80	7,396	17,740
568.25	5,488	1,350	570.85	7,435	18,111
568.30	5,524	1,625	570.90	7,473	18,483
568.35	5,560	1,902	570.95	7,512	18,858
568.40	5,596	2,181	571.00	7,551	19,235
568.45	5,632	2,462	571.05	7,591	19,613
568.50	5,669	2,744	571.10	7,630	19,994
568.55	5,705	3,028	571.15	7,670	20,376
568.60	5,741	3,315	571.20	7,710	20,761
568.65	5,777	3,603	571.25	7,750	21,147
568.70	5,813	3,892	571.30	7,789	21,536
568.75	5,849	4,184	571.35	7,829	21,926
568.80	5,885	4,477	571.40	7,869	22,318
568.85	5,921	4,772	571.45	7,908	22,713
568.90	5,957	5,069	571.50	7,948	23,109
568.95	5,993	5,368			
569.00	6,029	5,669			
569.05	6,066	5,971			
569.10	6,104	6,275			
569.15	6,141	6,581			
569.20	6,178	6,889			
569.25	6,216	7,199			
569.30	6,253	7,511			
569.35	6,290	7,824			
569.40	6,328	8,140			
569.45	6,365	8,457			
569.50	6,403	8,776			
569.55	6,440	9,097			
569.60	6,477	9,420			
569.65	6,515	9,745			
569.70	6,552	10,072			
569.75	6,589	10,400			
569.80	6,627	10,731			
569.85	6,664	11,063			
569.90	6,701	11,397			
569.95	6,739	11,733			
570.00	6,776	12,071			
570.05	6,815	12,411			
570.10	6,854	12,752			
570.15	6,892	13,096			
570.20	6,931	13,442			
570.25	6,970	13,789			
570.30	7,008	14,139			
570.35	7,047	14,490			
570.40	7,086	14,843			
570.45	7,125	15,199			
570.50	7,164	15,556			
570.55	7,202	15,915			

Summary for Pond N: BMP-N Bioretention Basin

Inflow Area = 45,738 sf, 60.00% Impervious, Inflow Depth = 9.96" for 100-Year-Future event
 Inflow = 11.89 cfs @ 12.08 hrs, Volume= 37,958 cf
 Outflow = 8.01 cfs @ 12.14 hrs, Volume= 35,433 cf, Atten= 33%, Lag= 3.4 min
 Primary = 8.01 cfs @ 12.14 hrs, Volume= 35,433 cf
 Routed to Pond P : BMP-P Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 599.90' @ 12.14 hrs Surf.Area= 2,789 sf Storage= 8,988 cf

Plug-Flow detention time= 114.8 min calculated for 35,433 cf (93% of inflow)
 Center-of-Mass det. time= 75.7 min (835.9 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	596.50'	12,084 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
596.50	2,488	0	0
597.00	2,519	1,252	1,252
598.00	2,630	2,575	3,826
599.00	2,722	2,676	6,502
600.00	2,796	2,759	9,261
601.00	2,850	2,823	12,084

Device	Routing	Invert	Outlet Devices
#1	Primary	596.40'	24.0" Round Culvert L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 596.40' / 595.60' S= 0.0111 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	598.50'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=7.89 cfs @ 12.14 hrs HW=599.88' (Free Discharge)

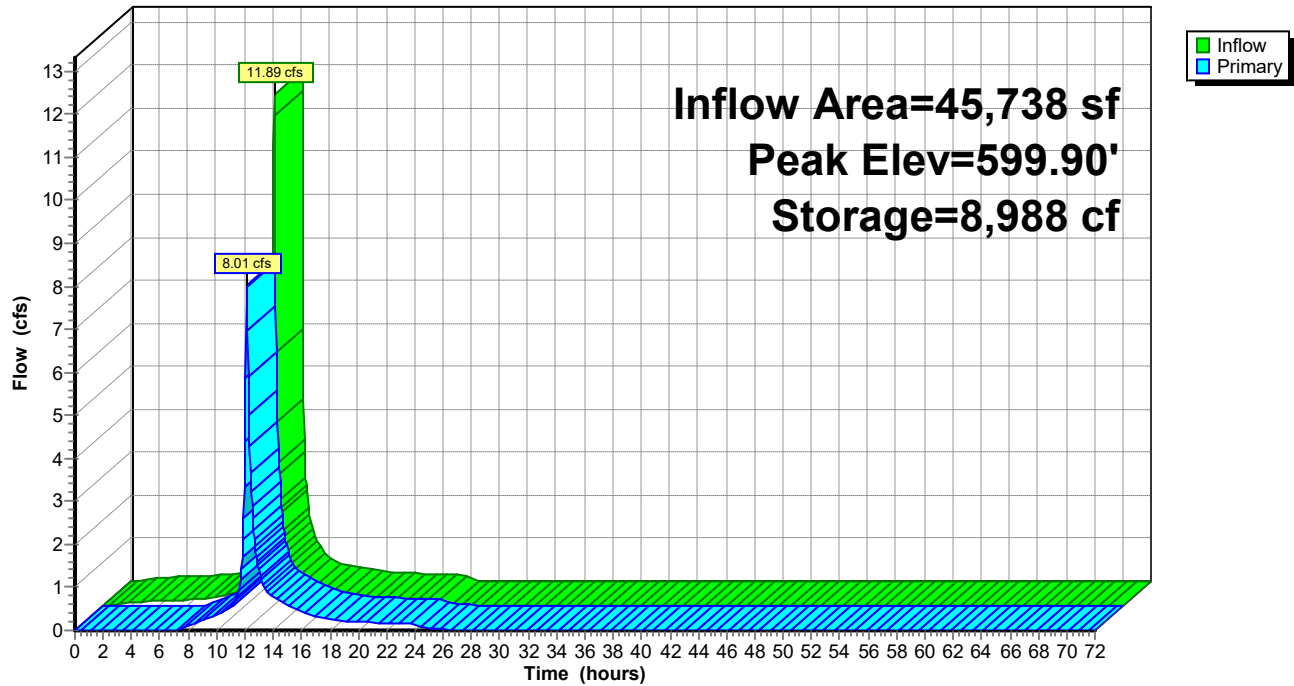
1=Culvert (Passes 7.89 cfs of 23.83 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.38 cfs @ 7.03 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 6.50 cfs @ 3.85 fps)

Pond N: BMP-N Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond N: BMP-N Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
596.50	2,488	0	599.10	2,729	6,775
596.55	2,491	124	599.15	2,733	6,911
596.60	2,494	249	599.20	2,737	7,048
596.65	2,497	374	599.25	2,741	7,185
596.70	2,500	499	599.30	2,744	7,322
596.75	2,504	624	599.35	2,748	7,459
596.80	2,507	749	599.40	2,752	7,597
596.85	2,510	875	599.45	2,755	7,735
596.90	2,513	1,000	599.50	2,759	7,873
596.95	2,516	1,126	599.55	2,763	8,011
597.00	2,519	1,252	599.60	2,766	8,149
597.05	2,525	1,378	599.65	2,770	8,287
597.10	2,530	1,504	599.70	2,774	8,426
597.15	2,536	1,631	599.75	2,778	8,565
597.20	2,541	1,758	599.80	2,781	8,704
597.25	2,547	1,885	599.85	2,785	8,843
597.30	2,552	2,012	599.90	2,789	8,982
597.35	2,558	2,140	599.95	2,792	9,122
597.40	2,563	2,268	600.00	2,796	9,261
597.45	2,569	2,397	600.05	2,799	9,401
597.50	2,575	2,525	600.10	2,801	9,541
597.55	2,580	2,654	600.15	2,804	9,681
597.60	2,586	2,783	600.20	2,807	9,822
597.65	2,591	2,913	600.25	2,810	9,962
597.70	2,597	3,042	600.30	2,812	10,102
597.75	2,602	3,172	600.35	2,815	10,243
597.80	2,608	3,302	600.40	2,818	10,384
597.85	2,613	3,433	600.45	2,820	10,525
597.90	2,619	3,564	600.50	2,823	10,666
597.95	2,624	3,695	600.55	2,826	10,807
598.00	2,630	3,826	600.60	2,828	10,949
598.05	2,635	3,958	600.65	2,831	11,090
598.10	2,639	4,090	600.70	2,834	11,232
598.15	2,644	4,222	600.75	2,837	11,373
598.20	2,648	4,354	600.80	2,839	11,515
598.25	2,653	4,487	600.85	2,842	11,657
598.30	2,658	4,619	600.90	2,845	11,800
598.35	2,662	4,752	600.95	2,847	11,942
598.40	2,667	4,886	601.00	2,850	12,084
598.45	2,671	5,019			
598.50	2,676	5,153			
598.55	2,681	5,287			
598.60	2,685	5,421			
598.65	2,690	5,555			
598.70	2,694	5,690			
598.75	2,699	5,825			
598.80	2,704	5,960			
598.85	2,708	6,095			
598.90	2,713	6,231			
598.95	2,717	6,366			
599.00	2,722	6,502			
599.05	2,726	6,638			

Summary for Pond P: BMP-P Bioretention Basin

Inflow Area = 149,411 sf, 62.10% Impervious, Inflow Depth = 9.86" for 100-Year-Future event
 Inflow = 34.69 cfs @ 12.08 hrs, Volume= 122,798 cf
 Outflow = 23.68 cfs @ 12.15 hrs, Volume= 117,148 cf, Atten= 32%, Lag= 4.0 min
 Primary = 23.68 cfs @ 12.15 hrs, Volume= 117,148 cf
 Routed to Pond R : BMP-R Bioretention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 579.81' @ 12.15 hrs Surf.Area= 7,370 sf Storage= 24,186 cf

Plug-Flow detention time= 91.4 min calculated for 117,067 cf (95% of inflow)
 Center-of-Mass det. time= 63.7 min (844.1 - 780.3)

Volume	Invert	Avail.Storage	Storage Description
#1	576.00'	25,575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
576.00	5,411	0	0
578.00	6,344	11,755	11,755
580.00	7,476	13,820	25,575

Device	Routing	Invert	Outlet Devices
#1	Primary	576.00'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 576.00' / 575.90' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	577.00'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	578.20'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=23.62 cfs @ 12.15 hrs HW=579.81' (Free Discharge)

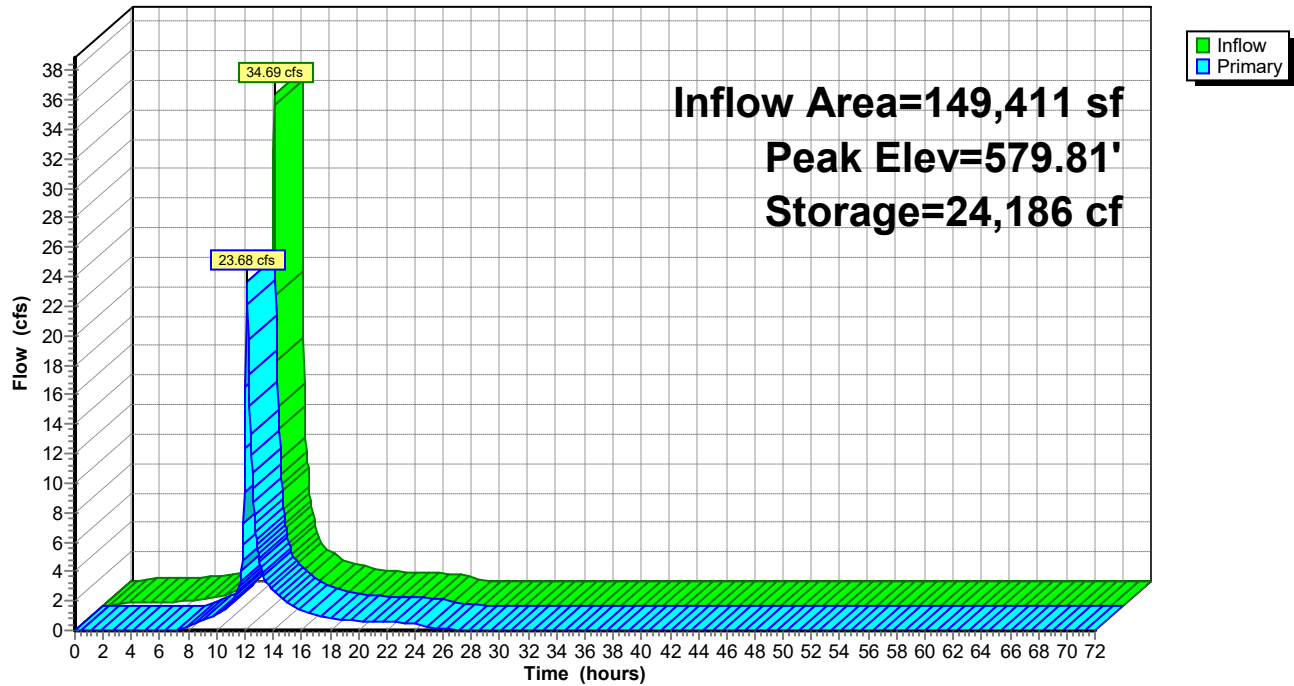
1=Culvert (Passes 23.62 cfs of 25.35 cfs potential flow)

2=Orifice/Grate (Orifice Controls 5.75 cfs @ 7.32 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 17.87 cfs @ 4.15 fps)

Pond P: BMP-P Bioretention Basin

Hydrograph



Stage-Area-Storage for Pond P: BMP-P Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
576.00	5,411	0	578.60	6,684	15,663
576.05	5,434	271	578.65	6,712	15,998
576.10	5,458	543	578.70	6,740	16,334
576.15	5,481	817	578.75	6,769	16,672
576.20	5,504	1,092	578.80	6,797	17,011
576.25	5,528	1,367	578.85	6,825	17,352
576.30	5,551	1,644	578.90	6,853	17,694
576.35	5,574	1,922	578.95	6,882	18,037
576.40	5,598	2,202	579.00	6,910	18,382
576.45	5,621	2,482	579.05	6,938	18,728
576.50	5,644	2,764	579.10	6,967	19,076
576.55	5,668	3,047	579.15	6,995	19,425
576.60	5,691	3,331	579.20	7,023	19,775
576.65	5,714	3,616	579.25	7,052	20,127
576.70	5,738	3,902	579.30	7,080	20,480
576.75	5,761	4,189	579.35	7,108	20,835
576.80	5,784	4,478	579.40	7,136	21,191
576.85	5,808	4,768	579.45	7,165	21,549
576.90	5,831	5,059	579.50	7,193	21,908
576.95	5,854	5,351	579.55	7,221	22,268
577.00	5,878	5,644	579.60	7,250	22,630
577.05	5,901	5,939	579.65	7,278	22,993
577.10	5,924	6,234	579.70	7,306	23,358
577.15	5,947	6,531	579.75	7,335	23,724
577.20	5,971	6,829	579.80	7,363	24,091
577.25	5,994	7,128	579.85	7,391	24,460
577.30	6,017	7,428	579.90	7,419	24,830
577.35	6,041	7,730	579.95	7,448	25,202
577.40	6,064	8,033	580.00	7,476	25,575
577.45	6,087	8,336			
577.50	6,111	8,641			
577.55	6,134	8,947			
577.60	6,157	9,255			
577.65	6,181	9,563			
577.70	6,204	9,873			
577.75	6,227	10,184			
577.80	6,251	10,496			
577.85	6,274	10,809			
577.90	6,297	11,123			
577.95	6,321	11,438			
578.00	6,344	11,755			
578.05	6,372	12,073			
578.10	6,401	12,392			
578.15	6,429	12,713			
578.20	6,457	13,035			
578.25	6,486	13,359			
578.30	6,514	13,684			
578.35	6,542	14,010			
578.40	6,570	14,338			
578.45	6,599	14,667			
578.50	6,627	14,998			
578.55	6,655	15,330			

Summary for Pond R: BMP-R Bioretention Basin

Inflow Area = 337,590 sf, 56.13% Impervious, Inflow Depth = 9.28" for 100-Year-Future event
 Inflow = 59.33 cfs @ 12.11 hrs, Volume= 261,100 cf
 Outflow = 30.98 cfs @ 12.33 hrs, Volume= 257,267 cf, Atten= 48%, Lag= 13.2 min
 Primary = 30.98 cfs @ 12.33 hrs, Volume= 257,267 cf
 Routed to Link 52L : PROPOSED TOTAL TO POA-5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 566.71' @ 12.33 hrs Surf.Area= 18,688 sf Storage= 65,430 cf

Plug-Flow detention time= 90.0 min calculated for 257,088 cf (98% of inflow)
 Center-of-Mass det. time= 79.1 min (900.9 - 821.9)

Volume	Invert	Avail.Storage	Storage Description
#1	562.50'	80,623 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
562.50	12,536	0	0
563.00	13,212	6,437	6,437
564.00	14,609	13,911	20,348
565.00	16,062	15,336	35,683
566.00	17,571	16,817	52,500
567.00	19,137	18,354	70,854
567.50	19,941	9,770	80,623

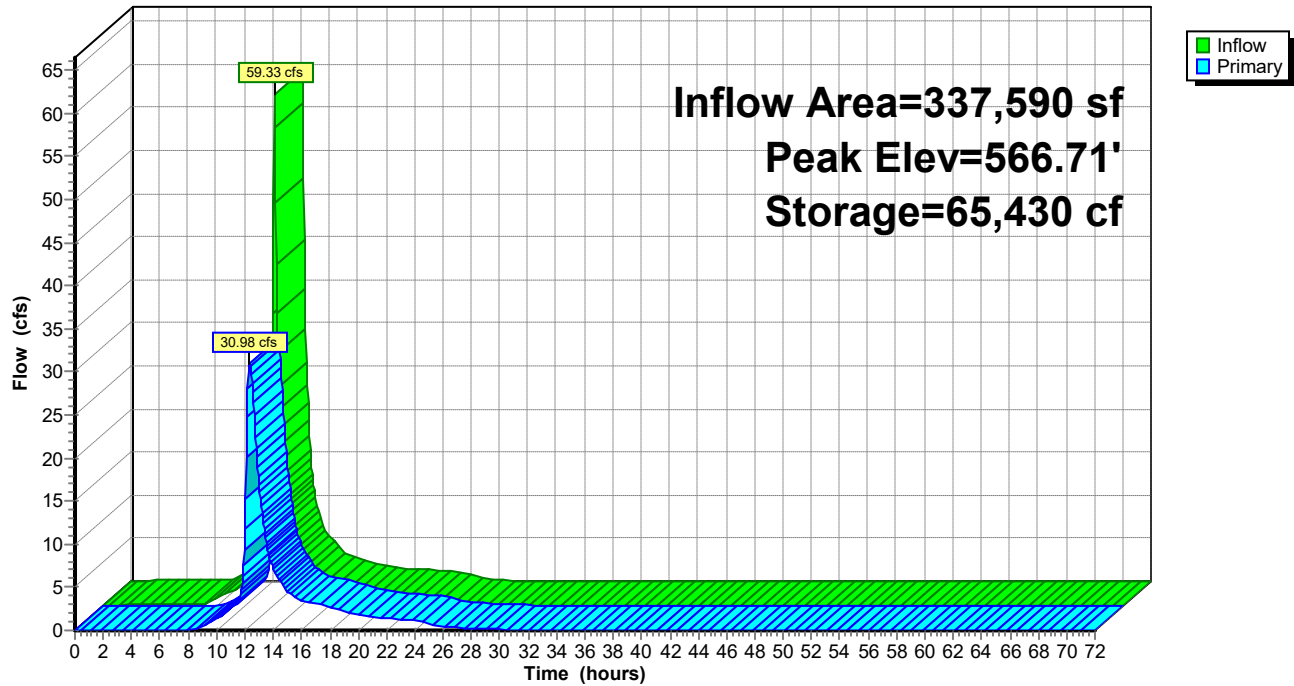
Device	Routing	Invert	Outlet Devices
#1	Primary	560.40'	36.0" Round Culvert L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 560.40' / 560.10' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	562.80'	10.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	564.30'	2.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=30.92 cfs @ 12.33 hrs HW=566.71' (Free Discharge)

- 1=Culvert (Passes 30.92 cfs of 74.64 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 6.24 cfs @ 8.99 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 24.67 cfs @ 5.08 fps)

Pond R: BMP-R Bioretention Basin

Hydrograph



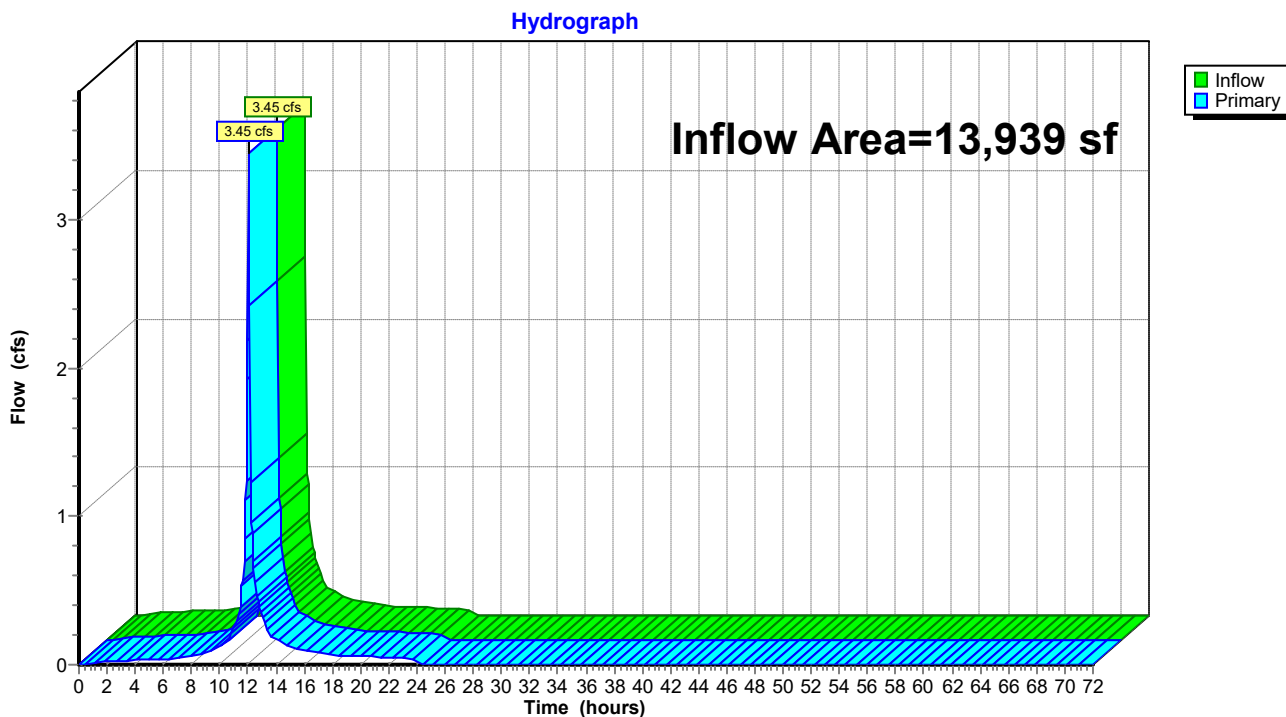
Stage-Area-Storage for Pond R: BMP-R Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
562.50	12,536	0	565.10	16,213	37,297
562.55	12,604	628	565.15	16,288	38,109
562.60	12,671	1,260	565.20	16,364	38,926
562.65	12,739	1,896	565.25	16,439	39,746
562.70	12,806	2,534	565.30	16,515	40,570
562.75	12,874	3,176	565.35	16,590	41,397
562.80	12,942	3,822	565.40	16,666	42,229
562.85	13,009	4,470	565.45	16,741	43,064
562.90	13,077	5,123	565.50	16,817	43,903
562.95	13,144	5,778	565.55	16,892	44,745
563.00	13,212	6,437	565.60	16,967	45,592
563.05	13,282	7,099	565.65	17,043	46,442
563.10	13,352	7,765	565.70	17,118	47,296
563.15	13,422	8,435	565.75	17,194	48,154
563.20	13,491	9,107	565.80	17,269	49,015
563.25	13,561	9,784	565.85	17,345	49,881
563.30	13,631	10,463	565.90	17,420	50,750
563.35	13,701	11,147	565.95	17,496	51,623
563.40	13,771	11,834	566.00	17,571	52,500
563.45	13,841	12,524	566.05	17,649	53,380
563.50	13,911	13,218	566.10	17,728	54,264
563.55	13,980	13,915	566.15	17,806	55,153
563.60	14,050	14,616	566.20	17,884	56,045
563.65	14,120	15,320	566.25	17,963	56,941
563.70	14,190	16,028	566.30	18,041	57,841
563.75	14,260	16,739	566.35	18,119	58,745
563.80	14,330	17,454	566.40	18,197	59,653
563.85	14,399	18,172	566.45	18,276	60,565
563.90	14,469	18,894	566.50	18,354	61,481
563.95	14,539	19,619	566.55	18,432	62,400
564.00	14,609	20,348	566.60	18,511	63,324
564.05	14,682	21,080	566.65	18,589	64,251
564.10	14,754	21,816	566.70	18,667	65,183
564.15	14,827	22,555	566.75	18,746	66,118
564.20	14,900	23,298	566.80	18,824	67,057
564.25	14,972	24,045	566.85	18,902	68,001
564.30	15,045	24,796	566.90	18,980	68,948
564.35	15,118	25,550	566.95	19,059	69,899
564.40	15,190	26,307	567.00	19,137	70,854
564.45	15,263	27,069	567.05	19,217	71,812
564.50	15,336	27,834	567.10	19,298	72,775
564.55	15,408	28,602	567.15	19,378	73,742
564.60	15,481	29,374	567.20	19,459	74,713
564.65	15,553	30,150	567.25	19,539	75,688
564.70	15,626	30,930	567.30	19,619	76,667
564.75	15,699	31,713	567.35	19,700	77,650
564.80	15,771	32,500	567.40	19,780	78,637
564.85	15,844	33,290	567.45	19,861	79,628
564.90	15,917	34,084	567.50	19,941	80,623
564.95	15,989	34,882			
565.00	16,062	35,683			
565.05	16,137	36,488			

Summary for Link 20L: TOTAL TO GI MTD F-1

Inflow Area = 13,939 sf, 53.13% Impervious, Inflow Depth = 9.61" for 100-Year-Future event
Inflow = 3.45 cfs @ 12.07 hrs, Volume= 11,163 cf
Primary = 3.45 cfs @ 12.07 hrs, Volume= 11,163 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond F : UG INFILTRATION BASIN F

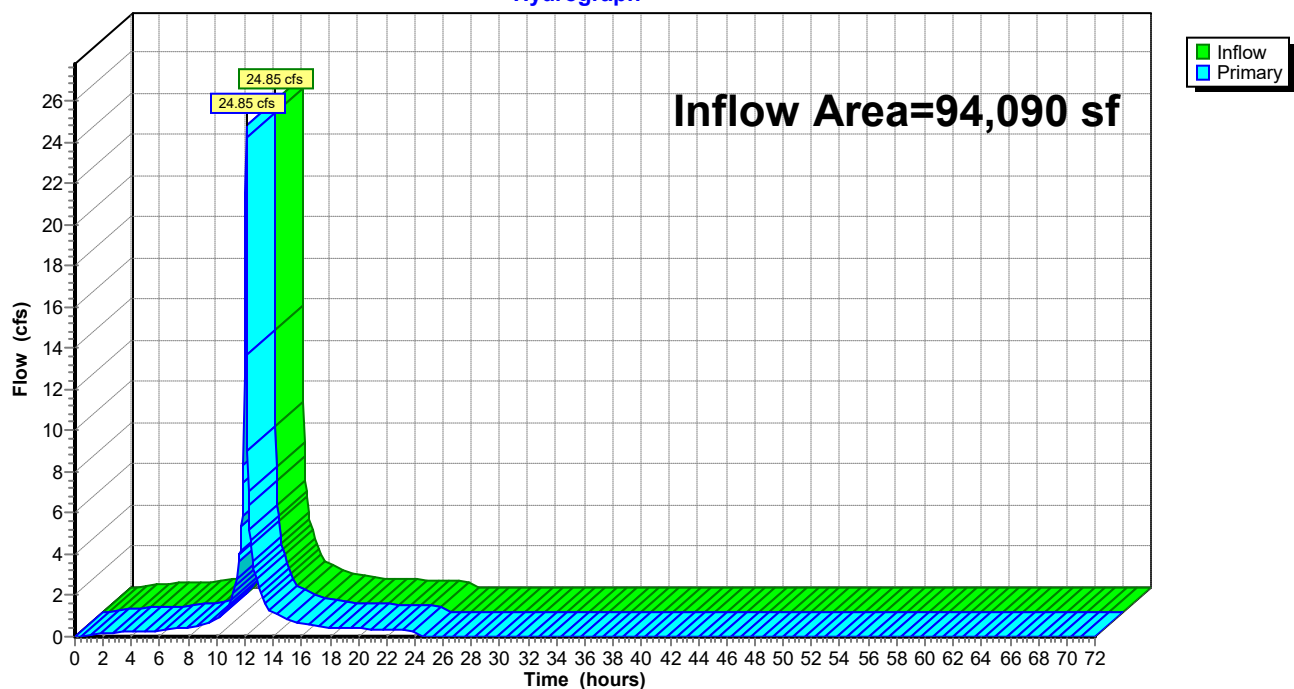
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 20L: TOTAL TO GI MTD F-1

Summary for Link 21L: TOTAL TO P-DA-5M

Inflow Area = 94,090 sf, 64.81% Impervious, Inflow Depth = 10.20" for 100-Year-Future event
Inflow = 24.85 cfs @ 12.09 hrs, Volume= 80,001 cf
Primary = 24.85 cfs @ 12.09 hrs, Volume= 80,001 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond M : BMP-M Bioretention Basin

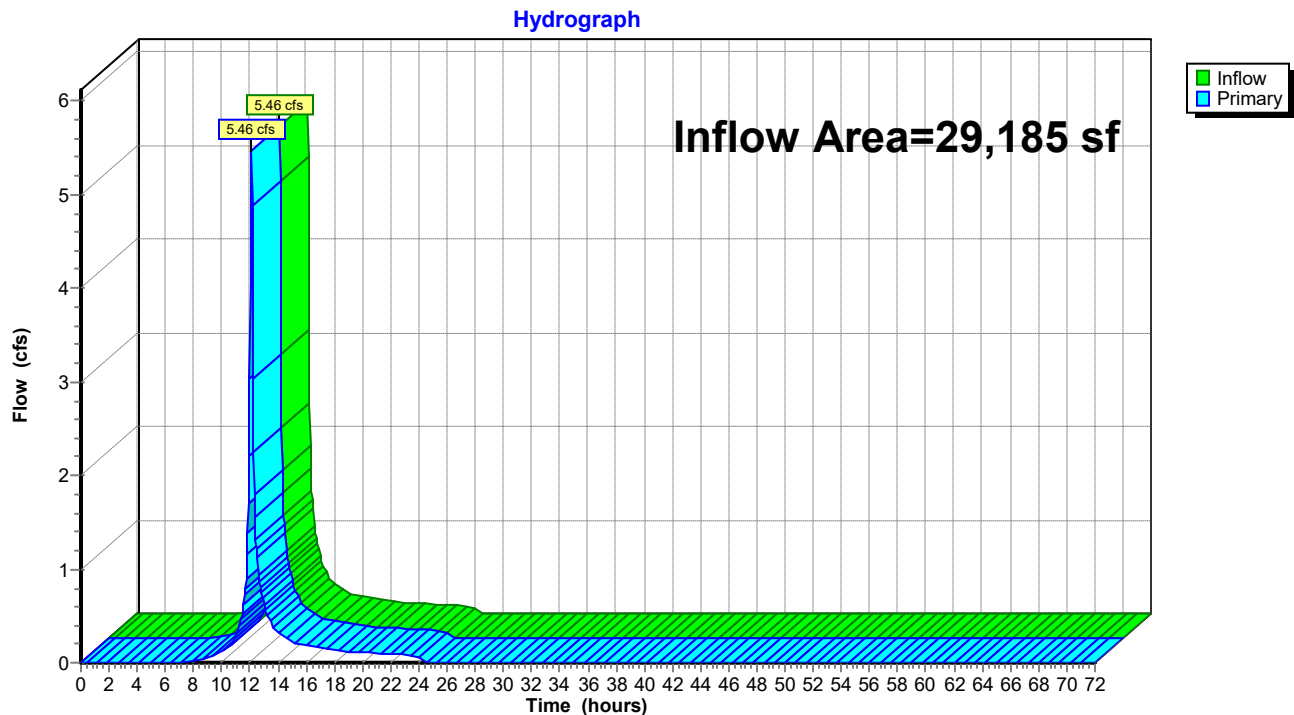
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 21L: TOTAL TO P-DA-5M**Hydrograph**

Summary for Link 33L: P-DA-1-BYPASS undetained TOTAL

Inflow Area = 29,185 sf, 2.99% Impervious, Inflow Depth = 7.07" for 100-Year-Future event
Inflow = 5.46 cfs @ 12.11 hrs, Volume= 17,185 cf
Primary = 5.46 cfs @ 12.11 hrs, Volume= 17,185 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : PROPOSED TOTAL TO POA-1

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 33L: P-DA-1-BYPASS undetained TOTAL

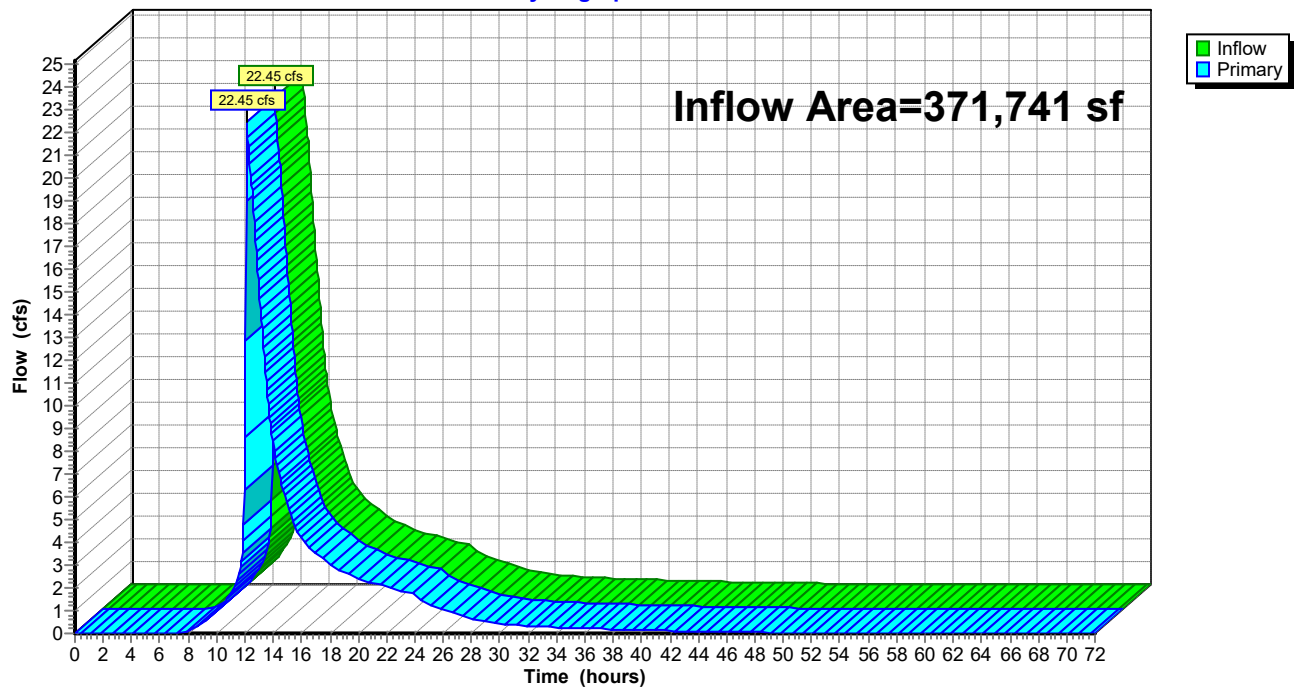
Summary for Link 34L: PROPOSED TOTAL TO POA-1

Inflow Area = 371,741 sf, 49.80% Impervious, Inflow Depth > 8.83" for 100-Year-Future event
Inflow = 22.45 cfs @ 12.17 hrs, Volume= 273,569 cf
Primary = 22.45 cfs @ 12.17 hrs, Volume= 273,569 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 34L: PROPOSED TOTAL TO POA-1

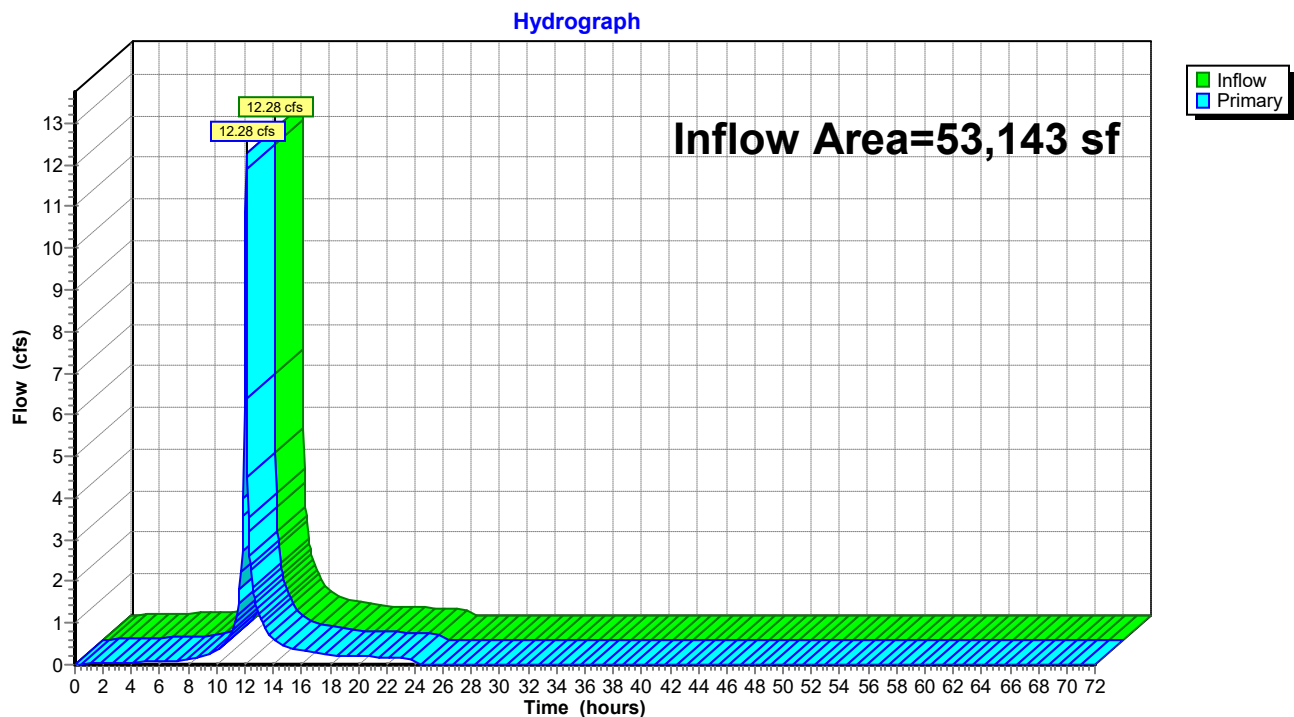
Hydrograph



Summary for Link 38L: TOTAL TO GI MTD 1C

Inflow Area = 53,143 sf, 28.69% Impervious, Inflow Depth = 8.37" for 100-Year-Future event
Inflow = 12.28 cfs @ 12.08 hrs, Volume= 37,068 cf
Primary = 12.28 cfs @ 12.08 hrs, Volume= 37,068 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond C : BMP C Bioretention Basin

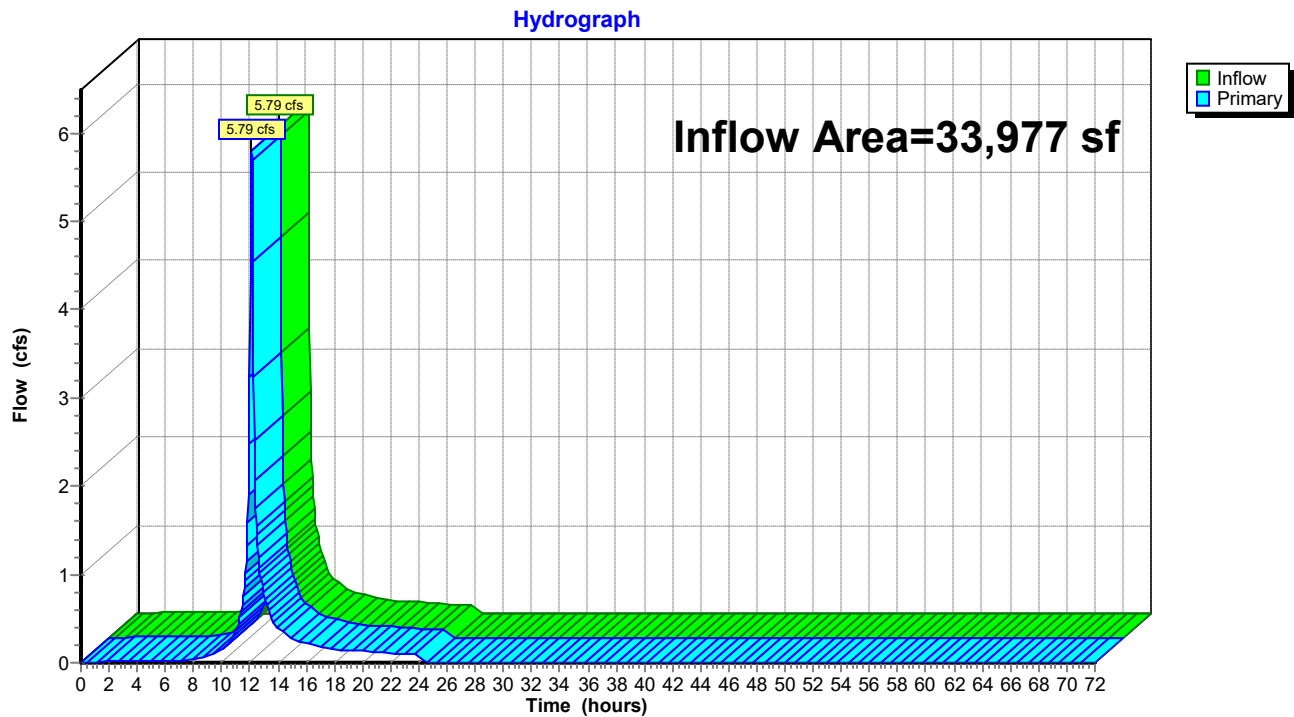
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 38L: TOTAL TO GI MTD 1C

Summary for Link 44L: P-DA-3-BYPASS undetained TOTAL

Inflow Area = 33,977 sf, 10.26% Impervious, Inflow Depth = 7.43" for 100-Year-Future event
Inflow = 5.79 cfs @ 12.13 hrs, Volume= 21,051 cf
Primary = 5.79 cfs @ 12.13 hrs, Volume= 21,051 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 45L : PROPOSED TOTAL TO POA-3

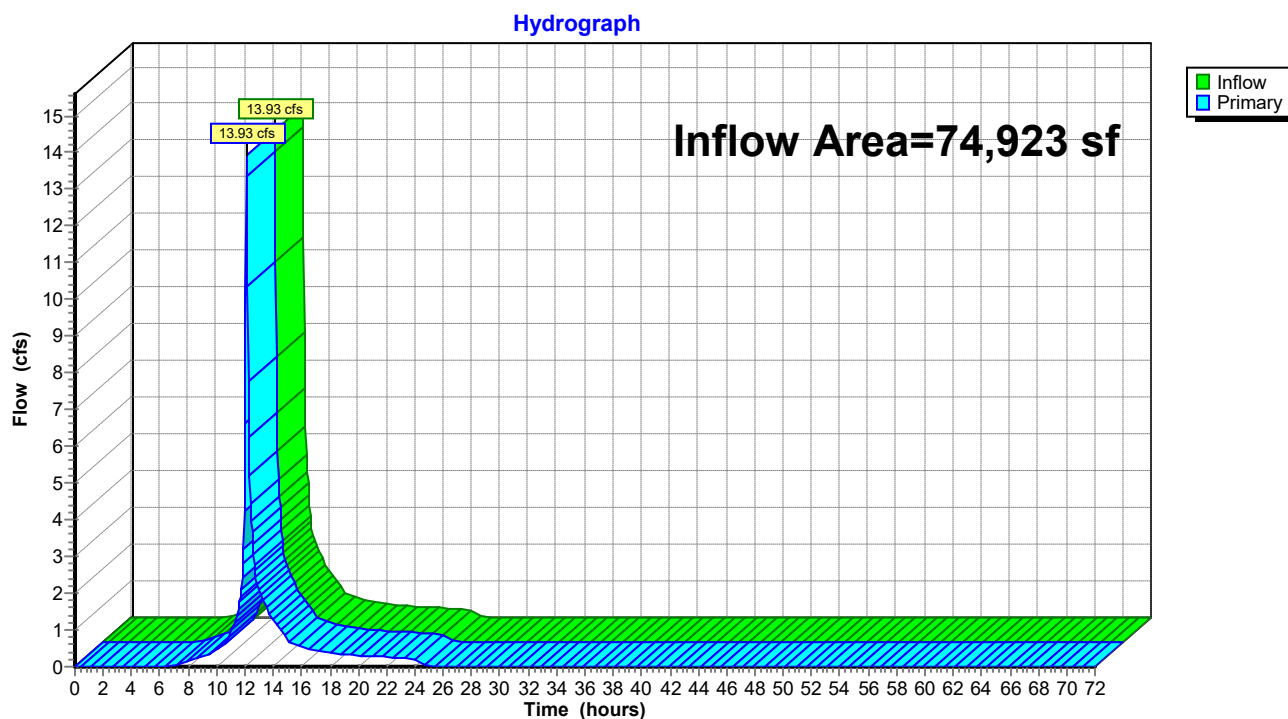
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 44L: P-DA-3-BYPASS undetained TOTAL

Summary for Link 45L: PROPOSED TOTAL TO POA-3

Inflow Area = 74,923 sf, 37.21% Impervious, Inflow Depth = 8.43" for 100-Year-Future event
Inflow = 13.93 cfs @ 12.12 hrs, Volume= 52,632 cf
Primary = 13.93 cfs @ 12.12 hrs, Volume= 52,632 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 45L: PROPOSED TOTAL TO POA-3

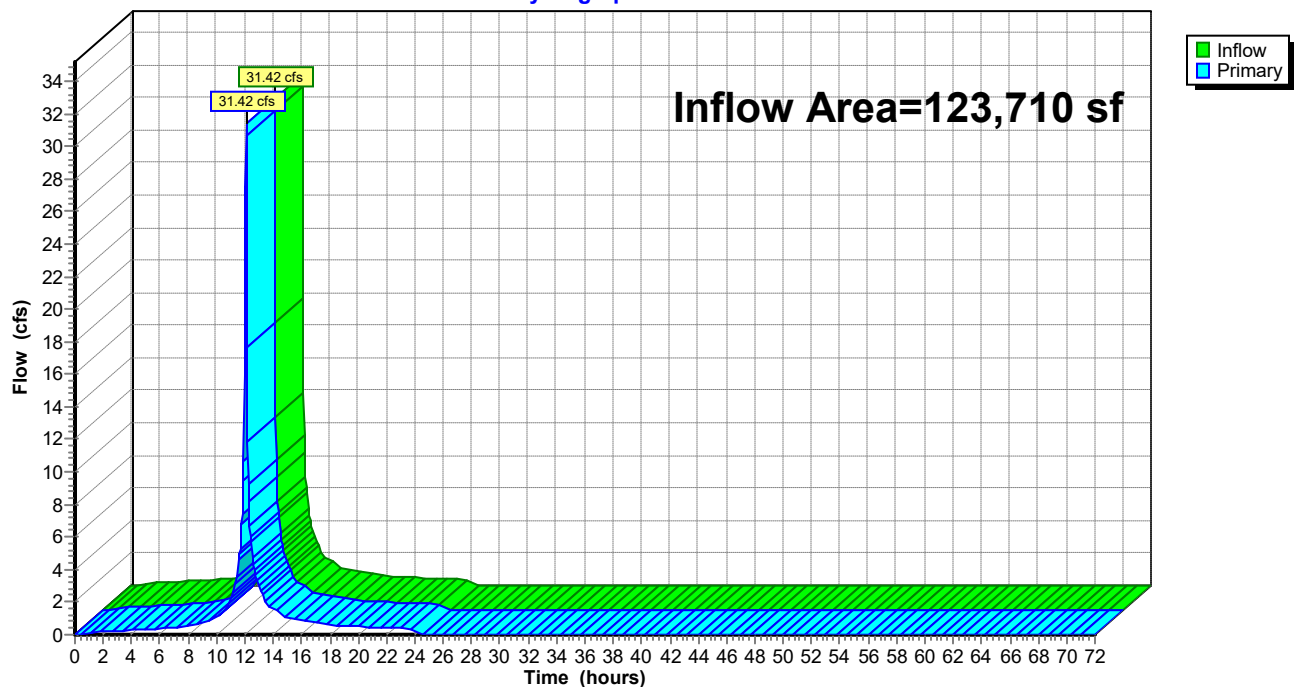
Summary for Link 46L: P-DA-1B TOTAL

Inflow Area = 123,710 sf, 57.39% Impervious, Inflow Depth = 9.83" for 100-Year-Future event
Inflow = 31.42 cfs @ 12.08 hrs, Volume= 101,305 cf
Primary = 31.42 cfs @ 12.08 hrs, Volume= 101,305 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond B : BMP-B Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 46L: P-DA-1B TOTAL

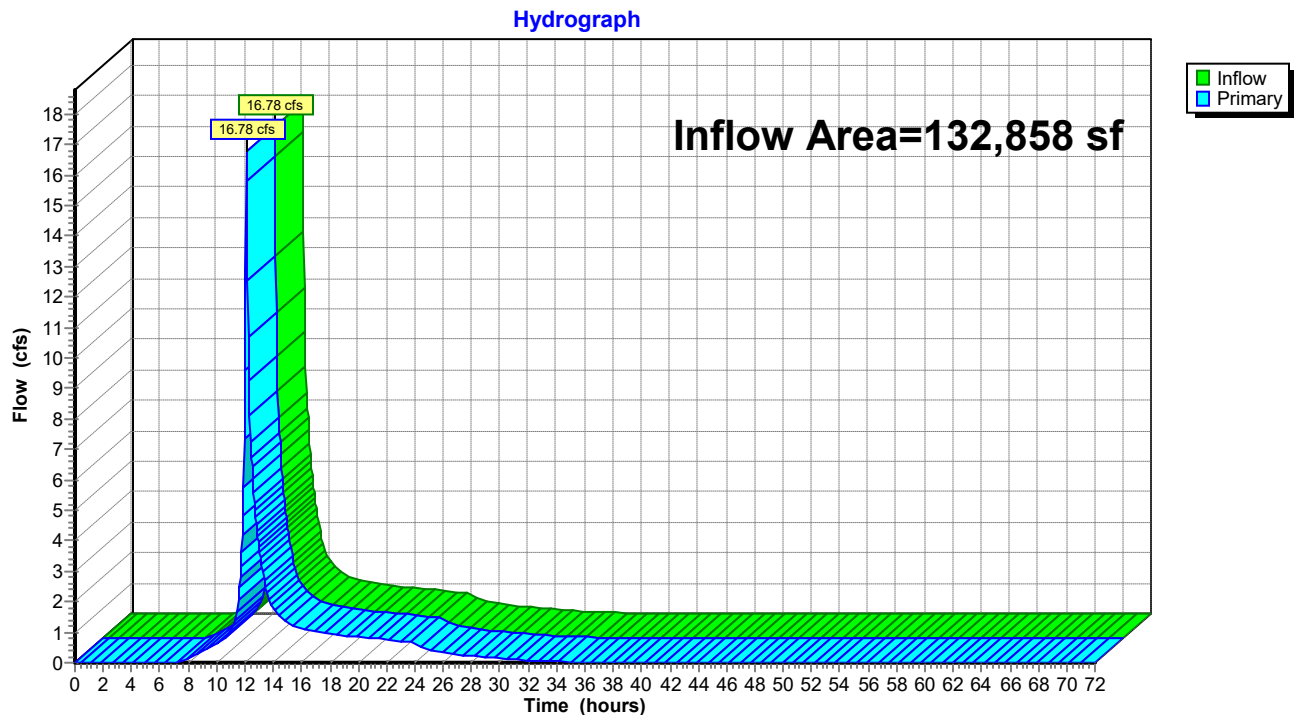
Hydrograph



Summary for Link 48L: PROPOSED TOTAL TO POA-4

Inflow Area = 132,858 sf, 44.59% Impervious, Inflow Depth = 8.68" for 100-Year-Future event
Inflow = 16.78 cfs @ 12.12 hrs, Volume= 96,121 cf
Primary = 16.78 cfs @ 12.12 hrs, Volume= 96,121 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

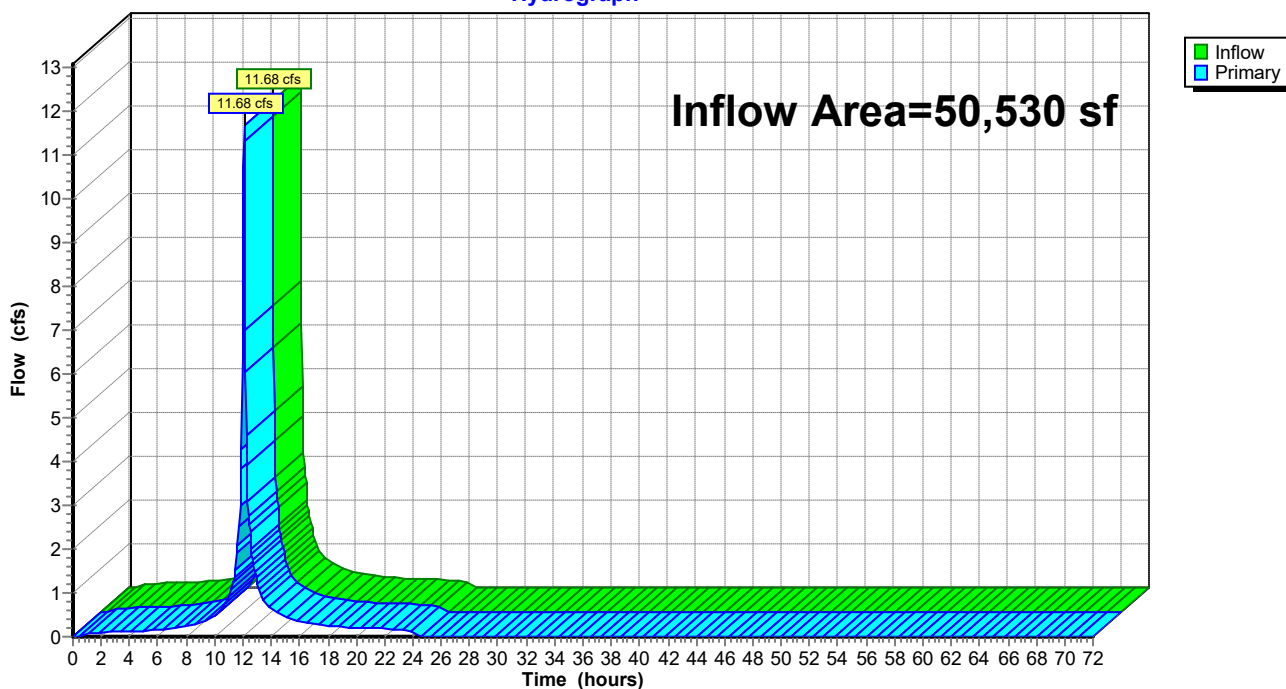
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 48L: PROPOSED TOTAL TO POA-4

Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 10.06" for 100-Year-Future event
Inflow = 11.68 cfs @ 12.08 hrs, Volume= 42,377 cf
Primary = 11.68 cfs @ 12.08 hrs, Volume= 42,377 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

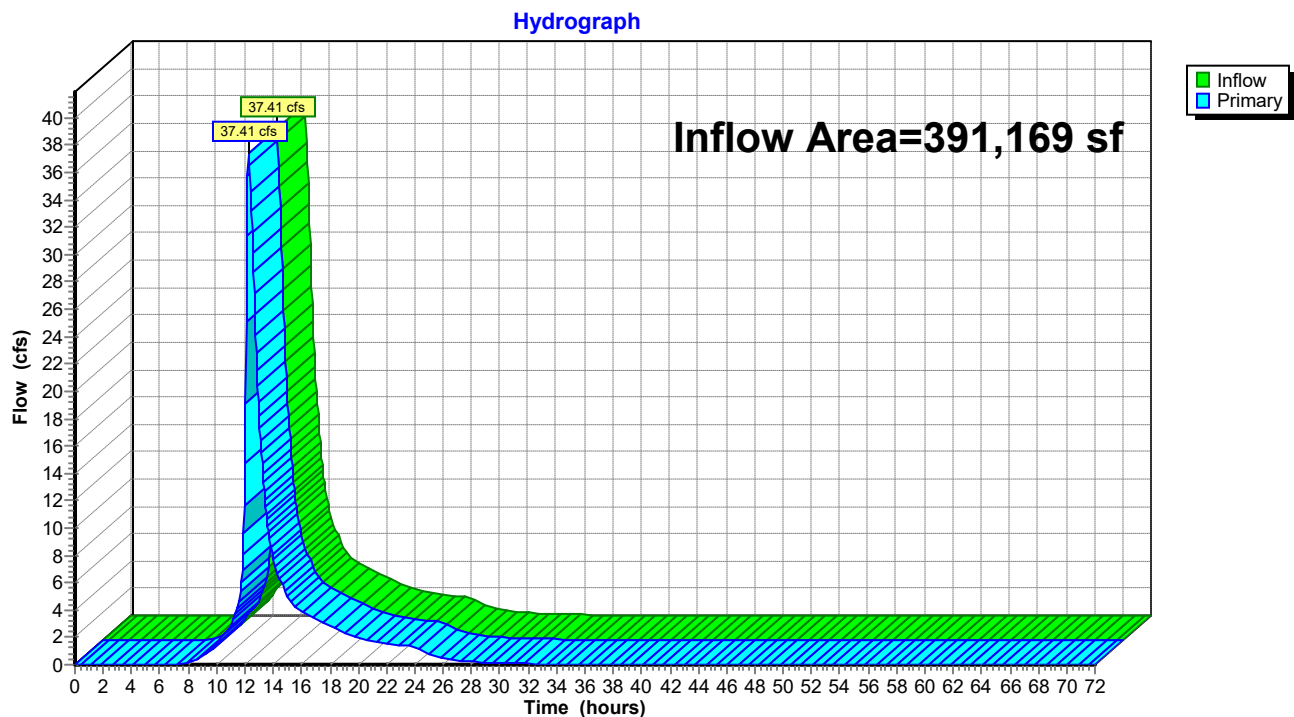
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1**Hydrograph**

Summary for Link 52L: PROPOSED TOTAL TO POA-5

Inflow Area = 391,169 sf, 48.44% Impervious, Inflow Depth = 8.84" for 100-Year-Future event
Inflow = 37.41 cfs @ 12.27 hrs, Volume= 288,105 cf
Primary = 37.41 cfs @ 12.27 hrs, Volume= 288,105 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 26L

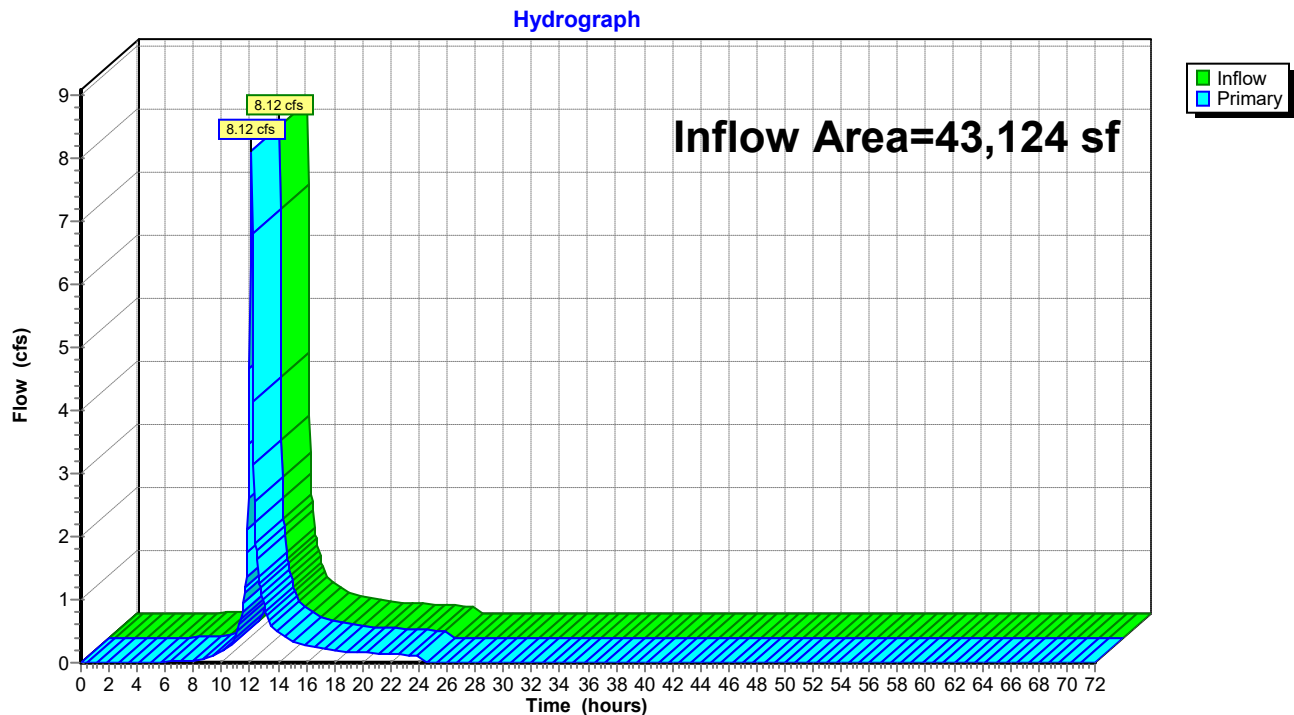
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 52L: PROPOSED TOTAL TO POA-5

Summary for Link 59L: P-DA-4 BYPASS TOTAL

Inflow Area = 43,124 sf, 6.06% Impervious, Inflow Depth = 7.12" for 100-Year-Future event
Inflow = 8.12 cfs @ 12.10 hrs, Volume= 25,580 cf
Primary = 8.12 cfs @ 12.10 hrs, Volume= 25,580 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : PROPOSED TOTAL TO POA-4

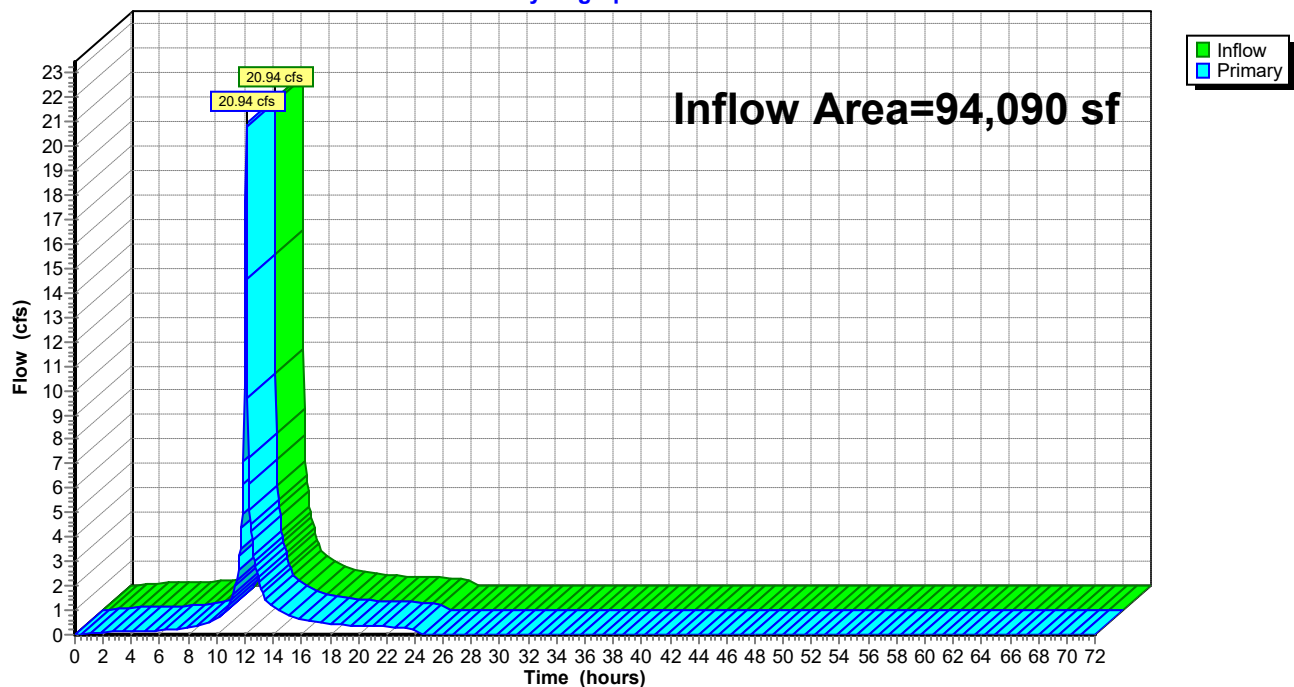
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 59L: P-DA-4 BYPASS TOTAL

Summary for Link 66L: P-DA-5R TOTAL

Inflow Area = 94,090 sf, 37.96% Impervious, Inflow Depth = 8.84" for 100-Year-Future event
Inflow = 20.94 cfs @ 12.09 hrs, Volume= 69,319 cf
Primary = 20.94 cfs @ 12.09 hrs, Volume= 69,319 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond R : BMP-R Bioretention Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 66L: P-DA-5R TOTAL**Hydrograph**

APPENDIX F

**GROUNDWATER RECHARGE SPREADSHEET
CALCULATIONS**

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
MORRIS CO., MENDHAM BORO	50.1	1.73

Project Name: GREENS AT MENDHAM

Description: POA-1 + POA-2+ POA-3 DEFICIT

Analysis Date: 02/13/26

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	1.14	Impervious areas	Gladstone	0.0	-
2	1.74	Woods	Gladstone	19.5	122,861
3	8	Open space	Gladstone	18.9	548,229
4					
5					
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	10.9			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				17.0	671,090

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	5.46	Open space	Gladstone	18.9	374,166
2	5.42	Impervious areas	Gladstone	0.0	-
3					
4					
5					
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	10.9			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				9.5	374,166

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	236,095
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Post-Development Annual Recharge Deficit= 296,924

(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC= #N/A	(in)	DRWC= #N/A	(in)
ERWC = #N/A	(in)	EDRWC= #N/A	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
GREENS AT MENDHAM	BMP-B recharge calcs	02/13/26	

Recharge BMP Input Parameters				Root Zone Water capacity Calculated Parameters				Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	13287.0	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.74	in	Inches of Runoff to capture	Qdesign	0.42	in
BMP Effective Depth, this is the design variable	dBMP	6.0	in	ERWC Modified to consider dEXC	EDRWC	0.74	in	Inches of Rainfall to capture	Pdesign	0.54	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-52.8	in	Empty Portion of RWC under Infil. BMP	RERWC	0.58	in	Recharge Provided Avg. over Imp. Area		19.1	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in					Runoff Captured Avg. over imp. Area		22.3	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	1	unitless								

BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES			
ABMP/Aimp	Aratio	0.07	unitless	Volume Balance--> Solve Problem to satisfy Annual Recharge dBMP Check--> OK dEXC Check--> OK BMP Location--> OK			
BMP Volume	VBMP	6,644	cu.ft				

Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	519,543	cu.ft	Annual BMP Recharge Volume		303,967	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	191,078	sq.ft	Avg BMP Recharge Efficiency		85.7%	Represents % Infiltration Recharged
Root Zone Water Capacity	RWC	5.48	in	%Rainfall became Runoff		78.7%	%
RWC Modified to consider dEXC	DRWC	5.48	in	%Runoff Infiltrated		56.5%	%
Climatic Factor	C-factor	1.73	no units	%Runoff Recharged		39.2%	%
Average Annual P	Pavg	50.1	in	%Rainfall Recharged		30.8%	%
Recharge Requirement over Imp. Area	dr	26.4	in				

OTHER NOTES
Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef & Aimp" button.

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
MORRIS CO., MENDHAM BORO	50.1	1.73

Project Name: GREENS AT MENDHAM

Description: POA-4 + POA-5 DEFICIT

Analysis Date: 02/13/26

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	2	Impervious areas	Gladstone	0.0	-
2	3.19	Woods	Gladstone	19.5	225,246
3	6.68	Open space	Gladstone	18.9	457,771
4	0.06	Gravel, dirt	Gladstone	11.1	2,420
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	11.9			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				15.8	685,437

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	6.61	Open space	Gladstone	18.9	452,974
2	5.2	Impervious areas	Gladstone	0.0	-
3	0.12	Woods	Gladstone	19.5	8,473
4	0				
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	11.9			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				10.7	461,447

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	226,512
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Post-Development Annual Recharge Deficit= 223,990

(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC= #N/A	(in)	DRWC= #N/A	(in)
ERWC = #N/A	(in)	EDRWC= #N/A	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
GREENS AT MENDHAM	BMI I RECHARGE	02/13/26	

Recharge BMP Input Parameters				Root Zone Water capacity Calculated Parameters				Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	2027.0	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.74	in	Inches of Runoff to capture	Qdesign	0.18	in
BMP Effective Depth, this is the design variable	dBMP	16.8	in	ERWC Modified to consider dEXC	EDRWC	0.74	in	Inches of Rainfall to capture	Pdesign	0.26	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-35.4	in	Empty Portion of RWC under Infil. BMP	RERWC	0.58	in	Recharge Provided Avg. over Imp. Area		11.8	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in					Runoff Captured Avg. over imp. Area		12.3	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	1	unitless								

BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES	
ABMP/Aimp	Aratio	0.01	unitless	Volume Balance--> Solve Problem to satisfy Annual Recharge dBMP Check--> OK dEXC Check--> OK BMP Location--> OK	
BMP Volume	VBMP	2,838	cu.ft		

Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	519,543	cu.ft	Annual BMP Recharge Volume		187,491	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	191,078	sq.ft	Avg BMP Recharge Efficiency		96.0%	Represents % Infiltration Recharged
Root Zone Water Capacity	RWC	5.48	in	%Rainfall became Runoff		78.7%	%
RWC Modified to consider dEXC	DRWC	5.48	in	%Runoff Infiltrated		31.1%	%
Climatic Factor	C-factor	1.73	no units	%Runoff Recharged		25.2%	%
Average Annual P	Pavg	50.1	in	%Rainfall Recharged		19.8%	%
Recharge Requirement over Imp. Area	dr	27.5	in				

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef & Aimp" button.

Project Name	Description	Analysis Date	BMP or LID Type
GREENS AT MENDHAM	BMI K RECHARGE	02/13/26	

Recharge BMP Input Parameters				Root Zone Water capacity Calculated Parameters				Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	2027.0	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.74	in	Inches of Runoff to capture	Qdesign	0.14	in
BMP Effective Depth, this is the design variable	dBMP	13.2	in	ERWC Modified to consider dEXC	EDRWC	0.00	in	Inches of Rainfall to capture	Pdesign	0.21	in
Upper level of the BMP surface (negative if above ground)	dBMPu	124.4	in	Empty Portion of RWC under Infil. BMP	RERWC	0.00	in	Recharge Provided Avg. over Imp. Area		10.1	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	176.4	in					Runoff Captured Avg. over imp. Area		10.1	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	1	unitless								

BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES
ABMP/Aimp	Aratio	0.01	unitless	Volume Balance--> Solve Problem to satisfy Annual Recharge dBMP Check----> OK dEXC Check----> OK BMP Location----> OK
BMP Volume	VBMP	2,230	cu.ft	

Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	519,543	cu.ft	Annual BMP Recharge Volume		160,543	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	191,078	sq.ft	Avg BMP Recharge Efficiency		100.0%	Represents % Infiltration Recharged
Root Zone Water Capacity	RWC	5.48	in	%Rainfall became Runoff		78.7%	%
RWC Modified to consider dEXC	DRWC	0.00	in	%Runoff Infiltrated		25.6%	%
Climatic Factor	C-factor	1.73	no units	%Runoff Recharged		21.6%	%
Average Annual P	Pavg	50.1	in	%Rainfall Recharged		17.0%	%
Recharge Requirement over Imp. Area	dr	27.5	in				

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

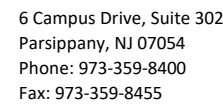
How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.

To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef & Aimp" button.

APPENDIX G

**GROUNDWATER MOUNDING
CALCULATIONS**

Prepared By Bowman Consulting Group, Ltd.
Project No.: 081228-01-001
Date: 2/13/26



PROPOSED BEST MANAGEMENT PRACTICE (BMP) STORMWATER MANAGEMENT FACILITY GROUNDWATER MOUNDING MODEL ADJUSTMENTS & ESTIMATED DRAIN TIME

									INITIAL MODEL			ADJUSTMENT 1 MODEL			FINAL RESULTS			ESTIMATED DRAIN TIME CALCULATION	
<u>Proposed BMP No.</u>	<u>Proposed BMP Bottom Area (sf)</u>	<u>Proposed BMP Bottom Elev. (bottom of BMP system)</u>	<u>Water Quality Volume (cf)</u>	<u>Storage Volume Below Lowest Outlet (cf)</u> ⁷	<u>Test Pit No.</u>	<u>Observed Bedrock/Groundwater Elev. OR lowest elev. of test pit</u>	<u>Bottom of BMP Separation to Bedrock or Groundwater (ft)</u>	<u>Tested Soil Permeability Rate (in/hr)</u>	<u>Design Permeability Rate (in/hr)</u>	<u>Duration of Infiltration Period (hr)</u> ⁴	<u>Groundwater Mounding Height (ft)</u> [X-Y Direction Y-X Direction]	<u>Design Permeability Rate (in/hr)</u>	<u>Duration of Infiltration Period (hr)</u>	<u>Groundwater Mounding Height (ft)</u> [X-Y Direction Y-X Direction]	<u>Final Groundwater Mounding Elev. [X-Y Direction Y-X Direction]</u>	<u>Separation to BMP Bottom (ft)</u> [X-Y Direction Y-X Direction]	<u>DRAIN TIME (Hours) =</u> <u>Water Quality Design Storm Runoff Volume</u> <u>System Infiltration Area x Subsoil Design Permeability Rate</u>		
BMP-A Bioretention Basin (underdrained)	1,445	548.50	1,052	1,184	TP-17	546.9	0.9 (bedrock to be excavated to provide required 1 ft separation)	3.0	Provide underdrained system								n/a		
					TP-18	547.6		24.0											
BMP-B Bioretention Basin (infiltration)	13,937	572.50	6,125	6,658	TP-1	562.1	5.6	8.0	2	2.87	3.344	1.00	6.02	3.344	570.24	2.26	2.64		
					TP-16	566.9		4.0			3.344			570.24	2.26				
BMP-C Bioretention Basin (underdrained)	6,986	557.00	3,868	4,018	TP-17	546.9	3.4	3.0	Provide underdrained system (does not meet minimum infiltration rates)								n/a		
					MZ TP-101	553.6		0.51											
					MZ TP-102	553.1		0.26											
					MZ TP-103	553.4		0.48											
BMP-F Underground Infiltration	2,230	599.20	1,502	1,520	TP-209	569.7		0.5	Basin Flooding Test - Passed								Assumed 72 hours (2.38 ft max storage depth of 100-yr future design storm)		
					TP-210	598.2	1.0 (bedrock to be excavated to provide required 2 ft separation)	0.5											
BMP-G Bioretention Basin (underdrained)	3,088	606.00	1,314	1,995	TP-8	608.6	(bedrock to be excavated to provide required 1 ft separation)	4.0	Provide underdrained system								n/a		
					TP-9	611.9		6.0											
					TP-228	606.2		n/a											
					TP-229	607.9		n/a											
BMP-H Bioretention Basin (underdrained)	6,303	607.00	2,028	2,603	TP-12	614.5	(bedrock to be excavated to provide required 1 ft separation)	1.0	Provide underdrained system								n/a		
					TP-13	611.2		6.0											
BMP-I Bioretention Basin (infiltration)	2,027	611.70	2,103	2,231	TP-19	N/E	9.0	3.0	1.5	8.81	5.877	0.75	17.61	4.930	607.63	4.07	16.60		
					TP-20	602.7		6.0			5.877			4.930	607.63	4.07			
BMP-J Bioretention Basin (underdrained)	2,351	604.00	1,990	2,005	TP-21	600.0	3.4	0.25	Provide underdrained system (does not meet minimum infiltration rates)								n/a		
					TP-22	600.6		0.50											
BMP-K Underground Infiltration	2,960	593.30	2,892	3,093	TP-23	595.8	(bedrock to be excavated to provide required 2 ft separation)	10.0	Basin Flooding Test - Passed								Assumed 72 hours (4.3 ft max storage depth of 100-yr future design storm) - TO BE ADJUSTED		
					TP-24	595.5		9.0											
					TP-109	595.8		basin flooding test											
					TP-110	595.5		basin flooding test											
BMP-M Bioretention Basin (underdrained)	5,308	565.00	5,258	5,368	MZ TP-106	557.9	6.4	0.06	Provide underdrained system (does not meet minimum infiltration rates)								n/a		
					MZ TP-107	558.6		0.51											

PROPOSED BEST MANAGEMENT PRACTICE (BMP) STORMWATER MANAGEMENT FACILITY GROUNDWATER MOUNDING MODEL ADJUSTMENTS & ESTIMATED DRAIN TIME

									INITIAL MODEL			ADJUSTMENT 1 MODEL			FINAL RESULTS		ESTIMATED DRAIN TIME CALCULATION	
Proposed BMP No.	Proposed BMP Bottom Area (sf)	Proposed BMP Bottom Elev. (bottom of BMP system)	Water Quality Volume (cf)	Storage Volume Below Lowest Outlet (cf) ⁷	Test Pit No.	Observed Bedrock/Groundwater Elev. OR lowest elev. of test pit	Bottom of BMP Separation to Bedrock or Groundwater (ft)	Tested Soil Permeability Rate (in/hr)	Design Permeability Rate (in/hr)	Duration of Infiltration Period (hr) ⁴	Groundwater Mounding Height (ft) [X-Y Direction Y-X Direction]	Design Permeability Rate (in/hr)	Duration of Infiltration Period (hr)	Groundwater Mounding Height (ft) [X-Y Direction Y-X Direction]	Final Groundwater Mounding Elev. [X-Y Direction Y-X Direction]	Separation to BMP Bottom (ft) [X-Y Direction Y-X Direction]	<u>DRAIN TIME (Hours) =</u> <i>Water Quality Design Storm Runoff Volume</i> <i>System Infiltration Area x Subsoil Design Permeability Rate</i>	
BMP-N Bioretention Basin (infiltration)	2,488	593.50	2,366	2,517	TP-38	585.9	6.0	2.0	1	12.14	6.356	0.50	24.28	5.640	593.14	0.36	22.82	
					TP-39	587.5		2.0			6.356			5.640	593.14	0.36		
BMP-P Bioretention Basin (underdrained)	5,411	573.00	5,633	6,036	TP-35A (not used due to distance to BMP)	578.0	5.5	6.00	Provide underdrained system								n/a	
					TP-227	567.5		n/a										
BMP-R Bioretention Basin (underdrained)	12,536	559.50	5,258	5,300	MZ TP-104	558.2	1.3	0.53	Provide underdrained system (does not meet minimum infiltration rates)								n/a	
					MZ TP-105	557.0		0.61										
					MZ TP-106	557.9		0.06										

- NOTES:
- 1.) Refer to Report entitled "Stormwater Management Report, Greens at Mendham ," prepared by Bowman Consulting Ltd., last revised 1/30/2026 for groundwater mounding Hantush spreadsheets and copies of Geotechnical Investigation Reports.
- 2.) Highest observed groundwater elevation and lowest tested permeability rate used in calculations as required.
- 3.) A factor of safety of 2 is applied to lowest tested permeability rate to determine the initial model permeability rate as required.
- 4.) Duration of infiltration period calculated using the $\text{Duration of infiltration period, } t \text{ (hr)} = \frac{\text{Volume of runoff to be infiltrated (cf)} \times 12 \text{ in/ft}}{\text{Infiltration area (sf)} \times \text{Recharge rate (in/hr)}}$ following forumula from NJDEP BMP Manual Chapter 13:
- 5.) Project site is located outside the coastal plain physiographic province of New Jersey. Therefore, the Horizontal hydraulic conductivitiy, K_h = R initial vertical design permeability rate.
- 6.) Adjusted models adjusted recharge rate by 50% reduction and adjusted duration of infiltration period by 200% increase from prior model, starting with the initial design model. A proportional adjustment was made to permeability rate and duration of infiltration period in accordance with BMP Manual Chapter 13. No changes to other inputs were made as part of adjustment models. A minimum permeability rate of 0.50 in/hr and maximum 72 hours duration of infiltration period are allowed.
- 7.) Storage volume below lowest basin outlet used in calculation.
- 8.) Test pit TP-18 infiltration rate used due to close proximity to proposed BMP-A.
- 9.) MZ TP refer to test pits per formed by MZ Engineering in December 2025

BASIN-B x-x DIRECTION

Input Values

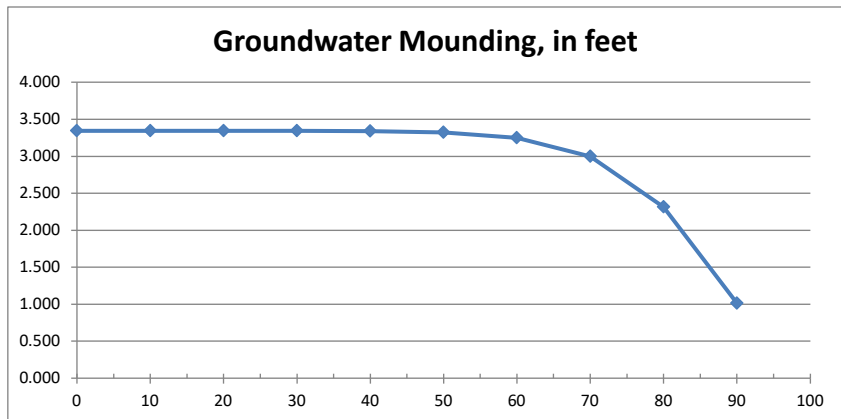
1.00	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.00	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
85.000	x	1/2 length of basin (x direction, in feet)
64.000	y	1/2 width of basin (y direction, in feet)
6.02	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.344	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.344	$\Delta h(\max)$	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

3.344	0
3.344	10
3.344	20
3.344	30
3.341	40
3.324	50
3.250	60
3.000	70
2.315	80
1.015	90



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.

BASIN-B y-y DIRECTION

Input Values

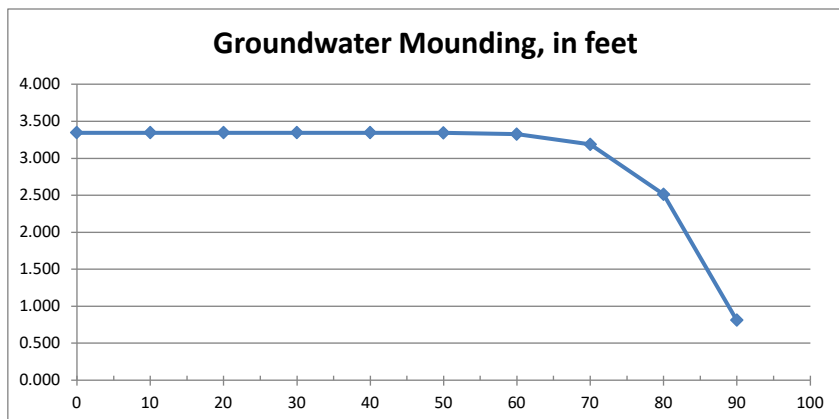
1.00	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.00	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
85.000	x	1/2 length of basin (x direction, in feet)
64.000	y	1/2 width of basin (y direction, in feet)
6.02	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.344	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.344	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

3.344	0
3.344	10
3.344	20
3.344	30
3.344	40
3.343	50
3.325	60
3.186	70
2.512	80
0.809	90



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.

BASIN-I x-x DIRECTION

Input Values

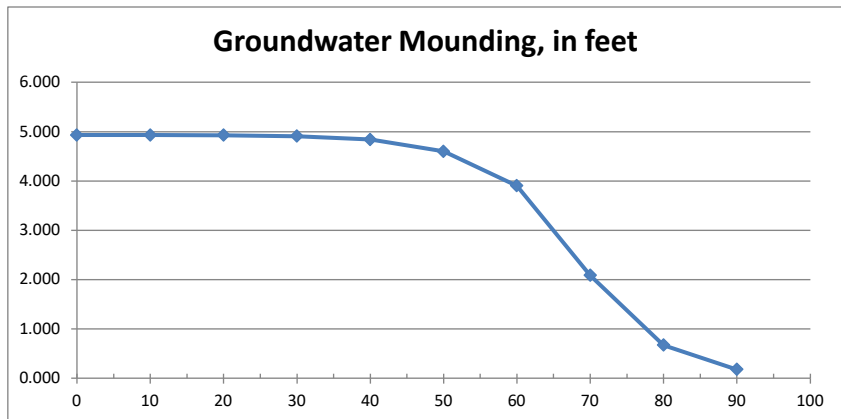
0.75	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
1.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
68.000	x	1/2 length of basin (x direction, in feet)
12.000	y	1/2 width of basin (y direction, in feet)
17.61	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

14.930	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.930	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

4.930	0
4.930	10
4.926	20
4.909	30
4.838	40
4.599	50
3.901	60
2.082	70
0.669	80
0.175	90



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.

BASIN-B y-y DIRECTION

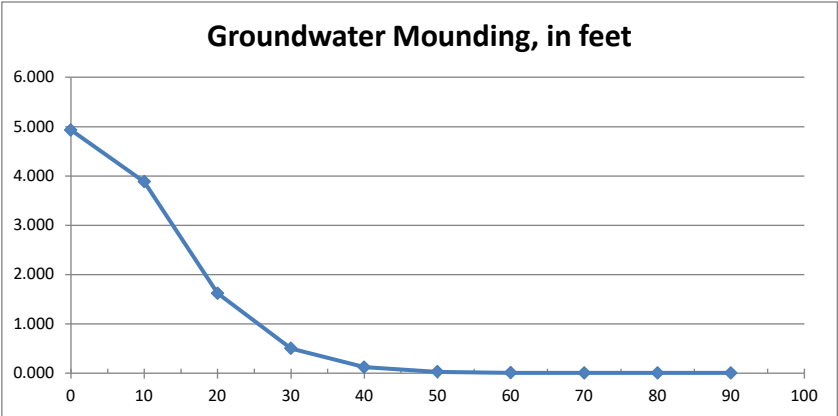
Input Values

0.75	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
1.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
12.000	x	1/2 length of basin (x direction, in feet)
68.000	y	1/2 width of basin (y direction, in feet)
17.61	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
14.930	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
4.930	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

4.930	0
3.882	10
1.618	20
0.499	30
0.121	40
0.024	50
0.006	60
0.003	70
0.002	80
0.002	90



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.

BASIN-N x-x DIRECTION

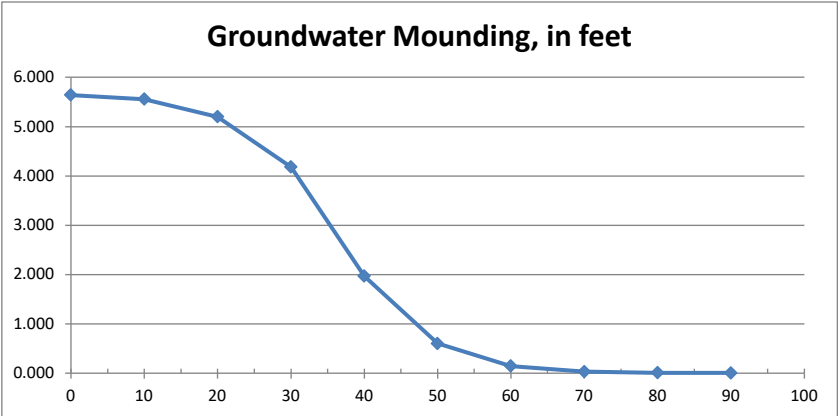
Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
1.00	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
36.000	x	1/2 length of basin (x direction, in feet)
18.000	y	1/2 width of basin (y direction, in feet)
24.59	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
15.640	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.640	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

5.640	0
5.557	10
5.197	20
4.181	30
1.964	40
0.601	50
0.144	60
0.028	70
0.006	80
0.003	90



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.

BASIN-N y-y DIRECTION

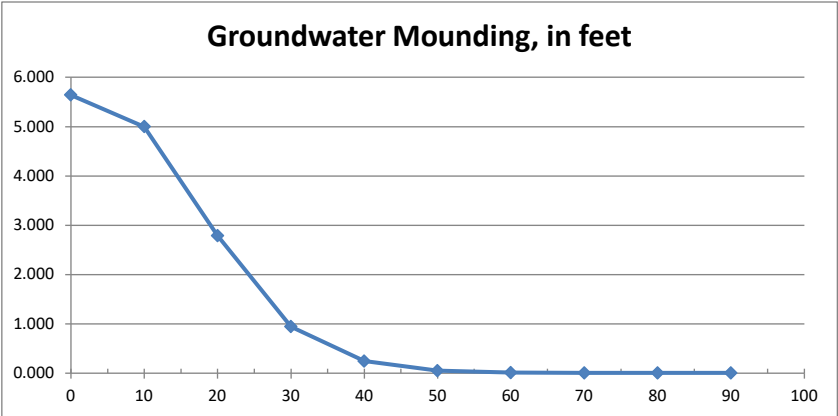
Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless)
1.00	Kh	Horizontal hydraulic conductivity (in/hr)
18.000	x	1/2 length of basin (x direction, in feet)
36.000	y	1/2 width of basin (y direction, in feet)
24.59	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
15.640	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.640	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

5.640	0
4.999	10
2.787	20
0.939	30
0.242	40
0.049	50
0.009	60
0.003	70
0.002	80
0.002	90



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.

APPENDIX H

EMERGENCY SPILLWAY CALCULATIONS



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. A

INPUT

Q (100) = 4.90 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 20.0 ft	
Top of Berm = 555.70	
100 YR Storm Elevation (Spillway) = 554.50	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 4.90 cfs
Q = C(L)(H) ^{1.5}
Height = 0.188 ft
100 Yr Crest Elevation = 554.69
Freeboard 1.01 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. B

INPUT

Q (100) = 8.16 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 10.0 ft	
Top of Berm = 580.00	
100 YR Storm Elevation (Spillway) = 578.34	
Treat as a Class IV Dam	yes

* Residential Site Improvement Standards

OUTPUT

Weir Q = 12.24 cfs
Q = C(L)(H) ^{1.5}

Height = 0.550 ft

100 Yr Crest Elevation = 578.90
--

Freeboard 1.10 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. H

INPUT

Q (100) = 4.38 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 30.0 ft	
Top of Berm = 612.60	
100 YR Storm Elevation (Spillway) = 611.45	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 4.38 cfs
Q = C(L)(H) ^{1.5}
Height = 0.133 ft
100 Yr Crest Elevation = 611.59
Freeboard 1.01 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. C

INPUT

Q (100) = 5.04 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 30.0 ft	
Top of Berm = 565.00	
100 YR Storm Elevation (Spillway) = 563.84	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 5.04 cfs
Q = C(L)(H) ^{1.5}
Height = 0.146 ft
100 Yr Crest Elevation = 563.99
Freeboard 1.01 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. 1

INPUT

Q (100) = 1.29 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 10.0 ft	
Top of Berm = 613.00	
100 YR Storm Elevation (Spillway) = 611.72	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 1.29 cfs
Q = C(L)(H) ^{1.5}
Height = 0.123 ft
100 Yr Crest Elevation = 611.85
Freeboard 1.15 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. I

INPUT

Q (100) = 10.78 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 30.0 ft	
Top of Berm = 617.30	
100 YR Storm Elevation (Spillway) = 616.15	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 10.78 cfs
Q = C(L)(H) ^{1.5}
Height = 0.243 ft
100 Yr Crest Elevation = 616.40
Freeboard 0.90 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. 1

INPUT

Q (100) = 1.54 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 40.0 ft	
Top of Berm = 613.05	
100 YR Storm Elevation (Spillway) = 611.99	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 1.54 cfs
Q = C(L)(H) ^{1.5}
Height = 0.055 ft
100 Yr Crest Elevation = 612.05
Freeboard 1.00 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. 1

INPUT

Q (100) = 8.01 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 30.0 ft	
Top of Berm = 601.10	
100 YR Storm Elevation (Spillway) = 599.90	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 8.01 cfs
Q = C(L)(H) ^{1.5}
Height = 0.199 ft
100 Yr Crest Elevation = 600.10
Freeboard 1.00 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. M

INPUT

Q (100) = 14.78 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 100.0 ft	
Top of Berm = 571.90	
100 YR Storm Elevation (Spillway) = 570.77	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 14.78 cfs
Q = C(L)(H) ^{1.5}
Height = 0.134 ft
100 Yr Crest Elevation = 570.91
Freeboard 0.99 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. 1

INPUT

Q (100) = 23.35 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 65.0 ft	
Top of Berm = 581.10	
100 YR Storm Elevation (Spillway) = 579.79	
Treat as a Class IV Dam	no

* Residential Site Improvement Standards

OUTPUT

Weir Q = 23.35 cfs
Q = C(L)(H) ^{1.5}
Height = 0.243 ft
100 Yr Crest Elevation = 580.04
Freeboard 1.06 ft



Emergency Spillway Calculations

Project: The Greens at Menham
Location: Borough of Menham, NJ

Computed By: PSP
Checked By:
Date: 2/4/2026

Detention Basin No. 1

INPUT

Q (100) = 31.68 cfs	
Loss Coefficient, C= 3.00	*
Length of Weir, L = 50.0 ft	
Top of Berm = 568.20	
100 YR Storm Elevation (Spillway) = 566.76	
Treat as a Class IV Dam	no

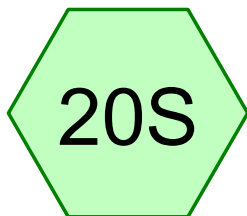
* Residential Site Improvement Standards

OUTPUT

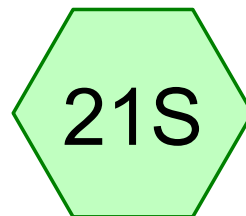
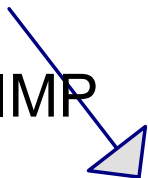
Weir Q = 31.68 cfs
Q = C(L)(H) ^{1.5}
Height = 0.355 ft
100 Yr Crest Elevation = 567.12
Freeboard 1.08 ft

APPENDIX I

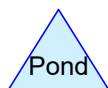
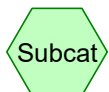
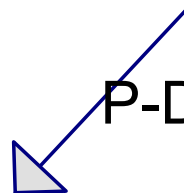
MANUFACTURED TREATMENT DEVICE DESIGN SIZING



P-DA-1F IMP



P-DA-1F PER



Routing Diagram for 081228-SWM

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081228-SWM

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Page 2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,534	61	>75% Grass cover, Good, HSG B (21S)
1,742	98	Impervious, HSG B (20S)
2,614	98	Motor Veh Surface, Paved parking, HSG B (20S)
3,049	98	Roofs, HSG B (20S)
13,939	81	TOTAL AREA

081228-SWM*NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"*

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Page 3

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 20S: P-DA-1F IMP

Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=1.03"

Flow Length=239' Tc=1.3 min CN=WQ Runoff=0.53 cfs 638 cf

Subcatchment 21S: P-DA-1F PER

Runoff Area=0.150 ac 0.00% Impervious Runoff Depth=0.00"

Flow Length=114' Tc=2.4 min CN=61 Runoff=0.00 cfs 0 cf

Total Runoff Area = 13,939 sf Runoff Volume = 638 cf Average Runoff Depth = 0.55"
46.88% Pervious = 6,534 sf 53.13% Impervious = 7,405 sf

Summary for Subcatchment 20S: P-DA-1F IMP

Runoff = 0.53 cfs @ 1.03 hrs, Volume= 638 cf, Depth= 1.03"
 Routed to Link 20L : TOTAL TO GI MTD F-1

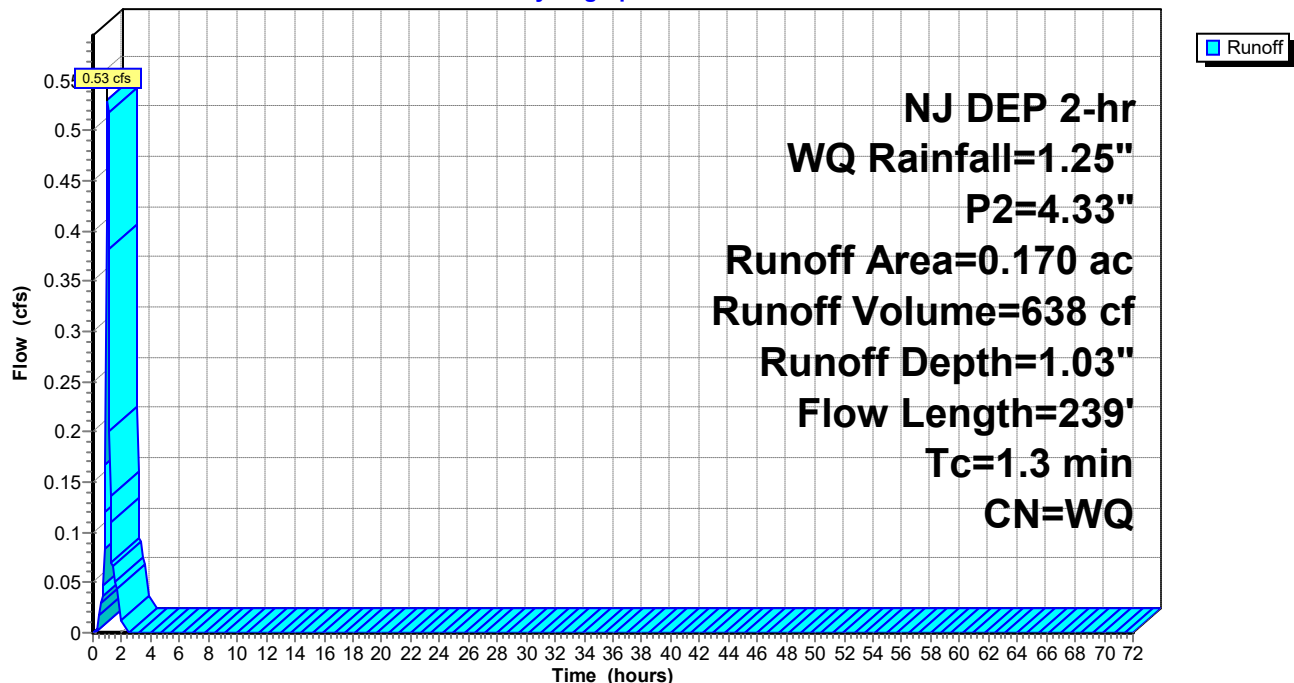
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
* 0.060	98	Motor Veh Surface, Paved parking, HSG B
* 0.040	98	Impervious, HSG B
0.170		Weighted Average
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	20	0.0158	2.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	119	0.0470	12.36	15.17	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
1.3	239	Total			

Subcatchment 20S: P-DA-1F IMP

Hydrograph



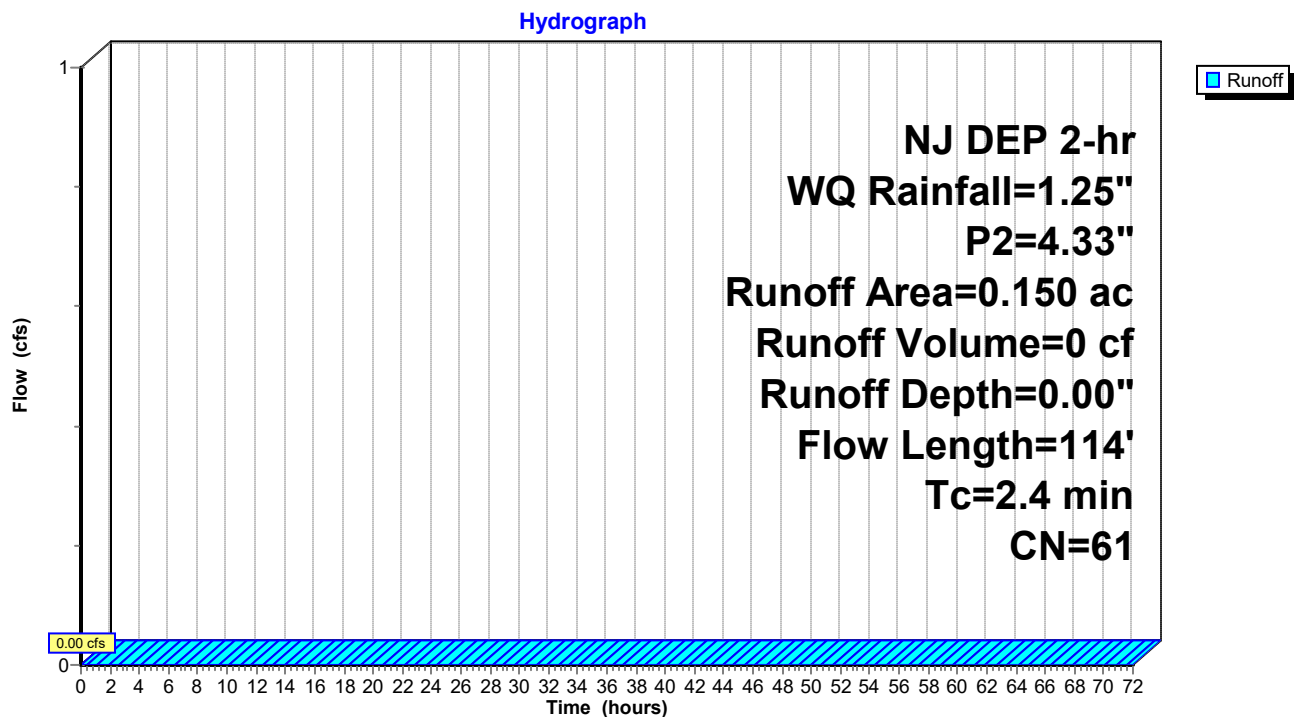
Summary for Subcatchment 21S: P-DA-1F PER

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 20L : TOTAL TO GI MTD F-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.150	61	>75% Grass cover, Good, HSG B
0.150		100.00% Pervious Area

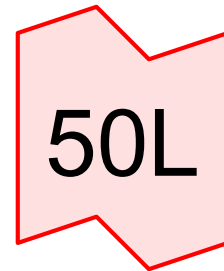
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	17	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.4	85	0.0100	3.75	1.31	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012 Concrete pipe, finished
0.0	12	0.0500	10.99	8.63	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.4	114	Total			

Subcatchment 21S: P-DA-1F PER

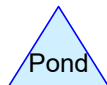
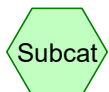


P-DA-4K IMP

P-DA-4K PER



TOTAL TO GI MTD K-1



Routing Diagram for 081228-SWM

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081228-SWM

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Page 2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
19,166	61	>75% Grass cover, Good, HSG B (48S)
6,970	98	Impervious, HSG B (47S)
10,890	98	Motor Veh Surface, Paved parking, HSG B (47S)
13,504	98	Roofs, HSG B (47S)
50,530	84	TOTAL AREA

081228-SWM*NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"*

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Page 3

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 47S: P-DA-4K IMPRunoff Area=0.720 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=283' Tc=1.7 min CN=WQ Runoff=2.22 cfs 2,704 cf**Subcatchment 48S: P-DA-4K PER**Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=412' Tc=8.8 min CN=61 Runoff=0.00 cfs 0 cf**Link 50L: TOTAL TO GI MTD K-1**Inflow=2.22 cfs 2,704 cf
Primary=2.22 cfs 2,704 cf**Total Runoff Area = 50,530 sf Runoff Volume = 2,704 cf Average Runoff Depth = 0.64"**
37.93% Pervious = 19,166 sf 62.07% Impervious = 31,363 sf

Summary for Subcatchment 47S: P-DA-4K IMP

Runoff = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf, Depth= 1.03"
 Routed to Link 50L : TOTAL TO GI MTD K-1

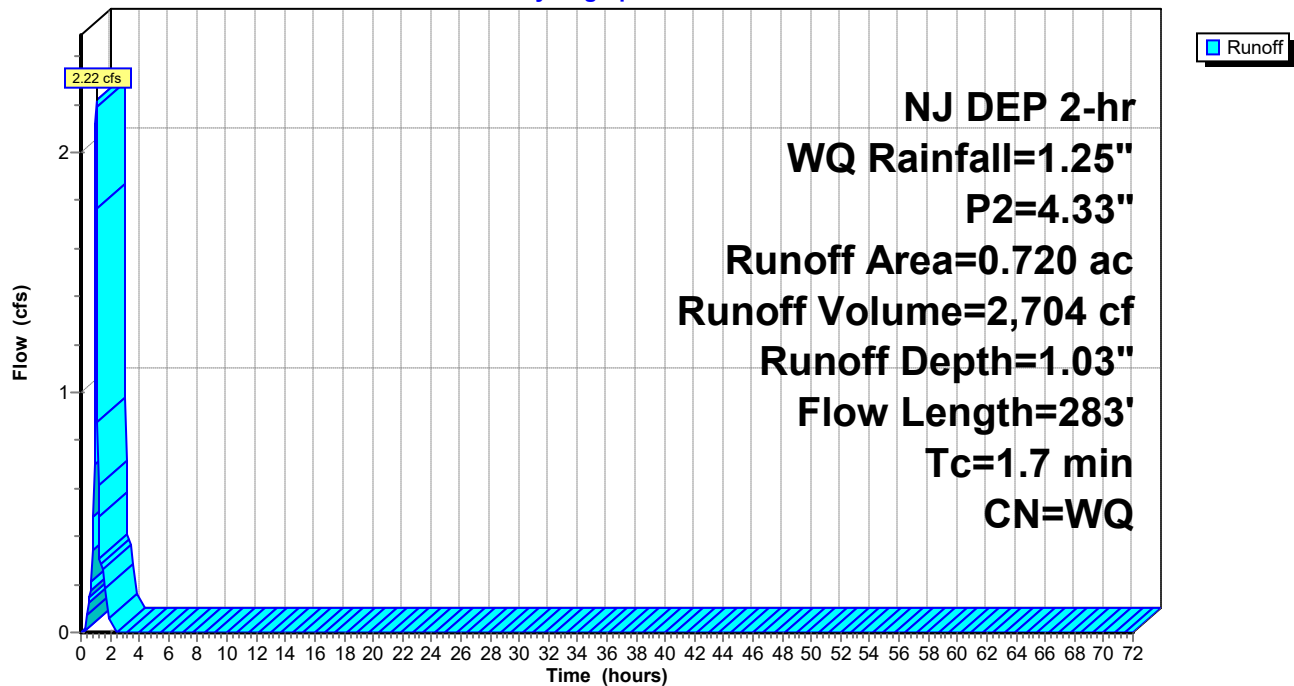
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.310	98	Roofs, HSG B
* 0.250	98	Motor Veh Surface, Paved parking, HSG B
* 0.160	98	Impervious, HSG B
0.720		Weighted Average
0.720		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0220	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.33"
0.1	17	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.0	13	0.0154	6.53	8.02	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.7	283	Total			

Subcatchment 47S: P-DA-4K IMP

Hydrograph



Summary for Subcatchment 48S: P-DA-4K PER

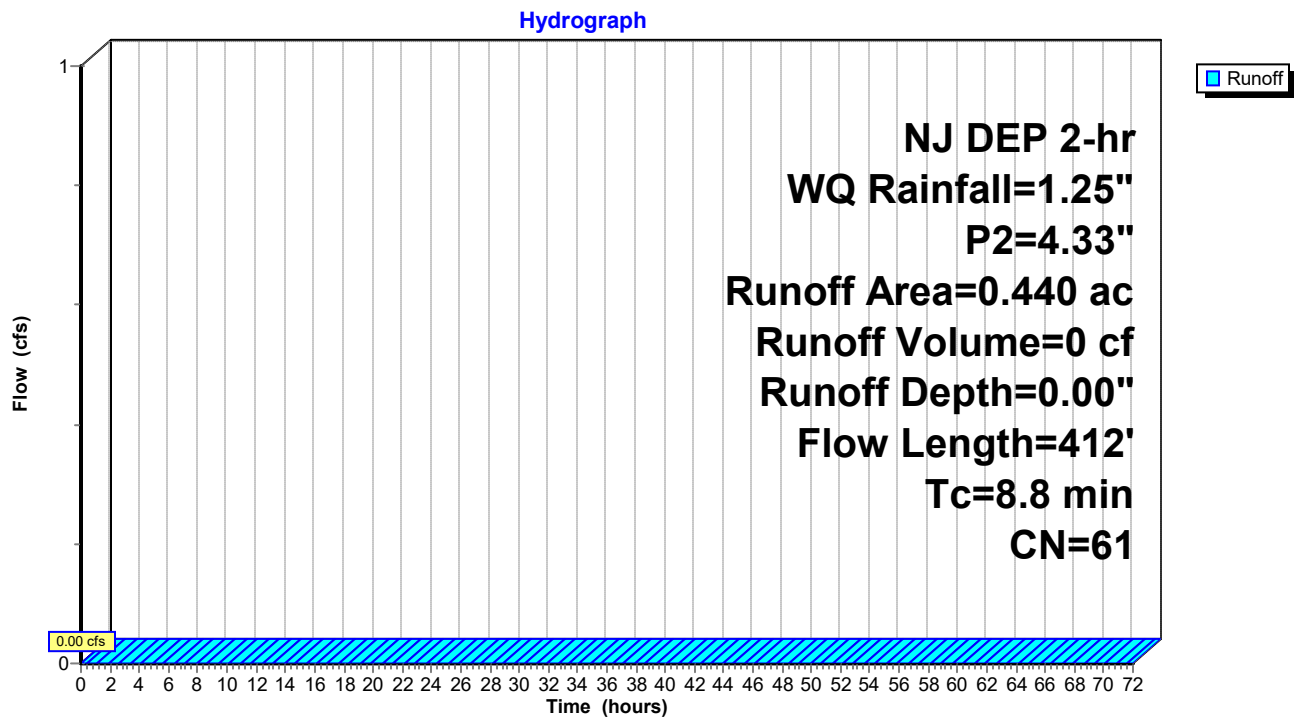
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link 50L : TOTAL TO GI MTD K-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25", P2=4.33"

Area (ac)	CN	Description
0.440	61	>75% Grass cover, Good, HSG B
0.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	96	0.0270	0.22		Sheet Flow, Grass: Short n= 0.150 P2= 4.33"
0.9	147	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0063	4.18	5.13	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.6	135	0.0050	3.72	4.57	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.0	18	0.0168	7.70	13.62	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
8.8	412	Total			

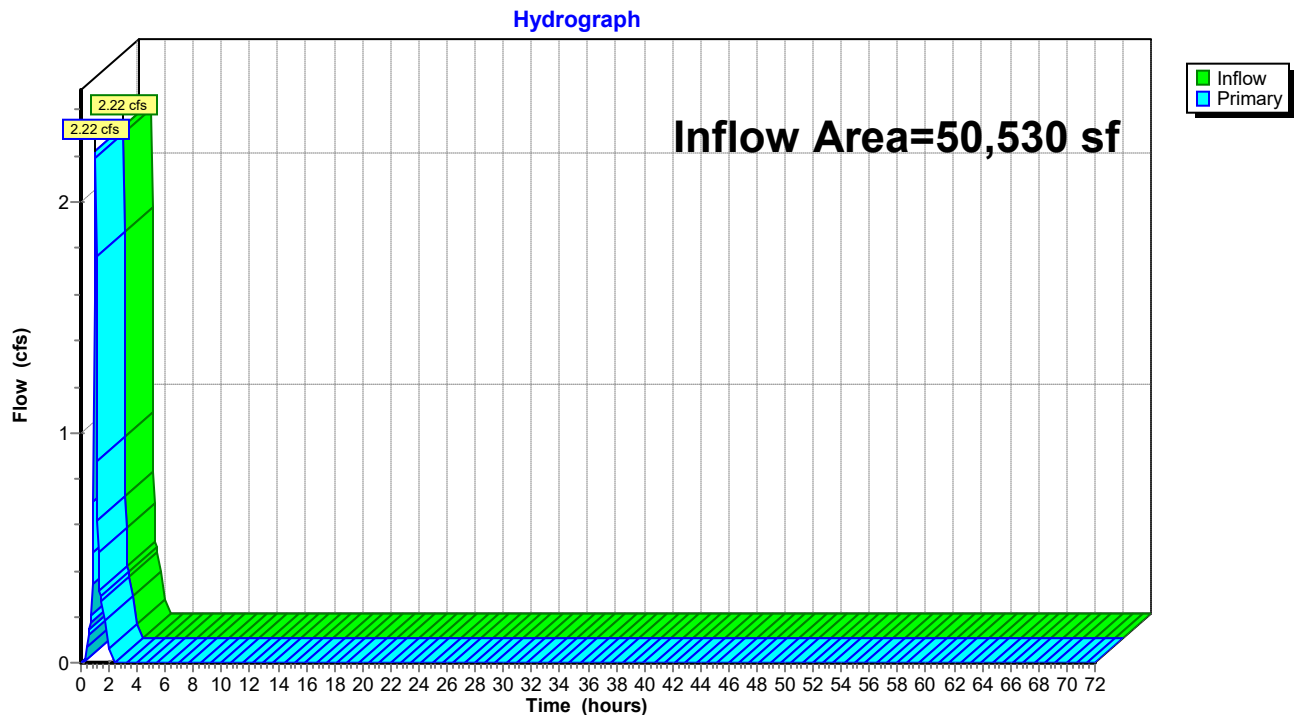
Subcatchment 48S: P-DA-4K PER



Summary for Link 50L: TOTAL TO GI MTD K-1

Inflow Area = 50,530 sf, 62.07% Impervious, Inflow Depth = 0.64" for WQ event
Inflow = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf
Primary = 2.22 cfs @ 1.03 hrs, Volume= 2,704 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond K : BMP-K UG Infiltration Basin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 50L: TOTAL TO GI MTD K-1



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHILIP D. MURPHY
Governor

DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT

SHAWN M. LATOURETTE
Commissioner

TAHESHA L. WAY
Lt. Governor

P.O. Box 420 Mail Code 401-02B
Trenton, New Jersey 08625-0420
609-633-7021 / Fax: 609-777-0432
<https://dep.nj.gov/stormwater/>

February 6, 2024

Bo Liu, P.E. Ph.D.
Research Engineer
Advanced Drainage Systems, Inc.
4640 Trueman Boulevard
Hilliard, OH 43026

Re: MTD Lab Certification
EcoStream Biofiltration System (EcoStream)
Online Installation

TSS Removal Rate 80%

Dear Dr. Liu:

This revised certification letter supersedes the Department's prior certification dated June 20, 2023. This revision was completed as a result of the addition of new models. Additionally, amendments to the Stormwater Management rules at N.J.A.C. 7:8 were adopted on July 17, 2023. Among other changes, these amendments removed the rational method as an allowable calculation method for compliance with the Stormwater Management rules in New Jersey. As a result, this revised certification also updates the example sizing calculation to utilize NRCS methodology, rather than the rational method.

The Stormwater Management rules under N.J.A.C. 7:8-5.2(f) and 5.2(j) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Advanced Drainage Systems, Inc. has requested a Laboratory Certification for the EcoStream Biofiltration System (EcoStream).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated August 4, 2021. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 14, 2022.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with

the Verification Appendix (dated May 2023 and last revised January 2024) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the EcoStream by Advanced Drainage Systems, Inc. at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 4.125 gpm/ft² of effective filtration treatment area.
2. The EcoStream shall be installed using the same configuration reviewed by NJCAT and sized in accordance with the criteria specified in item 7 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.5 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at <https://dep.nj.gov/stormwater/>.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the EcoStream. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at <https://www.adspipe.com/resources/documents/46DAA1FC-D53D-4B22-AC03FBEF7310E895> for any changes to the maintenance requirements.
6. For an MTD to be considered “green infrastructure” in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) infiltrate into the subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil. Any configuration that uses a bio-filtration media and can be configured "above ground" and incorporate a tree box, planter box, or shrubs, etc., would meet the GI definition. Any MTD with bio-filtration media that would be placed "below ground" as a vault without any vegetation can be considered GI (for NJ purposes) only if the device infiltrates the entire Water Quality Design Storm into the subsoil. Further, the below ground device (vault) would need to meet the NJDEP Stormwater BMP Manual conditions of having the soil below the MTD meet the minimum tested infiltration rate of one inch per hour, have at least two feet of separation from the seasonal high water table, and infiltrate into the subsoil.
7. Sizing Requirement:

The example below demonstrates the sizing procedure for the EcoStream:

Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 80% TSS removal using an EcoStream. The hydraulically most distant point to the inlet of the device is 110 feet. The site is located in an area for which the projected 2-year storm rainfall depth was calculated to be 3.84 inches.

The selection of the appropriate model of an EcoStream is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the EcoStream in this example is 0.25 acres. Based upon the information in Table 1 below, the Model ES-12 would be able to treat runoff without exceeding the maximum allowable drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

CN = 98 (Curve Number for impervious)
Dimensionless Unit Hydrograph (DUH) = SCS Standard DUH (peak rate factor of 484)
Time of concentration = 0.8 minutes
Q = 0.77 cfs

Given the site runoff is 0.77 cfs and based on Table 1 below, the minimum size unit to be used to treat the runoff without exceeding the MTFR is the Model ES-91.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below:

Table 1. EcoStream Biofiltration System Model MTFRs and Maximum Allowable Drainage Area.

Model	Typical Treatment Cell Dimensions W x L (ft)	Effective Filtration Treatment Area (ft²)	MTFR (cfs)	Maximum Allowable Drainage Area (acres)
ES-6	2 x 3	6	0.055	0.169
ES-12	3 x 4	12	0.110	0.339
ES-16	4 x 4	16	0.147	0.451
ES-20	4 x 5	20	0.184	0.564
ES-24	4 x 6	24	0.221	0.677
ES-32	4 x 8	32	0.294	0.903
ES-36	6 x 6	36	0.331	1.016
ES-40	4 x 10	40	0.368	1.129
ES-48	4 x 12	48	0.441	1.354
ES-60	6 x 10	60	0.551	1.693
ES-72	6 x 12	72	0.662	2.032
ES-80	8 x 10	80	0.735	2.257
ES-91	7 x 13	91	0.836	2.568
ES-96	8 x 12	96	0.882	2.709
ES-100	10 x 10	100	0.919	2.822
ES-112	8 x 14	112	1.029	3.160
ES-120	10 x 12	120	1.103	3.386
ES-128	8 x 16	128	1.176	3.612
ES-144	12 x 12	144	1.323	4.063
ES-160	10 x 16	160	1.470	4.515
ES-168	12 x 14	168	1.544	4.740
ES-176	8 x 22	176	1.618	4.966
ES-225	15 x 15	225	2.068	6.349
ES-256	16 x 16	256	2.353	7.223
ES-289	17 x 17	289	2.656	8.155
ES-324	18 x 18	324	2.978	9.142
ES-360	18 x 20	360	3.309	10.158

MTD F-1

WQ flow =
0.53 CFS

MTD K-1

WQ flow =
2.22 CFS

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Changi Wu of my office at chang.i.wu@dep.nj.gov.

Sincerely,

A handwritten signature in blue ink that reads "Gabriel Mahon". The signature is written in a cursive, flowing style.

Gabriel Mahon, Chief
Bureau of NJPDES Stormwater Permitting & Water Quality Management
Division of Watershed Protection and Restoration
New Jersey Department of Environmental Protection

Attachment: Maintenance Plan

cc: Richard Magee, NJCAT

EcoStream™ Biofiltration System Operation & Maintenance Guidance

Description

The EcoStream Biofiltration System (EcoStream) is an engineered stormwater biofiltration treatment system designed to capture and retain a variety of pollutants including sediments, phosphorus, heavy metals, and hydrocarbons from stormwater runoff. EcoStream incorporates the processes of sedimentation, filtration, infiltration, adsorption, and biological uptake to provide both water quality and quantity benefits in a small footprint. EcoStream should be activated after a site is stabilized to prevent uncontrolled stormwater runoff from the construction site from entering the system.

Configuration

The EcoStream system comes in many standard sizes and is available in several different deployment configurations. Excess flow spills over an overflow pipe and is directly discharged along with treated flow. The EcoStream system can be configured as a planter box filter with an open top that is suitable for shrubs and grasses, or as an underground filter with a subsurface inlet pipe. The optional external high flow bypass may be incorporated with any of these configurations.

Operations

Stormwater runoff enters the EcoStream via a pipe inlet or curb inlet and flows downward under gravity flow through mulch/media/gravel layers. The top layer provides pretreatment by retaining the coarse sediments, trash, and debris. The fine sediments and dissolved pollutants are further treated through the media bed in depth. Treated water enters an underdrain pipe or infiltrates into the ground (installations with open bottoms). A flow control orifice is placed downstream of the underdrain to ensure the distribution of flow in the media bed.

Inspections and Maintenance Overview

The EcoStream system requires periodic inspection and maintenance for it to operate at the design efficiency. The inspection process helps in deciding when and what level of maintenance will be needed to bring the unit up to or near peak efficiency. As with ADS' other water quality products, the maintenance cycle of the EcoStream system will be driven mostly by the actual solids and trash/debris load brought into the system.

The frequency of maintenance depends on the site-specific pollutant loading conditions. ADS recommends a visual inspection of the system quarterly for the first year of service, and after every high intensity and high-volume storm event occurring (1 in/hr and greater than 3 inches rainfall within 24 hours) during the first six months. After the first year, systems should be inspected at least bi-annually and ideally before the spring or rainy season and after the summer season, or prior to fall or winter seasons. The inspections should look for signs of but not limited to erosion, displacement, sediment, and trash accumulations in the upper portion of media bed or planting area. It is recommended that some general "good housekeeping" maintenance be performed at the beginning of the rainy or spring season every year. Depending on the site conditions, full system maintenance including removal of all media and plant life may be necessary if ponding water remains on top of media bed for 24 hours after any storm event.

For most maintenance needs, the EcoStream planting component follows the practices used for handling standard bioretention systems (i.e., general landscaping, cover management, and replacement planting of surface plants).

It may be advisable to “water” or irrigate the EcoStream plant area in geographical regions experiencing droughts or prolong periods without rainfall during the first year of service. Watering the plant life will help to ensure the plants can take hold and be established for future growth and treatment capabilities.

Inspection and General Maintenance Equipment

The following is a list of equipment recommended for inspection and general maintenance.

- Personal Protection Equipment (pants, steel-toed shoes, safety glasses, gloves, safety vest, hard hat, etc.)
- Manhole Hook or Crowbar
- Traffic Cones and Signage
- Stadia Rod and Tape Measure
- Inspection Operation and Maintenance (O&M) Log or other recording method (included at end of guide)
- Flashlight, Trash removal “Net” device, shovel, rake, broom and trash receptacle
- Vac Truck (if more extensive maintenance is required)
- Light Duty Construction Equipment (if bioretention media replacement is required)

General Inspection and Maintenance Procedures

Routine inspection will ensure that the system is performing at optimal conditions and that the risk of public flooding is low. EcoStream inspection involves a visual inspection of the plant surface area, structure inlet, and the media bed. This can all be done at the surface and requires no confined space entry into the EcoStream unit. An Inspection O&M log should be used, dates and weather conditions should be noted.

If the EcoStream is located in a traffic area (i.e. roadway or automobile travel way), and inspection is not possible without entering the vehicular area, safety measures should be employed --safety cones setup, etc. --prior to performing the inspection and maintenance.

For inspection of the treatment chamber of the EcoStream system, the manhole cover should be safely removed (i.e., using a manhole hook). A visual inspection of any inlet grates should be noted. If grates are missing or inlets are damaged, contact ADS for recommendation of repair. A visual inspection of the general appearance of the EcoStream should be performed, and notes should be taken detailing the condition of the surface plant life, invasive species intrusion, vandalism, erosion in the planting area and any signs of standing water or disturbed or “shifted” surface soil bed area. This general system condition should be noted in the inspection/maintenance log.

If the plant life and surface media show signs of distress, general landscaping O&M should be performed, i.e., raking, weeding (removal of invasive plants), and general planting replacement to maximize the cover area in the planting bed/media treatment chamber. If ponding of water is present in the media treatment cell and the last rain event was greater than 24 hours prior, further inspection should be performed to ensure the effluent pipe is not blocked.

A visual inspection (with a flashlight if needed) will inspect the appearance of the inlet (pipe or curb) and media bed. Remove all trash and debris from the inlet and the top of the media bed manually or by vacuum truck as required. If there is a visible sediment load or the media bed appears to have been greatly disturbed during preceding storm events, redistribute or replace the top mulch layer as needed. If sediment load is heavy, remove the mulch layer and inspect the biofiltration media and replace the top two-inch media if it appears clogged. Additionally, a further inspection should be undertaken within 24 hours after a major storm event to see if there is standing water in the system. Water stagnation in the treatment chamber indicates that media bed replacement may be recommended. ADS Field Engineering can assist with this analysis.

ADS should be contacted for material specifications and replacement parts. Media chamber replacement will involve utilizing small construction excavation equipment.

Disposal of material from the treatment chamber should be in accordance with the local municipality’s requirements. Typically, traditional municipal landfills can be used for disposal of solids and trash obtained from servicing the EcoStream. Call ADS at 800-821-6710 for further information.

Records of Operation and Maintenance

The owner shall maintain annual records of the operation and maintenance of the EcoStream unit to document the effective maintenance of this important component of a site’s stormwater management program. The attached Inspection & Maintenance Log is suggested and should be retained for a minimum period of two years.

EcoStream BioFilter Inspection and O&M Log Sheet

Project Name: _____

Location: _____

Date	Inspection or O&M	Observation/Actions	Operator comments and general description	Inspector



APPENDIX J
COVEYANCE SYSTEM CALCULATIONS



NOAA Atlas 14, Volume 2, Version 3
Location name: Mendham, New Jersey, USA*
Latitude: 40.7704°, Longitude: -74.6156°
Elevation: 627 ft**
* source: ESRI Maps
** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.06 (3.68-4.48)	4.84 (4.39-5.33)	5.71 (5.18-6.30)	6.34 (5.74-6.98)	7.10 (6.41-7.82)	7.68 (6.90-8.45)	8.22 (7.34-9.04)	8.70 (7.73-9.58)	9.31 (8.21-10.3)	9.74 (8.54-10.8)
10-min	3.22 (2.93-3.56)	3.85 (3.50-4.25)	4.57 (4.14-5.03)	5.06 (4.58-5.57)	5.65 (5.10-6.22)	6.08 (5.46-6.68)	6.49 (5.80-7.13)	6.85 (6.09-7.54)	7.31 (6.44-8.06)	7.63 (6.68-8.42)
15-min	2.68 (2.44-2.96)	3.22 (2.93-3.56)	3.84 (3.48-4.23)	4.25 (3.85-4.68)	4.76 (4.29-5.24)	5.12 (4.60-5.63)	5.46 (4.87-6.00)	5.75 (5.11-6.32)	6.12 (5.40-6.75)	6.38 (5.59-7.04)
30-min	1.83 (1.67-2.02)	2.22 (2.02-2.45)	2.71 (2.46-2.99)	3.07 (2.78-3.38)	3.51 (3.17-3.86)	3.84 (3.45-4.22)	4.16 (3.71-4.57)	4.45 (3.96-4.89)	4.84 (4.27-5.33)	5.12 (4.48-5.65)
60-min	1.14 (1.04-1.26)	1.39 (1.26-1.53)	1.74 (1.58-1.92)	1.99 (1.80-2.20)	2.33 (2.10-2.57)	2.59 (2.33-2.85)	2.86 (2.55-3.14)	3.11 (2.77-3.42)	3.46 (3.05-3.82)	3.73 (3.26-4.11)
2-hr	0.698 (0.632-0.769)	0.851 (0.773-0.938)	1.08 (0.975-1.19)	1.25 (1.13-1.38)	1.50 (1.34-1.64)	1.70 (1.51-1.86)	1.90 (1.69-2.09)	2.12 (1.86-2.32)	2.42 (2.10-2.66)	2.66 (2.29-2.93)
3-hr	0.522 (0.475-0.578)	0.636 (0.578-0.704)	0.805 (0.730-0.891)	0.937 (0.847-1.03)	1.12 (1.01-1.23)	1.27 (1.13-1.40)	1.42 (1.26-1.56)	1.58 (1.39-1.74)	1.80 (1.57-1.99)	1.98 (1.71-2.19)
6-hr	0.338 (0.308-0.375)	0.411 (0.375-0.454)	0.520 (0.472-0.573)	0.608 (0.551-0.669)	0.735 (0.660-0.806)	0.841 (0.749-0.921)	0.954 (0.843-1.04)	1.08 (0.942-1.18)	1.25 (1.08-1.37)	1.40 (1.19-1.53)
12-hr	0.211 (0.191-0.234)	0.256 (0.233-0.284)	0.326 (0.295-0.360)	0.384 (0.347-0.424)	0.471 (0.421-0.517)	0.545 (0.483-0.597)	0.626 (0.549-0.685)	0.717 (0.621-0.784)	0.851 (0.723-0.930)	0.966 (0.808-1.06)
24-hr	0.121 (0.112-0.132)	0.146 (0.135-0.160)	0.185 (0.170-0.202)	0.217 (0.199-0.237)	0.265 (0.242-0.288)	0.305 (0.277-0.332)	0.349 (0.315-0.380)	0.397 (0.355-0.432)	0.468 (0.413-0.510)	0.527 (0.460-0.575)
2-day	0.071 (0.066-0.078)	0.086 (0.079-0.094)	0.109 (0.100-0.119)	0.127 (0.117-0.139)	0.154 (0.141-0.168)	0.176 (0.160-0.192)	0.200 (0.181-0.218)	0.226 (0.202-0.247)	0.263 (0.233-0.288)	0.294 (0.257-0.323)
3-day	0.050 (0.046-0.054)	0.060 (0.055-0.065)	0.076 (0.070-0.082)	0.088 (0.081-0.096)	0.107 (0.098-0.116)	0.122 (0.111-0.132)	0.138 (0.125-0.150)	0.155 (0.140-0.169)	0.180 (0.160-0.197)	0.201 (0.177-0.220)
4-day	0.039 (0.036-0.042)	0.047 (0.043-0.051)	0.059 (0.055-0.064)	0.069 (0.064-0.075)	0.083 (0.076-0.090)	0.095 (0.086-0.102)	0.107 (0.097-0.116)	0.120 (0.108-0.130)	0.139 (0.124-0.151)	0.154 (0.136-0.168)
7-day	0.026 (0.024-0.028)	0.031 (0.029-0.034)	0.039 (0.036-0.042)	0.045 (0.042-0.049)	0.054 (0.050-0.058)	0.061 (0.056-0.066)	0.069 (0.063-0.075)	0.077 (0.070-0.084)	0.089 (0.080-0.097)	0.099 (0.087-0.107)
10-day	0.021 (0.019-0.022)	0.025 (0.023-0.027)	0.031 (0.029-0.033)	0.035 (0.033-0.038)	0.042 (0.038-0.045)	0.047 (0.043-0.050)	0.052 (0.048-0.056)	0.058 (0.053-0.062)	0.066 (0.059-0.071)	0.072 (0.064-0.078)
20-day	0.014 (0.013-0.015)	0.017 (0.016-0.018)	0.020 (0.019-0.021)	0.022 (0.021-0.024)	0.026 (0.024-0.028)	0.029 (0.027-0.031)	0.031 (0.029-0.034)	0.034 (0.032-0.037)	0.038 (0.035-0.041)	0.041 (0.037-0.044)
30-day	0.011 (0.011-0.012)	0.014 (0.013-0.014)	0.016 (0.015-0.017)	0.018 (0.017-0.019)	0.020 (0.019-0.021)	0.022 (0.021-0.023)	0.024 (0.022-0.025)	0.025 (0.024-0.027)	0.028 (0.026-0.029)	0.029 (0.027-0.031)
45-day	0.010 (0.009-0.010)	0.011 (0.011-0.012)	0.013 (0.012-0.014)	0.015 (0.014-0.015)	0.016 (0.015-0.017)	0.018 (0.017-0.019)	0.019 (0.018-0.020)	0.020 (0.019-0.021)	0.021 (0.020-0.023)	0.022 (0.021-0.024)
60-day	0.009 (0.008-0.009)	0.010 (0.010-0.011)	0.012 (0.011-0.012)	0.013 (0.012-0.014)	0.014 (0.013-0.015)	0.015 (0.014-0.016)	0.016 (0.015-0.017)	0.017 (0.016-0.018)	0.018 (0.017-0.019)	0.019 (0.018-0.020)

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.

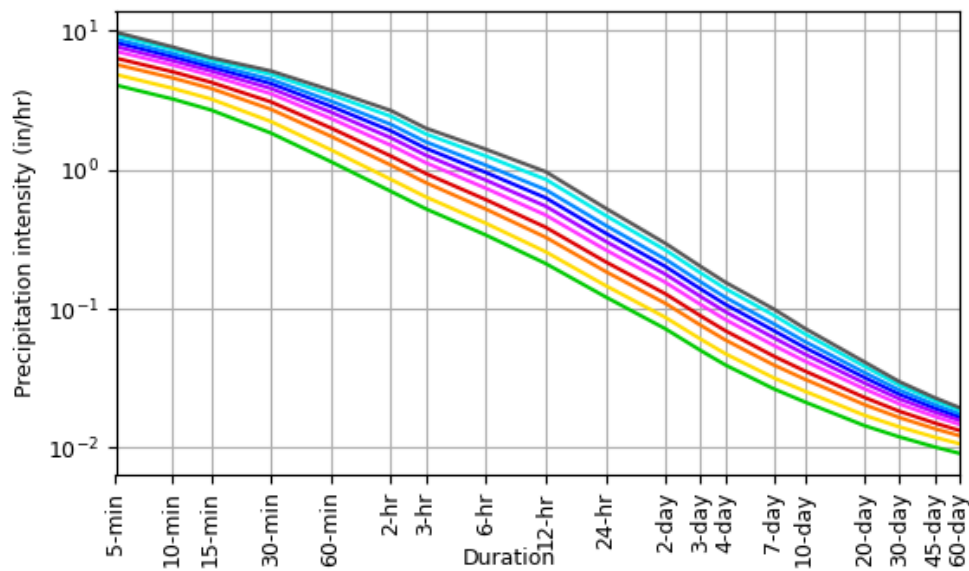
Please refer to NOAA Atlas 14 document for more information.

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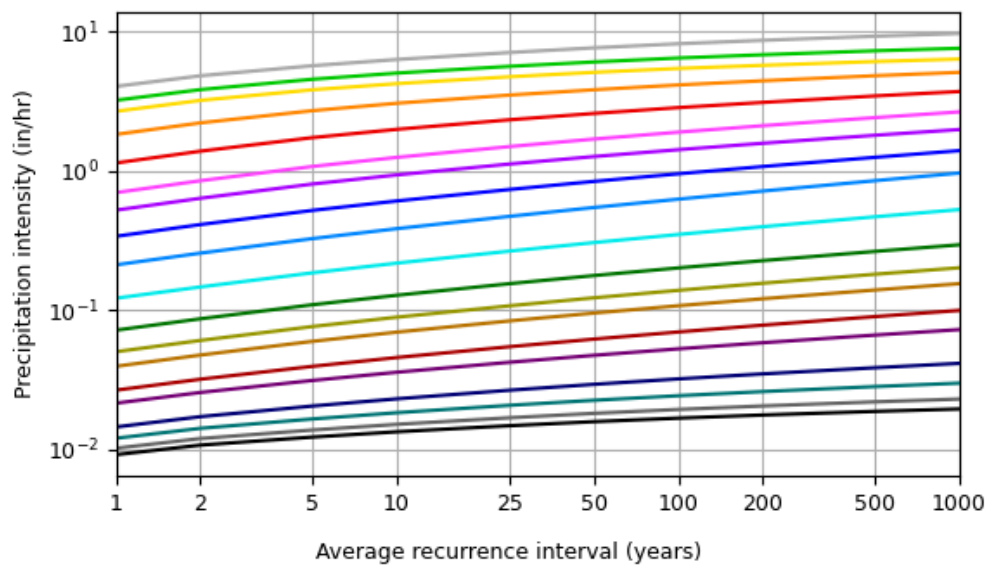
PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 40.7704°, Longitude: -74.6156°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000

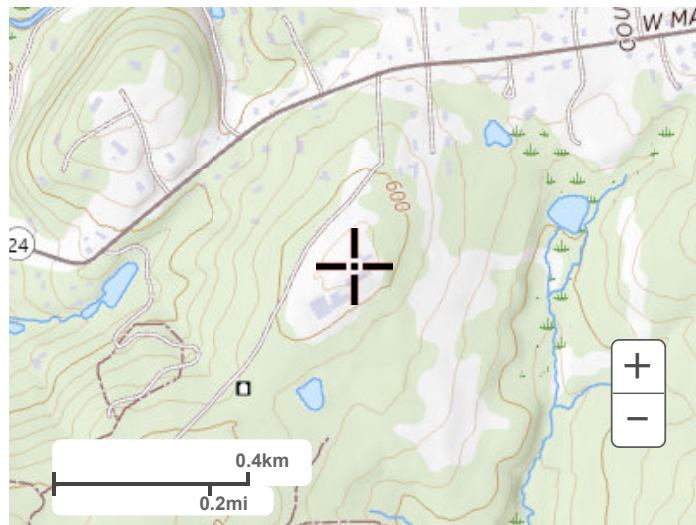


Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
30-day
45-day
60-day

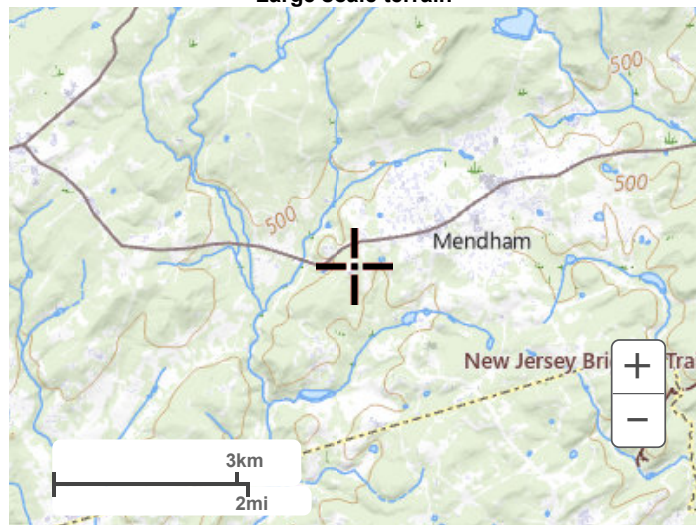
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Maps & aerials

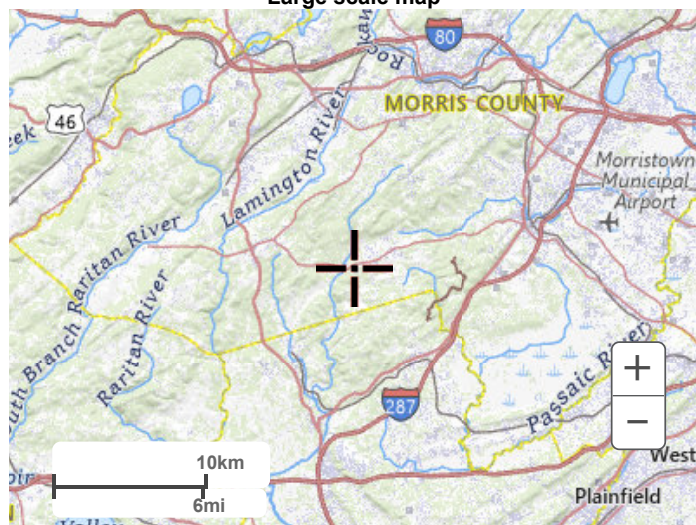
Small scale terrain



Large scale terrain



Large scale map



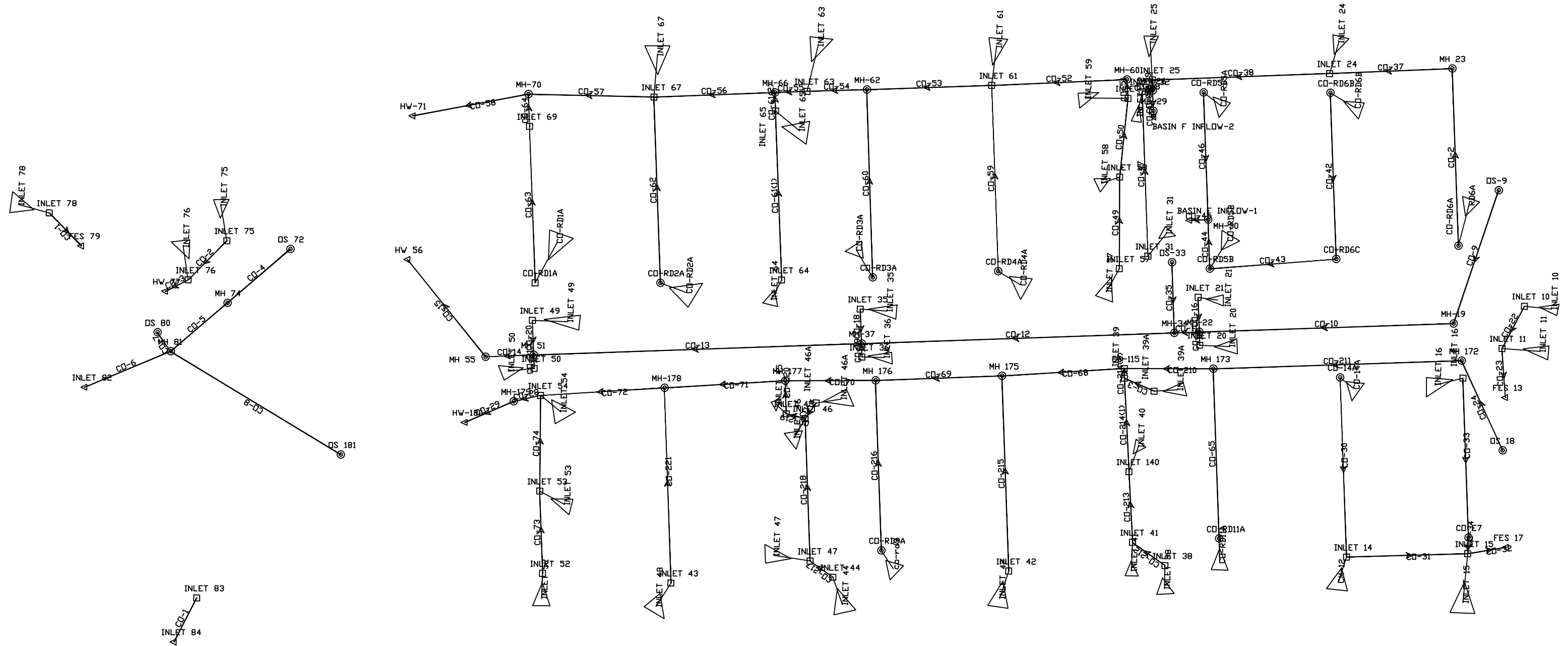
Large scale aerial



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STORMCAD MODEL - PLAN A
N.T.S.

100-YEAR DESIGN STORM (TO BE COMPLETED)

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Unified) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (ft²)	System CA (ft²)	Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Upstream Structure Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
INLET 78	FES 79	551.30	551.00	30.7	0.98	12.0	0.013	0.500	6.490	14,695	7,349	1.10	3.52	3.96	551.74	551.74	551.38
INLET 75	INLET 76	559.20	558.70	36.8	1.36	15.0	0.013	0.710	6.490	5,157	3,659	0.55	7.53	3.58	559.49	559.49	558.93
INLET 76	HW 77	552.00	551.50	17.1	2.93	15.0	0.013	0.683	6.455	6,103	7,827	1.17	11.05	5.85	552.43	552.43	551.78
OS 72	MH 74	559.00	556.40	55.4	4.69	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	48.99	0.00	559.00	559.00	556.40
MH 74	MH 81	554.50	551.50	49.9	6.01	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	55.45	0.00	554.50	554.50	551.50
MH 81	INLET 82	548.00	547.80	62.2	0.32	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	12.82	0.00	548.00	548.00	547.80
OS 80	MH 81	548.70	548.10	15.4	3.89	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	12.74	0.00	548.70	548.70	548.10
OS 181	MH 81	559.00	552.00	133.1	5.26	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	14.81	0.00	559.00	559.00	552.00
OS-9	MH-19	606.90	606.40	94.0	0.53	18.0	0.013	(N/A)	8.220	(N/A)	0	4.38	7.66	4.48	607.71	607.71	607.20
MH-19	MH-22	605.55	603.78	170.1	1.04	18.0	0.013	(N/A)	8.220	(N/A)	0	4.38	10.71	5.76	606.35	606.35	604.65
MH-22	MH-34	603.68	603.45	16.7	1.37	18.0	0.013	(N/A)	6.471	(N/A)	12,636	6.27	12.31	7.00	604.65	604.65	604.26
MH-34	MH-37	598.20	594.20	209.3	1.91	18.0	0.013	(N/A)	6.463	(N/A)	12,636	11.22	14.52	9.07	599.48	599.48	595.19
MH-37	MH 51	591.00	583.00	219.3	3.65	18.0	0.013	(N/A)	6.384	(N/A)	25,055	13.03	20.06	12.08	592.35	592.35	583.88
MH 51	MH 55	582.20	581.00	32.2	3.73	18.0	0.013	(N/A)	6.321	(N/A)	37,943	14.88	20.28	12.54	583.60	583.60	582.05
MH 55	HW 56	568.00	565.00	83.3	3.60	18.0	0.013	(N/A)	6.312	(N/A)	37,943	14.87	19.94	12.22	569.30	569.30	565.76
INLET 21	MH-22	605.70	605.40	23.2	1.29	15.0	0.013	0.762	6.490	8,656	6,597	0.99	7.35	4.18	606.09	606.09	605.71
INLET 20	MH-22	605.70	605.40	8.8	3.40	15.0	0.013	0.784	6.490	7,708	6,040	0.91	11.92	5.74	606.07	606.07	605.65
INLET 35	MH-37	594.90	594.60	23.1	1.30	15.0	0.013	0.763	6.490	8,260	6,301	0.95	7.36	4.12	595.28	595.28	594.90
INLET 36	MH-37	594.90	594.60	8.9	3.38	15.0	0.013	0.871	6.490	7,025	6,118	0.92	11.88	5.74	595.28	595.28	594.86
INLET 49	MH 51	584.50	582.20	23.2	9.90	15.0	0.013	0.820	6.490	8,342	6,839	1.03	20.33	8.66	584.90	584.90	583.60
INLET 50	MH 51	584.50	584.20	8.9	3.37	15.0	0.013	0.871	6.490	6,947	6,050	0.91	11.85	5.72	584.87	584.87	584.45
INLET 10	INLET 11	614.40	613.80	32.0	1.87	15.0	0.013	0.777	6.490	2,726	2,118	0.32	8.84	3.41	614.62	614.62	613.96
INLET 11	FES 13	611.00	609.00	32.8	6.10	12.0	0.013	0.858	6.458	3,833	5,405	0.81	8.80	6.99	611.38	611.38	609.20
OS 18	MH 172	606.10	605.65	65.9	0.68	18.0	0.013	(N/A)	8.220	(N/A)	0	1.29	8.68	3.52	606.53	606.53	606.04
INLET 54	MH-179	574.50	573.00	18.4	8.15	18.0	0.013	0.438	6.141	1,633	44,836	7.66	29.98	14.19	575.57	575.57	573.62
MH-179	HW-180	563.00	560.00	35.5	8.44	12.0	0.013	(N/A)	6.136	(N/A)	44,836	7.66	10.35	14.42	563.98	563.98	560.68
CO-14A	INLET 14	612.00	610.00	120.1	1.67	8.0	0.013	0.990	6.490	7,396	7,322	1.10	1.56	4.84	612.50	612.50	610.41
INLET 14	INLET 15	609.70	609.30	80.9	0.49	15.0	0.013	0.918	6.405	3,574	10,604	1.57	4.54	3.36	610.21	610.21	609.80
INLET 15	FES 17	609.20	609.00	26.1	0.77	15.0	0.013	0.398	6.322	1,807	14,765	2.16	5.65	4.30	609.79	609.79	609.54
INLET 16	CO E7	612.00	610.00	106.7	1.88	8.0	0.013	0.948	6.490	3,632	3,442	0.52	1.65	4.19	612.34	612.34	610.26
CO E7	INLET 15	610.00	609.80	10.7	1.87	8.0	0.013	(N/A)	6.403	(N/A)	3,442	0.51	1.65	4.17	610.33	610.33	610.06
OS-33	MH-34	599.10	598.60	47.1	1.06	15.0	0.013	(N/A)	8.220	(N/A)	0	4.95	6.66	5.94	600.00	600.00	599.40
MH 23	INLET 24	610.00	609.20	82.0	0.98	15.0	0.013	(N/A)	6.394	(N/A)	3,217	0.48	6.38	3.05	610.27	610.27	609.48
INLET 24	INLET 25	609.10	603.50	118.6	4.72	15.0	0.013	0.990	6.302	3,301	6,485	0.95	14.04	6.51	609.48	609.48	603.72
INLET 25	MH-26	603.20	603.00	7.3	2.75	15.0	0.013	0.642	6.239	1,132	7,212	1.04	10.72	5.54	603.60	603.60	603.29
MH-26	MH-29	602.90	602.50	13.4	2.98	15.0	0.013	(N/A)	6.235	(N/A)	9,919	1.43	11.15	6.25	603.37	603.37	602.82
MH-29	BASIN F INFLOW-2	599.80	599.58	4.1	5.41	15.0	0.013	(N/A)	6.227	(N/A)	9,919	1.43	15.03	7.72	600.27	600.27	599.91
CO-RD6B	CO-RD6C	610.40	609.29	111.1	1.00	8.0	0.013	0.990	6.490	6,713	6,646	1.00	1.21	3.86	610.87	610.87	609.75
CO-RD6C	CO-RD5B	609.29	607.60	84.7	2.00	8.0	0.013	(N/A)	6.391	(N/A)	6,646	0.98	1.71	5.06	609.76	609.76	608.15
CO-RD5B	MH-30	607.60	607.27	32.9	1.00	8.0	0.013	0.990	6.334	1,618	8,248	1.21	1.21	3.95	608.15	608.15	607.79
MH-30	BASIN F INFLOW-1	601.90	601.28	12.4	4.98	10.0	0.013	(N/A)	6.305	(N/A)	9,854	1.44	4.89	7.80	602.44	602.44	601.62
CO-RD5A	MH-30	608.70	607.85	85.0	1.00	8.0	0.013	0.990	6.490	1,623	1,607	0.24	1.21	2.70	608.93	608.93	608.05
INLET 31	INLET 32	604.50	604.00	110.2	0.45	12.0	0.013	0.472	6.490	3,375	1,593	0.24	2.40	1.95	604.71	604.71	604.20
INLET 32	MH-26	603.90	603.80	7.0	1.42	12.0	0.013	0.421	6.296	2,645	2,706	0.39	4.25	3.38	604.16	604.16	604.01
INILET 57	INLET 58	601.80	601.18	61.3	1.01	12.0	0.013	0.636	6.490	2,415	1,537	0.23	3.58	2.56	602.00	602.00	601.35
INLET 58	INLET 59	601.08	600.55	52.8	1.00	12.0	0.013	0.859	6.408	1,449	2,781	0.41	3.57	3.03	601.35	601.35	600.78

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Unified) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (ft²)	System CA (ft²)	Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Upstream Structure Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
INLET 59	MH-60	600.45	600.20	12.5	2.00	12.0	0.013	0.817	6.348	2,964	5,202	0.76	5.04	4.63	600.82	600.82	600.47
MH-60	INLET 61	600.10	598.29	90.3	2.00	15.0	0.013	(N/A)	6.339	(N/A)	5,202	0.76	9.14	4.52	600.44	600.44	598.79
INLET 61	MH-62	598.19	595.68	83.6	3.00	15.0	0.013	0.924	6.270	3,652	15,311	2.22	11.19	7.10	598.79	598.79	596.06
MH-62	INLET 63	594.10	592.50	40.0	4.00	15.0	0.013	(N/A)	6.230	(N/A)	18,525	2.67	12.92	8.30	594.76	594.76	592.89
INLET 63	MH-66	591.56	590.60	21.4	4.48	15.0	0.013	0.462	6.213	6,850	21,687	3.12	13.67	9.03	592.27	592.27	591.04
MH-66	INLET 67	588.30	586.68	81.0	2.00	18.0	0.013	(N/A)	6.205	(N/A)	27,122	3.89	14.86	7.08	589.05	589.05	587.20
INLET 67	MH-70	586.00	583.50	83.9	2.98	24.0	0.013	0.912	6.166	3,253	36,740	5.24	39.04	8.66	586.81	586.81	583.99
MH-70	HW-71	566.00	560.00	78.7	7.62	24.0	0.013	(N/A)	6.133	(N/A)	39,953	5.67	62.45	12.36	566.84	566.84	560.41
CO-RD4A	INLET 61	600.80	599.50	124.3	1.05	8.0	0.013	0.990	6.490	6,802	6,734	1.01	1.24	3.95	601.28	601.28	599.96
CO-RD3A	MH-62	599.30	596.80	125.5	1.99	8.0	0.013	0.990	6.490	3,246	3,214	0.48	1.71	4.20	599.63	599.63	597.04
CO-RD2A	INLET 67	591.20	588.20	124.2	2.42	8.0	0.013	0.990	6.490	6,720	6,653	1.00	1.88	5.46	591.67	591.67	588.55
CO-RD1A	INLET 69	587.50	586.10	104.6	1.34	12.0	0.013	0.990	6.490	3,245	3,213	0.48	4.12	3.51	587.79	587.79	586.33
INLET 69	MH-70	586.00	566.00	21.5	92.93	12.0	0.013	(N/A)	6.388	(N/A)	3,213	0.47	34.34	15.55	586.29	586.29	566.84
CO-RD11A	MH 173	609.50	608.00	113.6	1.32	8.0	0.013	0.990	6.490	0	0	0.00	1.39	0.00	609.50	609.50	608.00
CB-115	MH 175	598.20	595.50	82.0	3.29	12.0	0.013	(N/A)	6.333	(N/A)	8,098	2.48	6.47	7.69	598.87	598.87	596.28
MH 175	MH 176	595.50	594.70	84.6	0.95	18.0	0.013	(N/A)	6.296	(N/A)	19,275	4.10	10.21	5.46	596.28	596.28	595.36
MH 176	MH 177	594.60	587.50	60.4	11.76	12.0	0.013	(N/A)	6.243	(N/A)	20,883	4.31	12.22	14.20	595.47	595.47	588.41
MH 177	MH-178	587.50	586.70	80.8	0.99	18.0	0.013	(N/A)	6.229	(N/A)	29,324	5.52	10.45	5.99	588.41	588.41	587.47
MH-178	INLET 54	585.00	584.00	83.0	1.21	18.0	0.013	(N/A)	6.182	(N/A)	39,702	6.97	11.53	6.83	586.02	586.02	584.84
INLET 52	INLET 53	586.00	585.10	54.9	1.64	12.0	0.013	0.769	6.490	1,663	1,278	0.19	4.56	2.88	586.18	586.18	585.34
INLET 53	INLET 54	585.00	584.17	63.9	1.30	12.0	0.013	0.883	6.425	3,558	4,419	0.66	4.06	3.80	585.34	585.34	584.44
INLET 1	INLET 2	613.00	612.34	26.7	2.47	15.0	0.013	0.954	6.490	5,495	5,241	0.79	10.16	4.91	613.35	613.35	612.76
INLET 2	INLET 3	612.34	612.10	23.9	1.00	15.0	0.013	0.656	6.471	3,482	7,523	1.13	6.47	3.96	612.76	612.76	612.57
INLET 3	INLET 4	612.00	611.40	16.0	3.75	12.0	0.013	0.807	6.451	5,606	12,049	1.80	6.90	7.39	612.57	612.57	611.77
INLET 6	FES 7	610.27	610.00	40.6	0.66	18.0	0.013	0.972	6.356	8,433	20,680	3.04	8.56	4.43	610.93	610.93	610.62
INLET 131	INLET 133	609.00	608.00	47.0	2.13	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.76	0.00	609.00	609.00	608.00
INLET 133	INLET 134	608.00	607.54	45.7	1.01	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.48	0.00	608.00	608.00	607.54
INLET 134	INLET 135	607.44	607.00	43.4	1.01	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.50	0.00	607.44	607.44	607.00
INLET 135	INLET 136	606.50	606.28	43.8	0.50	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.44	0.00	606.50	606.50	606.28
INLET 136	INLET 138	606.18	604.80	87.9	1.57	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	13.16	0.00	606.18	606.18	604.80
INLET 138	O-12	596.80	596.50	6.0	5.00	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	23.49	0.00	596.80	596.80	596.50
RD15A	RD15B	610.20	609.10	75.5	1.46	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.68	0.00	610.20	610.20	609.10
RD15B	RD15E	609.10	607.00	19.5	10.75	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	11.68	0.00	609.10	609.10	607.00
RD15E	INLET 136	607.00	606.50	15.6	3.21	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.38	0.00	607.00	607.00	606.50
RD15C	RD15D	609.90	609.00	74.4	1.21	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.62	0.00	609.90	609.90	609.00
RD15D	RD15E	609.00	608.00	22.5	4.43	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.18	0.00	609.00	609.00	608.00
INLET 126	INLET 127	609.00	606.30	129.6	2.08	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.32	0.00	609.00	609.00	606.30
INLET 127	INLET 128	606.20	605.90	24.0	1.25	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.22	0.00	606.20	606.20	605.90
INLET 128	INLET 138	605.80	596.80	53.3	16.90	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	26.56	0.00	605.80	605.80	596.80
OS-140	INLET 143	596.40	595.60	71.6	1.12	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	11.11	0.00	596.40	596.40	595.60
INLET 143	INLET 144	595.50	592.70	70.9	3.95	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	20.88	0.00	595.50	595.50	592.70
INLET 144	MH-146	592.60	592.20	21.3	1.88	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	14.41	0.00	592.60	592.60	592.20
MH-146	HW-147	576.30	576.00	7.0	4.28	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	46.78	0.00	576.30	576.30	576.00
INLET 145	MH-146	593.00	592.20	72.5	1.10	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.27	0.00	593.00	593.00	592.20
INLET 141	INLET 142	602.50	602.20	27.2	1.10	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.78	0.00	602.50	602.50	602.20
INLET 142	INLET 143	598.60	595.50	42.4	7.31	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.63	0.00	598.60	598.60	595.50
CO-RD27A	CO-RD27B	601.40	600.38	102.1	1.00	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.56	0.00	601.40	601.40	600.38
CO-RD27B	INLET 143	599.20	597.90	25.7	5.06	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.26	0.00	599.20	599.20	597.90

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Unified) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (ft²)	System CA (ft²)	Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Upstream Structure Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
INLET 132	RD14A	611.40	611.30	5.2	1.94	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.68	0.00	611.40	611.40	611.30
RD14A	INLET 133	611.30	608.70	130.1	2.00	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.71	0.00	611.30	611.30	608.70
INLET 85	INLET 86	615.00	614.60	77.5	0.52	15.0	0.013	0.855	6.490	3,526	3,016	0.45	4.64	2.40	615.26	615.26	615.02
INLET 86	INLET 87	614.50	613.80	82.0	0.85	12.0	0.013	0.937	6.379	3,820	10,054	1.48	3.29	4.08	615.02	615.02	614.37
INLET 87	INLET 88	613.80	613.46	67.7	0.50	15.0	0.013	0.837	6.310	2,291	13,511	1.97	4.58	3.59	614.37	614.37	614.02
INLET 88	HW-89	613.36	613.20	26.9	0.60	15.0	0.013	0.250	6.245	1,784	13,957	2.02	4.98	3.85	613.93	613.93	613.75
CO-RD20A	CO-RD20B	615.50	614.71	158.4	0.50	6.0	0.013	0.990	6.490	5,038	4,988	0.75	0.40	3.81	616.71	618.00	615.14
CO-RD20B	CO-RD20D	614.61	613.92	66.0	1.05	12.0	0.013	(N/A)	6.347	(N/A)	4,988	0.73	3.64	3.63	614.97	614.97	614.40
CO-RD20D	INLET 90	613.92	613.54	20.7	1.84	12.0	0.013	(N/A)	5.801	(N/A)	9,504	1.28	4.83	5.19	614.40	614.40	614.19
INLET 90	INLET 91	613.54	613.42	24.0	0.50	12.0	0.013	0.769	5.787	6,377	14,406	1.93	2.52	3.54	614.19	614.19	614.01
INLET 91	HW-92	613.32	613.20	22.5	0.53	15.0	0.013	0.990	5.764	3,093	17,468	2.33	4.71	3.83	613.94	613.94	613.81
CO-RD20C	CO-RD20D	0.00	613.92	173.3	-354.32	12.0	0.013	0.990	6.490	4,562	4,516	0.68	67.06	0.86	614.52	614.52	614.40
MH-94	INLET 95	608.72	608.50	42.3	0.52	12.0	0.013	0.422	6.490	15,589	6,574	0.99	2.57	3.06	609.15	609.15	608.92
OS-93	INLET 95	609.00	608.50	32.2	1.55	15.0	0.013	(N/A)	8.220	(N/A)	0	8.13	8.04	7.47	610.12	610.12	609.54
INLET 148	INLET 149	615.60	613.50	105.7	1.99	10.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.09	0.00	615.60	615.60	613.50
INLET 149	INLET 153	608.75	605.46	31.5	10.46	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	11.52	0.00	608.75	608.75	605.46
INLET 153	MH-155	605.46	605.00	23.2	1.98	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.09	0.00	605.46	605.46	605.00
MH-155	MH-157	604.88	604.40	96.4	0.50	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	4.56	0.00	604.88	604.88	604.40
MH-157	INLET 160	604.10	602.90	57.0	2.11	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.37	0.00	604.10	604.10	602.90
INLET 160	MH-162	597.70	597.00	58.5	1.20	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	11.49	0.00	597.70	597.70	597.00
MH-162	INLET 163	596.90	593.80	116.6	2.66	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	17.13	0.00	596.90	596.90	593.80
INLET 164	INLET 169	590.00	576.40	38.7	35.14	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	21.12	0.00	590.00	590.00	576.40
INLET 169	O-17	576.40	0.00	11.6	4,959.22	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	250.89	0.00	576.40	576.40	0.00
INLET 168	INLET 169	582.50	582.00	70.4	0.71	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.02	0.00	582.50	582.50	582.00
OS-71	MH-212	570.75	567.20	71.0	5.00	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	50.57	0.00	570.75	570.75	567.20
MH-212	MH-213	567.10	563.30	50.0	7.60	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	62.35	0.00	567.10	567.10	563.30
MH-213	HW-214	563.20	562.50	51.5	1.36	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	26.37	0.00	563.20	563.20	562.50
INLET 154	MH-155	605.80	605.48	63.4	0.50	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.53	0.00	605.80	605.80	605.48
INLET 161	MH-162	598.00	597.60	19.4	2.06	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.26	0.00	598.00	598.00	597.60
CO-RD18A	CO-RD18B	608.50	607.00	112.0	1.34	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.65	0.00	608.50	608.50	607.00
CO-RD18B	INLET 156	607.00	606.75	19.5	1.28	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.64	0.00	607.00	607.00	606.75
INLET 156	MH-157	604.50	604.36	14.0	1.00	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.45	0.00	604.50	604.50	604.36
INLET 150	INLET 151	608.00	607.30	38.8	1.80	10.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.94	0.00	608.00	608.00	607.30
INLET 151	INLET 152	607.20	606.90	34.0	0.88	10.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.06	0.00	607.20	607.20	606.90
INLET 152	INLET 153	606.80	606.00	36.4	2.20	10.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.25	0.00	606.80	606.80	606.00
CO-RD19A	CO-RD19B	609.00	607.83	116.9	1.00	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.56	0.00	609.00	609.00	607.83
CO-RD19B	INLET 159	607.83	607.30	42.0	1.26	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	4.00	0.00	607.83	607.83	607.30
INLET 159	INLET 160	606.20	605.80	11.8	3.39	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.22	0.00	606.20	606.20	605.80
INLET 158	INLET 159	608.00	606.83	117.0	1.00	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.56	0.00	608.00	608.00	606.83
INLET 97	INLET 100	608.20	608.08	24.0	0.50	12.0	0.013	0.752	6.490	9,083	6,835	1.03	2.52	3.04	608.64	608.64	608.51
INLET 100	INLET 99	607.98	607.76	44.6	0.49	15.0	0.013	(N/A)	6.463	(N/A)	6,835	1.02	4.53	2.98	608.38	608.38	608.16
INLET 99	MH 103	607.66	607.30	121.0	0.30	18.0	0.013	(N/A)	6.411	(N/A)	6,835	1.01	5.73	2.44	608.09	608.09	607.68
MH 103	HW-104	607.20	607.00	6.0	3.35	18.0	0.013	(N/A)	6.241	(N/A)	6,835	0.99	19.21	5.71	607.57	607.57	607.26
INLET 102	MH 103	607.80	607.30	87.0	0.57	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.92	0.00	607.80	607.80	607.57
INLET 183	INLET 184	603.24	603.00	24.0	1.00	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.57	0.00	603.24	603.24	603.00
INLET 184	INLET 186	602.90	598.50	140.6	3.13	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	11.43	0.00	602.90	602.90	598.50
INLET 186	INLET 187	598.36	597.60	55.4	1.37	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.57	0.00	598.36	598.36	597.60
MH-193	MH-194	584.00	574.00	143.9	6.95	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	59.63	0.00	584.00	584.00	574.00

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Unified) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (ft²)	System CA (ft²)	Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Upstream Structure Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
MH-194	HW-195	570.00	568.00	102.7	1.95	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	31.57	0.00	570.00	570.00	568.00
INLET 190	INLET 191	590.30	590.00	24.0	1.25	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.98	0.00	590.30	590.30	590.00
INLET 188	INLET 189	593.80	593.65	24.0	0.63	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	5.11	0.00	593.80	593.80	593.65
INLET 189	MH-193	593.55	592.00	125.2	1.24	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.19	0.00	593.55	593.55	592.00
INLET 114	INLET 116	602.40	602.00	48.9	0.82	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.22	0.00	602.40	602.40	602.00
INLET 116	INLET 117	601.90	601.00	62.5	1.44	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	4.28	0.00	601.90	601.90	601.00
INLET 117	INLET 118	598.59	598.34	50.4	0.50	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	4.55	0.00	598.59	598.59	598.34
INLET 118	INLET 119	598.24	597.70	85.8	0.63	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.83	0.00	598.24	598.24	597.70
INLET 119	INLET 123	597.70	597.20	102.5	0.49	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.34	0.00	597.70	597.70	597.20
INLET 120	INLET 122	599.20	599.00	15.8	1.27	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.27	0.00	599.20	599.20	599.00
INLET 122	INLET 123	598.50	597.40	135.4	0.81	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	5.82	0.00	598.50	598.50	597.40
CO-RD25A	INLET 117	601.30	599.70	74.6	2.15	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.82	0.00	601.30	601.30	599.70
OS-105	MH-107	602.30	601.72	116.3	0.50	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	4.56	0.00	602.30	602.30	601.72
MH-107	BASIN K INFLOW-1	594.70	594.50	5.9	3.38	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	19.30	0.00	594.70	594.70	594.50
CO-RD24A	CO-RD24B	601.10	599.40	171.9	0.99	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.56	0.00	601.10	601.10	599.40
CO-RD24B	CO-RD26A	599.40	599.00	41.2	0.97	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.55	0.00	599.40	599.40	599.00
CO-RD26C	BASIN K INFLOW-2	595.50	595.40	2.9	3.43	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.24	0.00	595.50	595.50	595.40
RD16D	INLET 86	619.50	618.20	67.1	1.94	6.0	0.013	0.990	6.490	3,492	3,457	0.52	0.78	4.25	619.87	619.87	618.50
CO-RD16C	INLET 87	619.60	618.40	65.8	1.82	6.0	0.013	0.990	6.490	1,555	1,539	0.23	0.76	3.39	619.84	619.84	618.59
INLET 185	INLET 186	598.70	598.46	24.0	1.00	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.46	0.00	598.70	598.70	598.46
OS-109	MH-110	593.20	591.20	36.6	5.47	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	24.56	0.00	593.20	593.20	591.20
MH-110	HW-111	590.00	587.70	75.7	3.04	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	18.31	0.00	590.00	590.00	587.70
INLET 198	INLET 199	592.00	591.10	25.3	3.55	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.28	0.00	592.00	592.00	591.10
INLET 199	INLET 200	591.00	588.10	175.5	1.65	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.55	0.00	591.00	591.00	588.10
INLET 200	INLET 202	588.00	587.30	34.5	2.03	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	5.07	0.00	588.00	588.00	587.30
INLET 202	INLET 207	579.35	574.30	73.5	6.87	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	59.28	0.00	579.35	579.35	574.30
INLET 207	INLET 208	571.00	566.00	84.7	5.90	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	54.96	0.00	571.00	571.00	566.00
INLET 208	MH-209	565.90	565.10	51.7	1.55	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	28.15	0.00	565.90	565.90	565.10
MH-209	MH-210	565.00	563.20	138.1	1.30	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	25.83	0.00	565.00	565.00	563.20
MH-210	HW-211	563.10	562.50	53.5	1.12	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	23.95	0.00	563.10	563.10	562.50
OS-196	HW-197	567.00	562.50	36.7	12.26	24.0	0.013	(N/A)	8.220	(N/A)	0	0.00	79.20	0.00	567.00	567.00	562.50
INLET 203	INLET 204	580.80	580.40	18.5	2.17	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	5.25	0.00	580.80	580.80	580.40
INLET 206	INLET 207	578.90	578.00	43.9	2.05	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	5.10	0.00	578.90	578.90	578.00
OS-215	HW-216	560.40	560.10	24.1	1.25	36.0	0.013	(N/A)	8.220	(N/A)	0	0.00	74.45	0.00	560.40	560.40	560.10
MH 173	CB-115	604.60	598.20	59.5	10.76	12.0	0.013	(N/A)	6.490	(N/A)	0	1.29	11.69	9.79	605.08	605.08	598.87
MH 172	MH 173	605.55	604.72	166.2	0.50	18.0	0.013	(N/A)	8.220	(N/A)	0	1.29	7.42	3.15	605.98	605.98	605.14
INLET 38	INLET 41	600.00	599.60	26.6	1.50	12.0	0.013	0.419	6.490	3,469	1,455	0.22	4.37	2.90	600.19	600.19	599.75
INLET 41	INLET 140	599.50	599.20	47.4	0.63	15.0	0.013	0.831	6.458	2,713	3,709	0.55	5.14	2.74	599.79	599.79	599.48
INLET 42	MH 175	596.50	595.80	130.4	0.54	15.0	0.013	0.990	6.490	11,290	11,177	1.68	4.73	3.53	597.01	597.01	596.31
CO-RD9A	MH 176	597.00	596.00	113.6	0.88	8.0	0.013	0.990	6.490	1,624	1,608	0.24	1.13	2.58	597.23	597.23	596.21
INLET 44	INLET 47	590.50	589.40	18.7	5.90	12.0	0.013	0.397	6.490	3,931	1,559	0.23	8.65	4.77	590.70	590.70	589.76
INLET 47	INLET 46	589.40	588.90	95.2	0.53	15.0	0.013	0.880	6.477	4,739	5,728	0.86	4.68	2.91	589.76	589.76	589.26
INLET 46	INLET 45	588.80	588.60	13.0	1.54	15.0	0.013	0.530	6.364	1,466	8,149	1.20	8.01	4.69	589.23	589.23	588.94
INLET 45	MH 177	588.50	588.30	22.1	0.90	15.0	0.013	0.561	6.355	521	8,442	1.24	6.14	3.92	588.94	588.94	588.68
INLET 43	MH-178	585.80	585.10	130.5	0.54	15.0	0.013	0.940	6.490	11,035	10,378	1.56	4.73	3.46	586.29	586.29	586.02
INLET 83	INLET 84	542.00	539.59	33.1	7.28	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	17.42	0.00	542.00	542.00	539.59

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Unified) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (ft²)	System CA (ft²)	Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Upstream Structure Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
INLET 4	MH 5	611.40	610.90	57.9	0.86	18.0	0.013	0.701	6.443	616	12,481	1.86	9.76	4.25	611.91	611.91	611.34
MH 5	INLET 6	610.80	610.37	50.1	0.86	18.0	0.013	(N/A)	6.396	(N/A)	12,481	1.85	9.73	4.23	611.31	611.31	610.93
CO-RD6A	MH 23	612.70	610.33	118.6	2.00	6.0	0.013	0.990	6.490	3,250	3,217	0.48	0.79	4.24	613.05	613.05	610.61
INLET 64	INLET 65	591.60	589.34	113.1	2.00	8.0	0.013	0.852	6.490	4,691	3,995	0.60	1.71	4.47	591.96	591.96	589.61
INLET 65	MH-66	589.24	589.00	12.3	1.95	12.0	0.013	0.601	6.403	2,397	5,435	0.81	4.98	4.66	589.62	589.62	589.28
INLET 140	INLET 39	599.10	598.60	62.6	0.80	15.0	0.013	0.791	6.399	3,588	6,547	0.97	5.77	3.49	599.49	599.49	598.95
INLET 39	CB-115	598.50	598.40	6.3	1.58	15.0	0.013	(N/A)	6.338	(N/A)	8,098	1.19	8.11	4.72	598.93	598.93	598.87
INLET 39A	INLET 39	601.00	600.70	21.7	1.39	12.0	0.013	0.441	6.490	3,517	1,551	0.23	4.19	2.87	601.20	601.20	600.86
INLET 46A	INLET 46	589.10	588.90	12.8	1.56	12.0	0.013	0.414	6.490	3,968	1,644	0.25	4.45	3.04	589.30	589.30	589.23
INLET 204	INLET 205	580.40	579.40	99.4	1.01	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.57	0.00	580.40	580.40	579.40
INLET 205	INLET 206	579.40	578.90	45.4	1.10	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.74	0.00	579.40	579.40	578.90
INLET 201	INLET 202	585.80	585.50	12.0	2.50	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	10.22	0.00	585.80	585.80	585.50
INLET 129	INLET 130	612.10	610.50	40.0	4.00	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.12	0.00	612.10	612.10	610.50
INLET 130	INLET 131	610.50	609.10	72.2	1.94	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.68	0.00	610.50	610.50	609.10
INLET 100	INLET 101	608.40	608.10	53.7	0.56	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.42	0.00	608.40	608.40	608.10
INLET 101	INLET 102	608.10	607.80	60.8	0.49	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.85	0.00	608.10	608.10	607.80
CO-RD26A	CO-RD26B	599.00	597.76	124.6	1.00	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.21	0.00	599.00	599.00	597.76
CO-RD26B	CO-RD26C	597.76	596.00	30.1	5.84	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	8.61	0.00	597.76	597.76	596.00
INLET 121	INLET 122	599.90	599.60	13.0	2.30	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.81	0.00	599.90	599.90	599.60
INLET 108	INLET 112	603.50	603.00	106.8	0.47	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.44	0.00	603.50	603.50	603.00
INLET 112	INLET 114	602.90	602.50	64.9	0.62	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	2.80	0.00	602.90	602.90	602.50
INLET 123	MTD 124	596.80	596.50	17.9	1.68	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	13.61	0.00	596.80	596.80	596.50
INLET 163	INLET 164	593.70	592.83	42.0	2.07	18.0	0.013	(N/A)	8.220	(N/A)	0	0.00	15.12	0.00	593.70	593.70	592.83
CO-RD30A	CO-RD30B	592.00	591.20	158.4	0.51	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.40	0.00	592.00	592.00	591.20
CO-RD30B	INLET 169	591.20	591.00	9.6	2.08	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.81	0.00	591.20	591.20	591.00
CO-RD30B	INLET 168	583.50	582.60	153.0	0.59	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.43	0.00	583.50	583.50	582.60
INLET 187	INLET 187A	595.00	590.70	93.8	4.58	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	13.83	0.00	595.00	595.00	590.70
INLET 187A	INLET 191	590.60	590.00	46.3	1.30	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.36	0.00	590.60	590.60	590.00
CO-RD21A	CO-RD21B	607.70	603.50	169.6	2.48	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.88	0.00	607.70	607.70	603.50
CO-RD21B	CO-RD21D	603.50	602.00	74.0	2.03	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.80	0.00	603.50	603.50	602.00
CO-RD21D	INLET 185	602.00	598.70	34.9	9.44	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	10.95	0.00	602.00	602.00	598.70
CO-RD21C	CO-RD21D	606.70	602.00	175.0	2.69	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.92	0.00	606.70	606.70	602.00
INLET 167A	MH-162	598.40	598.00	35.5	1.13	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	6.85	0.00	598.40	598.40	598.00
INLET 191	MH-193	589.90	587.50	181.9	1.32	15.0	0.013	(N/A)	8.220	(N/A)	0	0.00	7.42	0.00	589.90	589.90	587.50
CO-RD28A	CO-RD28B	600.00	599.00	113.0	0.88	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.53	0.00	600.00	600.00	599.00
CO-RD28C	CO-RD28D	594.00	591.50	110.1	2.27	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.85	0.00	594.00	594.00	591.50
CO-RD28D	INLET 187A	591.50	590.60	11.7	7.72	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.90	0.00	591.50	591.50	590.60
CO-RD28B	CO-RD28D	599.00	591.50	68.9	10.88	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.85	0.00	599.00	599.00	591.50
CO-RD29A	MH-15	598.00	596.00	161.5	1.24	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.62	0.00	598.00	598.00	596.00
MH-15	CO-RD29D	596.00	591.30	69.0	6.81	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	9.30	0.00	596.00	596.00	591.30
CO-RD29D	INLET 187A	591.30	590.60	9.4	7.48	8.0	0.013	(N/A)	8.220	(N/A)	0	0.00	3.31	0.00	591.30	591.30	590.60
CO-RD29C	CO-RD29D	592.30	591.30	158.6	0.63	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.45	0.00	592.30	592.30	591.30
MH-18	MH-19	0.00	0.00	158.4	0.00	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.04	0.00	0.00	0.00	0.00
MH-19	INLET 201	0.00	585.80	20.4	-2,874.32	12.0	0.013	(N/A)	8.220	(N/A)	0	0.00	191.00	0.00	0.00	585.80	585.80
CO-RD27C	CO-RD27D	594.30	593.50	89.1	0.90	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	0.53	0.00	594.30	594.30	593.50
CO-RD27D	INLET 144	593.50	593.00	14.7	3.39	6.0	0.013	(N/A)	8.220	(N/A)	0	0.00	1.03	0.00	593.50	593.50	593.00

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (ft ²)	Runoff Coefficient (Rational)	Time of Concentration (min)	Flow (Total Out) (cfs)
521	INLET 1	INLET 1	5,495	0.954	10.00	0.79
522	INLET 2	INLET 2	3,482	0.656	10.00	0.34
523	INLET 3	INLET 3	5,606	0.807	10.00	0.68
524	INLET 4	INLET 4	616	0.701	10.00	0.06
525	INLET 6	INLET 6	8,433	0.972	10.00	1.23
526	INLET 10	INLET 10	2,726	0.777	10.00	0.32
527	INLET 11	INLET 11	3,833	0.858	10.00	0.49
528	RD6A	CO-RD6A	3,250	0.990	10.00	0.48
529	CO-14A	CO-14A	7,396	0.990	10.00	1.10
530	CM-12	INLET 14	3,574	0.918	10.00	0.49
532	INLET 16	INLET 16	3,632	0.948	10.00	0.52
533	INLET 15	INLET 15	1,807	0.398	10.00	0.11
573	INLET 78	INLET 78	14,695	0.500	10.00	1.10
574	INLET 75	INLET 75	5,157	0.710	10.00	0.55
575	INLET 76	INLET 76	6,103	0.683	10.00	0.63
576	CO-RD11A	CO-RD11A	0	0.990	10.00	0.00
577	INLET 38	INLET 38	3,469	0.419	10.00	0.22
578	INLET 41	INLET 41	2,713	0.831	10.00	0.34
579	INLET 40	INLET 140	3,588	0.791	10.00	0.43
580	INLET 39A	INLET 39A	3,517	0.441	10.00	0.23
581	INLET 42	INLET 42	11,290	0.990	10.00	1.68
582	INLET 44	INLET 44	3,931	0.397	10.00	0.23
583	INLET 47	INLET 47	4,739	0.880	10.00	0.63
584	INLET 46A	INLET 46A	3,968	0.414	10.00	0.25
585	INLET 46	INLET 46	1,466	0.530	10.00	0.12
586	INLET 45	INLET 45	521	0.561	10.00	0.04
587	INLET 43	INLET 43	11,035	0.940	10.00	1.56
588	INLET 52	INLET 52	1,663	0.769	10.00	0.19
589	INLET 53	INLET 53	3,558	0.883	10.00	0.47
590	INLET 54	INLET 54	1,633	0.438	10.00	0.11
591	INLET 20	INLET 20	7,708	0.784	10.00	0.91
592	INLET 21	INLET 21	8,656	0.762	10.00	0.99
593	INLET 35	INLET 35	8,260	0.763	10.00	0.95
594	INLET 36	INLET 36	7,025	0.871	10.00	0.92
595	INLET 49	INLET 49	8,342	0.820	10.00	1.03
596	INLET 50	INLET 50	6,947	0.871	10.00	0.91
597	co-rd9	CO-RD9A	1,624	0.990	10.00	0.24
598	INLET 24	INLET 24	3,301	0.990	10.00	0.49
599	CO-RD6B	CO-RD6B	6,713	0.990	10.00	1.00
600	CO-RD5B	CO-RD5B	1,618	0.990	10.00	0.24
601	CO-RD5A	CO-RD5A	1,623	0.990	10.00	0.24
602	INLET 57	INILET 57	2,415	0.636	10.00	0.23
603	INLET 31	INLET 31	3,375	0.472	10.00	0.24
604	INLET 58	INLET 58	1,449	0.859	10.00	0.19
605	INLET 59	INLET 59	2,964	0.817	10.00	0.36
606	INLET 25	INLET 25	1,132	0.642	10.00	0.11
607	INLET 32	INLET 32	2,645	0.421	10.00	0.17
608	CO-RD4A	CO-RD4A	6,802	0.990	10.00	1.01

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (ft ²)	Runoff Coefficient (Rational)	Time of Concentration (min)	Flow (Total Out) (cfs)
609	INLET 61	INLET 61	3,652	0.924	10.00	0.51
610	CO-RD3A	CO-RD3A	3,246	0.990	10.00	0.48
611	INLET 63	INLET 63	6,850	0.462	10.00	0.47
612	INLET 64	INLET 64	4,691	0.852	10.00	0.60
613	INLET 65	INLET 65	2,397	0.601	10.00	0.22
614	CO-RD2A	CO-RD2A	6,720	0.990	10.00	1.00
615	INLET 67	INLET 67	3,253	0.912	10.00	0.45
617	CO-RD1A	CO-RD1A	3,245	0.990	10.00	0.48
618	MH-94	MH-94	15,589	0.422	10.00	0.99
619	CM-61	CO-RD16C	1,555	0.990	10.00	0.23
620	CO-RD16D	RD16D	3,492	0.990	10.00	0.52
621	INLET 85	INLET 85	3,526	0.855	10.00	0.45
622	INLET 86	INLET 86	3,820	0.937	10.00	0.54
623	INLET 87	INLET 87	2,291	0.837	10.00	0.29
624	INLET 88	INLET 88	1,784	0.250	10.00	0.07
625	CO-RD20A	CO-RD20A	5,038	0.990	10.00	0.75
627	CO-RD20C	CO-RD20C	4,562	0.990	10.00	0.68
628	INLET 90	INLET 90	6,377	0.769	10.00	0.74
629	INLET 91	INLET 91	3,093	0.990	10.00	0.46
630	INLET 97	INLET 97	9,083	0.752	10.00	1.03

APPENDIX K

CONDUIT OUTLET PROTECTION CALCULATIONS

Bowman

Riprap Apron Calculations

Project: Greens at Mendham Village
Location: Mendham, NJ

Computed By: PSP
Checked By:
Date: 2/11/2026

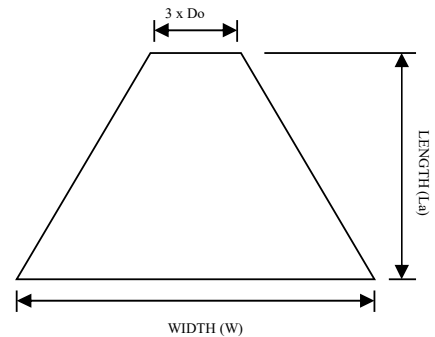
Detention Basin

HW 180

Criteria: N.J. Soil Erosion and Sediment Control Standards

INPUT

Q = 7.65 cfs	100F-yr storm
Pipe size, D(o) = 18 in	
Pipe Width, W(o) = 18 in	
q = 5.10 cfs/ft	
1/2 D(o) = 9.0 in	
0.2*D(o) = 0.3 ft	
Tailwater, Tw = 4.34 ft	
Use Tw = 4.34 ft	
Is apron confined? (yes/no) -	no



OUTPUT

Since $TW > 1/2 \cdot D_o$, $La = 3q/D_o^{1/2}$
= 12.49 ft

Use La = 13 ft (Extend to toe of slope)

$W = 3W_o + 0.4La$
= 9.50 ft

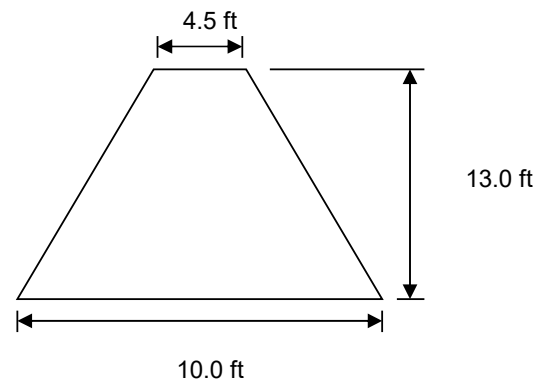
Use W = 10 ft

$d(50) = (0.016/Tw)(q)^{4/3}$
= 0.4 in

Use d(50) = 6 in

$Th = 2 \cdot d(50)$ w/filter fabric

Th = 12 in w/filter fabric



Bowman

Riprap Apron Calculations

Project: Greens at Mendham Village
Location: Mendham, NJ

Computed By: PSP
Checked By:
Date: 2/11/2026

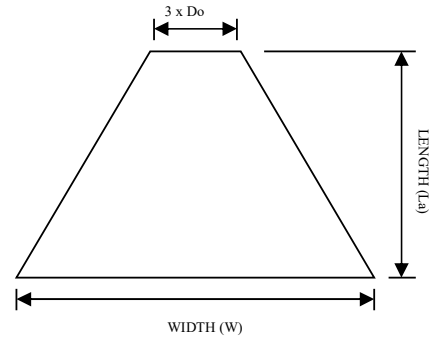
Detention Basin

FES 79

Criteria: N.J. Soil Erosion and Sediment Control Standards

INPUT

Q = 1.10 cfs
Pipe size, D(o) = 12 in
Pipe Width, W(o) = 12 in
q = 1.10 cfs/ft
1/2 D(o) = 6.0 in
0.2*D(o) = 0.2 ft
Tailwater, Tw = 3.50 ft (from pond w.s.e.)
Use Tw = 3.50 ft
Is apron confined? (yes/no) - no



OUTPUT

Since TW > 1/2 * Do, La = $3q/Do^{1/2}$
= 3.30 ft
Use La = 4 ft (Extend to toe of slope)

W = $3Wo + 0.4La$
= 4.32 ft

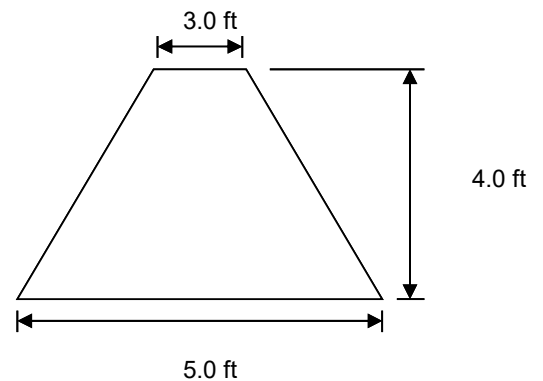
Use W = 5 ft

d(50) = $(0.016/Tw)(q)^{4/3}$
= 0.1 in

Use d(50) = 6 in

Th = 2*d(50) w/filter fabric

Th = 12 in w/filter fabric



Bowman

Riprap Apron Calculations

Project: Greens at Mendham Village
Location: Mendham, NJ

Computed By: PSP
Checked By:
Date: 2/11/2026

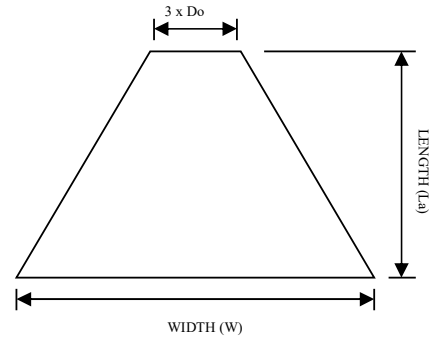
Detention Basin

HW 77

Criteria: N.J. Soil Erosion and Sediment Control Standards

INPUT

Q = 1.17 cfs
Pipe size, D(o) = 15 in
Pipe Width, W(o) = 15 in
q = 0.94 cfs/ft
1/2 D(o) = 7.5 in
0.2*D(o) = 0.3 ft
Tailwater, Tw = 3.00 ft (from pond w.s.e.)
Use Tw = 3.00 ft
Is apron confined? (yes/no) - no



OUTPUT

Since TW > 1/2 * Do, La = 3q/Do^(1/2)
= 2.51 ft
Use La = 3 ft (Extend to toe of slope)

W = 3Wo + 0.4La
= 4.75 ft

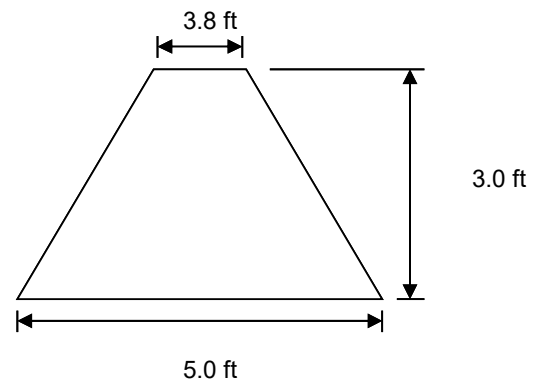
Use W = 5 ft

d(50) = (0.016/Tw)(q)^(4/3)
= 0.1 in

Use d(50) = 6 in

Th = 2*d(50) w/filter fabric

Th = 12 in w/filter fabric



Bowman

Riprap Apron Calculations

Project: Greens at Mendham Village
Location: Mendham, NJ

Computed By: PSP
Checked By:
Date: 2/11/2026

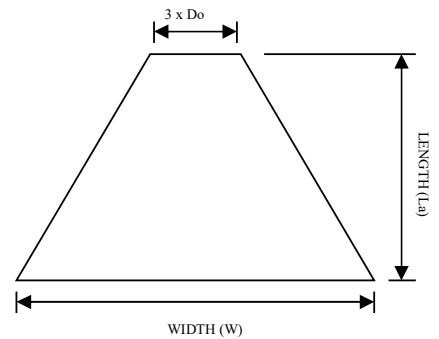
Detention Basin

HW 71

Criteria: N.J. Soil Erosion and Sediment Control Standards

INPUT

Q = 5.65 cfs	100F-yr storm
Pipe size, D(o) = 24 in	
Pipe Width, W(o) = 24 in	
q = 2.83 cfs/ft	
1/2 D(o) = 12.0 in	
0.2*D(o) = 0.4 ft	
Tailwater, Tw = 4.34 ft	(from pond w.s.e.)
Use Tw = 4.34 ft	
Is apron confined? (yes/no) -	no



OUTPUT

Since $TW > 1/2 \cdot D_o$, $L_a = 3q/D_o^{1/2}$
= 5.99 ft

Use $L_a = 6$ ft (Extend to toe of slope)

$W = 3W_o + 0.4L_a$
= 8.40 ft

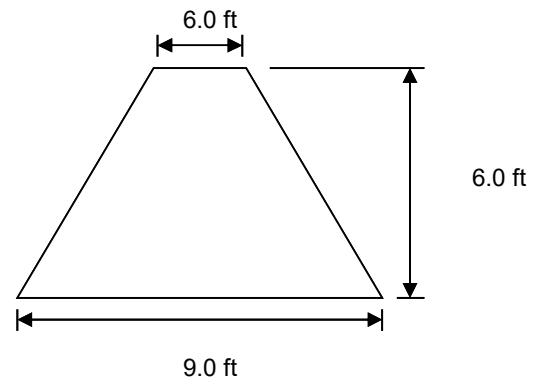
Use $W = 9$ ft

$d(50) = (0.016/Tw)(q)^{4/3}$
= 0.2 in

Use $d(50) = 6$ in

$Th = 2 \cdot d(50)$ w/filter fabric

Th = 12 in w/filter fabric



Bowman

Riprap Apron Calculations

Project: Greens at Mendham Village
Location: Mendham, NJ

Computed By: PSP
Checked By:
Date: 2/11/2026

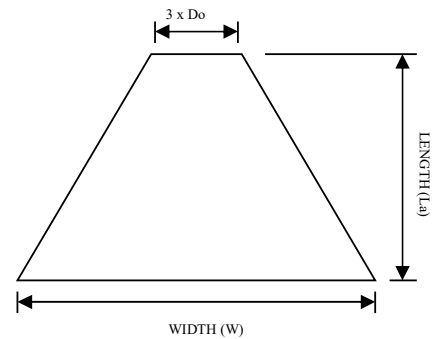
Detention Basin

HW 56

Criteria: N.J. Soil Erosion and Sediment Control Standards

INPUT

Q = 14.69 cfs	100F-yr storm
Pipe size, D(o) = 30 in	
Pipe Width, W(o) = 30 in	
q = 5.88 cfs/ft	
1/2 D(o) = 15.0 in	
0.2*D(o) = 0.5 ft	
Tailwater, Tw = 4.34 ft	(from pond w.s.e.)
Use Tw = 4.34 ft	
Is apron confined? (yes/no) -	no



OUTPUT

Since $TW > 1/2 D_o$, $L_a = 3q/D_o^{1/2}$
= 11.15 ft
Use $L_a = 12$ ft (Extend to toe of slope)

$W = 3W_o + 0.4L_a$
= 11.96 ft

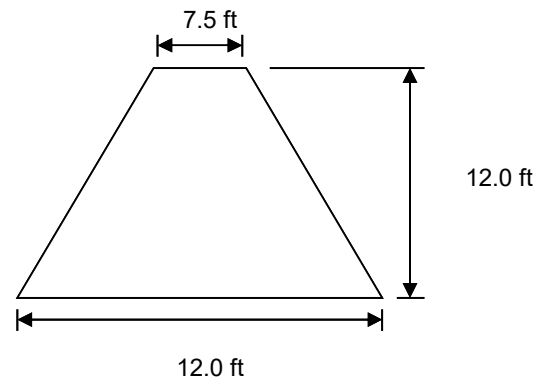
Use $W = 12$ ft

$d(50) = (0.016/Tw)(q)^{4/3}$
= 0.5 in

Use $d(50) = 6$ in

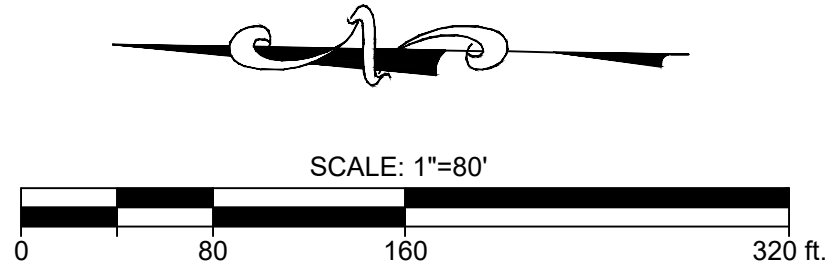
$Th = 2*d(50)$ w/filter fabric

Th = 12 in w/filter fabric



APPENDIX L

DRAINAGE AREA MAPS



SHEET No.
1
OF
3

EXISTING DRAINAGE AREA MAP
BLOCK 1801, LOT 5
BOROUGH OF MENDHAM, MORRIS COUNTY, NEW JERSEY

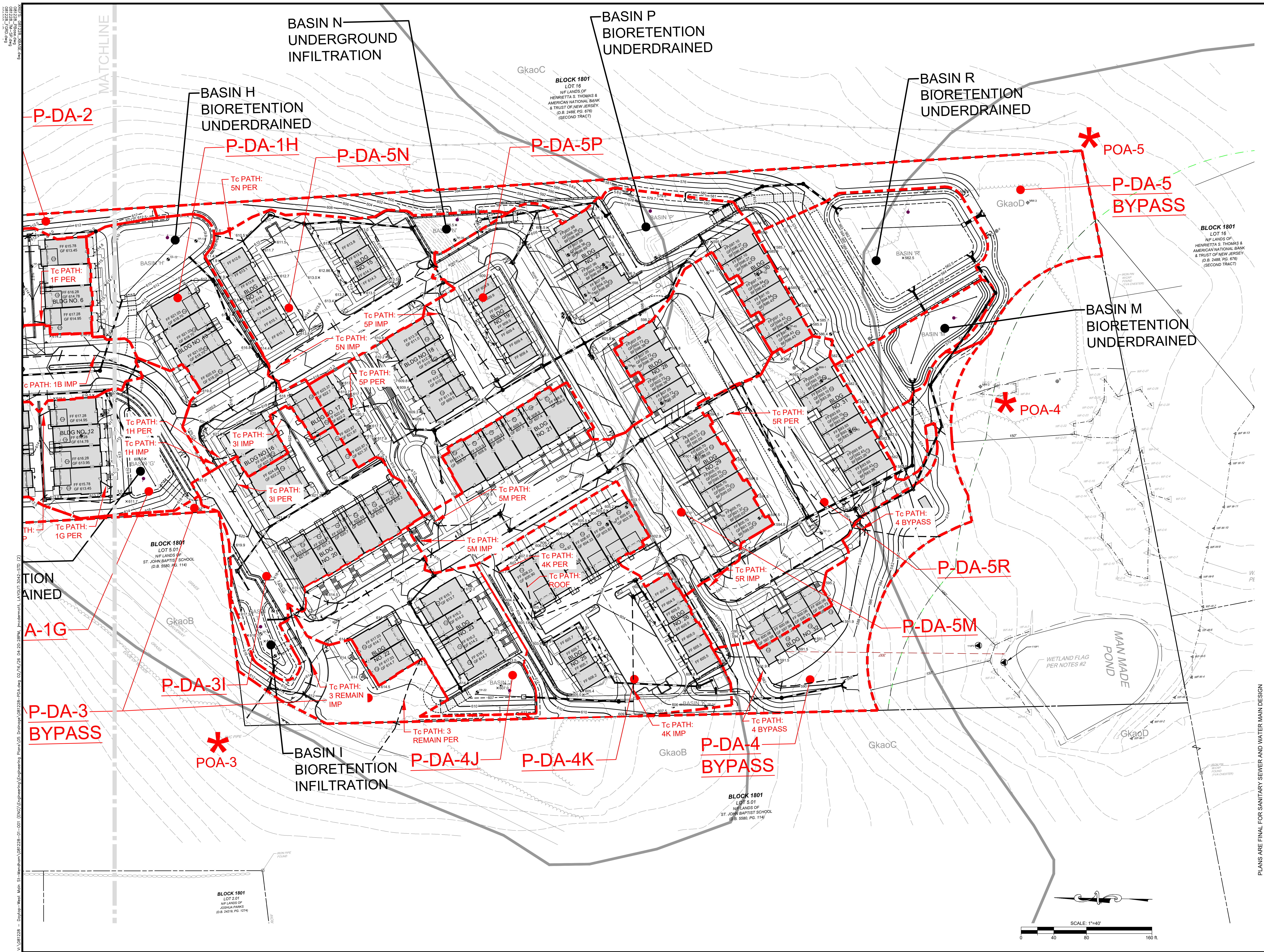
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NJ Certificate of Authorization
No. 24GA28222600

ERIC L. KELLER, N.J. Professional Engineer, Lic. 24GE03205400

PROJ.: 081228-01-001
 DATE: 01/30/2026
 CHKD:
 THIS DRAWING AND ALL INFORMATION

		REVISION	DATE	CHG
6				
5				
4				
3				
2				
1				



PLANS ARE FINAL FOR SANITARY SEWER AND WATER MAIN DESIGN

PRELIMINARY AND FINAL SITE PLAN FOR
WEICHERT - DAYTOP
PROPOSED DRAINAGE AREA MAP

SHEET No.
3
OF 3

ERIC L. KELLER, N.J. Professional Engineer, Lic. 24GE03205400

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Passaic, New Jersey 07654
Phone: 973-359-4400
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NJ Certificate No. 24GE03205400
Email: N.J.Bowman.com

DATE: 07/20/20
CHD:
BLOCK 1801 LOT 5
NF LANDS OF
ST. JOHN BAPTIST SCHOOL
(D.B. 5580, PG. 114)

NO.	REVISION	DATE	BY
1			
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