STORMWATER MANAGEMENT REPORT

Prepared for:

IDIL DAVIDSON, LLC
c/o IDI Logistics

Block 502.02, Lot 37.01 & 38.01
195-215 Davidson Avenue

Township of Franklin
Somerset County, New Jersey

Prepared by:

BOHLER

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Table of Contents

Appendices

A. Pre- vs. Post-Development Hydrographs
- McCuen-Spiess Sheet Flow Length Calculations
- 2-Year Storm Event
- 10-Year Storm Event
- 100-Year Storm Event

B. Water Quality
- Water Quality Storm Hydrograph
- Water Quality Storm Basin Drain Time

C. Design Calculations
- Basin Drain Time
- Emergency Spillway

D. Conveyance Calculations
- Pipe Sizing
- Underdrains
- Scour Hole Calculations

E. Supporting documents
- Manufactured Treatment Device Certification & Details
- Geotechnical Report

F. Maps
- Tax Map
- Aerial Map
- Soil Map
- State Planning Area Map
- USGS Map
- FEMA FIRM Map
- Drainage Area Maps
  - Existing Drainage Area Map
  - Proposed Drainage Area Map
  - Inlet Drainage Area Map

1. Introduction

The subject property is located at 195-215 Davidson Avenue in the Township of Franklin, Somerset County, New Jersey. The property is identified as Block 502.02, Lots 37.01 & 38.01 on the Township of Franklin tax maps and is a total of 13.044 acres in size and will hereafter be referred to as "the site". The site is bordered to the north by an industrial property and N.J. S.H. Route 287 beyond; to the east by Davidson Avenue with office buildings and hotel beyond; to the west by neighboring industrial property with a solar field beyond; and to the south by neighboring office and hotel properties. A tax map and aerial map are included at the beginning of Appendix F for reference.

The site is currently a vacant hotel and industrial building within the Business & Industry (B-I) Zone. The proposed development consists of a warehouse building and associated parking, sidewalks, and utilities. This project is a major development due to proposed disturbance greater than one acre and the creation of more than one-quarter acre of combined regulated impervious area. The project proposes a net decrease of motor vehicle surface area.

This report summarizes the design objectives, methodology, and calculations for the conveyance, attenuation, treatment, and discharge of stormwater runoff leaving the site and is meant to accompany the Site Plan documents prepared by Bohler Engineering. Pre-development and post-development conditions are examined for analysis of the stormwater quantity, water quality, and groundwater recharge based on the *NJDEP Stormwater Management Regulations (NJAC 7:8)* and soil erosion and sediment control based on *The Standards for Soil Erosion and Sediment Control in New Jersey*. The stormwater analysis also incorporates the proposed amendments to the *NJDEP Stormwater Management Regulations (NJAC 7:8)* as published in the New Jersey Register dated December 5, 2022.

2. Stormwater Management Design Methodology

In accordance with the *NJDEP Stormwater Management Regulations*, the proposed development must meet the requirements, if appropriate, for stormwater quantity reductions, water quality, groundwater recharge, etc. The assessment of stormwater runoff has been based upon the Soil Conservation Service Method (SCS) Unit Hydrograph as described in Chapters 7, 9, 10, 15 and 16, Part 630 Hydrology, National Engineering Handbook (NEH) (previously described in Technical Release Number 55 (TR55), "Urban Hydrology for Small Watersheds"). Theoretical storms are modeled with the 24-Hour SCS Unit Dimensionless Hydrograph using the NOAA Atlas 14 Type C rainfall distribution and recurrence intervals of 2, 10, and 100 years. Hydrograph creation and routings are accomplished using the *HydroCAD* Version 10.00 program by HydroCAD Software Solutions, LLC.

2.1 Rainfall Data

Rainfall data used in the stormwater calculations of this report are obtained from different sources based on the latest NJDEP stormwater regulations. The Water Quality storm event is based on the NJ BMP Manual Chapter 5 definition of having a total rainfall depth of 1.25 inches and a total duration of two (2) hours. Twenty-four-hour rainfall frequency data in Somerset County for all other storms is obtained from the Engineering Field Handbook NJ Supplement last revised August 2012.

TABLE 2.1 - 24-Hour Rainfall Frequency Data

Event (year)	2	10	25	100
Rainfall (in)	3.34	5.01	6.15	8.21

The proposed amendments to the *NJDEP Stormwater Management Regulations (NJAC 7:8),* as published in the New Jersey Register dated December 5, 2022, would require stormwater management calculations to consider current and projected rainfall to account for changes in rainfall event frequency, intensity, and duration. The precipitation depths for the 2-, 10-, and 100-year storm events are determined using adjustment factor applied to the NOAA Atlas 14 precipitation estimates. The rainfall depth values used in this project are listed in Table 2.2 and 2.3.

TABLE 2.2 – Current Adjusted, 24-Hour Rainfall Frequency Data

Event (year)	2	10	100
NOAA Atlas 14 Rainfall (in)	3.34	5.01	8.21
Adjustment Factor	1.00	1.03	1.09
Current Adjusted Rainfall (in)	3.34	5.16	8.95

TABLE 2.3 – Future Adjusted, 24-Hour Rainfall Frequency Data

Event (year)	2	10	100
NOAA Atlas 14 Rainfall (in)	3.34	5.01	8.21
Adjustment Factor	1.19	1.24	1.48
Future Adjusted Rainfall (in)	3.97	6.21	12.15

2.2 Site Soils

Site soil information has been obtained from the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey database. The soil types present within the studied watershed are shown in Table 2.4. The soils consist of hydrologic soil group (HSG) Type C, therefore the CN values used in calculations are those associated with Type C soils.

TABLE 2.4 - Site Soil Properties

Soil Symbol	Soil Name	Characteristics	Hydrologic Soil Group Rating
PenB	Penn Silt Loam	2% to 6% slopes	C
PenC	Penn Silt Loam	6% to 12% slopes	C
RehA	Reaville Silt Loam	0% to 2% slopes	C

2.3 Curve Numbers

For determining the runoff flows, the cover types in combination with the HSG rating must be determined for each drainage area. These are used to determine the runoff curve number (CN) values that are used in the hydraulic calculations. The CN values used in this project are listed in Table 2.5.

TABLE 2.5 - CN Values

Land Cover Description	HSG C
Open space, Good Condition (grass cover >75%)	74
Woods, Good Condition	70
Impervious Surfaces	98

2.4 Time of Concentration

The time of concentration (Tc) is calculated in accordance with Chapter 15 of the NRCS National Engineering Handbook and has been calculated separately for the pervious and impervious areas within each drainage area. Where there is a long stretch of sheet flow, the McCuen-Spiess formula is used to determine the appropriate length, not to exceed 100 feet. McCuen-Spiess sheet flow length calculations are provided in the beginning of Appendix A, and full Tc calculations for each drainage area can be found in the HydroCAD summaries in Appendix A.

3. Pre-Development Site Conditions

The studied watershed area is a total of 13.201 acres in size and consists of three unique drainage areas: Existing Drainage Area #1, Existing Drainage Area #2, and Existing Drainage Area #3, which are described in more detail below. In the pre-development condition, the site is a vacant hotel and industrial building with associated parking, sidewalks, and utilities. Currently, the runoff generated on site flow overland to Davidson Avenue or towards the rear of the property. The Existing Drainage Area Map in Appendix F illustrates the limits of each existing drainage area and how they relate to the existing site conditions.

3.1 Points of Analysis

The drainage areas flow to Points of Analysis located along Davidson Avenue or at the rear of the property. The Existing Drainage Area Map in Appendix F illustrates the identified points of analysis and how it relates to the existing topography on the site.

3.1.1 Existing Drainage Area #1

Existing Drainage Area #1 contains 11.387 acres of land, of which 7.143 acres are impervious surface, and includes the existing buildings and associated parking areas on site. The topography of the area slopes from east to west from a maximum elevation of approximately 72.05 to a minimum elevation of approximately 53.72 with slopes ranging from 0.5% to 10%. The runoff from Existing Drainage Area #1 flows from east to west and ultimately discharges to Point of Analysis #1, where stormwater runoff is discharge from the site through a stormwater conveyance system which runs within the storm and sanitary easement on the adjacent property to the south.

3.1.2 Existing Drainage Area #2

Existing Drainage Area #2 contains 1.043 acres of land, of which 0.318 acres are impervious surface, and includes the existing entrance driveways and landscape areas along Davidson Avenue. The topography of the area slopes from west to east from a maximum elevation of approximately 70.99 to a minimum elevation of approximately 66.72 with slopes ranging from 0.5% to 50%, excluding the man-made material piles currently on site. The runoff from Existing Drainage Area #2 flows from west to east and ultimately discharges to Point of Analysis #2, an inlet located in the right-of-way of Davidson Avenue.

3.1.3 Existing Drainage Area #3

Located at the northwest corner of the proposed site, Existing Drainage Area #3 contains 0.771 acres of land, of which there is no impervious surface, and includes a portion of the wooded area at the rear of the site. The topography of the area slopes from east to west from a maximum elevation of approximately 54.50 to a minimum elevation of approximately 50.40 with slopes ranging from 0.5% to 50%. The runoff from Existing Drainage Area #3 flow from east to west and ultimately discharges to Point of Analysis #3, onto the adjacent property to the north of the site.

4. Post-Development Site Conditions

The post-development condition for the site includes the construction of warehouse building with associated parking fields, driveways, sidewalks, utility infrastructure, stormwater infrastructure, and other site improvements. The proposed site is designed in a manner that generally maintains the existing drainage patterns. The studied watershed area in the post-development condition contains the same 13.201-acre area that was studied in the pre-development condition and consists of three unique drainage areas: Proposed Drainage Area #1, Proposed Drainage Area #2, and Proposed Drainage Area #3, which are described in more detail below.

A proposed stormwater conveyance system will collect the runoff from the proposed building and impervious areas via inlets, manholes, and stormwater piping and redirect it to the proposed bioretention basins on the site. The construction of the proposed improvements will disturb approximately 13.20 acres of land and will create approximately 8.06 acres of impervious coverage on the site in the post-development condition. The Proposed Drainage Area Map in Appendix F illustrates the limits of each proposed drainage area and how they relate to the proposed site conditions.

4.1 Point of Analysis

The three drainage areas in the post development condition flow to the same Point of Analysis identified in the existing condition, located along Davidson Avenue or at the rear of the property. The proposed runoff to Point of Analysis meets the stormwater management criteria set forth in *NJDEP Stormwater Management Regulations* by having the post-construction hydrograph not exceed the pre-construction hydrograph at any point for the two-, 10-, and 100-year storm events or by designing the stormwater measures so that the peak post-construction runoff rates from the disturbed areas are 50, 75, and 80 percent of the peak pre-construction runoff rates for the 2, 10, and 100-year design storms respectively. Refer to Section 4.3 Stormwater Quantity Controls for a summary of the pre-construction, allowable, and post-construction flows.

4.1.1 Proposed Drainage Area #1

Proposed Drainage Area #1 consists of approximately 12.268 acres of land, of which 7.991 acres are impervious surface, and includes the proposed warehouse building, parking area, sidewalks, driveways, stormwater and utility infrastructure. The drainage area also contains grass and landscape areas. The runoff from Proposed Drainage Area #1 is routed through the Bioretention Basins and ultimately flows to Point of Analysis #1.

4.1.2 Proposed Drainage Area #2

Proposed Drainage Area #2 consists of approximately 0.443 acres of land, of which 0.105 acres are impervious surface, and includes the a portion of the proposed driveways as well as landscape areas along the Davidson Avenue Right-of-Way. The runoff from Proposed Drainage Area #2 flows to Point of Analysis #2.

4.1.3 Proposed Drainage Area #3

Proposed Drainage Area #3 consists of approximately 0.490 acres of land, of which there is no impervious surface, and includes landscape and wooded area to remain. The runoff from Proposed Drainage Area #3 flows to Point of Analysis #3.

4.2 Proposed Structural Stormwater Management Strategies

The three drainage areas in the post development condition flow to the same points of analysis identified in the existing condition. Three of the drainage areas, Proposed Drainage Area #1, Proposed Drainage Area #2, and Proposed Drainage Area #3, flow through the proposed on-site stormwater management system, which is described in more detail below.

4.2.1 Manufactured Treatment Devices

Manufactured treatment devices are proposed that will treat the runoff from motor vehicle surface areas for the water quality design storm. These units are certified by the NJDEP to meet the requirements for Green Infrastructure, and a copy of the certification is attached in Appendix E.

Table 4.1 - Manufactured Treatment Device Summary

Manufactured Treatment Device #	1
Device	Aquaponic – AP-12
Drainage Area (Acres)	0.647
Max. Drainage Area for Device (Acres)	1.73
Water Quality Flow (CFS)	1.10
Max. Water Quality Flow for Device (CFS)	1.23
TSS Removal Rate (%)	80

4.2.2 Small-Scale Bioretention Systems

The project proposes small-scale bioretention systems. The bioretention systems meet the minimum requirements outlined in the *New Jersey Stormwater Best Management Practices Manual* by providing 18 inches of soil bed depth, with an underdrain system, containment and treatment of the entire water quality design storm volume to a maximum storage depth of 12 inches, and 1 foot minimum of separation between the bottom of the bioretention basin and the seasonal high ground water table for underdrain systems. Each bioretention system achieves 80% TSS removal.

Table 4.2 - Small-Scale Bioretention Systems Summary

Bioretention Basin #	2	3
Drainage Area (Acres) (Not Including Basin Area)	2.348	1.676
Soil Bed Depth (Inches)	18	18
Subsoil Permeability (Inches/Hour)	n/a	n/a
Drain Time (Hours)	31.20	15.20
Underdrain Size (Inches)	12	12
Water Quality Storm Depth (Feet)	0.52	0.63
TSS Removal Rate (%)	80	80
Seasonal High Ground Water Elevation	Not Encountered	Not Encountered
System Bottom Elevation	49.24	49.32

4.2.3 Large-Scale Bioretention Systems

The project proposes large-scale bioretention systems. The bioretention systems meet the minimum requirements outlined in the *New Jersey Stormwater Best Management Practices Manual* 1by providing 18 inches of soil bed depth, with an underdrain system, containment and treatment of the entire water quality design storm volume to a maximum storage depth of 12 inches, and 1 foot minimum of separation between the bottom of the bioretention basin and the seasonal high ground water table for underdrain systems.

Table 4.3 - Large-Scale Bioretention Systems Summary

Bioretention Basin #	1
Drainage Area (Acres) (Not Including Basin Area)	3.773
Soil Bed Depth (Inches)	18
Subsoil Permeability Rate (Inches/Hour)	n/a
Drain Time (Hours)	39.20
Underdrain Size (Inches)	12
Water Quality Storm Depth (Feet)	0.89
Seasonal High Ground Water Elevation	Not Encountered
System Bottom Elevation	56.14

4.2.4 Pipe Sizing

Calculations for sizing the stormwater pipe networks associated with the proposed stormwater management conveyance system can be found in Appendix D of this report. The Rational Method has been used to size the storm piping for the 100-year storm event, with calculations found in Appendix D. The calculations are based on a minimum time of concentration of 10 minute to any inlet (per NJ BMP Manual Chapter 5). An Inlet Area Map is included in Appendix F.

4.2.5 Emergency Spillways

The emergency spillways associated with the proposed basins are evaluated based on whether the basin classifies as a Class IV dam or not. Class IV dams raise the water level by five feet or more, has a drainage area of less than 150 acres, a storage volume less than 15 acre-feet, and a dam height of less than 15-feet. Basins that are classified as Class IV dams have their spillways designed to handle 150% of the 100-year design storm. A minimum of one-foot of freeboard is provided above the peak water elevation while the emergency spillway is operating. The proposed bioretention basin on-site are not classified as Class IV dams, however, emergency spillway calculations have been designed to handle 150% of the future adjusted100-year design storm. Refer to Appendix C for calculations.

4.3 Stormwater Quantity Controls

The following stormwater quantity standard techniques from the *NJDEP Stormwater Management Regulations* are being applied to each drainage area as noted in Sections 4.1:

1. For stormwater runoff leaving the site, the post-development runoff hydrographs for the 2-, 10-, and 100-year storms do not exceed, at any point in time, the pre-development runoff hydrographs for the same storm events. This technique will be applied to drainage areas that, under proposed conditions, will remain unchanged or have a net decrease in impervious coverage.

2. The post-development peak runoff rates for the 2-, 10-, and 100-year storm events are reduced to 50, 75, and 80 percent, respectively, of the pre-development peak runoff rates. These reductions only apply to portions of the site that are proposed to be developed, and reductions are not required for undisturbed areas.

To Point of Analysis #1, the project's proposed stormwater management facilities will consist of two (2) small-scale bioretention basins (Basin #2 and Basin #3) and one (1) large-scale bioretention basin (Basin #1) to attenuate the flows from the drainage areas outlined in Section 4.1 utilizing technique #2 above.

To Point of Analysis #2 and #3, stormwater runoff from the site area outlined in Section 4.1 will be met using utilizing technique #1 above.

As discussed in Section 2.1 Rainfall Data, the proposed amendments to the *NJDEP Stormwater Management Regulations (NJAC 7:8),* as published in the New Jersey Register dated December 5, 2022, would require stormwater management calculations to consider current and projected rainfall to account for changes in rainfall event frequency, intensity, and duration. The precipitation depths for the 2-, 10-, and 100-year storm events are determined using adjustment factor applied to the NOAA Atlas 14 precipitation estimates. The tables below summarize the existing, permitted, and proposed flow rates from the site to the Points of Analysis for the NOAA Atlas 14 rainfall depths, the current adjusted rainfall depths and the future adjusted rainfall depths. Detailed Calculations for associated with each point of analysis and each of storm event can be found in Appendix A.

4.3.1 NOAA Atlas 14 Precipitation Depths

Table 4.4 – Drainage Area #1 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	25.59	50%	12.79	11.09
10-Year Storm	40.20	75%	30.15	22.80
100-Year Storm	69.29	80%	55.43	47.32

Table 4.5 - Drainage Area #2 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.88	0.68
10-Year Storm	3.40	1.27
100-Year Storm	6.54	2.49

Table 4.6 - Drainage Area #3 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	0.83	0.62
10-Year Storm	1.93	1.37
100-Year Storm	4.35	2.98

4.3.2 Current Adjusted Precipitation Depths

Table 4.7 – Drainage Area #1 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	25.59	50%	12.79	11.09
10-Year Storm	41.53	75%	31.48	23.93
100-Year Storm	76.05	80%	60.84	52.99

Table 4.8 - Drainage Area #2 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.88	0.68
10-Year Storm	3.55	1.32
100-Year Storm	7.27	2.78

Table 4.9 - Drainage Area #3 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	0.83	0.62
10-Year Storm	2.04	1.44
100-Year Storm	4.94	3.36

4.3.3 Future Adjusted Precipitation Depths

Table 4.10 – Drainage Area #1 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	31.05	50%	15.52	15.36
10-Year Storm	51.11	75%	38.33	31.95
100-Year Storm	105.41	80%	84.32	76.69

Table 4.11 - Drainage Area #2 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	2.44	0.89
10-Year Storm	4.56	1.72
100-Year Storm	10.49	4.04

Table 4.12 - Drainage Area #3 - Existing vs. Proposed Flow Summary

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.22	0.89
10-Year Storm	2.81	1.96
100-Year Storm	7.49	5.03

4.4 Water Quality Controls

Water quality analysis is based on the requirements of NJAC § 7:8-5.5, which requires 80% TSS removal of post-development runoff from the net increase of motor vehicle surface areas (MVSA) before discharging the runoff.

Existing MVSA: 5.211 Acres
Proposed MVSA: 3.436 Acres

Increase of MVSA = 3.436 acres – 5.211 acres = -1.775 acres < 0.25 acres, therefore NJDEP Water Quality standards are NOT applied for post-construction conditions

Although the proposed design does not trigger Water Quality Analysis per NJAC § 7:8-5.5, TSS removal is provided by utilizing a bioretention basin and manufactured treatment devices.

The proposed stormwater management design incorporates TSS removal to meet Delaware and Raritan Canal Commission Water Quality Standards for 80% TSS Removal for new pavement areas. Per DRCC section 7.45-8.7 Table 2, bioretention systems provide 90% TSS removal and the manufactured treatment devices, as certified by NJCAT, provide 80% TSS removal. The proposed bioretention basin and manufactured treatment devices onsite will treat stormwater runoff from the new pavement areas for 90% and 80% TSS removal, respectively, and therefore will meet DRCC Water Quality Standards to treat stormwater runoff from pre- to post- construction conditions.

4.5 Groundwater Recharge

The subject site is previously developed and is located within the Metropolitan Planning Area (PA1). As such, the site falls under the NJDEP's definition for an urban redevelopment area. Therefore, no groundwater recharge is proposed as part of the stormwater management facilities on site.

4.6 Soil Erosion and Sediment Control

The Soil Erosion and Sediment Control plans and details are included within the Site Plan documents prepared by Bohler Engineering and must be followed throughout construction. Silt fences, stabilized construction entrances, a temporary stockpile and inlet filters are proposed during construction. This report and the Site Plan documents prepared by Bohler Engineering are being submitted to the Somerset-Union Soil Conservation District for approval.

Conduit outlet protection is provided in the form of scour holes to prevent scour and provide a stable area for water exiting the stormwater systems to reduce velocity. Additionally, off-site stability has been reviewed in accordance with the *Standards for Soil Erosion and Sediment Control in New Jersey (SESC Standards)*. Calculations for scour hole sizing can be found in Appendix C.

Proposed on-site stormwater facilities discharge to an existing stormwater conveyance network. The rate of runoff at the discharge point has been maintained or decreased.

The downstream off-site stability is met by decreasing the peak flows leaving the site by at least 50% for the 2-year storm and 75% for the 10-year storm for the areas to be disturbed.

4.7 Low-Impact Development and Non-Structural Stormwater Management Facilities

In accordance with the NJDEP regulations (NJAC 7:8-2.4) and the latest *New Jersey Stormwater Best Management Practices Manual*, several non-structural stormwater management strategies have been incorporated into the design of the site and are listed below:

1. **Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.**

   The footprint of the improvements has been minimized to the previously improved and/or disturbed areas. A portion of the existing wooded areas remain undisturbed. Stormwater runoff will be discharged in a similar manor of existing conditions.

2. **Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.**

   As part of the proposed site design, the minimum allowable parking and drive aisle sizes, in accordance with local ordinances are used in lieu of larger stalls and aisles to reduce the amount of impervious surface in the post-development condition.

3. **Maximize the protection of natural drainage features and vegetation.**

   A portion of the existing wooded areas remain undisturbed. Stormwater runoff will be discharged in a similar manner of existing conditions. Soil erosion measures are proposed to be utilized during construction to protect the adjoining undisturbed vegetation.

4. **Minimize the decrease in the "time of concentration" from pre-construction to postconstruction.**

   Bioretention basins have been included within the project's stormwater design to achieve maximized times of concentration.

5. **Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.**

   A comprehensive landscape plan has been incorporated into the design of the proposed improvements which includes low maintenance landscaping. The use of lawn areas has been minimized where applicable and fertilizers and pesticides are to be used sparingly. Native plants, including ground cover, shrubs and trees, are proposed. The native plantings will also require little or no irrigation once they are established.

6. **Provide other source controls to prevent or minimize the use or exposure of pollutants from development sites in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls include, but are not limited to:**

   i. Development design features that help to prevent accumulation and discharge of trash and debris in drainage systems.

   Proposed stormwater inlets have been specified with "eco" type curb pieces indicating the text "Dump No Waste, Drains to Waterways" and trash racks are specified for installation at the outlet control structure.

   ii. Development design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments.

   Spills and accumulation of pollutants are not anticipated due to the type of use proposed. However, proposed stormwater management facilities intercept stormwater from the impervious surfaces and the proposed roadways, which will provide a collection point for vehicular pollutants. The proposed bioretention basin and water quality device will improve water quality from vehicular surfaces by 80%.

   iii. When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

   The soil erosion and sediment control plans address the requirement for establishing vegetation. Preventative source controls include the use of "eco" inlet curb pieces, storm drain inlets, and trash racks on outlet control structures. The soil erosion and sediment control plan address re-stabilizing vegetation and implementing soil erosion and sediment control protection measures.

5. Conclusions

As demonstrated in the above sections, the stormwater management plan for the proposed development meets the current *NJDEP Stormwater Management Regulations*, *Standards for Soil Erosion and Sediment Control in New Jersey, and DRCC Regulations* and addresses the requirements for stormwater quantity reductions, water quality, groundwater recharge, and soil erosion and sediment control. As a result of the design calculations contained herein, Bohler Engineering anticipates that the stormwater design will not have a negative impact to surrounding areas.

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A. PRE- vs. POST-DEVELOPMENT HYDROGRAPHS

- **McCuen-Spiess Sheet Flow Length Calculations**
- **2-Year Storm Event**
- **10-Year Storm Event**
- **100-Year Storm Event**

BOHLER

Date: 12/28/2022
Project: IDI Franklin
Project No: NJA220121.00

Calculated By: ATK
Checked By: AS

McCuen-Spiess Equation Caculator

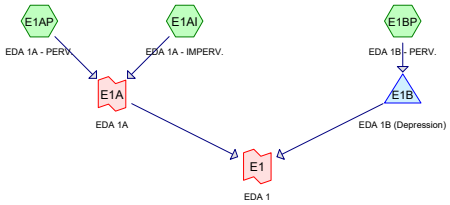
Max. Sheet Flow Length

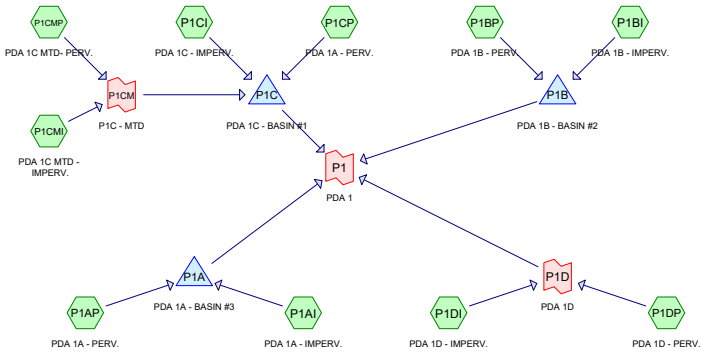
L = 100* (S)^0.5/n

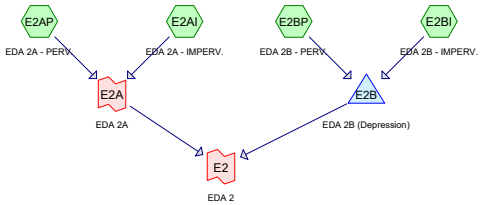
Tc Flow Path	Slope (S)	Mannings' No. (n)	Max. Flow Length (L)
A - B	0.028	0.15	112
F - G	0.015	0.13	94
J - K	0.015	0.13	94
N - O	0.3	0.15	365
AI - AJ	0.25	0.15	333
AK - AL	0.015	0.13	94
F - G	0.015	0.13	94
U - V	0.015	0.15	82
V - W	0.3	0.15	365
Z - AA	0.015	0.15	82
Z - AA	0.3	0.15	365
AF - AE	0.02	0.15	94
AE - AH	0.02	0.13	109

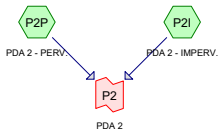
NOAA Atlas 14 Precipitation Depths

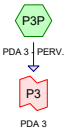
PRE- vs. POST-DEVELOPMENT HYDROGRAPHS

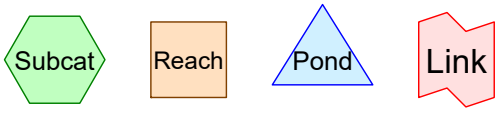












Routing Diagram for EX-PR
Prepared by Bohler Engineering NJ, LLC

Summary for Subcatchment E1AI: EDA 1A - IMPERV.

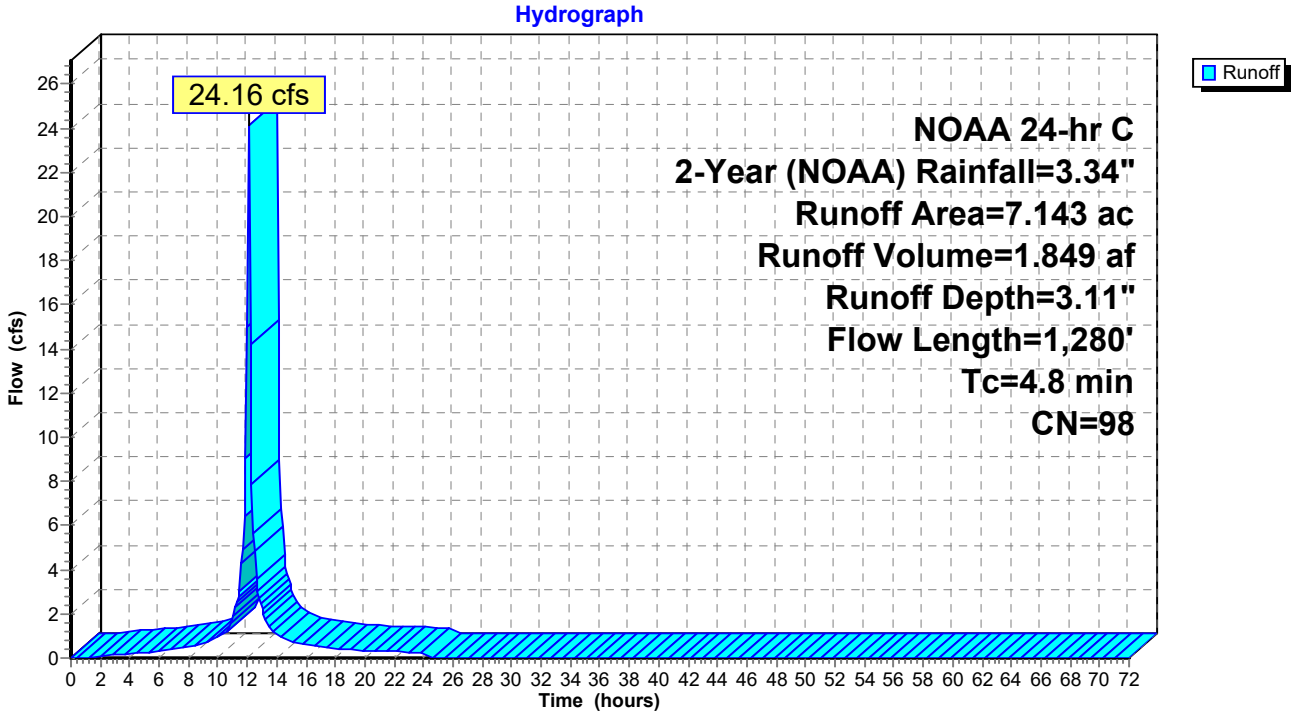
Runoff = 24.16 cfs @ 12.10 hrs, Volume= 1.849 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

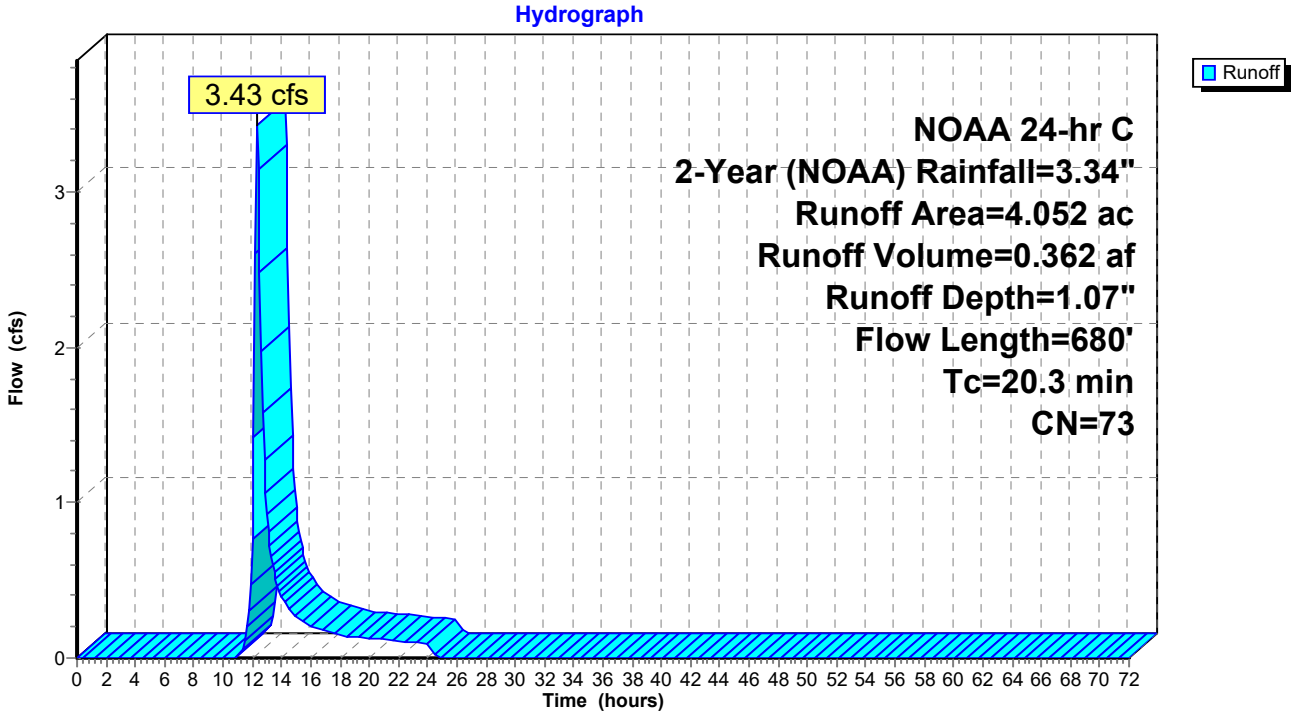
Runoff = 3.43 cfs @ 12.33 hrs, Volume= 0.362 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

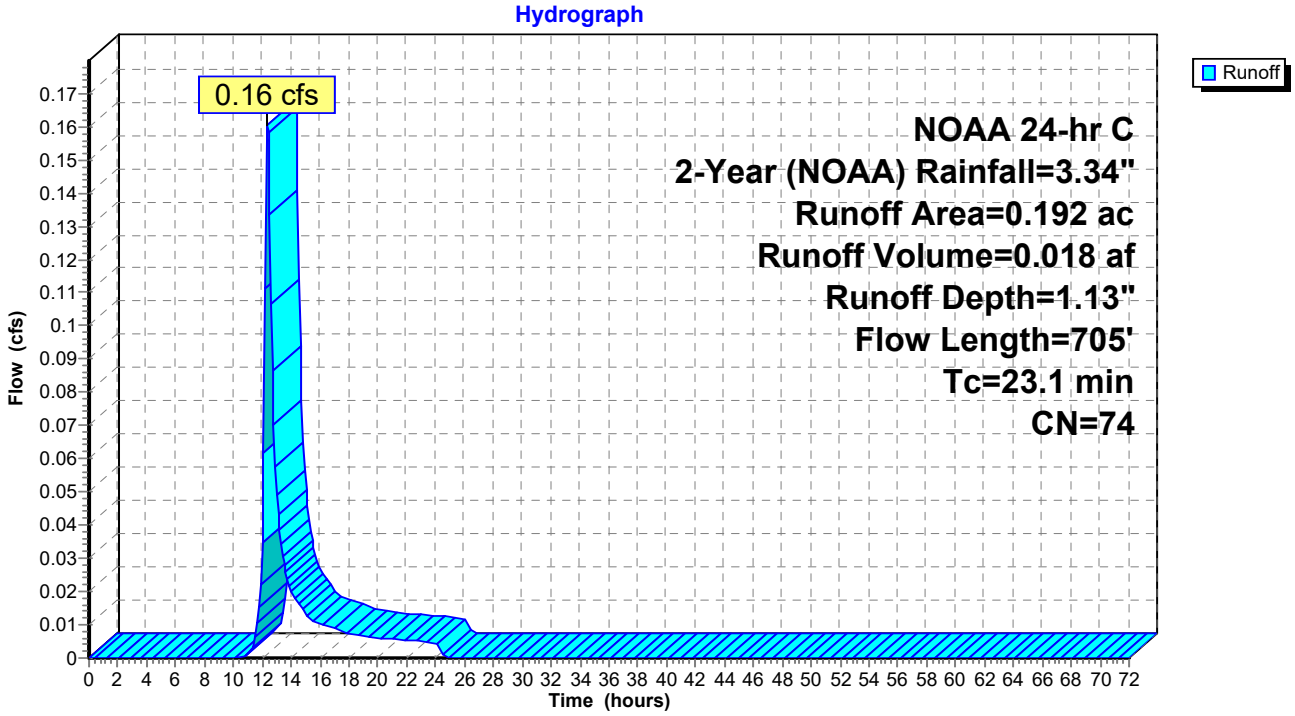
Runoff = 0.16 cfs @ 12.36 hrs, Volume= 0.018 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

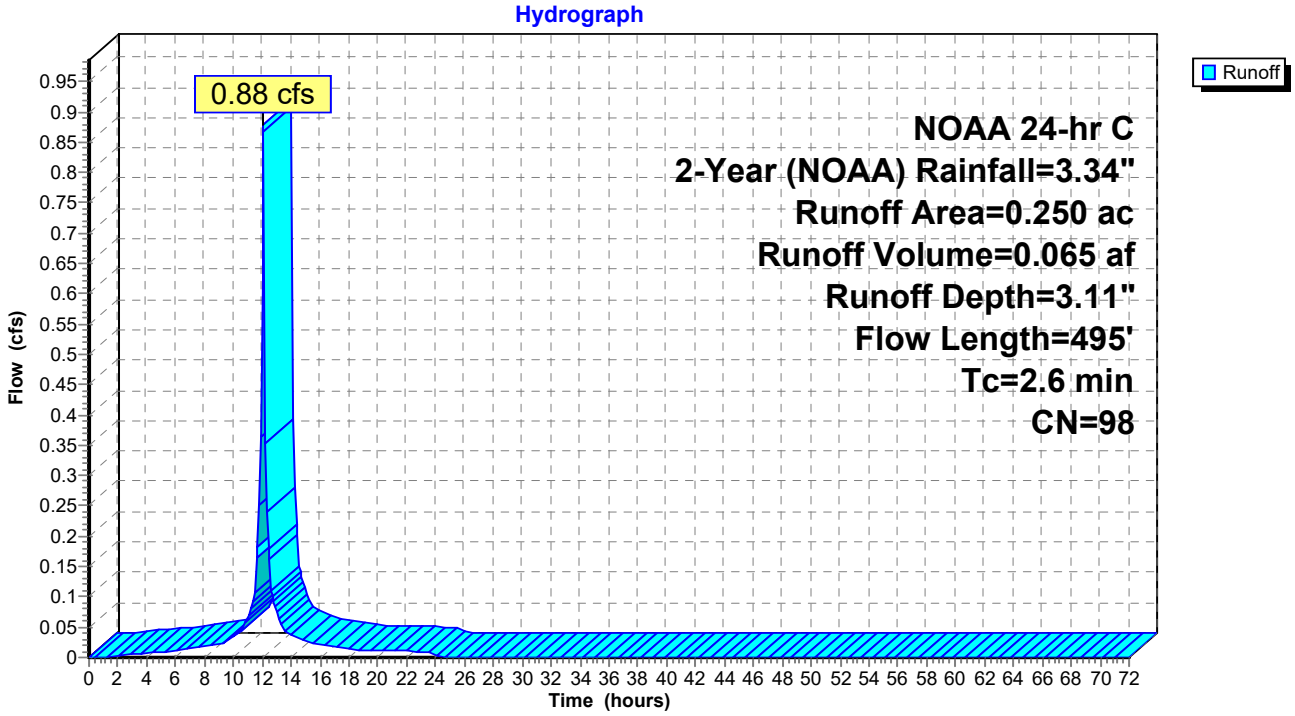
Runoff = 0.88 cfs @ 12.08 hrs, Volume= 0.065 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

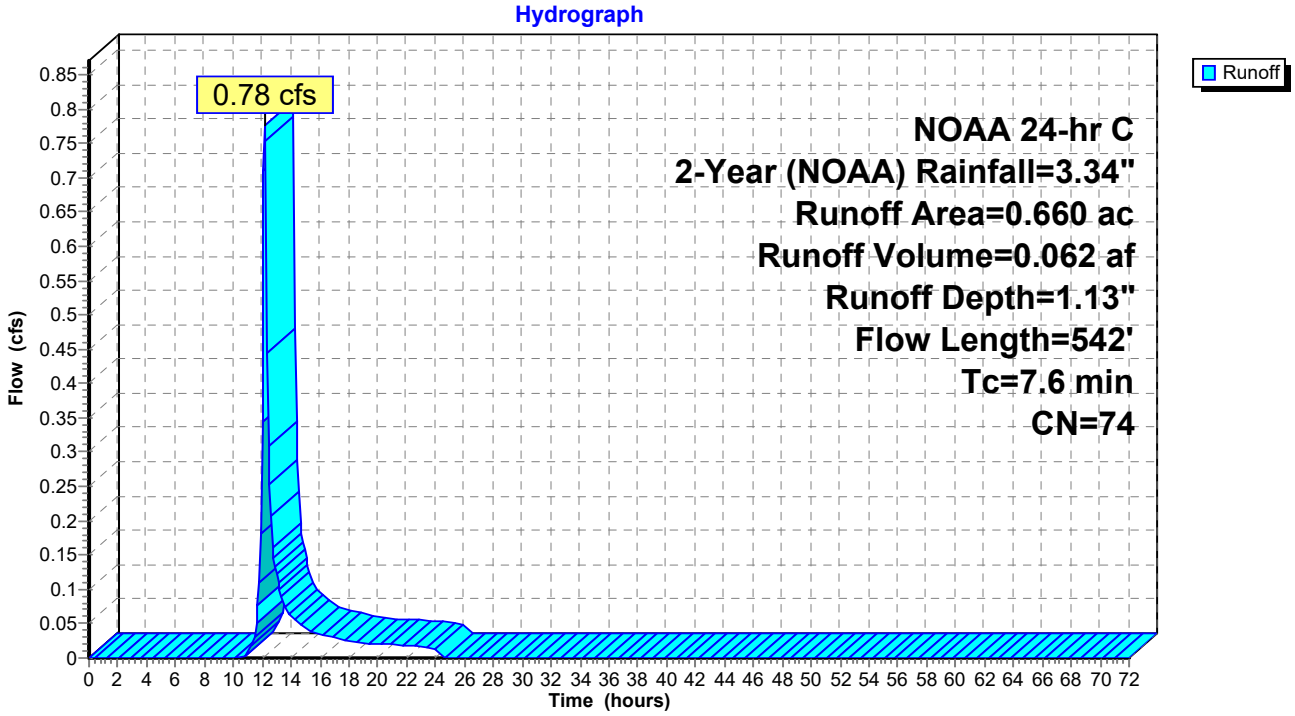
Runoff = 0.78 cfs @ 12.16 hrs, Volume= 0.062 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

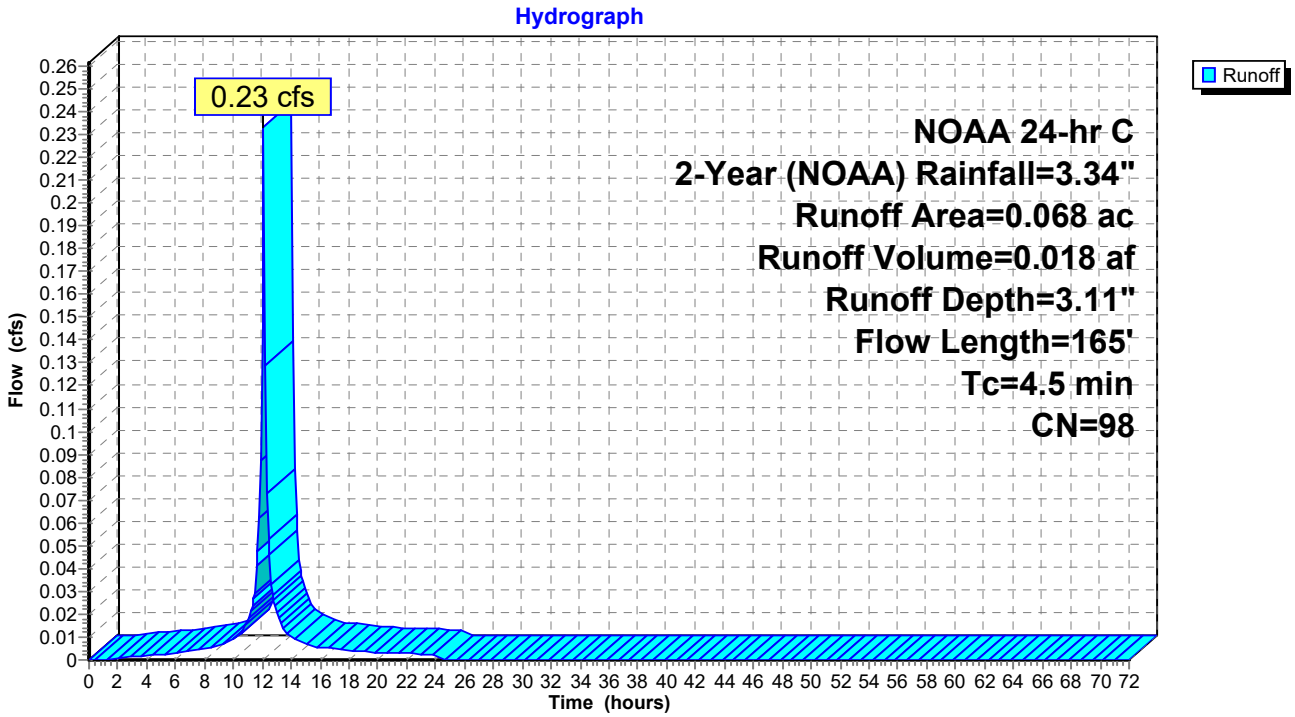
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.018 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

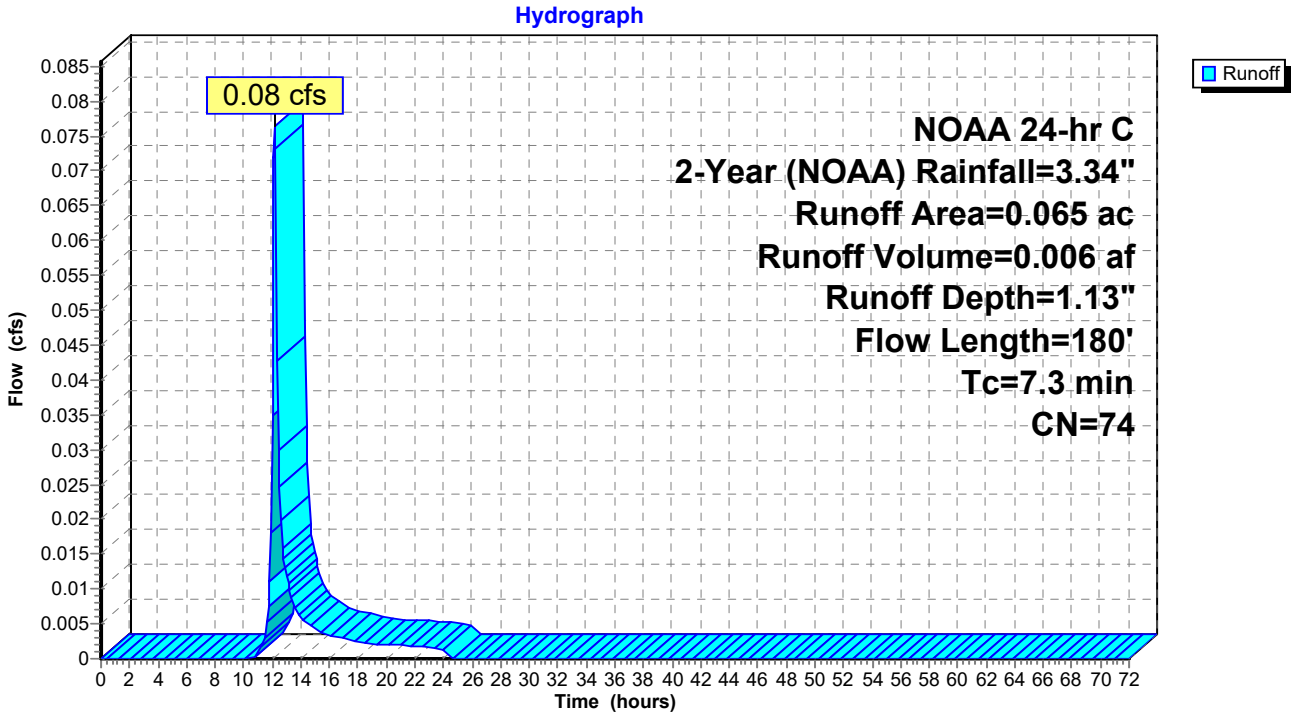
Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.006 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

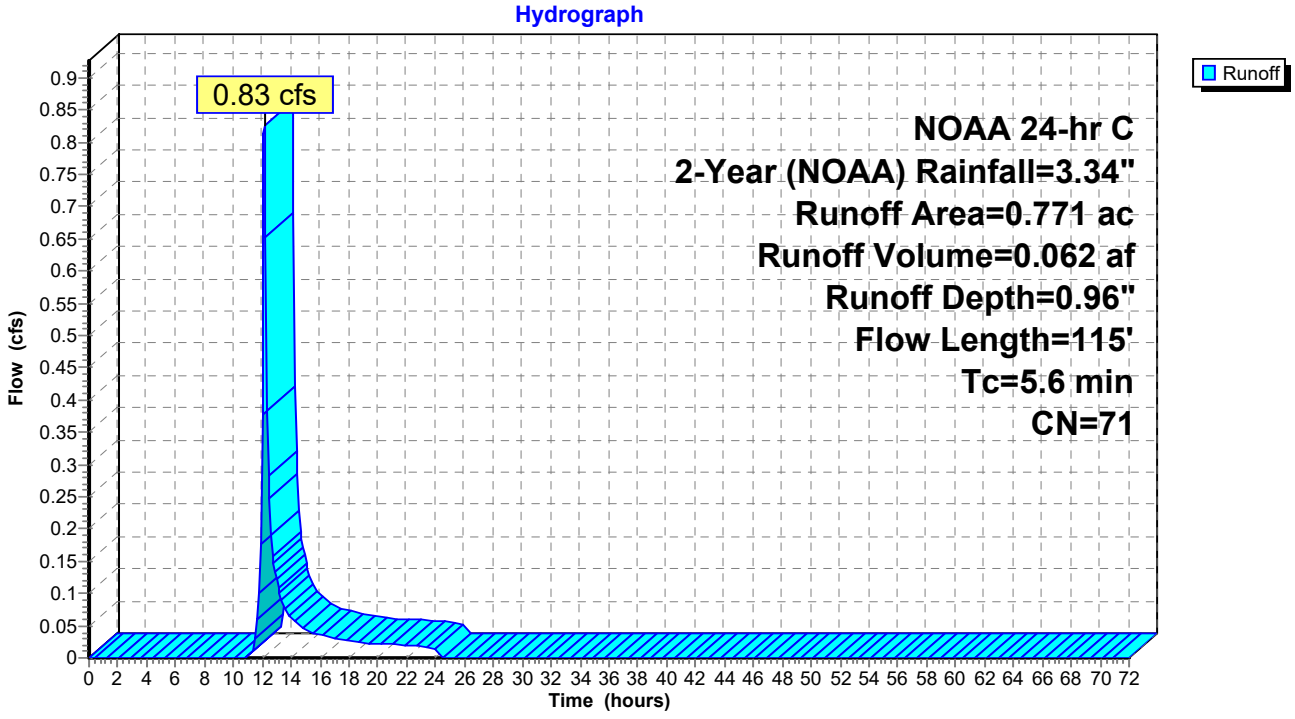
Runoff = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

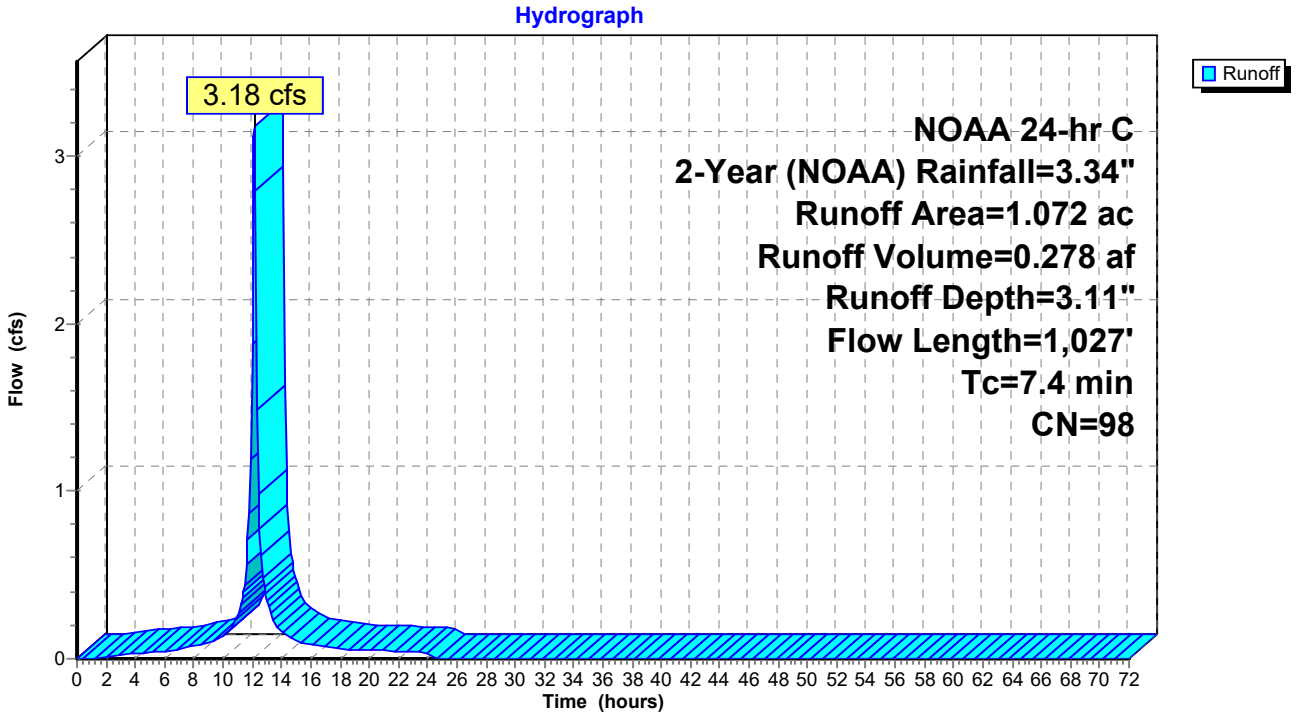
Runoff = 3.18 cfs @ 12.13 hrs, Volume= 0.278 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

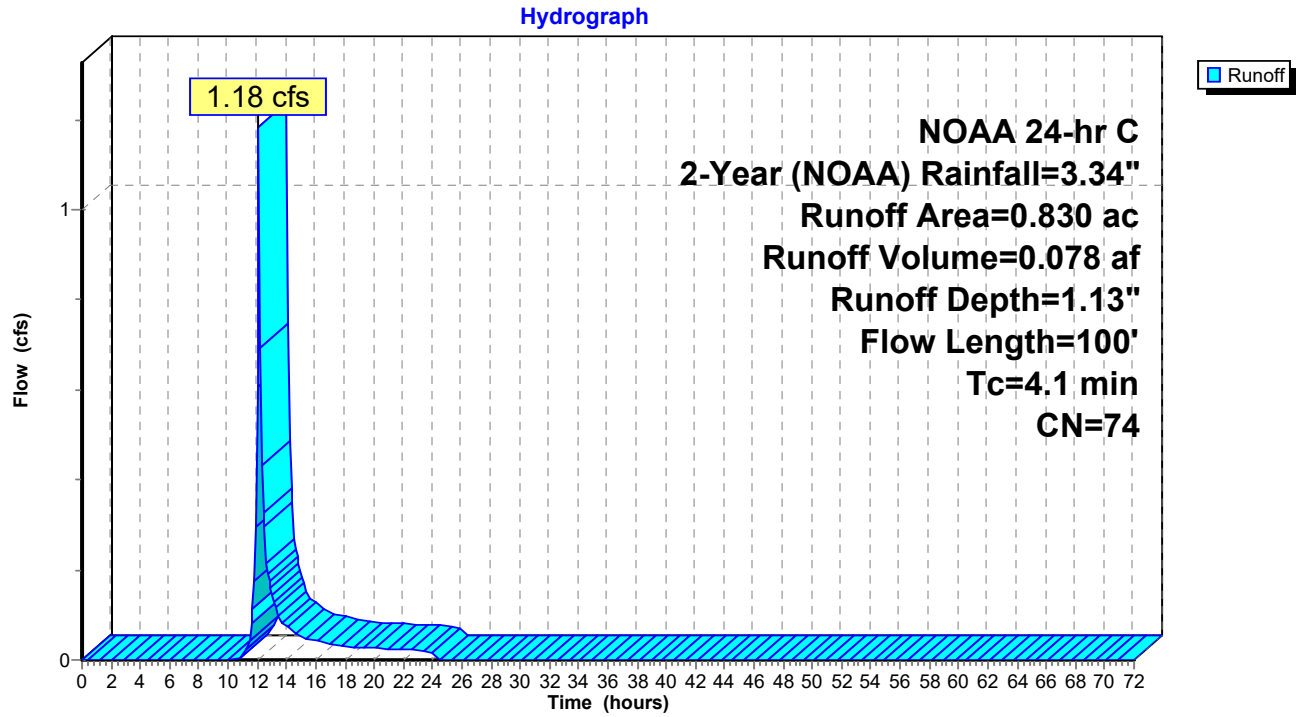
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.078 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

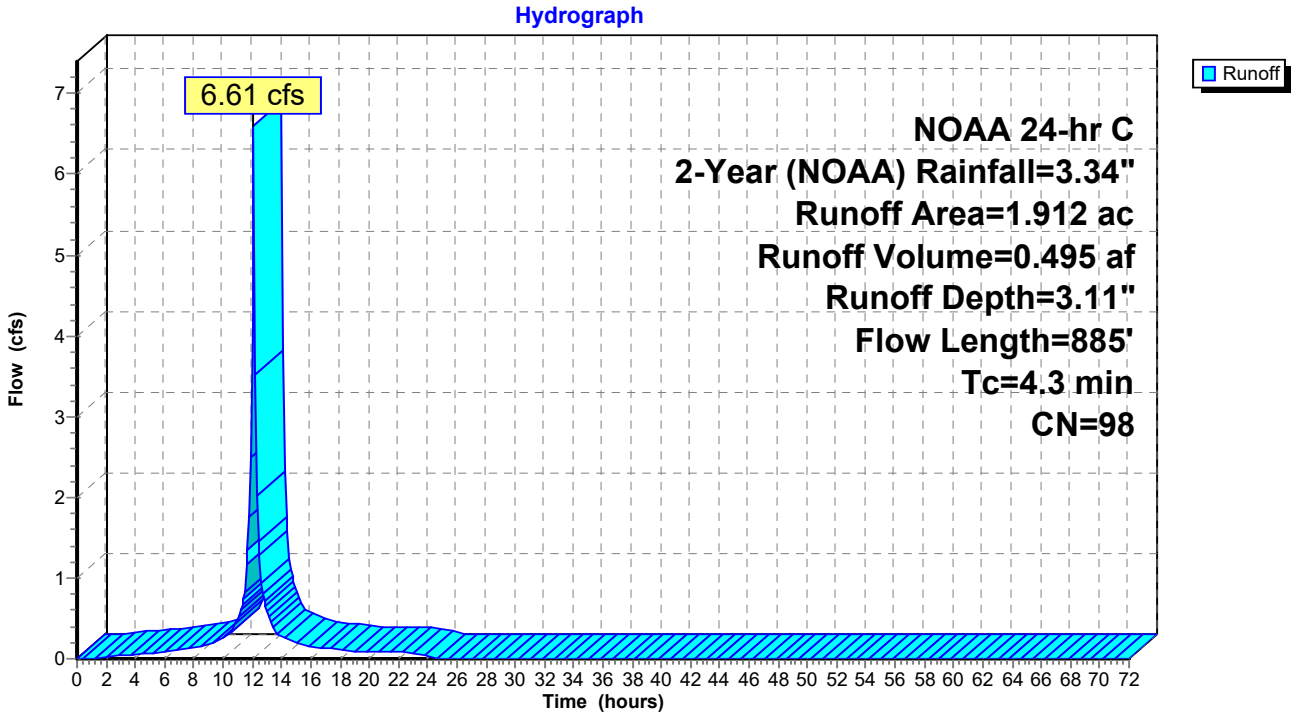
Runoff = 6.61 cfs @ 12.09 hrs, Volume= 0.495 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

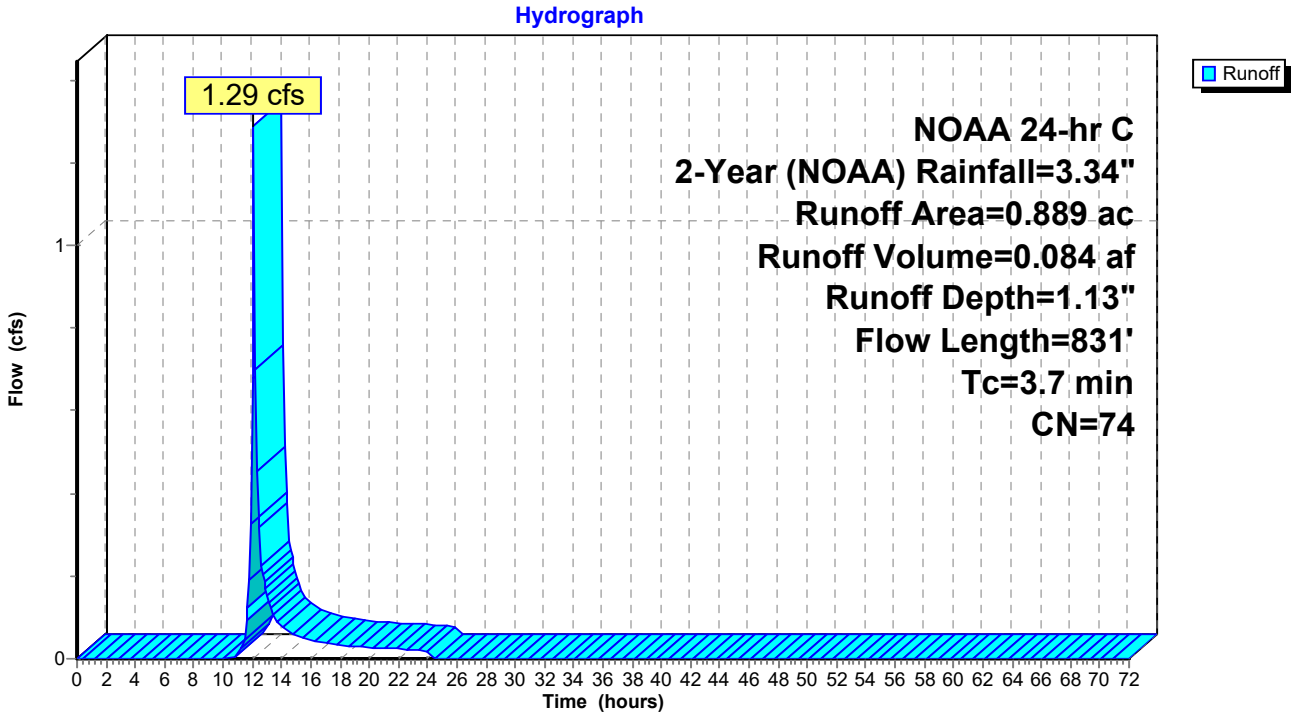
Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.084 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

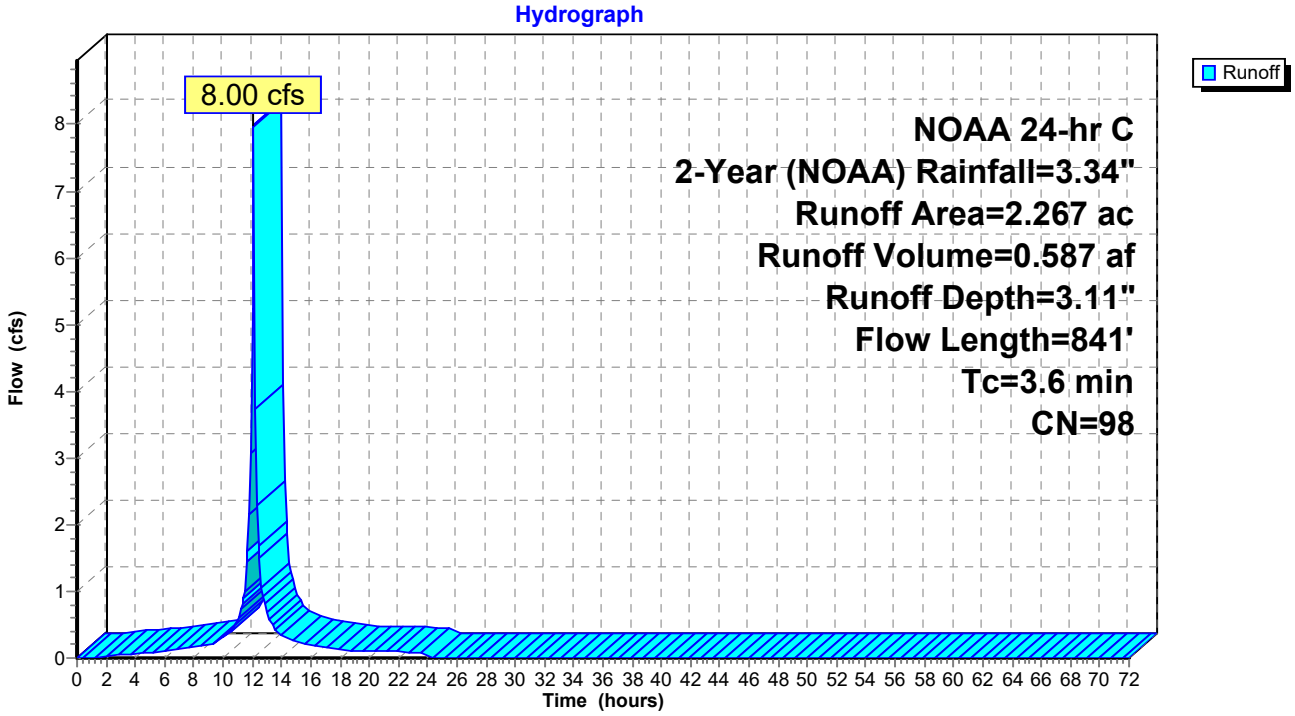
Runoff = 8.00 cfs @ 12.09 hrs, Volume= 0.587 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

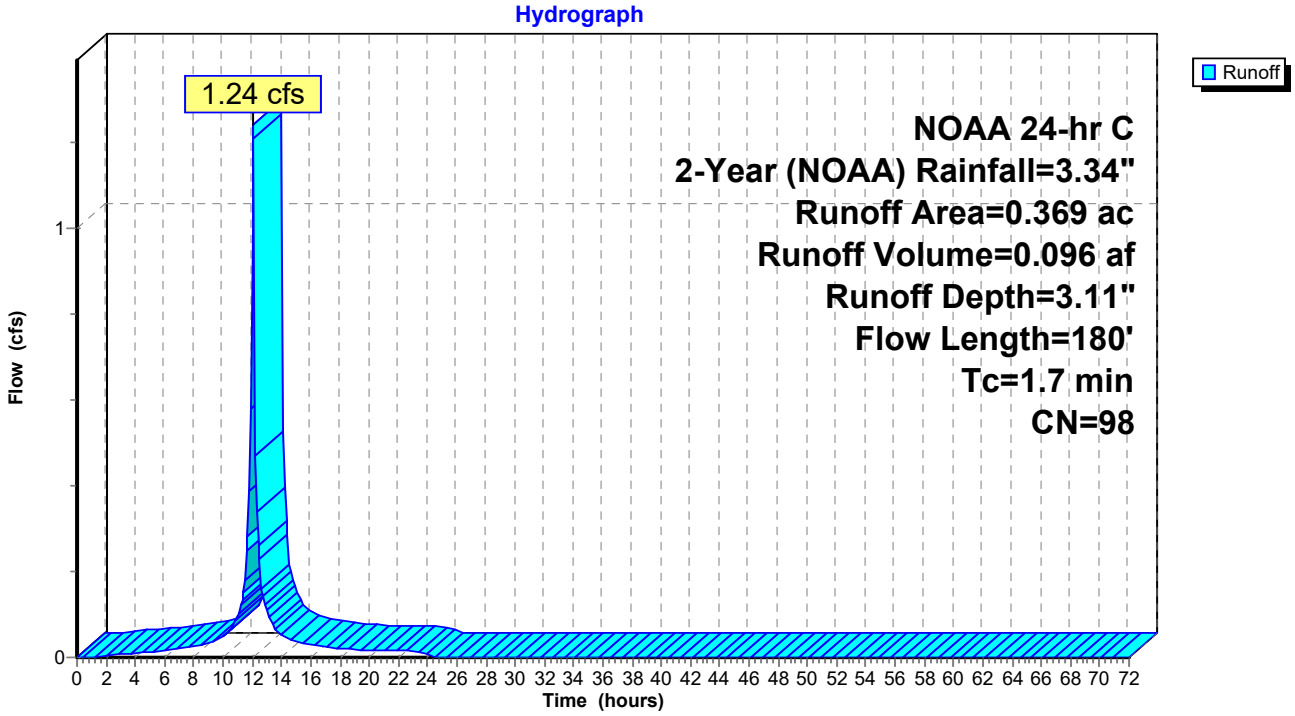
Runoff = 1.24 cfs @ 12.07 hrs, Volume= 0.096 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

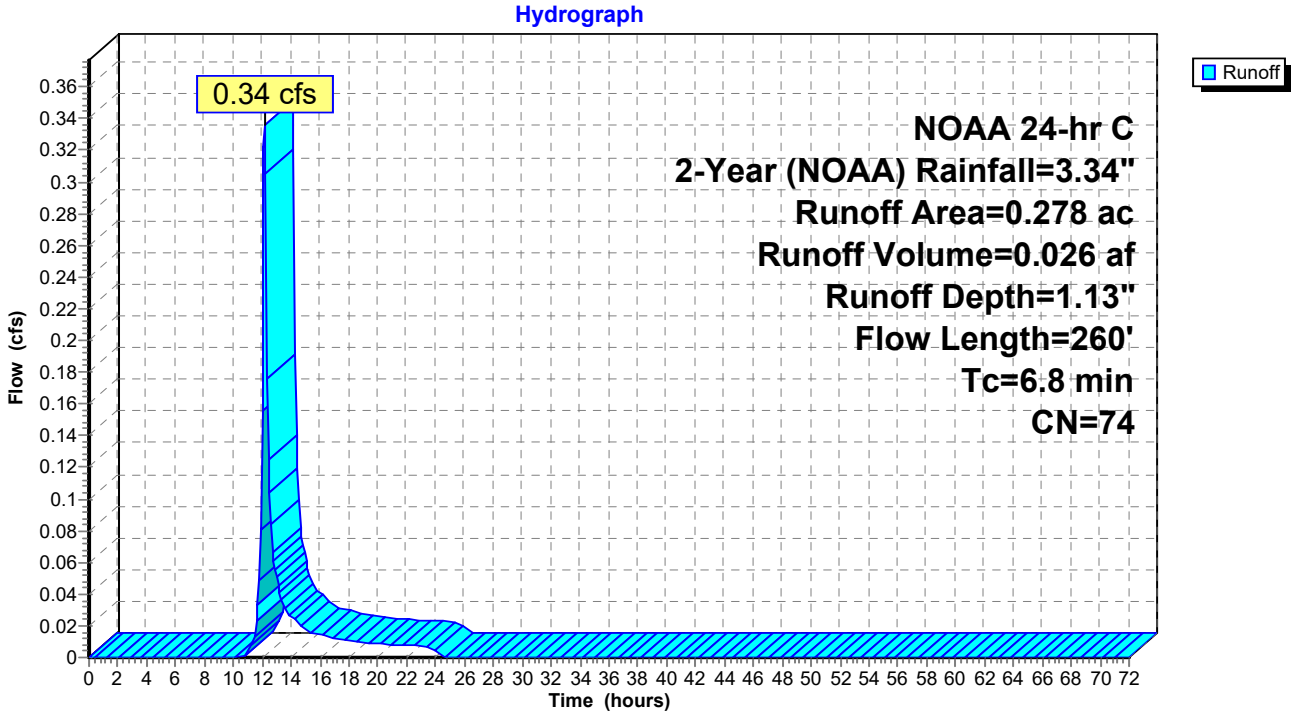
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 0.026 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

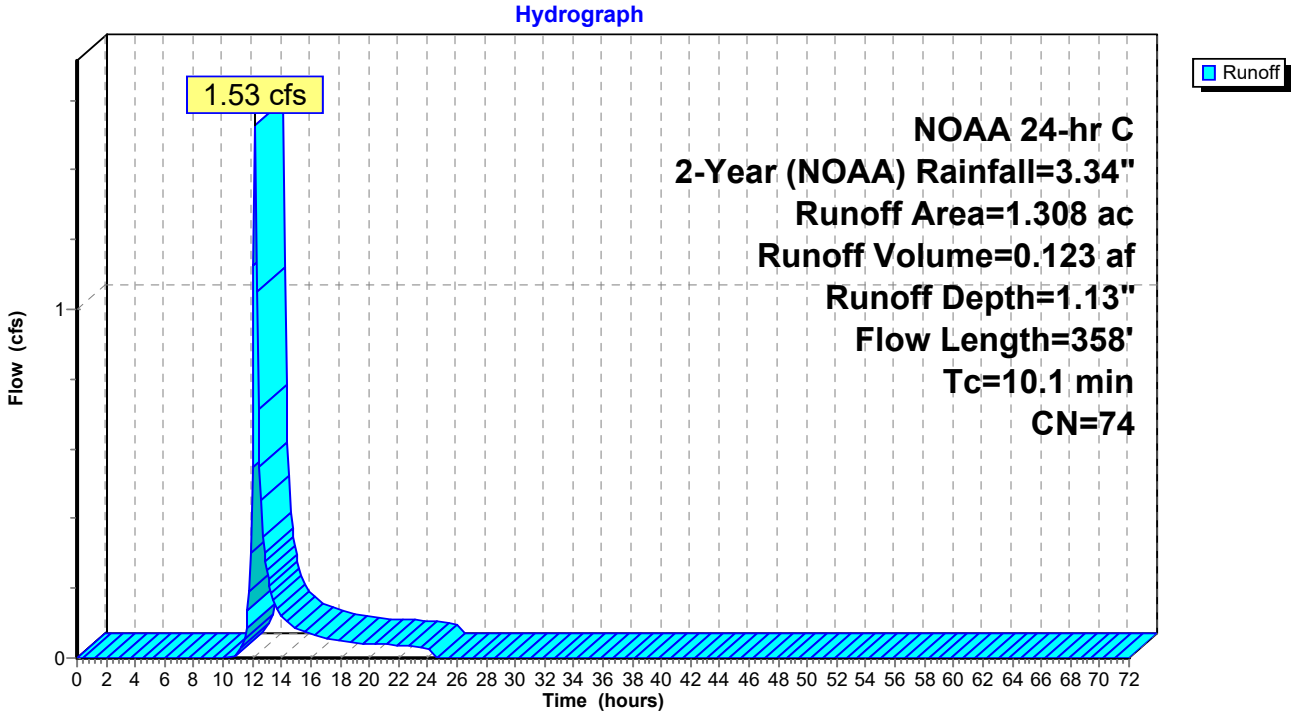
Runoff = 1.53 cfs @ 12.20 hrs, Volume= 0.123 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

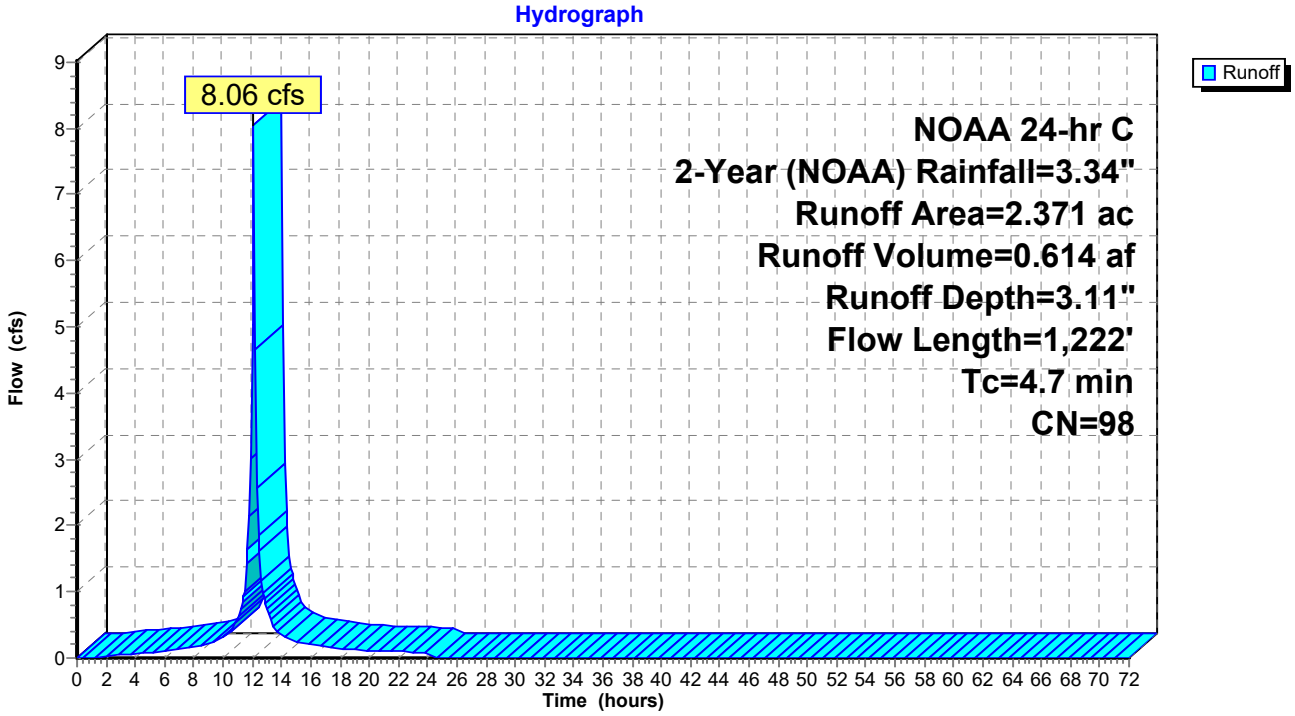
Runoff = 8.06 cfs @ 12.10 hrs, Volume= 0.614 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

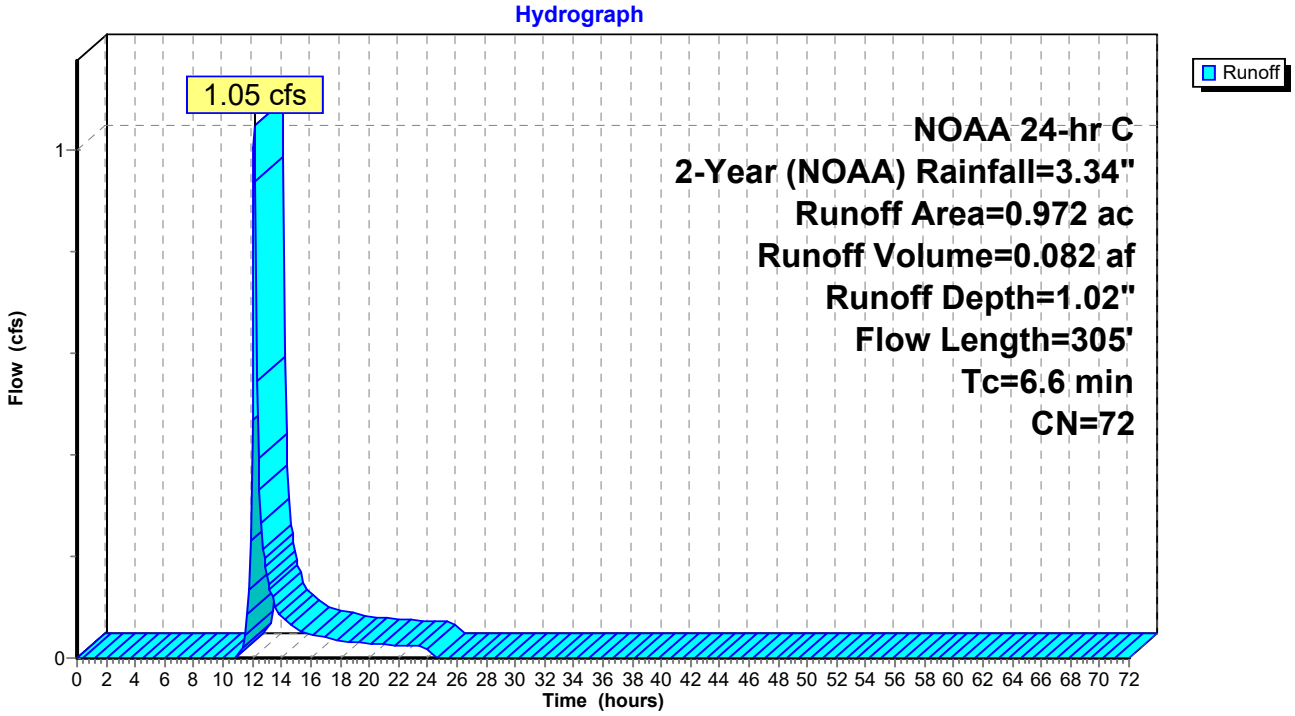
Runoff = 1.05 cfs @ 12.14 hrs, Volume= 0.082 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

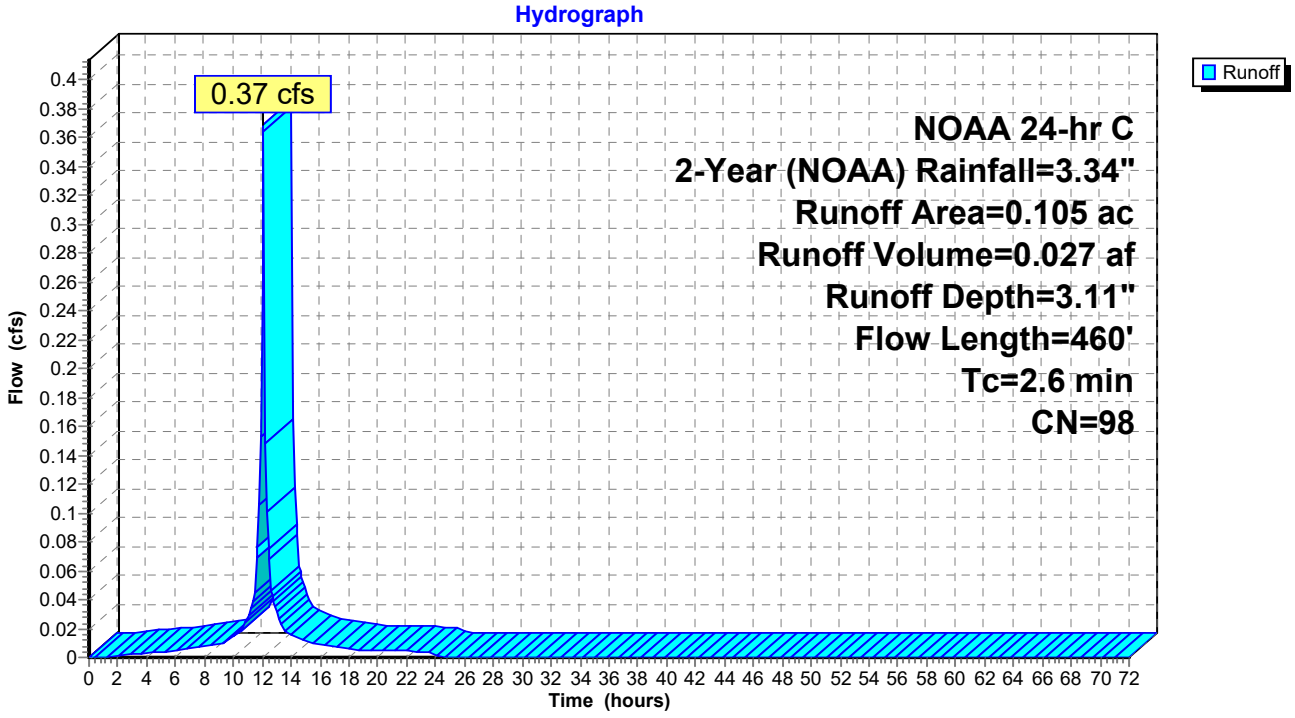
Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

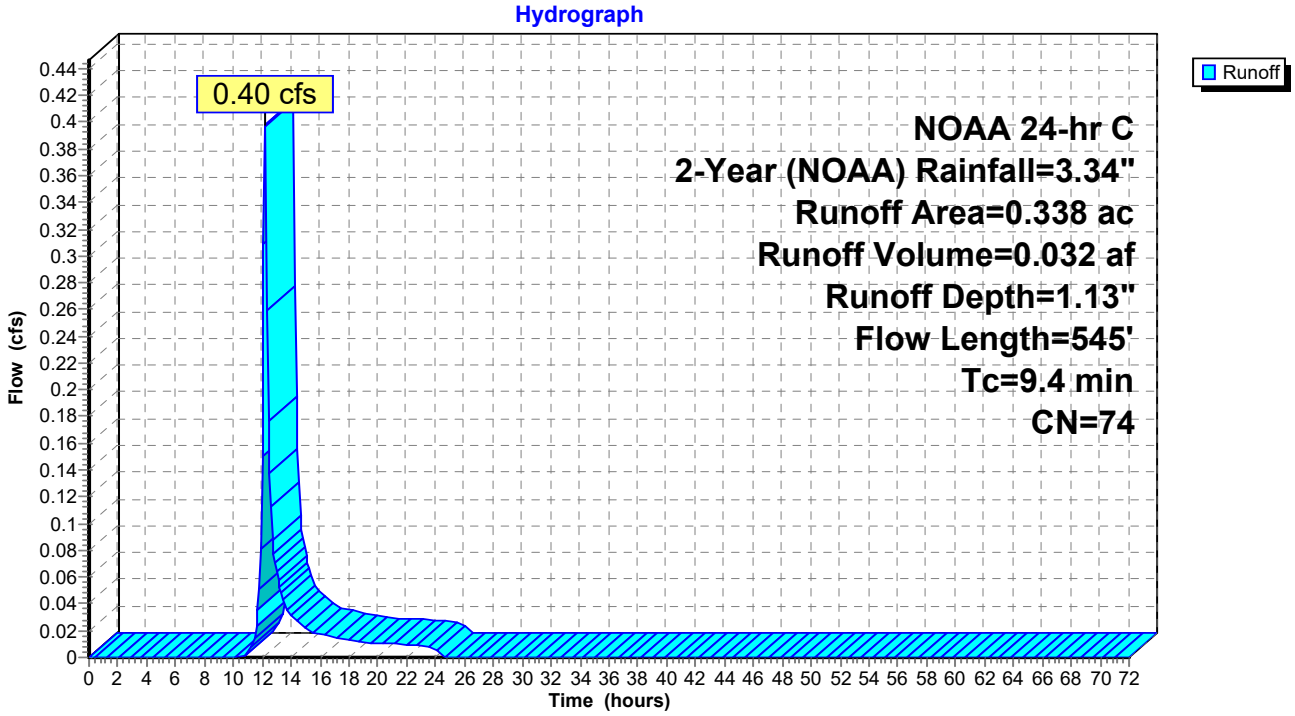
Runoff = 0.40 cfs @ 12.19 hrs, Volume= 0.032 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

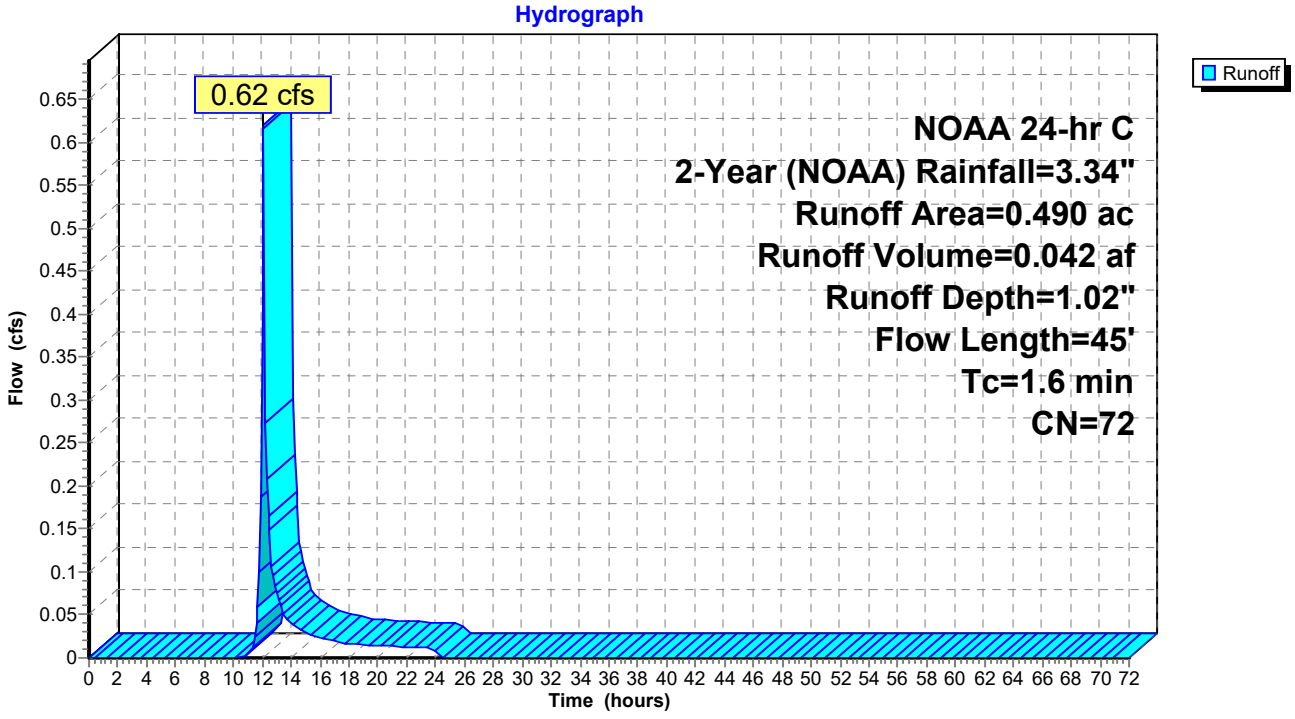
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (NOAA) Rainfall=3.34"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 1.13" for 2-Year (NOAA) event
Inflow = 0.16 cfs @ 12.36 hrs, Volume= 0.018 af
Outflow = 0.12 cfs @ 12.62 hrs, Volume= 0.013 af, Atten= 28%, Lag= 15.7 min
Primary = 0.12 cfs @ 12.62 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.08' @ 12.62 hrs Surf.Area= 1,656 sf Storage= 239 cf

Plug-Flow detention time= 168.6 min calculated for 0.013 af (73% of inflow)
Center-of-Mass det. time= 65.9 min (944.7 - 878.9)

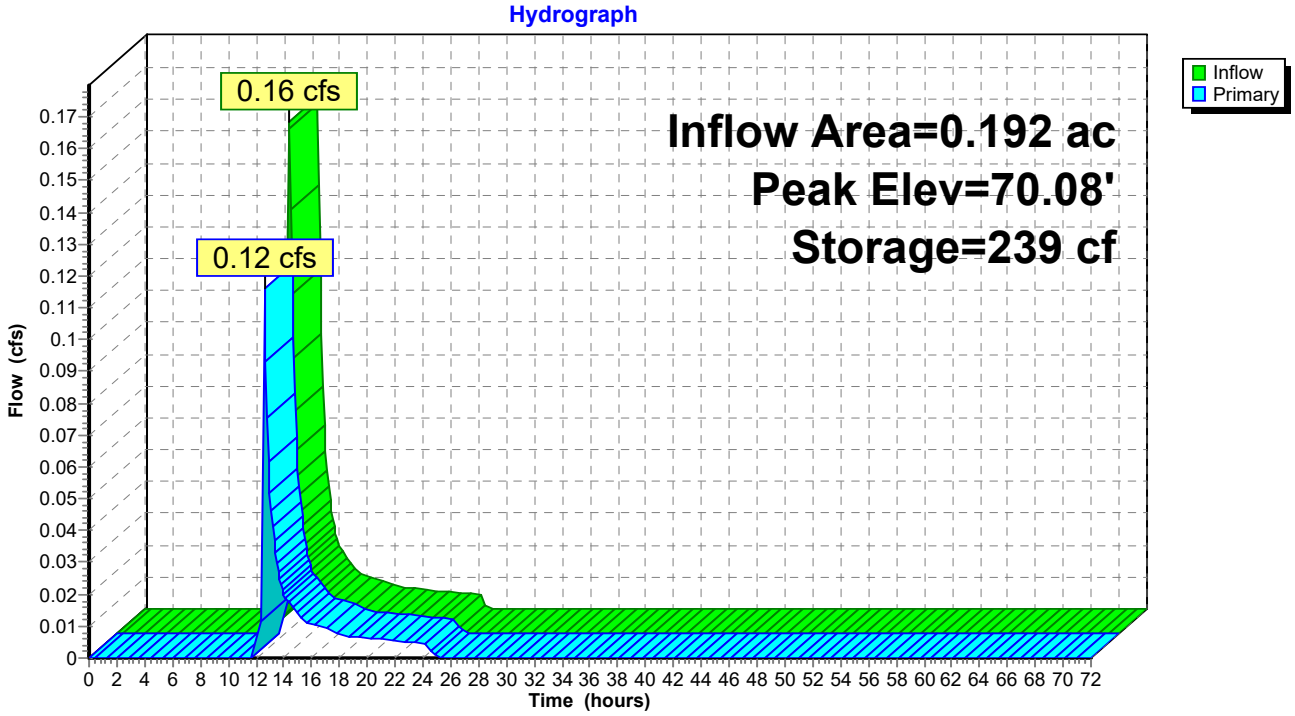
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.11 cfs @ 12.62 hrs HW=70.08' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.11 cfs @ 0.16 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 2.14" for 2-Year (NOAA) event
Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.024 af
Outflow = 0.30 cfs @ 12.11 hrs, Volume= 0.022 af, Atten= 2%, Lag= 0.1 min
Primary = 0.30 cfs @ 12.11 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.14' @ 12.11 hrs Surf.Area= 329 sf Storage= 76 cf

Plug-Flow detention time= 63.6 min calculated for 0.022 af (94% of inflow)
Center-of-Mass det. time= 30.2 min (813.5 - 783.4)

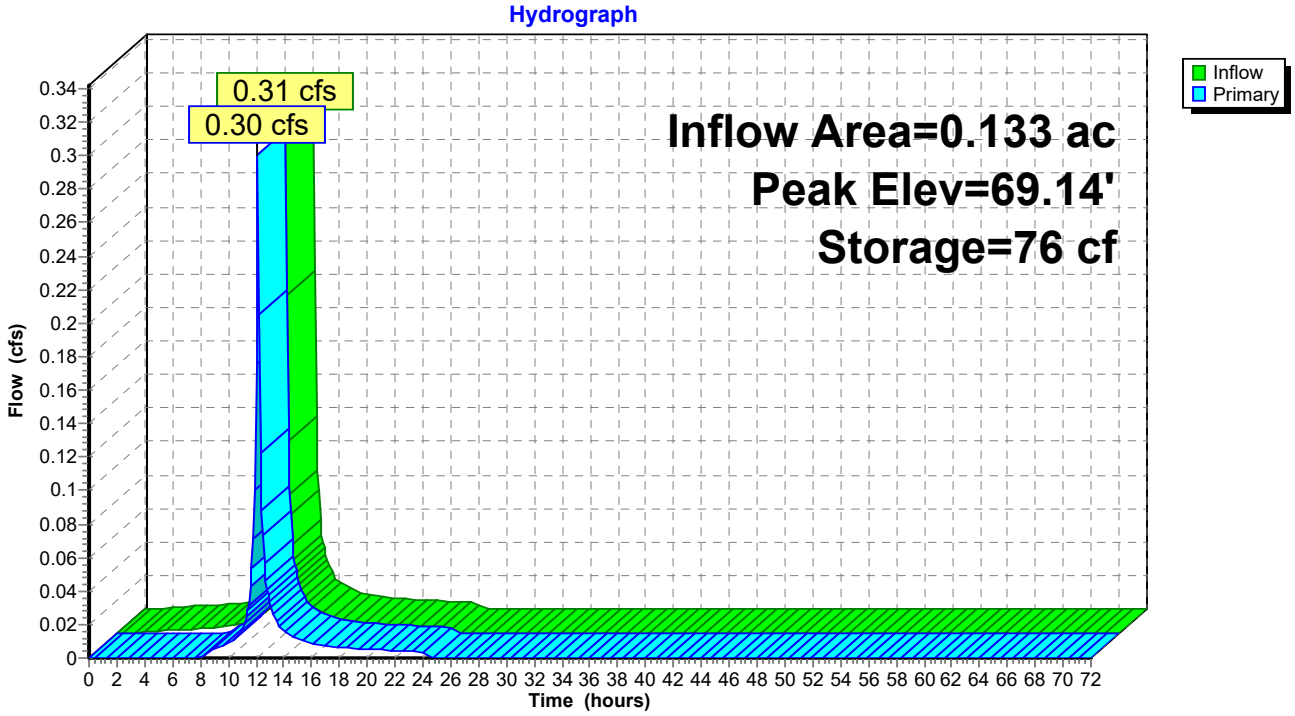
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.29 cfs @ 12.11 hrs HW=69.14' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.29 cfs @ 0.29 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 2.24" for 2-Year (NOAA) event
Inflow = 4.35 cfs @ 12.12 hrs, Volume= 0.356 af
Outflow = 2.43 cfs @ 12.29 hrs, Volume= 0.255 af, Atten= 44%, Lag= 10.1 min
Primary = 2.43 cfs @ 12.29 hrs, Volume= 0.255 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.00' @ 12.29 hrs Surf.Area= 7,304 sf Storage= 6,766 cf

Plug-Flow detention time= 204.9 min calculated for 0.255 af (72% of inflow)
Center-of-Mass det. time= 105.0 min (885.7 - 780.6)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

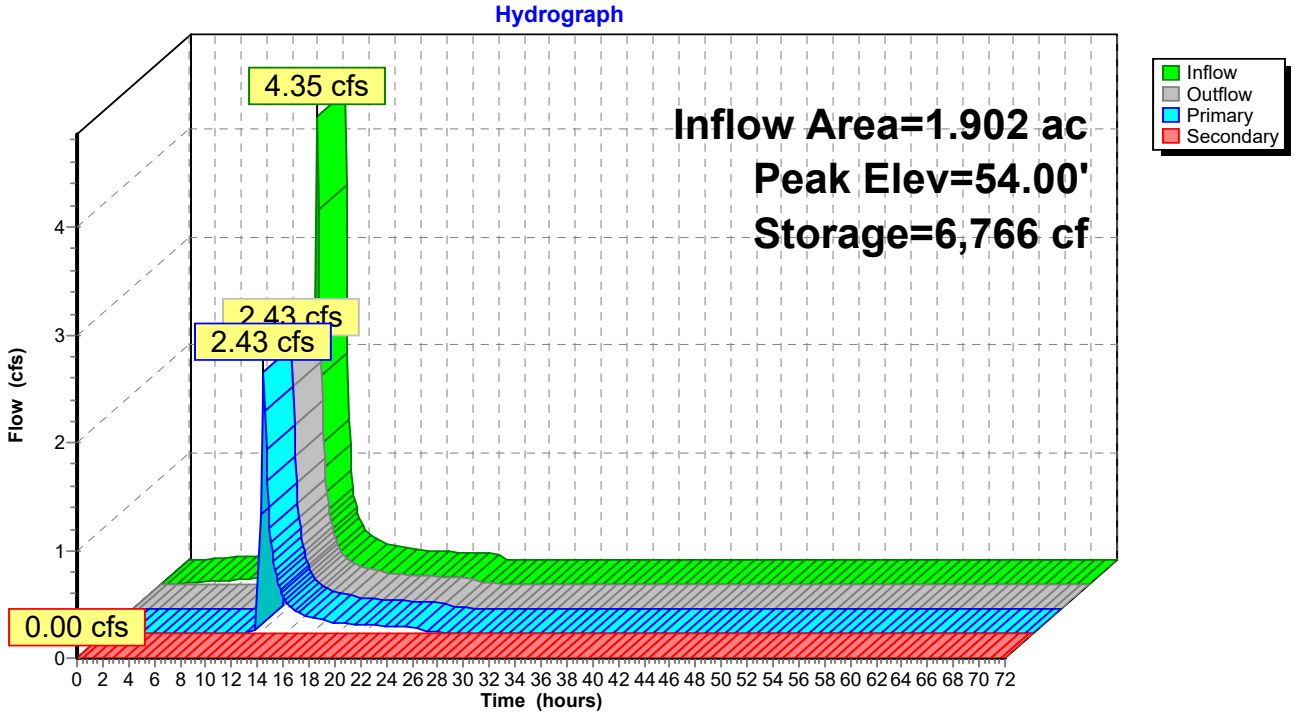
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.39 cfs @ 12.29 hrs HW=54.00' (Free Discharge)
└**1=Culvert** (Passes 2.39 cfs of 29.66 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 2.39 cfs @ 1.71 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 2.48" for 2-Year (NOAA) event
Inflow = 7.89 cfs @ 12.10 hrs, Volume= 0.579 af
Outflow = 1.02 cfs @ 12.69 hrs, Volume= 0.400 af, Atten= 87%, Lag= 35.9 min
Primary = 1.02 cfs @ 12.69 hrs, Volume= 0.400 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.03' @ 12.69 hrs Surf.Area= 15,616 sf Storage= 15,068 cf

Plug-Flow detention time= 367.6 min calculated for 0.400 af (69% of inflow)
Center-of-Mass det. time= 266.7 min (1,037.0 - 770.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

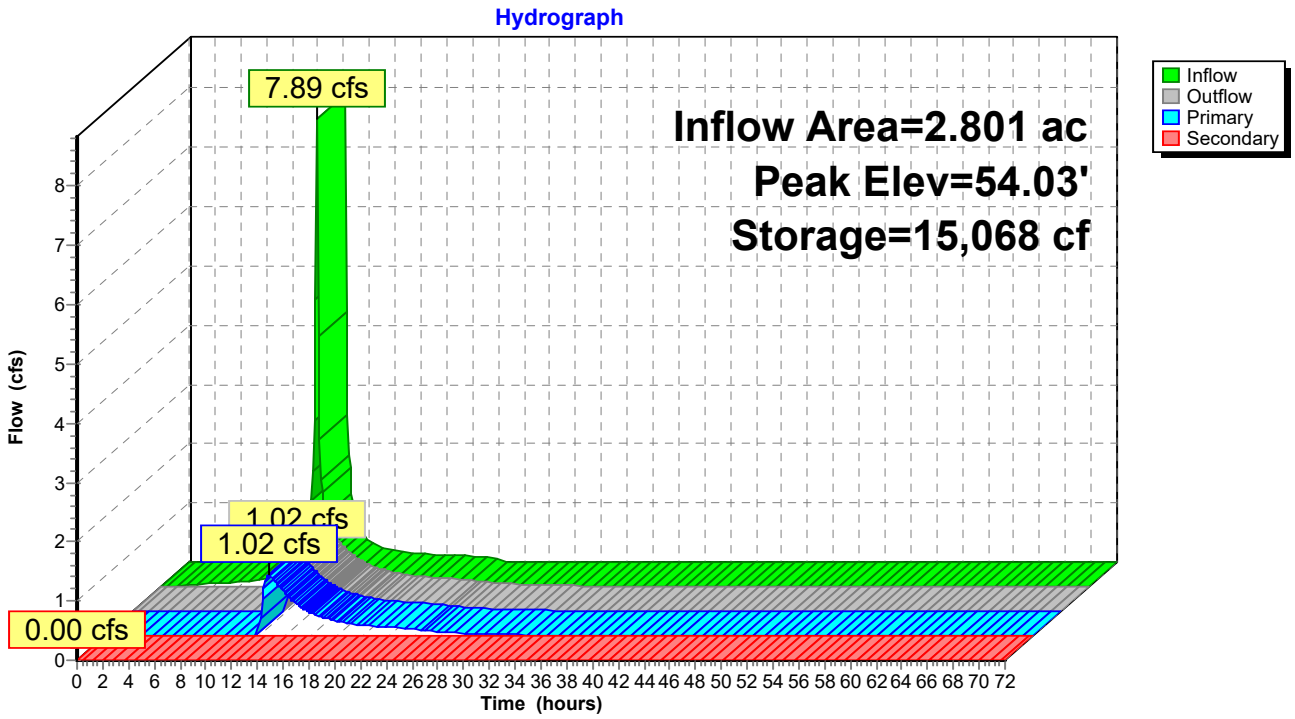
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.02 cfs @ 12.69 hrs HW=54.03' (Free Discharge)
└─**1=Culvert** (Passes 1.02 cfs of 30.37 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.99 cfs @ 2.07 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.48 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 2.36" for 2-Year (NOAA) event
Inflow = 10.62 cfs @ 12.09 hrs, Volume= 0.832 af
Outflow = 1.33 cfs @ 12.82 hrs, Volume= 0.593 af, Atten= 87%, Lag= 43.5 min
Primary = 1.33 cfs @ 12.82 hrs, Volume= 0.593 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 61.76' @ 12.82 hrs Surf.Area= 13,755 sf Storage= 21,643 cf

Plug-Flow detention time= 388.8 min calculated for 0.592 af (71% of inflow)
Center-of-Mass det. time= 294.1 min (1,068.4 - 774.3)

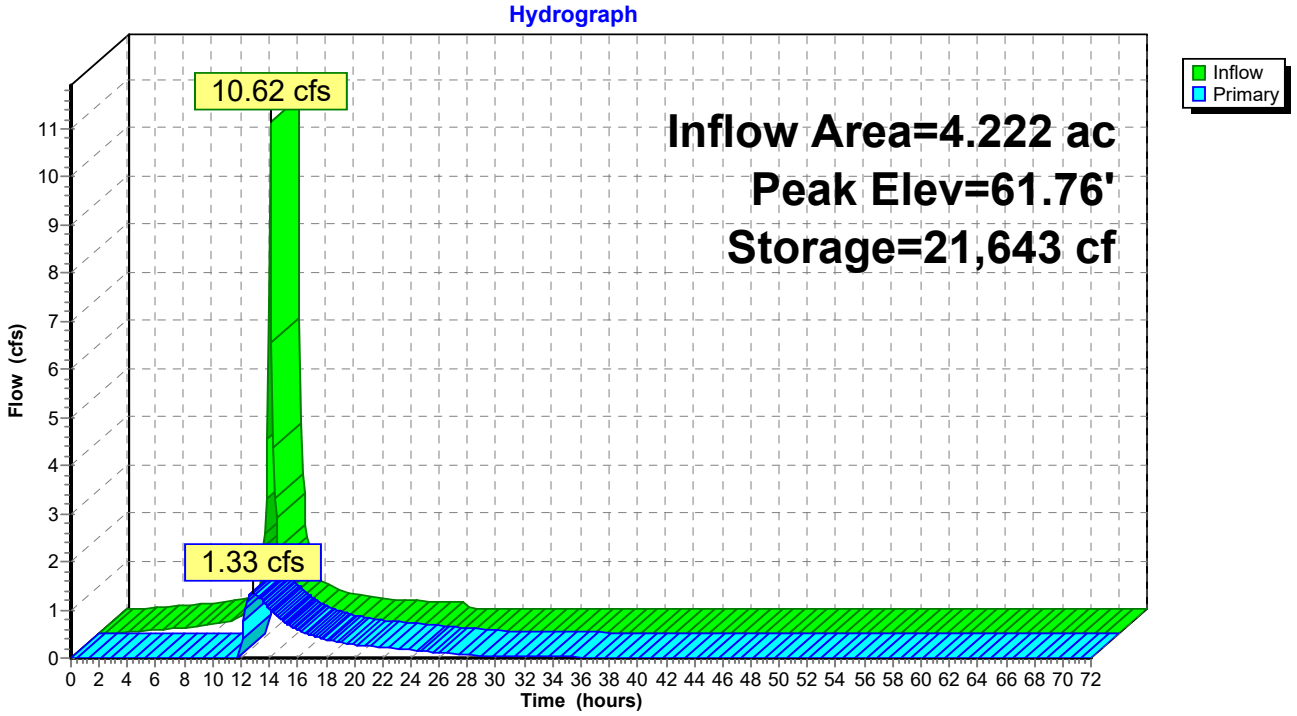
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=1.33 cfs @ 12.82 hrs HW=61.76' (Free Discharge)
└**1=Culvert** (Passes 1.33 cfs of 38.76 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 1.33 cfs @ 3.07 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

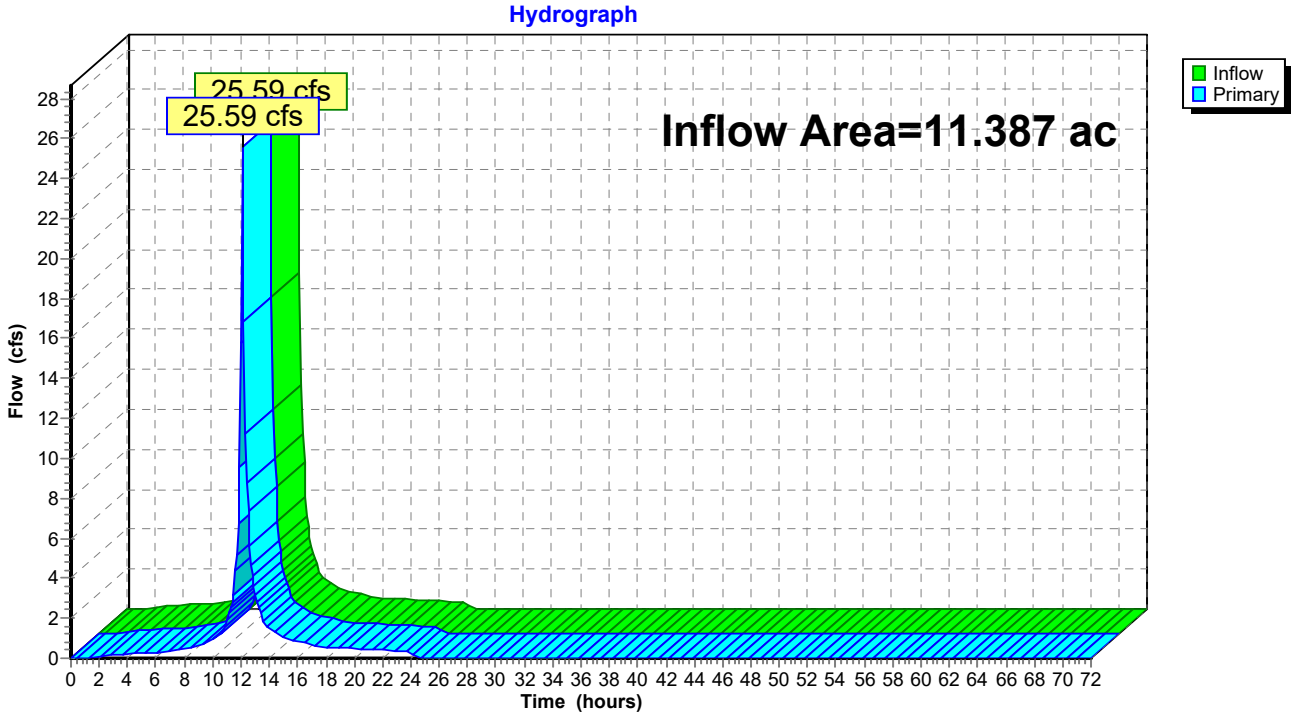


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 2.34" for 2-Year (NOAA) event
Inflow = 25.59 cfs @ 12.10 hrs, Volume= 2.225 af
Primary = 25.59 cfs @ 12.10 hrs, Volume= 2.225 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

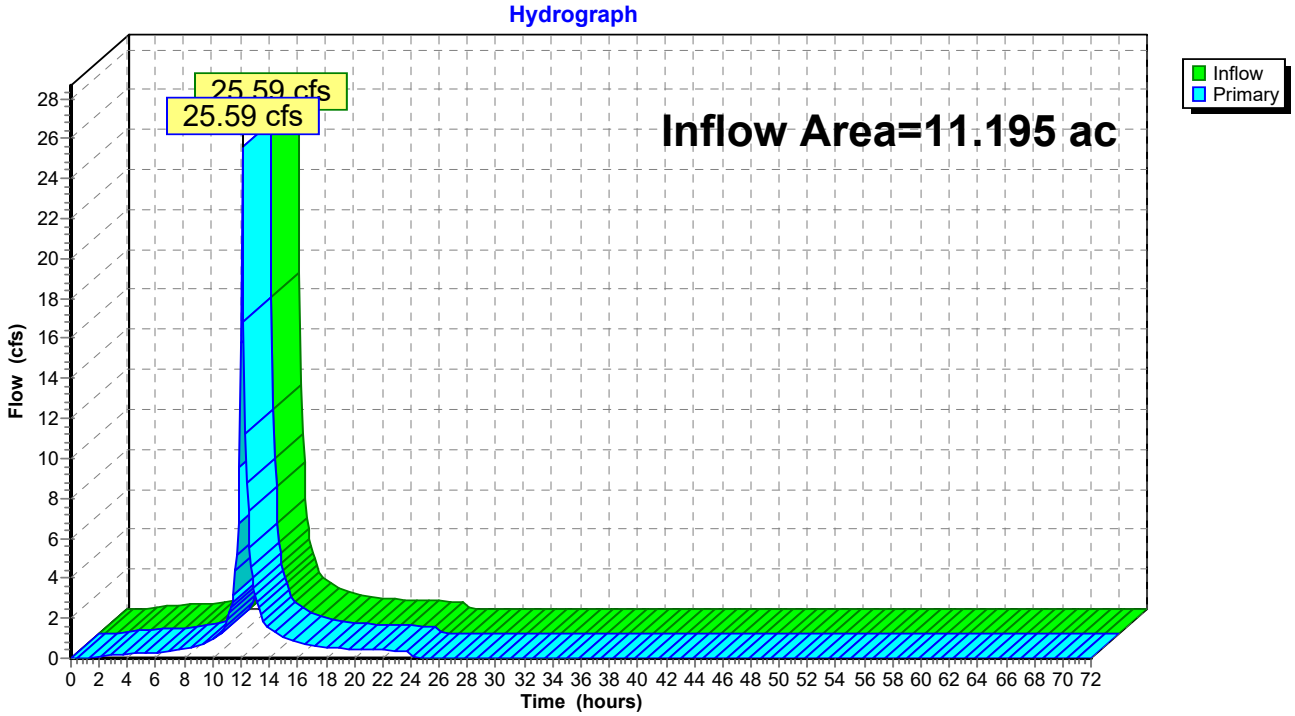


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 2.37" for 2-Year (NOAA) event
Inflow = 25.59 cfs @ 12.10 hrs, Volume= 2.212 af
Primary = 25.59 cfs @ 12.10 hrs, Volume= 2.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

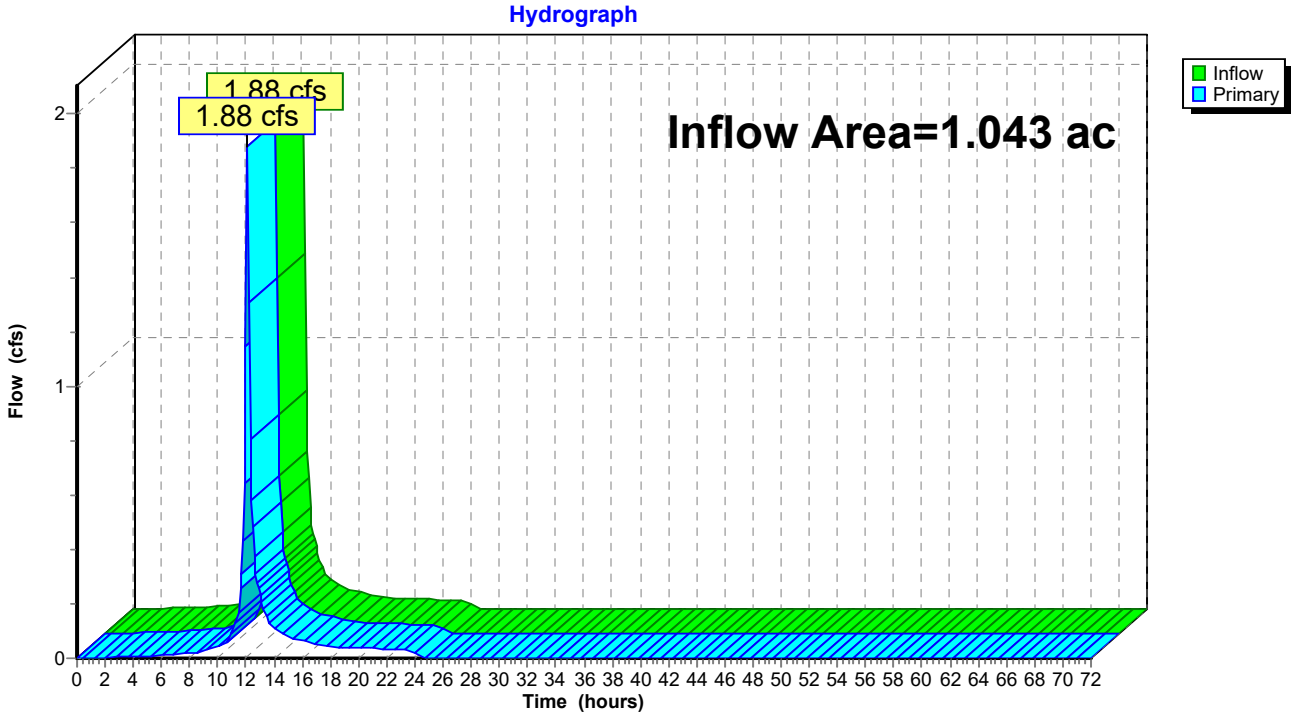


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 1.72" for 2-Year (NOAA) event
Inflow = 1.88 cfs @ 12.11 hrs, Volume= 0.149 af
Primary = 1.88 cfs @ 12.11 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

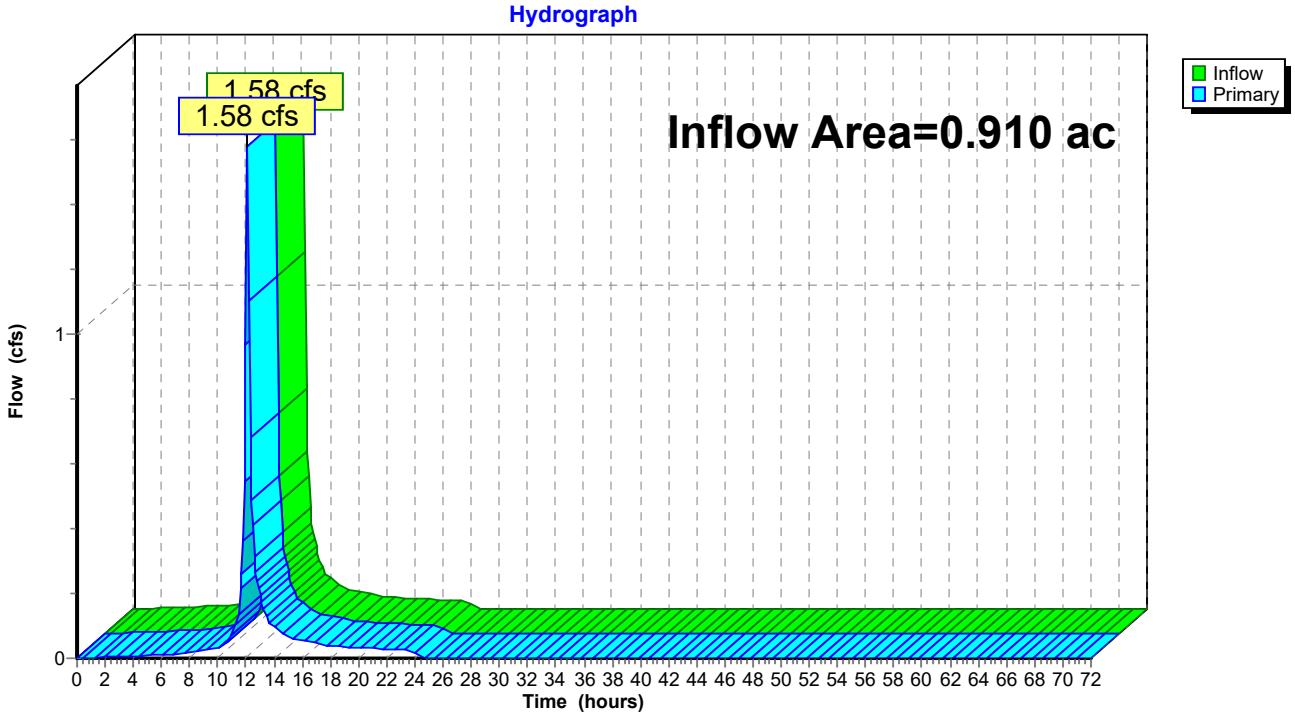


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 1.67" for 2-Year (NOAA) event
Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.127 af
Primary = 1.58 cfs @ 12.11 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

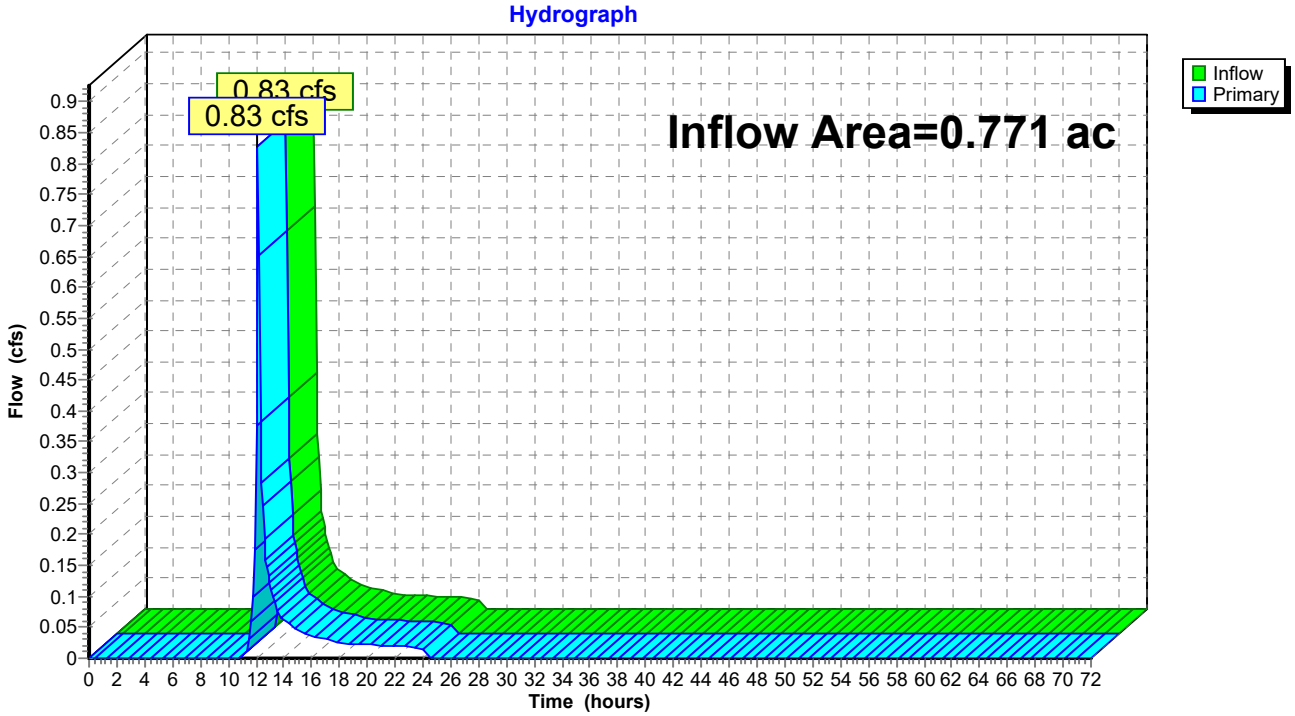


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 0.96" for 2-Year (NOAA) event
Inflow = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af
Primary = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

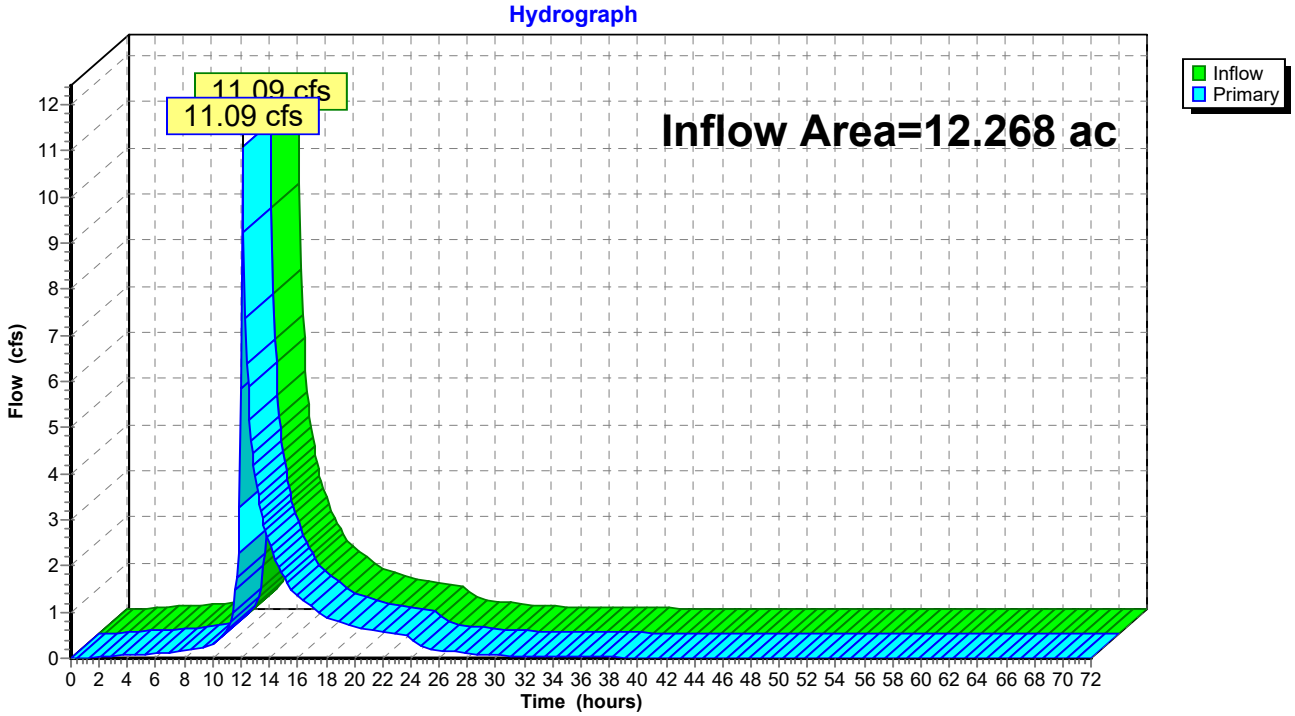


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 1.90" for 2-Year (NOAA) event
Inflow = 11.09 cfs @ 12.13 hrs, Volume= 1.944 af
Primary = 11.09 cfs @ 12.13 hrs, Volume= 1.944 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

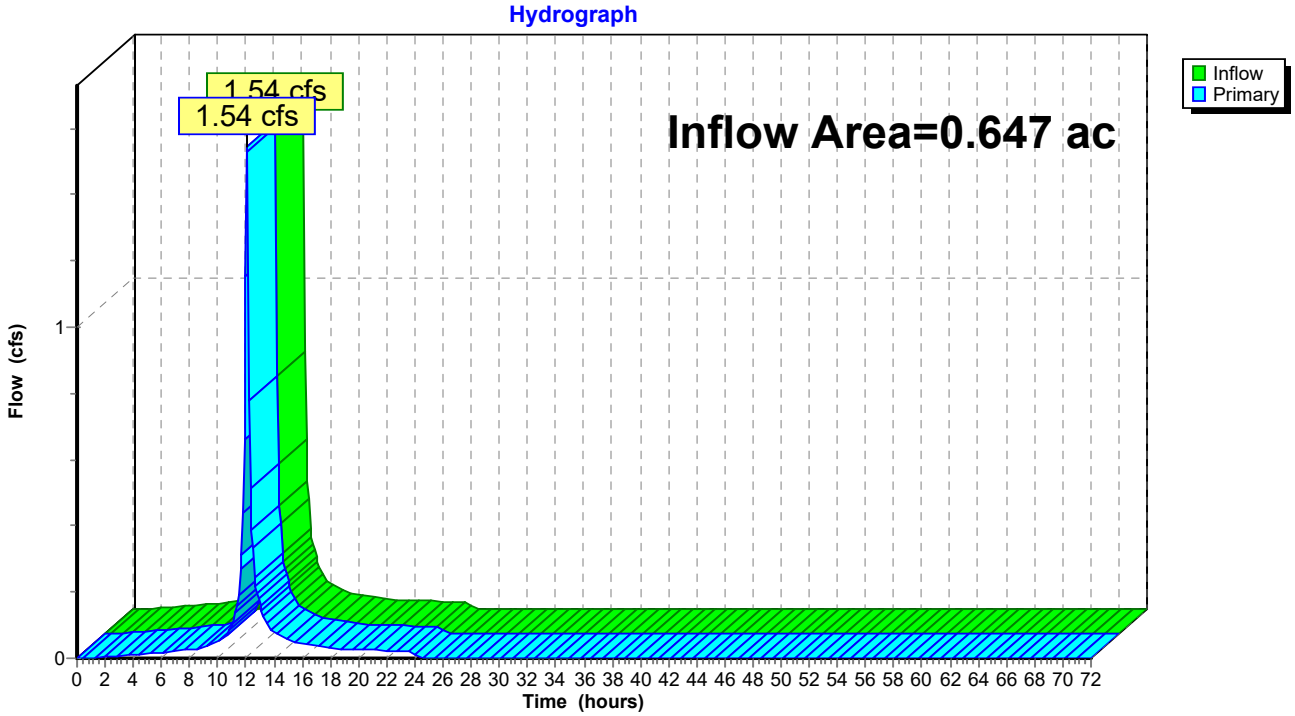


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 2.26" for 2-Year (NOAA) event
Inflow = 1.54 cfs @ 12.08 hrs, Volume= 0.122 af
Primary = 1.54 cfs @ 12.08 hrs, Volume= 0.122 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

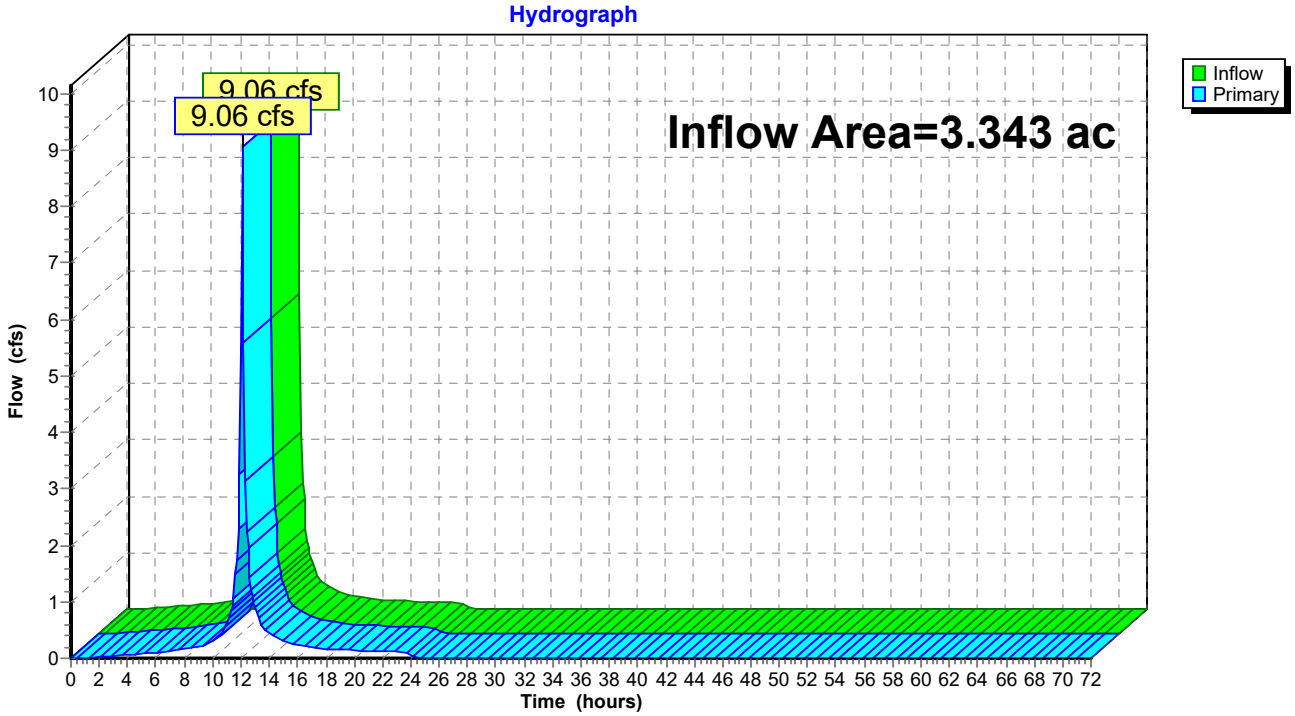


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 2.50" for 2-Year (NOAA) event
Inflow = 9.06 cfs @ 12.10 hrs, Volume= 0.696 af
Primary = 9.06 cfs @ 12.10 hrs, Volume= 0.696 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

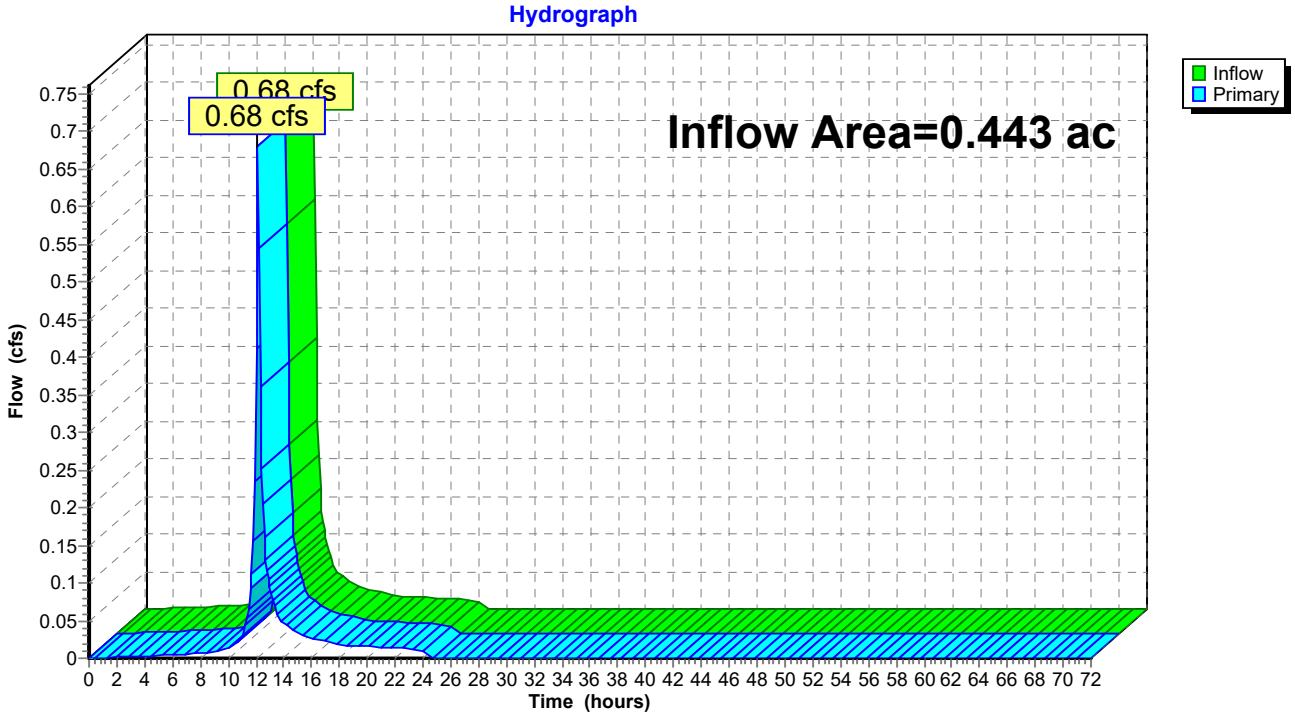


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 1.60" for 2-Year (NOAA) event
Inflow = 0.68 cfs @ 12.12 hrs, Volume= 0.059 af
Primary = 0.68 cfs @ 12.12 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

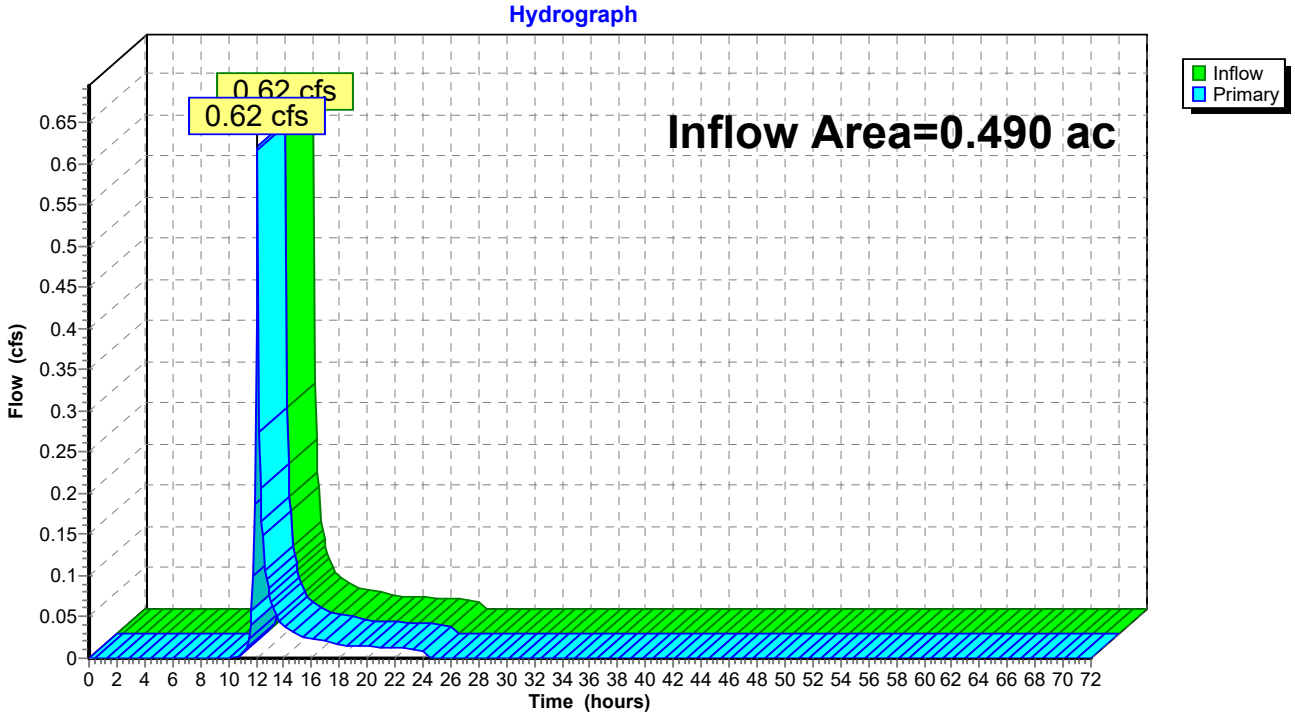


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 1.02" for 2-Year (NOAA) event
Inflow = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

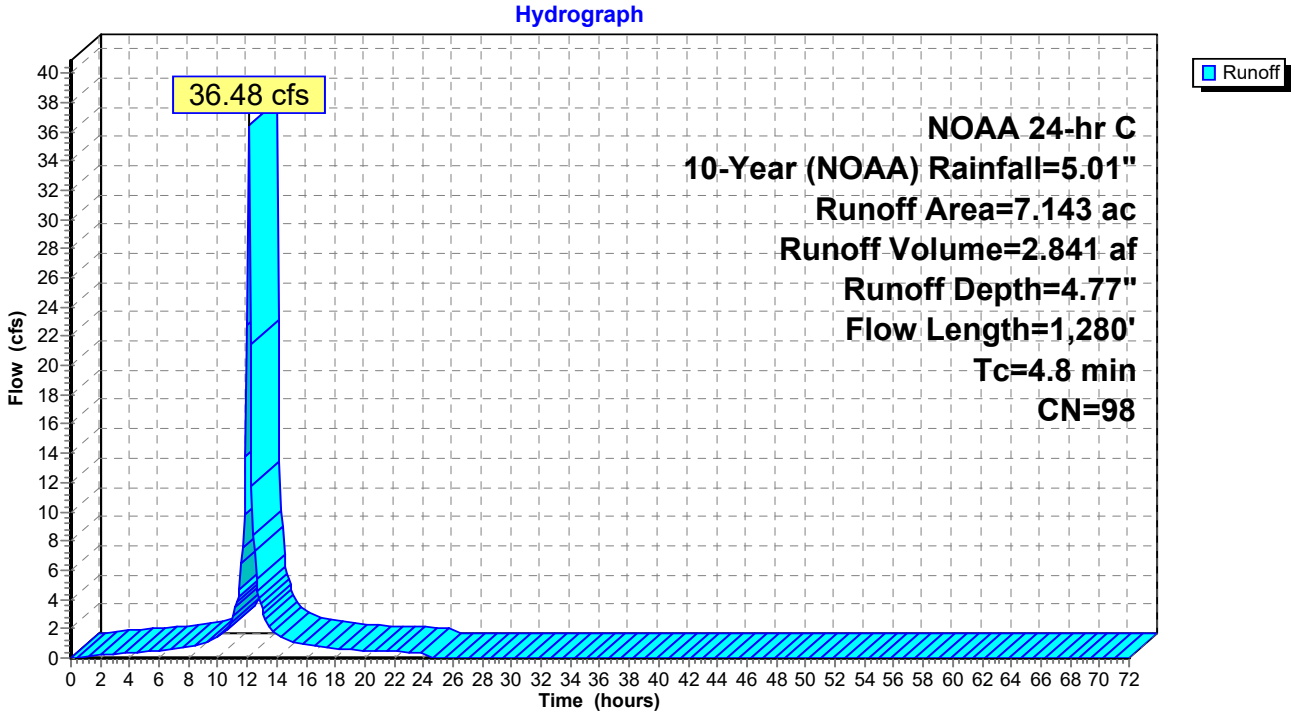
Runoff = 36.48 cfs @ 12.10 hrs, Volume= 2.841 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

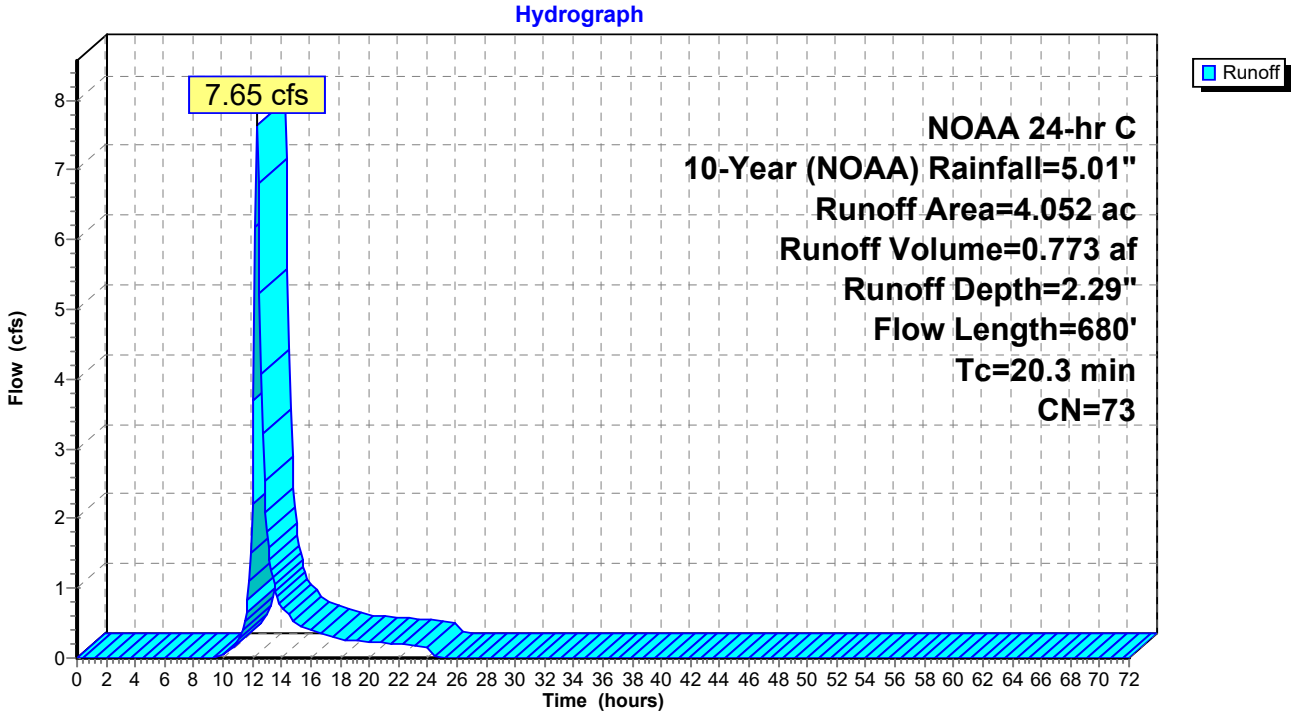
Runoff = 7.65 cfs @ 12.31 hrs, Volume= 0.773 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

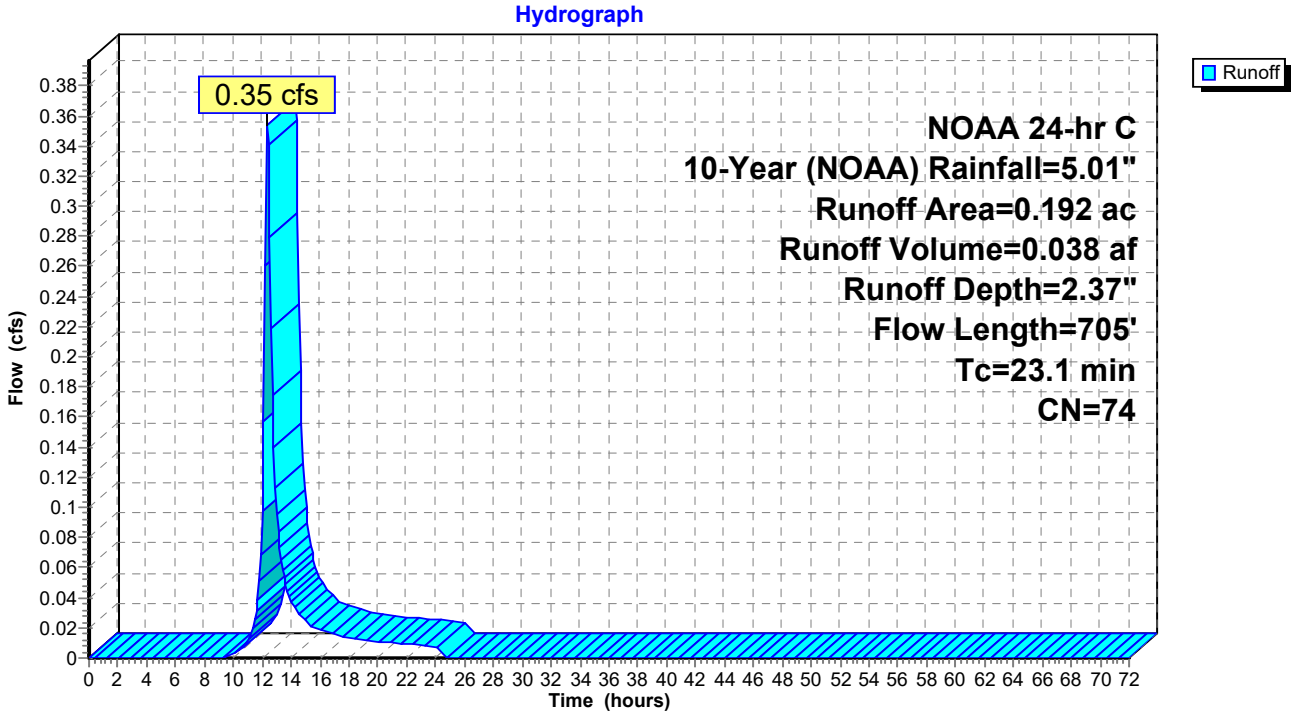
Runoff = 0.35 cfs @ 12.34 hrs, Volume= 0.038 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

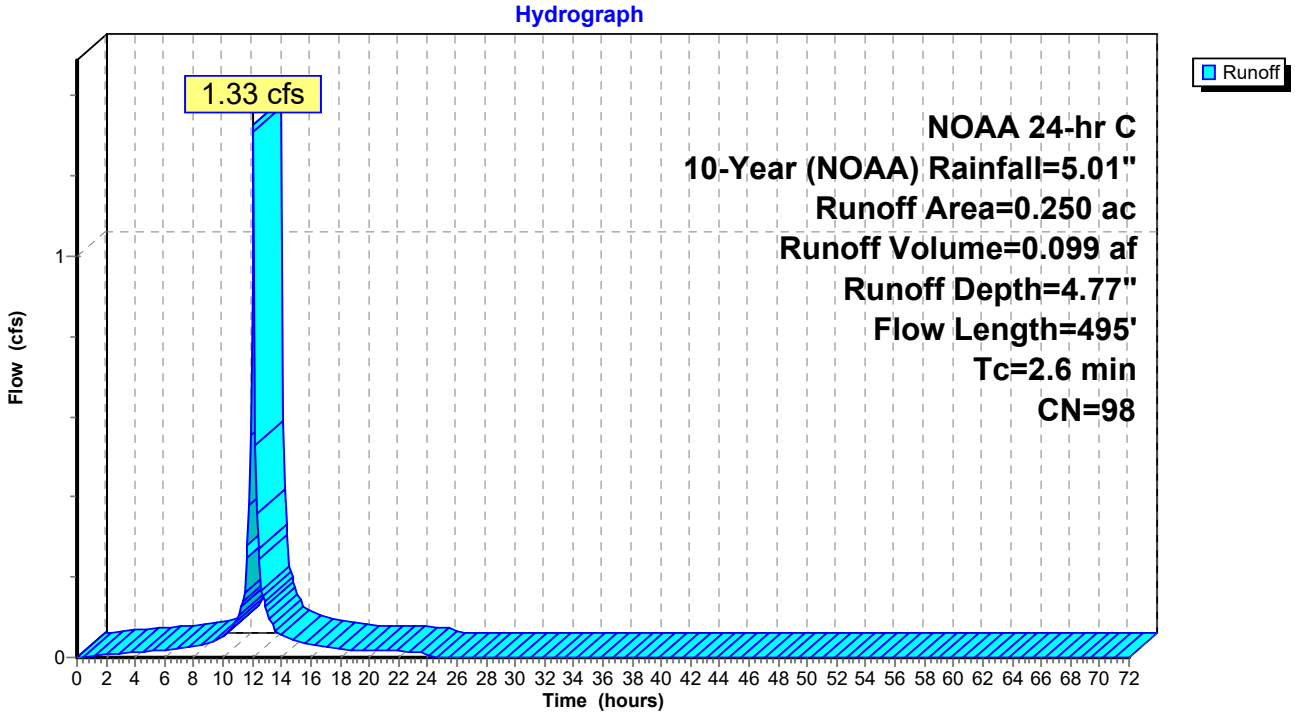
Runoff = 1.33 cfs @ 12.08 hrs, Volume= 0.099 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

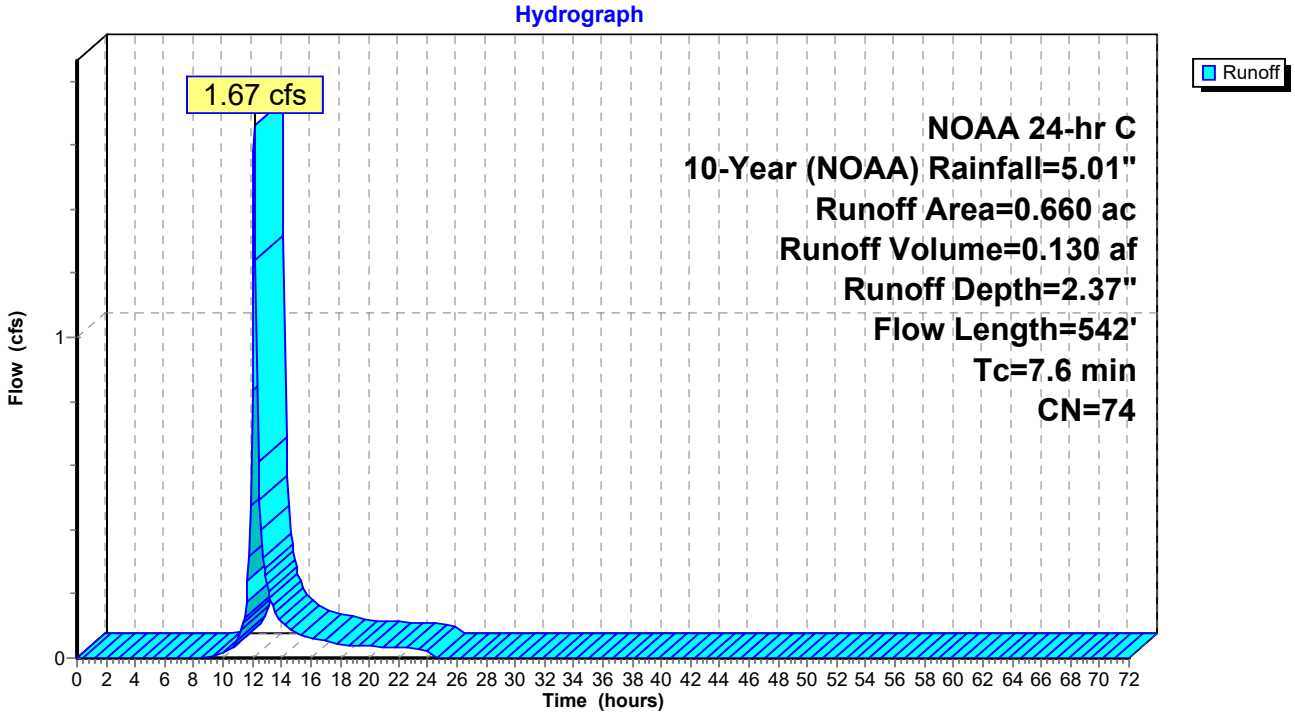
Runoff = 1.67 cfs @ 12.15 hrs, Volume= 0.130 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

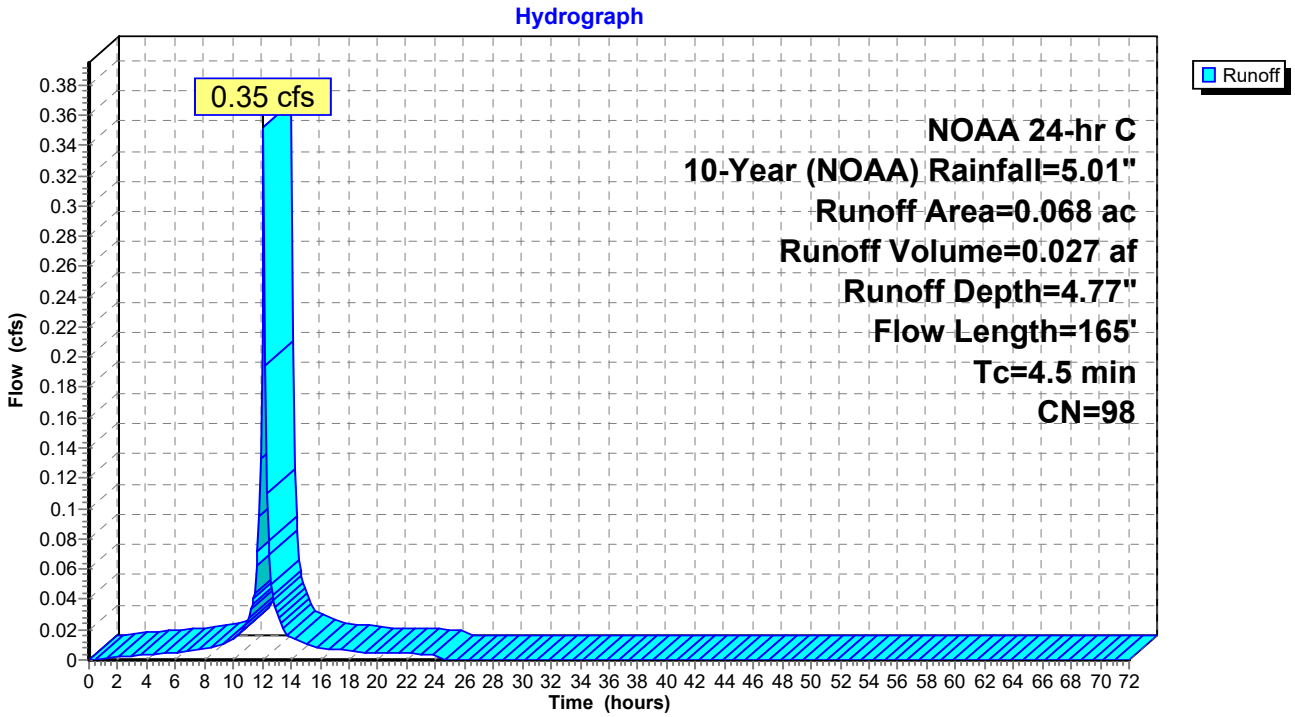
Runoff = 0.35 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

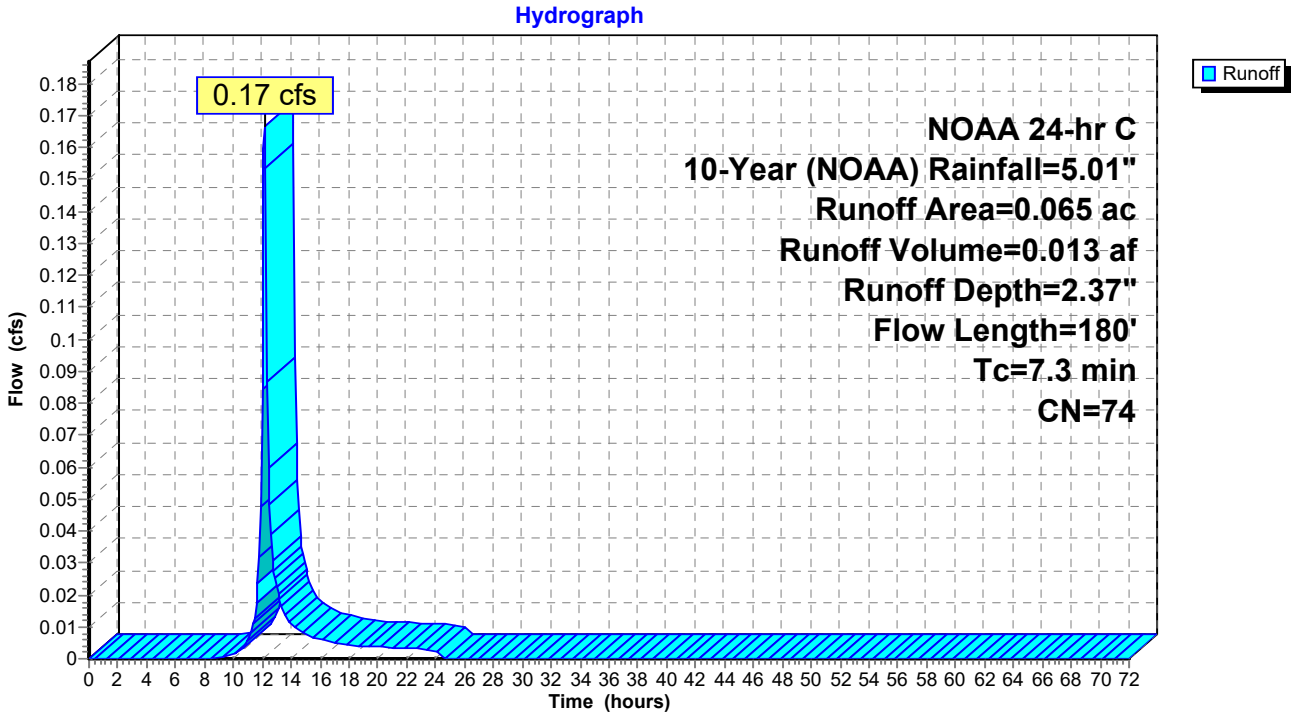
Runoff = 0.17 cfs @ 12.14 hrs, Volume= 0.013 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

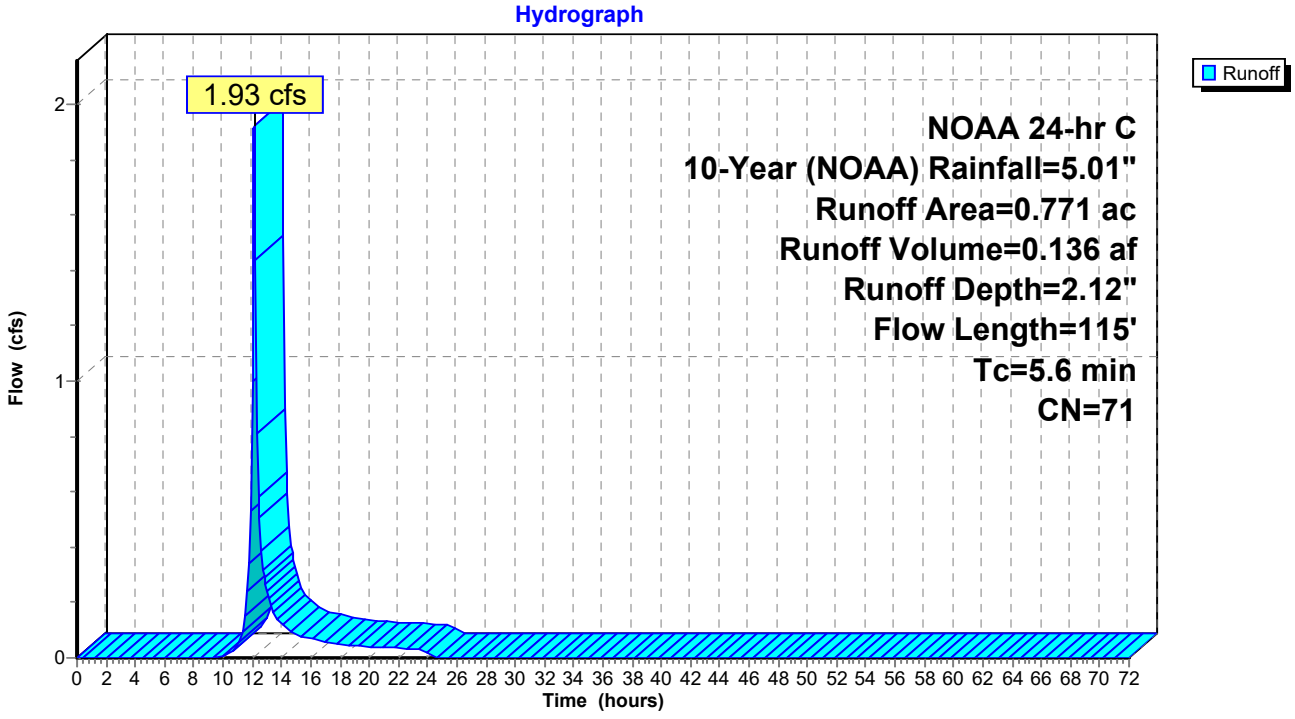
Runoff = 1.93 cfs @ 12.12 hrs, Volume= 0.136 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

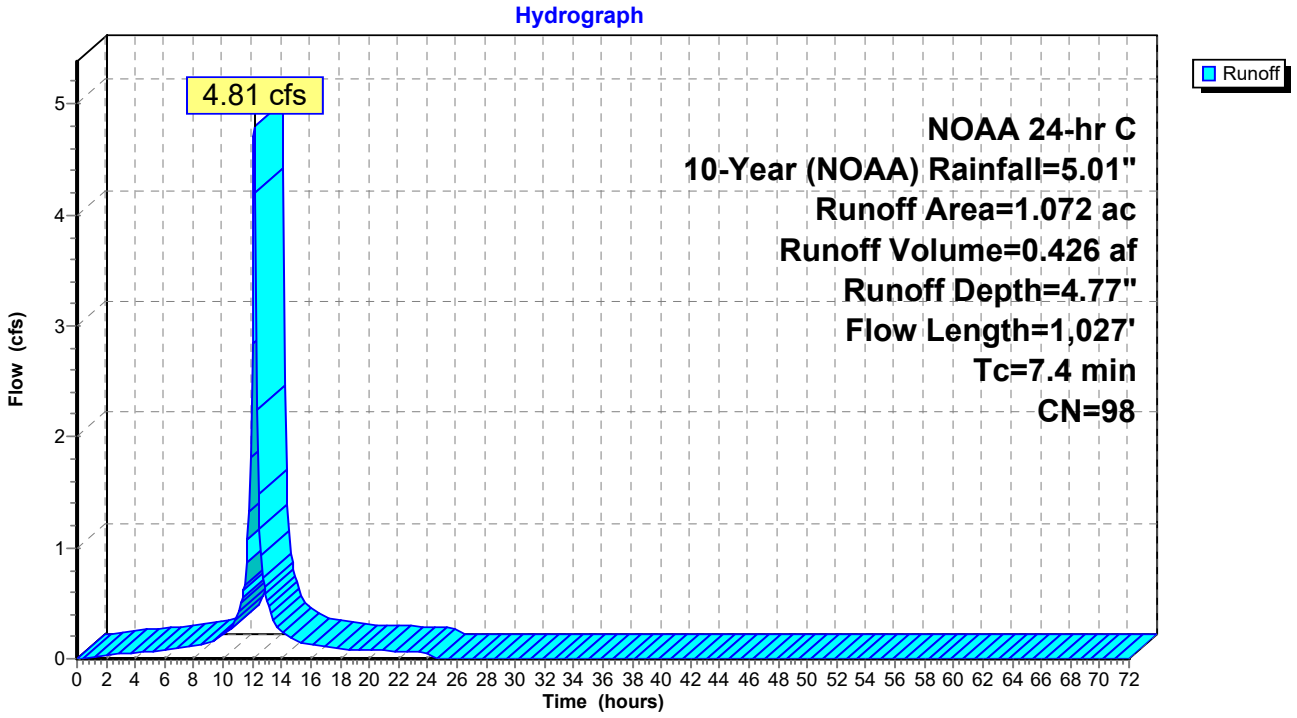
Runoff = 4.81 cfs @ 12.13 hrs, Volume= 0.426 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

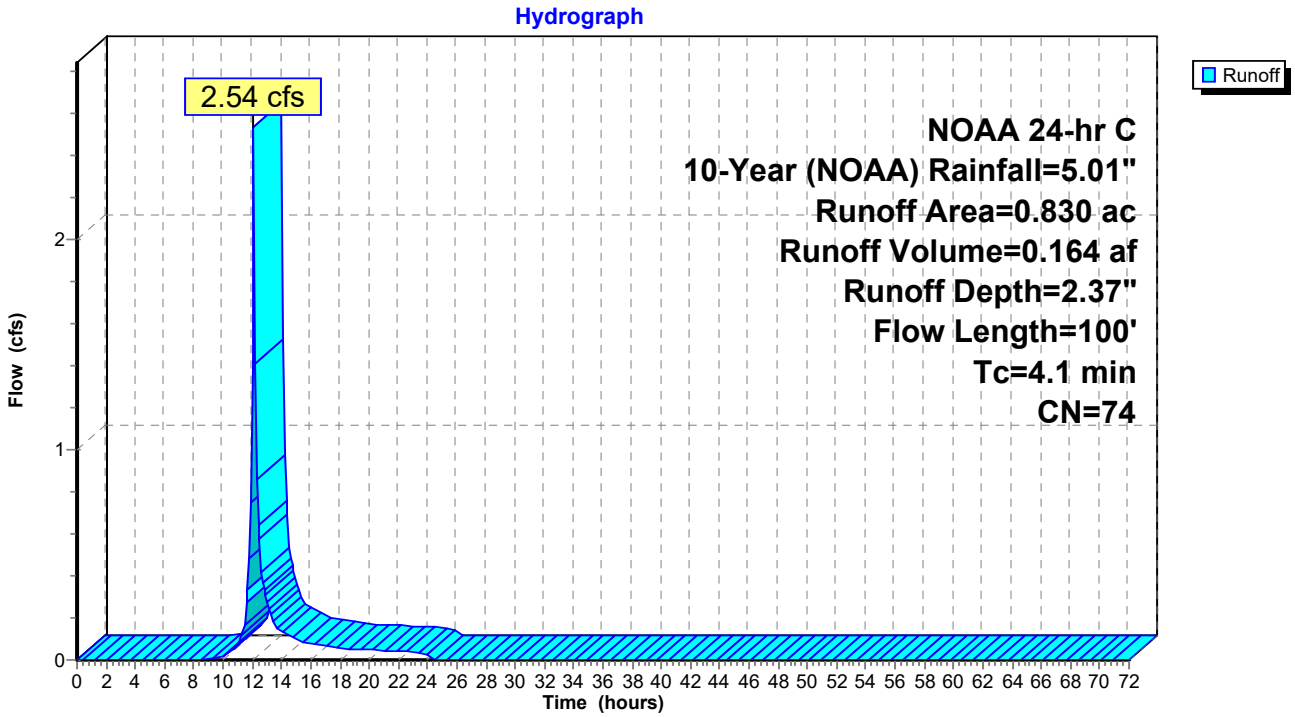
Runoff = 2.54 cfs @ 12.10 hrs, Volume= 0.164 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

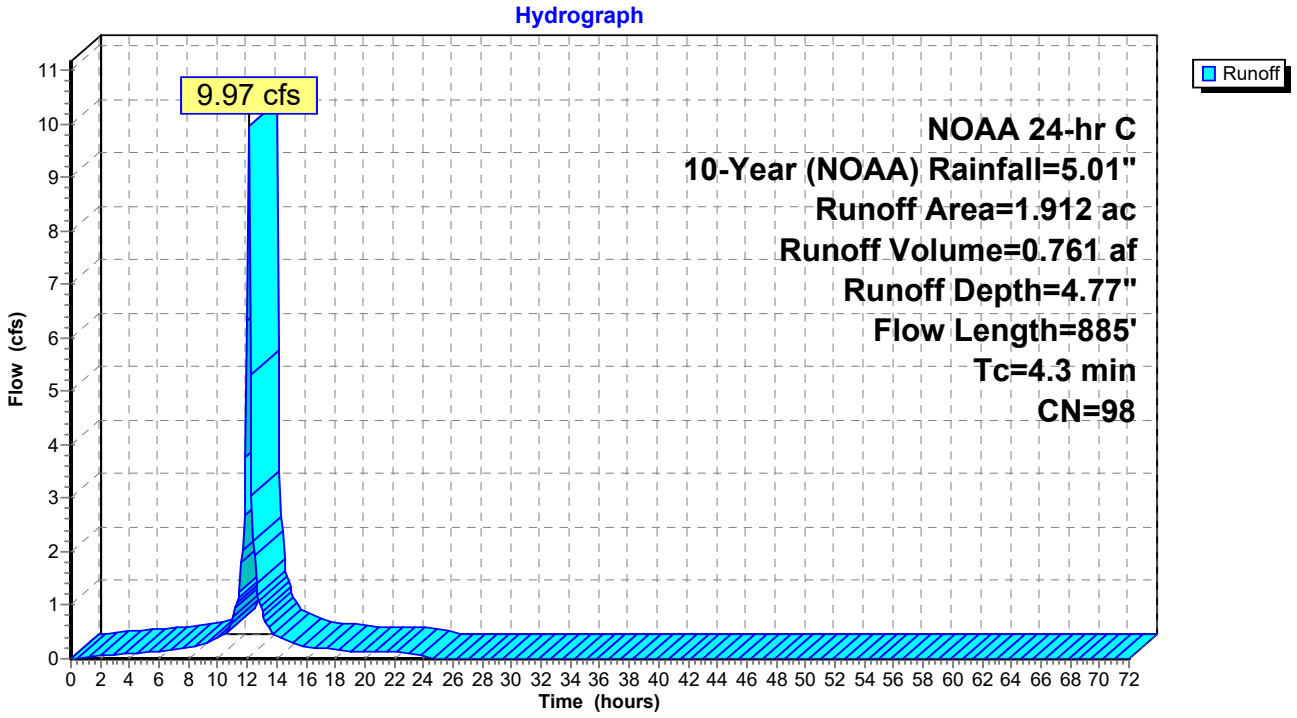
Runoff = 9.97 cfs @ 12.09 hrs, Volume= 0.761 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

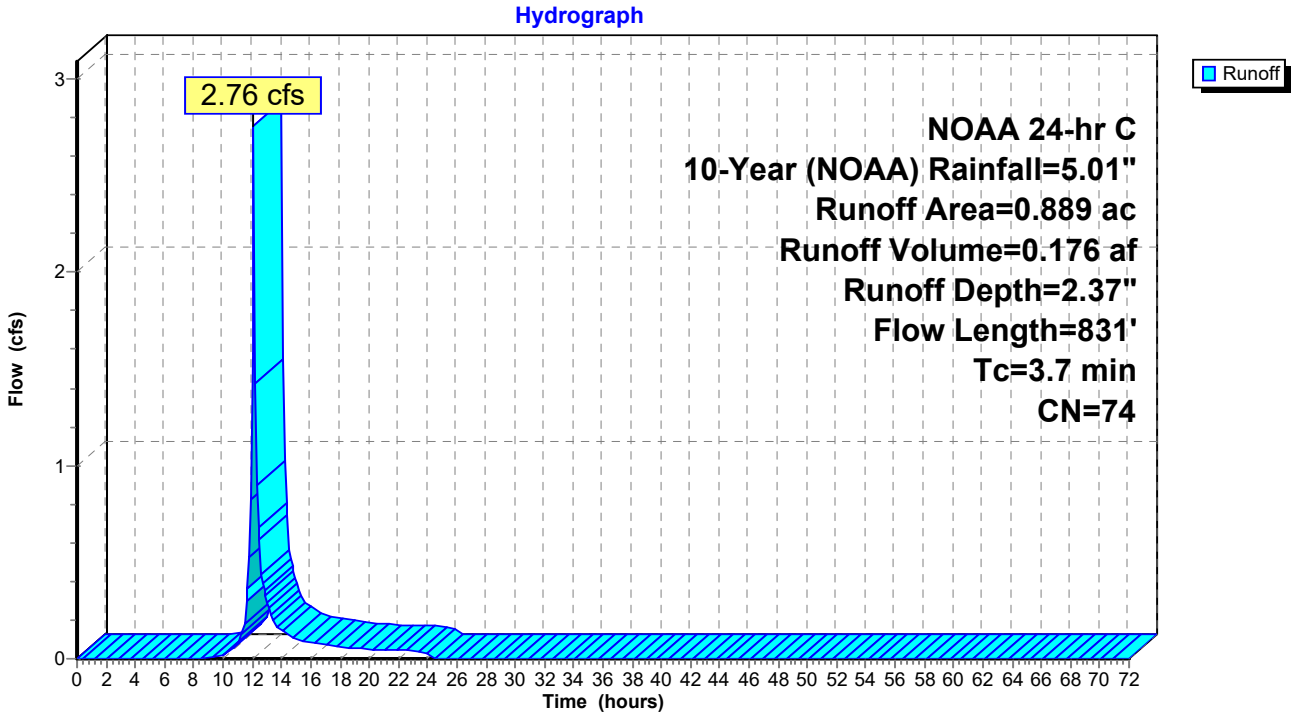
Runoff = 2.76 cfs @ 12.10 hrs, Volume= 0.176 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

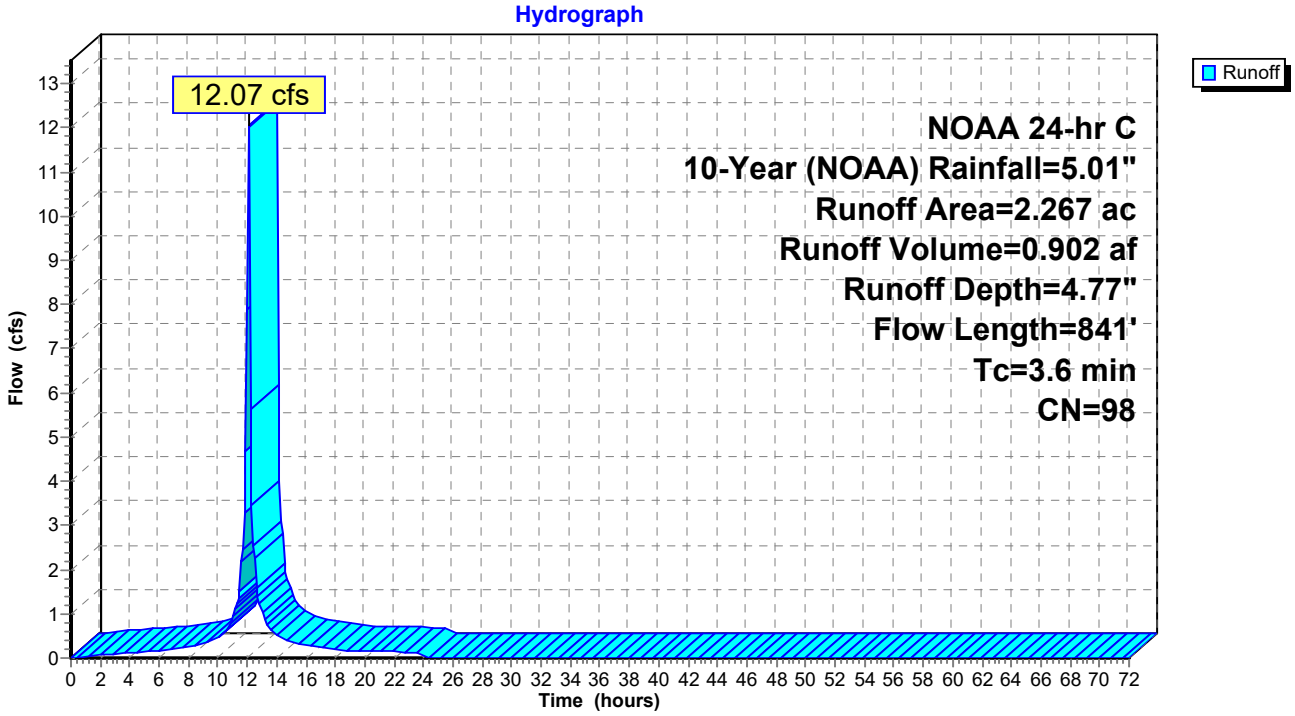
Runoff = 12.07 cfs @ 12.09 hrs, Volume= 0.902 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

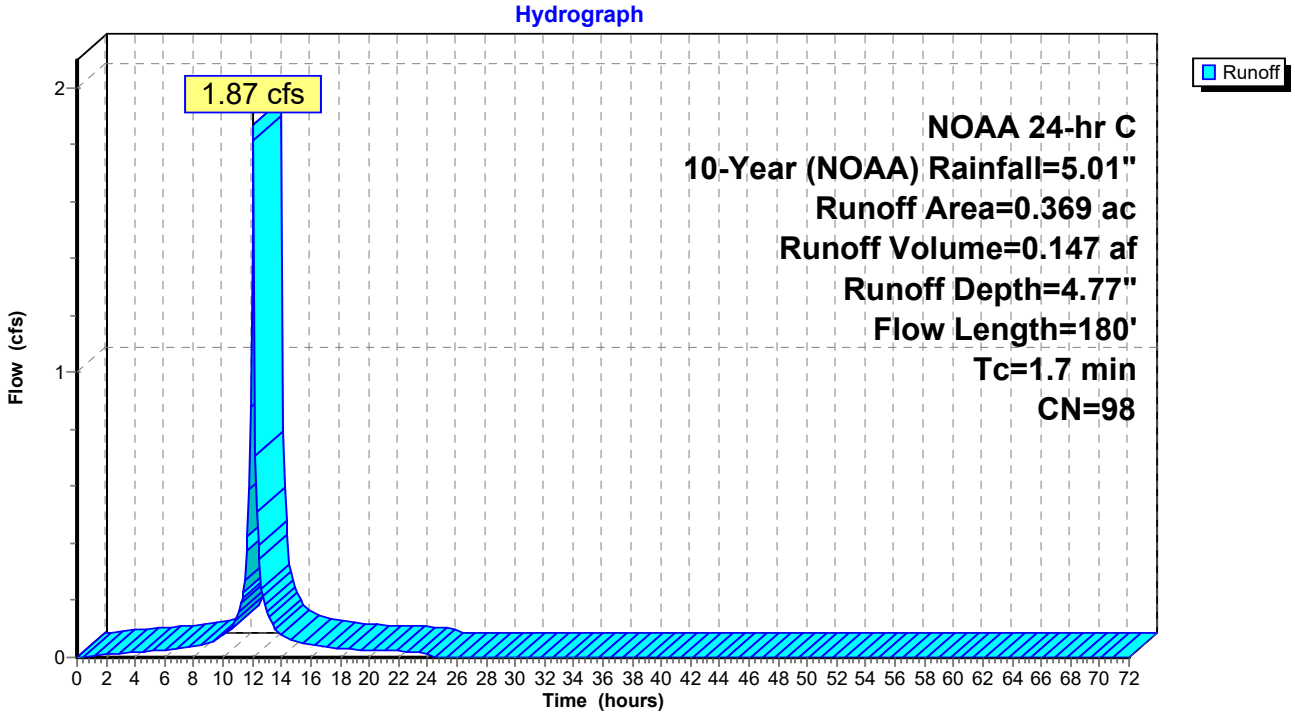
Runoff = 1.87 cfs @ 12.07 hrs, Volume= 0.147 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

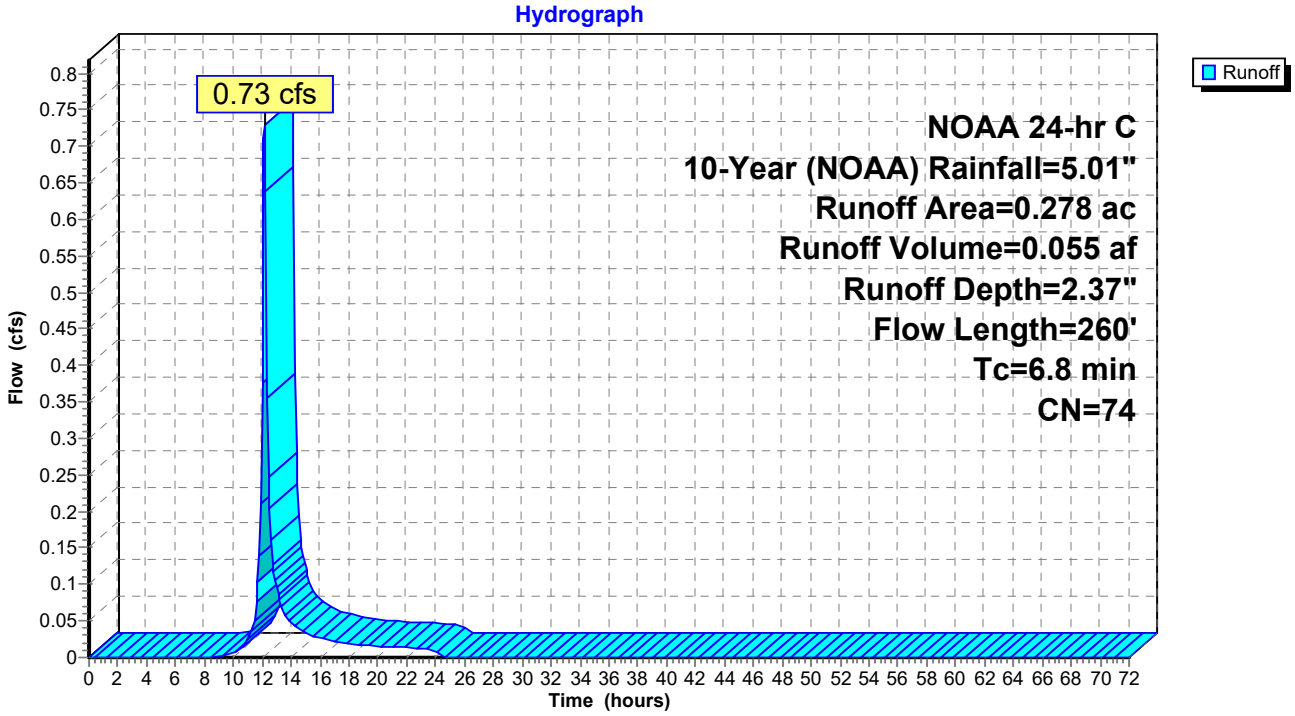
Runoff = 0.73 cfs @ 12.13 hrs, Volume= 0.055 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

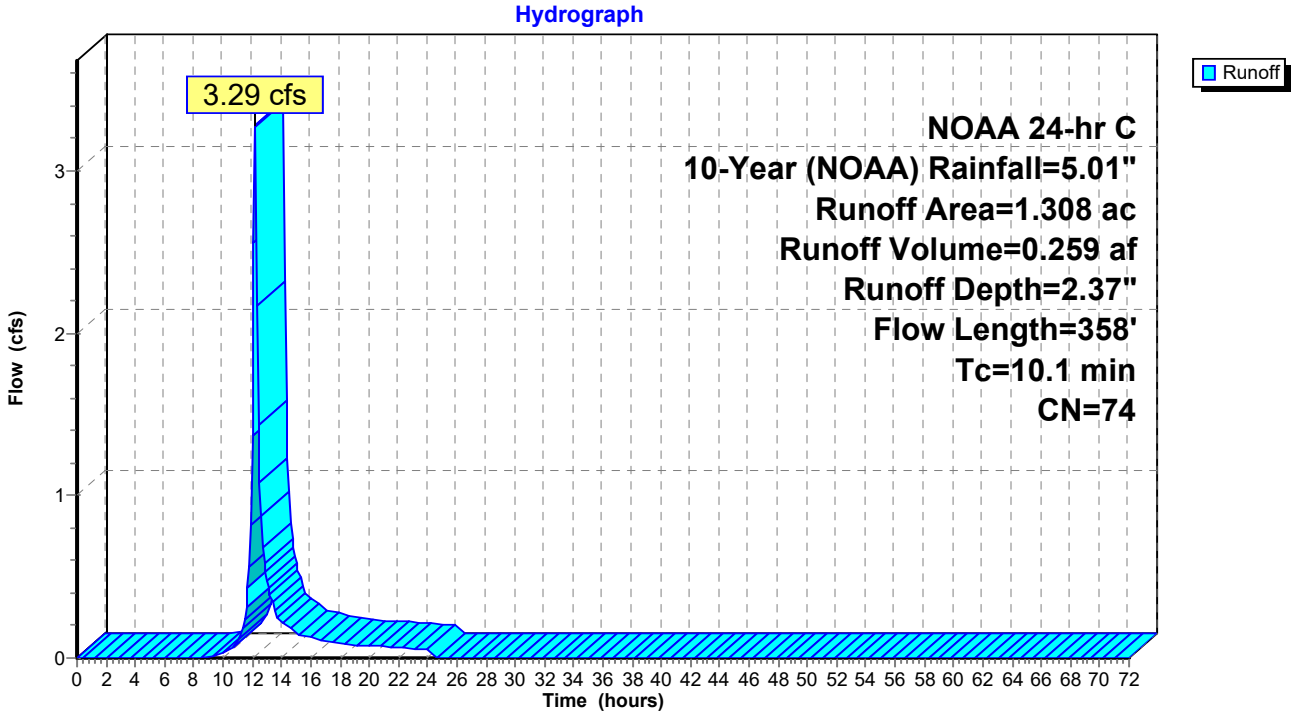
Runoff = 3.29 cfs @ 12.19 hrs, Volume= 0.259 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

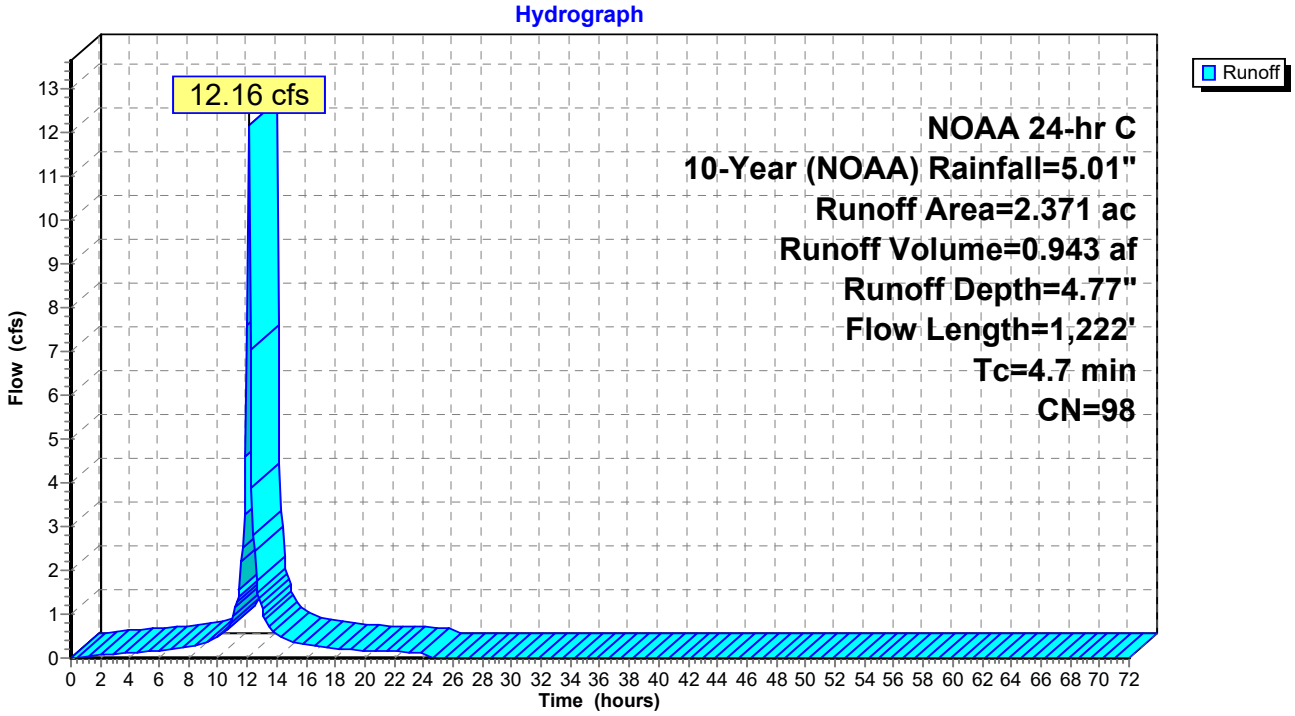
Runoff = 12.16 cfs @ 12.10 hrs, Volume= 0.943 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

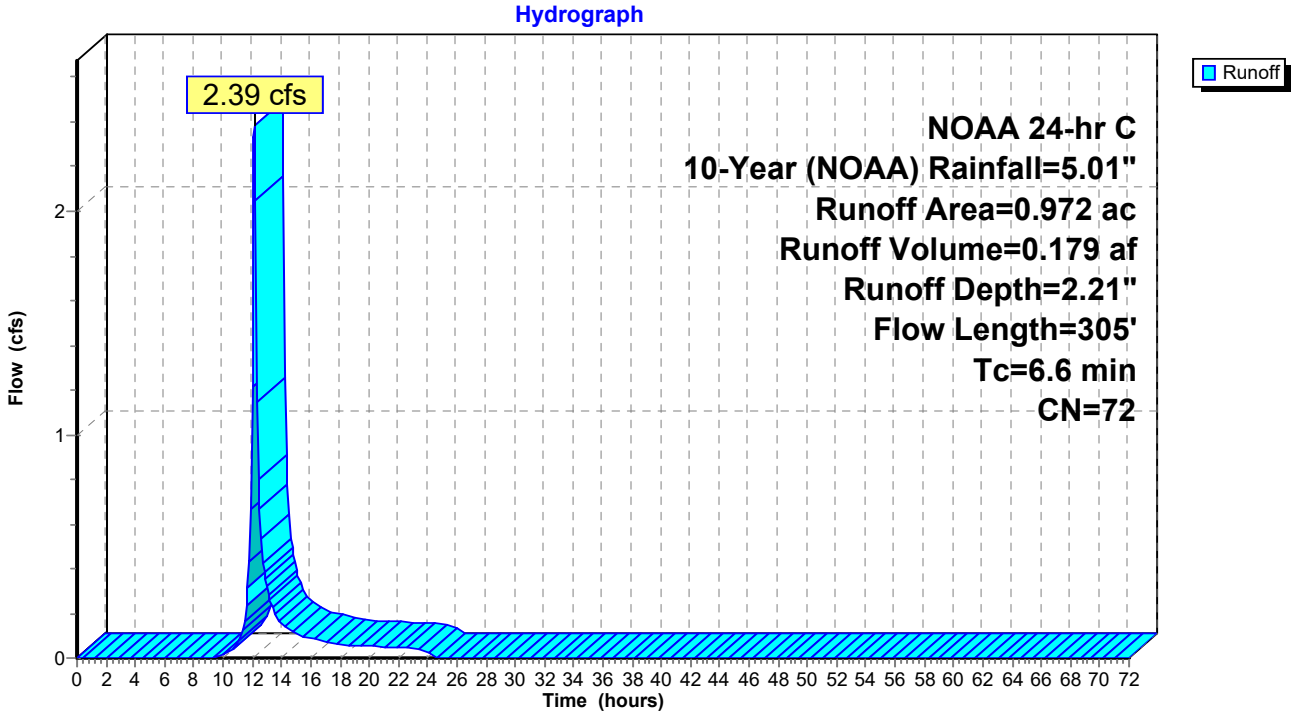
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 0.179 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

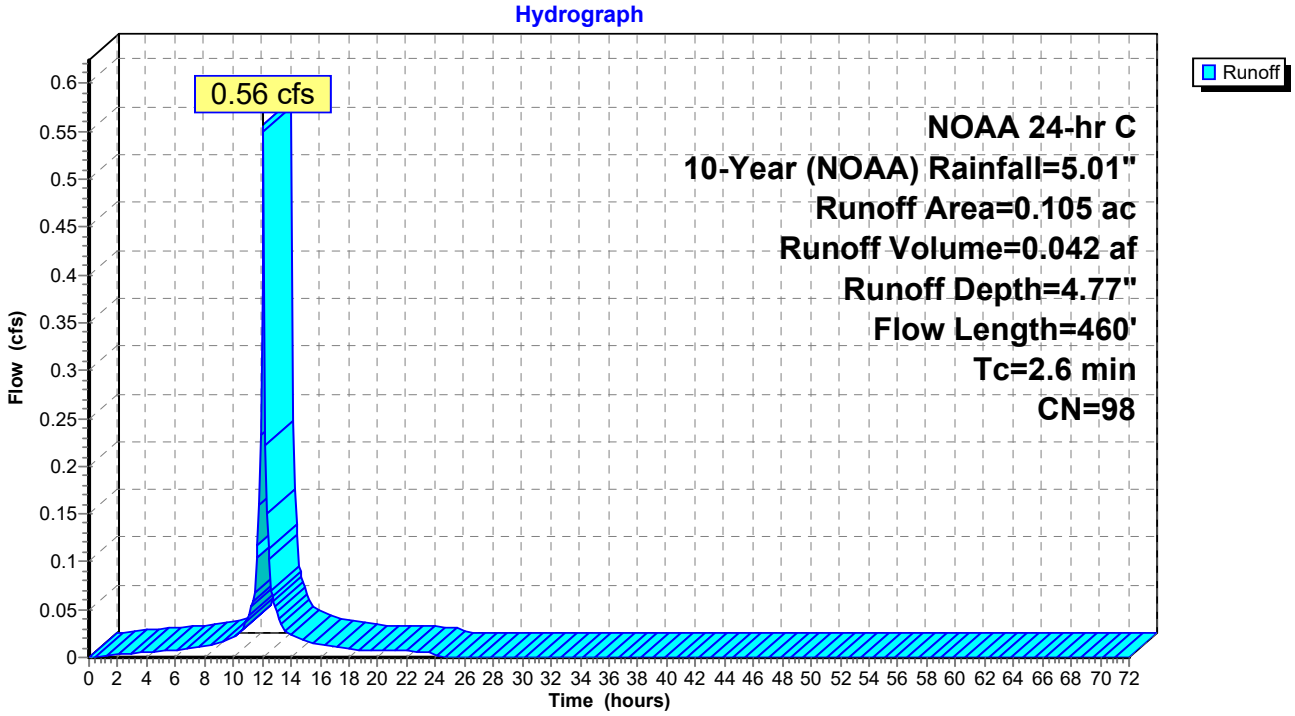
Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.042 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

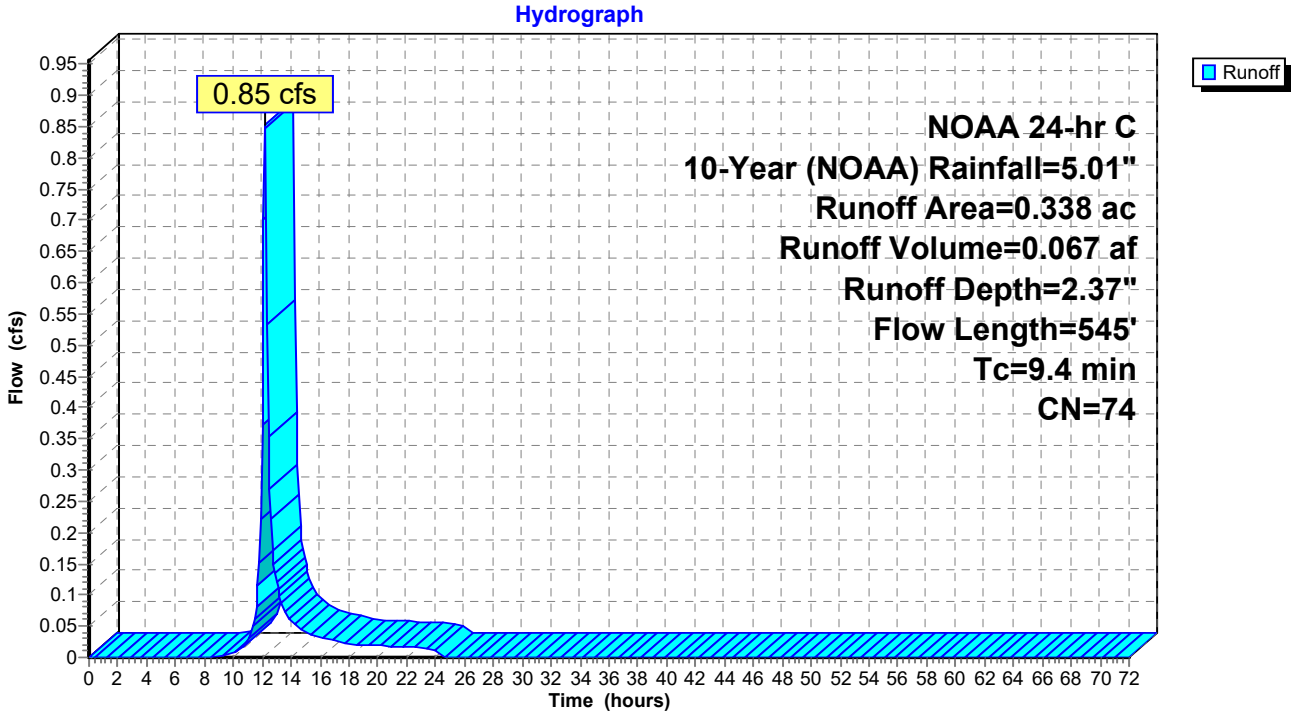
Runoff = 0.85 cfs @ 12.18 hrs, Volume= 0.067 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

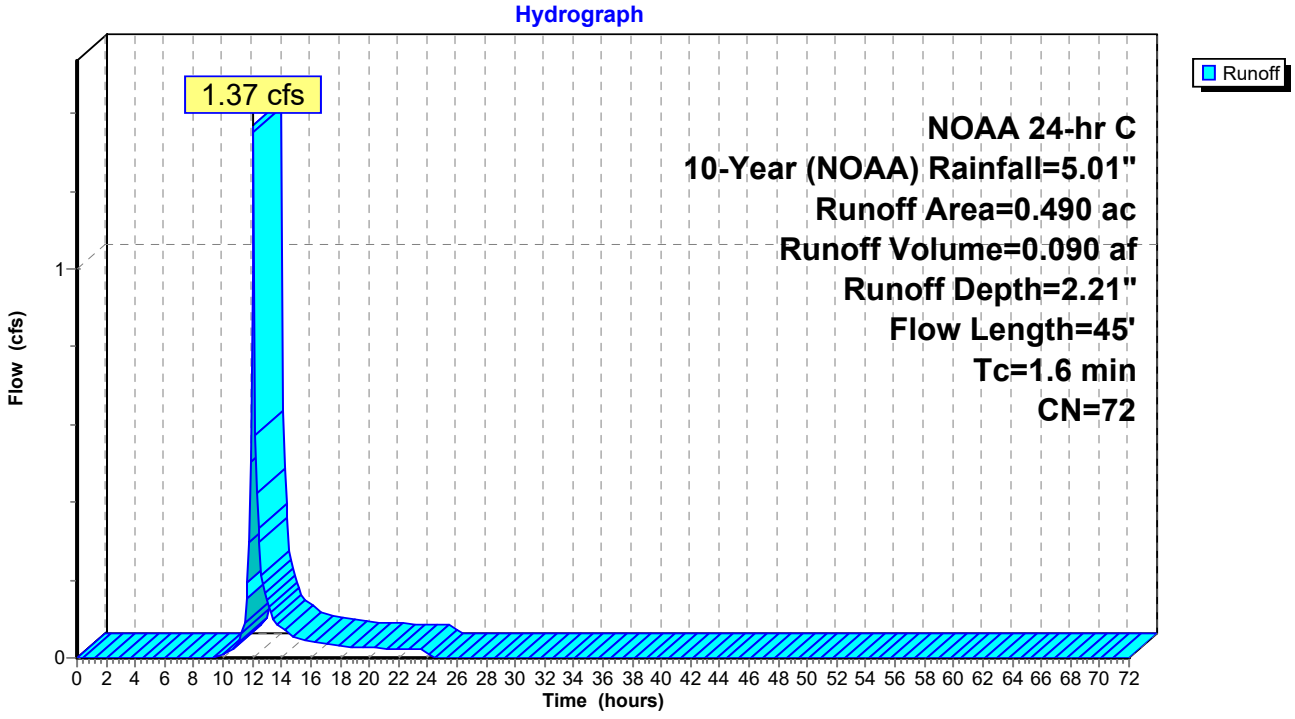
Runoff = 1.37 cfs @ 12.08 hrs, Volume= 0.090 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (NOAA) Rainfall=5.01"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 2.37" for 10-Year (NOAA) event
Inflow = 0.35 cfs @ 12.34 hrs, Volume= 0.038 af
Outflow = 0.34 cfs @ 12.36 hrs, Volume= 0.033 af, Atten= 3%, Lag= 1.1 min
Primary = 0.34 cfs @ 12.36 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.08' @ 12.36 hrs Surf.Area= 1,750 sf Storage= 254 cf

Plug-Flow detention time= 90.1 min calculated for 0.033 af (88% of inflow)
Center-of-Mass det. time= 28.9 min (885.4 - 856.6)

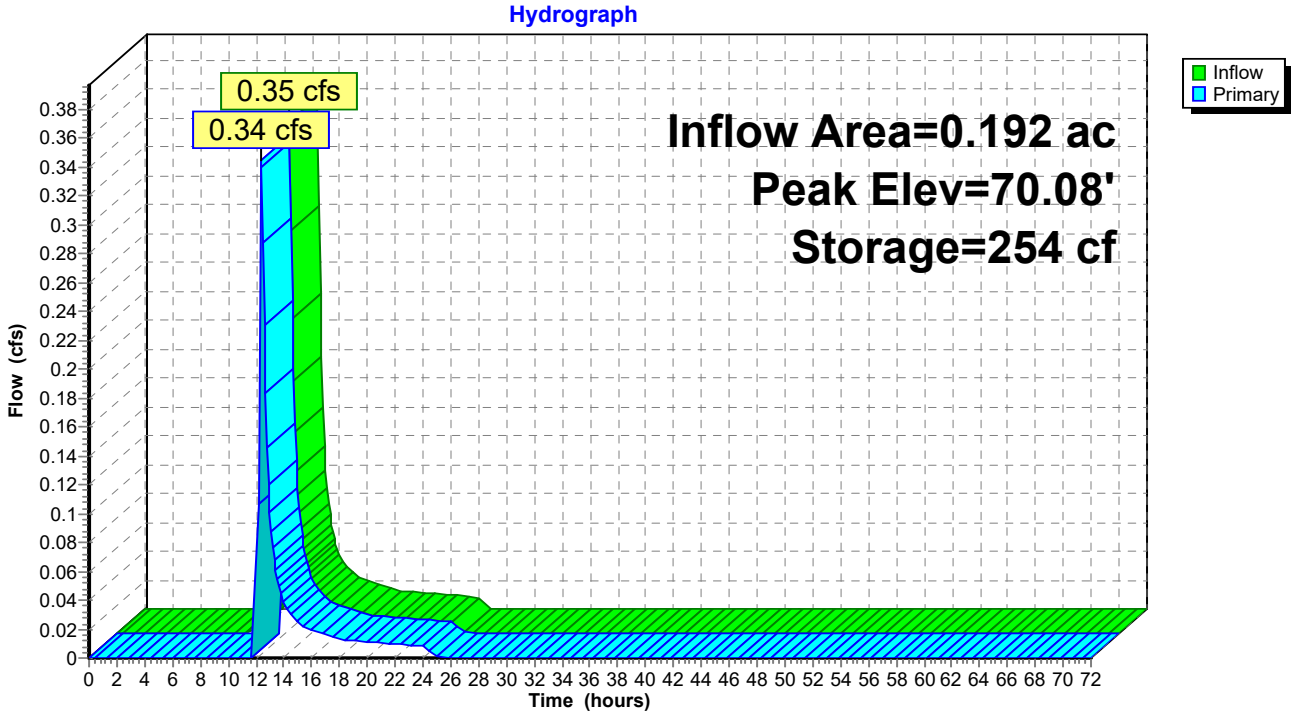
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.33 cfs @ 12.36 hrs HW=70.08' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.33 cfs @ 0.21 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 3.60" for 10-Year (NOAA) event
Inflow = 0.51 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af, Atten= 1%, Lag= 0.1 min
Primary = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.15' @ 12.11 hrs Surf.Area= 356 sf Storage= 80 cf

Plug-Flow detention time= 42.2 min calculated for 0.039 af (97% of inflow)
Center-of-Mass det. time= 21.4 min (799.3 - 777.8)

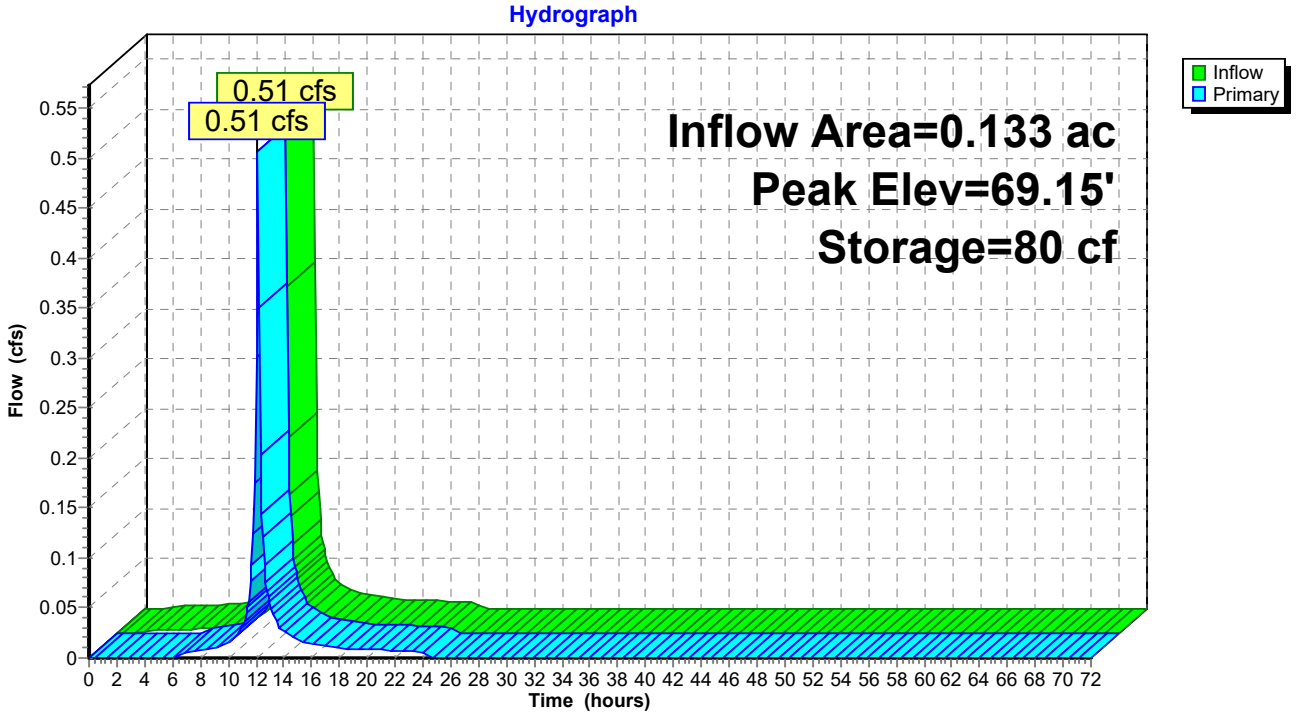
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.49 cfs @ 12.11 hrs HW=69.15' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.49 cfs @ 0.32 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 3.73" for 10-Year (NOAA) event
Inflow = 7.30 cfs @ 12.11 hrs, Volume= 0.590 af
Outflow = 5.11 cfs @ 12.23 hrs, Volume= 0.490 af, Atten= 30%, Lag= 6.9 min
Primary = 5.11 cfs @ 12.23 hrs, Volume= 0.490 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.21' @ 12.23 hrs Surf.Area= 7,560 sf Storage= 8,411 cf

Plug-Flow detention time= 156.4 min calculated for 0.490 af (83% of inflow)
Center-of-Mass det. time= 79.9 min (854.7 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

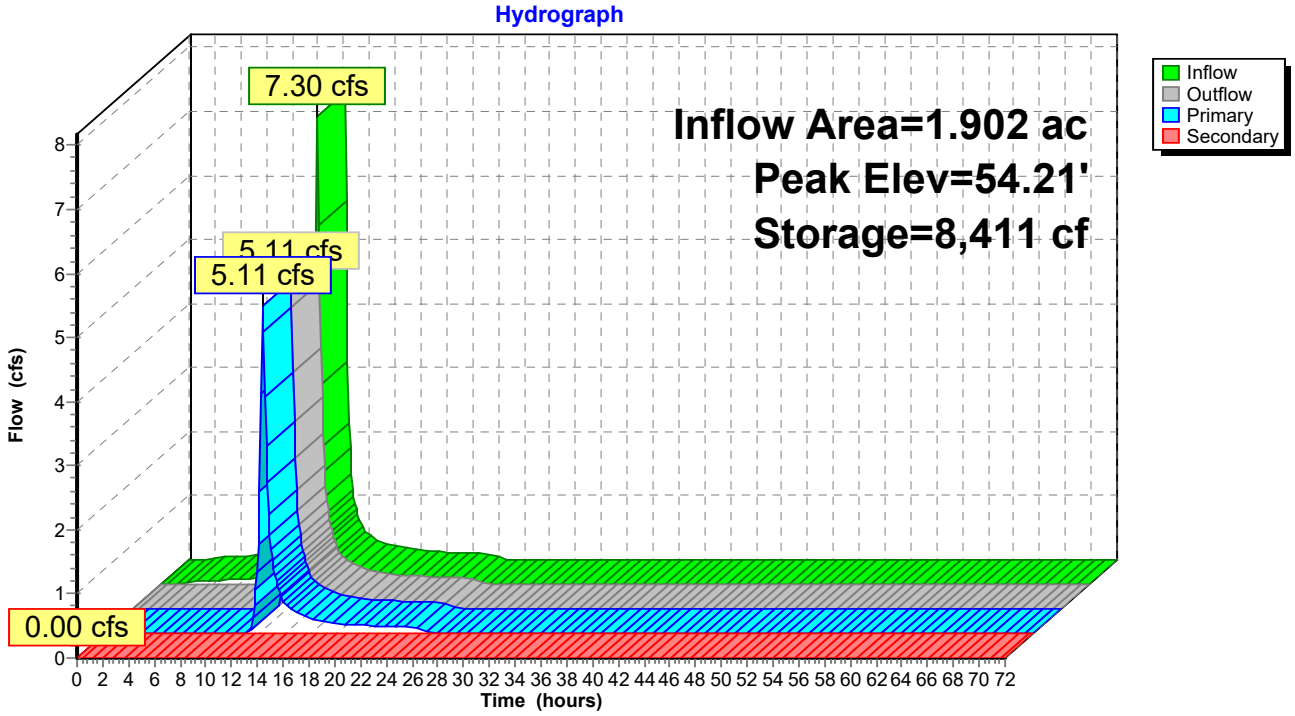
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.94 cfs @ 12.23 hrs HW=54.20' (Free Discharge)
└**1=Culvert** (Passes 4.94 cfs of 30.52 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 4.94 cfs @ 2.25 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 4.01" for 10-Year (NOAA) event
Inflow = 12.73 cfs @ 12.09 hrs, Volume= 0.936 af
Outflow = 3.90 cfs @ 12.33 hrs, Volume= 0.757 af, Atten= 69%, Lag= 14.1 min
Primary = 3.90 cfs @ 12.33 hrs, Volume= 0.757 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.38' @ 12.33 hrs Surf.Area= 16,335 sf Storage= 20,723 cf

Plug-Flow detention time= 274.0 min calculated for 0.757 af (81% of inflow)
Center-of-Mass det. time= 194.2 min (958.6 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

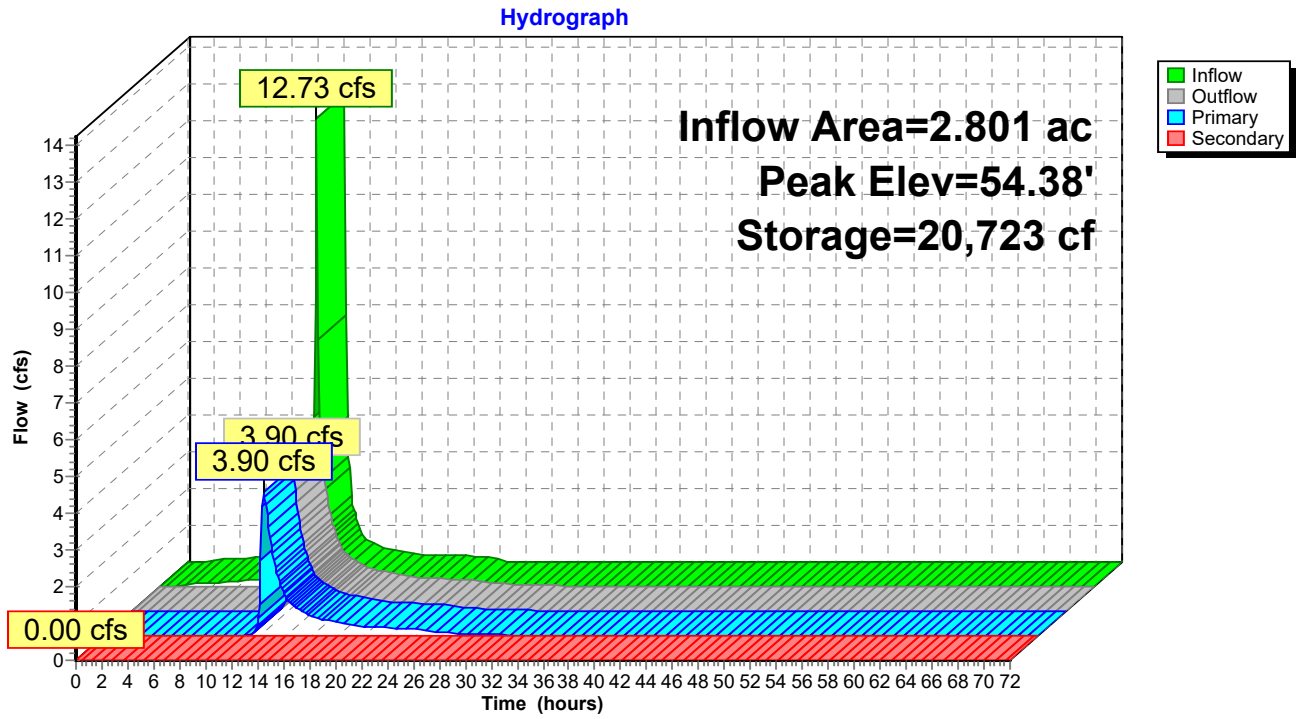
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.85 cfs @ 12.33 hrs HW=54.38' (Free Discharge)
└─**1=Culvert** (Passes 3.85 cfs of 31.66 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.49 cfs @ 3.01 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 1.36 cfs @ 1.79 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 3.87" for 10-Year (NOAA) event
Inflow = 17.11 cfs @ 12.10 hrs, Volume= 1.362 af
Outflow = 3.35 cfs @ 12.56 hrs, Volume= 1.123 af, Atten= 80%, Lag= 27.5 min
Primary = 3.35 cfs @ 12.56 hrs, Volume= 1.123 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 62.50' @ 12.56 hrs Surf.Area= 15,023 sf Storage= 32,165 cf

Plug-Flow detention time= 302.4 min calculated for 1.123 af (82% of inflow)
Center-of-Mass det. time= 226.1 min (994.9 - 768.8)

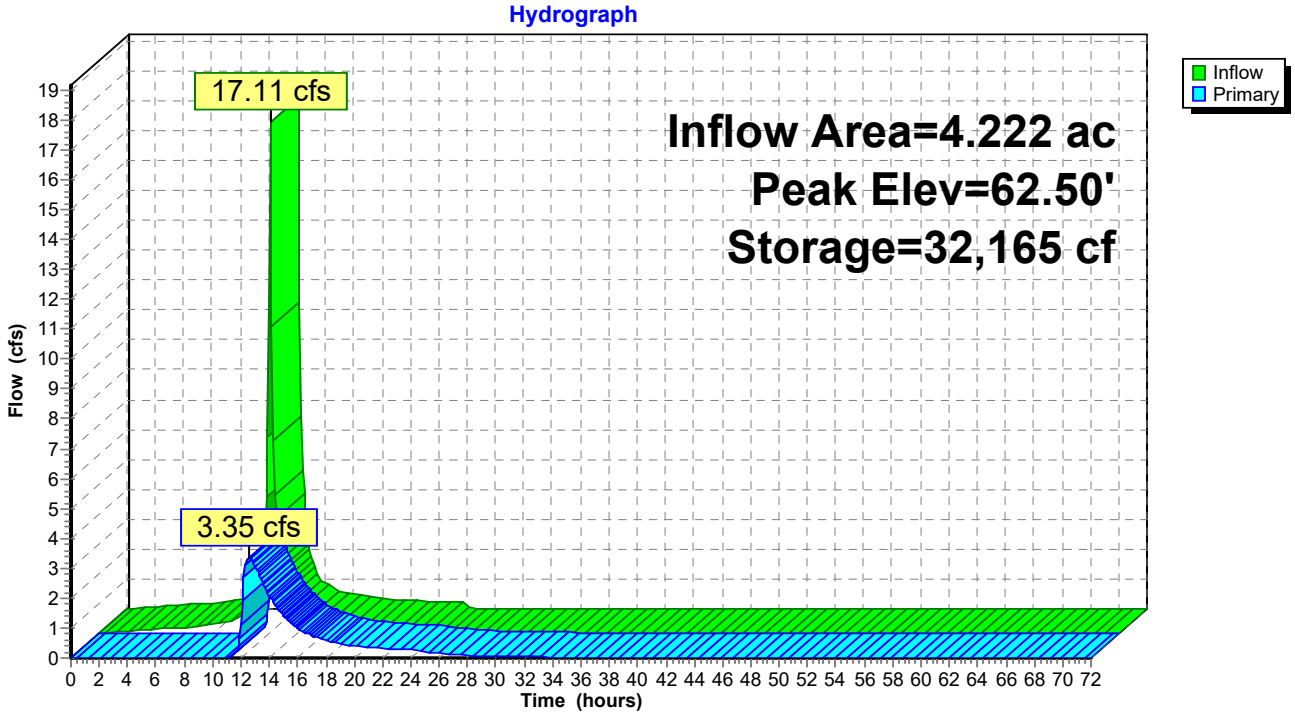
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=3.34 cfs @ 12.56 hrs HW=62.49' (Free Discharge)
└**1=Culvert** (Passes 3.34 cfs of 40.85 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 3.34 cfs @ 4.19 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

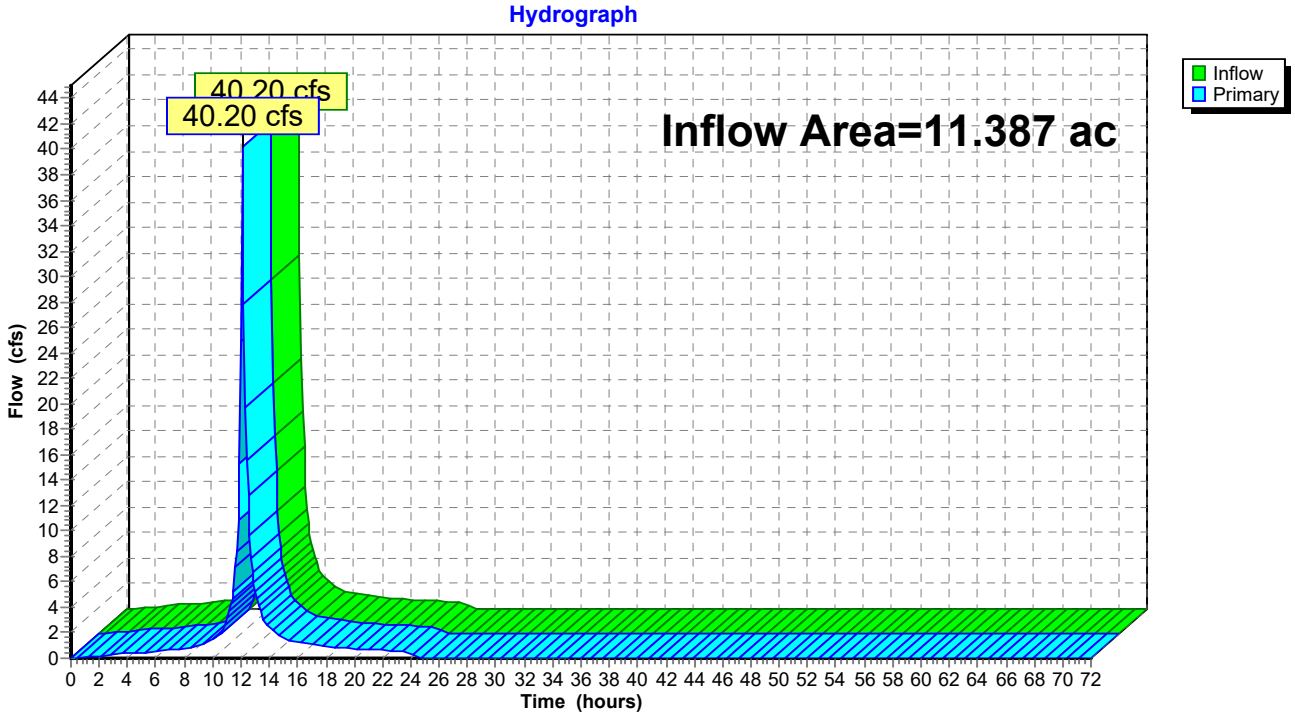


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 3.84" for 10-Year (NOAA) event
Inflow = 40.20 cfs @ 12.11 hrs, Volume= 3.647 af
Primary = 40.20 cfs @ 12.11 hrs, Volume= 3.647 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

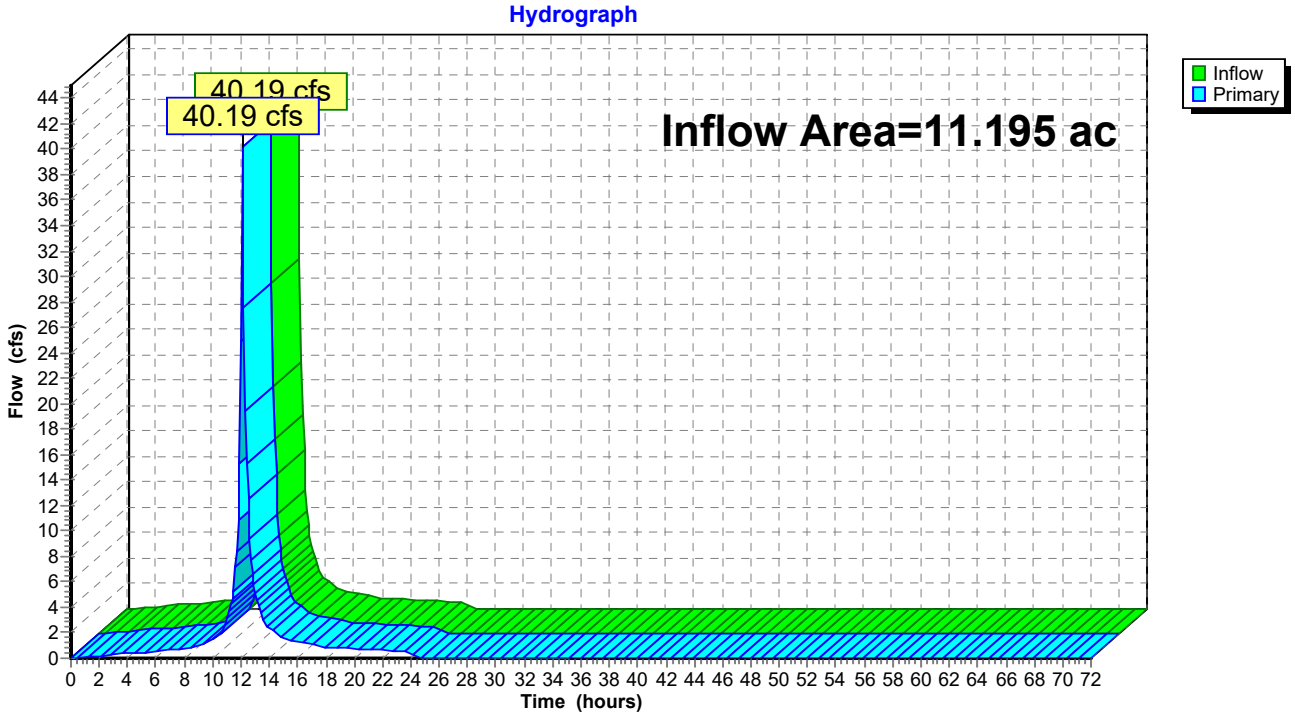


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 3.87" for 10-Year (NOAA) event
Inflow = 40.19 cfs @ 12.10 hrs, Volume= 3.614 af
Primary = 40.19 cfs @ 12.10 hrs, Volume= 3.614 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

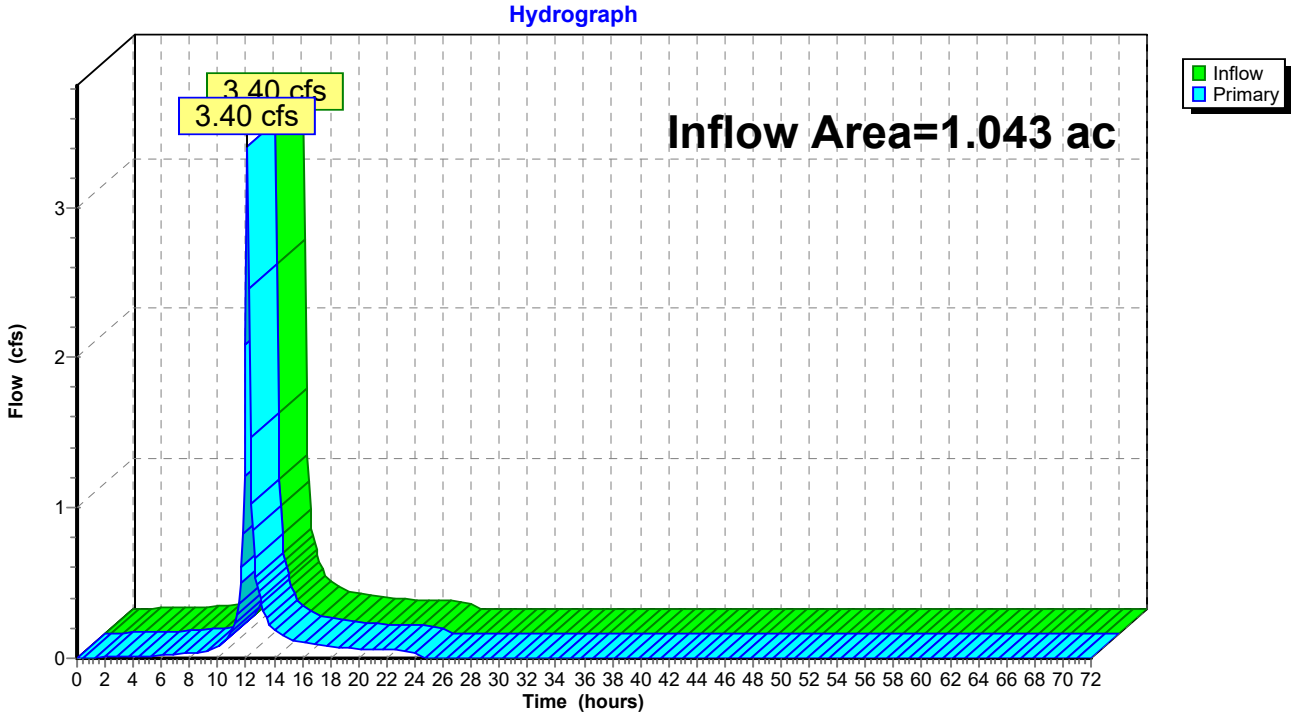


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 3.09" for 10-Year (NOAA) event
Inflow = 3.40 cfs @ 12.11 hrs, Volume= 0.268 af
Primary = 3.40 cfs @ 12.11 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

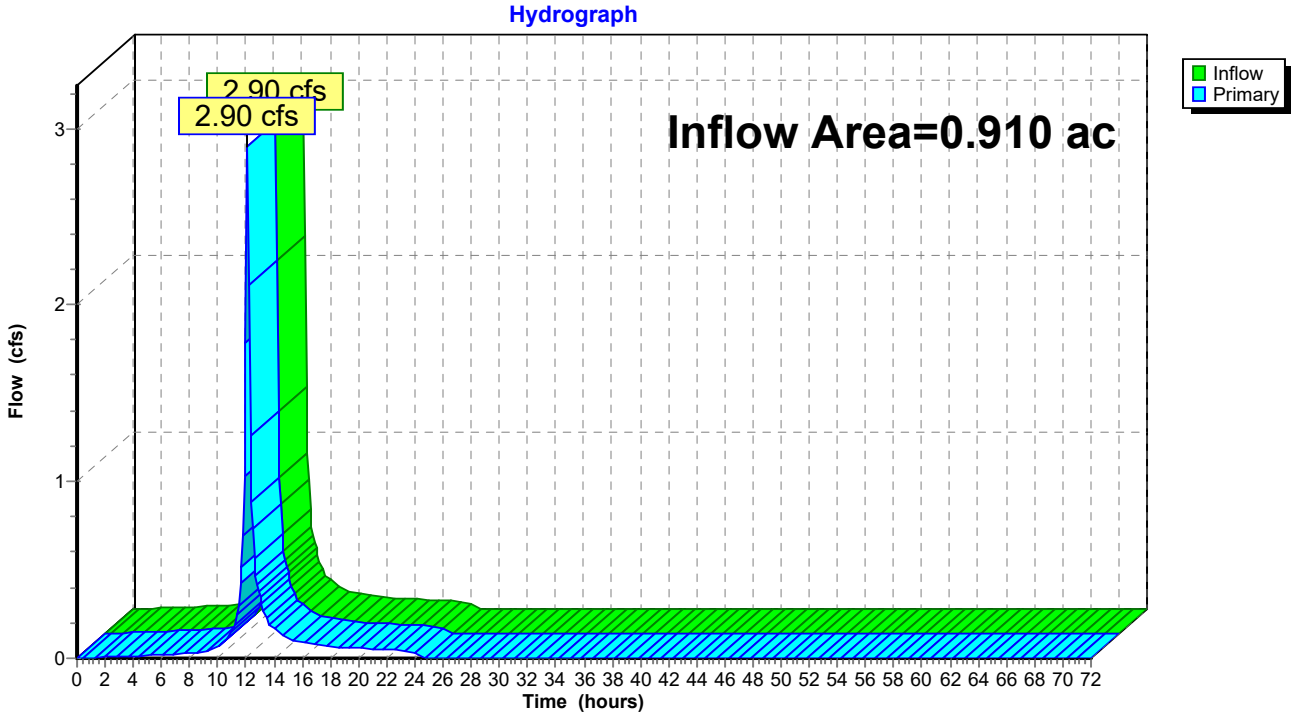


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 3.03" for 10-Year (NOAA) event
Inflow = 2.90 cfs @ 12.11 hrs, Volume= 0.230 af
Primary = 2.90 cfs @ 12.11 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

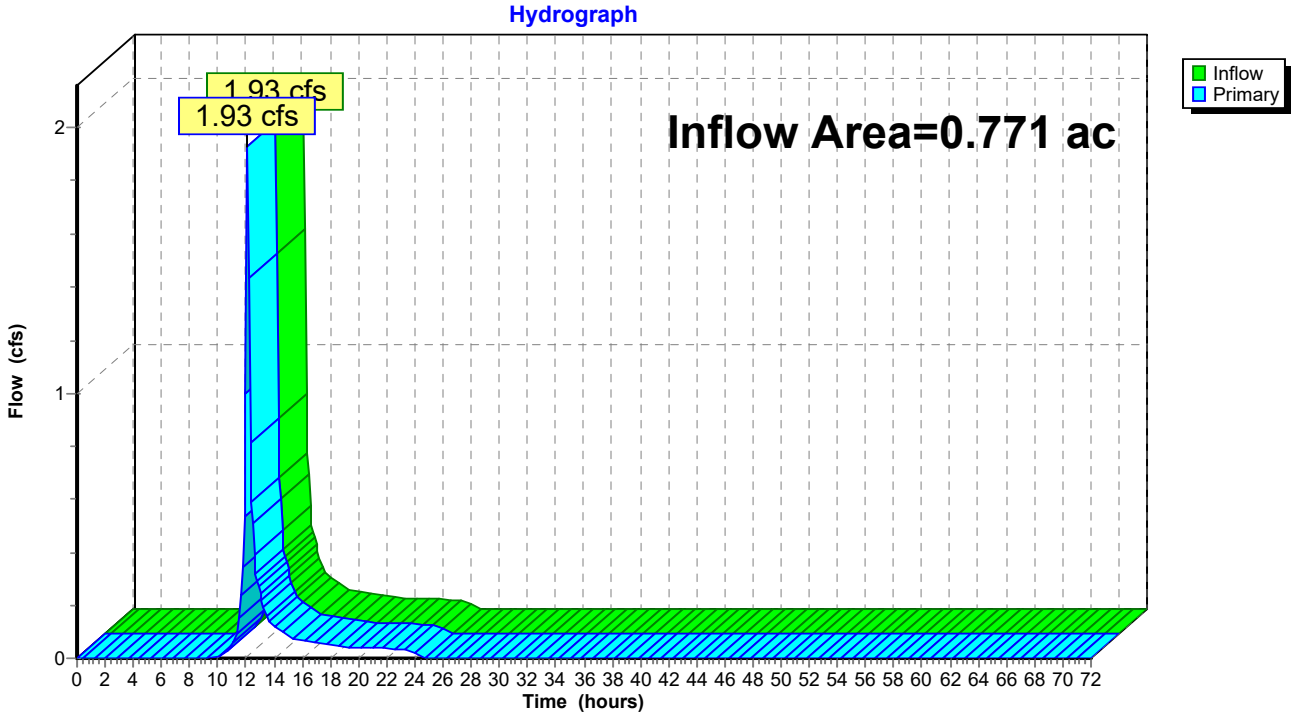


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 2.12" for 10-Year (NOAA) event
Inflow = 1.93 cfs @ 12.12 hrs, Volume= 0.136 af
Primary = 1.93 cfs @ 12.12 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

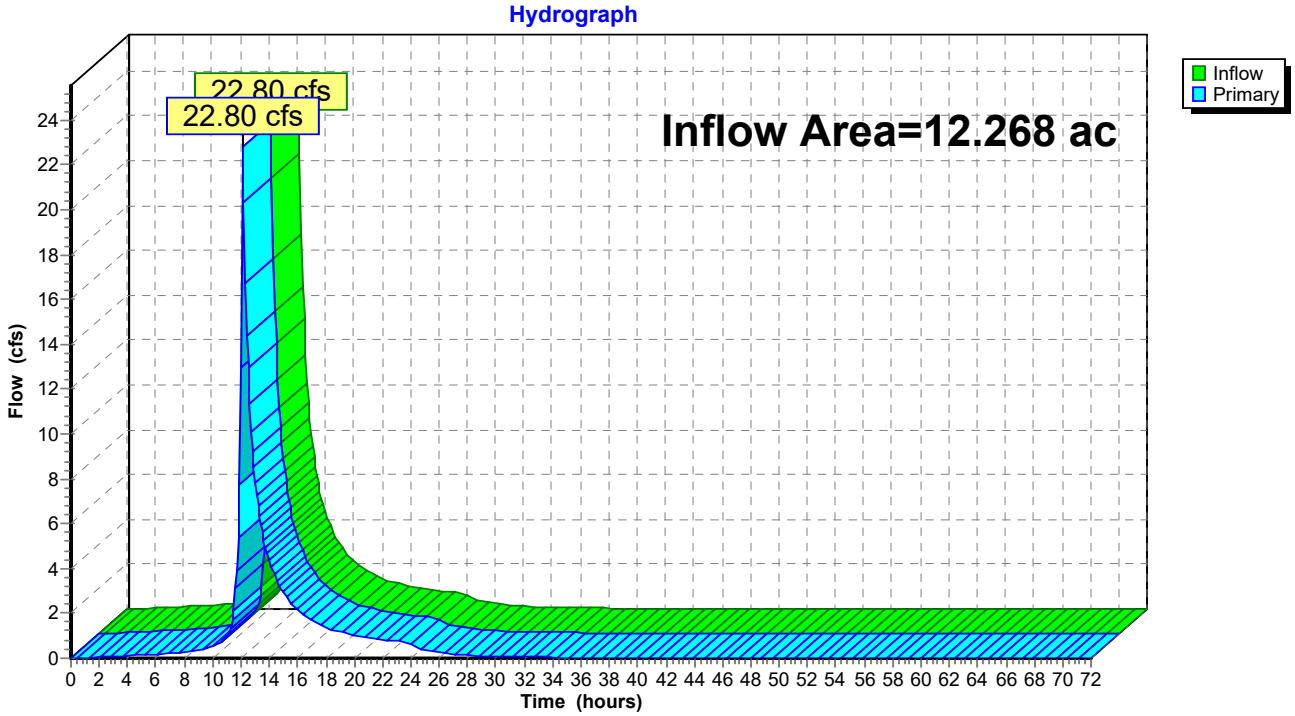


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 3.42" for 10-Year (NOAA) event
Inflow = 22.80 cfs @ 12.13 hrs, Volume= 3.492 af
Primary = 22.80 cfs @ 12.13 hrs, Volume= 3.492 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

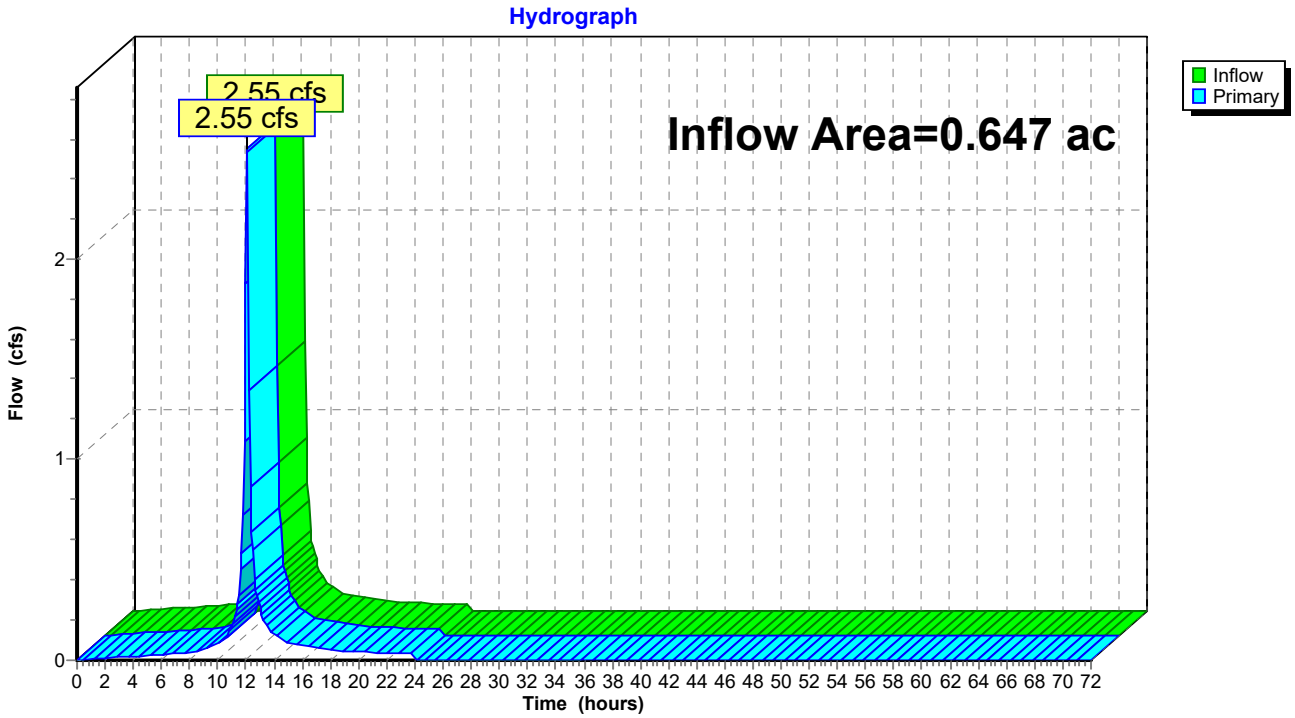


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 3.74" for 10-Year (NOAA) event
Inflow = 2.55 cfs @ 12.09 hrs, Volume= 0.202 af
Primary = 2.55 cfs @ 12.09 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

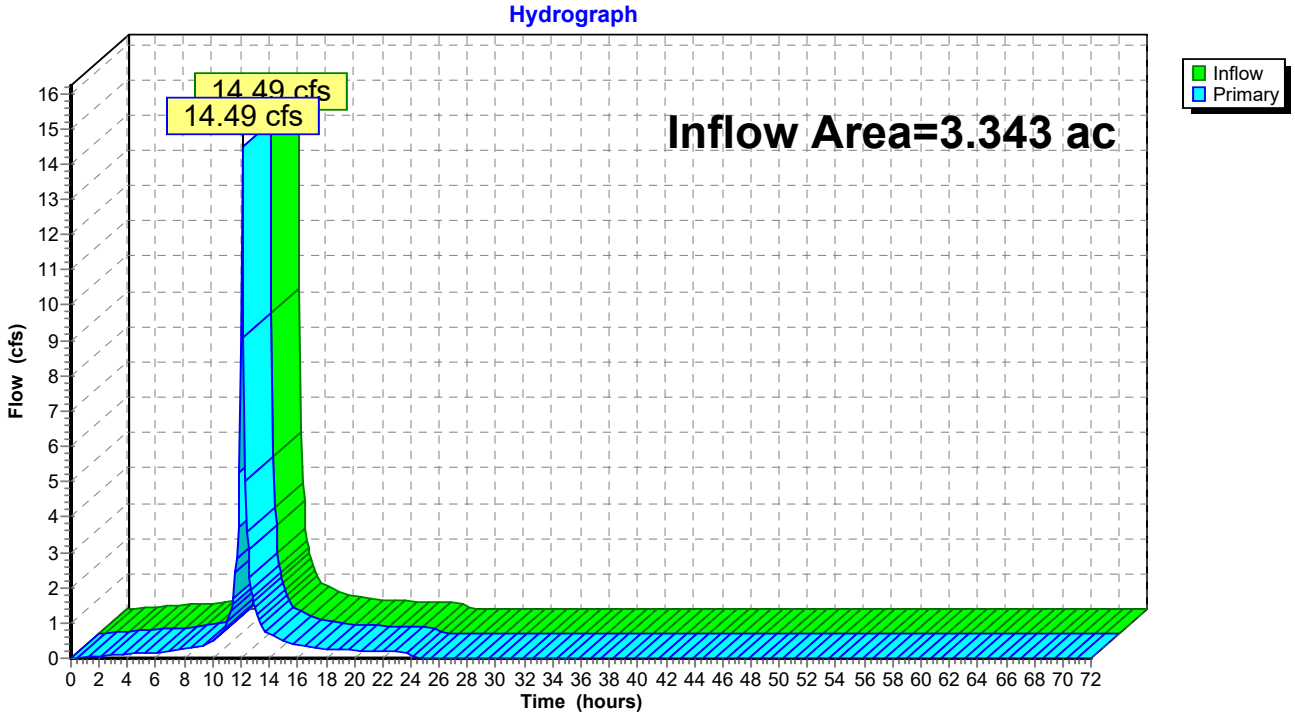


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 4.03" for 10-Year (NOAA) event
Inflow = 14.49 cfs @ 12.10 hrs, Volume= 1.122 af
Primary = 14.49 cfs @ 12.10 hrs, Volume= 1.122 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

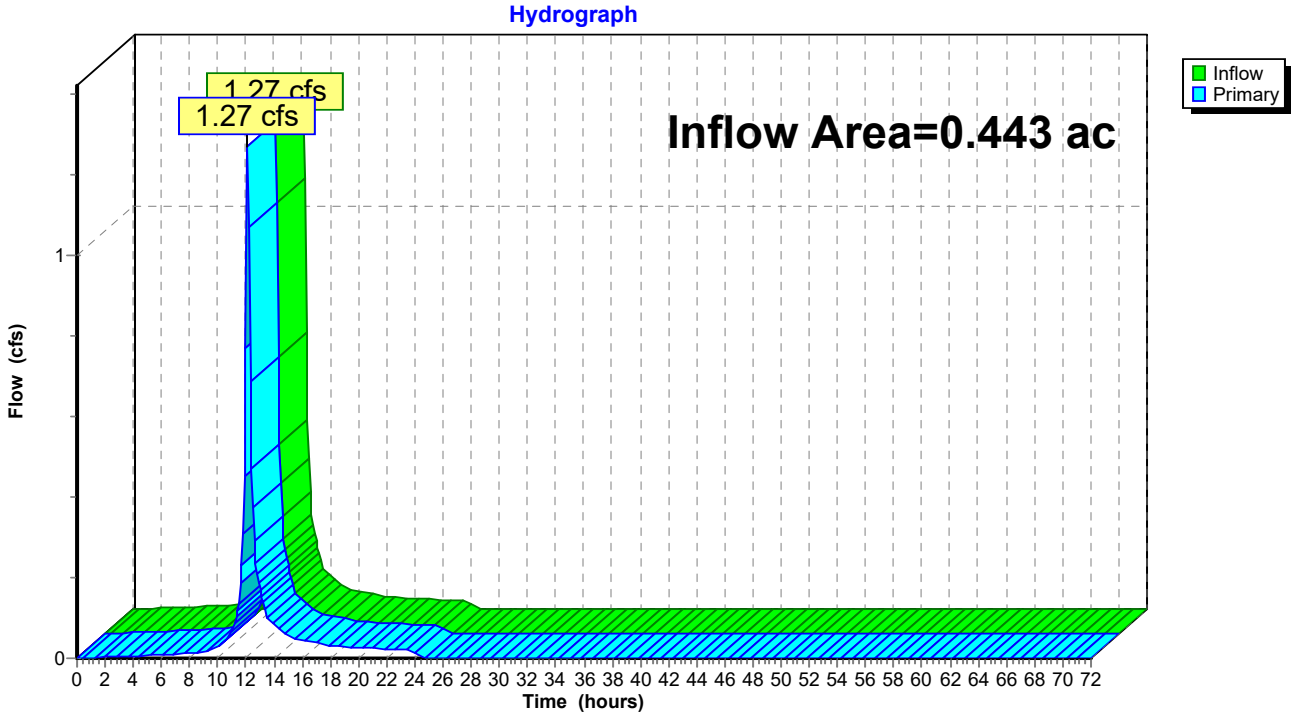


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 2.94" for 10-Year (NOAA) event
Inflow = 1.27 cfs @ 12.12 hrs, Volume= 0.109 af
Primary = 1.27 cfs @ 12.12 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

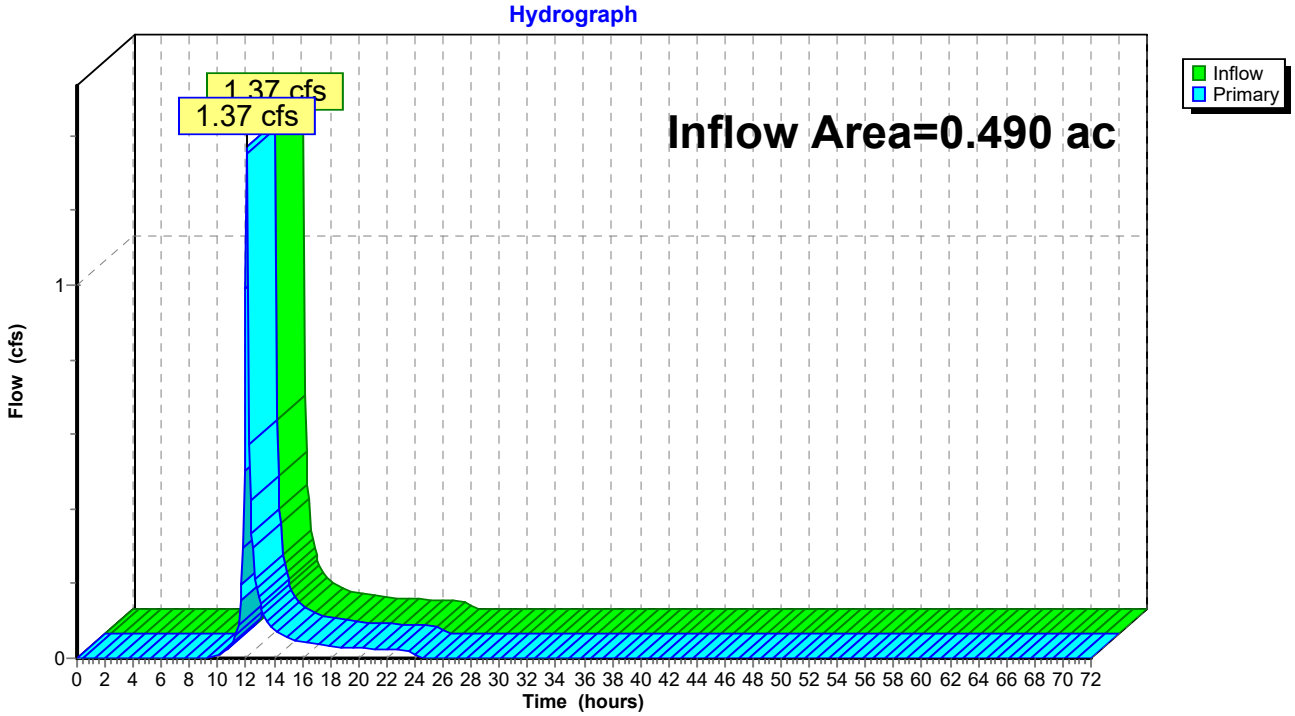


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 2.21" for 10-Year (NOAA) event
Inflow = 1.37 cfs @ 12.08 hrs, Volume= 0.090 af
Primary = 1.37 cfs @ 12.08 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

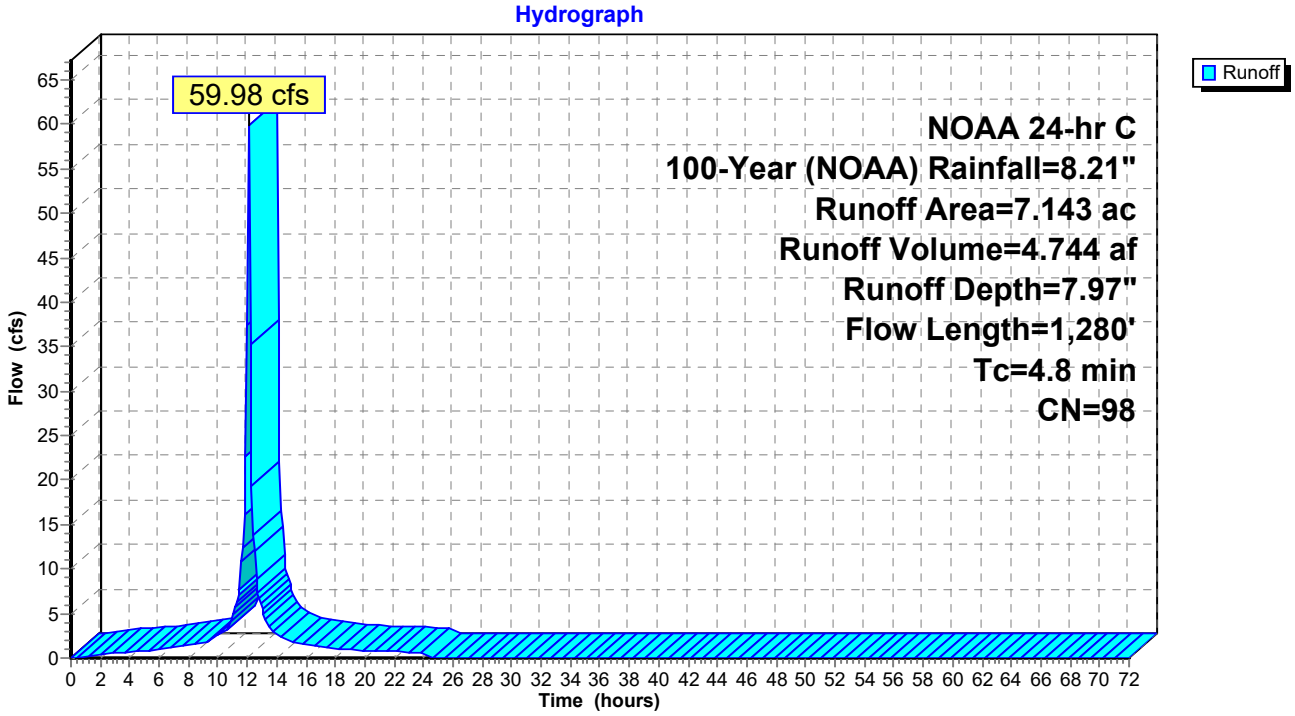
Runoff = 59.98 cfs @ 12.10 hrs, Volume= 4.744 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

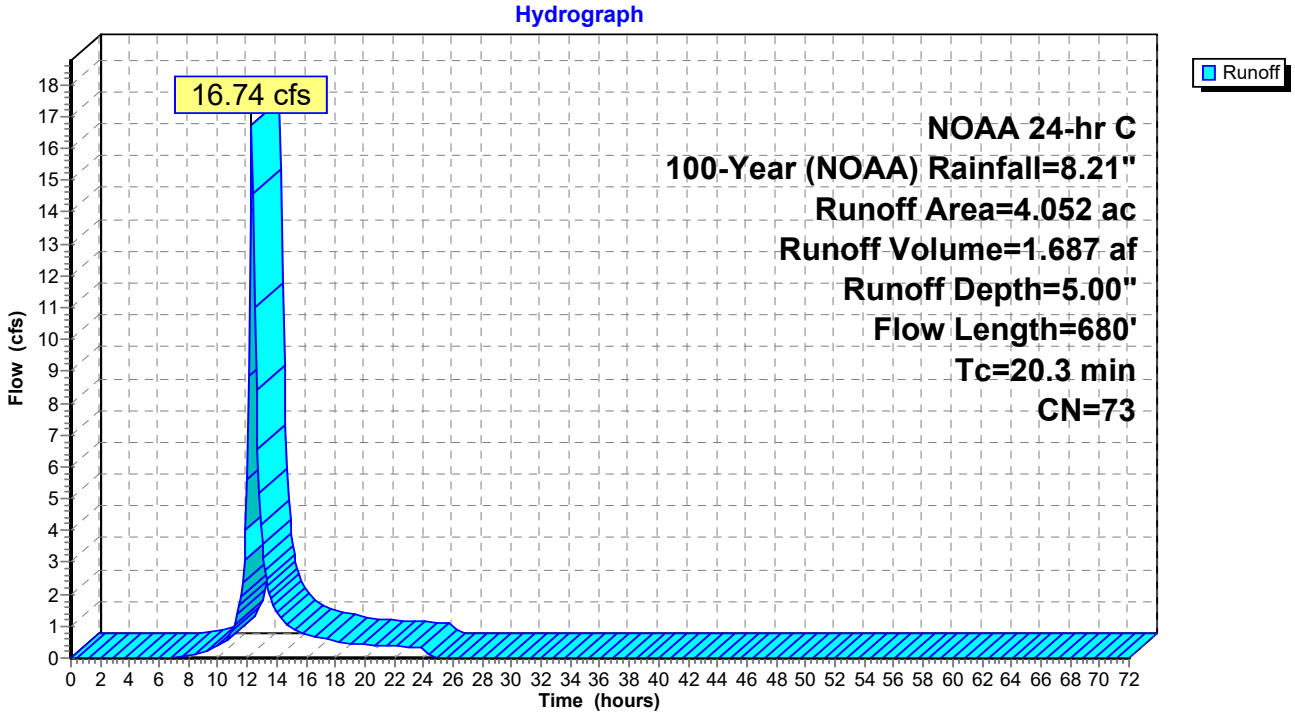
Runoff = 16.74 cfs @ 12.31 hrs, Volume= 1.687 af, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

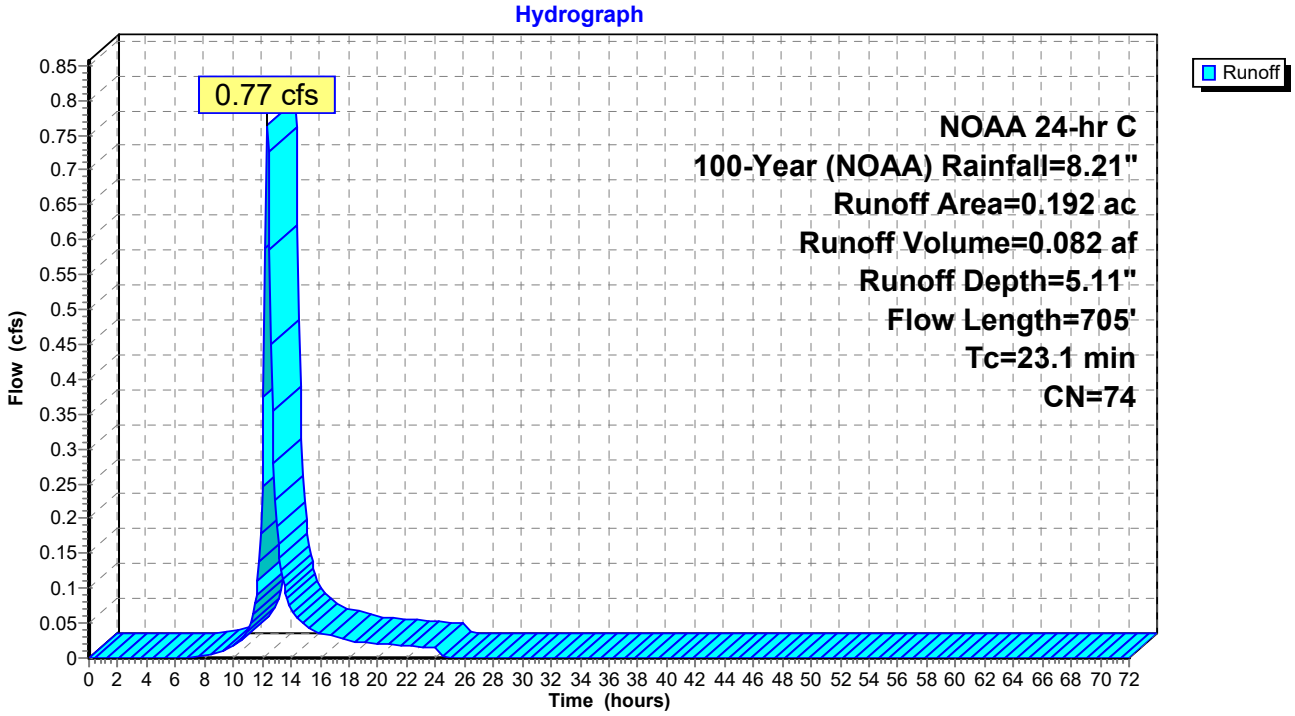
Runoff = 0.77 cfs @ 12.34 hrs, Volume= 0.082 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

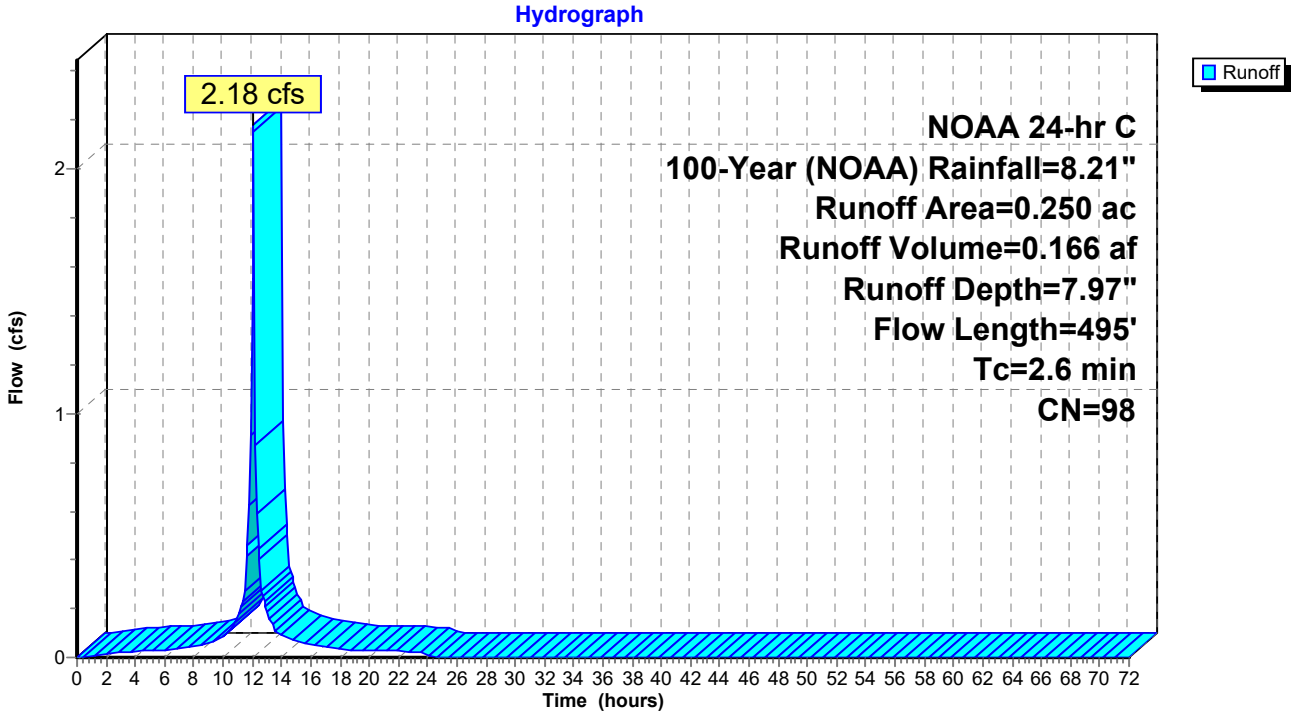
Runoff = 2.18 cfs @ 12.08 hrs, Volume= 0.166 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

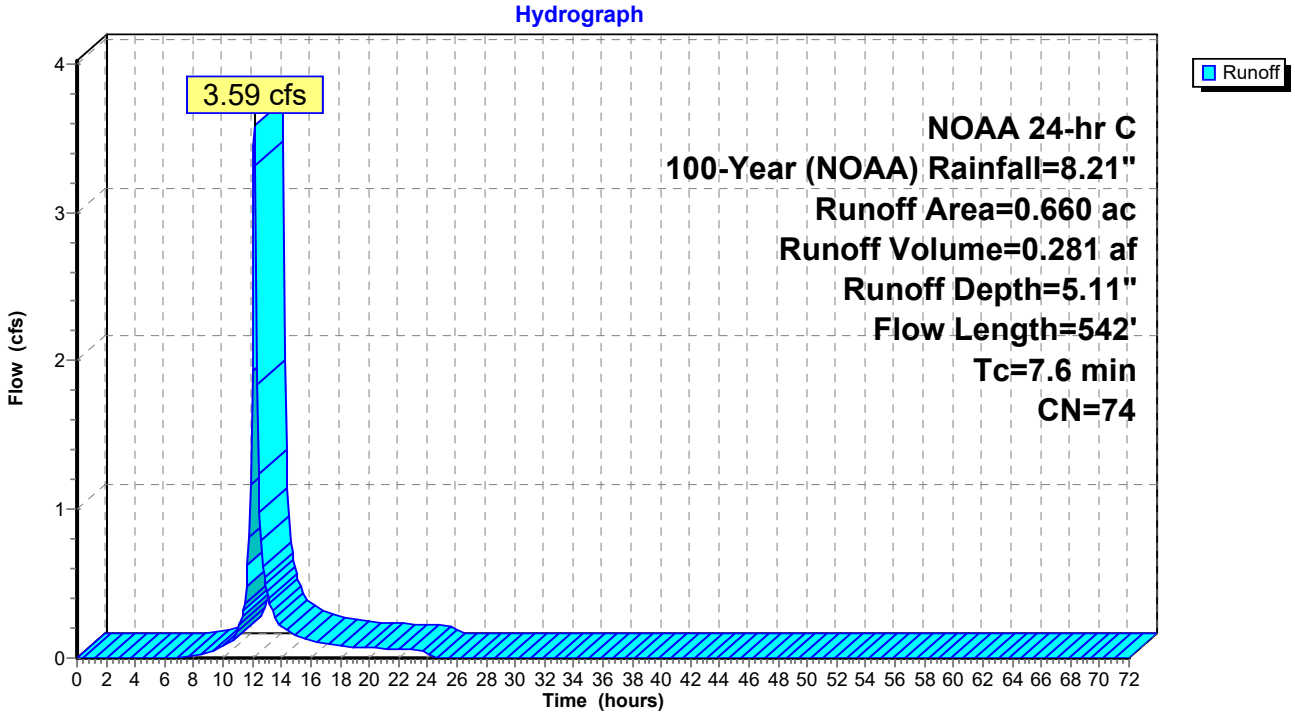
Runoff = 3.59 cfs @ 12.14 hrs, Volume= 0.281 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

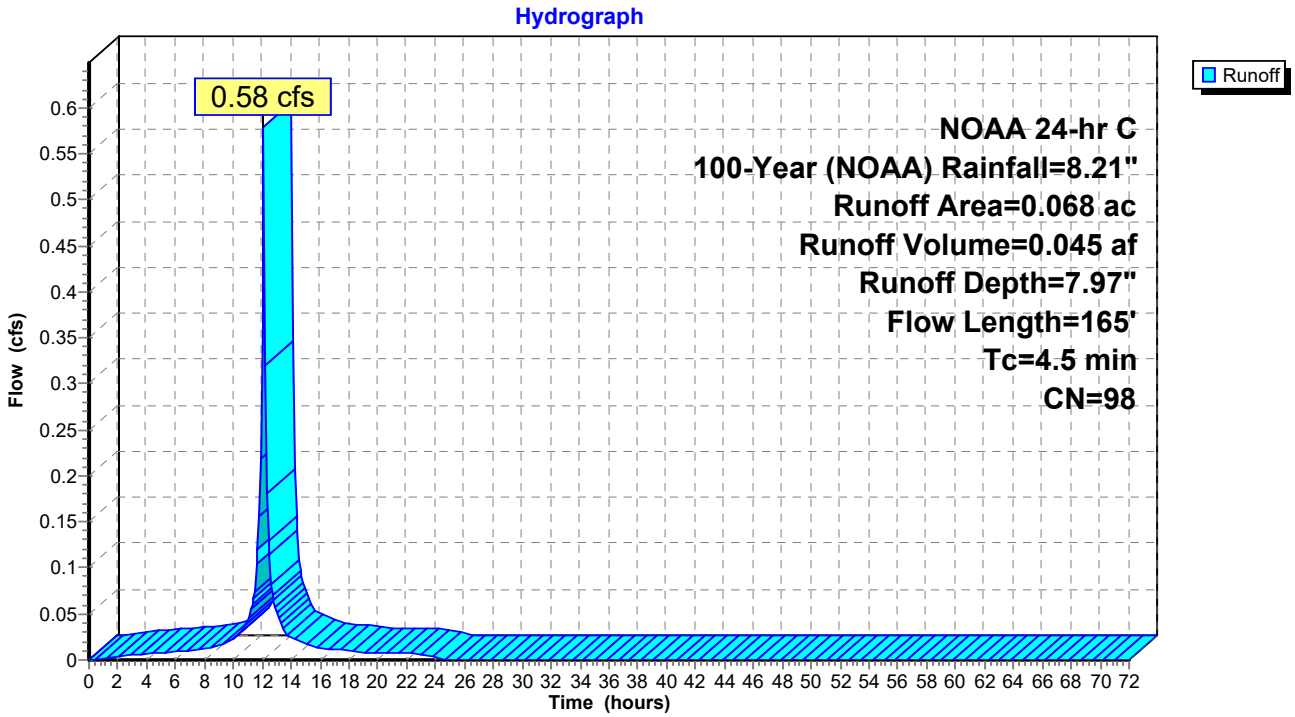
Runoff = 0.58 cfs @ 12.10 hrs, Volume= 0.045 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

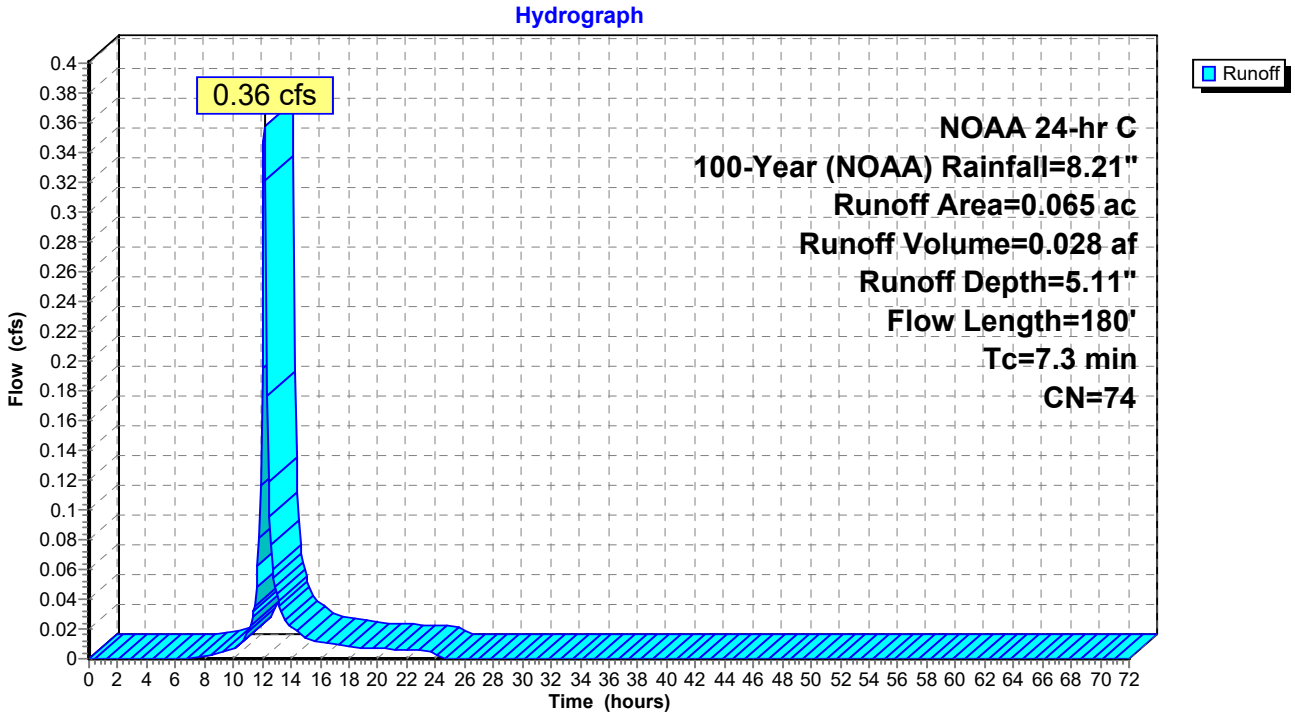
Runoff = 0.36 cfs @ 12.14 hrs, Volume= 0.028 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

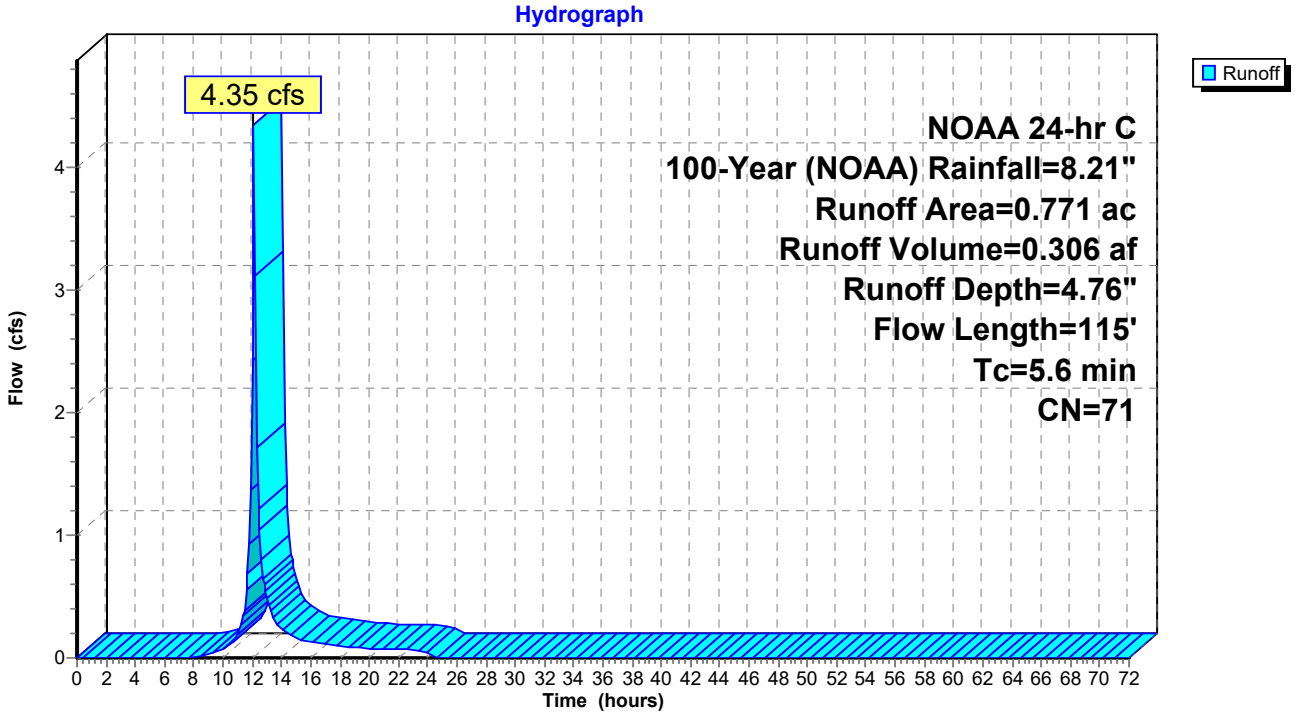
Runoff = 4.35 cfs @ 12.11 hrs, Volume= 0.306 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

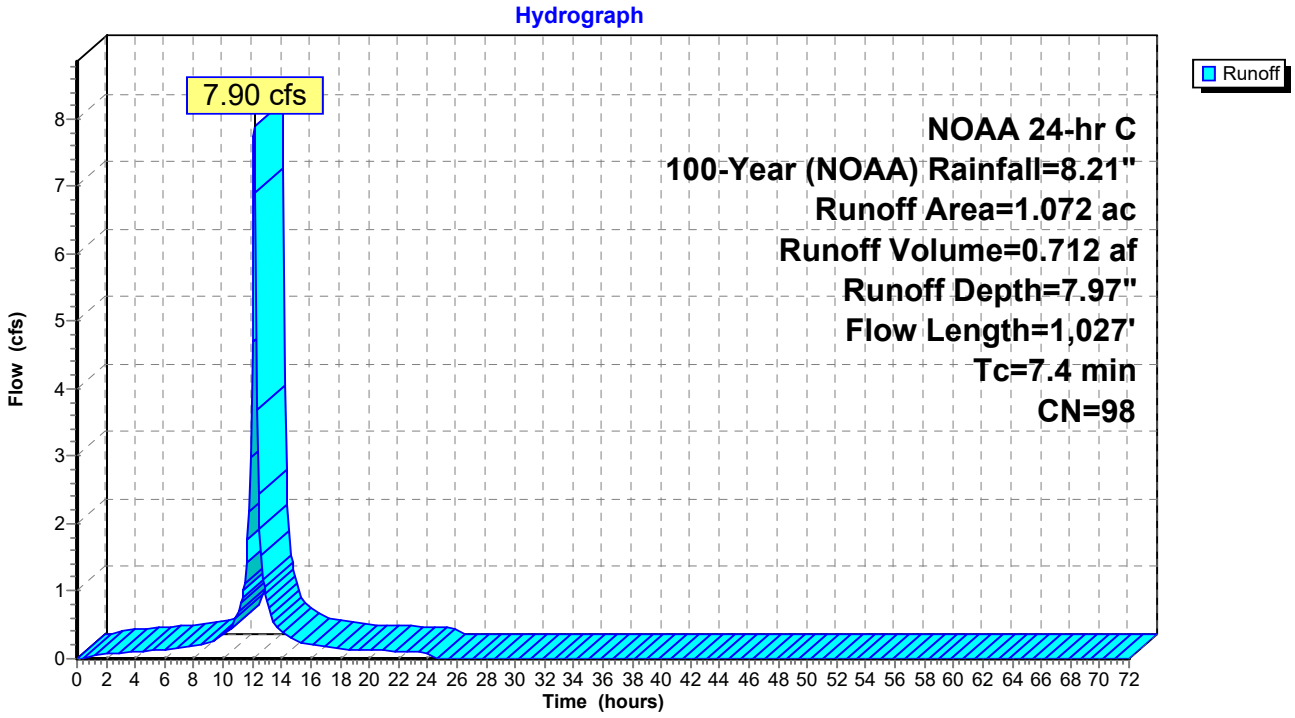
Runoff = 7.90 cfs @ 12.13 hrs, Volume= 0.712 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

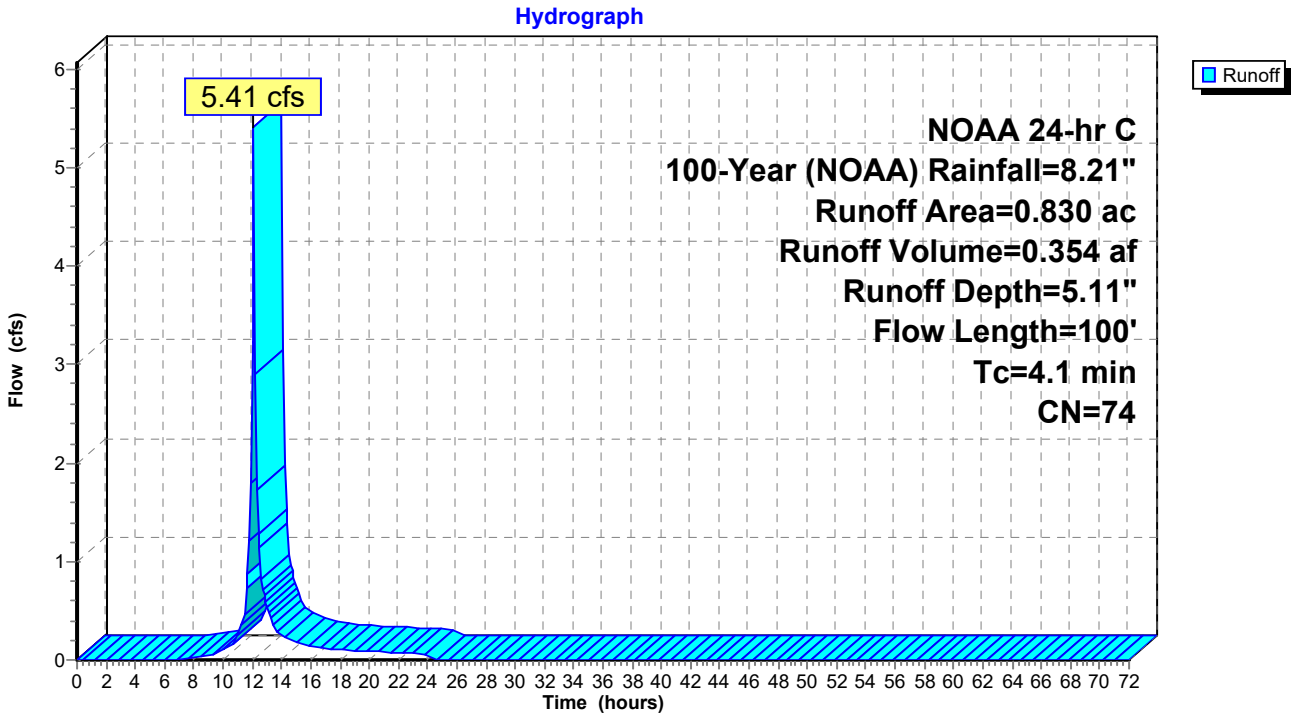
Runoff = 5.41 cfs @ 12.10 hrs, Volume= 0.354 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

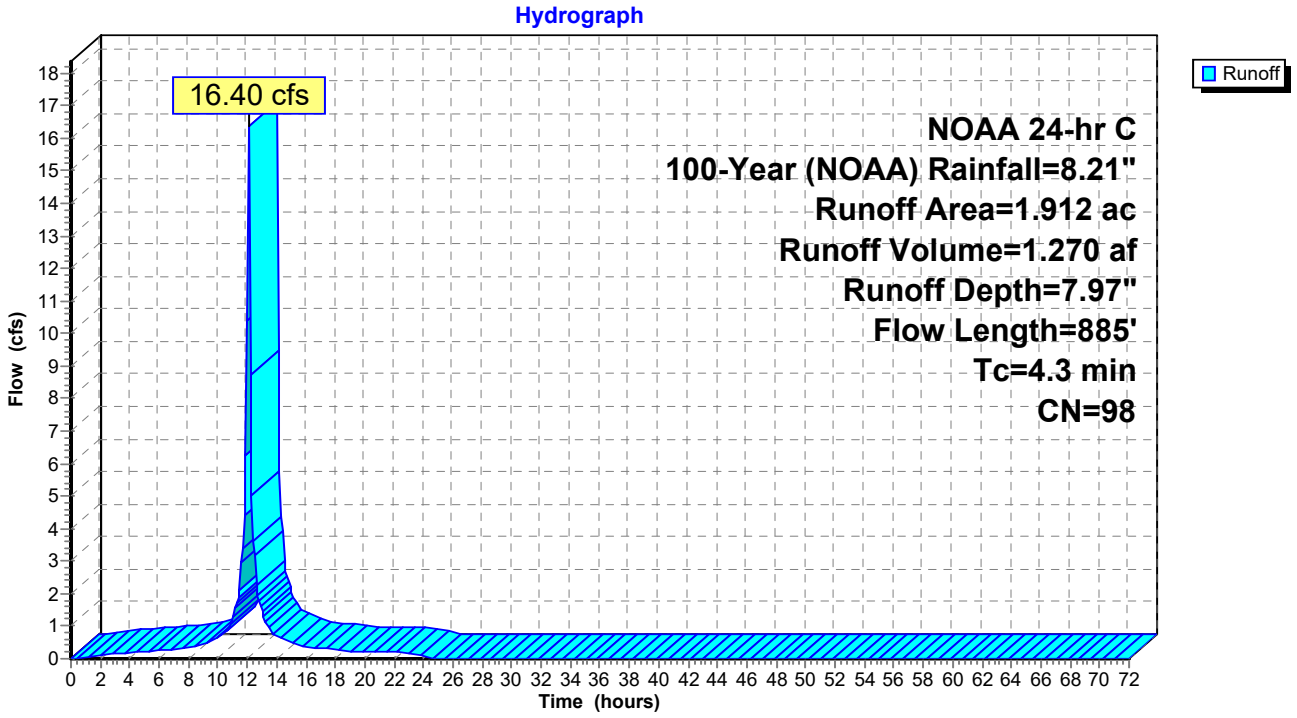
Runoff = 16.40 cfs @ 12.09 hrs, Volume= 1.270 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

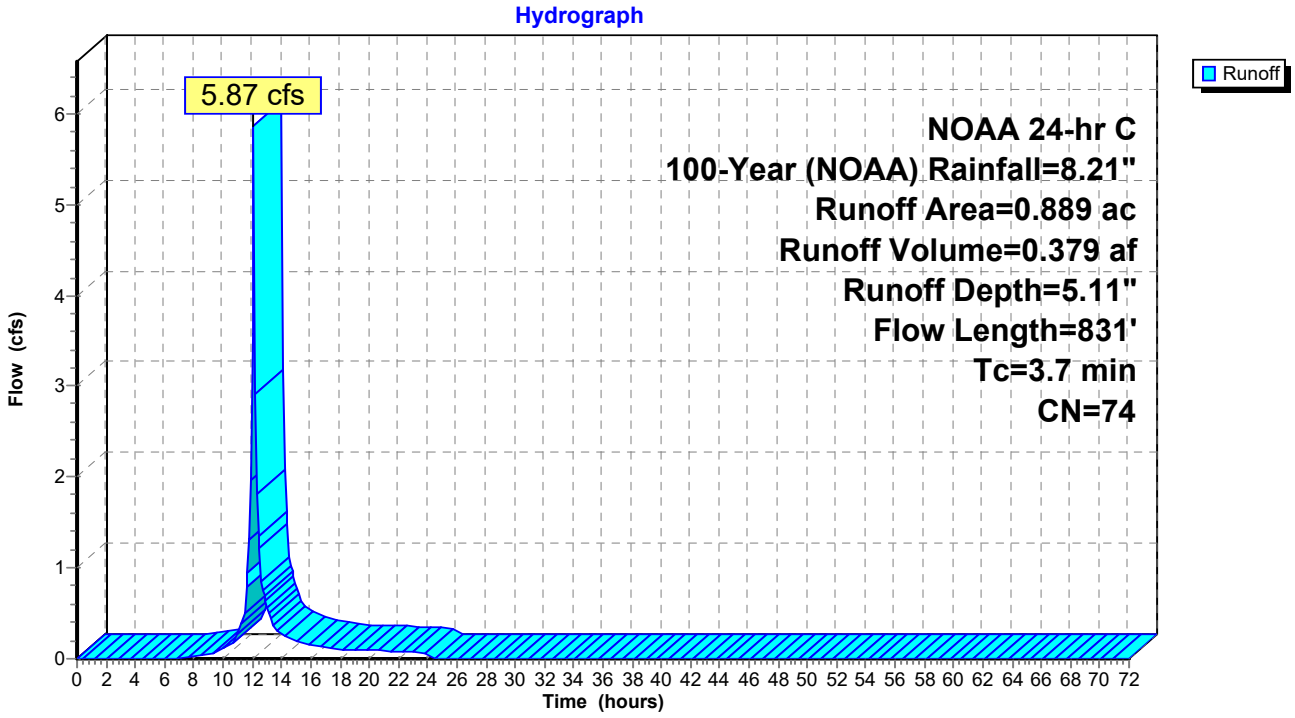
Runoff = 5.87 cfs @ 12.09 hrs, Volume= 0.379 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

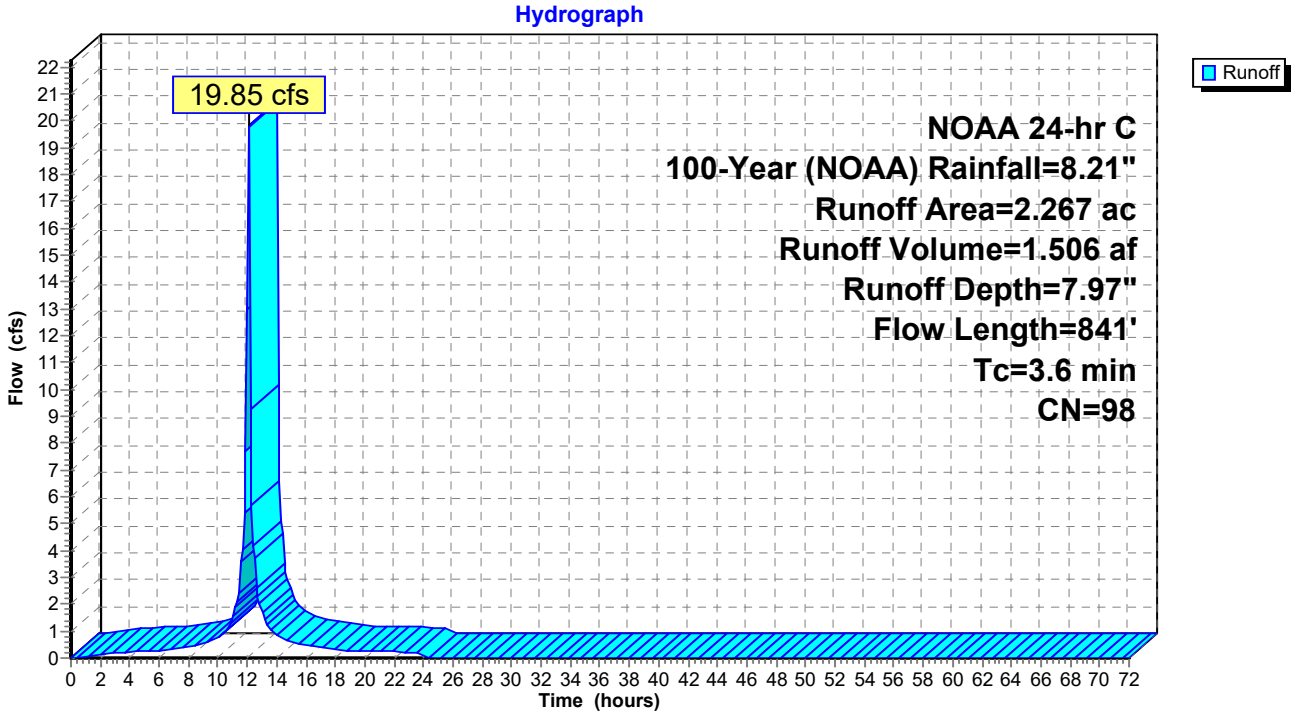
Runoff = 19.85 cfs @ 12.09 hrs, Volume= 1.506 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

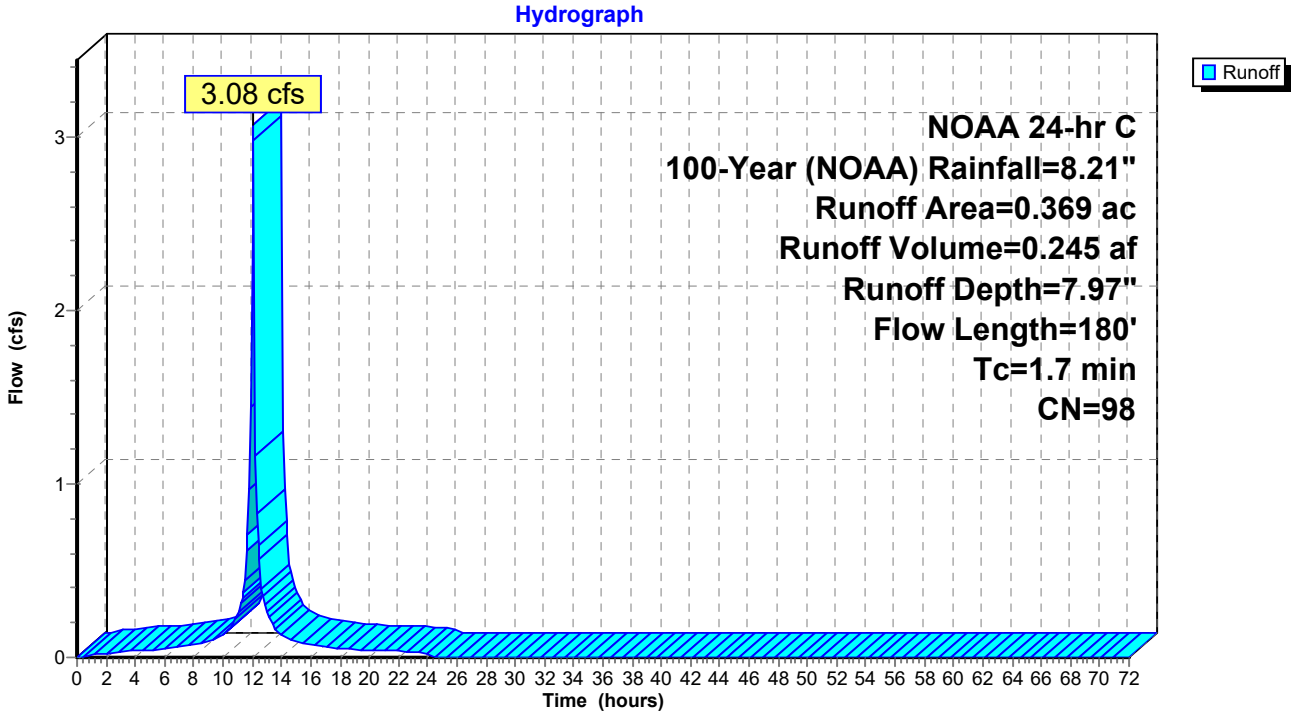
Runoff = 3.08 cfs @ 12.07 hrs, Volume= 0.245 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

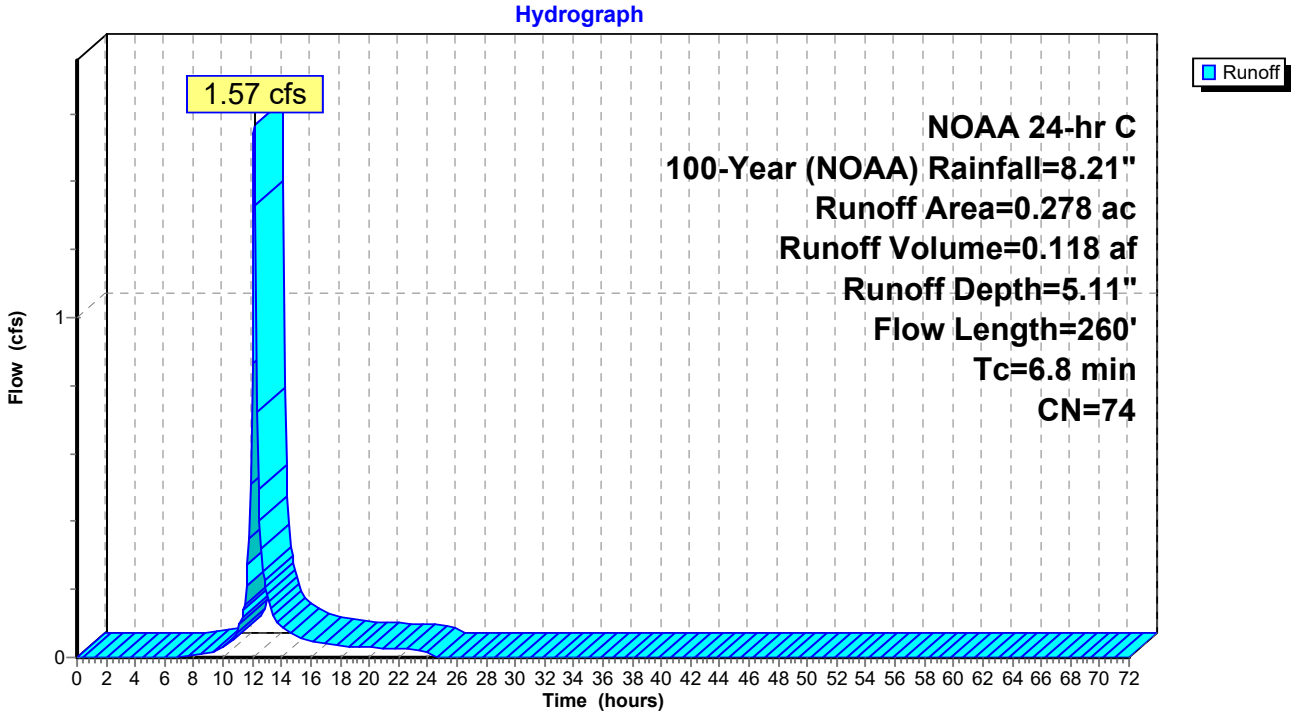
Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.118 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

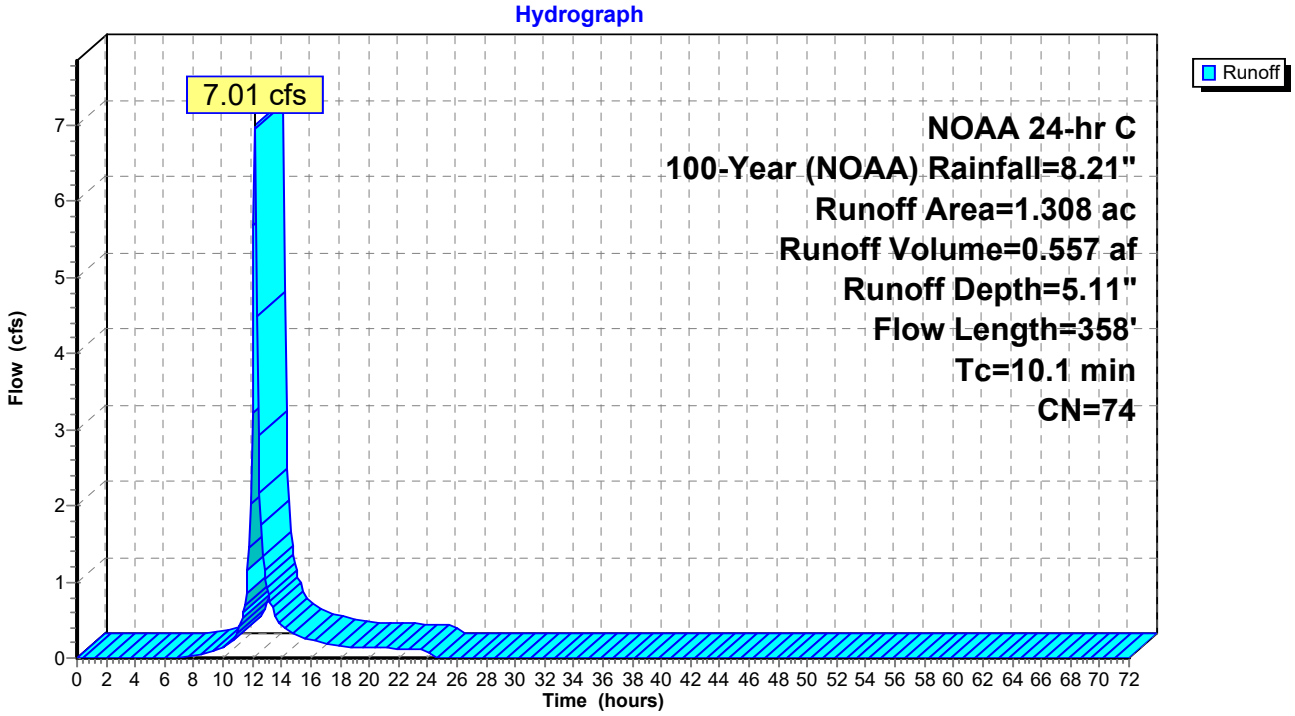
Runoff = 7.01 cfs @ 12.18 hrs, Volume= 0.557 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

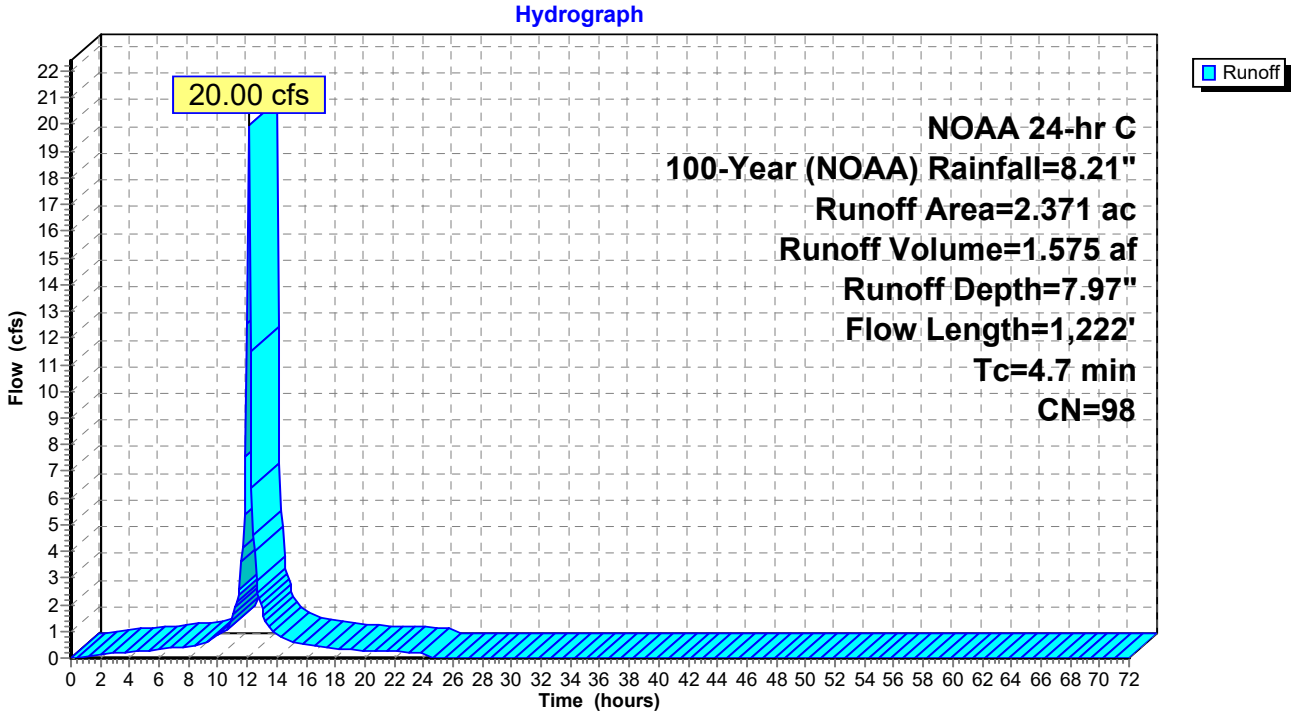
Runoff = 20.00 cfs @ 12.10 hrs, Volume= 1.575 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

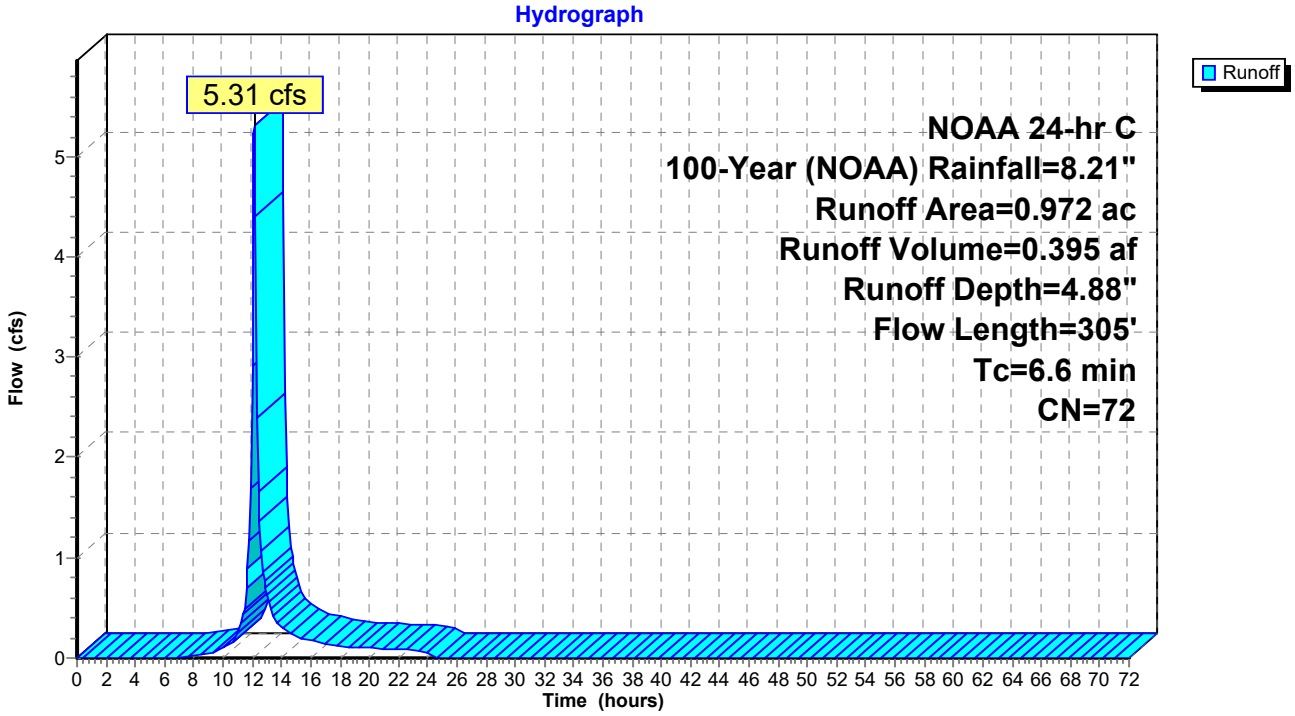
Runoff = 5.31 cfs @ 12.12 hrs, Volume= 0.395 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

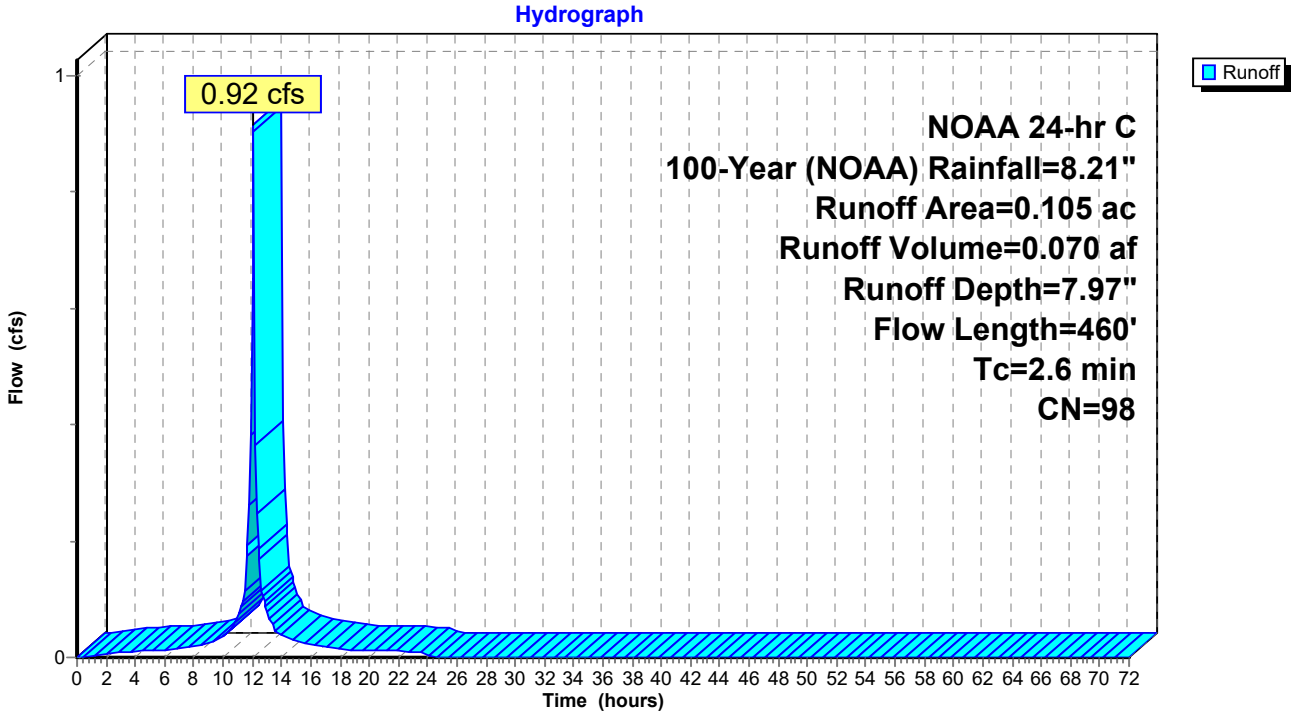
Runoff = 0.92 cfs @ 12.08 hrs, Volume= 0.070 af, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

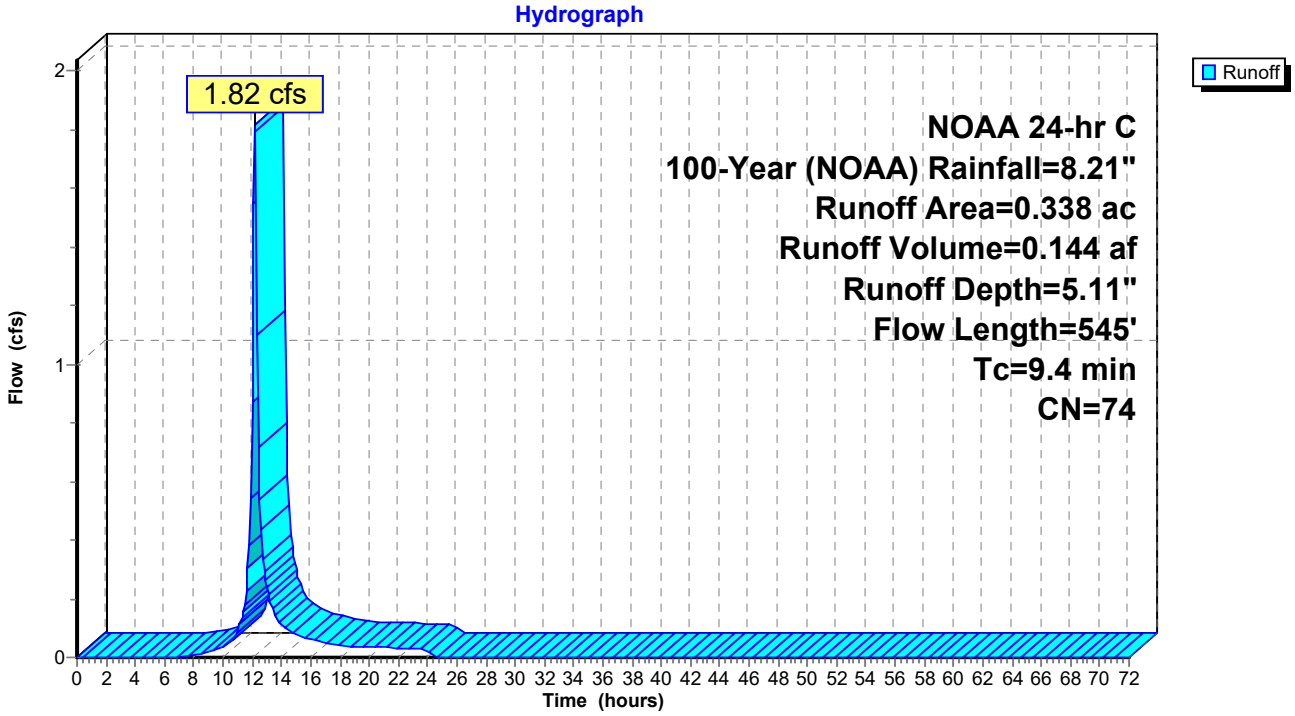
Runoff = 1.82 cfs @ 12.18 hrs, Volume= 0.144 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

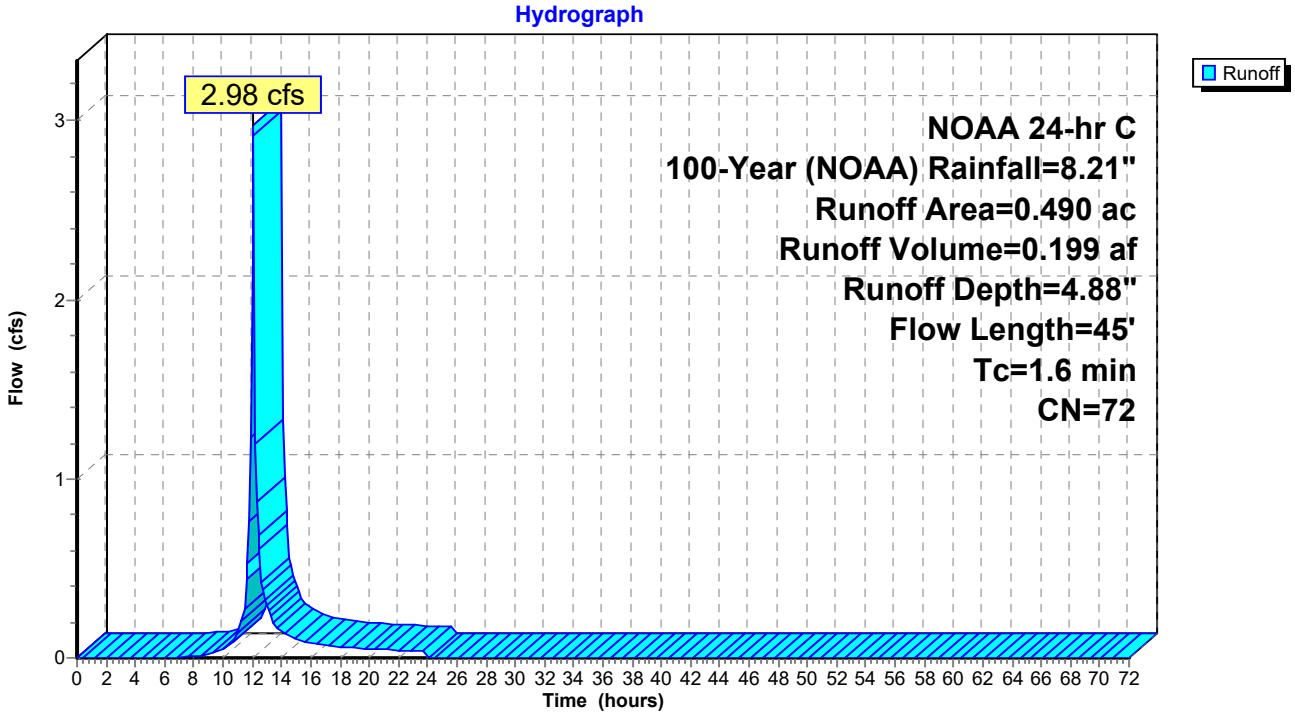
Runoff = 2.98 cfs @ 12.08 hrs, Volume= 0.199 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (NOAA) Rainfall=8.21"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 5.11" for 100-Year (NOAA) event
Inflow = 0.77 cfs @ 12.34 hrs, Volume= 0.082 af
Outflow = 0.76 cfs @ 12.34 hrs, Volume= 0.077 af, Atten= 1%, Lag= 0.4 min
Primary = 0.76 cfs @ 12.34 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.09' @ 12.34 hrs Surf.Area= 1,850 sf Storage= 271 cf

Plug-Flow detention time= 52.9 min calculated for 0.077 af (94% of inflow)
Center-of-Mass det. time= 18.5 min (852.7 - 834.2)

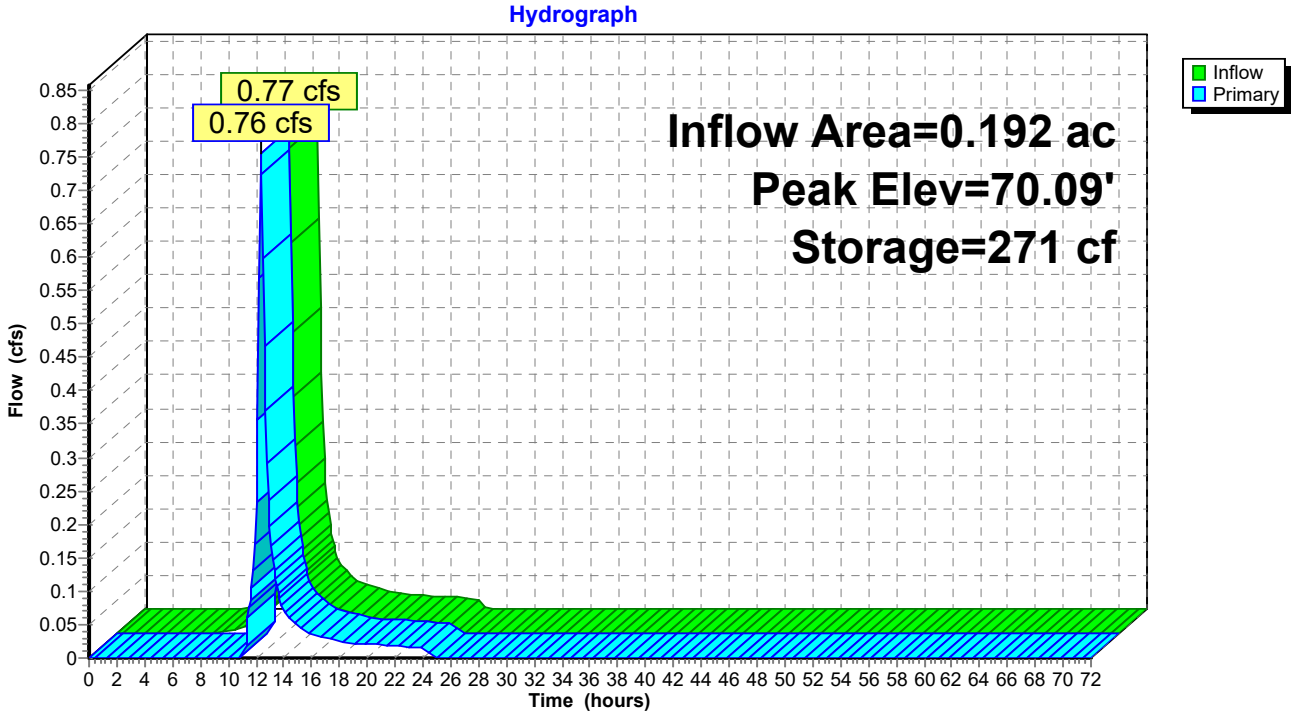
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.73 cfs @ 12.34 hrs HW=70.09' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.73 cfs @ 0.25 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 6.57" for 100-Year (NOAA) event
Inflow = 0.93 cfs @ 12.11 hrs, Volume= 0.073 af
Outflow = 0.92 cfs @ 12.11 hrs, Volume= 0.072 af, Atten= 1%, Lag= 0.0 min
Primary = 0.92 cfs @ 12.11 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.16' @ 12.11 hrs Surf.Area= 393 sf Storage= 85 cf

Plug-Flow detention time= 25.3 min calculated for 0.071 af (98% of inflow)
Center-of-Mass det. time= 13.7 min (784.0 - 770.3)

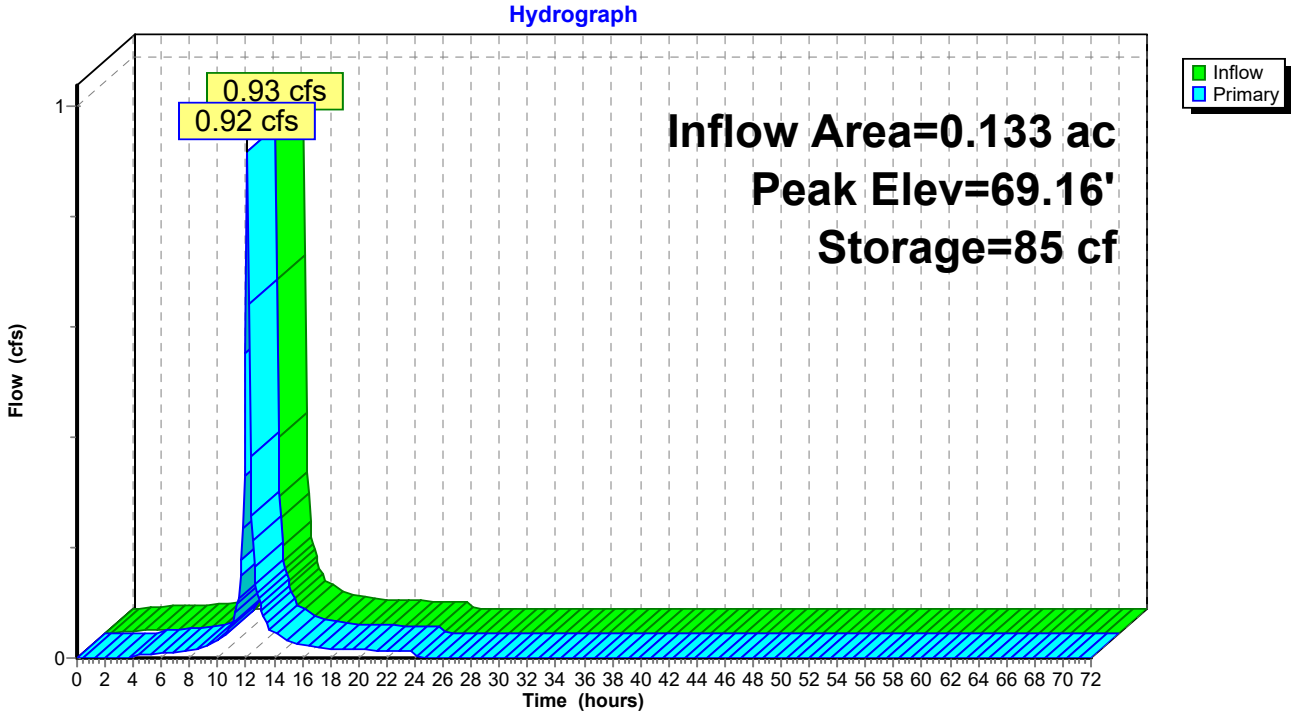
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.89 cfs @ 12.11 hrs HW=69.16' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.89 cfs @ 0.36 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 6.72" for 100-Year (NOAA) event
Inflow = 13.21 cfs @ 12.11 hrs, Volume= 1.066 af
Outflow = 10.09 cfs @ 12.21 hrs, Volume= 0.965 af, Atten= 24%, Lag= 5.9 min
Primary = 10.09 cfs @ 12.21 hrs, Volume= 0.965 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.49' @ 12.21 hrs Surf.Area= 7,900 sf Storage= 10,586 cf

Plug-Flow detention time= 110.1 min calculated for 0.964 af (90% of inflow)
Center-of-Mass det. time= 60.9 min (828.2 - 767.3)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

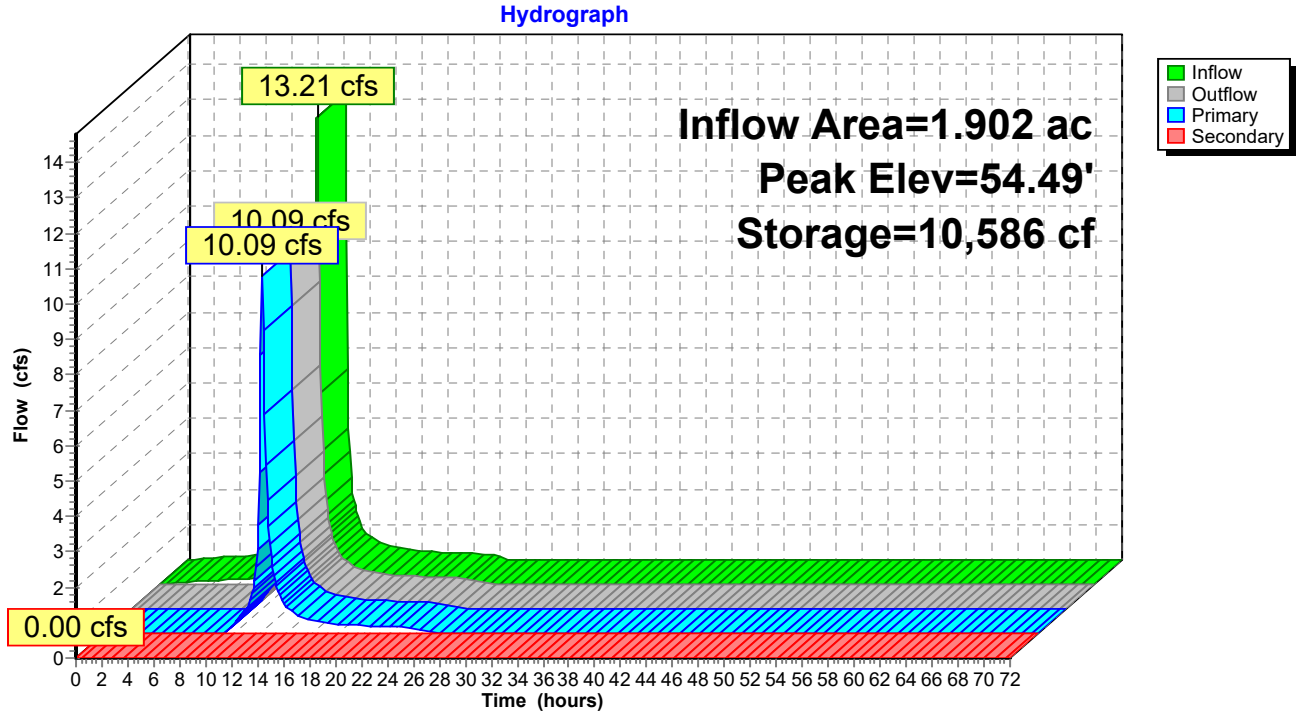
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.94 cfs @ 12.21 hrs HW=54.48' (Free Discharge)
└**1=Culvert** (Passes 9.94 cfs of 31.69 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 9.94 cfs @ 3.00 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 7.06" for 100-Year (NOAA) event
Inflow = 22.27 cfs @ 12.09 hrs, Volume= 1.649 af
Outflow = 10.57 cfs @ 12.24 hrs, Volume= 1.470 af, Atten= 53%, Lag= 8.7 min
Primary = 10.57 cfs @ 12.24 hrs, Volume= 1.470 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.88' @ 12.24 hrs Surf.Area= 17,343 sf Storage= 29,090 cf

Plug-Flow detention time= 195.3 min calculated for 1.468 af (89% of inflow)
Center-of-Mass det. time= 142.9 min (900.3 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

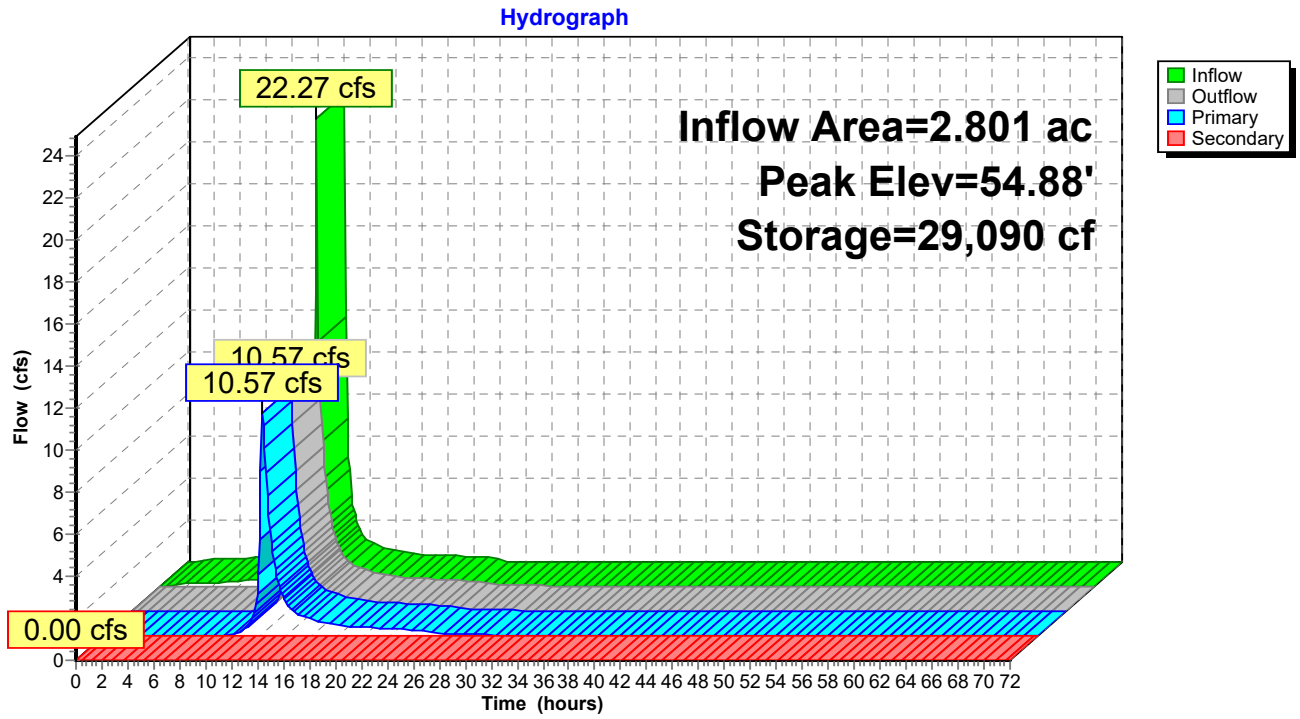
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.23 cfs @ 12.24 hrs HW=54.86' (Free Discharge)
└─**1=Culvert** (Passes 10.23 cfs of 33.34 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.97 cfs @ 3.80 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 5.26 cfs @ 3.06 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 6.90" for 100-Year (NOAA) event
Inflow = 29.96 cfs @ 12.10 hrs, Volume= 2.427 af
Outflow = 7.56 cfs @ 12.45 hrs, Volume= 2.188 af, Atten= 75%, Lag= 21.1 min
Primary = 7.56 cfs @ 12.45 hrs, Volume= 2.188 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 63.65' @ 12.45 hrs Surf.Area= 17,079 sf Storage= 50,656 cf

Plug-Flow detention time= 229.2 min calculated for 2.188 af (90% of inflow)
Center-of-Mass det. time= 177.3 min (939.3 - 762.0)

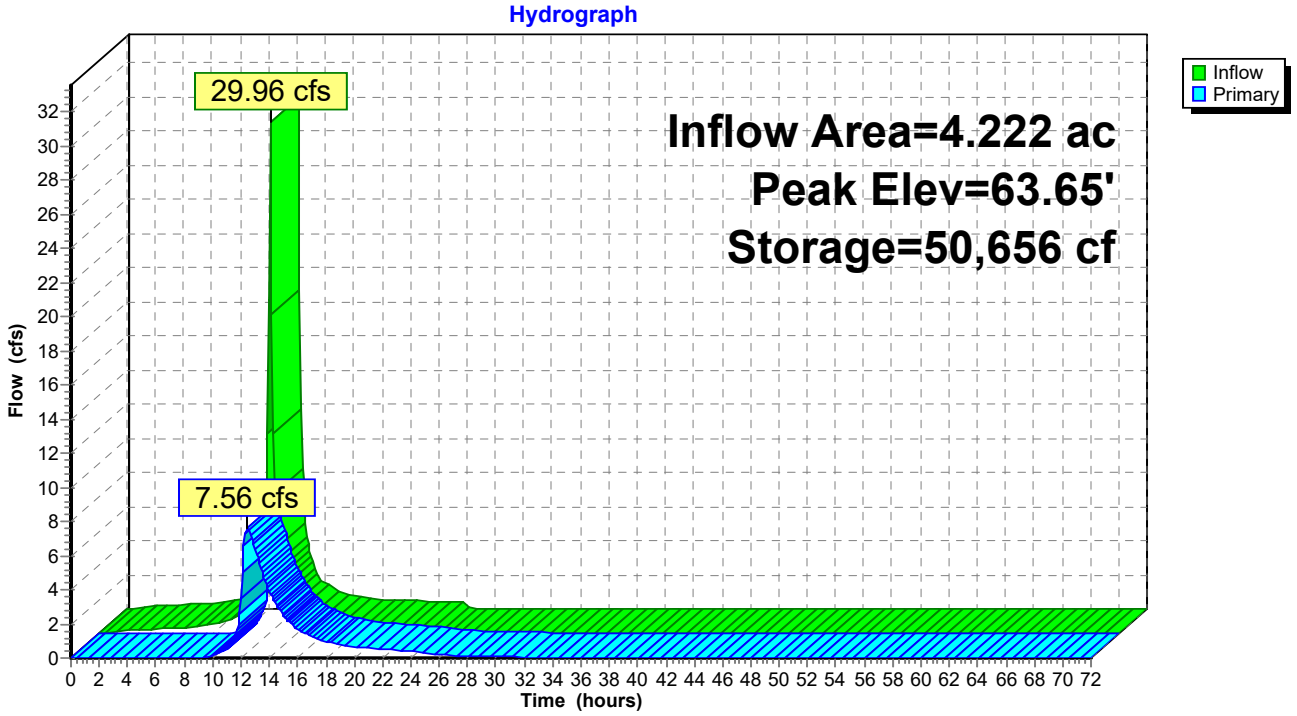
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=7.54 cfs @ 12.45 hrs HW=63.64' (Free Discharge)
↑└**1=Culvert** (Passes 7.54 cfs of 43.95 cfs potential flow)
↑└**2=Exfiltration** (Controls 0.00 cfs)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 7.54 cfs @ 5.50 fps)
└**4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

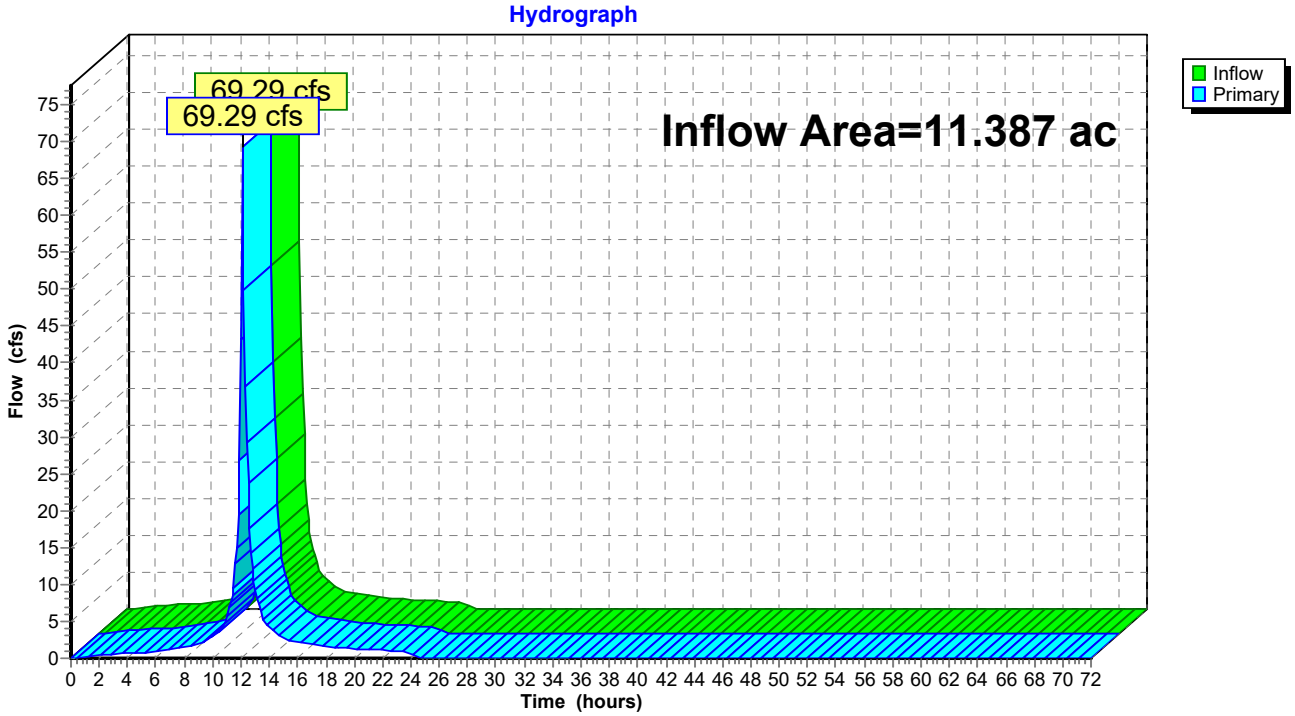


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 6.86" for 100-Year (NOAA) event
Inflow = 69.29 cfs @ 12.11 hrs, Volume= 6.508 af
Primary = 69.29 cfs @ 12.11 hrs, Volume= 6.508 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

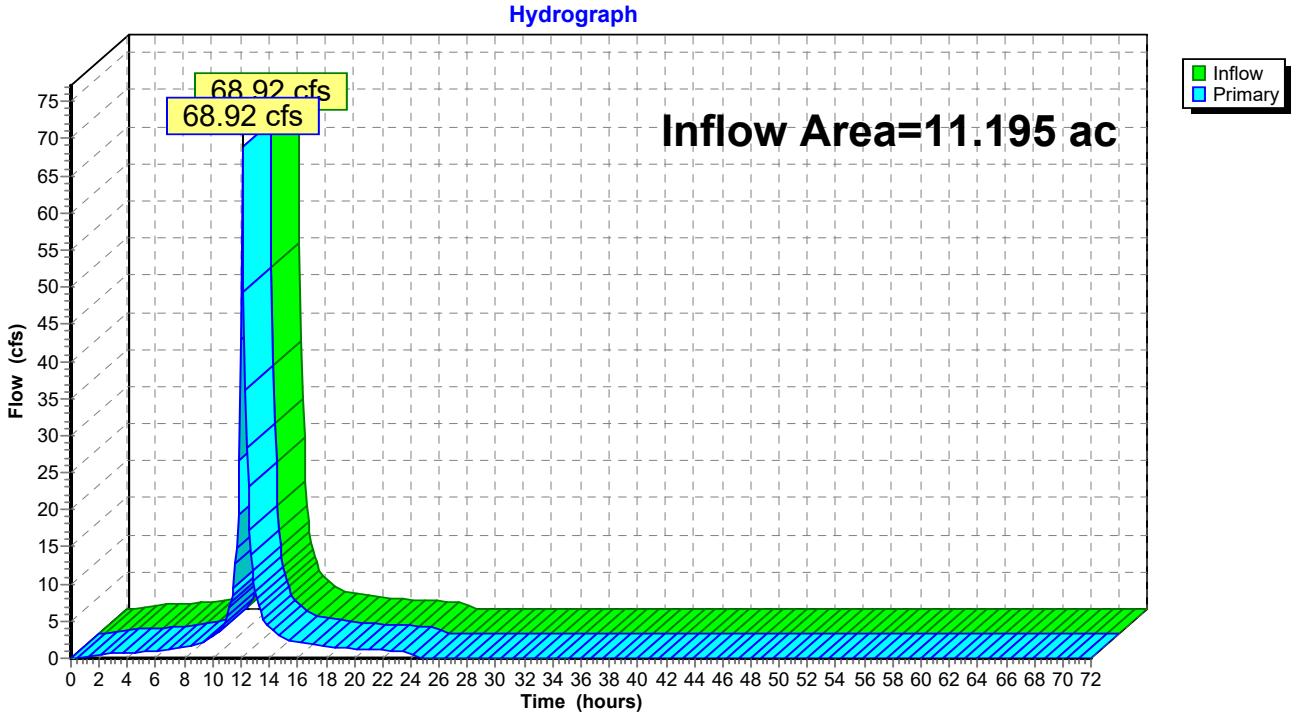


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 6.89" for 100-Year (NOAA) event
Inflow = 68.92 cfs @ 12.11 hrs, Volume= 6.431 af
Primary = 68.92 cfs @ 12.11 hrs, Volume= 6.431 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

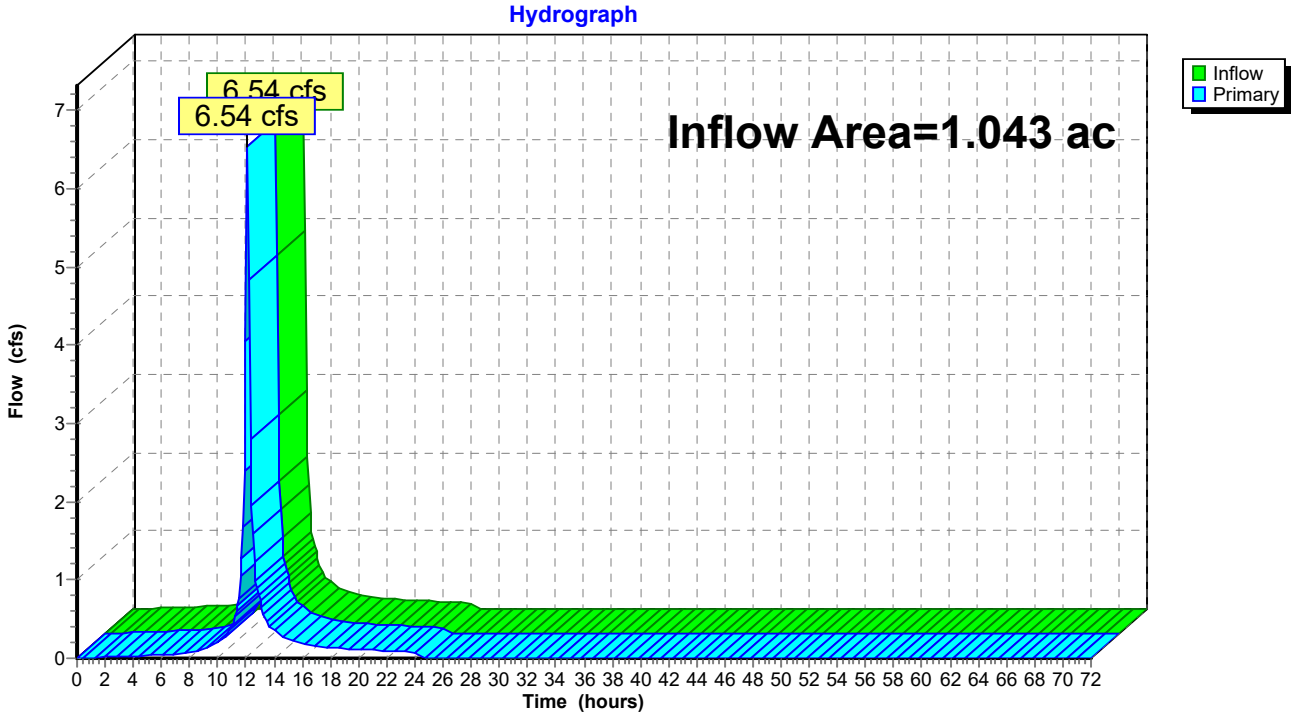


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 5.97" for 100-Year (NOAA) event
Inflow = 6.54 cfs @ 12.11 hrs, Volume= 0.519 af
Primary = 6.54 cfs @ 12.11 hrs, Volume= 0.519 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

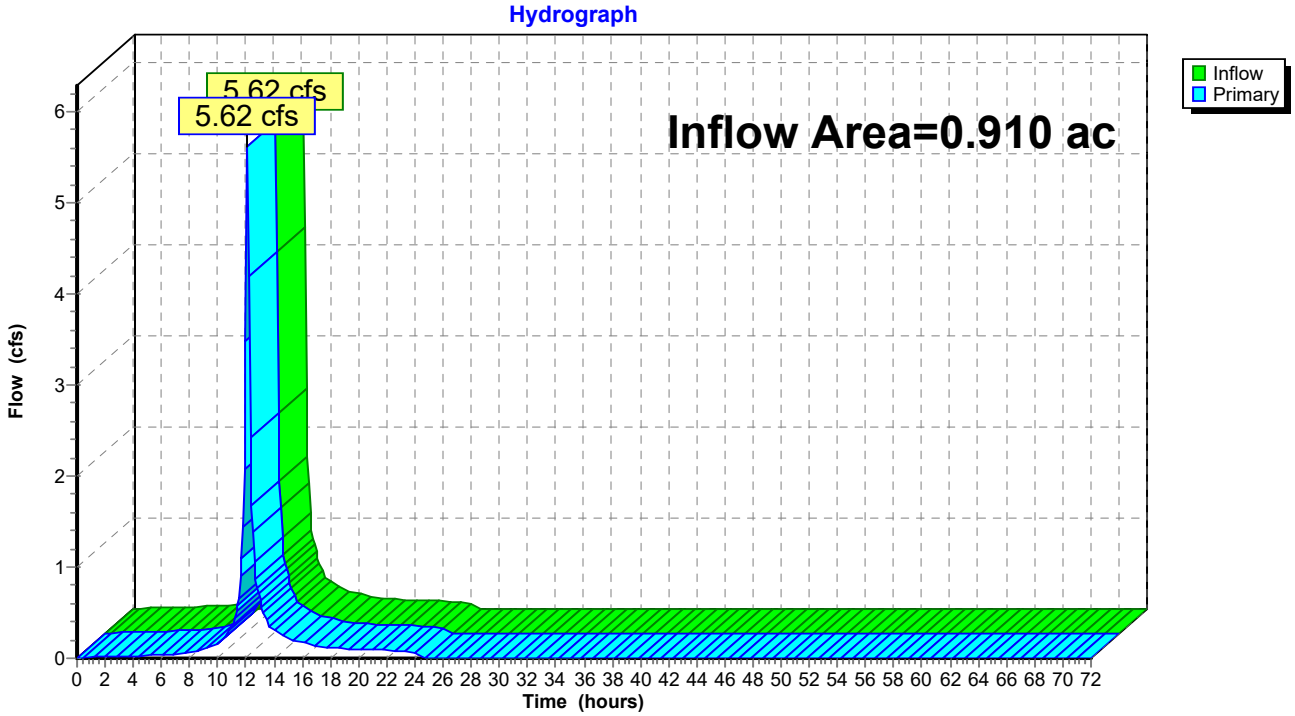


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 5.90" for 100-Year (NOAA) event
Inflow = 5.62 cfs @ 12.11 hrs, Volume= 0.447 af
Primary = 5.62 cfs @ 12.11 hrs, Volume= 0.447 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

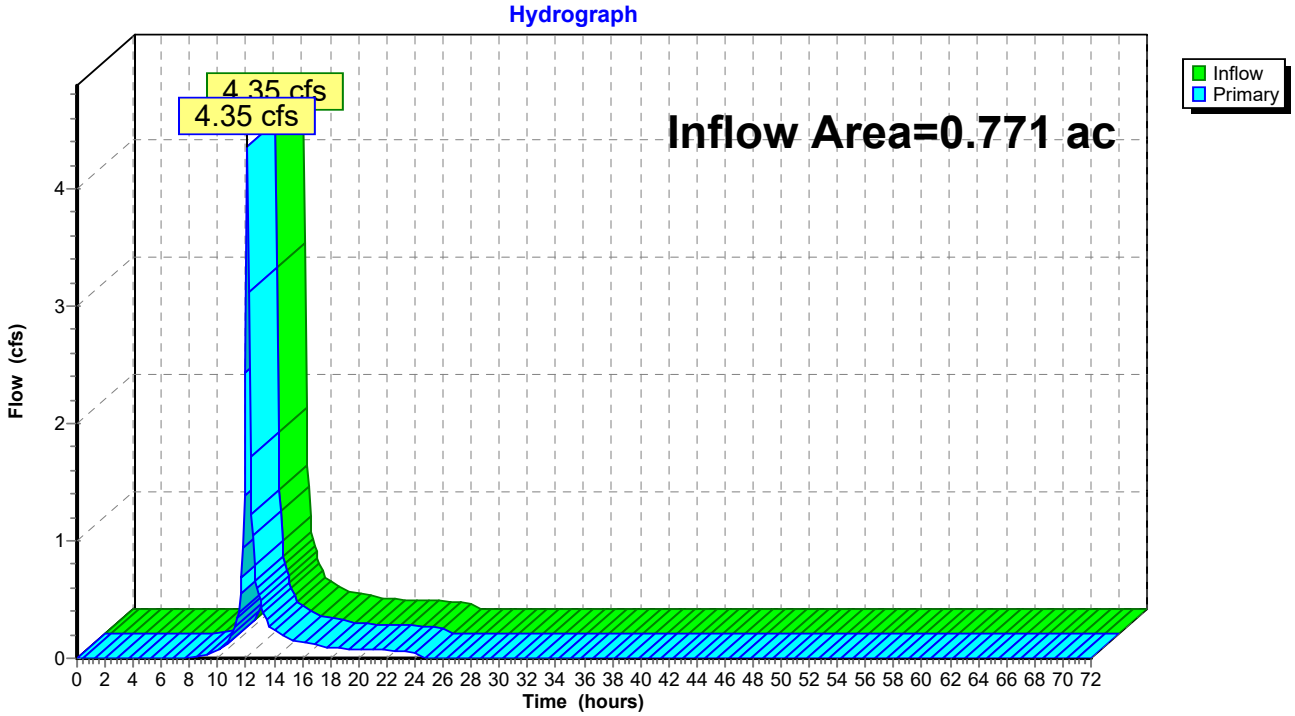


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-Year (NOAA) event
Inflow = 4.35 cfs @ 12.11 hrs, Volume= 0.306 af
Primary = 4.35 cfs @ 12.11 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

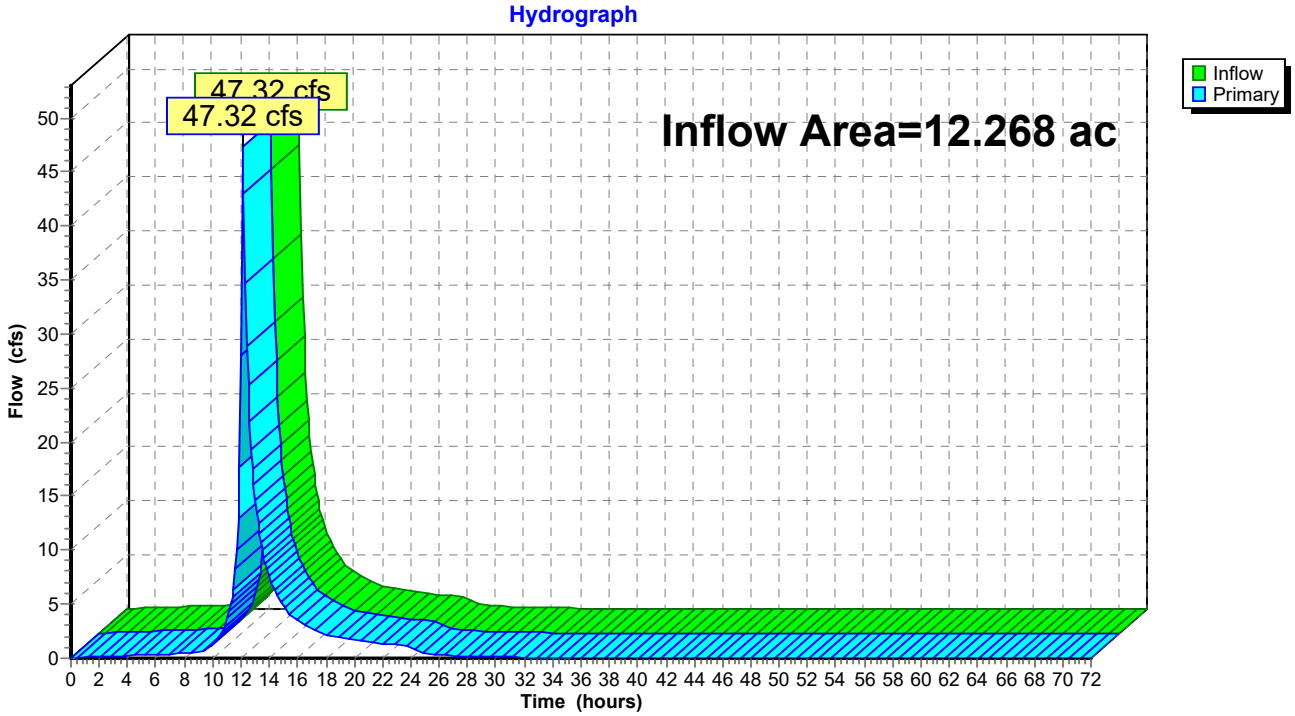


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 6.45" for 100-Year (NOAA) event
Inflow = 47.32 cfs @ 12.14 hrs, Volume= 6.592 af
Primary = 47.32 cfs @ 12.14 hrs, Volume= 6.592 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

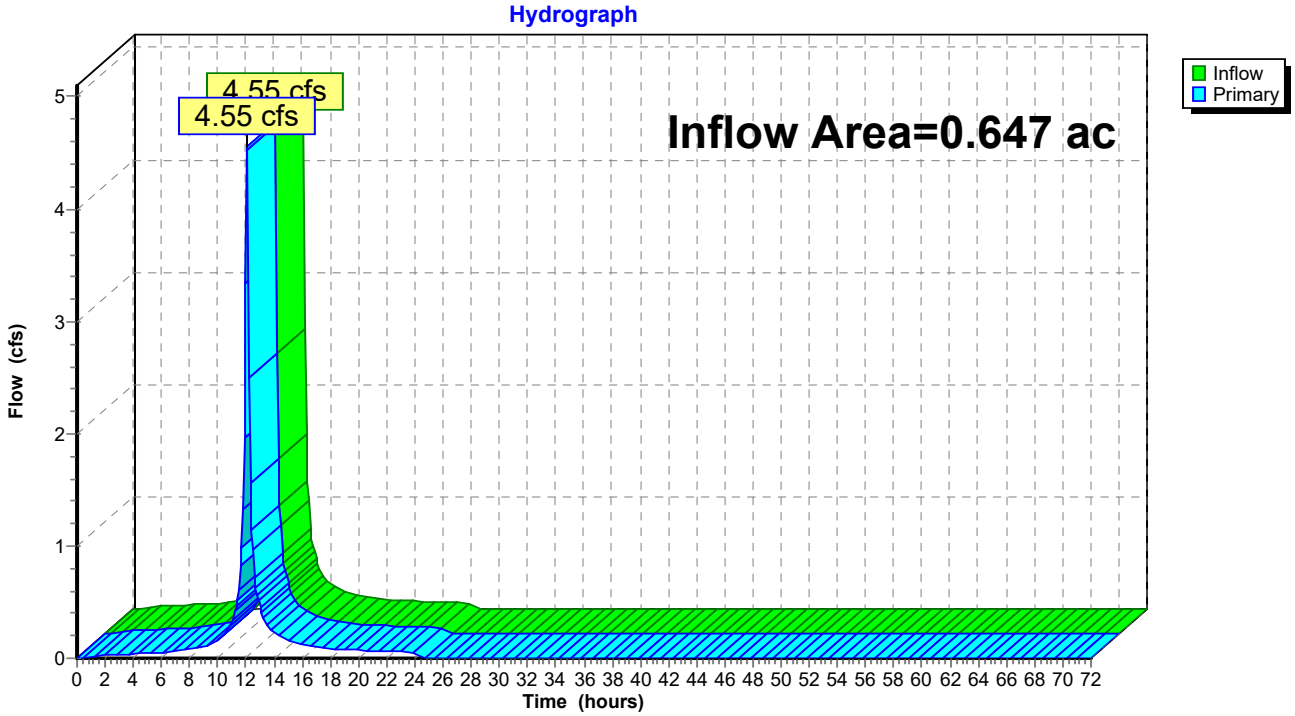


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 6.74" for 100-Year (NOAA) event
Inflow = 4.55 cfs @ 12.09 hrs, Volume= 0.364 af
Primary = 4.55 cfs @ 12.09 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

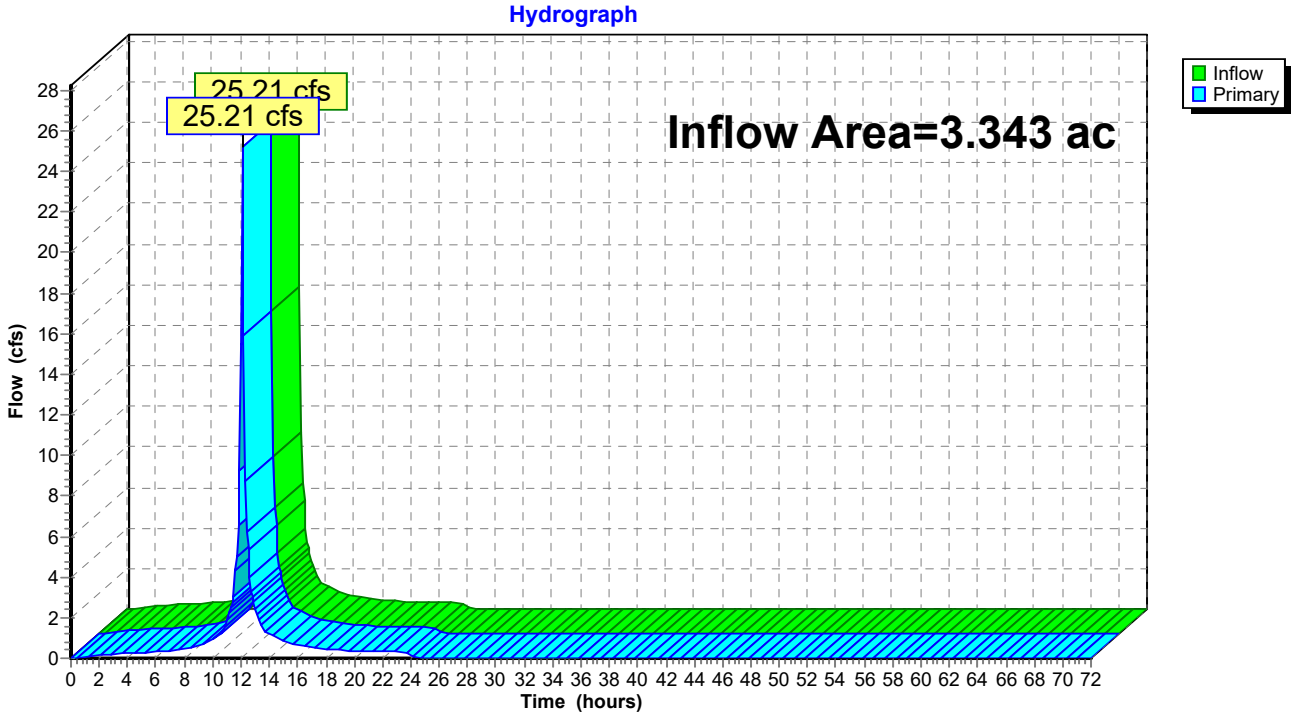


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 7.07" for 100-Year (NOAA) event
Inflow = 25.21 cfs @ 12.10 hrs, Volume= 1.970 af
Primary = 25.21 cfs @ 12.10 hrs, Volume= 1.970 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

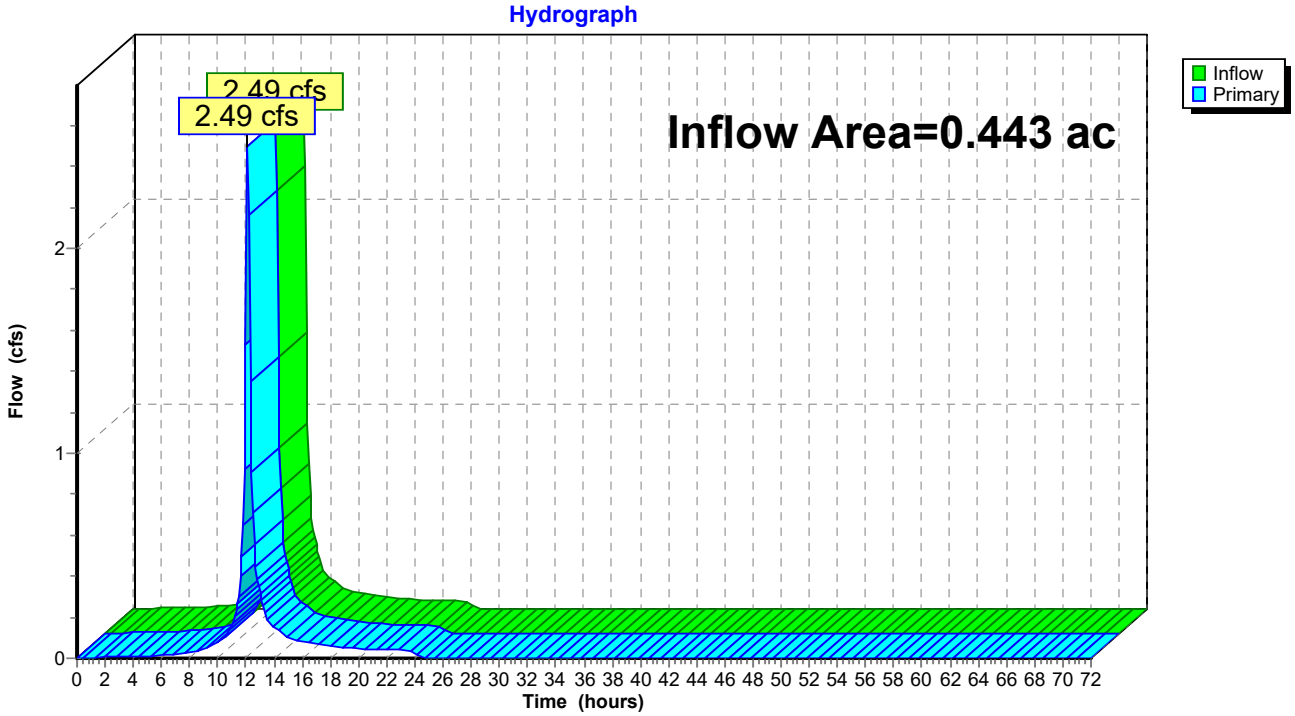


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 5.79" for 100-Year (NOAA) event
Inflow = 2.49 cfs @ 12.13 hrs, Volume= 0.214 af
Primary = 2.49 cfs @ 12.13 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

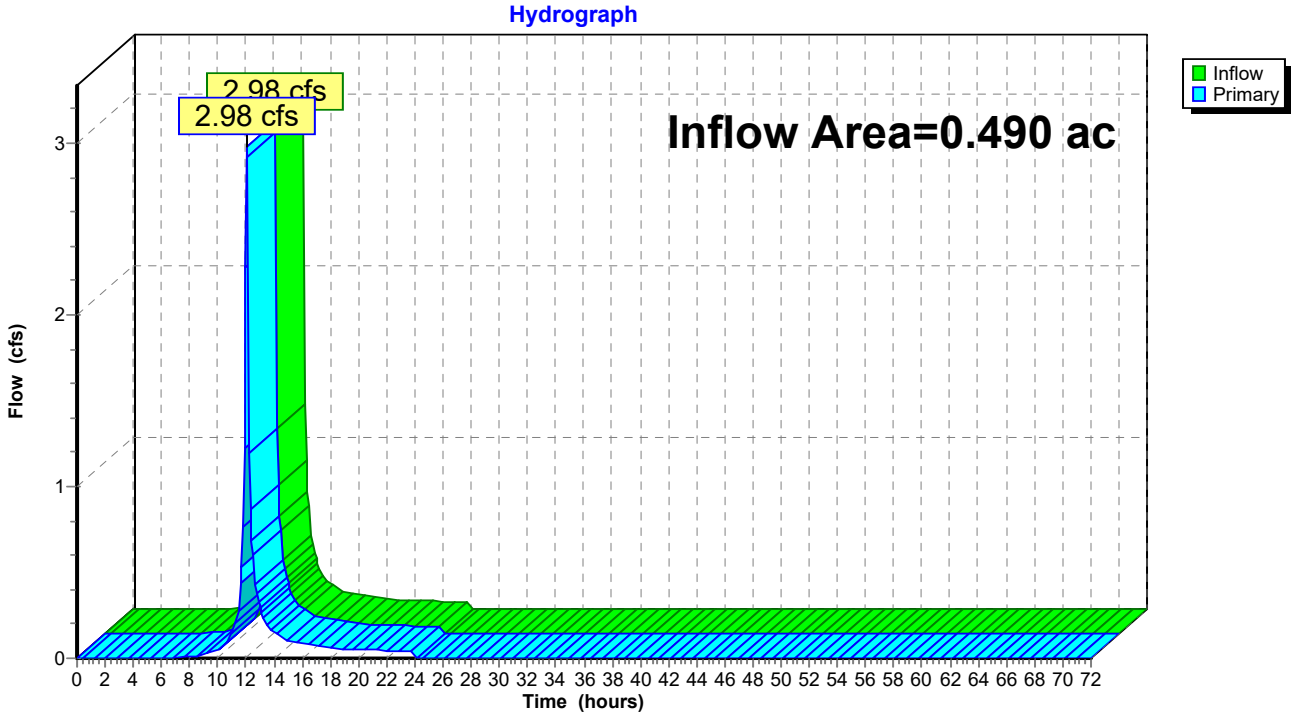


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 4.88" for 100-Year (NOAA) event
Inflow = 2.98 cfs @ 12.08 hrs, Volume= 0.199 af
Primary = 2.98 cfs @ 12.08 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min

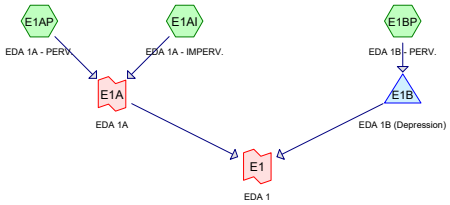
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

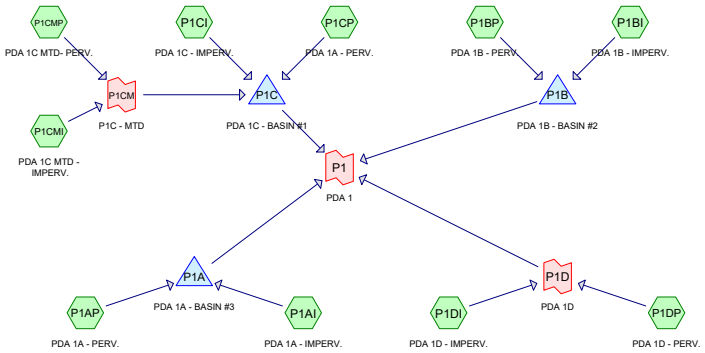
Link P3: PDA 3

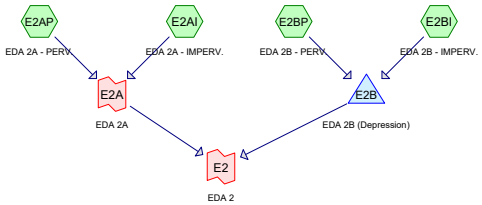


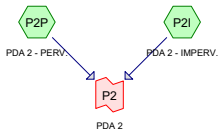
Current Adjusted Precipitation Depths

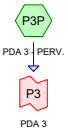
PRE- vs. POST-DEVELOPMENT HYDROGRAPHS

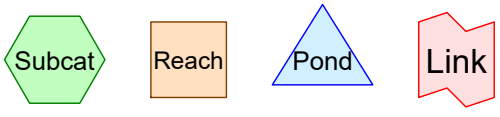












Routing Diagram for EX-PR
Prepared by Bohler Engineering NJ, LLC

Summary for Subcatchment E1AI: EDA 1A - IMPERV.

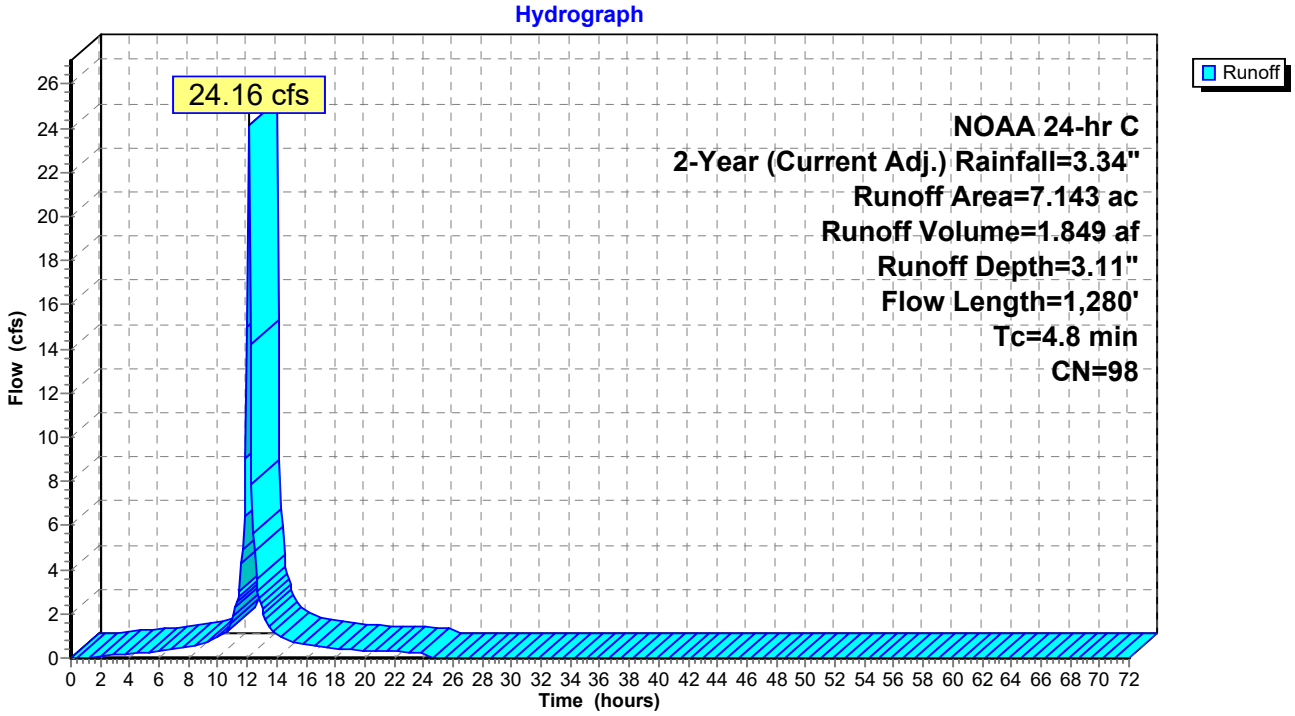
Runoff = 24.16 cfs @ 12.10 hrs, Volume= 1.849 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

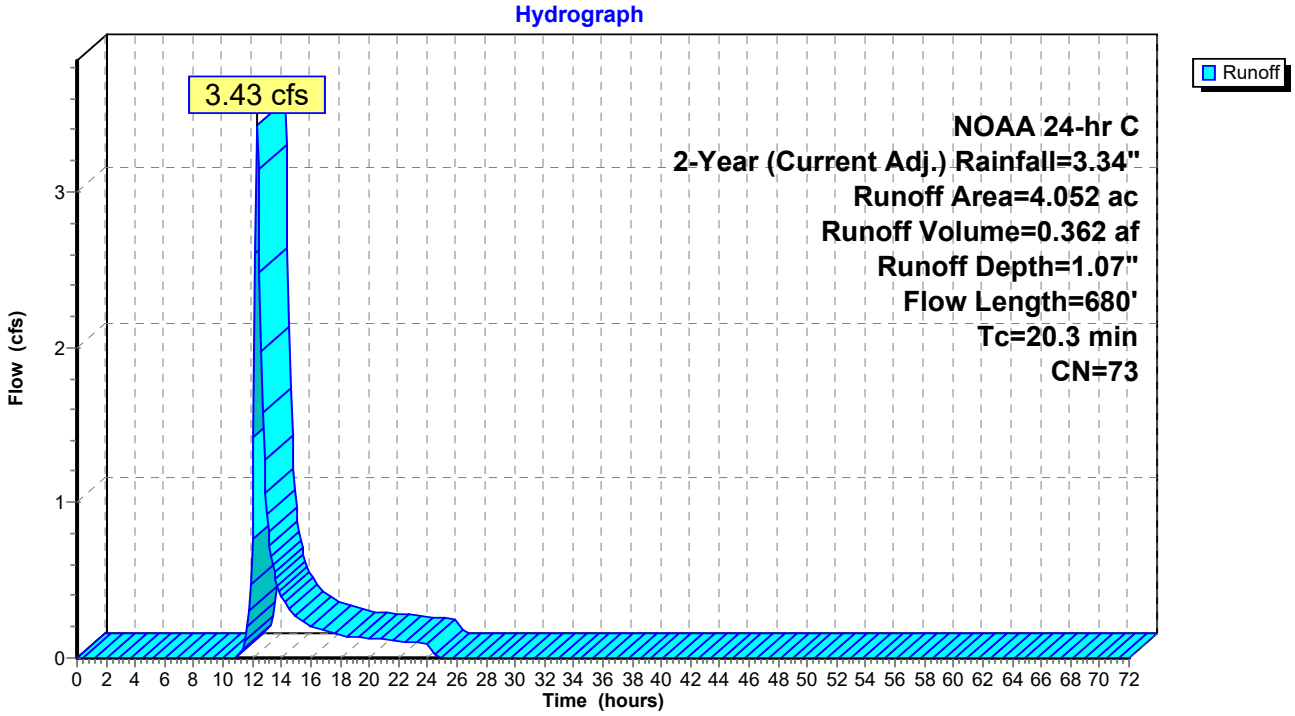
Runoff = 3.43 cfs @ 12.33 hrs, Volume= 0.362 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

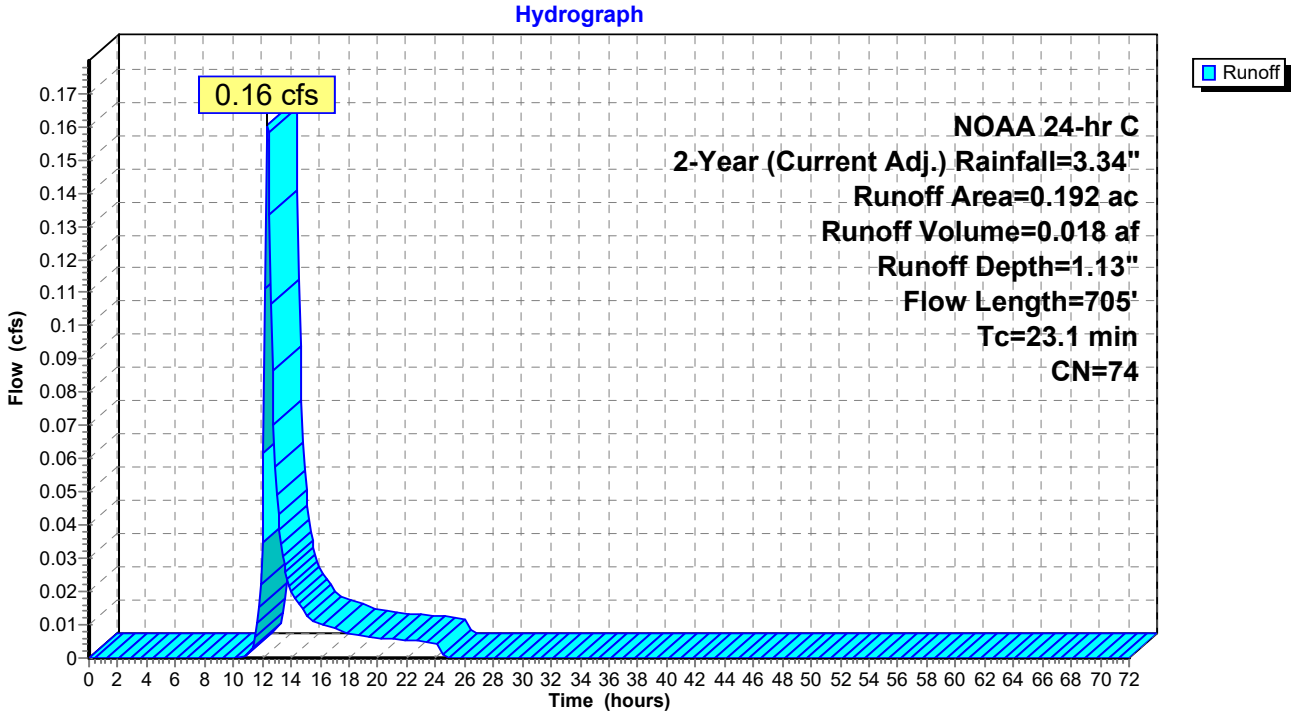
Runoff = 0.16 cfs @ 12.36 hrs, Volume= 0.018 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

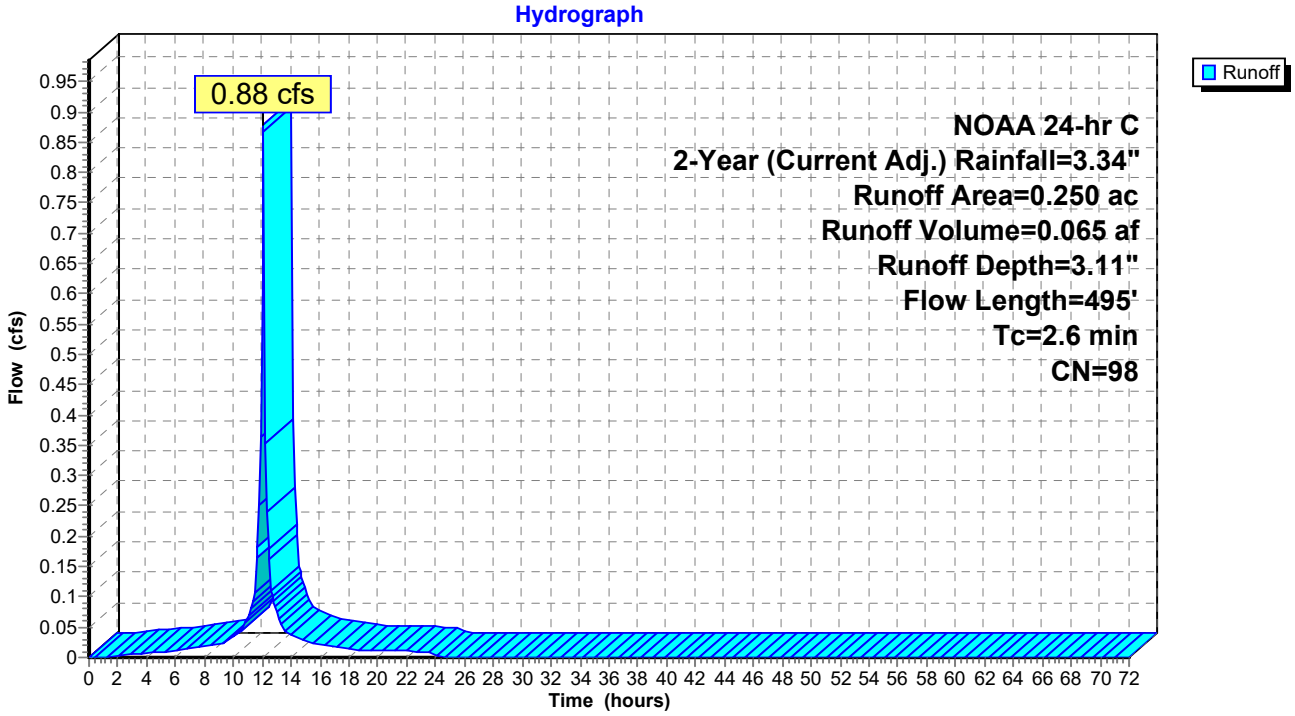
Runoff = 0.88 cfs @ 12.08 hrs, Volume= 0.065 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

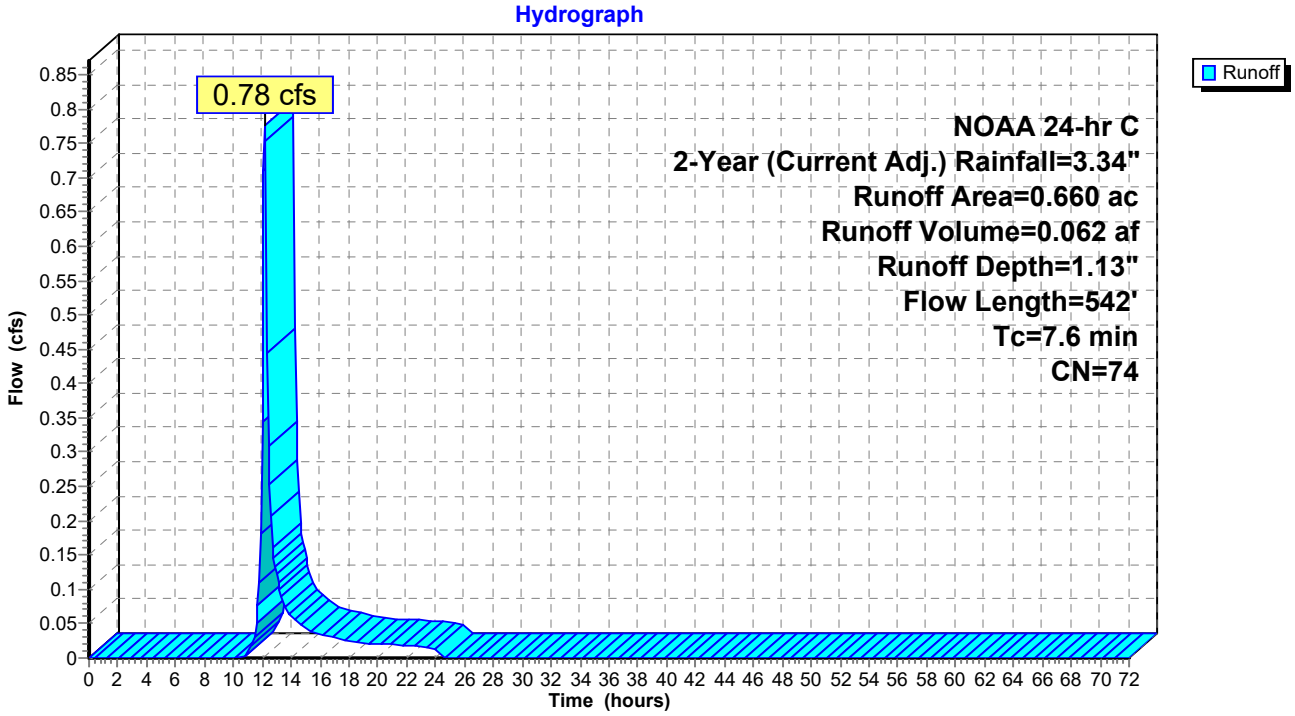
Runoff = 0.78 cfs @ 12.16 hrs, Volume= 0.062 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

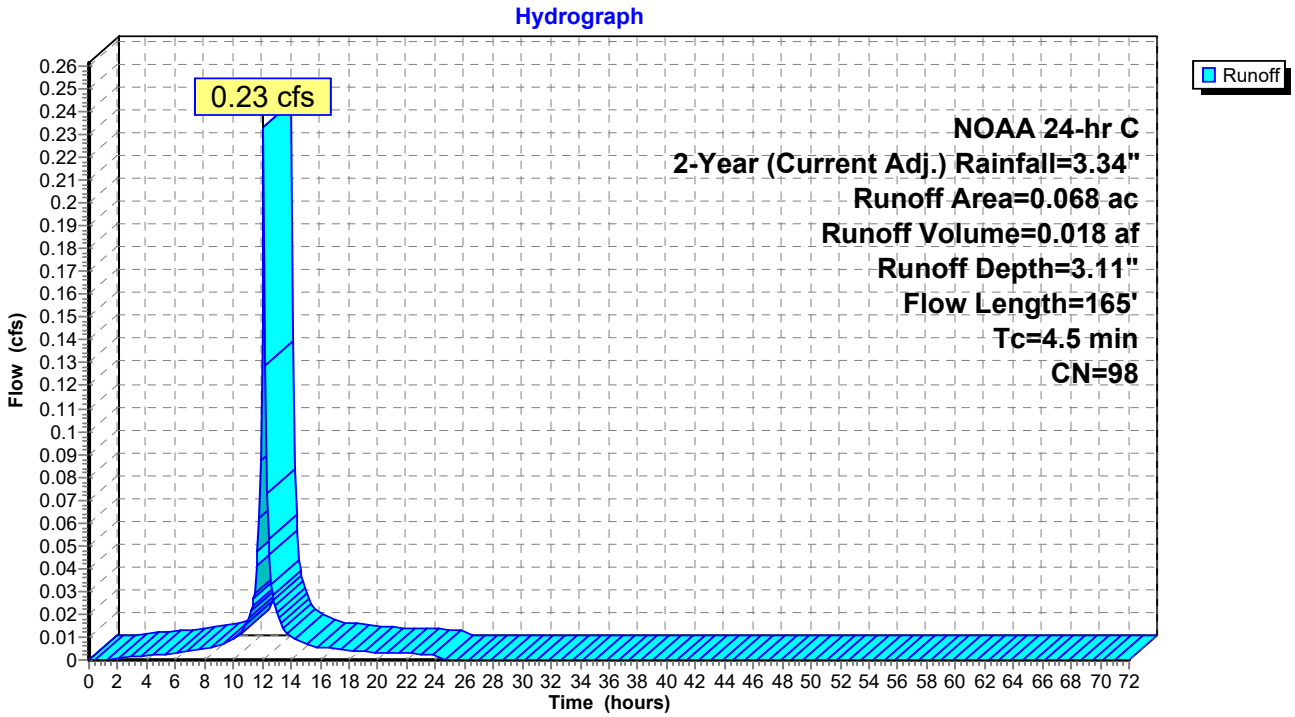
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.018 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

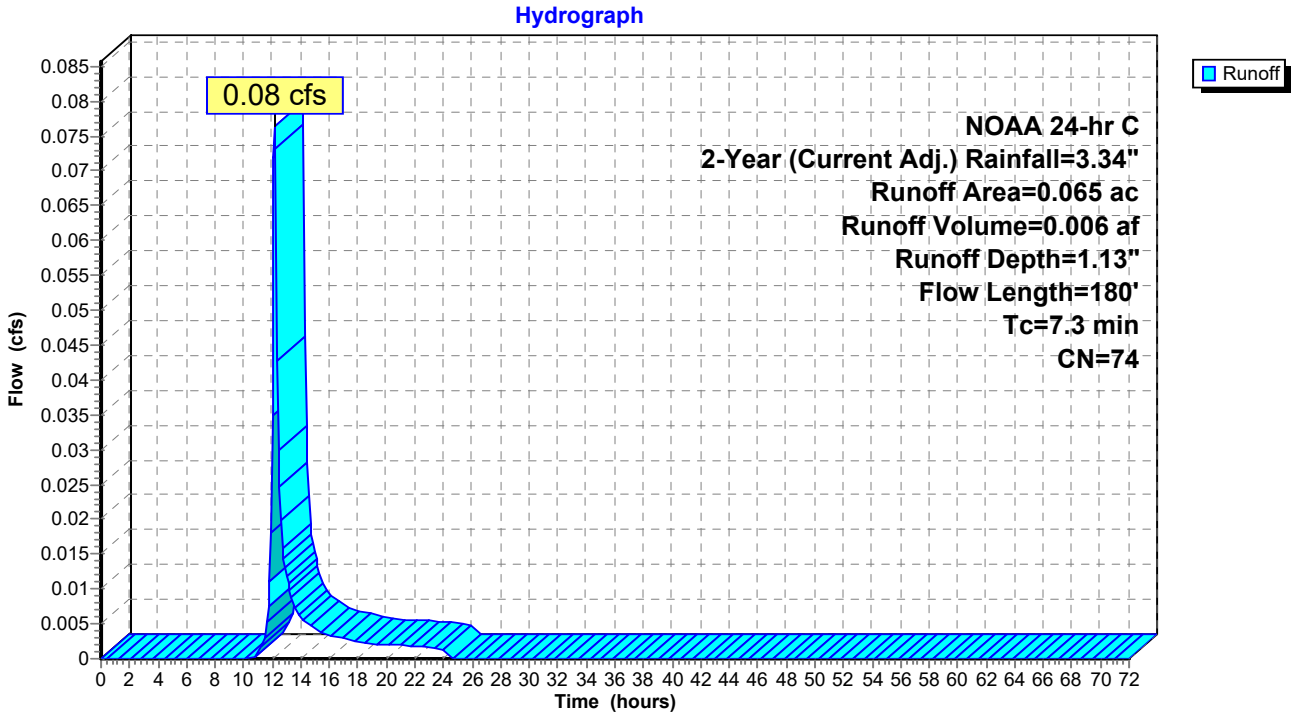
Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.006 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

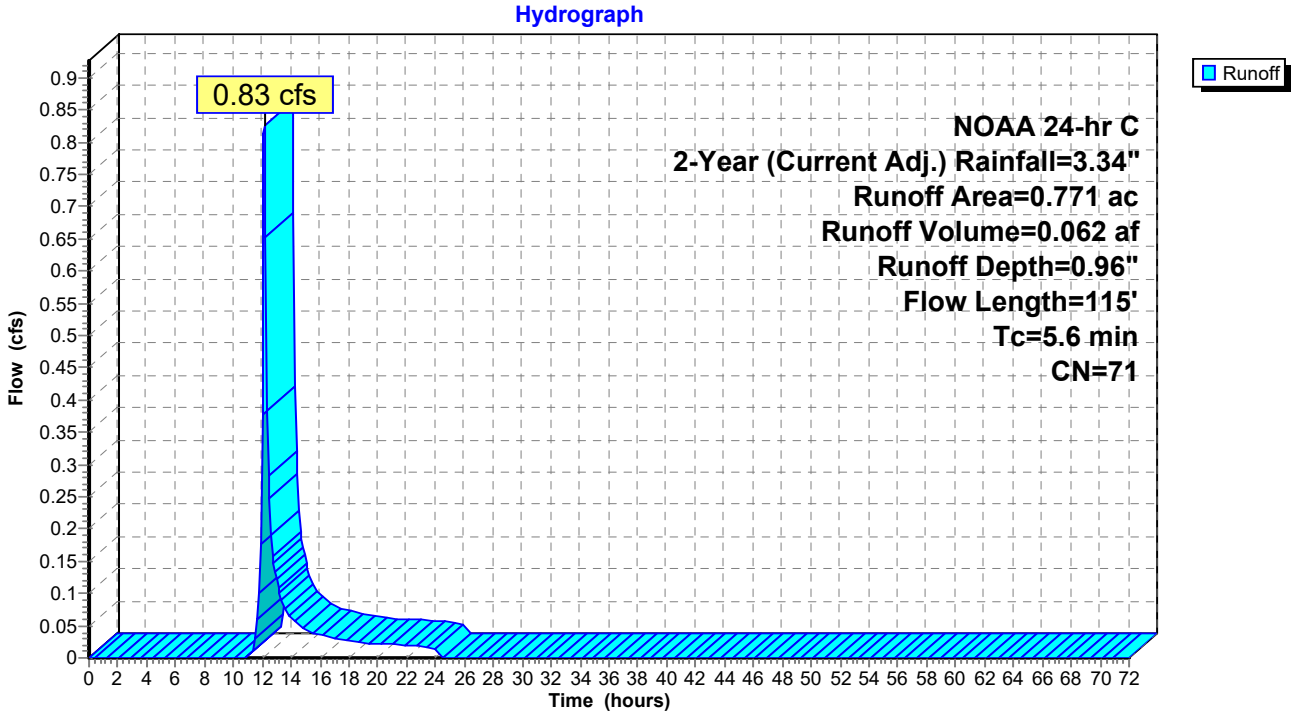
Runoff = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

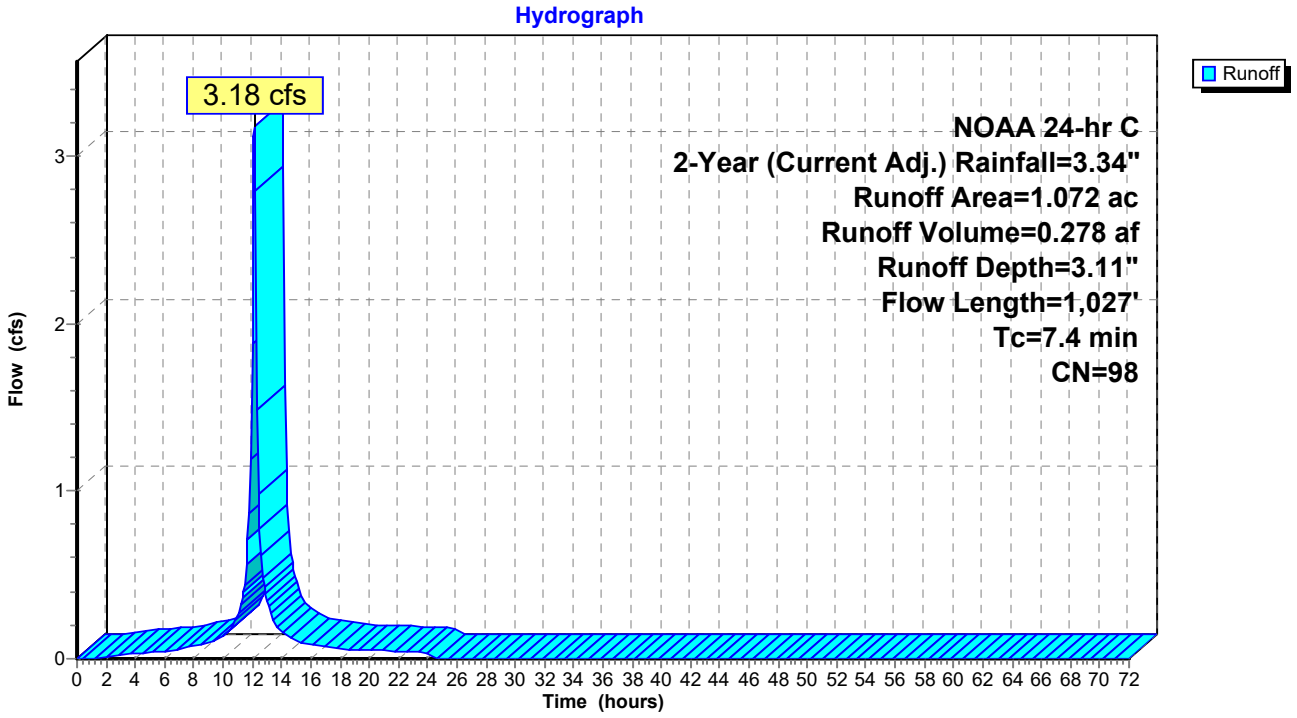
Runoff = 3.18 cfs @ 12.13 hrs, Volume= 0.278 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

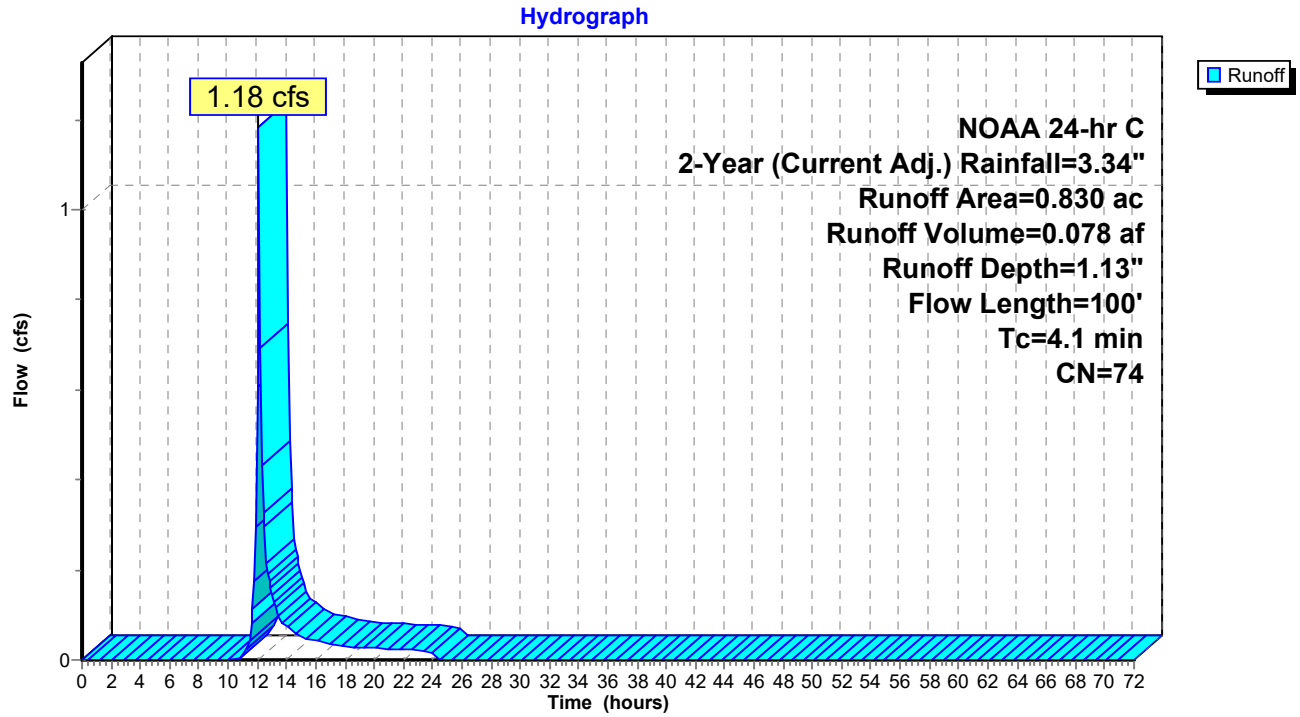
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.078 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

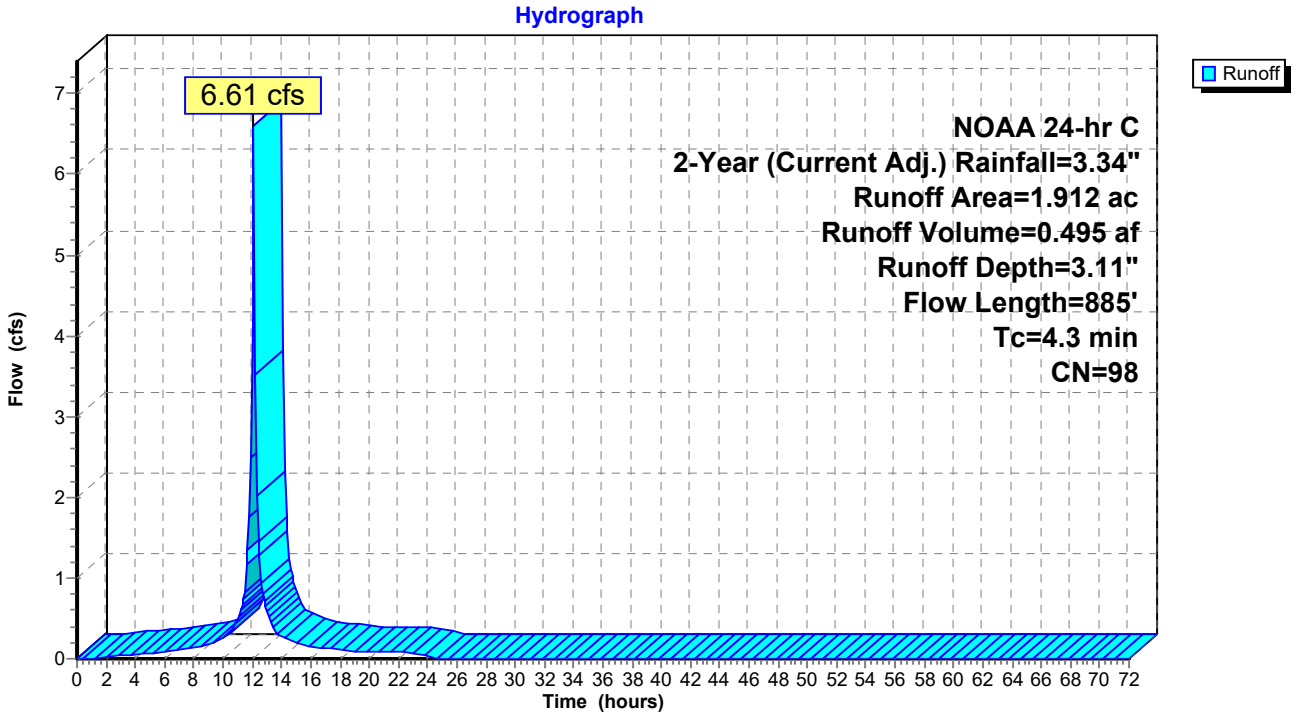
Runoff = 6.61 cfs @ 12.09 hrs, Volume= 0.495 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

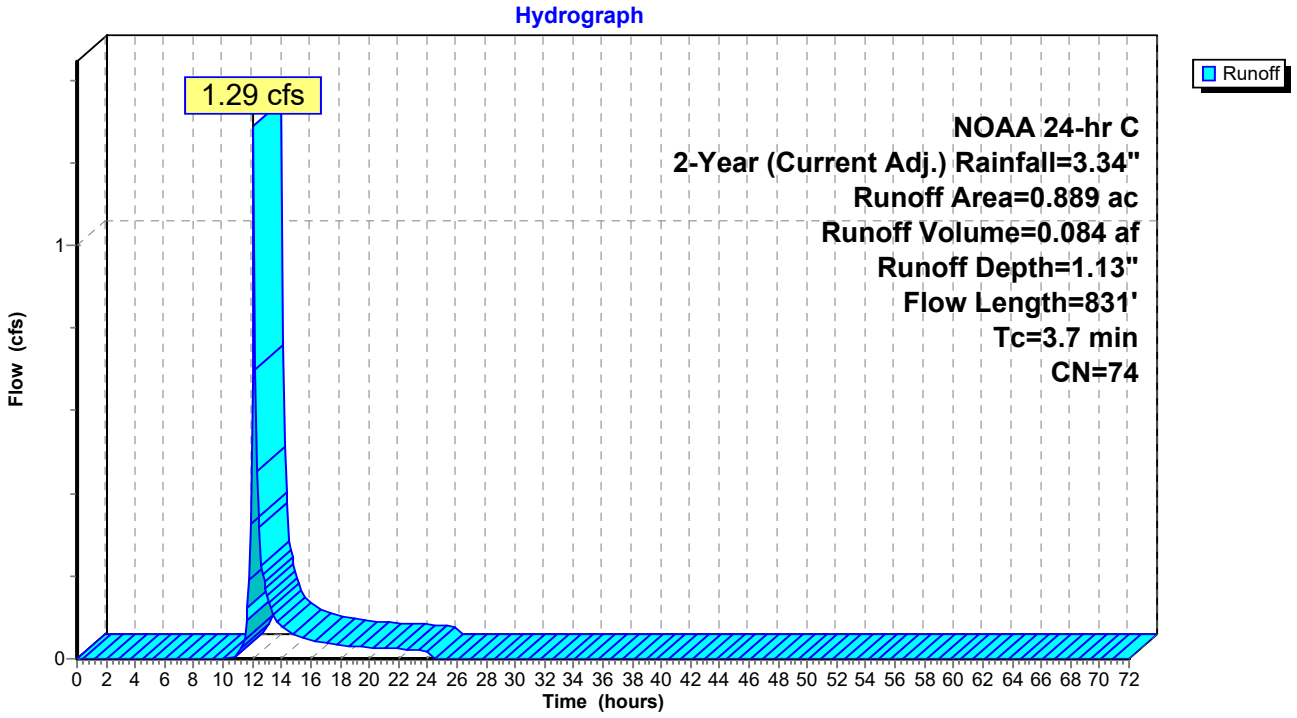
Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.084 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

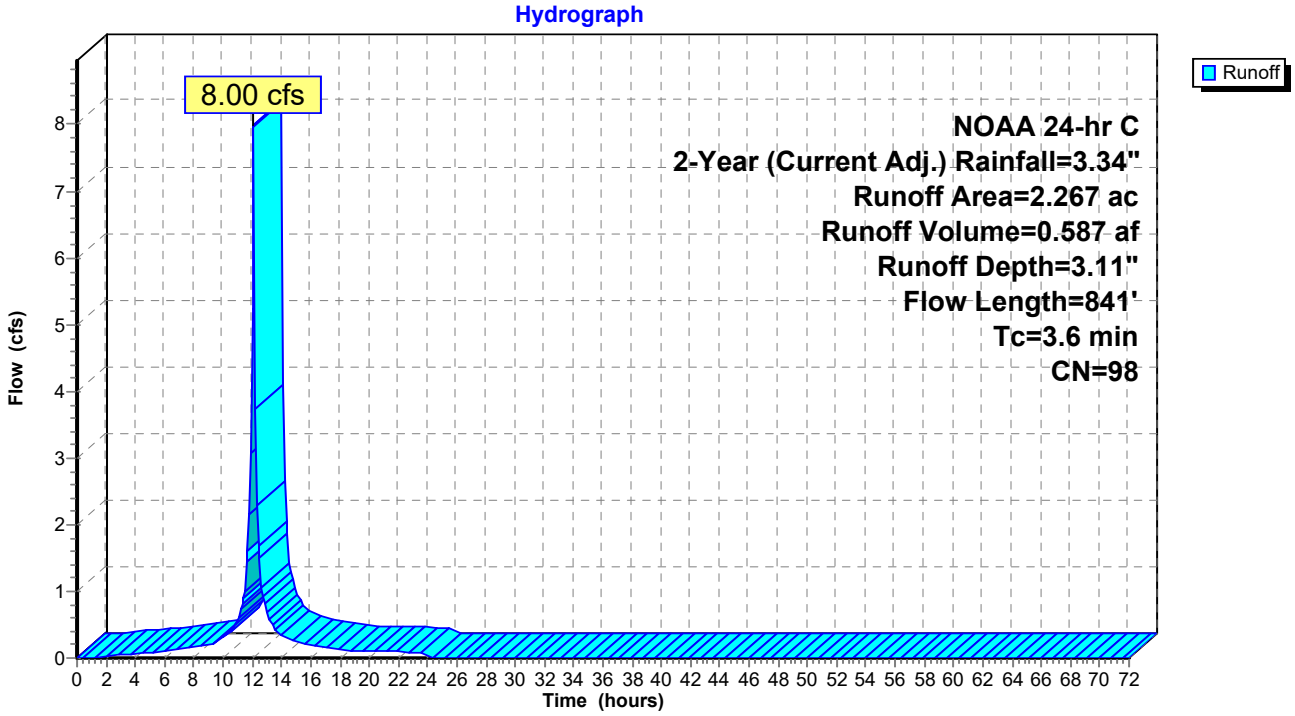
Runoff = 8.00 cfs @ 12.09 hrs, Volume= 0.587 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

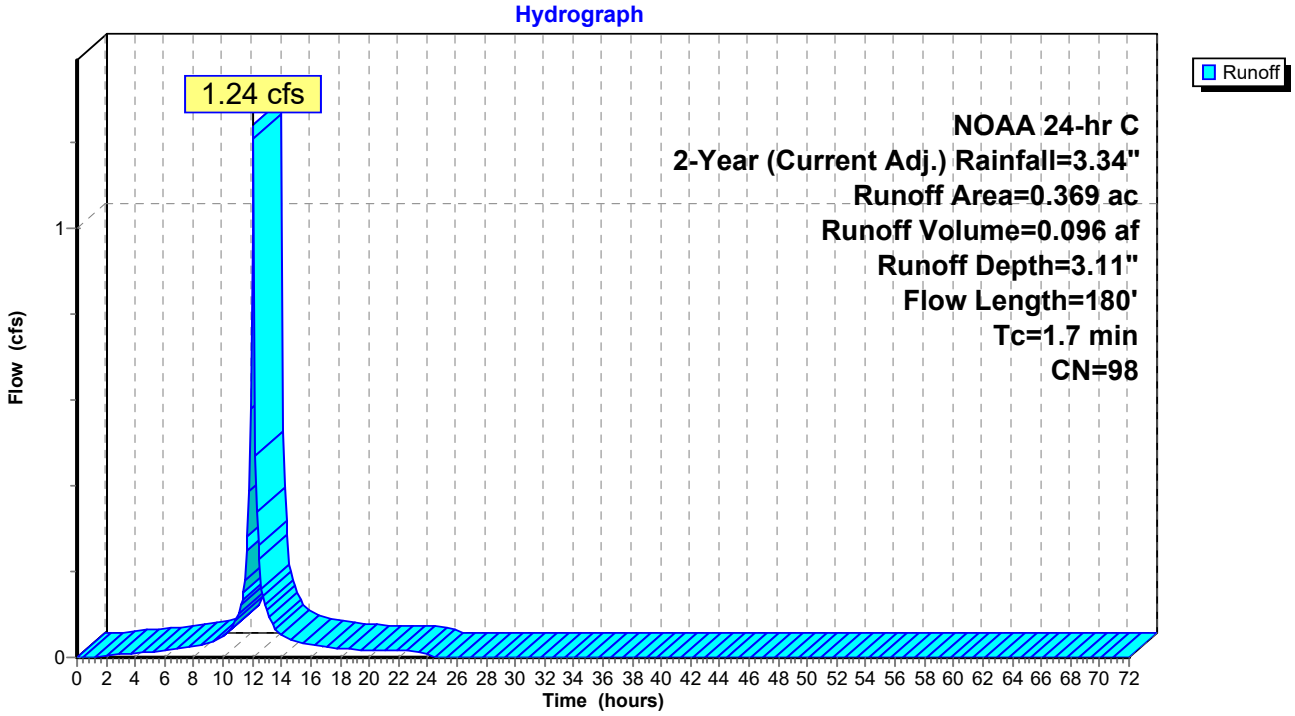
Runoff = 1.24 cfs @ 12.07 hrs, Volume= 0.096 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

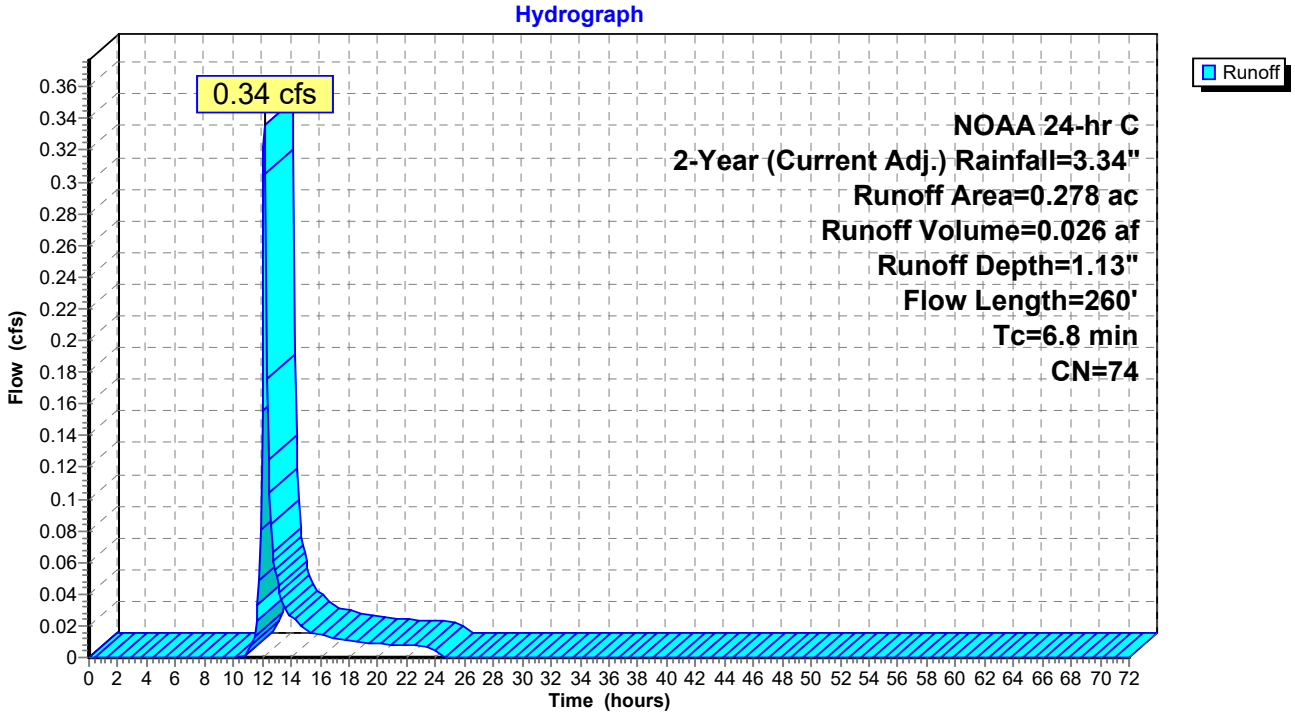
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 0.026 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

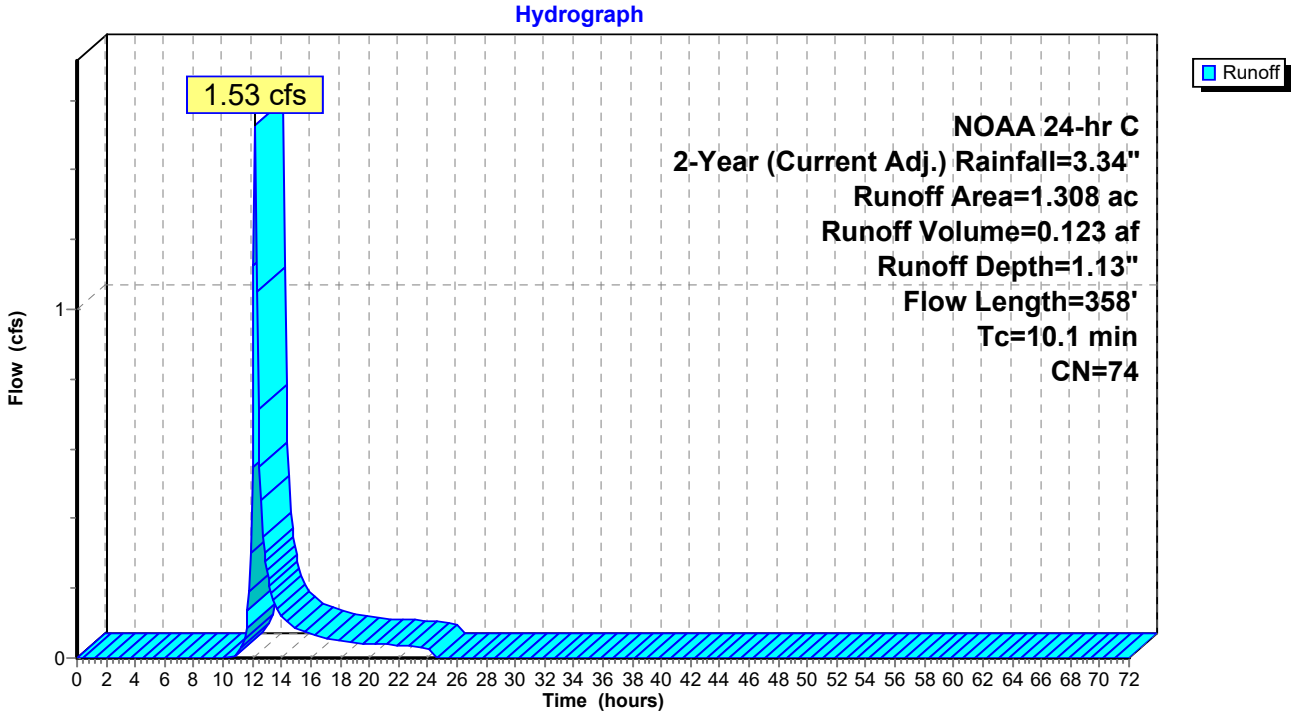
Runoff = 1.53 cfs @ 12.20 hrs, Volume= 0.123 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

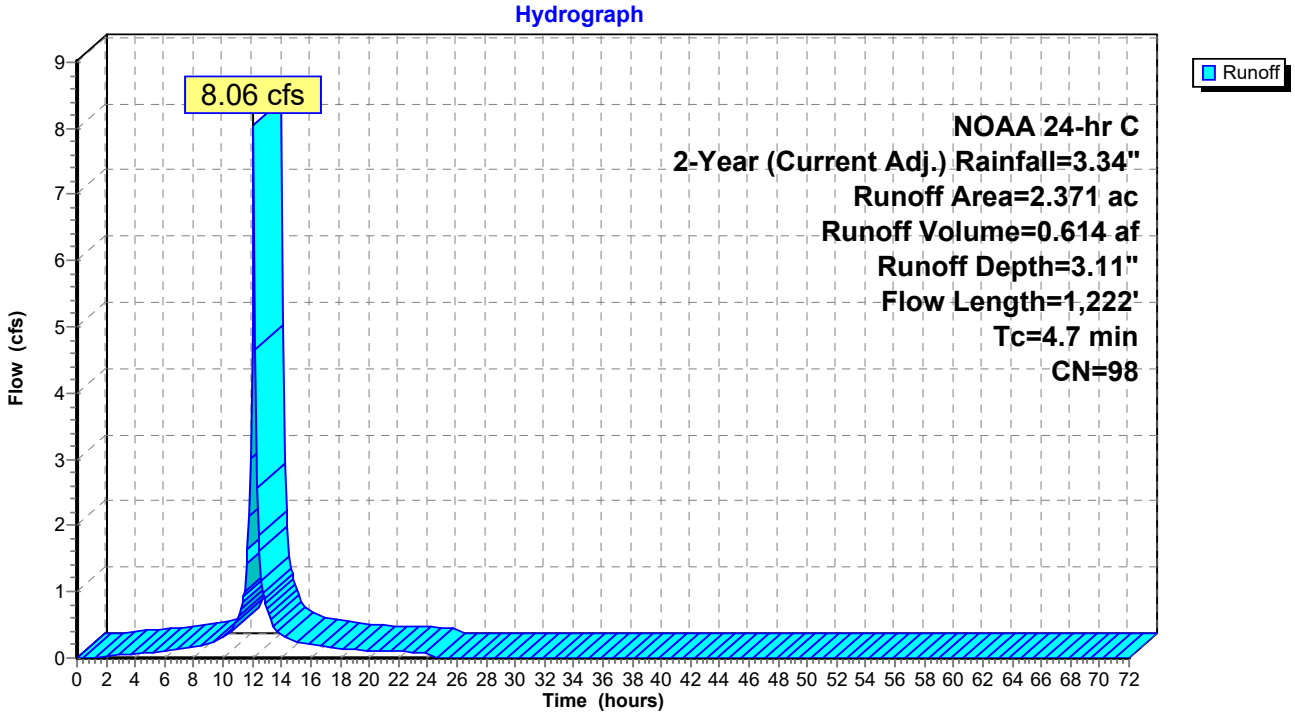
Runoff = 8.06 cfs @ 12.10 hrs, Volume= 0.614 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

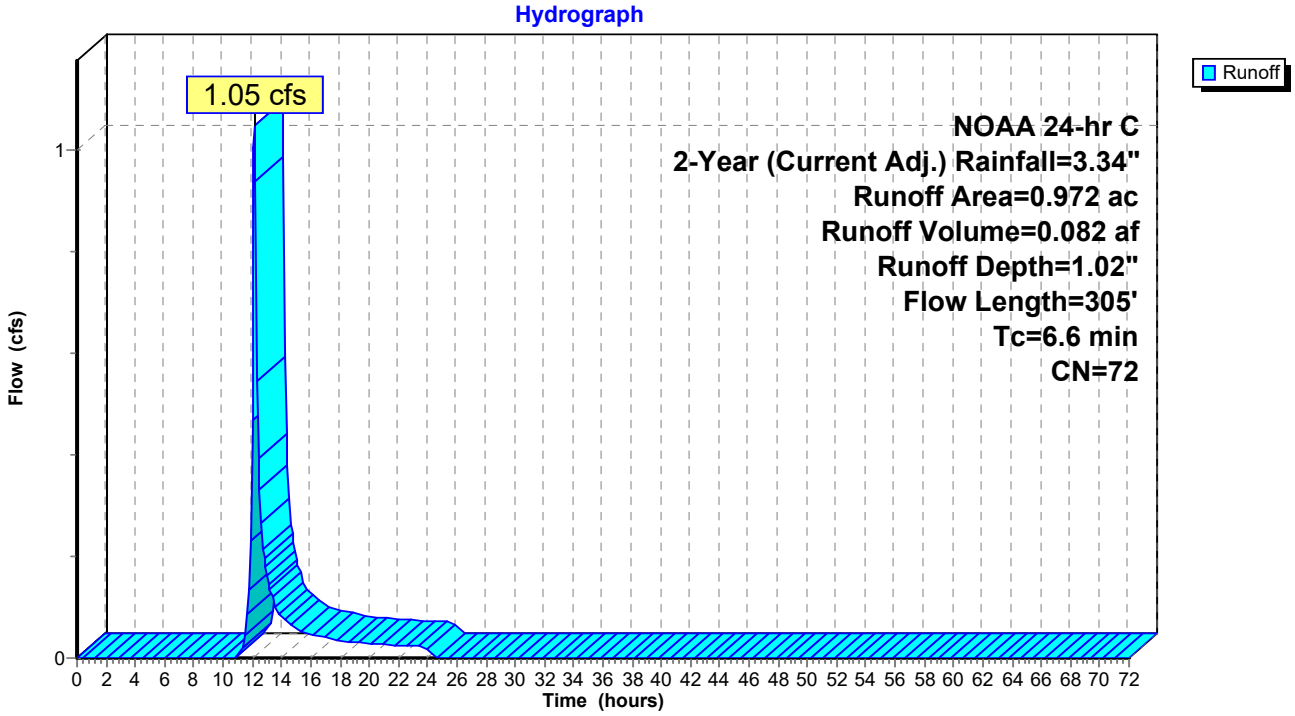
Runoff = 1.05 cfs @ 12.14 hrs, Volume= 0.082 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

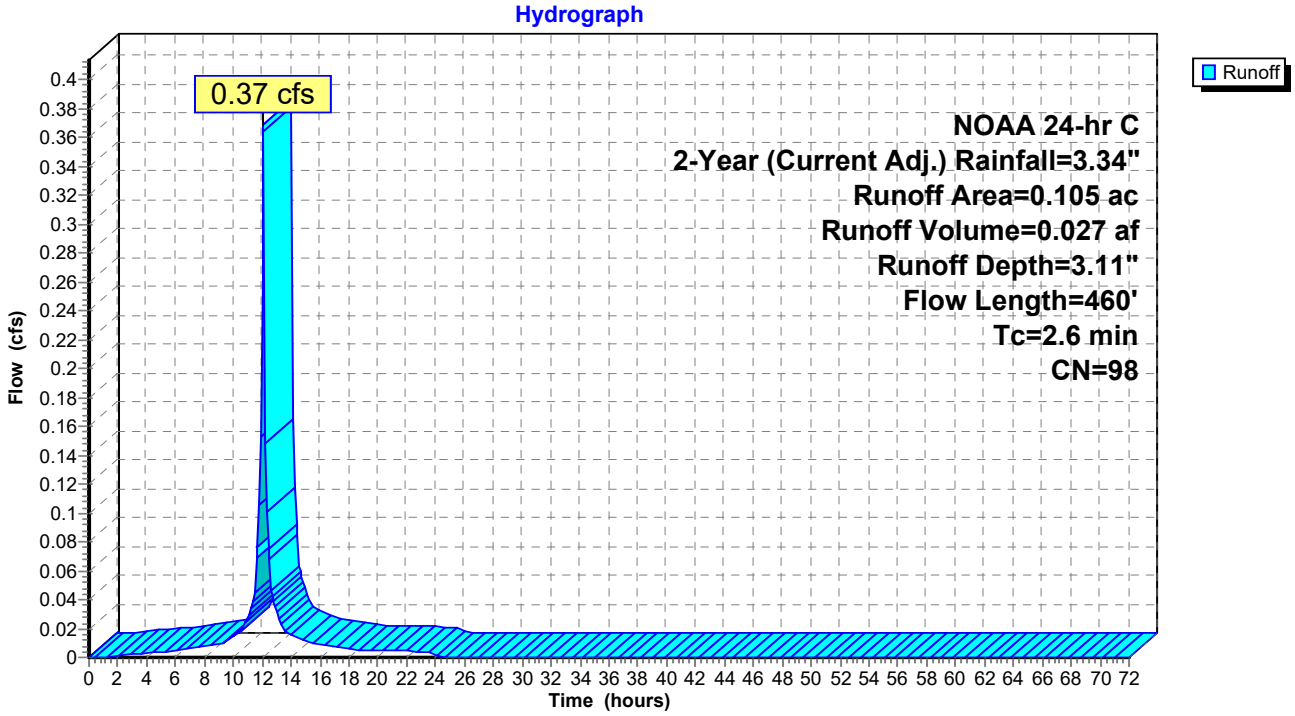
Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

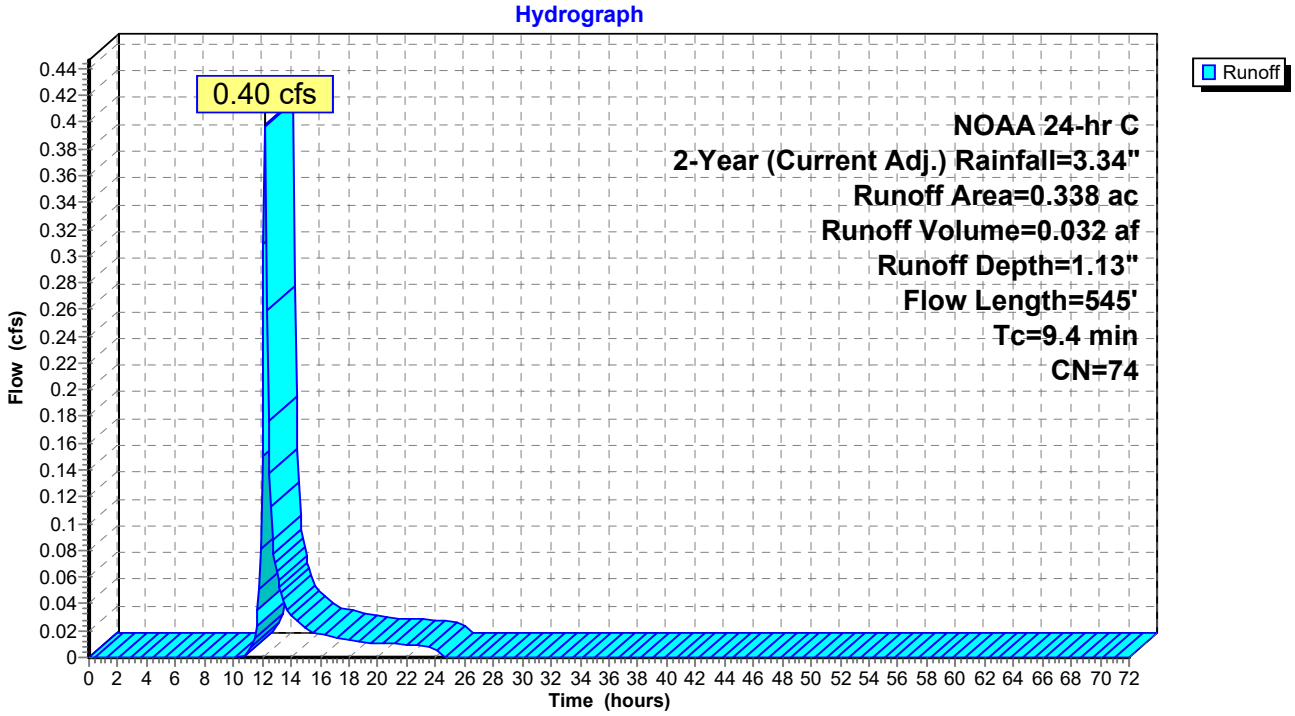
Runoff = 0.40 cfs @ 12.19 hrs, Volume= 0.032 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

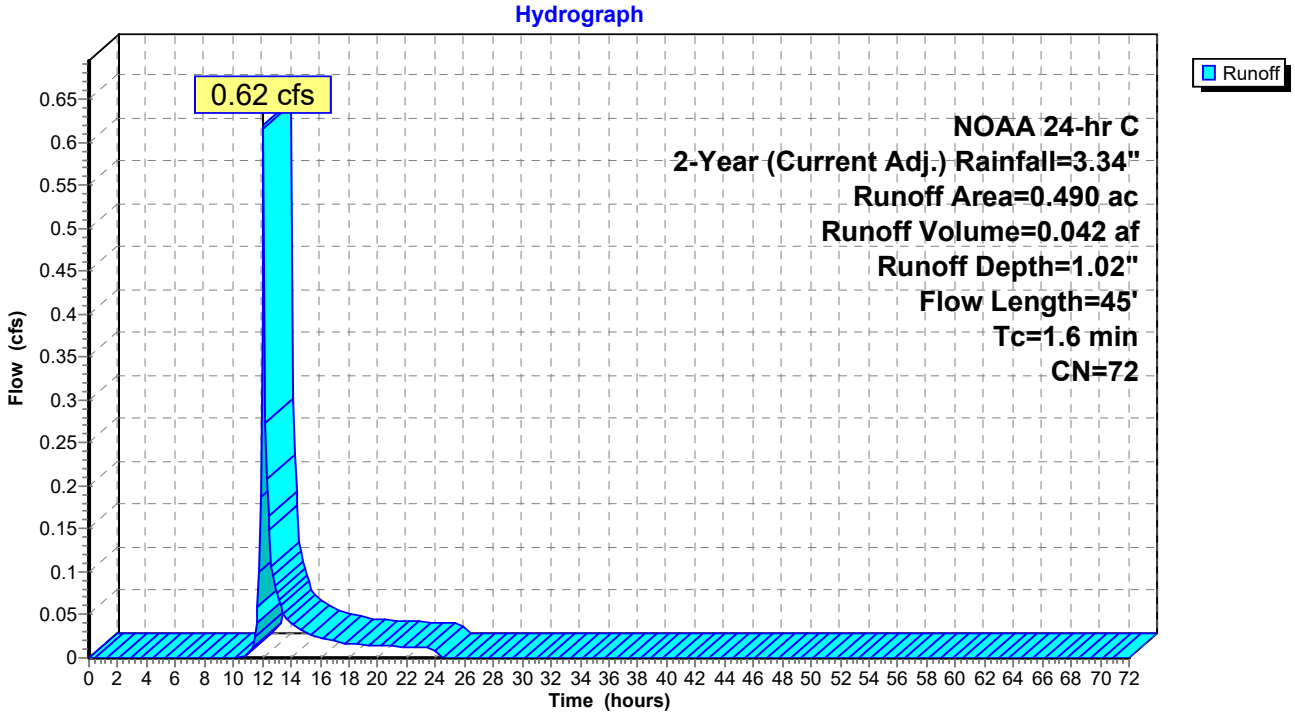
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Current Adj.) Rainfall=3.34"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 1.13" for 2-Year (Current Adj.) event
Inflow = 0.16 cfs @ 12.36 hrs, Volume= 0.018 af
Outflow = 0.12 cfs @ 12.62 hrs, Volume= 0.013 af, Atten= 28%, Lag= 15.7 min
Primary = 0.12 cfs @ 12.62 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.08' @ 12.62 hrs Surf.Area= 1,656 sf Storage= 239 cf

Plug-Flow detention time= 168.6 min calculated for 0.013 af (73% of inflow)
Center-of-Mass det. time= 65.9 min (944.7 - 878.9)

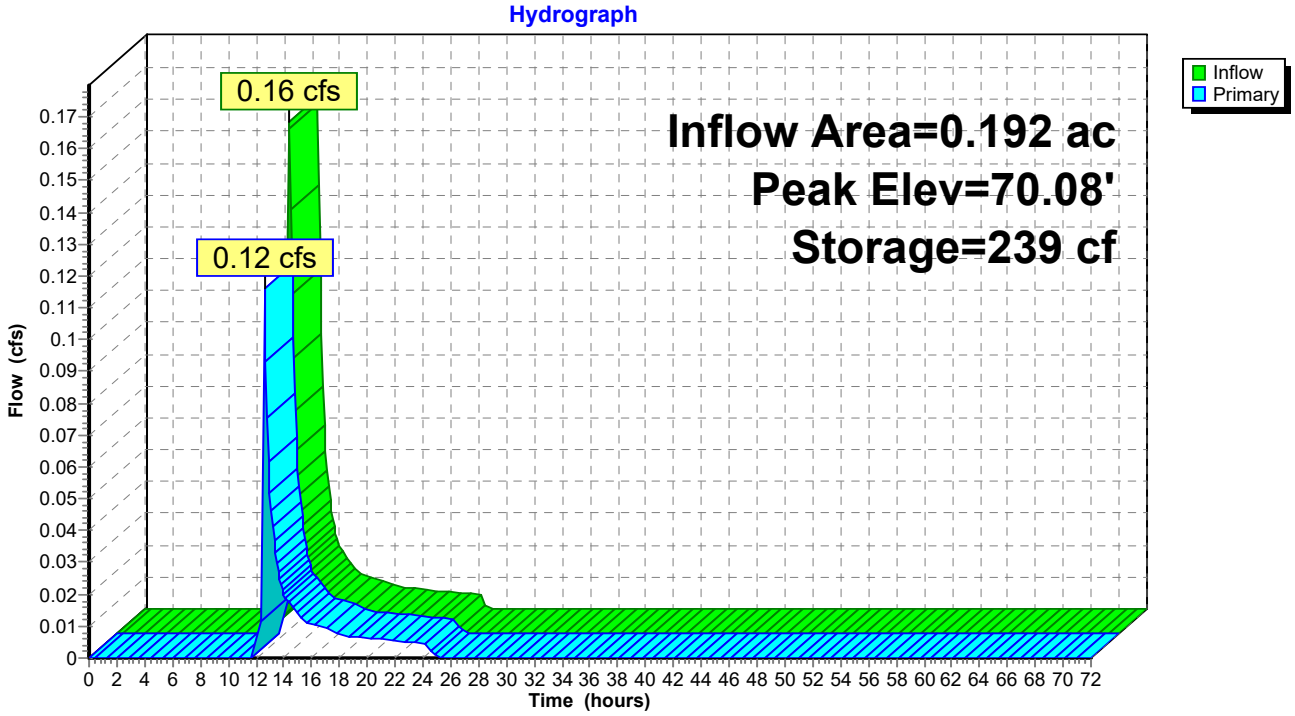
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.11 cfs @ 12.62 hrs HW=70.08' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.11 cfs @ 0.16 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 2.14" for 2-Year (Current Adj.) event
Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.024 af
Outflow = 0.30 cfs @ 12.11 hrs, Volume= 0.022 af, Atten= 2%, Lag= 0.1 min
Primary = 0.30 cfs @ 12.11 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.14' @ 12.11 hrs Surf.Area= 329 sf Storage= 76 cf

Plug-Flow detention time= 63.6 min calculated for 0.022 af (94% of inflow)
Center-of-Mass det. time= 30.2 min (813.5 - 783.4)

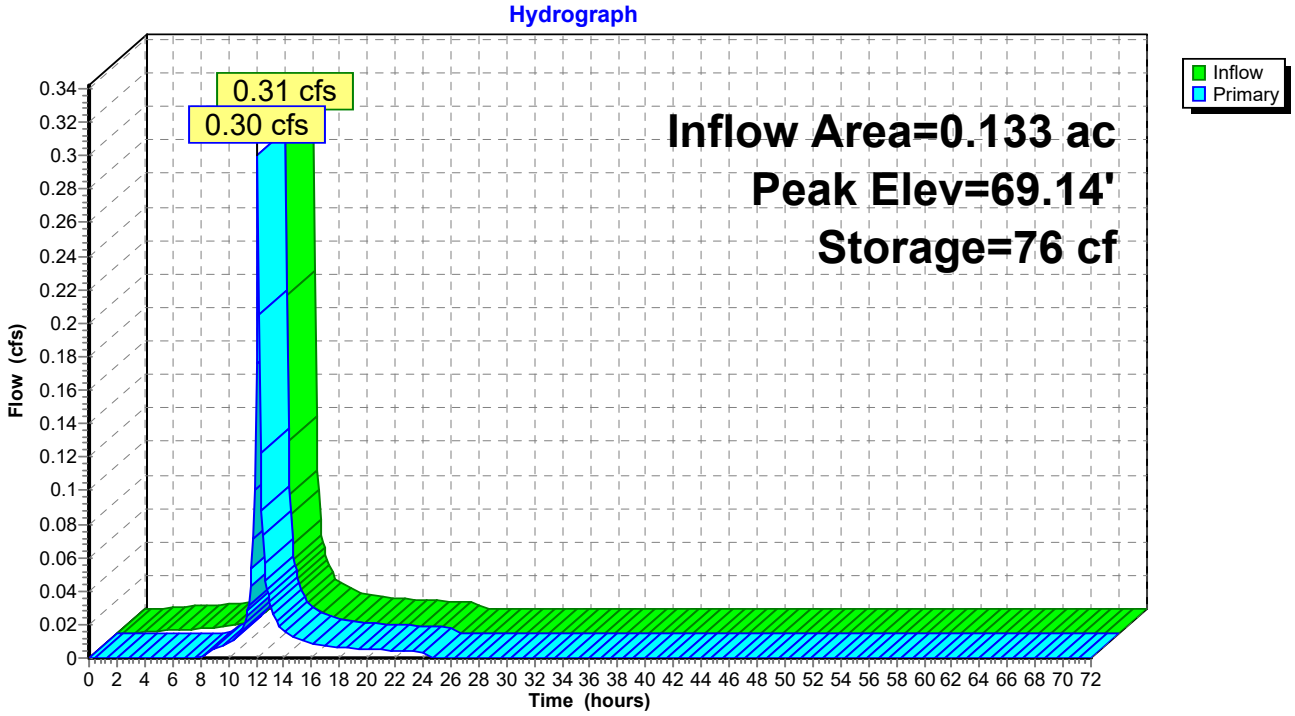
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.29 cfs @ 12.11 hrs HW=69.14' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.29 cfs @ 0.29 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 2.24" for 2-Year (Current Adj.) event
Inflow = 4.35 cfs @ 12.12 hrs, Volume= 0.356 af
Outflow = 2.43 cfs @ 12.29 hrs, Volume= 0.255 af, Atten= 44%, Lag= 10.1 min
Primary = 2.43 cfs @ 12.29 hrs, Volume= 0.255 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.00' @ 12.29 hrs Surf.Area= 7,304 sf Storage= 6,766 cf

Plug-Flow detention time= 204.9 min calculated for 0.255 af (72% of inflow)
Center-of-Mass det. time= 105.0 min (885.7 - 780.6)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

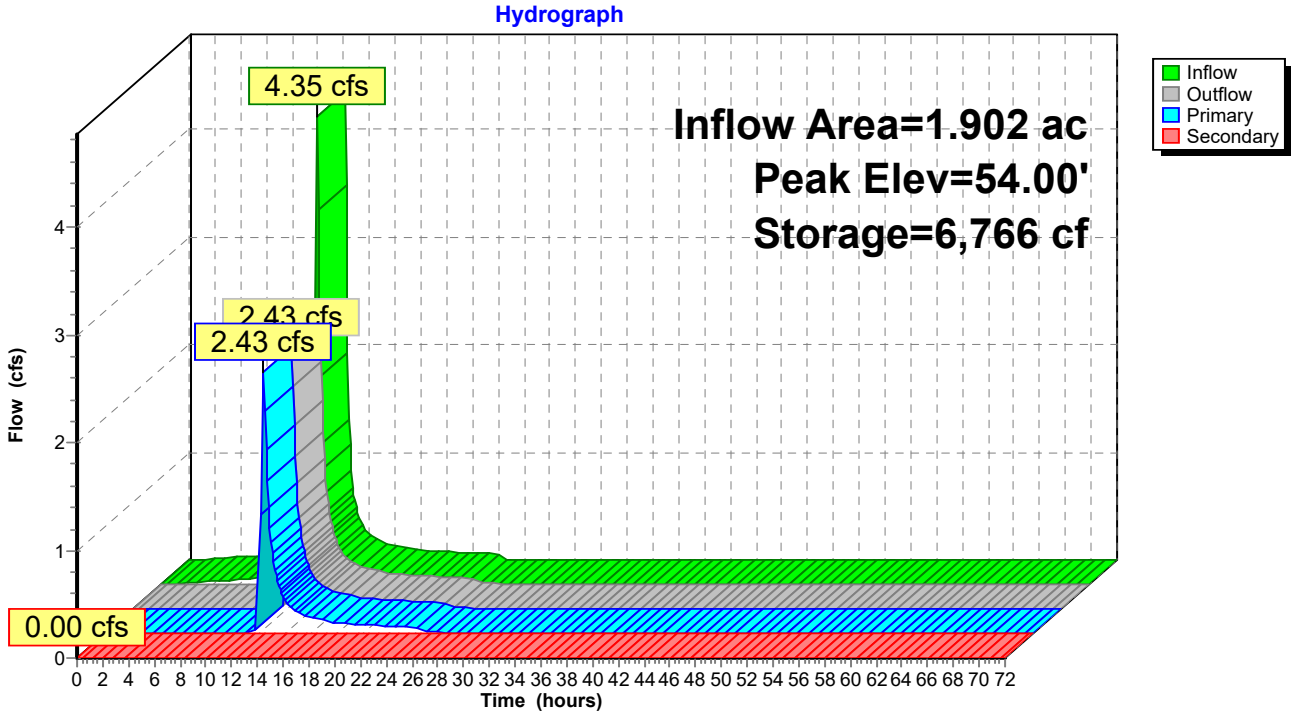
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.39 cfs @ 12.29 hrs HW=54.00' (Free Discharge)
└**1=Culvert** (Passes 2.39 cfs of 29.66 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 2.39 cfs @ 1.71 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 2.48" for 2-Year (Current Adj.) event
Inflow = 7.89 cfs @ 12.10 hrs, Volume= 0.579 af
Outflow = 1.02 cfs @ 12.69 hrs, Volume= 0.400 af, Atten= 87%, Lag= 35.9 min
Primary = 1.02 cfs @ 12.69 hrs, Volume= 0.400 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.03' @ 12.69 hrs Surf.Area= 15,616 sf Storage= 15,068 cf

Plug-Flow detention time= 367.6 min calculated for 0.400 af (69% of inflow)
Center-of-Mass det. time= 266.7 min (1,037.0 - 770.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

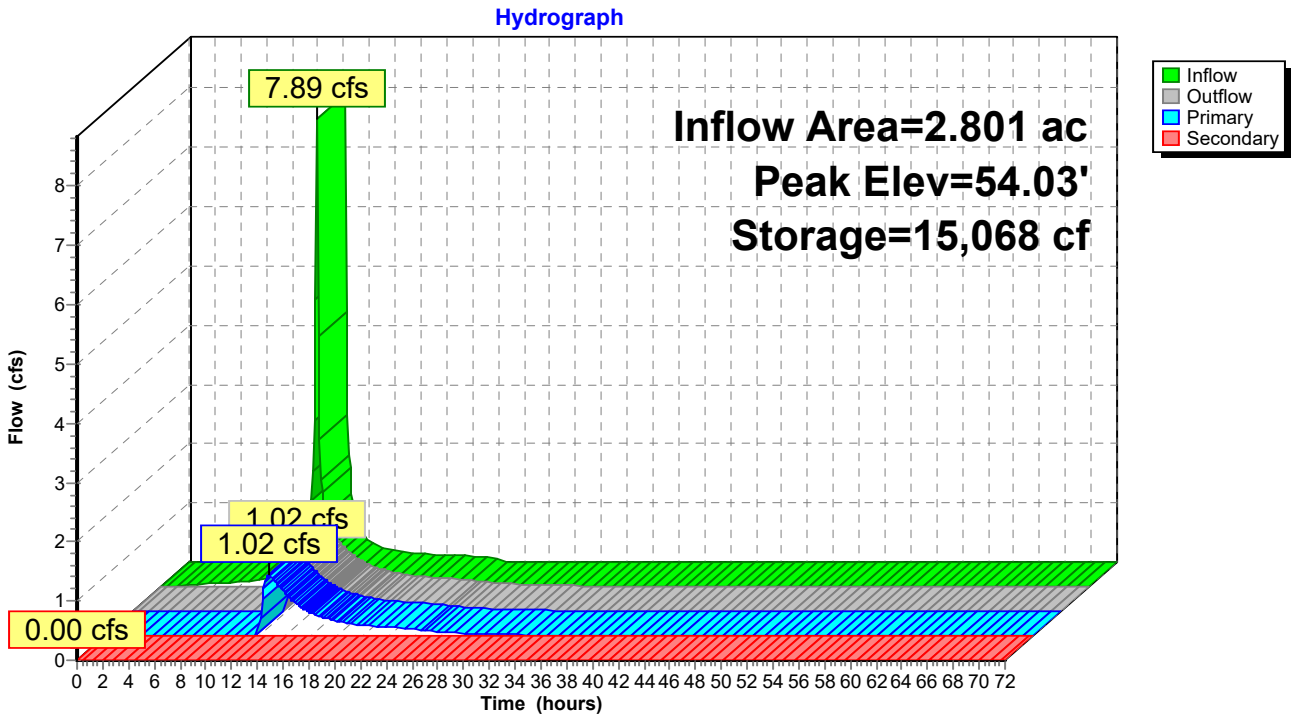
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.02 cfs @ 12.69 hrs HW=54.03' (Free Discharge)
└─**1=Culvert** (Passes 1.02 cfs of 30.37 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.99 cfs @ 2.07 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.48 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 2.36" for 2-Year (Current Adj.) event
Inflow = 10.62 cfs @ 12.09 hrs, Volume= 0.832 af
Outflow = 1.33 cfs @ 12.82 hrs, Volume= 0.593 af, Atten= 87%, Lag= 43.5 min
Primary = 1.33 cfs @ 12.82 hrs, Volume= 0.593 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 61.76' @ 12.82 hrs Surf.Area= 13,755 sf Storage= 21,643 cf

Plug-Flow detention time= 388.8 min calculated for 0.592 af (71% of inflow)
Center-of-Mass det. time= 294.1 min (1,068.4 - 774.3)

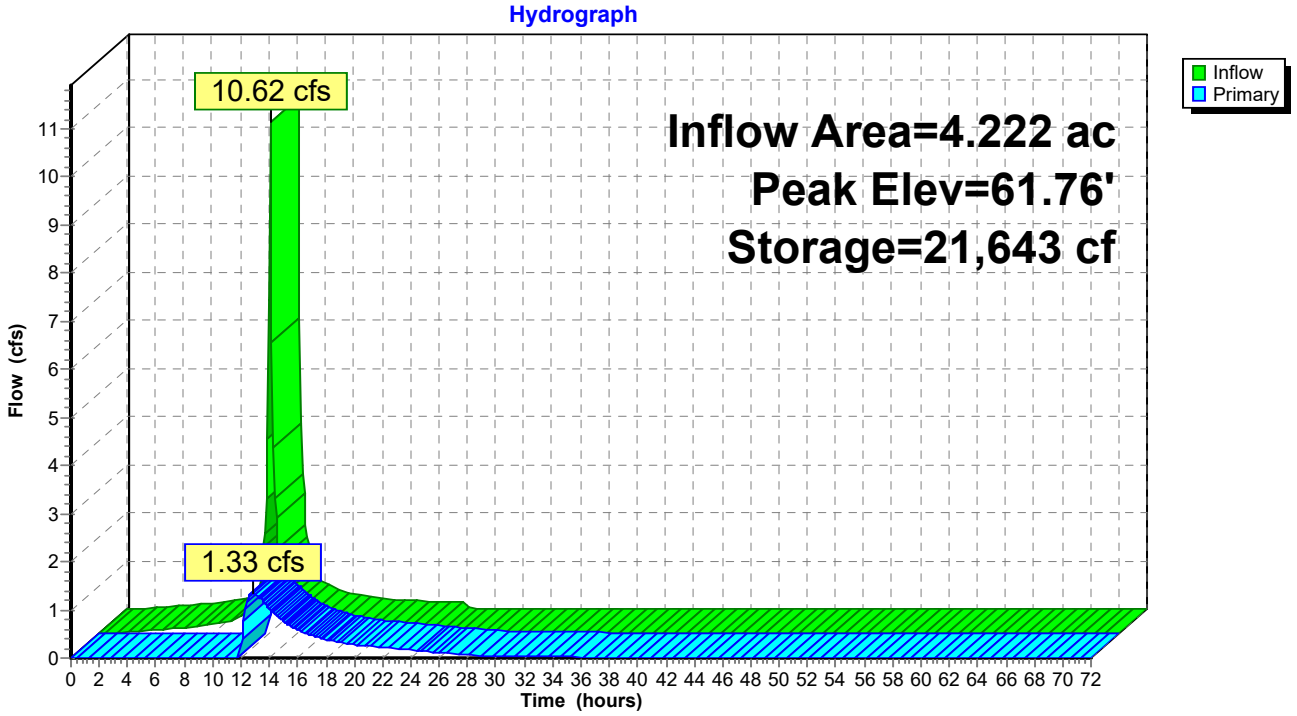
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=1.33 cfs @ 12.82 hrs HW=61.76' (Free Discharge)
- **1=Culvert** (Passes 1.33 cfs of 38.76 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 1.33 cfs @ 3.07 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

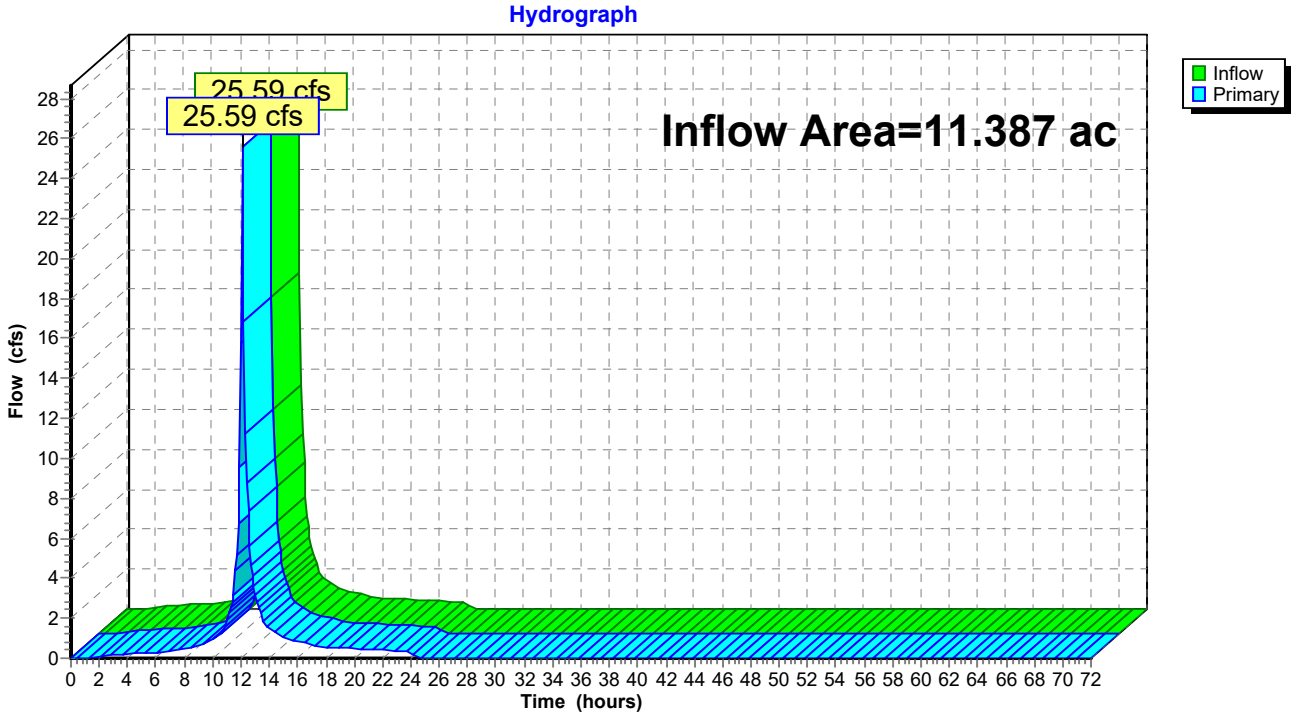


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 2.34" for 2-Year (Current Adj.) event
Inflow = 25.59 cfs @ 12.10 hrs, Volume= 2.225 af
Primary = 25.59 cfs @ 12.10 hrs, Volume= 2.225 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

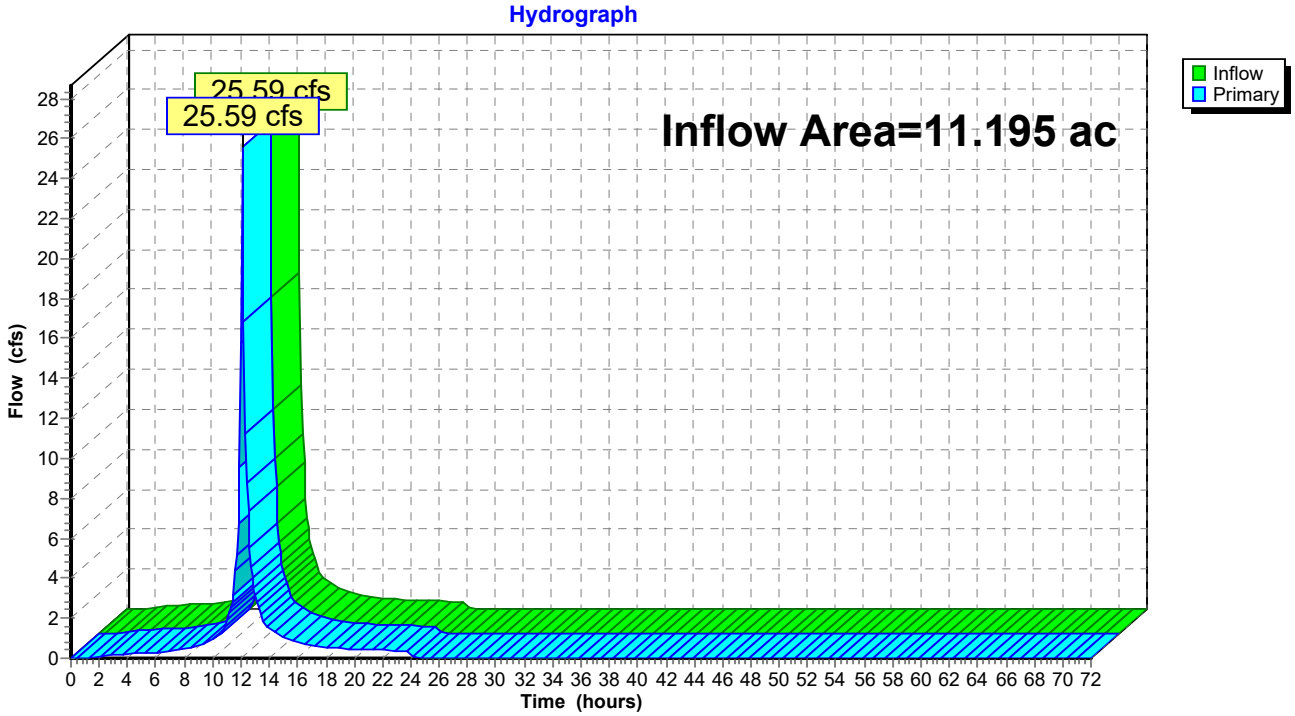


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 2.37" for 2-Year (Current Adj.) event
Inflow = 25.59 cfs @ 12.10 hrs, Volume= 2.212 af
Primary = 25.59 cfs @ 12.10 hrs, Volume= 2.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

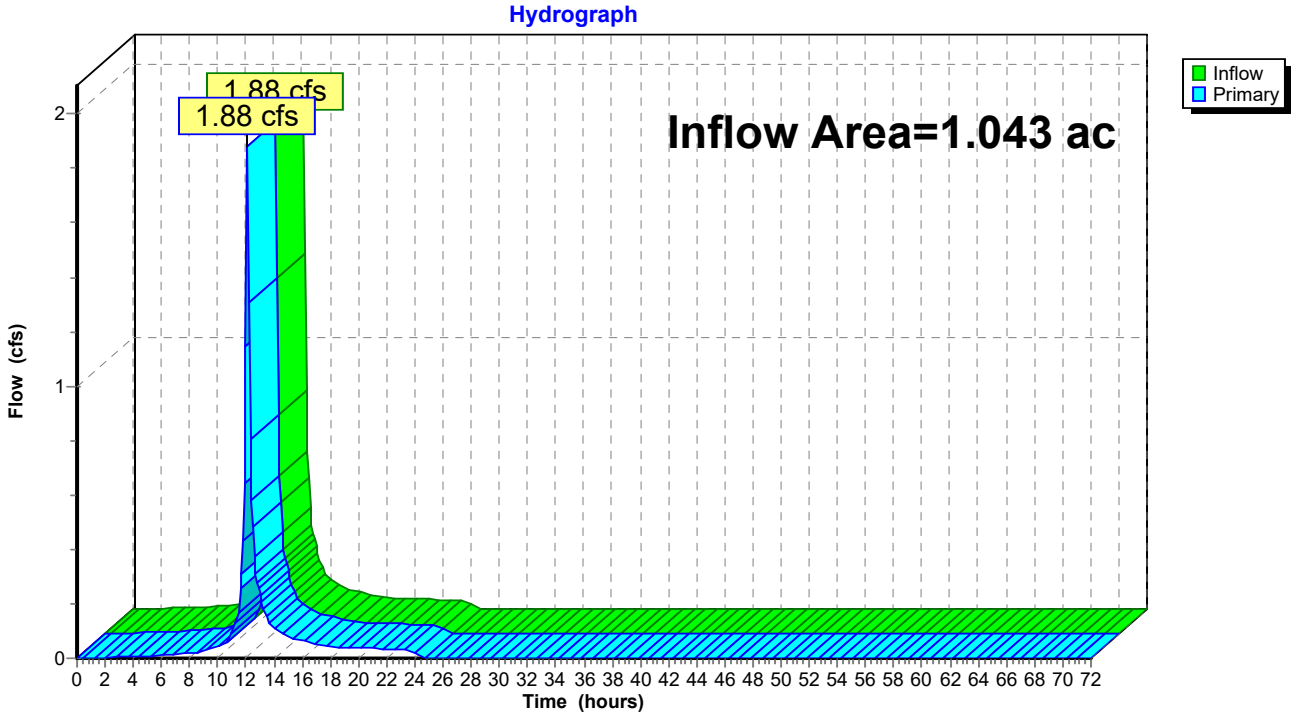


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 1.72" for 2-Year (Current Adj.) event
Inflow = 1.88 cfs @ 12.11 hrs, Volume= 0.149 af
Primary = 1.88 cfs @ 12.11 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

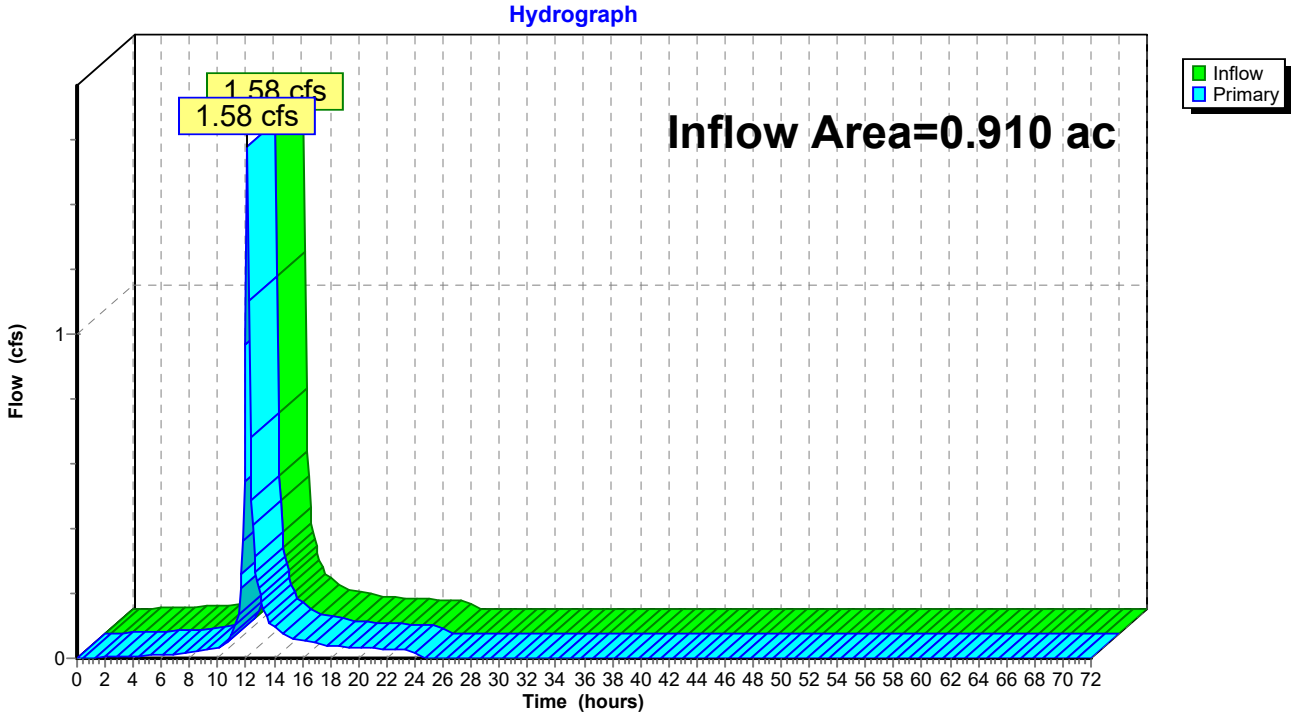


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 1.67" for 2-Year (Current Adj.) event
Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.127 af
Primary = 1.58 cfs @ 12.11 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

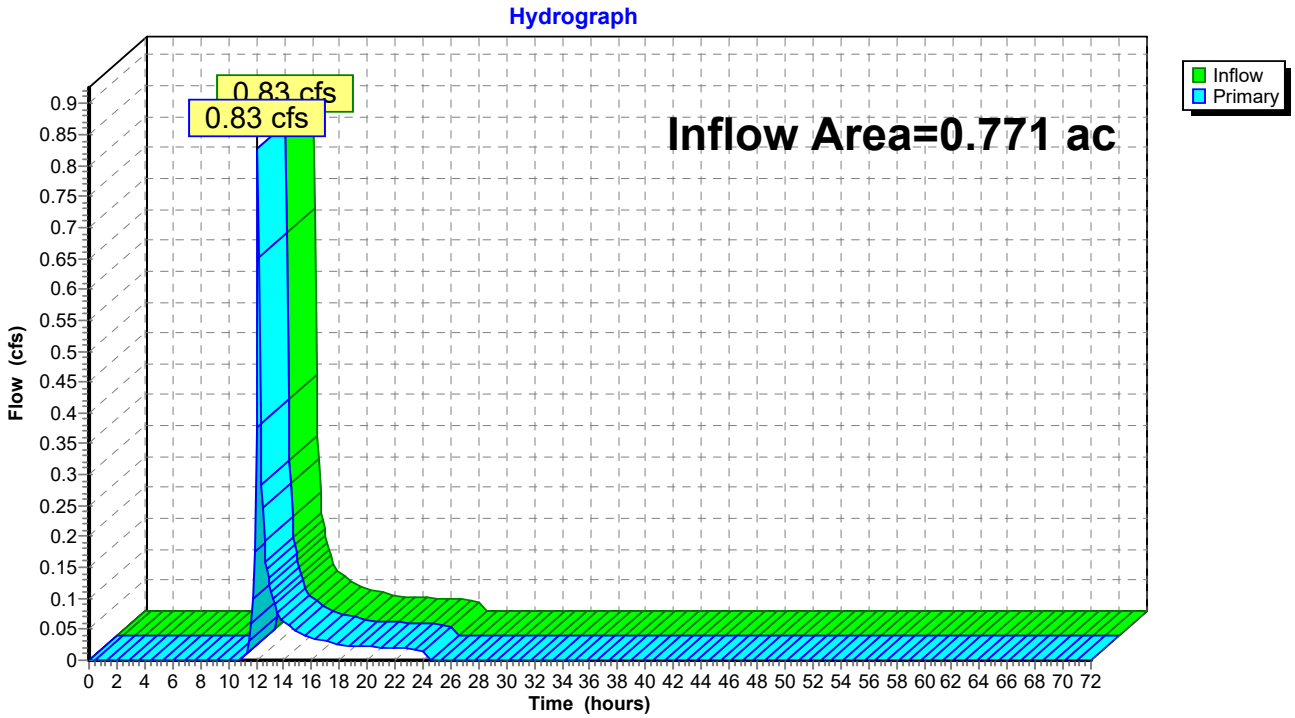


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 0.96" for 2-Year (Current Adj.) event
Inflow = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af
Primary = 0.83 cfs @ 12.12 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

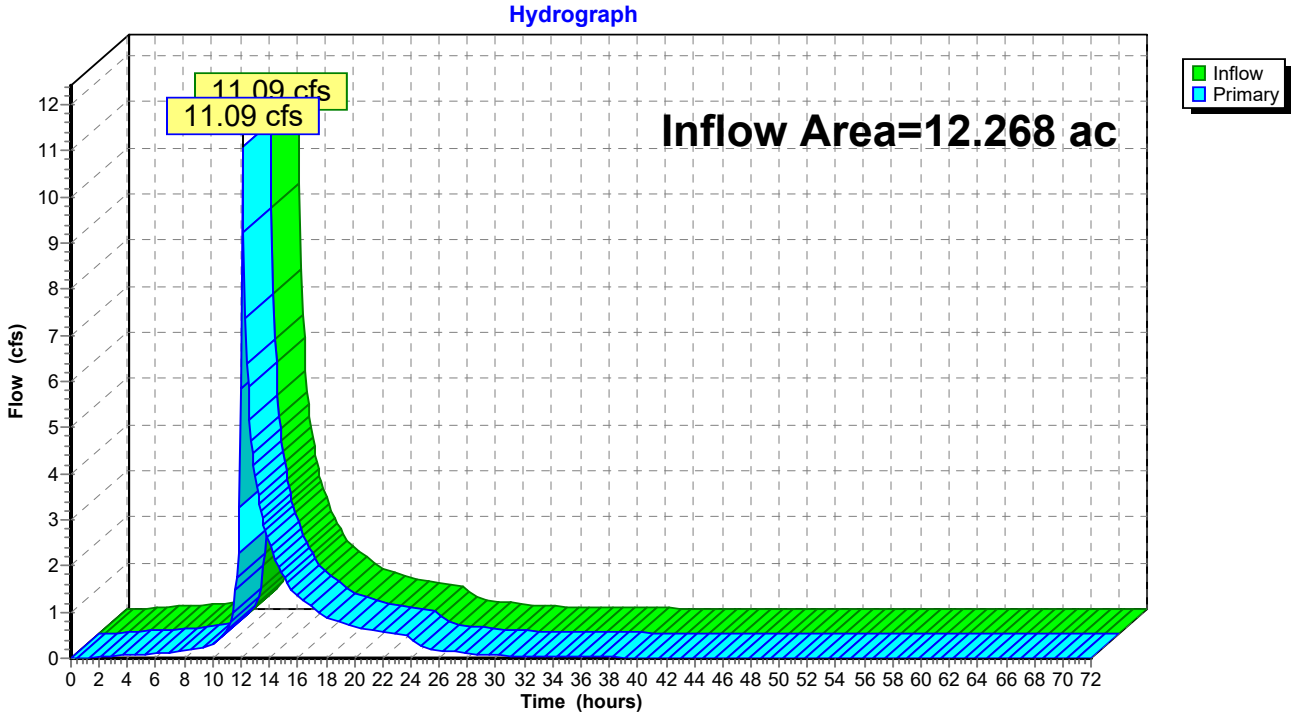


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 1.90" for 2-Year (Current Adj.) event
Inflow = 11.09 cfs @ 12.13 hrs, Volume= 1.944 af
Primary = 11.09 cfs @ 12.13 hrs, Volume= 1.944 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

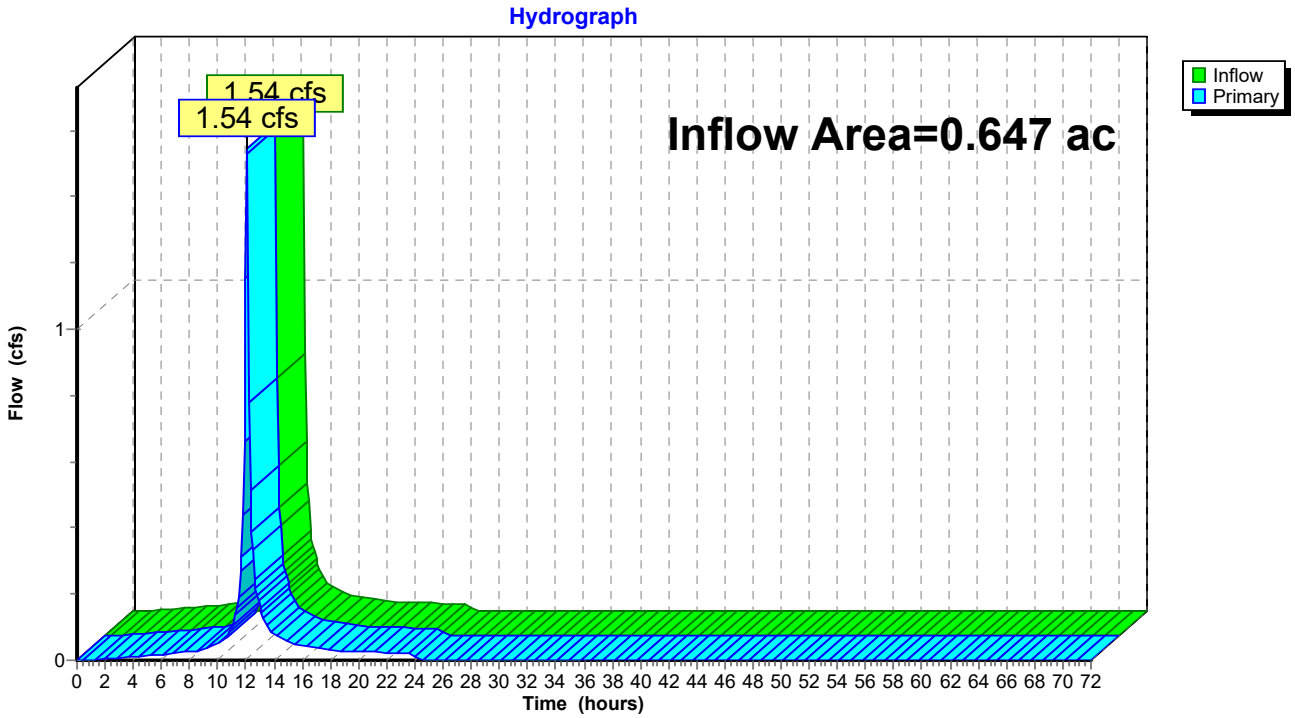


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 2.26" for 2-Year (Current Adj.) event
Inflow = 1.54 cfs @ 12.08 hrs, Volume= 0.122 af
Primary = 1.54 cfs @ 12.08 hrs, Volume= 0.122 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

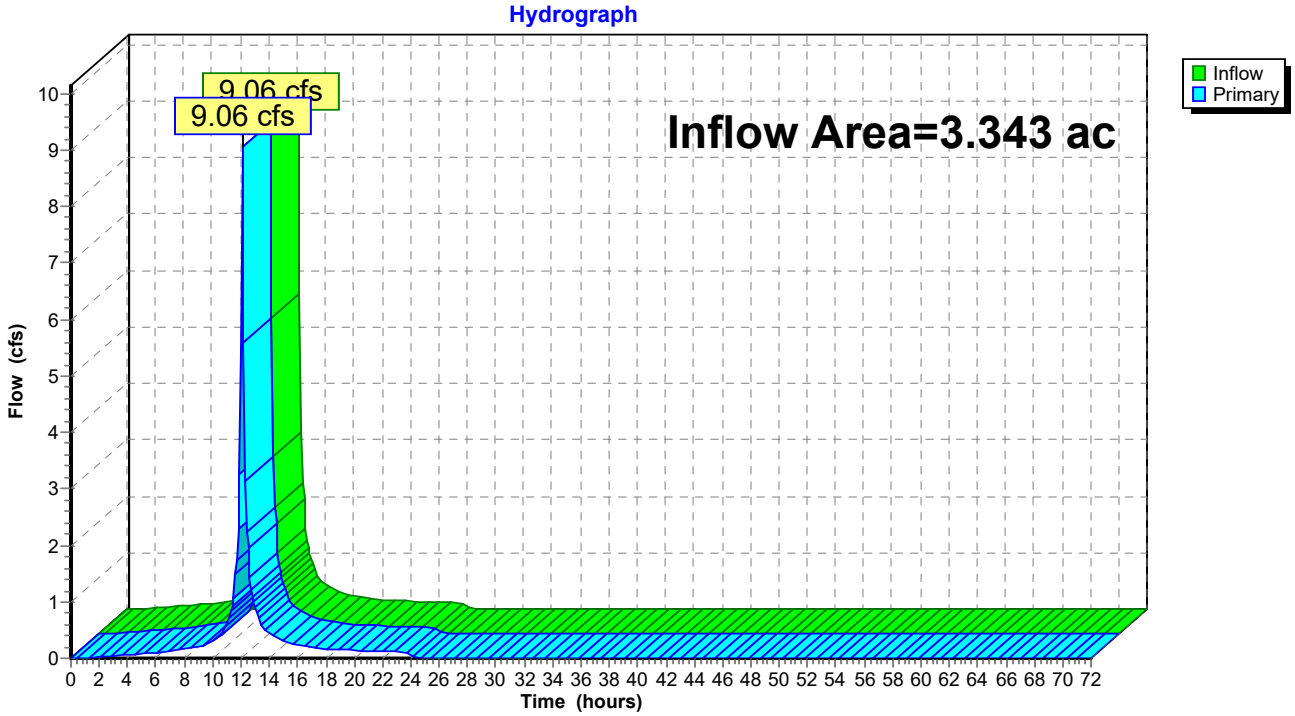


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 2.50" for 2-Year (Current Adj.) event
Inflow = 9.06 cfs @ 12.10 hrs, Volume= 0.696 af
Primary = 9.06 cfs @ 12.10 hrs, Volume= 0.696 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

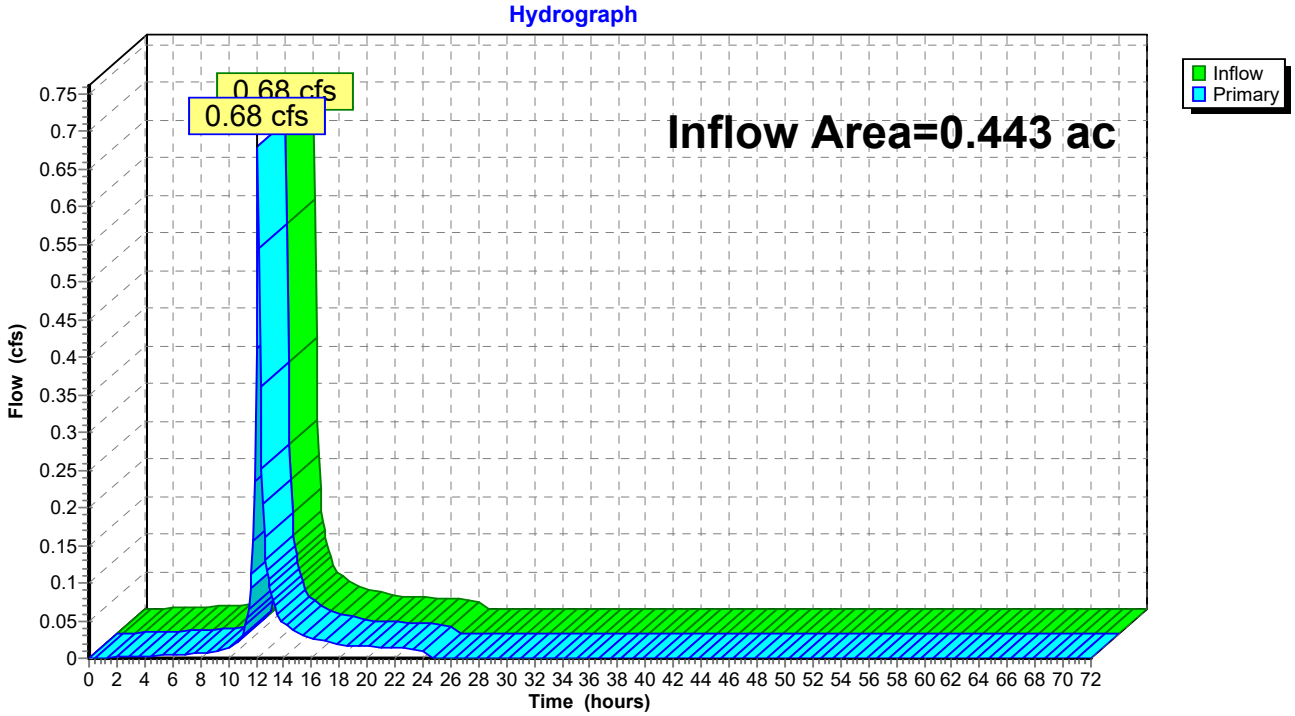


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 1.60" for 2-Year (Current Adj.) event
Inflow = 0.68 cfs @ 12.12 hrs, Volume= 0.059 af
Primary = 0.68 cfs @ 12.12 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

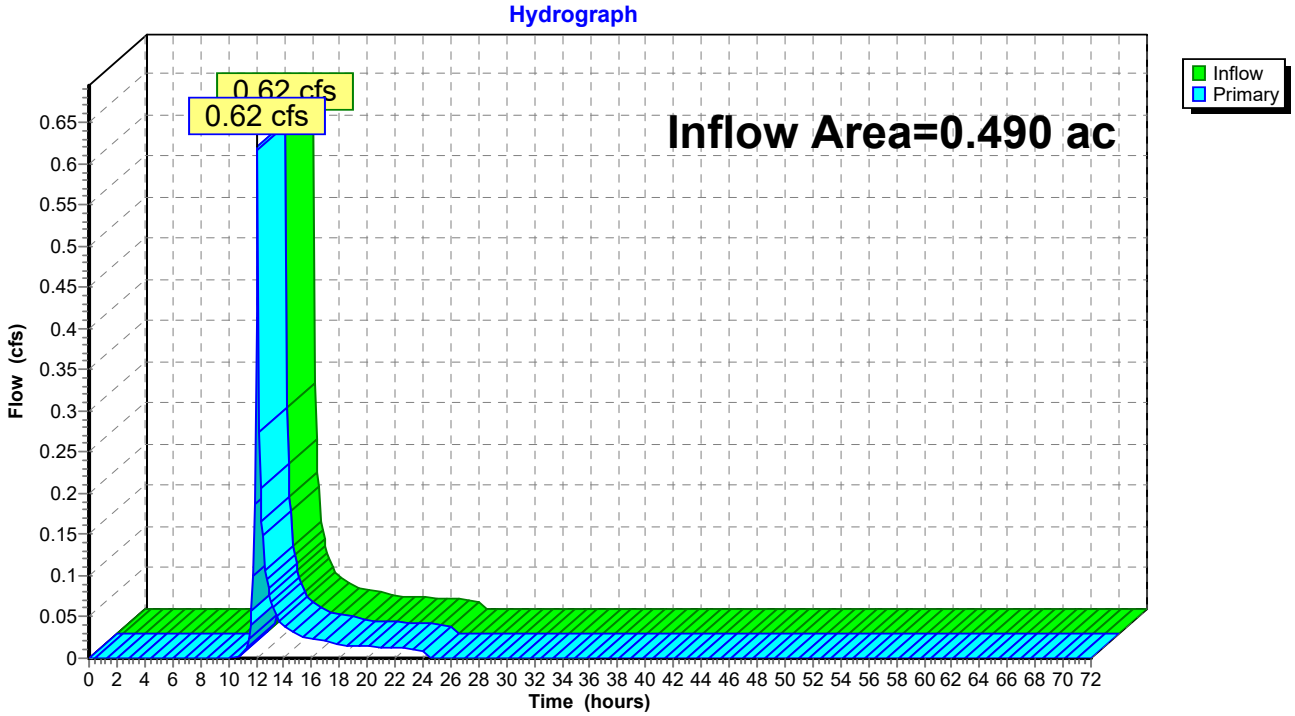


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 1.02" for 2-Year (Current Adj.) event
Inflow = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.62 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

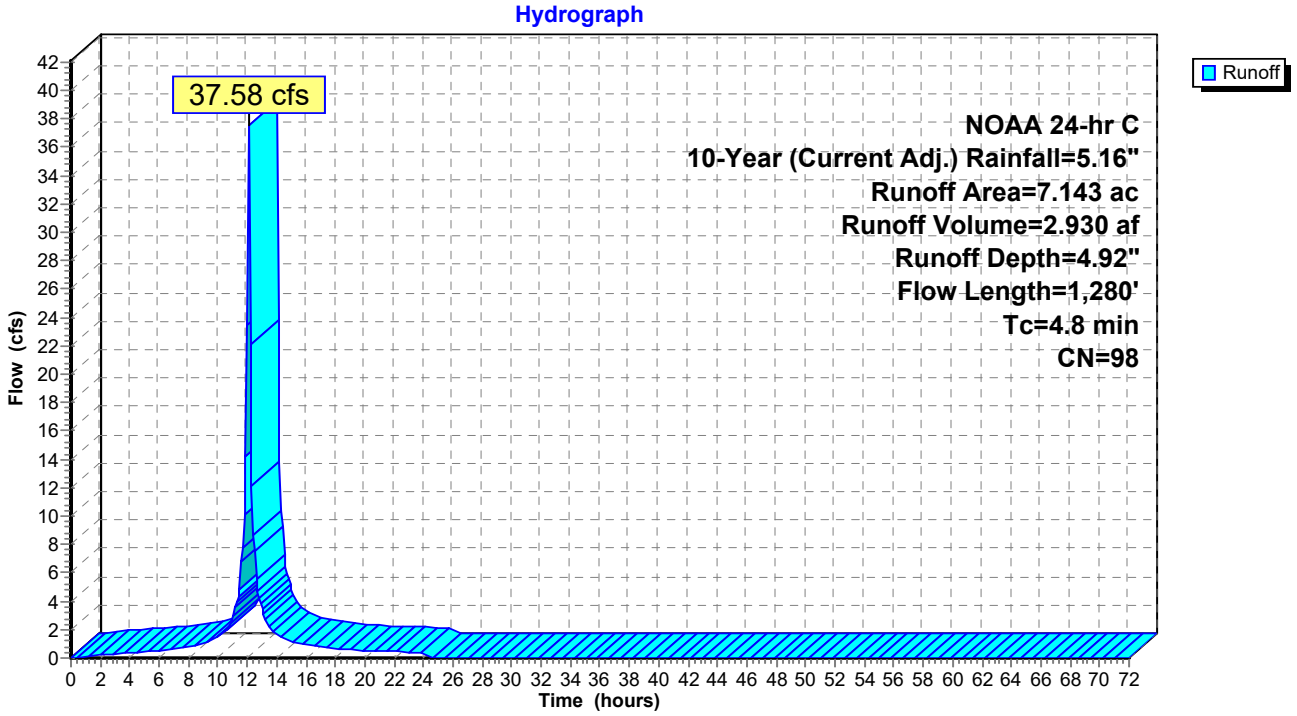
Runoff = 37.58 cfs @ 12.10 hrs, Volume= 2.930 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

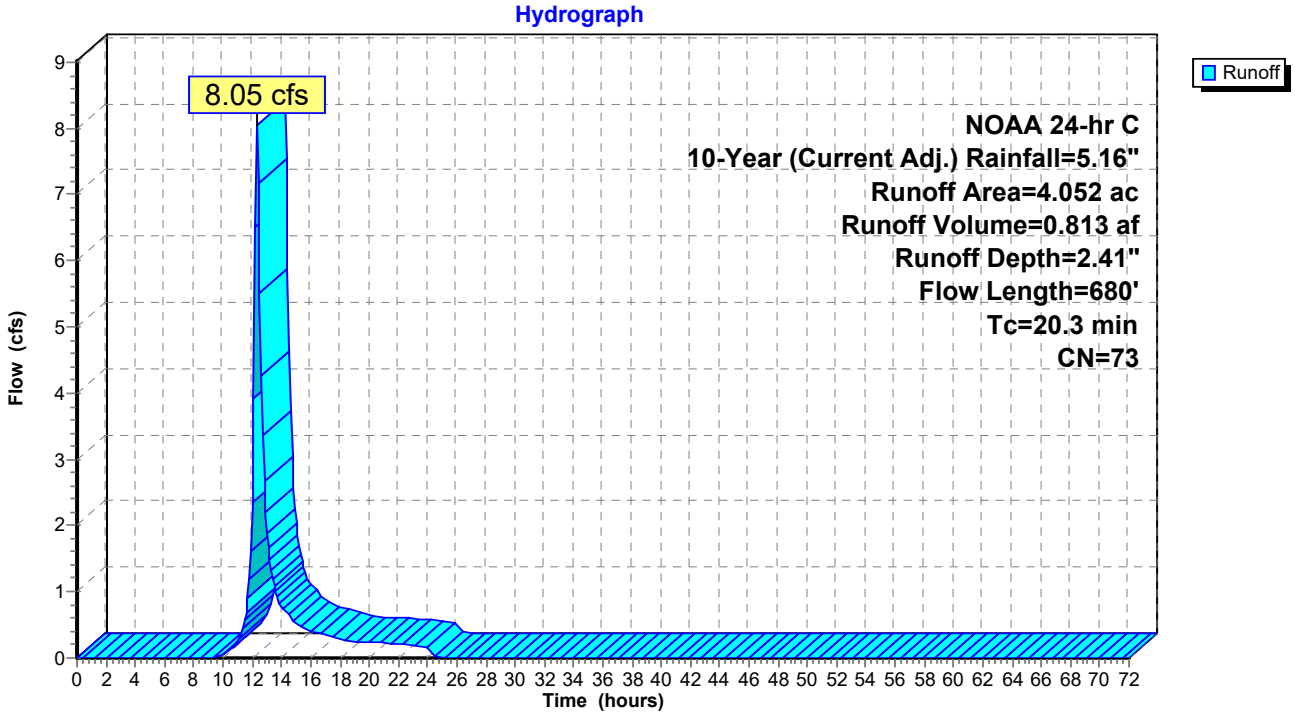
Runoff = 8.05 cfs @ 12.31 hrs, Volume= 0.813 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

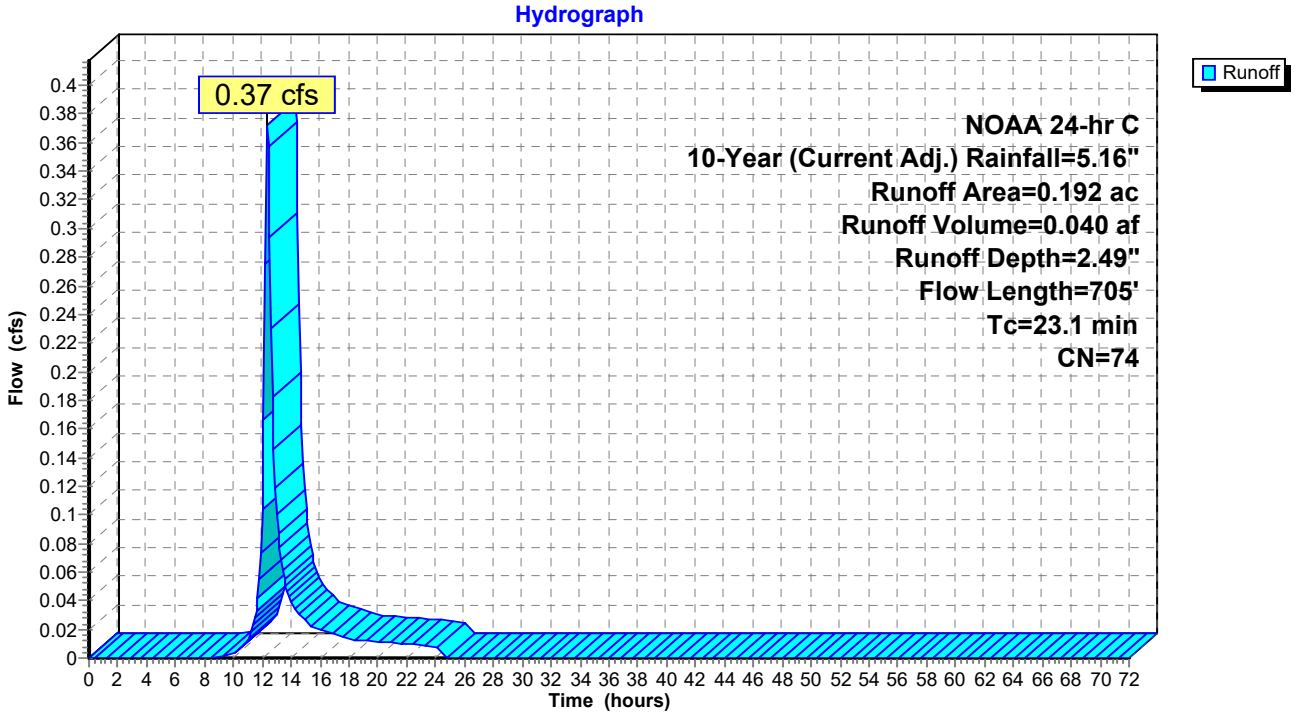
Runoff = 0.37 cfs @ 12.34 hrs, Volume= 0.040 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

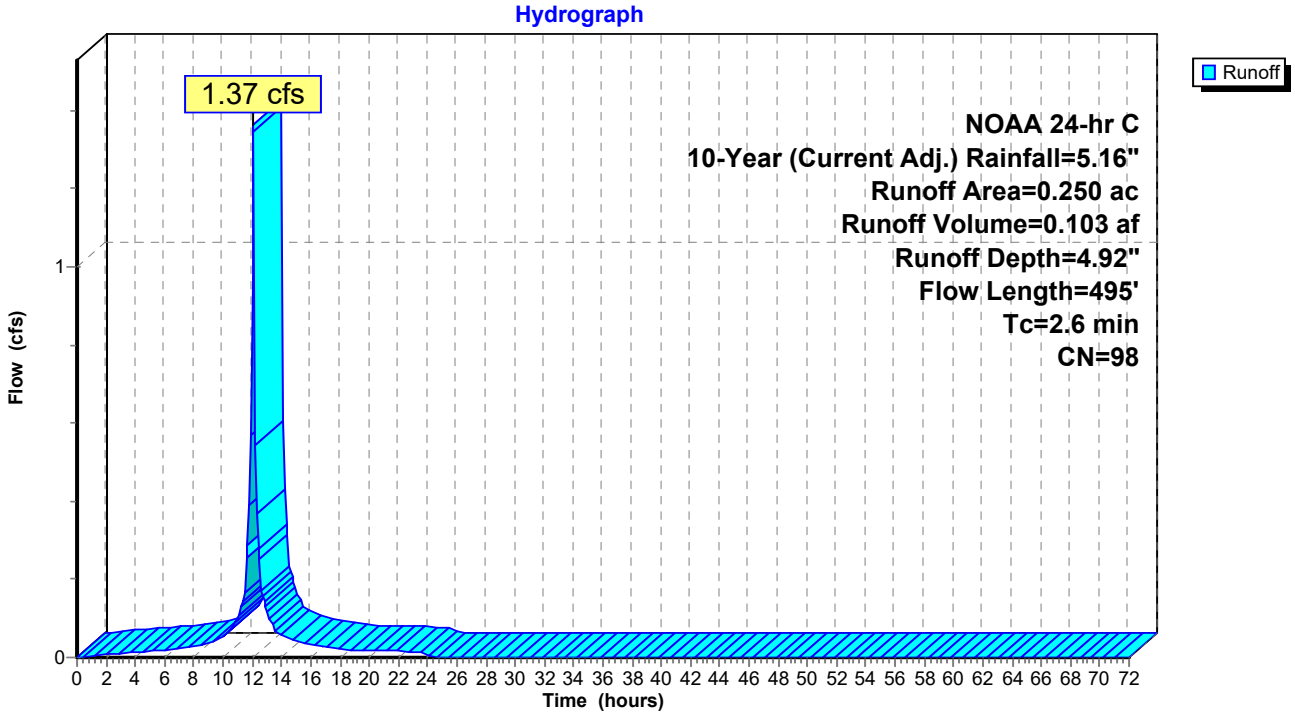
Runoff = 1.37 cfs @ 12.08 hrs, Volume= 0.103 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

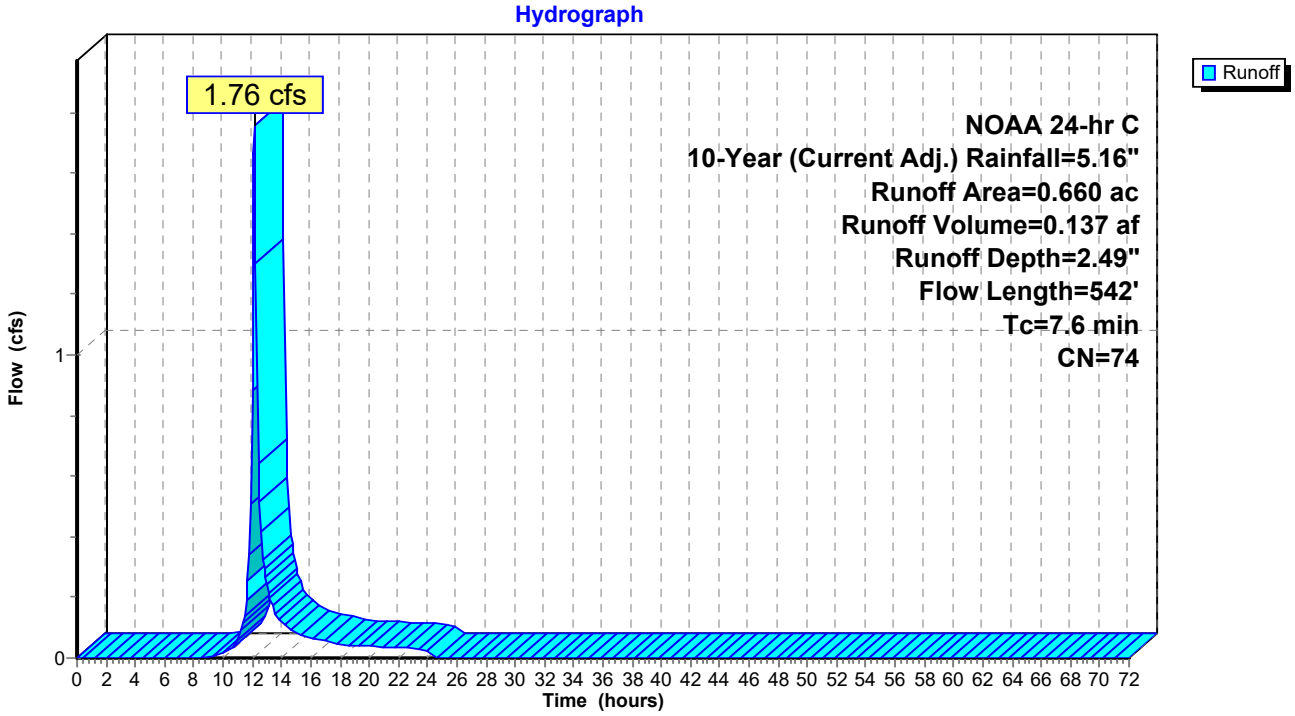
Runoff = 1.76 cfs @ 12.15 hrs, Volume= 0.137 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

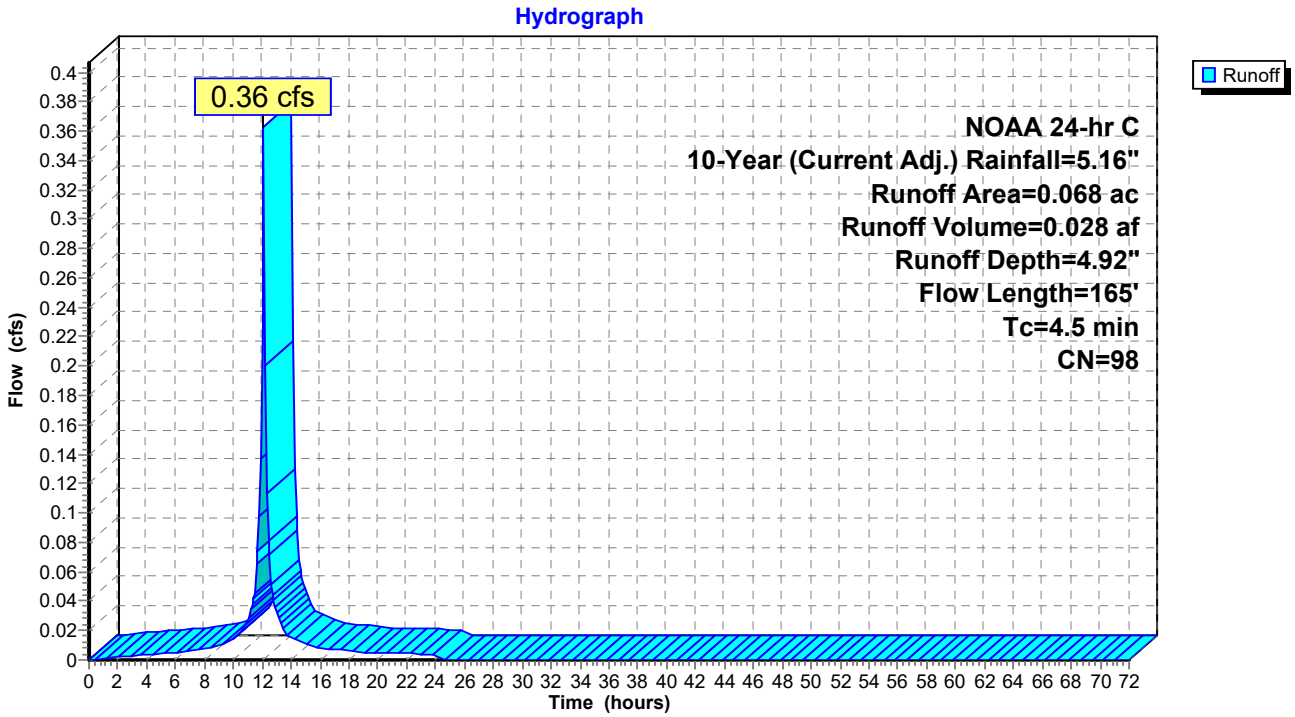
Runoff = 0.36 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

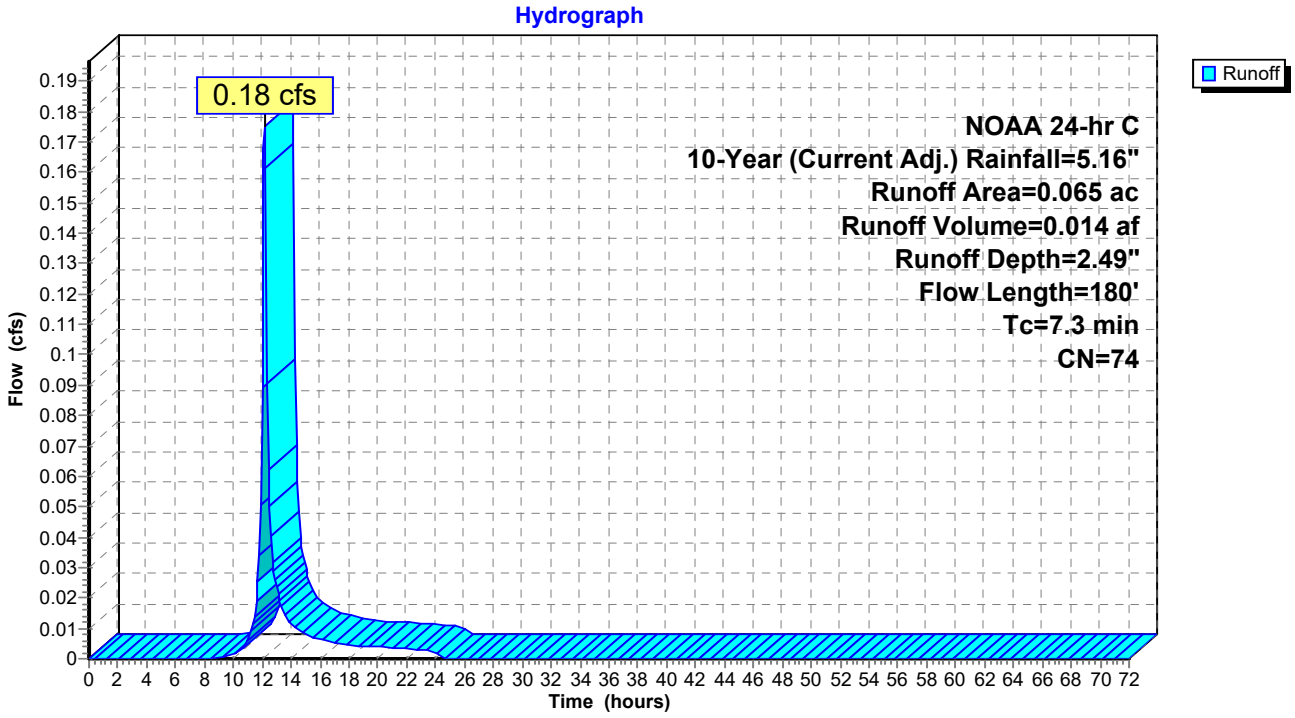
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.014 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

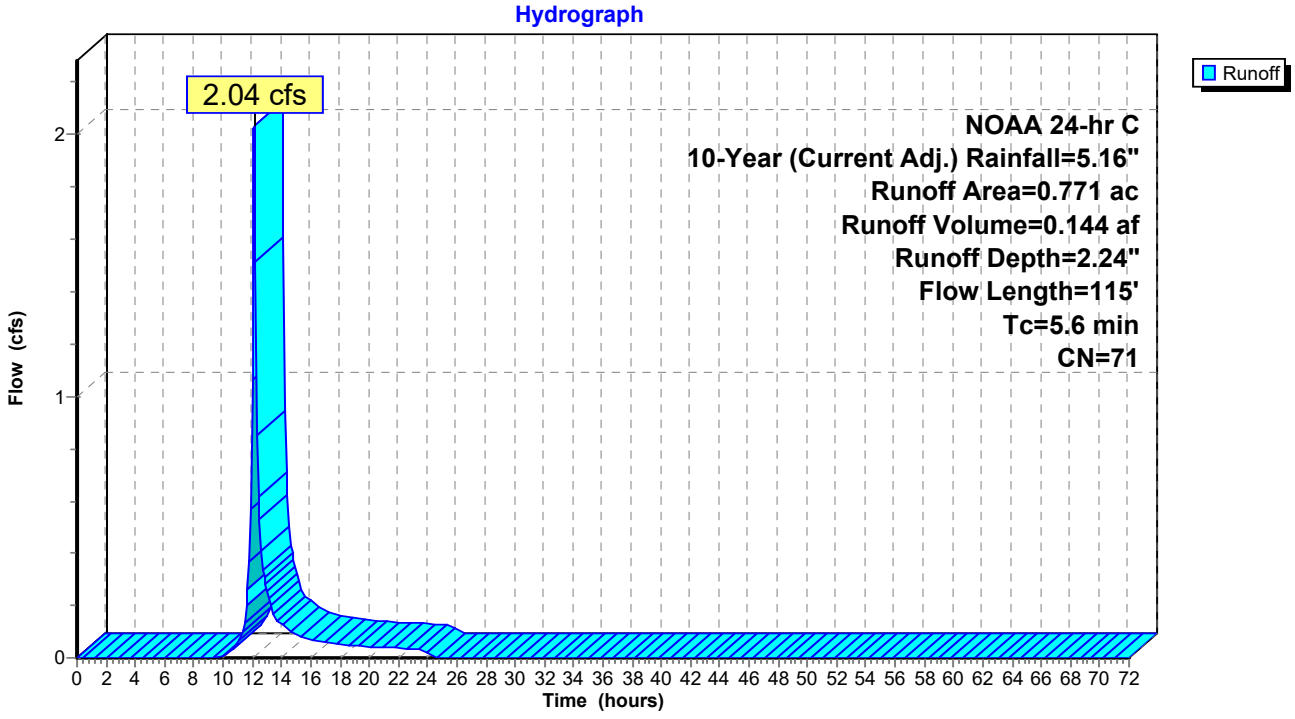
Runoff = 2.04 cfs @ 12.12 hrs, Volume= 0.144 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

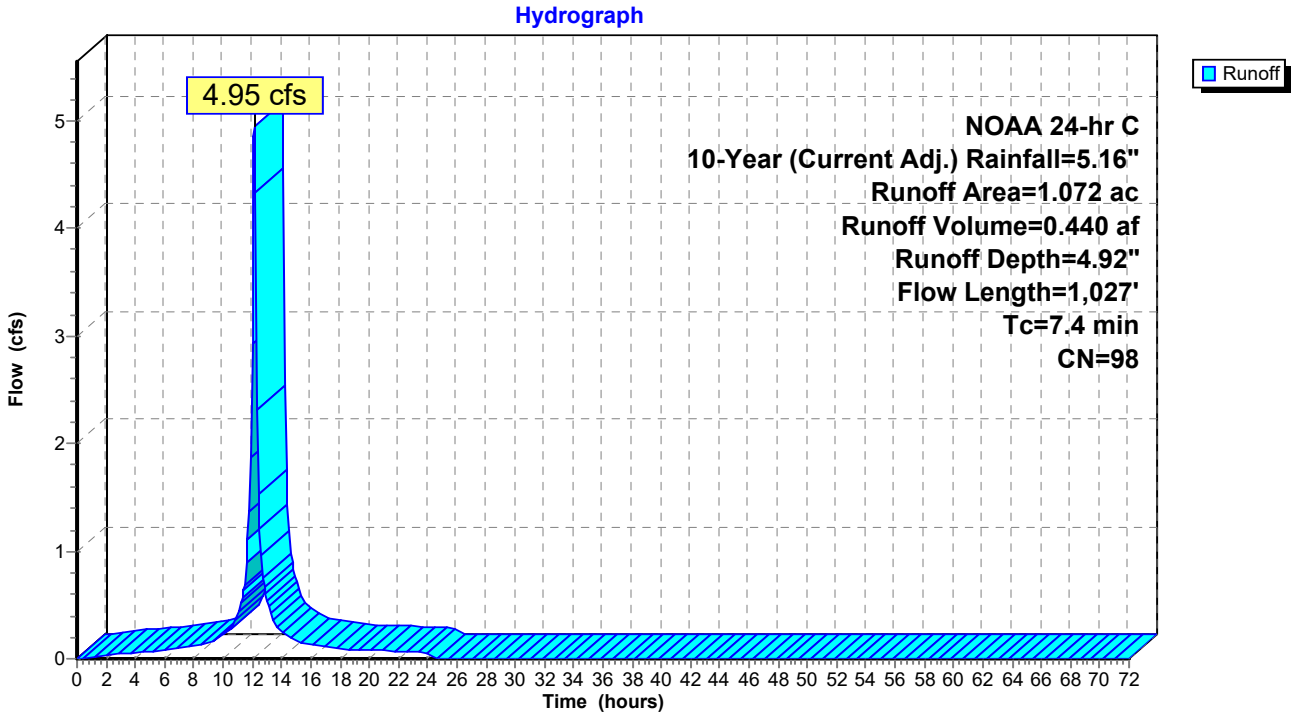
Runoff = 4.95 cfs @ 12.13 hrs, Volume= 0.440 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

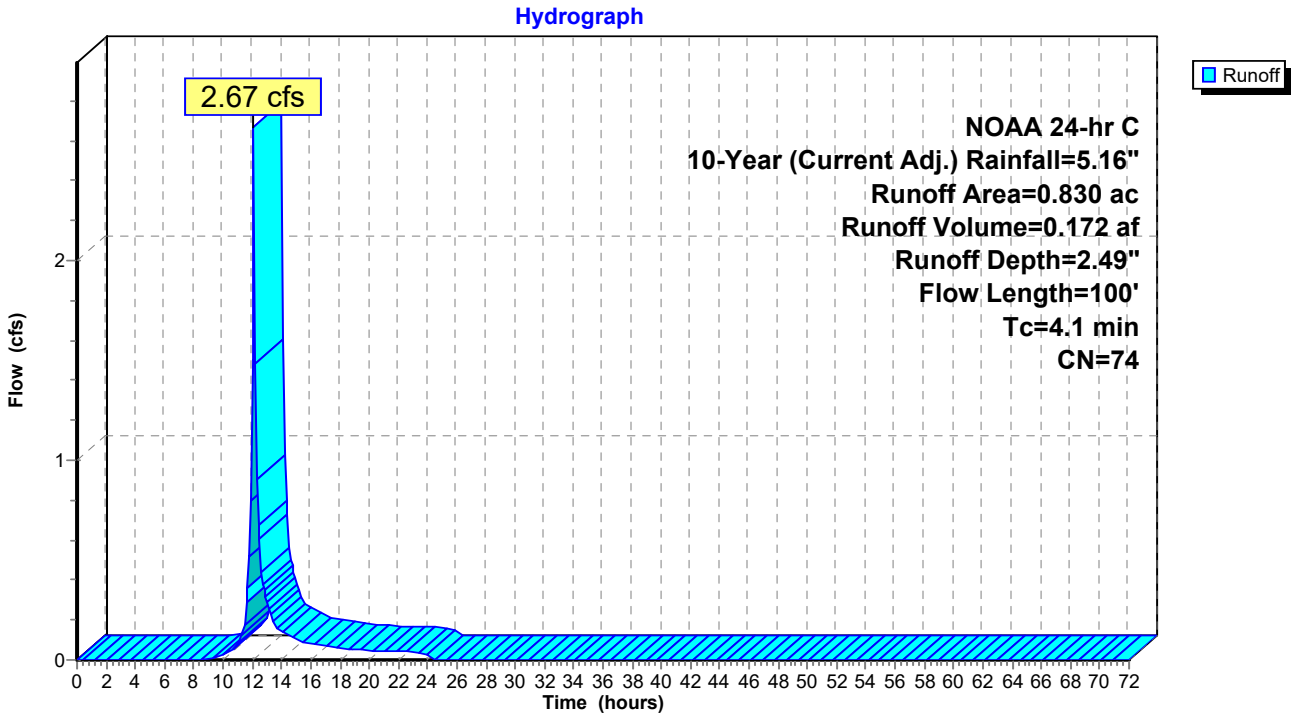
Runoff = 2.67 cfs @ 12.10 hrs, Volume= 0.172 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

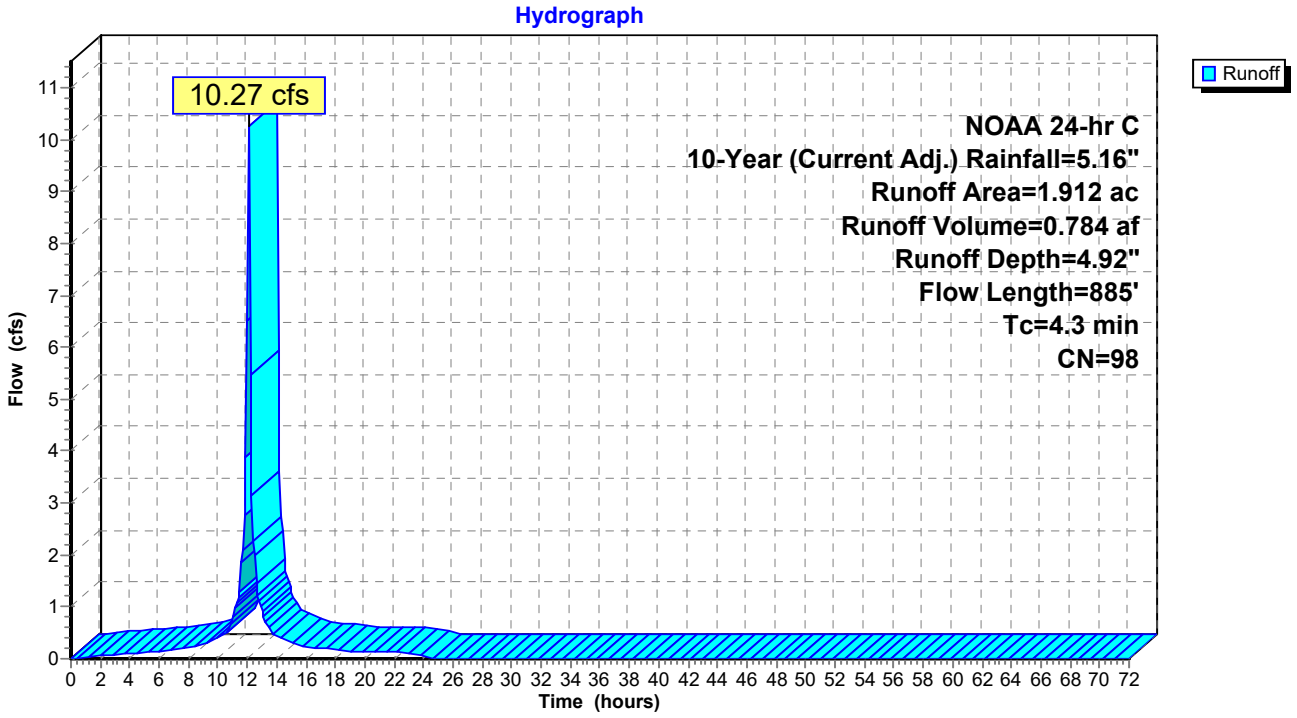
Runoff = 10.27 cfs @ 12.09 hrs, Volume= 0.784 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

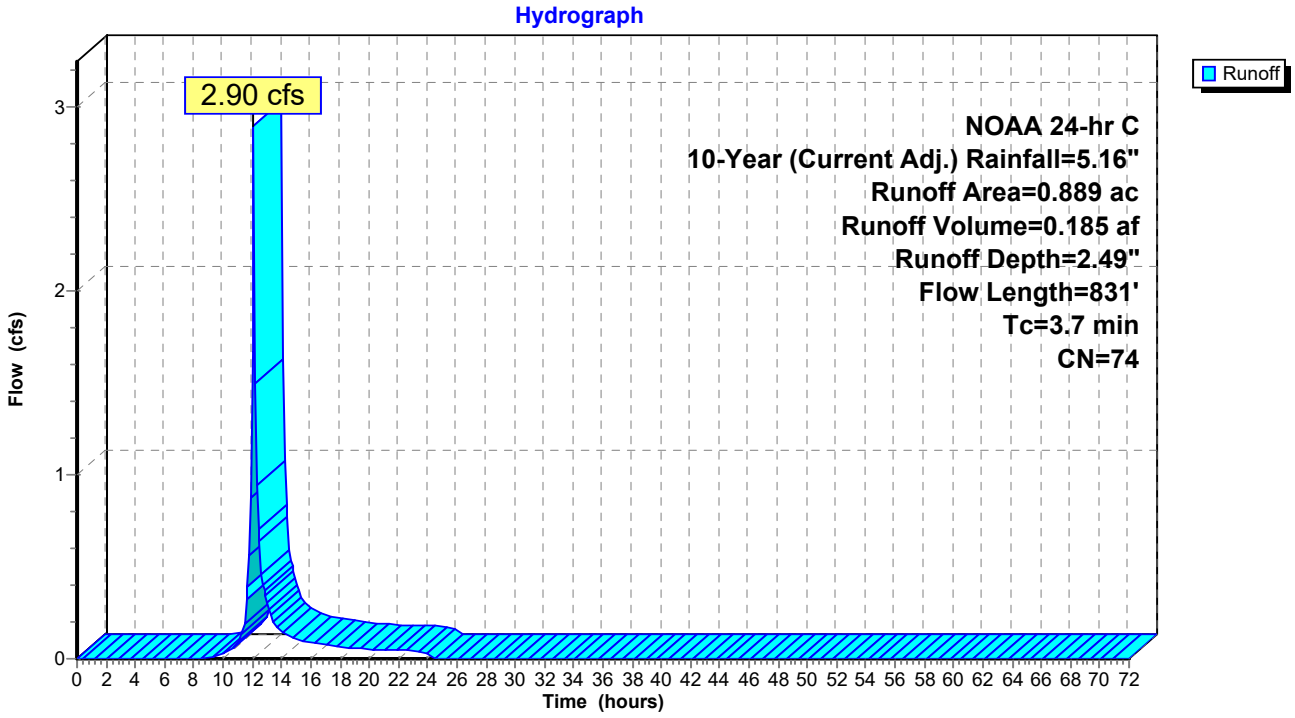
Runoff = 2.90 cfs @ 12.10 hrs, Volume= 0.185 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

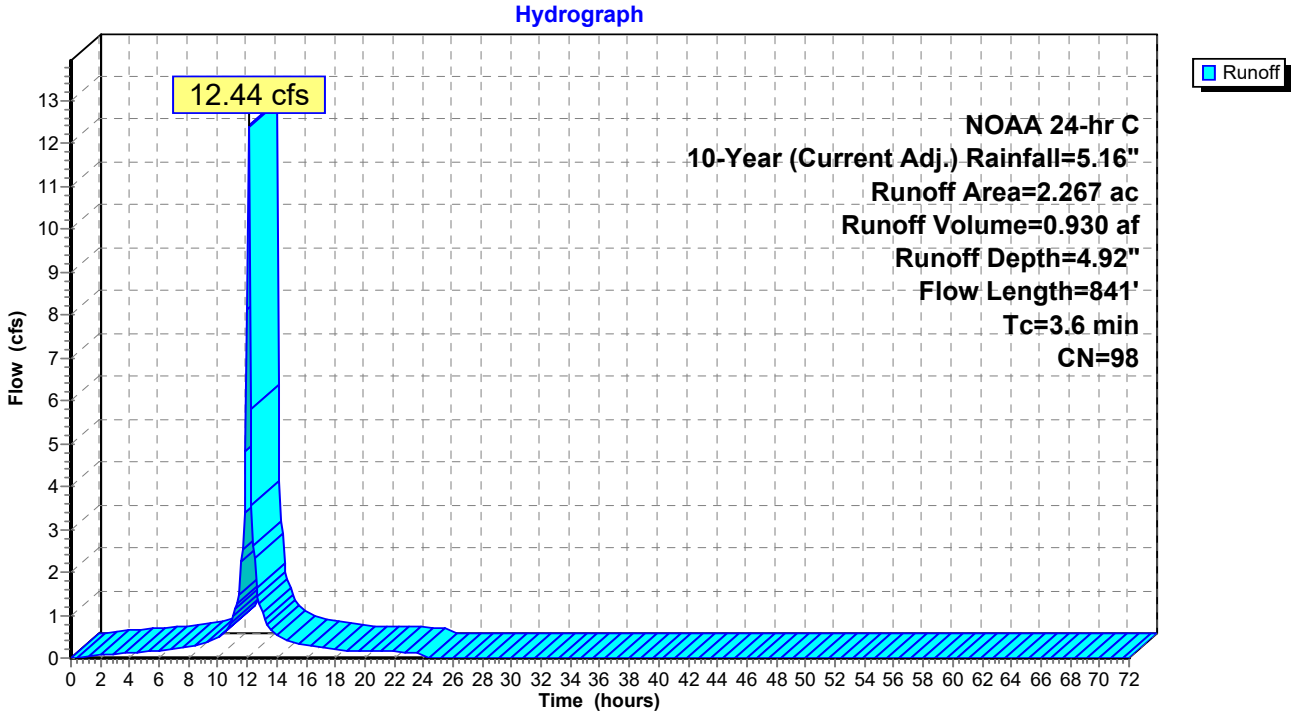
Runoff = 12.44 cfs @ 12.09 hrs, Volume= 0.930 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

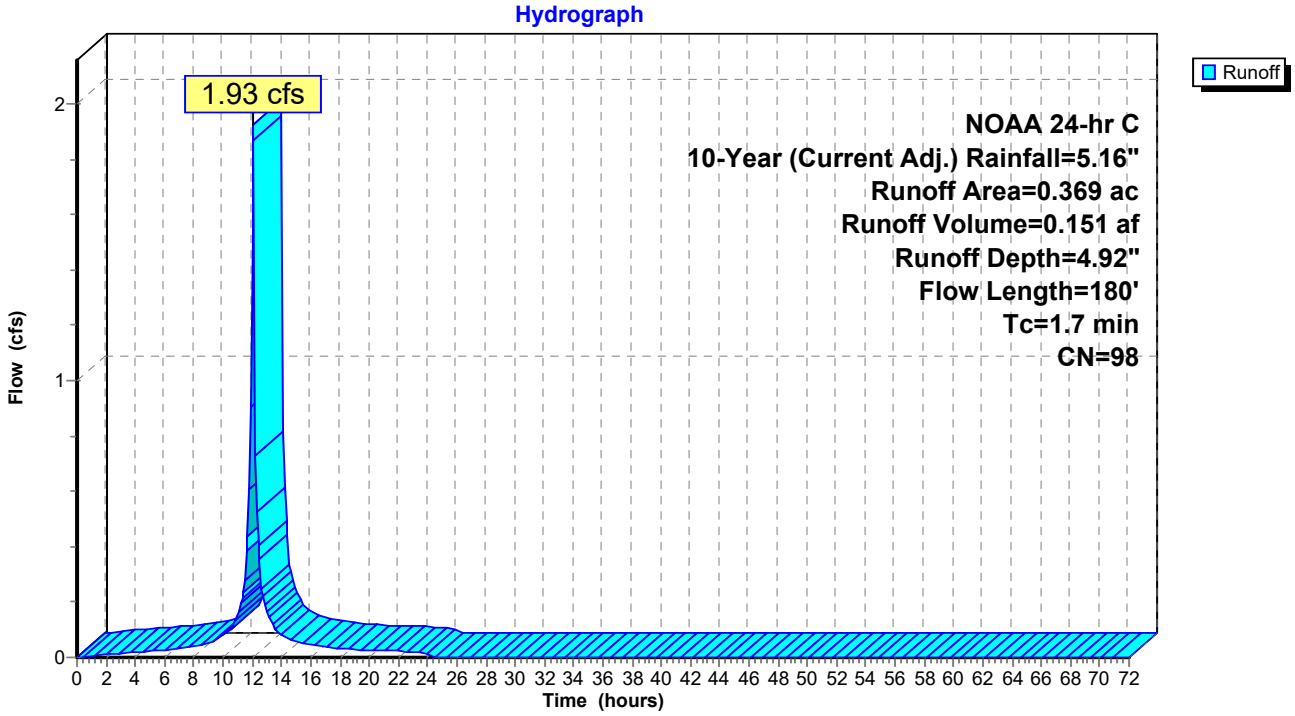
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 0.151 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

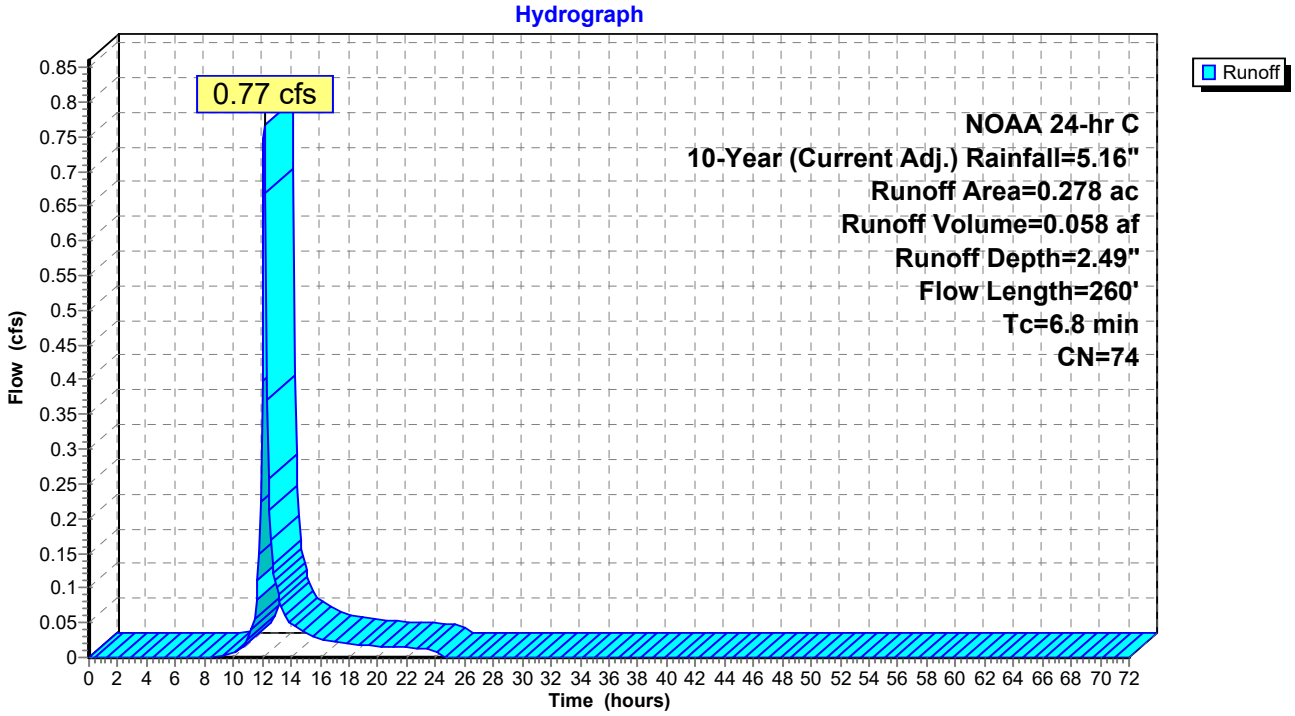
Runoff = 0.77 cfs @ 12.13 hrs, Volume= 0.058 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

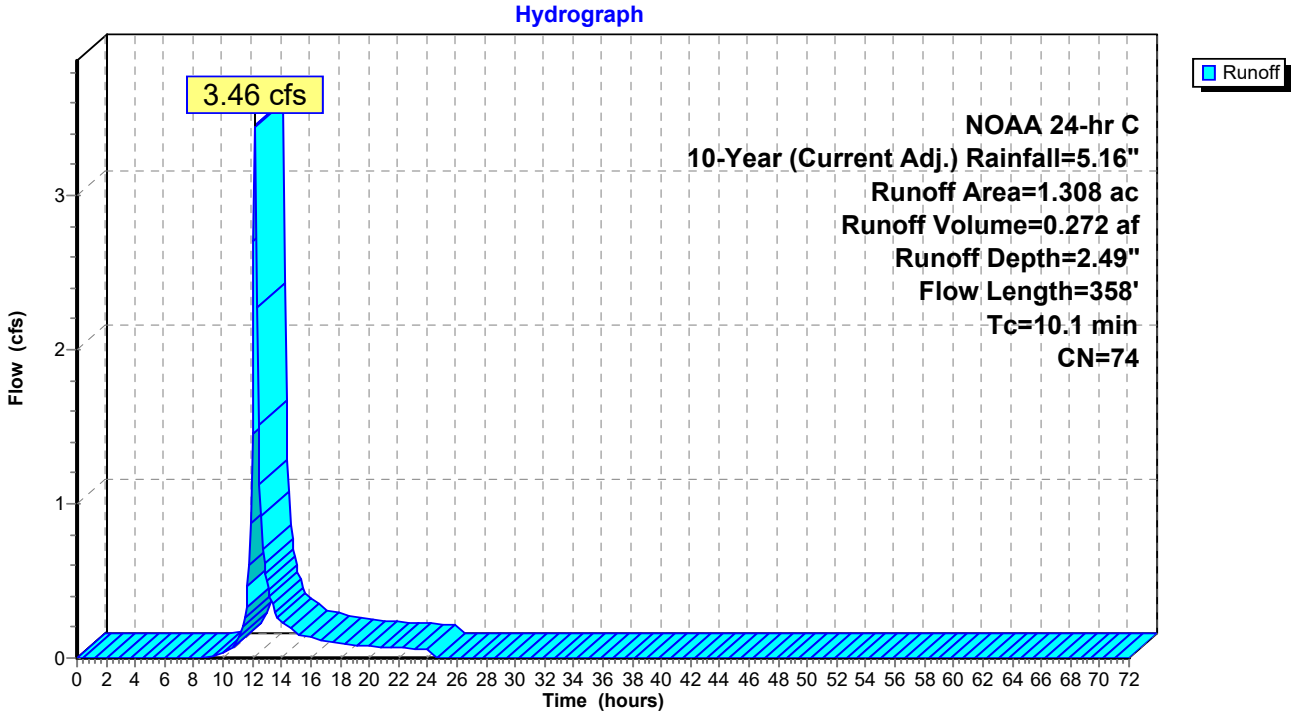
Runoff = 3.46 cfs @ 12.19 hrs, Volume= 0.272 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

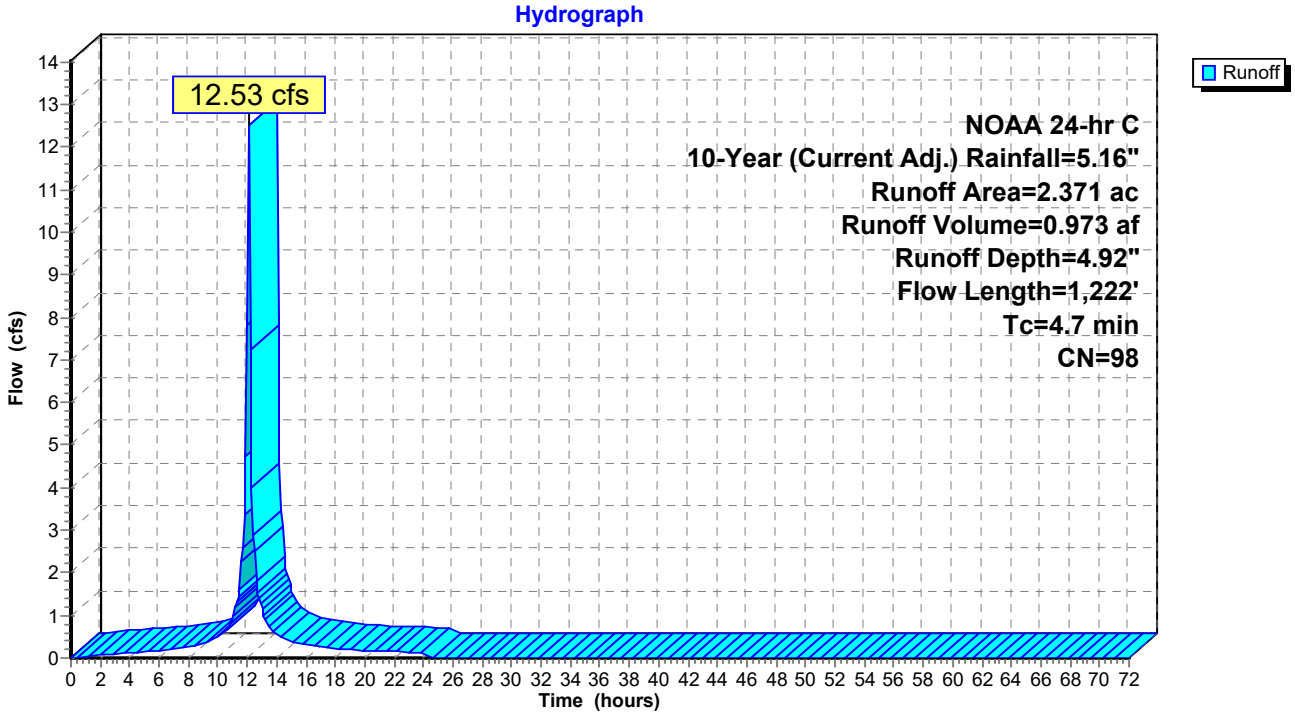
Runoff = 12.53 cfs @ 12.10 hrs, Volume= 0.973 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

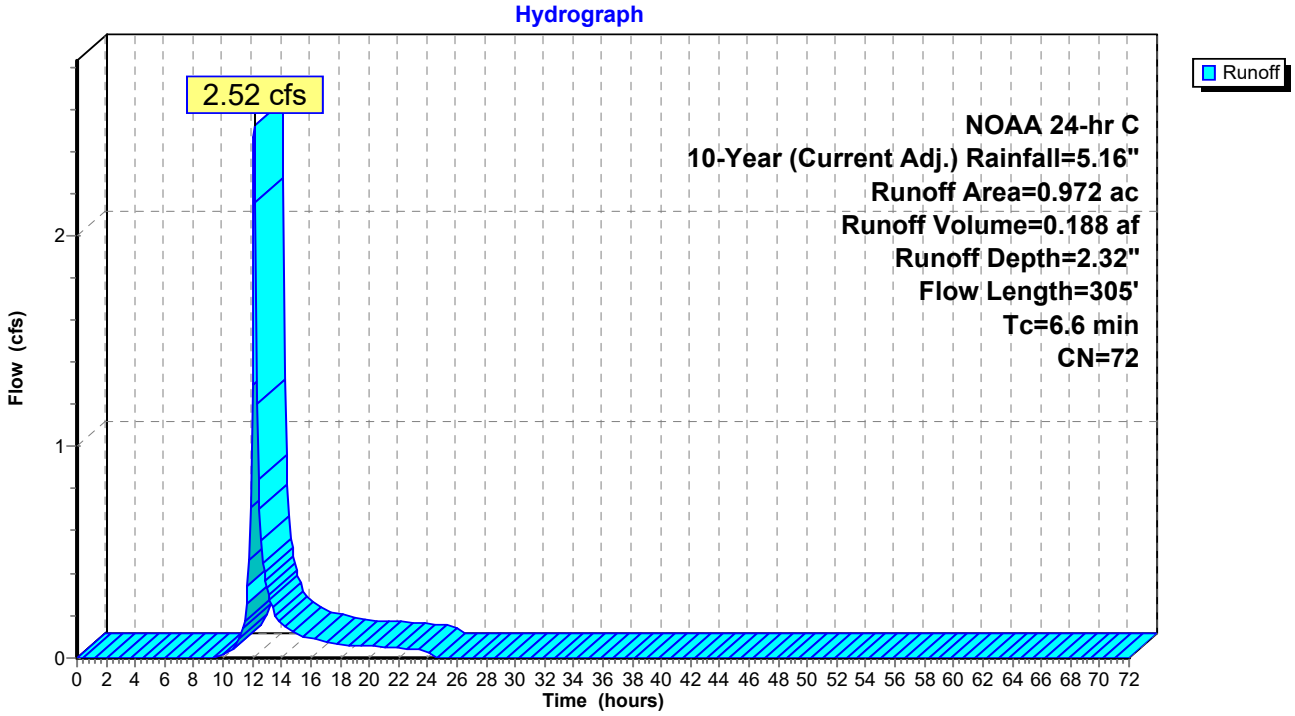
Runoff = 2.52 cfs @ 12.13 hrs, Volume= 0.188 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

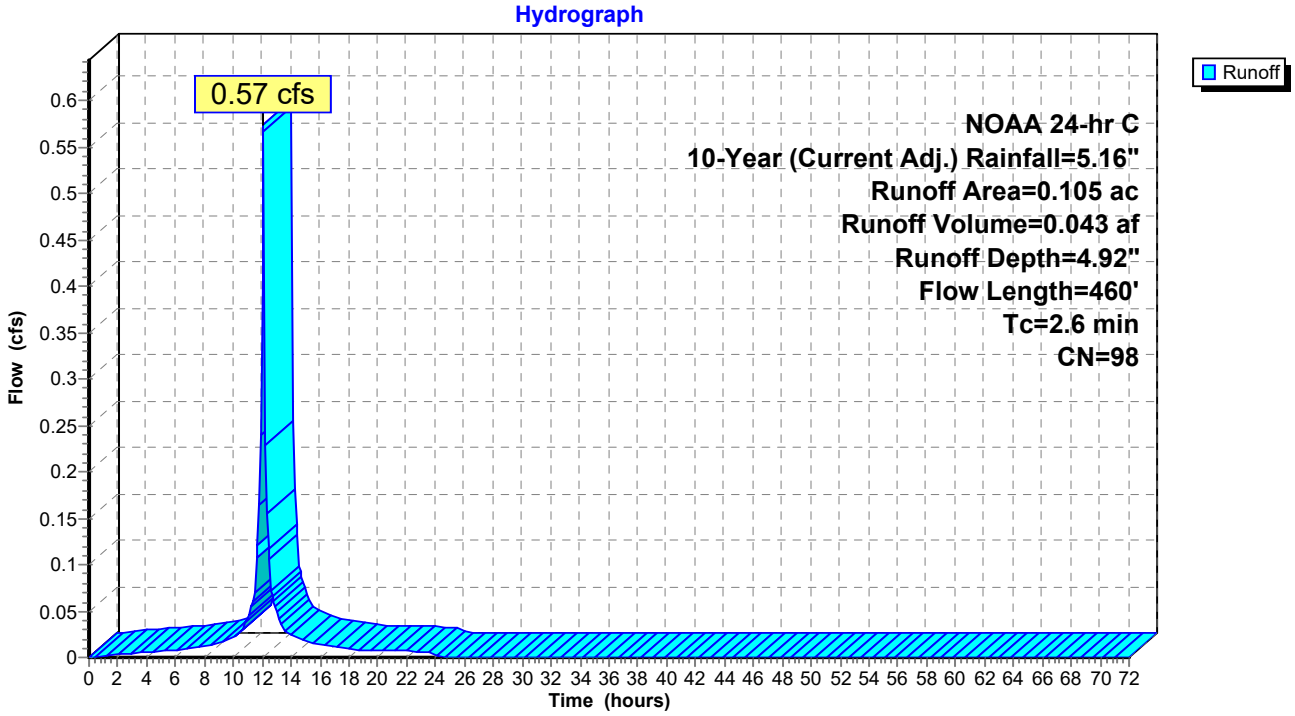
Runoff = 0.57 cfs @ 12.08 hrs, Volume= 0.043 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

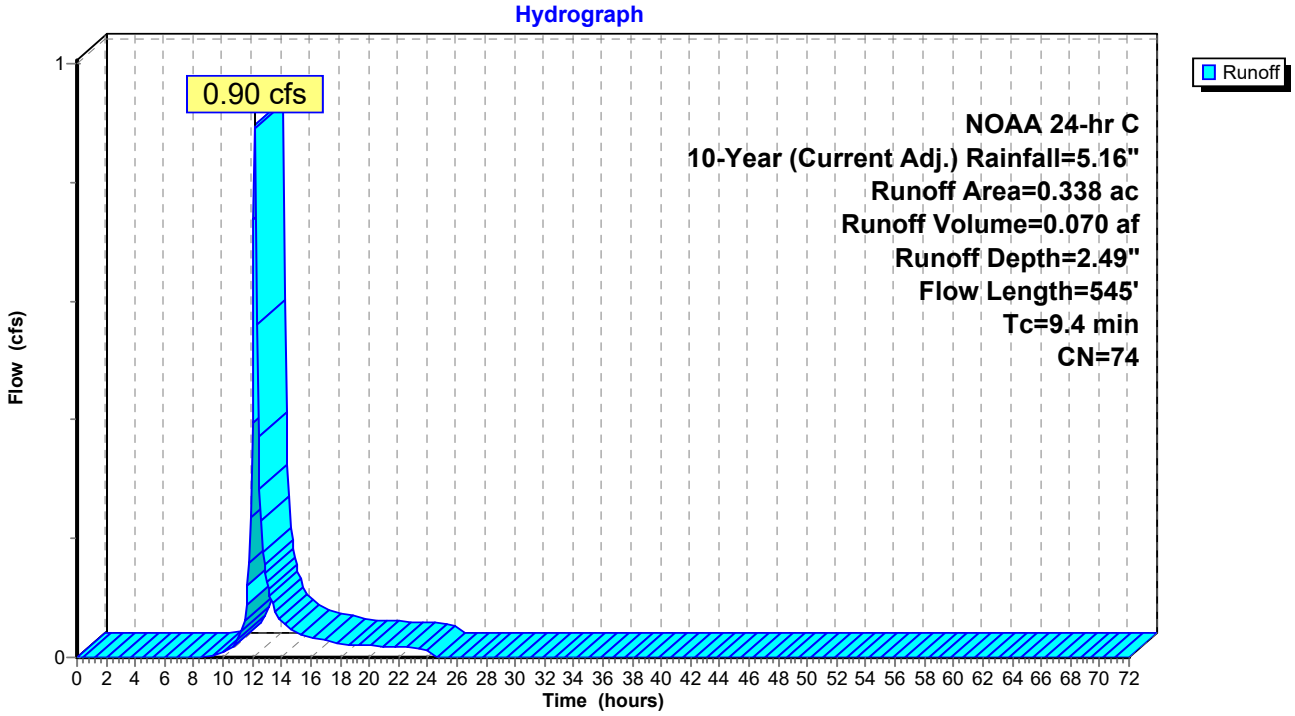
Runoff = 0.90 cfs @ 12.18 hrs, Volume= 0.070 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

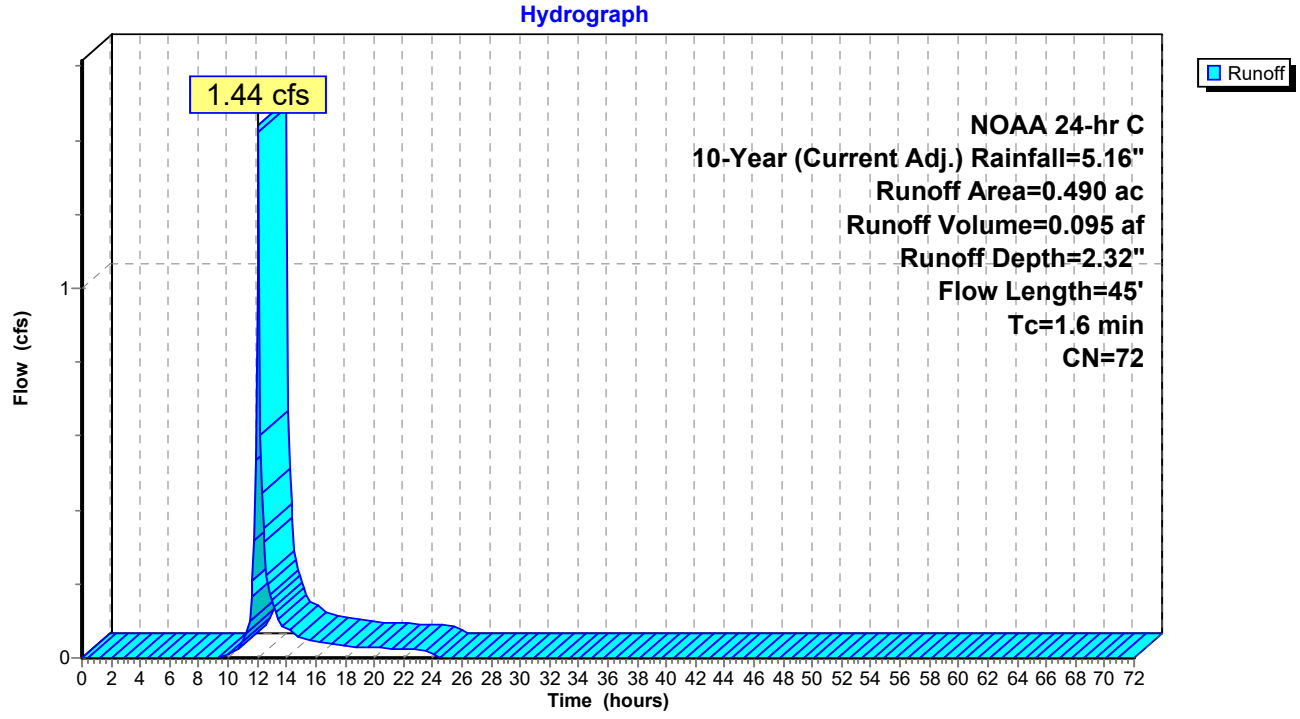
Runoff = 1.44 cfs @ 12.08 hrs, Volume= 0.095 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Current Adj.) Rainfall=5.16"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 2.49" for 10-Year (Current Adj.) event
Inflow = 0.37 cfs @ 12.34 hrs, Volume= 0.040 af
Outflow = 0.36 cfs @ 12.36 hrs, Volume= 0.035 af, Atten= 3%, Lag= 1.1 min
Primary = 0.36 cfs @ 12.36 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.09' @ 12.36 hrs Surf.Area= 1,756 sf Storage= 255 cf

Plug-Flow detention time= 88.7 min calculated for 0.035 af (88% of inflow)
Center-of-Mass det. time= 28.4 min (883.5 - 855.1)

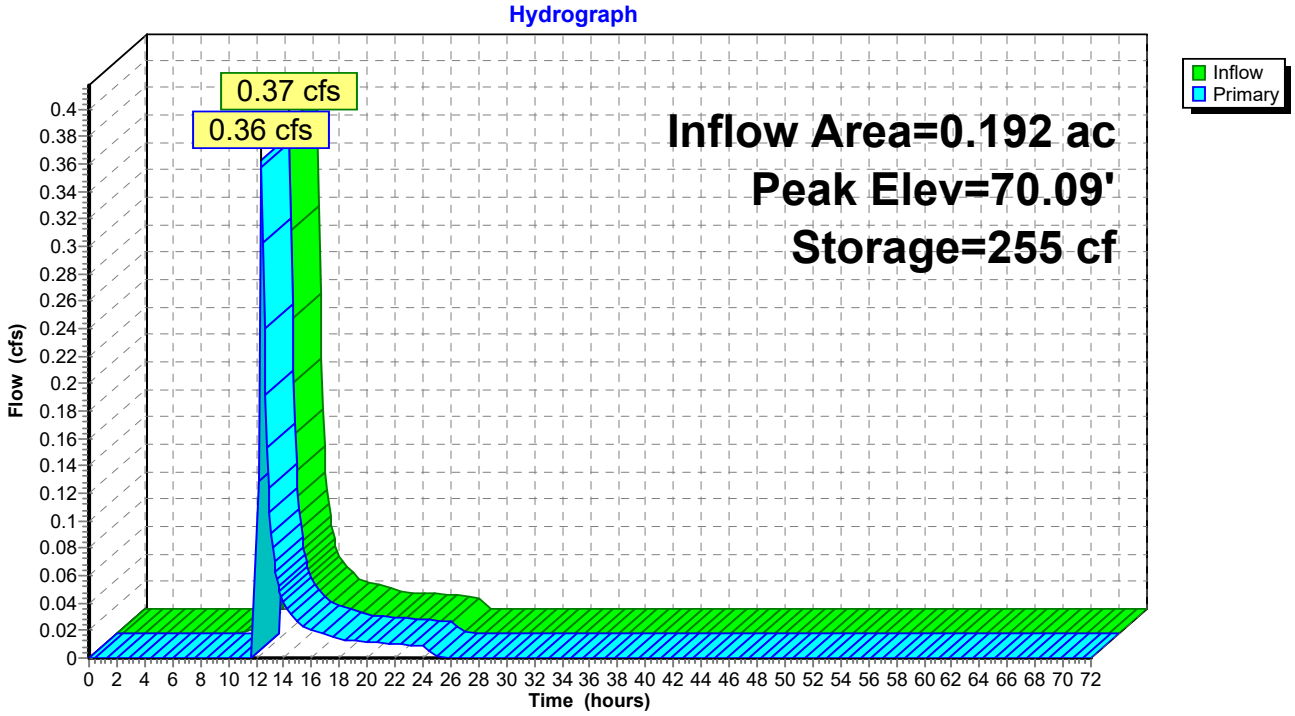
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.35 cfs @ 12.36 hrs HW=70.09' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.35 cfs @ 0.21 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 3.74" for 10-Year (Current Adj.) event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.1 min
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.15' @ 12.11 hrs Surf.Area= 358 sf Storage= 80 cf

Plug-Flow detention time= 40.4 min calculated for 0.040 af (97% of inflow)
Center-of-Mass det. time= 20.9 min (798.3 - 777.4)

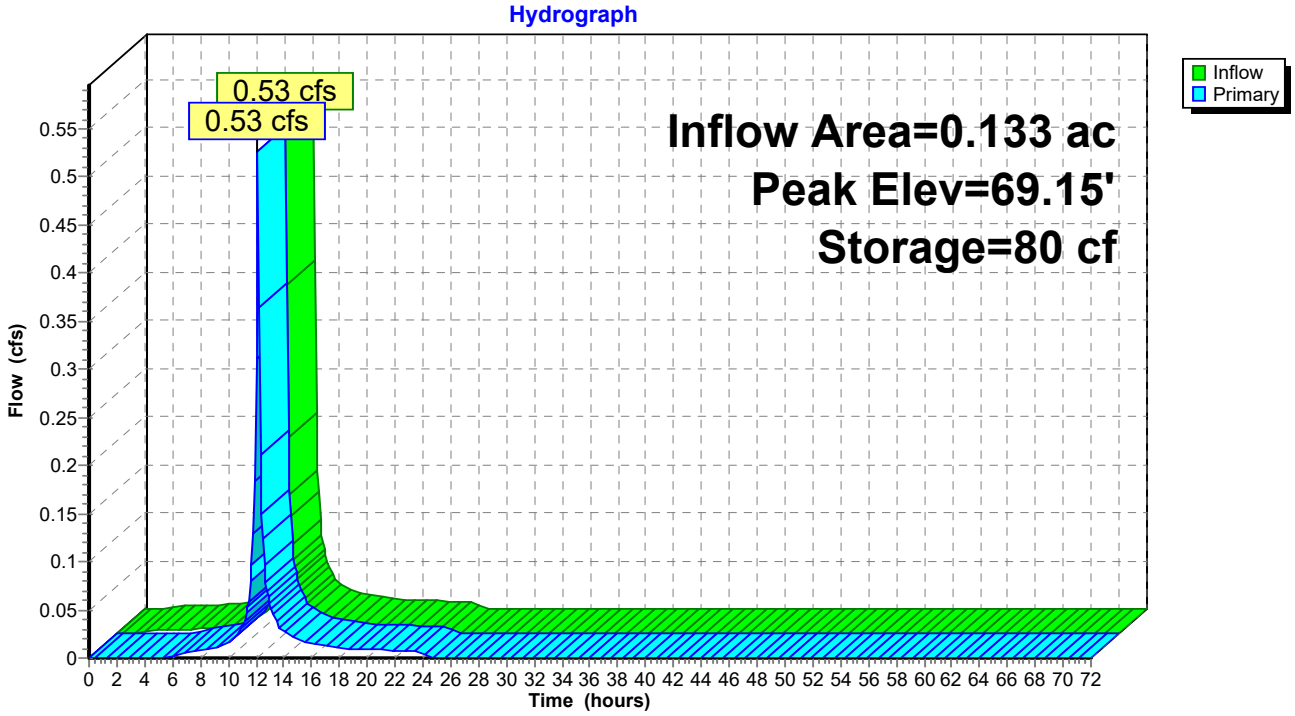
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.51 cfs @ 12.11 hrs HW=69.15' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.51 cfs @ 0.32 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 3.86" for 10-Year (Current Adj.) event
Inflow = 7.57 cfs @ 12.11 hrs, Volume= 0.612 af
Outflow = 5.33 cfs @ 12.23 hrs, Volume= 0.512 af, Atten= 30%, Lag= 6.8 min
Primary = 5.33 cfs @ 12.23 hrs, Volume= 0.512 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.23' @ 12.23 hrs Surf.Area= 7,578 sf Storage= 8,526 cf

Plug-Flow detention time= 150.9 min calculated for 0.511 af (83% of inflow)
Center-of-Mass det. time= 78.6 min (852.9 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

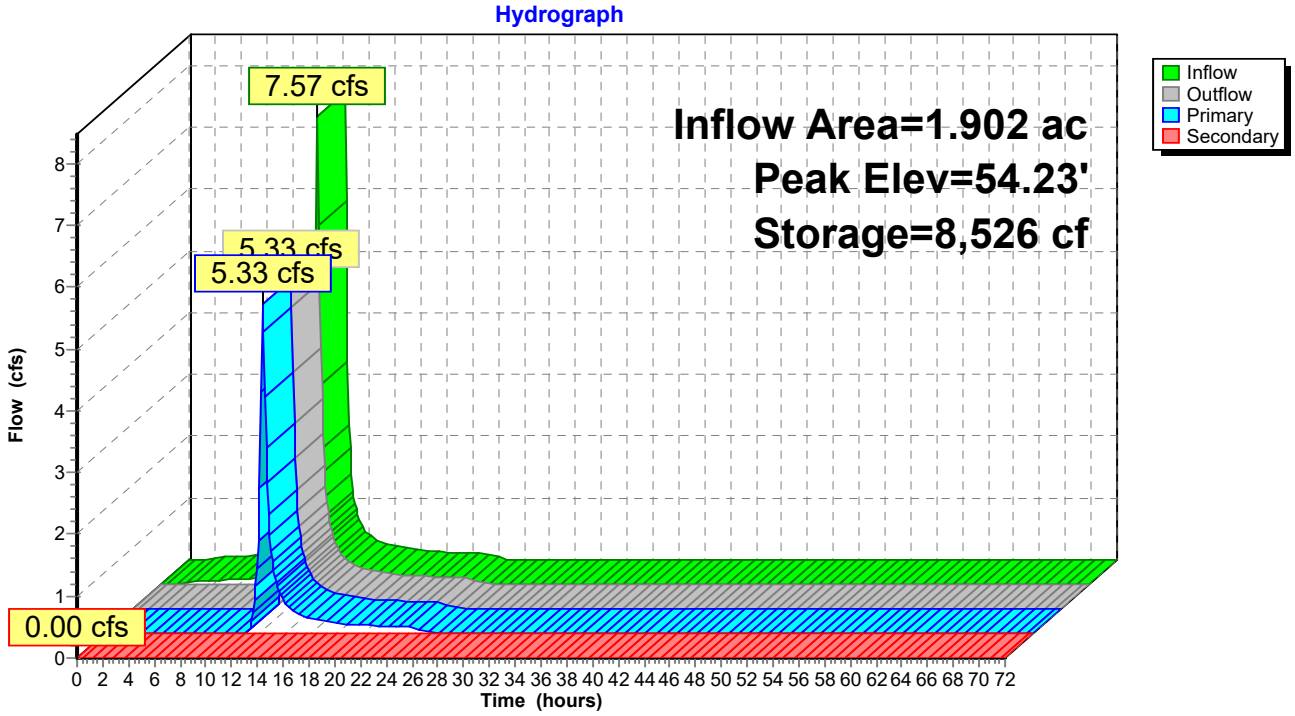
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=5.16 cfs @ 12.23 hrs HW=54.21' (Free Discharge)
└**1=Culvert** (Passes 5.16 cfs of 30.58 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 5.16 cfs @ 2.29 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 4.15" for 10-Year (Current Adj.) event
Inflow = 13.17 cfs @ 12.09 hrs, Volume= 0.969 af
Outflow = 4.20 cfs @ 12.32 hrs, Volume= 0.790 af, Atten= 68%, Lag= 13.6 min
Primary = 4.20 cfs @ 12.32 hrs, Volume= 0.790 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.41' @ 12.32 hrs Surf.Area= 16,392 sf Storage= 21,186 cf

Plug-Flow detention time= 264.9 min calculated for 0.789 af (81% of inflow)
Center-of-Mass det. time= 190.3 min (954.3 - 764.0)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

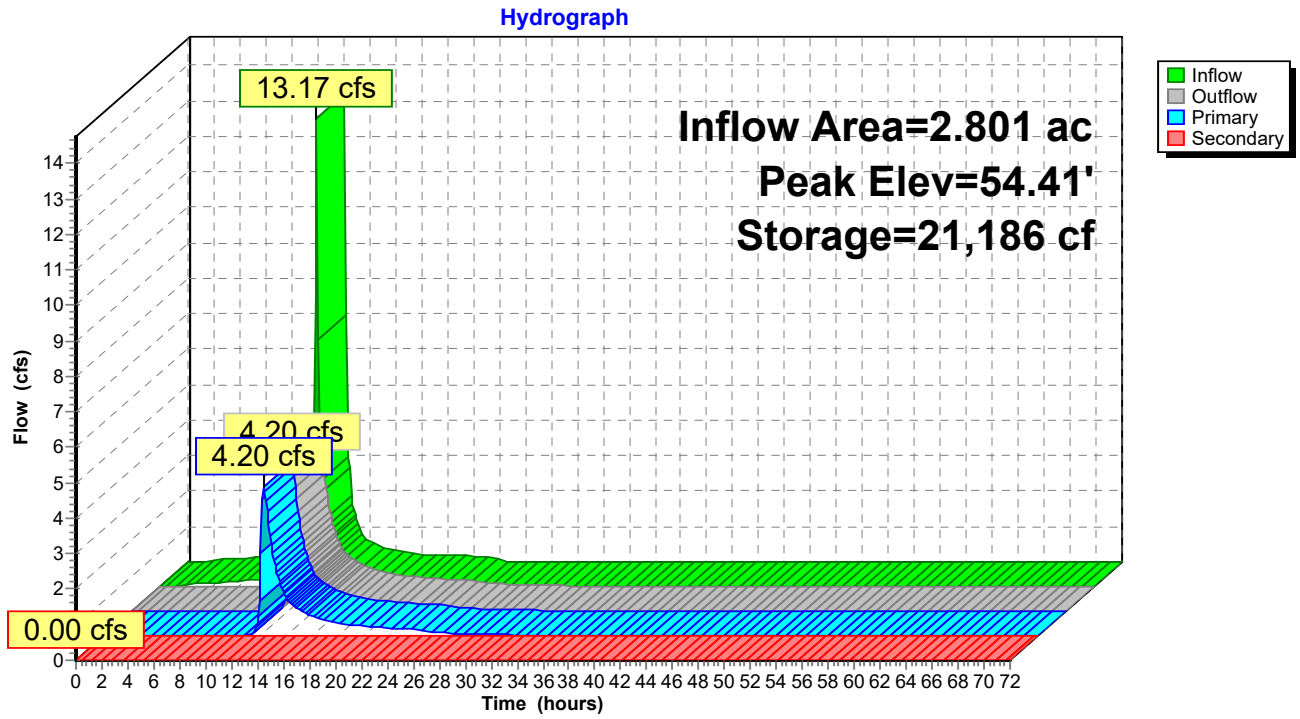
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.16 cfs @ 12.32 hrs HW=54.41' (Free Discharge)
└─**1=Culvert** (Passes 4.16 cfs of 31.76 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.63 cfs @ 3.06 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 1.53 cfs @ 1.87 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 4.01" for 10-Year (Current Adj.) event
Inflow = 17.70 cfs @ 12.10 hrs, Volume= 1.411 af
Outflow = 3.54 cfs @ 12.55 hrs, Volume= 1.172 af, Atten= 80%, Lag= 27.0 min
Primary = 3.54 cfs @ 12.55 hrs, Volume= 1.172 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 62.56' @ 12.55 hrs Surf.Area= 15,131 sf Storage= 33,095 cf

Plug-Flow detention time= 297.1 min calculated for 1.172 af (83% of inflow)
Center-of-Mass det. time= 222.5 min (990.9 - 768.4)

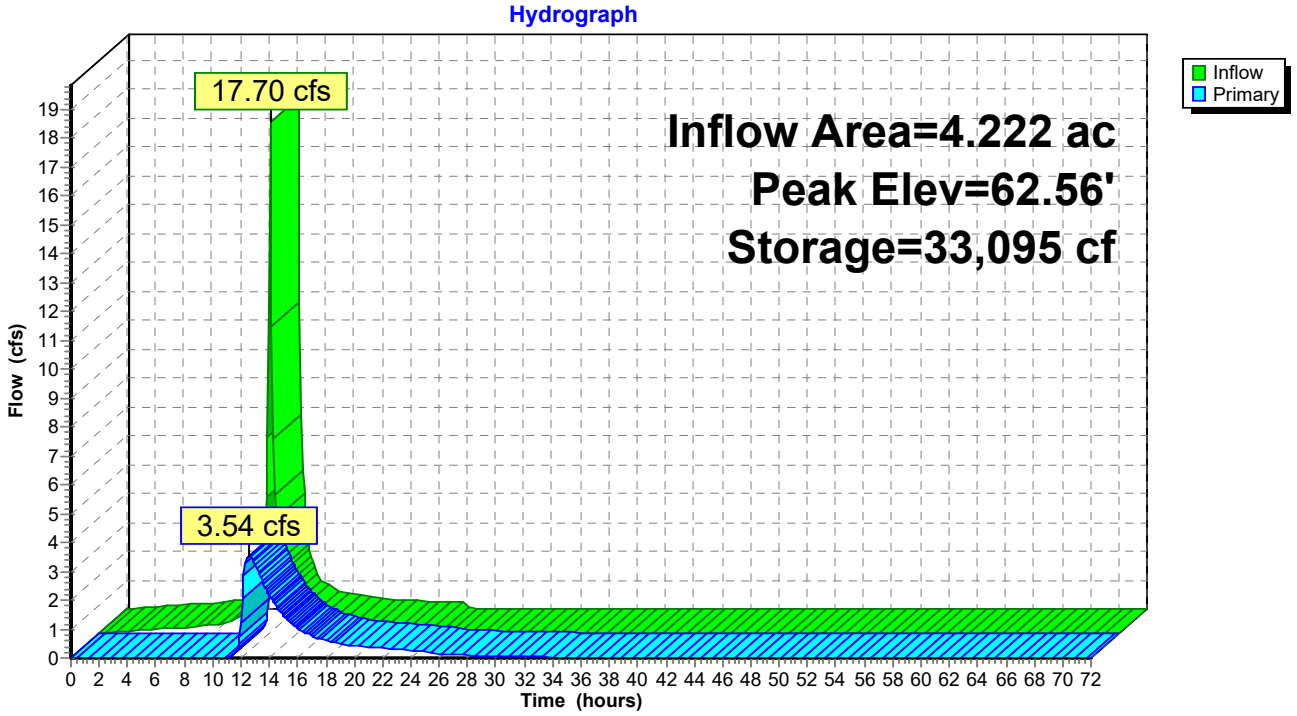
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=3.53 cfs @ 12.55 hrs HW=62.55' (Free Discharge)
- **1=Culvert** (Passes 3.53 cfs of 41.02 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 3.53 cfs @ 4.27 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

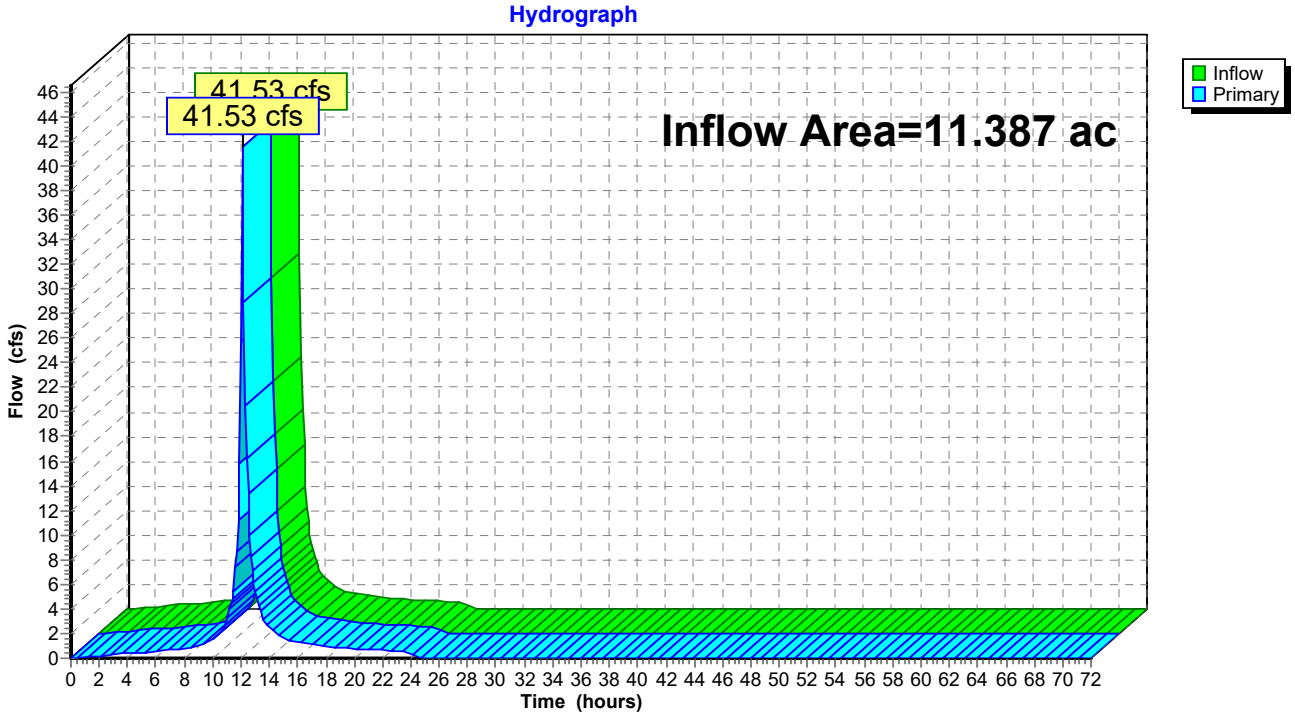


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 3.98" for 10-Year (Current Adj.) event
Inflow = 41.53 cfs @ 12.11 hrs, Volume= 3.778 af
Primary = 41.53 cfs @ 12.11 hrs, Volume= 3.778 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

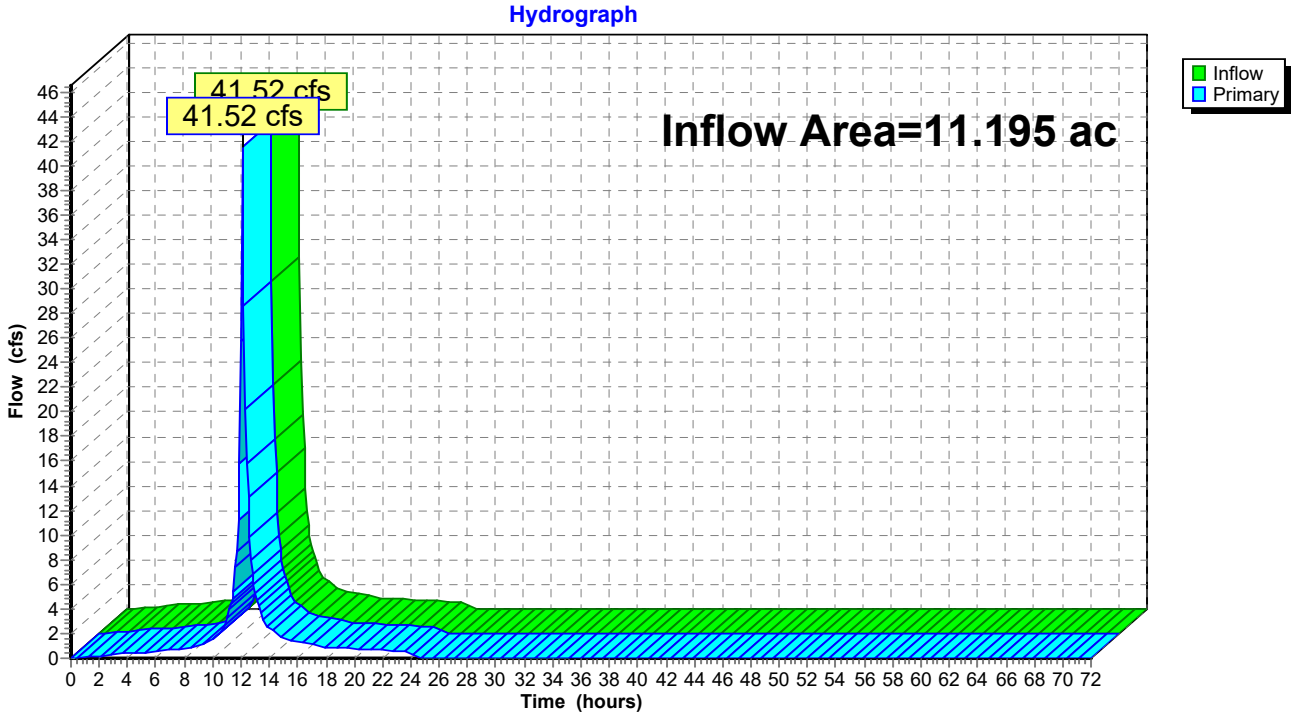


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 4.01" for 10-Year (Current Adj.) event
Inflow = 41.52 cfs @ 12.10 hrs, Volume= 3.743 af
Primary = 41.52 cfs @ 12.10 hrs, Volume= 3.743 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

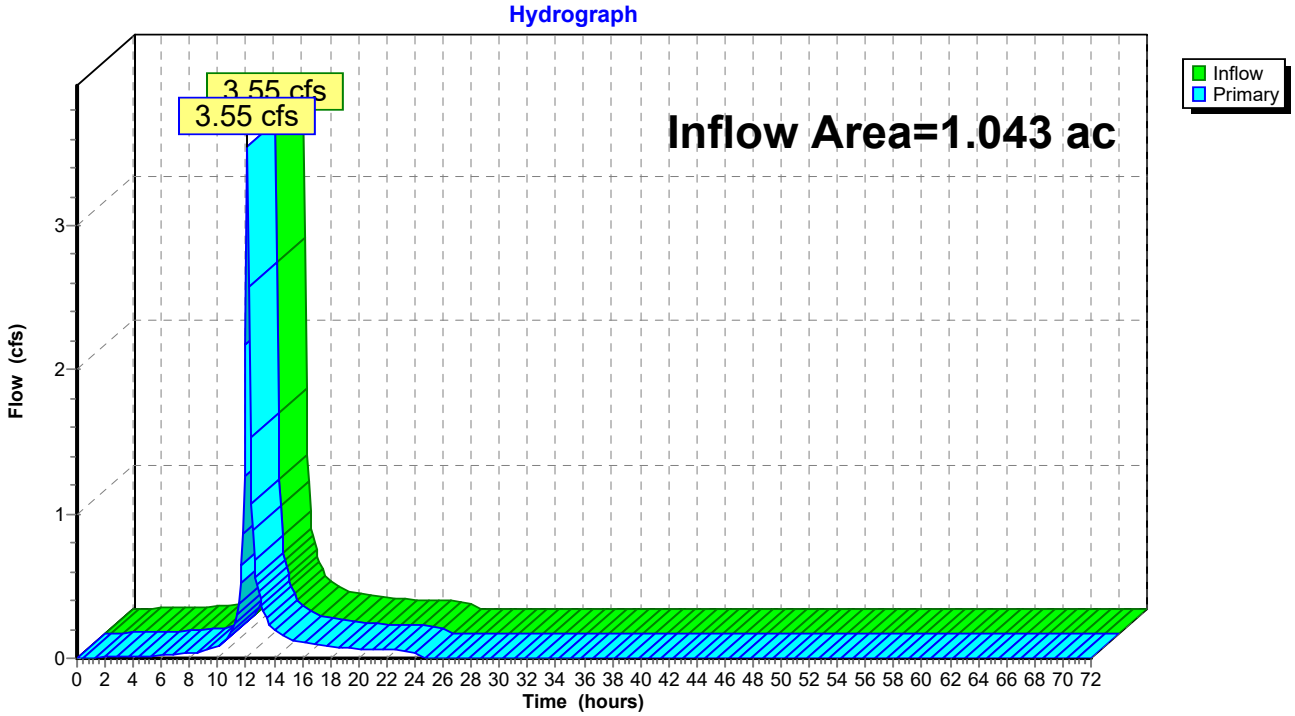


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 3.22" for 10-Year (Current Adj.) event
Inflow = 3.55 cfs @ 12.11 hrs, Volume= 0.280 af
Primary = 3.55 cfs @ 12.11 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

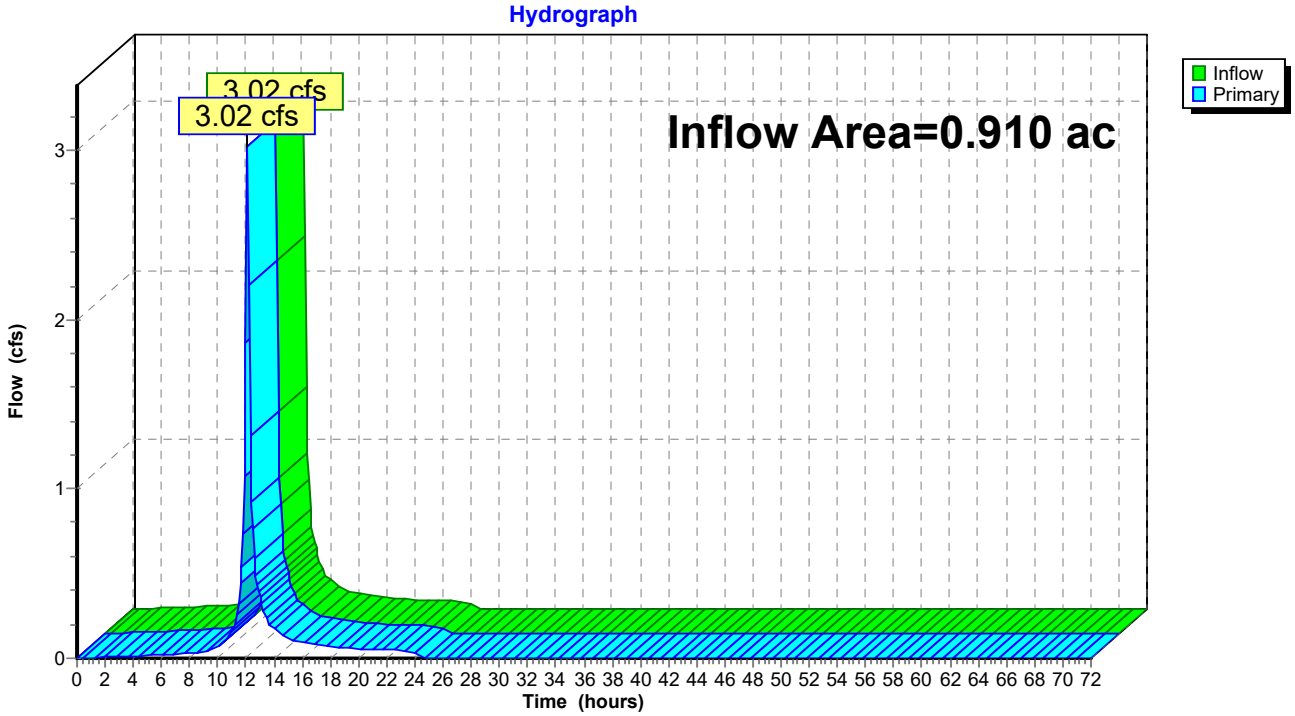


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 3.16" for 10-Year (Current Adj.) event
Inflow = 3.02 cfs @ 12.11 hrs, Volume= 0.240 af
Primary = 3.02 cfs @ 12.11 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

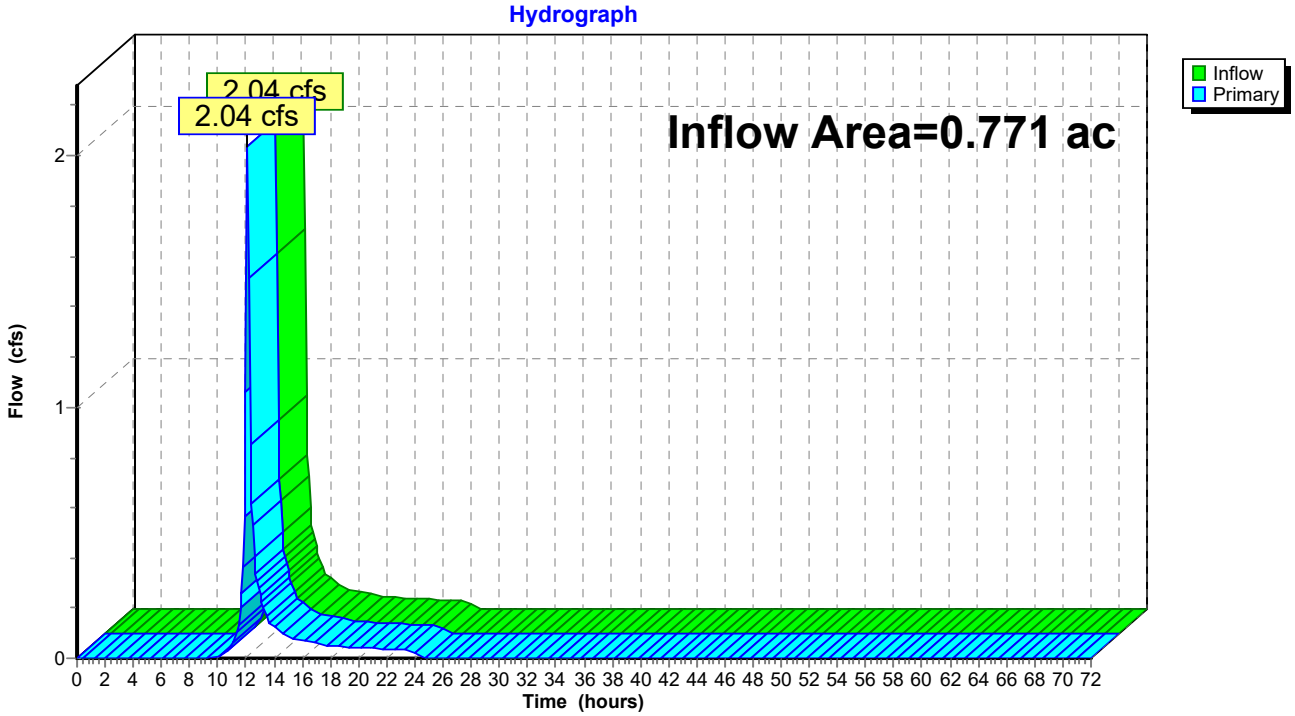


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-Year (Current Adj.) event
Inflow = 2.04 cfs @ 12.12 hrs, Volume= 0.144 af
Primary = 2.04 cfs @ 12.12 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

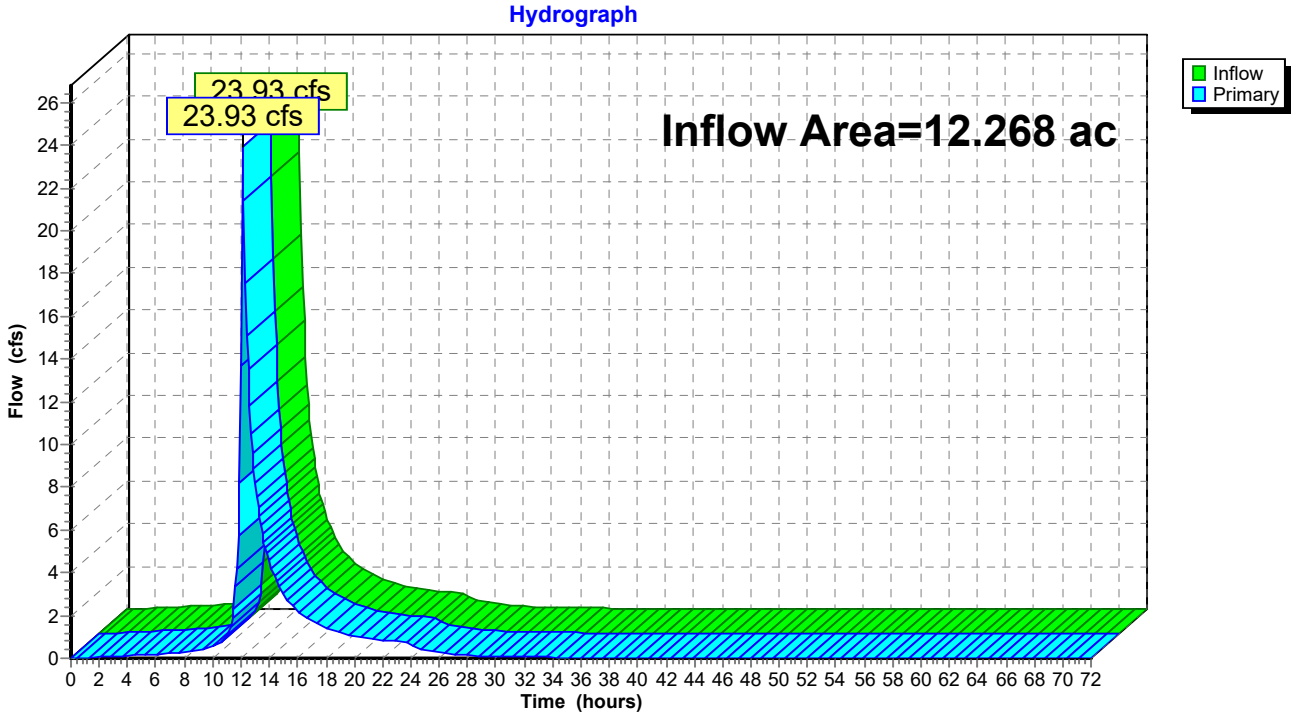


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 3.55" for 10-Year (Current Adj.) event
Inflow = 23.93 cfs @ 12.13 hrs, Volume= 3.634 af
Primary = 23.93 cfs @ 12.13 hrs, Volume= 3.634 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

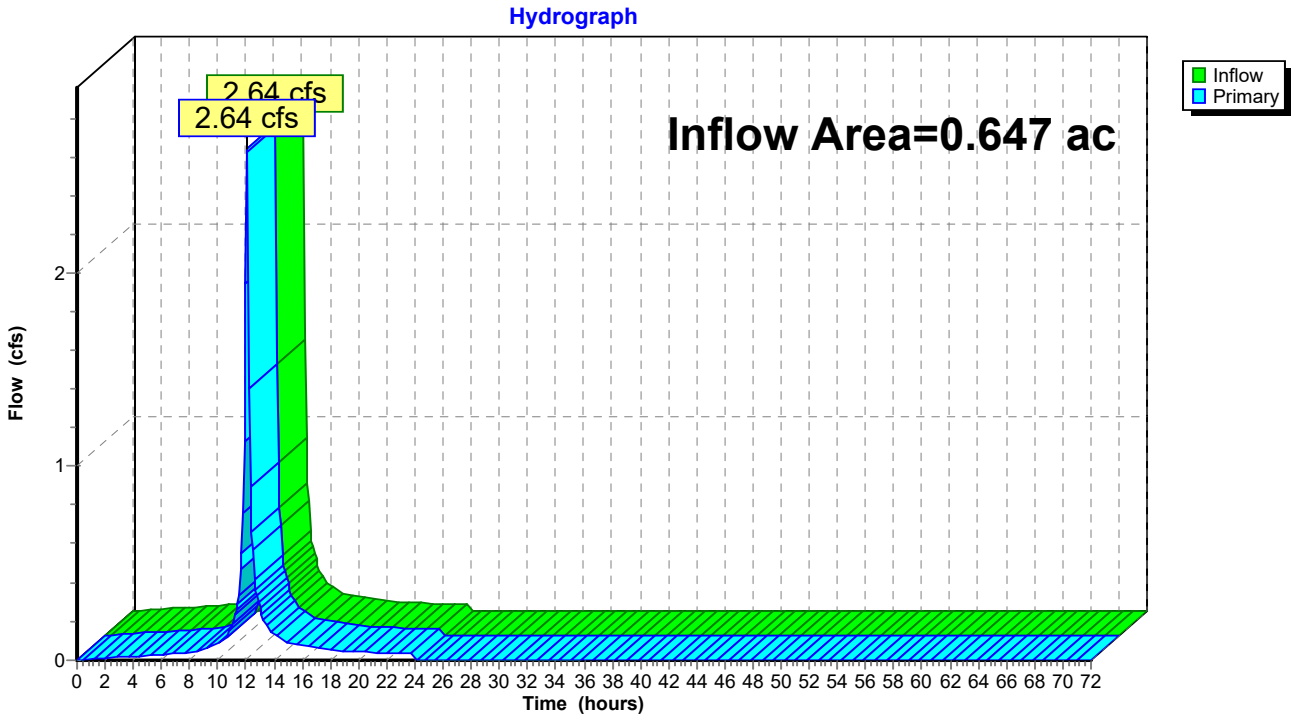


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 3.88" for 10-Year (Current Adj.) event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.209 af
Primary = 2.64 cfs @ 12.09 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

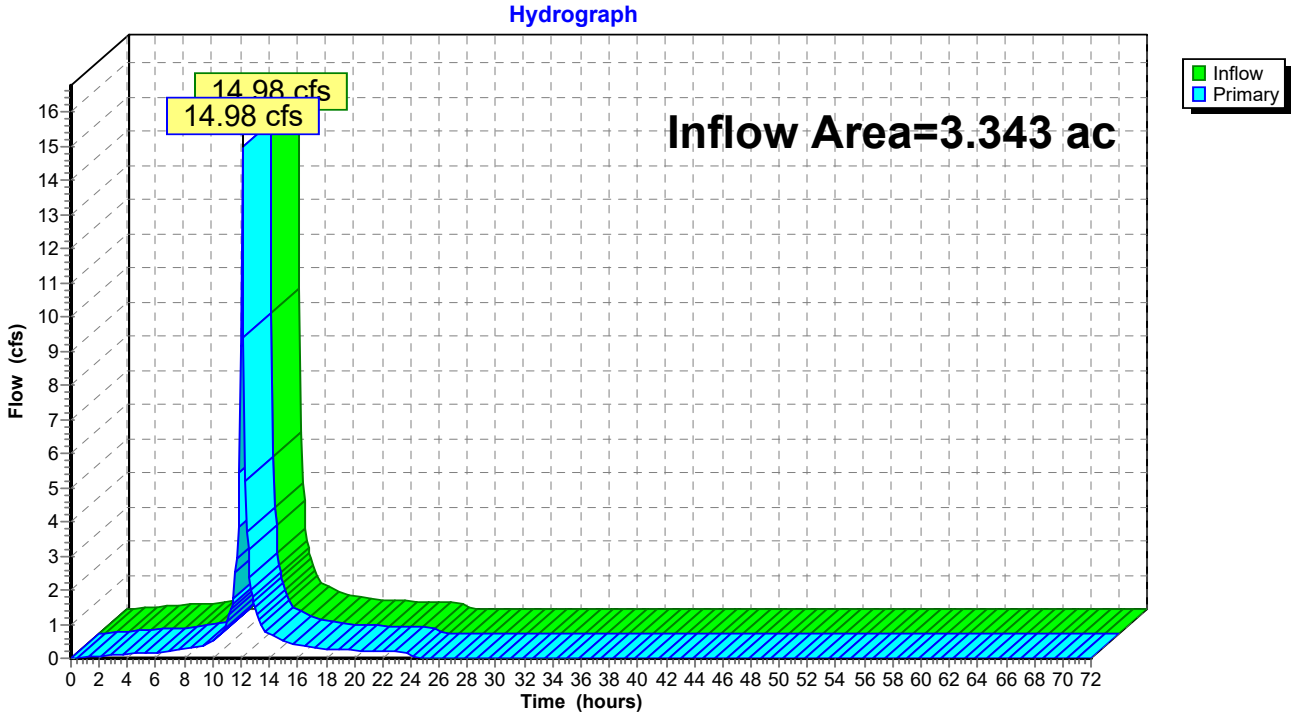


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 4.17" for 10-Year (Current Adj.) event
Inflow = 14.98 cfs @ 12.10 hrs, Volume= 1.161 af
Primary = 14.98 cfs @ 12.10 hrs, Volume= 1.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

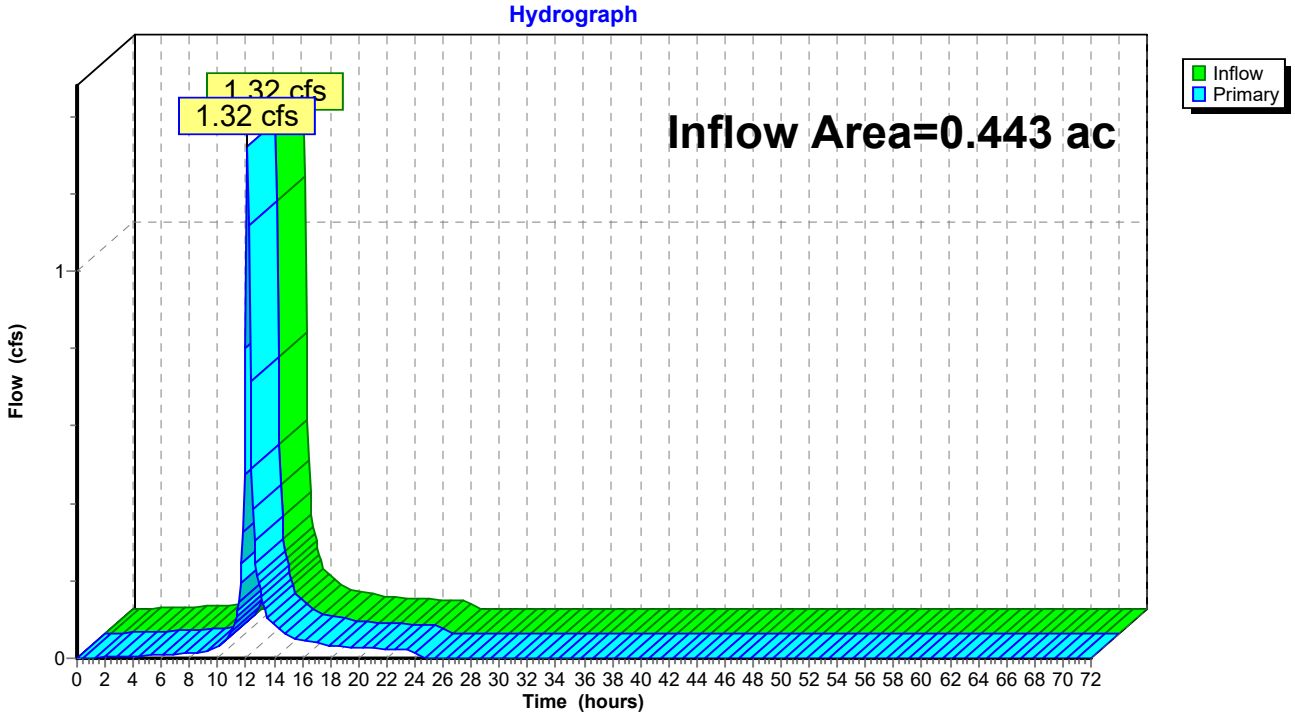


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 3.07" for 10-Year (Current Adj.) event
Inflow = 1.32 cfs @ 12.12 hrs, Volume= 0.113 af
Primary = 1.32 cfs @ 12.12 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

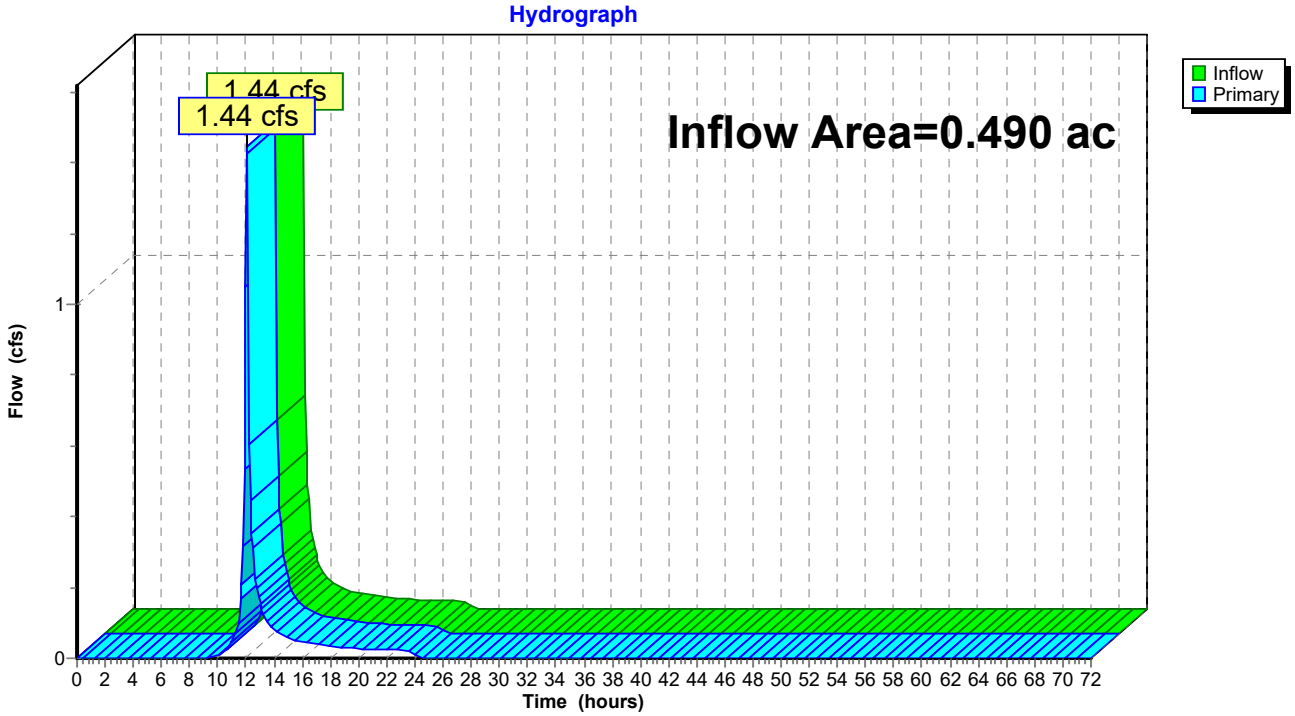


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-Year (Current Adj.) event
Inflow = 1.44 cfs @ 12.08 hrs, Volume= 0.095 af
Primary = 1.44 cfs @ 12.08 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

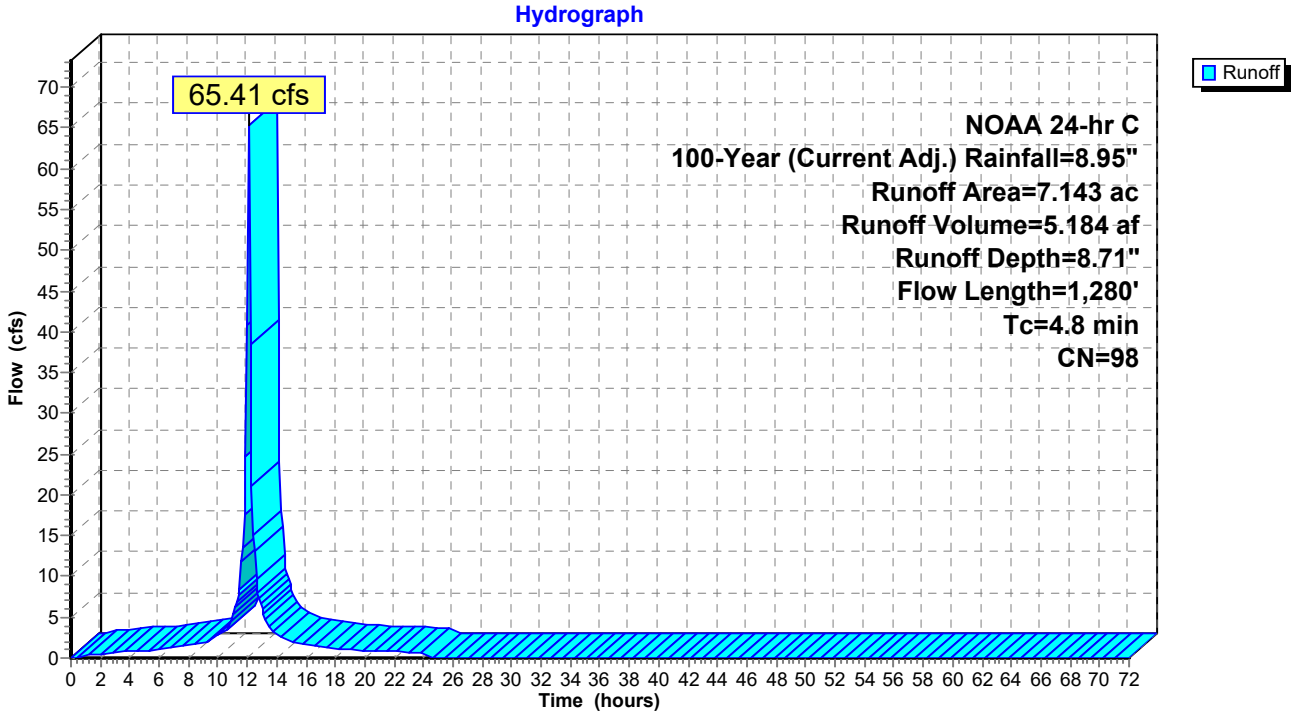
Runoff = 65.41 cfs @ 12.10 hrs, Volume= 5.184 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

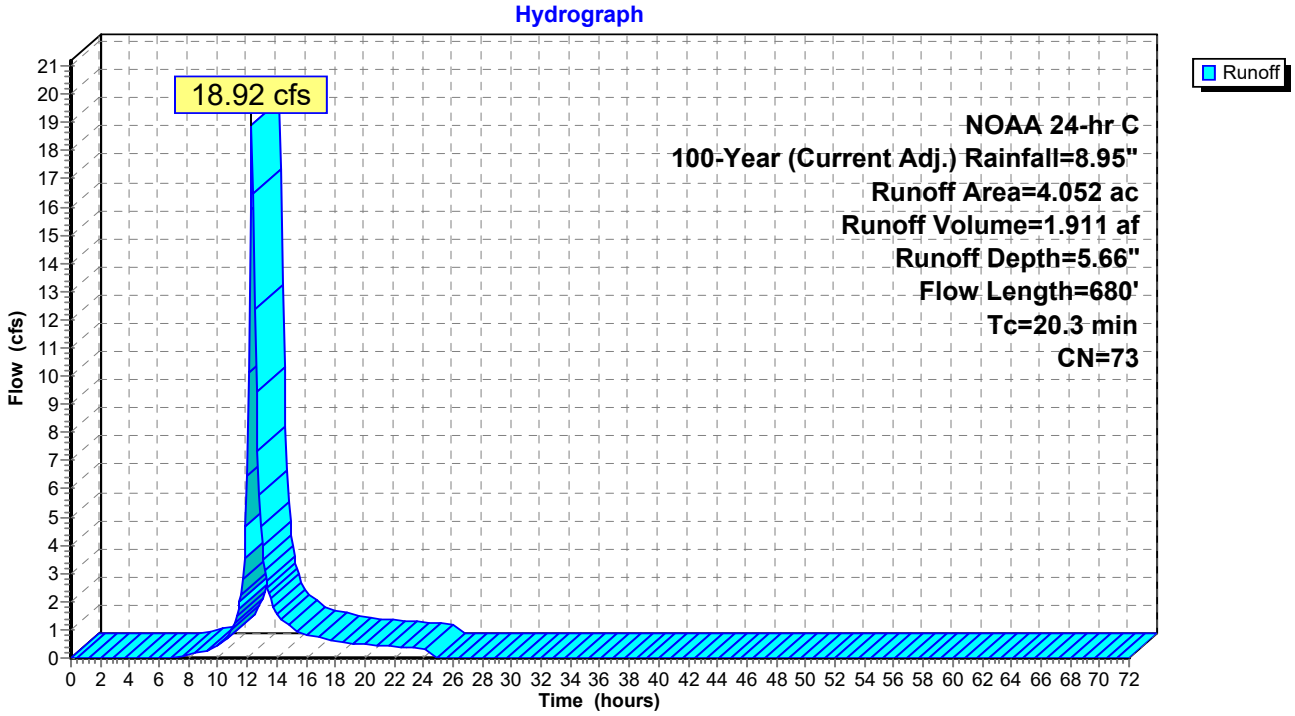
Runoff = 18.92 cfs @ 12.30 hrs, Volume= 1.911 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

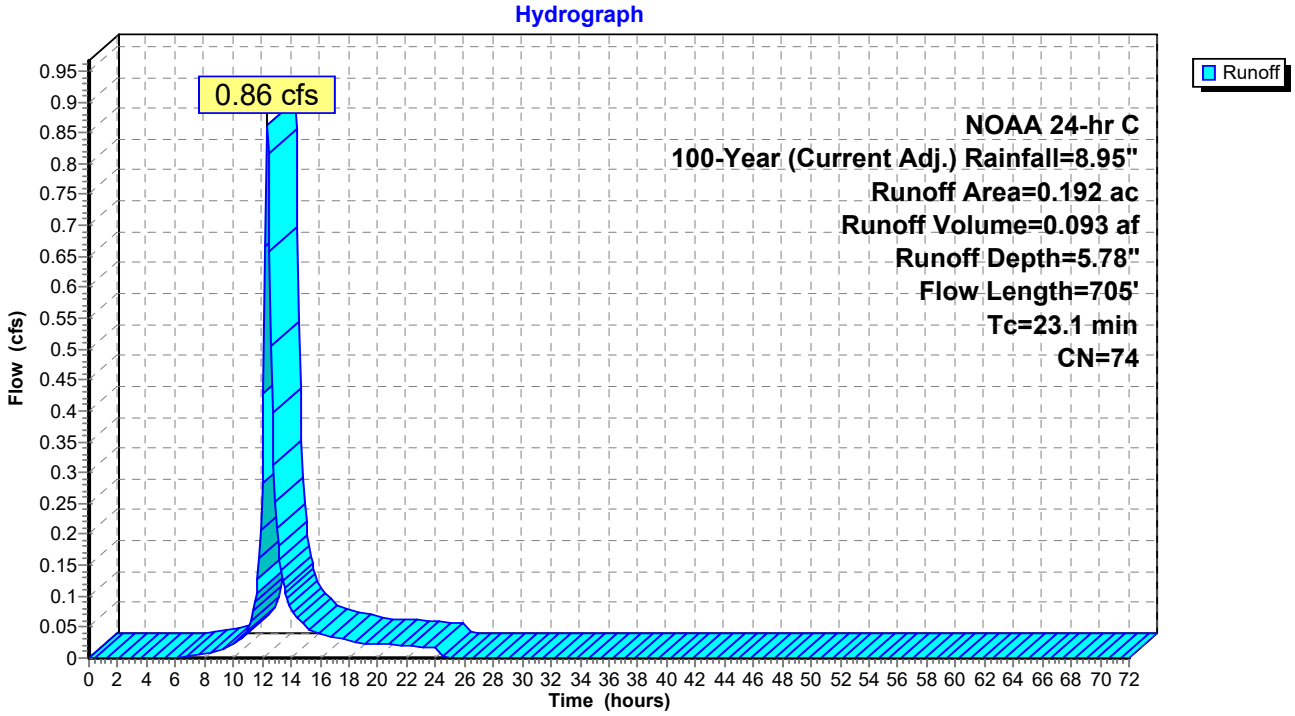
Runoff = 0.86 cfs @ 12.33 hrs, Volume= 0.093 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

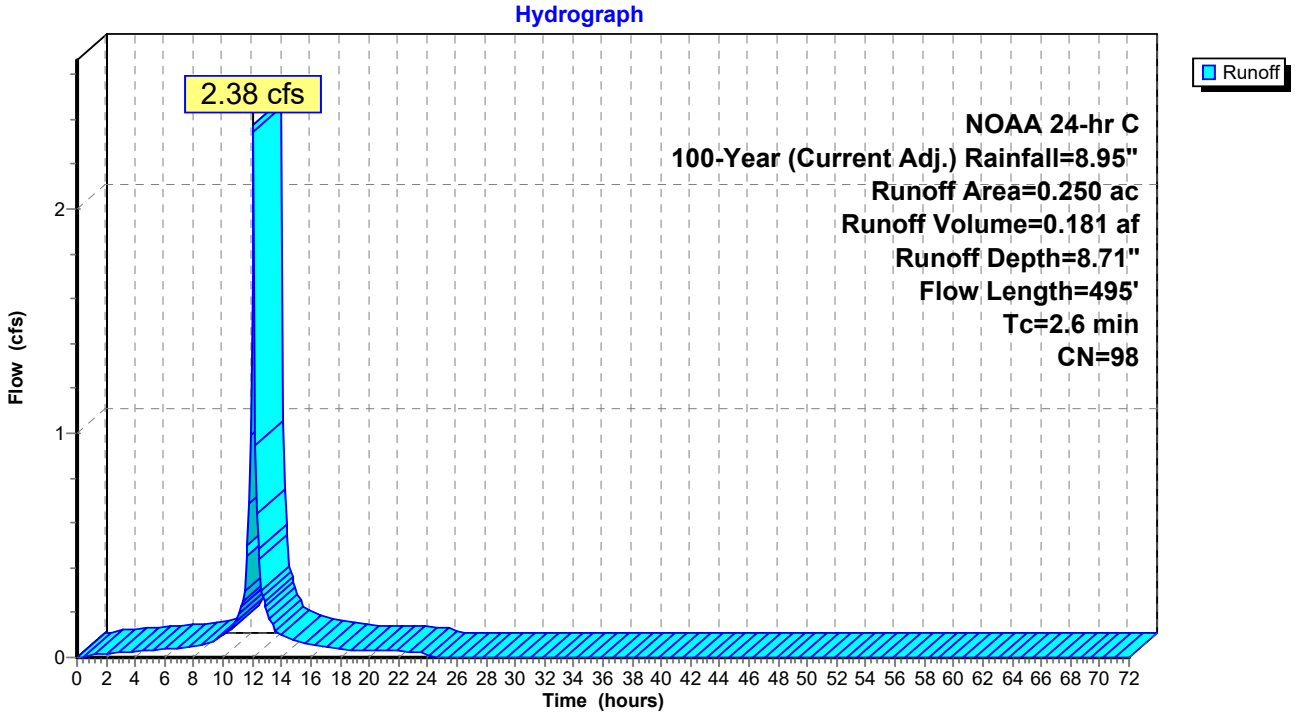
Runoff = 2.38 cfs @ 12.08 hrs, Volume= 0.181 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

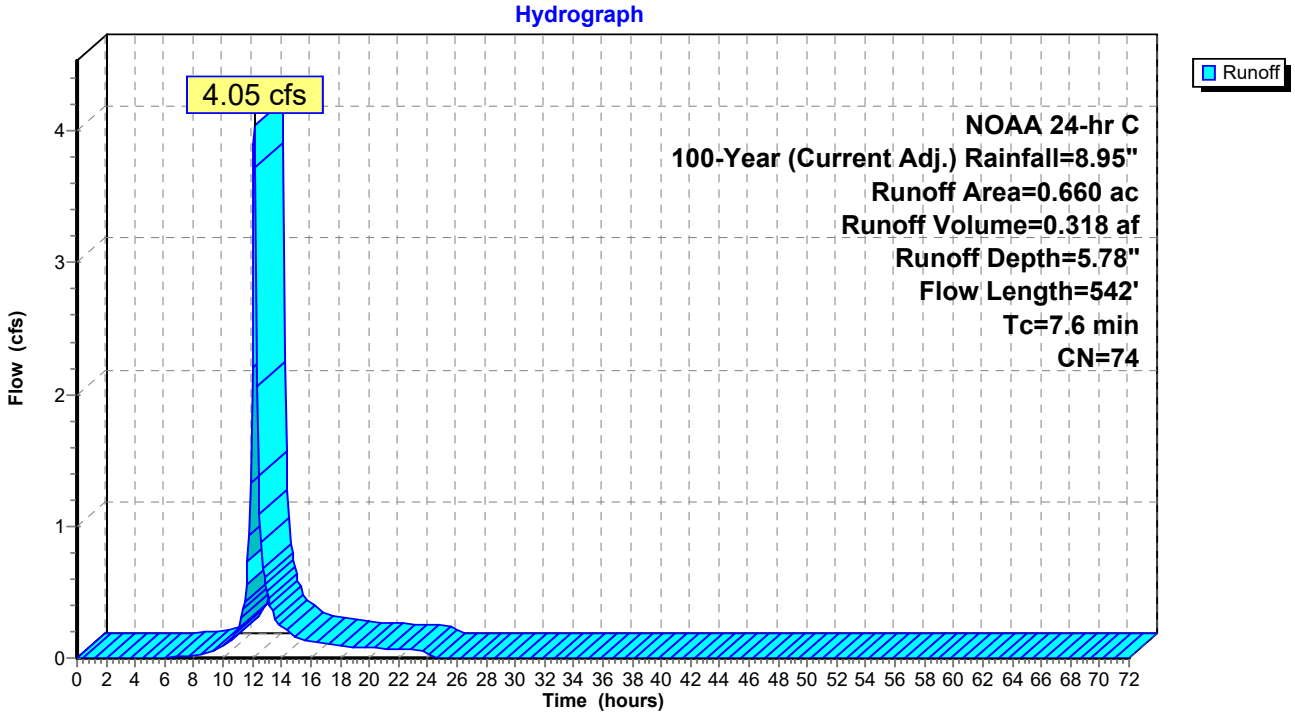
Runoff = 4.05 cfs @ 12.14 hrs, Volume= 0.318 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

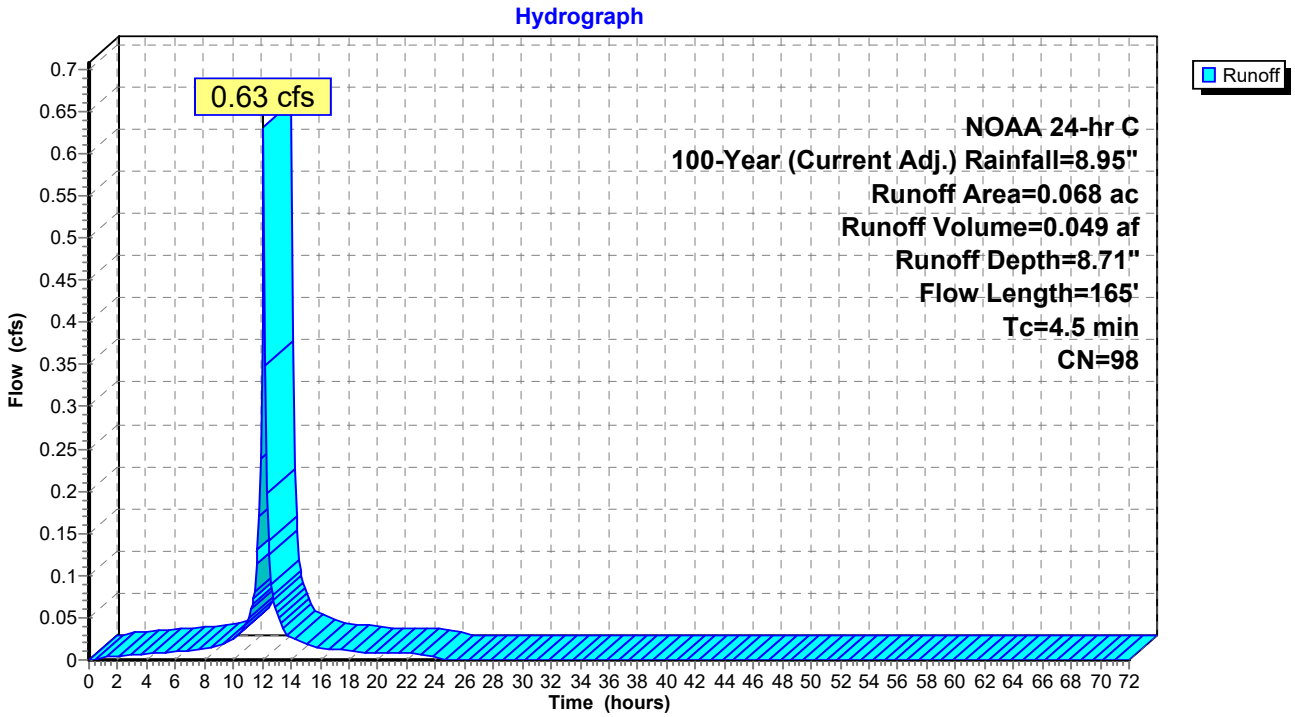
Runoff = 0.63 cfs @ 12.10 hrs, Volume= 0.049 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

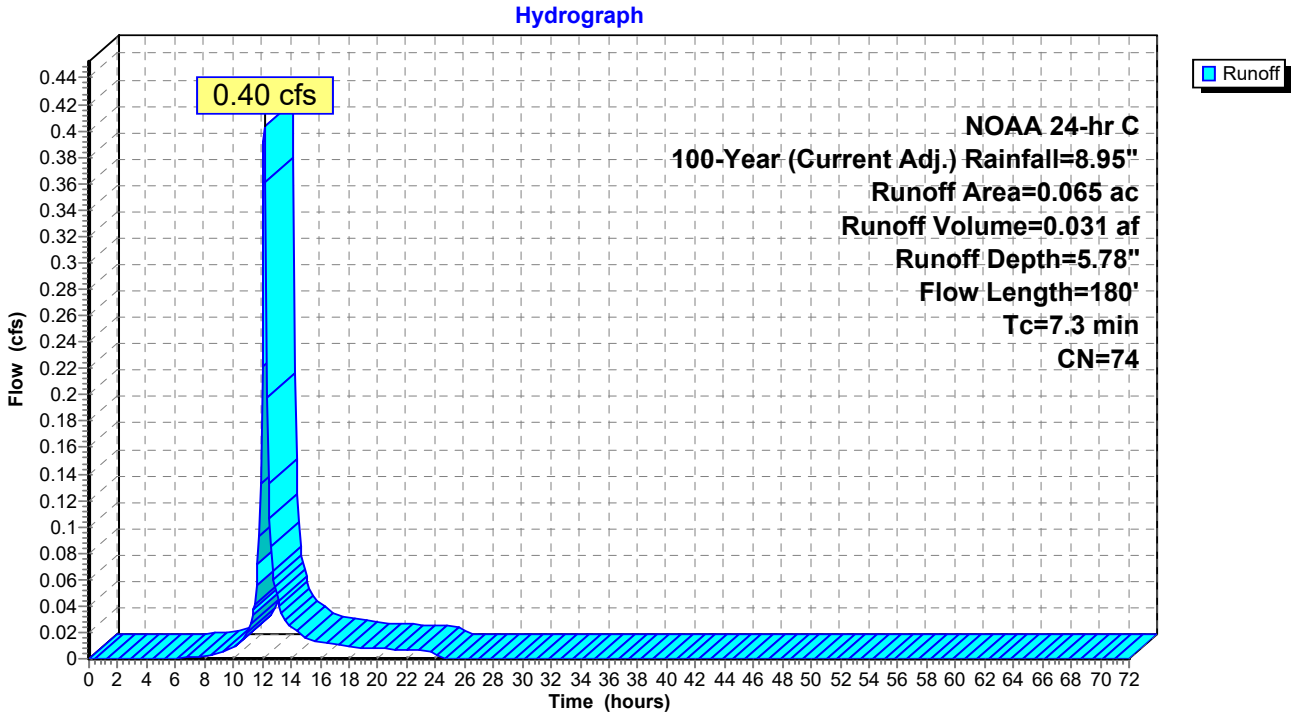
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

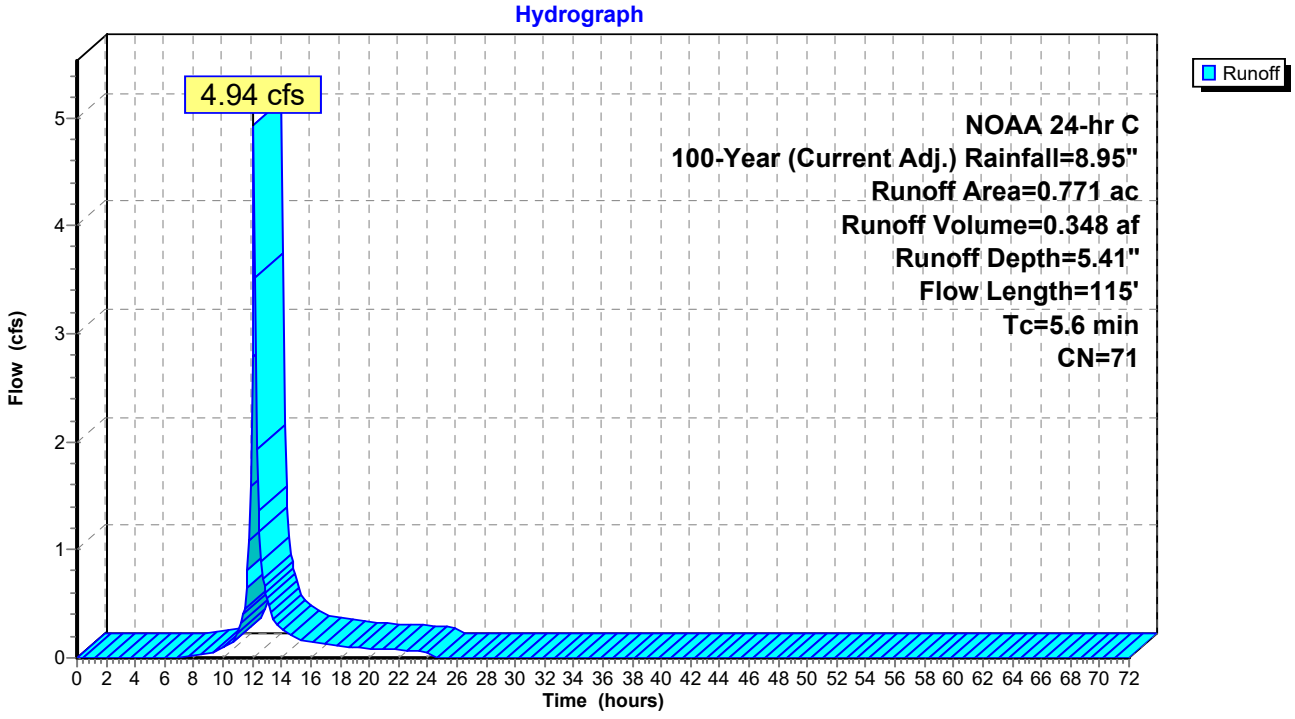
Runoff = 4.94 cfs @ 12.11 hrs, Volume= 0.348 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

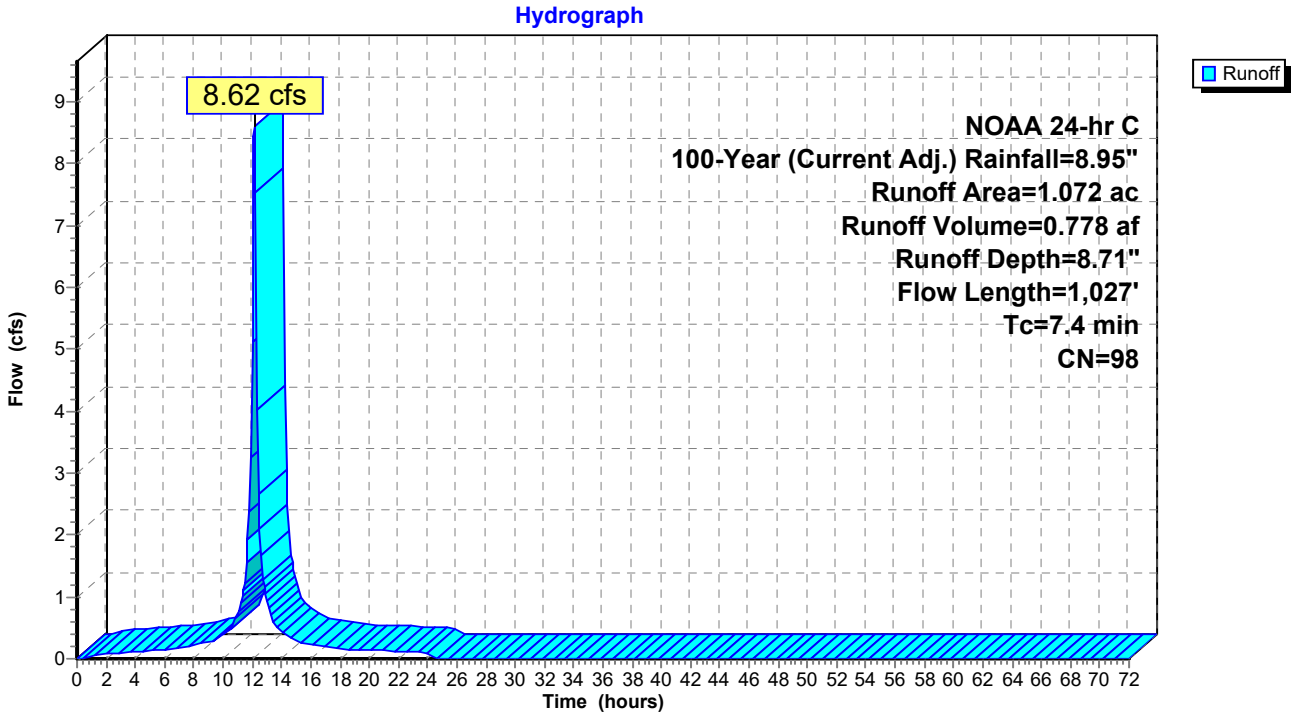
Runoff = 8.62 cfs @ 12.13 hrs, Volume= 0.778 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

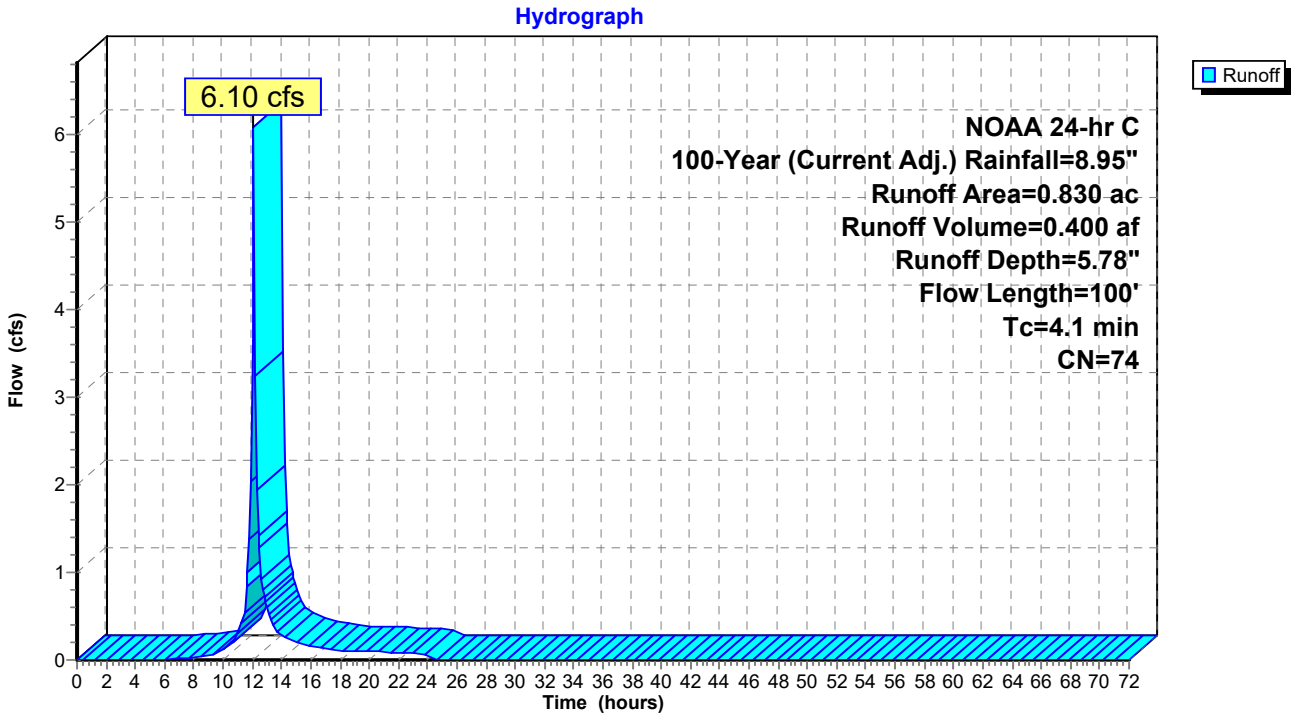
Runoff = 6.10 cfs @ 12.10 hrs, Volume= 0.400 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

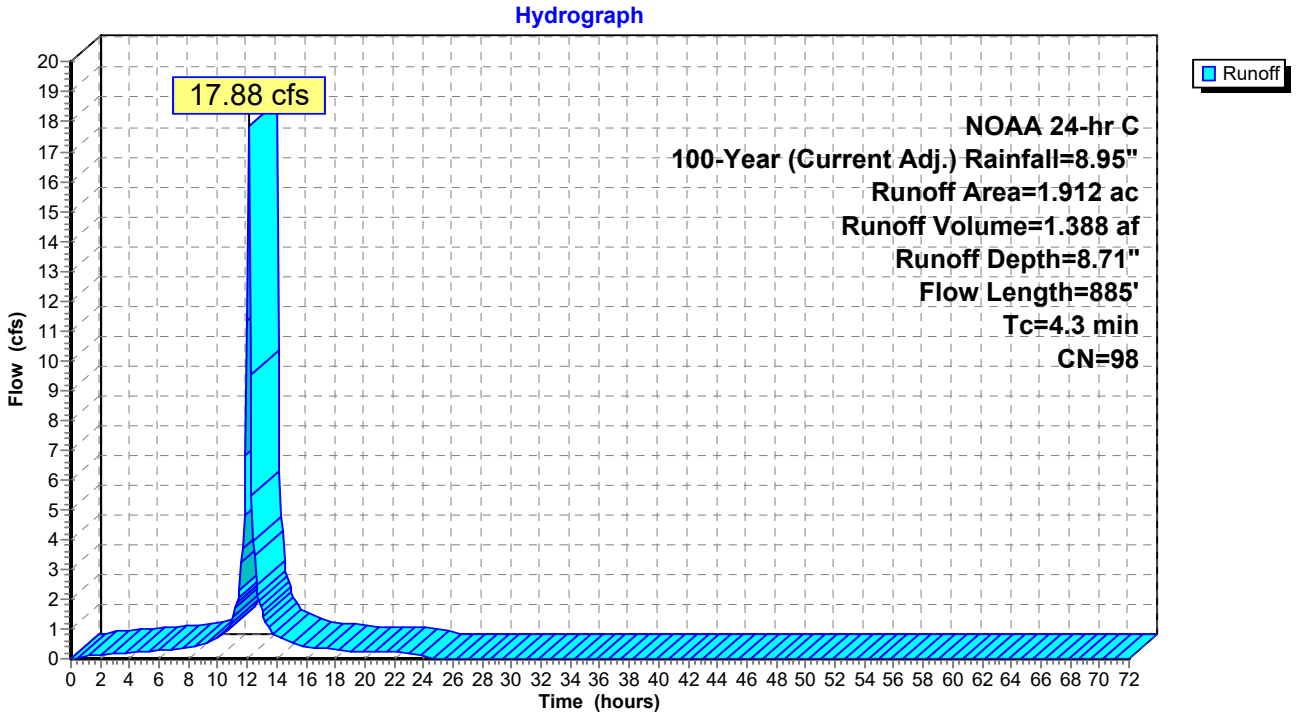
Runoff = 17.88 cfs @ 12.09 hrs, Volume= 1.388 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

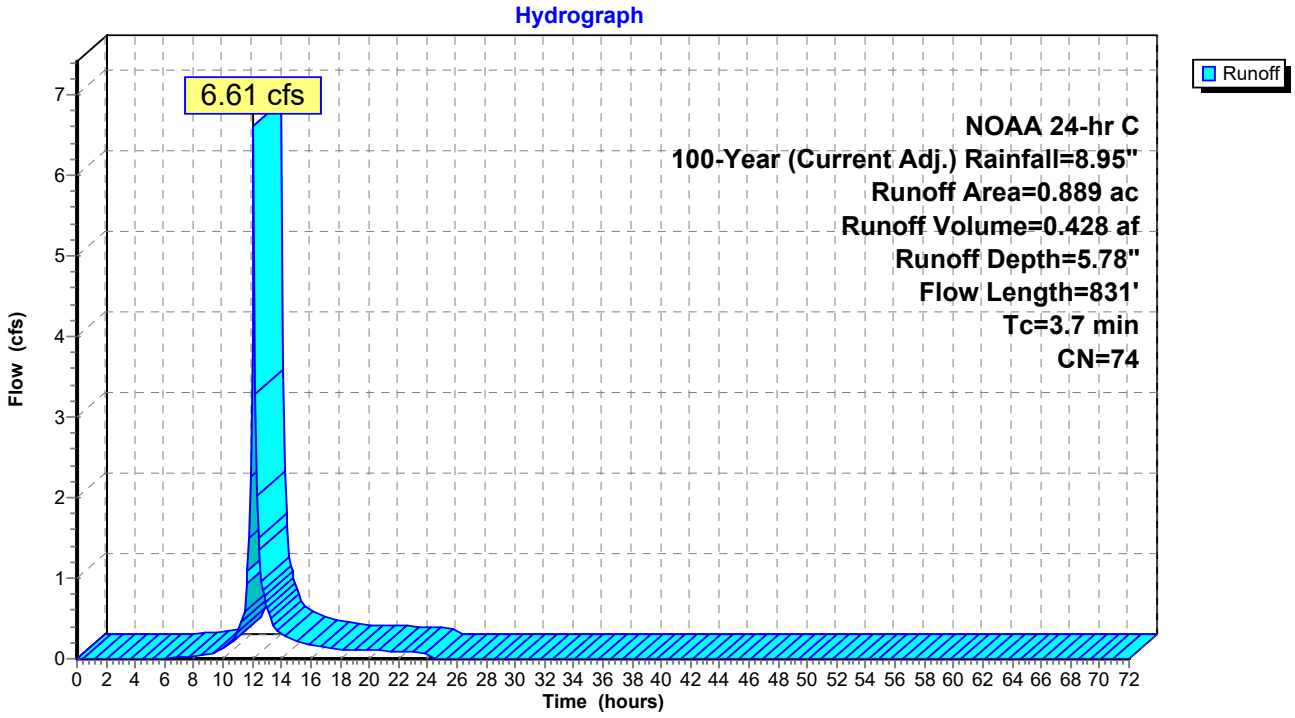
Runoff = 6.61 cfs @ 12.09 hrs, Volume= 0.428 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

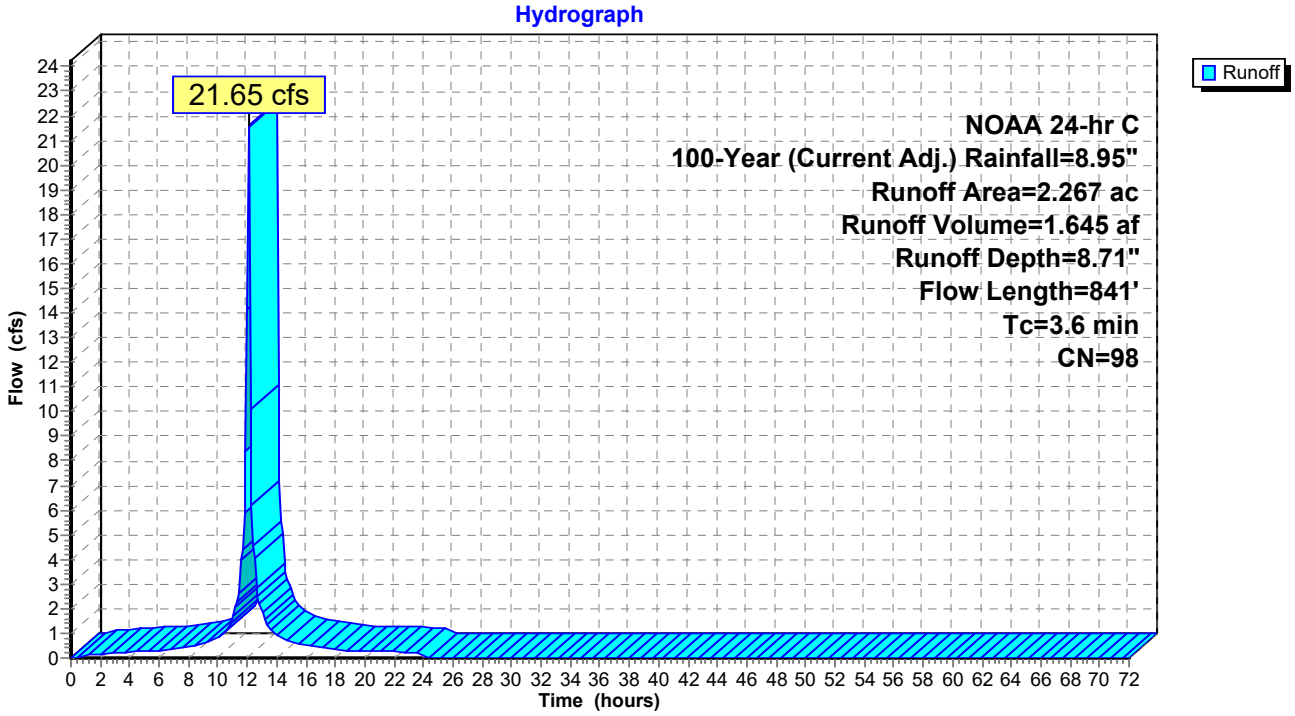
Runoff = 21.65 cfs @ 12.09 hrs, Volume= 1.645 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

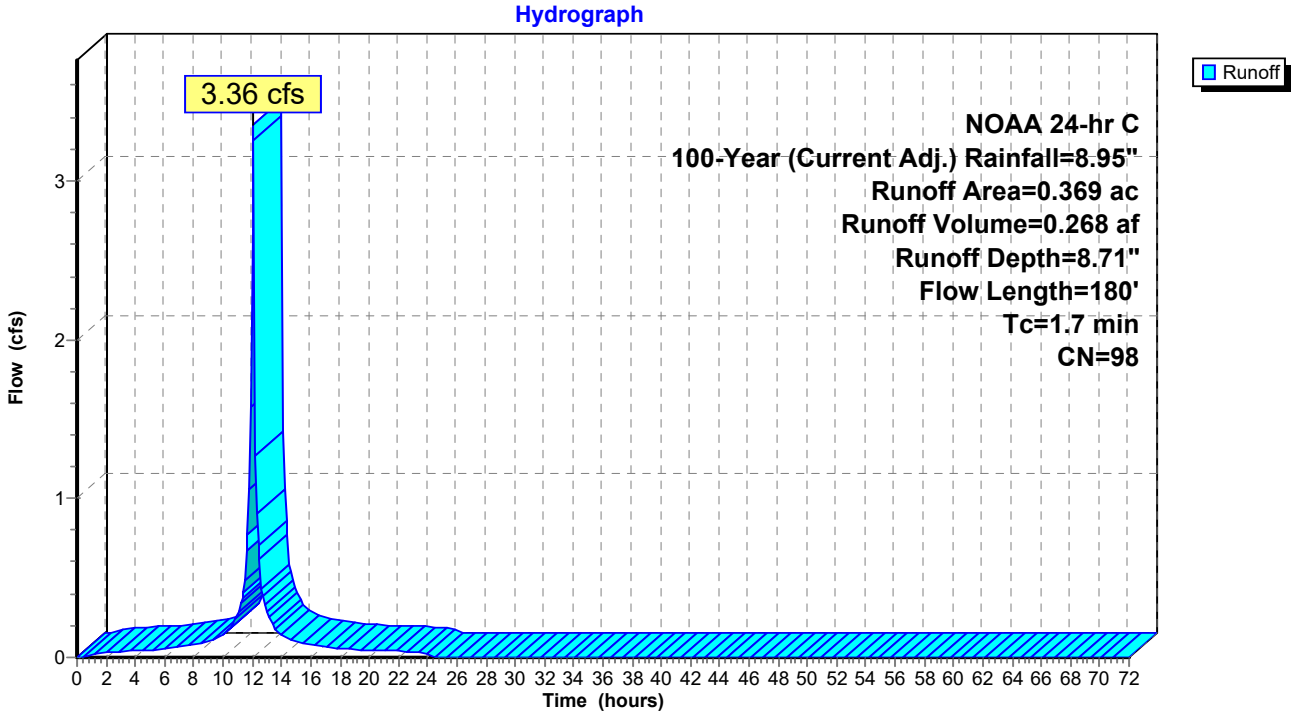
Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.268 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

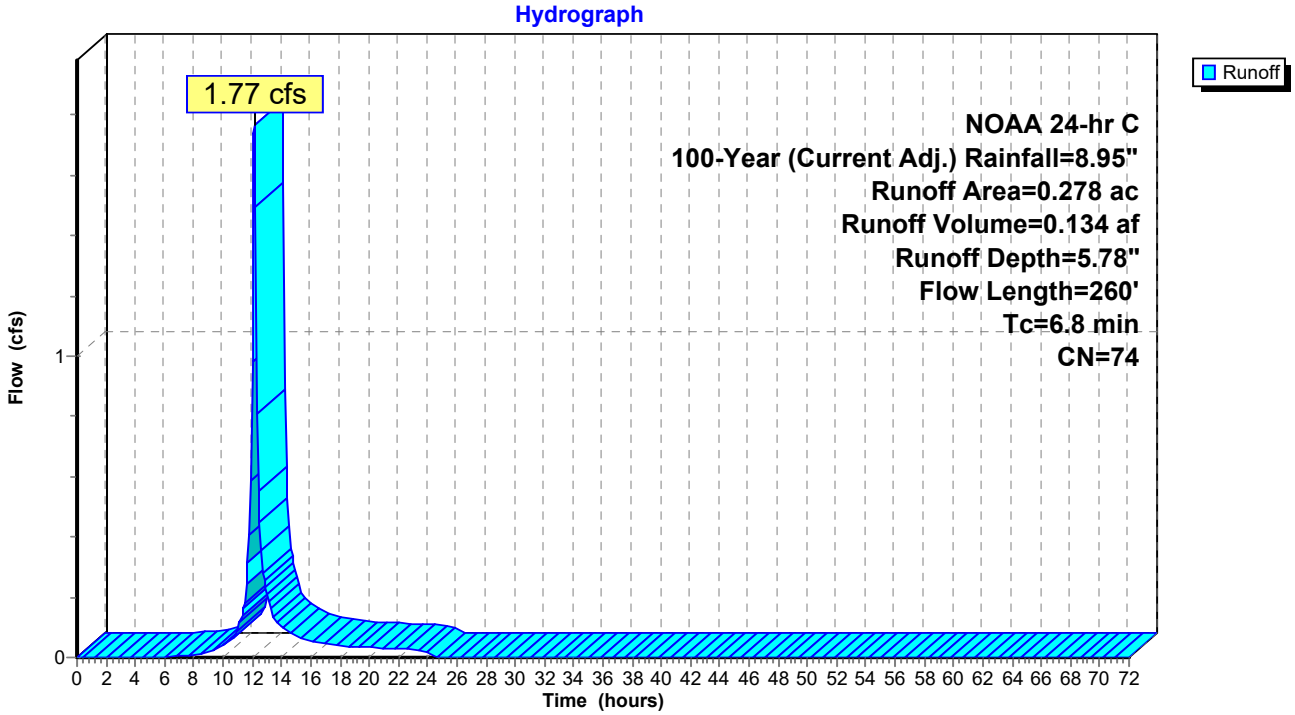
Runoff = 1.77 cfs @ 12.13 hrs, Volume= 0.134 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

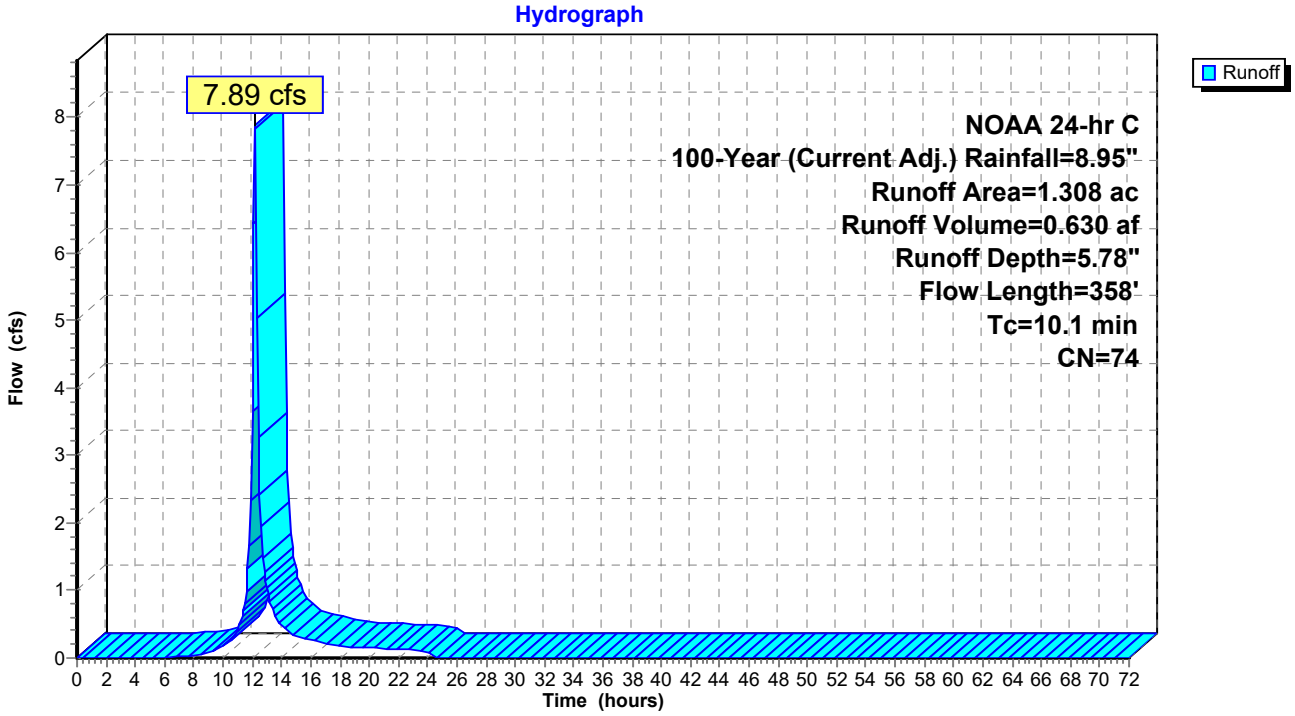
Runoff = 7.89 cfs @ 12.18 hrs, Volume= 0.630 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

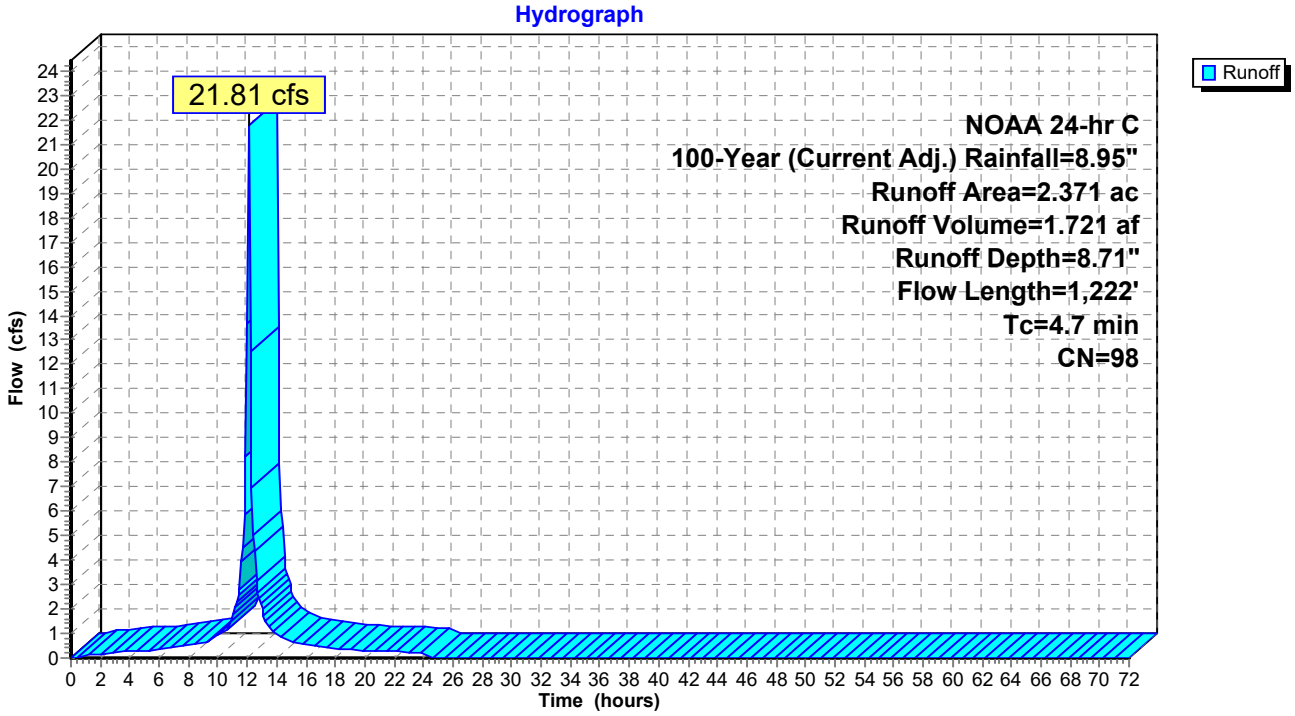
Runoff = 21.81 cfs @ 12.10 hrs, Volume= 1.721 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

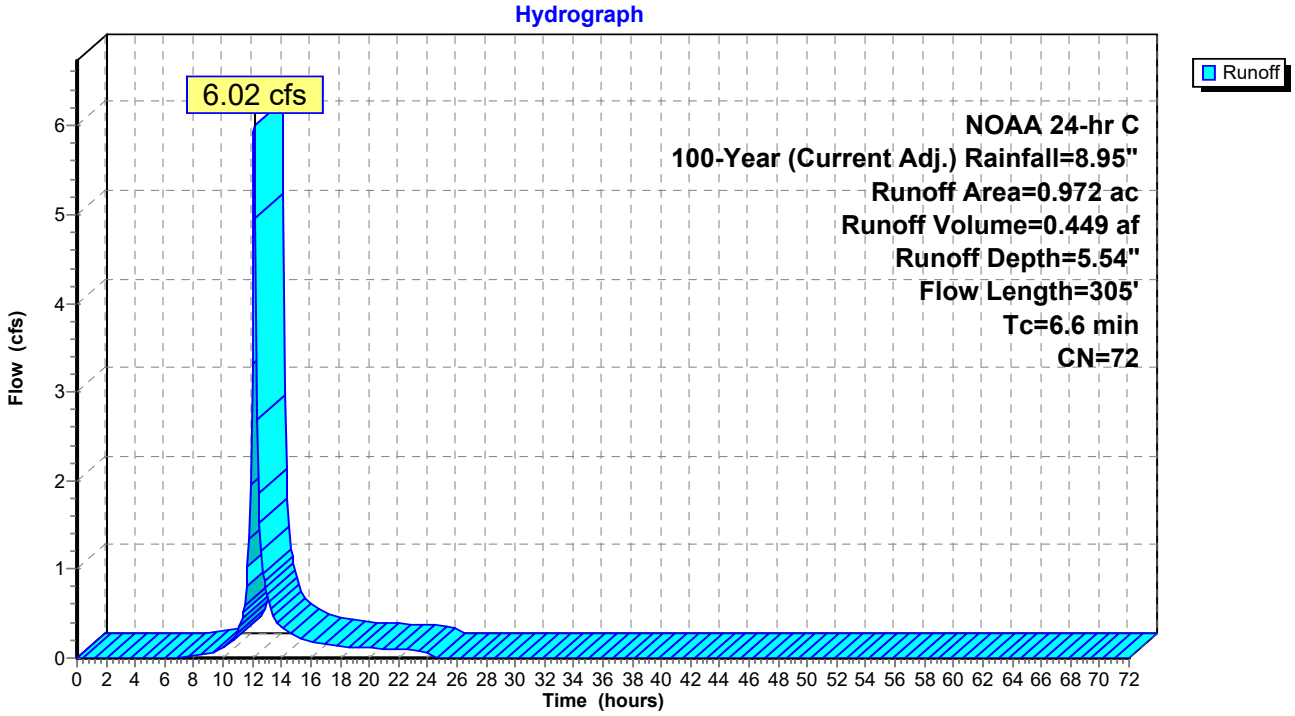
Runoff = 6.02 cfs @ 12.12 hrs, Volume= 0.449 af, Depth= 5.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

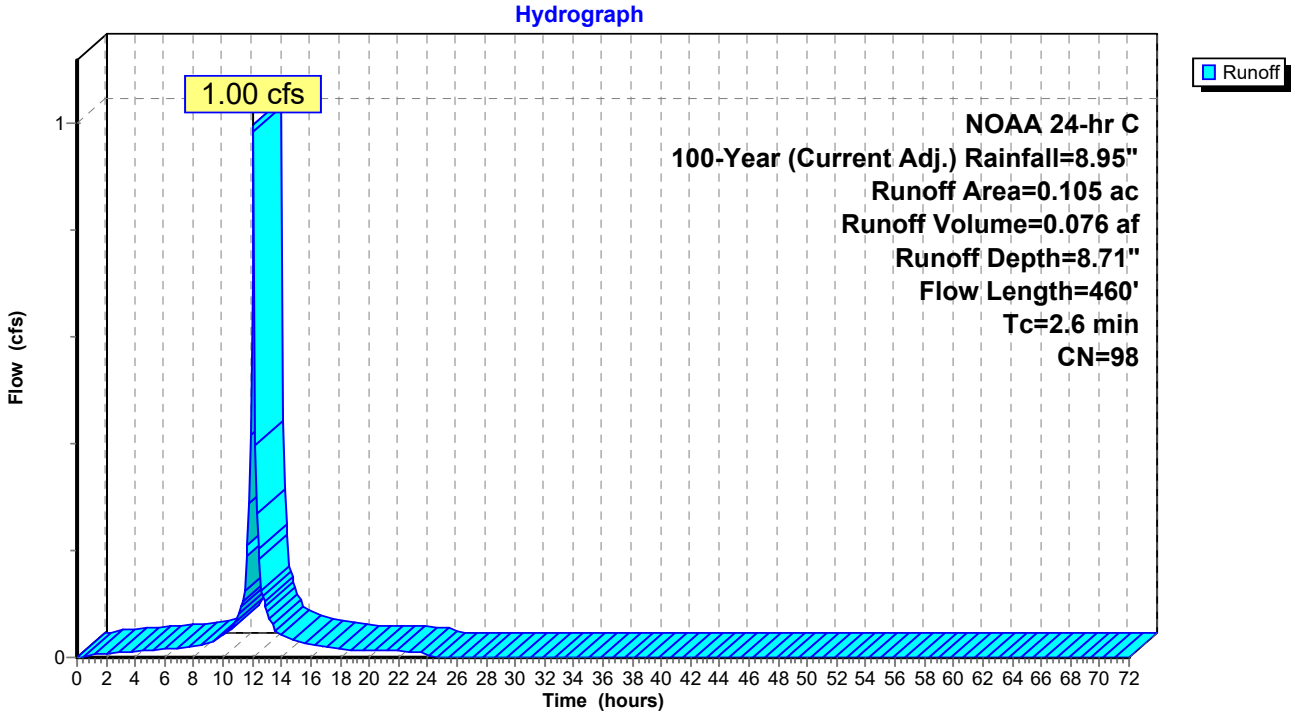
Runoff = 1.00 cfs @ 12.08 hrs, Volume= 0.076 af, Depth= 8.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

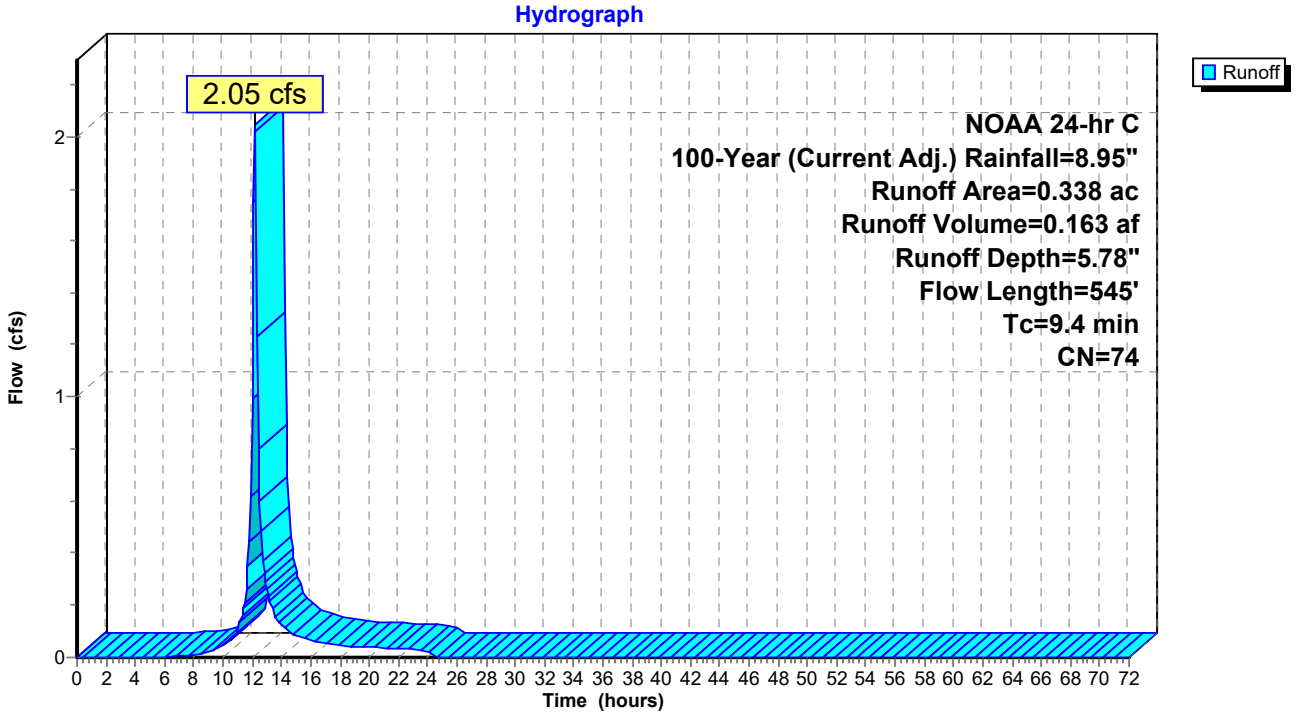
Runoff = 2.05 cfs @ 12.18 hrs, Volume= 0.163 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

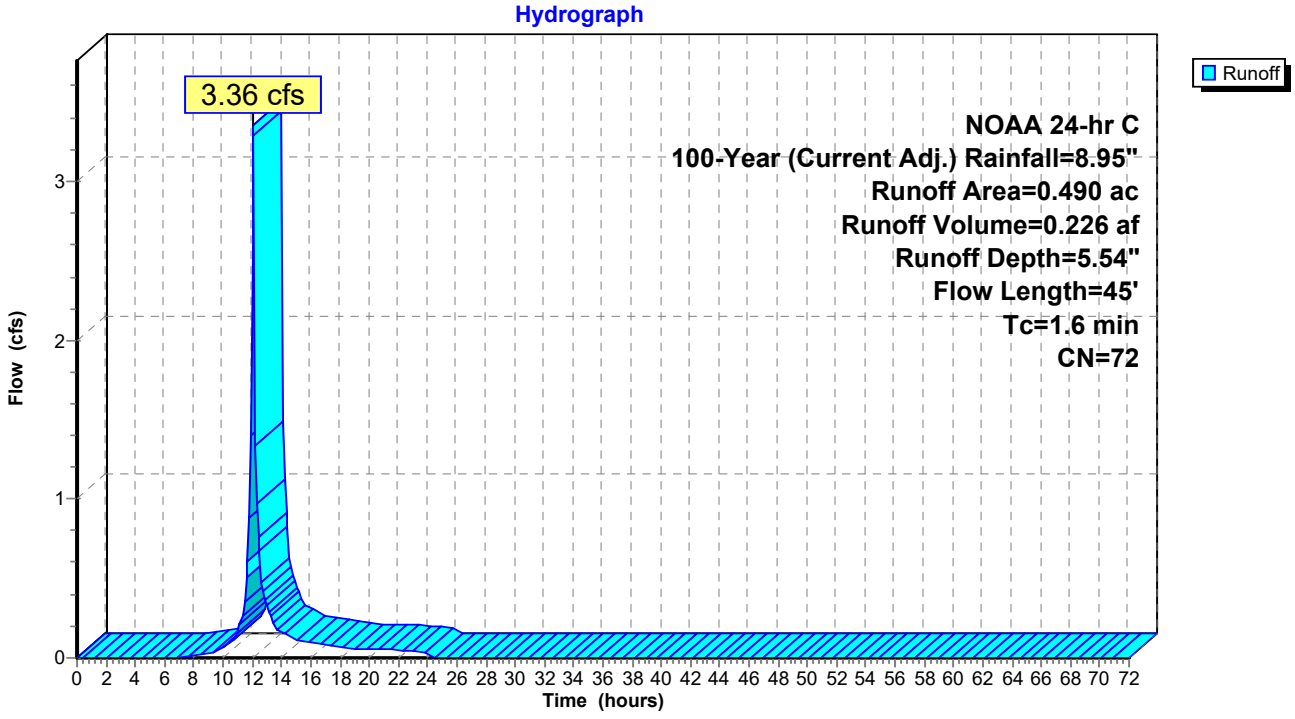
Runoff = 3.36 cfs @ 12.08 hrs, Volume= 0.226 af, Depth= 5.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Current Adj.) Rainfall=8.95"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 5.78" for 100-Year (Current Adj.) event
Inflow = 0.86 cfs @ 12.33 hrs, Volume= 0.093 af
Outflow = 0.85 cfs @ 12.34 hrs, Volume= 0.088 af, Atten= 2%, Lag= 0.5 min
Primary = 0.85 cfs @ 12.34 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.10' @ 12.34 hrs Surf.Area= 1,868 sf Storage= 274 cf

Plug-Flow detention time= 49.3 min calculated for 0.088 af (95% of inflow)
Center-of-Mass det. time= 17.6 min (848.2 - 830.6)

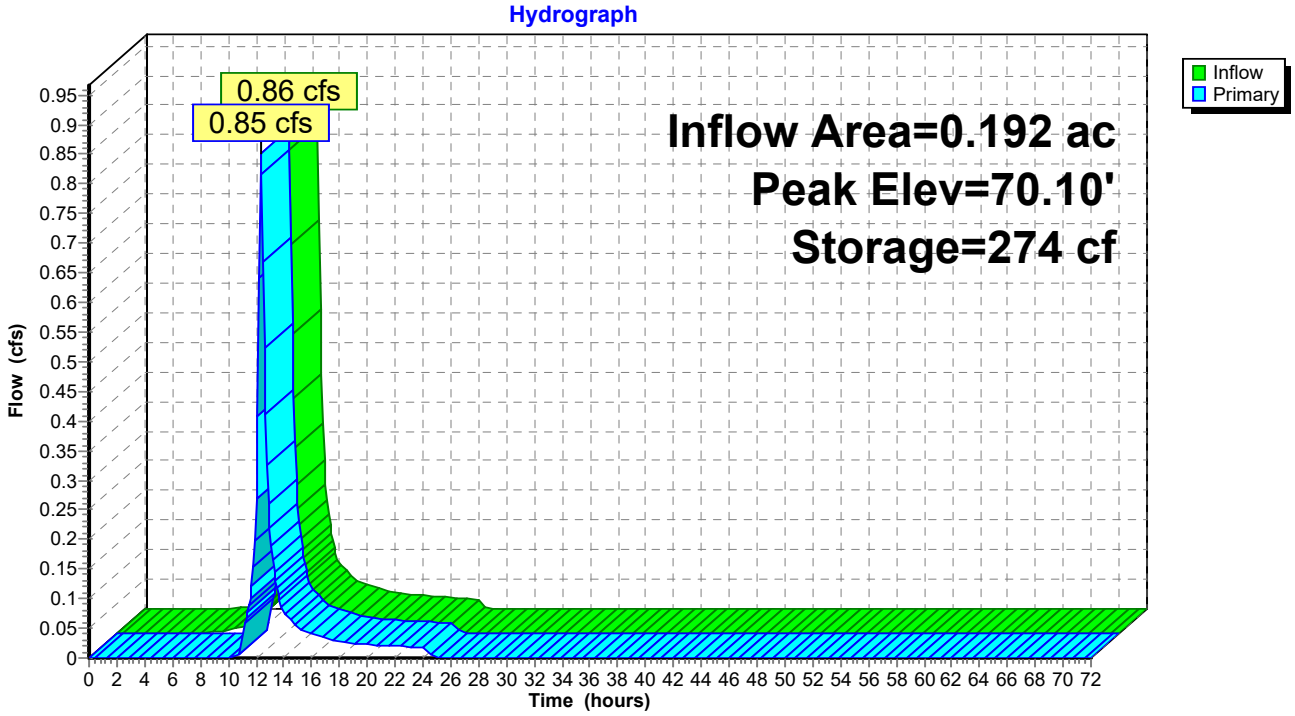
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.82 cfs @ 12.34 hrs HW=70.10' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.82 cfs @ 0.26 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 7.28" for 100-Year (Current Adj.) event
Inflow = 1.02 cfs @ 12.11 hrs, Volume= 0.081 af
Outflow = 1.02 cfs @ 12.11 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.11 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.17' @ 12.11 hrs Surf.Area= 400 sf Storage= 87 cf

Plug-Flow detention time= 23.3 min calculated for 0.079 af (98% of inflow)
Center-of-Mass det. time= 12.6 min (781.5 - 768.9)

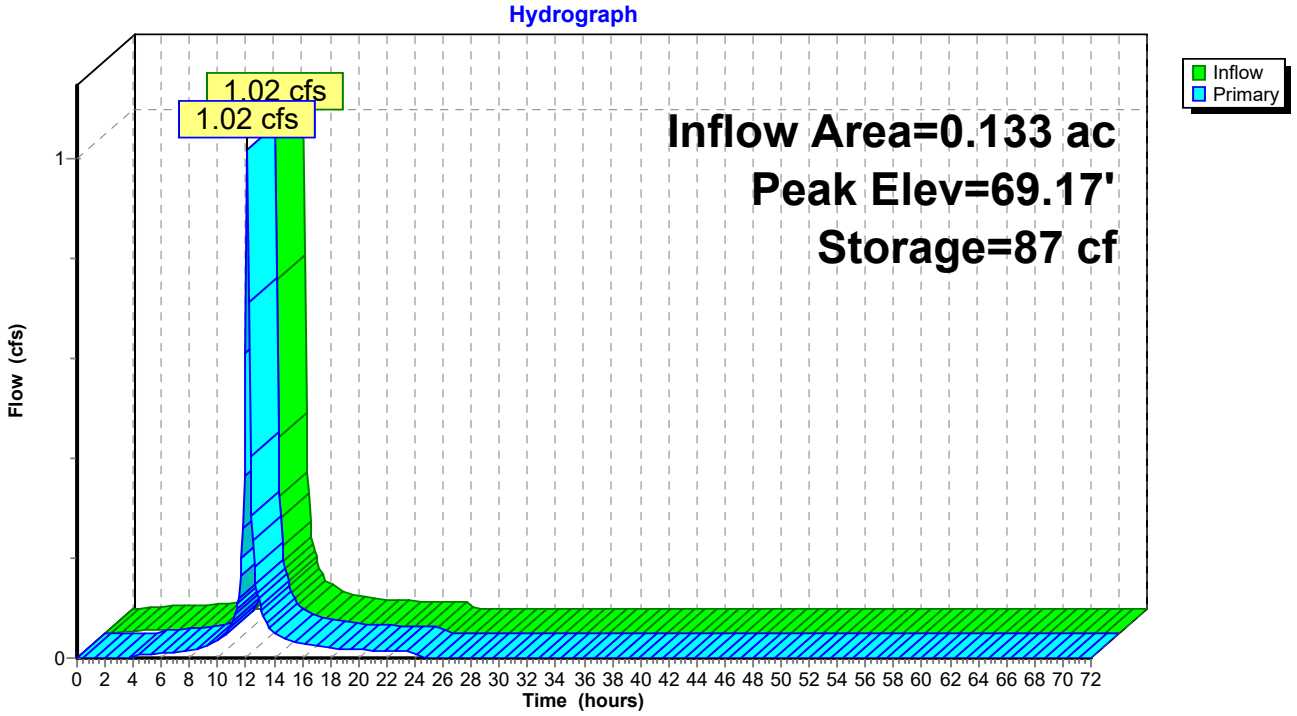
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.98 cfs @ 12.11 hrs HW=69.17' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.98 cfs @ 0.38 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 7.43" for 100-Year (Current Adj.) event
Inflow = 14.59 cfs @ 12.11 hrs, Volume= 1.178 af
Outflow = 11.18 cfs @ 12.21 hrs, Volume= 1.077 af, Atten= 23%, Lag= 5.8 min
Primary = 11.18 cfs @ 12.21 hrs, Volume= 1.077 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.54' @ 12.21 hrs Surf.Area= 7,971 sf Storage= 11,045 cf

Plug-Flow detention time= 106.0 min calculated for 1.077 af (91% of inflow)
Center-of-Mass det. time= 58.0 min (824.0 - 765.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

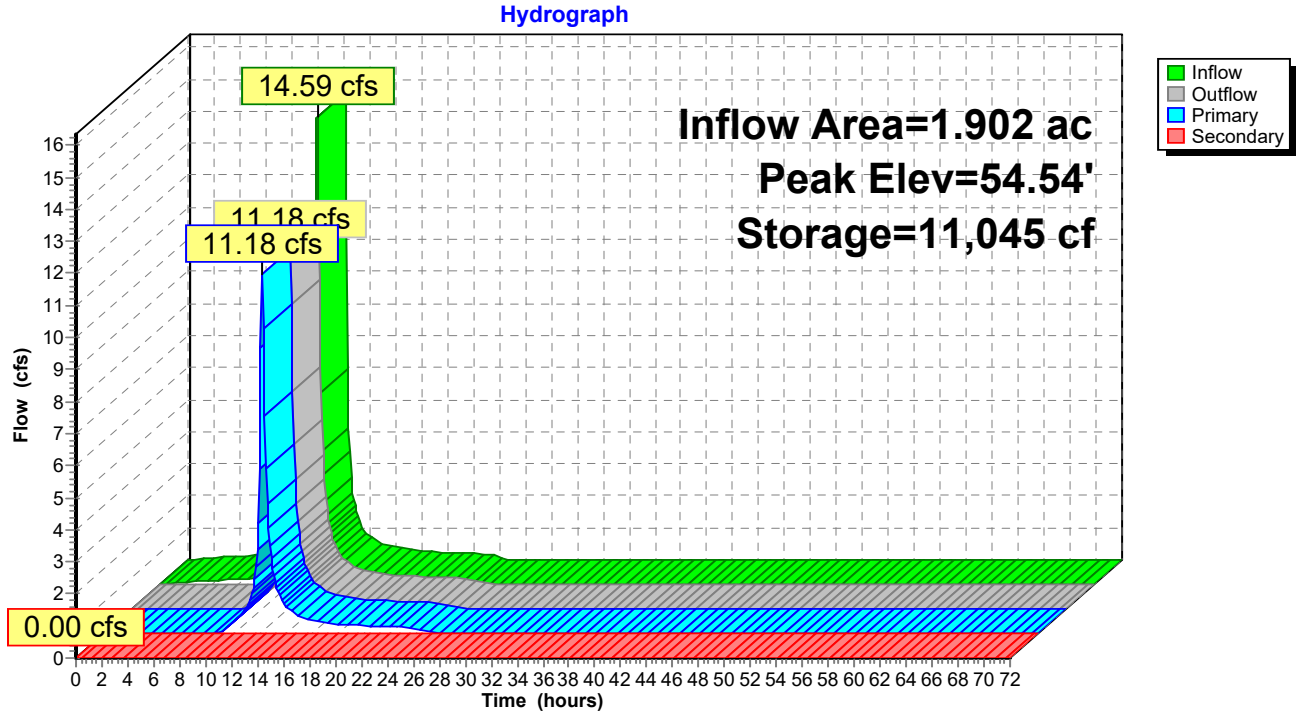
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.04 cfs @ 12.21 hrs HW=54.54' (Free Discharge)
└**1=Culvert** (Passes 11.04 cfs of 31.93 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 11.04 cfs @ 3.11 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 7.78" for 100-Year (Current Adj.) event
Inflow = 24.49 cfs @ 12.09 hrs, Volume= 1.816 af
Outflow = 11.94 cfs @ 12.24 hrs, Volume= 1.637 af, Atten= 51%, Lag= 8.5 min
Primary = 11.94 cfs @ 12.24 hrs, Volume= 1.637 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.97' @ 12.24 hrs Surf.Area= 17,523 sf Storage= 30,635 cf

Plug-Flow detention time= 184.9 min calculated for 1.635 af (90% of inflow)
Center-of-Mass det. time= 136.1 min (892.3 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

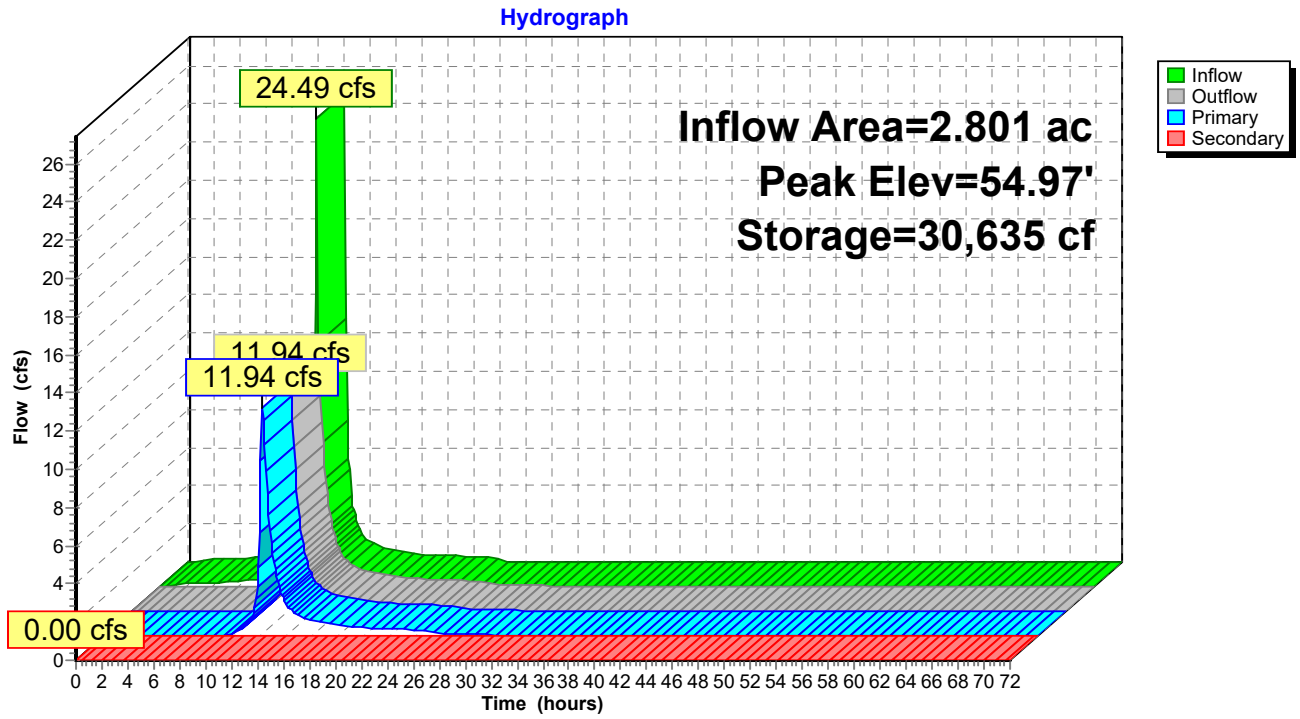
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.59 cfs @ 12.24 hrs HW=54.95' (Free Discharge)
└─**1=Culvert** (Passes 11.59 cfs of 33.64 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.48 cfs @ 3.92 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 6.11 cfs @ 3.23 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 7.61" for 100-Year (Current Adj.) event
Inflow = 32.96 cfs @ 12.10 hrs, Volume= 2.678 af
Outflow = 8.54 cfs @ 12.44 hrs, Volume= 2.439 af, Atten= 74%, Lag= 20.6 min
Primary = 8.54 cfs @ 12.44 hrs, Volume= 2.439 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 63.88' @ 12.44 hrs Surf.Area= 17,496 sf Storage= 54,642 cf

Plug-Flow detention time= 215.6 min calculated for 2.435 af (91% of inflow)
Center-of-Mass det. time= 170.7 min (931.5 - 760.8)

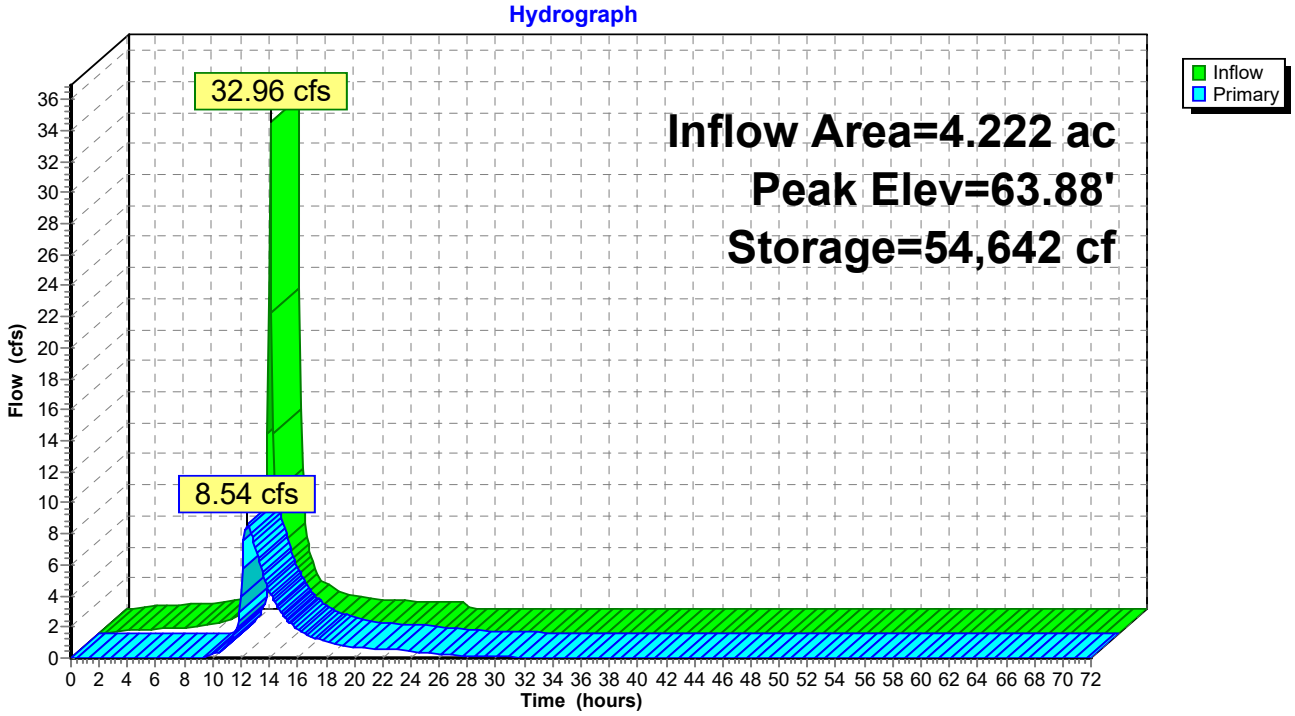
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=8.51 cfs @ 12.44 hrs HW=63.87' (Free Discharge)
- **1=Culvert** (Passes 8.51 cfs of 44.55 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 8.51 cfs @ 5.72 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

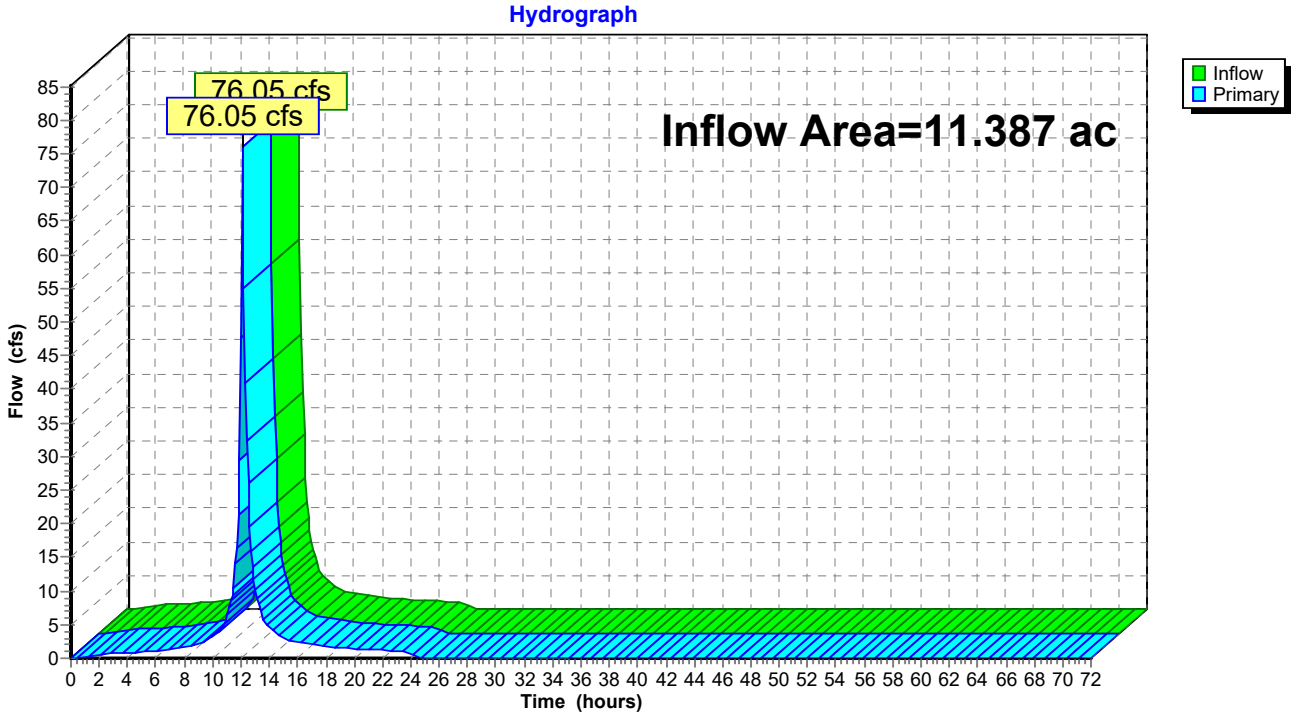


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 7.57" for 100-Year (Current Adj.) event
Inflow = 76.05 cfs @ 12.11 hrs, Volume= 7.183 af
Primary = 76.05 cfs @ 12.11 hrs, Volume= 7.183 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

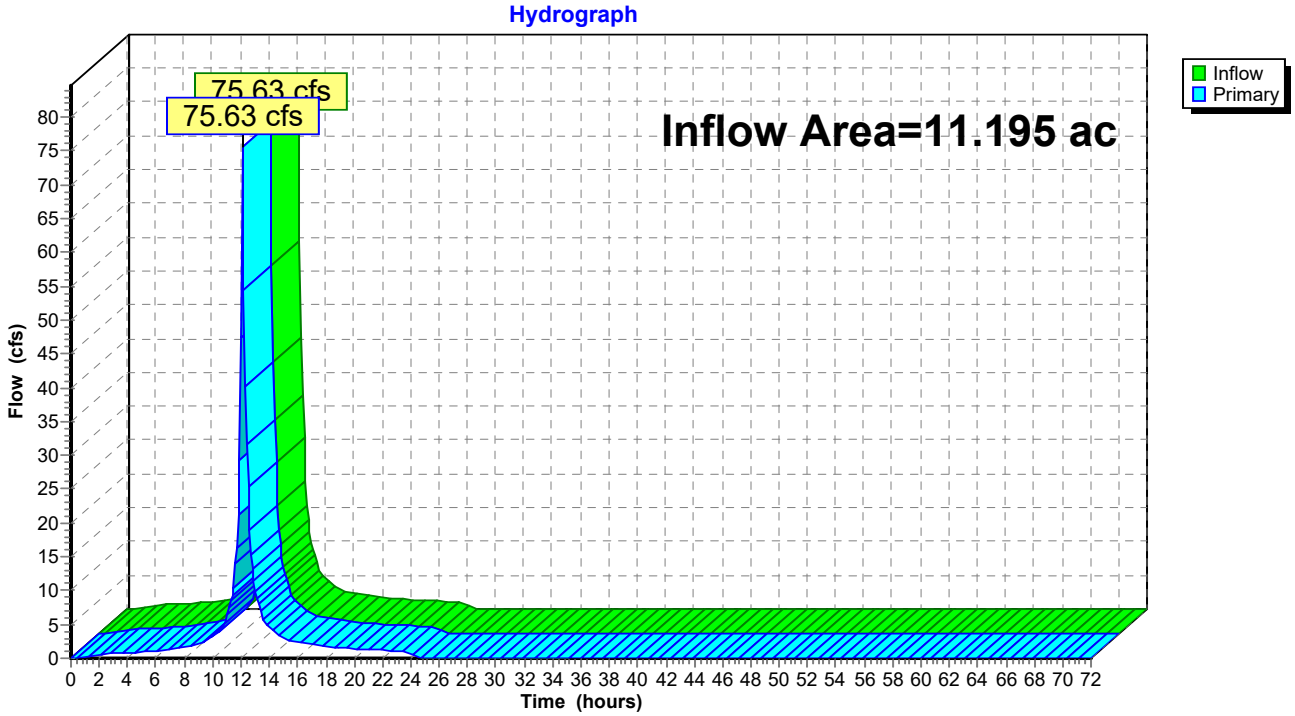


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 7.61" for 100-Year (Current Adj.) event
Inflow = 75.63 cfs @ 12.11 hrs, Volume= 7.096 af
Primary = 75.63 cfs @ 12.11 hrs, Volume= 7.096 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

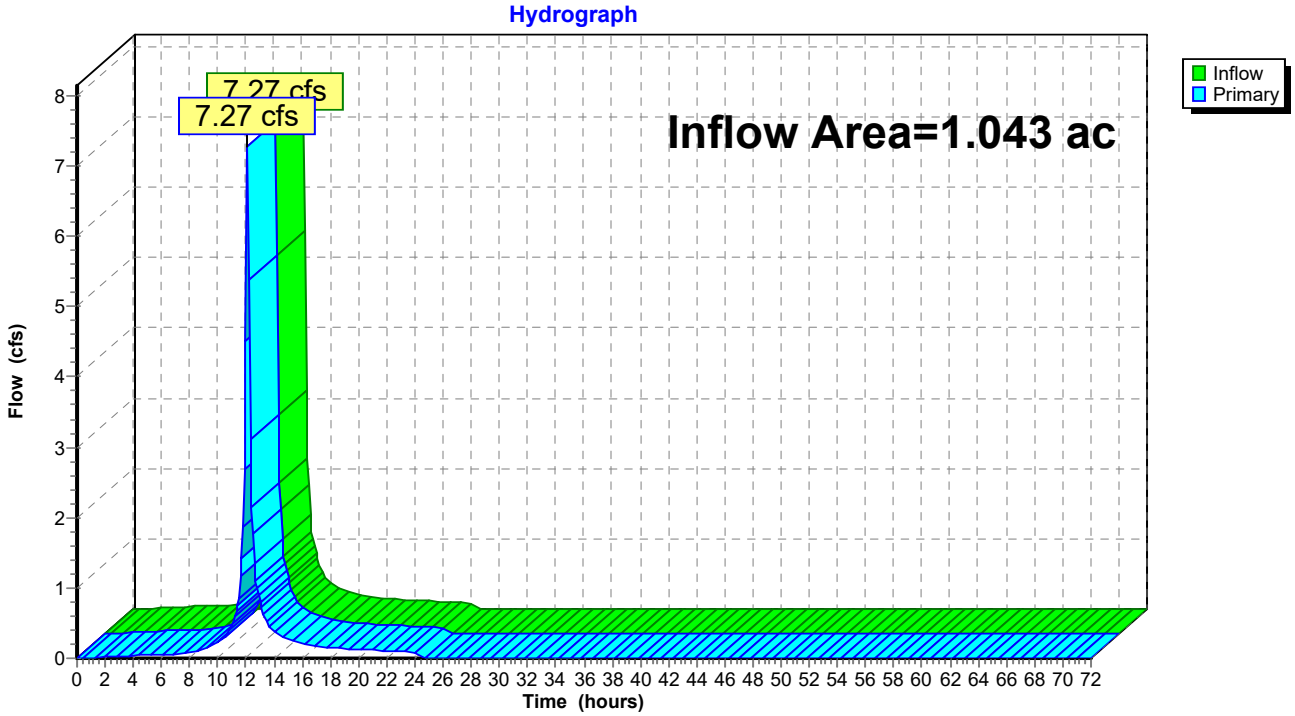


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 6.66" for 100-Year (Current Adj.) event
Inflow = 7.27 cfs @ 12.11 hrs, Volume= 0.579 af
Primary = 7.27 cfs @ 12.11 hrs, Volume= 0.579 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

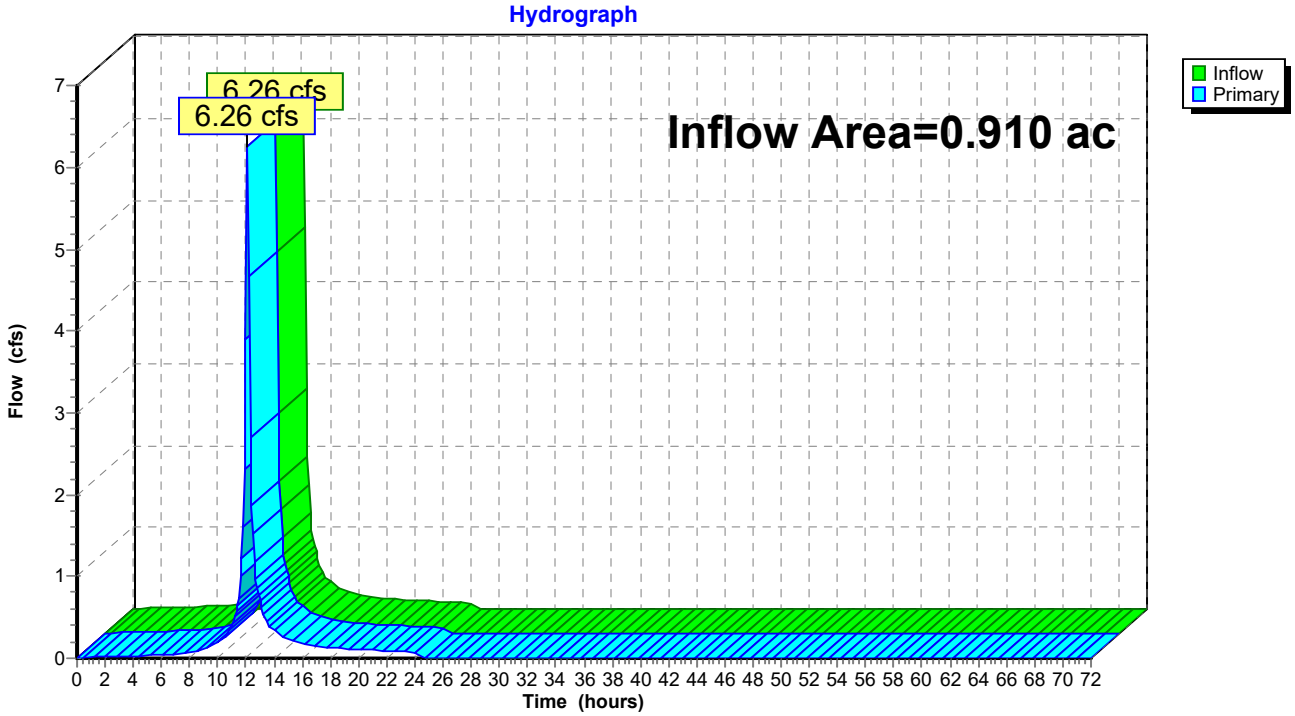


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 6.59" for 100-Year (Current Adj.) event
Inflow = 6.26 cfs @ 12.11 hrs, Volume= 0.500 af
Primary = 6.26 cfs @ 12.11 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

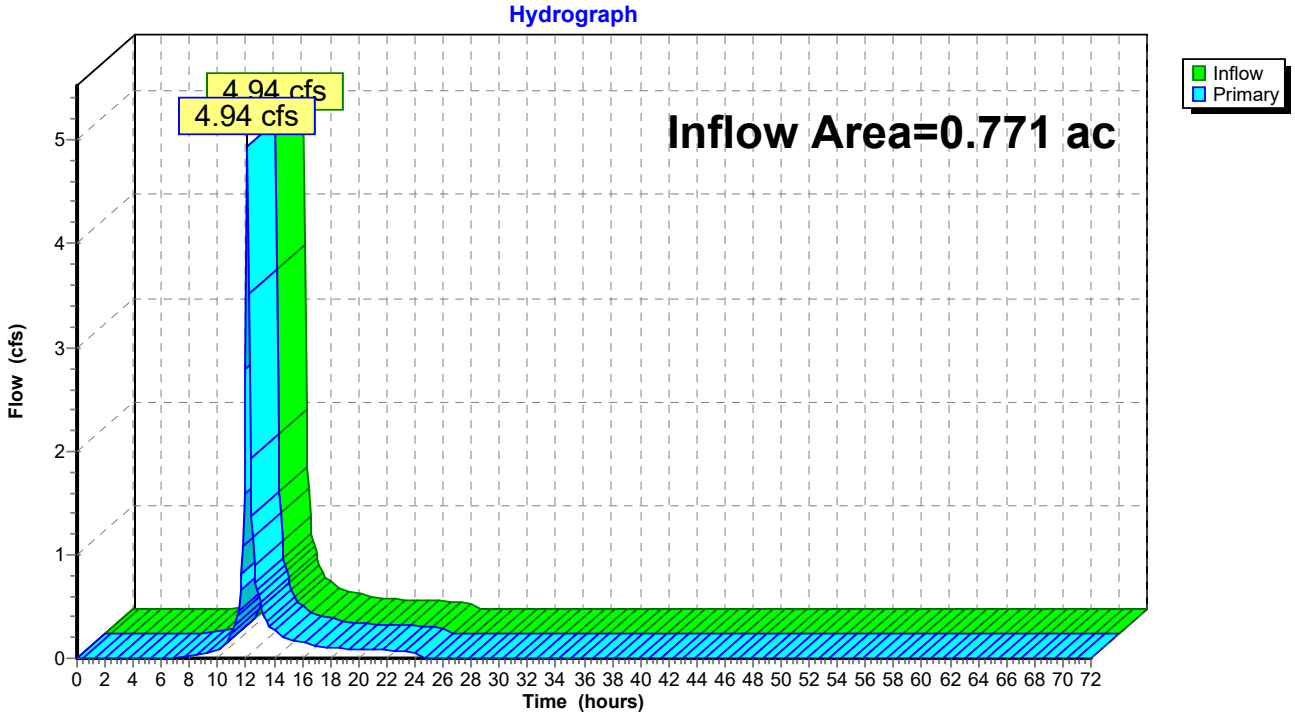


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 5.41" for 100-Year (Current Adj.) event
Inflow = 4.94 cfs @ 12.11 hrs, Volume= 0.348 af
Primary = 4.94 cfs @ 12.11 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

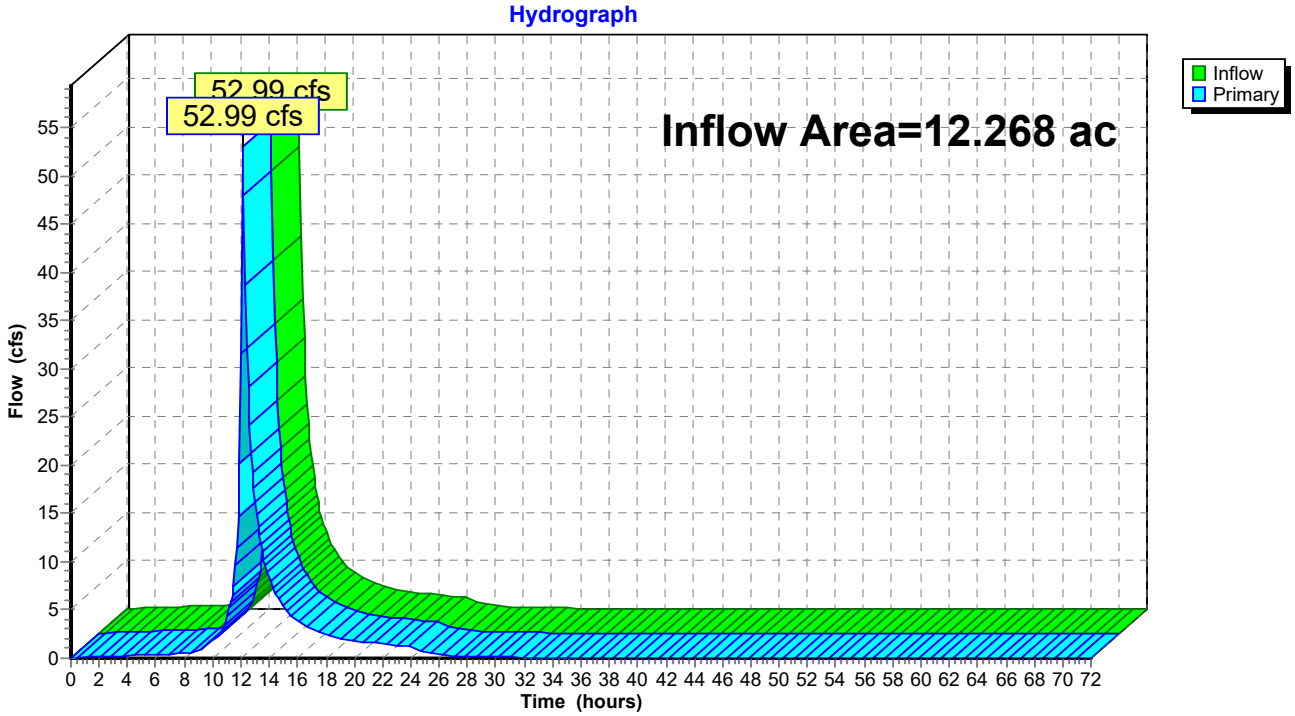


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 7.16" for 100-Year (Current Adj.) event
Inflow = 52.99 cfs @ 12.13 hrs, Volume= 7.323 af
Primary = 52.99 cfs @ 12.13 hrs, Volume= 7.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

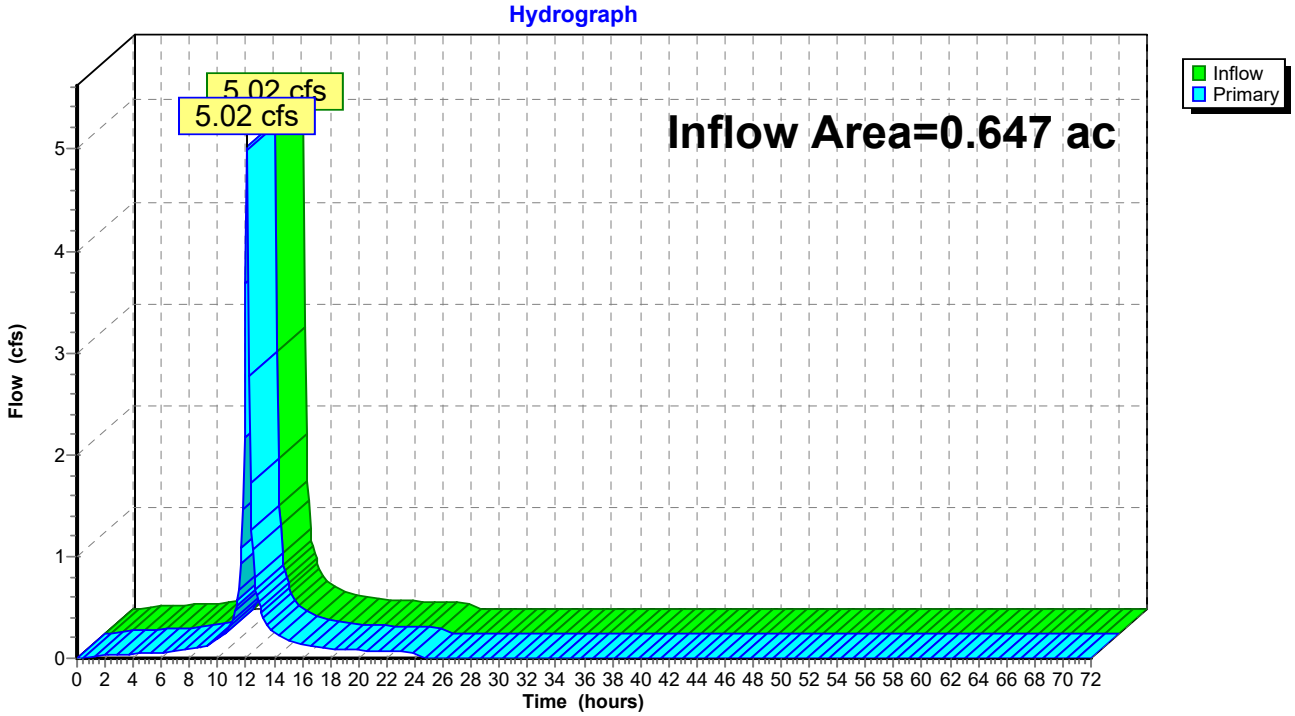


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 7.45" for 100-Year (Current Adj.) event
Inflow = 5.02 cfs @ 12.09 hrs, Volume= 0.402 af
Primary = 5.02 cfs @ 12.09 hrs, Volume= 0.402 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

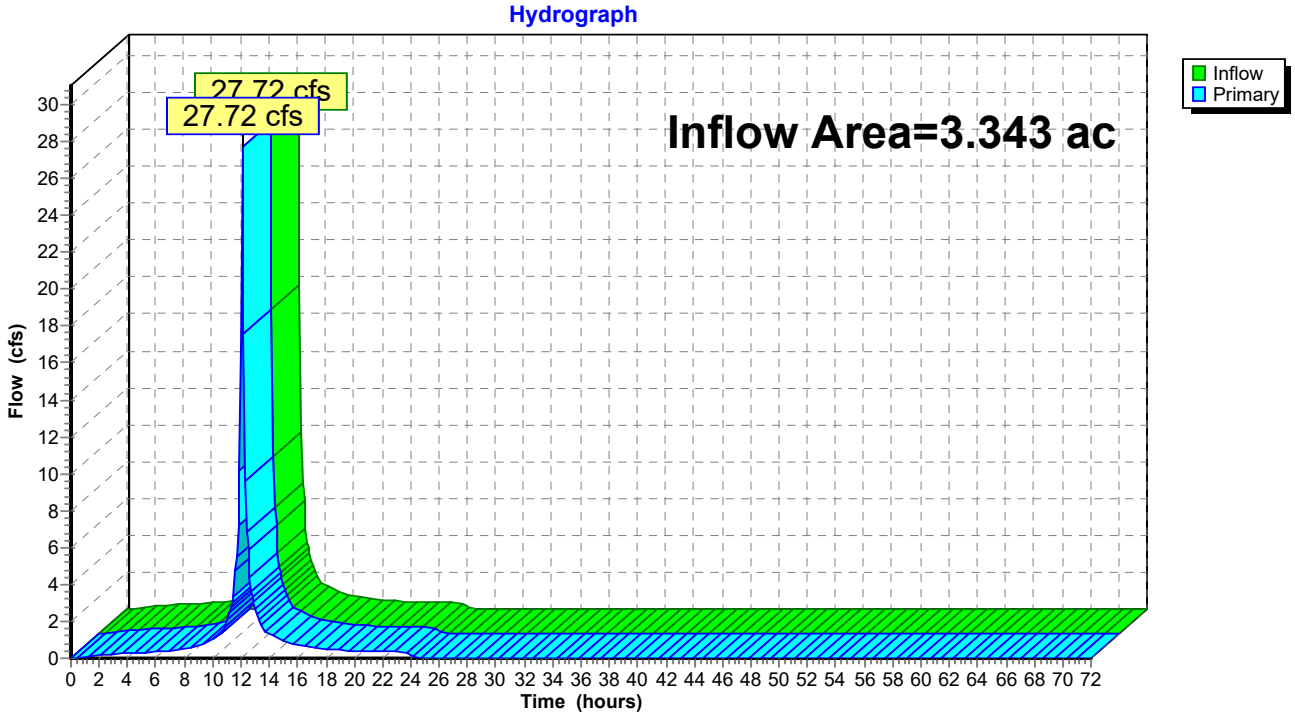


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 7.79" for 100-Year (Current Adj.) event
Inflow = 27.72 cfs @ 12.10 hrs, Volume= 2.169 af
Primary = 27.72 cfs @ 12.10 hrs, Volume= 2.169 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

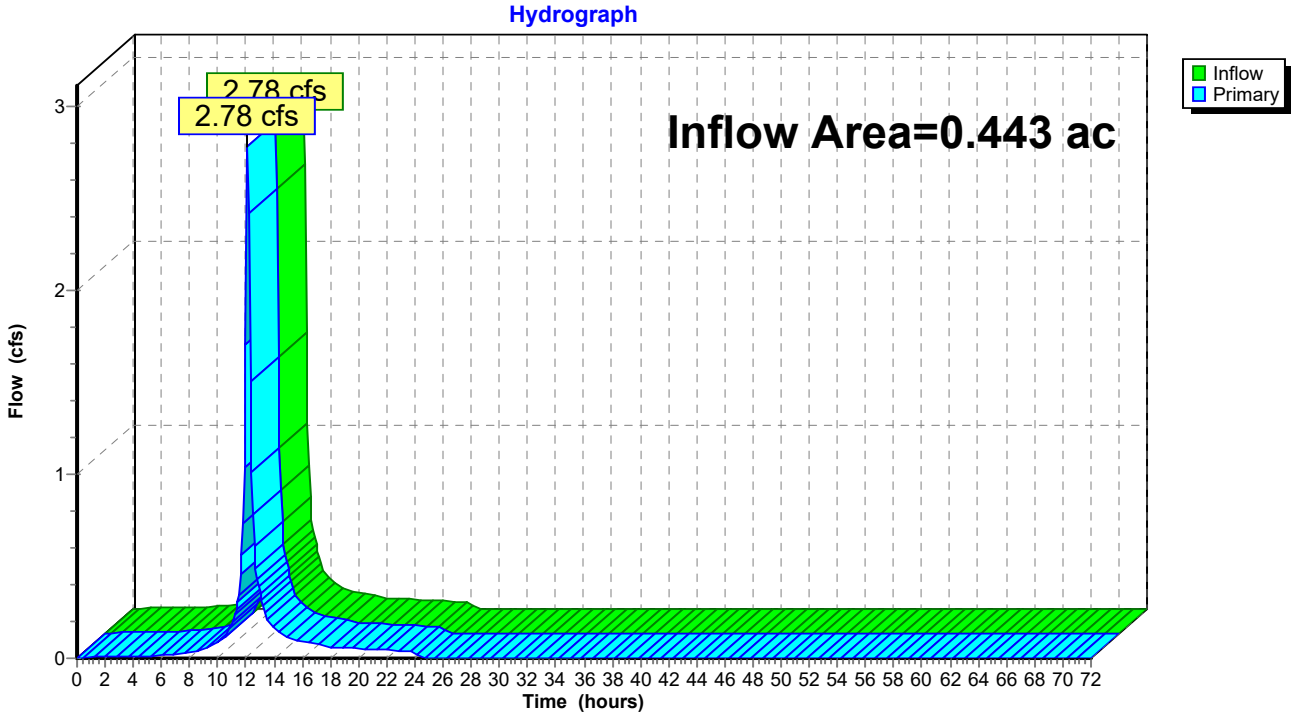


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 6.48" for 100-Year (Current Adj.) event
Inflow = 2.78 cfs @ 12.13 hrs, Volume= 0.239 af
Primary = 2.78 cfs @ 12.13 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

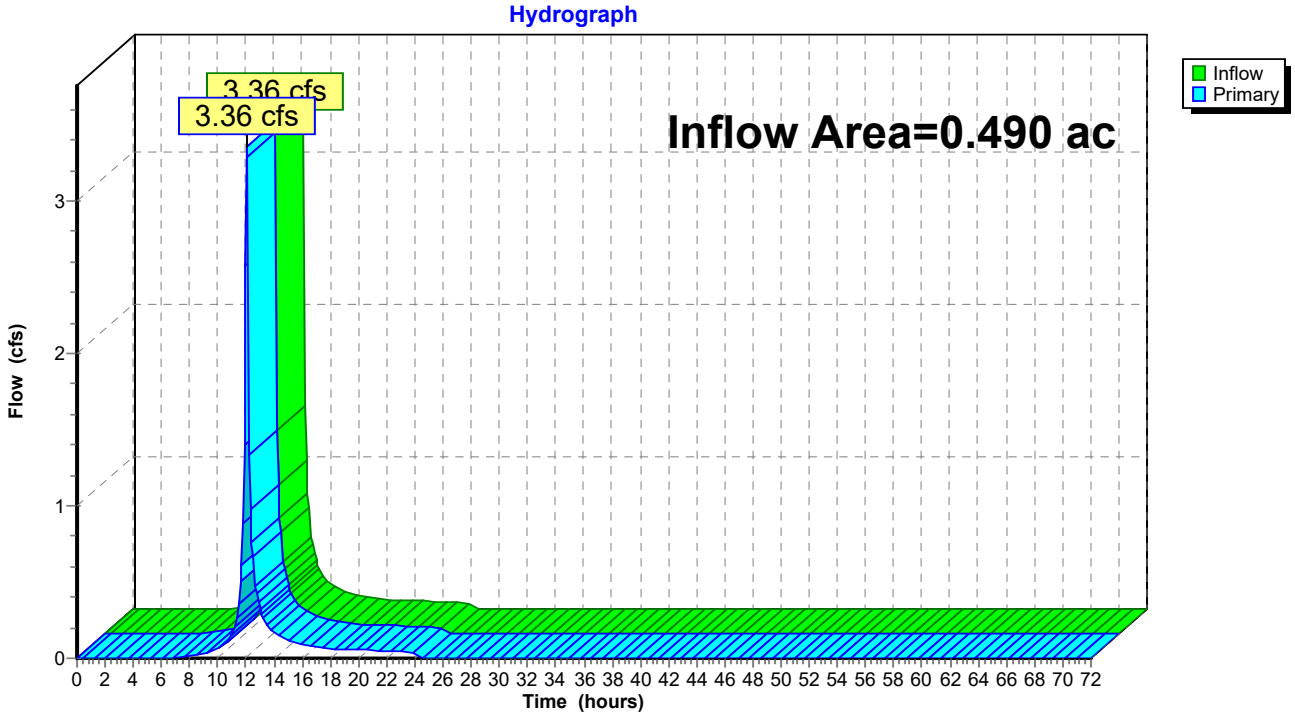


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 5.54" for 100-Year (Current Adj.) event
Inflow = 3.36 cfs @ 12.08 hrs, Volume= 0.226 af
Primary = 3.36 cfs @ 12.08 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.0 min

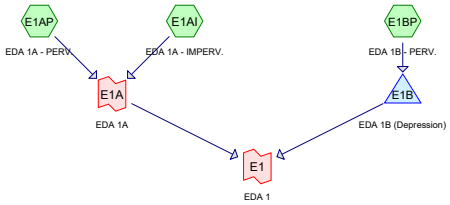
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

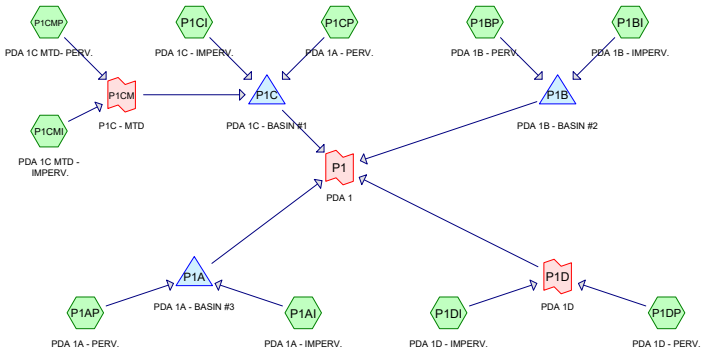
Link P3: PDA 3

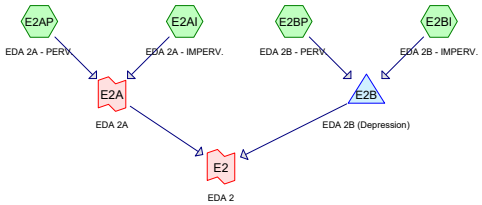


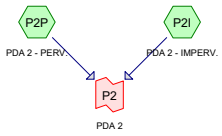
Future Adjusted Precipitation Depths

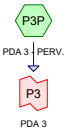
PRE- vs. POST-DEVELOPMENT HYDROGRAPHS

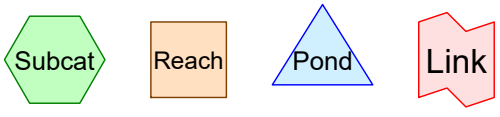












Routing Diagram for EX-PR
Prepared by Bohler Engineering NJ, LLC

Summary for Subcatchment E1AI: EDA 1A - IMPERV.

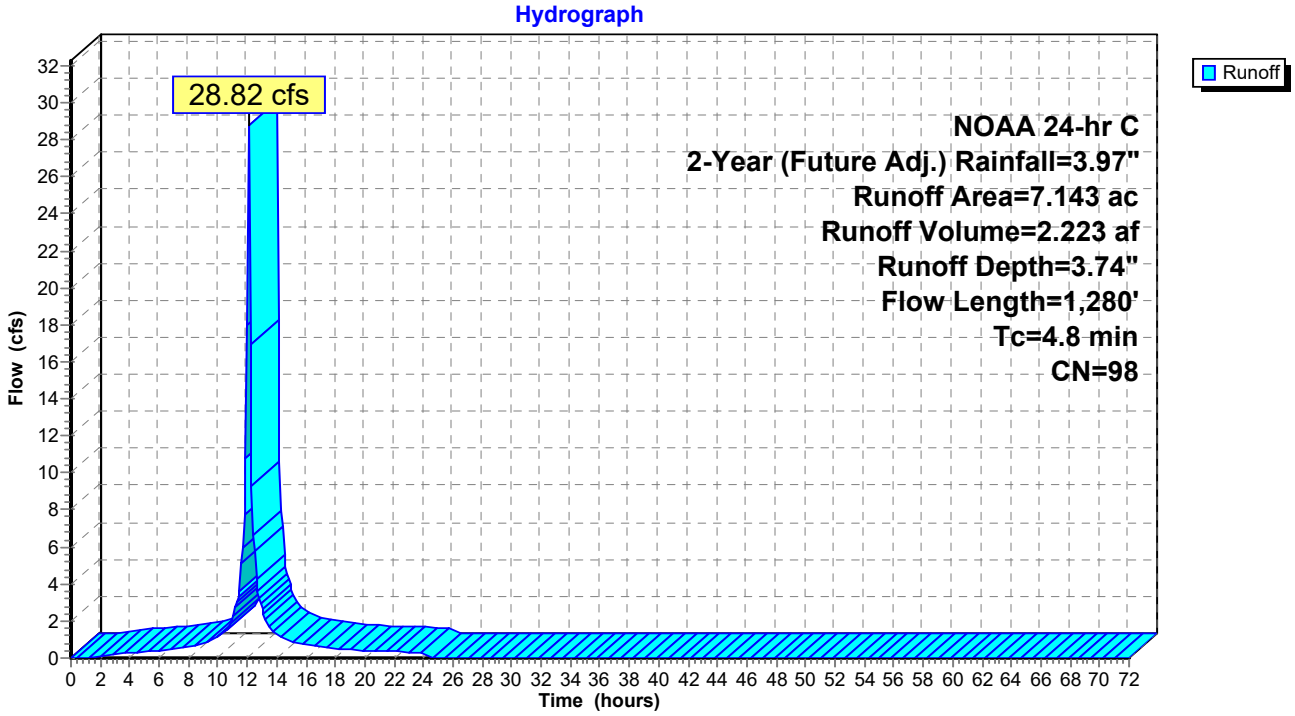
Runoff = 28.82 cfs @ 12.10 hrs, Volume= 2.223 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

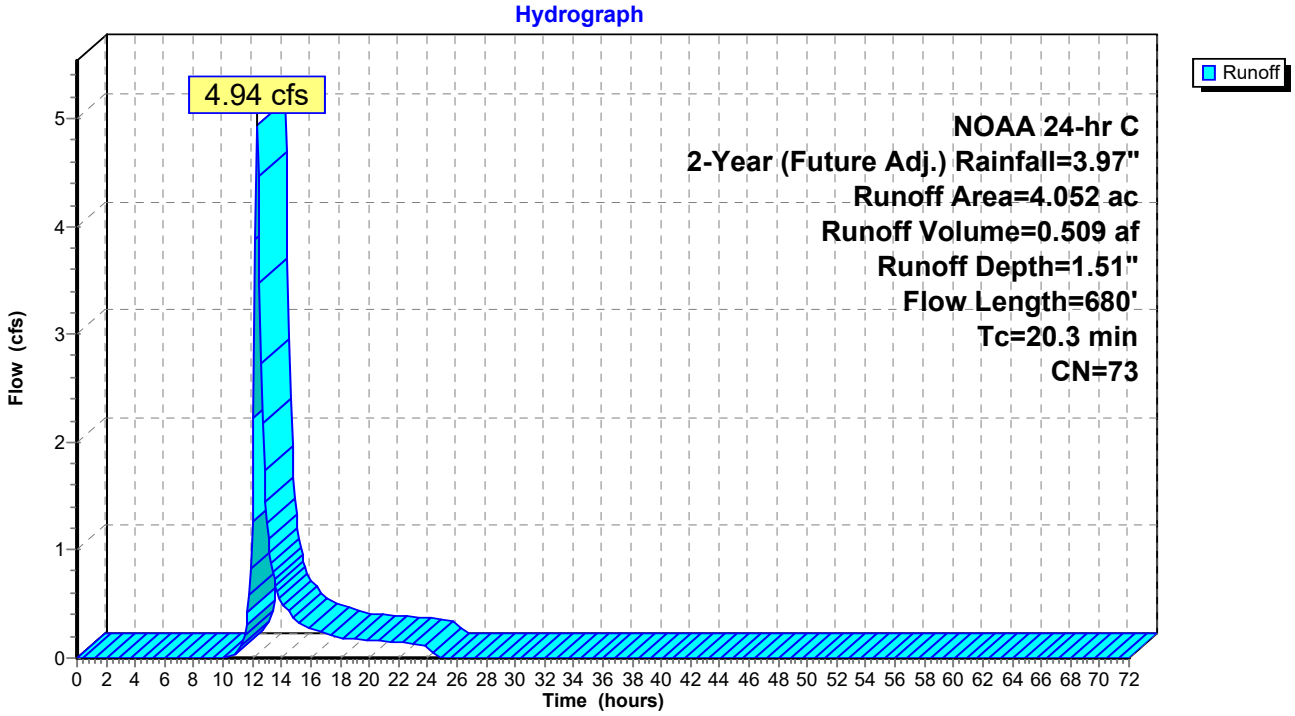
Runoff = 4.94 cfs @ 12.32 hrs, Volume= 0.509 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

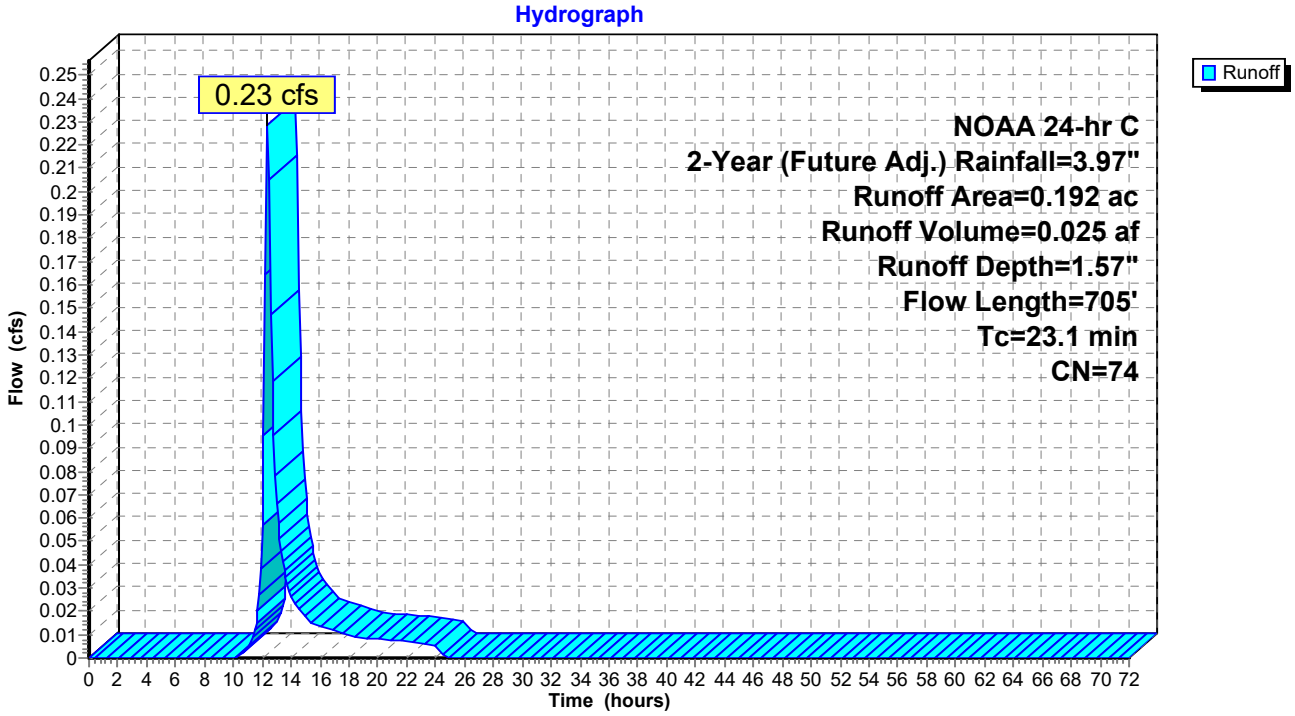
Runoff = 0.23 cfs @ 12.35 hrs, Volume= 0.025 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

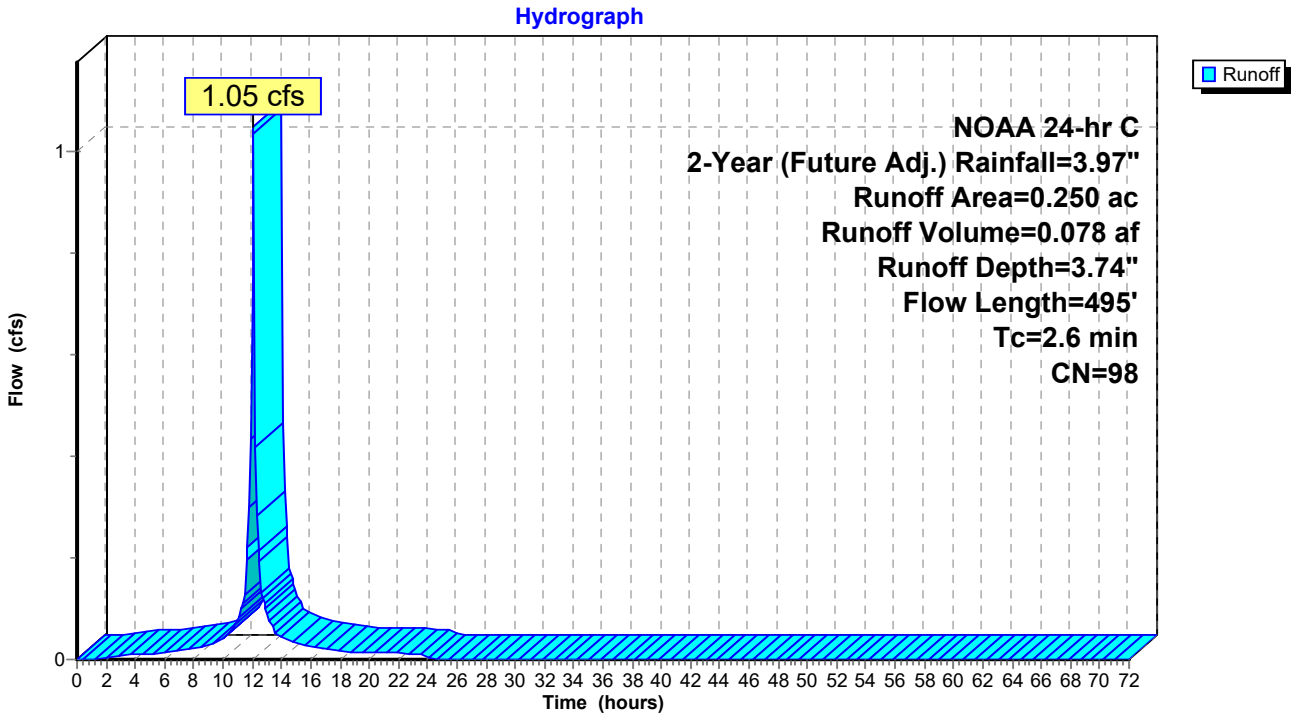
Runoff = 1.05 cfs @ 12.08 hrs, Volume= 0.078 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

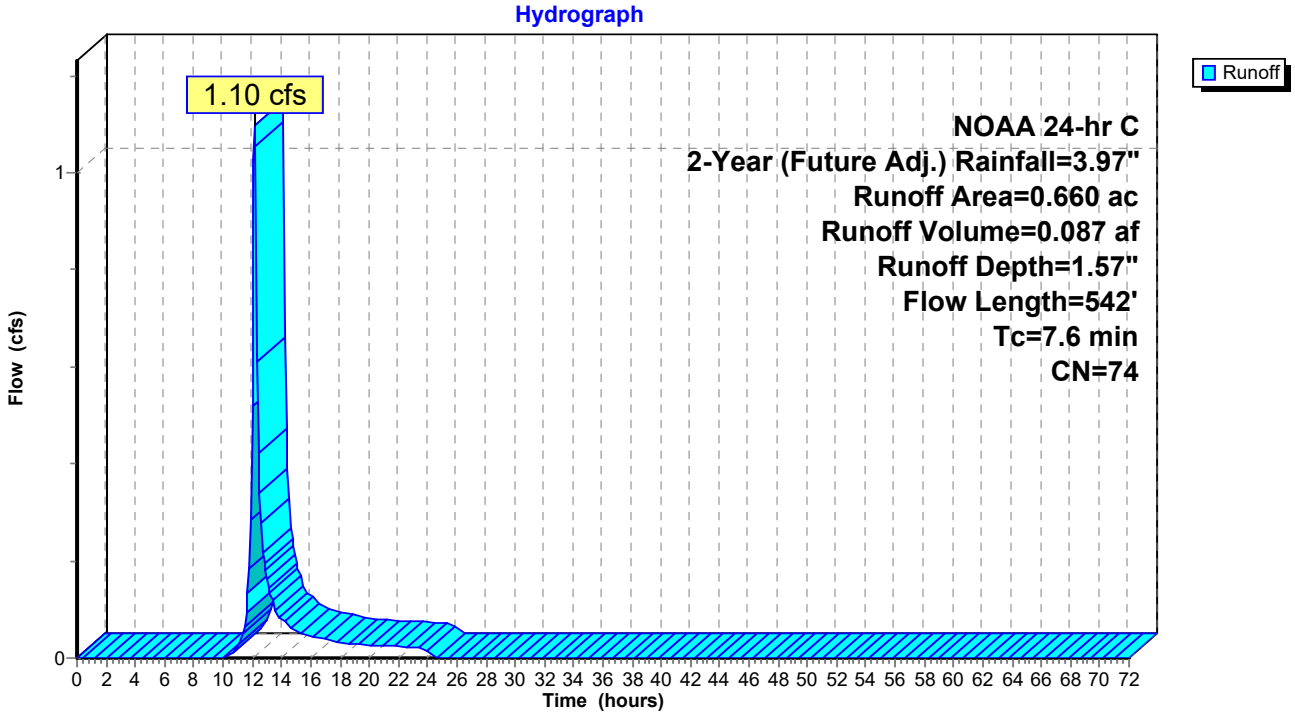
Runoff = 1.10 cfs @ 12.16 hrs, Volume= 0.087 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

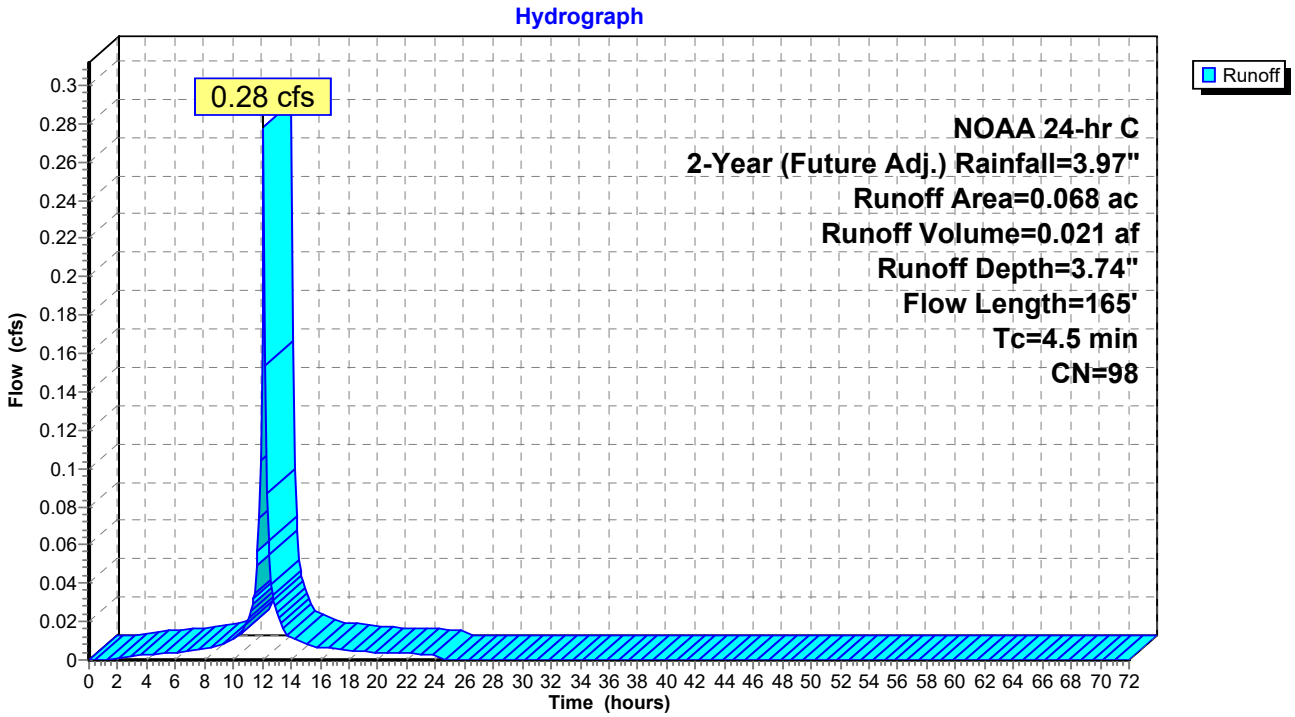
Runoff = 0.28 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

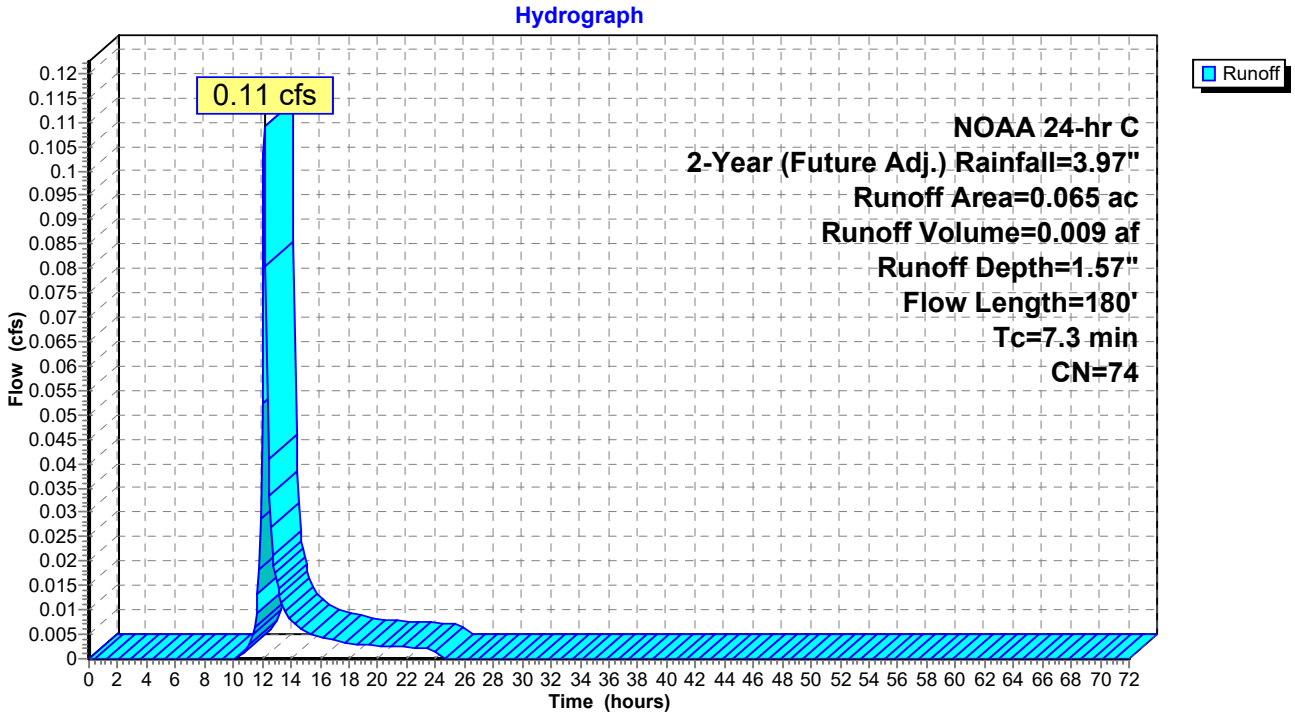
Runoff = 0.11 cfs @ 12.15 hrs, Volume= 0.009 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

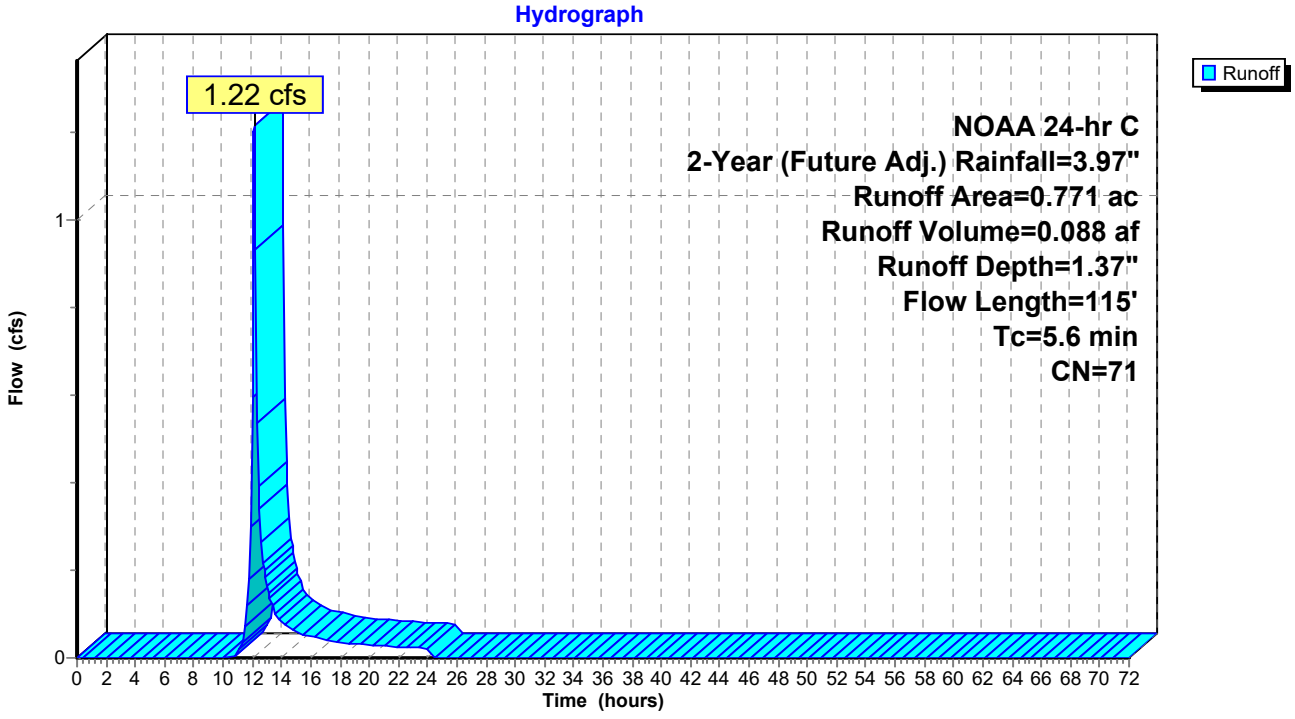
Runoff = 1.22 cfs @ 12.12 hrs, Volume= 0.088 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

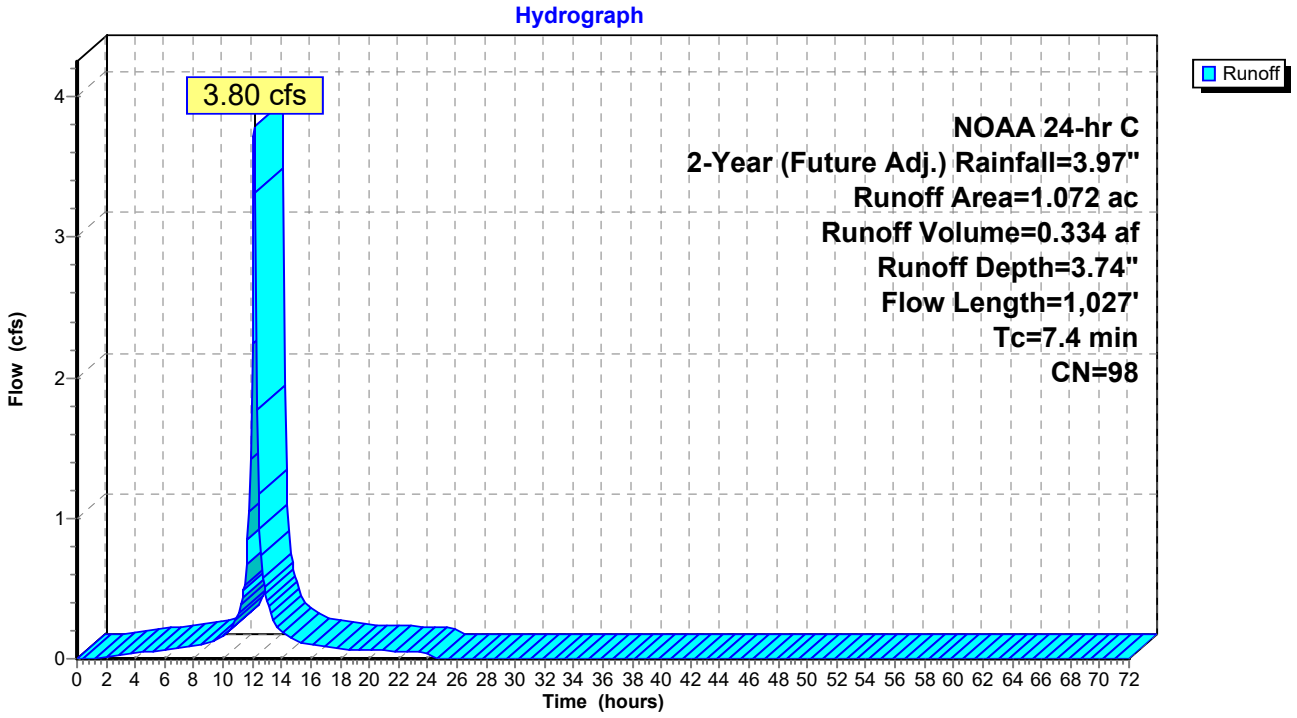
Runoff = 3.80 cfs @ 12.13 hrs, Volume= 0.334 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

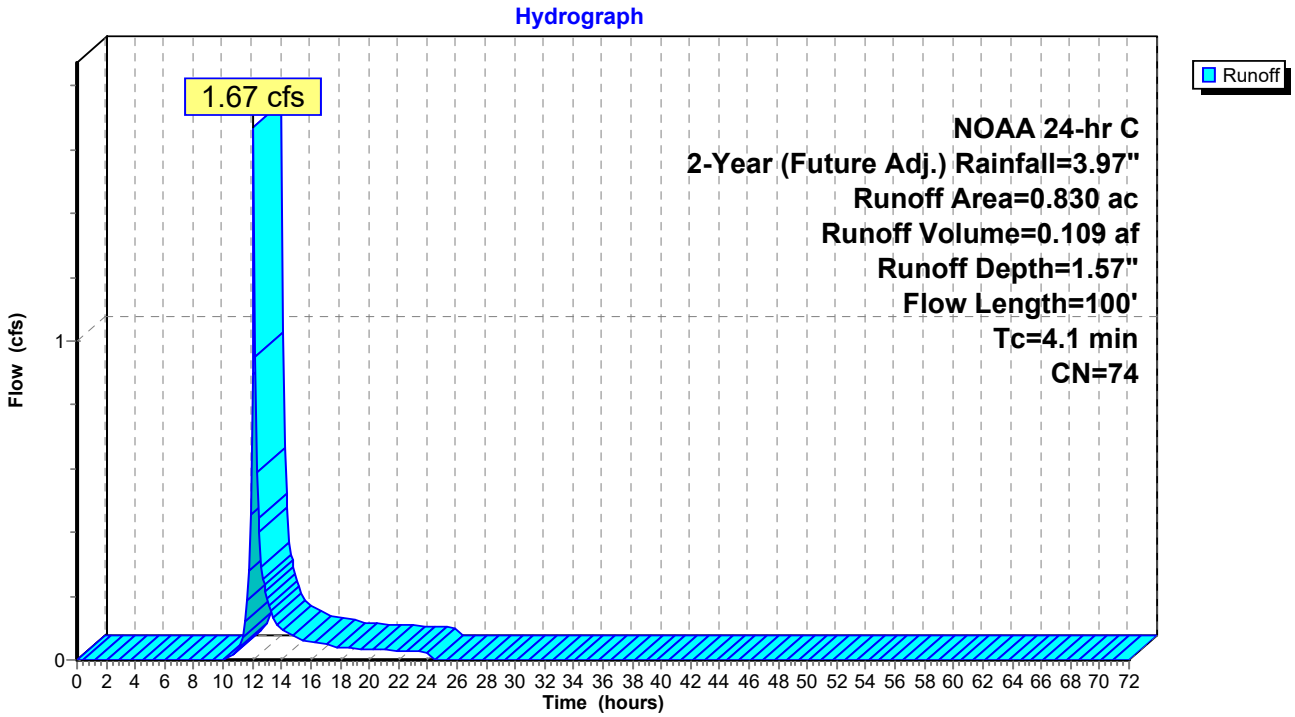
Runoff = 1.67 cfs @ 12.10 hrs, Volume= 0.109 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

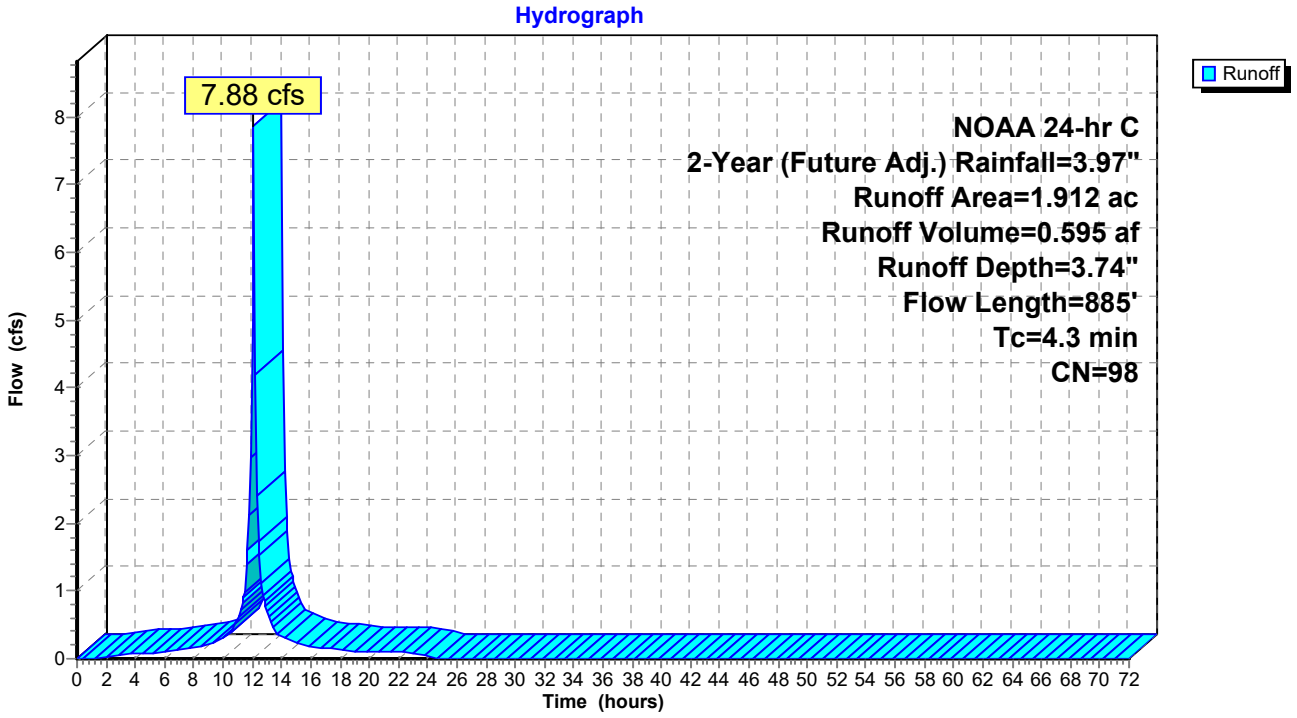
Runoff = 7.88 cfs @ 12.09 hrs, Volume= 0.595 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

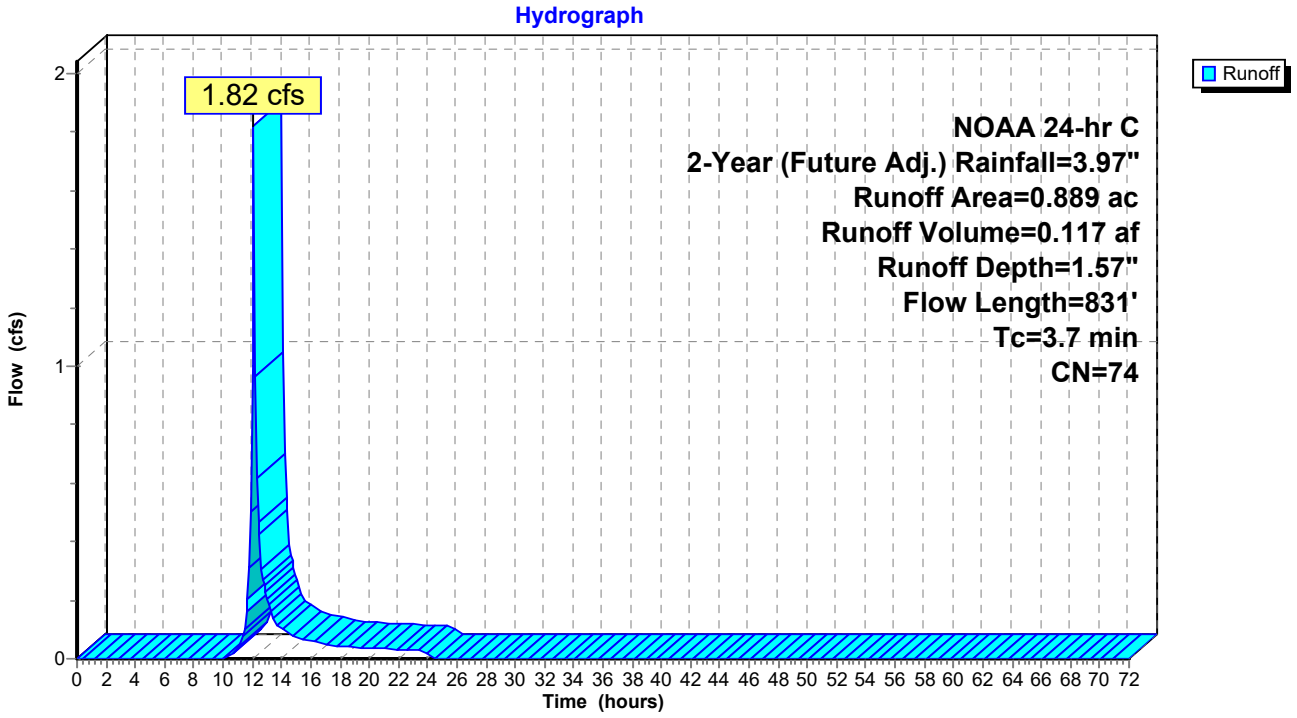
Runoff = 1.82 cfs @ 12.10 hrs, Volume= 0.117 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

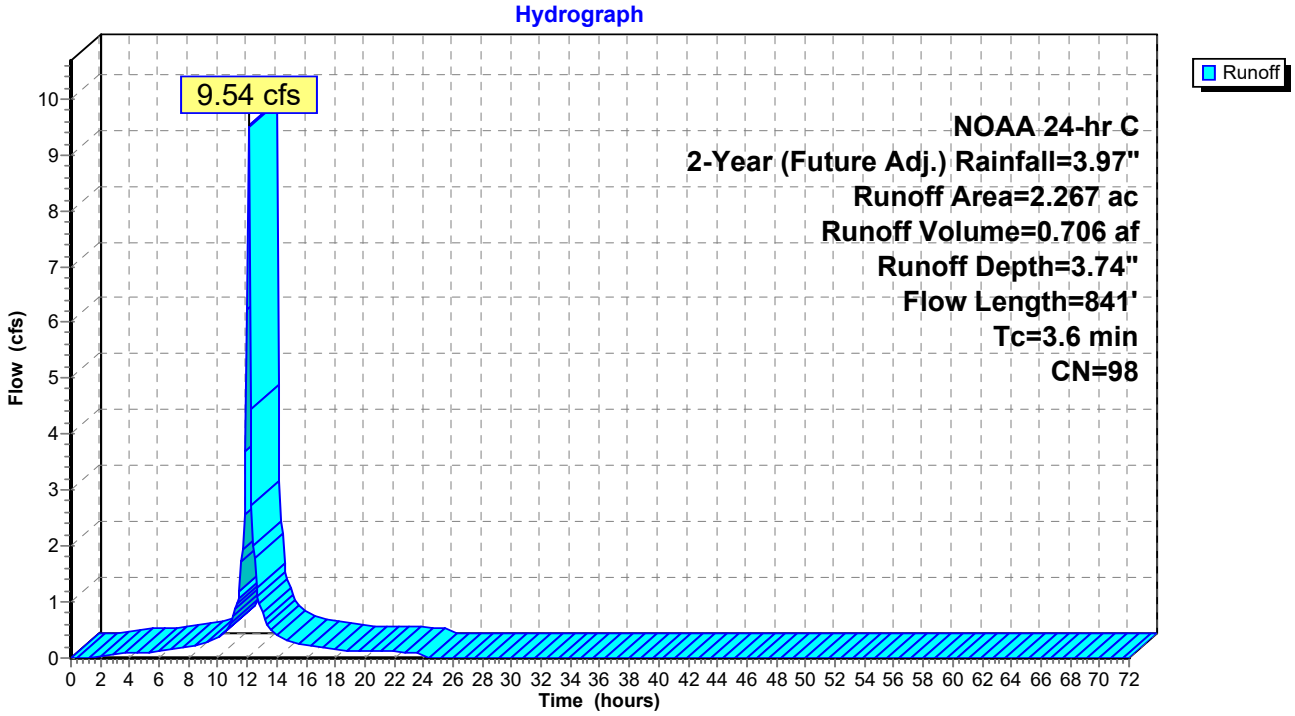
Runoff = 9.54 cfs @ 12.09 hrs, Volume= 0.706 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

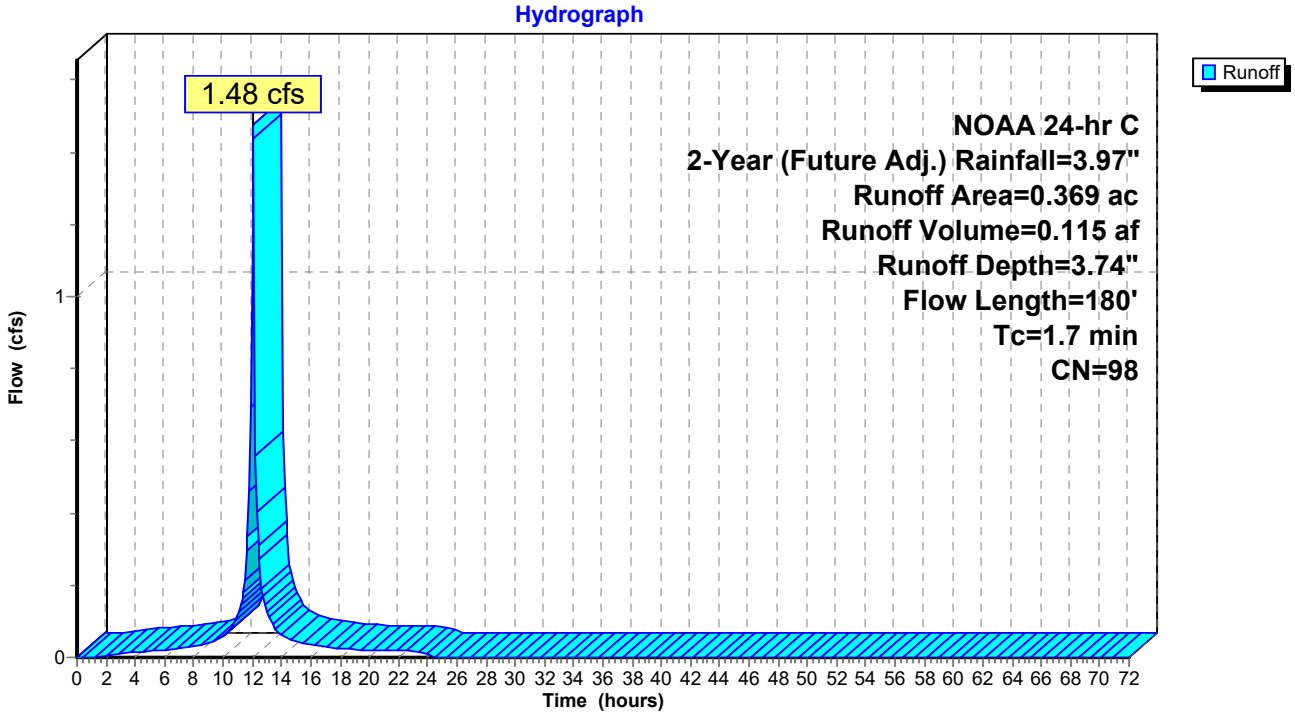
Runoff = 1.48 cfs @ 12.07 hrs, Volume= 0.115 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

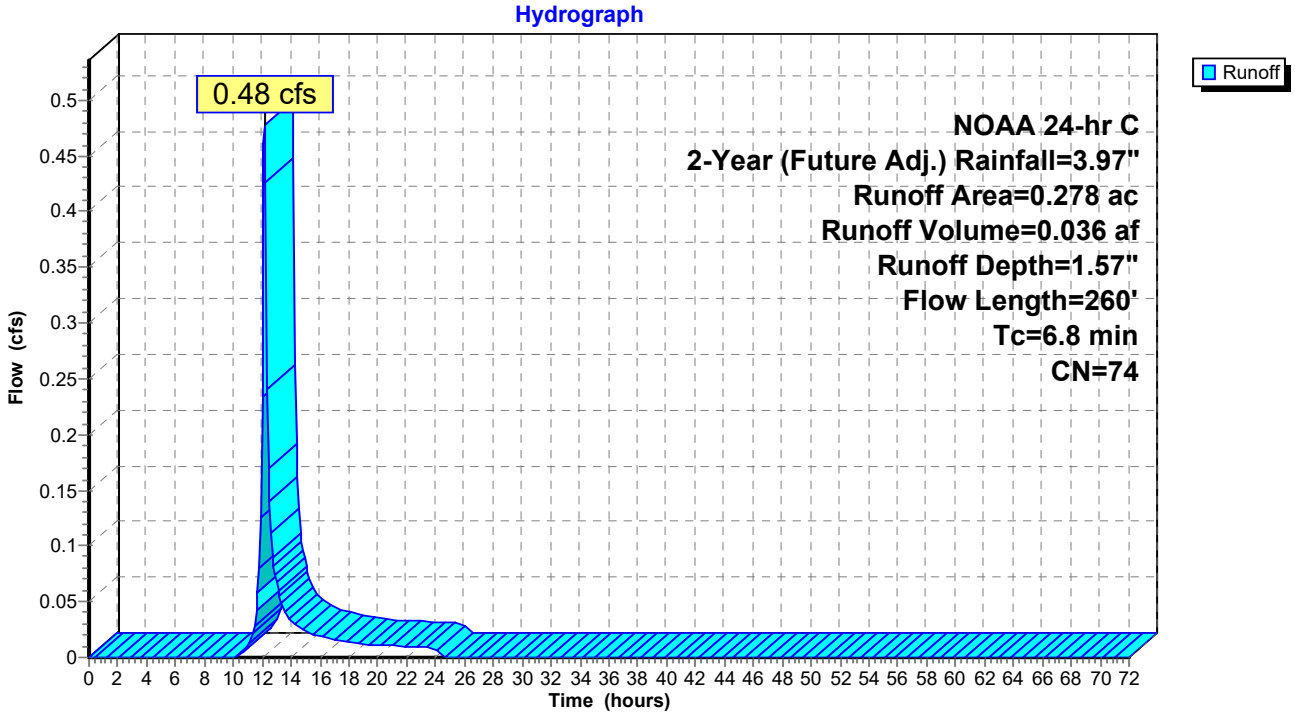
Runoff = 0.48 cfs @ 12.14 hrs, Volume= 0.036 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

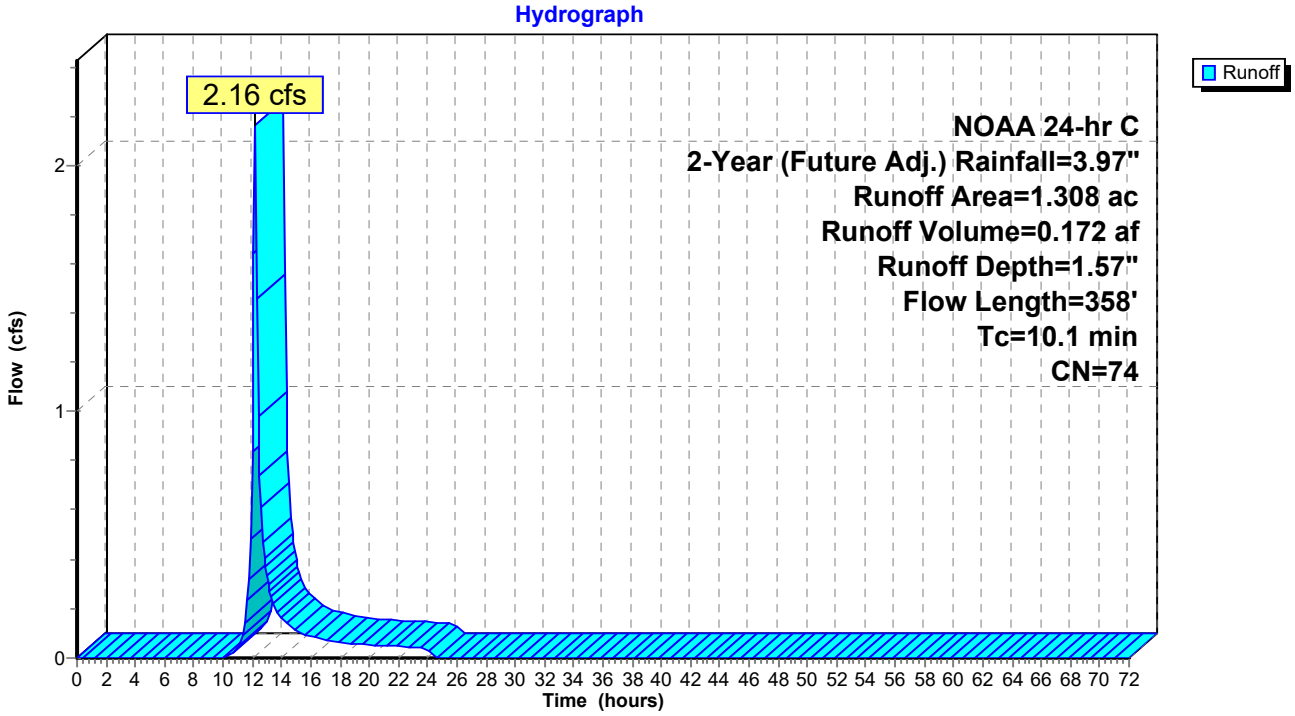
Runoff = 2.16 cfs @ 12.19 hrs, Volume= 0.172 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

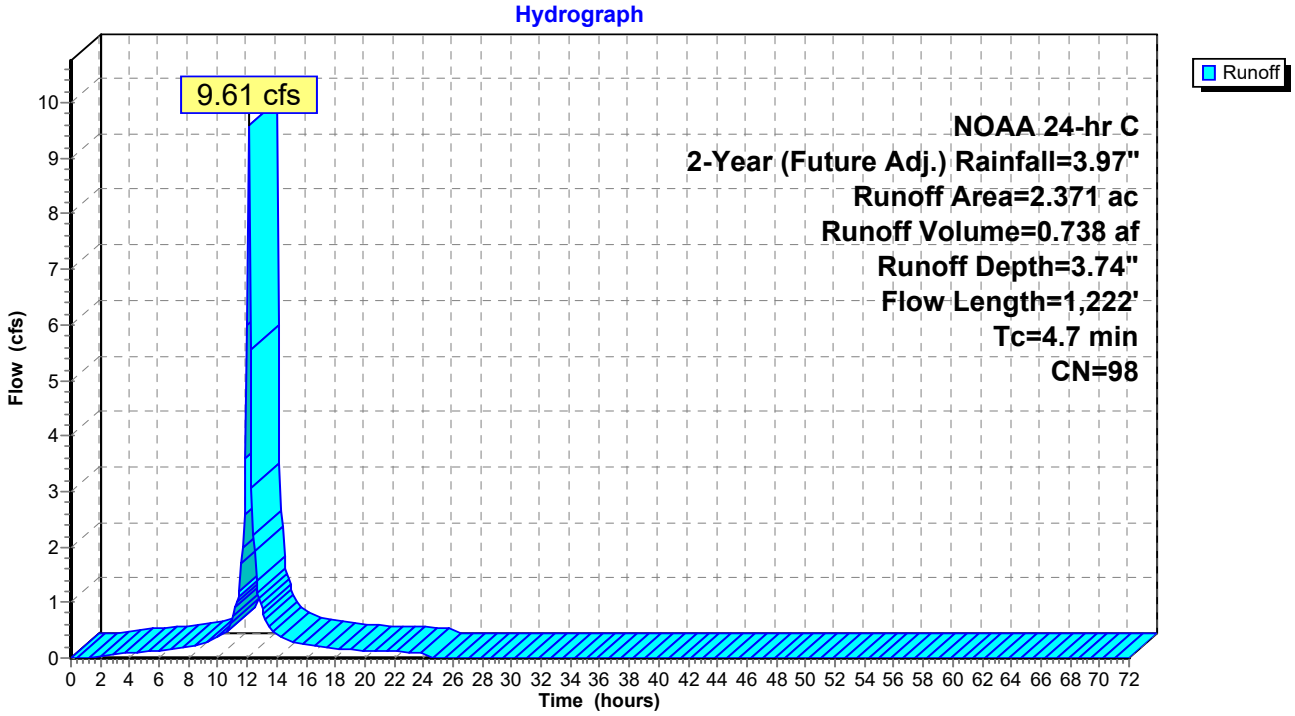
Runoff = 9.61 cfs @ 12.10 hrs, Volume= 0.738 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

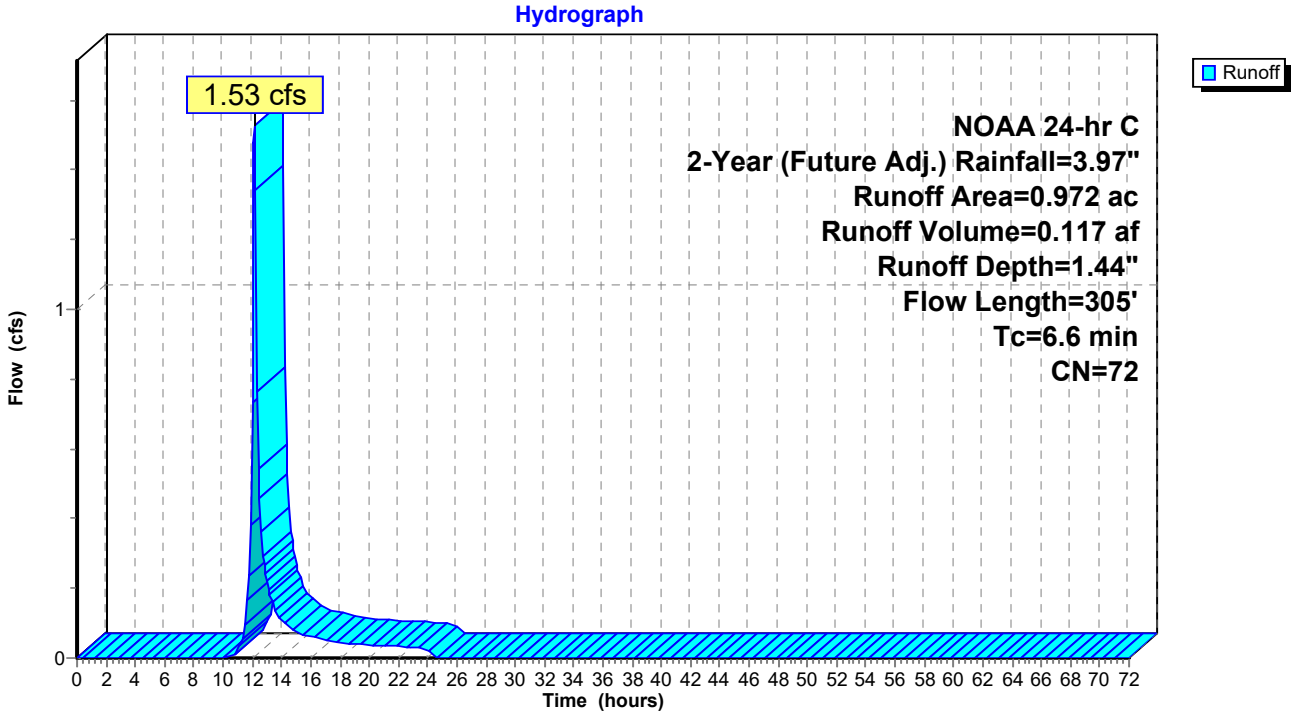
Runoff = 1.53 cfs @ 12.13 hrs, Volume= 0.117 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

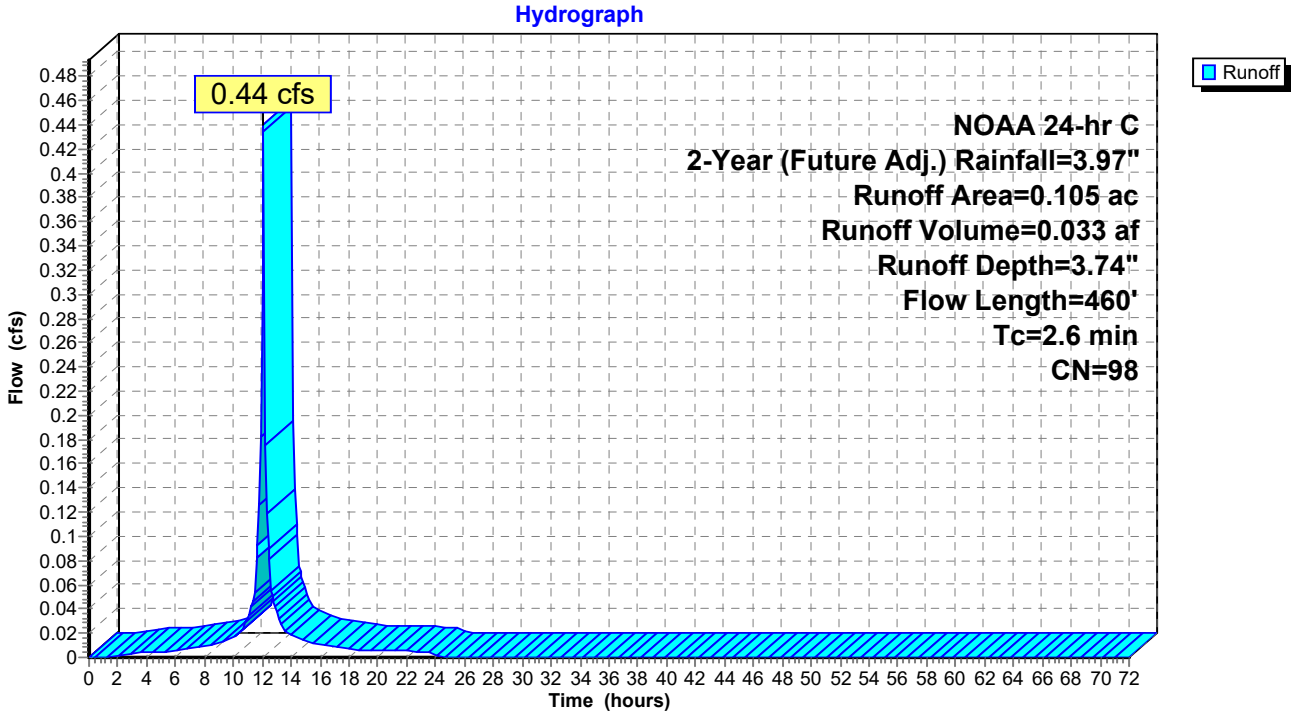
Runoff = 0.44 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

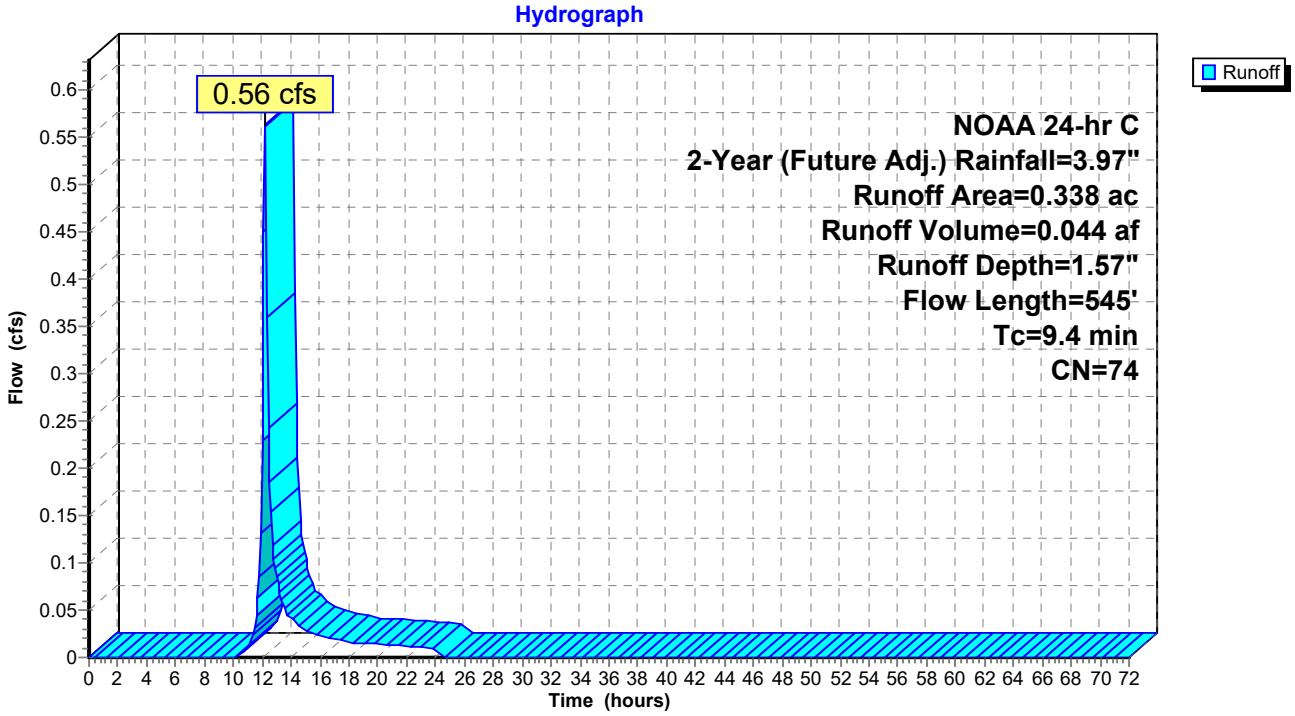
Runoff = 0.56 cfs @ 12.19 hrs, Volume= 0.044 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

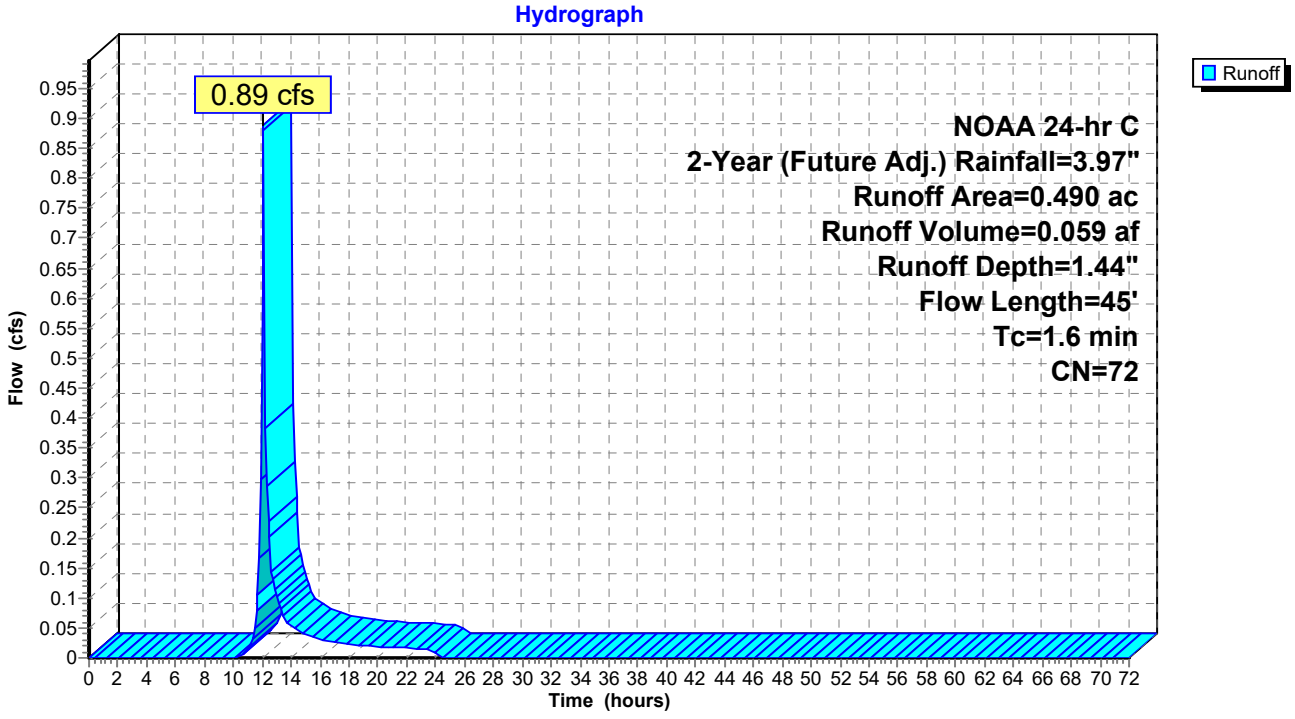
Runoff = 0.89 cfs @ 12.08 hrs, Volume= 0.059 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 2-Year (Future Adj.) Rainfall=3.97"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 1.57" for 2-Year (Future Adj.) event
Inflow = 0.23 cfs @ 12.35 hrs, Volume= 0.025 af
Outflow = 0.25 cfs @ 12.44 hrs, Volume= 0.020 af, Atten= 0%, Lag= 5.0 min
Primary = 0.25 cfs @ 12.44 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.08' @ 12.40 hrs Surf.Area= 1,713 sf Storage= 248 cf

Plug-Flow detention time= 127.0 min calculated for 0.020 af (80% of inflow)
Center-of-Mass det. time= 44.6 min (913.3 - 868.7)

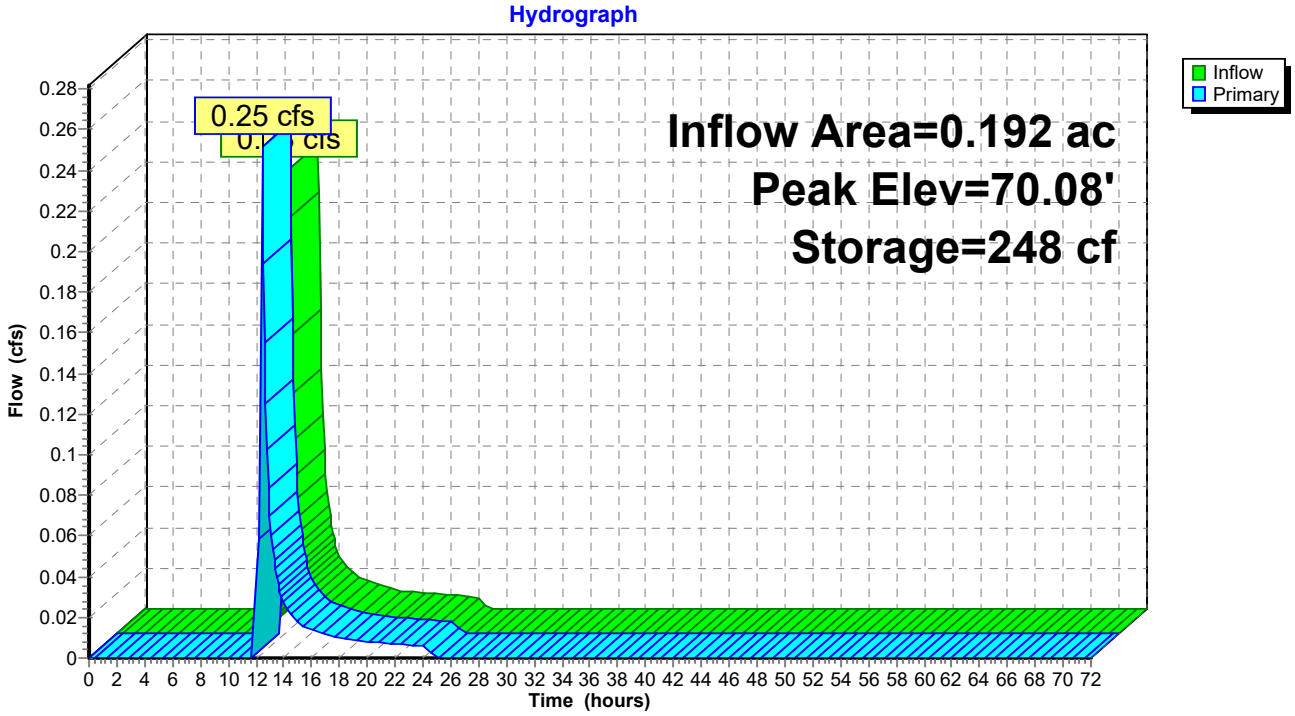
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.22 cfs @ 12.44 hrs HW=70.08' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.22 cfs @ 0.19 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 2.68" for 2-Year (Future Adj.) event
Inflow = 0.38 cfs @ 12.11 hrs, Volume= 0.030 af
Outflow = 0.37 cfs @ 12.11 hrs, Volume= 0.028 af, Atten= 2%, Lag= 0.1 min
Primary = 0.37 cfs @ 12.11 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.14' @ 12.11 hrs Surf.Area= 341 sf Storage= 77 cf

Plug-Flow detention time= 52.6 min calculated for 0.028 af (95% of inflow)
Center-of-Mass det. time= 26.2 min (807.3 - 781.1)

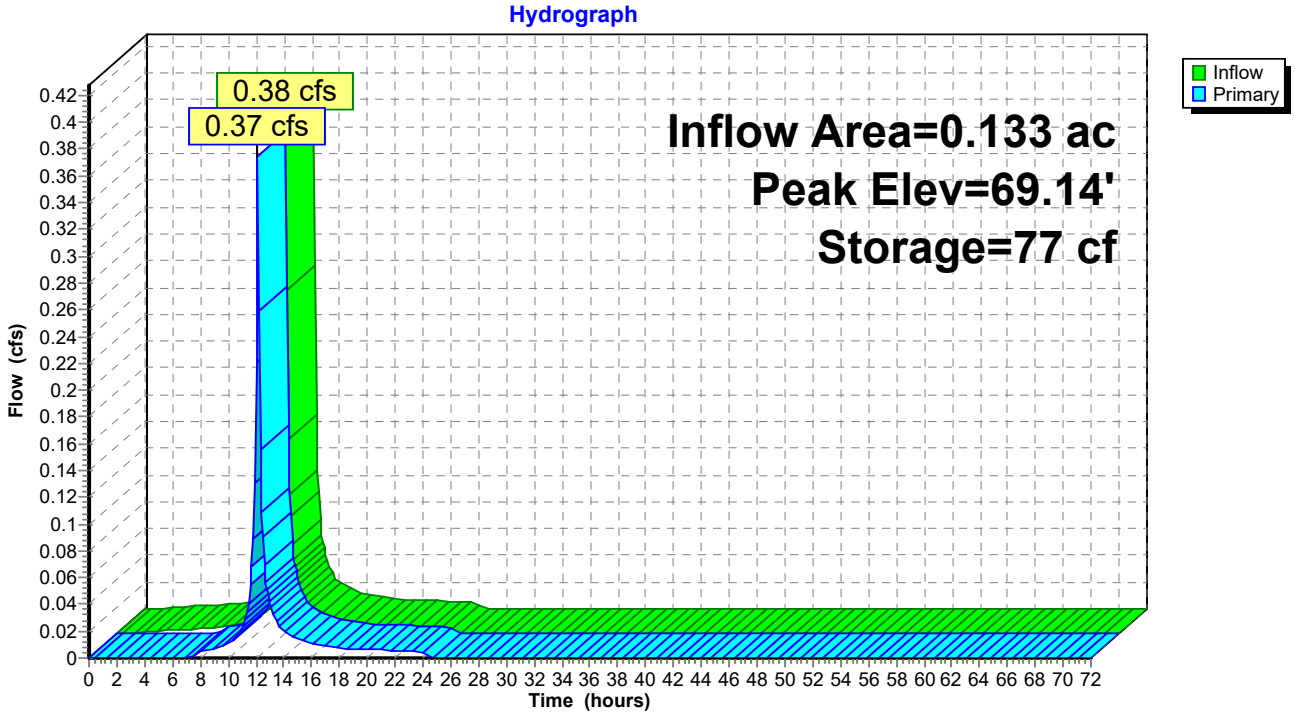
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.36 cfs @ 12.11 hrs HW=69.14' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.36 cfs @ 0.30 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 2.79" for 2-Year (Future Adj.) event
Inflow = 5.44 cfs @ 12.12 hrs, Volume= 0.443 af
Outflow = 3.51 cfs @ 12.25 hrs, Volume= 0.342 af, Atten= 36%, Lag= 7.8 min
Primary = 3.51 cfs @ 12.25 hrs, Volume= 0.342 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.10' @ 12.25 hrs Surf.Area= 7,418 sf Storage= 7,499 cf

Plug-Flow detention time= 179.5 min calculated for 0.341 af (77% of inflow)
Center-of-Mass det. time= 92.4 min (870.5 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

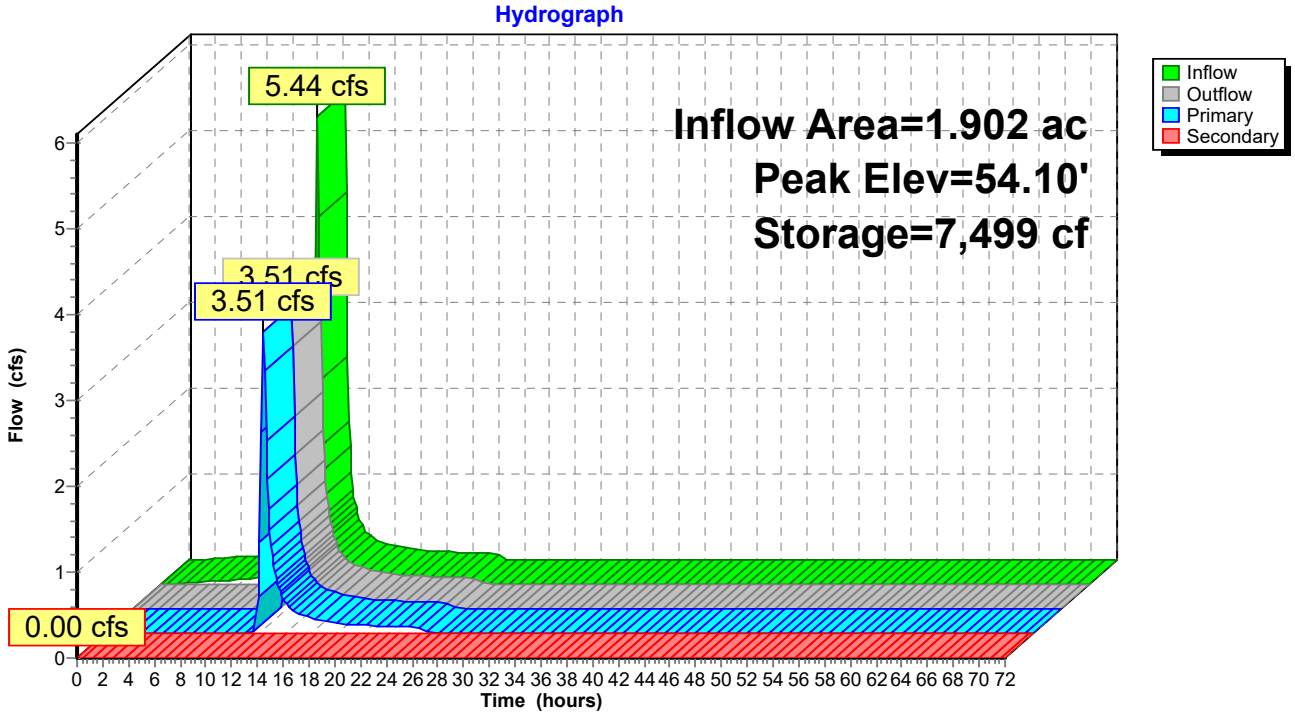
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.37 cfs @ 12.25 hrs HW=54.08' (Free Discharge)
└**1=Culvert** (Passes 3.37 cfs of 30.03 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 3.37 cfs @ 1.94 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 3.05" for 2-Year (Future Adj.) event
Inflow = 9.70 cfs @ 12.09 hrs, Volume= 0.712 af
Outflow = 1.92 cfs @ 12.50 hrs, Volume= 0.533 af, Atten= 80%, Lag= 24.0 min
Primary = 1.92 cfs @ 12.50 hrs, Volume= 0.533 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.17' @ 12.50 hrs Surf.Area= 15,903 sf Storage= 17,300 cf

Plug-Flow detention time= 323.1 min calculated for 0.533 af (75% of inflow)
Center-of-Mass det. time= 231.3 min (999.0 - 767.8)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

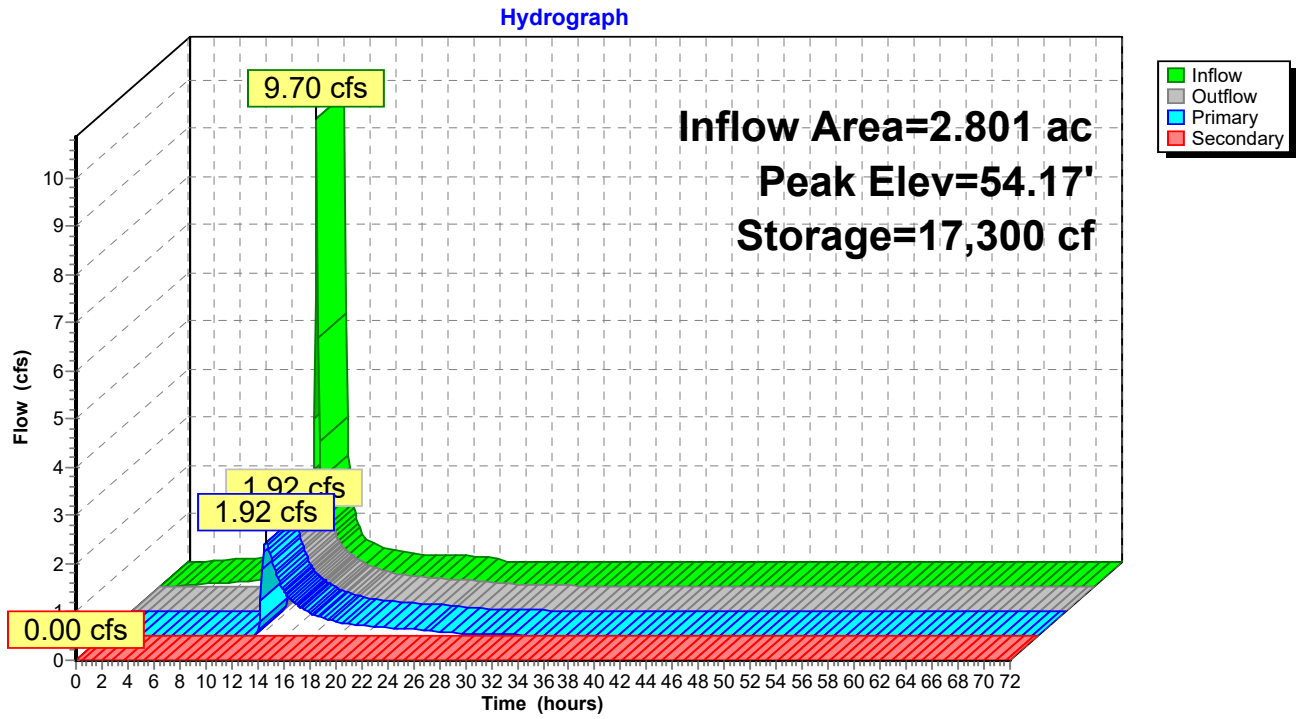
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.92 cfs @ 12.50 hrs HW=54.17' (Free Discharge)
└─**1=Culvert** (Passes 1.92 cfs of 30.90 cfs potential flow)
  ├─**2=Exfiltration** (Controls 0.00 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.52 cfs @ 2.45 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 1.16 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 2.92" for 2-Year (Future Adj.) event
Inflow = 13.04 cfs @ 12.10 hrs, Volume= 1.029 af
Outflow = 2.05 cfs @ 12.64 hrs, Volume= 0.790 af, Atten= 84%, Lag= 32.9 min
Primary = 2.05 cfs @ 12.64 hrs, Volume= 0.790 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 62.05' @ 12.64 hrs Surf.Area= 14,243 sf Storage= 25,643 cf

Plug-Flow detention time= 345.3 min calculated for 0.789 af (77% of inflow)
Center-of-Mass det. time= 260.1 min (1,032.0 - 772.0)

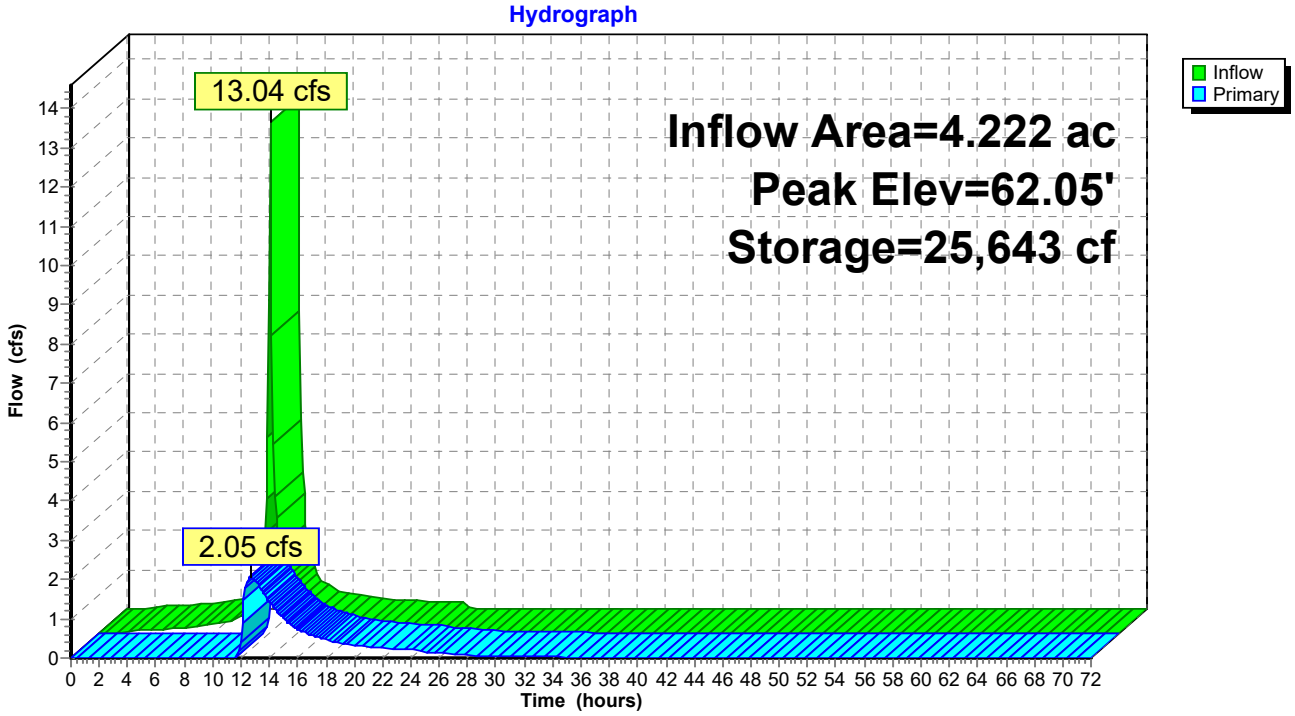
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=2.04 cfs @ 12.64 hrs HW=62.05' (Free Discharge)
- **1=Culvert** (Passes 2.04 cfs of 39.59 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 2.04 cfs @ 3.56 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

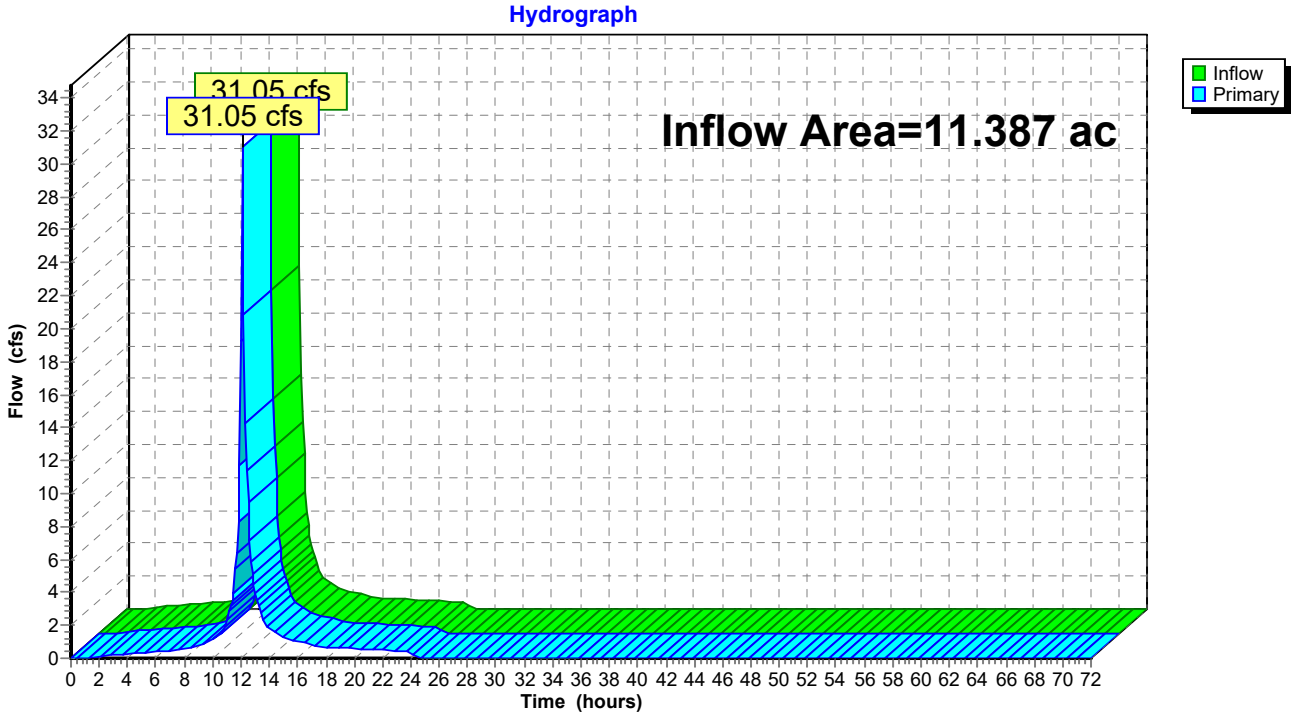


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 2.90" for 2-Year (Future Adj.) event
Inflow = 31.05 cfs @ 12.10 hrs, Volume= 2.752 af
Primary = 31.05 cfs @ 12.10 hrs, Volume= 2.752 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

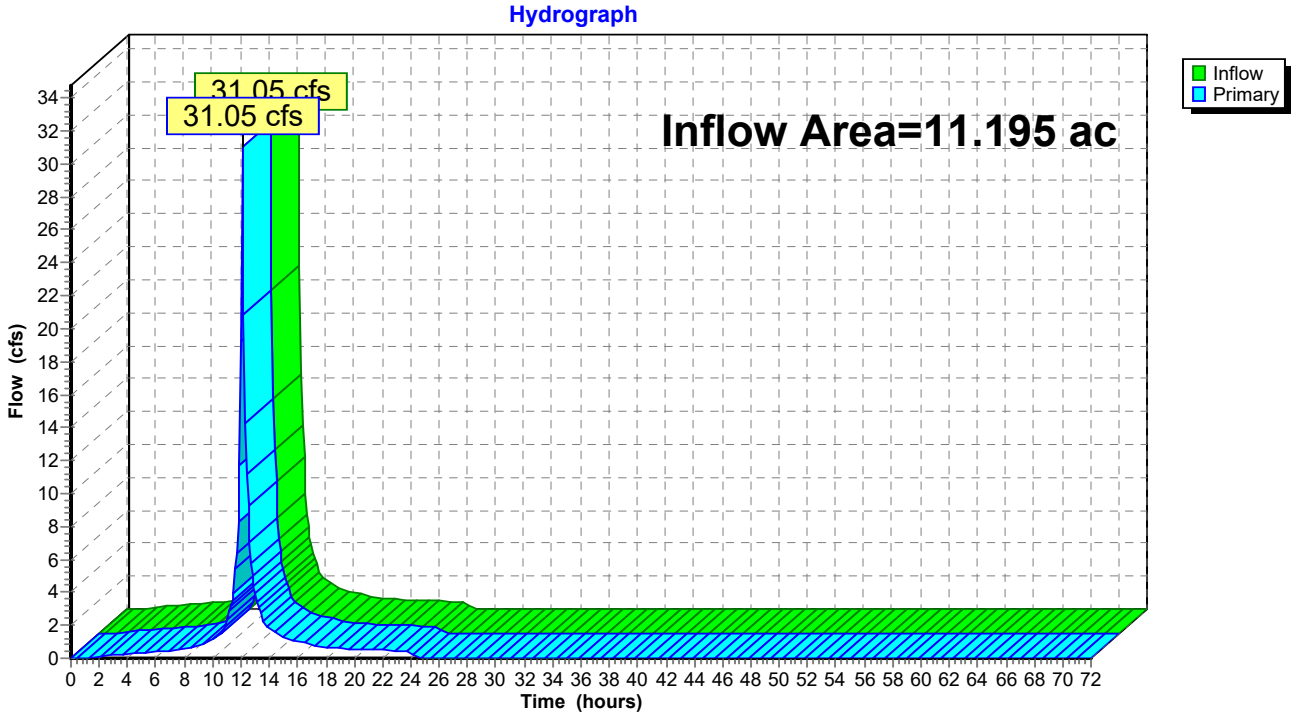


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 2.93" for 2-Year (Future Adj.) event
Inflow = 31.05 cfs @ 12.10 hrs, Volume= 2.732 af
Primary = 31.05 cfs @ 12.10 hrs, Volume= 2.732 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

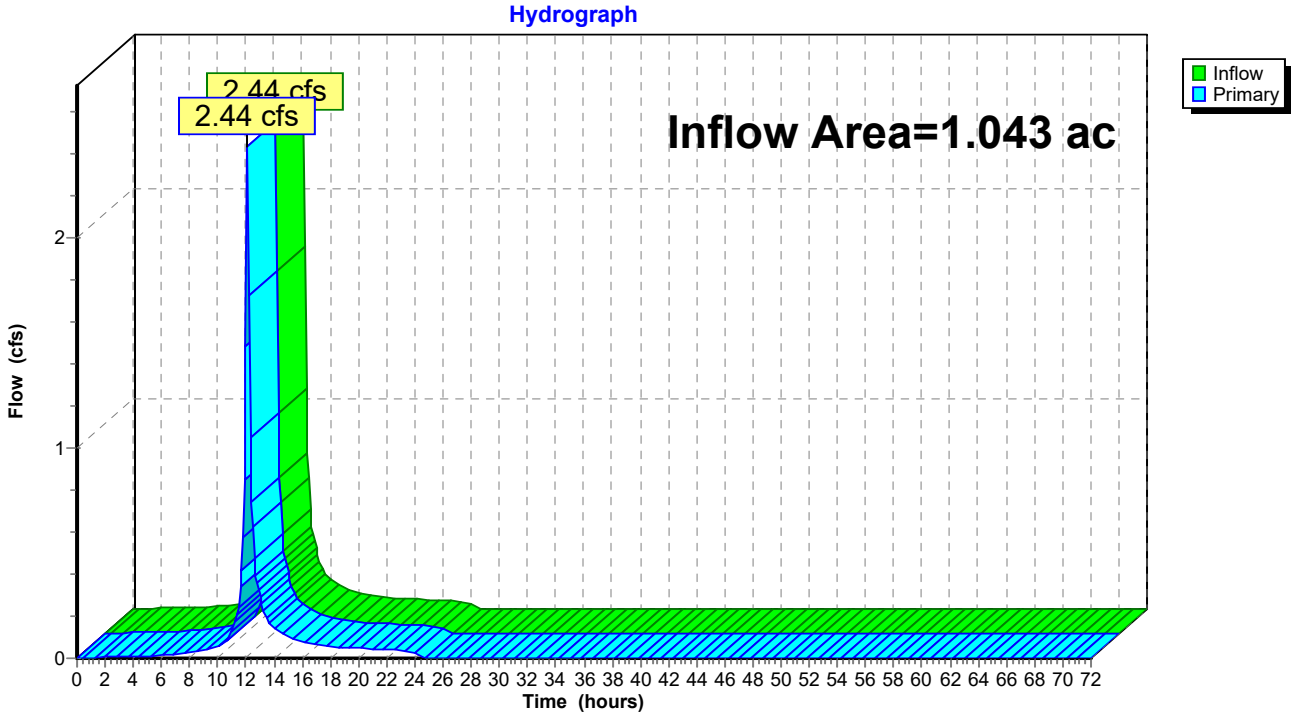


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 2.22" for 2-Year (Future Adj.) event
Inflow = 2.44 cfs @ 12.11 hrs, Volume= 0.193 af
Primary = 2.44 cfs @ 12.11 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

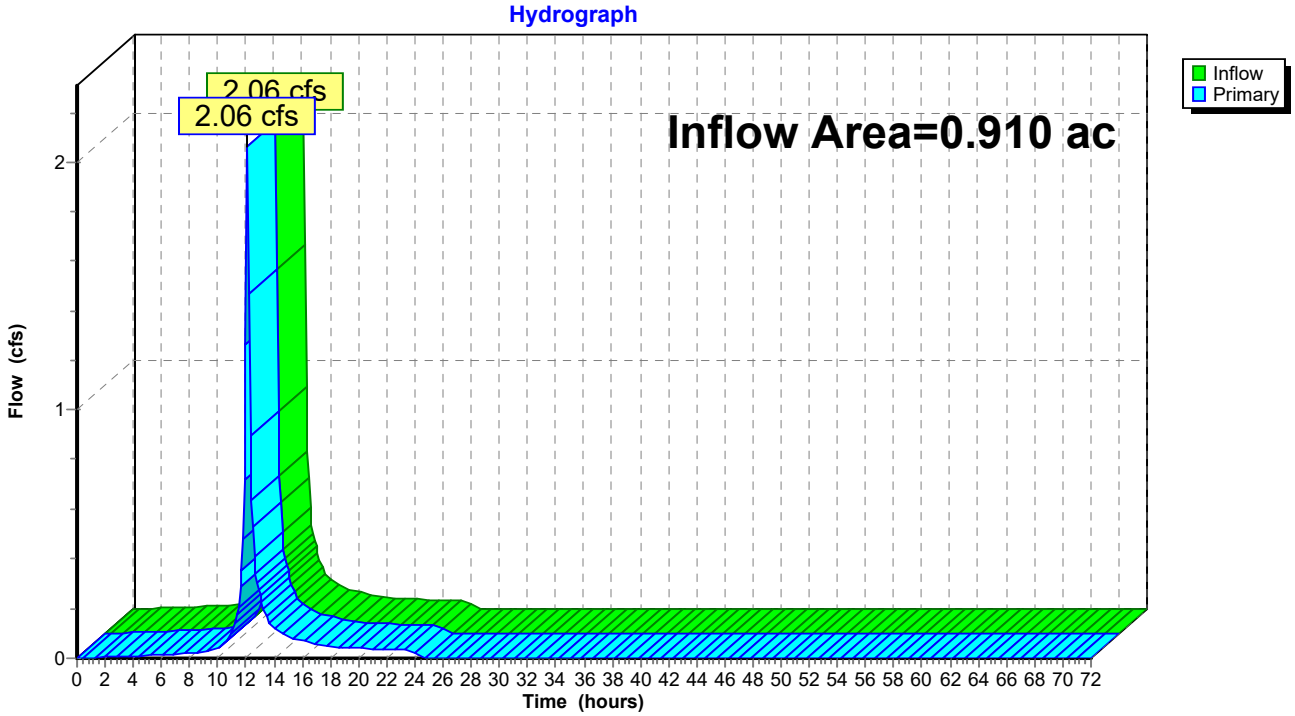


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 2.17" for 2-Year (Future Adj.) event
Inflow = 2.06 cfs @ 12.11 hrs, Volume= 0.164 af
Primary = 2.06 cfs @ 12.11 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

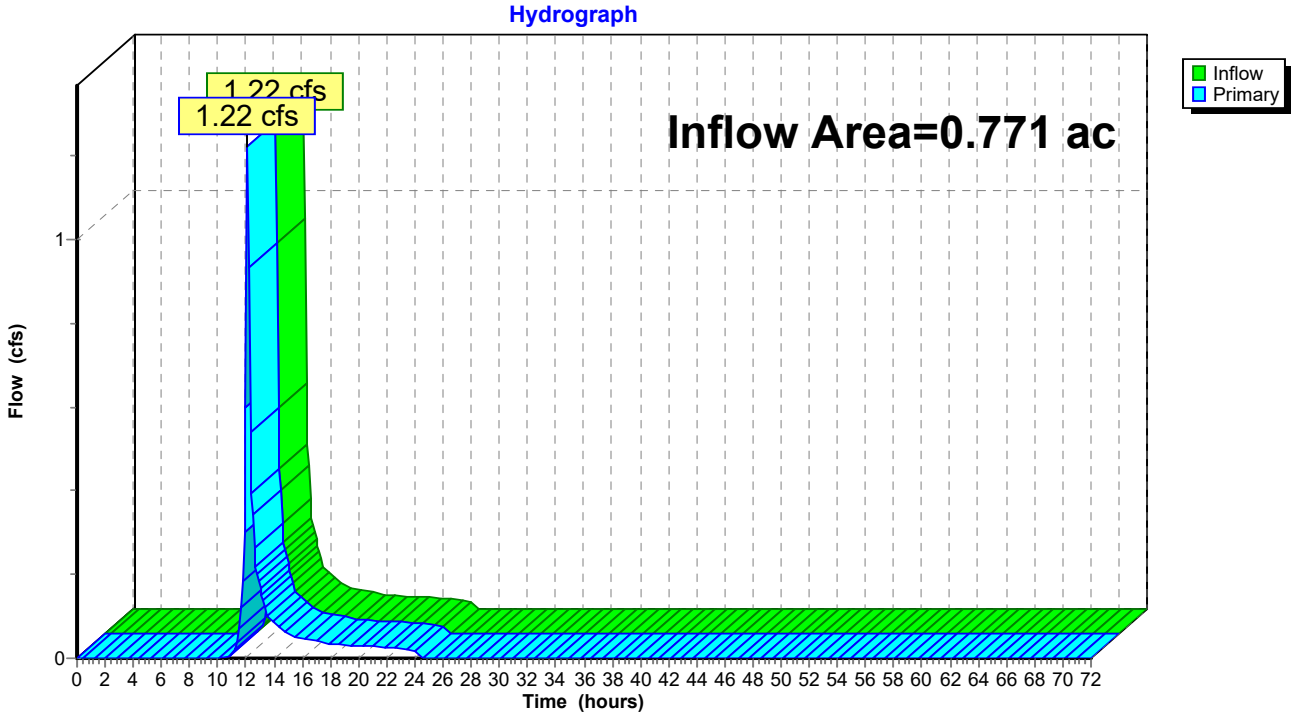


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 1.37" for 2-Year (Future Adj.) event
Inflow = 1.22 cfs @ 12.12 hrs, Volume= 0.088 af
Primary = 1.22 cfs @ 12.12 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

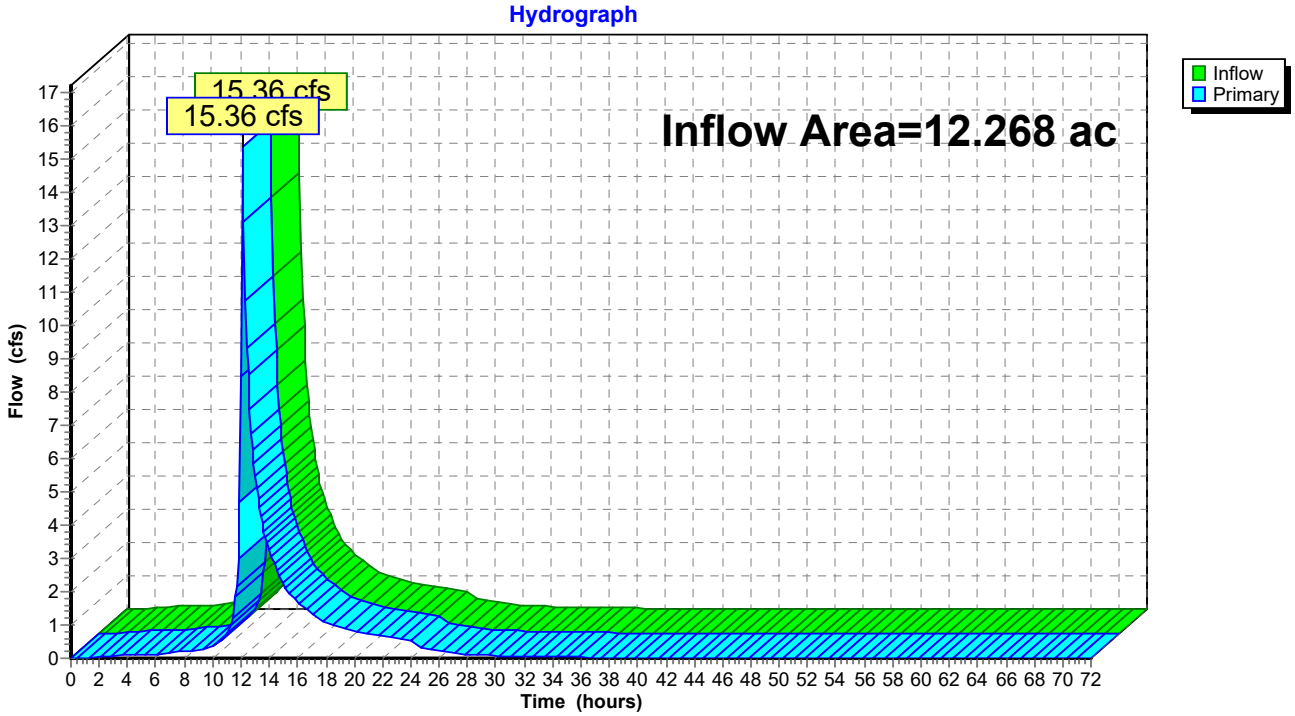


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 2.46" for 2-Year (Future Adj.) event
Inflow = 15.36 cfs @ 12.13 hrs, Volume= 2.519 af
Primary = 15.36 cfs @ 12.13 hrs, Volume= 2.519 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

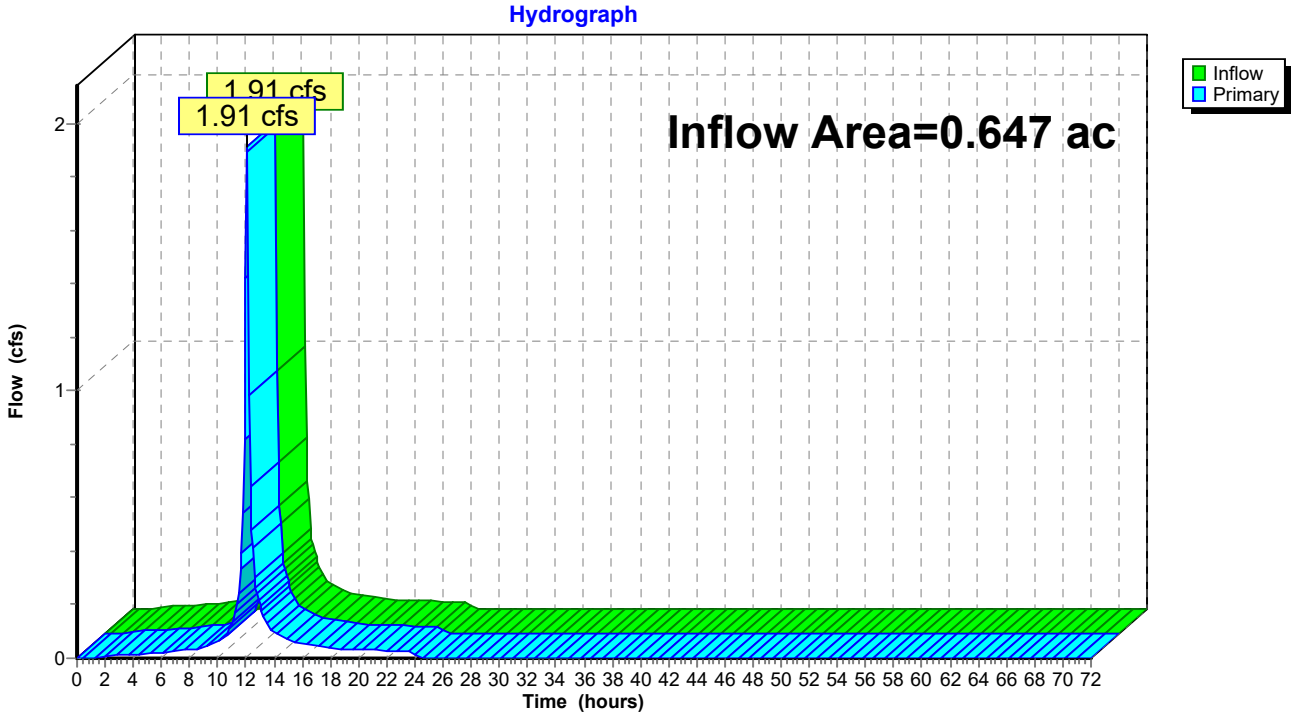


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 2.81" for 2-Year (Future Adj.) event
Inflow = 1.91 cfs @ 12.08 hrs, Volume= 0.151 af
Primary = 1.91 cfs @ 12.08 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

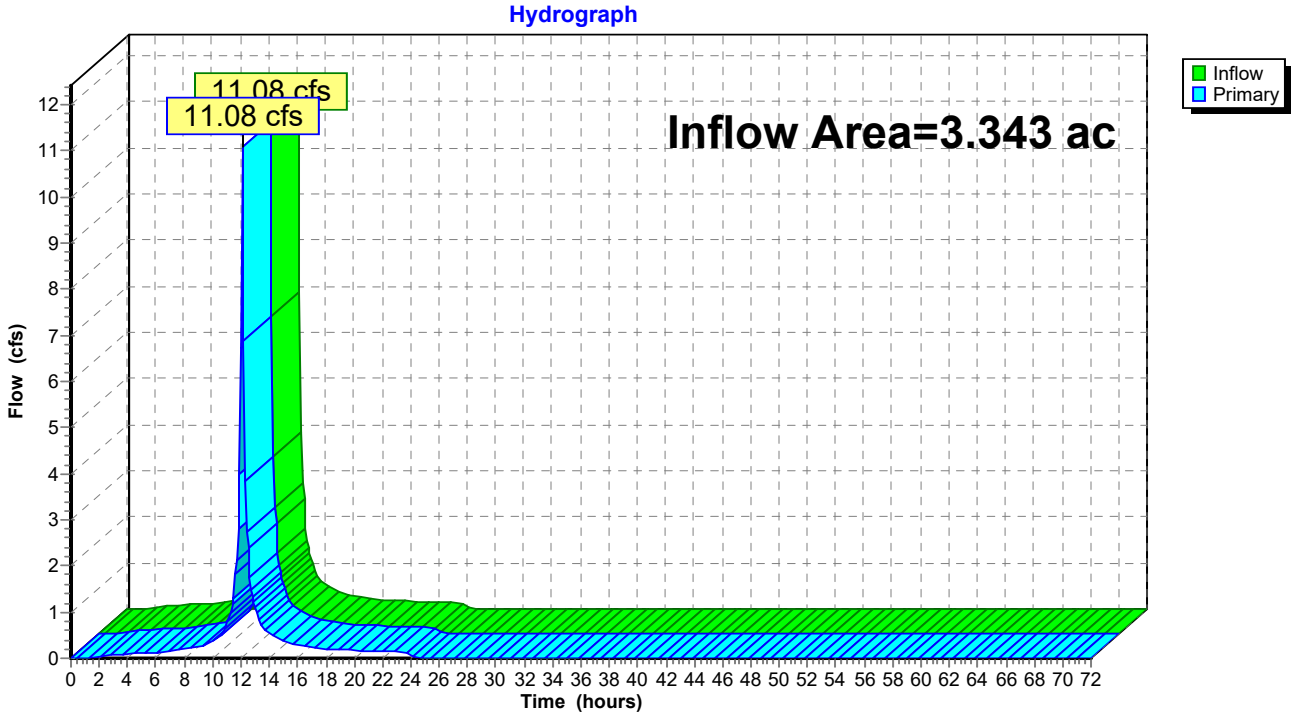


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 3.07" for 2-Year (Future Adj.) event
Inflow = 11.08 cfs @ 12.10 hrs, Volume= 0.855 af
Primary = 11.08 cfs @ 12.10 hrs, Volume= 0.855 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

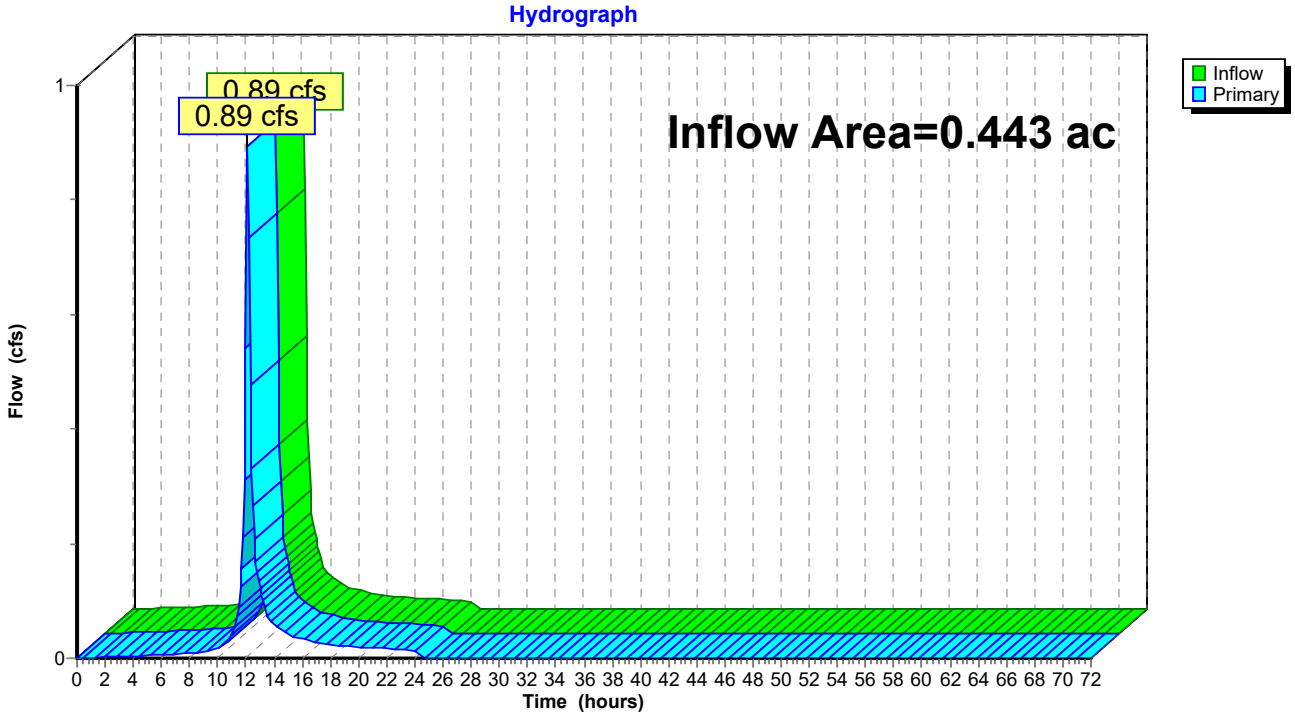


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 2.09" for 2-Year (Future Adj.) event
Inflow = 0.89 cfs @ 12.12 hrs, Volume= 0.077 af
Primary = 0.89 cfs @ 12.12 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

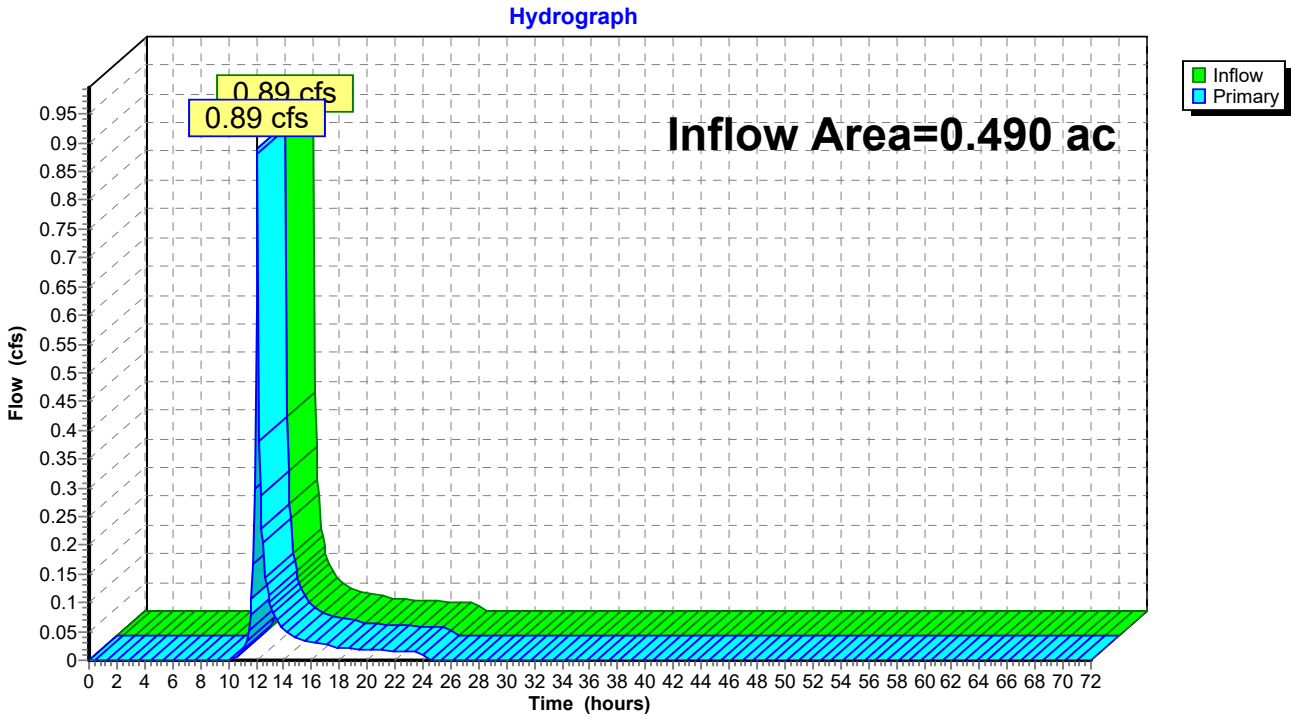


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 1.44" for 2-Year (Future Adj.) event
Inflow = 0.89 cfs @ 12.08 hrs, Volume= 0.059 af
Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

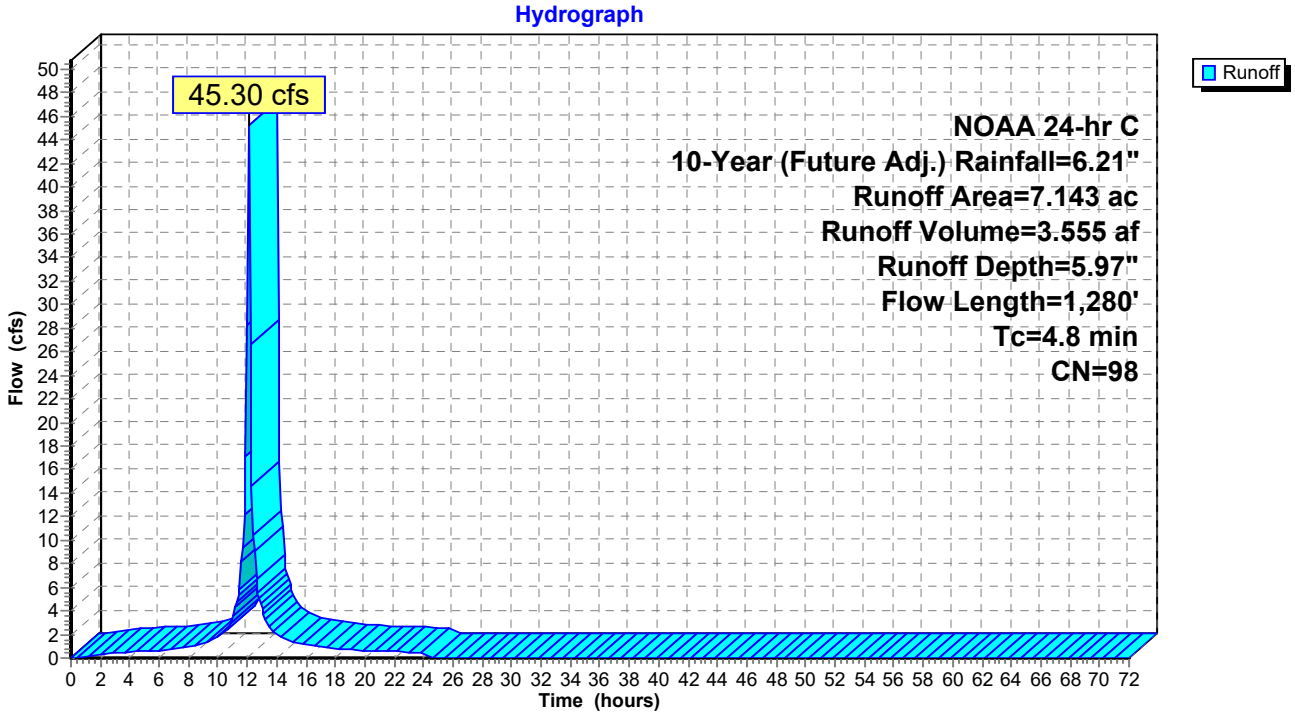
Runoff = 45.30 cfs @ 12.10 hrs, Volume= 3.555 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

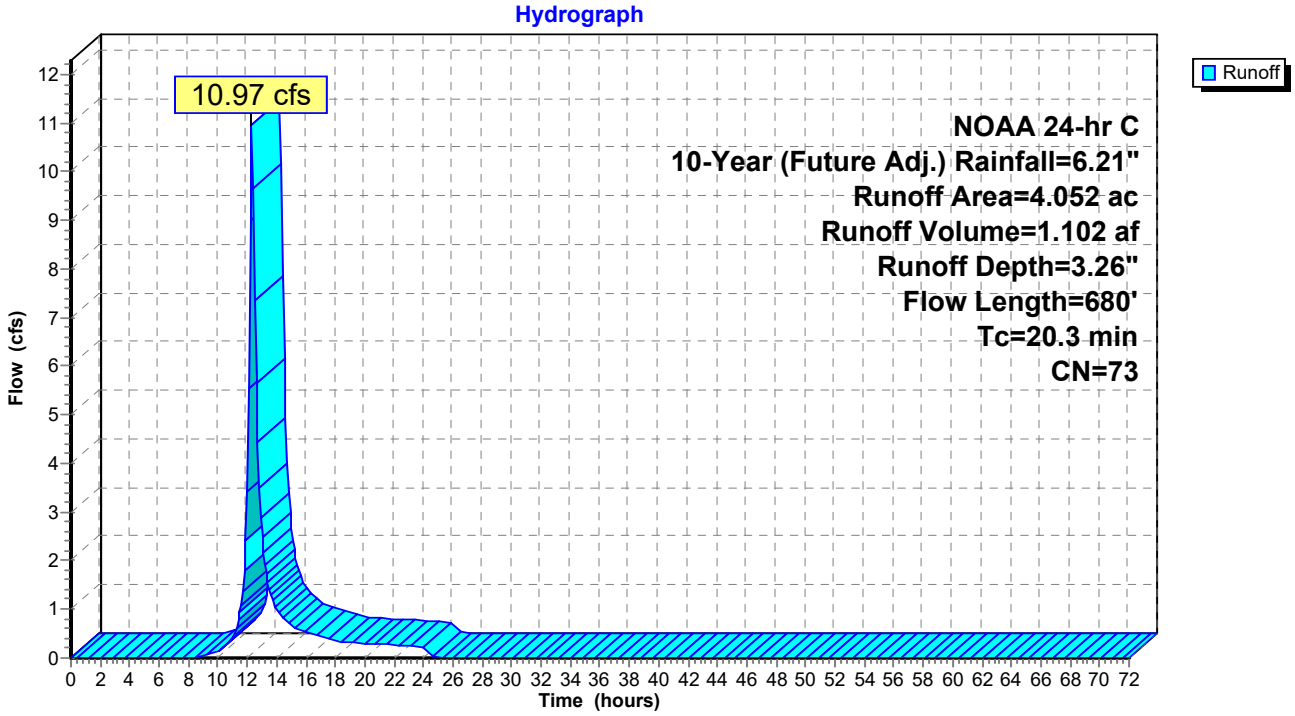
Runoff = 10.97 cfs @ 12.31 hrs, Volume= 1.102 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

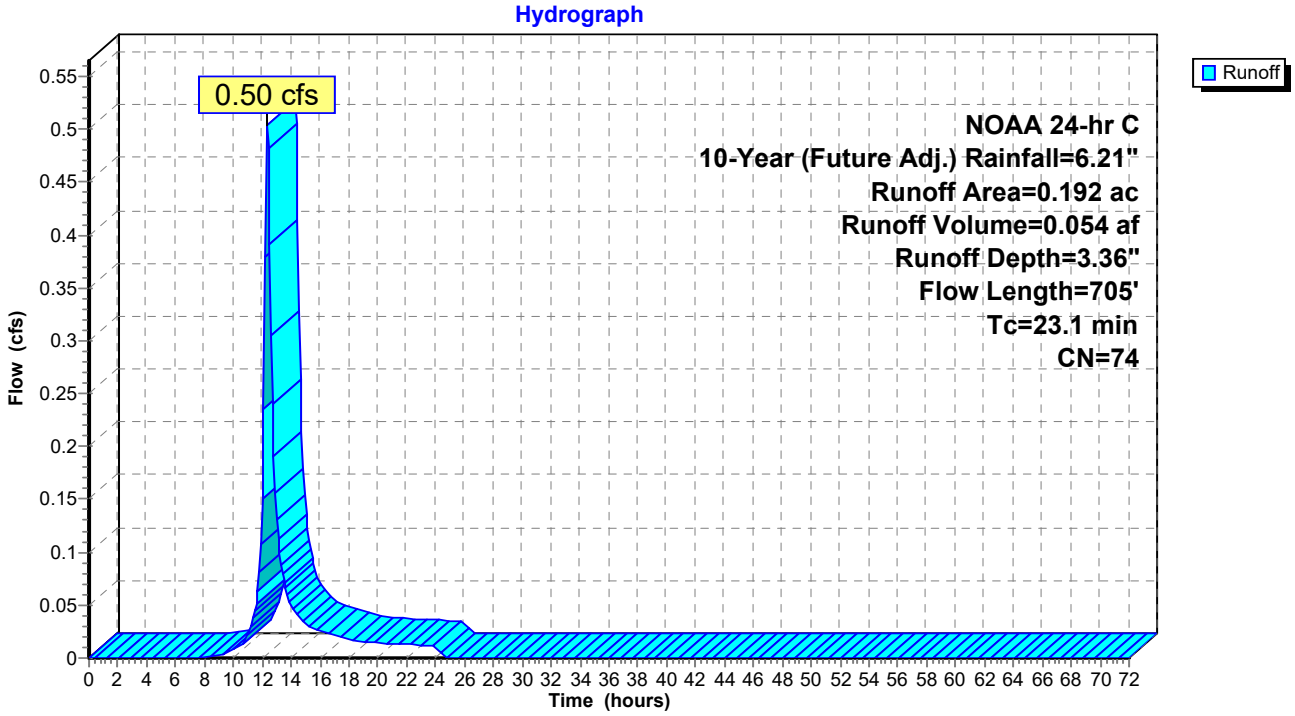
Runoff = 0.50 cfs @ 12.34 hrs, Volume= 0.054 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

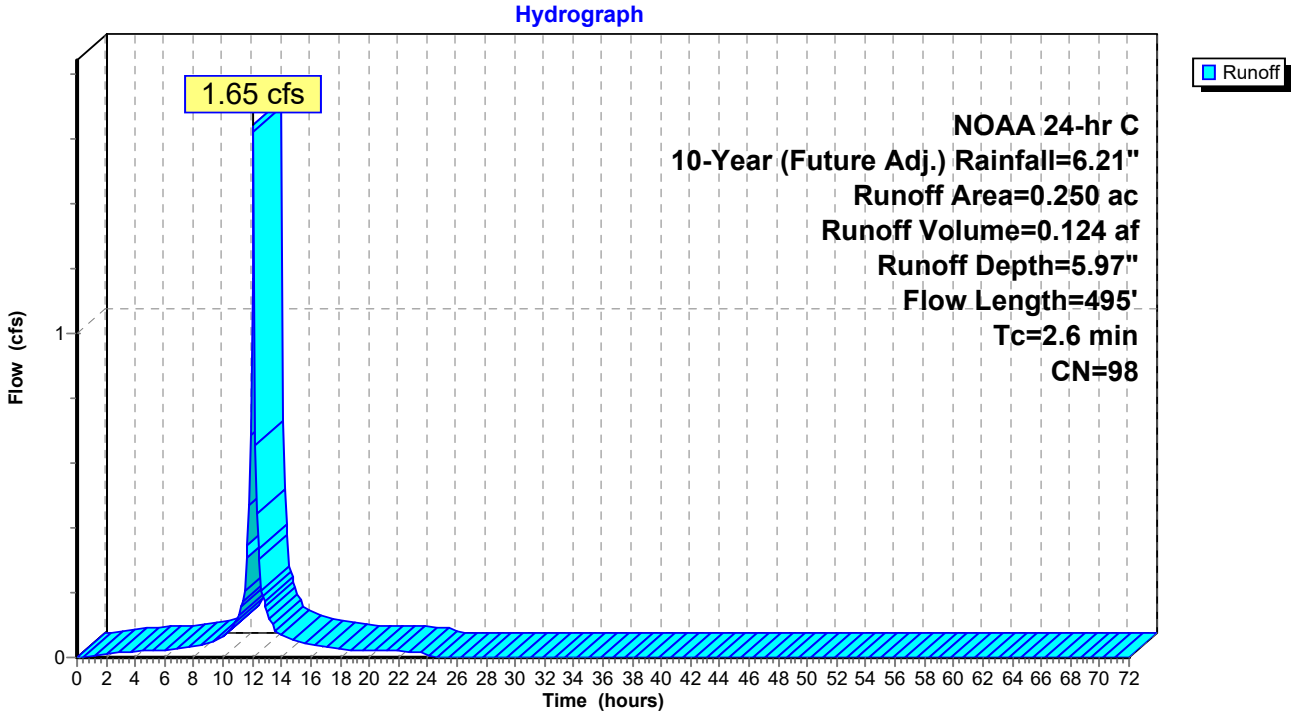
Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.124 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

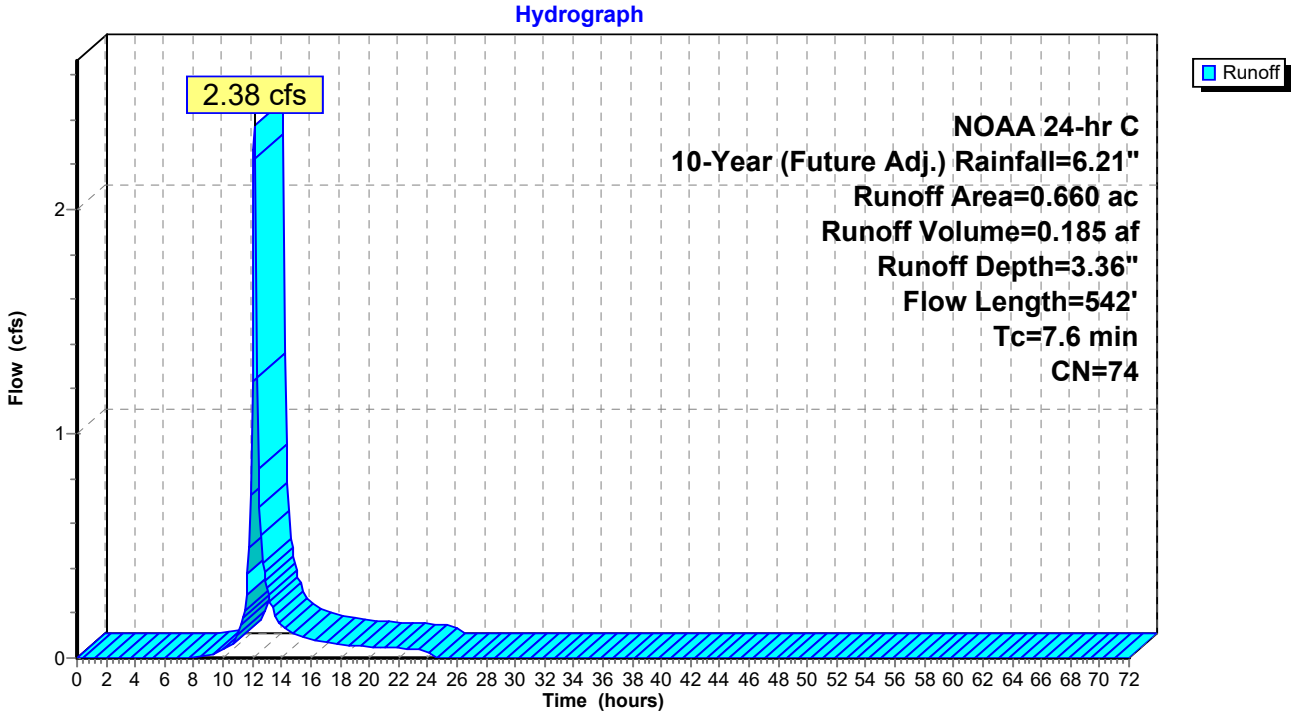
Runoff = 2.38 cfs @ 12.15 hrs, Volume= 0.185 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

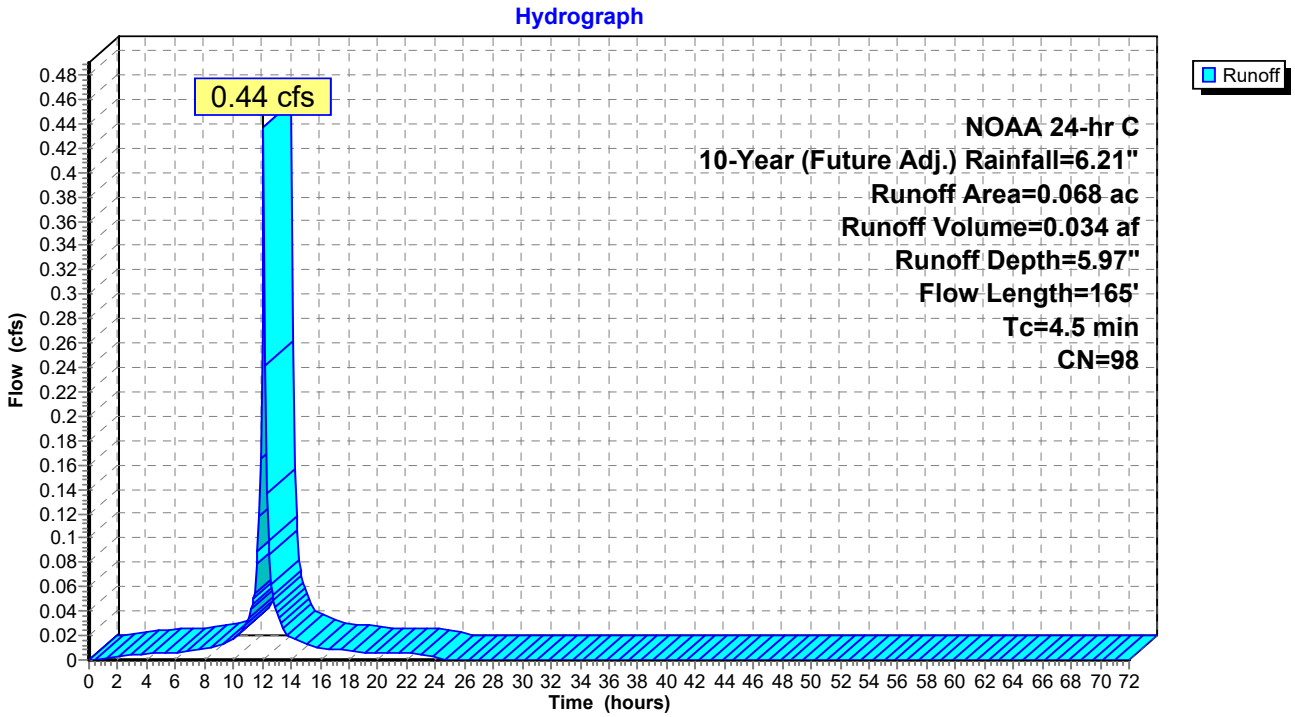
Runoff = 0.44 cfs @ 12.10 hrs, Volume= 0.034 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

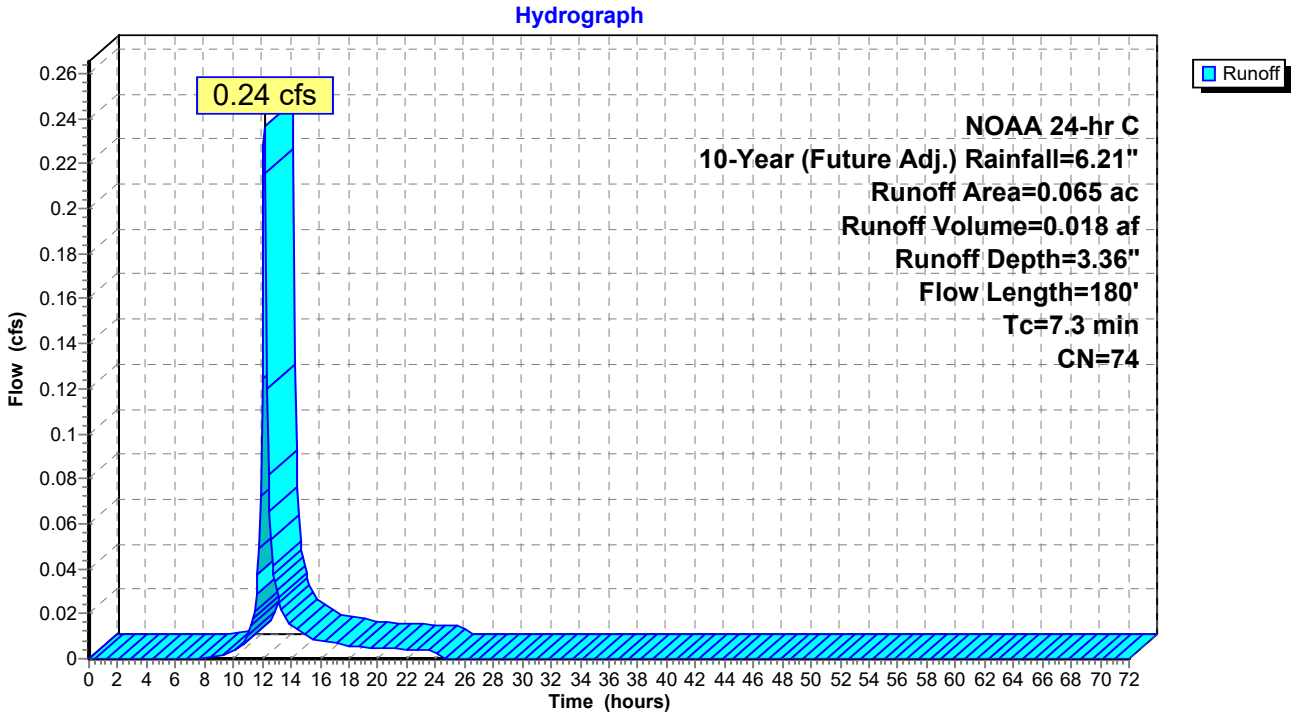
Runoff = 0.24 cfs @ 12.14 hrs, Volume= 0.018 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

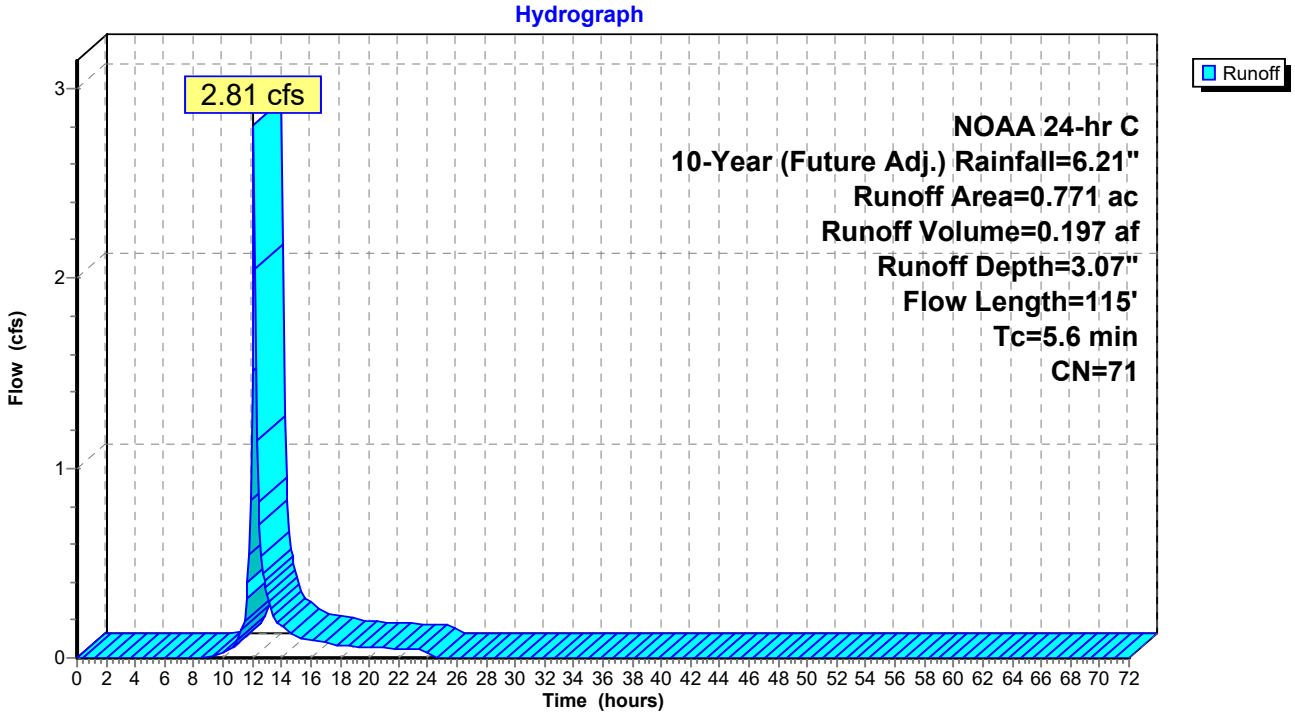
Runoff = 2.81 cfs @ 12.11 hrs, Volume= 0.197 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

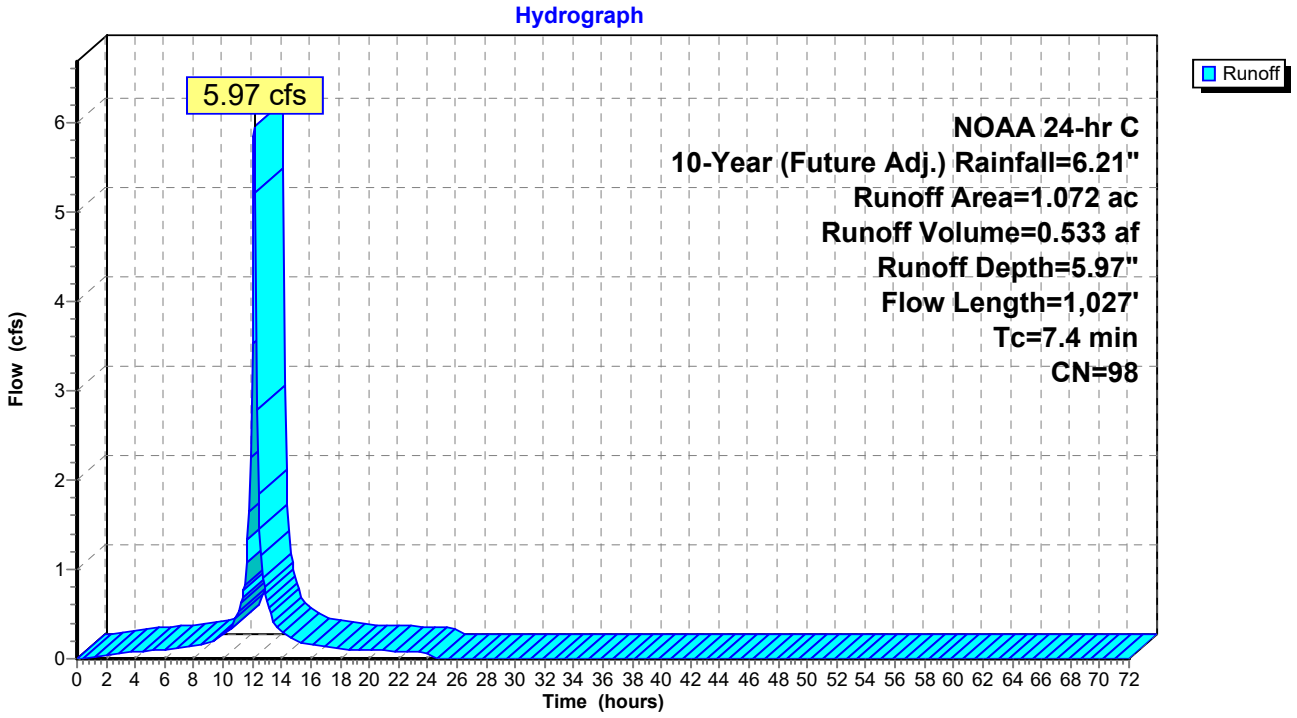
Runoff = 5.97 cfs @ 12.13 hrs, Volume= 0.533 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

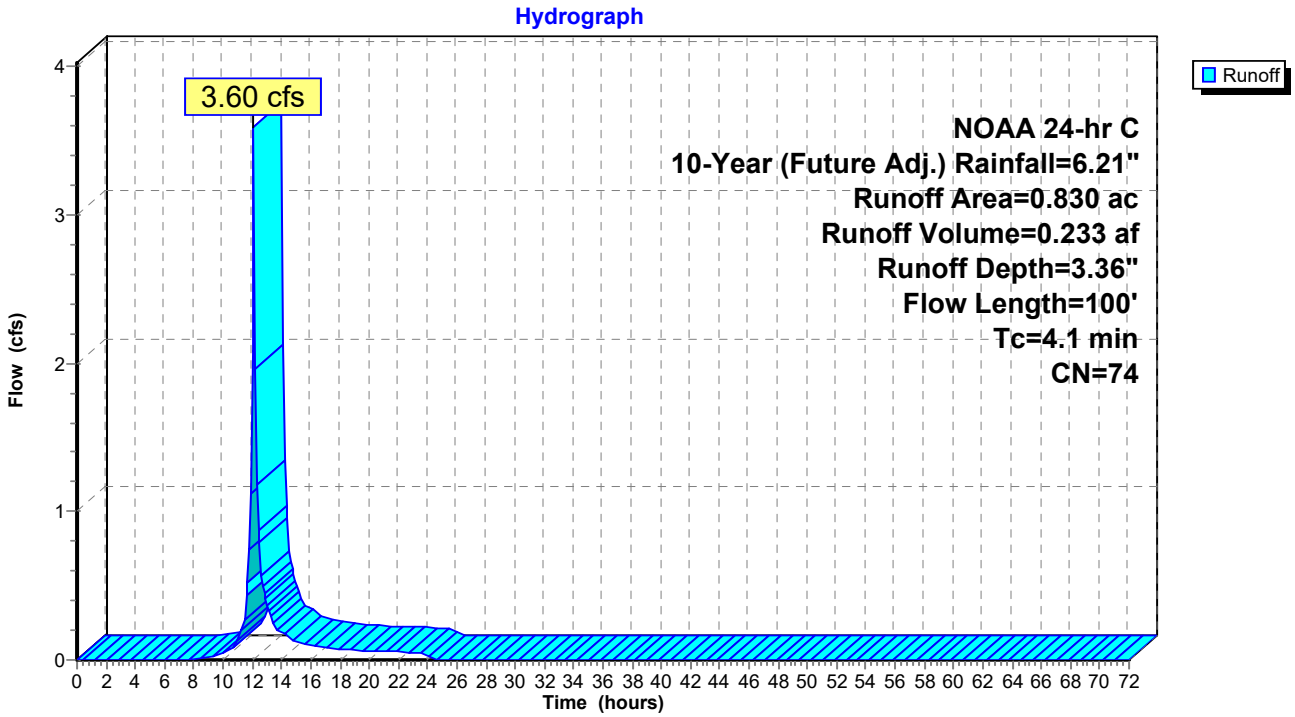
Runoff = 3.60 cfs @ 12.10 hrs, Volume= 0.233 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

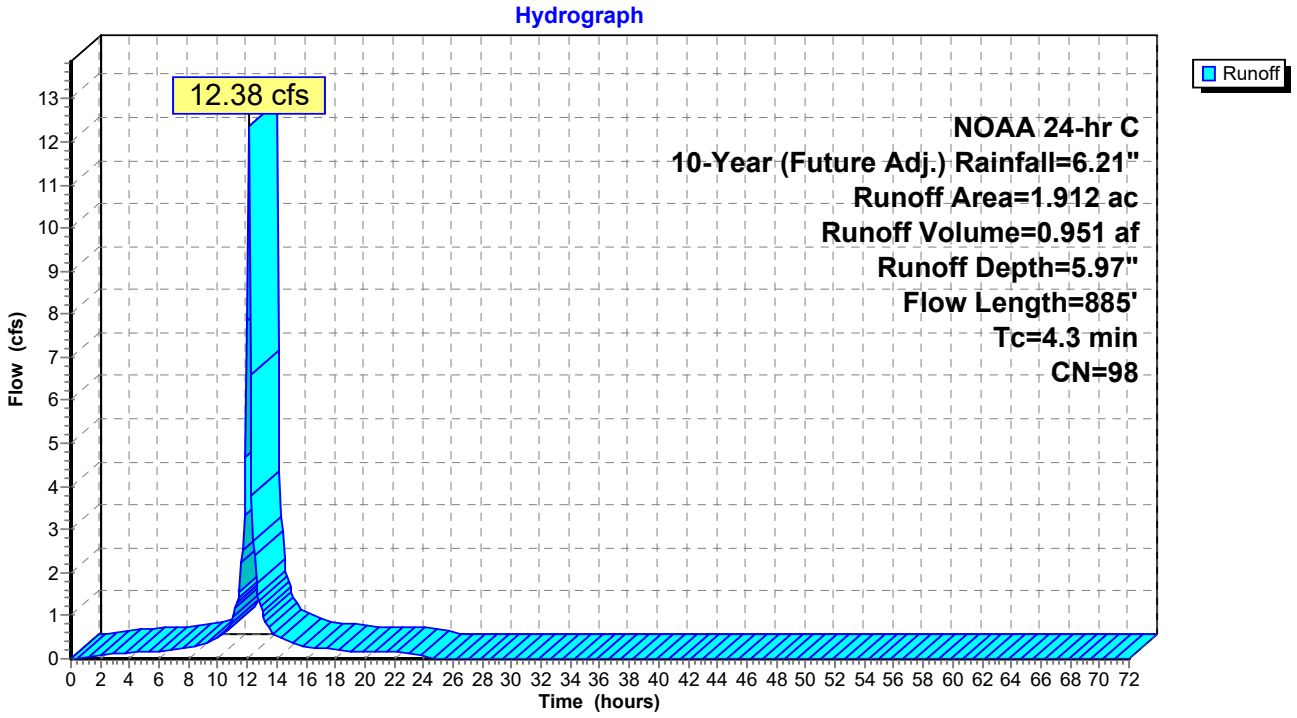
Runoff = 12.38 cfs @ 12.09 hrs, Volume= 0.951 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

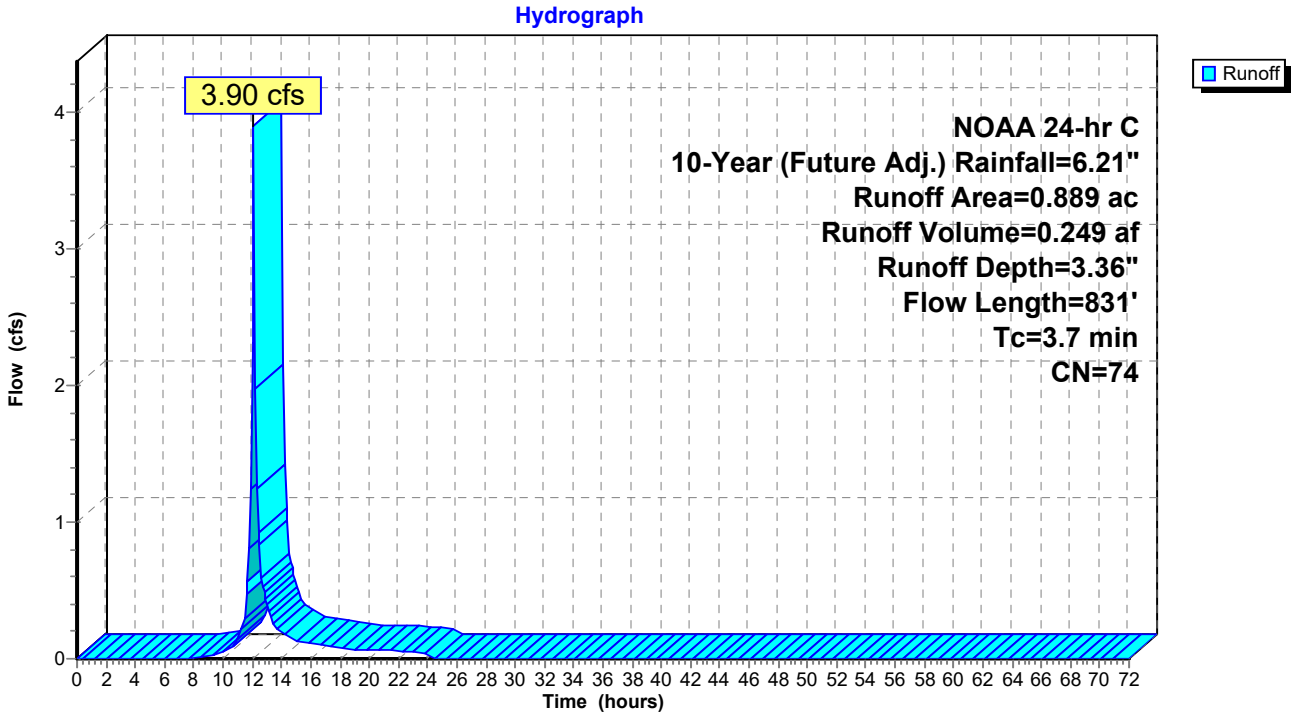
Runoff = 3.90 cfs @ 12.10 hrs, Volume= 0.249 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

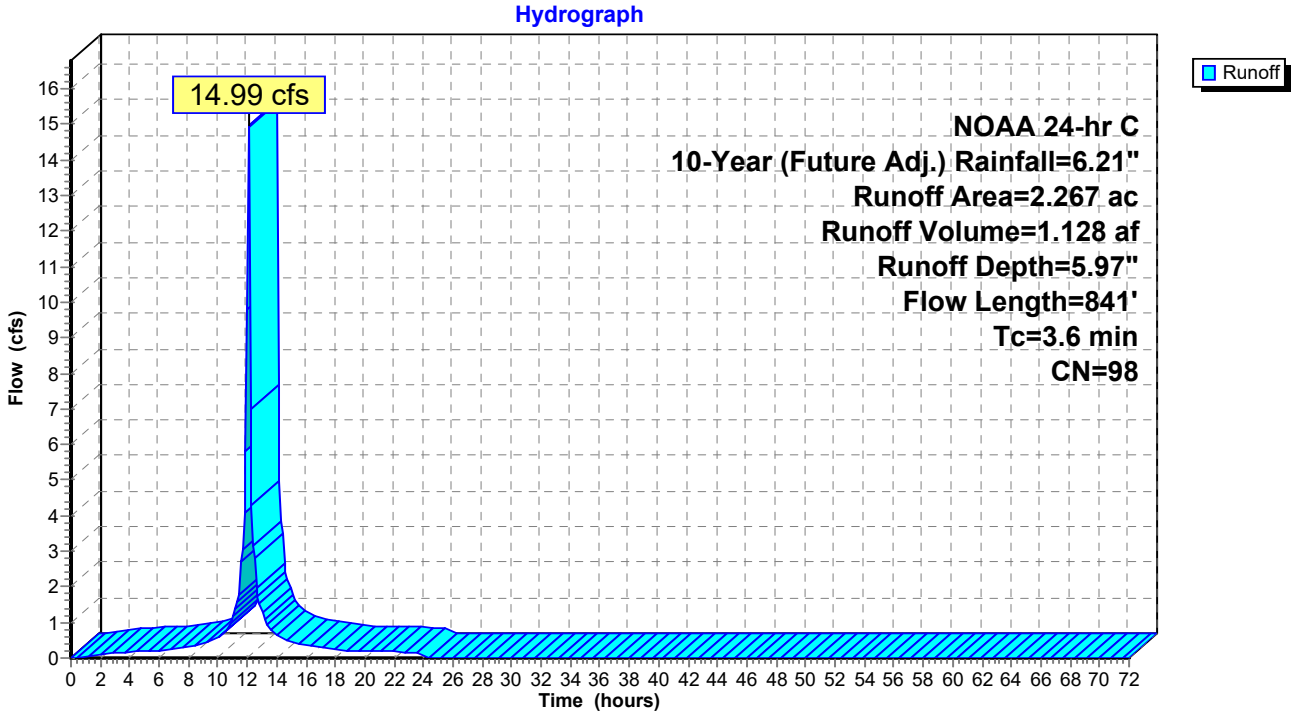
Runoff = 14.99 cfs @ 12.09 hrs, Volume= 1.128 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

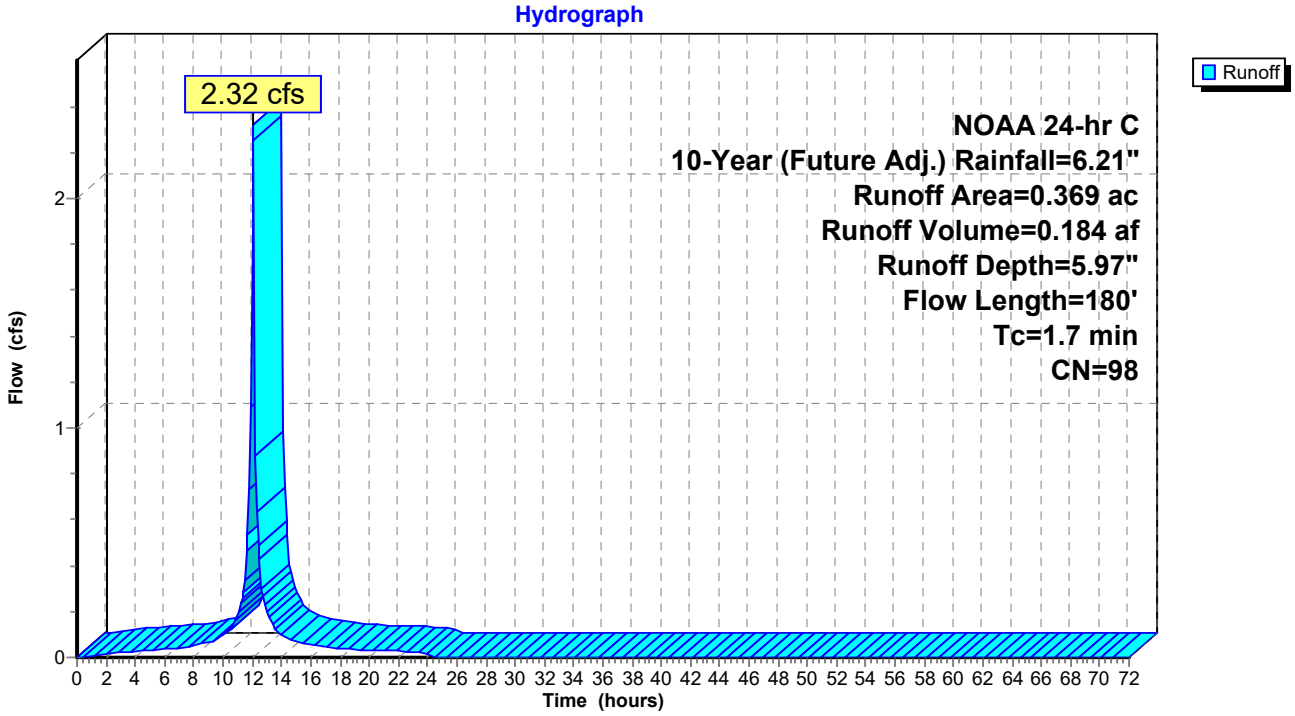
Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.184 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

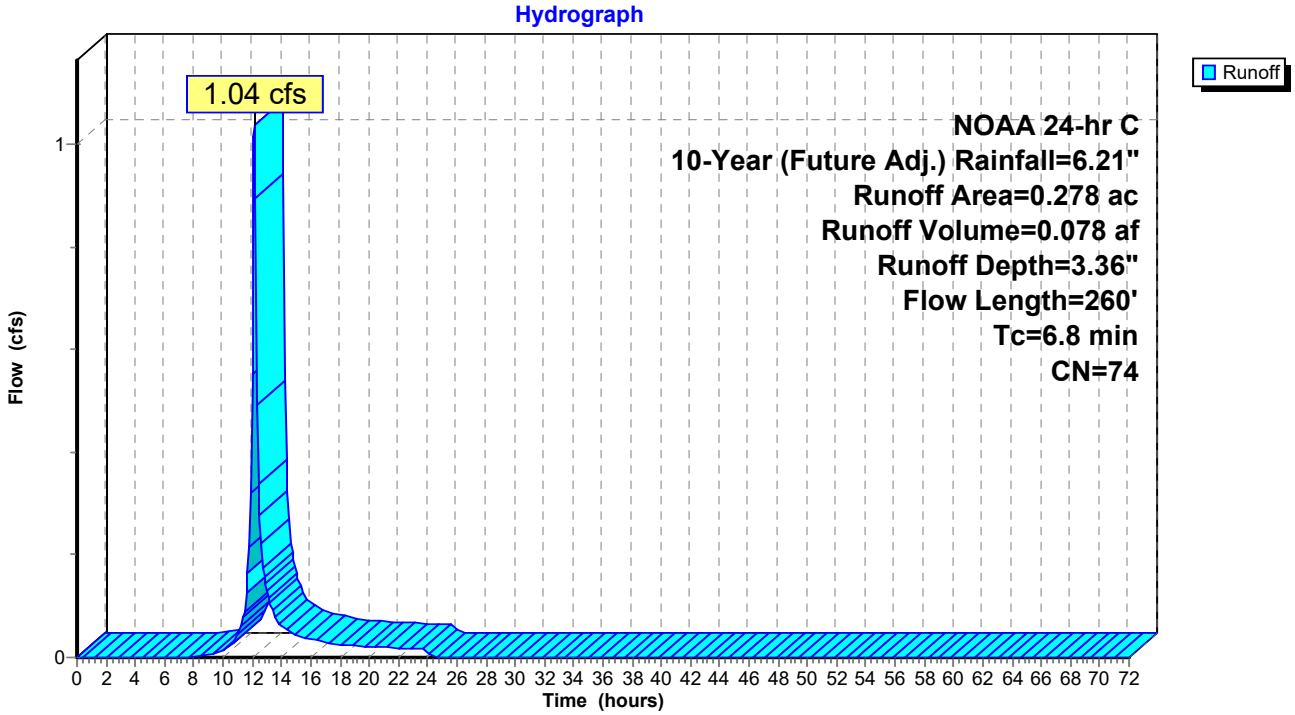
Runoff = 1.04 cfs @ 12.13 hrs, Volume= 0.078 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

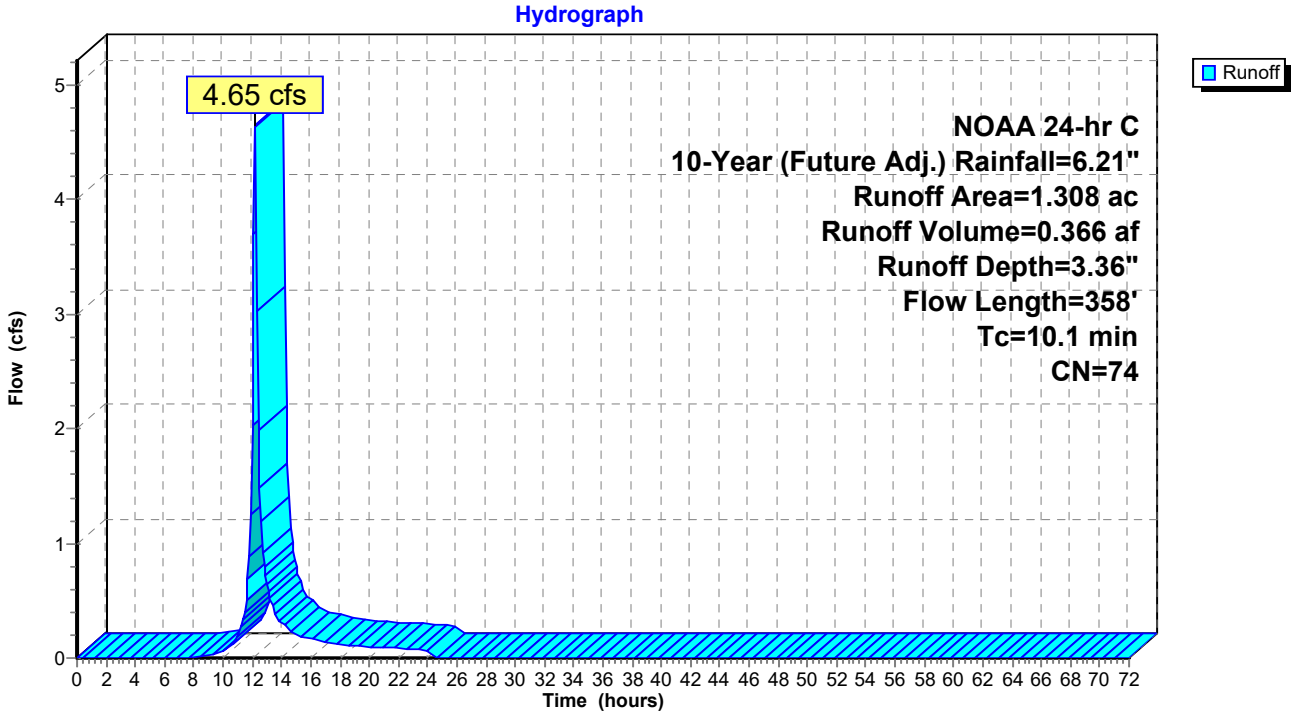
Runoff = 4.65 cfs @ 12.19 hrs, Volume= 0.366 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

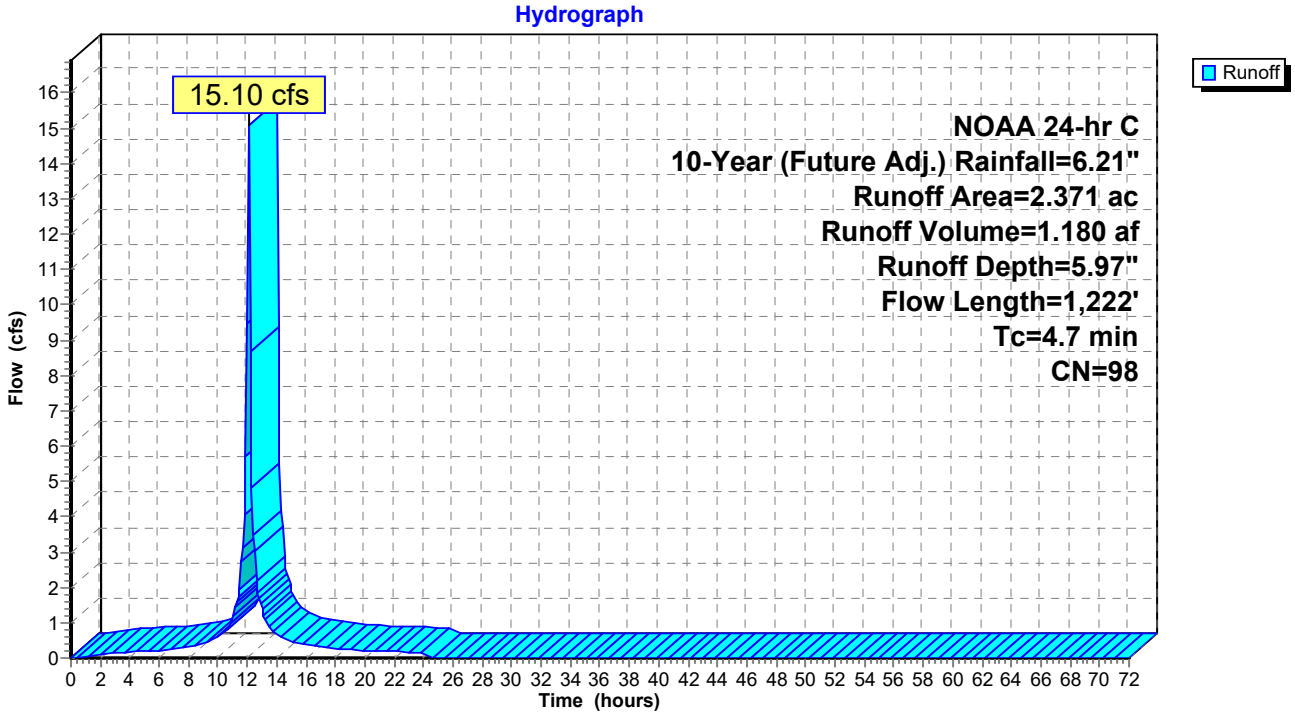
Runoff = 15.10 cfs @ 12.10 hrs, Volume= 1.180 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

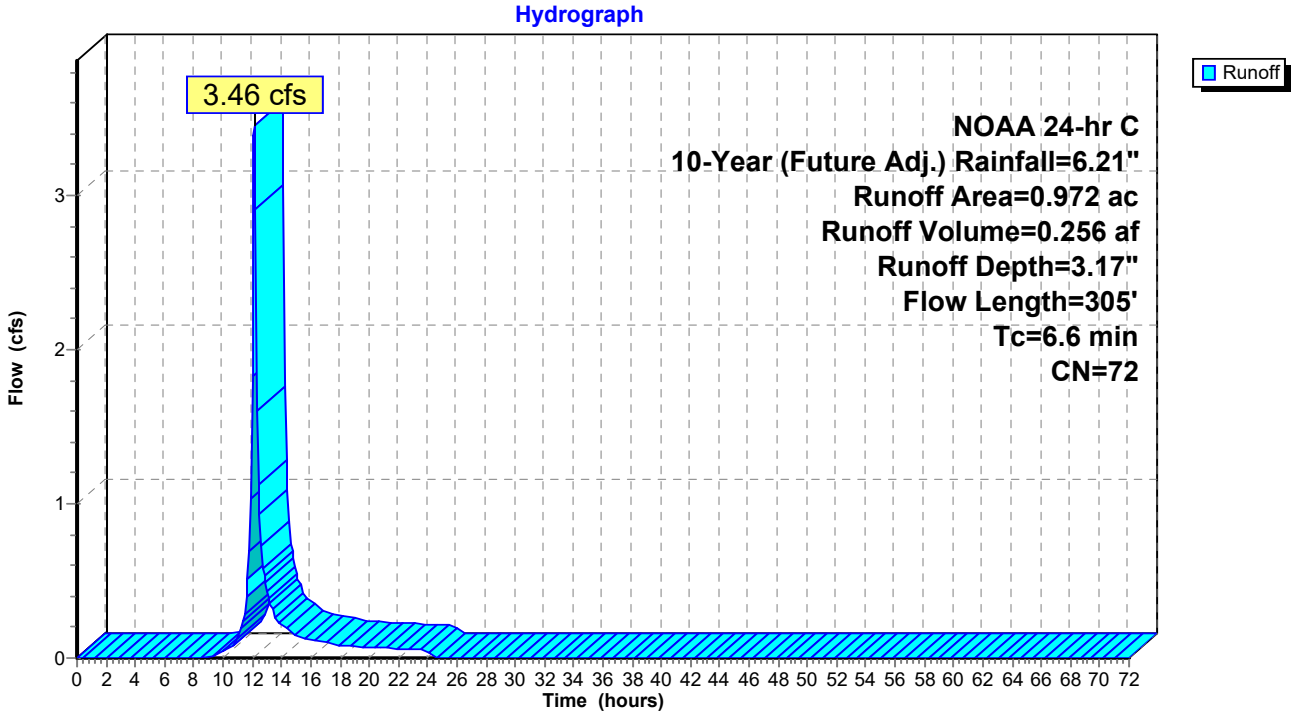
Runoff = 3.46 cfs @ 12.13 hrs, Volume= 0.256 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

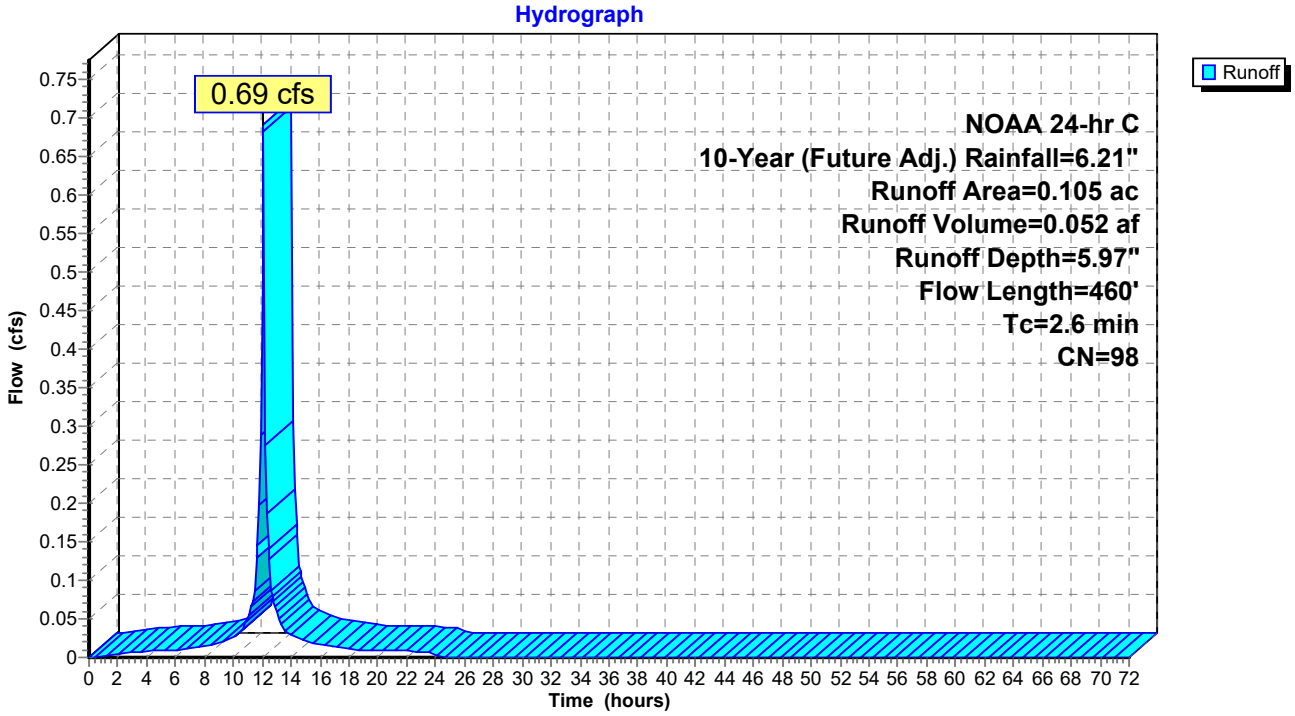
Runoff = 0.69 cfs @ 12.08 hrs, Volume= 0.052 af, Depth= 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

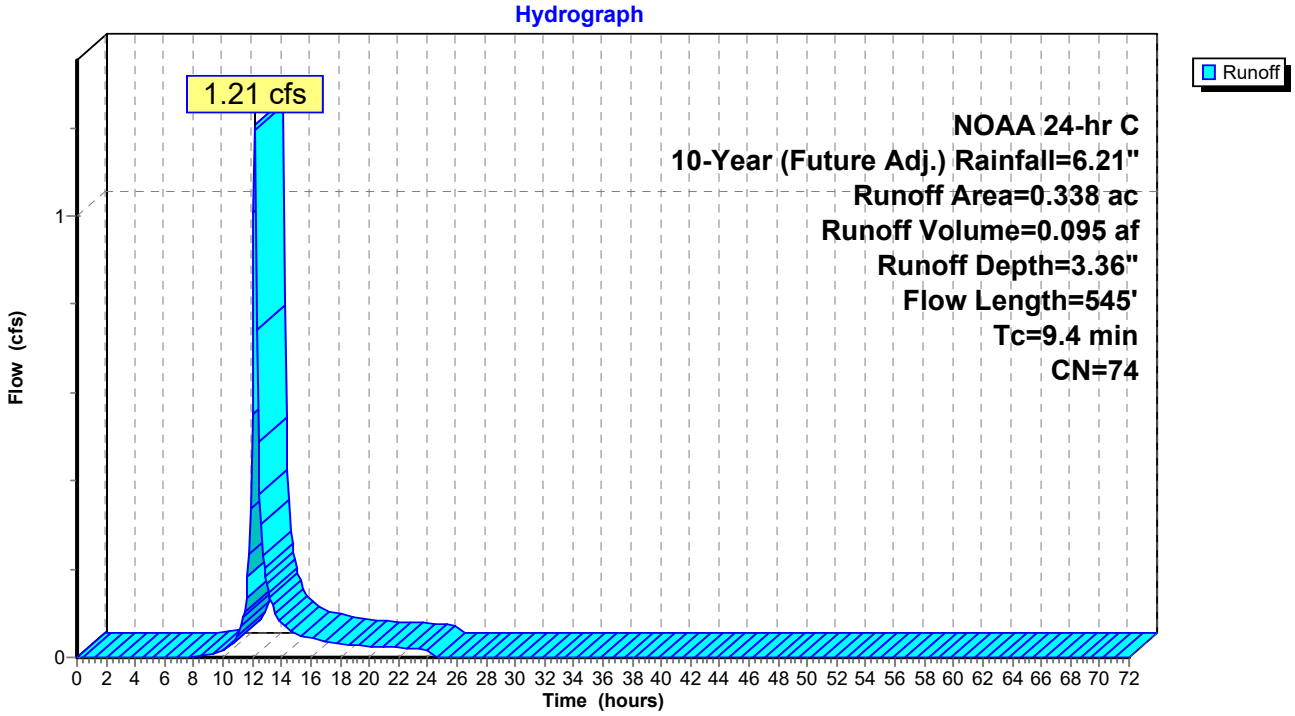
Runoff = 1.21 cfs @ 12.18 hrs, Volume= 0.095 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

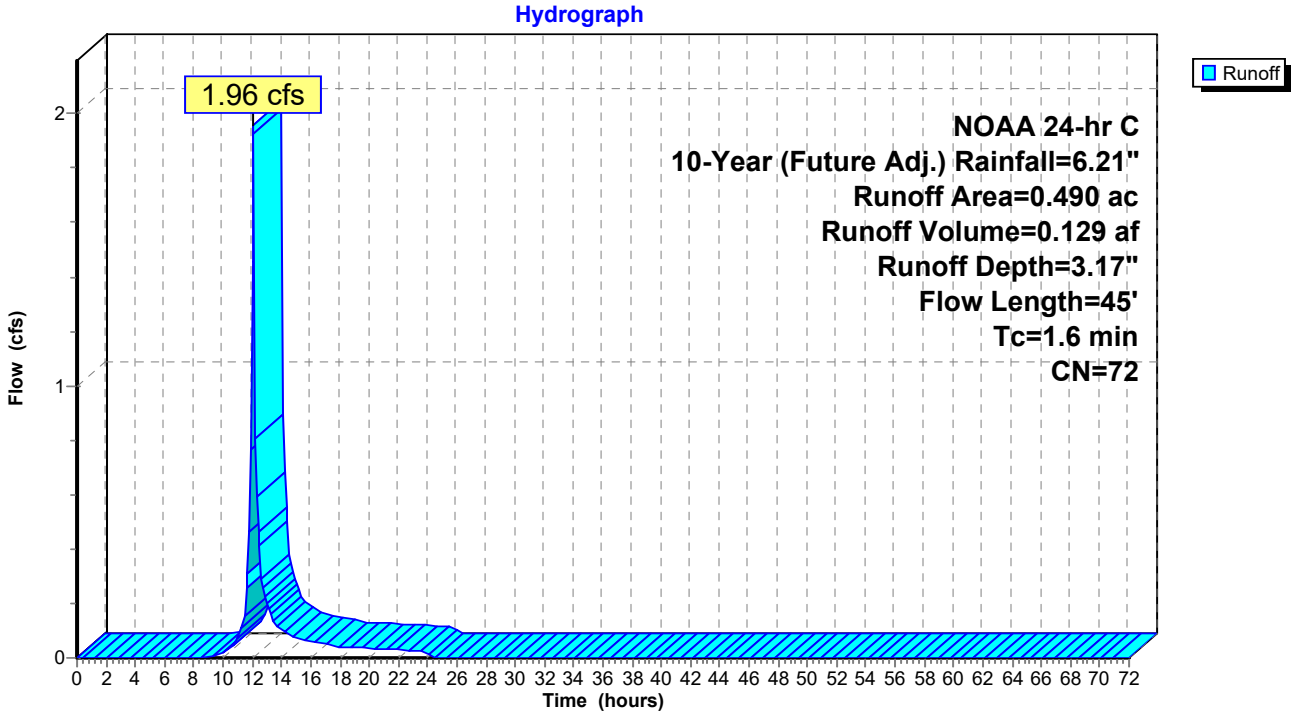
Runoff = 1.96 cfs @ 12.08 hrs, Volume= 0.129 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 10-Year (Future Adj.) Rainfall=6.21"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 3.36" for 10-Year (Future Adj.) event
Inflow = 0.50 cfs @ 12.34 hrs, Volume= 0.054 af
Outflow = 0.50 cfs @ 12.35 hrs, Volume= 0.049 af, Atten= 1%, Lag= 0.5 min
Primary = 0.50 cfs @ 12.35 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.09' @ 12.35 hrs Surf.Area= 1,793 sf Storage= 261 cf

Plug-Flow detention time= 69.8 min calculated for 0.049 af (91% of inflow)
Center-of-Mass det. time= 23.3 min (869.7 - 846.4)

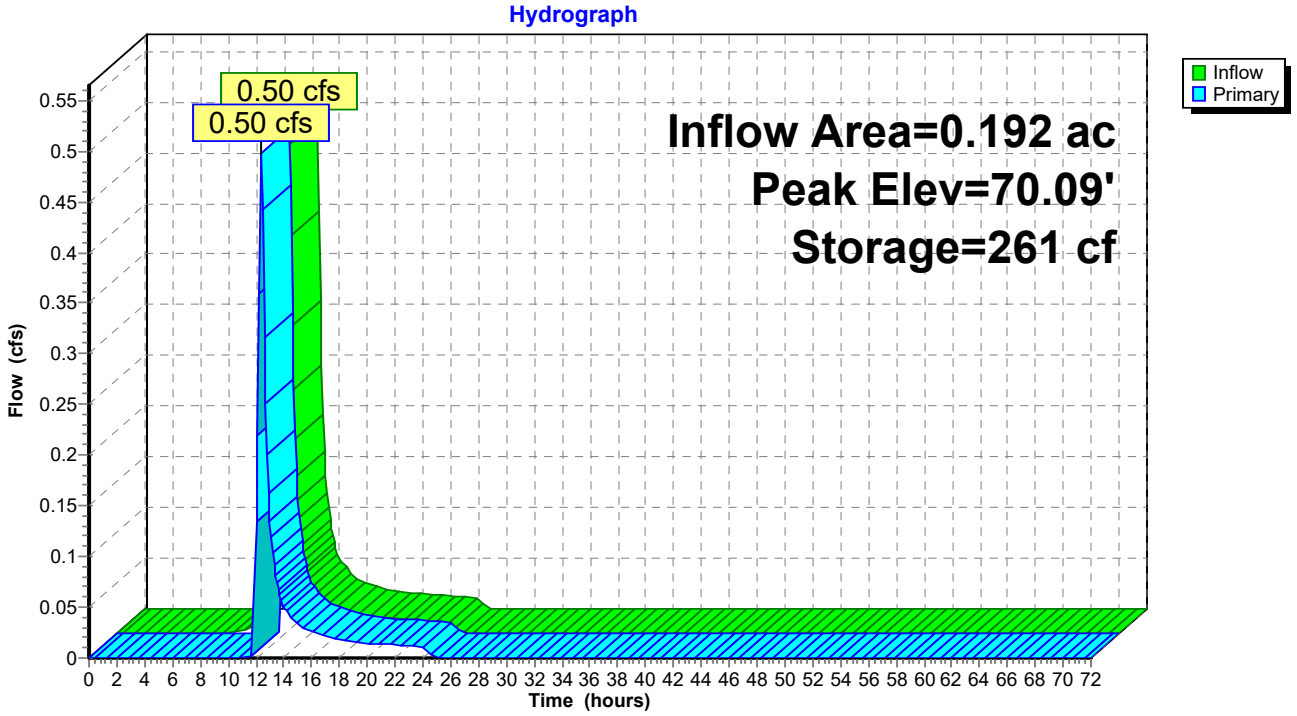
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.48 cfs @ 12.35 hrs HW=70.09' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 0.48 cfs @ 0.22 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 4.70" for 10-Year (Future Adj.) event
Inflow = 0.67 cfs @ 12.11 hrs, Volume= 0.052 af
Outflow = 0.66 cfs @ 12.11 hrs, Volume= 0.051 af, Atten= 1%, Lag= 0.1 min
Primary = 0.66 cfs @ 12.11 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.15' @ 12.11 hrs Surf.Area= 371 sf Storage= 82 cf

Plug-Flow detention time= 32.7 min calculated for 0.051 af (97% of inflow)
Center-of-Mass det. time= 17.7 min (792.3 - 774.7)

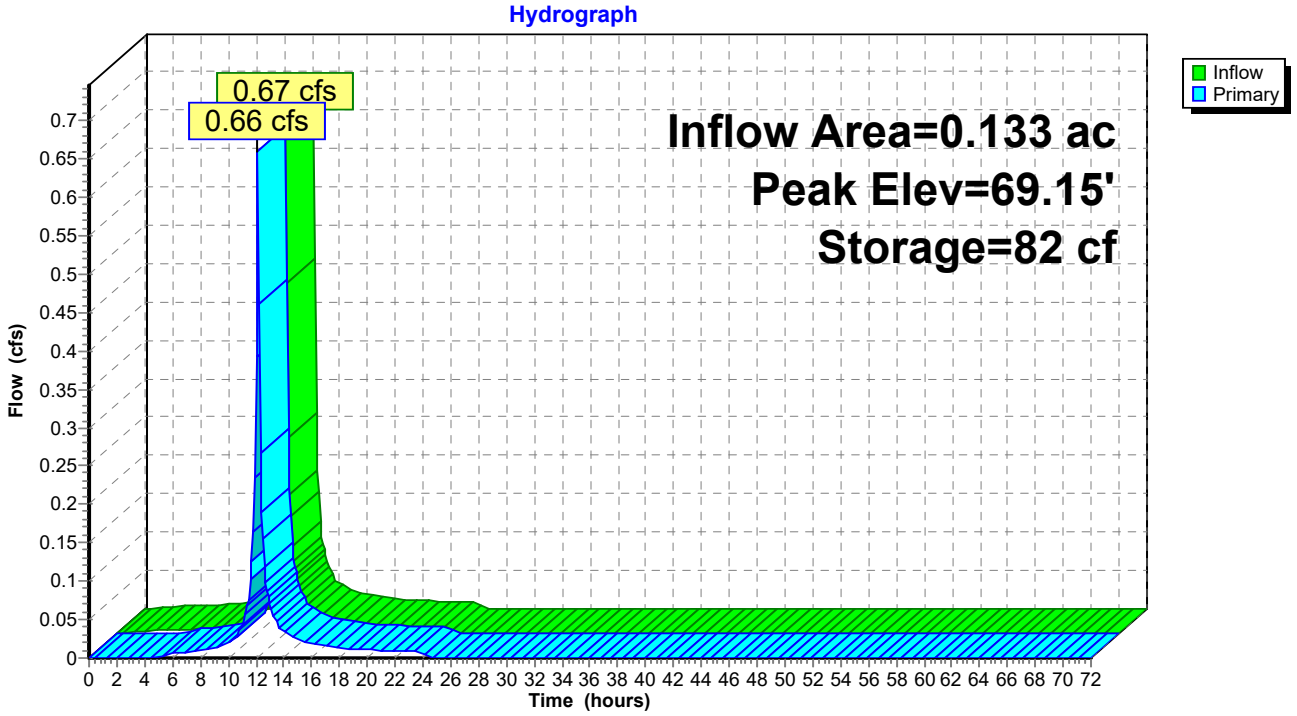
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.63 cfs @ 12.11 hrs HW=69.15' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.63 cfs @ 0.33 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 4.83" for 10-Year (Future Adj.) event
Inflow = 9.50 cfs @ 12.11 hrs, Volume= 0.766 af
Outflow = 6.95 cfs @ 12.22 hrs, Volume= 0.665 af, Atten= 27%, Lag= 6.4 min
Primary = 6.95 cfs @ 12.22 hrs, Volume= 0.665 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.32' @ 12.22 hrs Surf.Area= 7,697 sf Storage= 9,290 cf

Plug-Flow detention time= 135.7 min calculated for 0.665 af (87% of inflow)
Center-of-Mass det. time= 70.9 min (842.5 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

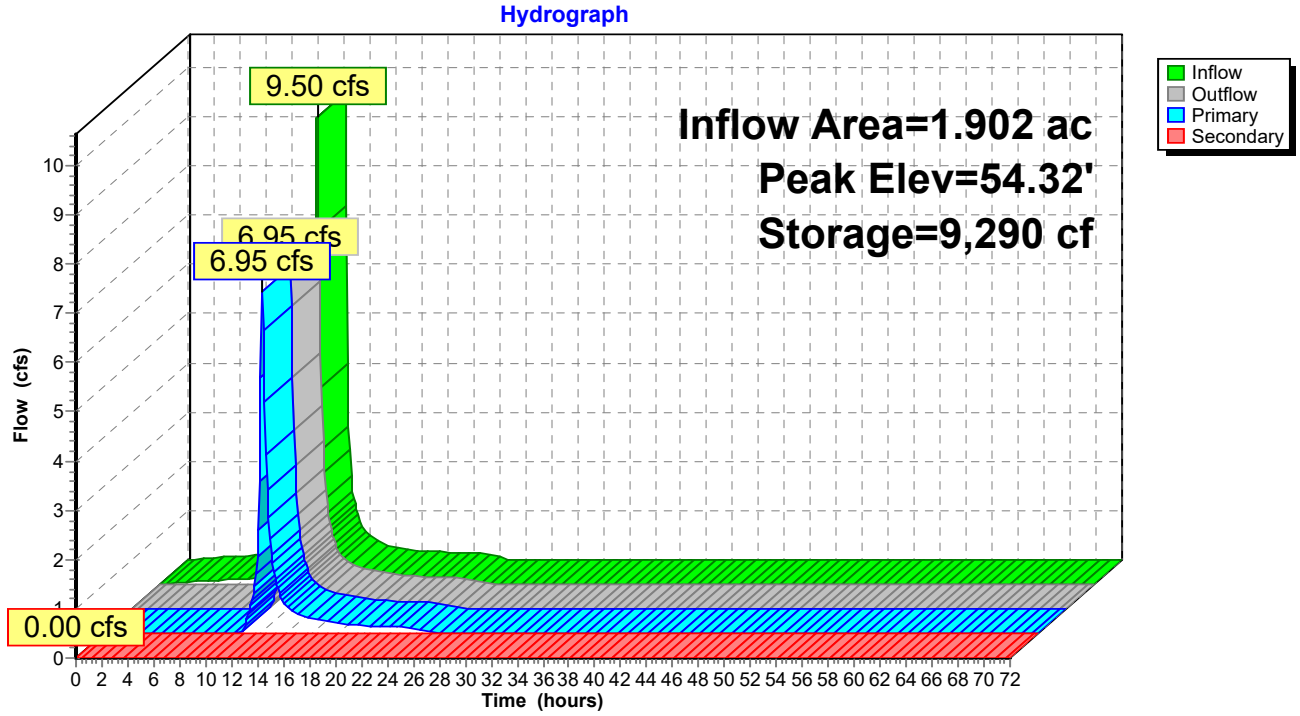
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.75 cfs @ 12.22 hrs HW=54.31' (Free Discharge)
└**1=Culvert** (Passes 6.75 cfs of 31.00 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 6.75 cfs @ 2.56 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 5.14" for 10-Year (Future Adj.) event
Inflow = 16.29 cfs @ 12.09 hrs, Volume= 1.201 af
Outflow = 6.31 cfs @ 12.28 hrs, Volume= 1.021 af, Atten= 61%, Lag= 10.9 min
Primary = 6.31 cfs @ 12.28 hrs, Volume= 1.021 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.59' @ 12.28 hrs Surf.Area= 16,754 sf Storage= 24,142 cf

Plug-Flow detention time= 237.5 min calculated for 1.021 af (85% of inflow)
Center-of-Mass det. time= 168.6 min (929.9 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

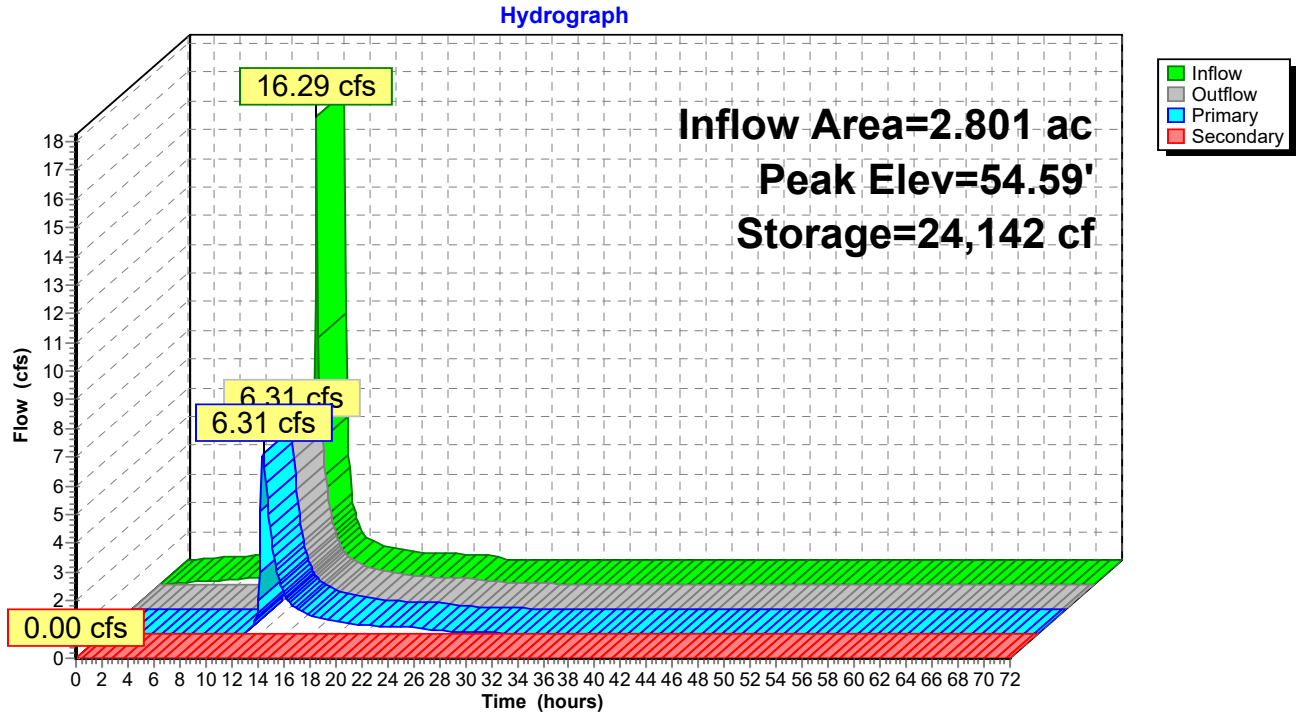
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.25 cfs @ 12.28 hrs HW=54.59' (Free Discharge)
└─**1=Culvert** (Passes 6.25 cfs of 32.39 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 3.38 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 2.75 cfs @ 2.35 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 4.99" for 10-Year (Future Adj.) event
Inflow = 21.89 cfs @ 12.10 hrs, Volume= 1.756 af
Outflow = 4.92 cfs @ 12.50 hrs, Volume= 1.517 af, Atten= 78%, Lag= 24.2 min
Primary = 4.92 cfs @ 12.50 hrs, Volume= 1.517 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 62.96' @ 12.50 hrs Surf.Area= 15,840 sf Storage= 39,372 cf

Plug-Flow detention time= 263.6 min calculated for 1.515 af (86% of inflow)
Center-of-Mass det. time= 202.1 min (968.0 - 765.9)

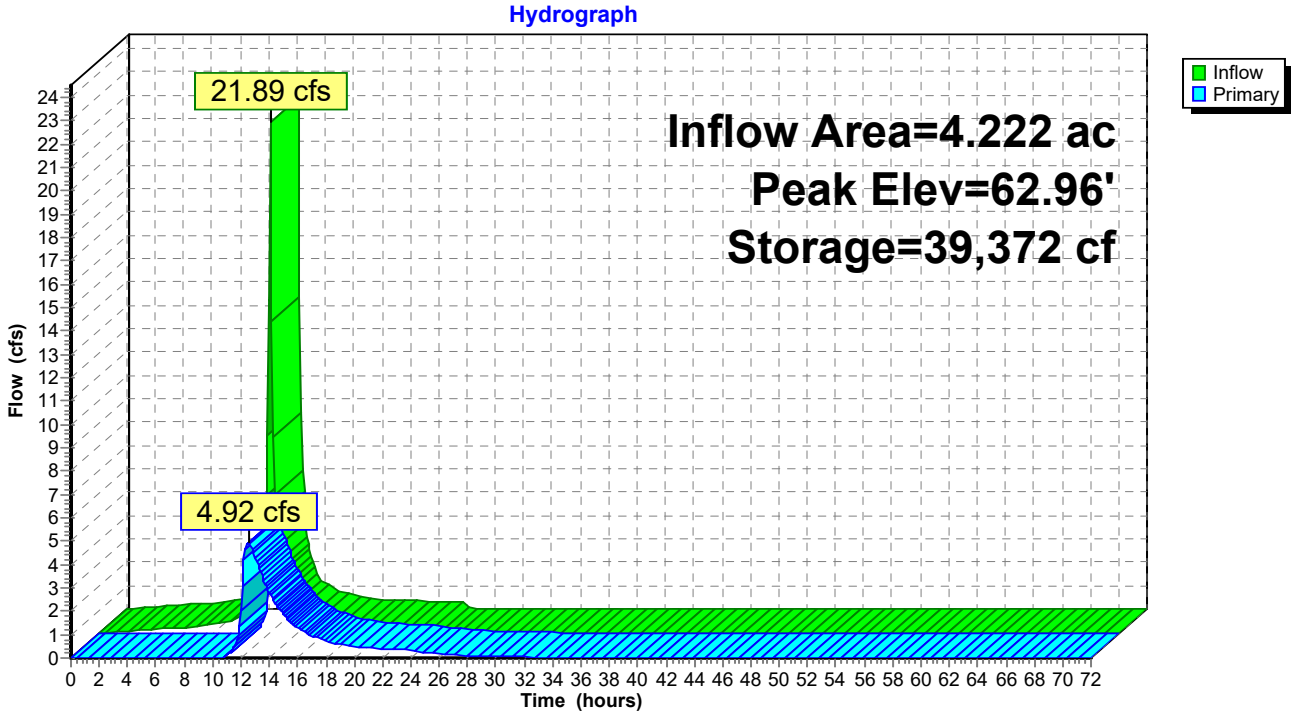
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=4.92 cfs @ 12.50 hrs HW=62.96' (Free Discharge)
- **1=Culvert** (Passes 4.92 cfs of 42.15 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 4.92 cfs @ 4.77 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

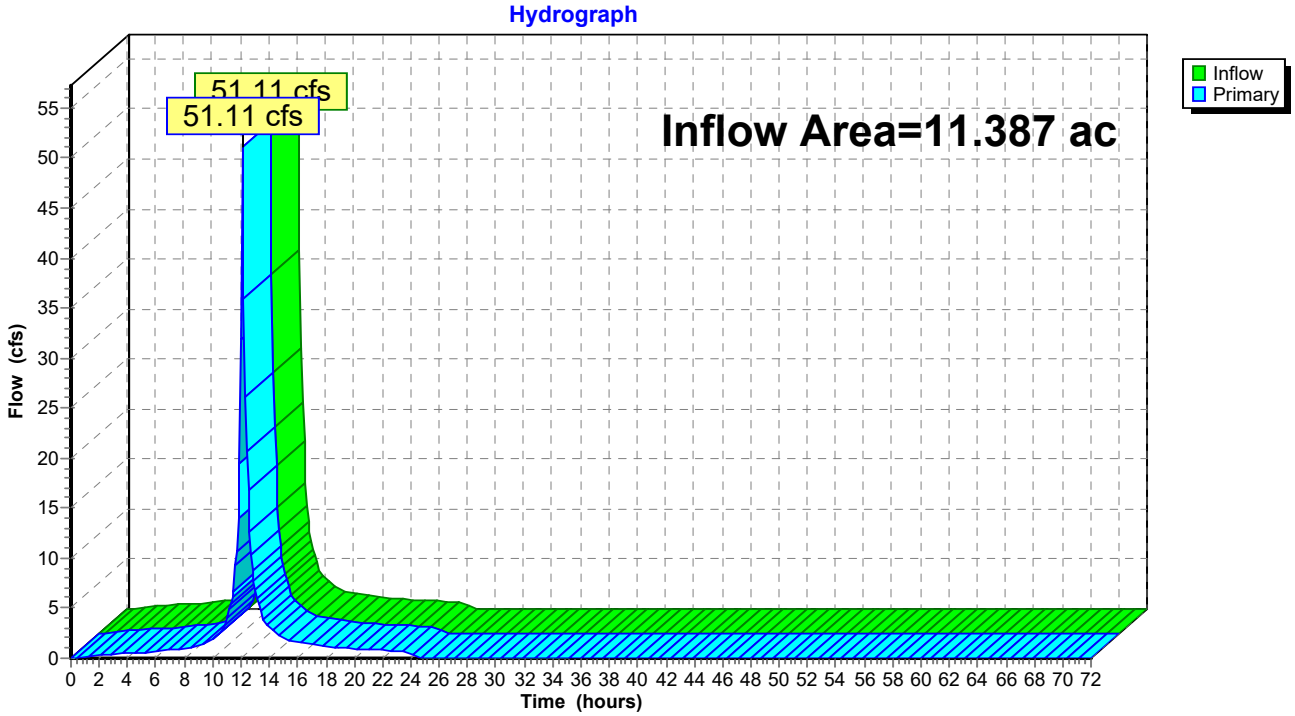


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 4.96" for 10-Year (Future Adj.) event
Inflow = 51.11 cfs @ 12.11 hrs, Volume= 4.705 af
Primary = 51.11 cfs @ 12.11 hrs, Volume= 4.705 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

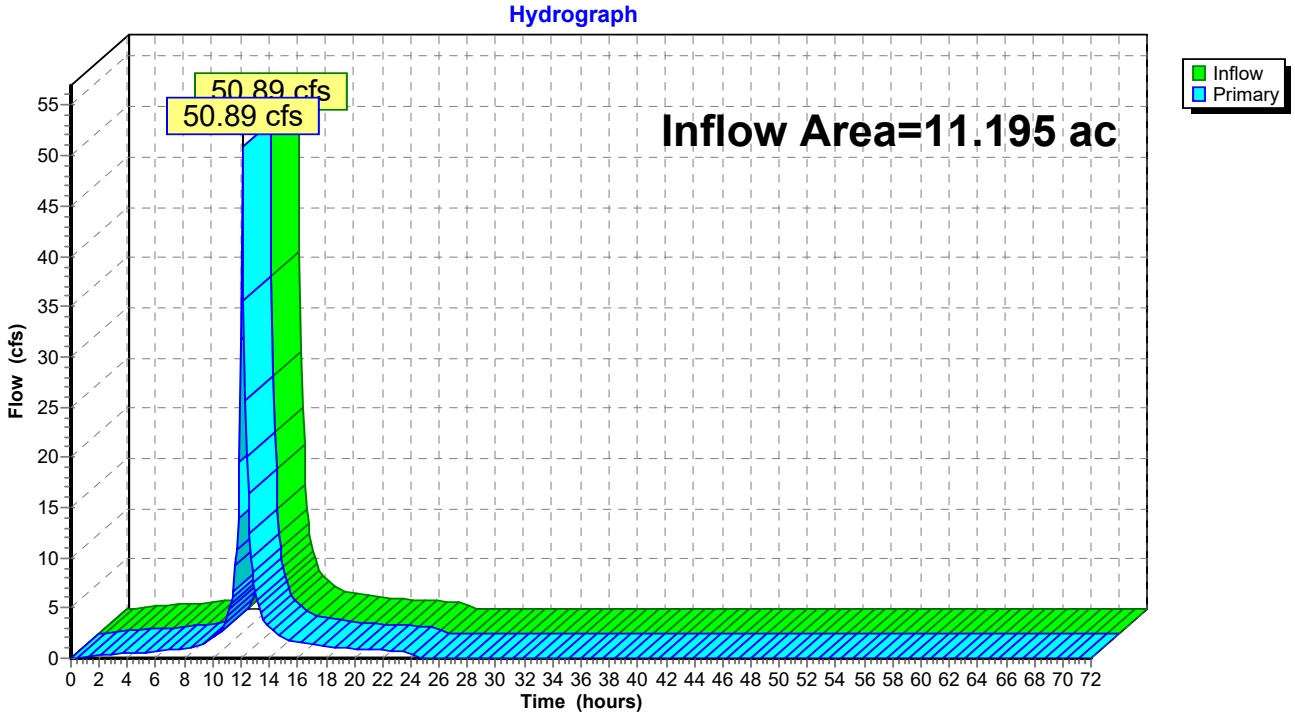


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 4.99" for 10-Year (Future Adj.) event
Inflow = 50.89 cfs @ 12.11 hrs, Volume= 4.657 af
Primary = 50.89 cfs @ 12.11 hrs, Volume= 4.657 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

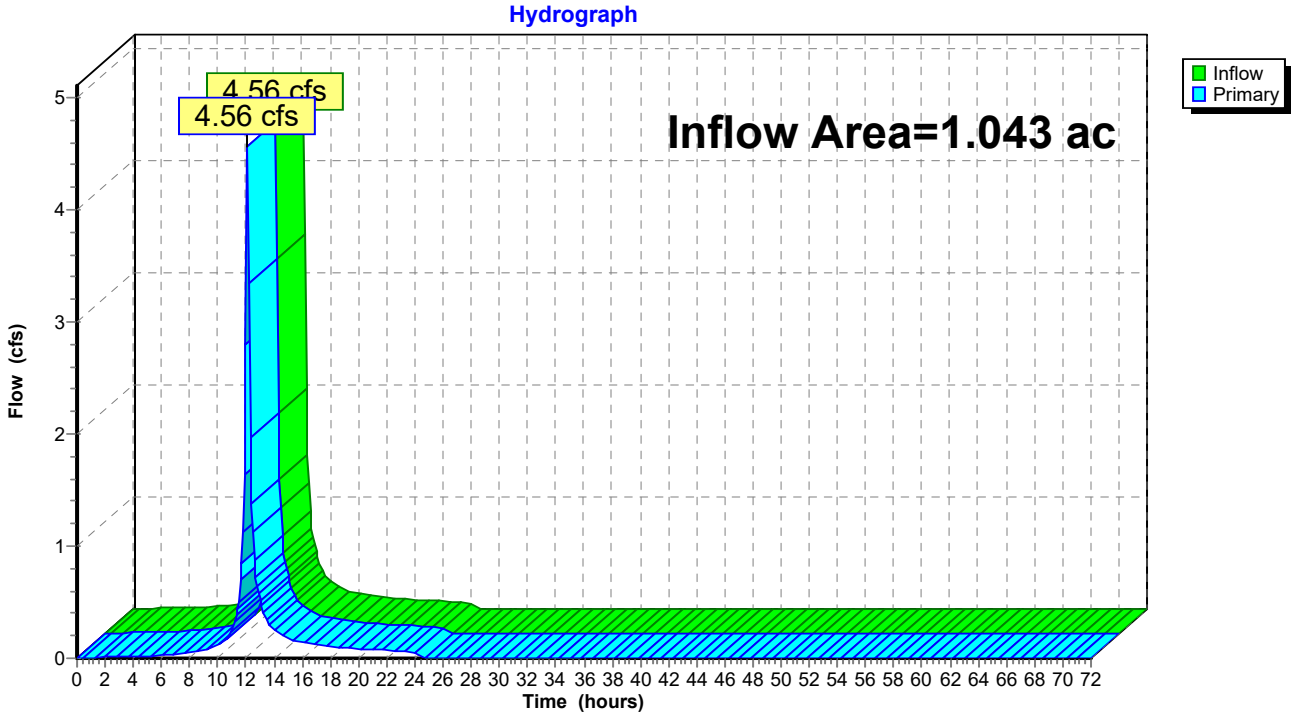


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 4.14" for 10-Year (Future Adj.) event
Inflow = 4.56 cfs @ 12.11 hrs, Volume= 0.360 af
Primary = 4.56 cfs @ 12.11 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

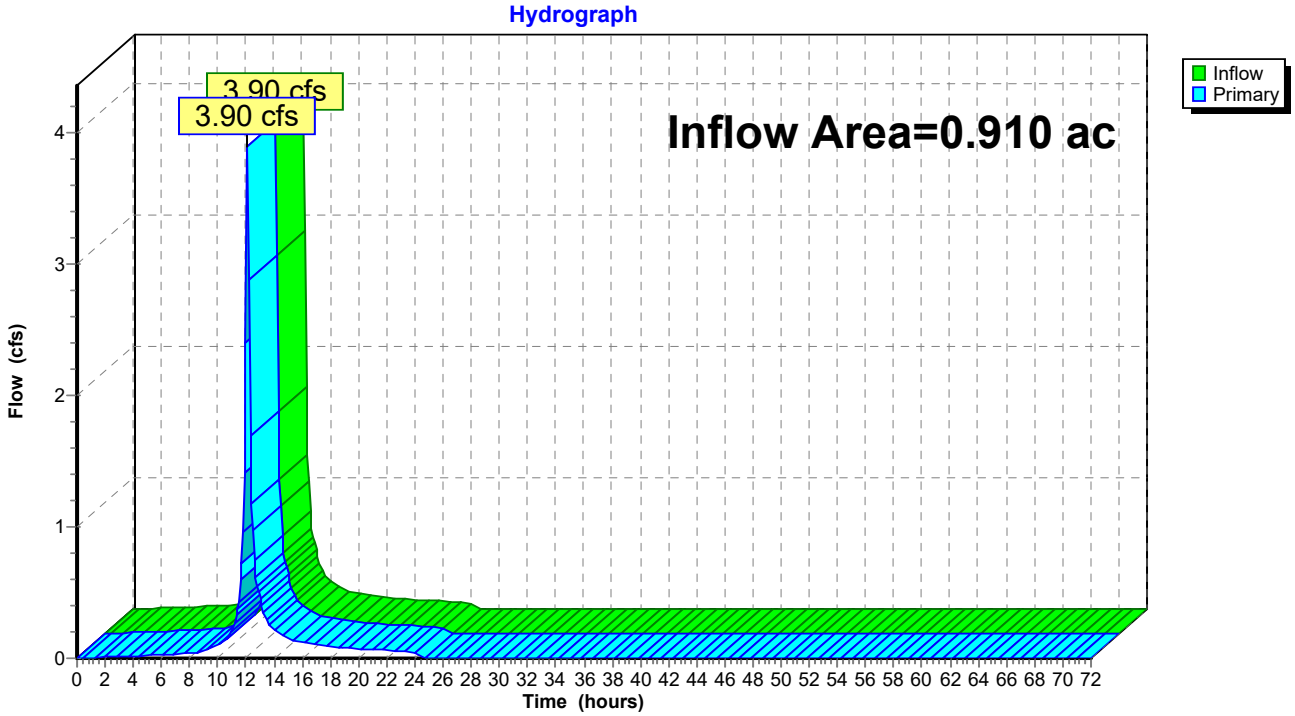


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 4.08" for 10-Year (Future Adj.) event
Inflow = 3.90 cfs @ 12.11 hrs, Volume= 0.309 af
Primary = 3.90 cfs @ 12.11 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

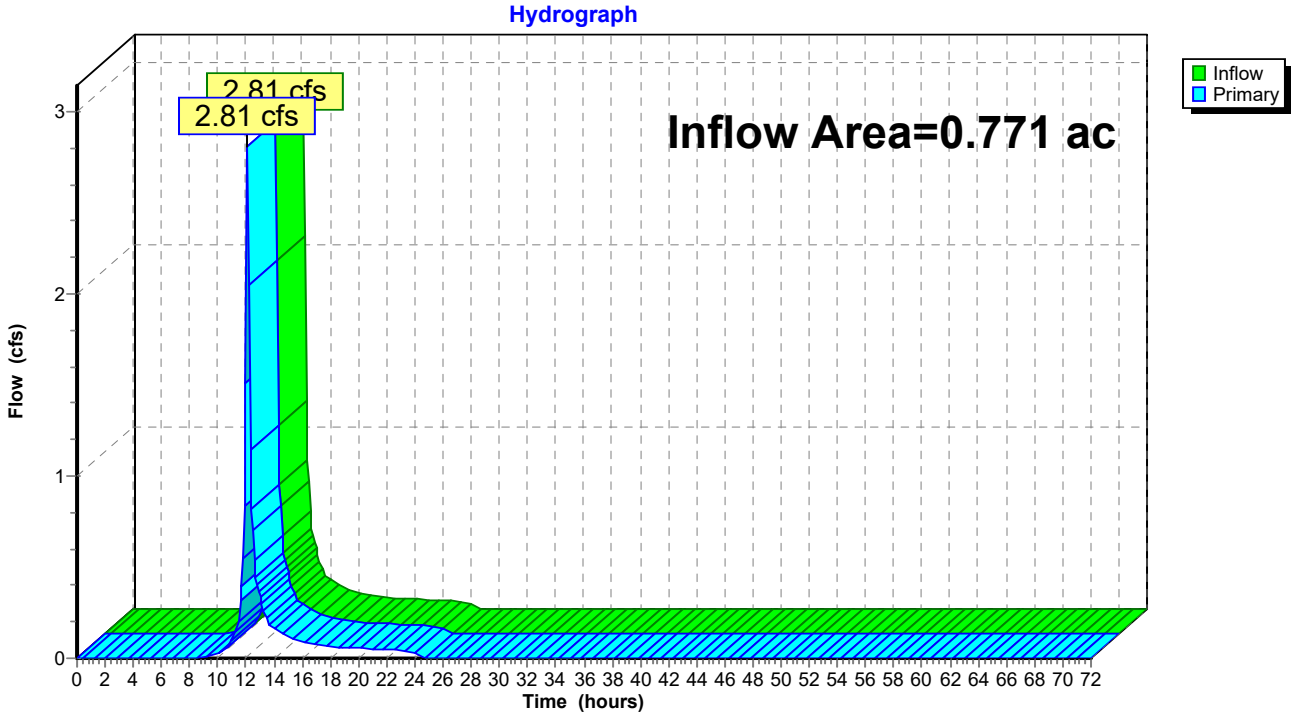


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 3.07" for 10-Year (Future Adj.) event
Inflow = 2.81 cfs @ 12.11 hrs, Volume= 0.197 af
Primary = 2.81 cfs @ 12.11 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

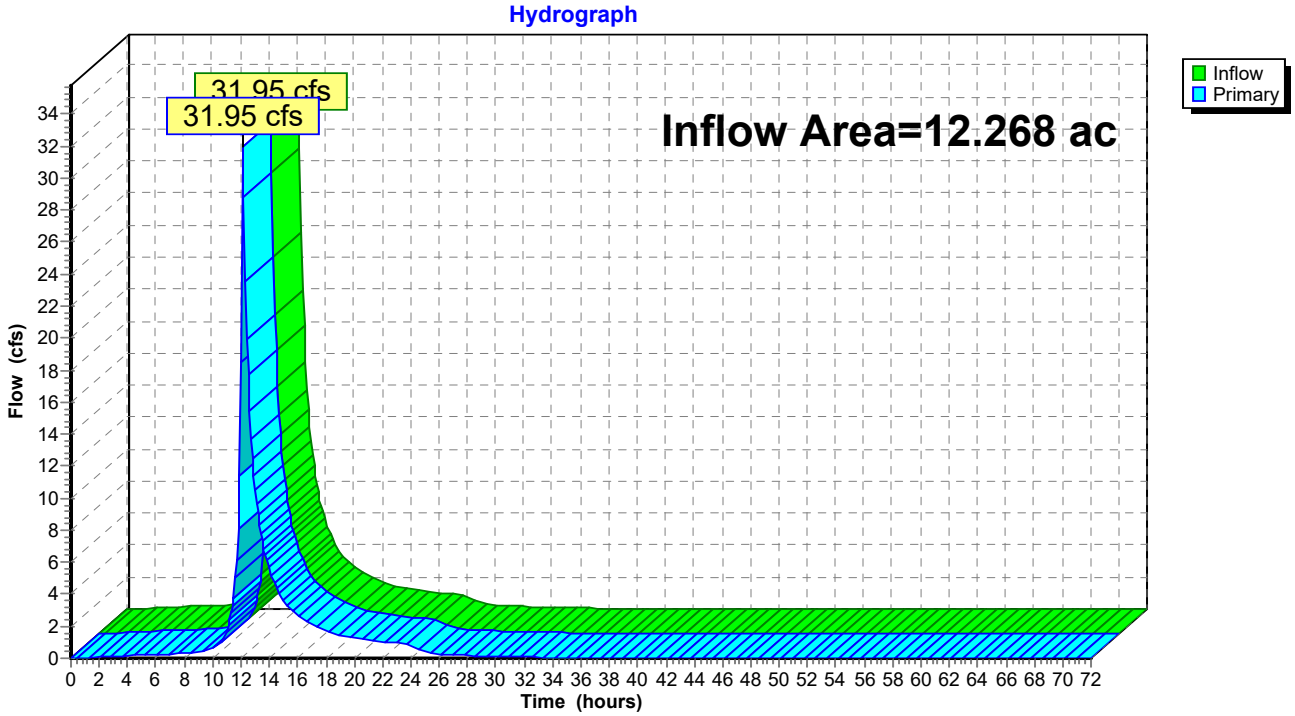


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 4.54" for 10-Year (Future Adj.) event
Inflow = 31.95 cfs @ 12.13 hrs, Volume= 4.640 af
Primary = 31.95 cfs @ 12.13 hrs, Volume= 4.640 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

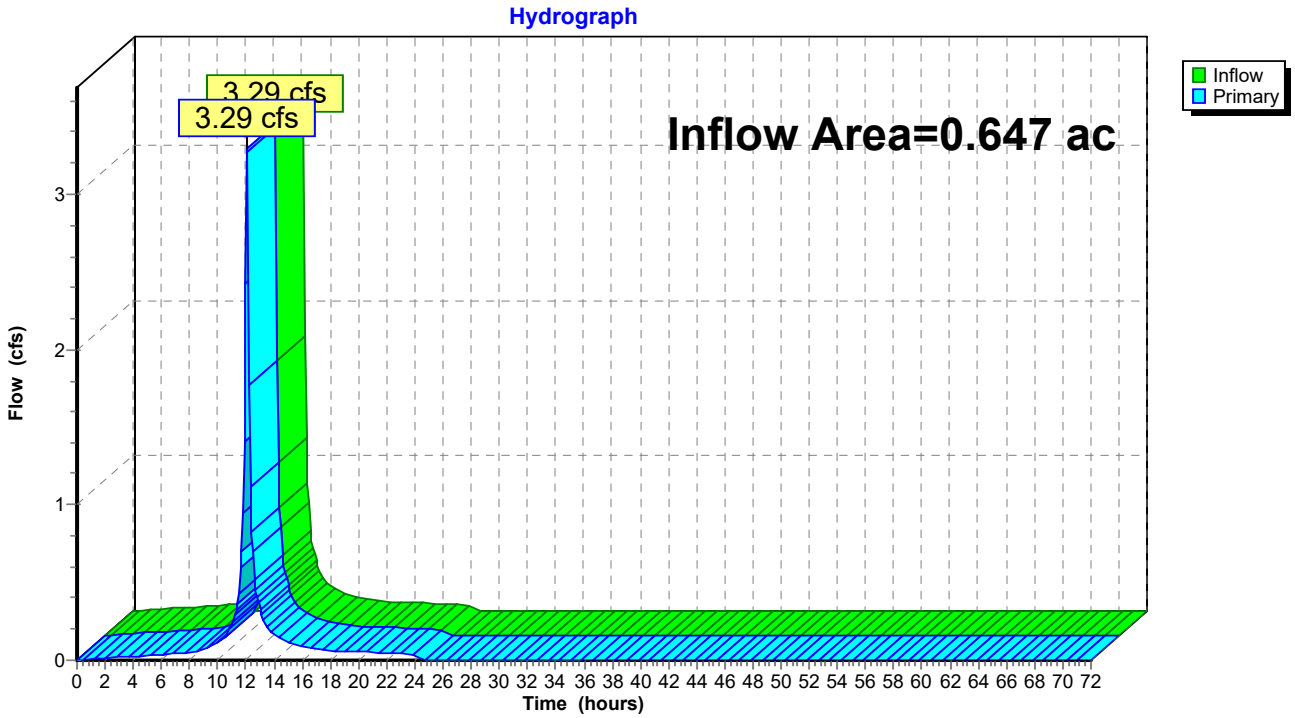


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 4.85" for 10-Year (Future Adj.) event
Inflow = 3.29 cfs @ 12.09 hrs, Volume= 0.262 af
Primary = 3.29 cfs @ 12.09 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

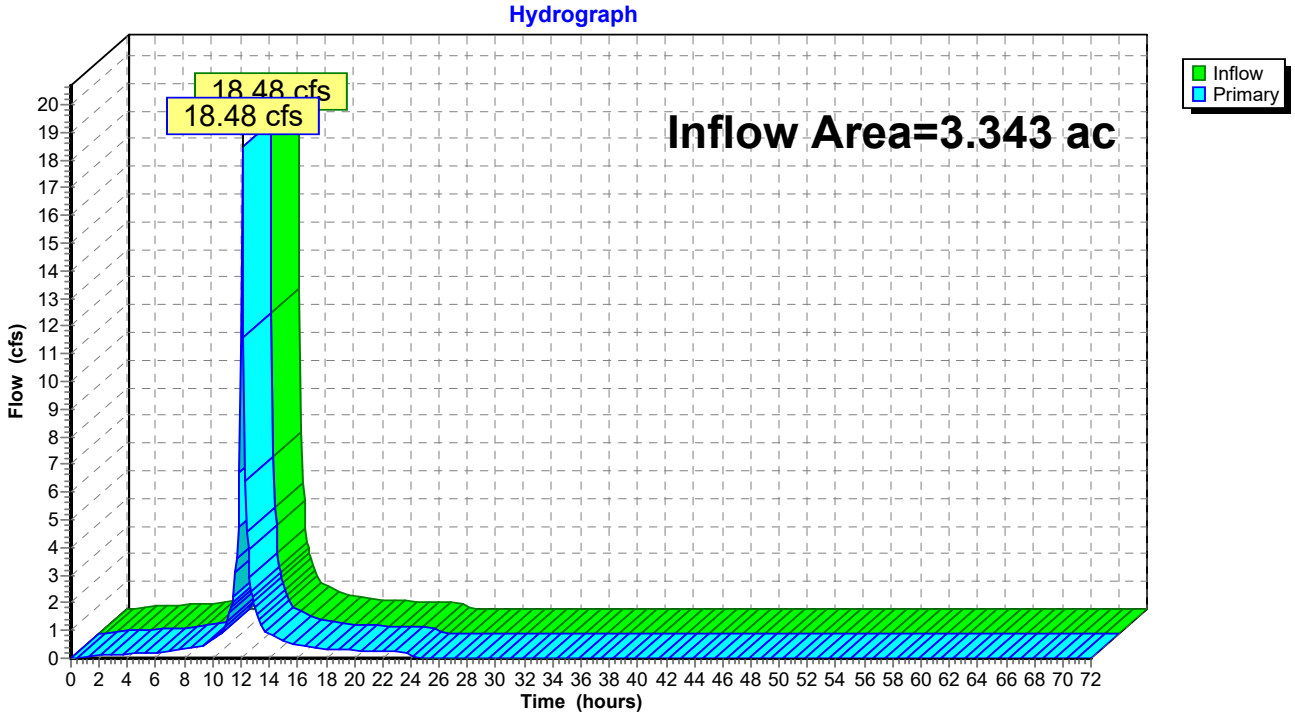


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 5.16" for 10-Year (Future Adj.) event
Inflow = 18.48 cfs @ 12.10 hrs, Volume= 1.436 af
Primary = 18.48 cfs @ 12.10 hrs, Volume= 1.436 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

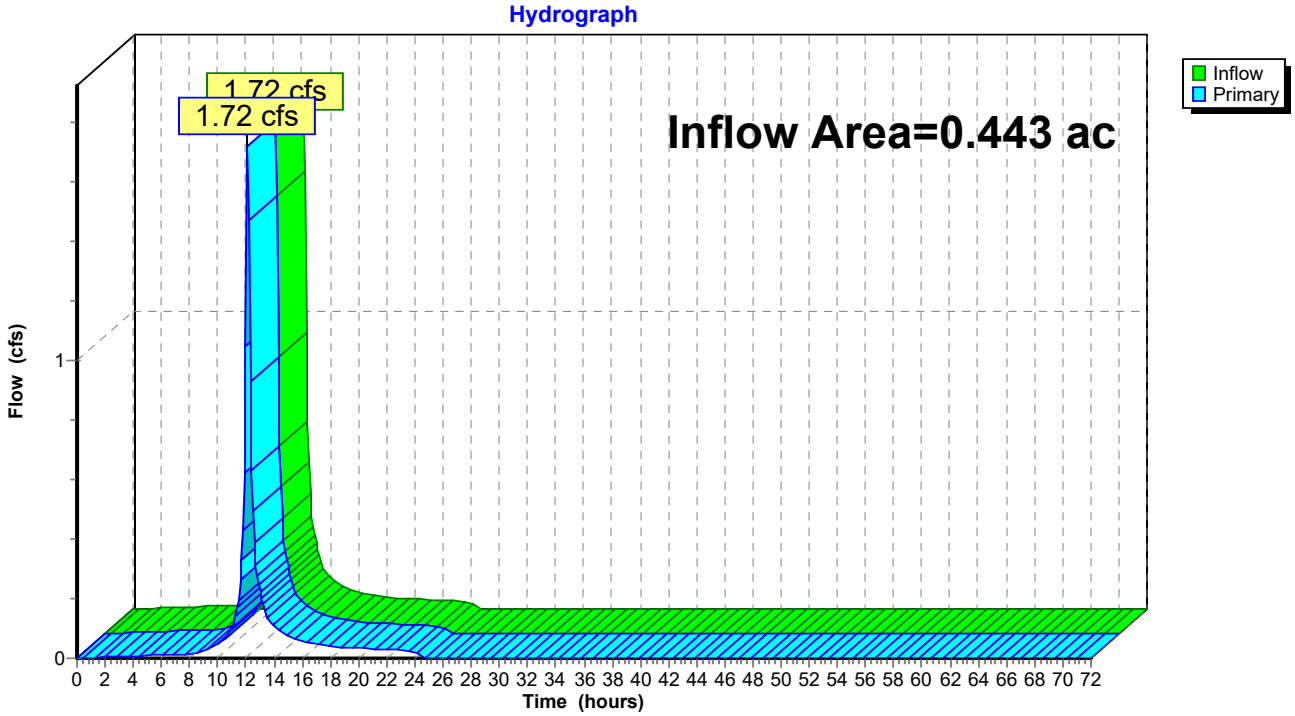


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 3.98" for 10-Year (Future Adj.) event
Inflow = 1.72 cfs @ 12.12 hrs, Volume= 0.147 af
Primary = 1.72 cfs @ 12.12 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

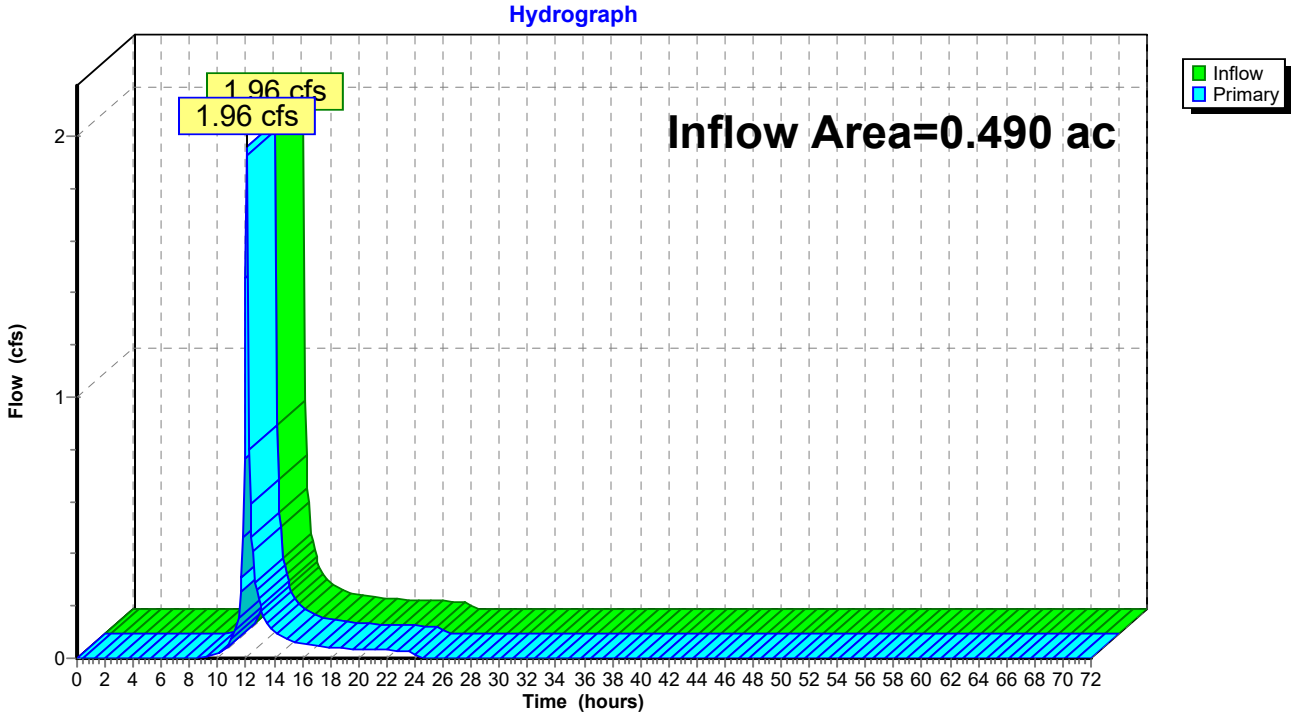


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 3.17" for 10-Year (Future Adj.) event
Inflow = 1.96 cfs @ 12.08 hrs, Volume= 0.129 af
Primary = 1.96 cfs @ 12.08 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Subcatchment E1AI: EDA 1A - IMPERV.

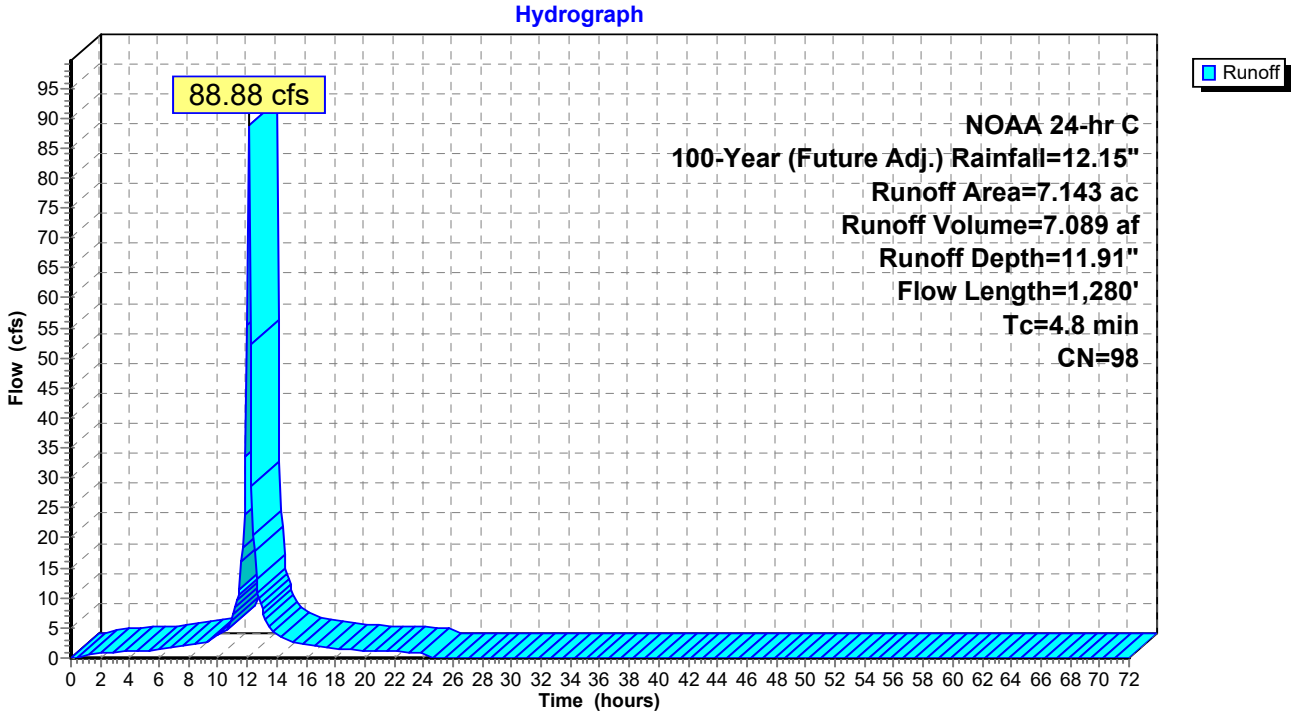
Runoff = 88.88 cfs @ 12.10 hrs, Volume= 7.089 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

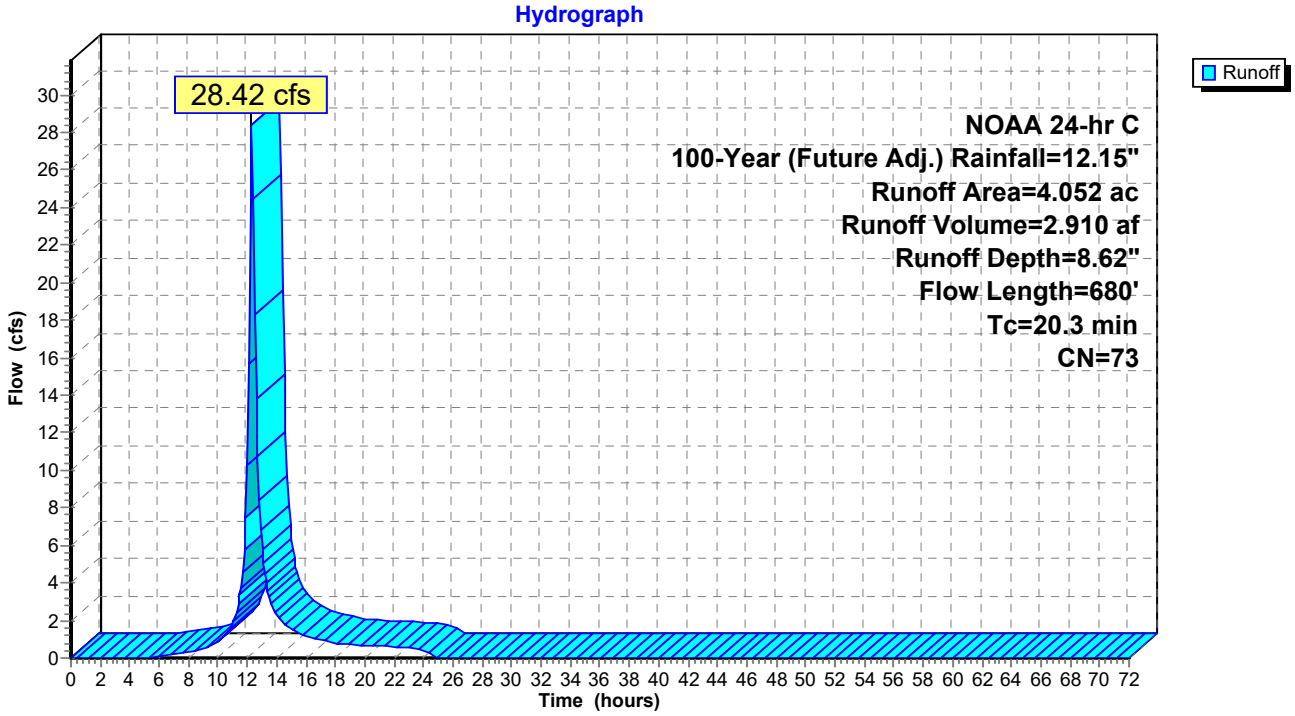
Runoff = 28.42 cfs @ 12.30 hrs, Volume= 2.910 af, Depth= 8.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

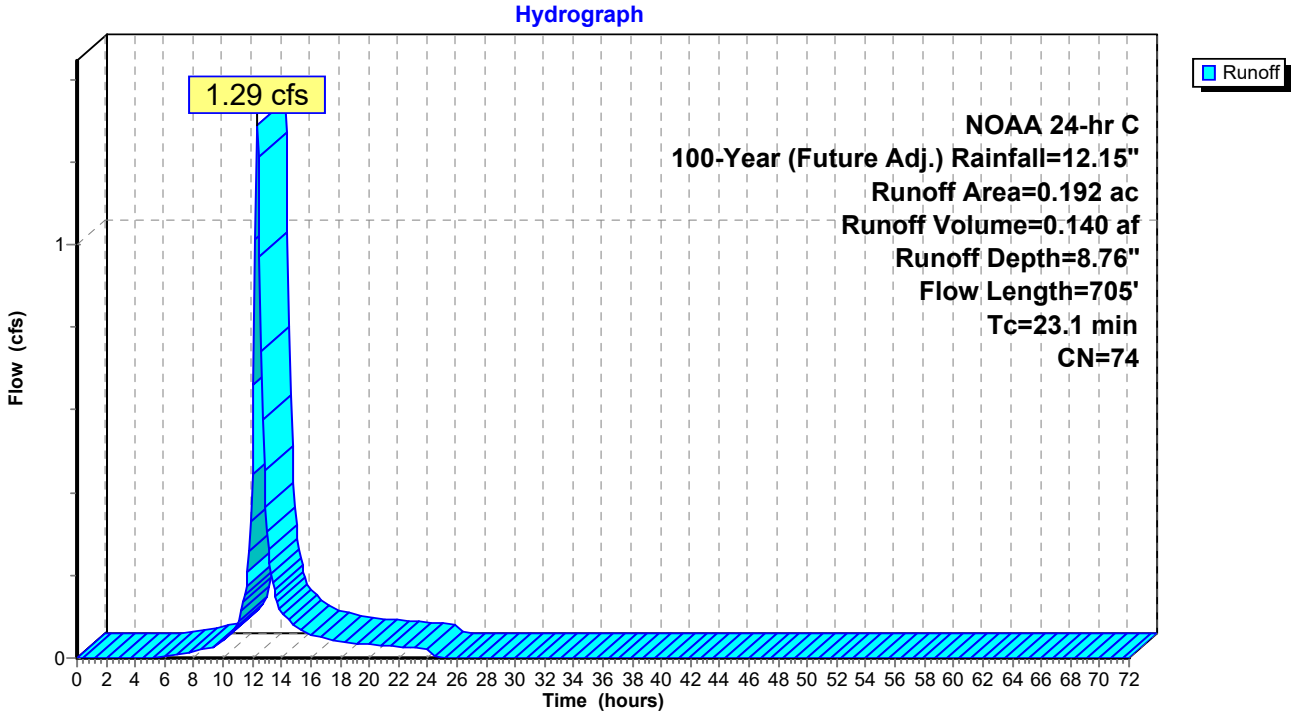
Runoff = 1.29 cfs @ 12.33 hrs, Volume= 0.140 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

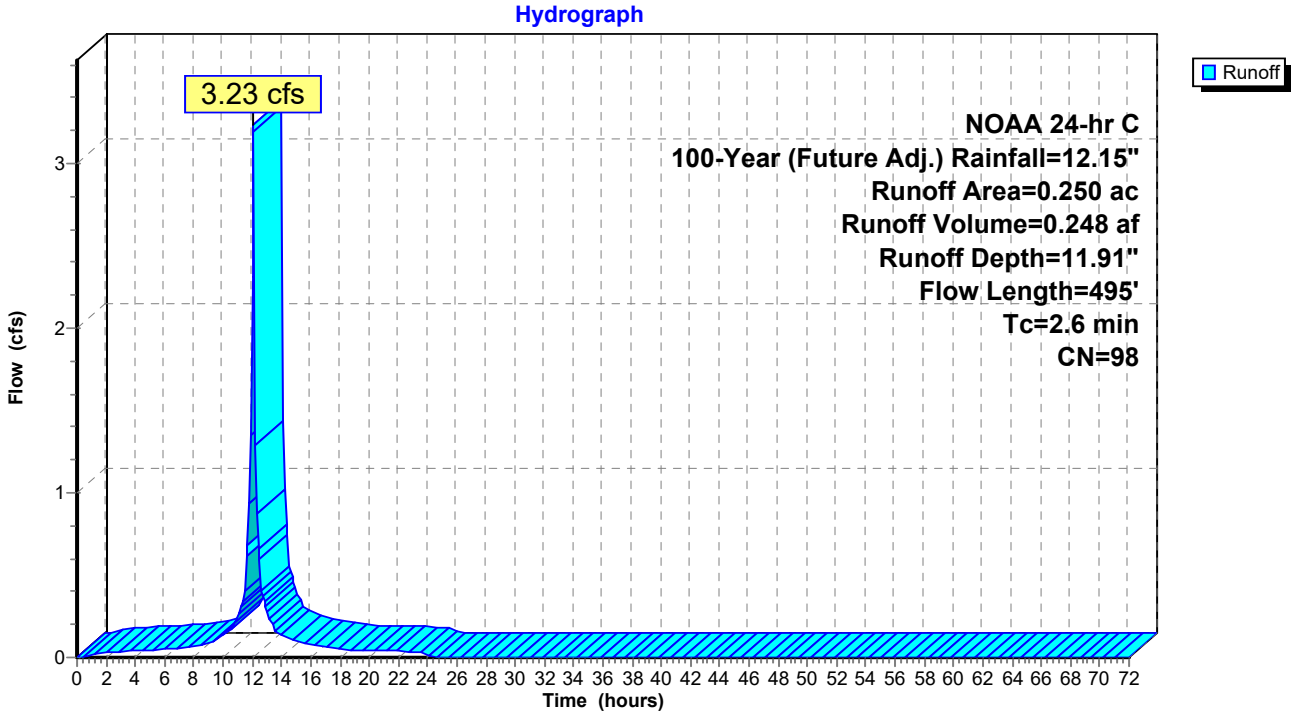
Runoff = 3.23 cfs @ 12.08 hrs, Volume= 0.248 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

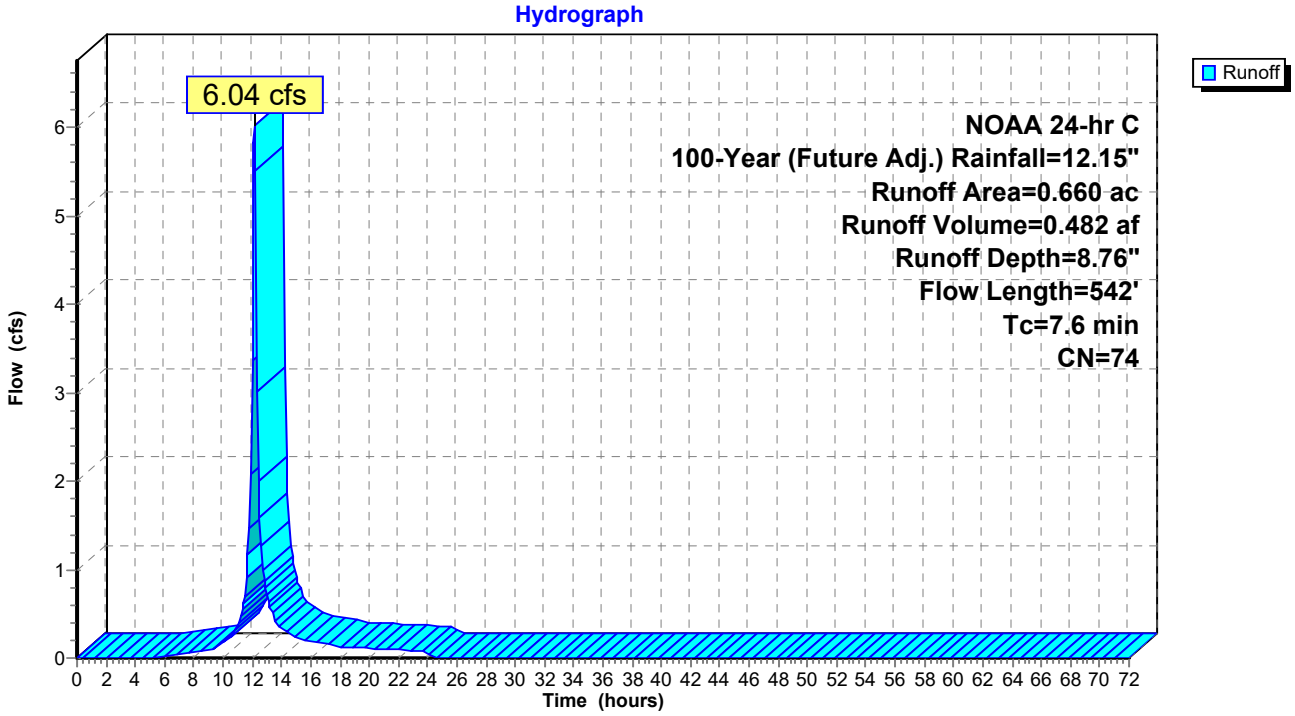
Runoff = 6.04 cfs @ 12.14 hrs, Volume= 0.482 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

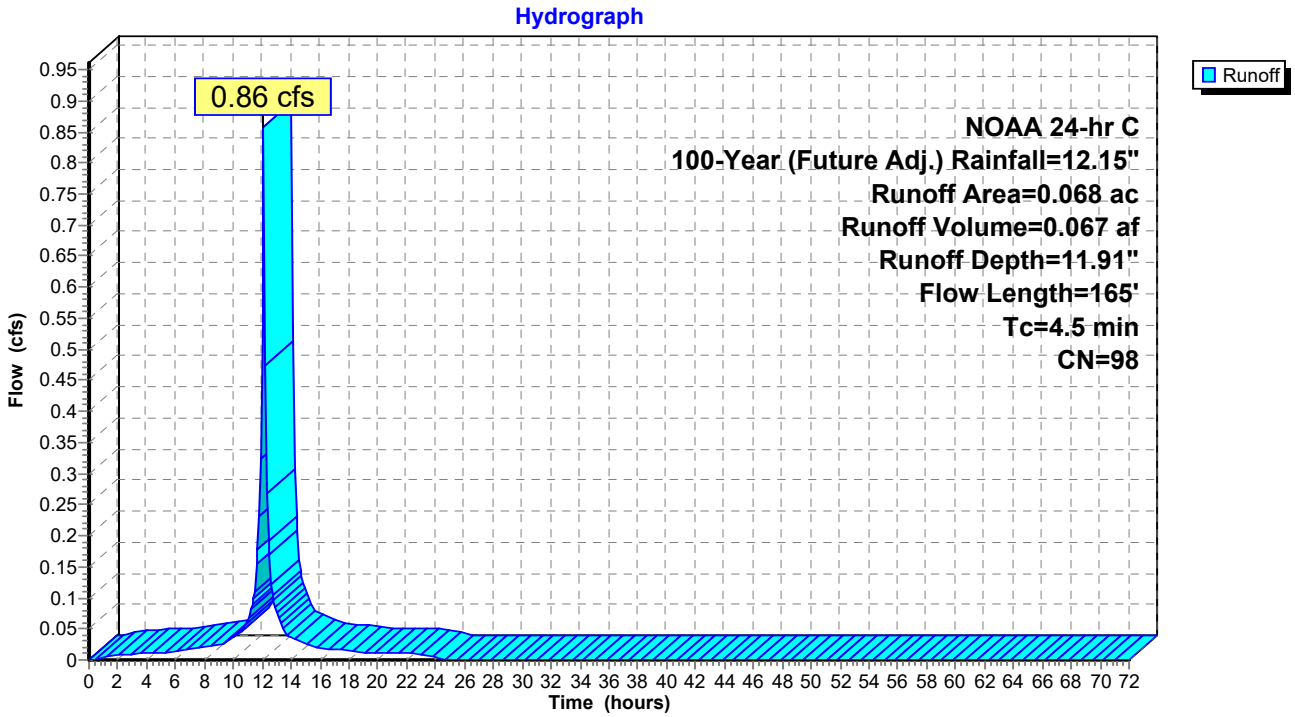
Runoff = 0.86 cfs @ 12.10 hrs, Volume= 0.067 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

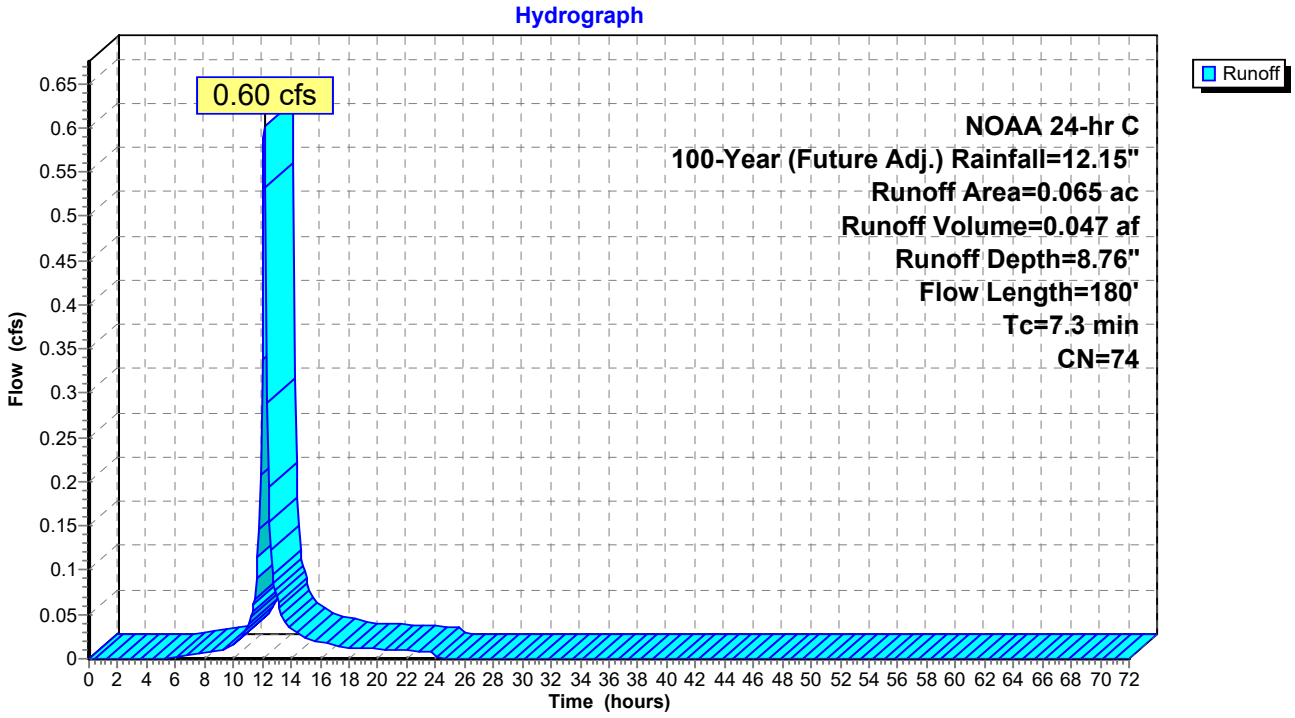
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 0.047 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

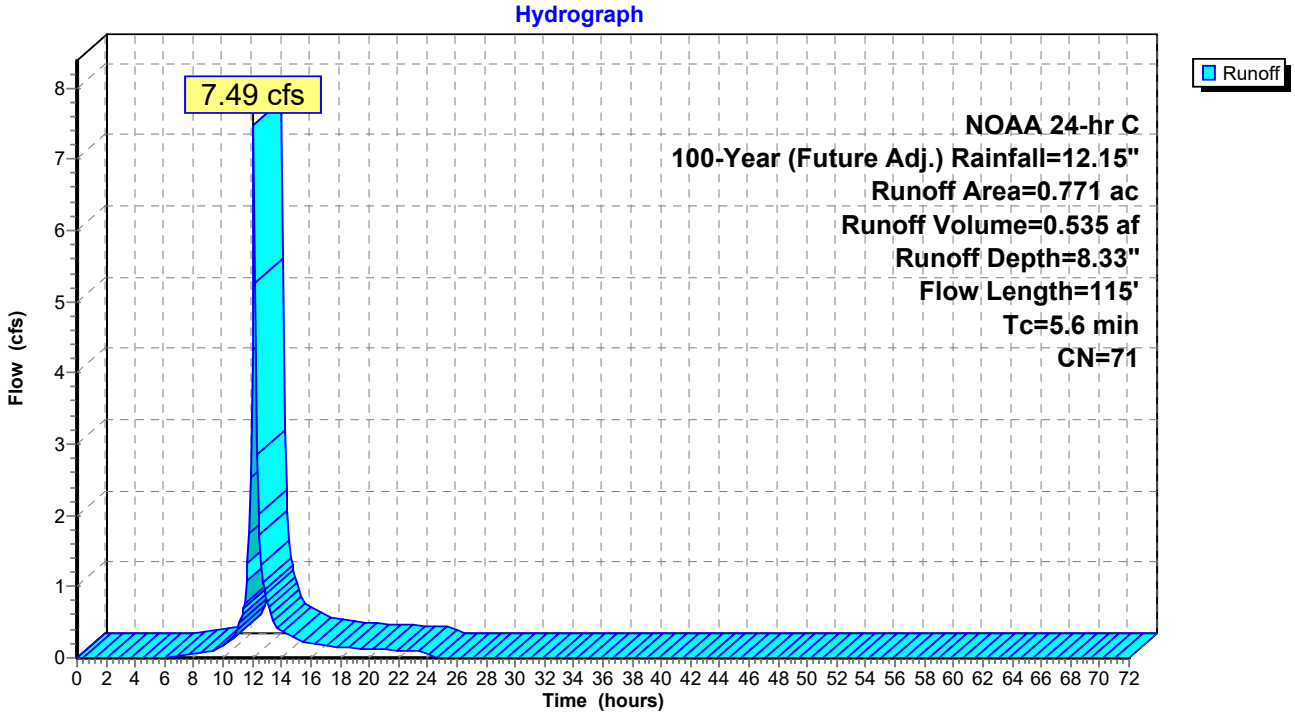
Runoff = 7.49 cfs @ 12.11 hrs, Volume= 0.535 af, Depth= 8.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

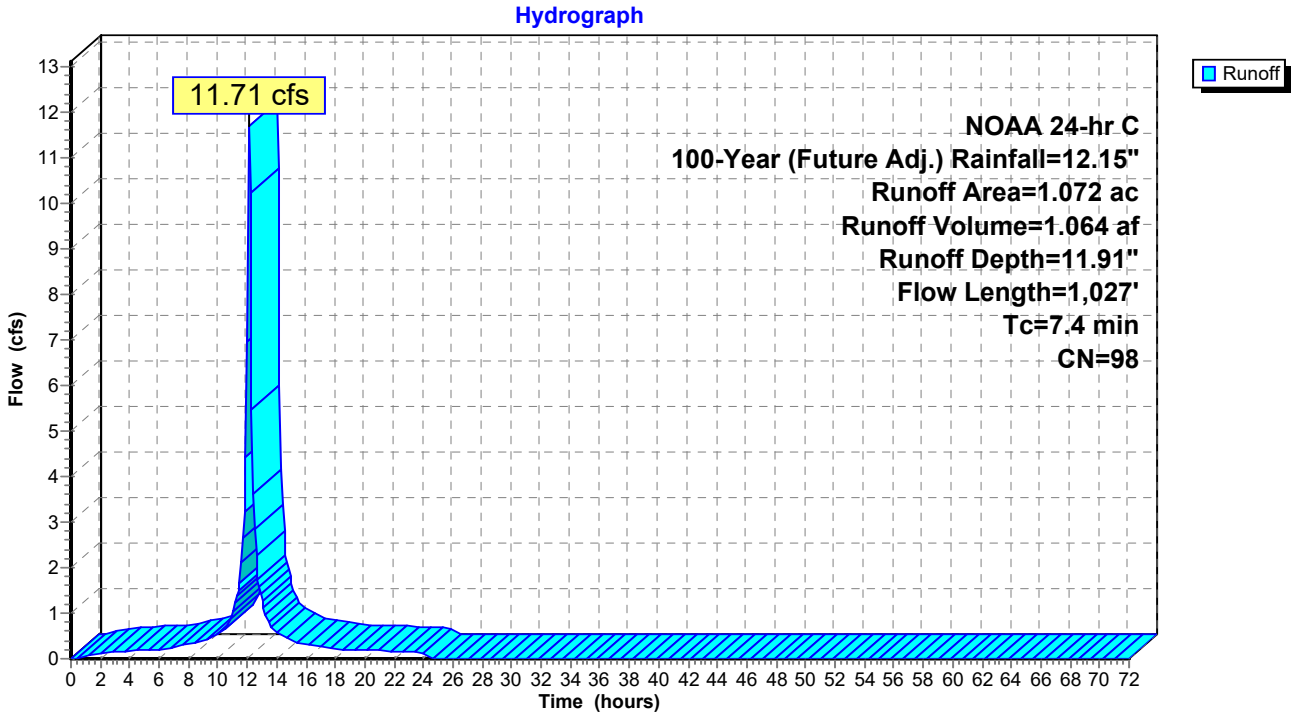
Runoff = 11.71 cfs @ 12.13 hrs, Volume= 1.064 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

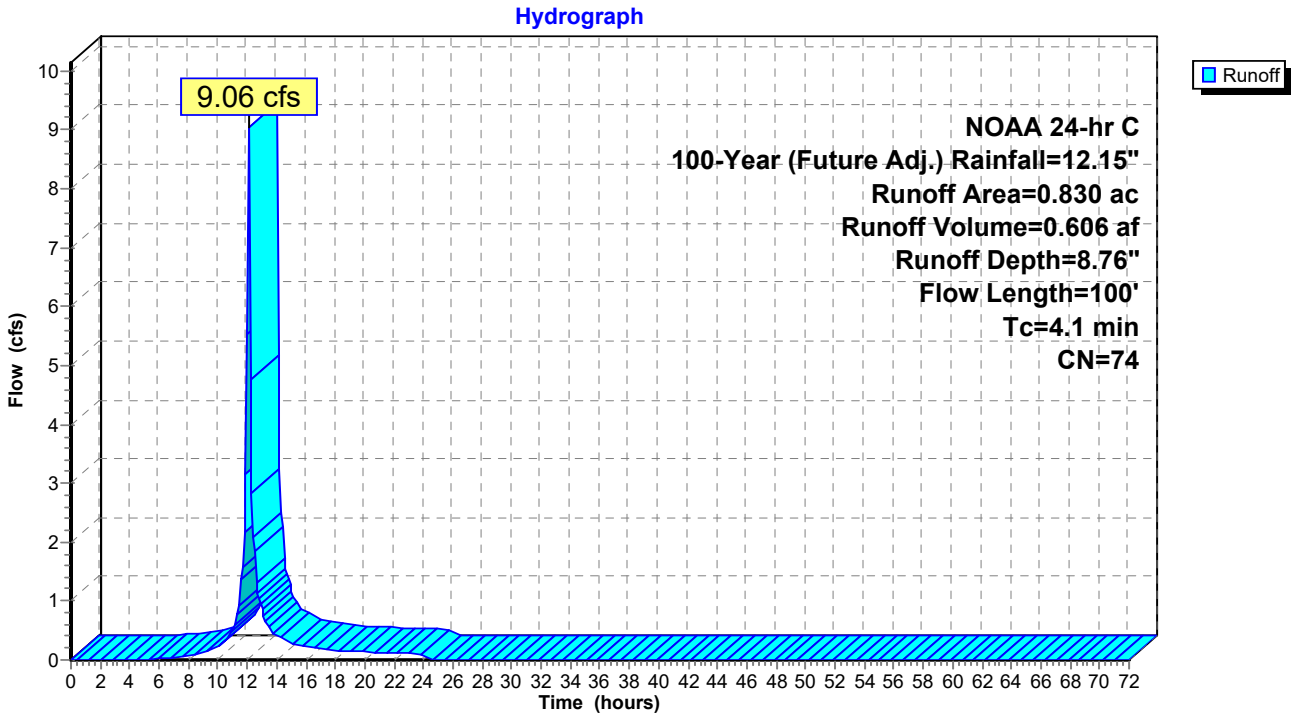
Runoff = 9.06 cfs @ 12.10 hrs, Volume= 0.606 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

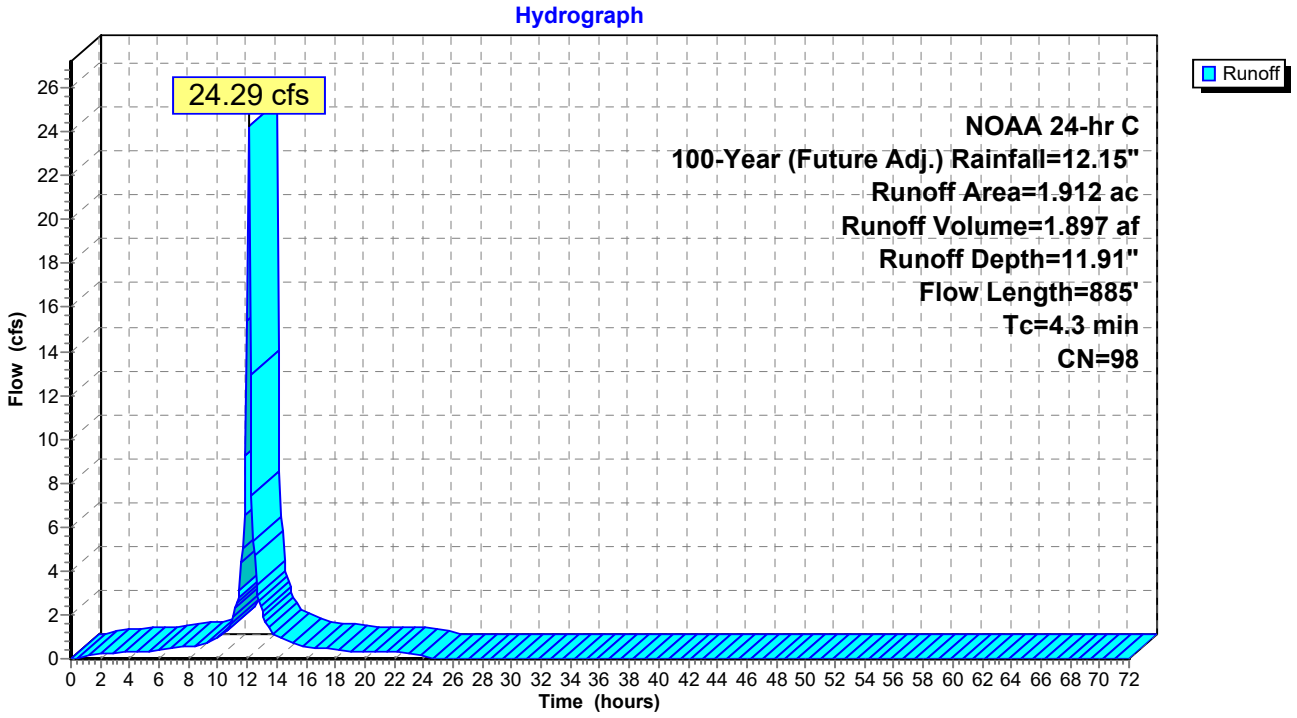
Runoff = 24.29 cfs @ 12.09 hrs, Volume= 1.897 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

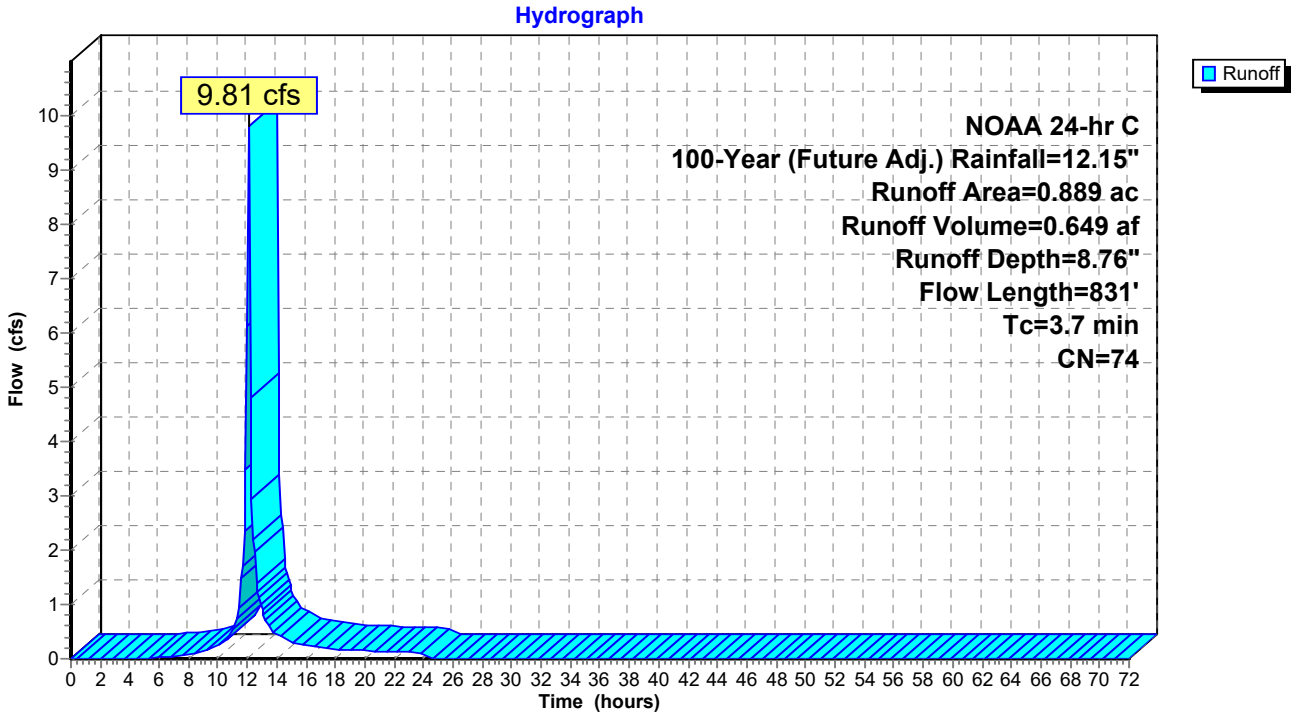
Runoff = 9.81 cfs @ 12.09 hrs, Volume= 0.649 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

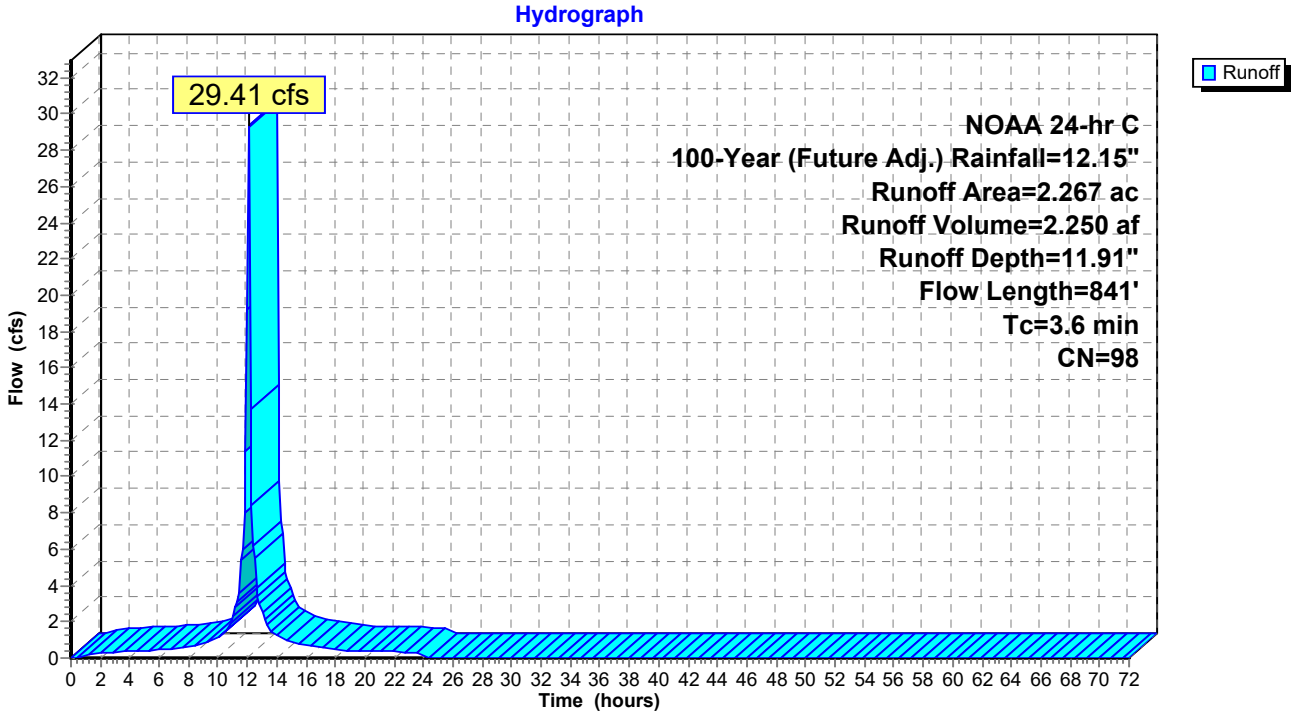
Runoff = 29.41 cfs @ 12.09 hrs, Volume= 2.250 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

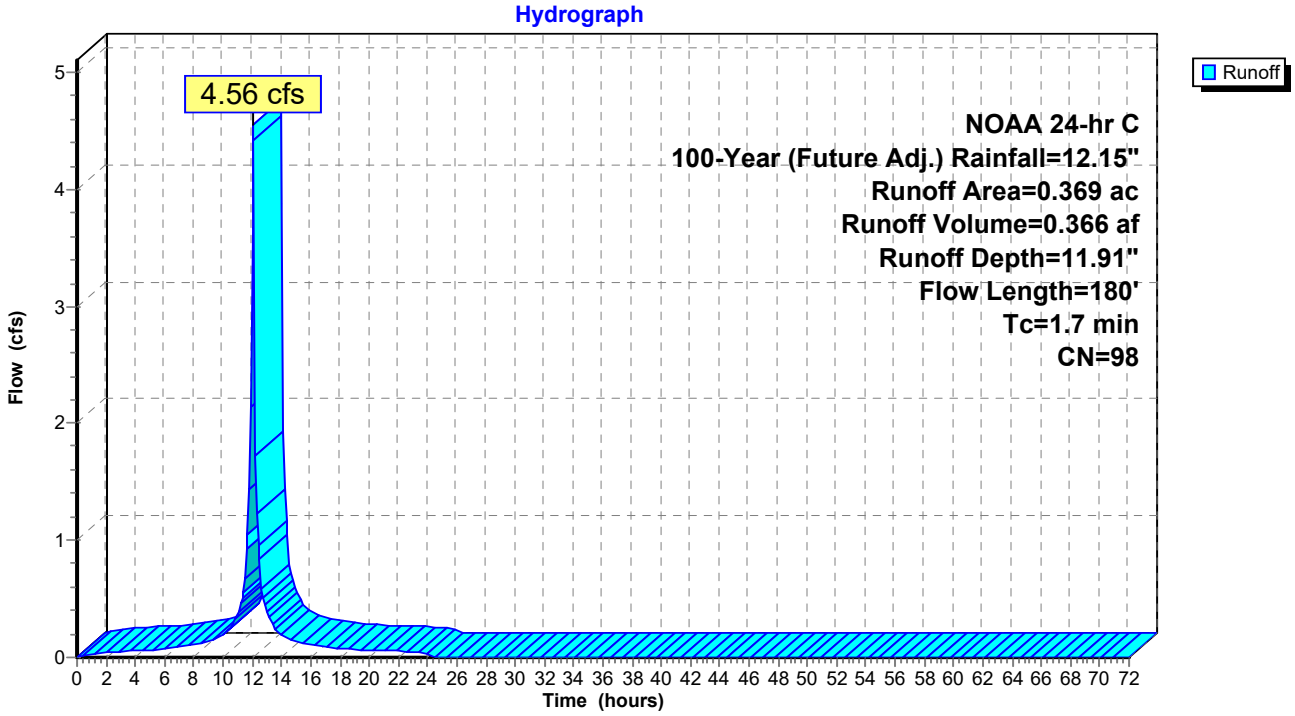
Runoff = 4.56 cfs @ 12.07 hrs, Volume= 0.366 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

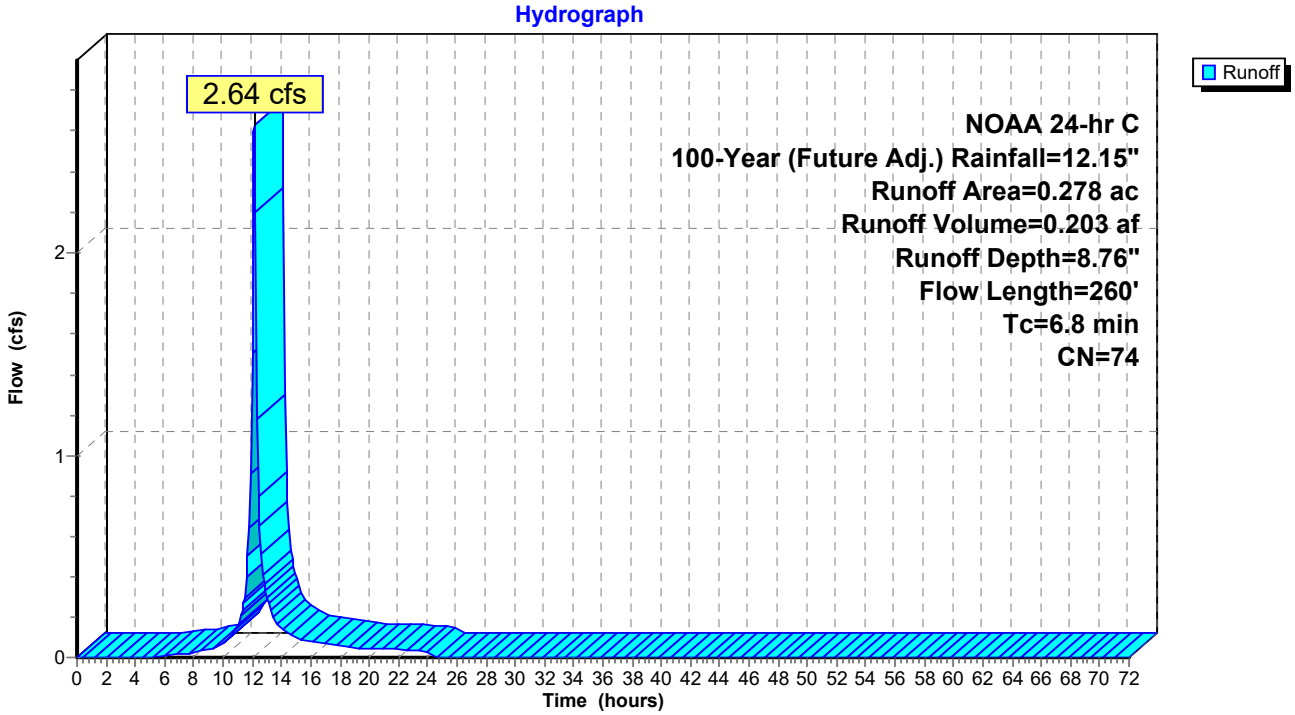
Runoff = 2.64 cfs @ 12.12 hrs, Volume= 0.203 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

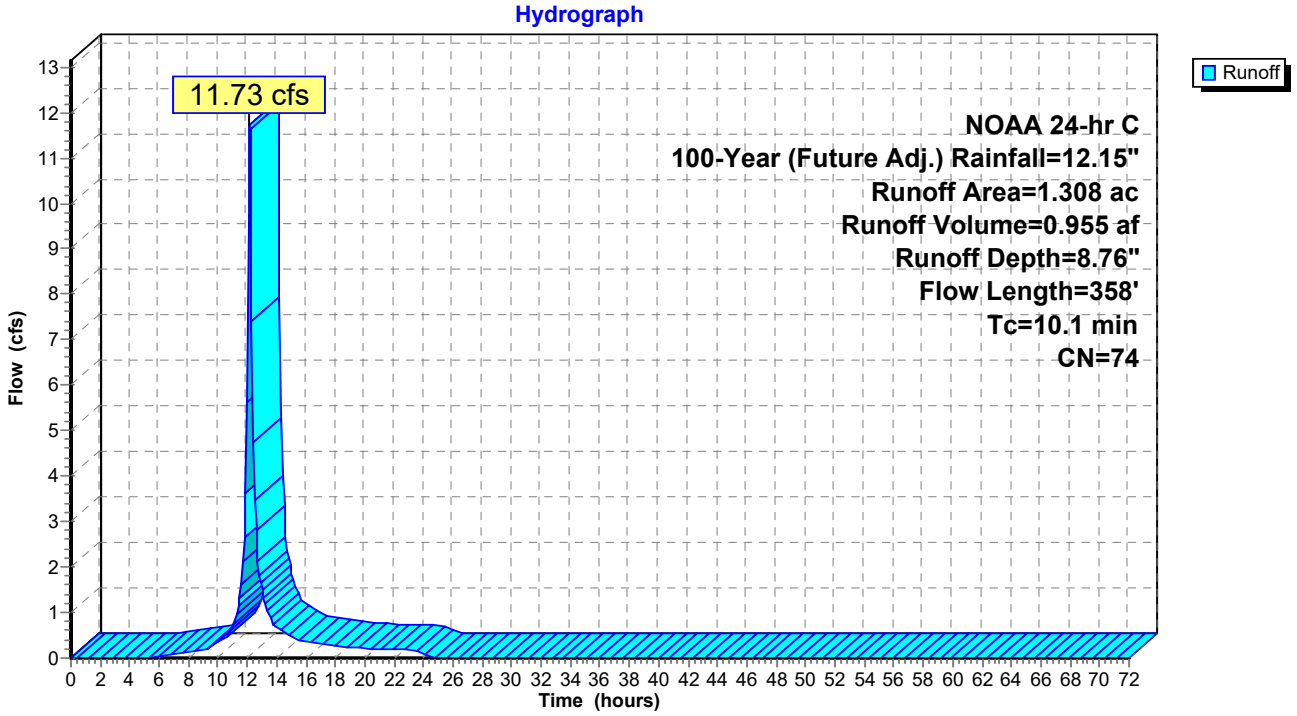
Runoff = 11.73 cfs @ 12.18 hrs, Volume= 0.955 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

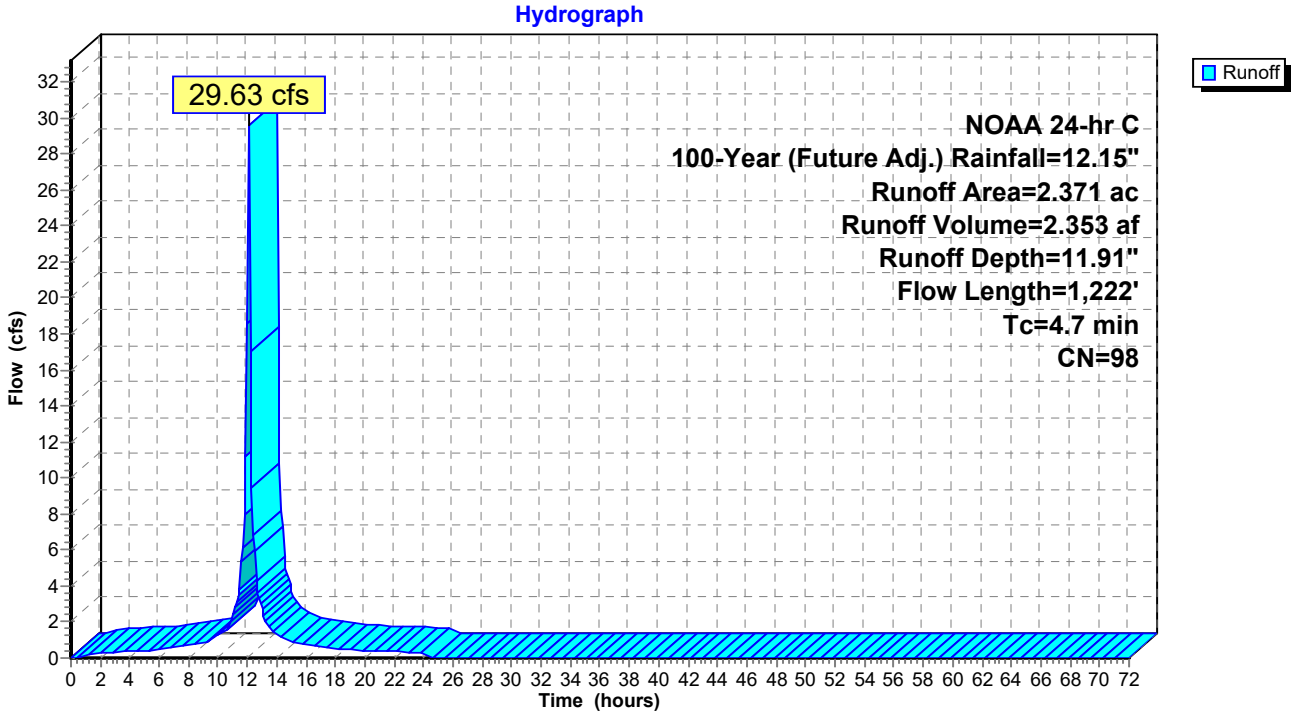
Runoff = 29.63 cfs @ 12.10 hrs, Volume= 2.353 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

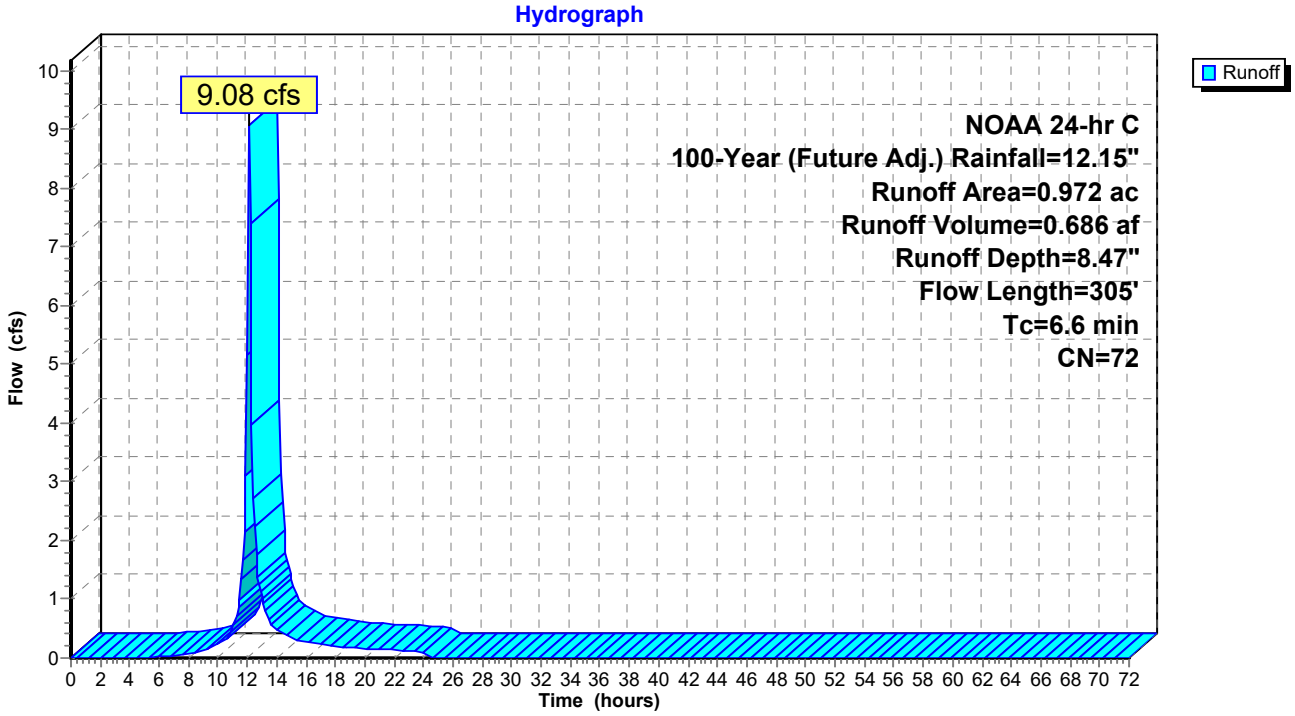
Runoff = 9.08 cfs @ 12.12 hrs, Volume= 0.686 af, Depth= 8.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

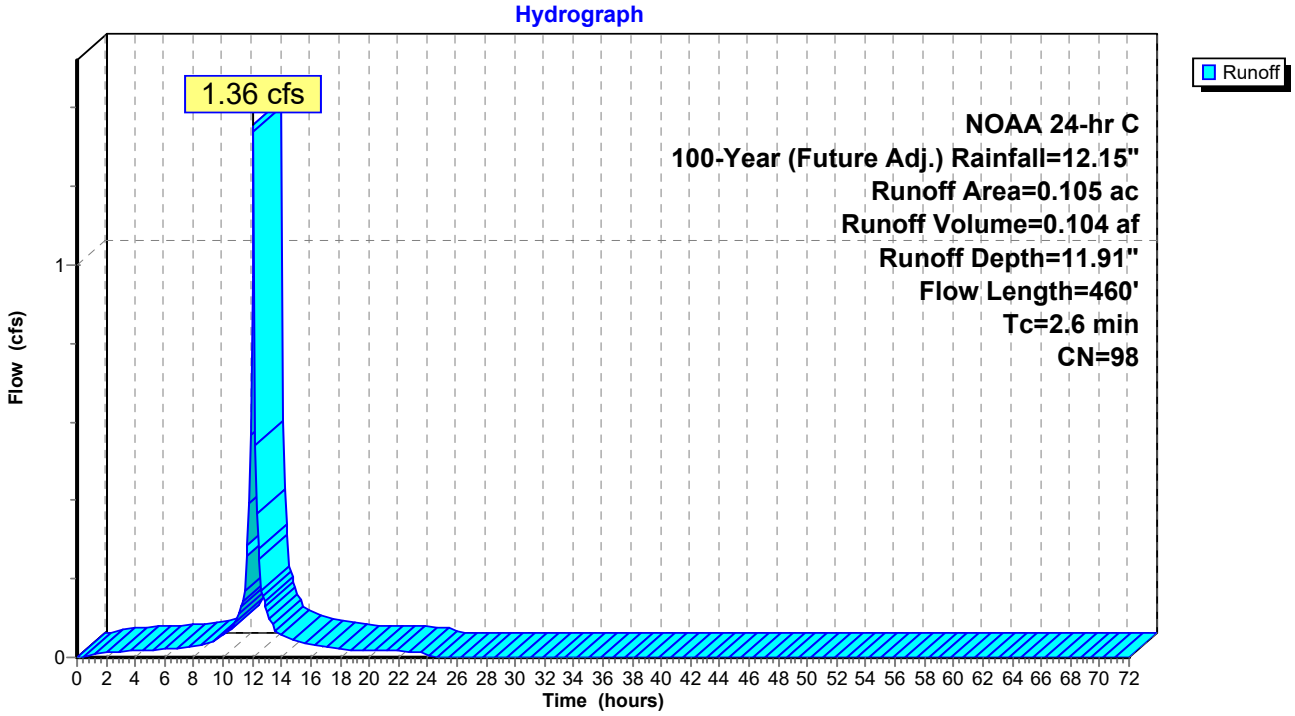
Runoff = 1.36 cfs @ 12.08 hrs, Volume= 0.104 af, Depth=11.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

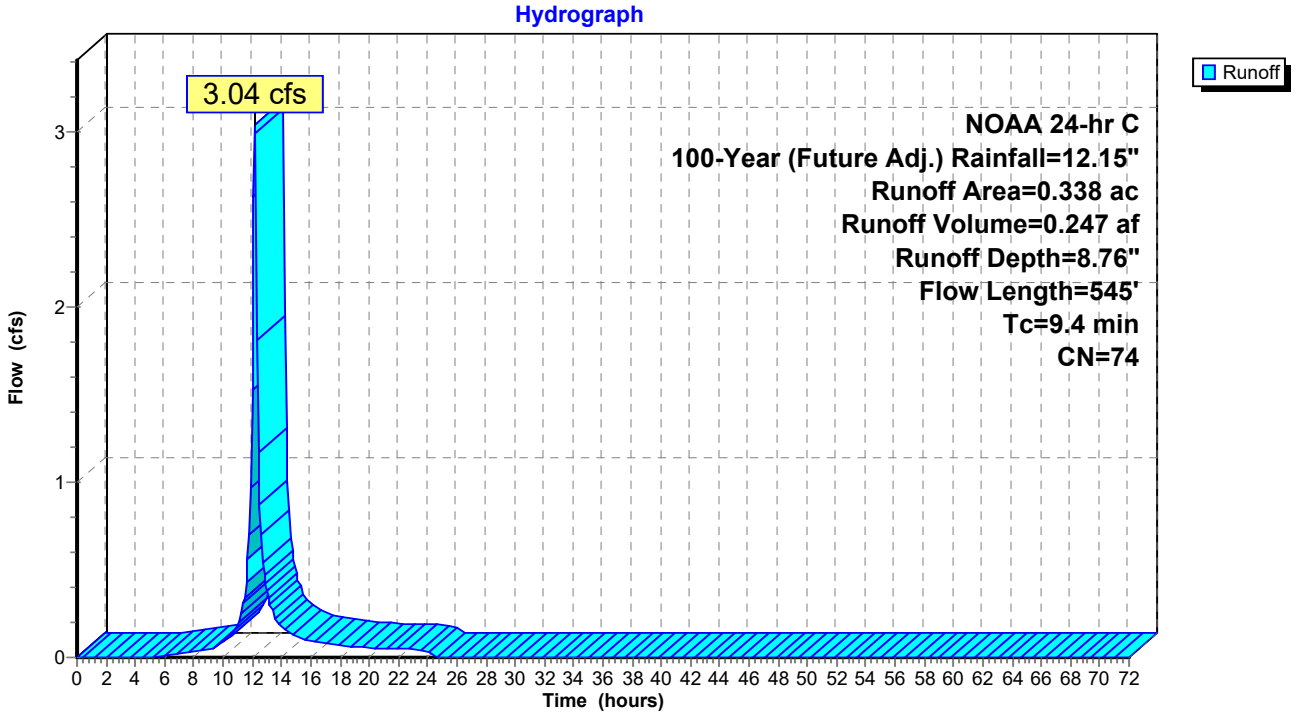
Runoff = 3.04 cfs @ 12.17 hrs, Volume= 0.247 af, Depth= 8.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

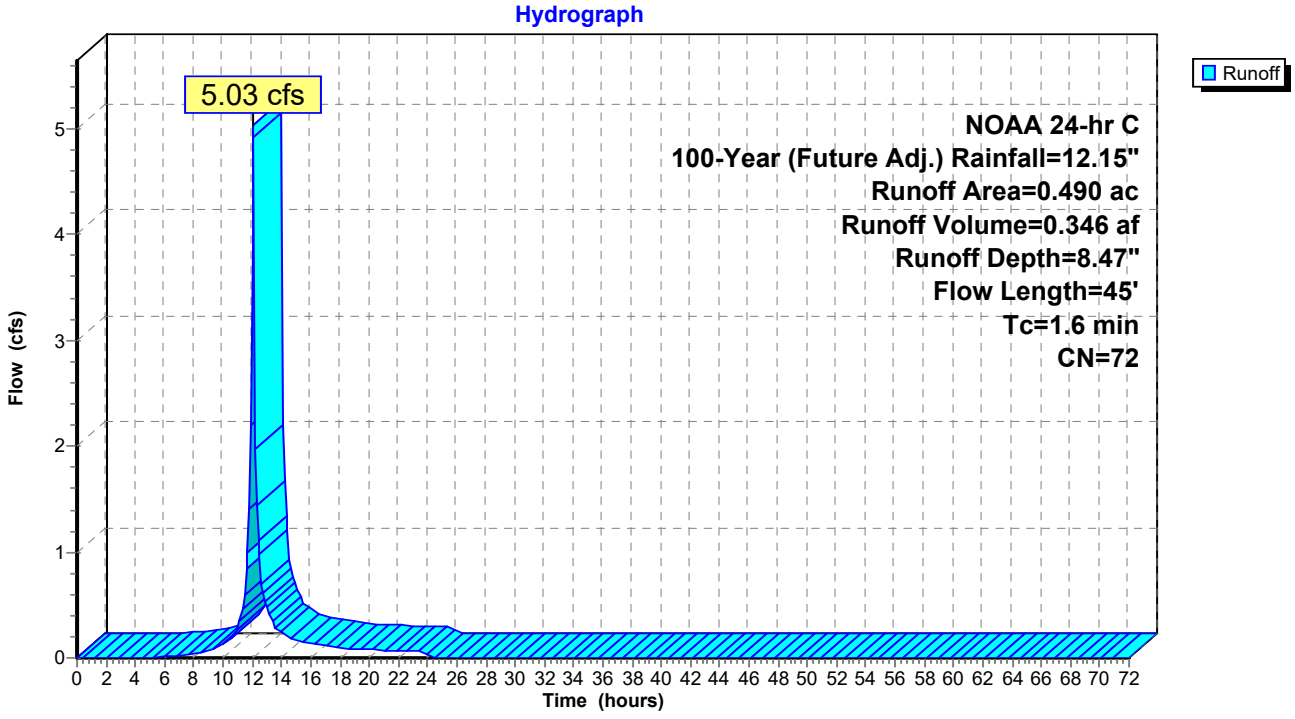
Runoff = 5.03 cfs @ 12.07 hrs, Volume= 0.346 af, Depth= 8.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr C 100-Year (Future Adj.) Rainfall=12.15"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 8.76" for 100-Year (Future Adj.) event
Inflow = 1.29 cfs @ 12.33 hrs, Volume= 0.140 af
Outflow = 1.27 cfs @ 12.34 hrs, Volume= 0.135 af, Atten= 1%, Lag= 0.3 min
Primary = 1.27 cfs @ 12.34 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 70.10' @ 12.34 hrs Surf.Area= 1,938 sf Storage= 286 cf

Plug-Flow detention time= 37.4 min calculated for 0.135 af (96% of inflow)
Center-of-Mass det. time= 14.8 min (833.4 - 818.6)

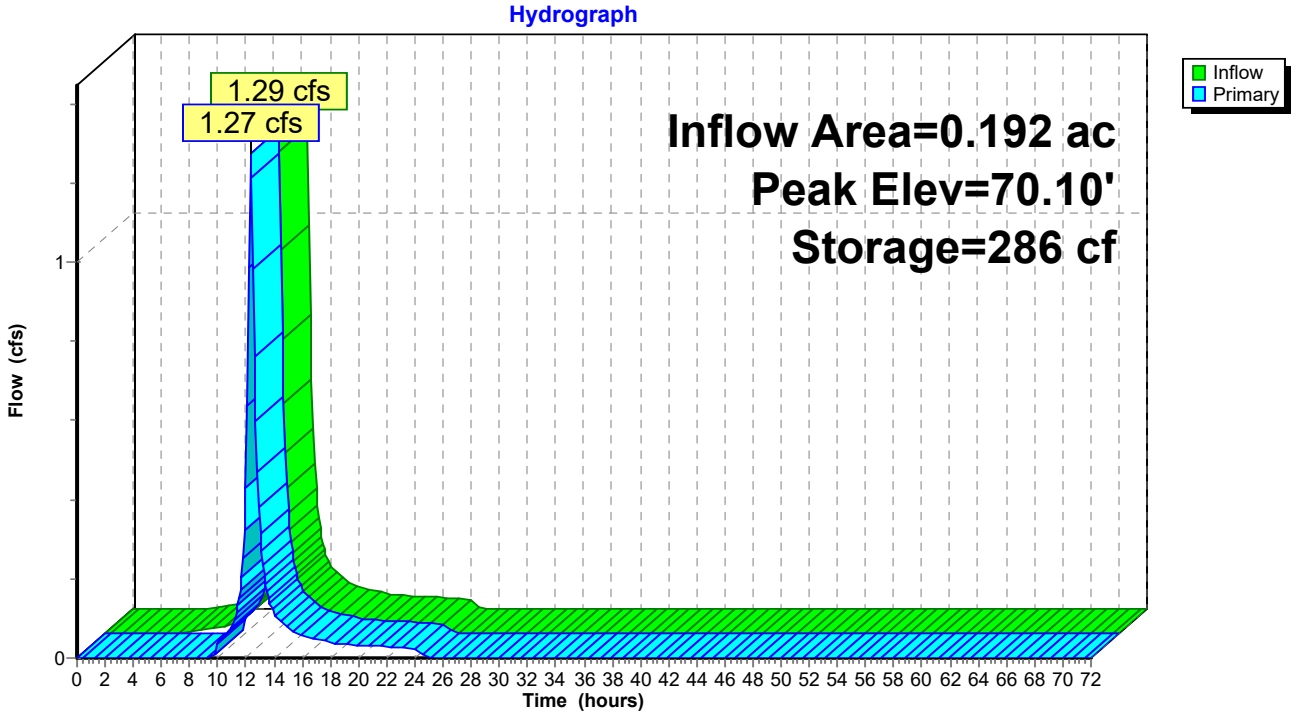
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=1.23 cfs @ 12.34 hrs HW=70.10' (Free Discharge)
1=Asymmetrical Weir (Weir Controls 1.23 cfs @ 0.30 fps)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 10.37" for 100-Year (Future Adj.) event
Inflow = 1.45 cfs @ 12.11 hrs, Volume= 0.115 af
Outflow = 1.44 cfs @ 12.11 hrs, Volume= 0.114 af, Atten= 1%, Lag= 0.0 min
Primary = 1.44 cfs @ 12.11 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.18' @ 12.11 hrs Surf.Area= 427 sf Storage= 91 cf

Plug-Flow detention time= 16.8 min calculated for 0.113 af (99% of inflow)
Center-of-Mass det. time= 9.5 min (773.4 - 763.9)

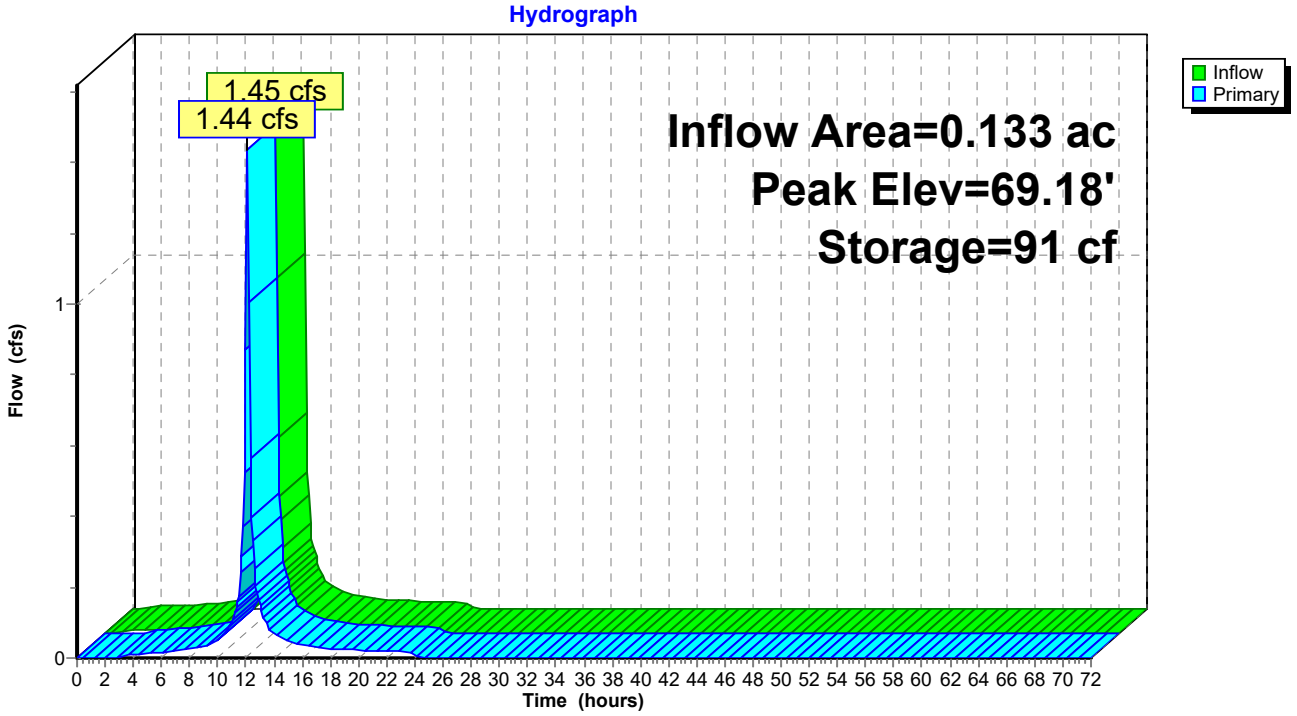
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=1.40 cfs @ 12.11 hrs HW=69.18' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 1.40 cfs @ 0.44 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 10.53" for 100-Year (Future Adj.) event
Inflow = 20.58 cfs @ 12.11 hrs, Volume= 1.670 af
Outflow = 16.09 cfs @ 12.20 hrs, Volume= 1.569 af, Atten= 22%, Lag= 5.5 min
Primary = 16.09 cfs @ 12.20 hrs, Volume= 1.569 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.79' @ 12.20 hrs Surf.Area= 8,271 sf Storage= 12,970 cf

Plug-Flow detention time= 83.0 min calculated for 1.567 af (94% of inflow)
Center-of-Mass det. time= 48.6 min (809.8 - 761.1)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

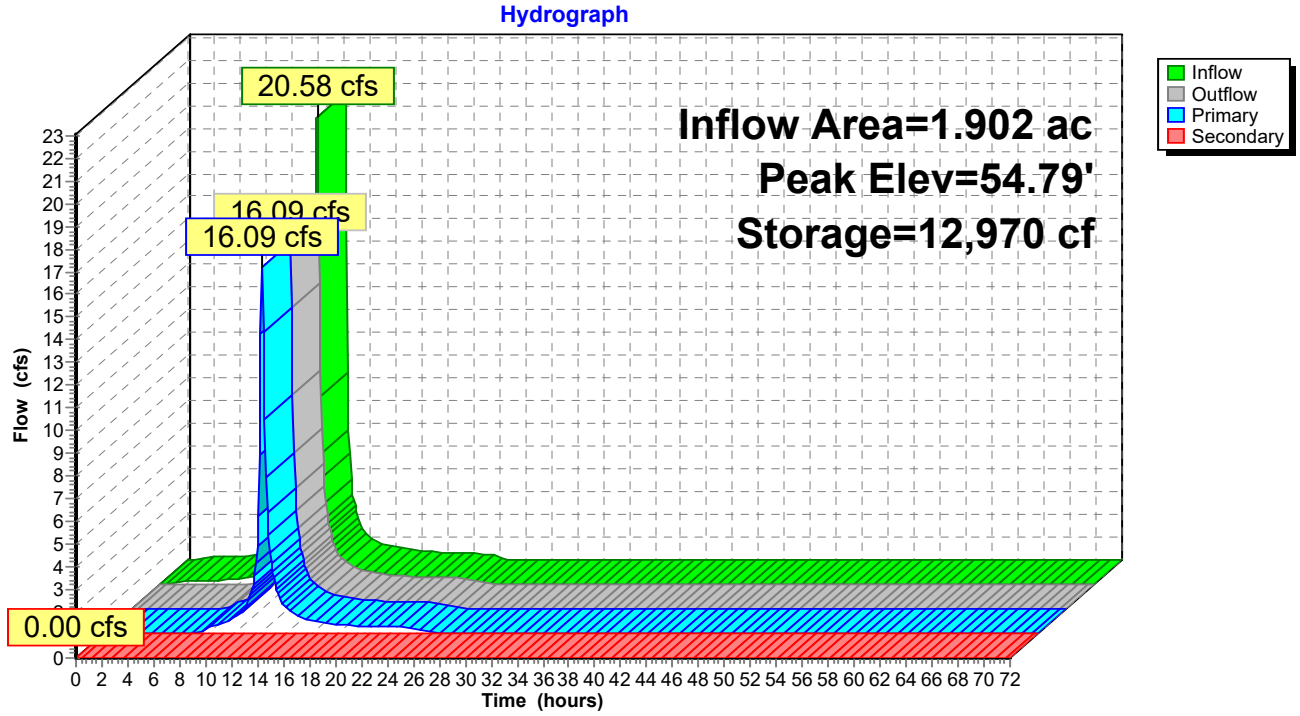
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.07 cfs @ 12.20 hrs HW=54.79' (Free Discharge)
└**1=Culvert** (Passes 16.07 cfs of 32.94 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 16.07 cfs @ 3.54 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 10.91" for 100-Year (Future Adj.) event
Inflow = 34.11 cfs @ 12.09 hrs, Volume= 2.546 af
Outflow = 17.75 cfs @ 12.23 hrs, Volume= 2.367 af, Atten= 48%, Lag= 8.0 min
Primary = 17.75 cfs @ 12.23 hrs, Volume= 2.367 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 55.31' @ 12.23 hrs Surf.Area= 18,258 sf Storage= 36,782 cf

Plug-Flow detention time= 152.3 min calculated for 2.364 af (93% of inflow)
Center-of-Mass det. time= 115.1 min (867.2 - 752.1)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

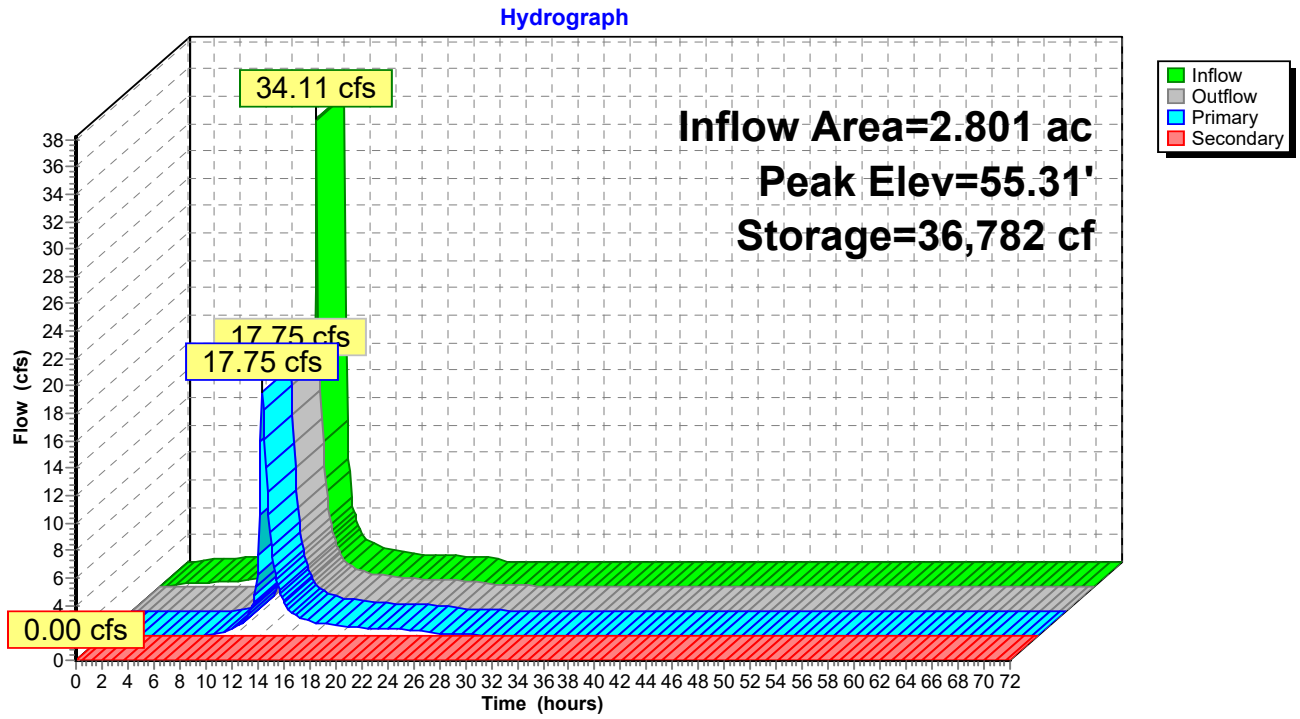
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=17.31 cfs @ 12.23 hrs HW=55.29' (Free Discharge)
└─**1=Culvert** (Passes 17.31 cfs of 34.78 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 7.61 cfs @ 4.38 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 9.70 cfs @ 3.77 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 10.73" for 100-Year (Future Adj.) event
Inflow = 45.98 cfs @ 12.10 hrs, Volume= 3.774 af
Outflow = 12.71 cfs @ 12.42 hrs, Volume= 3.535 af, Atten= 72%, Lag= 19.4 min
Primary = 12.71 cfs @ 12.42 hrs, Volume= 3.535 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 64.78' @ 12.42 hrs Surf.Area= 19,173 sf Storage= 71,226 cf

Plug-Flow detention time= 187.0 min calculated for 3.535 af (94% of inflow)
Center-of-Mass det. time= 150.1 min (906.6 - 756.6)

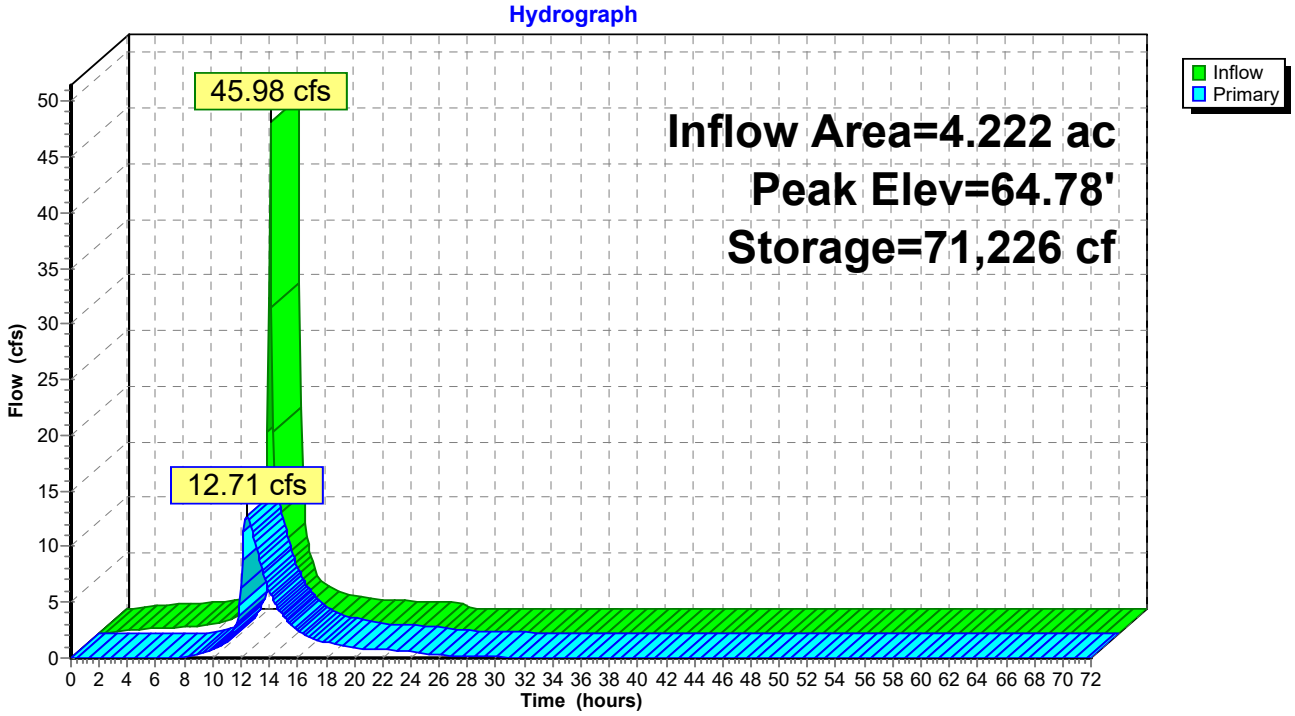
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=12.67 cfs @ 12.42 hrs HW=64.78' (Free Discharge)
- **1=Culvert** (Passes 12.67 cfs of 46.81 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 12.67 cfs @ 6.54 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

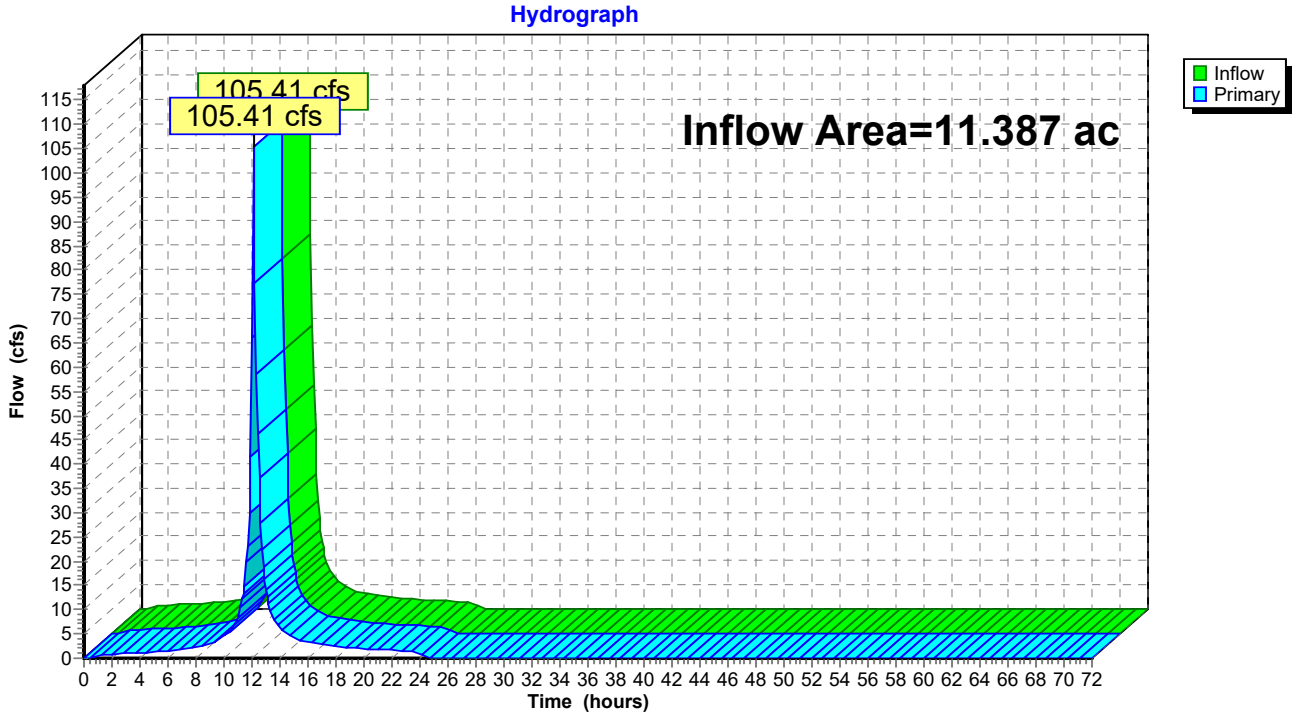


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 10.68" for 100-Year (Future Adj.) event
Inflow = 105.41 cfs @ 12.11 hrs, Volume= 10.133 af
Primary = 105.41 cfs @ 12.11 hrs, Volume= 10.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

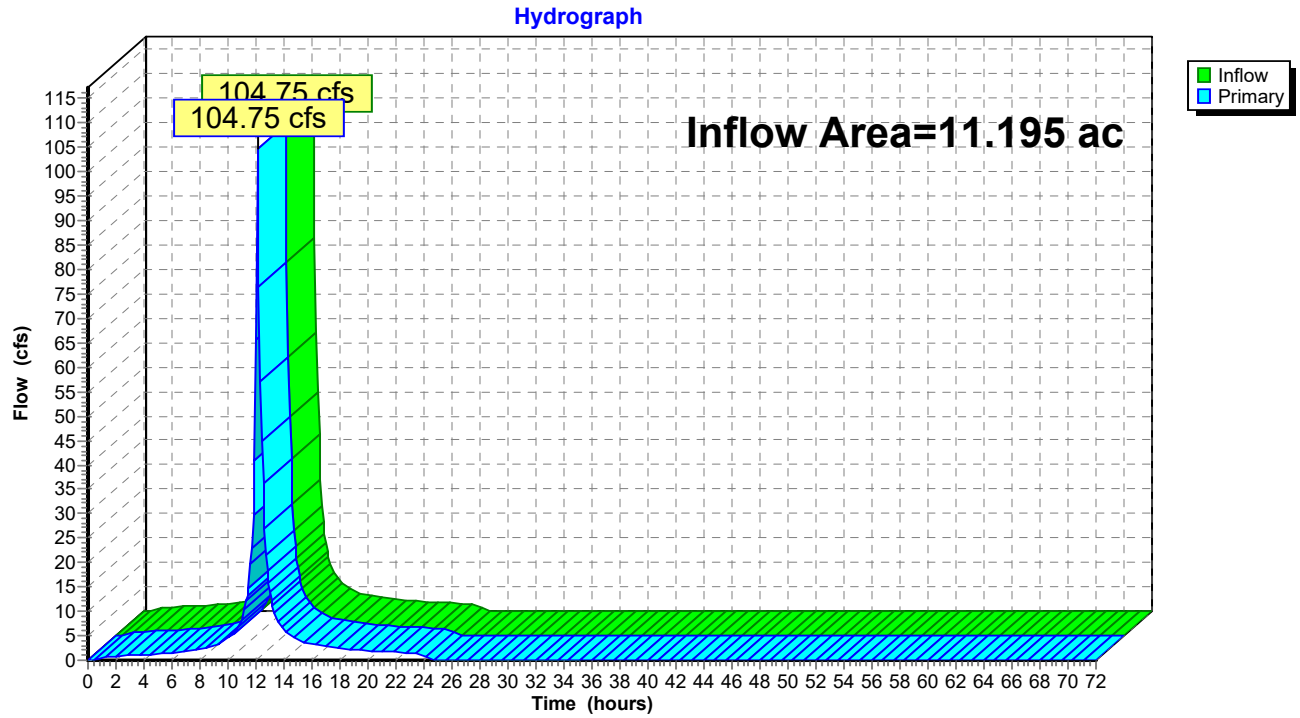


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 10.72" for 100-Year (Future Adj.) event
Inflow = 104.75 cfs @ 12.11 hrs, Volume= 9.998 af
Primary = 104.75 cfs @ 12.11 hrs, Volume= 9.998 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

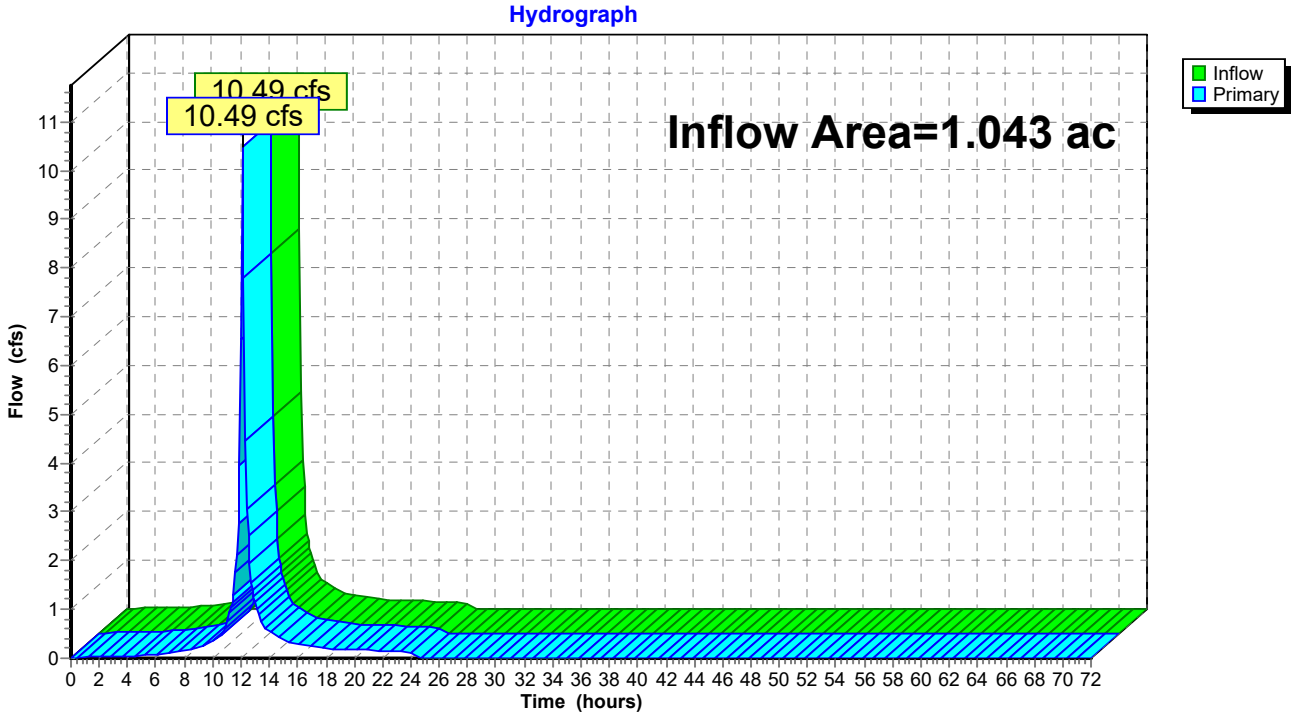


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 9.70" for 100-Year (Future Adj.) event
Inflow = 10.49 cfs @ 12.11 hrs, Volume= 0.843 af
Primary = 10.49 cfs @ 12.11 hrs, Volume= 0.843 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

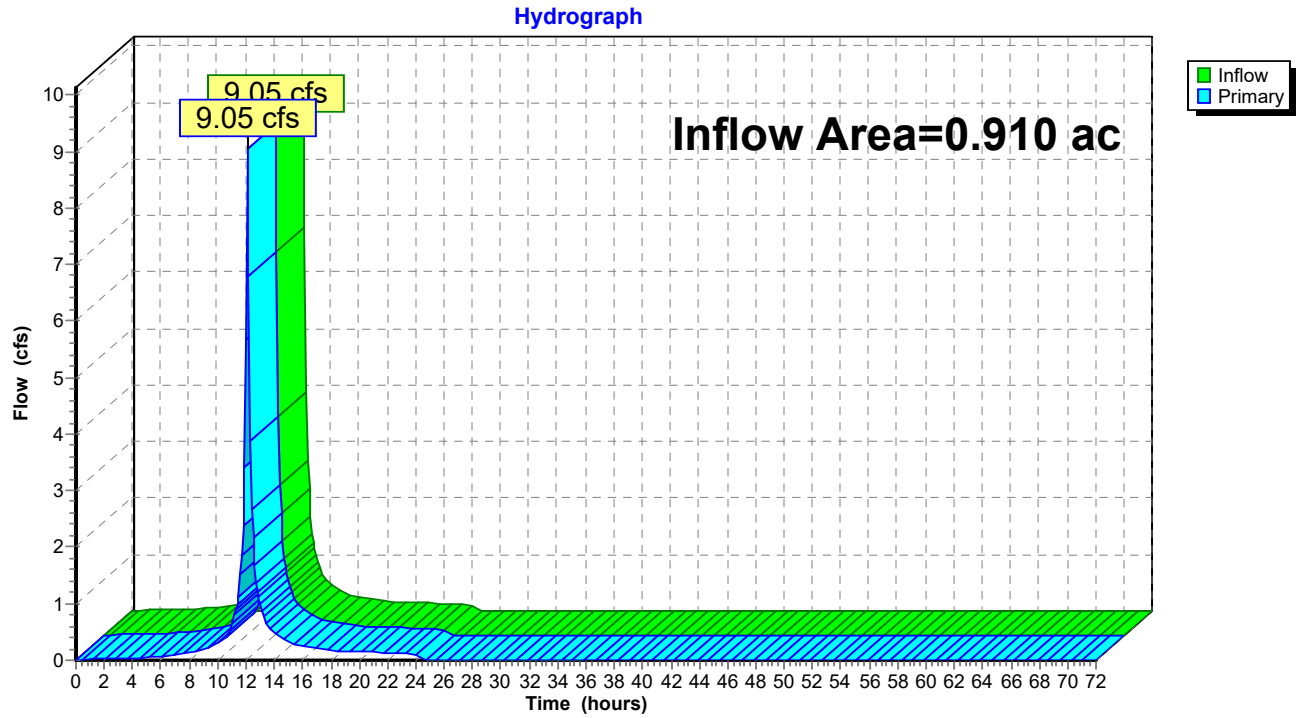


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 9.62" for 100-Year (Future Adj.) event
Inflow = 9.05 cfs @ 12.11 hrs, Volume= 0.730 af
Primary = 9.05 cfs @ 12.11 hrs, Volume= 0.730 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

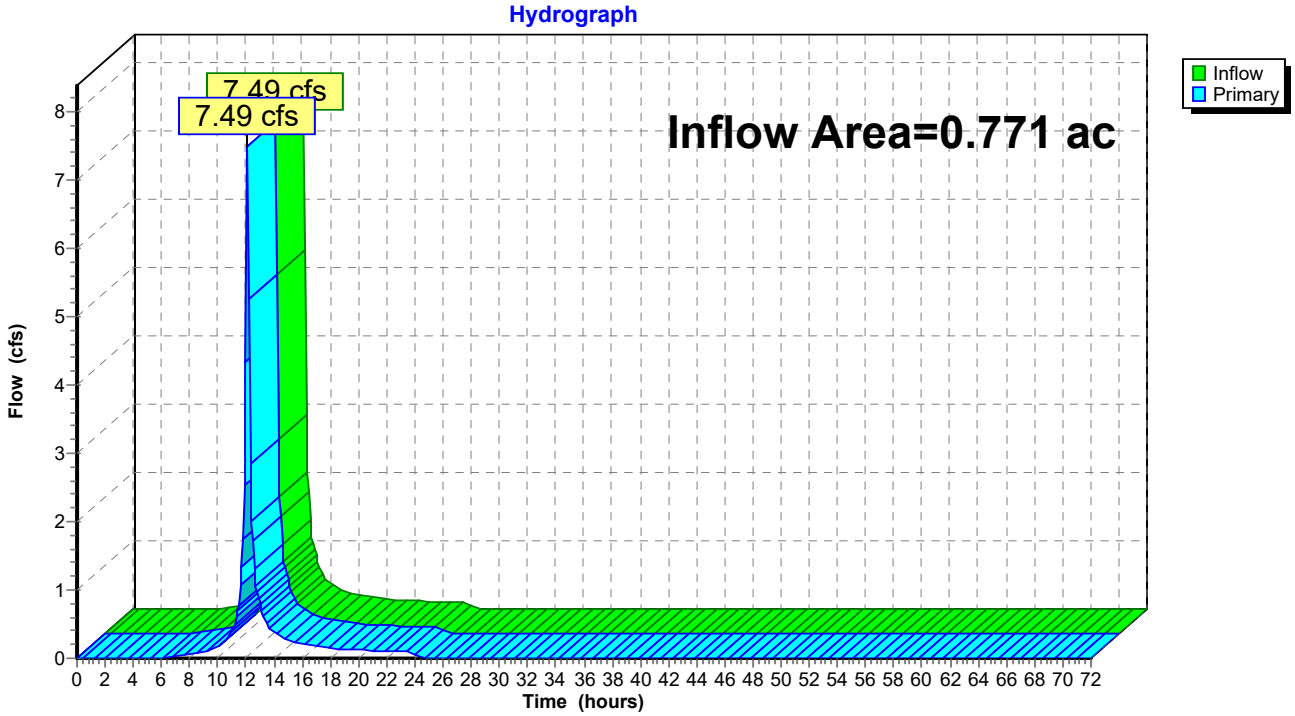


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 8.33" for 100-Year (Future Adj.) event
Inflow = 7.49 cfs @ 12.11 hrs, Volume= 0.535 af
Primary = 7.49 cfs @ 12.11 hrs, Volume= 0.535 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

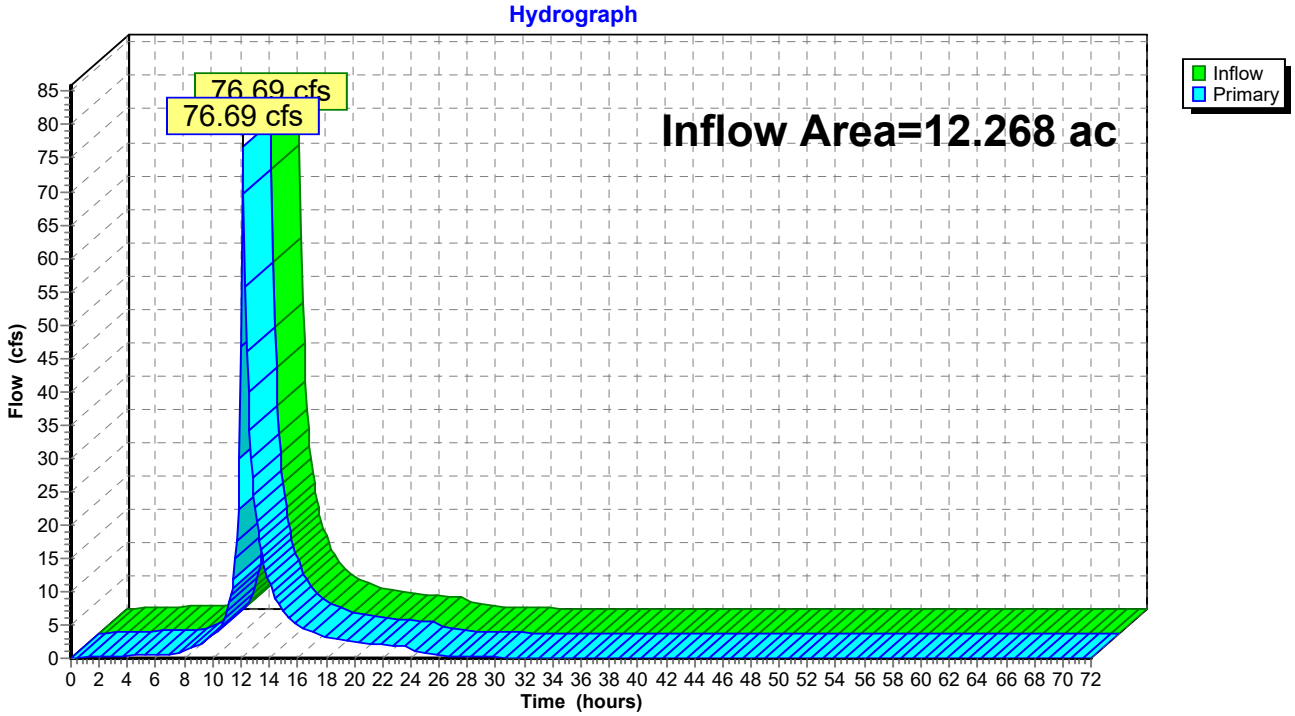


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 10.28" for 100-Year (Future Adj.) event
Inflow = 76.69 cfs @ 12.13 hrs, Volume= 10.510 af
Primary = 76.69 cfs @ 12.13 hrs, Volume= 10.510 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

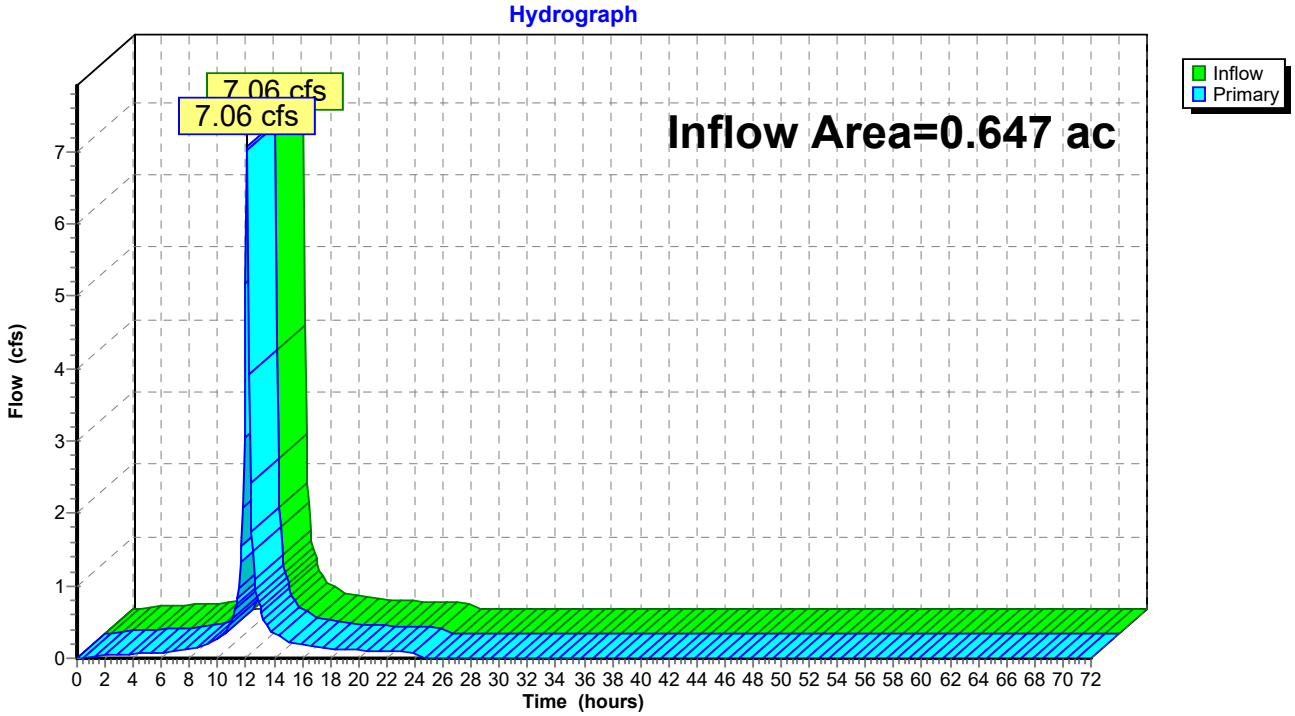


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 10.56" for 100-Year (Future Adj.) event
Inflow = 7.06 cfs @ 12.09 hrs, Volume= 0.569 af
Primary = 7.06 cfs @ 12.09 hrs, Volume= 0.569 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

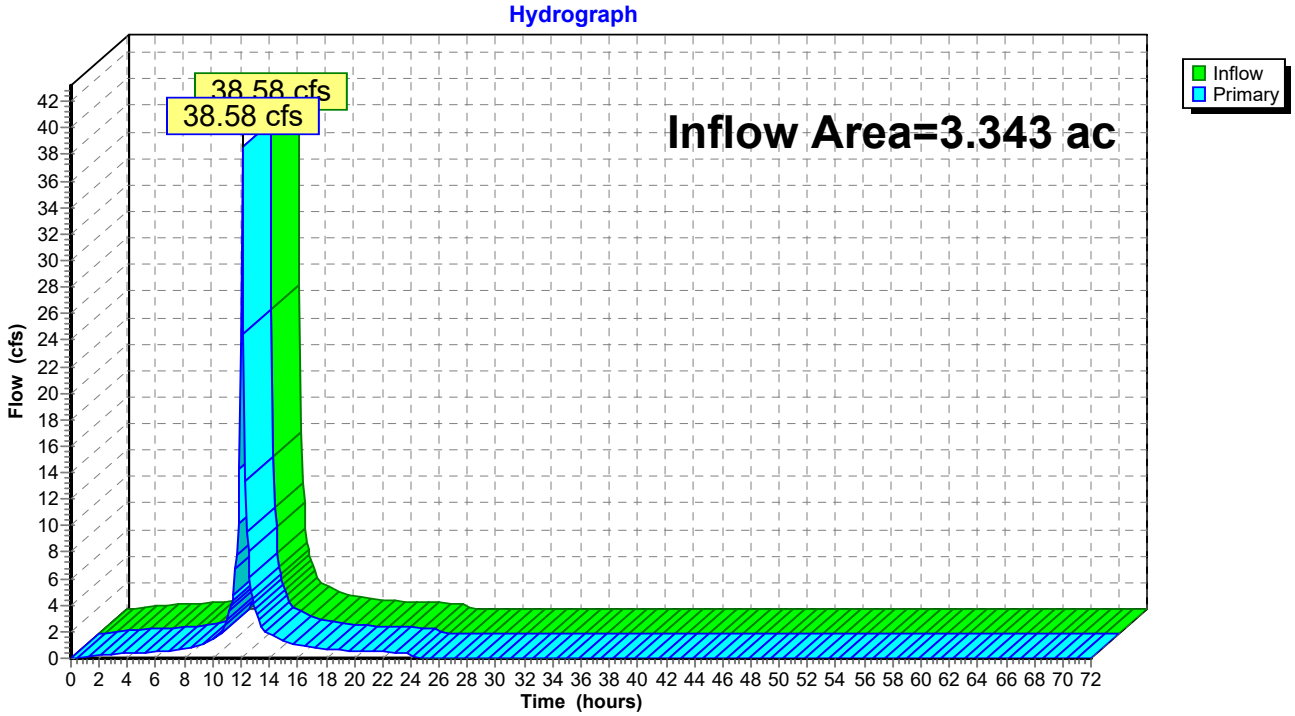


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 10.91" for 100-Year (Future Adj.) event
Inflow = 38.58 cfs @ 12.10 hrs, Volume= 3.039 af
Primary = 38.58 cfs @ 12.10 hrs, Volume= 3.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

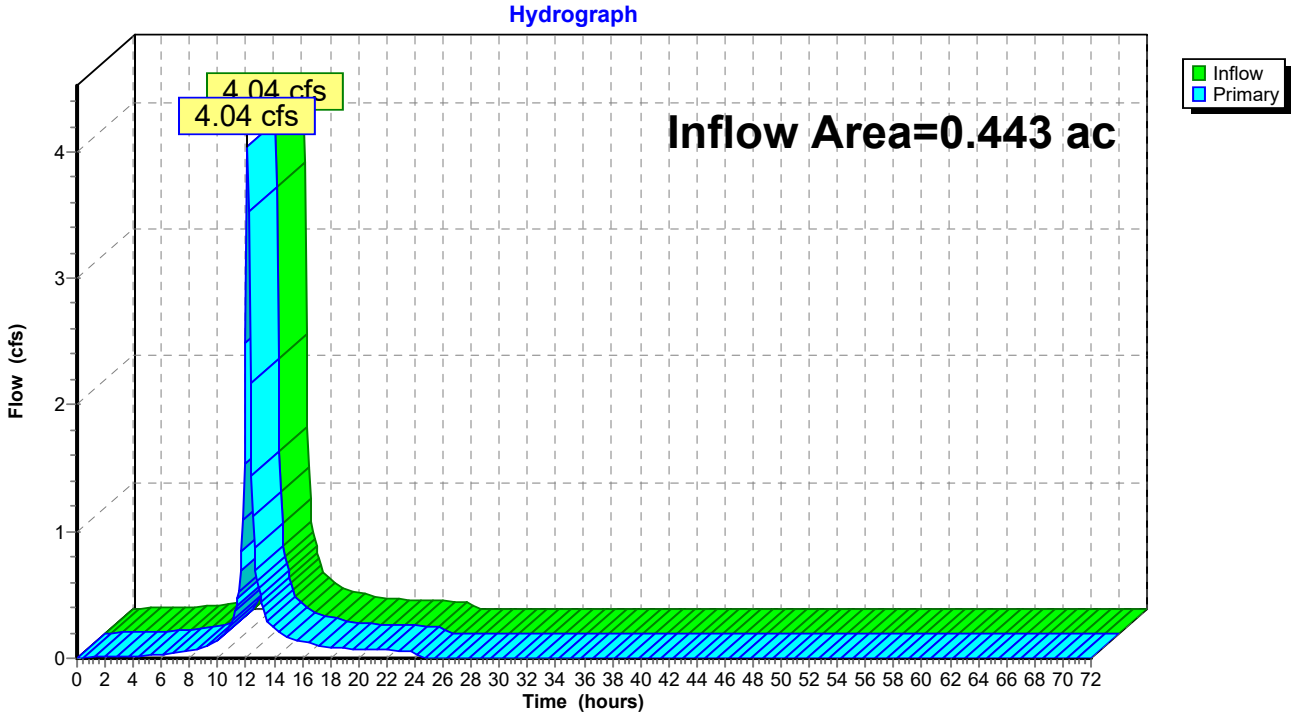


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 9.51" for 100-Year (Future Adj.) event
Inflow = 4.04 cfs @ 12.13 hrs, Volume= 0.351 af
Primary = 4.04 cfs @ 12.13 hrs, Volume= 0.351 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

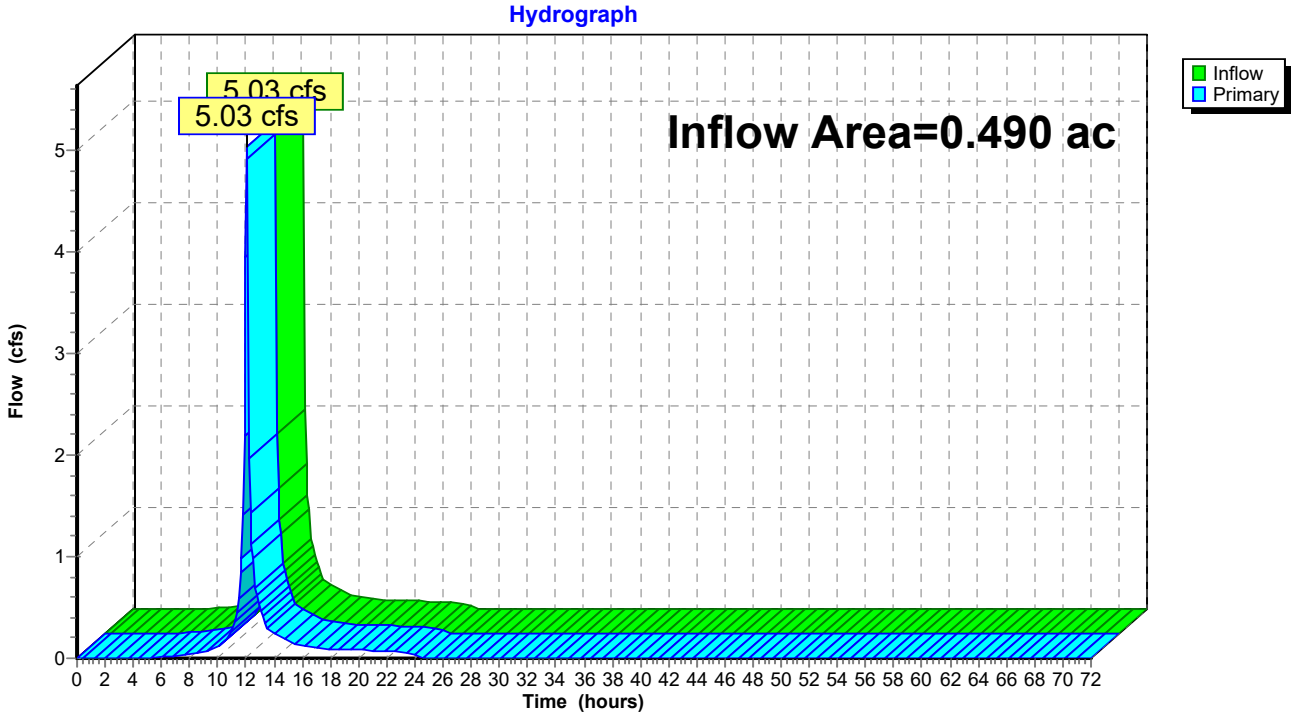


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 8.47" for 100-Year (Future Adj.) event
Inflow = 5.03 cfs @ 12.07 hrs, Volume= 0.346 af
Primary = 5.03 cfs @ 12.07 hrs, Volume= 0.346 af, Atten= 0%, Lag= 0.0 min

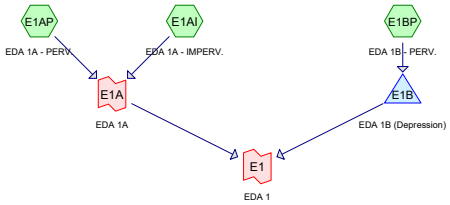
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

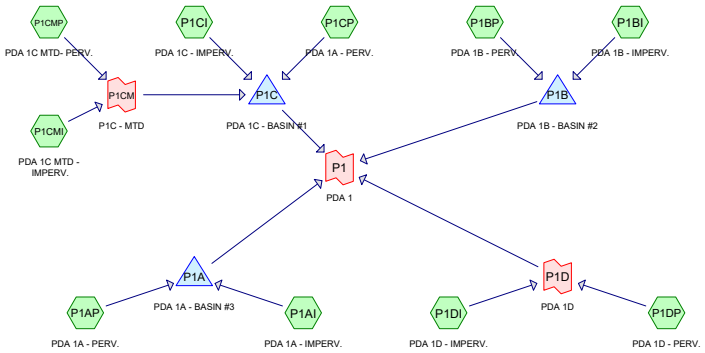
Link P3: PDA 3

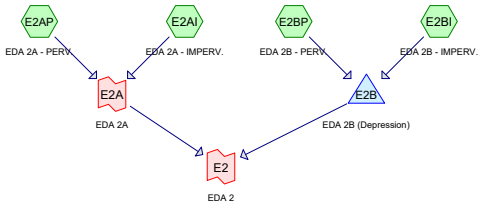


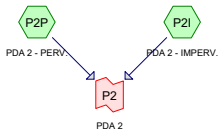
B. WATER QUALITY

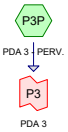
- **Water Quality Storm Hydrograph**
- **Water Quality Storm Basin Drain Time**

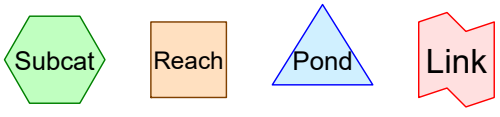












Routing Diagram for EX-PR
Prepared by Bohler Engineering NJ, LLC

Summary for Subcatchment E1AI: EDA 1A - IMPERV.

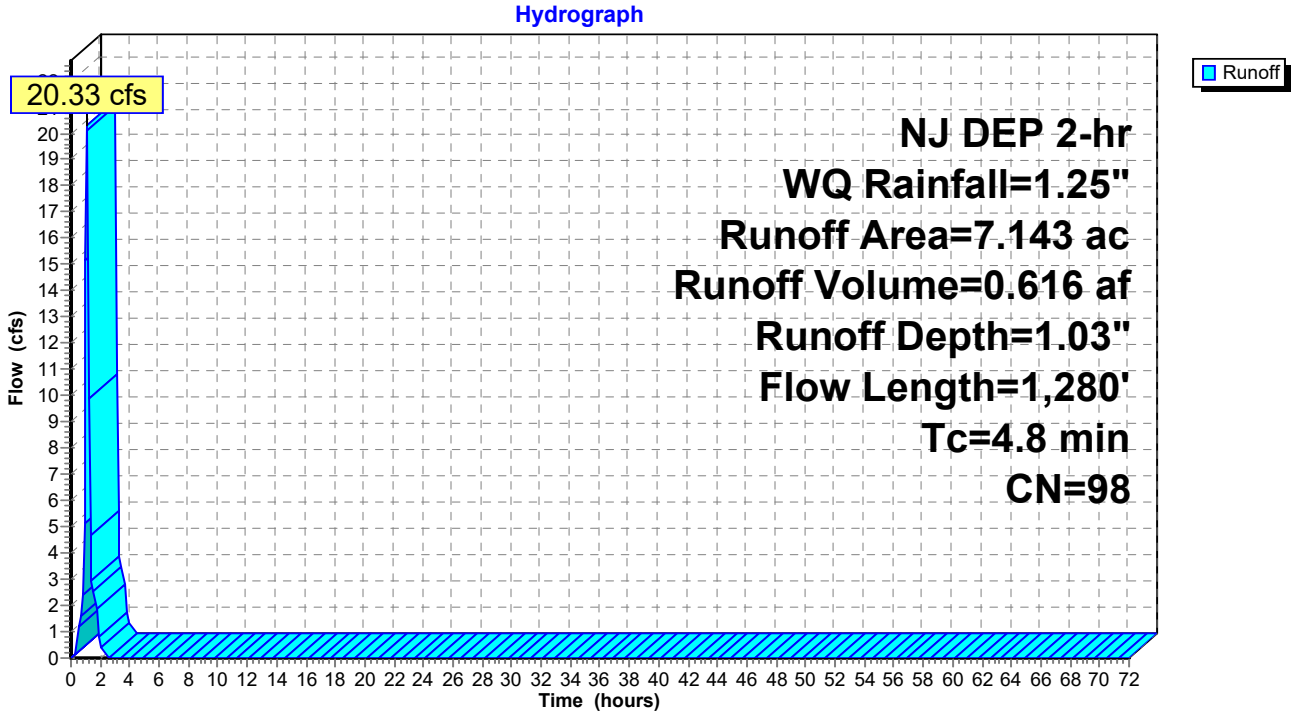
Runoff = 20.33 cfs @ 1.08 hrs, Volume= 0.616 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
7.143	98	Paved parking, HSG C
7.143		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, I-J** Smooth surfaces n= 0.011 P2= 3.34"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow, J-K** Paved Kv= 20.3 fps
0.4	140	0.0100	5.26	6.46	**Pipe Channel, K-L** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	170	0.0110	5.52	6.78	**Pipe Channel, L-M** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	145	0.0150	7.28	12.87	**Pipe Channel, M-N** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.5	175	0.0100	5.94	10.50	**Pipe Channel, N-O** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.6	250	0.0100	7.20	22.62	**Pipe Channel, O-P** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.8	235	0.0025	4.72	33.35	**Pipe Channel, P - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.8	1,280	Total			

Subcatchment E1AI: EDA 1A - IMPERV.



Summary for Subcatchment E1AP: EDA 1A - PERV.

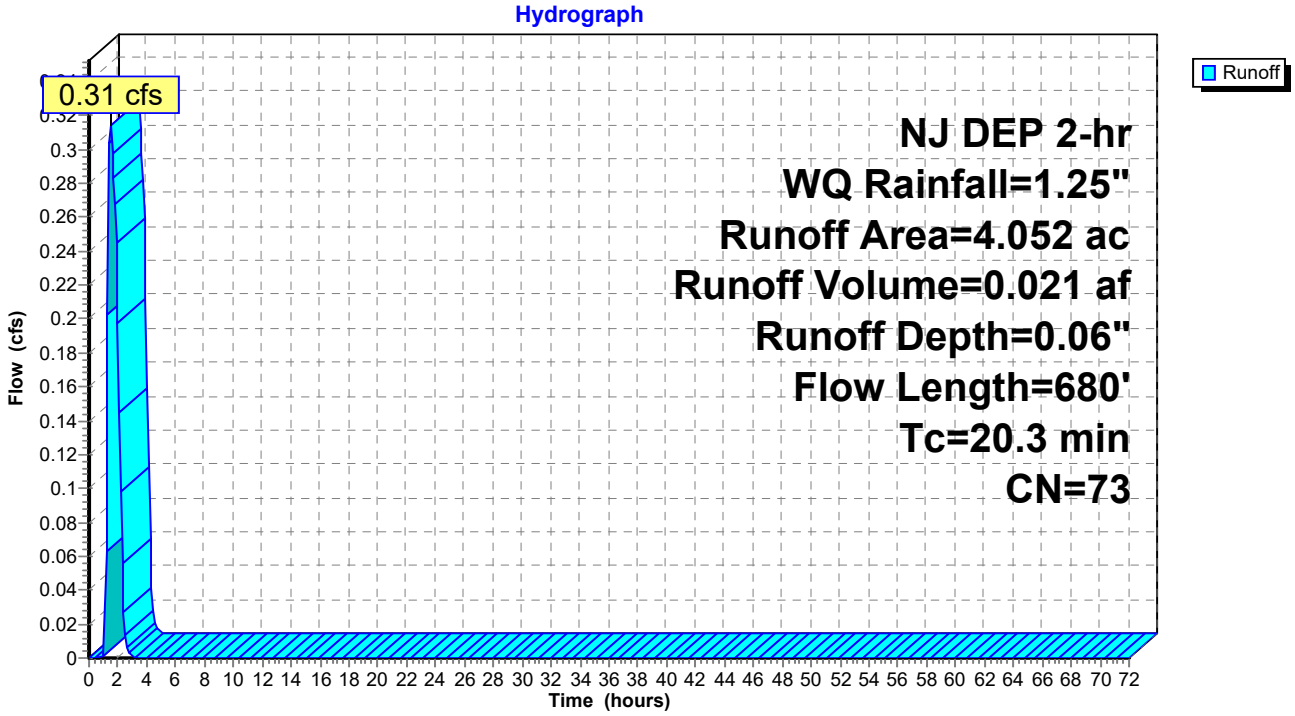
Runoff = 0.31 cfs @ 1.49 hrs, Volume= 0.021 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
3.058	74	>75% Grass cover, Good, HSG C
0.994	70	Woods, Good, HSG C
4.052	73	Weighted Average
4.052		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	46	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
4.6	54	0.0370	0.20		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.34"
2.1	200	0.0500	1.57		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
20.3	680	Total			

Subcatchment E1AP: EDA 1A - PERV.



Summary for Subcatchment E1BP: EDA 1B - PERV.

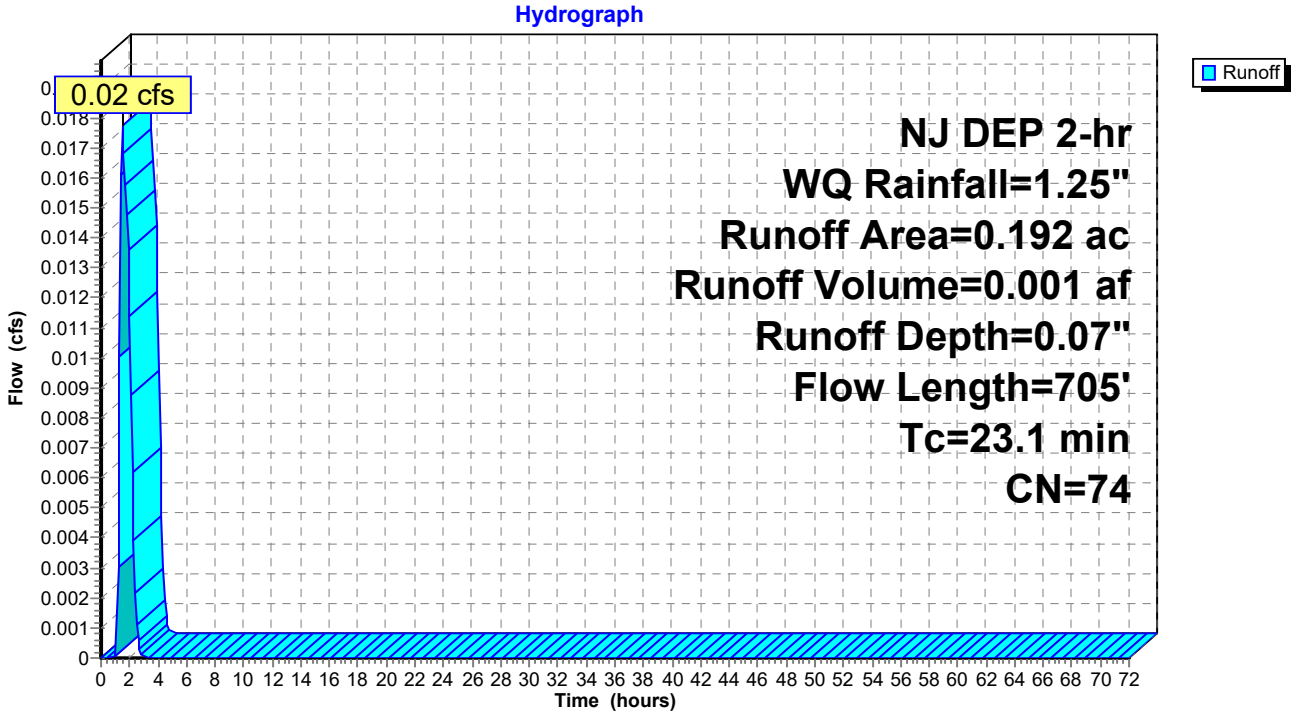
Runoff = 0.02 cfs @ 1.51 hrs, Volume= 0.001 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.192	74	>75% Grass cover, Good, HSG C
0.192		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	30	0.0020	0.05		**Sheet Flow, DA-DB** Grass: Short n= 0.150 P2= 3.34"
2.1	40	0.0020	0.31		**Shallow Concentrated Flow, DB-DC** Short Grass Pasture Kv= 7.0 fps
2.9	255	0.0450	1.48		**Shallow Concentrated Flow, DD-D** Short Grass Pasture Kv= 7.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.3	20	0.0500	1.12		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, G-H** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, H-POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
23.1	705	Total			

Subcatchment E1BP: EDA 1B - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

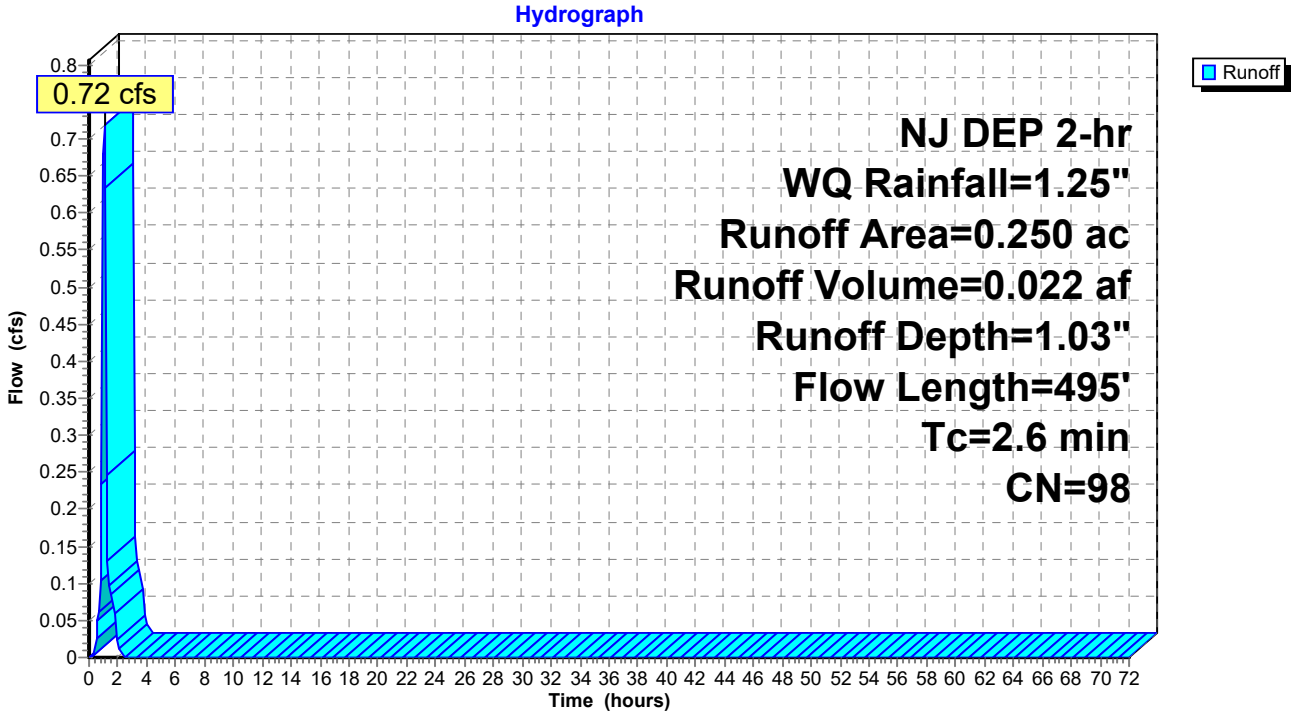
Runoff = 0.72 cfs @ 1.04 hrs, Volume= 0.022 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.250		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.76		**Sheet Flow, I-T** Smooth surfaces n= 0.011 P2= 3.34"
0.1	10	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	495	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

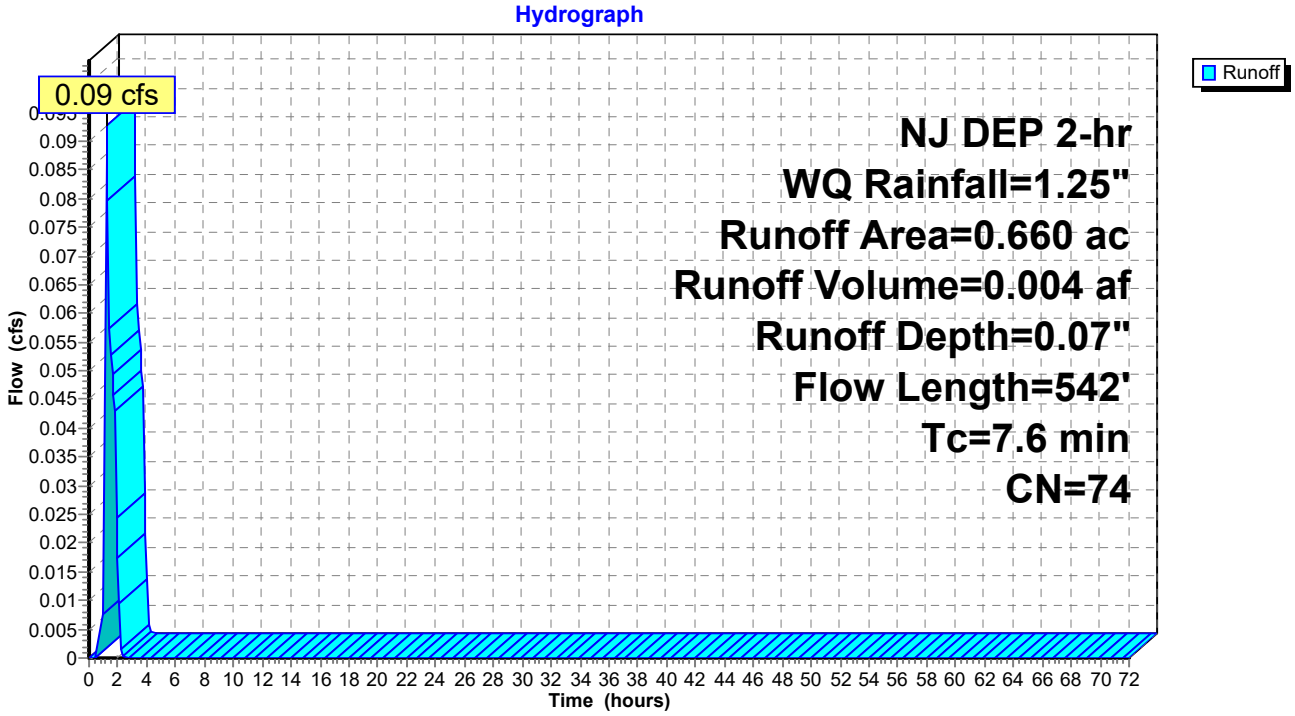
Runoff = 0.09 cfs @ 1.24 hrs, Volume= 0.004 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.660	74	>75% Grass cover, Good, HSG C
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	55	0.0300	0.18		**Sheet Flow, Q-R** Grass: Short n= 0.150 P2= 3.34"
0.4	17	0.0100	0.75		**Sheet Flow, R-S** Smooth surfaces n= 0.011 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, S-T** Paved Kv= 20.3 fps
0.2	35	0.0250	3.21		**Shallow Concentrated Flow, T-U** Paved Kv= 20.3 fps
0.3	50	0.0250	3.21		**Shallow Concentrated Flow, U-V** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, V - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.6	542	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

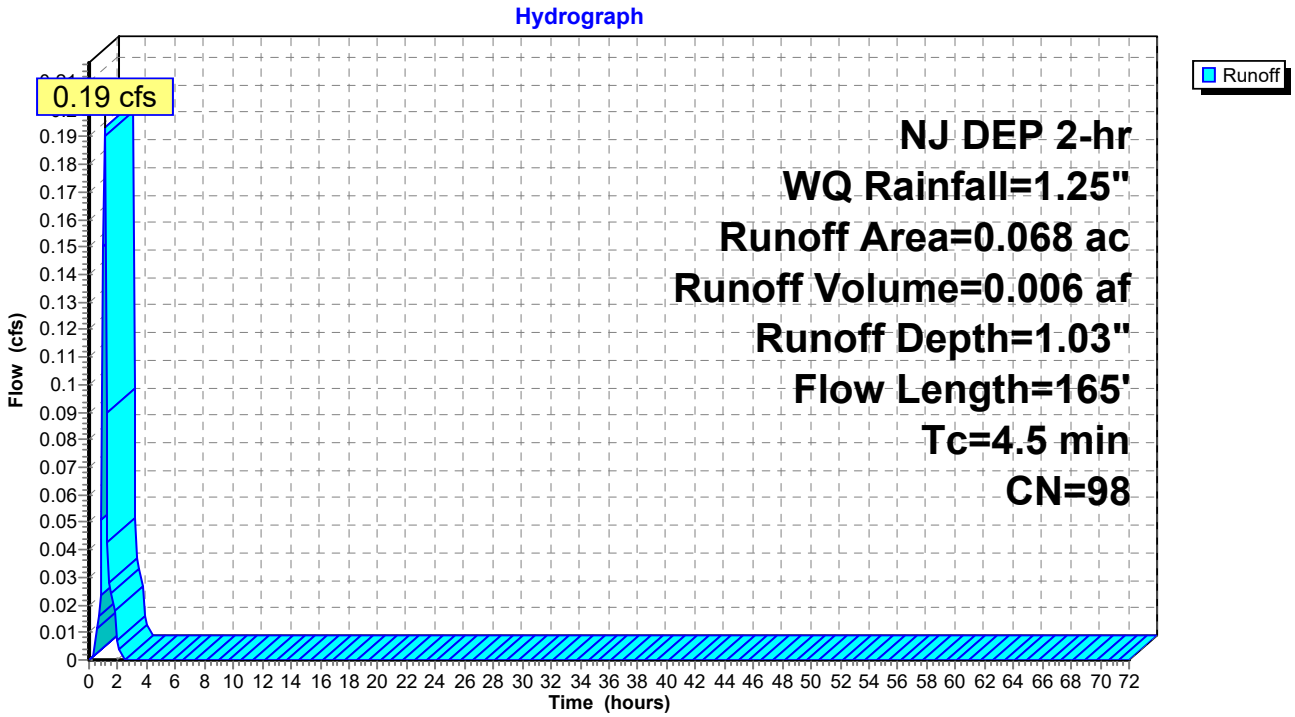
Runoff = 0.19 cfs @ 1.08 hrs, Volume= 0.006 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.068	98	Paved parking, HSG C
0.068		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ-POA 2** Paved Kv= 20.3 fps
4.5	165	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

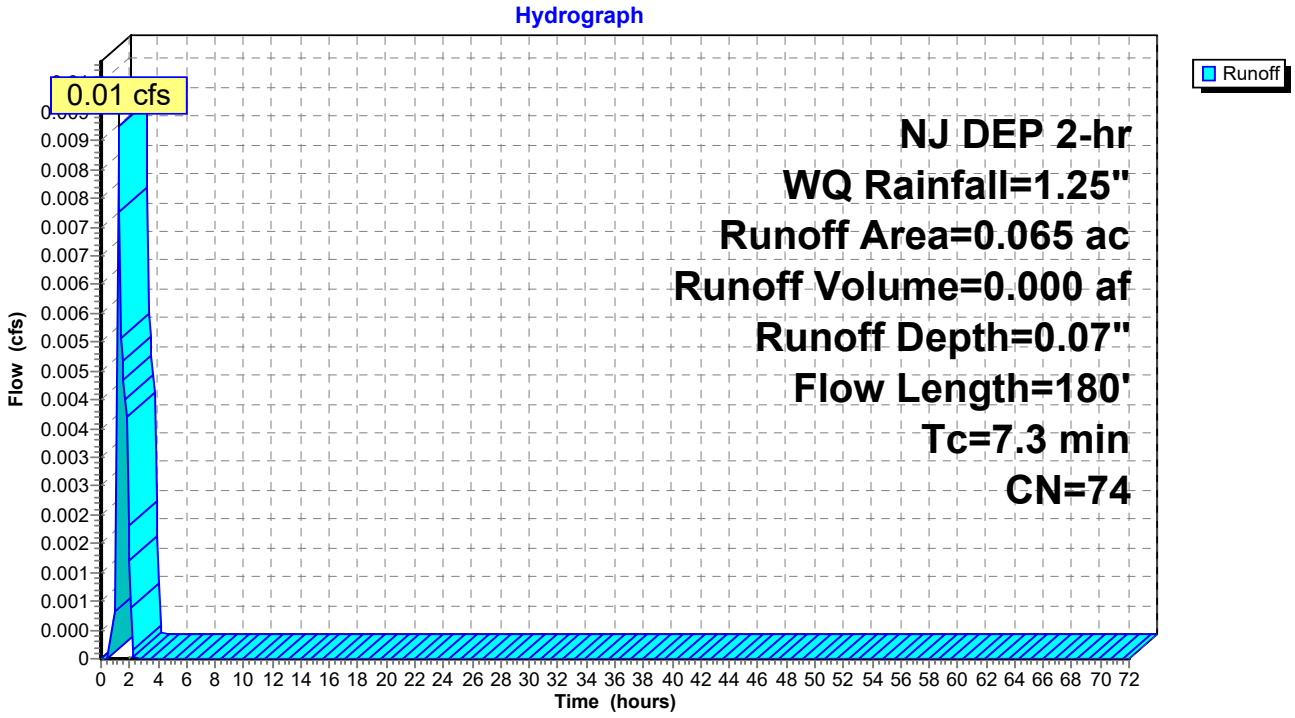
Runoff = 0.01 cfs @ 1.24 hrs, Volume= 0.000 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.065	74	>75% Grass cover, Good, HSG C
0.065		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	15	0.0100	0.09		**Sheet Flow, DE-DF** Grass: Short n= 0.150 P2= 3.34"
1.0	60	0.0100	0.96		**Sheet Flow, DF-DG** Smooth surfaces n= 0.011 P2= 3.34"
0.6	30	0.0150	0.86		**Shallow Concentrated Flow, DG-DH** Short Grass Pasture Kv= 7.0 fps
2.7	50	0.0020	0.31		**Shallow Concentrated Flow, DI-DJ** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0075	1.76		**Shallow Concentrated Flow, DJ - POA 2** Paved Kv= 20.3 fps
7.3	180	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment E3P: EDA 3 - PERV.

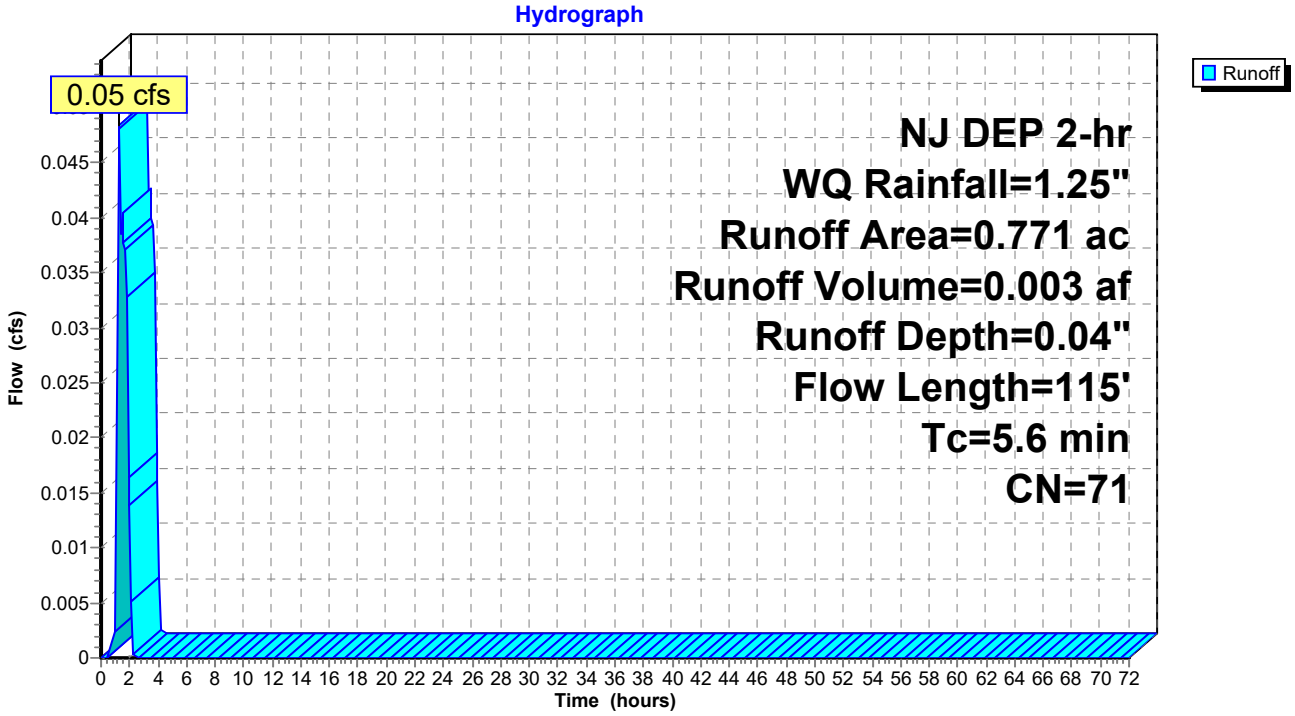
Runoff = 0.05 cfs @ 1.27 hrs, Volume= 0.003 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.238	74	>75% Grass cover, Good, HSG C
0.533	70	Woods, Good, HSG C
0.771	71	Weighted Average
0.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0125	0.10		**Sheet Flow, W-X** Grass: Short n= 0.150 P2= 3.34"
2.4	95	0.0175	0.66		**Shallow Concentrated Flow, X - POA 3** Woodland Kv= 5.0 fps
5.6	115	Total			

Subcatchment E3P: EDA 3 - PERV.



Summary for Subcatchment P1AI: PDA 1A - IMPERV.

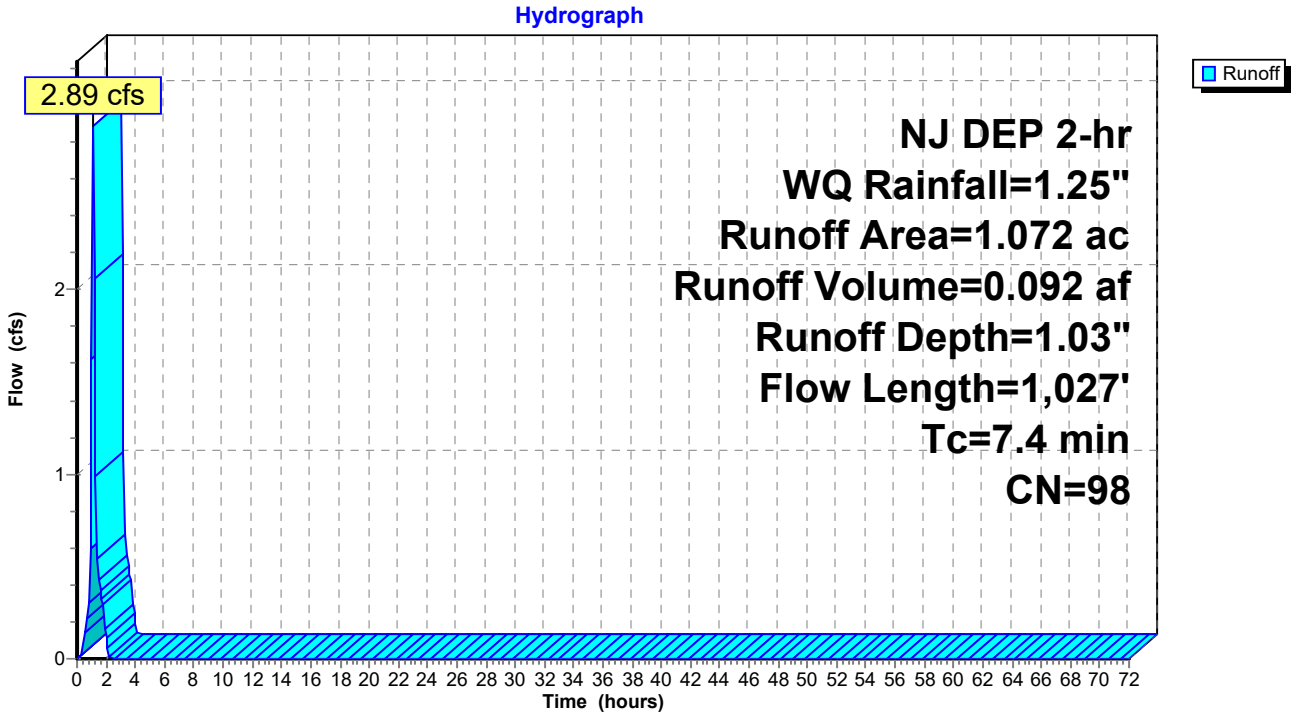
Runoff = 2.89 cfs @ 1.11 hrs, Volume= 0.092 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.072	98	Paved parking, HSG C
1.072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	65	0.0150	0.34		**Sheet Flow, F-G** Fallow n= 0.050 P2= 3.34"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
1.7	385	0.0050	3.72	4.57	**Pipe Channel, H-T** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.0	497	0.0050	4.20	7.43	**Pipe Channel, H-T** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
7.4	1,027	Total			

Subcatchment P1AI: PDA 1A - IMPERV.



Summary for Subcatchment P1AP: PDA 1A - PERV.

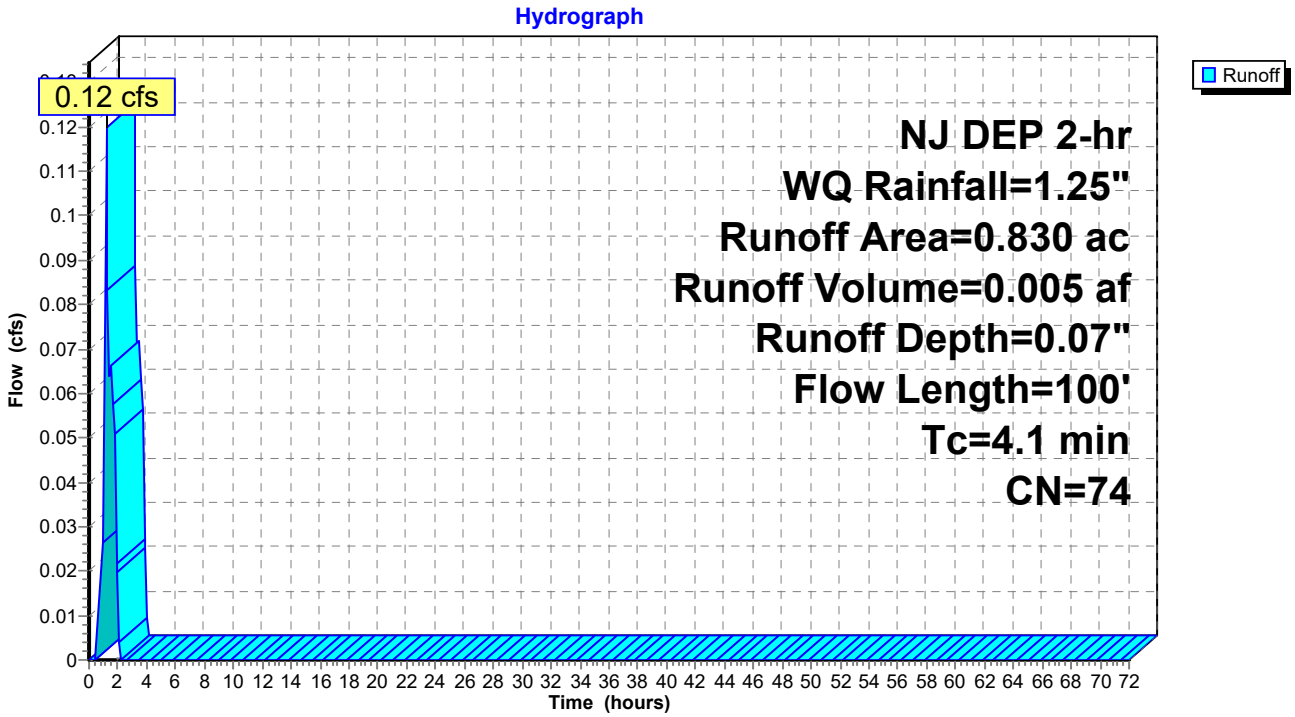
Runoff = 0.12 cfs @ 1.20 hrs, Volume= 0.005 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.830	74	>75% Grass cover, Good, HSG C
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	10	0.0150	0.10		**Sheet Flow, U-V** Grass: Short n= 0.150 P2= 3.34"
2.0	45	0.2000	0.37		**Sheet Flow, V-W** Grass: Short n= 0.150 P2= 3.34"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, W-X** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.3000	3.83		**Shallow Concentrated Flow, X-Y** Short Grass Pasture Kv= 7.0 fps
4.1	100	Total			

Subcatchment P1AP: PDA 1A - PERV.



Summary for Subcatchment P1BI: PDA 1B - IMPERV.

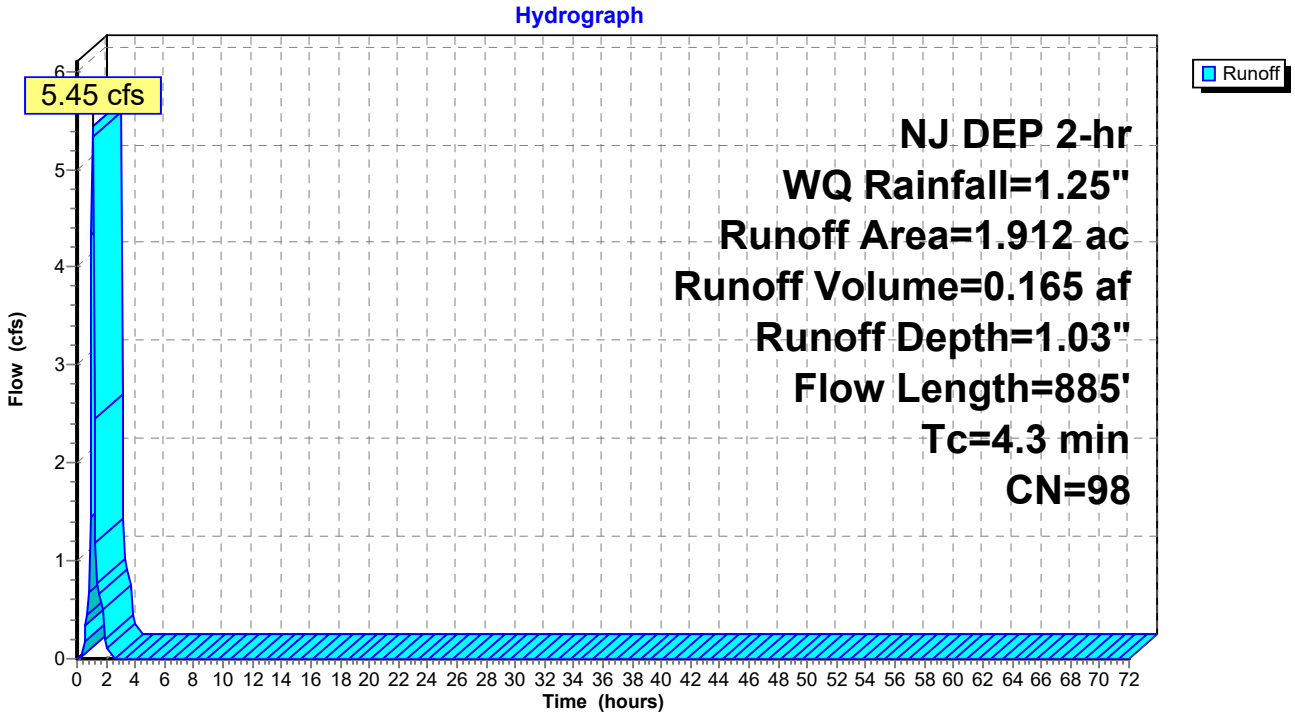
Runoff = 5.45 cfs @ 1.08 hrs, Volume= 0.165 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.912	98	Paved parking, HSG C
1.912		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, J-K** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, K-L** Paved Kv= 20.3 fps
2.0	506	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
4.3	885	Total			

Subcatchment P1BI: PDA 1B - IMPERV.



Summary for Subcatchment P1BP: PDA 1B - PERV.

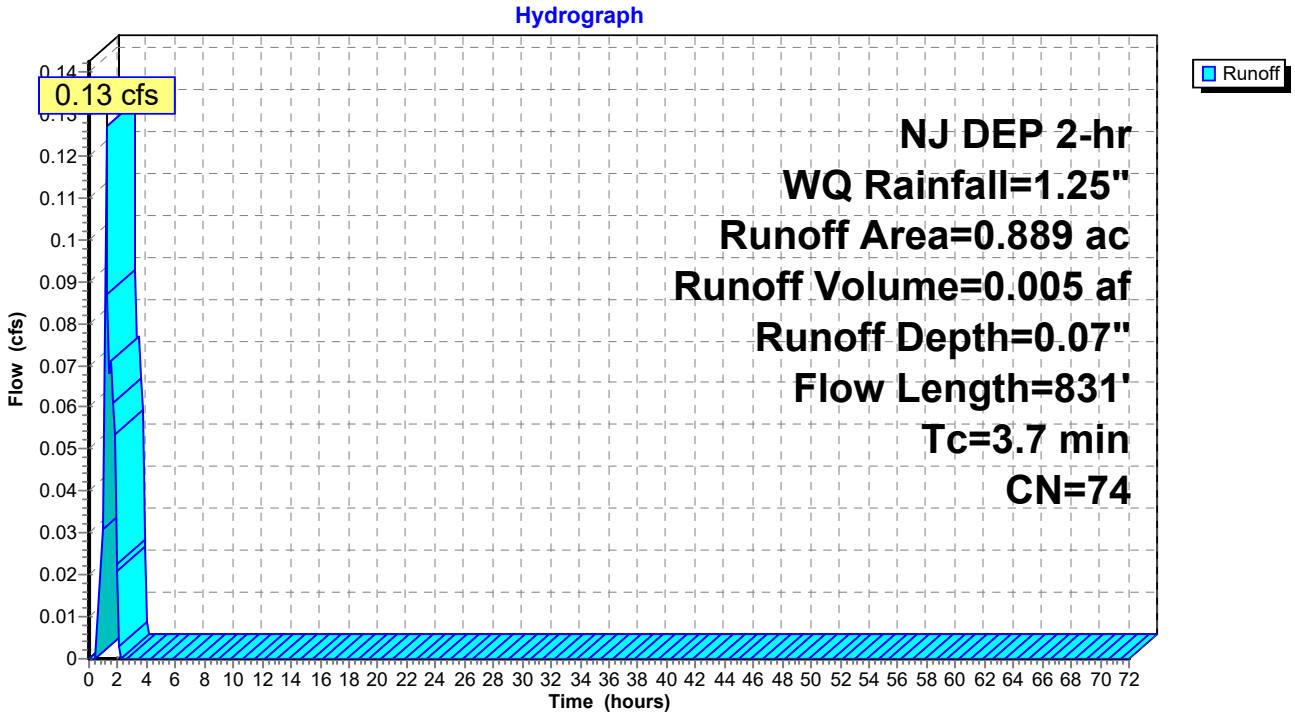
Runoff = 0.13 cfs @ 1.20 hrs, Volume= 0.005 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.889	74	>75% Grass cover, Good, HSG C
0.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3000	0.32		**Sheet Flow, N-O** Grass: Short n= 0.150 P2= 3.34"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, O-L** Paved Kv= 20.3 fps
2.0	507	0.0050	4.20	7.43	**Pipe Channel, L-M** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.9	264	0.0050	5.09	16.00	**Pipe Channel, L-M** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.7	831	Total			

Subcatchment P1BP: PDA 1B - PERV.



Summary for Subcatchment P1CI: PDA 1C - IMPERV.

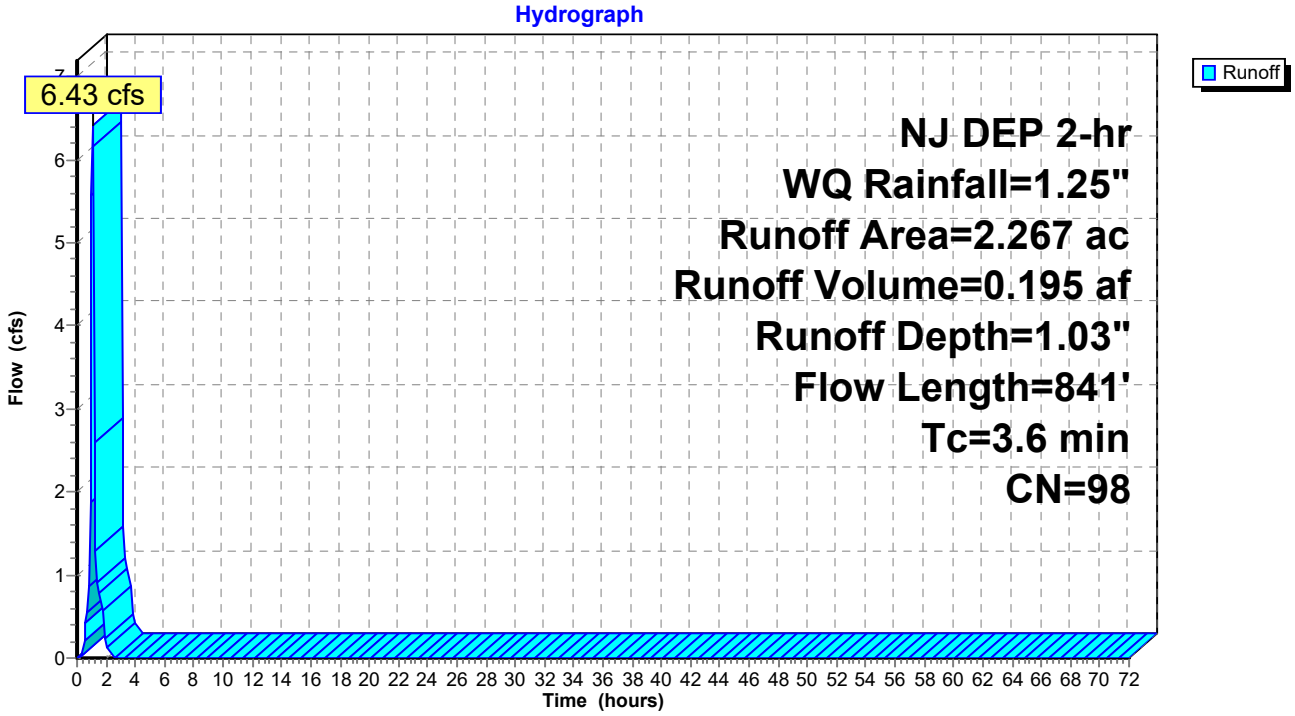
Runoff = 6.43 cfs @ 1.06 hrs, Volume= 0.195 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
2.267	98	Roofs, HSG C
2.267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, P-Q** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, Q-R** Paved Kv= 20.3 fps
0.1	18	0.0100	3.71	0.73	**Pipe Channel, R-S** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
1.9	637	0.0060	5.58	17.52	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	26	0.0100	7.20	22.62	**Pipe Channel, S-I** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
3.6	841	Total			

Subcatchment P1CI: PDA 1C - IMPERV.



Summary for Subcatchment P1CMI: PDA 1C MTD - IMPERV.

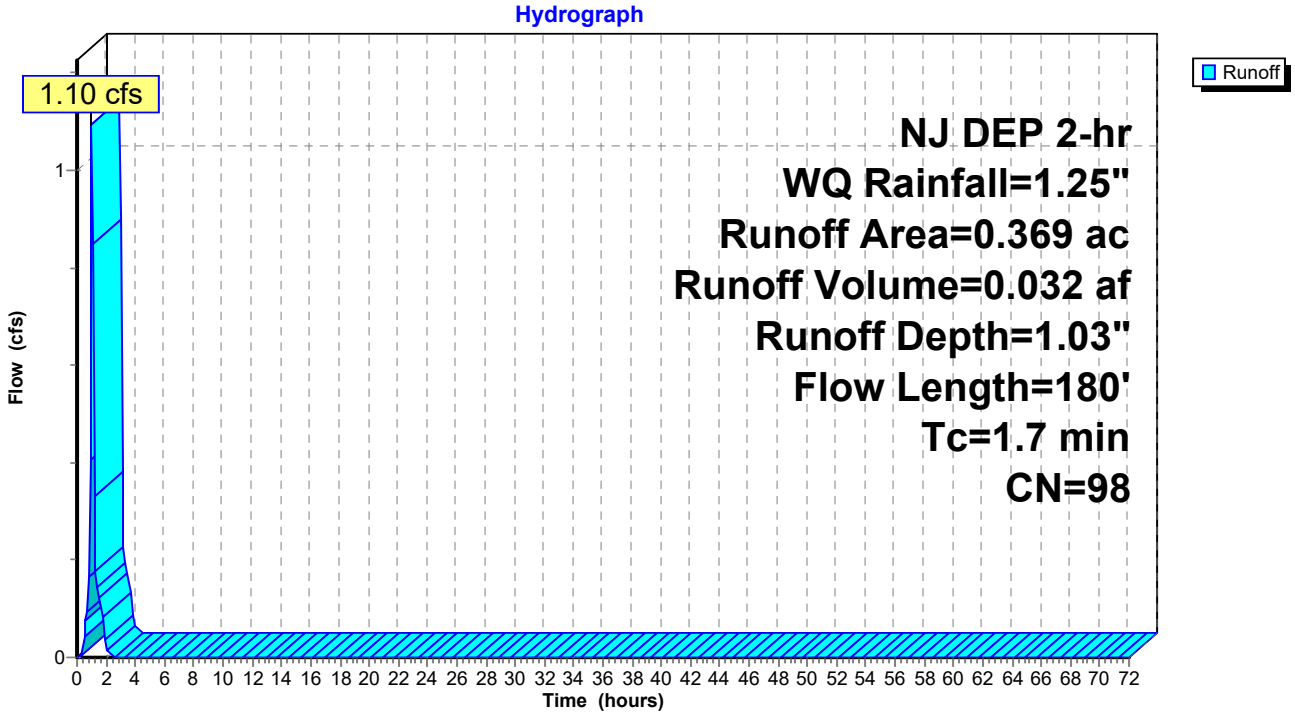
Runoff = 1.10 cfs @ 1.03 hrs, Volume= 0.032 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.369	98	Paved parking, HSG C
0.369		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		**Sheet Flow, AI-AJ** Smooth surfaces n= 0.011 P2= 3.34"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, AJ-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
1.7	180	Total			

Subcatchment P1CMI: PDA 1C MTD - IMPERV.



Summary for Subcatchment P1CMP: PDA 1C MTD- PERV.

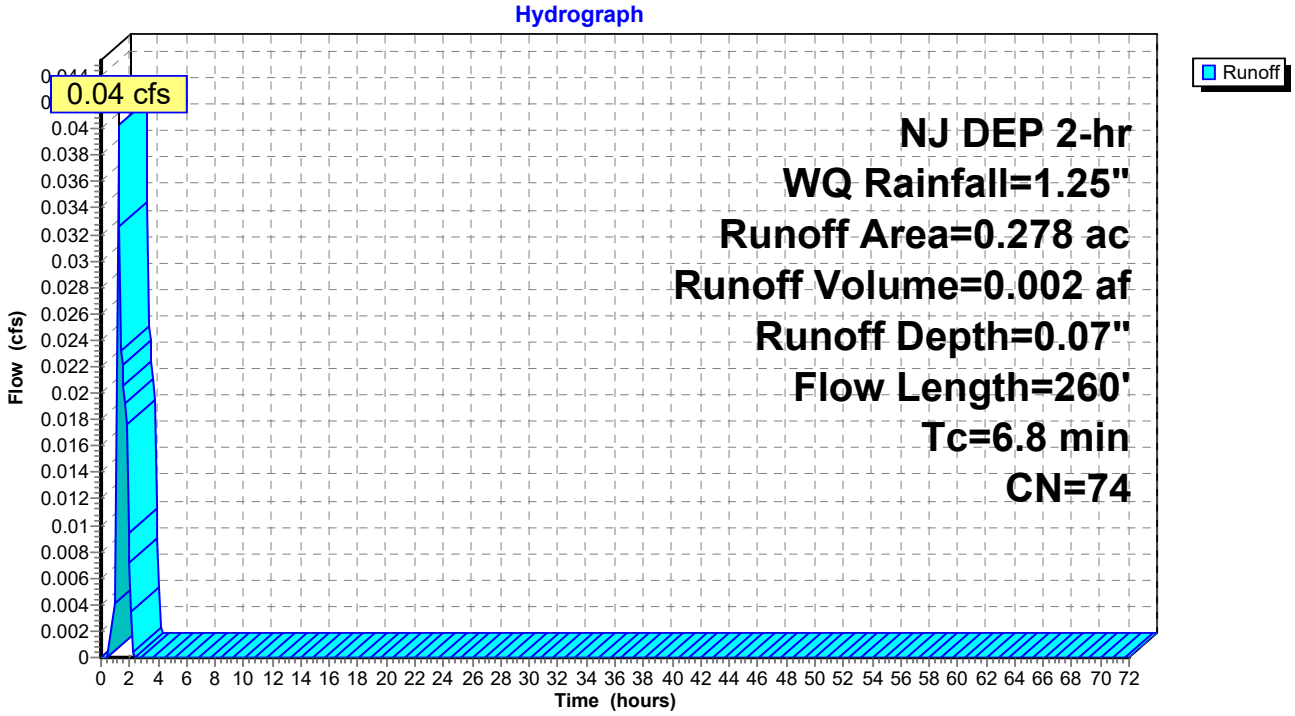
Runoff = 0.04 cfs @ 1.23 hrs, Volume= 0.002 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.278	74	>75% Grass cover, Good, HSG C
0.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	60	0.0280	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.6	95	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.3	40	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.8	260	Total			

Subcatchment P1CMP: PDA 1C MTD- PERV.



Summary for Subcatchment P1CP: PDA 1A - PERV.

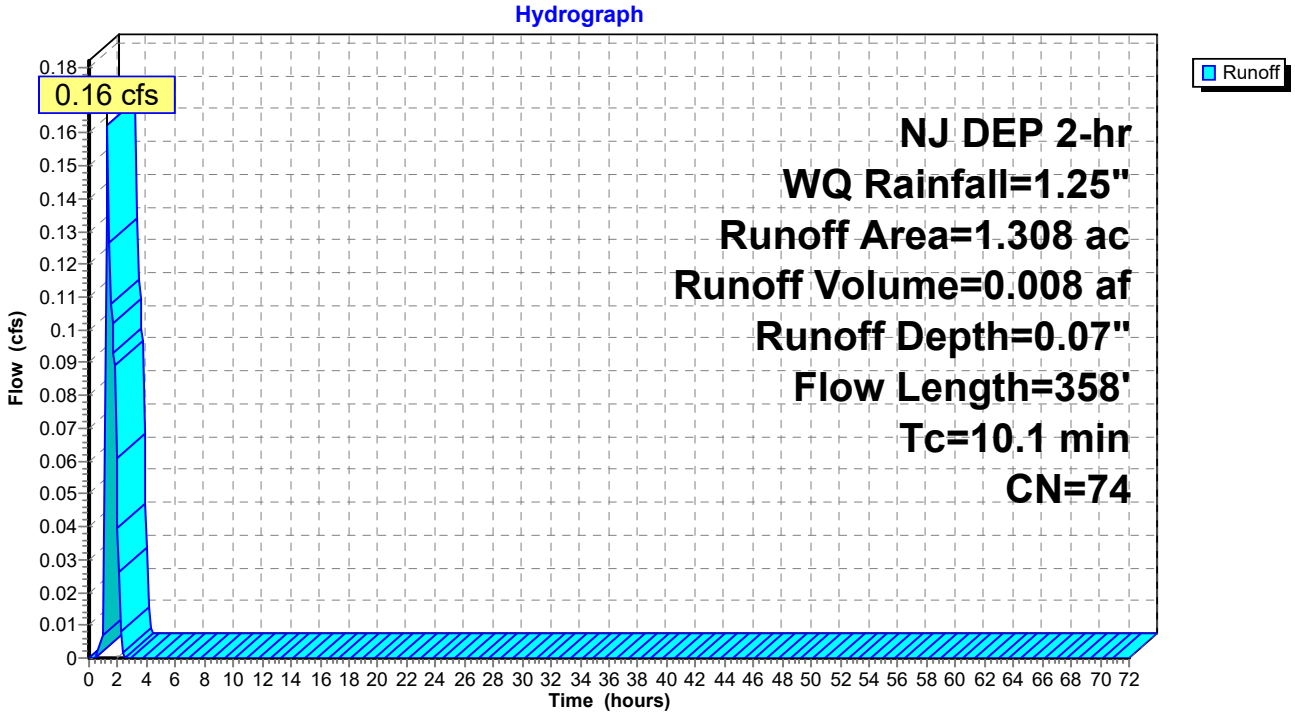
Runoff = 0.16 cfs @ 1.29 hrs, Volume= 0.008 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.308	74	>75% Grass cover, Good, HSG C
1.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	60	0.0100	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.34"
0.3	45	0.0200	2.87		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	65	0.0050	3.72	4.57	**Pipe Channel, D-AM** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.5	98	0.0025	2.97	5.25	**Pipe Channel, AM-E** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
10.1	358	Total			

Subcatchment P1CP: PDA 1A - PERV.



Summary for Subcatchment P1DI: PDA 1D - IMPERV.

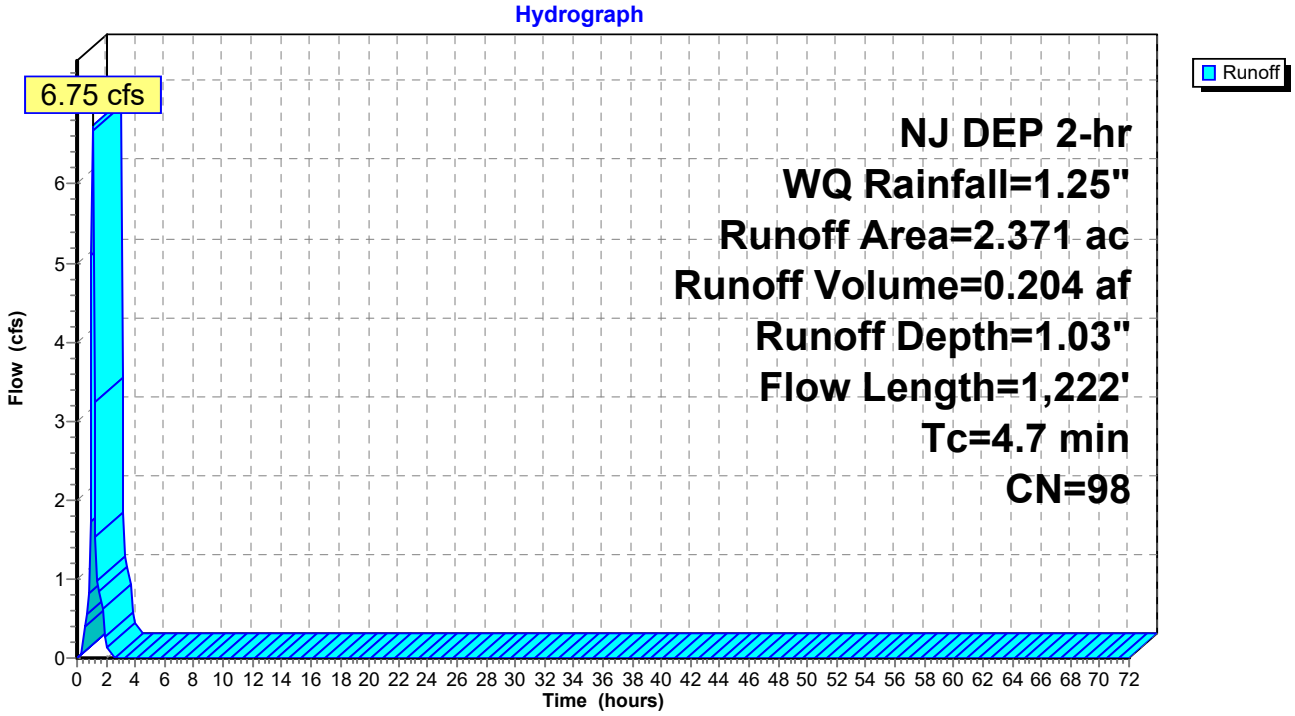
Runoff = 6.75 cfs @ 1.08 hrs, Volume= 0.204 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
2.371	98	Roofs, HSG C
2.371		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		**Sheet Flow, AL-AE** Smooth surfaces n= 0.011 P2= 3.34"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow, AE-AF** Paved Kv= 20.3 fps
0.1	20	0.0100	3.71	0.73	**Pipe Channel, AF-AG** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
2.5	882	0.0050	5.91	29.00	**Pipe Channel, AG-AH** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Concrete pipe, bends & connections
0.6	160	0.0025	4.72	33.35	**Pipe Channel, AH - POA 1** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Concrete pipe, bends & connections
4.7	1,222	Total			

Subcatchment P1DI: PDA 1D - IMPERV.



Summary for Subcatchment P1DP: PDA 1D - PERV.

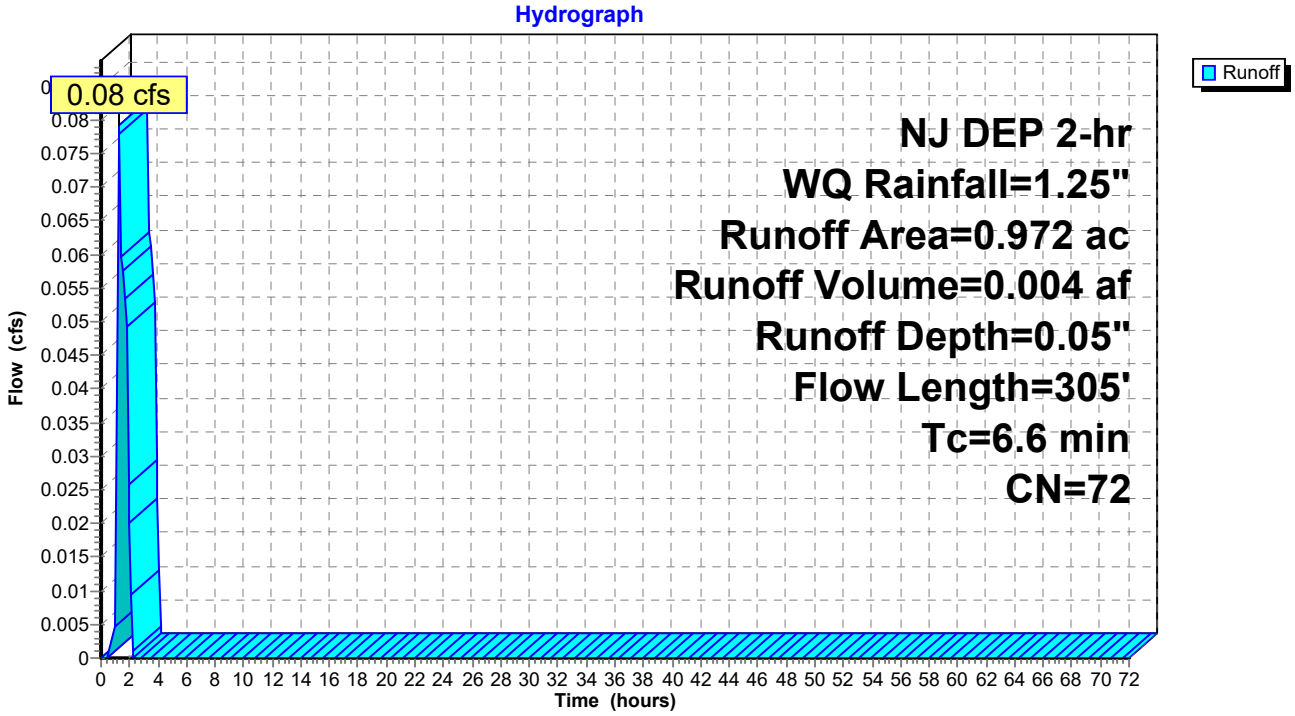
Runoff = 0.08 cfs @ 1.26 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.547	74	>75% Grass cover, Good, HSG C
0.425	70	Woods, Good, HSG C
0.972	72	Weighted Average
0.972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	60	0.2000	0.39		**Sheet Flow, Z-AA** Grass: Short n= 0.150 P2= 3.34"
0.5	30	0.0200	0.99		**Shallow Concentrated Flow, AA-AB** Short Grass Pasture Kv= 7.0 fps
3.3	170	0.0300	0.87		**Shallow Concentrated Flow, AB-AC** Woodland Kv= 5.0 fps
0.3	30	0.0450	1.48		**Shallow Concentrated Flow, AC-AD** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.0500	11.77	14.44	**Pipe Channel, AD - POA 1** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
6.6	305	Total			

Subcatchment P1DP: PDA 1D - PERV.



Summary for Subcatchment P2I: PDA 2 - IMPERV.

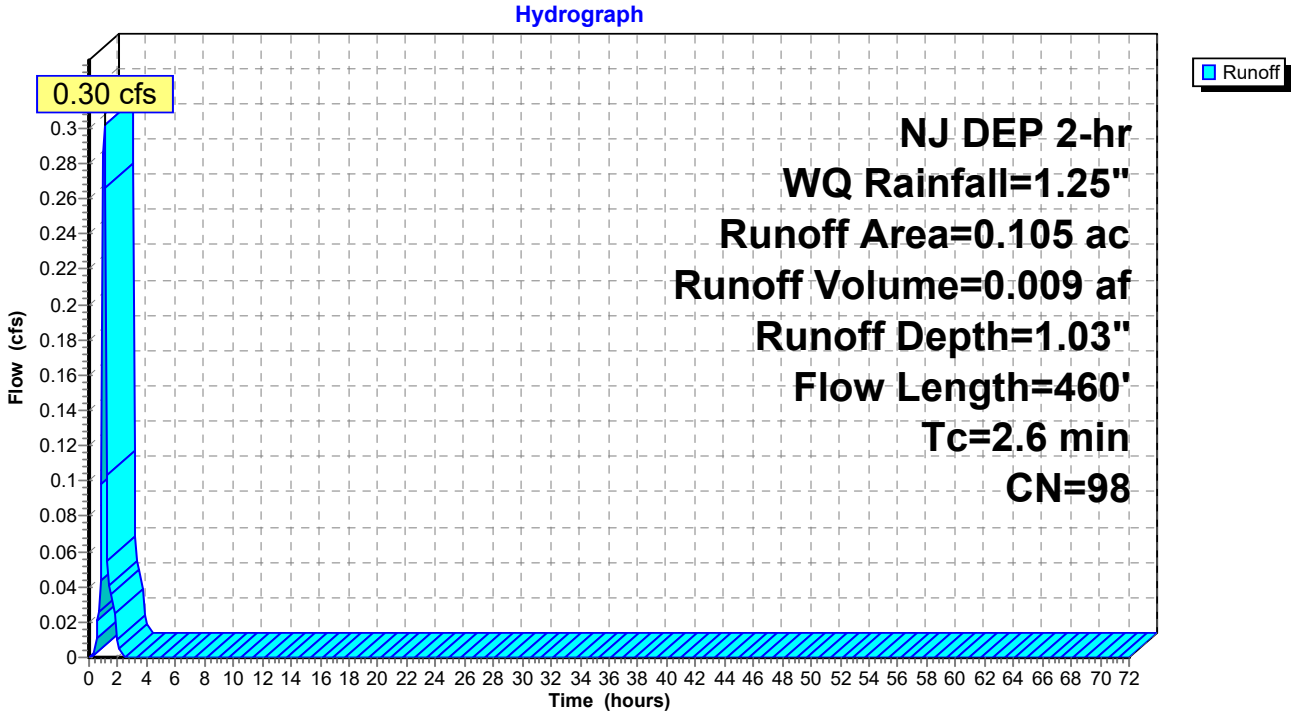
Runoff = 0.30 cfs @ 1.04 hrs, Volume= 0.009 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.105	98	Paved parking, HSG C
0.105		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0200	1.33		**Sheet Flow, AE-AH** Smooth surfaces n= 0.011 P2= 3.34"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, AH-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.6	460	Total			

Subcatchment P2I: PDA 2 - IMPERV.



Summary for Subcatchment P2P: PDA 2 - PERV.

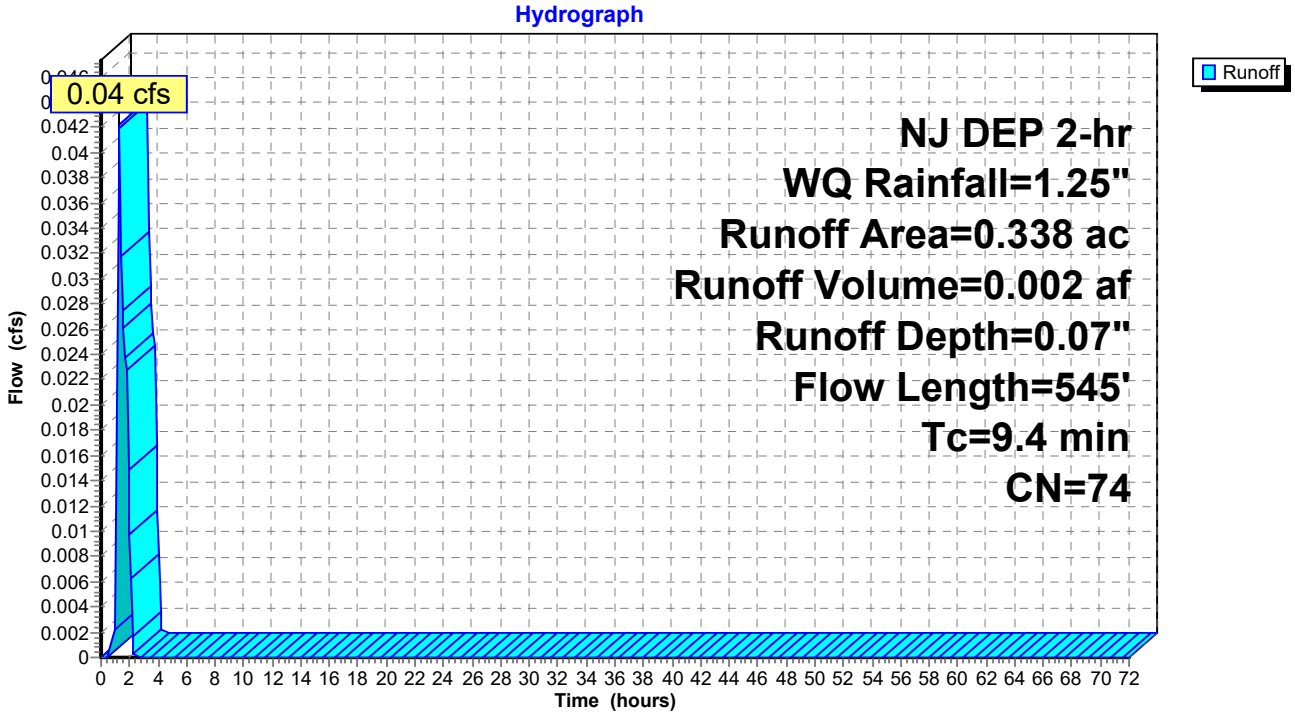
Runoff = 0.04 cfs @ 1.28 hrs, Volume= 0.002 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.338	74	>75% Grass cover, Good, HSG C
0.338		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	75	0.0250	0.18		**Sheet Flow, AE-AF** Grass: Short n= 0.150 P2= 3.34"
1.1	135	0.0100	2.03		**Shallow Concentrated Flow, AF-AG** Paved Kv= 20.3 fps
1.3	335	0.0050	4.20	7.43	**Pipe Channel, AG - POA 2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
9.4	545	Total			

Subcatchment P2P: PDA 2 - PERV.



Summary for Subcatchment P3P: PDA 3 - PERV.

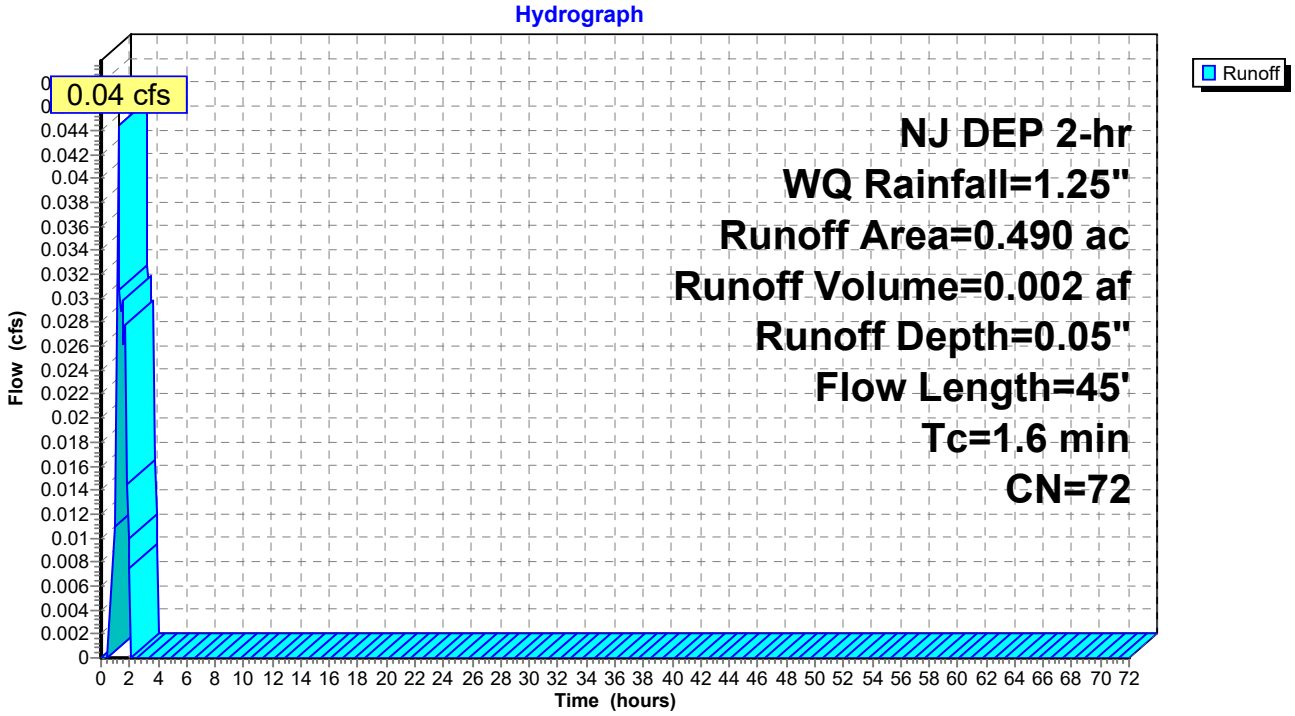
Runoff = 0.04 cfs @ 1.20 hrs, Volume= 0.002 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.305	74	>75% Grass cover, Good, HSG C
0.185	70	Woods, Good, HSG C
0.490	72	Weighted Average
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	31	0.2500	0.38		**Sheet Flow, AI-AJ** Grass: Short n= 0.150 P2= 3.34"
0.2	14	0.0500	1.12		**Shallow Concentrated Flow, AJ - POA 3** Woodland Kv= 5.0 fps
1.6	45	Total			

Subcatchment P3P: PDA 3 - PERV.



Summary for Pond E1B: EDA 1B (Depression)

Inflow Area = 0.192 ac, 0.00% Impervious, Inflow Depth = 0.07" for WQ event
Inflow = 0.02 cfs @ 1.51 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.91' @ 3.40 hrs Surf.Area= 722 sf Storage= 51 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

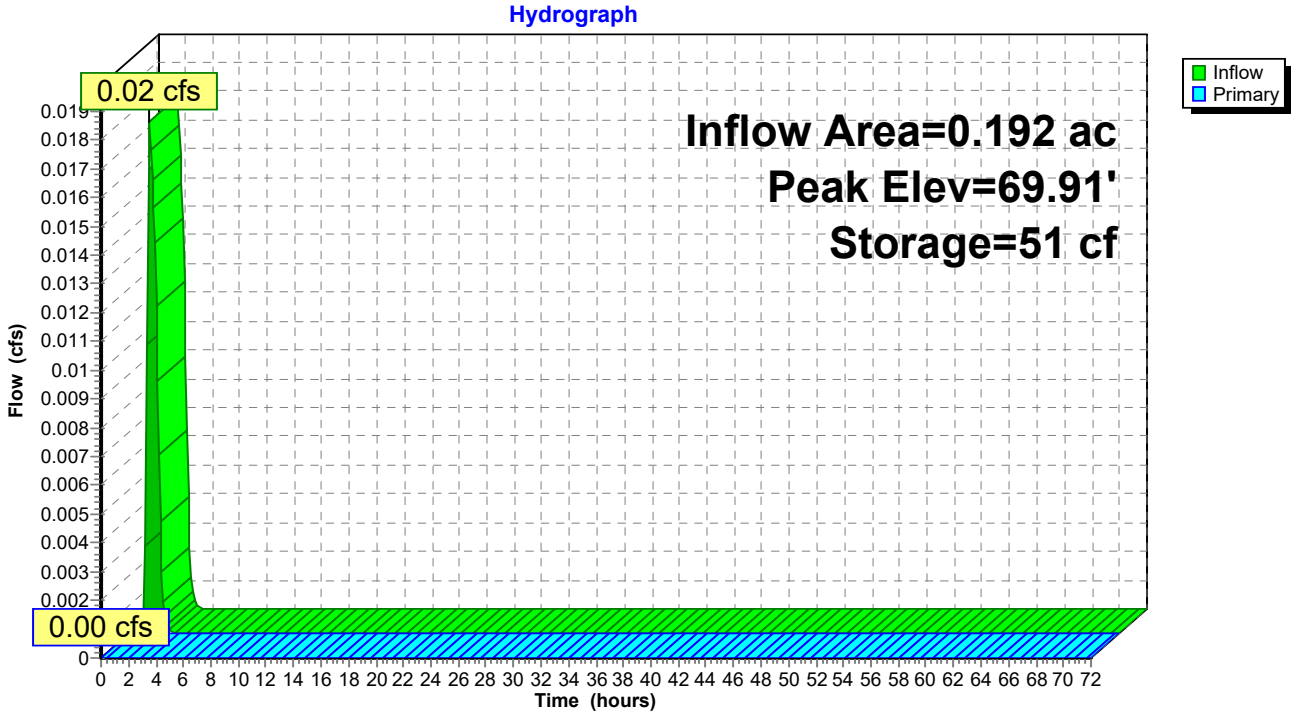
Volume	Invert	Avail.Storage	Storage Description
#1	69.77'	415 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.77	0	0	0
70.00	1,165	134	134
70.06	1,485	80	213
70.16	2,550	202	415

Device	Routing	Invert	Outlet Devices
#1	Primary	70.06'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 61.70 106.20 139.50 176.00 223.60 270.40 298.30 312.70 Elev. (feet) 70.29 70.16 70.10 70.06 70.13 70.19 70.06 70.09 70.29

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.77' (Free Discharge)
1=Asymmetrical Weir (Controls 0.00 cfs)

Pond E1B: EDA 1B (Depression)



Summary for Pond E2B: EDA 2B (Depression)

Inflow Area = 0.133 ac, 51.13% Impervious, Inflow Depth = 0.57" for WQ event
Inflow = 0.20 cfs @ 1.08 hrs, Volume= 0.006 af
Outflow = 0.18 cfs @ 1.12 hrs, Volume= 0.004 af, Atten= 9%, Lag= 2.2 min
Primary = 0.18 cfs @ 1.12 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 69.13' @ 1.13 hrs Surf.Area= 309 sf Storage= 73 cf

Plug-Flow detention time= 18.7 min calculated for 0.004 af (71% of inflow)
Center-of-Mass det. time= 9.4 min (79.6 - 70.2)

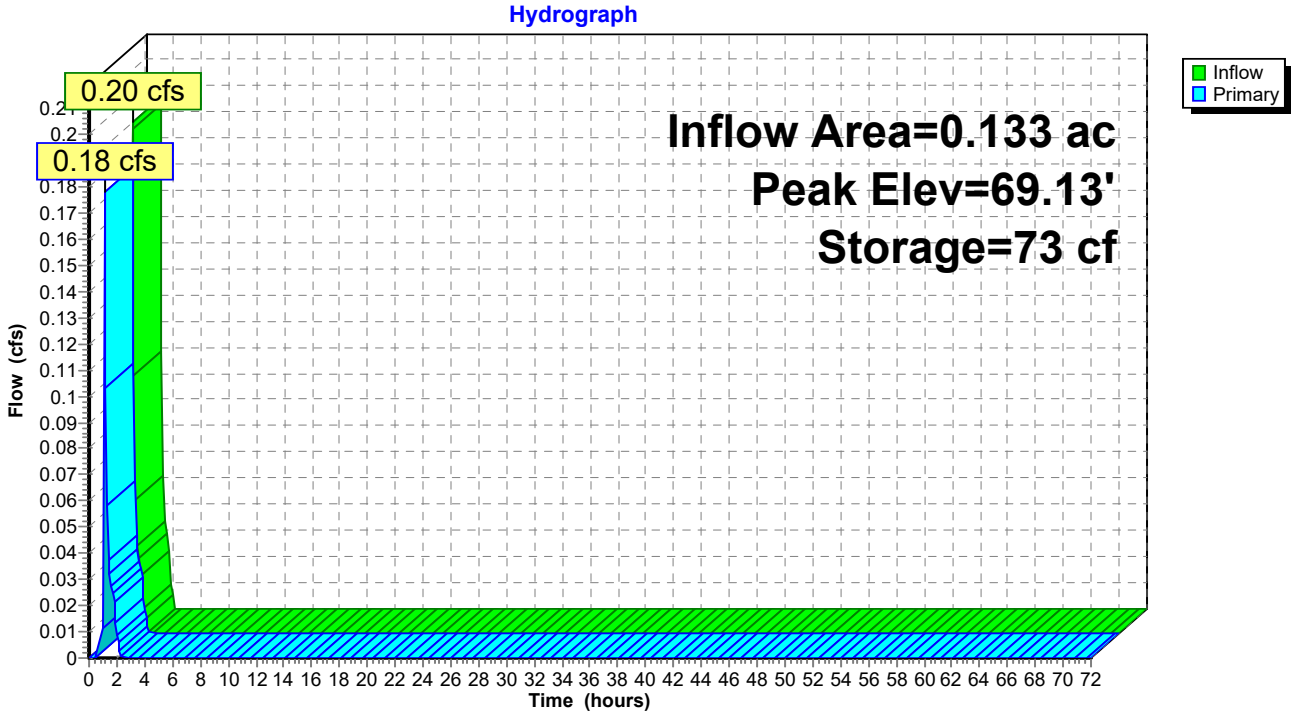
Volume	Invert	Avail.Storage	Storage Description
#1	68.32'	246 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.32	0	0	0
69.00	142	48	48
69.07	170	11	59
69.40	960	186	246

Device	Routing	Invert	Outlet Devices
#1	Primary	69.07'	**Asymmetrical Weir, C= 3.27** Offset (feet) -20.70 0.00 7.70 29.40 41.10 Elev. (feet) 69.40 69.07 69.16 69.11 69.40

Primary OutFlow Max=0.15 cfs @ 1.12 hrs HW=69.12' (Free Discharge)
↑—**1=Asymmetrical Weir** (Weir Controls 0.15 cfs @ 0.28 fps)

Pond E2B: EDA 2B (Depression)



Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 0.62" for WQ event
Inflow = 2.97 cfs @ 1.11 hrs, Volume= 0.098 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 53.63' @ 2.50 hrs Surf.Area= 6,888 sf Storage= 4,248 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	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

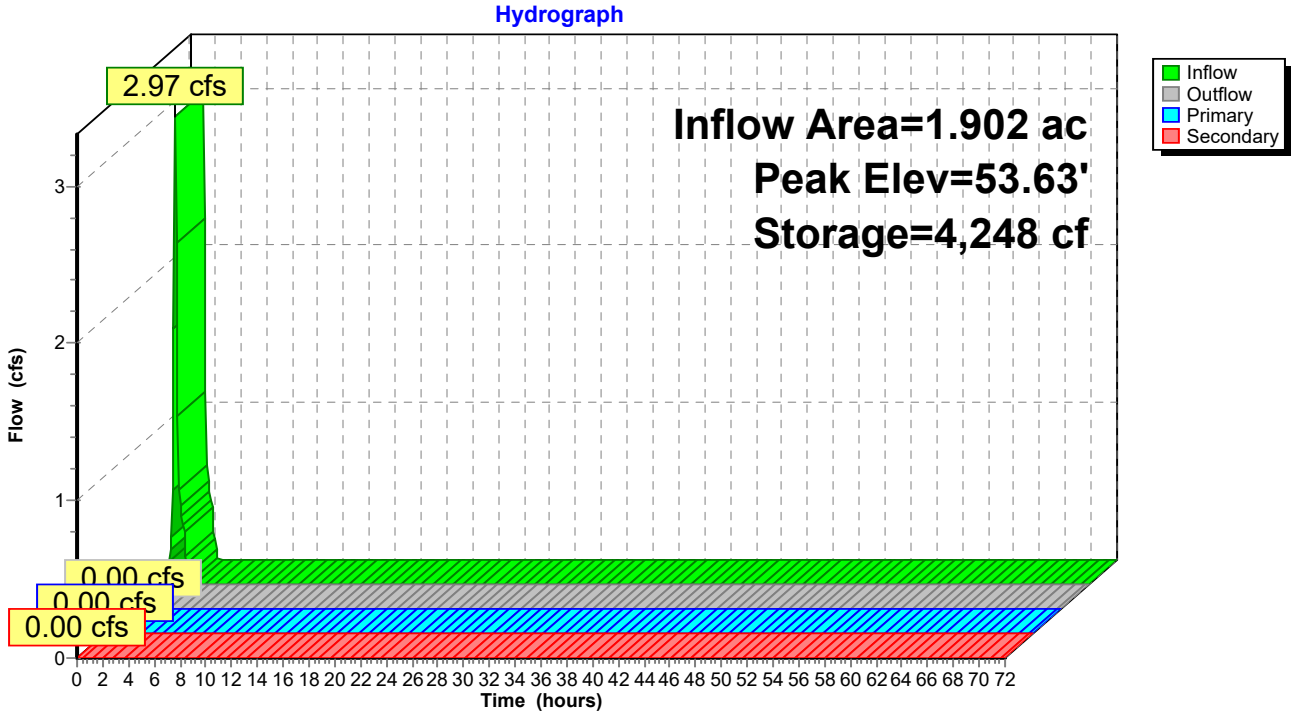
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 24.87 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Pond P1A: PDA 1A - BASIN #3



Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 0.73" for WQ event
Inflow = 5.52 cfs @ 1.08 hrs, Volume= 0.170 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 53.52' @ 2.30 hrs Surf.Area= 14,647 sf Storage= 7,418 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	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

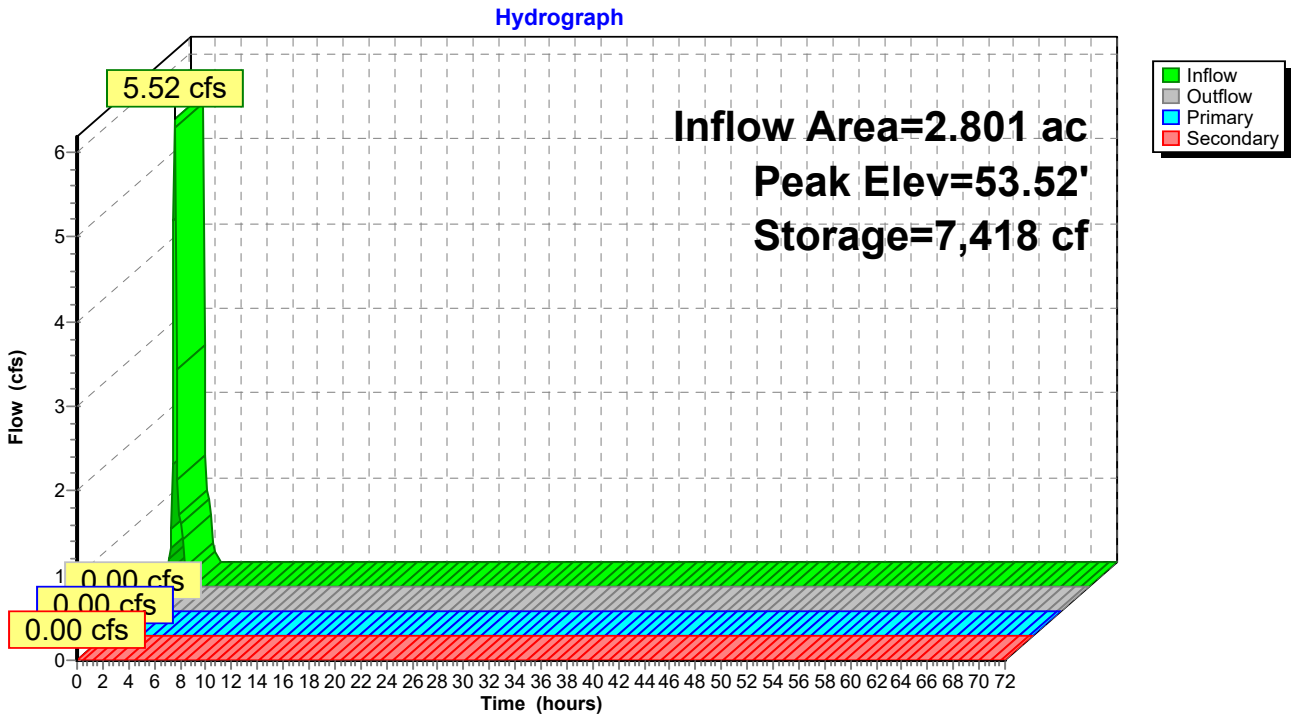
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**1=Culvert** (Passes 0.00 cfs of 25.84 cfs potential flow)
  └─**2=Exfiltration** (Controls 0.00 cfs)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P1B: PDA 1B - BASIN #2



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 0.67" for WQ event
Inflow = 7.40 cfs @ 1.06 hrs, Volume= 0.237 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 60.89' @ 2.70 hrs Surf.Area= 12,280 sf Storage= 10,324 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

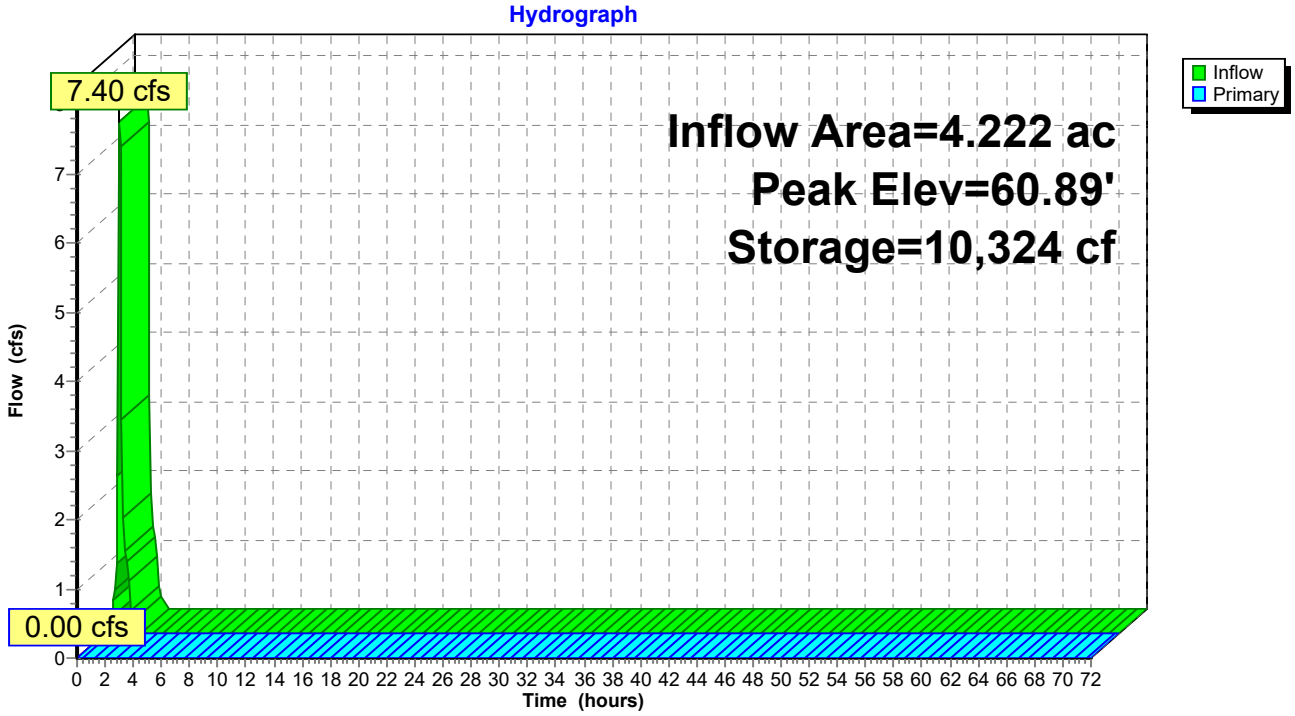
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=60.00' (Free Discharge)
- **1=Culvert** (Passes 0.00 cfs of 33.14 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Pond P1C: PDA 1C - BASIN #1

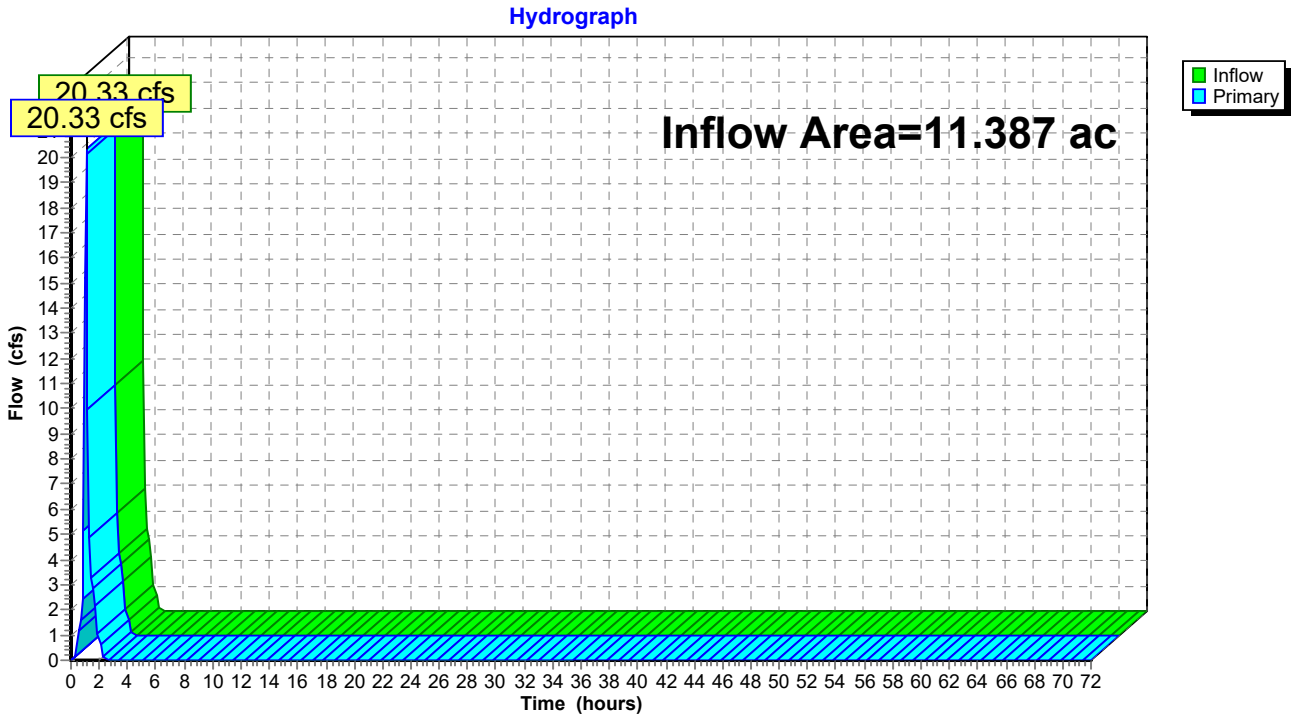


Summary for Link E1: EDA 1

Inflow Area = 11.387 ac, 62.73% Impervious, Inflow Depth = 0.67" for WQ event
Inflow = 20.33 cfs @ 1.08 hrs, Volume= 0.637 af
Primary = 20.33 cfs @ 1.08 hrs, Volume= 0.637 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1: EDA 1

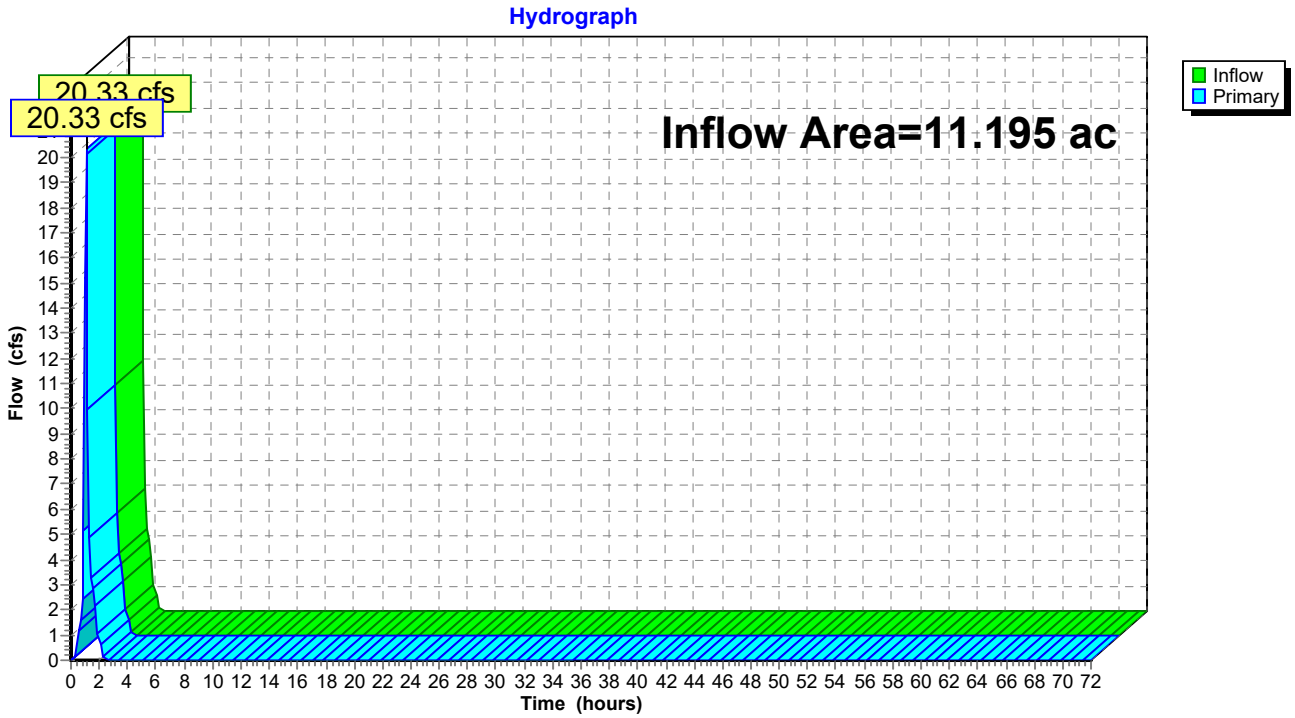


Summary for Link E1A: EDA 1A

Inflow Area = 11.195 ac, 63.81% Impervious, Inflow Depth = 0.68" for WQ event
Inflow = 20.33 cfs @ 1.08 hrs, Volume= 0.637 af
Primary = 20.33 cfs @ 1.08 hrs, Volume= 0.637 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E1A: EDA 1A

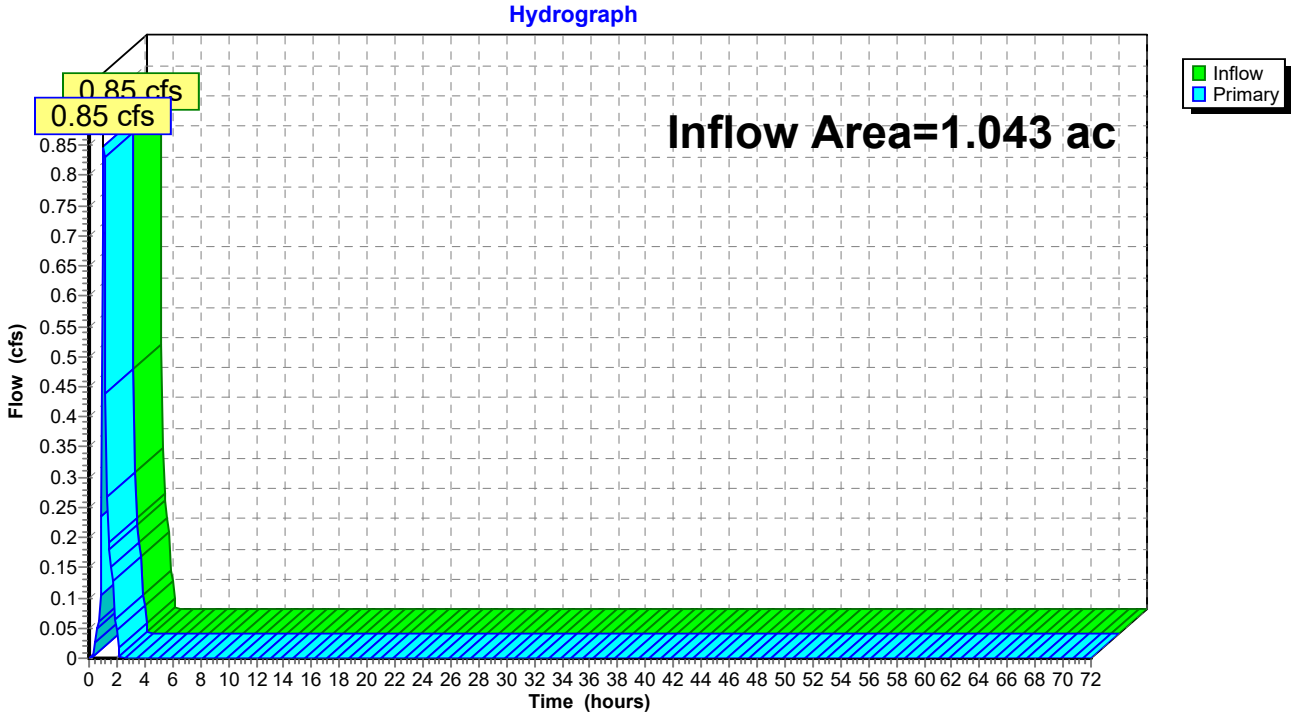


Summary for Link E2: EDA 2

Inflow Area = 1.043 ac, 30.49% Impervious, Inflow Depth = 0.35" for WQ event
Inflow = 0.85 cfs @ 1.07 hrs, Volume= 0.030 af
Primary = 0.85 cfs @ 1.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2: EDA 2

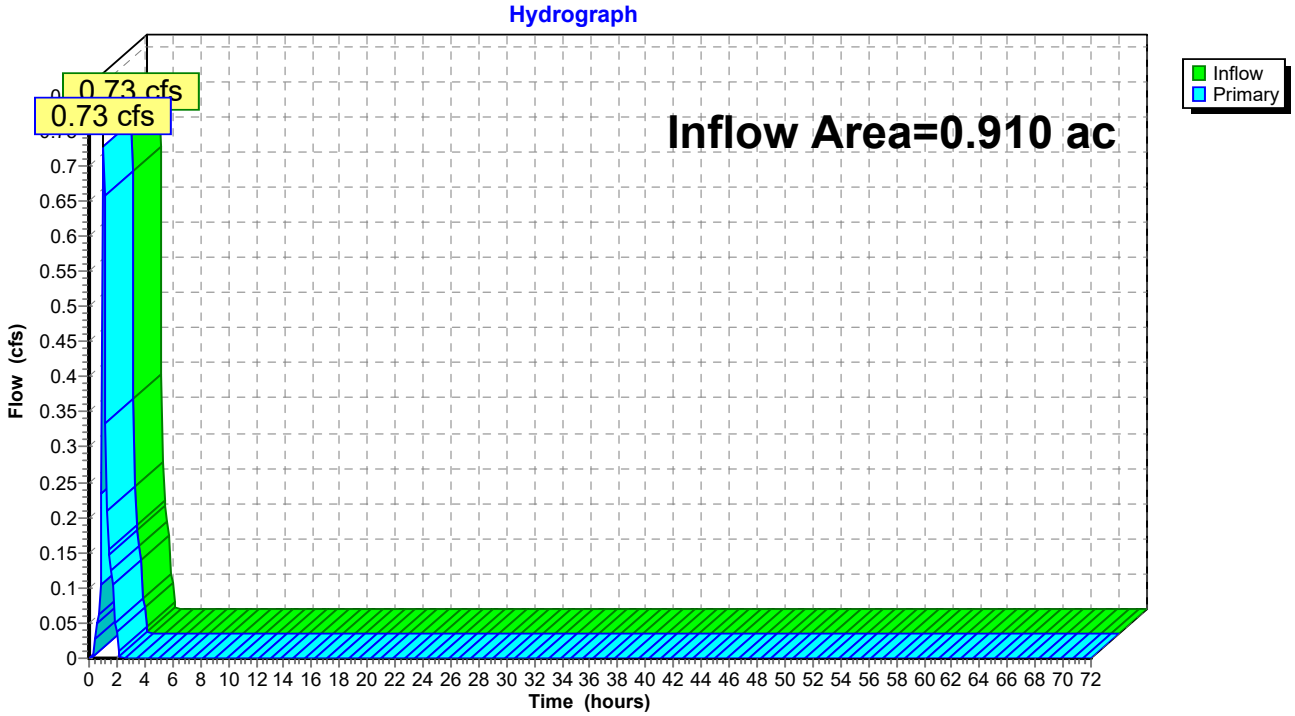


Summary for Link E2A: EDA 2A

Inflow Area = 0.910 ac, 27.47% Impervious, Inflow Depth = 0.34" for WQ event
Inflow = 0.73 cfs @ 1.05 hrs, Volume= 0.026 af
Primary = 0.73 cfs @ 1.05 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E2A: EDA 2A

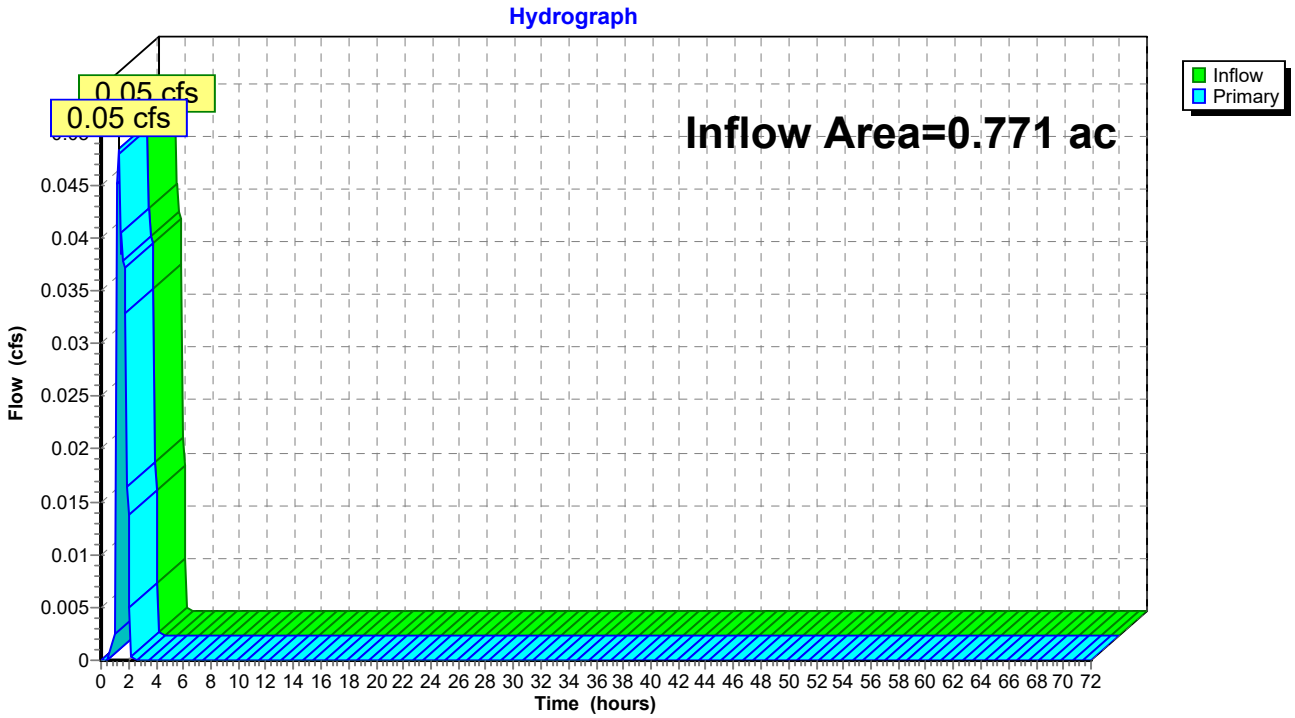


Summary for Link E3: EDA 3

Inflow Area = 0.771 ac, 0.00% Impervious, Inflow Depth = 0.04" for WQ event
Inflow = 0.05 cfs @ 1.27 hrs, Volume= 0.003 af
Primary = 0.05 cfs @ 1.27 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link E3: EDA 3

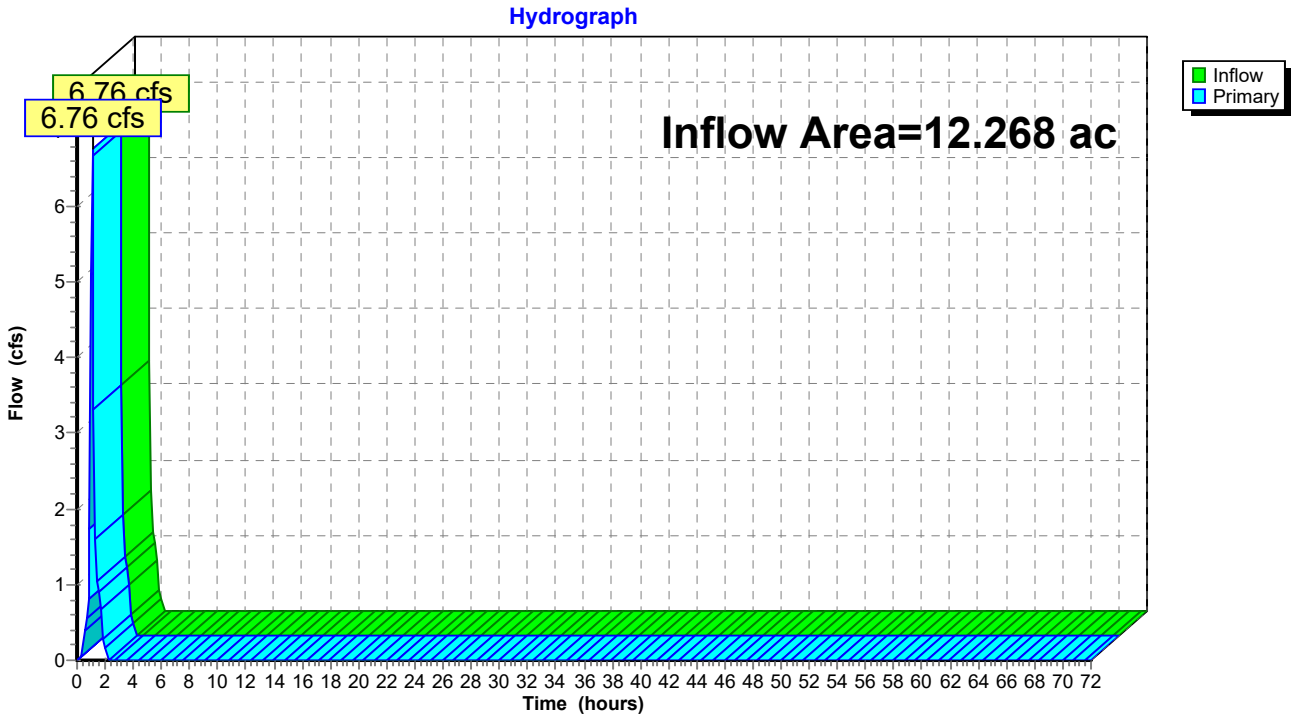


Summary for Link P1: PDA 1

Inflow Area = 12.268 ac, 65.14% Impervious, Inflow Depth = 0.20" for WQ event
Inflow = 6.76 cfs @ 1.08 hrs, Volume= 0.209 af
Primary = 6.76 cfs @ 1.08 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1: PDA 1

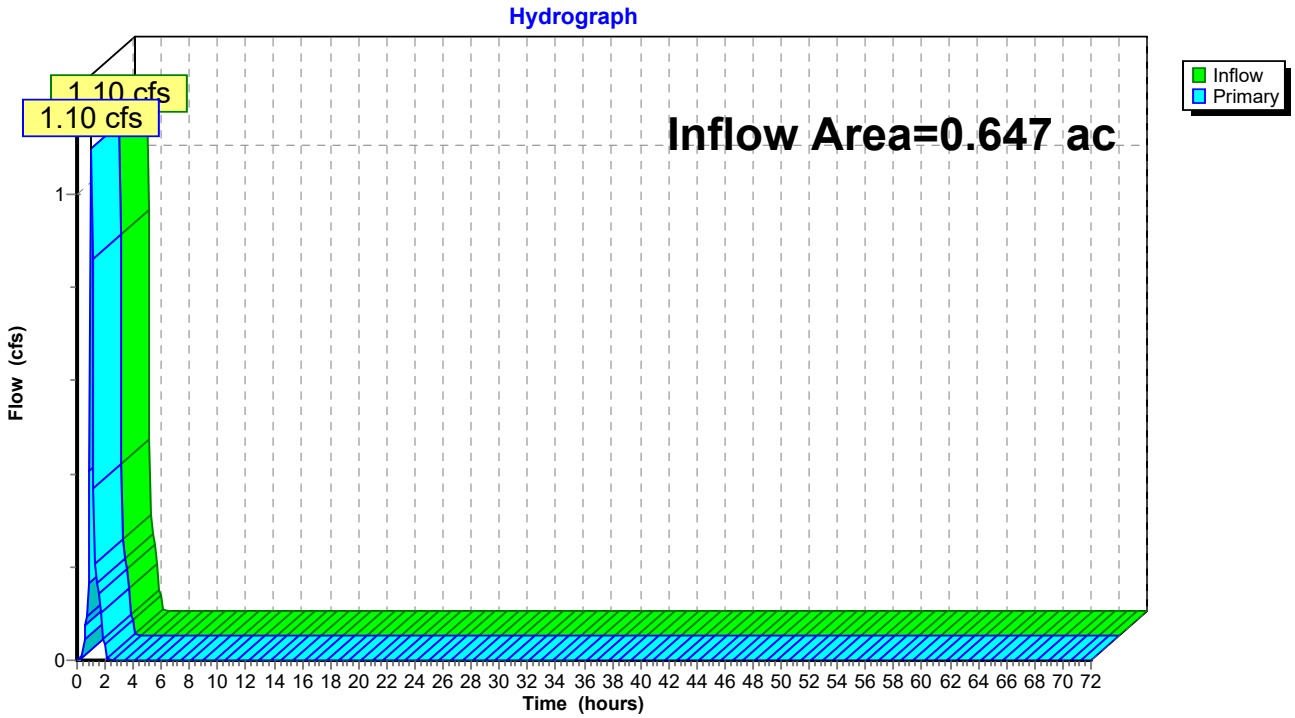


Summary for Link P1CM: P1C - MTD

Inflow Area = 0.647 ac, 57.03% Impervious, Inflow Depth = 0.62" for WQ event
Inflow = 1.10 cfs @ 1.03 hrs, Volume= 0.034 af
Primary = 1.10 cfs @ 1.03 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1CM: P1C - MTD

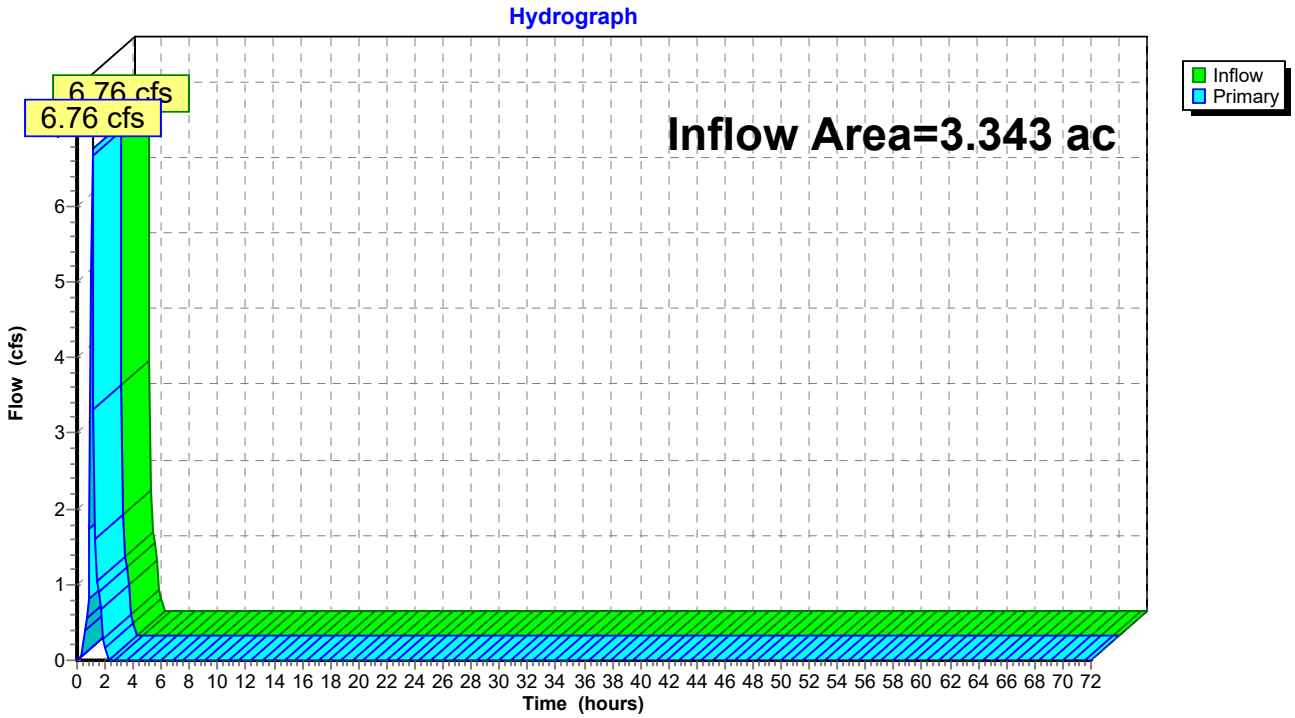


Summary for Link P1D: PDA 1D

Inflow Area = 3.343 ac, 70.92% Impervious, Inflow Depth = 0.75" for WQ event
Inflow = 6.76 cfs @ 1.08 hrs, Volume= 0.209 af
Primary = 6.76 cfs @ 1.08 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P1D: PDA 1D

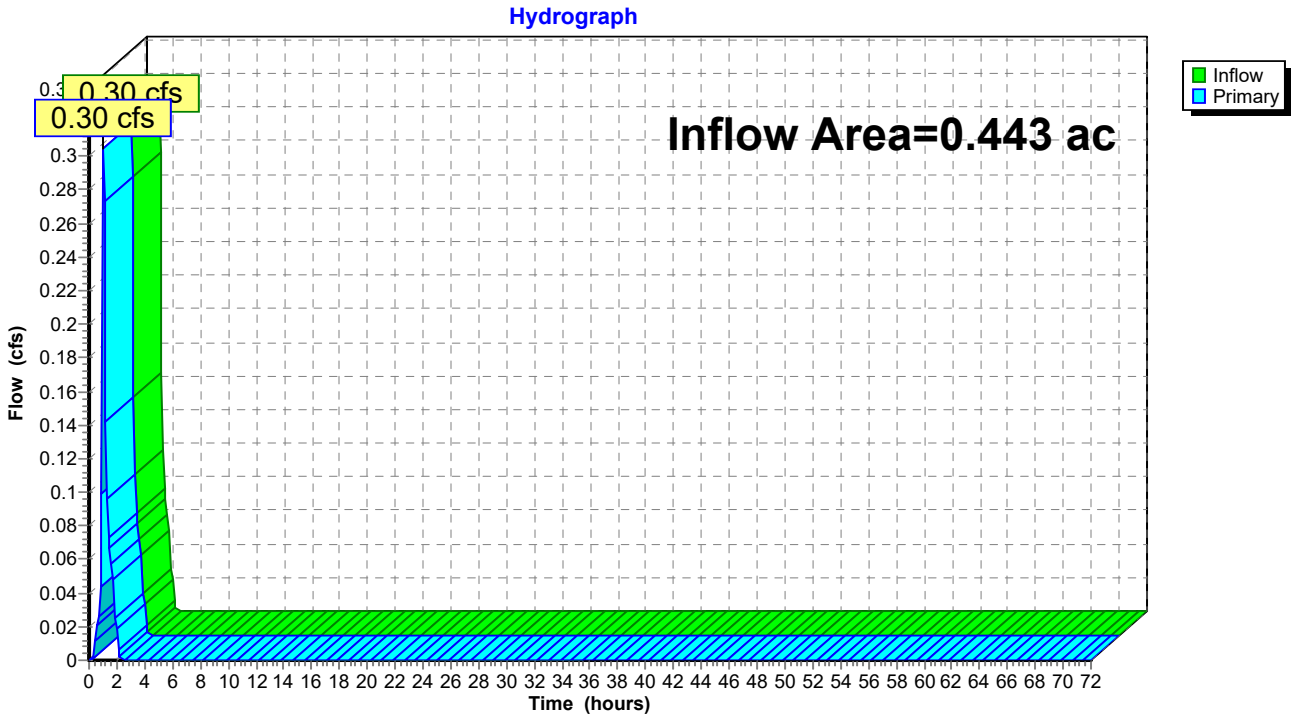


Summary for Link P2: PDA 2

Inflow Area = 0.443 ac, 23.70% Impervious, Inflow Depth = 0.30" for WQ event
Inflow = 0.30 cfs @ 1.04 hrs, Volume= 0.011 af
Primary = 0.30 cfs @ 1.04 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P2: PDA 2

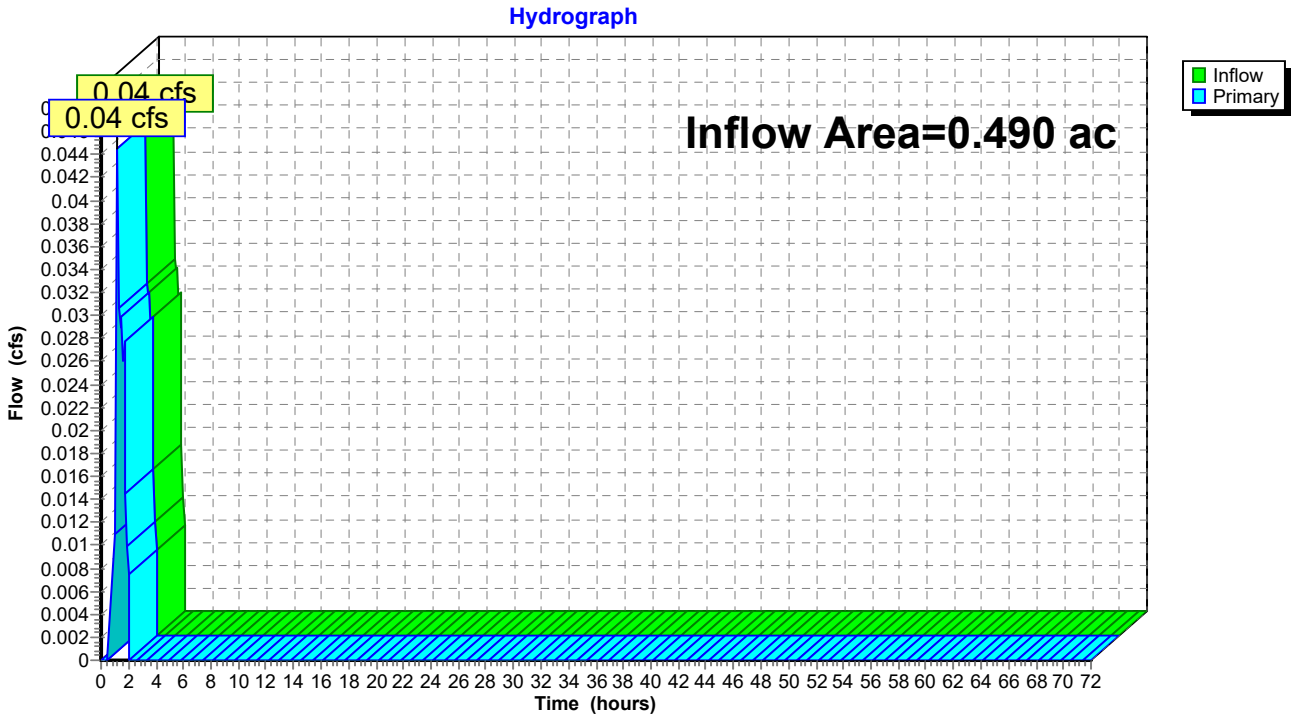


Summary for Link P3: PDA 3

Inflow Area = 0.490 ac, 0.00% Impervious, Inflow Depth = 0.05" for WQ event
Inflow = 0.04 cfs @ 1.20 hrs, Volume= 0.002 af
Primary = 0.04 cfs @ 1.20 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Link P3: PDA 3



Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 0.67" for WQ event
Inflow = 7.40 cfs @ 1.06 hrs, Volume= 0.237 af
Outflow = 0.14 cfs @ 2.07 hrs, Volume= 0.237 af, Atten= 98%, Lag= 60.7 min
Primary = 0.14 cfs @ 2.07 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 60.84' @ 2.07 hrs Surf.Area= 12,182 sf Storage= 9,600 cf

Plug-Flow detention time= 608.1 min calculated for 0.237 af (100% of inflow)
Center-of-Mass det. time= 606.5 min (675.3 - 68.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.50 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.14 cfs @ 2.07 hrs HW=60.84' (Free Discharge)
└**1=Culvert** (Passes 0.14 cfs of 35.91 cfs potential flow)
  └**2=Exfiltration** (Exfiltration Controls 0.14 cfs)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Hydrograph for Pond P1C: PDA 1C - BASIN #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	60.00	0.00
0.20	0.00	0	60.00	0.00
0.40	0.10	18	60.00	0.00
0.60	0.49	205	60.02	0.04
0.80	1.02	649	60.06	0.13
1.00	**6.63**	2,755	60.25	0.13
1.20	**3.09**	6,944	60.61	0.14
1.40	1.19	8,215	60.72	0.14
1.60	0.93	8,904	60.78	0.14
1.80	0.63	9,404	60.82	0.14
2.00	0.28	**9,588**	**60.83**	**0.14**
2.20	0.01	**9,560**	**60.83**	**0.14**
2.40	0.00	9,461	60.82	0.14
2.60	0.00	9,359	60.82	0.14
2.80	0.00	9,258	60.81	0.14
3.00	0.00	9,157	60.80	0.14
3.20	0.00	9,056	60.79	0.14
3.40	0.00	8,955	60.78	0.14
3.60	0.00	8,855	60.77	0.14
3.80	0.00	8,754	60.77	0.14
4.00	0.00	8,653	60.76	0.14
4.20	0.00	8,553	60.75	0.14
4.40	0.00	8,453	60.74	0.14
4.60	0.00	8,353	60.73	0.14
4.80	0.00	8,253	60.72	0.14
5.00	0.00	8,153	60.72	0.14
5.20	0.00	8,053	60.71	0.14
5.40	0.00	7,953	60.70	0.14
5.60	0.00	7,854	60.69	0.14
5.80	0.00	7,754	60.68	0.14
6.00	0.00	7,655	60.67	0.14
6.20	0.00	7,556	60.67	0.14
6.40	0.00	7,456	60.66	0.14
6.60	0.00	7,357	60.65	0.14
6.80	0.00	7,259	60.64	0.14
7.00	0.00	7,160	60.63	0.14
7.20	0.00	7,061	60.62	0.14
7.40	0.00	6,963	60.62	0.14
7.60	0.00	6,864	60.61	0.14
7.80	0.00	6,766	60.60	0.14
8.00	0.00	6,668	60.59	0.14
8.20	0.00	6,570	60.58	0.14
8.40	0.00	6,472	60.57	0.14
8.60	0.00	6,374	60.57	0.14
8.80	0.00	6,276	60.56	0.14
9.00	0.00	6,179	60.55	0.14
9.20	0.00	6,081	60.54	0.14
9.40	0.00	5,984	60.53	0.14
9.60	0.00	5,886	60.52	0.14
9.80	0.00	5,789	60.52	0.13
10.00	0.00	5,692	60.51	0.13
10.20	0.00	5,595	60.50	0.13

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
10.40	0.00	5,498	60.49	0.13
10.60	0.00	5,402	60.48	0.13
10.80	0.00	5,305	60.47	0.13
11.00	0.00	5,209	60.47	0.13
11.20	0.00	5,112	60.46	0.13
11.40	0.00	5,016	60.45	0.13
11.60	0.00	4,920	60.44	0.13
11.80	0.00	4,824	60.43	0.13
12.00	0.00	4,728	60.42	0.13
12.20	0.00	4,632	60.42	0.13
12.40	0.00	4,537	60.41	0.13
12.60	0.00	4,441	60.40	0.13
12.80	0.00	4,346	60.39	0.13
13.00	0.00	4,250	60.38	0.13
13.20	0.00	4,155	60.37	0.13
13.40	0.00	4,060	60.37	0.13
13.60	0.00	3,965	60.36	0.13
13.80	0.00	3,870	60.35	0.13
14.00	0.00	3,776	60.34	0.13
14.20	0.00	3,681	60.33	0.13
14.40	0.00	3,587	60.32	0.13
14.60	0.00	3,492	60.32	0.13
14.80	0.00	3,398	60.31	0.13
15.00	0.00	3,304	60.30	0.13
15.20	0.00	3,210	60.29	0.13
15.40	0.00	3,116	60.28	0.13
15.60	0.00	3,022	60.27	0.13
15.80	0.00	2,928	60.27	0.13
16.00	0.00	2,835	60.26	0.13
16.20	0.00	2,741	60.25	0.13
16.40	0.00	2,648	60.24	0.13
16.60	0.00	2,555	60.23	0.13
16.80	0.00	2,462	60.22	0.13
17.00	0.00	2,369	60.22	0.13
17.20	0.00	2,276	60.21	0.13
17.40	0.00	2,183	60.20	0.13
17.60	0.00	2,090	60.19	0.13
17.80	0.00	1,998	60.18	0.13
18.00	0.00	1,905	60.17	0.13
18.20	0.00	1,813	60.17	0.13
18.40	0.00	1,721	60.16	0.13
18.60	0.00	1,629	60.15	0.13
18.80	0.00	1,537	60.14	0.13
19.00	0.00	1,445	60.13	0.13
19.20	0.00	1,353	60.12	0.13
19.40	0.00	1,262	60.12	0.13
19.60	0.00	1,170	60.11	0.13
19.80	0.00	1,079	60.10	0.13
20.00	0.00	987	60.09	0.13
20.20	0.00	896	60.08	0.13
20.40	0.00	805	60.07	0.13
20.60	0.00	714	60.07	0.13

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
20.80	0.00	624	60.06	0.12
21.00	0.00	543	60.05	0.11
21.20	0.00	472	60.04	0.09
21.40	0.00	411	60.04	0.08
21.60	0.00	357	60.03	0.07
21.80	0.00	311	60.03	0.06
22.00	0.00	270	60.02	0.05
22.20	0.00	235	60.02	0.05
22.40	0.00	204	60.02	0.04
22.60	0.00	178	60.02	0.03
22.80	0.00	155	60.01	0.03
23.00	0.00	134	60.01	0.03
23.20	0.00	117	60.01	0.02
23.40	0.00	102	60.01	0.02
23.60	0.00	88	60.01	0.02
23.80	0.00	77	60.01	0.01
24.00	0.00	67	60.01	0.01
24.20	0.00	58	60.01	0.01
24.40	0.00	51	60.00	0.01
24.60	0.00	44	60.00	0.01
24.80	0.00	38	60.00	0.01
25.00	0.00	33	60.00	0.01
25.20	0.00	29	60.00	0.01
25.40	0.00	25	60.00	0.00
25.60	0.00	22	60.00	0.00
25.80	0.00	19	60.00	0.00
26.00	0.00	17	60.00	0.00
26.20	0.00	14	60.00	0.00
26.40	0.00	13	60.00	0.00
26.60	0.00	11	60.00	0.00
26.80	0.00	9	60.00	0.00
27.00	0.00	8	60.00	0.00
27.20	0.00	7	60.00	0.00
27.40	0.00	6	60.00	0.00
27.60	0.00	5	60.00	0.00
27.80	0.00	5	60.00	0.00
28.00	0.00	4	60.00	0.00
28.20	0.00	4	60.00	0.00
28.40	0.00	3	60.00	0.00
28.60	0.00	3	60.00	0.00
28.80	0.00	2	60.00	0.00
29.00	0.00	2	60.00	0.00
29.20	0.00	2	60.00	0.00
29.40	0.00	2	60.00	0.00
29.60	0.00	1	60.00	0.00
29.80	0.00	1	60.00	0.00
30.00	0.00	1	60.00	0.00
30.20	0.00	1	60.00	0.00
30.40	0.00	1	60.00	0.00
30.60	0.00	1	60.00	0.00
30.80	0.00	1	60.00	0.00
31.00	0.00	1	60.00	0.00

BASIN DRAIN TIME =
25.4 HRS - 2.0 HRS =
23.4 HRS < 72 HRS, OKAY

Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 0.73" for WQ event
Inflow = 5.52 cfs @ 1.08 hrs, Volume= 0.170 af
Outflow = 0.17 cfs @ 2.00 hrs, Volume= 0.170 af, Atten= 97%, Lag= 55.2 min
Primary = 0.17 cfs @ 2.00 hrs, Volume= 0.170 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 53.47' @ 2.00 hrs Surf.Area= 14,535 sf Storage= 6,567 cf

Plug-Flow detention time= 345.4 min calculated for 0.170 af (100% of inflow)
Center-of-Mass det. time= 346.1 min (415.3 - 69.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.50 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.17 cfs @ 2.00 hrs HW=53.47' (Free Discharge)
└─**1=Culvert** (Passes 0.17 cfs of 28.16 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.17 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Hydrograph for Pond P1B: PDA 1B - BASIN #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	53.00	0.00	0.00	**0.00**
0.20	0.00	0	53.00	0.00	0.00	0.00
0.40	0.06	9	53.00	0.00	0.00	0.00
0.60	0.33	125	53.01	0.05	0.05	0.00
0.80	0.68	398	53.03	0.15	0.15	0.00
1.00	**4.32**	1,709	53.12	0.16	0.16	0.00
1.20	**2.57**	4,786	53.34	0.17	0.17	0.00
1.40	0.84	5,736	53.41	0.17	0.17	0.00
1.60	0.66	6,177	53.44	0.17	0.17	0.00
1.80	0.47	6,486	53.46	0.17	0.17	0.00
2.00	0.20	**6,567**	**53.47**	**0.17**	**0.17**	0.00
2.20	0.00	6,497	53.46	0.17	0.17	0.00
2.40	0.00	6,377	53.45	0.17	0.17	0.00
2.60	0.00	6,256	53.44	0.17	0.17	0.00
2.80	0.00	6,135	53.44	0.17	0.17	0.00
3.00	0.00	6,014	53.43	0.17	0.17	0.00
3.20	0.00	5,894	53.42	0.17	0.17	0.00
3.40	0.00	5,774	53.41	0.17	0.17	0.00
3.60	0.00	5,653	53.40	0.17	0.17	0.00
3.80	0.00	5,533	53.39	0.17	0.17	0.00
4.00	0.00	5,414	53.39	0.17	0.17	0.00
4.20	0.00	5,294	53.38	0.17	0.17	0.00
4.40	0.00	5,174	53.37	0.17	0.17	0.00
4.60	0.00	5,055	53.36	0.17	0.17	0.00
4.80	0.00	4,935	53.35	0.17	0.17	0.00
5.00	0.00	4,816	53.34	0.17	0.17	0.00
5.20	0.00	4,697	53.34	0.17	0.17	0.00
5.40	0.00	4,578	53.33	0.17	0.17	0.00
5.60	0.00	4,459	53.32	0.16	0.16	0.00
5.80	0.00	4,340	53.31	0.16	0.16	0.00
6.00	0.00	4,222	53.30	0.16	0.16	0.00
6.20	0.00	4,103	53.29	0.16	0.16	0.00
6.40	0.00	3,985	53.29	0.16	0.16	0.00
6.60	0.00	3,867	53.28	0.16	0.16	0.00
6.80	0.00	3,749	53.27	0.16	0.16	0.00
7.00	0.00	3,631	53.26	0.16	0.16	0.00
7.20	0.00	3,513	53.25	0.16	0.16	0.00
7.40	0.00	3,395	53.24	0.16	0.16	0.00
7.60	0.00	3,278	53.24	0.16	0.16	0.00
7.80	0.00	3,160	53.23	0.16	0.16	0.00
8.00	0.00	3,043	53.22	0.16	0.16	0.00
8.20	0.00	2,926	53.21	0.16	0.16	0.00
8.40	0.00	2,809	53.20	0.16	0.16	0.00
8.60	0.00	2,692	53.19	0.16	0.16	0.00
8.80	0.00	2,575	53.19	0.16	0.16	0.00
9.00	0.00	2,459	53.18	0.16	0.16	0.00
9.20	0.00	2,342	53.17	0.16	0.16	0.00
9.40	0.00	2,226	53.16	0.16	0.16	0.00
9.60	0.00	2,110	53.15	0.16	0.16	0.00
9.80	0.00	1,993	53.14	0.16	0.16	0.00
10.00	0.00	1,877	53.14	0.16	0.16	0.00
10.20	0.00	1,762	53.13	0.16	0.16	0.00

Hydrograph for Pond P1B: PDA 1B - BASIN #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	0.00	1,646	53.12	0.16	0.16	0.00
10.60	0.00	1,530	53.11	0.16	0.16	0.00
10.80	0.00	1,415	53.10	0.16	0.16	0.00
11.00	0.00	1,300	53.09	0.16	0.16	0.00
11.20	0.00	1,185	53.09	0.16	0.16	0.00
11.40	0.00	1,070	53.08	0.16	0.16	0.00
11.60	0.00	955	53.07	0.16	0.16	0.00
11.80	0.00	840	53.06	0.16	0.16	0.00
12.00	0.00	725	53.05	0.16	0.16	0.00
12.20	0.00	611	53.04	0.16	0.16	0.00
12.40	0.00	497	53.04	0.16	0.16	0.00
12.60	0.00	384	53.03	0.15	0.15	0.00
12.80	0.00	291	53.02	0.11	0.11	0.00
13.00	0.00	220	53.02	0.09	0.09	0.00
13.20	0.00	166	53.01	0.06	0.06	0.00
13.40	0.00	126	53.01	0.05	0.05	0.00
13.60	0.00	95	53.01	0.04	0.04	0.00
13.80	0.00	72	53.01	0.03	0.03	0.00
14.00	0.00	55	53.00	0.02	0.02	0.00
14.20	0.00	41	53.00	0.02	0.02	0.00
14.40	0.00	31	53.00	0.01	0.01	0.00
14.60	0.00	24	53.00	0.01	0.01	0.00
14.80	0.00	18	53.00	0.01	0.01	0.00
15.00	0.00	14	53.00	0.01	0.01	0.00
15.20	0.00	10	53.00	0.00	0.00	0.00
15.40	0.00	8	53.00	0.00	0.00	0.00
15.60	0.00	6	53.00	0.00	0.00	0.00
15.80	0.00	4	53.00	0.00	0.00	0.00
16.00	0.00	3	53.00	0.00	0.00	0.00
16.20	0.00	3	53.00	0.00	0.00	0.00
16.40	0.00	2	53.00	0.00	0.00	0.00
16.60	0.00	1	53.00	0.00	0.00	0.00
16.80	0.00	1	53.00	0.00	0.00	0.00
17.00	0.00	1	53.00	0.00	0.00	0.00
17.20	0.00	1	53.00	0.00	0.00	0.00
17.40	0.00	0	53.00	0.00	0.00	0.00
17.60	0.00	0	53.00	0.00	0.00	0.00
17.80	0.00	0	53.00	0.00	0.00	0.00
18.00	0.00	0	53.00	0.00	0.00	0.00
18.20	0.00	0	53.00	0.00	0.00	0.00
18.40	0.00	0	53.00	0.00	0.00	0.00
18.60	0.00	0	53.00	0.00	0.00	0.00
18.80	0.00	0	53.00	0.00	0.00	0.00
19.00	0.00	0	53.00	0.00	0.00	0.00
19.20	0.00	0	53.00	0.00	0.00	0.00
19.40	0.00	0	53.00	0.00	0.00	0.00
19.60	0.00	0	53.00	0.00	0.00	0.00
19.80	0.00	0	53.00	0.00	0.00	0.00
20.00	0.00	0	53.00	0.00	0.00	0.00
20.20	0.00	0	53.00	0.00	0.00	0.00
20.40	0.00	0	53.00	0.00	0.00	0.00
20.60	0.00	0	53.00	0.00	0.00	0.00

BASIN DRAIN TIME =
15.20 HRS - 2.0 HRS =
13.2 HRS < 72 HRS, OKAY

Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 0.62" for WQ event
Inflow = 2.97 cfs @ 1.11 hrs, Volume= 0.098 af
Outflow = 0.08 cfs @ 2.08 hrs, Volume= 0.098 af, Atten= 97%, Lag= 58.0 min
Primary = 0.08 cfs @ 2.08 hrs, Volume= 0.098 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 53.57' @ 2.08 hrs Surf.Area= 6,820 sf Storage= 3,842 cf

Plug-Flow detention time= 431.7 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 432.5 min (504.8 - 72.3)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.50 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 2.08 hrs HW=53.57' (Free Discharge)
└**1=Culvert** (Passes 0.08 cfs of 27.70 cfs potential flow)
  ├**2=Exfiltration** (Exfiltration Controls 0.08 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Hydrograph for Pond P1A: PDA 1A - BASIN #3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	53.00	0.00	0.00	**0.00**
0.20	0.00	0	53.00	0.00	0.00	0.00
0.40	0.01	2	53.00	0.00	0.00	0.00
0.60	0.14	49	53.01	0.02	0.02	0.00
0.80	0.30	181	53.03	0.06	0.06	0.00
1.00	**1.62**	691	53.10	0.07	0.07	0.00
1.20	**2.18**	2,385	53.35	0.08	0.08	0.00
1.40	0.60	3,216	53.48	0.08	0.08	0.00
1.60	0.43	3,525	53.52	0.08	0.08	0.00
1.80	0.33	3,744	53.56	0.08	0.08	0.00
2.00	0.13	**3,835**	**53.57**	**0.08**	**0.08**	0.00
2.20	0.01	**3,826**	**53.57**	**0.08**	**0.08**	0.00
2.40	0.00	3,772	53.56	0.08	0.08	0.00
2.60	0.00	3,715	53.55	0.08	0.08	0.00
2.80	0.00	3,658	53.54	0.08	0.08	0.00
3.00	0.00	3,602	53.53	0.08	0.08	0.00
3.20	0.00	3,545	53.53	0.08	0.08	0.00
3.40	0.00	3,489	53.52	0.08	0.08	0.00
3.60	0.00	3,433	53.51	0.08	0.08	0.00
3.80	0.00	3,376	53.50	0.08	0.08	0.00
4.00	0.00	3,320	53.49	0.08	0.08	0.00
4.20	0.00	3,264	53.48	0.08	0.08	0.00
4.40	0.00	3,208	53.48	0.08	0.08	0.00
4.60	0.00	3,152	53.47	0.08	0.08	0.00
4.80	0.00	3,096	53.46	0.08	0.08	0.00
5.00	0.00	3,041	53.45	0.08	0.08	0.00
5.20	0.00	2,985	53.44	0.08	0.08	0.00
5.40	0.00	2,929	53.43	0.08	0.08	0.00
5.60	0.00	2,874	53.43	0.08	0.08	0.00
5.80	0.00	2,818	53.42	0.08	0.08	0.00
6.00	0.00	2,763	53.41	0.08	0.08	0.00
6.20	0.00	2,708	53.40	0.08	0.08	0.00
6.40	0.00	2,652	53.39	0.08	0.08	0.00
6.60	0.00	2,597	53.39	0.08	0.08	0.00
6.80	0.00	2,542	53.38	0.08	0.08	0.00
7.00	0.00	2,487	53.37	0.08	0.08	0.00
7.20	0.00	2,432	53.36	0.08	0.08	0.00
7.40	0.00	2,377	53.35	0.08	0.08	0.00
7.60	0.00	2,323	53.34	0.08	0.08	0.00
7.80	0.00	2,268	53.34	0.08	0.08	0.00
8.00	0.00	2,213	53.33	0.08	0.08	0.00
8.20	0.00	2,159	53.32	0.08	0.08	0.00
8.40	0.00	2,104	53.31	0.08	0.08	0.00
8.60	0.00	2,050	53.30	0.08	0.08	0.00
8.80	0.00	1,995	53.30	0.08	0.08	0.00
9.00	0.00	1,941	53.29	0.08	0.08	0.00
9.20	0.00	1,887	53.28	0.08	0.08	0.00
9.40	0.00	1,833	53.27	0.08	0.08	0.00
9.60	0.00	1,779	53.26	0.07	0.07	0.00
9.80	0.00	1,725	53.26	0.07	0.07	0.00
10.00	0.00	1,671	53.25	0.07	0.07	0.00
10.20	0.00	1,617	53.24	0.07	0.07	0.00

Hydrograph for Pond P1A: PDA 1A - BASIN #3 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	0.00	1,564	53.23	0.07	0.07	0.00
10.60	0.00	1,510	53.22	0.07	0.07	0.00
10.80	0.00	1,456	53.22	0.07	0.07	0.00
11.00	0.00	1,403	53.21	0.07	0.07	0.00
11.20	0.00	1,349	53.20	0.07	0.07	0.00
11.40	0.00	1,296	53.19	0.07	0.07	0.00
11.60	0.00	1,243	53.18	0.07	0.07	0.00
11.80	0.00	1,189	53.18	0.07	0.07	0.00
12.00	0.00	1,136	53.17	0.07	0.07	0.00
12.20	0.00	1,083	53.16	0.07	0.07	0.00
12.40	0.00	1,030	53.15	0.07	0.07	0.00
12.60	0.00	977	53.14	0.07	0.07	0.00
12.80	0.00	924	53.14	0.07	0.07	0.00
13.00	0.00	872	53.13	0.07	0.07	0.00
13.20	0.00	819	53.12	0.07	0.07	0.00
13.40	0.00	766	53.11	0.07	0.07	0.00
13.60	0.00	714	53.11	0.07	0.07	0.00
13.80	0.00	661	53.10	0.07	0.07	0.00
14.00	0.00	609	53.09	0.07	0.07	0.00
14.20	0.00	557	53.08	0.07	0.07	0.00
14.40	0.00	504	53.07	0.07	0.07	0.00
14.60	0.00	452	53.07	0.07	0.07	0.00
14.80	0.00	400	53.06	0.07	0.07	0.00
15.00	0.00	348	53.05	0.07	0.07	0.00
15.20	0.00	296	53.04	0.07	0.07	0.00
15.40	0.00	244	53.04	0.07	0.07	0.00
15.60	0.00	193	53.03	0.07	0.07	0.00
15.80	0.00	149	53.02	0.05	0.05	0.00
16.00	0.00	115	53.02	0.04	0.04	0.00
16.20	0.00	89	53.01	0.03	0.03	0.00
16.40	0.00	69	53.01	0.02	0.02	0.00
16.60	0.00	53	53.01	0.02	0.02	0.00
16.80	0.00	41	53.01	0.01	0.01	0.00
17.00	0.00	32	53.00	0.01	0.01	0.00
17.20	0.00	25	53.00	0.01	0.01	0.00
17.40	0.00	19	53.00	0.01	0.01	0.00
17.60	0.00	15	53.00	0.01	0.01	0.00
17.80	0.00	11	53.00	0.00	0.00	0.00
18.00	0.00	9	53.00	0.00	0.00	0.00
18.20	0.00	7	53.00	0.00	0.00	0.00
18.40	0.00	5	53.00	0.00	0.00	0.
18.60	0.00	4	53.00	0.00	0.00	0.
18.80	0.00	3	53.00	0.00	0.00	0.
19.00	0.00	2	53.00	0.00	0.00	0.
19.20	0.00	2	53.00	0.00	0.00	0.
19.40	0.00	1	53.00	0.00	0.00	0.00
19.60	0.00	1	53.00	0.00	0.00	0.00
19.80	0.00	1	53.00	0.00	0.00	0.00
20.00	0.00	1	53.00	0.00	0.00	0.00
20.20	0.00	1	53.00	0.00	0.00	0.00
20.40	0.00	0	53.00	0.00	0.00	0.00
20.60	0.00	0	53.00	0.00	0.00	0.00

BASIN DRAIN TIME =
17.8 HRS - 2.0 HRS =
15.8 HRS < 72 HRS, OKAY

C. DESIGN CALCULATIONS

- **Basin Drain Time**
- **Emergency Spillway**

Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 10.73" for 100-Year (Future Adj.) event
Inflow = 45.98 cfs @ 12.10 hrs, Volume= 3.774 af
Outflow = 12.71 cfs @ 12.42 hrs, Volume= 3.535 af, Atten= 72%, Lag= 19.4 min
Primary = 12.71 cfs @ 12.42 hrs, Volume= 3.535 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 64.78' @ 12.42 hrs Surf.Area= 19,173 sf Storage= 71,226 cf

Plug-Flow detention time= 187.0 min calculated for 3.535 af (94% of inflow)
Center-of-Mass det. time= 150.1 min (906.6 - 756.6)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' 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
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=12.67 cfs @ 12.42 hrs HW=64.78' (Free Discharge)
- **1=Culvert** (Passes 12.67 cfs of 46.81 cfs potential flow)
  - **2=Exfiltration** (Controls 0.00 cfs)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 12.67 cfs @ 6.54 fps)
  - **4=Horizontal Grate** (Controls 0.00 cfs)

Hydrograph for Pond P1C: PDA 1C - BASIN #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	60.00	0.00
0.20	0.00	0	60.00	0.00
0.40	0.02	4	60.00	0.00
0.60	0.09	43	60.00	0.00
0.80	0.14	125	60.01	0.00
1.00	0.18	240	60.02	0.00
1.20	0.21	383	60.04	0.00
1.40	0.24	546	60.05	0.00
1.60	0.26	729	60.07	0.00
1.80	0.28	927	60.09	0.00
2.00	0.30	1,139	60.10	0.00
2.20	0.32	1,363	60.13	0.00
2.40	0.33	1,599	60.15	0.00
2.60	0.35	1,844	60.17	0.00
2.80	0.36	2,099	60.19	0.00
3.00	0.37	2,363	60.22	0.00
3.20	0.38	2,634	60.24	0.00
3.40	0.39	2,913	60.26	0.00
3.60	0.40	3,201	60.29	0.00
3.80	0.41	3,494	60.32	0.00
4.00	0.42	3,794	60.34	0.00
4.20	0.43	4,101	60.37	0.00
4.40	0.44	4,415	60.40	0.00
4.60	0.45	4,734	60.42	0.00
4.80	0.46	5,060	60.45	0.00
5.00	0.47	5,394	60.48	0.00
5.20	0.48	5,738	60.51	0.00
5.40	0.50	6,092	60.54	0.00
5.60	0.51	6,456	60.57	0.00
5.80	0.53	6,830	60.60	0.00
6.00	0.54	7,214	60.64	0.00
6.20	0.57	7,615	60.67	0.00
6.40	0.61	8,039	60.71	0.00
6.60	0.64	8,490	60.74	0.00
6.80	0.68	8,965	60.78	0.00
7.00	0.72	9,466	60.82	0.00
7.20	0.75	9,994	60.87	0.00
7.40	0.79	10,548	60.91	0.00
7.60	0.83	11,121	60.96	0.02
7.80	0.87	11,706	61.01	0.05
8.00	0.91	12,296	61.05	0.09
8.20	0.95	12,887	61.10	0.13
8.40	0.98	13,473	61.15	0.17
8.60	1.03	14,054	61.19	0.23
8.80	1.07	14,625	61.24	0.28
9.00	1.11	15,185	61.28	0.34
9.20	1.23	15,758	61.32	0.41
9.40	1.36	16,372	61.37	0.48
9.60	1.50	17,025	61.42	0.57
9.80	1.64	17,711	61.47	0.66
10.00	1.78	18,425	61.53	0.77
10.20	1.92	19,158	61.58	0.89

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
10.40	2.07	19,906	61.64	1.02
10.60	2.37	20,695	61.70	1.17
10.80	2.88	21,682	61.77	1.34
11.00	3.43	22,912	61.86	1.55
11.20	4.35	24,488	61.97	1.83
11.40	5.36	26,530	62.11	2.22
11.60	8.30	29,369	62.31	2.77
11.80	12.76	34,309	62.64	3.80
12.00	**30.07**	45,046	63.31	6.23
12.20	**29.23**	65,911	64.50	11.35
12.40	12.68	**71,190**	**64.78**	**12.70**
12.60	7.76	69,609	64.70	12.29
12.80	5.80	65,869	64.50	11.34
13.00	4.69	61,841	64.28	10.33
13.20	3.81	57,804	64.06	9.32
13.40	3.21	53,965	63.84	8.37
13.60	2.65	50,366	63.63	7.49
13.80	2.42	47,073	63.44	6.71
14.00	2.26	44,180	63.26	6.02
14.20	2.12	41,634	63.10	5.43
14.40	1.96	39,378	62.96	4.92
14.60	1.81	37,360	62.84	4.47
14.80	1.67	35,541	62.72	4.07
15.00	1.51	33,885	62.61	3.71
15.20	1.40	32,375	62.51	3.39
15.40	1.36	31,029	62.42	3.11
15.60	1.32	29,842	62.34	2.87
15.80	1.28	28,789	62.27	2.66
16.00	1.24	27,851	62.20	2.47
16.20	1.20	27,010	62.15	2.31
16.40	1.16	26,250	62.09	2.16
16.60	1.12	25,561	62.04	2.03
16.80	1.08	24,932	62.00	1.92
17.00	1.04	24,355	61.96	1.81
17.20	1.00	23,822	61.92	1.71
17.40	0.96	23,325	61.89	1.62
17.60	0.92	22,863	61.85	1.54
17.80	0.88	22,429	61.82	1.47
18.00	0.84	22,020	61.79	1.39
18.20	0.81	21,633	61.76	1.33
18.40	0.80	21,279	61.74	1.27
18.60	0.79	20,959	61.71	1.21
18.80	0.78	20,671	61.69	1.16
19.00	0.77	20,409	61.67	1.11
19.20	0.76	20,173	61.66	1.07
19.40	0.75	19,959	61.64	1.03
19.60	0.74	19,764	61.63	1.00
19.80	0.73	19,587	61.61	0.97
20.00	0.72	19,424	61.60	0.94
20.20	0.71	19,272	61.59	0.91
20.40	0.70	19,131	61.58	0.89
20.60	0.69	19,000	61.57	0.87

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
20.80	0.68	18,878	61.56	0.85
21.00	0.67	18,762	61.55	0.83
21.20	0.66	18,651	61.54	0.81
21.40	0.65	18,547	61.54	0.79
21.60	0.64	18,447	61.53	0.78
21.80	0.63	18,350	61.52	0.76
22.00	0.62	18,258	61.51	0.75
22.20	0.61	18,169	61.51	0.73
22.40	0.60	18,082	61.50	0.72
22.60	0.59	17,998	61.49	0.71
22.80	0.58	17,915	61.49	0.69
23.00	0.57	17,834	61.48	0.68
23.20	0.56	17,753	61.48	0.67
23.40	0.55	17,674	61.47	0.66
23.60	0.54	17,595	61.46	0.65
23.80	0.53	17,518	61.46	0.64
24.00	0.57	17,452	61.45	0.63
24.20	0.05	17,194	61.43	0.59
24.40	0.00	16,800	61.40	0.54
24.60	0.00	16,431	61.38	0.49
24.80	0.00	16,093	61.35	0.45
25.00	0.00	15,784	61.33	0.41
25.20	0.00	15,501	61.30	0.38
25.40	0.00	15,240	61.28	0.35
25.60	0.00	14,998	61.27	0.32
25.80	0.00	14,776	61.25	0.30
26.00	0.00	14,569	61.23	0.28
26.20	0.00	14,376	61.22	0.26
26.40	0.00	14,197	61.20	0.24
26.60	0.00	14,030	61.19	0.22
26.80	0.00	13,874	61.18	0.21
27.00	0.00	13,727	61.17	0.20
27.20	0.00	13,590	61.16	0.18
27.40	0.00	13,462	61.15	0.17
27.60	0.00	13,341	61.14	0.16
27.80	0.00	13,227	61.13	0.15
28.00	0.00	13,119	61.12	0.15
28.20	0.00	13,018	61.11	0.14
28.40	0.00	12,922	61.10	0.13
28.60	0.00	12,831	61.10	0.12
28.80	0.00	12,745	61.09	0.12
29.00	0.00	12,663	61.08	0.11
29.20	0.00	12,586	61.08	0.10
29.40	0.00	12,513	61.07	0.10
29.60	0.00	12,443	61.07	0.10
29.80	0.00	12,376	61.06	0.09
30.00	0.00	12,312	61.05	0.09
30.20	0.00	12,251	61.05	0.08
30.40	0.00	12,193	61.05	0.08
30.60	0.00	12,138	61.04	0.08
30.80	0.00	12,085	61.04	0.07
31.00	0.00	12,034	61.03	0.07

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
31.20	0.00	11,986	61.03	0.07
31.40	0.00	11,940	61.03	0.06
31.60	0.00	11,896	61.02	0.06
31.80	0.00	11,854	61.02	0.06
32.00	0.00	11,814	61.02	0.05
32.20	0.00	11,775	61.01	0.05
32.40	0.00	11,738	61.01	0.05
32.60	0.00	11,702	61.01	0.05
32.80	0.00	11,668	61.00	0.05
33.00	0.00	11,635	61.00	0.04
33.20	0.00	11,603	61.00	0.04
33.40	0.00	11,573	61.00	0.04
33.60	0.00	11,543	60.99	0.04
33.80	0.00	11,515	60.99	0.04
34.00	0.00	11,487	60.99	0.04
34.20	0.00	11,460	60.99	0.04
34.40	0.00	11,435	60.98	0.04
34.60	0.00	11,410	60.98	0.03
34.80	0.00	11,386	60.98	0.03
35.00	0.00	11,362	60.98	0.03
35.20	0.00	11,340	60.98	0.03
35.40	0.00	11,318	60.98	0.03
35.60	0.00	11,297	60.97	0.03
35.80	0.00	11,277	60.97	0.03
36.00	0.00	11,257	60.97	0.03
36.20	0.00	11,238	60.97	0.03
36.40	0.00	11,220	60.97	0.02
36.60	0.00	11,202	60.97	0.02
36.80	0.00	11,185	60.96	0.02
37.00	0.00	11,169	60.96	0.02
37.20	0.00	11,153	60.96	0.02
37.40	0.00	11,138	60.96	0.02
37.60	0.00	11,123	60.96	0.02
37.80	0.00	11,108	60.96	0.02
38.00	0.00	11,094	60.96	0.02
38.20	0.00	11,080	60.96	0.02
38.40	0.00	11,066	60.95	0.02
38.60	0.00	11,053	60.95	0.02
38.80	0.00	11,040	60.95	0.02
39.00	0.00	11,027	60.95	0.02
39.20	0.00	11,014	60.95	0.02
39.40	0.00	11,002	60.95	0.02
39.60	0.00	10,989	60.95	0.02
39.80	0.00	10,977	60.95	0.02
40.00	0.00	10,966	60.95	0.02
40.20	0.00	10,954	60.95	0.02
40.40	0.00	10,943	60.95	0.02
40.60	0.00	10,932	60.94	0.02
40.80	0.00	10,921	60.94	0.01
41.00	0.00	10,911	60.94	0.01
41.20	0.00	10,900	60.94	0.01
41.40	0.00	10,890	60.94	0.01

Hydrograph for Pond P1C: PDA 1C - BASIN #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
41.60	0.00	10,880	60.94	0.01
41.80	0.00	10,871	60.94	0.01
42.00	0.00	10,861	60.94	0.01
42.20	0.00	10,852	60.94	0.01
42.40	0.00	10,842	60.94	0.01
42.60	0.00	10,833	60.94	0.01
42.80	0.00	10,825	60.94	0.01
43.00	0.00	10,816	60.93	0.01
43.20	0.00	10,807	60.93	0.01
43.40	0.00	10,799	60.93	0.01
43.60	0.00	10,791	60.93	0.01
43.80	0.00	10,783	60.93	0.01
44.00	0.00	10,775	60.93	0.01
44.20	0.00	10,767	60.93	0.01
44.40	0.00	10,760	60.93	0.01
44.60	0.00	10,753	60.93	0.01
44.80	0.00	10,745	60.93	0.01
45.00	0.00	10,738	60.93	0.01
45.20	0.00	10,731	60.93	0.01
45.40	0.00	10,725	60.93	0.01
45.60	0.00	10,718	60.93	0.01
45.80	0.00	10,711	60.93	0.01
46.00	0.00	10,705	60.93	0.01
46.20	0.00	10,699	60.93	0.01
46.40	0.00	10,692	60.92	0.01
46.60	0.00	10,686	60.92	0.01
46.80	0.00	10,681	60.92	0.01
47.00	0.00	10,675	60.92	0.01
47.20	0.00	10,669	60.92	0.01
47.40	0.00	10,663	60.92	0.01
47.60	0.00	10,658	60.92	0.01
47.80	0.00	10,653	60.92	0.01
48.00	0.00	10,647	60.92	0.01
48.20	0.00	10,642	60.92	0.01
48.40	0.00	10,637	60.92	0.01
48.60	0.00	10,632	60.92	0.01
48.80	0.00	10,627	60.92	0.01
49.00	0.00	10,623	60.92	0.01
49.20	0.00	10,618	60.92	0.01
49.40	0.00	10,613	60.92	0.01
49.60	0.00	10,609	60.92	0.01
49.80	0.00	10,605	60.92	0.01
50.00	0.00	10,600	60.92	0.01
50.20	0.00	10,596	60.92	0.01
50.40	0.00	10,592	60.92	0.01
50.60	0.00	10,588	60.92	0.01
50.80	0.00	10,584	60.92	0.01
51.00	0.00	10,580	60.92	0.01
51.20	0.00	10,576	60.92	0.01
51.40	0.00	10,573	60.91	0.01
51.60	0.00	10,569	60.91	0.01
51.80	0.00	10,565	60.91	0.00

BASIN DRAIN TIME =
51.6 HRS - 12.4 HRS =
39.2 HRS < 72 HRS, OKAY

Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 10.91" for 100-Year (Future Adj.) event
Inflow = 34.11 cfs @ 12.09 hrs, Volume= 2.546 af
Outflow = 17.75 cfs @ 12.23 hrs, Volume= 2.367 af, Atten= 48%, Lag= 8.0 min
Primary = 17.75 cfs @ 12.23 hrs, Volume= 2.367 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 55.31' @ 12.23 hrs Surf.Area= 18,258 sf Storage= 36,782 cf

Plug-Flow detention time= 152.3 min calculated for 2.364 af (93% of inflow)
Center-of-Mass det. time= 115.1 min (867.2 - 752.1)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**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
#4	Device 1	54.00'	**2.0' 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
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=17.31 cfs @ 12.23 hrs HW=55.29' (Free Discharge)
└─**1=Culvert** (Passes 17.31 cfs of 34.78 cfs potential flow)
  ├─**2=Exfiltration** (Controls 0.00 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 7.61 cfs @ 4.38 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 9.70 cfs @ 3.77 fps)
  └─**5=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└─**6=Spillway Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Hydrograph for Pond P1B: PDA 1B - BASIN #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	53.00	0.00	0.00	**0.00**
0.20	0.00	0	53.00	0.00	0.00	0.00
0.40	0.01	2	53.00	0.00	0.00	0.00
0.60	0.06	28	53.00	0.00	0.00	0.00
0.80	0.10	86	53.01	0.00	0.00	0.00
1.00	0.13	167	53.01	0.00	0.00	0.00
1.20	0.15	269	53.02	0.00	0.00	0.00
1.40	0.17	387	53.03	0.00	0.00	0.00
1.60	0.19	518	53.04	0.00	0.00	0.00
1.80	0.21	661	53.05	0.00	0.00	0.00
2.00	0.22	814	53.06	0.00	0.00	0.00
2.20	0.23	976	53.07	0.00	0.00	0.00
2.40	0.24	1,147	53.08	0.00	0.00	0.00
2.60	0.25	1,324	53.10	0.00	0.00	0.00
2.80	0.26	1,509	53.11	0.00	0.00	0.00
3.00	0.27	1,699	53.12	0.00	0.00	0.00
3.20	0.28	1,896	53.14	0.00	0.00	0.00
3.40	0.28	2,098	53.15	0.00	0.00	0.00
3.60	0.29	2,306	53.17	0.00	0.00	0.00
3.80	0.30	2,518	53.18	0.00	0.00	0.00
4.00	0.31	2,736	53.20	0.00	0.00	0.00
4.20	0.31	2,958	53.21	0.00	0.00	0.00
4.40	0.32	3,185	53.23	0.00	0.00	0.00
4.60	0.32	3,417	53.25	0.00	0.00	0.00
4.80	0.33	3,653	53.26	0.00	0.00	0.00
5.00	0.34	3,895	53.28	0.00	0.00	0.00
5.20	0.35	4,144	53.30	0.00	0.00	0.00
5.40	0.36	4,400	53.32	0.00	0.00	0.00
5.60	0.37	4,662	53.33	0.00	0.00	0.00
5.80	0.38	4,931	53.35	0.00	0.00	0.00
6.00	0.39	5,206	53.37	0.00	0.00	0.00
6.20	0.41	5,492	53.39	0.00	0.00	0.00
6.40	0.43	5,795	53.41	0.00	0.00	0.00
6.60	0.46	6,116	53.43	0.00	0.00	0.00
6.80	0.48	6,453	53.46	0.00	0.00	0.00
7.00	0.51	6,808	53.48	0.00	0.00	0.00
7.20	0.53	7,182	53.51	0.00	0.00	0.00
7.40	0.56	7,574	53.54	0.00	0.00	0.00
7.60	0.58	7,983	53.56	0.01	0.01	0.00
7.80	0.61	8,402	53.59	0.02	0.02	0.00
8.00	0.64	8,823	53.62	0.05	0.05	0.00
8.20	0.66	9,241	53.65	0.09	0.09	0.00
8.40	0.69	9,651	53.68	0.12	0.12	0.00
8.60	0.72	10,053	53.70	0.17	0.17	0.00
8.80	0.74	10,443	53.73	0.21	0.21	0.00
9.00	0.77	10,821	53.75	0.26	0.26	0.00
9.20	0.86	11,203	53.78	0.31	0.31	0.00
9.40	0.95	11,611	53.81	0.37	0.37	0.00
9.60	1.04	12,040	53.83	0.43	0.43	0.00
9.80	1.13	12,487	53.86	0.50	0.50	0.00
10.00	1.23	12,949	53.89	0.58	0.58	0.00
10.20	1.33	13,423	53.92	0.66	0.66	0.00

Hydrograph for Pond P1B: PDA 1B - BASIN #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	1.43	13,904	53.96	0.75	0.75	0.00
10.60	1.64	14,411	53.99	0.85	0.85	0.00
10.80	1.99	15,046	54.03	1.02	1.02	0.00
11.00	2.36	15,792	54.08	1.27	1.27	0.00
11.20	3.01	16,681	54.13	1.64	1.64	0.00
11.40	3.70	17,744	54.20	2.14	2.14	0.00
11.60	5.88	19,150	54.29	2.92	2.92	0.00
11.80	8.93	21,604	54.44	4.48	4.48	0.00
12.00	**21.55**	27,133	54.77	8.85	8.85	0.00
12.20	**17.72**	**36,611**	**55.30**	**17.60**	**17.60**	0.00
12.40	7.54	33,186	55.11	14.30	14.30	0.00
12.60	4.77	28,942	54.87	10.44	10.44	0.00
12.80	3.76	25,568	54.68	7.47	7.47	0.00
13.00	3.05	23,320	54.54	5.69	5.69	0.00
13.20	2.48	21,639	54.44	4.50	4.50	0.00
13.40	2.10	20,358	54.36	3.68	3.68	0.00
13.60	1.73	19,326	54.30	3.03	3.03	0.00
13.80	1.60	18,514	54.25	2.56	2.56	0.00
14.00	1.50	17,912	54.21	2.23	2.23	0.00
14.20	1.40	17,439	54.18	1.99	1.99	0.00
14.40	1.30	17,047	54.16	1.80	1.80	0.00
14.60	1.20	16,706	54.13	1.65	1.65	0.00
14.80	1.10	16,395	54.11	1.51	1.51	0.00
15.00	1.00	16,103	54.10	1.39	1.39	0.00
15.20	0.93	15,828	54.08	1.29	1.29	0.00
15.40	0.90	15,593	54.06	1.20	1.20	0.00
15.60	0.88	15,395	54.05	1.13	1.13	0.00
15.80	0.85	15,223	54.04	1.07	1.07	0.00
16.00	0.82	15,070	54.03	1.02	1.02	0.00
16.20	0.80	14,931	54.02	0.98	0.98	0.00
16.40	0.77	14,801	54.01	0.95	0.95	0.00
16.60	0.74	14,676	54.00	0.91	0.91	0.00
16.80	0.71	14,555	54.00	0.88	0.88	0.00
17.00	0.69	14,433	53.99	0.86	0.86	0.00
17.20	0.66	14,311	53.98	0.83	0.83	0.00
17.40	0.64	14,186	53.97	0.81	0.81	0.00
17.60	0.61	14,061	53.97	0.78	0.78	0.00
17.80	0.58	13,934	53.96	0.76	0.76	0.00
18.00	0.56	13,806	53.95	0.74	0.74	0.00
18.20	0.54	13,678	53.94	0.71	0.71	0.00
18.40	0.53	13,559	53.93	0.69	0.69	0.00
18.60	0.53	13,450	53.93	0.67	0.67	0.00
18.80	0.52	13,350	53.92	0.65	0.65	0.00
19.00	0.51	13,258	53.91	0.64	0.64	0.00
19.20	0.51	13,173	53.91	0.62	0.62	0.00
19.40	0.50	13,093	53.90	0.61	0.61	0.00
19.60	0.49	13,018	53.90	0.59	0.59	0.00
19.80	0.49	12,948	53.89	0.58	0.58	0.00
20.00	0.48	12,882	53.89	0.57	0.57	0.00
20.20	0.47	12,818	53.88	0.56	0.56	0.00
20.40	0.46	12,757	53.88	0.55	0.55	0.00
20.60	0.46	12,700	53.88	0.54	0.54	0.00

Hydrograph for Pond P1B: PDA 1B - BASIN #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	0.45	12,644	53.87	0.53	0.53	0.00
21.00	0.44	12,590	53.87	0.52	0.52	0.00
21.20	0.44	12,537	53.87	0.51	0.51	0.00
21.40	0.43	12,486	53.86	0.50	0.50	0.00
21.60	0.42	12,436	53.86	0.49	0.49	0.00
21.80	0.42	12,387	53.86	0.49	0.49	0.00
22.00	0.41	12,339	53.85	0.48	0.48	0.00
22.20	0.41	12,291	53.85	0.47	0.47	0.00
22.40	0.40	12,245	53.85	0.46	0.46	0.00
22.60	0.39	12,198	53.84	0.46	0.46	0.00
22.80	0.38	12,153	53.84	0.45	0.45	0.00
23.00	0.38	12,108	53.84	0.44	0.44	0.00
23.20	0.37	12,062	53.84	0.43	0.43	0.00
23.40	0.37	12,017	53.83	0.43	0.43	0.00
23.60	0.36	11,973	53.83	0.42	0.42	0.00
23.80	0.35	11,928	53.83	0.41	0.41	0.00
24.00	0.39	11,893	53.82	0.41	0.41	0.00
24.20	0.00	11,707	53.81	0.38	0.38	0.00
24.40	0.00	11,447	53.79	0.34	0.34	0.00
24.60	0.00	11,213	53.78	0.31	0.31	0.00
24.80	0.00	11,000	53.77	0.28	0.28	0.00
25.00	0.00	10,807	53.75	0.26	0.26	0.00
25.20	0.00	10,632	53.74	0.23	0.23	0.00
25.40	0.00	10,470	53.73	0.21	0.21	0.00
25.60	0.00	10,322	53.72	0.20	0.20	0.00
25.80	0.00	10,186	53.71	0.18	0.18	0.00
26.00	0.00	10,061	53.70	0.17	0.17	0.00
26.20	0.00	9,945	53.69	0.15	0.15	0.00
26.40	0.00	9,837	53.69	0.14	0.14	0.00
26.60	0.00	9,738	53.68	0.13	0.13	0.00
26.80	0.00	9,645	53.67	0.12	0.12	0.00
27.00	0.00	9,558	53.67	0.12	0.12	0.00
27.20	0.00	9,478	53.66	0.11	0.11	0.00
27.40	0.00	9,403	53.66	0.10	0.10	0.00
27.60	0.00	9,333	53.65	0.09	0.09	0.00
27.80	0.00	9,267	53.65	0.09	0.09	0.00
28.00	0.00	9,205	53.65	0.08	0.08	0.00
28.20	0.00	9,147	53.64	0.08	0.08	0.00
28.40	0.00	9,092	53.64	0.07	0.07	0.00
28.60	0.00	9,041	53.63	0.07	0.07	0.00
28.80	0.00	8,993	53.63	0.06	0.06	0.00
29.00	0.00	8,947	53.63	0.06	0.06	0.00
29.20	0.00	8,904	53.63	0.06	0.06	0.00
29.40	0.00	8,863	53.62	0.06	0.06	0.00
29.60	0.00	8,825	53.62	0.05	0.05	0.00
29.80	0.00	8,788	53.62	0.05	0.05	0.00
30.00	0.00	8,753	53.61	0.05	0.05	0.00
30.20	0.00	8,720	53.61	0.04	0.04	0.00
30.40	0.00	8,688	53.61	0.04	0.04	0.00
30.60	0.00	8,658	53.61	0.04	0.04	0.00
30.80	0.00	8,630	53.61	0.04	0.04	0.00
31.00	0.00	8,603	53.60	0.04	0.04	0.00

Hydrograph for Pond P1B: PDA 1B - BASIN #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
31.20	0.00	8,577	53.60	0.03	0.03	0.00
31.40	0.00	8,553	53.60	0.03	0.03	0.00
31.60	0.00	8,530	53.60	0.03	0.03	0.00
31.80	0.00	8,508	53.60	0.03	0.03	0.00
32.00	0.00	8,486	53.60	0.03	0.03	0.00
32.20	0.00	8,466	53.60	0.03	0.03	0.00
32.40	0.00	8,446	53.59	0.03	0.03	0.00
32.60	0.00	8,427	53.59	0.03	0.03	0.00
32.80	0.00	8,409	53.59	0.02	0.02	0.00
33.00	0.00	8,392	53.59	0.02	0.02	0.00
33.20	0.00	8,375	53.59	0.02	0.02	0.00
33.40	0.00	8,358	53.59	0.02	0.02	0.00
33.60	0.00	8,343	53.59	0.02	0.02	0.00
33.80	0.00	8,328	53.59	0.02	0.02	0.00
34.00	0.00	8,313	53.59	0.02	0.02	0.00
34.20	0.00	8,299	53.58	0.02	0.02	0.00
34.40	0.00	8,286	53.58	0.02	0.02	0.00
34.60	0.00	8,273	53.58	0.02	0.02	0.00
34.80	0.00	8,260	53.58	0.02	0.02	0.00
35.00	0.00	8,248	53.58	0.02	0.02	0.00
35.20	0.00	8,236	53.58	0.02	0.02	0.00
35.40	0.00	8,225	53.58	0.02	0.02	0.00
35.60	0.00	8,215	53.58	0.01	0.01	0.00
35.80	0.00	8,204	53.58	0.01	0.01	0.00
36.00	0.00	8,194	53.58	0.01	0.01	0.00
36.20	0.00	8,185	53.58	0.01	0.01	0.00
36.40	0.00	8,176	53.58	0.01	0.01	0.00
36.60	0.00	8,167	53.58	0.01	0.01	0.00
36.80	0.00	8,158	53.57	0.01	0.01	0.00
37.00	0.00	8,150	53.57	0.01	0.01	0.00
37.20	0.00	8,142	53.57	0.01	0.01	0.00
37.40	0.00	8,134	53.57	0.01	0.01	0.00
37.60	0.00	8,127	53.57	0.01	0.01	0.00
37.80	0.00	8,120	53.57	0.01	0.01	0.00
38.00	0.00	8,113	53.57	0.01	0.01	0.00
38.20	0.00	8,107	53.57	0.01	0.01	0.00
38.40	0.00	8,100	53.57	0.01	0.01	0.00
38.60	0.00	8,094	53.57	0.01	0.01	0.00
38.80	0.00	8,089	53.57	0.01	0.01	0.00
39.00	0.00	8,083	53.57	0.01	0.01	0.00
39.20	0.00	8,077	53.57	0.01	0.01	0.00
39.40	0.00	8,072	53.57	0.01	0.01	0.00
39.60	0.00	8,067	53.57	0.01	0.01	0.00
39.80	0.00	8,061	53.57	0.01	0.01	0.00
40.00	0.00	8,056	53.57	0.01	0.01	0.00
40.20	0.00	8,051	53.57	0.01	0.01	0.00
40.40	0.00	8,046	53.57	0.01	0.01	0.00
40.60	0.00	8,041	53.57	0.01	0.01	0.00
40.80	0.00	8,037	53.57	0.01	0.01	0.00
41.00	0.00	8,032	53.57	0.01	0.01	0.00
41.20	0.00	8,027	53.57	0.01	0.01	0.00
41.40	0.00	8,023	53.57	0.01	0.01	0.00

Hydrograph for Pond P1B: PDA 1B - BASIN #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
41.60	0.00	8,018	53.57	0.01	0.01	0.00
41.80	0.00	8,014	53.56	0.01	0.01	0.00
42.00	0.00	8,010	53.56	0.01	0.01	0.00
42.20	0.00	8,006	53.56	0.01	0.01	0.00
42.40	0.00	8,002	53.56	0.01	0.01	0.00
42.60	0.00	7,998	53.56	0.01	0.01	0.00
42.80	0.00	7,994	53.56	0.01	0.01	0.00
43.00	0.00	7,990	53.56	0.01	0.01	0.00
43.20	0.00	7,986	53.56	0.01	0.01	0.00
43.40	0.00	7,982	53.56	0.01	0.01	0.00
43.60	0.00	7,979	53.56	0.00	0.00	0.00
43.80	0.00	7,975	53.56	0.00	0.00	0.00
44.00	0.00	7,972	53.56	0.00	0.00	0.00
44.20	0.00	7,968	53.56	0.00	0.00	0.00
44.40	0.00	7,965	53.56	0.00	0.00	0.00
44.60	0.00	7,962	53.56	0.00	0.00	0.00
44.80	0.00	7,959	53.56	0.00	0.00	0.00
45.00	0.00	7,955	53.56	0.00	0.00	0.00
45.20	0.00	7,952	53.56	0.00	0.00	0.00
45.40	0.00	7,949	53.56	0.00	0.00	0.00
45.60	0.00	7,946	53.56	0.00	0.00	0.00
45.80	0.00	7,943	53.56	0.00	0.00	0.00
46.00	0.00	7,940	53.56	0.00	0.00	0.00
46.20	0.00	7,938	53.56	0.00	0.00	0.00
46.40	0.00	7,935	53.56	0.00	0.00	0.00
46.60	0.00	7,932	53.56	0.00	0.00	0.00
46.80	0.00	7,929	53.56	0.00	0.00	0.00
47.00	0.00	7,927	53.56	0.00	0.00	0.00
47.20	0.00	7,924	53.56	0.00	0.00	0.00
47.40	0.00	7,922	53.56	0.00	0.00	0.00
47.60	0.00	7,919	53.56	0.00	0.00	0.00
47.80	0.00	7,917	53.56	0.00	0.00	0.00
48.00	0.00	7,915	53.56	0.00	0.00	0.00
48.20	0.00	7,912	53.56	0.00	0.00	0.00
48.40	0.00	7,910	53.56	0.00	0.00	0.00
48.60	0.00	7,908	53.56	0.00	0.00	0.00
48.80	0.00	7,906	53.56	0.00	0.00	0.00
49.00	0.00	7,903	53.56	0.00	0.00	0.00
49.20	0.00	7,901	53.56	0.00	0.00	0.00
49.40	0.00	7,899	53.56	0.00	0.00	0.00
49.60	0.00	7,897	53.56	0.00	0.00	0.00
49.80	0.00	7,895	53.56	0.00	0.00	0.00
50.00	0.00	7,893	53.56	0.00	0.00	0.00
50.20	0.00	7,891	53.56	0.00	0.00	0.00
50.40	0.00	7,889	53.56	0.00	0.00	0.00
50.60	0.00	7,888	53.56	0.00	0.00	0.00
50.80	0.00	7,886	53.56	0.00	0.00	0.00
51.00	0.00	7,884	53.56	0.00	0.00	0.00
51.20	0.00	7,882	53.56	0.00	0.00	0.00
51.40	0.00	7,881	53.56	0.00	0.00	0.00
51.60	0.00	7,879	53.56	0.00	0.00	0.00
51.80	0.00	7,877	53.56	0.00	0.00	0.00

BASIN DRAIN TIME =
43.4 HRS - 12.2 HRS =
31.2 HRS < 72 HRS, OKAY

Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 10.53" for 100-Year (Future Adj.) event
Inflow = 20.58 cfs @ 12.11 hrs, Volume= 1.670 af
Outflow = 16.09 cfs @ 12.20 hrs, Volume= 1.569 af, Atten= 22%, Lag= 5.5 min
Primary = 16.09 cfs @ 12.20 hrs, Volume= 1.569 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 54.79' @ 12.20 hrs Surf.Area= 8,271 sf Storage= 12,970 cf

Plug-Flow detention time= 83.0 min calculated for 1.567 af (94% of inflow)
Center-of-Mass det. time= 48.6 min (809.8 - 761.1)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' 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
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.07 cfs @ 12.20 hrs HW=54.79' (Free Discharge)
└**1=Culvert** (Passes 16.07 cfs of 32.94 cfs potential flow)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Weir Controls 16.07 cfs @ 3.54 fps)
  └**4=Horizontal Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' (Free Discharge)
└**5=Spillway - Broad-Crested Weir** (Controls 0.00 cfs)

Hydrograph for Pond P1A: PDA 1A - BASIN #3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	53.00	0.00	0.00	**0.00**
0.20	0.00	0	53.00	0.00	0.00	0.00
0.40	0.00	0	53.00	0.00	0.00	0.00
0.60	0.03	11	53.00	0.00	0.00	0.00
0.80	0.05	39	53.01	0.00	0.00	0.00
1.00	0.07	82	53.01	0.00	0.00	0.00
1.20	0.08	137	53.02	0.00	0.00	0.00
1.40	0.09	201	53.03	0.00	0.00	0.00
1.60	0.10	273	53.04	0.00	0.00	0.00
1.80	0.11	351	53.05	0.00	0.00	0.00
2.00	0.12	436	53.06	0.00	0.00	0.00
2.20	0.13	525	53.08	0.00	0.00	0.00
2.40	0.13	620	53.09	0.00	0.00	0.00
2.60	0.14	718	53.11	0.00	0.00	0.00
2.80	0.15	821	53.12	0.00	0.00	0.00
3.00	0.15	927	53.14	0.00	0.00	0.00
3.20	0.15	1,036	53.15	0.00	0.00	0.00
3.40	0.16	1,149	53.17	0.00	0.00	0.00
3.60	0.16	1,265	53.19	0.00	0.00	0.00
3.80	0.17	1,383	53.21	0.00	0.00	0.00
4.00	0.17	1,504	53.22	0.00	0.00	0.00
4.20	0.17	1,628	53.24	0.00	0.00	0.00
4.40	0.18	1,755	53.26	0.00	0.00	0.00
4.60	0.18	1,884	53.28	0.00	0.00	0.00
4.80	0.19	2,016	53.30	0.00	0.00	0.00
5.00	0.19	2,153	53.32	0.00	0.00	0.00
5.20	0.20	2,294	53.34	0.00	0.00	0.00
5.40	0.21	2,439	53.36	0.00	0.00	0.00
5.60	0.21	2,589	53.38	0.00	0.00	0.00
5.80	0.22	2,744	53.41	0.00	0.00	0.00
6.00	0.22	2,903	53.43	0.00	0.00	0.00
6.20	0.24	3,069	53.46	0.00	0.00	0.00
6.40	0.25	3,245	53.48	0.00	0.00	0.00
6.60	0.27	3,431	53.51	0.00	0.00	0.00
6.80	0.28	3,629	53.54	0.00	0.00	0.00
7.00	0.30	3,839	53.57	0.00	0.00	0.00
7.20	0.32	4,060	53.60	0.00	0.00	0.00
7.40	0.33	4,293	53.64	0.00	0.00	0.00
7.60	0.35	4,530	53.67	0.04	0.04	0.00
7.80	0.37	4,726	53.70	0.13	0.13	0.00
8.00	0.39	4,869	53.72	0.22	0.22	0.00
8.20	0.40	4,969	53.74	0.29	0.29	0.00
8.40	0.42	5,037	53.75	0.34	0.34	0.00
8.60	0.44	5,087	53.75	0.38	0.38	0.00
8.80	0.46	5,125	53.76	0.41	0.41	0.00
9.00	0.48	5,155	53.76	0.44	0.44	0.00
9.20	0.52	5,190	53.77	0.47	0.47	0.00
9.40	0.58	5,238	53.78	0.51	0.51	0.00
9.60	0.64	5,296	53.79	0.56	0.56	0.00
9.80	0.70	5,357	53.79	0.62	0.62	0.00
10.00	0.77	5,421	53.80	0.68	0.68	0.00
10.20	0.83	5,486	53.81	0.74	0.74	0.00

Hydrograph for Pond P1A: PDA 1A - BASIN #3 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	0.90	5,550	53.82	0.81	0.81	0.00
10.60	1.01	5,622	53.83	0.88	0.88	0.00
10.80	1.24	5,748	53.85	1.03	1.03	0.00
11.00	1.48	5,919	53.88	1.23	1.23	0.00
11.20	1.88	6,141	53.91	1.51	1.51	0.00
11.40	2.34	6,428	53.95	1.91	1.91	0.00
11.60	3.49	6,833	54.01	2.52	2.52	0.00
11.80	5.41	7,702	54.12	3.85	3.85	0.00
12.00	**12.48**	9,688	54.37	7.89	7.89	0.00
12.20	**15.00**	**12,970**	**54.79**	**16.09**	**16.09**	0.00
12.40	5.67	10,305	54.45	9.43	9.43	0.00
12.60	3.57	8,530	54.23	5.35	5.35	0.00
12.80	2.61	7,531	54.10	3.57	3.57	0.00
13.00	2.12	6,985	54.03	2.73	2.73	0.00
13.20	1.71	6,595	53.98	2.16	2.16	0.00
13.40	1.45	6,325	53.94	1.77	1.77	0.00
13.60	1.20	6,113	53.91	1.47	1.47	0.00
13.80	1.08	5,947	53.88	1.26	1.26	0.00
14.00	1.02	5,844	53.87	1.13	1.13	0.00
14.20	0.95	5,767	53.86	1.05	1.05	0.00
14.40	0.88	5,701	53.85	0.97	0.97	0.00
14.60	0.82	5,639	53.84	0.90	0.90	0.00
14.80	0.75	5,576	53.83	0.84	0.84	0.00
15.00	0.68	5,513	53.82	0.77	0.77	0.00
15.20	0.63	5,451	53.81	0.71	0.71	0.00
15.40	0.61	5,404	53.80	0.66	0.66	0.00
15.60	0.59	5,372	53.80	0.63	0.63	0.00
15.80	0.57	5,346	53.79	0.61	0.61	0.00
16.00	0.56	5,323	53.79	0.59	0.59	0.00
16.20	0.54	5,303	53.79	0.57	0.57	0.00
16.40	0.52	5,283	53.78	0.55	0.55	0.00
16.60	0.50	5,264	53.78	0.53	0.53	0.00
16.80	0.48	5,245	53.78	0.51	0.51	0.00
17.00	0.47	5,224	53.77	0.50	0.50	0.00
17.20	0.45	5,204	53.77	0.48	0.48	0.00
17.40	0.43	5,183	53.77	0.46	0.46	0.00
17.60	0.41	5,162	53.77	0.44	0.44	0.00
17.80	0.40	5,141	53.76	0.43	0.43	0.00
18.00	0.38	5,120	53.76	0.41	0.41	0.00
18.20	0.36	5,099	53.76	0.39	0.39	0.00
18.40	0.36	5,084	53.75	0.38	0.38	0.00
18.60	0.35	5,073	53.75	0.37	0.37	0.00
18.80	0.35	5,064	53.75	0.36	0.36	0.00
19.00	0.35	5,057	53.75	0.35	0.35	0.00
19.20	0.34	5,051	53.75	0.35	0.35	0.00
19.40	0.34	5,045	53.75	0.35	0.35	0.00
19.60	0.33	5,038	53.75	0.34	0.34	0.00
19.80	0.33	5,032	53.75	0.34	0.34	0.00
20.00	0.32	5,027	53.75	0.33	0.33	0.00
20.20	0.32	5,020	53.74	0.33	0.33	0.00
20.40	0.31	5,014	53.74	0.32	0.32	0.00
20.60	0.31	5,008	53.74	0.32	0.32	0.00

Hydrograph for Pond P1A: PDA 1A - BASIN #3 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	0.31	5,002	53.74	0.31	0.31	0.00
21.00	0.30	4,995	53.74	0.31	0.31	0.00
21.20	0.30	4,989	53.74	0.30	0.30	0.00
21.40	0.29	4,983	53.74	0.30	0.30	0.00
21.60	0.29	4,977	53.74	0.30	0.30	0.00
21.80	0.28	4,971	53.74	0.29	0.29	0.00
22.00	0.28	4,965	53.74	0.29	0.29	0.00
22.20	0.27	4,958	53.74	0.28	0.28	0.00
22.40	0.27	4,952	53.73	0.28	0.28	0.00
22.60	0.27	4,946	53.73	0.27	0.27	0.00
22.80	0.26	4,940	53.73	0.27	0.27	0.00
23.00	0.26	4,934	53.73	0.26	0.26	0.00
23.20	0.25	4,927	53.73	0.26	0.26	0.00
23.40	0.25	4,921	53.73	0.26	0.26	0.00
23.60	0.24	4,915	53.73	0.25	0.25	0.00
23.80	0.24	4,909	53.73	0.25	0.25	0.00
24.00	0.26	4,907	53.73	0.25	0.25	0.00
24.20	0.02	4,834	53.72	0.20	0.20	0.00
24.40	0.00	4,721	53.70	0.13	0.13	0.00
24.60	0.00	4,645	53.69	0.09	0.09	0.00
24.80	0.00	4,590	53.68	0.07	0.07	0.00
25.00	0.00	4,549	53.67	0.05	0.05	0.00
25.20	0.00	4,518	53.67	0.04	0.04	0.00
25.40	0.00	4,494	53.67	0.03	0.03	0.00
25.60	0.00	4,476	53.66	0.02	0.02	0.00
25.80	0.00	4,463	53.66	0.02	0.02	0.00
26.00	0.00	4,453	53.66	0.01	0.01	0.00
26.20	0.00	4,445	53.66	0.01	0.01	0.00
26.40	0.00	4,438	53.66	0.01	0.01	0.00
26.60	0.00	4,432	53.66	0.01	0.01	0.00
26.80	0.00	4,426	53.66	0.01	0.01	0.00
27.00	0.00	4,421	53.66	0.01	0.01	0.00
27.20	0.00	4,417	53.66	0.01	0.01	0.00
27.40	0.00	4,413	53.65	0.01	0.01	0.00
27.60	0.00	4,410	53.65	0.00	0.00	0.00
27.80	0.00	4,406	53.65	0.00	0.00	0.00
28.00	0.00	4,404	53.65	0.00	0.00	0.00
28.20	0.00	4,401	53.65	0.00	0.00	0.00
28.40	0.00	4,399	53.65	0.00	0.00	0.00
28.60	0.00	4,397	53.65	0.00	0.00	0.00
28.80	0.00	4,396	53.65	0.00	0.00	0.00
29.00	0.00	4,394	53.65	0.00	0.00	0.00
29.20	0.00	4,393	53.65	0.00	0.00	0.00
29.40	0.00	4,392	53.65	0.00	0.00	0.00
29.60	0.00	4,391	53.65	0.00	0.00	0.00
29.80	0.00	4,390	53.65	0.00	0.00	0.00
30.00	0.00	4,389	53.65	0.00	0.00	0.00
30.20	0.00	4,388	53.65	0.00	0.00	0.00
30.40	0.00	4,388	53.65	0.00	0.00	0.00
30.60	0.00	4,387	53.65	0.00	0.00	0.00
30.80	0.00	4,387	53.65	0.00	0.00	0.00
31.00	0.00	4,386	53.65	0.00	0.00	0.00

BASIN DRAIN TIME =
27.40 HRS - 12.2 HRS =
15.20 HRS < 72 HRS, OKAY

EX-PR (Emergency Spillway Calc *NOAA 24-hr C 1.5 x 100-Year (Future Adj.) Rainfall=18.23"*

Prepared by Bohler Engineering NJ, LLC

Summary for Pond P1C: PDA 1C - BASIN #1

Inflow Area = 4.222 ac, 62.43% Impervious, Inflow Depth = 16.72" for 1.5 x 100-Year (Future Adj.) event
Inflow = 70.69 cfs @ 12.10 hrs, Volume= 5.881 af
Outflow = 49.64 cfs @ 12.16 hrs, Volume= 5.872 af, Atten= 30%, Lag= 3.8 min
Primary = 49.64 cfs @ 12.16 hrs, Volume= 5.872 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Starting Elev= 64.78' Surf.Area= 19,166 sf Storage= 71,154 cf
Peak Elev= 65.90' @ 12.19 hrs Surf.Area= 26,349 sf Storage= 96,154 cf (25,000 cf above start)

Plug-Flow detention time= 190.4 min calculated for 4.233 af (72% of inflow)
Center-of-Mass det. time= 14.4 min (765.5 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	98,740 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	10,795	0	0
61.00	12,455	11,625	11,625
62.00	14,155	13,305	24,930
63.00	15,905	15,030	39,960
64.00	17,715	16,810	56,770
65.00	19,575	18,645	75,415
66.00	27,075	23,325	98,740

BASIN NOT CLASSIFIED AS A CLASS IV DAM

ASSUME OUTLET FAILED
BASIN ROUTING STARTING AT ELEVATION 64.78' (100 YR STORM)
RUN 150% OF 100 YEAR STORM

Device	Routing	Invert	Outlet Devices
#1	Primary	54.20'	**24.0" Round Culvert** L= 40.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.20' / 54.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	60.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	60.90'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	64.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=49.38 cfs @ 12.16 hrs HW=65.86' (Free Discharge)
└**1=Culvert** (Inlet Controls 49.38 cfs @ 15.72 fps)
  ├**2=Exfiltration** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Horizontal Grate** (Passes 49.38 cfs of 56.86 cfs potential flow)

TOP OF BERM = 67.25 - 65.90 = 1.35' > 1' FREEBOARD, HENCE OK

150% OF THE 100-YEAR STORM TO BE CONTAINED WITHIN BASIN

EX-PR (Emergency Spillway Calc *NOAA 24-hr C 1.5 x 100-Year (Future Adj.) Rainfall=18.23"*

Prepared by Bohler Engineering NJ, LLC

Summary for Pond P1B: PDA 1B - BASIN #2

Inflow Area = 2.801 ac, 68.26% Impervious, Inflow Depth = 16.91" for 1.5 x 100-Year (Future Adj.) event
Inflow = 52.33 cfs @ 12.09 hrs, Volume= 3.948 af
Outflow = 44.74 cfs @ 12.13 hrs, Volume= 3.931 af, Atten= 15%, Lag= 2.2 min
Primary = 26.48 cfs @ 12.13 hrs, Volume= 3.444 af
Secondary = 18.26 cfs @ 12.13 hrs, Volume= 0.487 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Starting Elev= 55.31' Surf.Area= 18,252 sf Storage= 36,725 cf
Peak Elev= 55.99' @ 12.13 hrs Surf.Area= 19,705 sf Storage= 49,551 cf (12,826 cf above start)

Plug-Flow detention time= 169.5 min calculated for 3.083 af (78% of inflow)
Center-of-Mass det. time= 16.6 min (763.6 - 747.0)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	49,830 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	13,645	0	0
54.00	15,555	14,600	14,600
55.00	17,585	16,570	31,170
56.00	19,735	18,660	49,830

BASIN NOT CLASSIFIED AS A CLASS IV DAM

ASSUME OUTLET FAILED
BASIN ROUTING STARTING AT ELEVATION 55.31' (100 YR STORM)
RUN 150% OF 100 YEAR STORM

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 53.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.73' S= 0.0051 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.55'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	54.00'	**2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	55.35'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	55.60'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=25.37 cfs @ 12.13 hrs HW=55.97' (Free Discharge)
└─**1=Culvert** (Passes 25.37 cfs of 36.95 cfs potential flow)
  ├─**2=Exfiltration** (Controls 0.00 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Horizontal Grate** (Weir Controls 25.37 cfs @ 2.57 fps)

Secondary OutFlow Max=17.03 cfs @ 12.13 hrs HW=55.97' (Free Discharge)
└─**6=Spillway - Broad-Crested Rectangular Weir** (Weir Controls 17.03 cfs @ 1.54 fps)

TOP OF BERM = 57.25 - 55.97 = 1.28' > 1' FREEBOARD, HENCE OK

Per Section 12 of the New Jersey Soil Erosion Control Standards, the allowable velocity for discharge is 3.0 fps (for Silt Loam) without outlet conduit protection.
Velocity over emergency spillway is 1.54 fps < 3.0 fps. OK to have grass spillway.

EX-PR (Emergency Spillway Calc *NOAA 24-hr C 1.5 x 100-Year (Future Adj.) Rainfall=18.23"*
Prepared by Bohler Engineering NJ, LLC

Summary for Pond P1A: PDA 1A - BASIN #3

Inflow Area = 1.902 ac, 56.36% Impervious, Inflow Depth = 16.51" for 1.5 x 100-Year (Future Adj.) event
Inflow = 31.93 cfs @ 12.11 hrs, Volume= 2.617 af
Outflow = 29.59 cfs @ 12.14 hrs, Volume= 2.617 af, Atten= 7%, Lag= 1.8 min
Primary = 19.35 cfs @ 12.14 hrs, Volume= 2.380 af
Secondary = 10.24 cfs @ 12.14 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Starting Elev= 54.80' Surf.Area= 8,288 sf Storage= 13,076 cf
Peak Elev= 55.32' @ 12.14 hrs Surf.Area= 8,955 sf Storage= 17,567 cf (4,490 cf above start)

Plug-Flow detention time= 112.4 min calculated for 2.317 af (89% of inflow)
Center-of-Mass det. time= 6.8 min (761.7 - 754.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	23,860 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	6,185	0	0
54.00	7,300	6,743	6,743
55.00	8,535	7,918	14,660
56.00	9,865	9,200	23,860

BASIN NOT CLASSIFIED AS A CLASS IV DAM

ASSUME OUTLET FAILED
BASIN ROUTING STARTING AT ELEVATION 54.80' (100 YR STORM)
RUN 150% OF 100 YEAR STORM

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**24.0" Round Culvert** L= 75.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 48.63' S= 0.0049 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	53.00'	**1.000 in/hr Exfiltration X 0.00 over Surface area**
#3	Device 1	53.65'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 0.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	54.80'	**48.0" x 48.0" Horiz. Horizontal Grate** C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Secondary	55.05'	**30.0' long x 10.0' breadth Spillway - Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=18.55 cfs @ 12.14 hrs HW=55.30' (Free Discharge)
└**1=Culvert** (Passes 18.55 cfs of 34.83 cfs potential flow)
  └**2=Exfiltration** (Controls 0.00 cfs)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Horizontal Grate** (Weir Controls 18.55 cfs @ 2.31 fps)

Secondary OutFlow Max=9.46 cfs @ 12.14 hrs HW=55.30' (Free Discharge)
└**5=Spillway - Broad-Crested Rectangular Weir** (Weir Controls 9.46 cfs @ 1.26 fps)

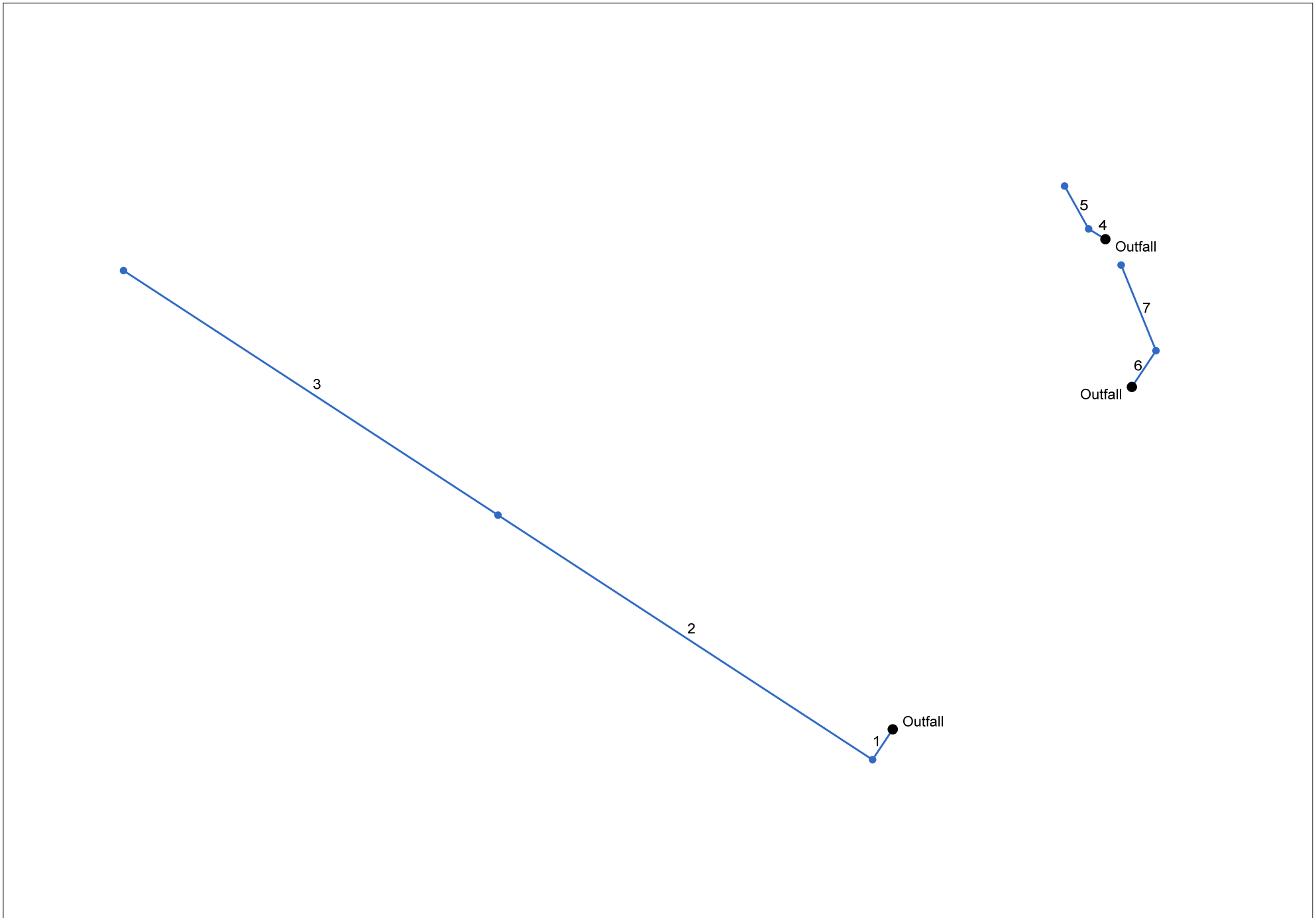
TOP OF BERM = 56.50 - 54.80 = 1.70' > 1' FREEBOARD, HENCE OK

Per Section 12 of the New Jersey Soil Erosion Control Standards, the allowable velocity for discharge is 3.0 fps (for Silt Loam) without outlet conduit protection.
Velocity over emergency spillway is 1.26 fps < 3.0 fps. OK to have grass spillway.

D. CONVEYANCE CALCULATIONS

- **Pipe Sizing**
- **Underdrains**
- **Scour Hole Calculations**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: New.stm	Number of lines: 7	Date: 12/16/2022

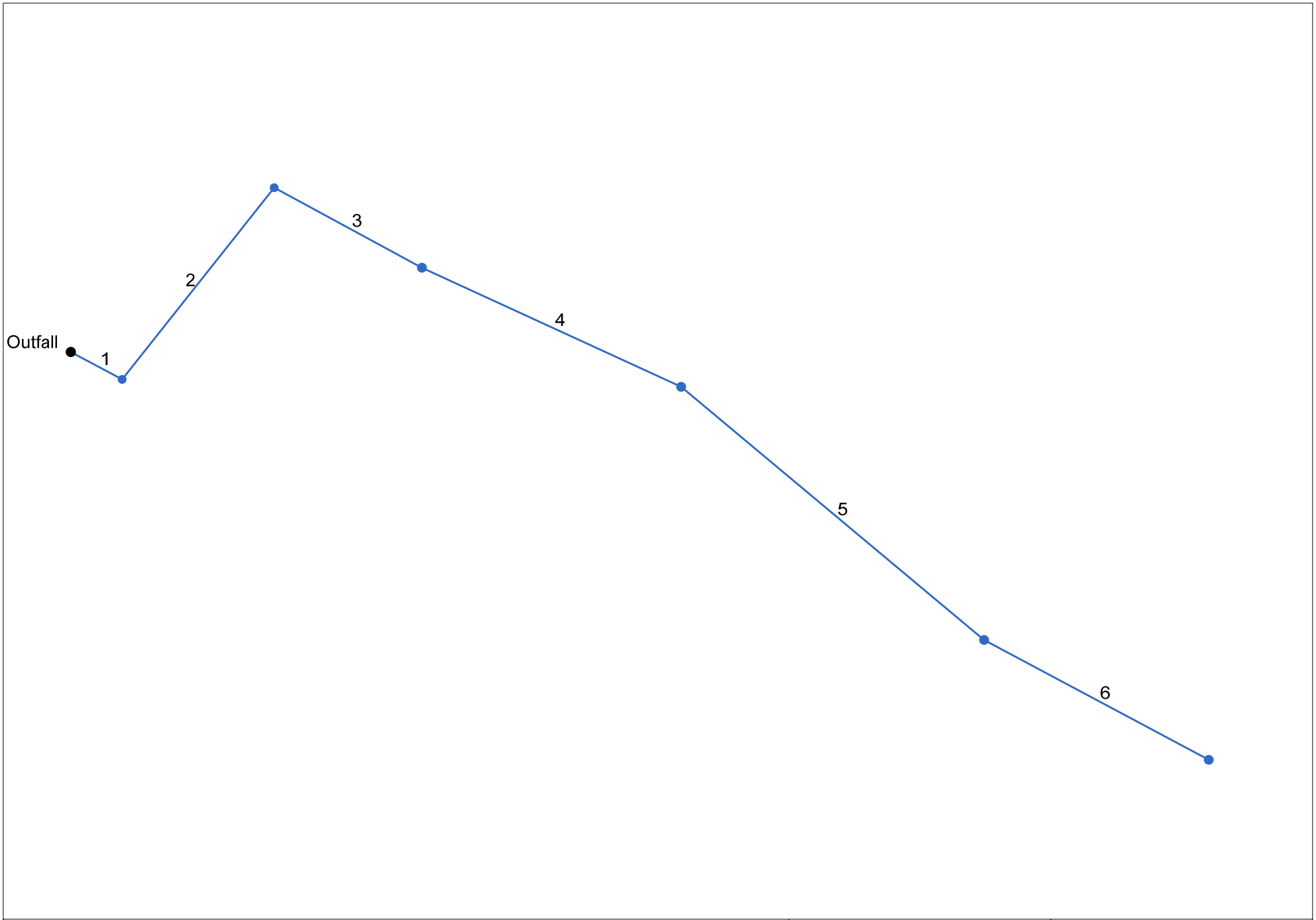
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	26.000	0.00	2.26	0.00	0.00	2.15	10.0	12.1	7.2	15.45	29.40	7.99	24	1.00	60.00	60.26	61.03	61.68	62.58	69.42	B1.0S-RS.1
2	1	318.000	0.00	2.26	0.00	0.00	2.15	10.0	11.0	7.4	15.94	22.79	7.22	24	0.60	61.87	63.78	63.10	65.22	69.42	69.74	RS.1-RS.2
3	2	318.000	2.26	2.26	0.95	2.15	2.15	10.0	10.0	7.7	16.43	22.79	6.74	24	0.60	63.78	65.69	65.22	67.15	69.74	69.73	RS.2-RS.3
4	End	14.000	0.00	0.51	0.00	0.00	0.48	10.0	10.2	7.6	3.69	4.57	4.14	15	0.50	62.75	62.82	63.60	63.67	64.69	65.98	FES MTD - B1.2A
5	4	35.000	0.51	0.51	0.95	0.48	0.48	10.0	10.0	7.7	3.71	4.50	3.47	15	0.49	62.83	63.00	63.89	63.98	65.98	65.05	B1.2A -B1.2B
6	End	31.000	0.00	0.65	0.00	0.00	0.62	10.0	10.4	7.6	4.67	5.33	3.40	18	0.26	60.00	60.08	61.09	61.17	62.21	64.83	B1.0N - B1.0A
7	6	66.000	0.65	0.65	0.95	0.62	0.62	10.0	10.0	7.7	4.73	5.17	3.29	18	0.24	60.18	60.34	61.32	61.47	64.83	62.85	B1.0A-B1.1

Project File: New.stm | Number of lines: 7 | Run Date: 12/16/2022

NOTES:Intensity = 545.78 / (Inlet time + 28.60) ^ 1.17; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: New.stm	Number of lines: 6	Date: 12/15/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	30.999	0.33	2.04	0.95	0.31	1.94	10.0	13.8	6.9	13.29	20.45	6.51	24	0.48	53.00	53.15	54.17	54.46	55.06	59.40	B2 - B2.1
2	1	142.014	0.15	1.71	0.95	0.14	1.62	10.0	13.2	7.0	11.34	20.79	6.24	24	0.50	55.49	56.20	56.54	57.41	59.40	59.73	B2.1 - B2.2
3	2	89.639	0.32	1.56	0.95	0.30	1.48	10.0	12.7	7.1	10.48	20.83	5.71	24	0.50	56.30	56.75	57.41	57.91	59.73	61.26	B2.2-B2.3
4	3	150.333	0.43	1.24	0.95	0.41	1.18	10.0	12.2	7.2	8.45	9.64	6.05	18	0.50	58.15	58.90	59.24	60.03	61.26	63.59	B2.3-B2.4
5	4	219.665	0.45	0.81	0.95	0.43	0.77	10.0	11.1	7.4	5.71	9.66	5.35	18	0.50	59.90	61.00	60.73	61.92	63.59	64.80	B2.4-B2.5
6	5	135.737	0.36	0.36	0.95	0.34	0.34	10.0	10.0	7.7	2.62	5.94	3.99	15	0.50	61.25	61.93	61.92	62.58	64.80	65.05	B2.5-B2.6

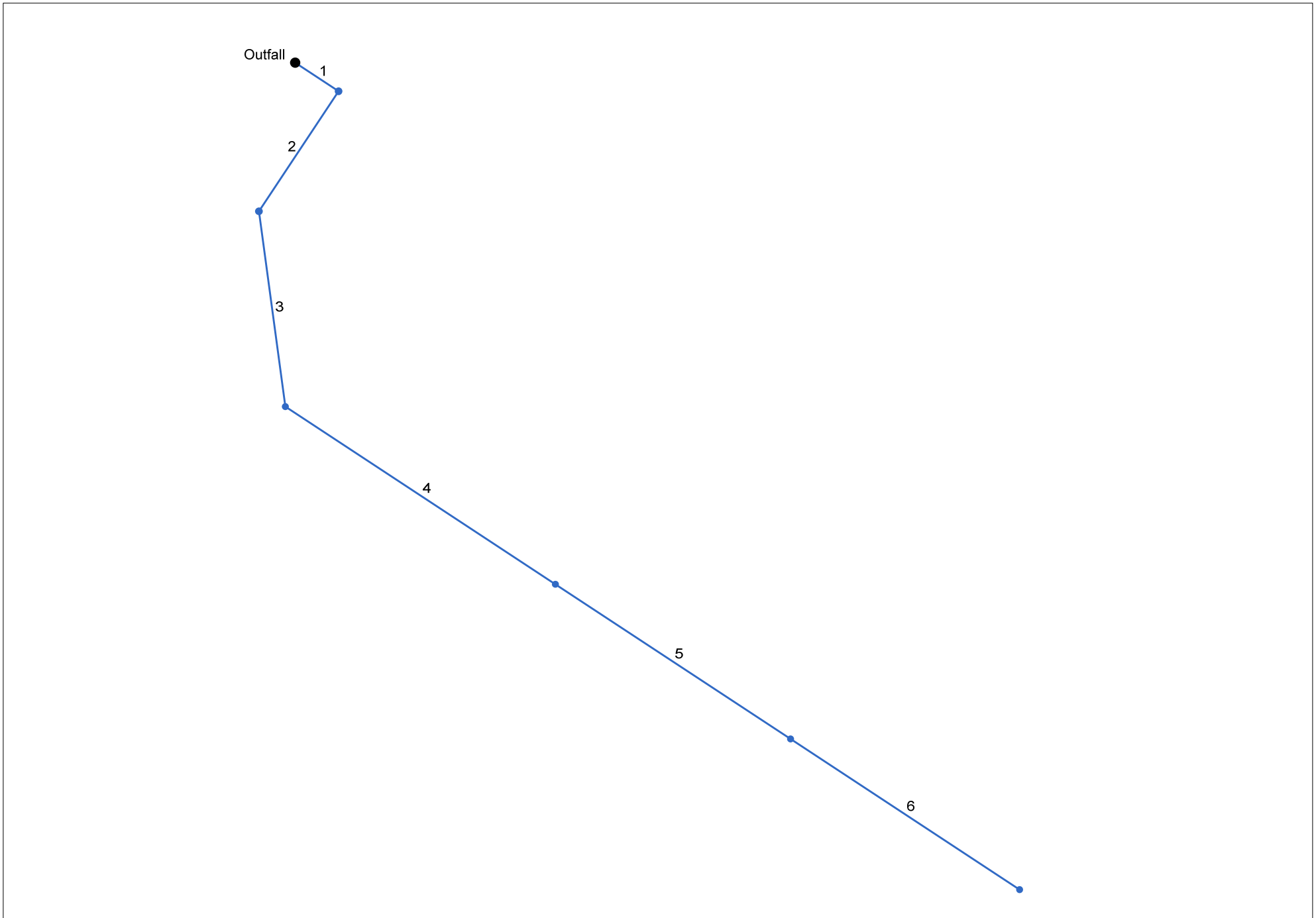
Project File: New.stm

Number of lines: 6

Run Date: 12/15/2022

NOTES:Intensity = 545.78 / (Inlet time + 28.60) ^ 1.17; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Pipe Sizing - Basin 3.stm	Number of lines: 6	Date: 12/15/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	36.000	0.00	1.30	0.00	0.00	1.24	10.0	14.5	6.7	8.31	9.65	6.02	18	0.50	53.00	53.18	54.07	54.30	55.06	59.33	B3-B3.0A
2	1	100.000	0.00	1.30	0.00	0.00	1.24	10.0	14.2	6.8	8.39	9.65	6.04	18	0.50	56.20	56.70	57.28	57.82	59.33	62.39	B2.0A-B3.0B
3	2	137.000	0.26	1.30	0.95	0.25	1.24	10.0	13.7	6.9	8.49	9.69	6.07	18	0.50	59.30	59.99	60.39	61.12	62.39	67.08	B3.0B-B3.1
4	3	224.000	0.38	1.04	0.95	0.36	0.99	10.0	12.8	7.1	6.97	9.65	5.69	18	0.50	61.00	62.12	61.94	63.14	67.08	67.51	B3.1-B3.2
5	4	195.000	0.38	0.66	0.95	0.36	0.63	10.0	11.9	7.2	4.54	5.95	5.18	15	0.50	62.47	63.45	63.29	64.31	67.51	67.51	B3.2-B3.3
6	5	190.000	0.28	0.28	0.95	0.27	0.27	10.0	10.0	7.7	2.04	5.94	3.17	15	0.50	63.55	64.50	64.31	65.07	67.51	67.57	B3.3-B3.4

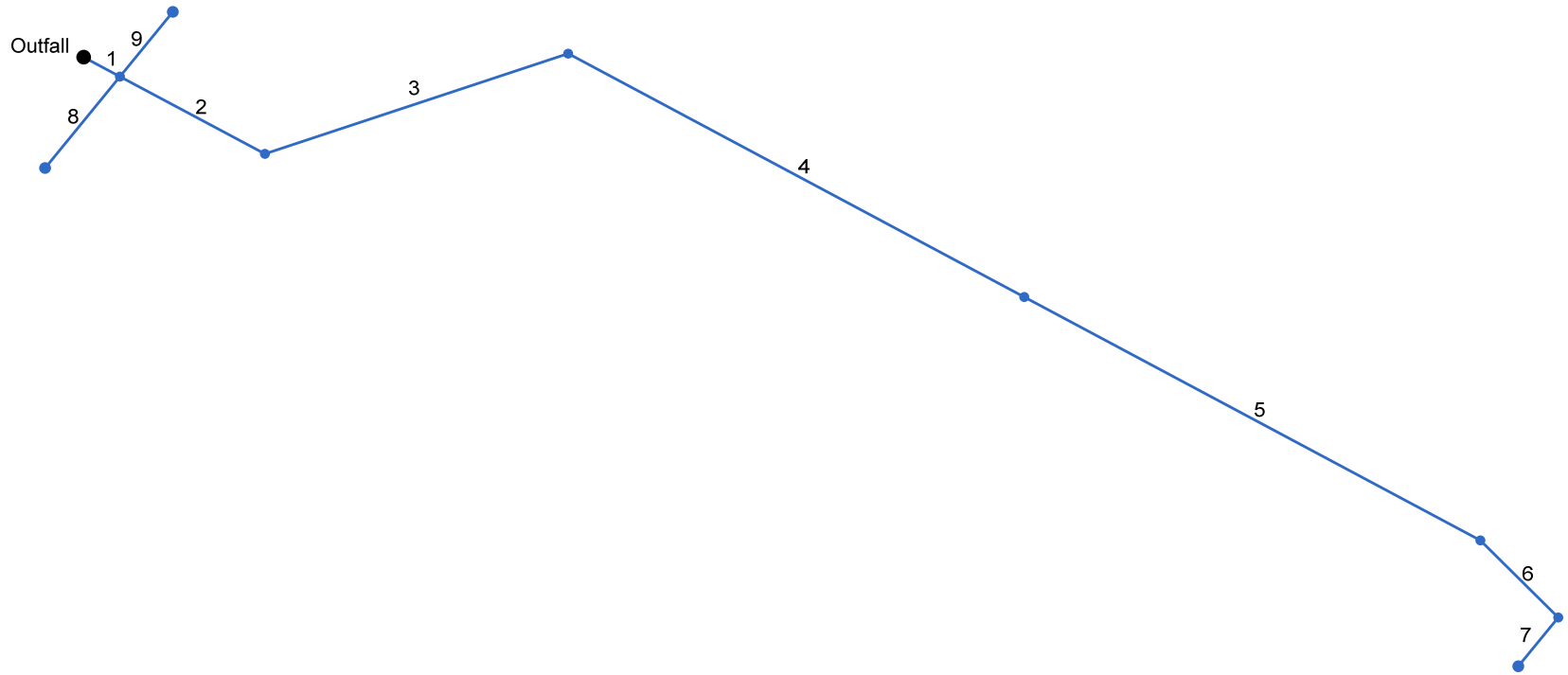
Project File: Pipe Sizing - Basin 3.stm

Number of lines: 6

Run Date: 12/15/2022

NOTES:Intensity = 545.78 / (Inlet time + 28.60) ^ 1.17; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: New.stm	Number of lines: 9	Date: 12/16/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	24.000	0.15	2.52	0.51	0.08	2.33	10.0	12.9	7.0	62.93	63.81	10.06	36	0.54	46.60	46.73	49.02	49.28	55.50	57.02	C1.0 - C1.1
2	1	96.000	0.00	2.37	0.00	0.00	2.25	10.0	12.6	7.1	28.68	37.70	7.96	30	0.50	47.92	48.40	49.55	50.22	57.02	58.42	C1.1-C1.2
3	2	181.000	0.00	2.37	0.00	0.00	2.25	10.0	12.1	7.2	28.93	37.80	7.99	30	0.50	48.61	49.52	50.25	51.35	58.42	65.60	C1.2-C1.3
4	3	302.000	0.00	2.37	0.00	0.00	2.25	10.0	11.2	7.4	29.33	37.70	7.82	30	0.50	49.62	51.13	51.35	52.98	65.60	65.97	C1.3-C1.4
5	4	302.000	2.37	2.37	0.95	2.25	2.25	10.0	10.4	7.6	29.75	37.70	7.63	30	0.50	51.13	52.64	52.98	54.50	65.97	65.87	C1.4-C1.5
6	5	68.000	0.00	0.00	0.00	0.00	0.00	10.0	10.1	0.0	12.71	20.79	6.46	24	0.50	53.64	53.98	54.77	55.26	65.87	65.47	C1.5-C1.6
7	6	40.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	12.71	9.65	7.19	18	0.50	54.00	54.20	55.50	55.85	65.47	60.00	C1.6-OCS1
8	1	75.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	16.09	20.93	6.98	24	0.51	48.62	49.00	49.94	50.44	57.02	53.00	C1.1-OCS3
9	1	53.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	17.75	20.99	7.22	24	0.51	48.73	49.00	50.14	50.52	57.02	53.00	C1.1-OCS2

Project File: New.stm | Number of lines: 9 | Run Date: 12/16/2022

NOTES:Intensity = 545.78 / (Inlet time + 28.60) ^ 1.17; Return period =Yrs. 100 ; c = cir e = ellip b = box

Bioretention Basin #1 Underdrain Sizing

Requirement: The network of pipes for a bioretention basin with underdrains must have a conveyance rate at least twice the design permeability of the sand layer. Where the sand permeability is twice the design permeability of the soil bed.

Area of Infiltration: 10,795 SF

Design Permeability of Sand Layer = 1.0 in/hr (Permeability of Soil Bed = 2.0 in/hr., Design Permeability of Soil Bed = 0.5 in/hr)

Required Capacity of Underdrain System: 10,795 SF * (1'/12")*(1hr /60 min)* (1 min/60 sec)* (2* 1.0 in/hr) = 0.50 cfs

BOHLER

Date:	12/28/2022
Project:	IDI Franklin
Project No:	NJA220121
Calculated By:	ATK
Checked By:	AS

Bioretention Basin Underdrain Sizing

Manning's Equation

Design Parameters:

Pipe Diameter, D	12	in
Pipe Material	PVC	
Slope, s	0.10	%
Flow Depth, y	FULL	

Calculations:

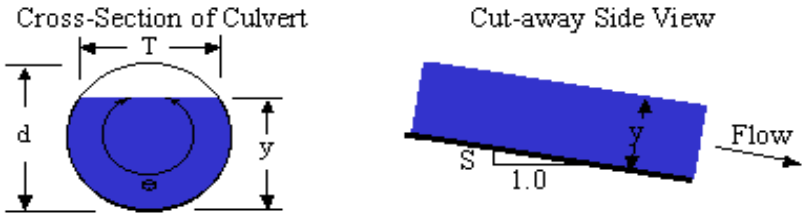
Cross-Sectional Area, $A = D^2/8\,[\theta - \sin(\theta)]$ =	0.79	ft^2
Manning's Coefficient, n	0.010	
Hydraulic Radius, R	0.25	ft
Angle, θ =	6.28	radians
Wetted Perimeter, $P = \theta D/2$	3.14	ft
Flow Depth, y	1.00	ft
Flow Top Width, $T = 2[y(D-y)]^{1/2}$	0.00	ft
Gravity Constant, g	32.174	ft/s^2
Froude Number, F	0.00	
	Subcritical Flow	

- **Flow & Velocity:**

Flow, $Q_o = \dfrac{1.486 \cdot R^{2/3} s^{1/2} A}{n}$ . . . . . **1.46 cfs**

0.95 MGD

Velocity, $V = Q/A$ . . . . . **1.86 fps**



$$Q=VA \qquad V=\frac{k}{n}R^{2/3}S^{1/2} \qquad R=\frac{A}{P} \qquad A=\frac{d^2}{8}\left(\theta-\sin(\theta)\right)$$

$$P=\frac{\theta d}{2} \qquad y=\frac{d}{2}\left[1-\cos\left(\frac{\theta}{2}\right)\right] \qquad T=2\sqrt{y(d-y)} \qquad F=V\sqrt{\frac{T}{gA\cos(Tan^{-1}S)}}$$

12" PVC @ 0.10% Capacity = 1.46 cfs > 0.50 cfs required, therefore OKAY

Bioretention Basin #1 to contain 12" PVC underdrain set at 0.10% slope

Bioretention Basin #2 Underdrain Sizing

Requirement: The network of pipes for a bioretention basin with underdrains must have a conveyance rate at least twice the design permeability of the sand layer. Where the sand permeability is twice the design permeability of the soil bed.

Area of Infiltration: 13,643 SF

Design Permeability of Sand Layer = 1.0 in/hr (Permeability of Soil Bed = 2.0 in/hr., Design Permeability of Soil Bed = 0.5 in/hr)

Required Capacity of Underdrain System: 13,643 SF * (1'/12")*(1hr /60 min)* (1 min/60 sec)* (2* 1.0 in/hr) = 0.63 cfs

BOHLER

Date:	12/28/2022
Project:	IDI Franklin
Project No:	NJA220121
Calculated By:	ATK
Checked By:	AS

Bioretention Basin Underdrain Sizing

Manning's Equation

Design Parameters:

Pipe Diameter, D	12	in
Pipe Material	PVC	
Slope, s	0.10	%
Flow Depth, y	FULL	

Calculations:

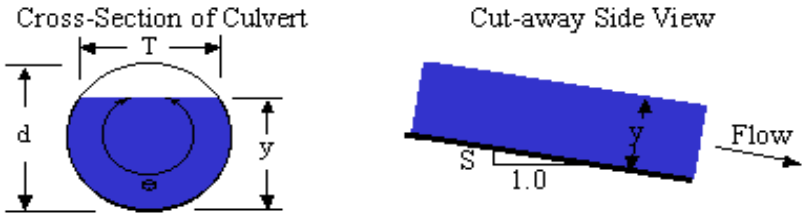
Cross-Sectional Area, $A = D^2/8\,[\theta - \sin(\theta)]$ =	0.79	ft^2
Manning's Coefficient, n	0.010	
Hydraulic Radius, R	0.25	ft
Angle, θ =	6.28	radians
Wetted Perimeter, $P = \theta D/2$	3.14	ft
Flow Depth, y	1.00	ft
Flow Top Width, $T = 2[y(D-y)]^{1/2}$	0.00	ft
Gravity Constant, g	32.174	ft/s^2
Froude Number, F	0.00	
	Subcritical Flow	

- **Flow & Velocity:**

Flow, $Q_o = \dfrac{1.486 \cdot R^{2/3} s^{1/2} A}{n}$ . . . . . **1.46 cfs**

0.95 MGD

Velocity, $V = Q/A$ . . . . . **1.86 fps**



$$Q=VA \qquad V=\frac{k}{n}R^{2/3}S^{1/2} \qquad R=\frac{A}{P} \qquad A=\frac{d^2}{8}\left(\theta-\sin(\theta)\right)$$

$$P=\frac{\theta d}{2} \qquad y=\frac{d}{2}\left[1-\cos\left(\frac{\theta}{2}\right)\right] \qquad T=2\sqrt{y(d-y)} \qquad F=V\sqrt{\frac{T}{gA\cos(Tan^{-1}S)}}$$

12" PVC @ 0.10% Capacity = 1.46 cfs > 0.63 cfs required, therefore OKAY

Bioretention Basin #2 to contain 12" PVC underdrain set at 0.10% slope

Bioretention Basin #3 Underdrain Sizing

Requirement: The network of pipes for a bioretention basin with underdrains must have a conveyance rate at least twice the design permeability of the sand layer. Where the sand permeability is twice the design permeability of the soil bed.

Area of Infiltration: 6,187 SF

Design Permeability of Sand Layer = 1.0 in/hr (Permeability of Soil Bed = 2.0 in/hr., Design Permeability of Soil Bed = 0.5 in/hr)

Required Capacity of Underdrain System: 6,187 SF * (1'/12")*(1hr /60 min)* (1 min/60 sec)* (2* 1.0 in/hr) = 0.27 cfs

BOHLER

Date:	12/28/2022
Project:	IDI Franklin
Project No:	NJA220121
Calculated By:	ATK
Checked By:	AS

Bioretention Basin Underdrain Sizing

Manning's Equation

Design Parameters:

Pipe Diameter, D	12	in
Pipe Material	PVC	
Slope, s	0.10	%
Flow Depth, y	FULL	

Calculations:

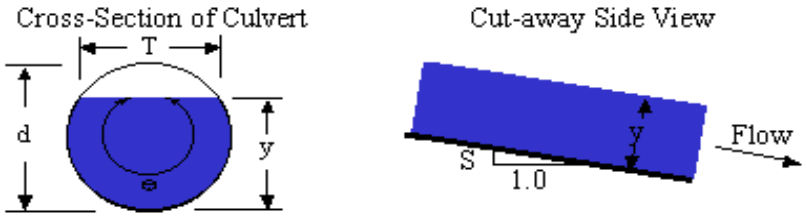
Cross-Sectional Area, $A = D^2/8\,[\theta - \sin(\theta)]$ =	0.79	ft^2
Manning's Coefficient, n	0.010	
Hydraulic Radius, R	0.25	ft
Angle, θ =	6.28	radians
Wetted Perimeter, $P = \theta D/2$	3.14	ft
Flow Depth, y	1.00	ft
Flow Top Width, $T = 2[y(D-y)]^{1/2}$	0.00	ft
Gravity Constant, g	32.174	ft/s^2
Froude Number, F	0.00	
	Subcritical Flow	

- **Flow & Velocity:**

Flow, $Q_o = \dfrac{1.486 \cdot R^{2/3} s^{1/2} A}{n}$ . . . . . **1.46 cfs**

0.95 MGD

Velocity, $V = Q/A$ . . . . . **1.86 fps**



$$Q=VA \qquad V=\frac{k}{n}R^{2/3}S^{1/2} \qquad R=\frac{A}{P} \qquad A=\frac{d^2}{8}\left(\theta-\sin(\theta)\right)$$

$$P=\frac{\theta d}{2} \qquad y=\frac{d}{2}\left[1-\cos\left(\frac{\theta}{2}\right)\right] \qquad T=2\sqrt{y(d-y)} \qquad F=V\sqrt{\frac{T}{gA\cos(Tan^{-1}S)}}$$

12" PVC @ 0.10% Capacity = 0.27 cfs > 0.50 cfs required, therefore OKAY

Bioretention Basin #3 to contain 12" PVC underdrain set at 0.10% slope

BOHLER

Date: 12/28/2022
Project: IDI Franklin
Project No: NJA220121

35 Technology Drive, Warren, NJ 07059
(908) 668-8300

Calculated By: ATK
Checked By: AS

Conduit Outlet Protection Calculations

Scour Hole # 1-N

Design Parameters:

Design Storm Flow for 25 Year, Q	4.63	cfs
Vertical Dimension of Outlet Pipe, D_o	18	in
Horizontal Dimension of Outlet Pipe, W_o	18	in
Tailwater Depth, TW [1]	2.05	ft
Scour Hole Depth, y (1/2 D_o or D_o)	9	in

Apron Dimension Calculations:

Minimum Bottom Width, $W_1 = 2W_o$	W_1 = 3.00 ft
Minimum Bottom Length, $L_1 = 3D_o$	L_1 = 4.50 ft
Minimum Top Width *(max side slope of 3:1)*, W_2	W_2 = 7.50 ft
Minimum Top Length *(max side slope of 3:1)*, L_2	L_2 = 9.00 ft

Rip Rap Stone Size Calculations:

Unit Dicharge, $q = Q/D_o$ = 3.09 cfs per foot

- **Case I: $y = 1/2\ D_o$**

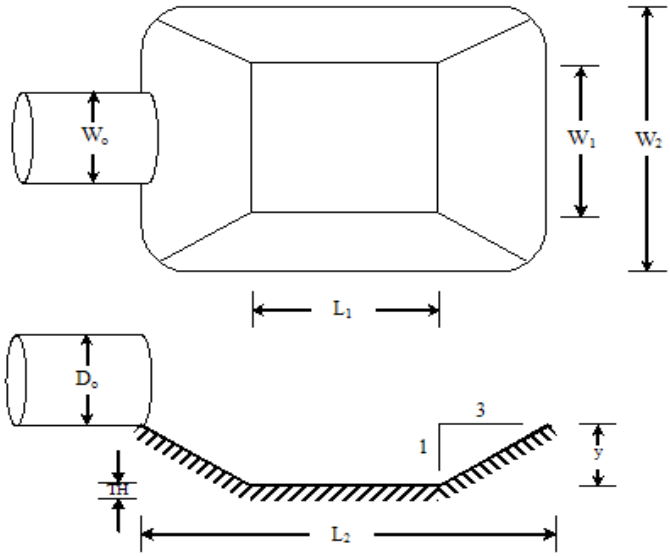
  Median Stone, $d_{50} = \frac{0.0125\ q^{1.33}}{TW}$ = 0.33 in Therefore, use $d50$ = 6 in

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . TH = 12 in

- **Case II: $y = D_o$**

  Median Stone, $d_{50} = \frac{0.0082\ q^{1.33}}{TW}$ =

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . .



Notes:

1. The side slopes shall be 3:1 or flatter.
2. The bottom grade shall be 0.0% (level).
3. There shall be no overfall at the end of the apron or at the end of the culvert.
4. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
5. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
6. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
7. Where the scour hole is to be placed within an existing or proposed waterway:
   a. The scour hole sidewalls should be eliminated to maintain a smooth hydraulic line along the waterway bottom to avoid inviting turbulent flow from a sudden depression in the waterway.
   b. If the flow in the waterway is greater than the flow from the proposed outlet, the rip-rap used to construct the scour hole should be sized based on the greater flow value according to the standard rip-rap.

Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

BOHLER

Date: 12/28/2022
Project: IDI Franklin
Project No: NJA220121

35 Technology Drive, Warren, NJ 07059
(908) 668-8300

Calculated By: ATK
Checked By: AS

Conduit Outlet Protection Calculations

Scour Hole # 1-S

Design Parameters:

Design Storm Flow for 25 Year, Q	15.48	cfs
Vertical Dimension of Outlet Pipe, D_o	24	in
Horizontal Dimension of Outlet Pipe, W_o	24	in
Tailwater Depth, TW [1]	2.05	ft
Scour Hole Depth, y (1/2 D_o or D_o)	12	in

Apron Dimension Calculations:

Minimum Bottom Width, $W_1 = 2W_o$	W_1 = 4.00 ft
Minimum Bottom Length, $L_1 = 3D_o$	L_1 = 6.00 ft
Minimum Top Width *(max side slope of 3:1)*, W_2	W_2 =10.00 ft
Minimum Top Length *(max side slope of 3:1)*, L_2	L_2 =12.00 ft

Rip Rap Stone Size Calculations:

Unit Dicharge, $q = Q/D_o$ = 7.74 cfs per foot

- **Case I: $y = 1/2\ D_o$**

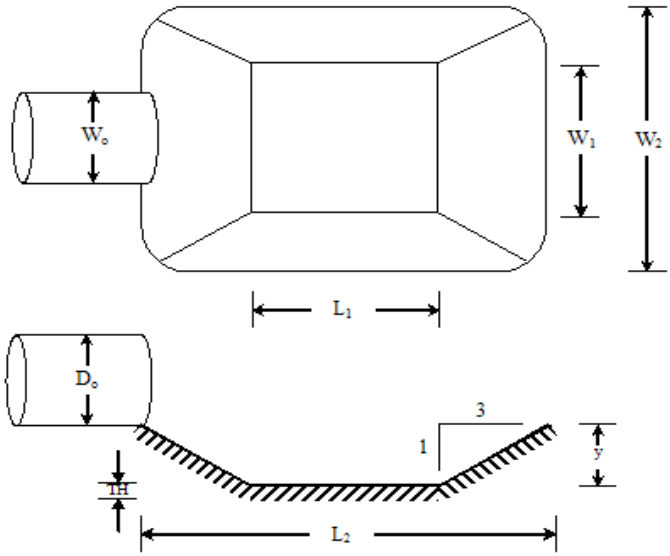
  Median Stone, $d_{50} = \frac{0.0125\ q^{1.33}}{TW}$ = 1.11 in Therefore, use *d50* = 6 in

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . *TH* = 12 in

- **Case II: $y = D_o$**

  Median Stone, $d_{50} = \frac{0.0082\ q^{1.33}}{TW}$ =

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . .



Notes:

1. The side slopes shall be 3:1 or flatter.
2. The bottom grade shall be 0.0% (level).
3. There shall be no overfall at the end of the apron or at the end of the culvert.
4. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
5. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
6. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
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Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

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Calculated By: ATK
Checked By: AS

Conduit Outlet Protection Calculations

Scour Hole # 2

Design Parameters:

Design Storm Flow for 25 Year, Q	13.29	cfs
Vertical Dimension of Outlet Pipe, D_o	24	in
Horizontal Dimension of Outlet Pipe, W_o	24	in
Tailwater Depth, TW [1]	1.17	ft
Scour Hole Depth, y (1/2 D_o or D_o)	12	in

Apron Dimension Calculations:

Minimum Bottom Width, $W_1 = 2W_o$	W_1 = 4.00 ft
Minimum Bottom Length, $L_1 = 3D_o$	L_1 = 6.00 ft
Minimum Top Width *(max side slope of 3:1)*, W_2	W_2 =10.00 ft
Minimum Top Length *(max side slope of 3:1)*, L_2	L_2 =12.00 ft

Rip Rap Stone Size Calculations:

Unit Dicharge, $q = Q/D_o$ = 6.65 cfs per foot

- **Case I: $y = 1/2\ D_o$**

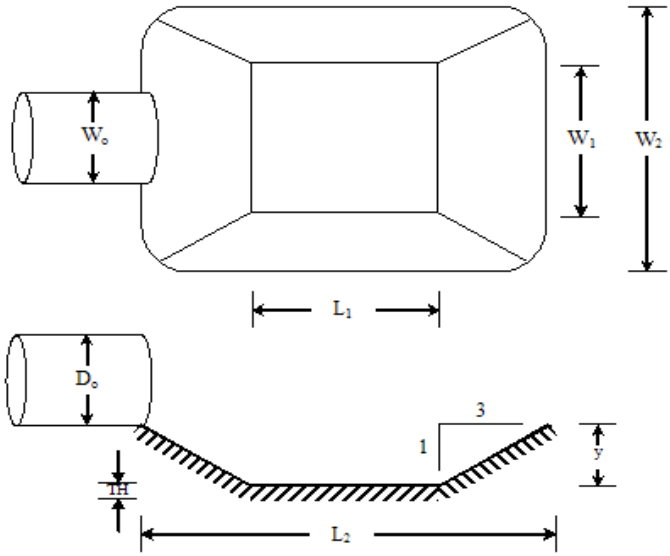
  Median Stone, $d_{50} = \frac{0.0125\ q^{1.33}}{TW}$ = 1.59 in Therefore, use *d50* = 6 in

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . *TH* = 12 in

- **Case II: $y = D_o$**

  Median Stone, $d_{50} = \frac{0.0082\ q^{1.33}}{TW}$ =

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . .



Notes:

1. The side slopes shall be 3:1 or flatter.
2. The bottom grade shall be 0.0% (level).
3. There shall be no overfall at the end of the apron or at the end of the culvert.
4. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
5. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
6. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
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Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

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Calculated By: ATK
Checked By: AS

Conduit Outlet Protection Calculations

Scour Hole # 3

Design Parameters:

Design Storm Flow for 25 Year, Q	8.31	cfs
Vertical Dimension of Outlet Pipe, D_o	18	in
Horizontal Dimension of Outlet Pipe, W_o	18	in
Tailwater Depth, TW [1]	1.10	ft
Scour Hole Depth, y (1/2 D_o or D_o)	9	in

Apron Dimension Calculations:

Minimum Bottom Width, $W_1 = 2W_o$	W_1 = 3.00 ft
Minimum Bottom Length, $L_1 = 3D_o$	L_1 = 4.50 ft
Minimum Top Width *(max side slope of 3:1)*, W_2	W_2 = 7.50 ft
Minimum Top Length *(max side slope of 3:1)*, L_2	L_2 = 9.00 ft

Rip Rap Stone Size Calculations:

Unit Dicharge, $q = Q/D_o$ = 5.54 cfs per foot

- **Case I: $y = 1/2\ D_o$**

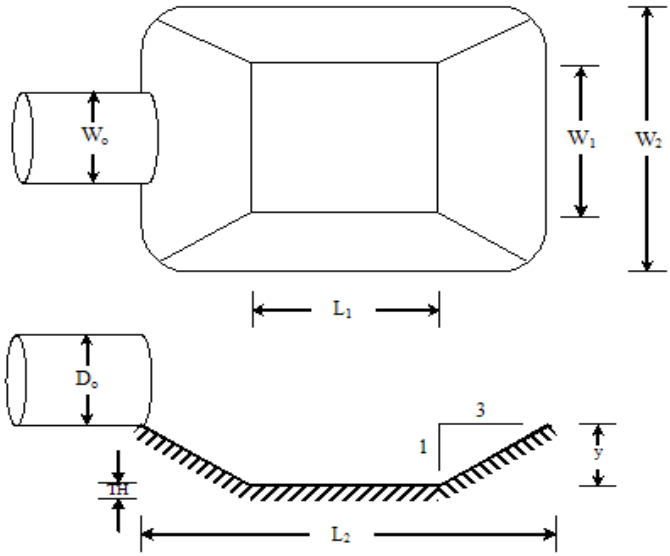
  Median Stone, $d_{50} = \frac{0.0125\ q^{1.33}}{TW}$ = 1.33 in Therefore, use $d50$ = 6 in

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . TH = 12 in

- **Case II: $y = D_o$**

  Median Stone, $d_{50} = \frac{0.0082\ q^{1.33}}{TW}$ =

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric . . . . . .



Notes:

1. The side slopes shall be 3:1 or flatter.
2. The bottom grade shall be 0.0% (level).
3. There shall be no overfall at the end of the apron or at the end of the culvert.
4. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
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Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

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Project No: NJA220121

35 Technology Drive, Warren, NJ 07059
(908) 668-8300

Calculated By: ATK
Checked By: AS

Conduit Outlet Protection Calculations

Scour Hole # MTD

Design Parameters:

Design Storm Flow for 25 Year, Q	3.71	cfs
Vertical Dimension of Outlet Pipe, D_o	15	in
Horizontal Dimension of Outlet Pipe, W_o	15	in
Tailwater Depth, TW [1]	0.25	ft
Scour Hole Depth, y (1/2 D_o or D_o)	8	in

Apron Dimension Calculations:

Minimum Bottom Width, $W_1 = 2W_o$	W_1 =	2.50 ft
Minimum Bottom Length, $L_1 = 3D_o$	L_1 =	3.75 ft
Minimum Top Width *(max side slope of 3:1)*, W_2	W_2 =	6.25 ft
Minimum Top Length *(max side slope of 3:1)*, L_2	L_2 =	7.50 ft

Rip Rap Stone Size Calculations:

Unit Dicharge, $q = Q/D_o$ = 2.97 cfs per foot

- **Case I: $y = 1/2\ D_o$**

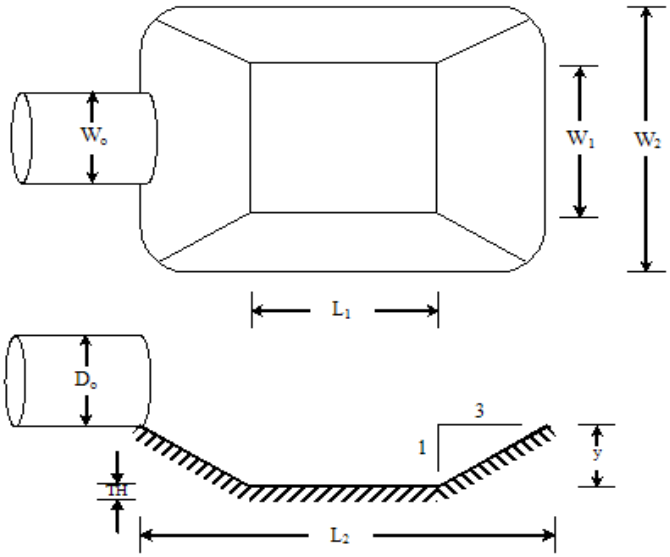
  Median Stone, $d_{50} = \dfrac{0.0125\ q^{1.33}}{TW}$ = 2.55 in Therefore, use *d50* = **6 in**

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric *TH* = **12 in**

- **Case II: $y = D_o$**

  Median Stone, $d_{50} = \dfrac{0.0082\ q^{1.33}}{TW}$ =

  Apron Thickness, $TH = 2 \times d_{50}$ with filter fabric



Notes:

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Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

E. SUPPORTING DOCUMENTS

- **Manufactured Treatment Device Certification & Details**
- **Geotechnical Report**

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

Division of Water Quality
Bureau of Stormwater Permitting
401 East State Street
P.O. Box 420 Mail Code 401-02B
Trenton, New Jersey 08625-0420
Phone: 609-633-7021 / Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

SHAWN M. LATOURETTE
Acting Commissioner

January 21, 2021

Mark B. Miller
Research Scientist
AquaShield™, Inc.
2733 Kanasita Drive, Suite 111
Chattanooga, TN 37343

Re: MTD Lab Certification
Aqua-Ponic™ Stormwater Biofiltration System
Off-line Installation

TSS Removal Rate 80%

Dear Mr. Miller:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) 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). AquaShield™, Inc. has requested a Laboratory Certification for the Aqua-Ponic™ Stormwater Biofiltration System.

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. 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 25, 2013.

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 November 2020) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the Aqua-Ponic™ stormwater treatment unit by AquaShield™ 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 7.0 gpm/ft^2 of effective filtration treatment area.

2. The Aqua-Ponic™ stormwater treatment unit 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 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Aqua-Ponic™. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at maintenance_manual_aqua-ponic_6-20.pdf (aquashieldinc.com) for any changes to the maintenance requirements.

6. For an MTD to be considered "green infrastructure" (GI) 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) treat runoff by infiltration into subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil; and/or (3) store stormwater for reuse.

   In order for an Aqua-Ponic™ system to meet the definition of GI, the Aqua-Ponic™ system must treat stormwater runoff through filtration by vegetation. To this end, consistent with the vegetative cover requirement for bioretention systems, the minimum vegetative cover in an Aqua-Ponic™ system is 85% in order to qualify as GI under the Stormwater Management rules at N.J.A.C. 7:8. The vegetative cover should be determined based on the expected coverage of the proposed plantings when matured. Plant death or damage shall require replanting to maintain this 85% coverage requirement if the system is installed as GI.

7. Sizing Requirement:

   The example below demonstrates the sizing procedure for the Aqua-Ponic™:

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using the Aqua-Ponic™. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

The selection of the appropriate model of Aqua-Ponic™ 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 Aqua-Ponic™ in this example is 0.25 acres. Included in Table 1 below, several Aqua-Ponic™ models are designed with a maximum allowable drainage area greater than 0.25 acres. Specifically, the Aqua-Ponic™ model AP-5 with a maximum drainage area allowable of 0.30 acres would be the smallest model 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:

time of concentration = 10 minutes
i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
c = 0.99 (runoff coefficient for impervious)
Q = ciA = 0.99 x 3.2 x 0.25 = 0.79 cfs

Given the site runoff is 0.79 cfs and based on the MTFR's listed in Table 1 below, the AP-8 with an MTFR of 0.79 cfs would be the smallest model that could be used to treat the impervious area without exceeding the MTFR. If using more than one unit for treating runoff, the units should be configured such that the flowrate to each unit does not exceed the design MTFR for each unit and ensuring the entire 0.25 acre area is treated.

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. Aqua-Ponic™ MTFRs and Maximum Allowable Drainage Areas

Model*	Maximum Treatment Flow Rate (MTFR) (cfs)	Drainage Area (acres)
AP-2	0.05	0.05
AP-3	0.11	0.11
AP-4	0.20	0.19
AP-5	0.31	0.30
AP-6	0.44	0.43
AP-7	0.60	0.59
AP-8	0.79	0.77
AP-9	0.99	0.97
AP-10	1.23	1.20
AP-11	1.48	1.45
AP-12	1.77	1.73
AP-13	2.07	2.03

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 our office at (609) 633-7021.

Sincerely,

Gabriel Mahon, Chief
Bureau of Stormwater Permitting

Attachment: Maintenance Plan
cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP – Water & Land Management
Nancy Kempel, NJDEP– BSTP
Keith Stampfel, NJDEP – DLRP
Dennis Contois, NJDEP – DLRP

INSPECTION & MAINTENANCE MANUAL

Aqua-Ponic™ Stormwater Biofiltration System

Manufactured By:

AquaShield,™ Inc.
2733 Kanasita Drive
Suite 111
Chattanooga, TN 37343
(888) 344-9044
www.aquashieldinc.com

June 2020

INTRODUCTION

As the stormwater industry has matured there has been an ever-increasing movement toward the implementation of Low Impact Development (LID) products and practices as the preferred means to implement stormwater control measures within "green infrastructure" (GI) stormwater management programs. The Aqua-Ponic™ Stormwater Biofiltration System is now offered by AquaShield™, Inc. to meet the design challenges of LID principles along with enhanced aesthetics in an urban environment.

This Inspection & Maintenance (I&M) Manual includes information to better assist stakeholders with understanding the importance of implementing an effective program to ensure long-term functionality of an Aqua-Ponic™ system installation. The following aspects of an Aqua-Ponic™ system are described in this I&M manual:

- Aqua-Ponic™ Basics
- Mode of Operation
- Inspection and Maintenance.

AQUA-PONIC™ BASICS

Aqua-Ponic™ technology is a modular proprietary, permanent, post-construction biofiltration system designed to remove total suspended solids (TSS), Total (insoluble) Phosphorus, and heavy metals such as copper and zinc from stormwater runoff. A distinguishing feature of the Aqua-Ponic™ is its combination of filtration with the principles of ***hydroponics*** - a method of hydroculture for growing plants without soil by instead using mineral nutrient solutions in a water solvent. That is, the Aqua-Ponic™ uses stormwater runoff as a nutrient asset instead of a liability. Terrestrial plants are grown with only their roots exposed to the nutrient liquid while being physically supported by a plant stabilization filter medium. The hydroponic design provides a sustainable water supply to the vegetation during those periods of time when hot and/or dry conditions may prevail.

The Aqua-Ponic™ system utilizes hardy low-profile perennial vegetation such as native grasses, shrub grasses and/or ornamental flowering plants. A facility can utilize a single type or multiple types of plants to enhance the viewscape. It is important to specify plants that demonstrate viability within the climatic zone of a site installation.

MODE of OPERATION

The minimum 12-inch plant stabilization media layer within the Aqua-Ponic™ serves three operational roles by providing (1) pollutant filtration, (2) plant stabilization and (3) nutrient uptake. Figure 1 is an illustration of the Aqua-Ponic™ Biofiltration System. Design elements include a three (3)-inch top layer of pea gravel underlain by the plant stabilization filter bed. Water enters the system as sheet flow and then flows downward under gravity flow conditions through the pea gravel, filter bed and the associated root systems of the vegetation. The pea gravel layer serves to protect the underlying plant stabilization filter bed while dispersing the influent stormwater runoff across the treatment area. The filtered water then percolates further downward into the underlying water sump. A supporting and removeable perforated stainless-steel sheet underlies the filter bed. A post-filtration flow control orifice is placed across the outlet pipe opening in order to facilitate an even distribution of influent runoff across the filter treatment

area. Crushed recycled landscaping glass can be used as an alternative to the top pea gravel layer which further enhances colorful viewscape options for the Aqua-Ponic™.

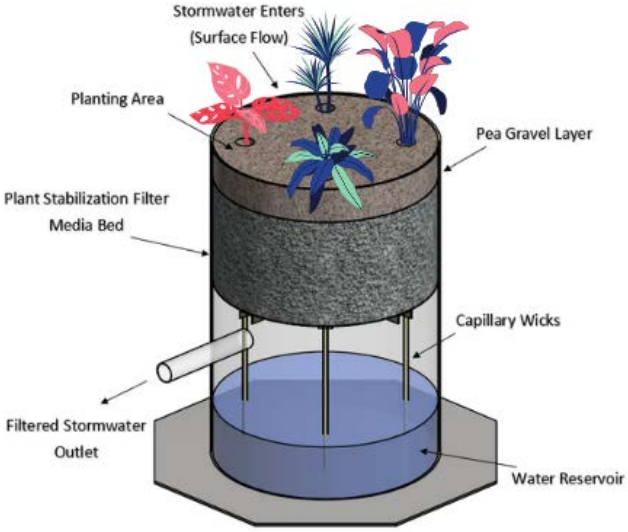


Figure 1. Diagram of Aqua-Ponic™ Biofiltration System.

The sump serves as a water reservoir for the vegetation during quiescent periods. A series of wicks are suspended from the base of the plant stabilization bed via rubber grommets (eyelets). The wicks extend downward to near the base of the sump. Using capillary action, water is wicked up to the plant stabilization filter bed which serves to provide a sustainable supply of water and any soluble nutrients and metals not trapped in the filter bed during a runoff event. Treated water in excess of the sump storage volume exits the system via the outlet opening just below the base of the filter bed.

Each Aqua-Ponic™ unit is constructed of lightweight and durable Polymer Coated Steel (PCS) to provide long term operational and structural functionality. Aqua-Ponic™ units are shipped with the inclusion of any perforated sheets and the capillary wicks in place according to the model size. The plant stabilization filter media is shipped simultaneously in separate containers. For aesthetic reasons it is the responsibility of others to choose either the pea gravel or any recycled glass landscaping stone for the top bed layer. It is also the responsibility of others to specify, acquire and plant the vegetation. AquaShield™ does not specify the plants for Aqua-Ponic™ systems but can assist where warranted.

INSPECTION & MAINTENANCE

Maintenance frequency for the Aqua-Ponic™ will ultimately be determined by site-specific pollutant loading conditions. Inspections of the, plants, top gravel layer and the upper portion of the plant stabilization filter media can be accomplished from the surface without special tools. AquaShield™ recommends periodic inspections following installation to determine a site-specific maintenance cycle to ensure functionality of the media and the vegetation.

We recommend that periodic system inspections be performed to determine the pollutant and trash loading characteristics. In general, quarterly inspections should be performed during the first year of operation to better anticipate maintenance frequency in the first year and subsequent years of operation.

An Aqua-Ponic™ maintenance event should first determine any obvious signs of degradation, displacement, sediment or trash accumulation, or oil in the upper layers of the unit. The top gravel layer should be completely replaced and can be removed by shoveling or vacuuming. The top several inches of the underlying plant stabilization filter media may be replaced at the same time if warranted. Care should be taken not to damage the plants or disturb rootballs during limited media replacement. Care should also be taken when replacing a plant to avoid disturbing remaining plants.

Depending on site conditions, it may be necessary to remove all the media and all the plants and completely replace these components of the system. It is recommended that the wicks be replaced if a system is fully replaced with stabilization media and plants.

Sediment can accumulate in the base of the water supply sump over a period of time. After removing the pea gravel layer, the plants and the plant stabilization filter media bed, the perforated metal plate should be removed to access the water supply sump from the surface for the purpose of vacuuming water and any accumulated sediment. The wicking ropes should also be replaced at this time. The perforated metal plate with the new wicking ropes should be set in place prior to installing the plant stabilization filter media on top of the plate.

AquaShield™ can provide the plant stabilization filter media, wicks and any associated grommets. Although unlikely, the supporting stainless-steel plate can also be supplied by AquaShield™ if its replacement is necessary. While we recommend that the pea gravel be replaced as warranted, it may be feasible to wash the gravel during a maintenance event. However, in most cases it is more efficient to replace the pea gravel or any landscaping glass to avoid disposal of water that was used to clean either of those materials.

All I&M activities can be performed from the surface without the need for AquaShield™ personnel to be present. We recommend that all materials removed during the maintenance process be handled and disposed in accordance with all applicable federal, state and local guidelines. Depending on the influent pollutant characteristics of the facility drainage area, it may be appropriate to perform Toxicity Characteristics Leaching Procedure (TCLP) analyses on representative samples of the spent filter media to ensure that the handling and disposition of materials complies with any applicable environmental regulations and practices.

Attached is a two-page Aqua-Ponic™ I&M Log to document service provider(s), activities and scheduling.

Next two pages include I&M Logs

AQUA-PONIC™ INSPECTION & MAINTENANCE LOG

MAINTENANCE COMPANY INFORMATION

Company Name: _____

Street Address: _____

City: _____ State/Prov.:_____ Zip/Postal Code: _____

Contact: _____ Title: _____

Office Phone: _____ Cell Phone: _____

ACTIVITY LOG

Date of Cleaning: _____

Time of Cleaning: Start: _____ End: _____

Date of Next Inspection: _____

Floatable debris present: Yes No Action taken: _____

_____

Oil present: Yes No Action taken: _____

Filter Media Needs Replacement: Yes No

Structural damage: Yes No Where: _____

Clogging: Yes No Describe: _____

Additional Comments and/or Actions to be Taken	Time Frame

AQUA-PONIC

Inspection & Maintenance Schedule Log

First Year Post-Construction

Date Installed/Activated: _____

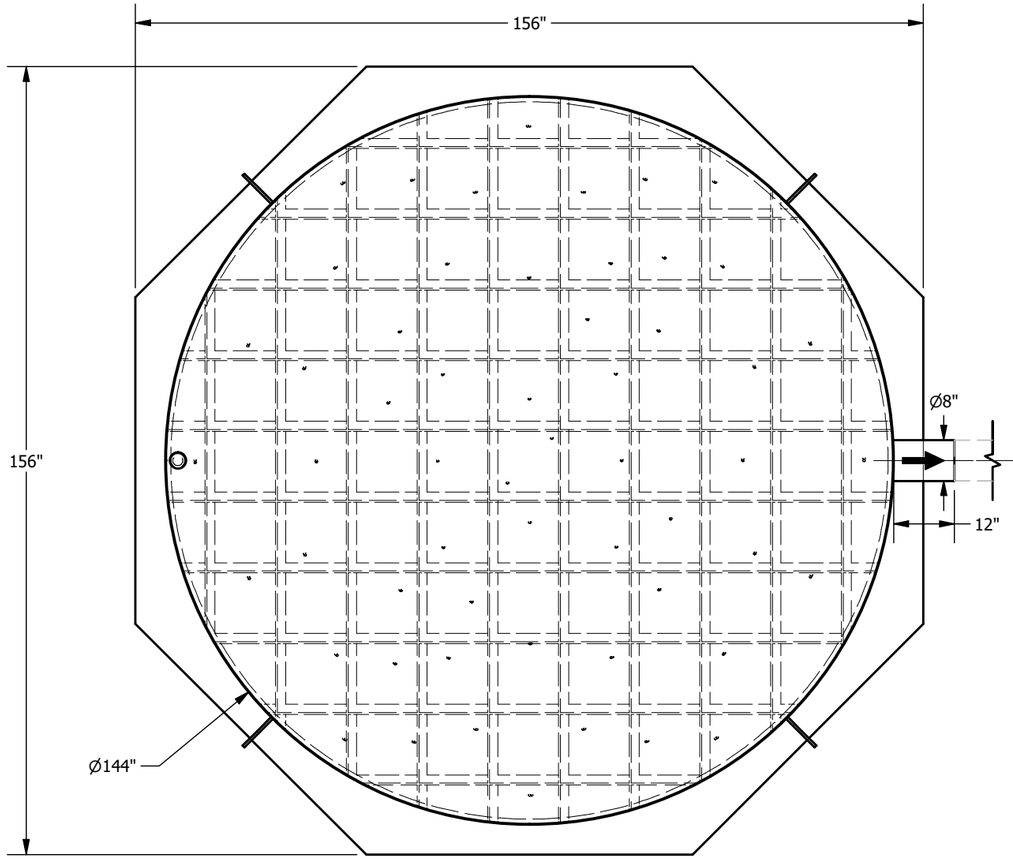
	Month											
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inspect and Clean as needed			X			X			X			X
Inspect Bypass and maintain as needed			X			X			X			X
Clean System*												X

Second and Subsequent Years Post-Construction

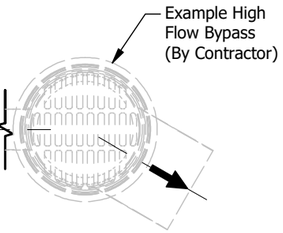
	Month											
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inspect and Clean as needed												X
Inspect Bypass, maintain as needed												X
Clean System												X

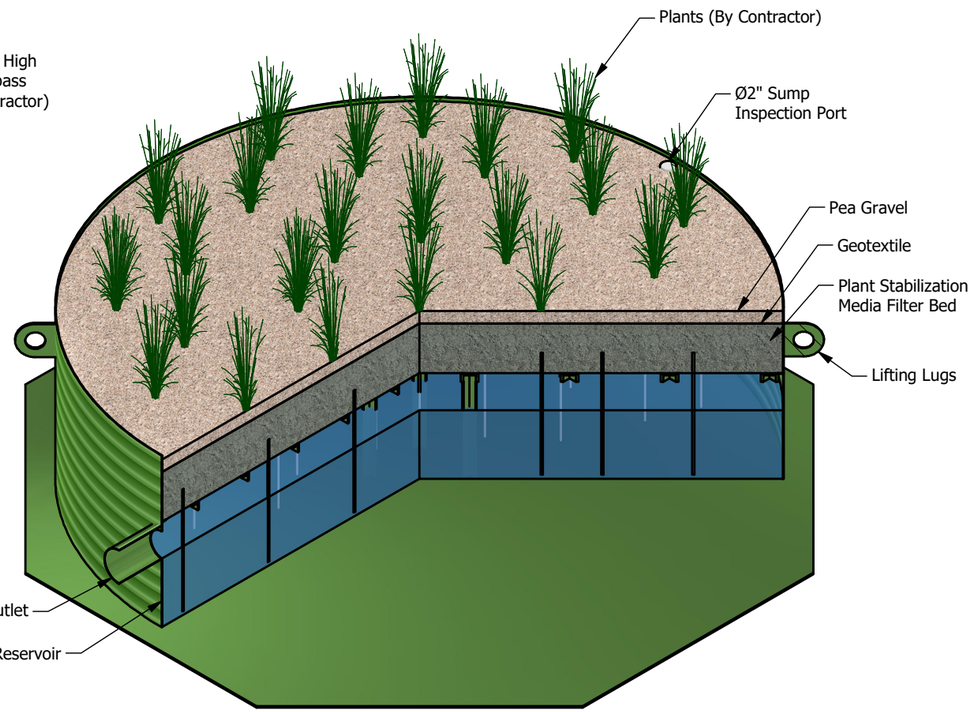
Aqua-Ponic™ Polymer Coated Steel (PCS)
Stormwater Biofiltration System

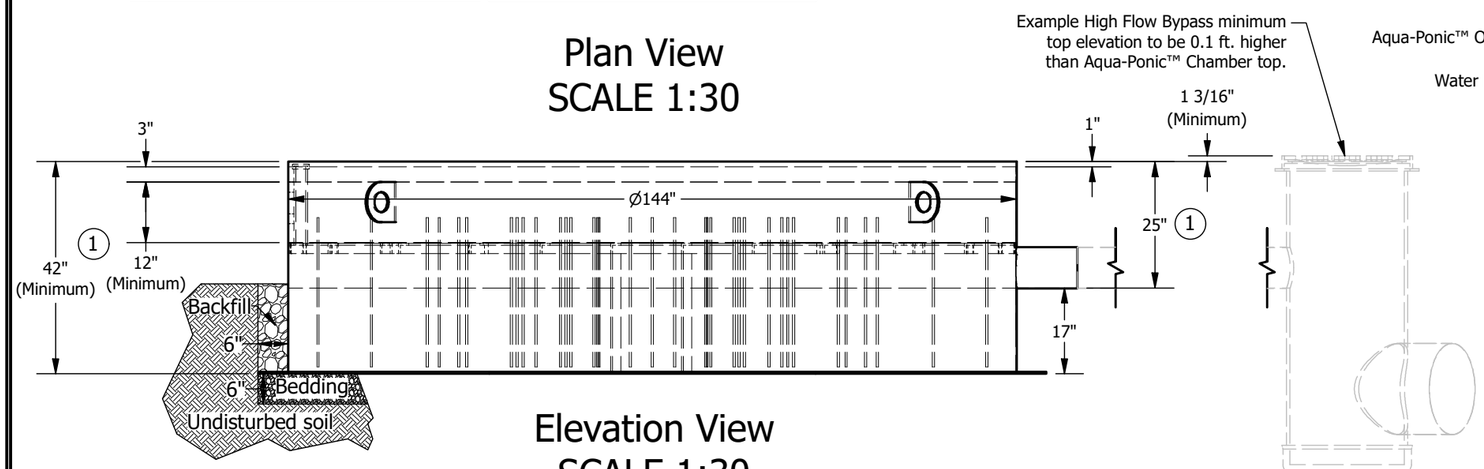
(1) Chamber height & Invert depth based on 12" filter bed depth (18" & 24' available upon request).



Plan View
SCALE 1:30







Elevation View
SCALE 1:30

AquaShield WATER TREATMENT SOLUTIONS 2733 Kanasita Drive, Suite 111, Chattanooga, TN 37343 Phone (888) 344-9044 Fax (423) 826-2112 www.aquashieldinc.com	Aqua-Ponic™ Stormwater Biofiltration System AP-12	Structure #:	AP-12 STD	Rvwed	Rvw. Date	Rev Date	Description of Revision
		Drawn By:	OFlores				
	Standard Detail	Scale:	As Shown				
		Date:	5/2/2022				
		U.S. Patent Pending					

INSPECTION & MAINTENANCE MANUAL

Aqua-Ponic™ Stormwater Biofiltration System

Manufactured By:

AquaShield,™ Inc.
2733 Kanasita Drive
Suite 111
Chattanooga, TN 37343
(888) 344-9044
www.aquashieldinc.com

June 2020

INTRODUCTION

As the stormwater industry has matured there has been an ever-increasing movement toward the implementation of Low Impact Development (LID) products and practices as the preferred means to implement stormwater control measures within "green infrastructure" (GI) stormwater management programs. The Aqua-Ponic™ Stormwater Biofiltration System is now offered by AquaShield™, Inc. to meet the design challenges of LID principles along with enhanced aesthetics in an urban environment.

This Inspection & Maintenance (I&M) Manual includes information to better assist stakeholders with understanding the importance of implementing an effective program to ensure long-term functionality of an Aqua-Ponic™ system installation. The following aspects of an Aqua-Ponic™ system are described in this I&M manual:

- Aqua-Ponic™ Basics
- Mode of Operation
- Inspection and Maintenance.

AQUA-PONIC™ BASICS

Aqua-Ponic™ technology is a modular proprietary, permanent, post-construction biofiltration system designed to remove total suspended solids (TSS), Total (insoluble) Phosphorus, and heavy metals such as copper and zinc from stormwater runoff. A distinguishing feature of the Aqua-Ponic™ is its combination of filtration with the principles of ***hydroponics*** - a method of hydroculture for growing plants without soil by instead using mineral nutrient solutions in a water solvent. That is, the Aqua-Ponic™ uses stormwater runoff as a nutrient asset instead of a liability. Terrestrial plants are grown with only their roots exposed to the nutrient liquid while being physically supported by a plant stabilization filter medium. The hydroponic design provides a sustainable water supply to the vegetation during those periods of time when hot and/or dry conditions may prevail.

The Aqua-Ponic™ system utilizes hardy low-profile perennial vegetation such as native grasses, shrub grasses and/or ornamental flowering plants. A facility can utilize a single type or multiple types of plants to enhance the viewscape. It is important to specify plants that demonstrate viability within the climatic zone of a site installation.

MODE of OPERATION

The minimum 12-inch plant stabilization media layer within the Aqua-Ponic™ serves three operational roles by providing (1) pollutant filtration, (2) plant stabilization and (3) nutrient uptake. Figure 1 is an illustration of the Aqua-Ponic™ Biofiltration System. Design elements include a three (3)-inch top layer of pea gravel underlain by the plant stabilization filter bed. Water enters the system as sheet flow and then flows downward under gravity flow conditions through the pea gravel, filter bed and the associated root systems of the vegetation. The pea gravel layer serves to protect the underlying plant stabilization filter bed while dispersing the influent stormwater runoff across the treatment area. The filtered water then percolates further downward into the underlying water sump. A supporting and removeable perforated stainless-steel sheet underlies the filter bed. A post-filtration flow control orifice is placed across the outlet pipe opening in order to facilitate an even distribution of influent runoff across the filter treatment

area. Crushed recycled landscaping glass can be used as an alternative to the top pea gravel layer which further enhances colorful viewscape options for the Aqua-Ponic™.

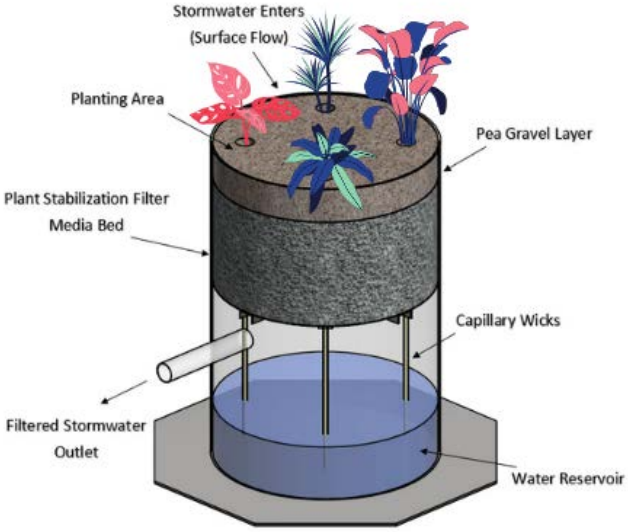


Figure 1. Diagram of Aqua-Ponic™ Biofiltration System.

The sump serves as a water reservoir for the vegetation during quiescent periods. A series of wicks are suspended from the base of the plant stabilization bed via rubber grommets (eyelets). The wicks extend downward to near the base of the sump. Using capillary action, water is wicked up to the plant stabilization filter bed which serves to provide a sustainable supply of water and any soluble nutrients and metals not trapped in the filter bed during a runoff event. Treated water in excess of the sump storage volume exits the system via the outlet opening just below the base of the filter bed.

Each Aqua-Ponic™ unit is constructed of lightweight and durable Polymer Coated Steel (PCS) to provide long term operational and structural functionality. Aqua-Ponic™ units are shipped with the inclusion of any perforated sheets and the capillary wicks in place according to the model size. The plant stabilization filter media is shipped simultaneously in separate containers. For aesthetic reasons it is the responsibility of others to choose either the pea gravel or any recycled glass landscaping stone for the top bed layer. It is also the responsibility of others to specify, acquire and plant the vegetation. AquaShield™ does not specify the plants for Aqua-Ponic™ systems but can assist where warranted.

INSPECTION & MAINTENANCE

Maintenance frequency for the Aqua-Ponic™ will ultimately be determined by site-specific pollutant loading conditions. Inspections of the, plants, top gravel layer and the upper portion of the plant stabilization filter media can be accomplished from the surface without special tools. AquaShield™ recommends periodic inspections following installation to determine a site-specific maintenance cycle to ensure functionality of the media and the vegetation.

We recommend that periodic system inspections be performed to determine the pollutant and trash loading characteristics. In general, quarterly inspections should be performed during the first year of operation to better anticipate maintenance frequency in the first year and subsequent years of operation.

An Aqua-Ponic™ maintenance event should first determine any obvious signs of degradation, displacement, sediment or trash accumulation, or oil in the upper layers of the unit. The top gravel layer should be completely replaced and can be removed by shoveling or vacuuming. The top several inches of the underlying plant stabilization filter media may be replaced at the same time if warranted. Care should be taken not to damage the plants or disturb rootballs during limited media replacement. Care should also be taken when replacing a plant to avoid disturbing remaining plants.

Depending on site conditions, it may be necessary to remove all the media and all the plants and completely replace these components of the system. It is recommended that the wicks be replaced if a system is fully replaced with stabilization media and plants.

Sediment can accumulate in the base of the water supply sump over a period of time. After removing the pea gravel layer, the plants and the plant stabilization filter media bed, the perforated metal plate should be removed to access the water supply sump from the surface for the purpose of vacuuming water and any accumulated sediment. The wicking ropes should also be replaced at this time. The perforated metal plate with the new wicking ropes should be set in place prior to installing the plant stabilization filter media on top of the plate.

AquaShield™ can provide the plant stabilization filter media, wicks and any associated grommets. Although unlikely, the supporting stainless-steel plate can also be supplied by AquaShield™ if its replacement is necessary. While we recommend that the pea gravel be replaced as warranted, it may be feasible to wash the gravel during a maintenance event. However, in most cases it is more efficient to replace the pea gravel or any landscaping glass to avoid disposal of water that was used to clean either of those materials.

All I&M activities can be performed from the surface without the need for AquaShield™ personnel to be present. We recommend that all materials removed during the maintenance process be handled and disposed in accordance with all applicable federal, state and local guidelines. Depending on the influent pollutant characteristics of the facility drainage area, it may be appropriate to perform Toxicity Characteristics Leaching Procedure (TCLP) analyses on representative samples of the spent filter media to ensure that the handling and disposition of materials complies with any applicable environmental regulations and practices.

Attached is a two-page Aqua-Ponic™ I&M Log to document service provider(s), activities and scheduling.

Next two pages include I&M Logs

AQUA-PONIC™ INSPECTION & MAINTENANCE LOG

MAINTENANCE COMPANY INFORMATION

Company Name: _____

Street Address: _____

City: _____ State/Prov.:_____ Zip/Postal Code: _____

Contact: _____ Title: _____

Office Phone: _____ Cell Phone: _____

ACTIVITY LOG

Date of Cleaning: _____

Time of Cleaning: Start: _____ End: _____

Date of Next Inspection: _____

Floatable debris present: Yes No Action taken: _____

_____

Oil present: Yes No Action taken: _____

Filter Media Needs Replacement: Yes No

Structural damage: Yes No Where: _____

Clogging: Yes No Describe: _____

Additional Comments and/or Actions to be Taken	Time Frame

AQUA-PONIC

Inspection & Maintenance Schedule Log

First Year Post-Construction

Date Installed/Activated: _____

	Month											
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inspect and Clean as needed			X			X			X			X
Inspect Bypass and maintain as needed			X			X			X			X
Clean System*												X

Second and Subsequent Years Post-Construction

	Month											
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inspect and Clean as needed												X
Inspect Bypass, maintain as needed												X
Clean System												X

WHITESTONE
An Employee-Owned Company

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
908.668.7777
whitestoneassoc.com

October 12, 2022

via email

BOHLER ENGINEERING NJ, LLC
30 Independence Boulevard
Suite 200
Warren, New Jersey 07059

Attention: Alexander Lomei, P.E.
Senior Project Manager

Regarding: SWM AREA EVALUATION & BASIN FLOOD TESTING
PROPOSED WAREHOUSE
195 & 215 DAVIDSON AVENUE
BLOCK 502.02, LOTS 37.01 & 38.01
FRANKLIN, SOMERSET COUNTY, NEW JERSEY
WHITESTONE PROJECT NO.: GJ2219588.000

Dear Mr. Lomei:

Whitestone Associates, Inc. (Whitestone) has completed a stormwater management (SWM) area evaluation at the above-referenced site. The results of the evaluation presented below are based on the soil conditions disclosed by the soil profile pits conducted during Whitestone's September 2022 field investigation. The evaluation reported herein was conducted to provide subsurface conditions, seasonal high groundwater, and basin flood test results within proposed SWM areas provided by Bohler Engineering NJ, LLC (Bohler).

1.0 PROJECT DESCRIPTION

The subject property located at 195 and 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01) in Franklin, Somerset County, New Jersey currently houses a commercial and industrial building with associated pavements, utilities, and landscaped areas.

Based on the May 17, 2022 (last revised August 24, 2022) *Conceptual Grading - Concept Plan 'C'* prepared by Bohler, the proposed development will include demolishing the site structures and constructing a 201,600-square feet warehouse with SWM facilities, pavements, landscaping, and utilities. As requested by Bohler, SWM testing was conducted by Whitestone in accordance with New Jersey Best Management Practices Manual (BMP Manual) standards.

2.0 FIELD EXPLORATION

Whitestone's scope of services consisted of conducting an engineering evaluation of the subsurface conditions disclosed by 12 soil profile pits (identified as SPP-1 through SPP-12). The subsurface tests extended to machine refusal on apparent bedrock at depths ranging between approximately six feet below

ground surface (fbgs) to 12 fbgs. The subsurface tests were located in the field using normal taping procedures and estimated right angles from existing features and are presumed to be accurate within a few feet. Upon completion, the test locations were backfilled to existing surface levels using soils generated during excavation of the test pits. The locations of the subsurface tests conducted as part of this evaluation are shown on the attached Figure 1 - *Test Location Plan*. The *Records of Subsurface Exploration* are attached in Appendix A.

3.0 SWM AREA TEST RESULTS

Subsurface Profile: The subsurface tests were conducted within existing grass-covered and paved portions of the site and encountered approximately 12 inches of topsoil at the surface and approximately four inches to five inches of asphaltic concrete pavement underlain by four inches to 12 inches of gravel subbase. Below the surface cover, the tests encountered natural residual materials generally consisting of silty clay underlain by weathered rock. The profile pits completed as part of this evaluation were terminated due to machine refusal on apparent bedrock as indicated in the following table.

INFILTRATION/PERMEABILITY TEST SUMMARY					
Profile Pit #	**Surface Elevation**	**ESHGW Depth/Elevation (fbgs)**	**USDA Classification @ Test**	**Basin Flood Test**	
				Depth (fbgs)	**Rate (in/hour)**
SPP-1	NS	NE	Apparent Bedrock	11.0	< 0.2
SPP-2	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-3	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-4	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-5	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-6	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-7	NS	NE	Apparent Bedrock	6.0	< 0.2
SPP-8	NS	NE	Apparent Bedrock	7.0	< 0.2
SPP-9	NS	NE	Apparent Bedrock	12.0	< 0.2
SPP-10	NS	NE	Apparent Bedrock	12.0	< 0.2
SPP-11	NS	NE	Apparent Bedrock	12.0	< 0.2
SPP-12	NS	NE	Apparent Bedrock	12.0	< 0.2

Estimated Seasonal High Groundwater Levels: The methods used in determining the estimated seasonal high groundwater (ESHGW) level include evaluating the soil morphology within a test location and identifying irregular spots or blotches of different colors or minerals unlike that of the surrounding soils (mottles). Mottling is the result of the oxidation of minerals within a soil structure as a water level slowly fluctuates.

Static groundwater, perched groundwater, and or mottling was not encountered within the subsurface tests completed as part of this investigation. As such, indications of seasonal high groundwater levels were not encountered to a maximum depth explored of approximately 12 fbgs.

Infiltration Testing: Due to the presence of impermeable upper site soils, basin flood tests were conducted within the bedrock strata encountered in the six supplemental profile pits conducted within the proposed infiltration bed footprints. The basin flood tests conducted within the profile pits were conducted in general accordance with the New Jersey BMP Manual. The results of the in-situ testing indicated that none of the basin flood tests drained the required 12 inches within 12 hours of filling. Therefore, per the BMP Manual, the limiting zone is considered to be a massive rock substratum and an infiltration rate cannot be assigned. Detailed in-situ infiltration test results are available in Appendix B - *Infiltration Test Results*.

4.0 CLOSING

Whitestone appreciates the opportunity to be of continued service to Snack Innovations and trusts that this information will be helpful for evaluating the proposed development of this property. Please contact us at (908) 668-7777 to further discuss these findings.

Sincerely,

WHITESTONE ASSOCIATES, INC.

Kyle J. Kopacz, P.E.
Associate

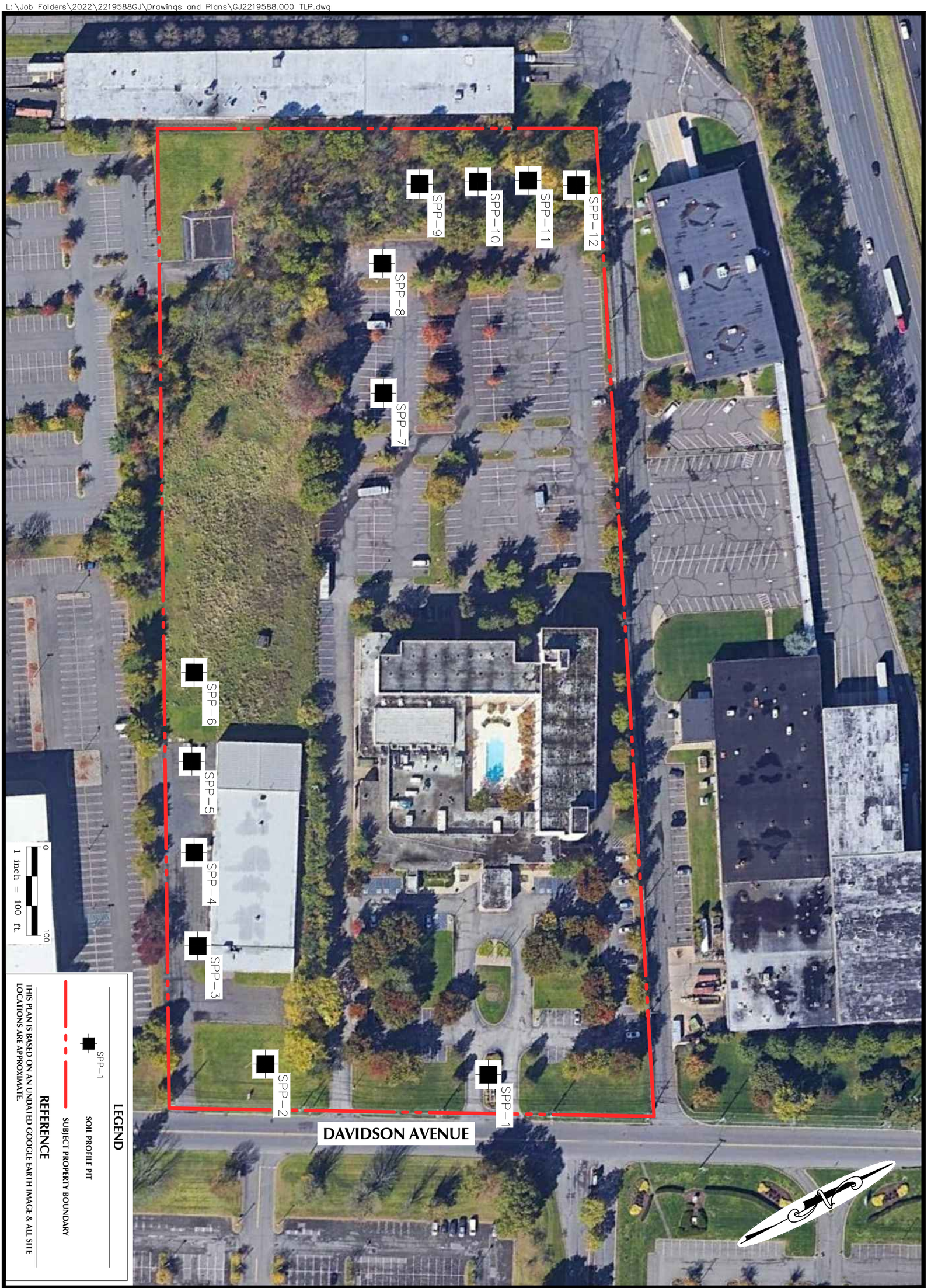
Laurence W. Keller, P.E.
Vice President

TJ/ri L:\Job Folders\2022\2219588GJ\Reports and Submittals\19588 SWM.docx
Enclosures
Copy: Bradford A. Bohler, P.E., Bohler Engineering NJ, LLC
Amin Sharifi, Bohler Engineering NJ, LLC

WHITESTONE

FIGURE 1
Test Location Plan

L:\Job Folders\2022\2219588GJ\Drawings and Plans\GJ2219588.000 TLP.dwg



PROJECT #: GJ2219588.000
DESIGNED BY: GR
DATE: 10/11/22
SCALE: 1" = 100'
PROJ. MGR.: KK
FIGURE: 1

DRAWING TITLE:
TEST LOCATION PLAN

CLIENT:
BOHLER ENGINEERING NJ, LLC

PROJECT:
PROPOSED WAREHOUSE
195 & 215 DAVIDSON AVENUE
FRANKLIN, SOMERSET COUNTY, NJ

WHITESTONE
An Employee-Owned Company
30 INDEPENDENCE BOULEVARD, SUITE 250, WARREN, NJ 07059
908.668.7777 WHITESTONEASSOC.COM

WHITESTONE

APPENDIX A
Records of Subsurface Exploration

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-1

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

				Water Depth (feet bgs) | Elevation (feet)		Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	9/22/2022			
Termination Depth:	11.0 feet bgs	**Date Completed:**	9/22/2022			
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.3	PAVEMENT	4" Asphalt	
			0.3 - 0.8	SUBBASE	6" Subbase	
			0.8 - 2.5	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Strong, Blocky Structure; Firm; No Roots	
			2.5 - 11		Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist to Wet; Platy Structure; Very Firm; No Roots	
			10.0	WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			11.0		Soil Profile Pit SPP-1 Terminated at a Depth of 11.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-2

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/23/2022	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	6.0 feet bgs	**Date Completed:**	9/23/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 1	TOPSOIL	12" Topsoil	On Grass
			1.0				
				1 - 2.5	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Strong, Blocky Structure; Firm; No Roots	
			2.0				
				2.5 - 6		Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			3.0				
			4.0				
			5.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0				
						Soil Profile Pit SPP-2 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

WHITESTONE

Soil Profile Pit No.: SPP-3

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

				Water Depth (feet bgs) | Elevation (feet)		Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	9/23/2022			
Termination Depth:	6.0 feet bgs	**Date Completed:**	9/23/2022			
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.3	PAVEMENT	4" Asphalt	
				0.3 - 1.3	SUBBASE	12" Subbase	
			1.0				
				1.3 - 6	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			2.0				
			3.0				
			4.0				
			5.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0				
						Soil Profile Pit SPP-3 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

WHITESTONE

Soil Profile Pit No.: SPP-4

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

				Water Depth (feet bgs) | Elevation (feet)		Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	9/23/2022			
Termination Depth:	6.0 feet bgs	**Date Completed:**	9/23/2022			
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.3	PAVEMENT	4" Asphalt	
				0.3 - 1.3	SUBBASE	12" Subbase	
			1.0				
				1.3 - 6	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			2.0				
			3.0				
			4.0				
			5.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0				
						Soil Profile Pit SPP-4 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

WHITESTONE

Soil Profile Pit No.: SPP-5

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

				Water Depth (feet bgs) | Elevation (feet)		Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	9/23/2022			
Termination Depth:	6.0 feet bgs	**Date Completed:**	9/23/2022			
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.3	PAVEMENT	4" Asphalt	
				0.3 - 1.3	SUBBASE	12" Subbase	
			1.0				
				1.3 - 6	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			2.0				
			3.0				
			4.0				
			5.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0				
						Soil Profile Pit SPP-5 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-6

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/23/2022	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	6.0 feet bgs	**Date Completed:**	9/23/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 1	TOPSOIL	12" Topsoil	
			1.0				
				1 - 6	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			2.0				
			3.0				
			4.0				
			5.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0				
						Soil Profile Pit SPP-6 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-7

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/23/2022		**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**
Termination Depth:	5.9 feet bgs	**Date Completed:**	9/23/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	▽	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	▽	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	▼	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.3	PAVEMENT	4" Asphalt	
				0.3 - 0.8	SUBBASE	6" Subbase	
			1.0	0.8 - 3	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Strong, Blocky Structure; Firm; No Roots	
			2.0				
			3.0	3 - 5.9		As Above, Platy Structure, Very Moist	
			4.0				
			5.0		WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			6.0			Soil Profile Pit SPP-7 Terminated at a Depth of 5.9 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-8

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/23/2022	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	7.0 feet bgs	**Date Completed:**	9/23/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.3	PAVEMENT	4" Asphalt	
				0.3 - 0.8	SUBBASE	6" Subbase	
			1.0	0.8 - 1.5	FILL	10" Recycled Crushed Concrete (RCA)	
				1.5 - 7	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Platy Structure; Very Firm; No Roots	
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
					WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			7.0				
						Soil Profile Pit SPP-8 Terminated at a Depth of 7.0 Feet Below Ground Surface	
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-9

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

				Water Depth (feet bgs) | Elevation (feet)		Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	9/22/2022			
Termination Depth:	12.0 feet bgs	**Date Completed:**	9/22/2022			
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.3	PAVEMENT	4" Asphalt	
			0.3 - 0.8	SUBBASE	6" Subbase	
			0.8 - 12	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist to Wet; Platy Structure; Very Firm; No Roots	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0	WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			13.0		Soil Profile Pit SPP-9 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-10

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/22/2022	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	12.0 feet bgs	**Date Completed:**	9/22/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.3	PAVEMENT	4" Asphalt	
			0.3 - 0.6	SUBBASE	4" Subbase	
			0.6 - 12	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist to Wet; Platy Structure; Very Firm; No Roots	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0	WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			13.0		Soil Profile Pit SPP-10 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-11

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/22/2022		**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	9/22/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---	▽	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	▽	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---	▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.3	PAVEMENT	4" Asphalt	
			0.3 - 0.6	SUBBASE	4" Subbase	
			0.6 - 12	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist to Wet; Platy Structure; Very Firm; No Roots	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			▽			
			11.0 ▼			
			12.0	WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			13.0		Soil Profile Pit SPP-11 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-12

Project:	Proposed Warehouse	**WAI Project No.:**	GJ2219588.000
Location:	195 & 215 Davidson Avenue (Block 502.02, Lots 37.01 & 38.01), Franklin, Somerset County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	9/22/2022	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	12.0 feet bgs	**Date Completed:**	9/22/2022				
Proposed Location:	SWM	**Logged By:**	MO	**During:**	NE | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Test Method:	Visual Observation	**Rig Type:**	Backhoe	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 -0.5	PAVEMENT	Asphalt	
			0.5 - 1	SUBBASE	Subbase	
			1.0			
			1 - 3	RESIDUAL	Brown (5YR 4/6) SILTY CLAY; No Gravel; Moist; Strong, Blocky Structure; Firm; No Roots; No Mottling	
			2.0			
			3.0			
			3 - 12		As Above, Very Moist, Platy Structure	
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
				WEATHERED ROCK	Brown (5YR 4/6) Weathered Rock (Shale); Moist, Platy Structure	
			11.0			
			12.0			
			13.0		Soil Profile Pit SPP-12 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

APPENDIX B
Infiltration Test Results

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-1

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 11.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:18 A.M.	8:18 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-2

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:45 A.M.	8:45 P.M.	12.0	10.0	2.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-3

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	9:12 A.M.	9:12 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-4

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	9:05 A.M.	9:05 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-5

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	9:16 A.M.	9:16 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-6

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	9:00 A.M.	9:00 P.M.	12.0	12.0	0.0	12.0	<0.2
Remarks:							Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-7

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 6.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	9:20 A.M.	9:20 P.M.	12.0	12.0	0.0	12.0	<0.2
Remarks:							Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Project: Proposed Warehouse

Location: 195 & 215 Davidson Avenue

Franklin, Somerset County, NJ

File No. GJ2219588.000

Field Engineer: MO

Test Hole No.: SPP-8

Date: 9/23/2022

Weather: Clear

Surface Elevation: NS

Test Depth (Feet): 7.00

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:57 A.M.	8:57 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-9

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 12.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:31 A.M.	8:31 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-10

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 12.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:37 A.M.	8:37 P.M	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-11

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 12.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:42 A.M.	8:42 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-12

Project: Proposed Warehouse

Date: 9/23/2022

Location: 195 & 215 Davidson Avenue

Weather: Clear

Franklin, Somerset County, NJ

Surface Elevation: NS

File No. GJ2219588.000

Test Depth (Feet): 12.00

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
FT	8:49 A.M	8:49 P.M.	12.0	12.0	0.0	12.0	<0.2

Remarks: Field *i* = <0.2 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

APPENDIX C
Supplemental Information (USCS, Terms & Symbols)

WHITESTONE
An Employee-Owned Company

30 Independence Boulevard
Suite 250
Warren, NJ 07059
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whitestoneassoc.com

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMITS LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMITS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS FOR SAMPLES WITH 5% TO 12% FINES

GRADATION*

% FINER BY WEIGHT

TRACE..... 1% TO 10%
LITTLE..... 10% TO 20%
SOME..... 20% TO 35%
AND..... 35% TO 50%

COMPACTNESS*
Sand and/or Gravel

RELATIVE DENSITY

LOOSE. ..... 0% TO 40%
MEDIUM DENSE.... 40% TO 70%
DENSE..... 70% TO 90%
VERY DENSE..... 90% TO 100%

CONSISTENCY*
Clay and/or Silt

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT..... LESS THAN 250
SOFT..... ..... 250 TO 500
MEDIUM..... 500 TO 1000
STIFF..... 1000 TO 2000
VERY STIFF..... 2000 TO 4000
HARD..... GREATER THAN 4000

** VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.*

L:\Geotechnical Forms and References\Reports\USCSTRMSSYM NJ.docx

WHITESTONE
An Employee-Owned Company

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
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GEOTECHNICAL TERMS AND SYMBOLS

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard Penetration Value: Blows per ft. of a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.
Qu: Unconfined compressive strength, TSF.
Qp: Penetrometer value, unconfined compressive strength, TSF.
Mc: Moisture content, %.
LL: Liquid limit, %.
PI: Plasticity index, %.
δd: Natural dry density, PCF.
▼: Apparent groundwater level at time noted after completion of boring.

DRILLING AND SAMPLING SYMBOLS

NE: Not Encountered (Groundwater was not encountered).
SS: Split-Spoon - 1 ⅜" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
OB: Diamond Bit.
CB: Carbide Bit
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Term (Non-Cohesive Soils)	Standard Penetration Resistance
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Term (Cohesive Soils)	Qu (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

PRELIMINARY GEOTECHNICAL ENGINEERING SERVICES REPORT

For the proposed

WAREHOUSE
195 & 215 DAVIDSON AVENUE
SOMERSET, NEW JERSEY

Prepared for

IDI Logistics, LLC
1100 Peachtree Street, Suite 1000
Atlanta, Georgia 30309

Prepared by

Professional Service Industries, Inc.
1707 South Cameron Street, Suite B
Harrisburg, Pennsylvania 17104
Telephone (717) 230-8622

PSI PROJECT NO. 04912218

May 5, 2022

Paul H. McMichael
Principal Consultant

Karl E. Suter, P.E.
Chief Engineer

TABLE OF CONTENTS

1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Written authorization to proceed with this preliminary geotechnical engineering evaluation was provided by Mr. Robert A. Fischer, Jr. with IDI Logistics, LLC. PSI's geotechnical services were performed under the "*IDIG Form 902-REG: Professional Services Agreement for Testing Services*" dated April 11, 2022, which included PSI's Proposal No. 0491-370526 (dated April 7, 2022) as Exhibit B.

1.2 PROJECT DESCRIPTION

Project information was provided by IDI Logistics which included a conceptual site layout plan (undated) that indicated a proposed 225,000 SF warehouse.

PSI understands that the project will consist of a new warehouse development to be located across two adjacent properties (195 and 215 Davidson Avenue) that would be consolidated into one single property for the planned development in Somerset, New Jersey. At time of this report, both properties were developed including a multi-story hotel at 195 Davidson Avenue and a two-story masonry structure at 215 Davidson Avenue. Based on the provided conceptual site layout plan, it appears that the proposed warehouse structure is planned to be generally placed predominantly at the hotel property and the truck pavements/loading docks to be located southwest of the warehouse and in the adjacent property with the two-story masonry structure.

Structural loading information was not provided; therefore, PSI has based this report on maximum column and wall loads of 150 kips and 7 kips per linear foot, respectively.

Topographic/grading information was not provided at the time of this report. Based on information contained in Google Earth Pro, ground elevations across the proposed development limits range from approximately EL 53 to 71 feet; and across the proposed building footprint from approximately EL 55 to 70 feet. A finished floor elevation (FFE) for warehouse was not provided; however, PSI understands that the FFE will be about 4 feet above final surrounding exterior grades to accommodate truck docks. Therefore, PSI has based our report on a finished floor elevation (FFE) of EL 70 feet which would require fill placements up to 15 feet, exclusive of cuts and fills associated with the removal of unsuitable soil sections.

The information presented in this section was used in our preliminary evaluation. Estimated loads and corresponding foundation sizes have a direct effect on the recommendations, including the type of foundation, the allowable bearing pressure, and the estimated settlement. In addition, estimated subgrade elevations and cut/fill amounts can have a direct effect on the provided recommendations. If any of the noted information has changed or additional information becomes available, PSI should be notified so that we may amend the recommendations presented in this report, if appropriate.

1.3 PURPOSE AND SCOPE OF WORK

The purpose of our preliminary geotechnical services was to assess the subsurface conditions at the site and develop geotechnical related site preparation, fill placement, foundation, and slab-on-grade and pavement recommendations. PSI's scope of services included a subsurface exploration (19 test borings) and laboratory work which formed the basis for the preliminary geotechnical recommendations contained in this report. In order to provide a "final" geotechnical report, PSI recommends additional exploration through test borings. PSI should be engaged to provide these services.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

The project site is located at 195 Davidson Avenue (~3¾-acres) and 215 Davidson Avenue (~8¾-acres) in Somerset, New Jersey. The overall area of the two subject properties is bordered by Davison Avenue to the southeast with commercial developments on the remaining three sides. The approximate site location is shown on a USGS topographic map (Figure 1) included in the Appendix.

The site is developed with a multi-story hotel (63,000± SF) at 195 Davidson Avenue and a two-story masonry structure (24,000± SF) at 215 Davidson Avenue both with associated asphaltic concrete pavements. To the rear or northwest of the existing masonry structure, relatively open green space with perimeter trees was present. The greenspace area was upwards of 5 feet higher than the existing hotel pavements that bound it on its northeast side.

Based on historical aerials, the hotel structure appears to have been built sometime between 1979 and 1984 and the two-story structure sometime between 1970 and 1972.

Based on information contained in Google Earth Pro, ground elevations across the proposed development limits range from approximately EL 53 to 71 feet and generally slopes downward from southeast (Davidson Avenue) to northwest (rear of both properties).

At the time of PSI's exploration, the site was developed with a multi-story hotel at 195 Davison Avenue and a two-story masonry structure at 215 Davidson Avenue with associated pavements at each property.

2.2 SUBSURFACE CONDITIONS

2.2.1 SURFICIAL/BEDROCK GEOLOGIC MAP REVIEW

Based on geologic mapping contained within the online NJ-GeoWeb application (https://www.nj.gov/dep/gis/geowebsplash.htm), the surficial geology is predominantly indicated to be "Weathered Shale, Mudstone, and Sandstone (Qws)" that consists of red brown, yellow to light gray silty sand to silty clay with shale, mudstone, or sandstone fragments that can be as much as 10 feet thick overtop shale/mudstone and 30 feet thick overtop sandstone. The surficial geology at the northwest portion of the overall development limits is indicated to be Eolian Deposits (Qe) which consists of windblown, very pale brown to yellow fine sand and silt that may as much as 15 feet thick. T

Per the "Bedrock Geologic Map of the Bound Brook Quadrangle – Somerset and Middlesex Counties, New Jersey" (R. Volkert, D. Monteverde, and S.M. Silvestri, 2011), the project site is underlain by the Passaic Formation which consists of interbedded sequence of red-brown fine-to-coarse-grained sandstone, siltstone, shaly siltstone, silty mudstone, and mudstone (JTrp) separated by gray bed sequences composed gray to black siltstone, silty mudstone, shale, and silty argillite (JTrpg). The rocks of this formation form fining-upward sequences as much 15 feet thick.

2.2.2 SUBSURFACE EXPLORATION

PSI subcontracted the services of Allied Well Drilling, Inc. to drill 19 test borings which were drilled between April 21 and April 26, 2022. The test boring locations were selected and marked in the field by PSI personnel who are not licensed surveyors. The New Jersey One Call System was notified for public utility clearance, prior to drilling and excavating the site. PSI also engaged GPRS, Inc. to mark/clear private utilities in area surrounding each boring location.

Borings were advanced with hollow-stem augers to depths ranging from approximately 4 to 18 feet below the existing ground surface (bgs). Planned boring depths were typically 20 feet, however, refusal was encountered above the planned termination depth in all borings. Standard Penetration Tests (SPT) and split-spoon sampling was performed in general accordance with ASTM D1586.

At Boring B-07, the boring was advanced through the refusal material between the approximate depths of 18 and 30 feet in general conformance with ASTM Standards using an NQ sized barrel, which yields a nominal 2-inch diameter rock core. The total length of recovered rock core, divided by the length of the run, is referred to as rock core recovery (REC), and is expressed as a percentage. The Rock Quality Designation (RQD) is a measure of the rock mass quality, and is defined as the total length of sound, intact rock core pieces 4 inches or more in length, divided by the length of the rock core run, also expressed as a percentage. The rock core recovery and RQD are shown on the boring logs.

The results of the visual classifications of recovered soil, the SPT blow counts and water level observations are presented in the boring logs in the Appendix of this report. The soil samples will be stored in our laboratory for further analysis, if requested. Unless notified otherwise, the samples will be disposed of after 3 months.

The table below lists the boring IDs, approximate surface elevations (based on Google Earth Pro), depth to approximate bottom of residual soils, and refusal depths.

Boring ID	APPROX. Boring Ground EL[1] (ft)	APPROX. Top of Highly Weathered Rock[2] (ft)	REFUSAL DEPTH	APPROX. Boring Depth (ft)
B-01	69	3	10.4	10.4
B-02	71	2	4.3	4.3
B-03	61	5	9.3	9.3
B-04	57	4	12.5	12.5
B-05	54	5	9.5	9.5
B-06	55	2	9.5	9.5
B-07	57	4.5	18	30*
B-08	61	1	4	4
B-09	58	5	9	9
B-10	59	7	9	9
B-11	64	3	8	8
B-12	69	2	4	4
B-13	68	3	7	7
B-14	70	6	15	15
B-15	70	6	12.5	13.5
B-16	70	2	9	9
B-17	72	2	12.5	12.5
B-18	69	3	15	15
B-19	61	4	8	8
Note 1) Boring ground elevation based on Google Earth Pro.				
Note 2) Also, depth to SPT N-values of 50 bpf or higher				
*Boring B-07 advanced through refusal material with rock coring				

The results of the drilling are summarized as follows:

Surficial Materials:
Beginning at the ground surface at each boring location, approximately 6 to 12 inches of asphaltic concrete or 6 inches of topsoil was encountered. The actual type and thickness of surficial material should be expected to vary widely across the site and between boring locations. The site is developed with a structure with associated concrete walkways, landscaped areas, and perimeter woods.

FILL:
Below the surficial materials at Borings B-14, B-15, B-17, B-18, and B-19 (located at 215 Davidson Avenue), FILL materials were encountered to depths ranging from 2 to 4 bgs. The FILL materials were classified as brown to red brown Clayey/Silty SAND (SC/SM) with varying amounts of gravel, or lean CLAY (CL) or SILT (ML) with varying amounts of sand. The FILL materials at some locations contained trace amounts of organics and debris (e.g., coal at Boring B-15).

The SPT N-values within the FILL materials ranged from Weight of Hammer (W) over 24 inches to 11 blows per foot (bpf). The very soft/loose weight of hammer soils was encountered at Boring B-19 between the depths of 2 to 4 feet. The results of the Standard Penetration Tests in human-placed fill may not be reliable indicators of the actual consistency or relative density of the in-place fill materials. The miscellaneous character of the fill could cause erroneous values and, therefore, may not be indicative of the true engineering properties for the fill. The engineering characteristics of this material, such as strength and compressibility, are likely to be extremely variable.

RESIDUUM:
Underlying the pavements or FILL, RESIDUUM was encountered to depths ranging from 1 to 7 feet bgs. These soils were typically classified as Clayey/Silty SAND (SC/SM) with varying amounts of gravel. The SPT N-values within the granular soils typically ranged from 12 to 30 bpf, indicating medium relative densities.

Highly Weathered Bedrock (Augered & Spoon Sampled):
Underlying the residual soils, highly weathered siltstone was encountered to the respective refusal depths. As sampled in the limited sized split-spoon, the recovered materials were generally classified as red-brown Clayey/Silty SAND with Gravel (SC/SM) or Clayey/Silty GRAVEL (GC/GM). The SPT N-values within this stratum ranged from 65 bpf to 50 blows to advance the sampler between 1 to 5 inches indicating very dense relative densities.

Bedrock (Rock Core Drilling):
At Boring B-07, the refusal conditions were explored with rock coring techniques between the depths of 18 to 30 feet bgs. The rock encountered at the cored locations typically consisted of red-brown siltstone. For the initial core run (R-1 18 to 20 feet), there was 56 percent recovery (REC) and 0 percent RQD. For the subsequent two 5-foot core runs R-2 and R-3, the rock core RECs were both 93 percent and the RQD values were 47 and 52 percent, respectively.

The preceding subsurface descriptions are generalized to highlight the major soil or rock strata encountered during the exploration. The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. The strata shown on the logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The strata represent the approximate boundaries between subsurface materials, where the actual transition may be gradual.

2.3 GROUNDWATER CONDITIONS

At the time of our drilling activities (April 2022), groundwater was not encountered while drilling or upon completion. The borings were backfilled immediately upon completion for safety considerations; thus, long-term groundwater level measurements were not possible.

The observations presented on the test boring logs represent the groundwater conditions at the time of measurement and may not be indicative of other times. Additionally, discontinuous zones of perched water may exist within the overburden materials and the contractor should anticipate surface and subsurface seepage into any subsurface excavations during high moisture periods of the year. Variations in groundwater levels should be expected seasonally, annually and from location to location.

It is possible for the groundwater table to vary within the depths explored during other times of the year depending upon climatic conditions (seasonal fluctuation). Groundwater monitoring wells are required to accurately define the position and fluctuation of the groundwater table, especially if a boring is drilled in cohesive soil, where several days or weeks may be required for the groundwater to reach a static level. The installation of such monitoring wells was not included in the scope of services for this project.

2.4 LABORATORY TESTING

PSI performed laboratory testing on selected soil samples in general accordance with ASTM standards. The laboratory testing included natural moisture content determination, Atterberg Limits, and grain size distribution. The laboratory test results are included in the Appendix and shown on the boring logs opposite of the sample tested.

3.0 OBSERVATIONS AND RECOMMENDATIONS

3.1 GENERAL

The following overview of geotechnical-related issues expected to impact site development is provided below.

- Existing Development: At the time of our exploration (April 2022), the respective properties to be combined were both developed with structures and associated pavements. PSI recommends that existing construction to be abandoned be completely demolished prior to the start of construction activities to include the complete removal of below-grade elements. Abandoned utilities should be completely removed beneath new construction. The resulting excavations should be backfilled with compacted structural fill in accordance with Section 3.3 below.

  Most of the borings drilled at 215 Davidson Avenue encountered FILL to depths of 2 to 4 feet some of which contained trace organics/debris and was in the very loose condition. Therefore, it may be necessary to remove/recompact or over-excavate/replacement some of this existing undocumented FILL.

- Shallow Dense Conditions/Bedrock: Based on PSI's test borings, highly weathered siltstone was encountered at depths ranging from approximately 1 to 7 feet bgs and on average at depths of 3½ feet bgs or less. Therefore, PSI anticipates that some difficult or rock excavation will be encountered during excavations for footings and/or utilities and possibly during grading operations depending on final grades. Construction budgets and schedules should include contingencies for difficult or rock excavations.

- Possible Tall Fill Placements: At the time of this report, PSI was not provided with existing topographic plans or proposed grading plans. Based on elevation information contained in Google Earth Pro, upwards of 15 feet of grade differences appear to be present across the proposed building footprint. Depending on the actual height of new fill, the potential need for settlement monitoring and/or schedule allowances prior to new foundation construction may be necessary. If needed, PSI can provided additional recommendations in a final report once existing/proposed grading plans are provides and the final subsurface exploration is completed.

- Potential for Dissimilar Bearing Materials: Based on our borings and report basis for existing and proposed grades, the potential exists for dissimilar bearing materials between foundation units between interior and exterior foundations and between taller fill placement areas and areas at or close to proposed design grades. Therefore, for the final report PSI should be provided existing/proposed grades and the proposed finished floor elevation. It may be necessary to extend some foundations deeper and/or remove and replace weathered rock materials to provide a cushion.

3.2 SITE PREPARATION AND EARTHWORK RECOMMENDATIONS

3.2.1 GENERAL

For demolition activities, PSI recommends that demolition activities include the removal of below grade construction (e.g., foundations, below grade walls, abandoned utilities) and resulting pits/trenches be backfilled with structural fill as recommended in this report. If prior construction is not fully removed and resulting pits/trenches not appropriately backfilled, then these activities would need to be performed prior to new earthwork and construction.

Site preparation procedures should include the removal of demolition debris (if not performed during demolition activities), organics, over-sized rock, debris- or organic-laden FILL materials and any other deleterious material within the construction area. Topsoil, if present, may be stockpiled for later use in landscaped areas or may be removed from the site. PSI also recommends that demolished asphalt pavements (milled or otherwise) not be used as structural fill. Often there is economic value to recycle these materials at a local asphalt plant. Under no circumstances should topsoil or other organic- or debris-laden soil be placed as structural fill.

Following clearing/grubbing operations and cuts to design grades, the entire site including the proposed building and pavement areas should be proof-rolled with a fully loaded triaxle dump truck under the observation of a PSI representative or a representative of MT Group, also an Intertek owned company. Those areas observed to rut and deflect excessively should be removed and replaced or otherwise stabilized. The subgrade repair or stabilization approaches should be determined at the time of construction, but may include scarifying subgrades, the placement of a geotextile/geogrid or cement/lime modification/stabilization.

Prior to placement of stone subbase for concrete slabs or asphalt pavements, the site should be proof-rolled at each construction sequence with a 15 to 20 ton loaded tandem axle dump truck or other heavy pneumatic-tired construction equipment and soft subgrades repaired as determined by the PSI or their representative.

Any required backfill or new structural fill required to achieve the design site grades should comply with Section 3.3 Structural Fill Material Placement below. It is also recommended that MT Group be retained to perform field density testing during fill/backfill placement. The placement of a geotextile and/or coarse stone may be required to stabilize the undercut subgrade and to facilitate backfilling.

Subgrade areas should be kept properly drained and free of ponded water surfaces. This may be achieved by either sloping the site topography adjacent to the construction to direct the water away from the excavation or trenching and berming to collect the excess run-off. Final excavations to desired subgrades should be accomplished immediately prior to the placement of concrete. The contractor should not place concrete on disturbed subgrades. If the subgrade soils are wet, machine or foot traffic should be reduced or eliminated to lessen disturbance of the

subgrade. If the site clearing is performed separate from the proposed building construction, restoration of the site to provide for positive drainage is recommended.

Materials placed as fill below pavements and buildings should meet the requirements of structural fill as provided below.

3.2.2 DISCUSSION OF POTENTIAL "ROCK" EXCAVATION

Based on our field exploration, most of the in-place soils should generally be excavatable using conventional excavation equipment, such as scrapers, front end loaders, bulldozers, etc. However, the in-place soils appear to be of limited thickness in the area of each boring location. Therefore, materials having SPT resistances greater than 50 blows per foot will require pre-loosening with heavy equipment in order to achieve excavation. Ripping should generally be performed using a Caterpillar D-8T or equivalent large bulldozer equipped with a single-tooth ripper blade. However, the rippability of the underlying siltstone bedrock may be limited to a few feet, and impact hammers would be needed to remove more competent rock.

For the purposes of this report, we recommend that subsurface materials causing auger refusal or having SPT N-values in excess of 50 blows per 3 inches of penetration be considered unrippable rock. Disagreements often arise relative to excavatability of materials in the transition zone between soil and rock. Therefore, we recommend that the project specification stipulate that excavation materials are considered "unclassified" and provide contractors the information from the geotechnical borings to aid their estimates.

If excavation materials will be classified, we suggest the contract documents include unit rock excavation prices. To reduce potential ambiguities, we suggest the contract documents define general rock excavation as:

> Material that cannot be dislodged and excavated with a single-tooth ripper drawn by a crawler tractor having a draw bar pull rated at not less than 56,000 pounds (Caterpillar D8T or equivalent) and occupying an original volume of at least one cubic yard. Additionally, trench rock excavation should be defined as material that cannot be excavated with a backhoe having a bucket curling force rated at not less than 45,000 pounds (Caterpillar 330D L or equivalent) and occupying an original volume of at least ½ cubic yard. If the Contractor elects to use equipment with power ratings that exceed the minimum power ratings described in this section, then rock should be defined based on the actual equipment used.

Excavation of weathered rock or bedrock is typically much more difficult within confined excavations—such as, footings, utility trenches, etc. Jackhammering or blasting is generally required for removing these materials at or below the level that auger refusal is encountered. If blasting is required, we recommend conducting a pre-blast condition survey by a registered land surveyor of the surrounding structures that may be impacted by the blasting and the performance of vibration monitoring during blasting. A pre-blast survey will help to establish

the existing condition and integrity of the surrounding structures prior to commencement of construction activities. Collecting the actual pre-existing and post-construction conditions will help reduce the possibility of future damage claims.

If blasting is allowed, care should be taken to avoid over-blasting, as this may damage adjacent structures and the underlying rock, thereby reducing the load bearing capability of the rock. If blasting is utilized, all loose rock and rock fragments should be cleaned out of the excavations prior to placement of structural fill, reinforcement steel or concrete, particularly within foundation excavations or other load bearing areas. Also, if blasting is utilized, the excavation of the rock should be done in accordance with 29 CFR Part 1926 Subpart U, Blasting and the Use of Explosives, prepared by the United States Department of Labor, Occupational Safety and Health Administration (OSHA).

PSI has not tested the siltstone for durability, however, siltstones often are degradable materials that rapidly weather and disintegrate when exposed at the ground surface after excavation. Therefore, if the siltstone material is to be used as fill, it must be broken down to smaller pieces so that the resulting material is dense graded when compacted. In other words, it must be broken down so that the largest fragments are no larger than 3 inches and there must be sufficient fines to fill all the void space between the larger pieces. Otherwise, there may be large, unexpected settlement of fill composed of siltstone material. If final grading plans indicate that siltstone will be excavated in planned cuts, durability testing should be performed on a sufficient number of samples to determine whether the rock is durable or nondurable. Backfill specifications should reflect the findings.

3.3 STRUCTURAL FILL MATERIAL AND PLACEMENT

Materials to be used as fill/backfill should be tested for compliance with the specifications below for structural fill. If the materials do not meet the specifications, then they may be placed in non-bearing, landscaped areas, or removed off-site.

The in-place soils will be very sensitive to moisture content variations. This general sensitivity to water will influence construction since subgrade support capacities will deteriorate when this soil type becomes wet and/or disturbed. It is not unusual for wet or cool season grading operations to be hindered by the continual need to dry back the on-site natural soils during placement. If fill placement must proceed during other than the summer months, then use of imported granular fill with less than 10 percent passing the No. 200 sieve may be necessary.

For any necessary fill, it is recommended that all imported or on-site soils be tested and evaluated by PSI or their representative. In general, fill materials planned for use as structural fill should be free of organic matter and construction debris, and should not be excessively wet or excessively plastic, and should have rock fragments no larger than 3 inches in maximum dimension.

Satisfactory fill material should include clean soil with USCS classifications of GW, GM, GC, SW,

SP, SM, SC, along with some CL or ML. However, use of fine grained CL and ML soils should be limited to re-use of site materials. Fine grained CL and ML soils should not be imported to the site for use as fill. The fill material should have a maximum Liquid Limit of 40 and a Plasticity Index of 20 or less. Unsatisfactory fill material includes highly elastic, plastic, or organic soils (MH, CH, OH, OL, PT) or soils with a Maximum Dry Density (MDD) of at least 105 pcf as determined by a Modified Proctor, and these materials should not be used as structural fill.

If recycled concrete aggregate (RCA) is desired for use as structural fill, PSI recommends it meets with NJDOT Specification 901.10.02. <u>However, PSI recommends it not be used as aggregate base immediately below pavements or slab-on-grade floors</u>.

Structural fill should be placed in accordance with the following recommendations:

1. Structural fill materials should be placed in layers of not more than 8 inches in loose thickness with soils that have rock fragments that are no larger than 3 inches in their maximum dimension.

2. Structural fill materials should have maximum liquid limit of 40 and a maximum plasticity index of 20, tested per ASTM D-4318. Preference should be given to using granular low plasticity soils for structural fill.

3. Moisture contents should be within <u>+</u>2 percentage points of optimum moisture content per ASTM D-1557 (Modified Proctor). Adjustments to the natural moisture contents of the soils may be required in order to obtain specified compaction levels. Additionally, soils to be used as fill should have a Maximum Dry Density (MDD) of at least 105 pcf as determined by a Modified Proctor.

4. Each layer of the fill materials in the building areas and in pavement subgrade areas should be compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557).

5. PSI or MT Group should monitor the fill placement and compaction operations on a full-time basis and should perform a sufficient number of density tests to verify that proper degrees of compaction are achieved.

If on-site material is considered for reuse as structural fill, then PSI recommends that at the start of construction and during construction (as needed) bulk samples be collected for laboratory testing by PSI/MT Group. However, given the potential for over-sized rock fragments from the weathered rock stratum, PSI recommends that these materials be broken down to 3 inches or smaller diameters prior to its re-use at structural fill.

3.4 FOUNDATION RECOMMENDATIONS

3.4.1 SHALLOW FOUNDATIONS

After the site has been prepared as described this report, the proposed structure may be supported on shallow spread footings bearing on dense residual soils, weathered rock or compacted structural fill. Based on the preliminary exploration and a finished floor elevation of EL 92 feet, the available shallow foundation bearing pressure at the anticipated bearing stratum ranges from 2,500 to 5,000 psf. This range represents the uncertainty associated with the proposed existing/final grades and proposed finished floor elevation (FFE). Once the grading/FFE information is provided and additional borings are performed to confirm if similar subsurface conditions are present beneath the existing structure, we will be able to refine the value. For preliminary budgeting purposes, we recommend using a maximum allowable bearing pressure of 3,000 pounds per square foot (psf) for preliminary design of shallow foundations bearing on dense residual soils or weathered rock. PSI will further evaluate foundation settlements after specific structural loading and grading has been provided.

Exterior foundations should be designed for a minimum embedment of 36 inches below final exterior grades to provide adequate cover for frost protection. In areas where interior foundations are constructed in heated areas, the footings may be constructed at shallower depths; however, as previously indicated the potential exists for dissimilar bearing conditions between interior and exterior foundation units. PSI will provide specific recommendations in the final report after structural loading and existing/proposed grading and finished floor elevation is provided.

PSI recommends that load-bearing wall footings have a minimum width of 18 inches and that column footings have a minimum width of 24 inches, regardless of the actual bearing pressure. Wall footings should be provided with nominal, continuous, longitudinal steel reinforcement for greater bending strength so they can span across small areas of loose or soft soils that may go undetected during construction.

Because of possible variations in subsurface conditions and related bearing capacity, all footing excavations should be observed by PSI/MT Group. Foundation bearing surface evaluations should be performed in each foundation excavation prior to placement of reinforcing steel. These evaluations should be performed by a representative of PSI/MT Group to confirm that the design allowable soil bearing pressure is available and that our design assumptions about the subgrade are applicable to the conditions encountered during construction. The foundation bearing surface evaluations should be performed using a combination of visual observation and dynamic cone penetrometer testing.

Where unsuitable bearing conditions are encountered as determined by PSI/MT Group, these soils should be undercut and replaced with controlled structural fill. Unsuitable foundation bearing conditions may consist of, but are not limited to, soft/loose relative densities, excessively wet conditions, nested debris and organic soil and wood materials or relatively intact hard obstructions. The over-excavation should extend laterally from all foundation edges a minimum of one half the depth of the undercut. The backfill should consist of approved,

compacted structural fill as described in Section 3.3 above.

We recommend that the exposed bases of the foundation excavations be compacted prior to placement of reinforcing steel to densify loose natural soils disturbed by the excavation process. Prior to the placement of concrete, where reinforcing steel is placed in the foundations, an inspection must be conducted to observe that specified chairs or supports are provided that the reinforcing steel is properly positioned, as specified.

Exposure to the environment can weaken the soils at the foundation-bearing surface if they are exposed for extended periods of time. If the foundation-bearing surface becomes unstable due to exposure to the environment, remedial work, including the removal of unsuitable soils may need to be performed prior to concrete placement. The foundation bearing surface can be protected with a lean concrete mud mat within the footing excavation; however, it should be located below the design bottom of the foundation concrete.

Once the footing concrete is placed, the foundations should be backfilled with structural fill as soon as it is safe to do so without causing damage to them. The backfill serves to protect the footing, is a component of overturning resistance and prevents accumulation of water around the foundations which can soften and weaken the bearing soils. The ground surface near the completed foundations should be sloped to drain away from the foundations throughout construction to avoid accumulation of moisture in the subgrade soils.

3.4.2 Uplift and Shear Resistance of Shallow Foundations

Shallow foundations may be used to resist both uplift and lateral forces. For the case of uplift forces, the resistance should be calculated including the weight of the foundation and the weight of the overburden soil above the foundation. The overburden soil above the foundation must be well-compacted structural fill. The unit weight of the foundation and soil overburden must account for the location of the design water table. Materials below the water table should be assigned buoyant unit weights and materials above the water table, total unit weights. For materials above the water level, PSI recommends using total unit weights of 110 and 150 pcf for soil and concrete materials in this calculation.

For sustained uplift loading conditions, the resisting force should be calculated using the weight of the foundation and the weight of the material within a vertical projection of the foundation perimeter. The safety factor for uplift resistance for the sustained loading condition should be at least 2.

For transient uplift loads, such as wind loads, the uplift resistance should be computed similarly to the case of the sustained loading, except that the prism of soil above the foundation used to compute the resistance is formed by the projection of lines from the top perimeter of the foundation upwards at an angle of 20 to 30 degrees from the vertical depending on the type of soil.

For clay backfill above the footing, the upward projection of the sides of the soil prism should be at a 30-degree angle, outward from the vertical. For sand backfill above the footing, the upward projection of the sides of the soil prism should be at a 20-degree angle, outward from the vertical. The safety factor for uplift resistance for the transient loading condition is the ratio of the sum of the foundation and overburden weights divided by the uplift force and should be at least 1.5.

If greater uplift resistance is required, the aggregate pier suppliers typically have a special uplift resisting element that can be added to piers where it is required. This has to be added prior to the construction of the piers, rather than once they are in place. Consequently, the uplift loads must be known at the design stage.

Passive earth pressures of foundation materials adjacent to the footing, as well as soil friction along the footing base, may be used to resist sliding. The passive earth pressure can be calculated using an estimated passive earth pressure coefficient of 2 for limited deflection. Due to the variability of foundation materials that will be exposed at the bearing level, we have assumed relatively firm undisturbed soils or compacted structural fill as the foundation material to be used for computing passive earth pressures and soil friction. An allowable friction coefficient of 0.3 between the concrete footing and soil can be utilized.

3.5 SEISMIC DESIGN

PSI understands that project site is located within a municipality that employs the **2018 International Building Code, NJ Edition**. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site. As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. To define the Site Class for this project, we have interpreted the results of soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet.

Based upon our evaluation, the subsurface conditions within the site are consistent with the characteristics of a **Site Class "C"** as defined in 2018 IBC, NJ Edition. The associated probabilistic ground acceleration values and site coefficients for the general site area were obtained from the OSHPD geohazards web page: http://seismicmaps.org/

The seismic values and coefficient are presented in Table 1 below:

Table 1: Ground Motion Values*

Period (sec)	Mapped MCE Spectral Response Acceleration** (g)		Site Coefficients		Adjusted MCE Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
0.2	S_s	0.255	F_a	1.3	S_{Ms}	0.331	S_{Ds}	0.221
1.0	S_1	0.056	F_v	1.5	S_{M1}	0.084	S_{D1}	0.056

2% Probability of Exceedance in 50 years for **40.5387, -74.5251*
***At B-C interface (i.e. top of bedrock).*
MCE = Maximum Considered Earthquake; g = acceleration due to gravity

If the Seismic Design Category, as determined from the intended building use and the 2018 IBC, NJ Edition is interpreted to be D through F, the code requires an assessment of slope stability, liquefaction potential and surface rupture due to faulting or lateral spreading. Detailed evaluations of these factors were beyond the scope of this study. However, the following table presents a qualitative assessment of these issues considering the site class, the subsurface soil properties, the groundwater elevation, and probabilistic ground motions:

Table 2: Qualitative Seismic Risk Assessments

Hazard	Relative Risk	Comments
Liquefaction	Low	The weathered rock is relatively shallow and the overburden soils are typically dense and generally appear to have sufficient fines contents to resist liquefaction; also seismicity is relatively low.
Slope Stability	Low	Probabilistic ground accelerations are low and the site has relatively minor slopes.
Surface Rupture	Low	The site is not underlain by a mapped active fault.

3.6 Floor Slab Recommendations

The concrete slab for the structure may be ground-supported (slab-on-grade) after ground improvement such as rammed aggregate piers or undercutting as described in Section 3.4.1 above. Should soft or loose soils be identified at slab subgrade during proof-rolling or proof-compaction, undercutting or stabilization may be required. A visual inspection of the exposed soil slab subgrade must be made by PSI/MT Group.

For the subgrade prepared as recommended in this report, a Modulus of Subgrade Reaction, *k* value, of 150 pounds per cubic inch (pci) may be used on in-situ soil subgrades or approved engineered fill in the grade slab design, based on a presumed value for a 1 foot by 1 foot plate

load test.

In order to increase the consistency of the subgrade reaction immediately beneath any concrete slab-on-grade, we recommend that floor slabs be underlain by a minimum of 4 inches of free-draining (a maximum particle size of ¾ inch with less than 5 percent material passing the No. 200 sieve), well-graded gravel or crushed rock base course. Base course material should be moisture conditioned to within +/- 2 percent of optimum moisture content and compacted by mechanical means to a minimum of 95 percent of the material's maximum dry density as determined in accordance with ASTM D-1557. For open-graded aggregate materials without a clear moisture-density relationship, the base course should be compacted to a relatively firm and unyielding condition.

The crushed stone should also provide a capillary break to limit migration of moisture through the slab. If additional protection against moisture vapor is desired, a vapor retarding membrane may also be incorporated into the design. Factors such as cost, special considerations for construction and the floor coverings suggest that the architect and owner make decisions on the use of and placement location for vapor retarding membranes.

The precautions listed below should be followed for construction of slabs-on-grade pads. These details will not reduce the amount of movement but are intended to reduce potential damage should some settlement of the supporting subgrade take place. Some increase in moisture content is inevitable as a result of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices.

Cracking of slabs-on-grade is normal and should be expected. Cracking can occur not only as a result of heaving or compression of the supporting soil and/or bedrock material, but also as a result of concrete curing stresses. The occurrence of concrete shrinkage cracks, and problems associated with concrete curing may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement, finishing, and curing, and by the placement of crack control joints at frequent intervals, particularly, where re-entrant slab corners occur. The designer of the slab-on-grade concrete floor should consult the most current American Concrete Institute (ACI) guidelines/standards for concrete floor design.

Backfill soils in all interior and exterior utility line trenches should be carefully compacted to the degree required in accordance with project specifications and as stated in this report.

Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

3.7 EARTH RETAINING DOCK WALLS

Earth retaining dock walls should be designed to resist lateral earth pressures which is developed from the soils present within a wedge behind the retaining wall. The lateral earth pressure acting on a retaining structure is a function of the weight and friction angle of the soil that exists above the theoretical plane projecting up from the wall at a 45 degree. The lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient K. If the walls are not free to rotate or deflect at the top, PSI recommends designing the walls for the "at-rest" lateral earth pressure condition using K_o. Walls that are permitted to rotate and deflect at the top can be designed for the active lateral earth pressure condition using K_a.

Based on granular and not fine-grained or cohesive soils being used for backfill behind the below grade walls and area surcharge loads are considered in the retaining wall design, and no slopes at top or bottom of the earth retaining wall, the below grade wall should be designed based on the following (using the Rankine Theory):

Wall designed for active pressure (*free to rotate)*:
Equivalent Fluid Pressure = 39 lbs/cubic foot
Equivalent Fluid Pressure = 82 lbs/cubic foot (without wall drainage)
Active Earth Pressure Coefficient [K_a]= 0.33

Wall designed to be at rest (*not free to rotate at the top)*:
Equivalent Fluid Pressure = 60 lbs/cubic foot
Equivalent Fluid Pressure = 92 lbs/cubic foot (without wall drainage)
At Rest Earth Pressure Coefficient [K_o]= 0.50

Additional design parameters include the following:

1) Approximate unit weight of backfill soils: 120 pcf.

2) Passive earth pressure coefficient: K_p = 3.00; however, only ½ the full passive earth equivalent fluid pressure should be used in wall design.

3) Coefficient of friction (concrete on soil) = 0.3

4) Angle of internal friction (backfill soils): $\phi = 30^o$

All below-grade walls should be provided with perimeter drains placed behind walls in order to intercept and dispose of groundwater or surface infiltration and to intercept and relieve hydrostatic pressures on retaining walls. The earth pressure parameters presented in this section are based on drained conditions for the backfill. If such drainage is not provided, then hydrostatic pressures should also be considered in the retaining wall design as indicated by the equivalent fluid pressures "without wall drainage". **However, PSI recommends that earth retaining walls be designed with drainage abled to relieve the hydrostatic pressure.** One possible drainage system would include:

1) A 4 or 6-inch diameter perforated drain tile at the bottom of the backfill to collect seepage water with the tile connected to a suitable means of disposal.

2) Clean 1/2-inch or 1-inch gravel classified as "GP" and containing less than 5% passing a #200 sieve surrounding the draintile.

3) Non-woven 4 ounce per square yard geotextile between the drainage material and the backfill soils to prevent infiltration of finer soils into the draintile, granular drainage blanket, or granular backfill.

3.8 PAVEMENT DESIGN

After preparation of the soil subgrade in Section 3.2 of this report and prior to placing the subbase, the subgrade should be proofrolled with a fully loaded tandem axle dump truck, or similar rubber-tired vehicle, in order to detect areas or pockets of unusually soft or loose material. These areas, if encountered, should be removed, and replaced with structural fill. Where unsuitable soils or debris-laden FILL is left in-place beneath pavements, the potential for subsidence or sinkhole development will exist.

PSI has determined a theoretical pavement design based on the anticipated traffic use, assumed traffic loads, and estimated subgrade properties. The following assumptions and design parameters were used in the flexible pavement section designs:

1) The traffic loading was assumed to have an equivalent traffic loading condition of 25,000 equivalent 18-kip single axle loads (ESALs) for light duty pavements (car traffic only), and 1,250,000 ESALs for heavy duty truck pavements.

2) The pavement design is based on a reliability of 95% and a standard deviation of 0.40.

3) The Initial and Terminal Serviceability Indexes are 4.2 and 2.5, respectively.

4) The asphaltic concrete to be used for the proposed flexible pavement will be an average grade plant NJDOT Marsal or Superpave mixes with a Structural Coefficient of 0.44 for both courses.

5) The aggregate subbase material to be used is assumed to be a high quality, densely graded crushed stone with a resilient modulus of 36,000 psi and a Structural Coefficient of 0.11. The drainage coefficient for aggregate base course material is 1.0.

6) A preliminary CBR value of 5 percent for the on-site soils was used which yields a Resilient Modulus of approximately 5,800 psi.

The civil engineer for the project may have more traffic and project design data available than is currently available to PSI or thicker sections may be required in DOT right-of-ways or per local ordinance and may wish to modify and refine these pavement sections. We will, upon request, be pleased to provide a more detailed pavement section design when definite traffic loading

and site layout plans are available. Based upon our field results, analysis and assumptions, the following pavement sections were obtained:

Light Duty Flexible Pavements

1.5"	Surface Asphaltic Concrete (HMA NJDOT Superpave 9.5 mm)
2.5"	Bottom Asphaltic Concrete (HMA NJDOT Superpave 19.0 mm)
6.0"	Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent) Over a compacted, proof-rolled, and approved subgrade.

Heavy Duty Flexible Pavements

2.0"	Surface Asphaltic Concrete (HMA NJDOT Superpave 9.5 mm)
4.5"	Base Asphaltic Concrete (HMA NJDOT Superpave 9.5 mm)
10.0"	Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent) Over a compacted, proof-rolled, and approved subgrade

The following assumptions and design parameters were used in the rigid pavement section designs:

1) The traffic loading was assumed to have an equivalent traffic loading condition of 25,000 equivalent 18-kip single axle loads (ESALs) for light duty pavements, and 1,250,000 ESALs for heavy duty truck pavements.

2) The design pavement design is based on a reliability of 95% and a standard deviation of 0.35.

3) The Initial (Pi) and Terminal Serviceability (Pt) Indexes are 4.5 and 2.5, respectively.

4) Based on 4,500 psi concrete, a Concrete Modulus of Rupture, Mr, of 627 psi and a concrete Elastic Modulus, E, of 3.8 million psi was utilized in design.

5) The Load Transfer Coefficient, J, of 3.8 was used.

6) For rigid pavements, the effective subgrade modulus is 180 pci per Table 3.2 ACI 330R-08 based on 6 inches of densely graded aggregate base and a soil subgrade modulus of 150 pci.

For rigid pavements, PSI recommends the following minimum sections for light duty (parking areas) and heavy-duty (drive aisles and approach areas) uses, as well as in areas to receive truck traffic:

Light Duty Rigid Pavement

6.0" Paving Concrete (Air-Entrained)
(Minimum 28-day compressive strength of 4,500 psi)
6.0" Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent);
Over a compacted, proofrolled, and approved subgrade

Heavy Duty Rigid Pavement*

8.0" Paving Concrete (Air-Entrained)
(Minimum 28-day compressive strength of 4,500 psi)
6.0" Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent);
Over a compacted, proofrolled, and approved subgrade

*NOTE: The heavy-duty concrete pavement should have dowelled joints into thickened edges (12 inches) for semi-tractor trailer and refuse dumpster truck traffic. The concrete should also be designed with 5 ± 1 percent entrained air to improve workability and durability.

Proper finishing of concrete pavements requires the use of appropriate construction joints to reduce the potential for cracking. Construction joints should be designed in accordance with current Portland Cement Association guidelines. Joints should be sealed to reduce the potential for water infiltration into pavement joints and subsequent infiltration into the supporting soils. All pavement materials and construction procedures should conform to NJDOT and appropriate city, or county requirements. The above section represents minimum thicknesses representative of typical local construction practices, and as such, the owner and designer should anticipate the need for periodic maintenance.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 GROUNDWATER CONTROL

As previously indicated at the time of our drilling activities (April 2022), groundwater was not encountered while drilling or upon completion. It is possible that seasonal variations and subsurface conditions will cause the water levels across the site to vary. In this geology, infiltrating water from precipitation often perches on top of the very dense weathered rock or rock and may be encountered in shallow excavations following periods of precipitation.

PSI recommends that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavation, on floor slab areas or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

At a minimum, earthwork or other contractors involved in excavations should be prepared for

conventional dewatering measures such as submersible pumps and sump pits. The Geotechnical engineer should be consulted if excessive and uncontrolled amounts of seepage occur. Consultation with the project Storm Civil Engineer may also be necessary.

4.2 EXCAVATION CONSIDERATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was established to better enhance the safety of workers entering trenches or excavations.

Federal regulation mandates that all excavations, whether they be utility trenches, basement or footing excavations or others (i.e. underground storage tanks), be constructed in accordance with the OSHA requirements. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could risk injury to workers and be liable for substantial financial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in “29 CFR Part 1926”, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. PSI is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

5.0 RECOMMENDATIONS FOR FINAL SUBSURFACE EXPLORATION

Based on our understanding of the current site layout, PSI anticipates an additional 20 to 40 borings will be needed predominantly at the proposed warehouse footprint depending on final footprint size, location, and grading plans. Additional exploration at 215 Davidson Avenue to include test borings and/or test pits is also recommended to further explore the undocumented fill conditions disclosed by PSI’s preliminary test borings. The actual number of test borings and associated depths will be determined upon receipt of the final site layout and grading plans for the project.

6.0 REPORT LIMITATIONS

This report has been prepared to aid in the preliminary evaluation of subsurface conditions for the proposed **IDI Warehouse** to be located at **195 and 215 Davidson Avenue** in **Somerset**, **NJ**. The intent of the included recommendations is to serve as basis for preliminary design and cost analysis. **This report should not be used for final design and construction purposes.**

The preliminary evaluations and recommendations are, of necessity, based on the information made available to us at the time of the actual writing of the report and the on-site conditions, surface and subsurface that existed at the time the exploratory borings were drilled. Further, that the limited number of exploratory borings, in relation both to the areal extent of the site and to depth, are representative of the general subsurface conditions at the site.

We recommend that Professional Service Industries, Inc. be retained to provide additional subsurface exploration and geotechnical evaluation for final design and construction purposes. We also recommend that PSI be retained to provide observation and testing of the geotechnical-related construction activities for this project. PSI cannot accept responsibility for any conditions that deviate from those described in this report, nor for the performance of the structure, if PSI is not engaged to provide these additional services.

The scope of work for this report did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

This report has been prepared for the exclusive use of IDI Logistics. PSI warrants that the evaluations and recommendations contained in this report are based on generally accepted professional engineering practices in the field of geotechnical engineering.

APPENDIX

Figure 1: Site Location Plan

Figure 2: Boring Location Plan

Boring Summary/Boring Logs/General Notes

Laboratory Test Results

FIGURE 1: SITE LOCATION PLAN

Proposed IDI Warehouse
195 & 215 Davidson Avenue, Somerset, NJ
PSI Project No.: 04912218

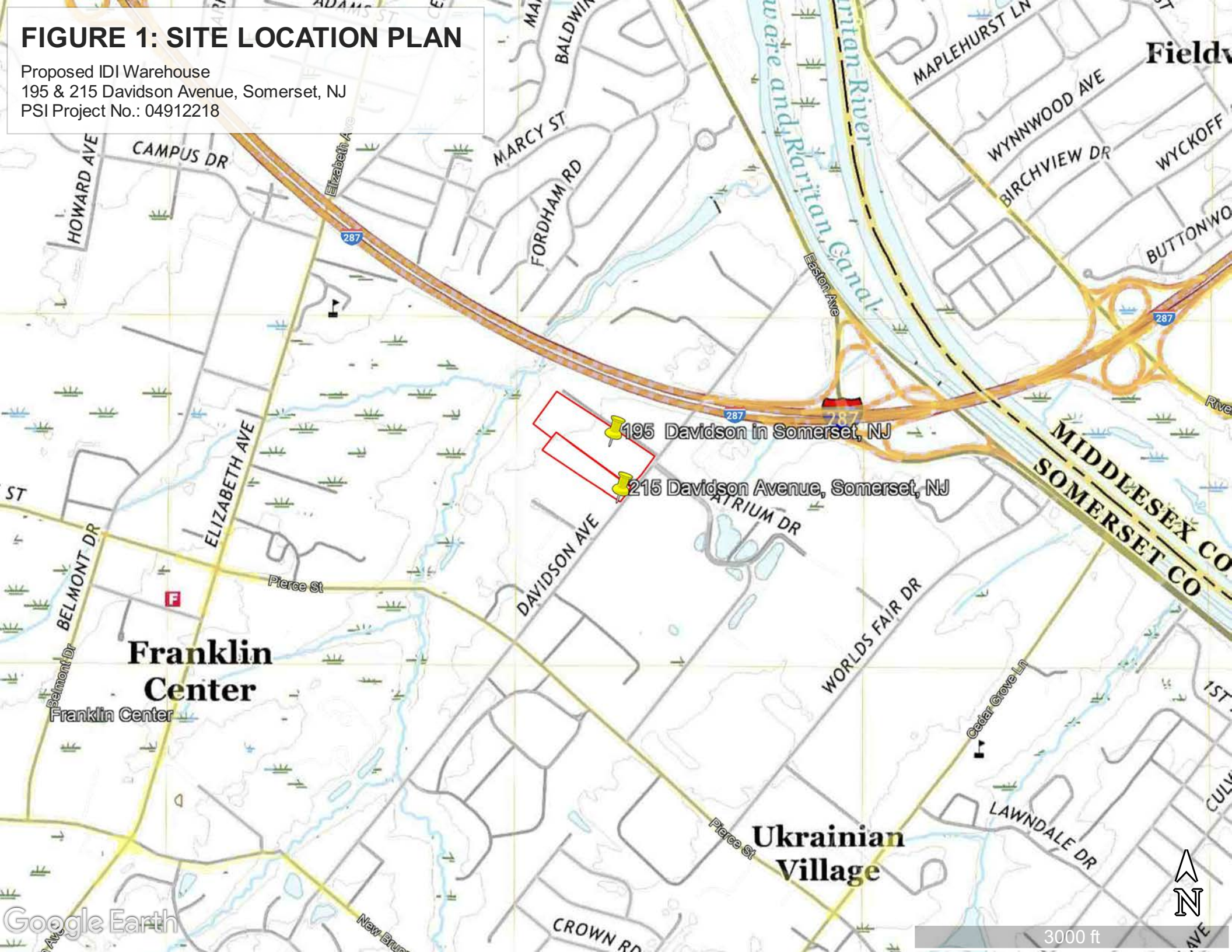
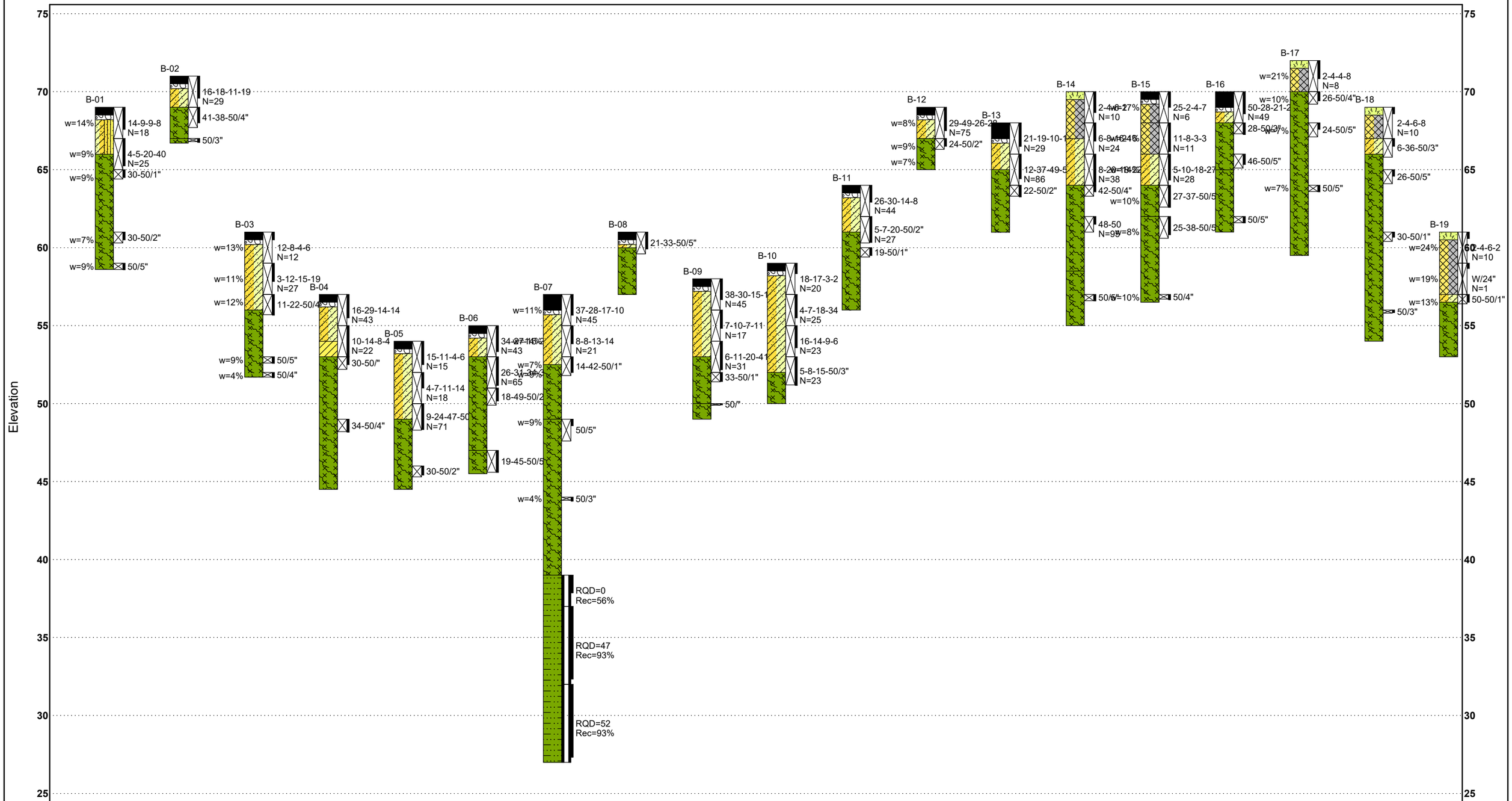


FIGURE 2: BORING LOCATION PLAN

Proposed IDI Warehouse
195 & 215 Davidson Avenue, Somerset, NJ
PSI Project No.: 04912218



intertek psi
Professional Service Industries, Inc.
1707 S. Cameron Street, Suite B
Harrisburg, PA 17104

Boring Summary

IDI Warehouse
PSI Project Number: 04912218

195 & 215 Davidson Avenue
Somerset, NJ

BORING B-01

DATE STARTED:	4/21/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/21/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	10.4 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	69 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
				S-1	17	**RESIDUUM**- Medium Dense, Red Brown, Silty, Clayey SAND with Gravel, moist	SC-SM	14-9-9-8 N=18	14		LL = 28 PL = 22 Fines=26.2%
				S-2	21	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Silty, Clayey GRAVEL with Sand, moist		4-5-20-40 N=25	9		LL = 26 PL = 19 Fines=21.4%
65				S-3	6			30-50/1"	9	>>◎	
	5						GC-GM				
				S-4	6			30-50/2"	7	>>◎	
60											
	10			S-5	5			50/5"	9	>>◎	
						Spoon Refusal @ 10.4 ft					

intertek psi

Professional Service Industries, Inc.
1707 S. Cameron Street, Suite B
Harrisburg, PA 17104
Telephone: (717) 230-8622

PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-02

DATE STARTED:	4/20/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/20/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	4.3 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	71 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.	
Upon Completion	Not Enc.	

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
70						Aggregate Base					
				S-1	17	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND trace Gravel, moist	SC/SM	16-18-11-19 N=29		◎	
				S-2	12	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND, trace Gravel, moist	SC/SM	41-38-50/4"		>>◎	
				S-3	3	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	50/3"		>>◎	
						Auger Refusal @ 4.3 ft					

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Telephone: (717) 230-8622

PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-03

DATE STARTED:	4/21/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/21/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.3 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	61 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
60				S-1	6	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		12-8-4-6 N=12	13		
				S-2	14		SC/SM	3-12-15-19 N=27	11		
				S-3	16			11-22-50/4"	12	>>◎	
	5					**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist					
55							GC/GM				
				S-4	5			50/5"	9	>>◎	
				S-5	4			50/4"	4	>>◎	
						Spoon Refusal @ 9.3 ft					

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BORING B-04

DATE STARTED:	4/20/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/20/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	12.5 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	57 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
55				S-1	18	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	16-29-14-14 N=43			
				S-2	24	**RESIDUUM:**- Very Sitff, Gray, Sandy Lean CLAY, moist	CL	10-14-8-4 N=22			
				S-3	6	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist		30-50/"		>>◎	
	5										
50				S-4	10		GC/GM	34-50/4"		>>◎	
	10										
45						Auger Refusal @ 12.5 ft					

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Somerset, NJ

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BORING B-05

DATE STARTED:	4/21/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/21/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.5 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	54 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
				S-1	18	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND trace to with Gravel, moist		15-11-4-6 N=15			
				S-2	12		SC/SM	4-7-11-14 N=18			
50											
	5			S-3	20	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist		9-24-47-50/2" N=71		>>◎	
							GC/GM				
				S-4	7			30-50/2"		>>◎	
45											
						Auger Refusal @ 9.5 ft					

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Somerset, NJ

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BORING B-06

DATE STARTED:	4/21/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/21/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.5 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	55 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 / 25 / 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 / 2.0 / 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
				S-1	20	**RESIDUUM**- Dense, Red Brown, Clayey/Silty SAND trace Gravel, moist	SC/SM	34-27-16-24 N=43		◎	
				S-2	22	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		26-31-34-39 N=65		>>◎	
50	5			S-3	10		SC/SM	18-49-50/2"		>>◎	
				S-4	17	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	19-45-50/5"		>>◎	
						Auger Refusal @ 9.5 ft					

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LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

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BORING B-07

DATE STARTED:	4/26/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/26/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	57 ft	**SAMPLING METHOD:**	2-in SS2-in Core
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS) RQD & Recovery % (NX)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					12" Asphalt					
				S-1	16	Aggregate Base **RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND trace Gravel, moist		37-28-17-10 N=45	11		
55				S-2	14		SC/SM	8-8-13-14 N=21	14		**Auger Cuttings (1 to 5 ft)**
				S-3	12			14-42-50/1"	7 9	>>	LL = 29 PL = 17 Fines=53.0%
50	5						SC/SM				
				S-4	5	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist		50/5"	9	>>	
45	10										
				S-5	3		GC/GM	50/3"	4	>>	
40	15					Auger Refusal @ 18 ft					
				R-1	14	**SILTSTONE**- Red Brown, Weathered to Slightly Weathered, Slightly Broken to Broken		RQD=0 Rec=56%		>>	
35	20										
				R-2	56			RQD=47 Rec=93%		>>	
	25					*Continued Next Page*					

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BORING B-07

DATE STARTED:	4/26/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/26/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	57 ft	**SAMPLING METHOD:**	2-in SS2-in Core
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS) RQD & Recovery % (NX)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	25					**SILTSTONE**- Red Brown, Weathered to Slightly Weathered, Slightly Broken to Broken					
30				R-3	56			RQD=52 Rec=93%		>>◎	
	30					Test Boring Terminated @ 30 ft					

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Somerset, NJ

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CORE BOX PHOTO - BORING B-7
Proposed IDI Warehouse - Somerset,NJ
PSI PROJECT NO.: 04912218

BORING B-08

DATE STARTED:	4/22/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/22/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	4.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	61 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
60				S-1	13	Aggregate Base		21-33-50/5"		>>◎	
						RESIDUUM- Very Dense, Red Brown, Clayey/Silty SAND trace Gravel, moist	SC/SM				
						HIGHLY WEATHERED SILTSTONE Sampled As:- Very Dense, Red Brown, Clayey/Silty SAND, trace Gravel, moist	SC/SM				
						Auger Refusal @ 4 ft					

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Somerset, NJ

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BORING B-09

DATE STARTED:	4/22/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/22/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	58 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt Aggregate Base					
				S-1	16	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		38-30-15-16 N=45			
55				S-2	14		SC/SM	7-10-7-11 N=17			
	5			S-3	22	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		6-11-20-41 N=31			
				S-4	7		SC/SM	33-50/1"		>>	
50				S-5	1	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	50/"		>>	
						Auger Refusal @ 9 ft					

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BORING B-10

DATE STARTED:	4/22/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/22/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	59 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ Moisture PL LL (0 25 50) STRENGTH, tsf Qu Qp (0 2.0 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
				S-1	8	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		18-17-3-2 N=20			
				S-2	18			4-7-18-34 N=25			
55							SC/SM				
	5			S-3	17			16-14-9-6 N=23			
				S-4	22			5-8-15-50/3" N=23			
						HIGHLY WEATHERED SILTSTONE Sampled As:- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM				
50						Auger Refusal @ 9 ft					

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BORING B-11

DATE STARTED:	4/22/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/22/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	8.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	64 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture / PL / LL (0, 25, 50) / STRENGTH, tsf Qu / Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
						Aggregate Base					
				S-1	13	**RESIDUUM**- Medium Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	26-30-14-8 N=44			
				S-2	20			5-7-20-50/2" N=27			
60				S-3	6	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist		19-50/1"		>>	
	5						GC/GM				
						Auger Refusal @ 8 ft					

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Somerset, NJ

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BORING B-12

DATE STARTED:	4/22/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/22/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	4.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	69 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					6" Asphalt					
				S-1	18	Aggregate Base **RESIDUUM**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	29-49-26-28 N=75	8	>>◎	
				S-2	6	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	24-50/2"	9 7	>>◎	**Auger Cuttings (1 to 4 ft)** LL = 28 PL = 16 Fines=53.2%
65						Auger Refusal @ 4 ft					

Professional Service Industries, Inc.
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PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-13

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	7.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	68 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					12" Asphalt					
				S-1	18	Aggregate Base		21-19-10-11 N=29			
						RESIDUUM- Medium Dense to Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM				
65				S-2	19	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		12-37-49-50 N=86		>>◎	
				S-3	9			22-50/2"		>>◎	
	5						SC/SM				
						Auger Refusal @ 7 ft					

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	Somerset, NJ

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BORING B-14

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	70 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Topsoil					
				S-1	16	**FILL**- Red Brown, Sandy CLAY to Clayey SAND, trace Organics, moist	CL/SC	2-4-6-2 N=10			
				S-2	14	**RESIDUUM**- Dense, Red Brown, Clayey/Silty SAND, trace Gravel, moist	SC/SM	6-8-16-16 N=24			
65	5			S-3	24			8-20-18-22 N=38			
				S-4	5	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		42-50/4"		>>◎	
				S-5	6		SC/SM	48-50 N=95		>>◎	
60	10										
				S-6	5	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	50/5"		>>◎	
55	15					Auger Refusal @ 15 ft					

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	Somerset, NJ

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BORING B-15

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	13.5 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	70 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Asphalt					
				S-1	12	Aggregate Base **FILL**- Red Brown, Sandy lean CLAY, trace Gravel, moist	CL	25-2-4-7 N=6	17		
				S-2	22	**FILL**- Brown, SILT with Sand, trace Coal Fragments, moist	ML	11-8-3-3 N=11	24		
65	5			S-3	20	**RESIDUUM**- Red Brown, Medium Dense, Clayey/Silty SAND with Gravel, moist	SC/SM	5-10-18-27 N=28	14		
				S-4	17	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	27-37-50/5"	10	>>◎	
				S-5	14	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM	25-38-50/5"	8	>>◎	
60	10			S-6	4	Auger Refusal @ 13.5 ft		50/4"	10	>>◎	

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LOCATION: 195 & 215 Davidson Avenue
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BORING B-16

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	9.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	70 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 / 25 / 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 / 2.0 / 4.0)	Additional Remarks
	0					12" Asphalt					
				S-1	17	Aggregate Base		50-28-21-23 N=49		◎	
						RESIDUUM- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM				
				S-2	9	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	28-50/3"		>>◎	
				S-3	8			46-50/5"		>>◎	
65	5					**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty GRAVEL with Sand, moist	GC/GM				
				S-4	5			50/5"		>>◎	
						Auger Refusal @ 9 ft					

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PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-17

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	12.5 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	72 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Topsoil					
				S-1	14	**FILL**- Red Brown, Sandy SILT/CLAY, trace Organics, Gravel, moist	ML/CL	2-4-4-8 N=8	21		
70				S-2	7	**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist		26-50/4"	10	>>◎	
				S-3	5			24-50/5"	7	>>◎	
	5										
65							SC/SM				
				S-4	5			50/5"	7	>>◎	
	10										
60						Auger Refusal @ 12.5 ft					

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PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-18

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	69 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water: While Drilling — Not Enc.; Upon Completion — Not Enc.

BORING LOCATION: See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					6" Topsoil					
				S-1	5	**FILL**- Red Brown, Sandy CLAY/SILT, trace Organics, Gravel, moist	CL/ML	2-4-6-8 N=10			
				S-2	6	**RESIDUUM**- Medium Dense to Dense, Red Brown, Clayey/Silty SAND with Gravel, moist	SC/SM	6-36-50/3"		>>	
65						**HIGHLY WEATHERED SILTSTONE Sampled As:**- Very Dense, Red Brown, Clayey/Silty SAND with Gravel, moist					
	5			S-3	5			26-50/5"		>>	
				S-4	4			30-50/1"		>>	
60							SC/SM				
	10										
				S-5	2			50/3"		>>	
55											
	15					Auger Refusal @ 15 ft					

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PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue, Somerset, NJ

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-19

DATE STARTED:	4/25/22	**DRILL COMPANY:**	Allied Well Drilling, Inc.
DATE COMPLETED:	4/25/22	**DRILLER:** J. Torres	**LOGGED BY:** S. Muddasani
COMPLETION DEPTH	8.0 ft	**DRILL RIG:**	Diedrich D50 Turbo
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	61 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:	n/a°	**HAMMER TYPE:**	Automatic
LONGITUDE:	n/a°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	P. McMichael

Water

While Drilling	Not Enc.
Upon Completion	Not Enc.

BORING LOCATION:
See Boring Location Plan

REMARKS: Boring ground elevation based on information contained in Google Earth Pro.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					6" Topsoil					
60				S-1	5	**FILL**- Red Brown, Clayey/Silty SAND, trace Organics, Gravel, moist	SC/SM	2-4-6-2 N=10	24		
				S-2	4	2 to 4 ft: Very Loose		W/24" N=1	19		
				S-3	6	**RESIDUUM**- Very Dense, Red Brown, Clayey/Silty SAND, trace Gravel, moist	SC/SM	50-50/1"	13		
	5										
55							SC/SM				
						Auger Refusal @ 8 ft					

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PROJECT NO.: 04912218
PROJECT: IDI Warehouse
LOCATION: 195 & 215 Davidson Avenue
Somerset, NJ

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GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

Degree of Brokeness

Characteristic	Description
Less than 1 inch	Very Broken
1 inch to 3 inches	Broken
3 inches to 6 inches	Slightly Broken
Greater than 6 inches	Massive

Brokeness: A general rock description referring to any breaks or separations in the rock. Includes bedding planes and fractures.

DEGREE OF WEATHERING

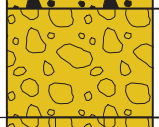
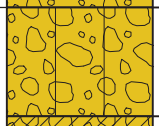
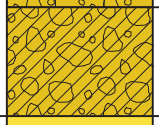
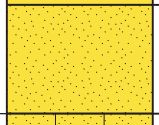
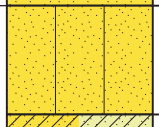
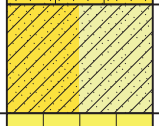
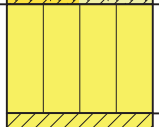
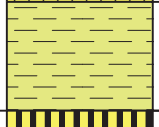
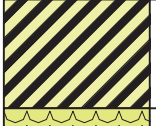
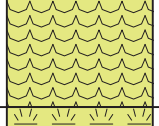
Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
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 (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

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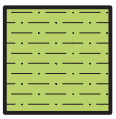
Graphic Symbols for Materials and Rock Deposits

CONCRETE
Portland Cement Concrete

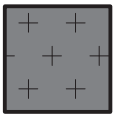
BITUMINOUS CONCRETE



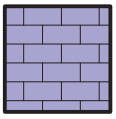
CLAYSTONE

COAL
Coal, Anthracite Coal

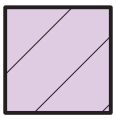
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



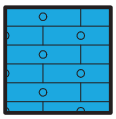
IGNEOUS ROCK
Anorthsite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



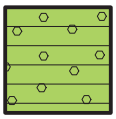
LIMESTONE
Limestone, Dolomite



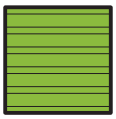
METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate



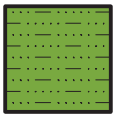
CHERT



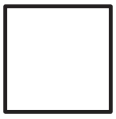
SANDSTONE
Sandstone, Orthoquarzite (Sandstone)



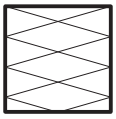
SHALE



SILTSTONE



NO RECOVERY



VOID

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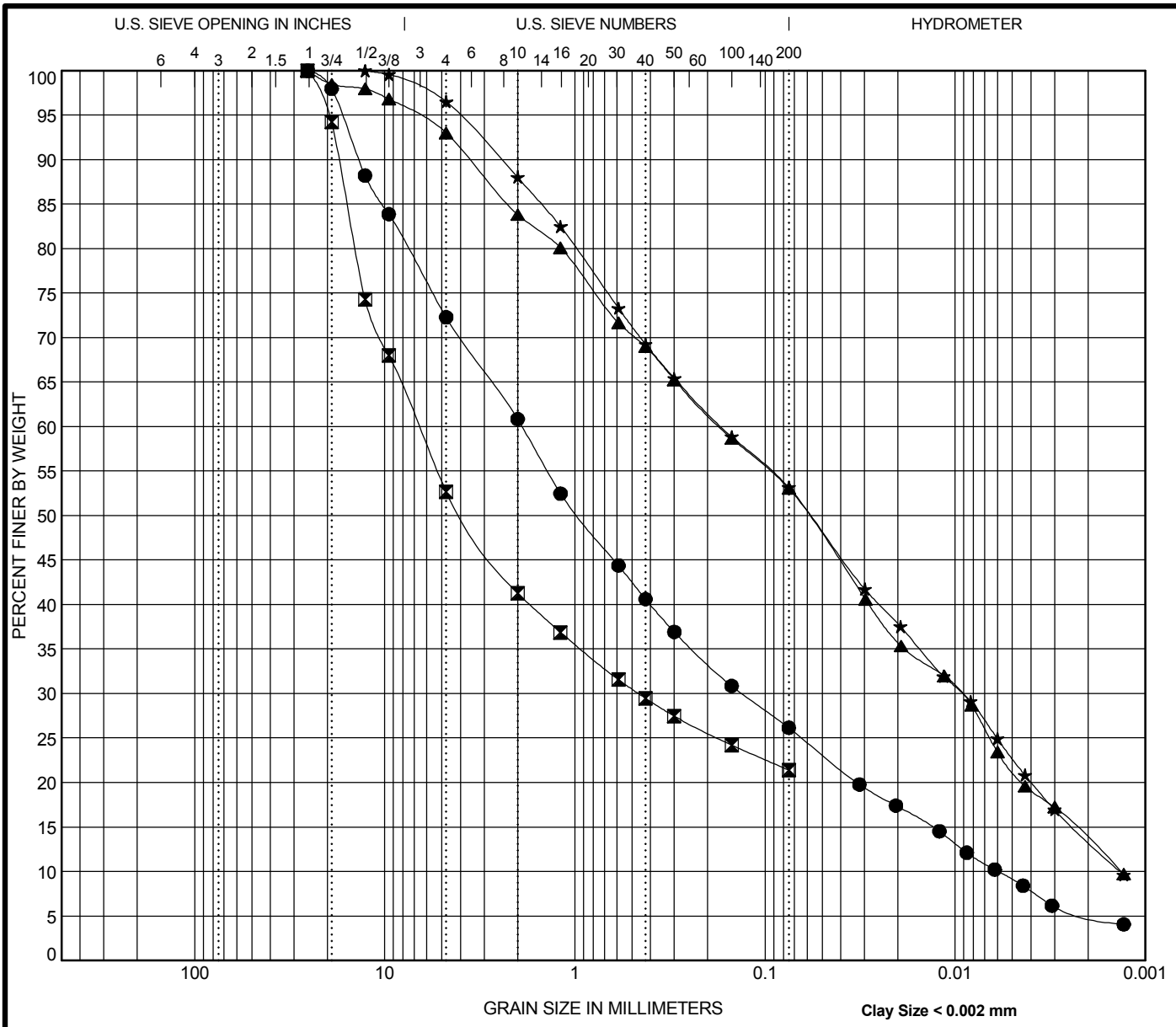

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	B-01	1.0	Silty, Clayey SAND with Gravel	28	22	6	1.55	318.53
⊠	B-01	3.0	Silty, Clayey GRAVEL with Sand	26	19	7		
▲	B-07	Cuttings: 1 to 5 ft	Sandy Lean CLAY (CL)	29	17	12	0.38	128.28
★	B-12	Cuttings: 1 to 4 ft	Sandy Lean CLAY (CL)	28	16	12	0.37	124.51

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-01	1.0	25.4	1.899	0.132	0.006	27.7	46.1	21.1	5.1
⊠	B-01	3.0	25.4	6.625	0.463		47.3	31.3	21.4	
▲	B-07	Cuttings: 1 to 5 ft	25.4	0.172	0.009	0.001	7.0	40.0	39.5	13.6
★	B-12	Cuttings: 1 to 4 ft	12.7	0.169	0.009	0.001	3.5	43.4	39.8	13.4

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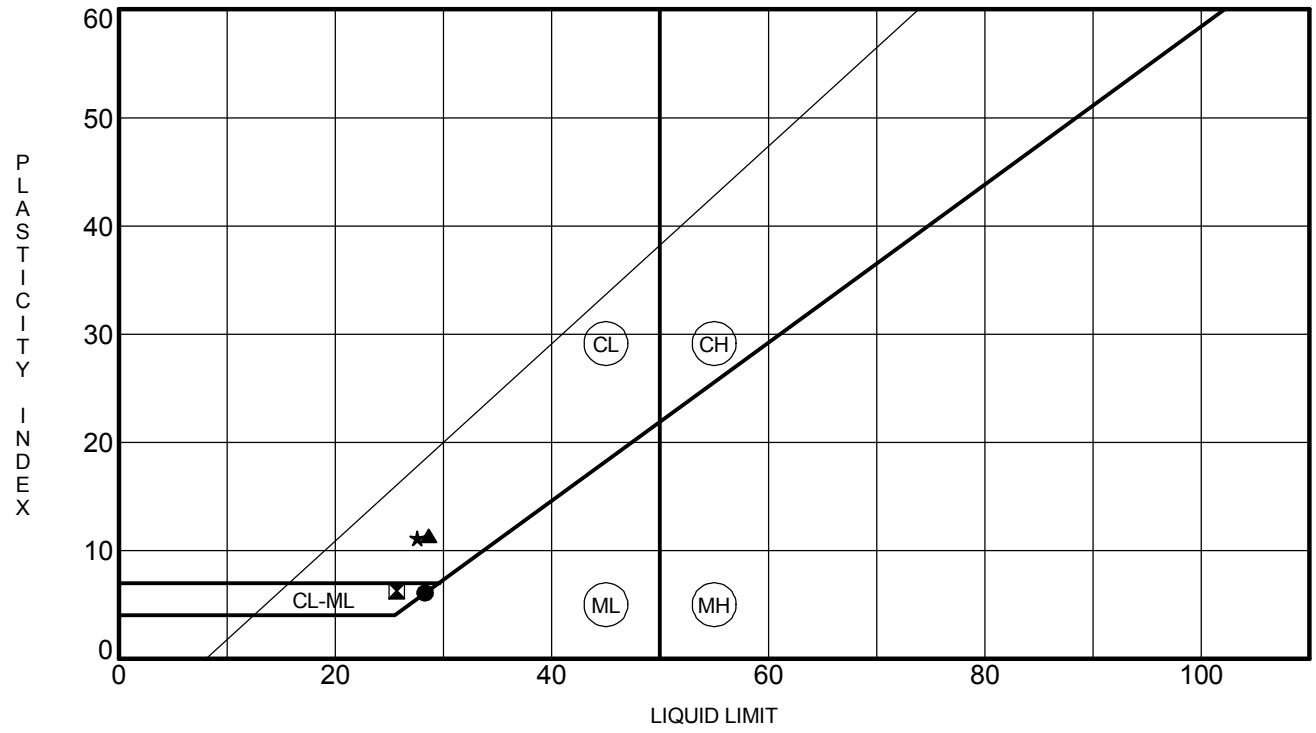
Professional Service Industries, Inc.
1707 S. Cameron Street, Suite B
Harrisburg, PA 17104
Telephone: (717) 230-8622
Fax: (717) 230-8626

GRAIN SIZE DISTRIBUTION

Project: IDI Warehouse
PSI Job No.: 04912218
Location: 195 & 215 Davidson Avenue
Somerset, NJ



	Boring	Depth (ft)	LL	PL	PI	Fines	Classification (*Visual)
●	B-01	1.0	28	22	6	26.2	Silty, Clayey SAND with Gravel
⊠	B-01	3.0	26	19	7	21.4	Silty, Clayey GRAVEL with Sand
▲	B-07	Cuttings: 1 to 5 ft	29	17	12	53.0	Sandy Lean CLAY (CL)
★	B-12	Cuttings: 1 to 4 ft	28	16	12	53.2	Sandy Lean CLAY (CL)

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ATTERBERG LIMIT RESULTS

PSI Job No.: 04912218
Project: IDI Warehouse
Location: 195 & 215 Davidson Avenue
Somerset, NJ

Laboratory Summary Sheet

Borehole	Approx. Depth	Liquid Limit	Plastic Limit	Plasticity Index	Qu (tsf)	%<#200 Sieve	Est. Specific Gravity	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-01	1	28	22	6		26.2%		14			
B-01	3	26	19	7		21.4%		9			
B-01	4.5							9			
B-01	8.5							7			
B-01	10.2							9			
B-03	1							13			
B-03	3							11			
B-03	4.5							12			
B-03	8.2							9			
B-03	9.2							4			
B-07	1							11			
B-07	3							14			
B-07	1 to 5'	29	17	12		53.0%		7			
B-07	5							9			
B-07	8.2							9			
B-07	13.1							4			
B-12	1							8			
B-12	2.5							9			
B-12	1 to 4'	28	16	12		53.2%		7			
B-15	1							17			
B-15	3							24			
B-15	5							14			
B-15	7							10			
B-15	9							8			
B-15	13.2							10			
B-17	1							21			
B-17	2.5							10			
B-17	4.5							7			
B-17	8.2							7			
B-19	1							24			
B-19	3							19			
B-19	4.5							13			

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1707 S. Cameron Street, Suite B
Harrisburg, PA 17104
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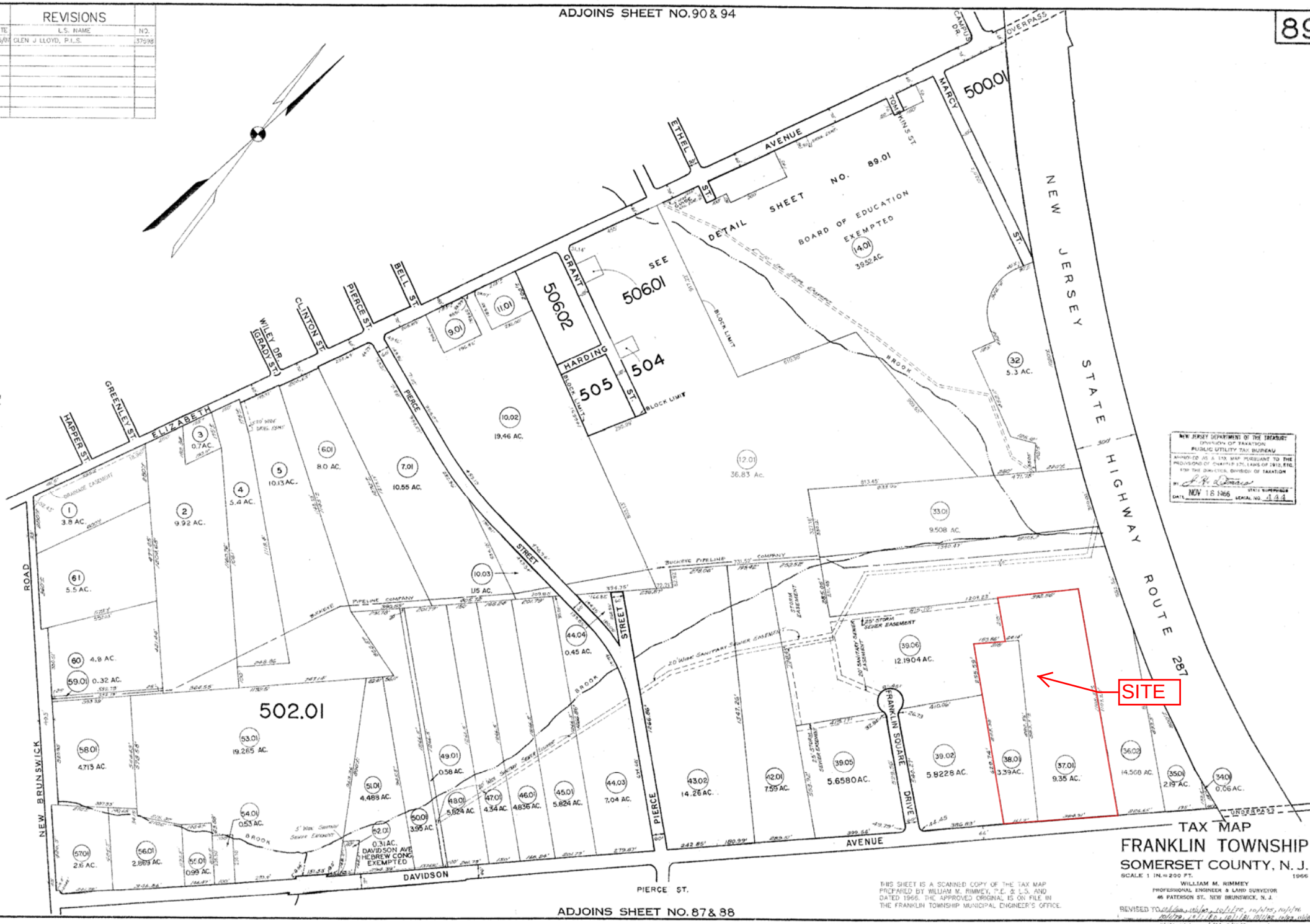
Fax: (717) 230-8626

Summary of Laboratory Results

PSI Job No.: 04912218
Project: IDI Warehouse
Location: 195 & 215 Davidson Avenue
Somerset, NJ

F. MAPS

- **Tax Map**
- **Aerial Map**
- **Soil Map**
- **State Planning Area Map**
- **USGS Map**
- **FEMA FIRM Map**
- **Drainage Area Maps**
  - **Existing Drainage Area Map**
  - **Proposed Drainage Area Map**
  - **Inlet Drainage Area Map**


REVISIONS
L.S. NAME
NO.
GLEN J LLOYD, P.L.S.
37998
ADJOINS SHEET NO. 90 & 94
89
DETAIL SHEET NO. 89.01
BOARD OF EDUCATION
EXEMPTED
14.01
39.52 AC.
SEE 506.01
506.02
505
504
HARDING
GRANT
BELL ST.
PIERCE ST.
CLINTON ST.
WILEY DR (GRADY ST.)
GREENLEY ST.
HARPER ST.
ELIZABETH
ETHEL ST.
AVENUE
TOMPKINS ST.
MARCY
500.01
CAMPUS DR.
OVERPASS
NEW JERSEY STATE HIGHWAY ROUTE 287
BROOK
BLOCK LIMIT
32
5.3 AC.
10.02
19.46 AC.
11.01
9.01
12.01
36.83 Ac.
33.01
9.508 AC.
1
3.8 AC.
2
9.92 AC.
3
0.7AC.
4
5.4 AC.
5
10.13 AC.
6.01
8.0 AC.
7.01
10.55 AC.
61
5.5 AC.
60
4.8 AC.
59.01
0.32 AC.
502.01
10.03
1.15 AC.
STREET
BUCKEYE PIPELINE COMPANY
PIPELINE COMPANY
20' WIDE SANITARY SEWER EASEMENT
25' STORM SEWER EASEMENT
STORM EASEMENT
44.04
0.45 AC.
39.06
12.1904 AC.
SITE
FRANKLIN SQUARE DRIVE
53.01
19.265 AC.
58.01
4.713 AC.
49.01
0.58 AC.
48.01
5.624 AC.
47.01
4.34 AC.
46.01
4.835 AC.
45.01
5.824 AC.
44.03
7.04 AC.
43.02
14.26 AC.
42.01
7.59 AC.
39.05
5.6580 AC.
39.02
5.8228 AC.
38.01
3.39 AC.
37.01
9.35 AC.
36.02
14.568 AC.
35.01
2.19 AC.
34.01
0.06 AC.
51.01
4.488 AC.
50.01
3.95 AC.
54.01
0.53 AC.
52.01
0.31 AC.
DAVIDSON AVE HEBREW CONG. EXEMPTED
57.01
2.6 AC.
56.01
2.869 AC.
55.01
0.99 AC.
NEW BRUNSWICK ROAD
DAVIDSON
PIERCE ST.
PIERCE
UNDERPASS
ADJOINS SHEET NO. 87 & 88
NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
PUBLIC UTILITY TAX BUREAU
NOV 18 1966
TAX MAP
FRANKLIN TOWNSHIP
SOMERSET COUNTY, N. J.
SCALE 1 IN. = 200 FT.
1966
WILLIAM M. RIMMEY
PROFESSIONAL ENGINEER & LAND SURVEYOR
46 PATERSON ST., NEW BRUNSWICK, N. J.
THIS SHEET IS A SCANNED COPY OF THE TAX MAP PREPARED BY WILLIAM M. RIMMEY, P.E. & L.S. AND DATED 1966. THE APPROVED ORIGINAL IS ON FILE IN THE FRANKLIN TOWNSHIP MUNICIPAL ENGINEER'S OFFICE.
8

Aerial Map

12/16/2022, 2:38:07 PM

County Boundaries

Parcels Data (Block and Lot)

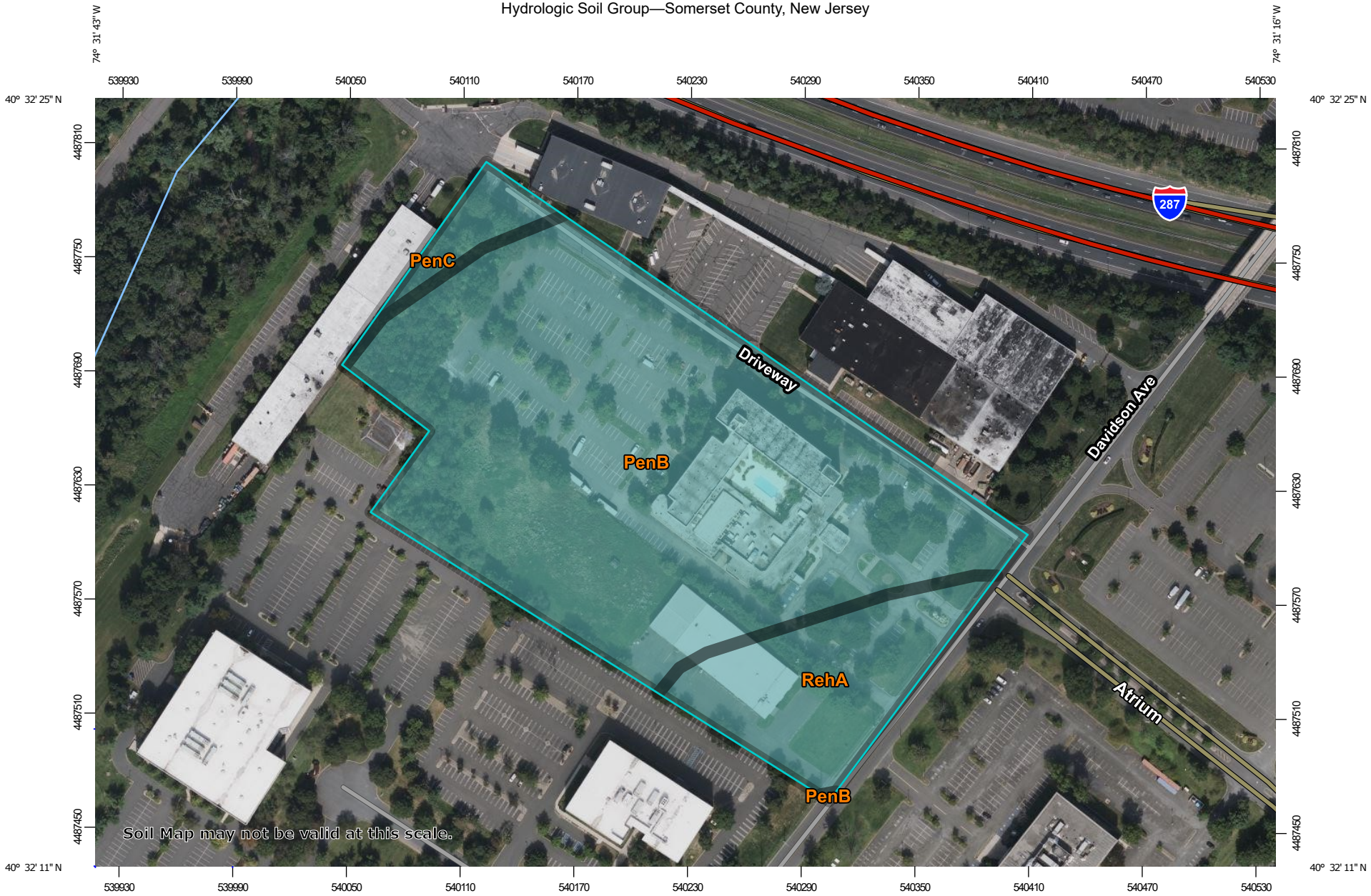
1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri Community Maps Contributors, Somerset County, NJ, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph,

New Jersey Department of Environmental Protection



Map Scale: 1:2,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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: Somerset County, New Jersey
Survey Area Data: Version 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 14, 2020—Oct 3, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PenB	Penn silt loam, 2 to 6 percent slopes	C	11.8	80.1%
PenC	Penn silt loam, 6 to 12 percent slopes	C	0.6	4.0%
RehA	Reaville silt loam, 0 to 2 percent slopes	C	2.3	15.9%
Totals for Area of Interest			**14.7**	**100.0%**

Description

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

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

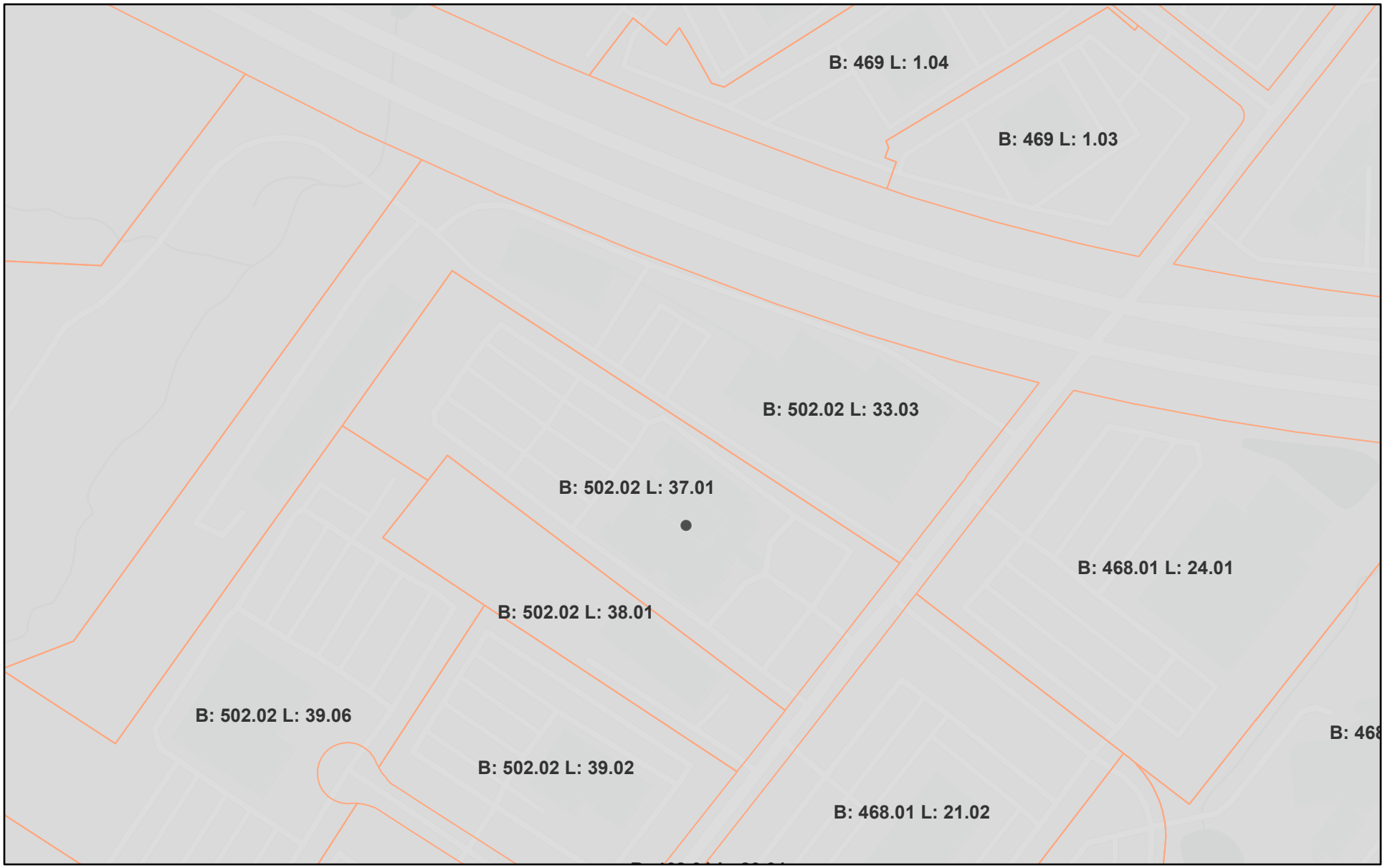
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

State Planning Area Map



12/16/2022, 2:40:06 PM

State Planning Area Boundaries

Metropolitan Planning Area (PA 1)

County Boundaries

Parcels Data (Block and Lot)

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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New Jersey Department of Environmental Protection

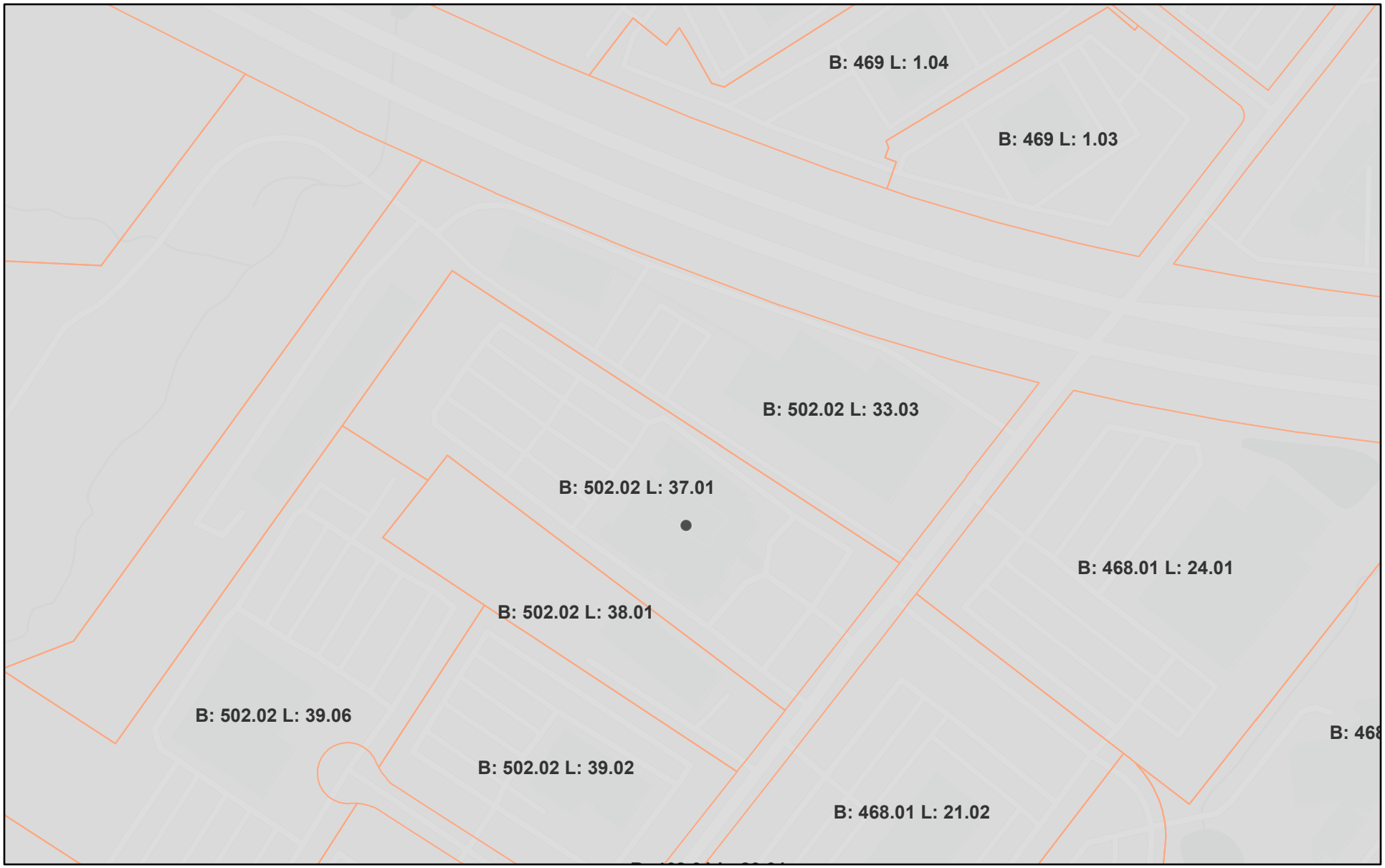
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

State Planning Area Map



12/16/2022, 2:40:06 PM

State Planning Area Boundaries

Metropolitan Planning Area (PA 1)

County Boundaries

Parcels Data (Block and Lot)

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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