STORMWATER MANAGEMENT REPORT

For Proposed

Multi-Family Residential
with Non-Residential Event Space

Prepared for:

CBD Bloomfield Developer Urban Renewal, LLC

Block 244, Lots 10, 42 & 46
675-699 Bloomfield Avenue (C.R. 605)
14 & 34-40 State Street
Bloomfield Township
Essex County, New Jersey

Prepared by:

BOHLER

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1. Introduction

The subject property is located at 675-699 Bloomfield Avenue, 34-40 State Street and 14 State Street in Bloomfield Township, Essex County, New Jersey. The property is identified as Block 244, Lots 10, 42 and 46 on Bloomfield Township's tax maps and is a total of 2.225 acres in size and will hereafter be referred to as "the site". The site is bordered to the north by commercial and multi-family residential uses with Park Street beyond; to the east by the single-family residential uses and State Street; to the south by commercial uses with Liberty Street beyond; and to the west by Bloomfield Avenue (Essex County Route 506). A tax map and aerial map are included at the beginning of Appendix H for reference.

The proposed development consists of a multi-family residential development with non-residential event space and associated parking, sidewalks, and utilities. This project is a major development due to proposed disturbance greater than one acre. The proposed improvements decrease impervious coverage and motor vehicle surface area on site.

This report summarizes the design objectives, methodology, and calculations for the conveyance, attenuation, 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*.

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 D rainfall distribution and recurrence intervals of 2, 10, and 100 years. Hydrograph creation and routings are accomplished using the HydroCAD stormwater modeling 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 NJ stormwater management regulations *(NJAC 7:8)*. 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 Essex County for all other storms has been obtained from the Engineering Field Handbook NJ Supplement last revised August 2012 (developed from data contained in NOAA Atlas 14 Volume 2). Per amended NJ stormwater management regulations dated July 17, 2023, the precipitation depths for the 2-, 10-, and 100-year storm events are determined using adjustment factors applied to the NOAA Atlas 14 rainfall estimates. The rainfall depth values used in this project are listed in Table 2.1 and 2.2.

TABLE 2.1 – Current Adjusted, 24-Hour Rainfall Frequency Data

Event (year)	2	10	100
NOAA Atlas 14 Rainfall (inches)	3.44	5.22	8.66
Adjustment Factor	1.01	1.03	1.06
Current Adjusted Rainfall (inches)	3.47	5.38	9.18

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

Event (year)	2	10	100
NOAA Atlas 14 Rainfall (inches)	3.44	5.22	8.66
Adjustment Factor	1.19	1.22	1.33
Future Adjusted Rainfall (inches)	4.09	6.37	11.52

2.2 Site Soils

Site soil information has been obtained from the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey database. The HSG rating for soils on site are undefined per NRCS Web Soil Survey data. In accordance with Chapter 12, Subsection 1b of the NJ Stormwater Best Management practices manual, the runoff computation for pre- and post-development drainage conditions may be based upon default HSGs.

TABLE 2.3 – Default Hydrologic Soil Group for Runoff Computations (BMP Manual Chp. 12, Table 12-1)

	Outside Coastal Plain
Pre-Construction	HSG B
Post-Construction	HSG D

The soils consist of hydrologic soil group (HSG) Type B and D, therefore the CN values used in calculations are those associated with Type B and D soils.

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 2.4.

TABLE 2.4 - CN Values

Land Cover Description	HSG B	HSG D
Open space, Good Condition (grass cover >75%)	61	80
Impervious Surfaces	98	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 in the proposed condition, the McCuen-Spiess formula is used to determine the appropriate length, not to exceed 100 feet. Tc calculations for each drainage area can be found in the HydroCAD summaries in Appendices A, B & C.

3. Pre-Development Site Conditions

The studied watershed area is a total of 2.225 acres in size and consists of two unique drainage areas: Existing Drainage Area #1 and Existing Drainage Area #2, which are described in more detail below. In the pre-development condition, the site is developed consisting of three (3) buildings and associated parking, sidewalks, and utilities. Currently, the runoff generated on site outfalls to Bloomfield Avenue or State Street. The Existing Drainage Area Map in Appendix H illustrates the limits of each existing drainage area and how they relate to the existing site conditions.

3.1 Point of Analysis

Both existing drainage areas flow to different points of analysis The Existing Drainage Area Map in Appendix H 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 0.634 acres of land, of which 0.528 acres are impervious surface, and includes a portion of the parking areas in addition to the existing artificial turf play area. The topography of the area slopes from north to southwest from a maximum elevation of approximately 137.00 to a minimum elevation of approximately 131.00 with slopes ranging from 0% to 5%. The runoff from Existing Drainage Area #1 flows overland from north to southwest and ultimately discharges to Point of Analysis #1, Bloomfield Avenue.

3.1.2 Existing Drainage Area #2

Existing Drainage Area #2 contains 1.591 acres of land, of which 1.540 acres are impervious surface, and includes the remaining portion of the parking areas and buildings. The topography of the area slopes from north to southeast from a maximum elevation of approximately 137.00 to a minimum elevation of approximately 130.40 with slopes ranging from 0% to 5%. The runoff from Existing Drainage Area #2 flows overland from north to southwest to State street and ultimately discharges into the Stormwater Conveyance System to Point of Analysis #2.

Existing Drainage Area #2 has been divided into two (2) sub-drainage areas to analyze the flow to each entry point of the stormwater conveyance system within State Street.

3.1.2.1 Existing Drainage Area #2A

Located to the northeast of the site, Existing Drainage Area #2A contains 1.011 acres of land, of which 1.010 acres are impervious surface and include two (2) buildings with associated parking area. The runoff from Existing Drainage Area #2A flows overland through the site into the stormwater conveyance system located in State Street.

3.1.2.2 Existing Drainage Area #2B

Located to the southeast of the site, Existing Drainage Area #2B contains 0.580 acres of land, of which 0.530 acres are impervious surface and include one (1) building with associated parking area. The runoff from Existing Drainage Area #2B flows overland through the site into the stormwater conveyance system located in State Street.

4. Post-Development Site Conditions

The post-development condition for the site includes the construction of a multi-family residential development with non-residential event space and associated parking, 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 2.225-acre area that was studied in the pre-development condition and consists of two unique drainage areas: Proposed Drainage Area #1, and Proposed Drainage Area #2, 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 underground infiltration basin on the site. The construction of the proposed improvements will disturb approximately 2.45 acres of land. The proposed improvements decrease impervious coverage by 0.429 acres and decrease motor vehicle surface area by 1.044 acres. The Proposed Drainage Area Map in Appendix H illustrates the limits of each proposed drainage area and how they relate to the proposed site conditions

4.1 Point of Analysis

The two drainage areas in the post development condition flow to the same Points of Analysis identified in the existing condition, located within Bloomfield Avenue or State Street. The proposed runoff to Points of Analysis meets the stormwater management criteria set forth in *NJDEP Stormwater Management Regulations* by either 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 0.063 acres of land, of which 0.023 acres are impervious surface, and includes the proposed sidewalks and landscape areas. The runoff from Proposed Drainage Area #1 is flows overland to Bloomfield Avenue and ultimately flows to Point of Analysis #1.

Bloomfield Avenue does not contain a stormwater conveyance system along the site's frontage. Stormwater runoff to Bloomfield Avenue will be limited to overland flow from the site.

4.1.2 Proposed Drainage Area #2

Proposed Drainage Area #2 consists of approximately 2.162 acres of land, of which 1.934 acres are impervious surface, and includes the proposed residential buildings, parking fields, sidewalks, driveways, stormwater and utility infrastructure. The drainage area also contains grass and landscape areas. The runoff from Proposed Drainage Area #2 is routed to the proposed stormwater conveyance system and ultimately flows to the stormwater conveyance system located in State Street, Point of Analysis #2.

4.1.2.1 Proposed Drainage Area #2A

Proposed Drainage Area #2A consists of approximately 1.796 acres of land, of which 1.616 acres are impervious surface, and includes the building, parking, and landscape area. The runoff from the roof area is routed through the underground infiltration basin. The attenuated flow from the basin is combined with the runoff from the remaining drainage area and ultimately flows to Point of Analysis #2A. The runoff from Proposed Drainage Area #2A flows through the proposed on-site stormwater conveyance system site into the stormwater conveyance system located in State Street.

The stormwater runoff for each sub-drainage area is designed to match or decrease peak post-construction runoff rates compared to the peak pre-construction runoff rates for the 2-, 10, and 100-year design storms to not adversely impact the existing stormwater conveyance system. Whereas the runoff to Points of Analysis #2 meets the stormwater management criteria set forth in *NJDEP Stormwater Management Regulations* 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.

4.1.2.2 Proposed Drainage Area #2B

Proposed Drainage Area #2B consists of approximately 0.366 acres of land, of which 0.318 acres are impervious surface, and includes parking, and landscape area. The runoff from the parking area is routed through the proposed on-site conveyance system and ultimately discharges to Point of Analysis #2B. The runoff from Proposed Drainage Area #2B flows through the proposed on-site stormwater conveyance system site into the stormwater conveyance system located in State Street.

The stormwater runoff for each sub-drainage area is designed to match or decrease peak post-construction runoff rates compared to the peak pre-construction runoff rates for the 2-, 10, and 100-year design storms to not adversely impact the existing stormwater conveyance system. Whereas the runoff to Points of Analysis #2 meets the stormwater management criteria set forth in *NJDEP Stormwater Management Regulations* 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.

4.2 Proposed Structural Stormwater Management Strategies

The two drainage areas in the post development condition flow to the same points of analysis identified in the existing condition. One of the drainage areas, Proposed Drainage Area #2, flows through the proposed on-site stormwater management system, which is described in more detail below. Drain time specified below is for the 100-year future adjusted storm.

4.2.1 Small-Scale Infiltration Basins

A small-scale infiltration basin will be installed as a part of this project. The basin meets the minimum requirements of small-scale infiltration basins, including infiltration of the entire water quality design storm volume and at least 2 feet between the bottom of the basin and the seasonal high ground water table.

Additionally, permeability tests have been completed in the area of the basin and an infiltration rate of 4.3 inches per hour has been observed. The maximum design volume to be infiltrated is the Water Quality Storm Design volume, with larger storms being discharged via outlet control structures.

Pre-treatment is required on all small-scale subsurface infiltration basins. However, pre—treatment of roof runoff which is directly discharged to a small-scale sub-surface basin is not required when there no potential debris and other vegetative material is present in roof runoff. The building is significantly taller than any surrounding trees and does not have a vegetative roof, therefore, roof runoff does not need to be pretreated.

Table 4.1 - Small-Scale Infiltration Basins Summary

Infiltration Basin #	1
Drainage Area (Acres)	1.376
Pretreatment	N/A
Subsoil Permeability Rate (inches/hour)	10
Tested Subsoil Design Permeability Rate (inches/hour)	4.3 (SPP-1)
Design Permeability Rate (inches/hour)	2.15
Drain Time (Hours)	26.6
Water Quality Storm Depth (Feet)	0.75
Seasonal High Ground Water Elevation	NRCS Depth to Water Table: 128.50 (6.5 fbg) SWM Area Eval. (Whitestone): 124.00 (SPP-1)
System Bottom Elevation	130.50

4.2.2 Pipe Sizing

Calculations for sizing the stormwater pipe networks associated with the proposed stormwater management conveyance system can be found in Appendix F 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 F. The calculations are based on a minimum time of concentration of 10 minute to any inlet. An Inlet Area Map is included in Appendix H.

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 through 4.2:

1. For stormwater runoff leaving the site, the post-development runoff hydrographs for the current and future/projected 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 current and future/projected 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 stormwater runoff from the drainage areas outlined in Section 4.1 utilize technique #1 above. Tables 4.2, 4.6, and 4.10 summarizes the existing, permitted, and proposed flow rates from the site to Point of Analysis #1, and detailed calculations can be found in Appendices A, B & C.

To Point of Analysis #2, the project's proposed stormwater management facilities will consist of one small-scale infiltration basins to attenuate the flows from the drainage areas outlined in Section 4.1 utilizing technique #2 above. Tables 4.3, 4.7, and 4.11 summarizes the existing, permitted, and proposed flow rates from the site to Point of Analysis #2, and detailed calculations can be found in Appendices A, B & C.

4.3.1 NOAA Atlas 14 Precipitation Depths

Table 4.2 – Point of Analysis #1 Existing vs. Proposed Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.77	0.16
10-Year Storm	2.80	0.27
100-Year Storm	4.85	0.50

See Appendix A for Comparison Hydrographs.

Table 4.3 – Point of Analysis #2 Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	4.93	50%	2.46	2.30
10-Year Storm	7.55	75%	5.66	3.96
100-Year Storm	12.61	80%	10.08	9.02

Table 4.4 – Point of Analysis #2A Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	3.30	1.24
10-Year Storm	5.04	2.35
100-Year Storm	8.39	6.43

Table 4.5 – Point of Analysis #2B Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.64	1.07
10-Year Storm	2.52	1.68
100-Year Storm	4.24	2.84

4.3.2 Current Adjusted Precipitation Depths

Table 4.6 – Point of Analysis #1 Existing vs. Proposed Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.78	0.16
10-Year Storm	2.89	0.28
100-Year Storm	5.16	0.53

See Appendix B for Comparison Hydrographs.

Table 4.7 – Point of Analysis #2 Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	4.97	50%	2.48	2.33
10-Year Storm	7.78	75%	5.83	4.16
100-Year Storm	13.38	80%	10.70	9.84

Table 4.8 – Point of Analysis #2A Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	3.33	1.26
10-Year Storm	5.20	2.50
100-Year Storm	8.89	7.08

Table 4.9 – Point of Analysis #2B Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.65	1.08
10-Year Storm	2.60	1.73
100-Year Storm	4.50	3.02

4.3.3 Future Adjusted Precipitation Depths

Table 4.10 – Point of Analysis #1 Existing vs. Proposed Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	2.14	0.20
10-Year Storm	3.47	0.35
100-Year Storm	6.58	0.70

See Appendix C for Comparison Hydrographs.

Table 4.11 – Point of Analysis #2 Existing vs. Proposed Flow Summary

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS	CFS
2-Year Storm	5.86	50%	2.93	2.91
10-Year Storm	9.21	75%	6.90	5.47
100-Year Storm	16.77	80%	13.41	13.35

Table 4.12 – Point of Analysis #2A Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	3.93	1.65
10-Year Storm	6.15	3.58
100-Year Storm	11.15	9.96

Table 4.13 – Point of Analysis #2B Existing vs. Proposed Peak Flow Comparison

	Existing Peak Flow	Proposed Peak Flow
	CFS	CFS
2-Year Storm	1.94	1.28
10-Year Storm	3.07	2.05
100-Year Storm	5.65	3.78

4.4 Water Quality Controls

As stated in the NJDEP Stormwater Management Regulations, the stormwater runoff quality standards are applicable when the development proposed an increase of one-quarter acre (10,890 square-feet) or more of regulated motor vehicle surfaces. The proposed development of the site will result in a net decrease of 1.044 acres of new motor vehicle surfaces, and therefore water quality controls do not apply.

Motor Vehicle Surface Areas:
Existing Motor Vehicle Surface Area: 1.539 Acres
Proposed Motor Vehicle Surface Area: 0.495 Acres
Net Increase in Motor Vehicle Surface Area: 0.495 Acres – 1.539 Acres = -1.044 Acres

4.5 Groundwater Recharge

The subject site has been 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. Due to the conditions described, no groundwater recharge is proposed as part of the stormwater management facilities on site.

However, it should be noted that the proposed stormwater management system incorporates a small-scale infiltration basin for attenuation of stormwater runoff from the site. The proposed small-scale infiltration basin is designed to infiltrate the water quality storm and therefore, groundwater recharge is proposed for the proposed development. While not required, the design provides groundwater recharge which exceeds the NJDEP requirements.

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 Hudson Essex Passaic Soil Conservation District for approval.

Additionally, off-site stability has been reviewed in accordance with the *Standards for Soil Erosion and Sediment Control in New Jersey (SESC Standards)*. 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.

4.7 Low-Impact Development and Nonstructural 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 nonstructural 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. The majority of the existing wooded areas remain undisturbed. Stormwater runoff will be discharged in a similar manor of existing conditions. Riparian zone and wetland disturbance has been minimized to continue providing water quality benefits.

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

   The overall impervious coverage is less than 88% and is below the municipal ordinance requirement of 90% maximum impervious coverage. As part of the proposed site design, the minimum allowable parking and drive aisle sizes, in accordance with local ordinances, *and RSIS guidelines if residential* are used in lieu of larger stalls and aisles to reduce the amount of impervious surface in the post-development condition.

   The roof runoff from the building will be discharged to the underground small-scale infiltration basin and disconnected from the stormwater conveyance system.

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

   The footprint of the improvements has been minimized to the previously developed area. 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 properties.

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

   A small-scale infiltration basins has been included within the project's stormwater design to achieve maximized times of concentration.

5. **Minimize land disturbance, including clearing and grading.**

   The footprint of the improvements has been minimized to the previously developed area.

6. **Minimize soil compaction.**

   Soil compaction has been minimized within the project limits.

7. **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.

8. **Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas.**

   The stormwater and grading design for the site provides a vegetative path to control and collect stormwater runoff to the north of the proposed building.

9. **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. In addition, a “Stormwater Management Facilities Operation & Maintenance Manual” has been prepared for use by contractors and the owners that specify that street sweeping must occur on a bi-monthly schedule.

   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.

   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. Pollution prevention techniques such as water quality treatment through infiltration and minimized clearing have been implemented in the design. The soil erosion and sediment control plan addresses re-stabilizing vegetation and implementing soil erosion and sediment control protection measures. Prevention and maintenance are also addressed in the Stormwater Operations and Maintenance Manual prepared for the project.

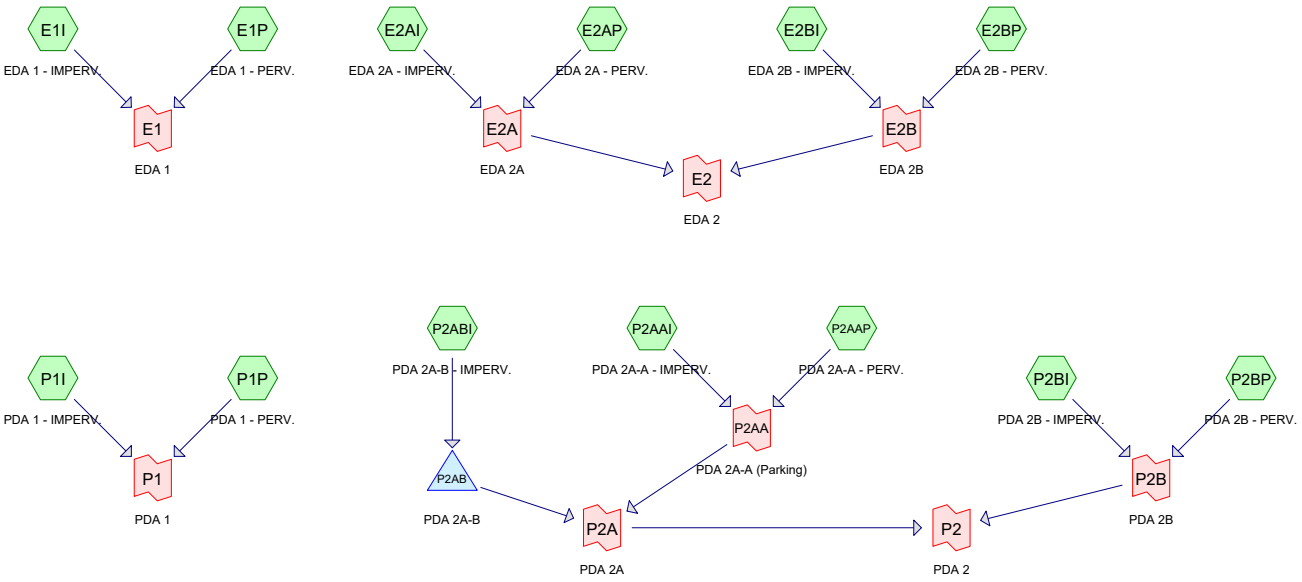
5. Conclusions

As demonstrated in the above sections, the stormwater management plan for the proposed development meets the current *NJDEP Stormwater Management Regulations* and *Standards for Soil Erosion and Sediment Control in New Jersey* 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 – NOAA Atlas 14 Precipitation Depths

- **2-Year Storm Event**
- **10-Year Storm Event**
- **100-Year Storm Event**
- **Pre- vs. Post Comparison**



Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
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Summary for Subcatchment E1I: EDA 1 - IMPERV.

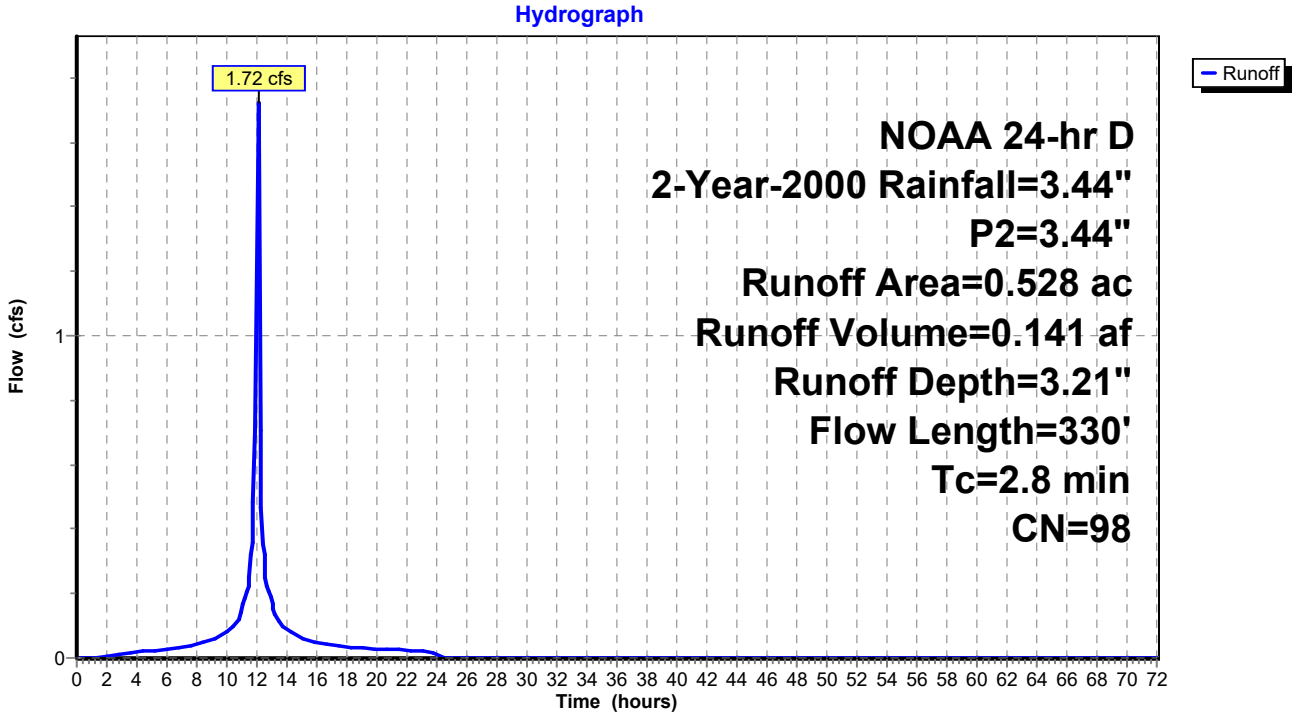
Runoff = 1.72 cfs @ 12.08 hrs, Volume= 0.141 af, Depth= 3.21"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.44"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

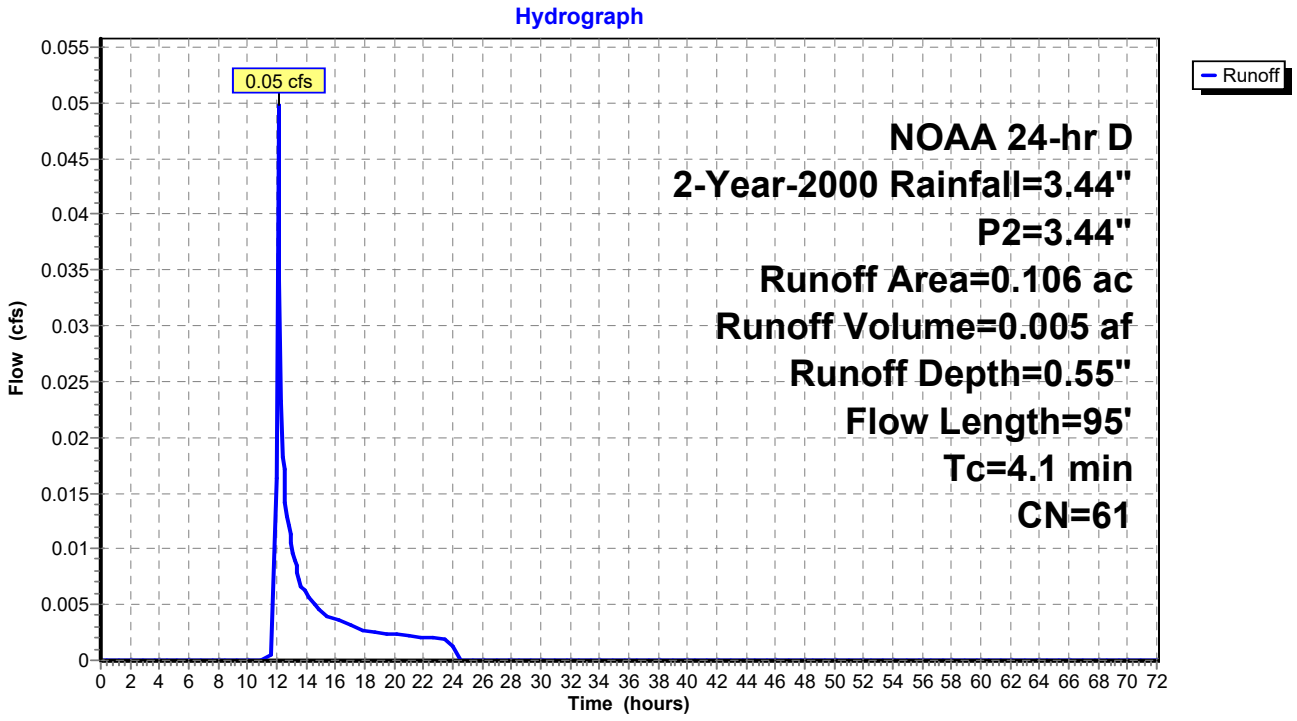
Runoff = 0.05 cfs @ 12.12 hrs, Volume= 0.005 af, Depth= 0.55"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.44"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

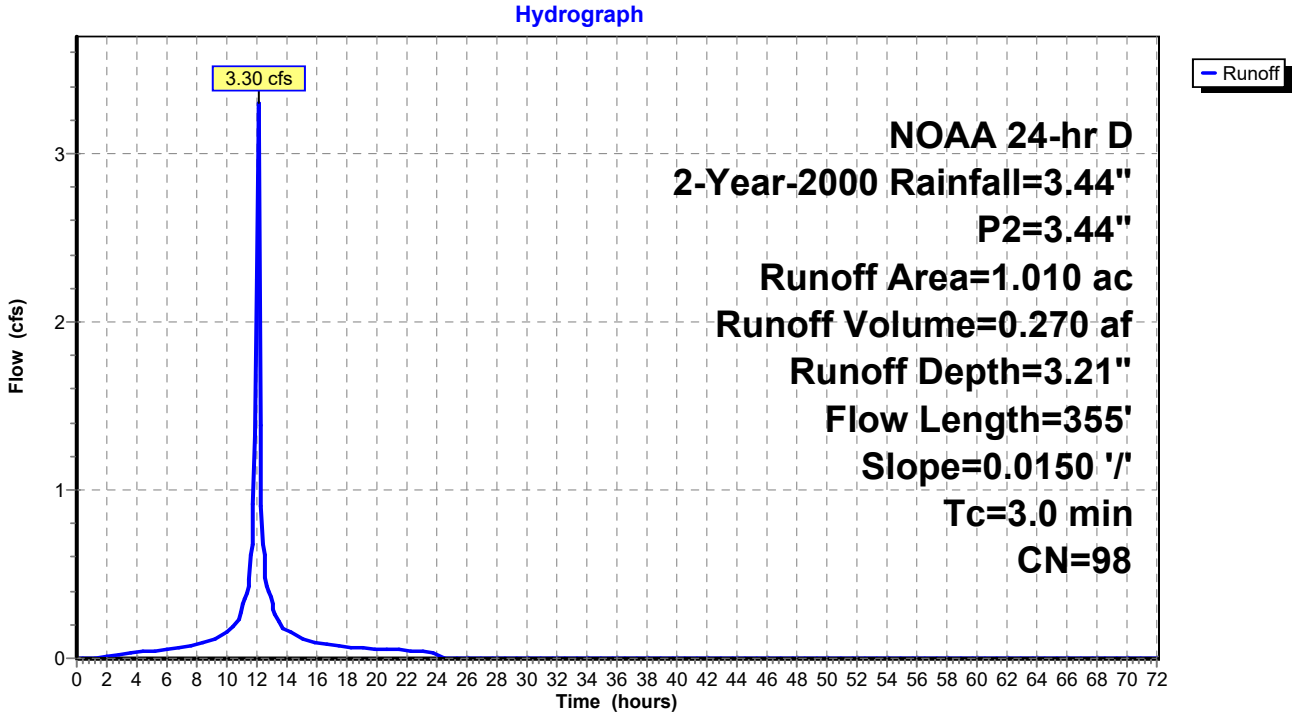
Runoff = 3.30 cfs @ 12.09 hrs, Volume= 0.270 af, Depth= 3.21"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.44"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

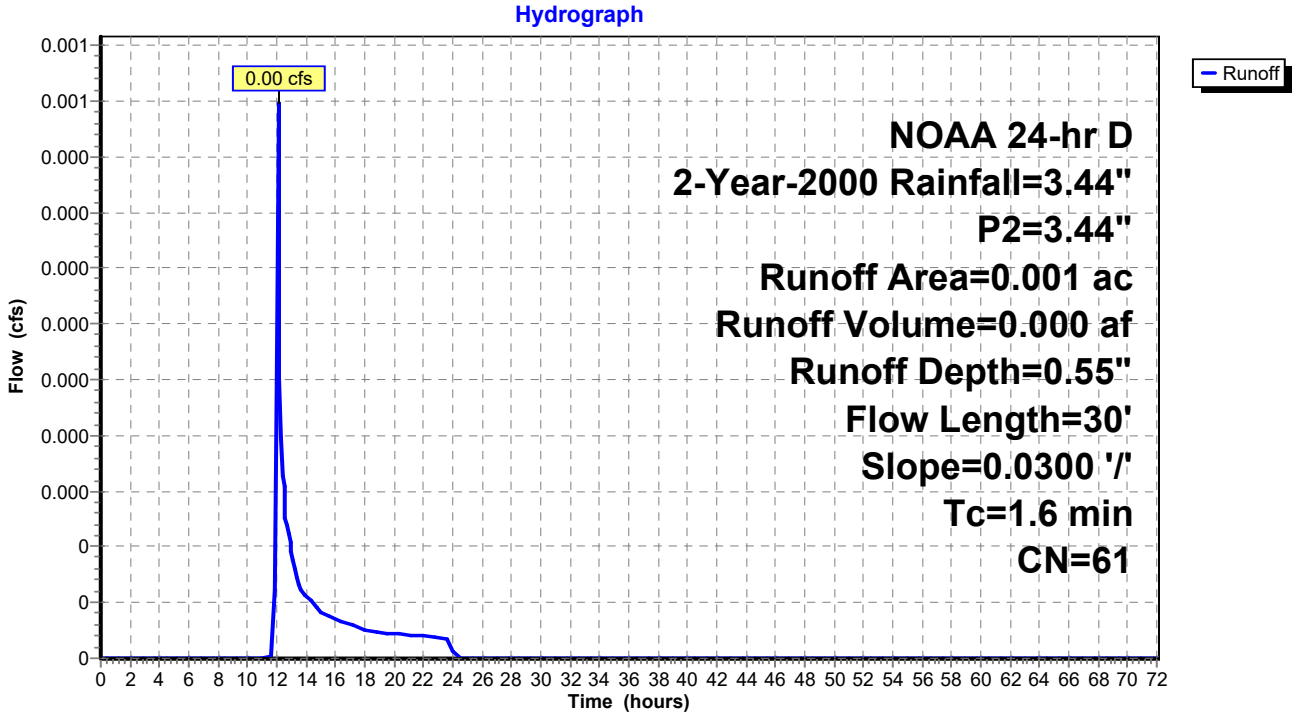
Runoff = 0.00 cfs @ 12.10 hrs, Volume= 0.000 af, Depth= 0.55"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.44"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

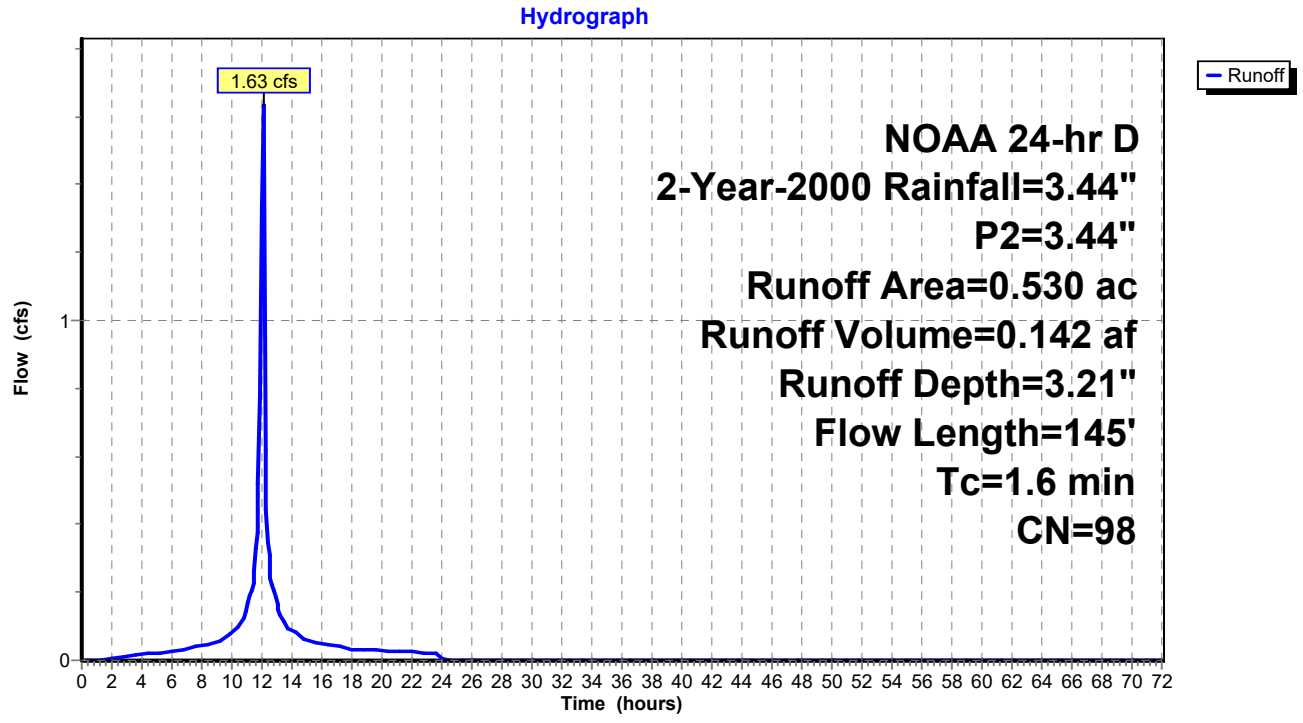
Runoff = 1.63 cfs @ 12.07 hrs, Volume= 0.142 af, Depth= 3.21"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

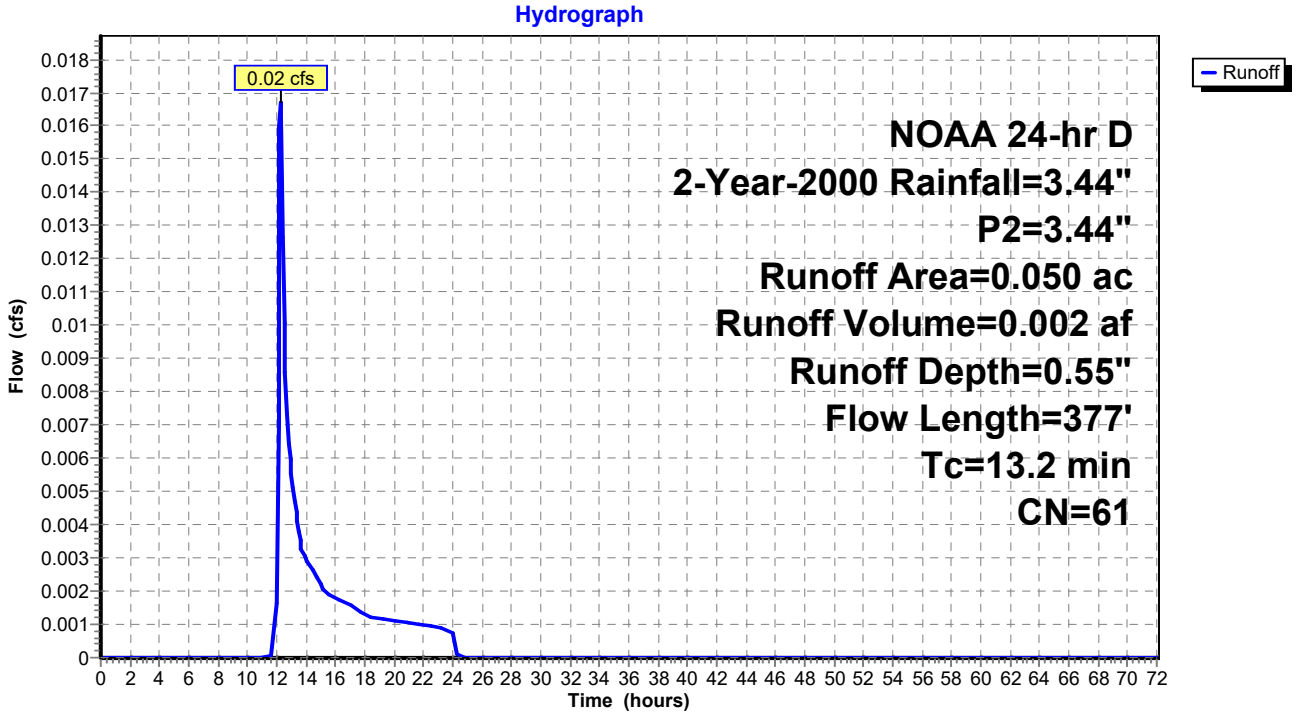
Runoff = 0.02 cfs @ 12.26 hrs, Volume= 0.002 af, Depth= 0.55"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

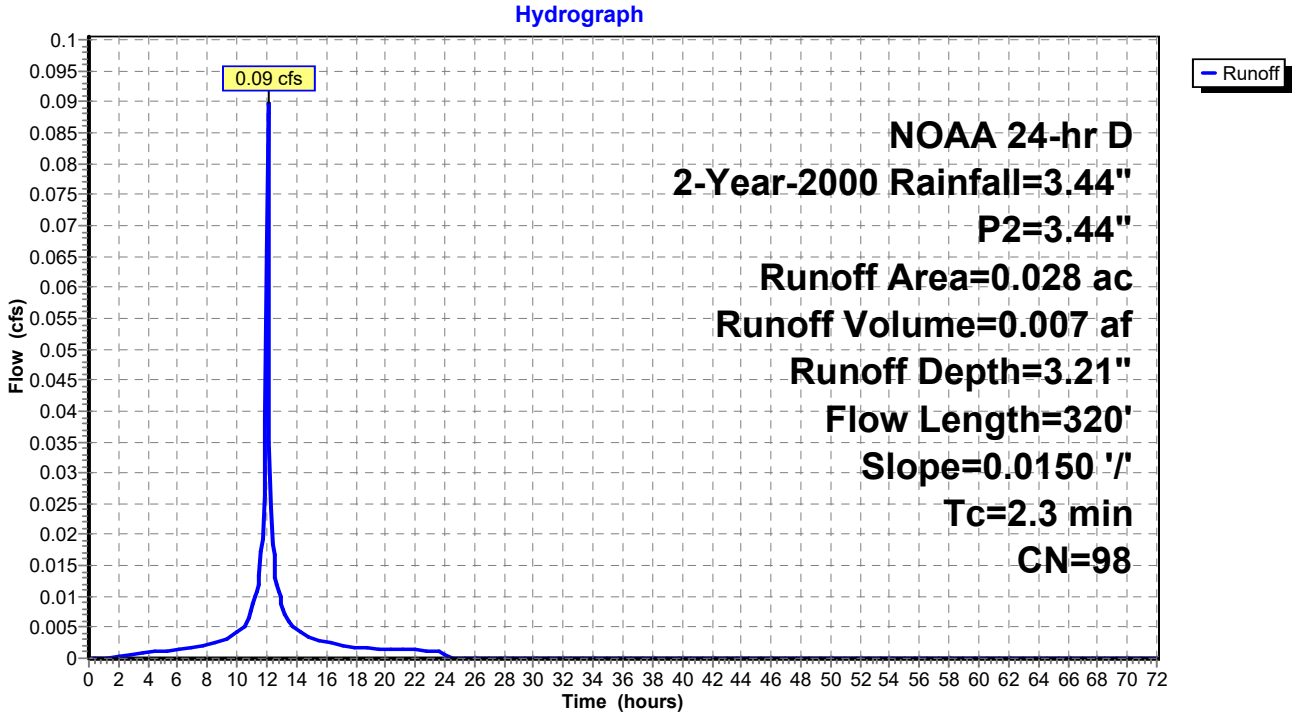
Runoff = 0.09 cfs @ 12.08 hrs, Volume= 0.007 af, Depth= 3.21"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.44"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

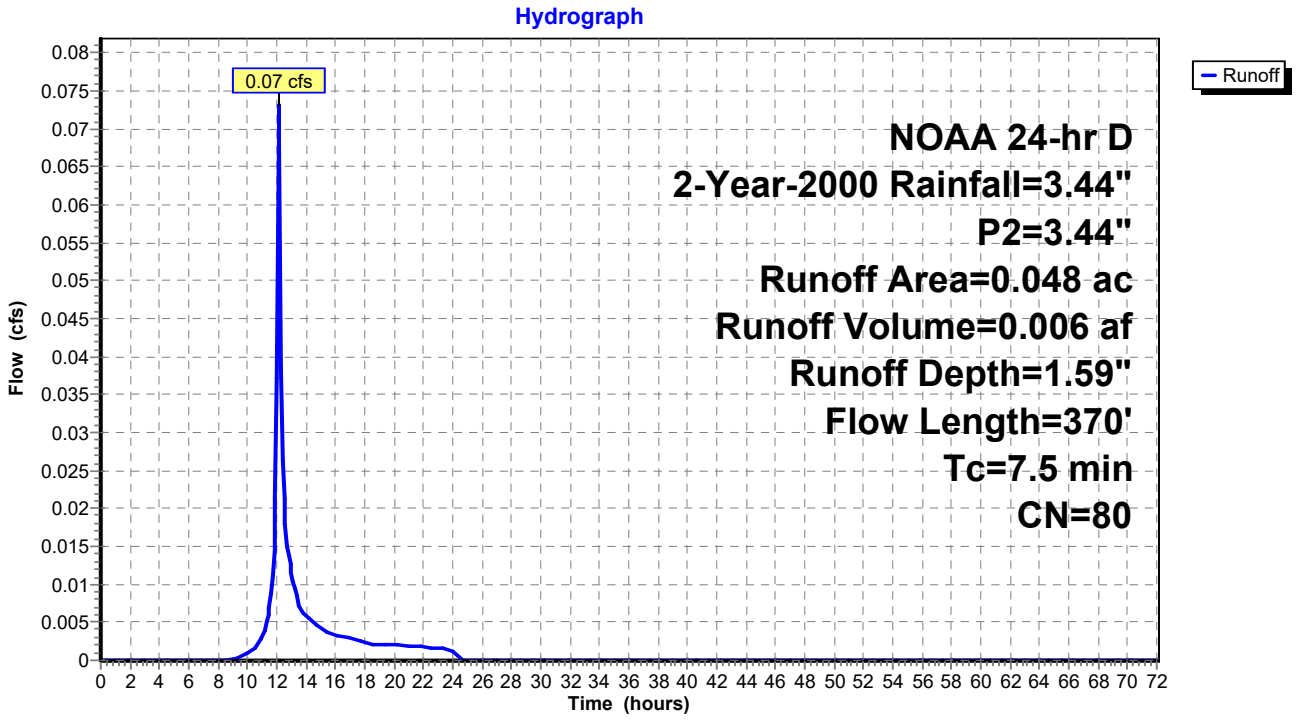
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.006 af, Depth= 1.59"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.44"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

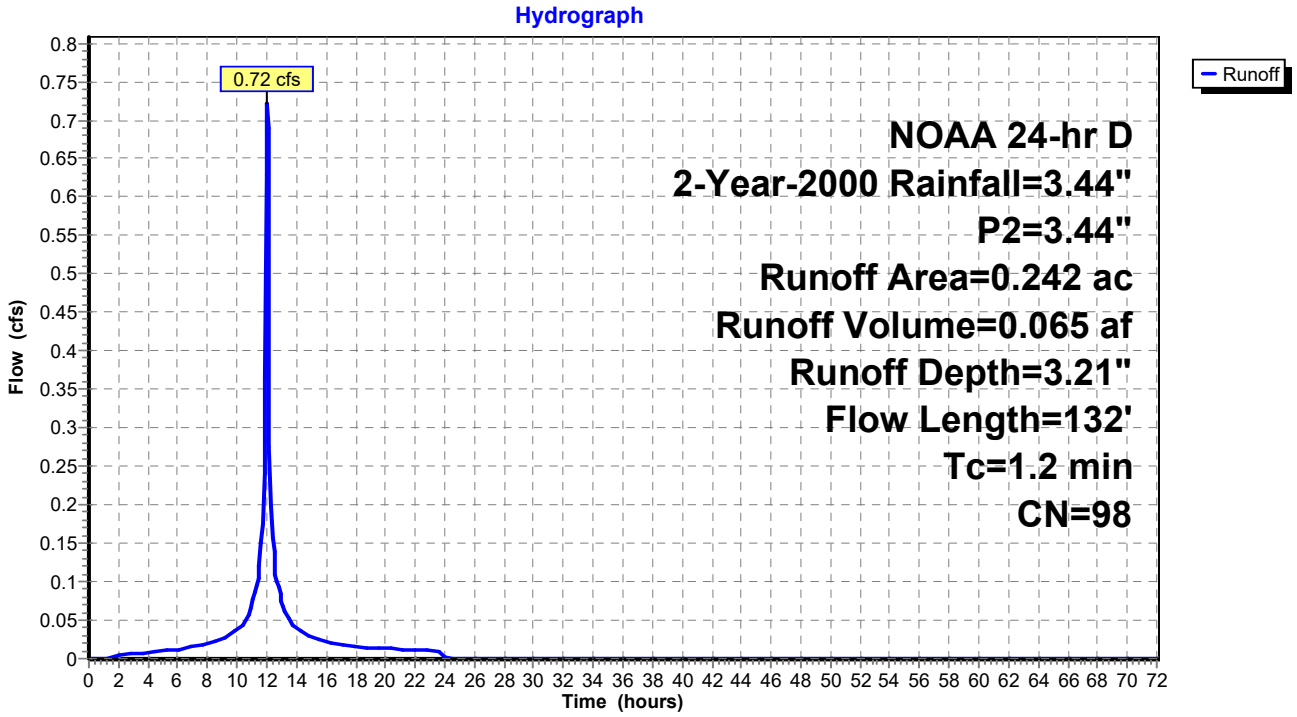
Runoff = 0.72 cfs @ 12.06 hrs, Volume= 0.065 af, Depth= 3.21"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.56		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.44"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

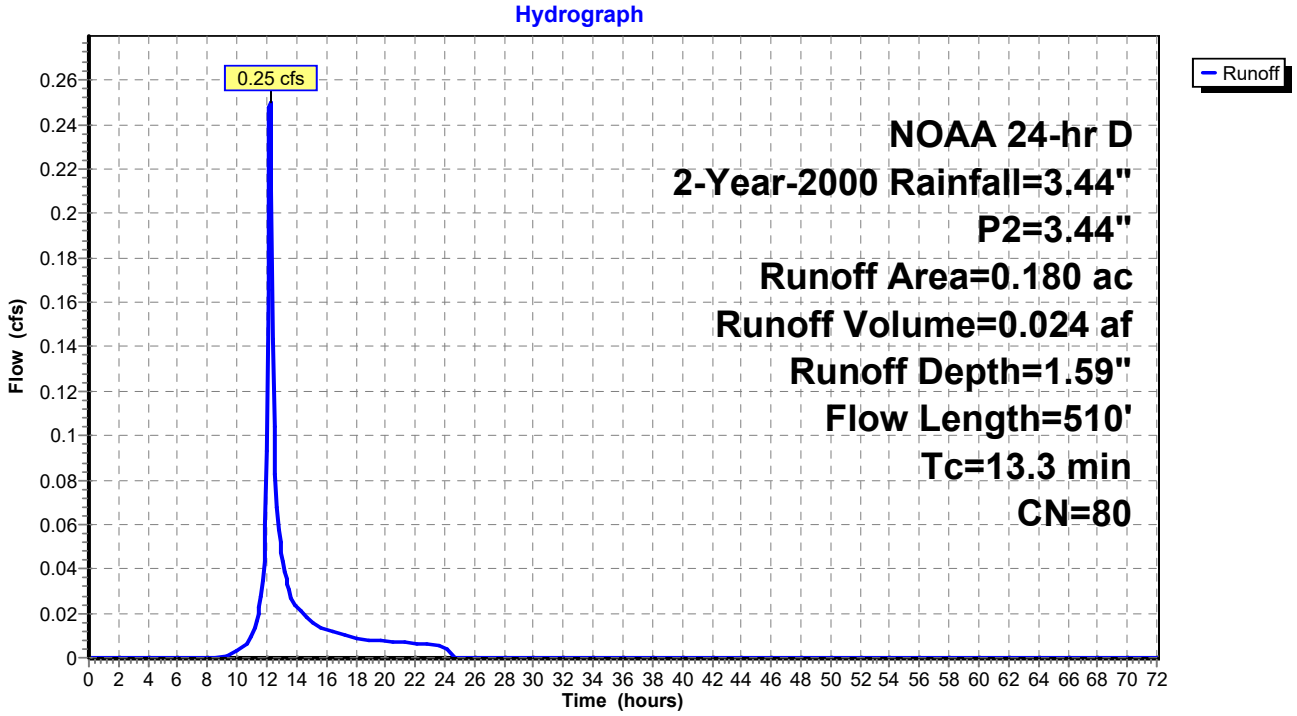
Runoff = 0.25 cfs @ 12.22 hrs, Volume= 0.024 af, Depth= 1.59"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

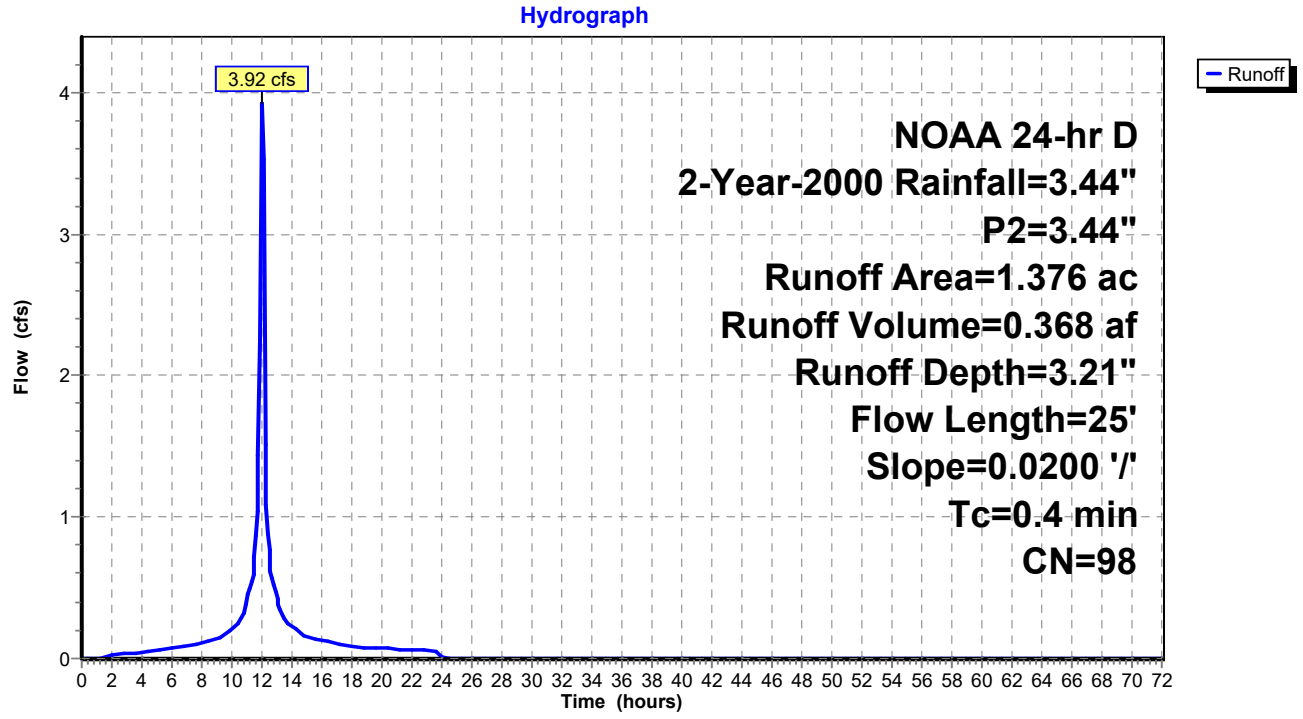
Runoff = 3.92 cfs @ 12.03 hrs, Volume= 0.368 af, Depth= 3.21"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.08		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.44"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

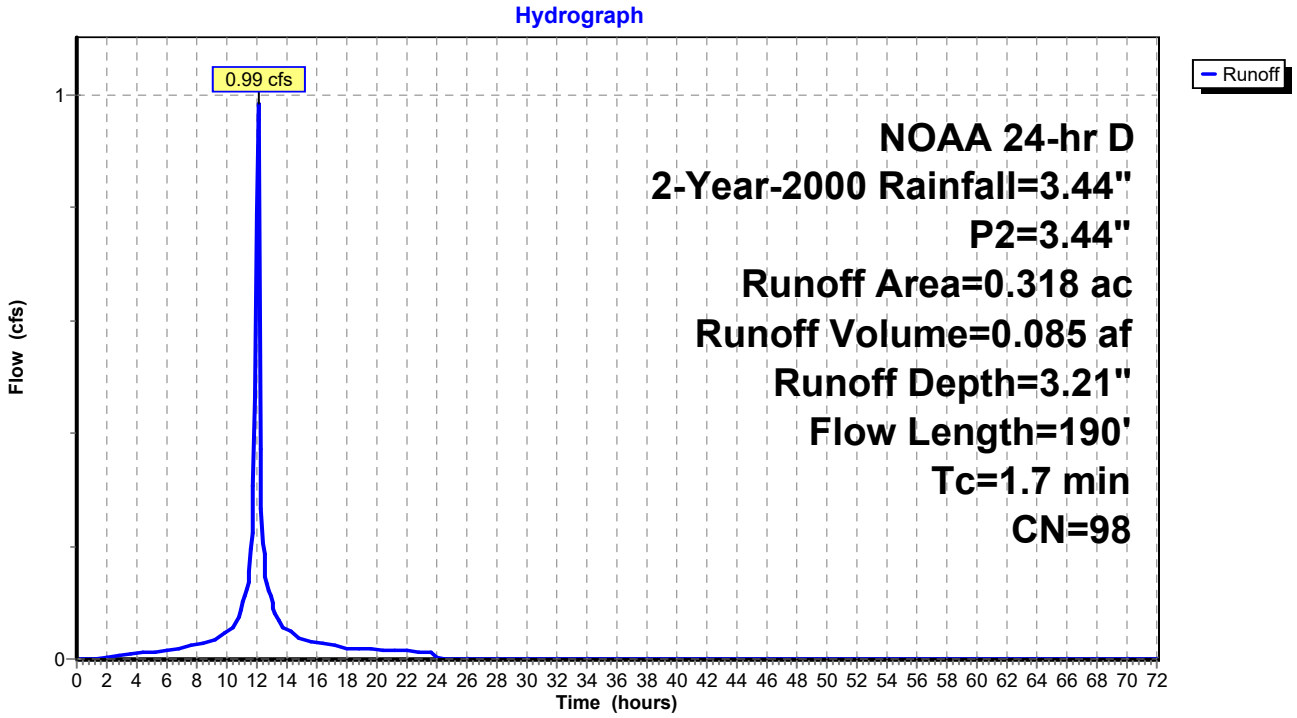
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.085 af, Depth= 3.21"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

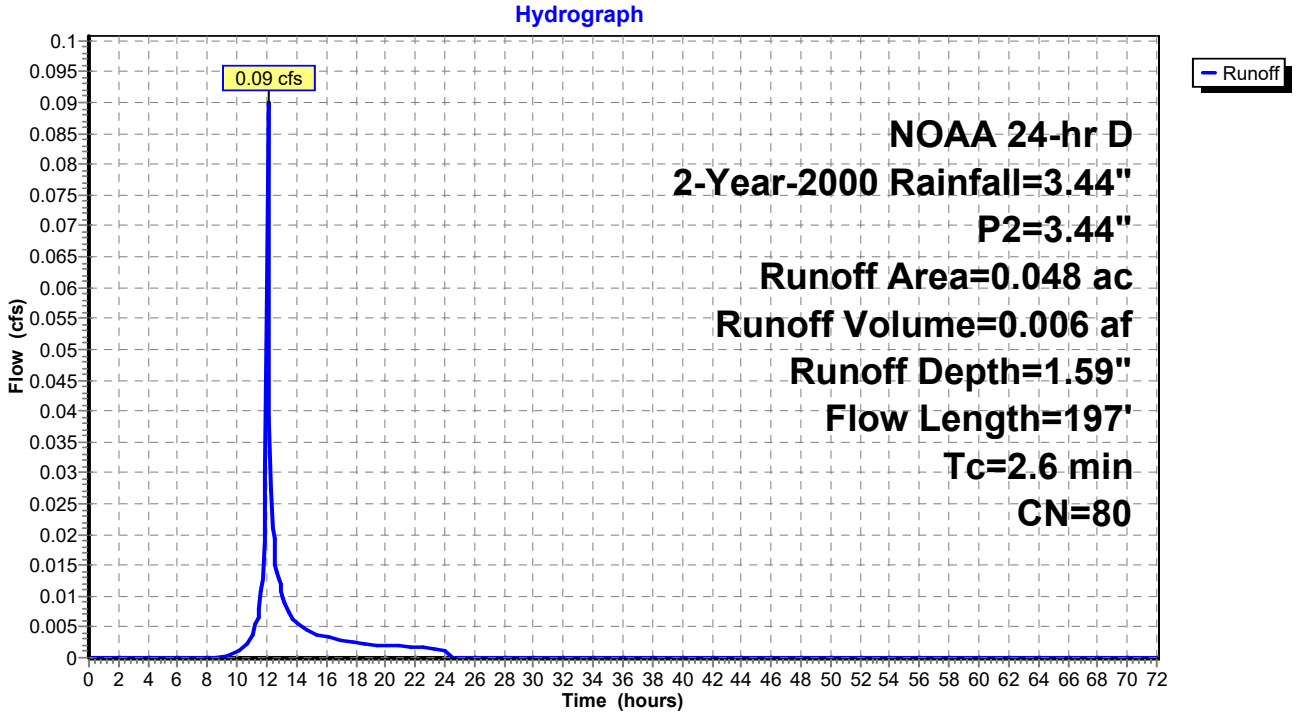
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 1.59"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2000 Rainfall=3.44", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 3.21" for 2-Year-2000 event
Inflow = 3.92 cfs @ 12.03 hrs, Volume= 0.368 af
Outflow = 0.57 cfs @ 12.70 hrs, Volume= 0.250 af, Atten= 85%, Lag= 39.7 min
Primary = 0.57 cfs @ 12.70 hrs, Volume= 0.250 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 131.79' @ 12.70 hrs Surf.Area= 10,137 sf Storage= 9,699 cf

Plug-Flow detention time= 376.6 min calculated for 0.250 af (68% of inflow)
Center-of-Mass det. time= 273.8 min (1,025.3 - 751.5)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

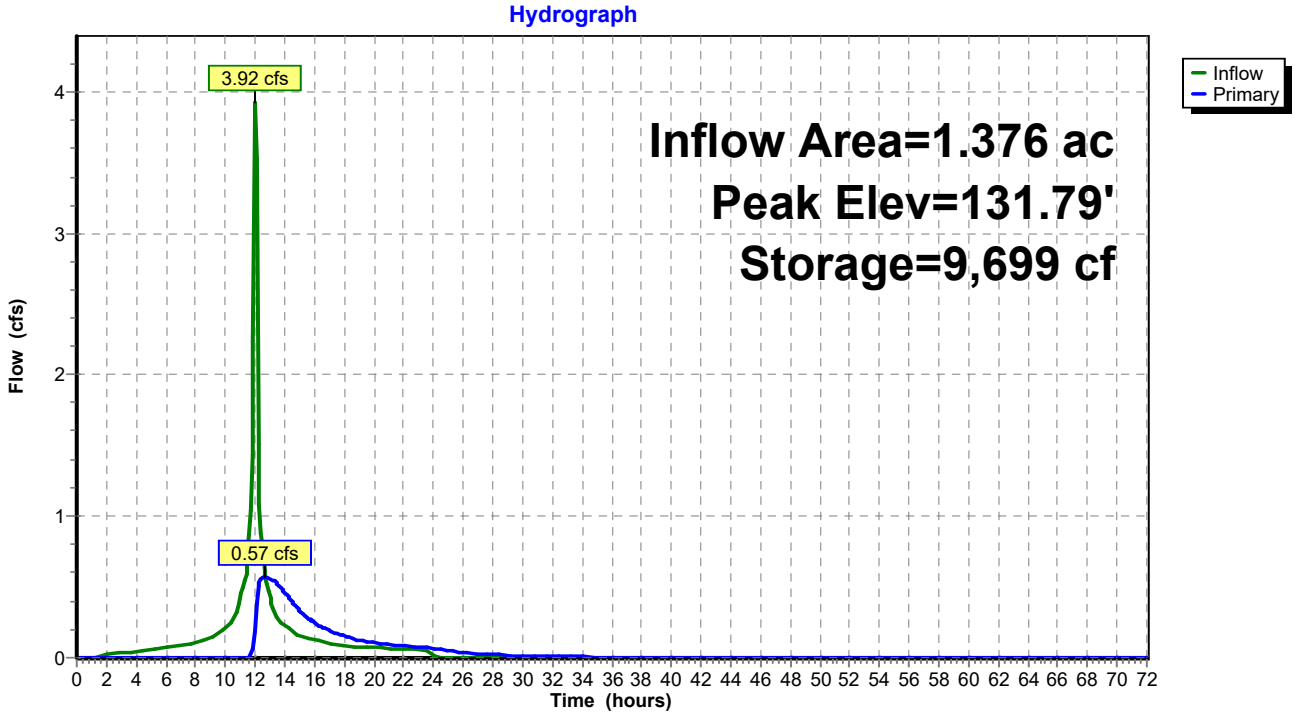
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.57 cfs @ 12.70 hrs HW=131.79' (Free Discharge)
└─**1=Culvert** (Passes 0.57 cfs of 6.71 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 2.74 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

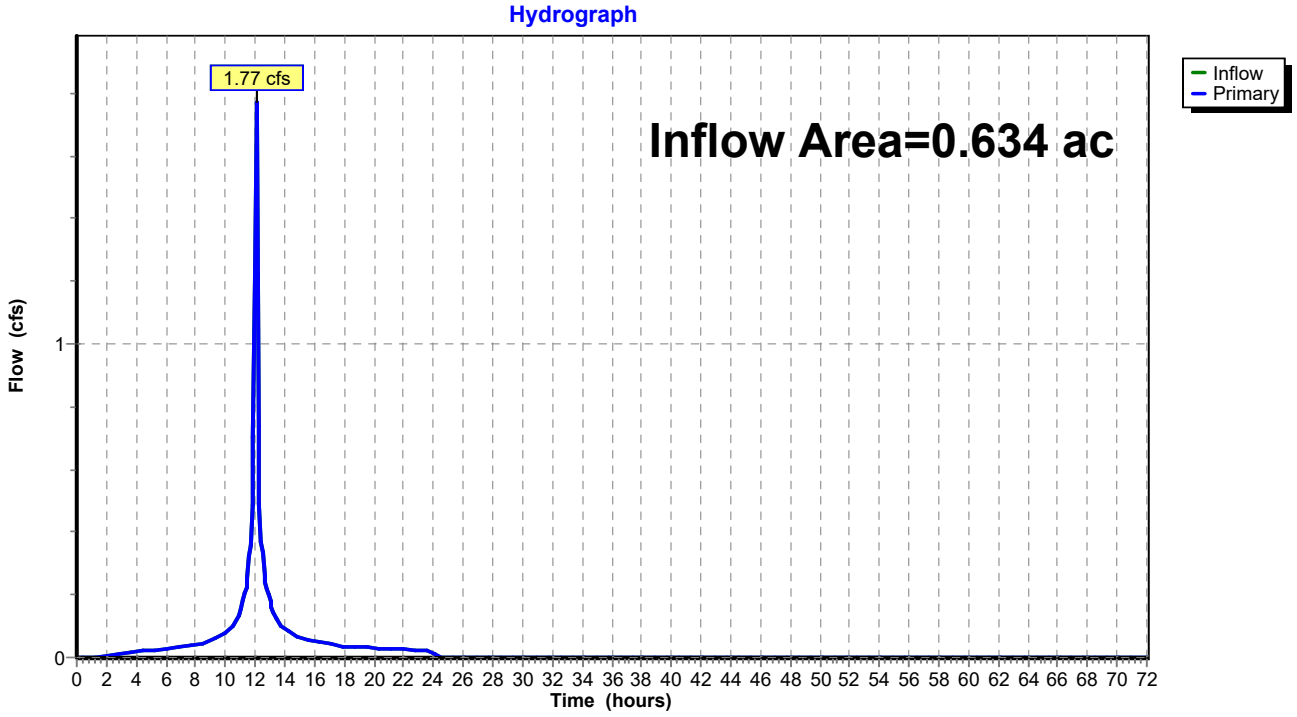


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 2.76" for 2-Year-2000 event
Inflow = 1.77 cfs @ 12.08 hrs, Volume= 0.146 af
Primary = 1.77 cfs @ 12.08 hrs, Volume= 0.146 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

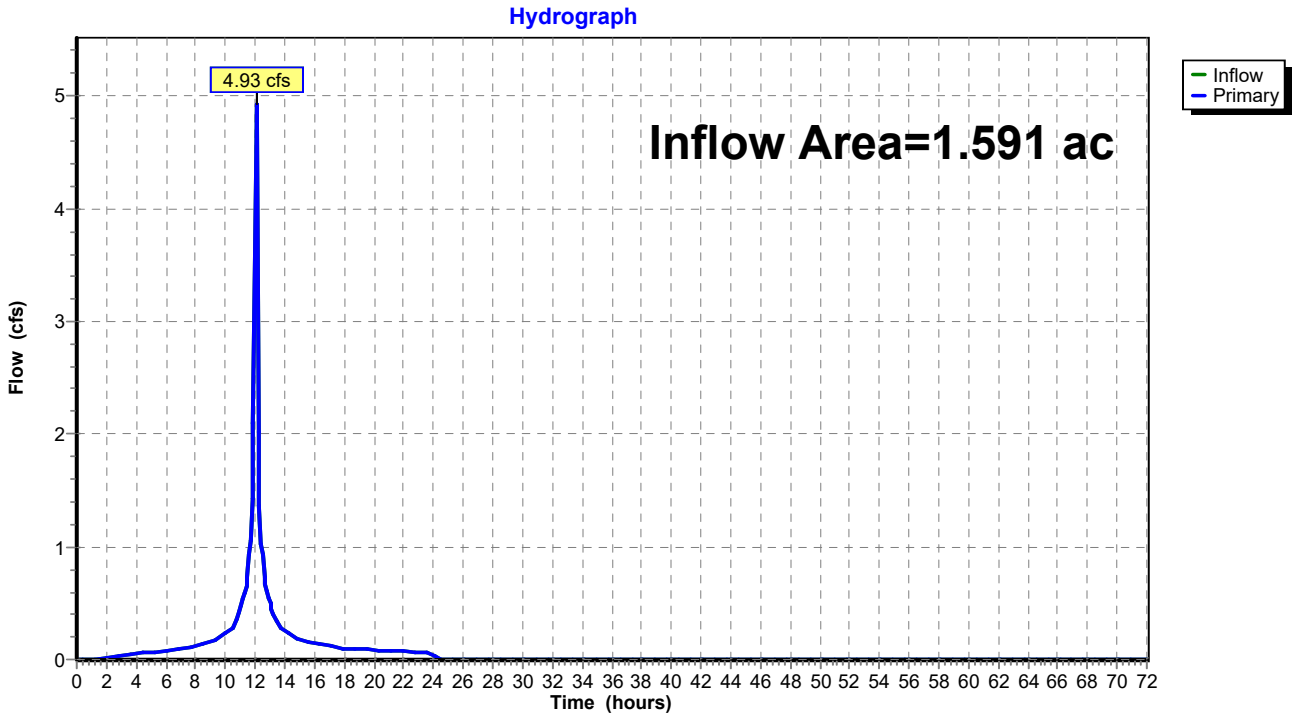


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 3.12" for 2-Year-2000 event
Inflow = 4.93 cfs @ 12.08 hrs, Volume= 0.414 af
Primary = 4.93 cfs @ 12.08 hrs, Volume= 0.414 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

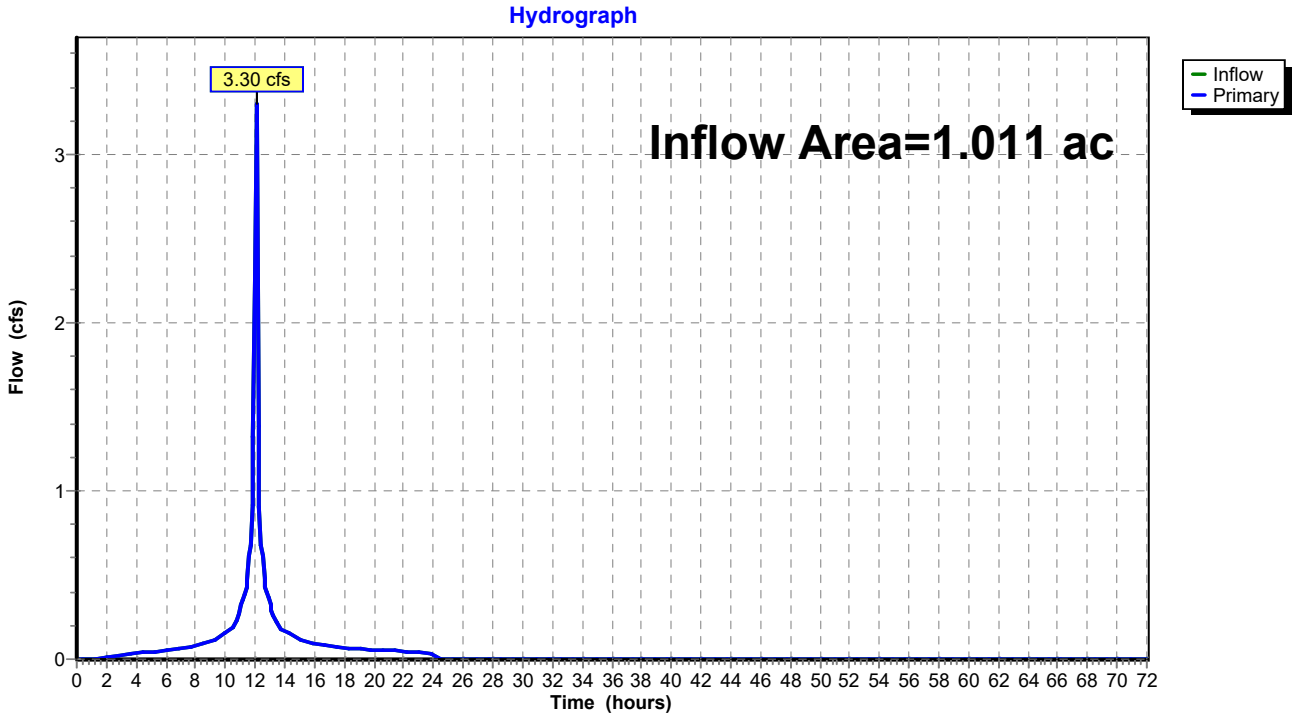


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 3.20" for 2-Year-2000 event
Inflow = 3.30 cfs @ 12.09 hrs, Volume= 0.270 af
Primary = 3.30 cfs @ 12.09 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

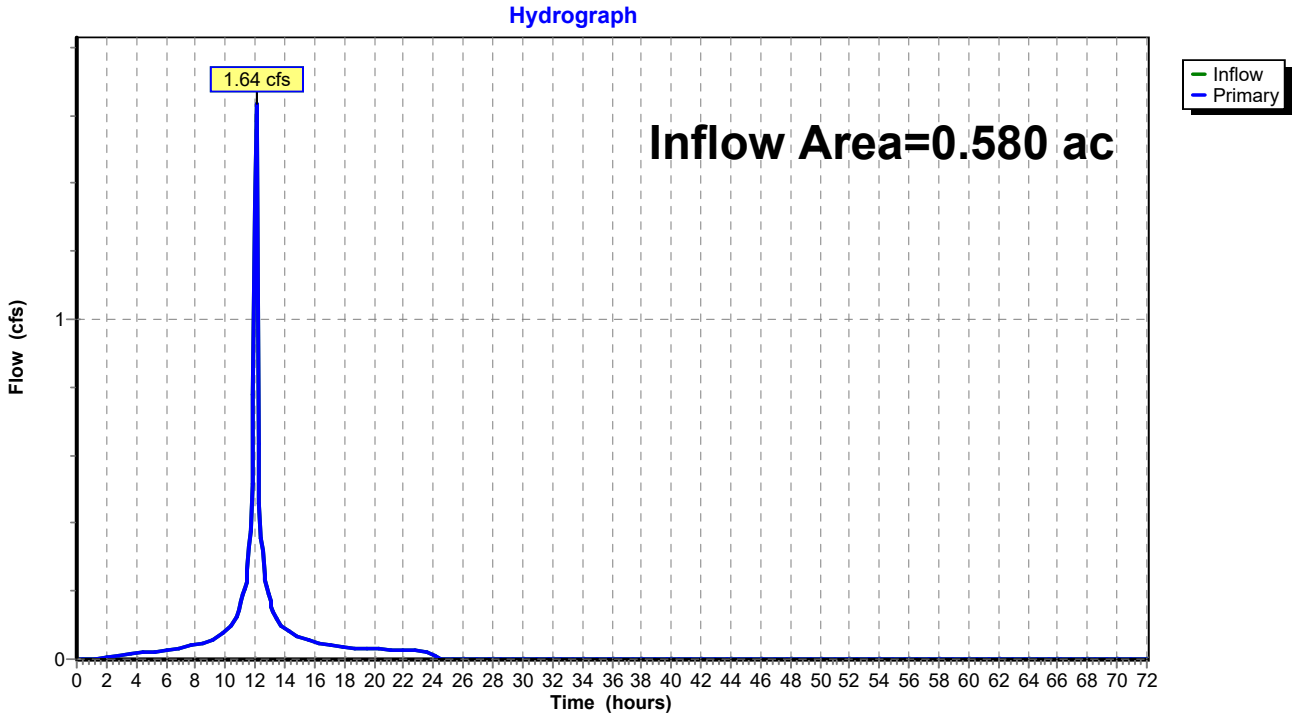


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 2.98" for 2-Year-2000 event
Inflow = 1.64 cfs @ 12.07 hrs, Volume= 0.144 af
Primary = 1.64 cfs @ 12.07 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

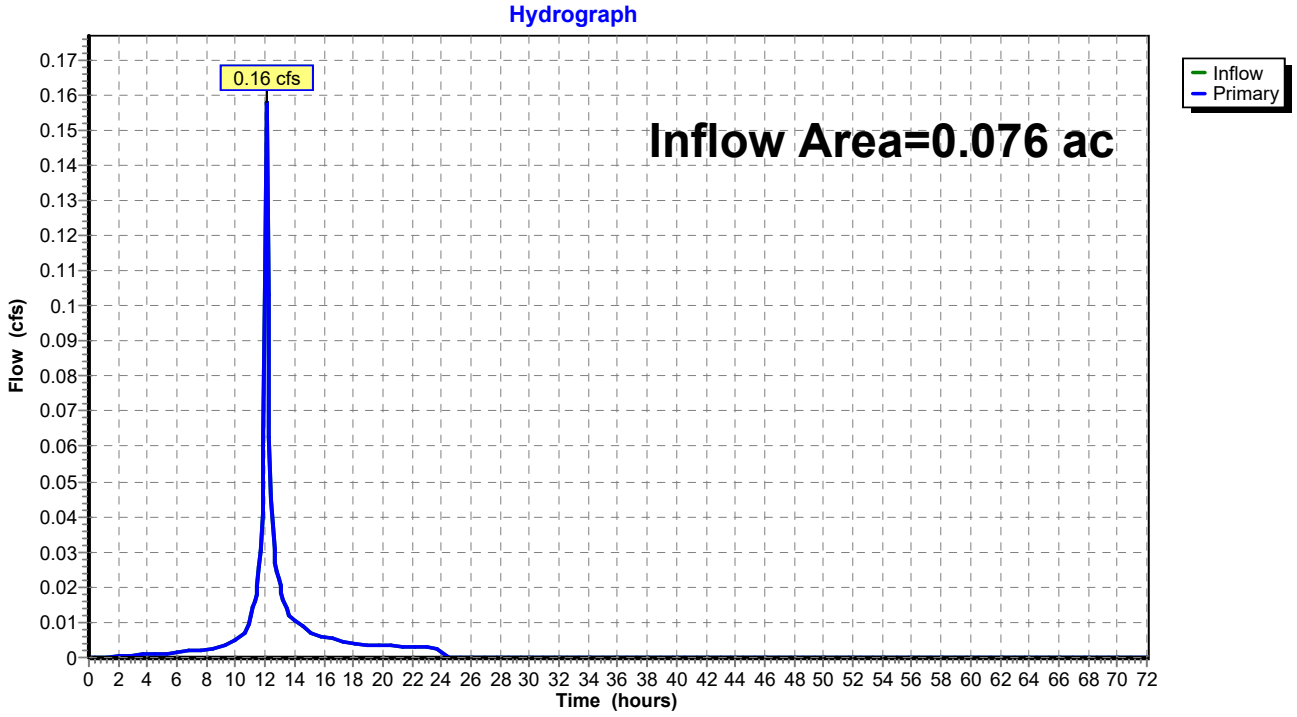


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 2.18" for 2-Year-2000 event
Inflow = 0.16 cfs @ 12.10 hrs, Volume= 0.014 af
Primary = 0.16 cfs @ 12.10 hrs, Volume= 0.014 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

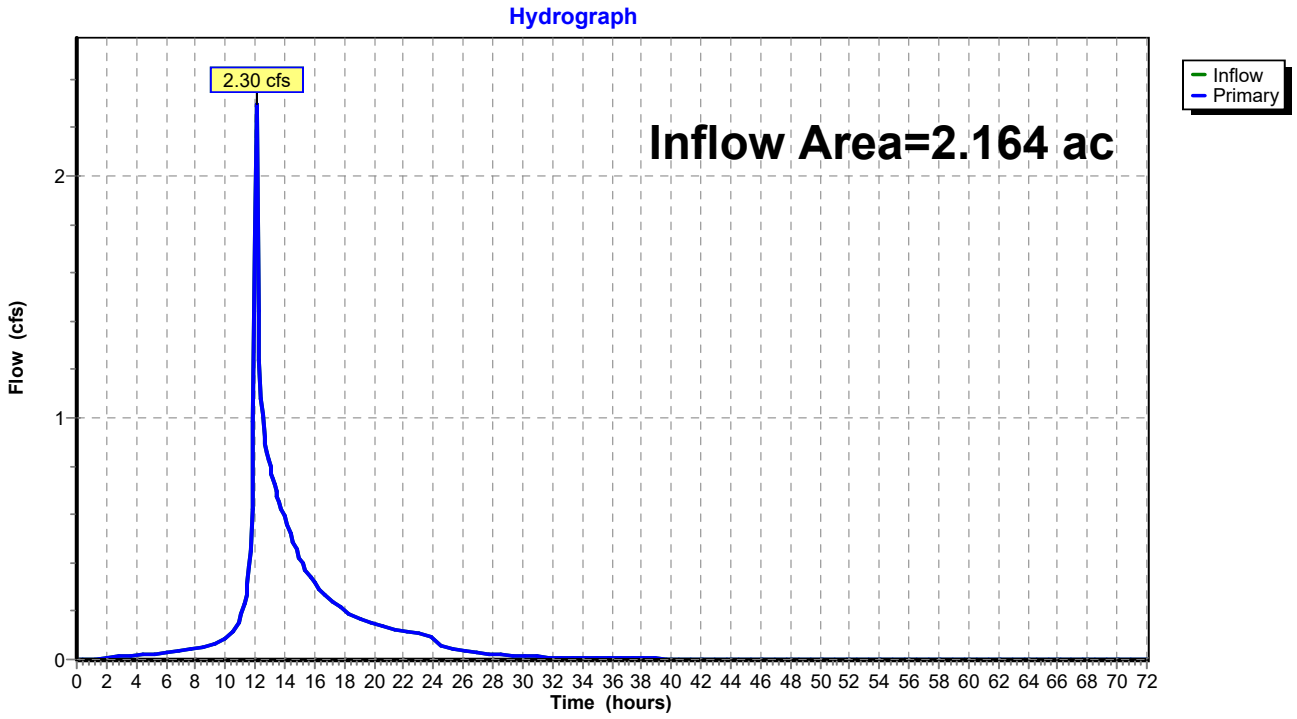


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 2.38" for 2-Year-2000 event
Inflow = 2.30 cfs @ 12.09 hrs, Volume= 0.430 af
Primary = 2.30 cfs @ 12.09 hrs, Volume= 0.430 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

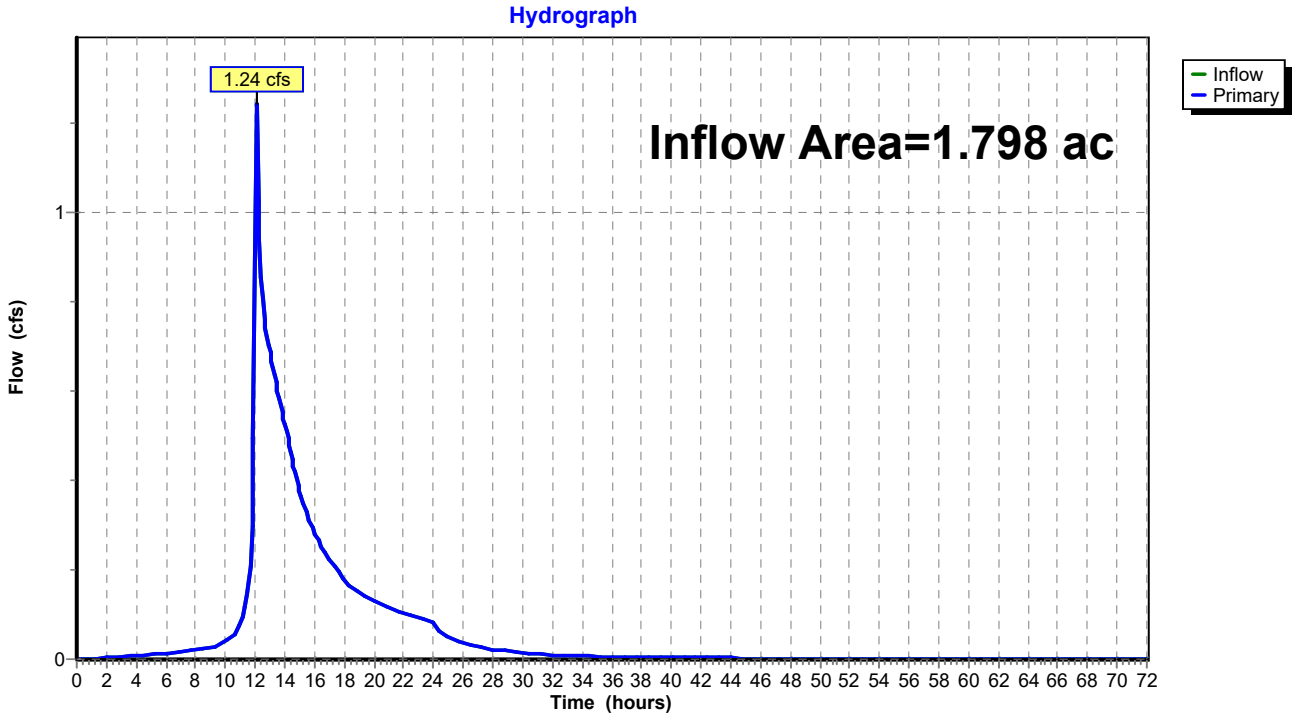


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 2.26" for 2-Year-2000 event
Inflow = 1.24 cfs @ 12.11 hrs, Volume= 0.338 af
Primary = 1.24 cfs @ 12.11 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

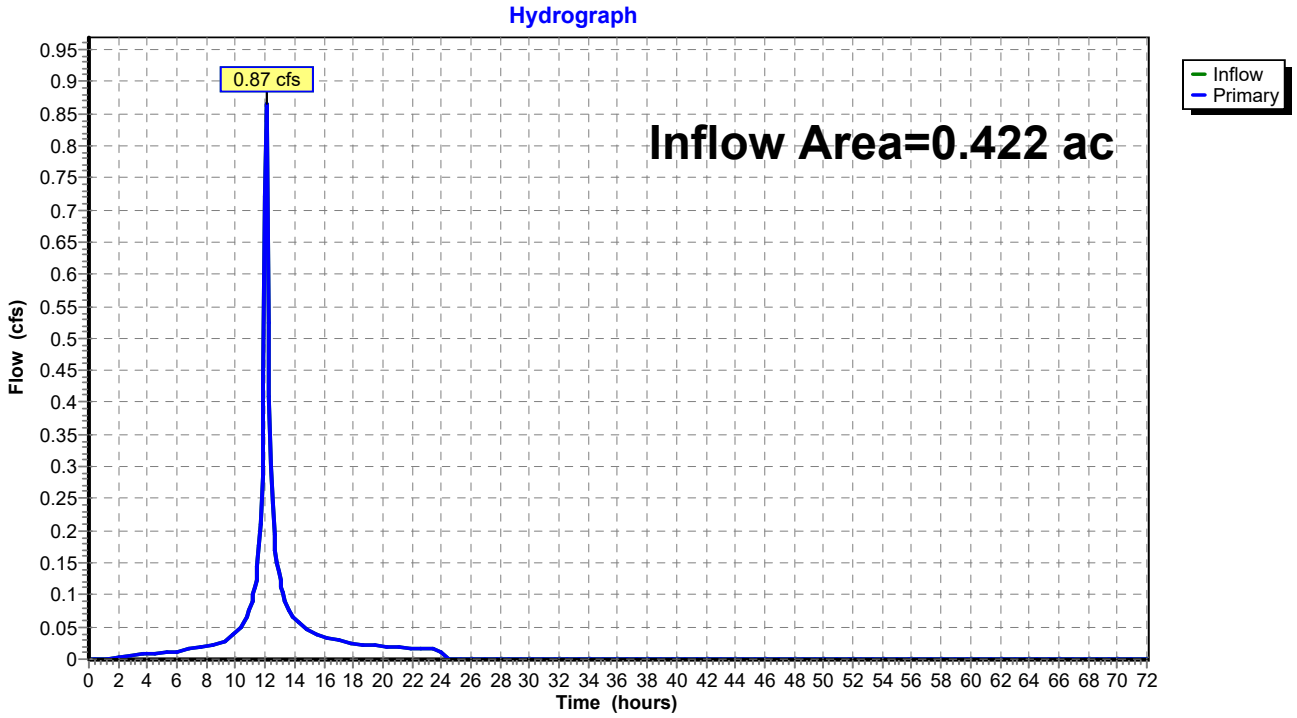


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 2.52" for 2-Year-2000 event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 0.089 af
Primary = 0.87 cfs @ 12.08 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

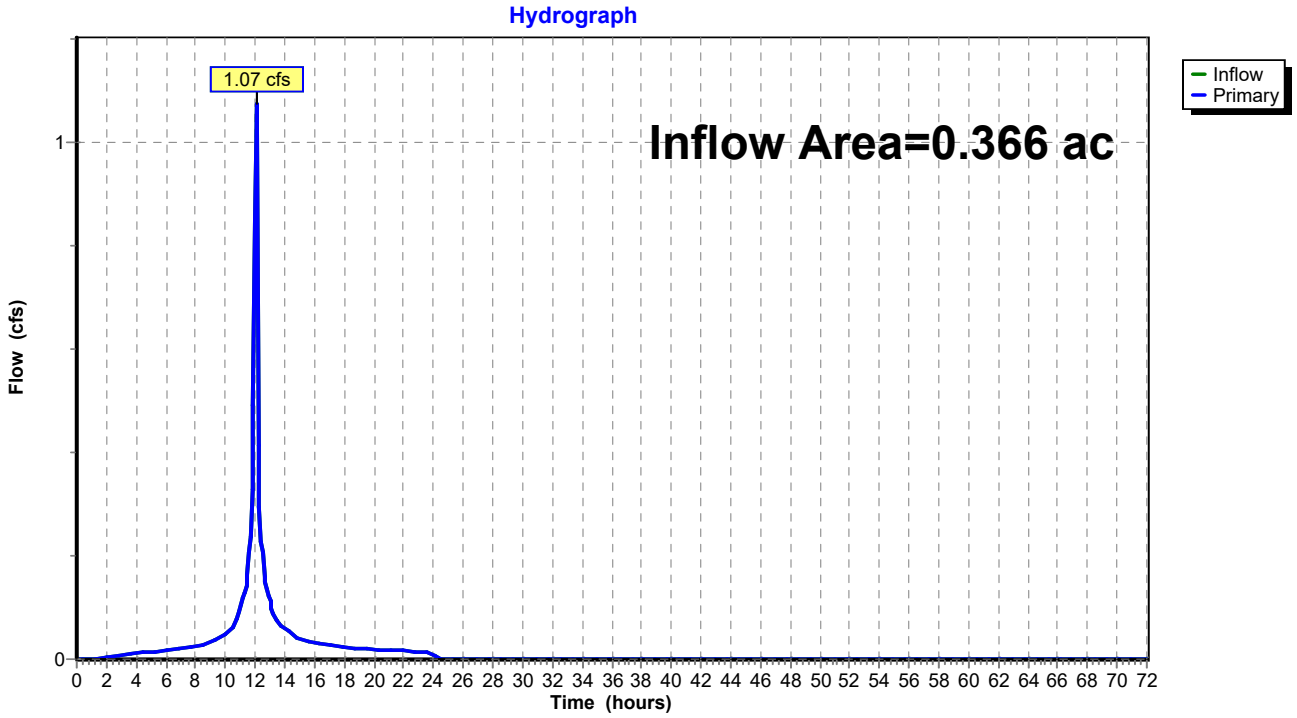


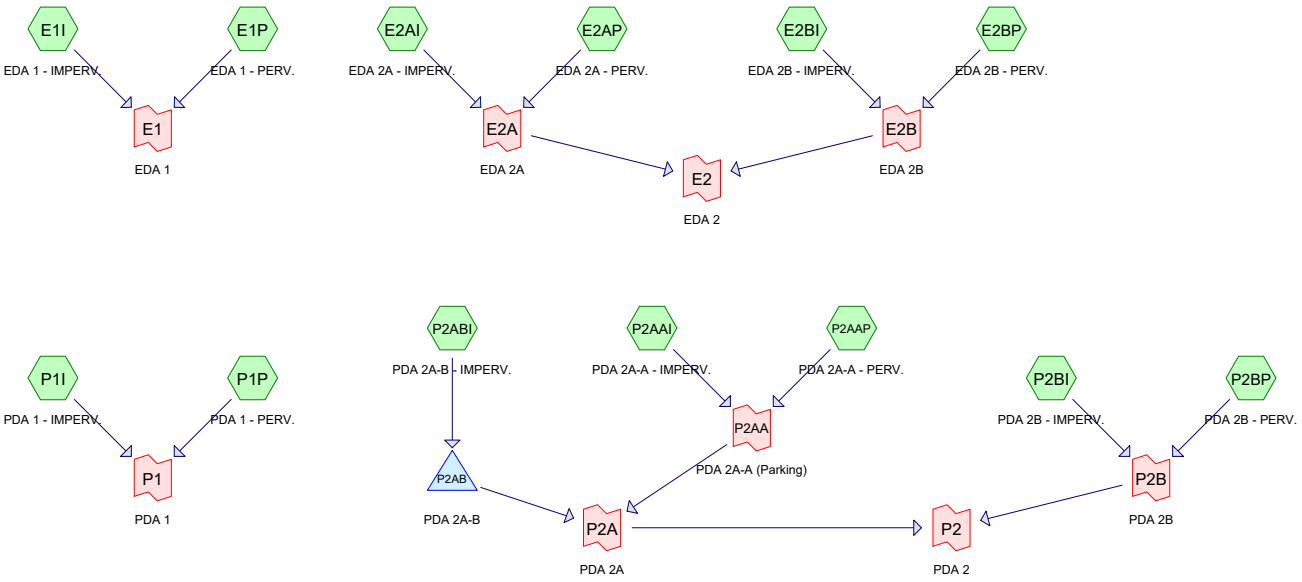
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 2.99" for 2-Year-2000 event
Inflow = 1.07 cfs @ 12.07 hrs, Volume= 0.091 af
Primary = 1.07 cfs @ 12.07 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

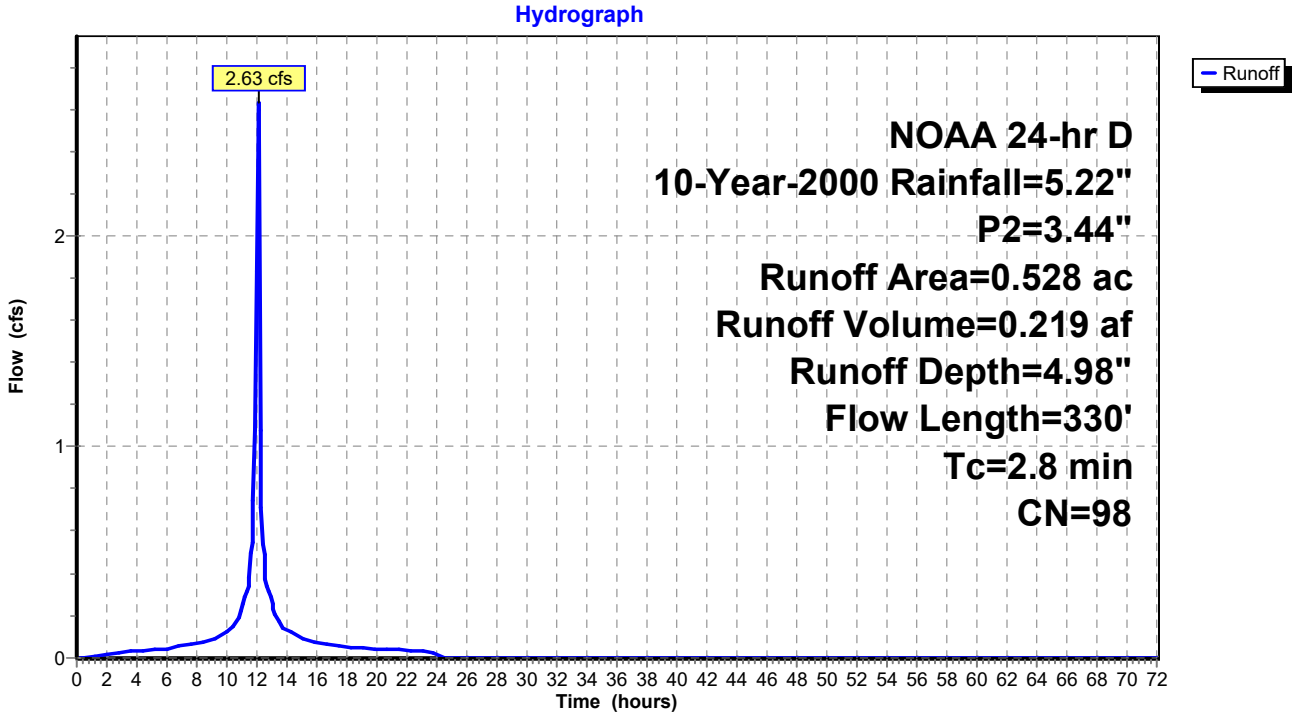
Runoff = 2.63 cfs @ 12.08 hrs, Volume= 0.219 af, Depth= 4.98"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.44"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

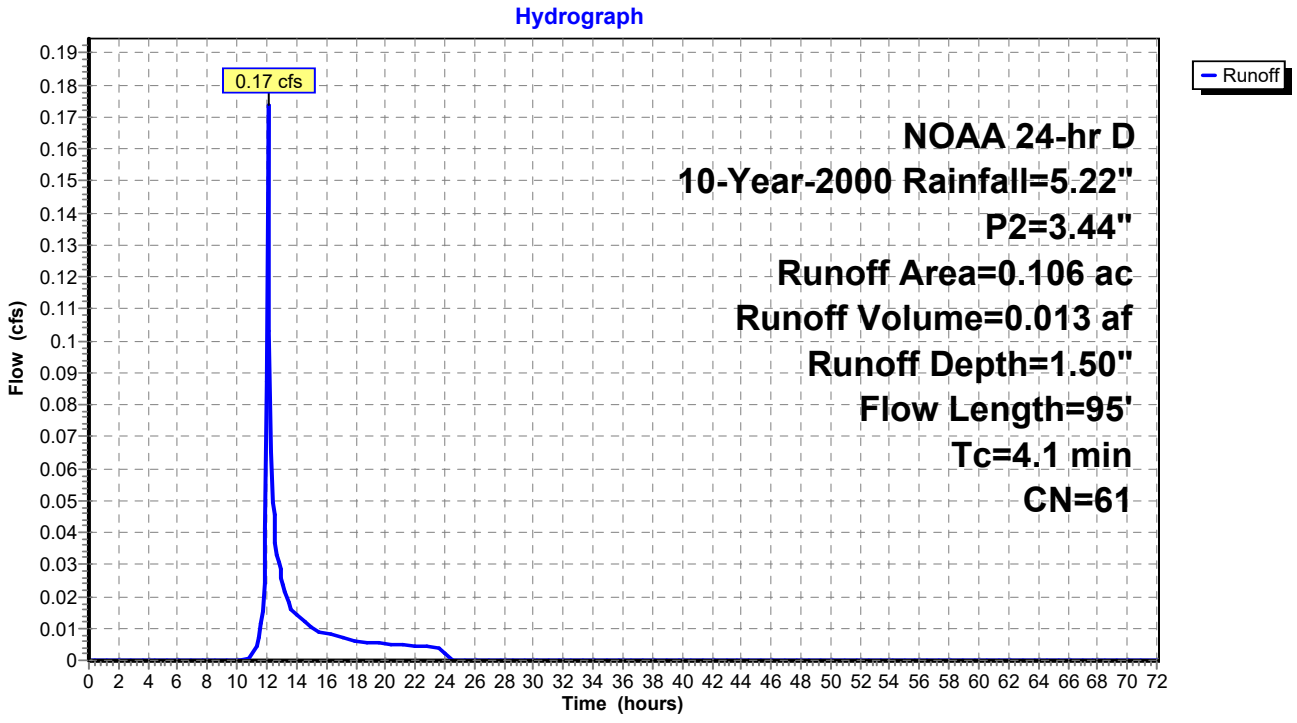
Runoff = 0.17 cfs @ 12.11 hrs, Volume= 0.013 af, Depth= 1.50"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.44"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

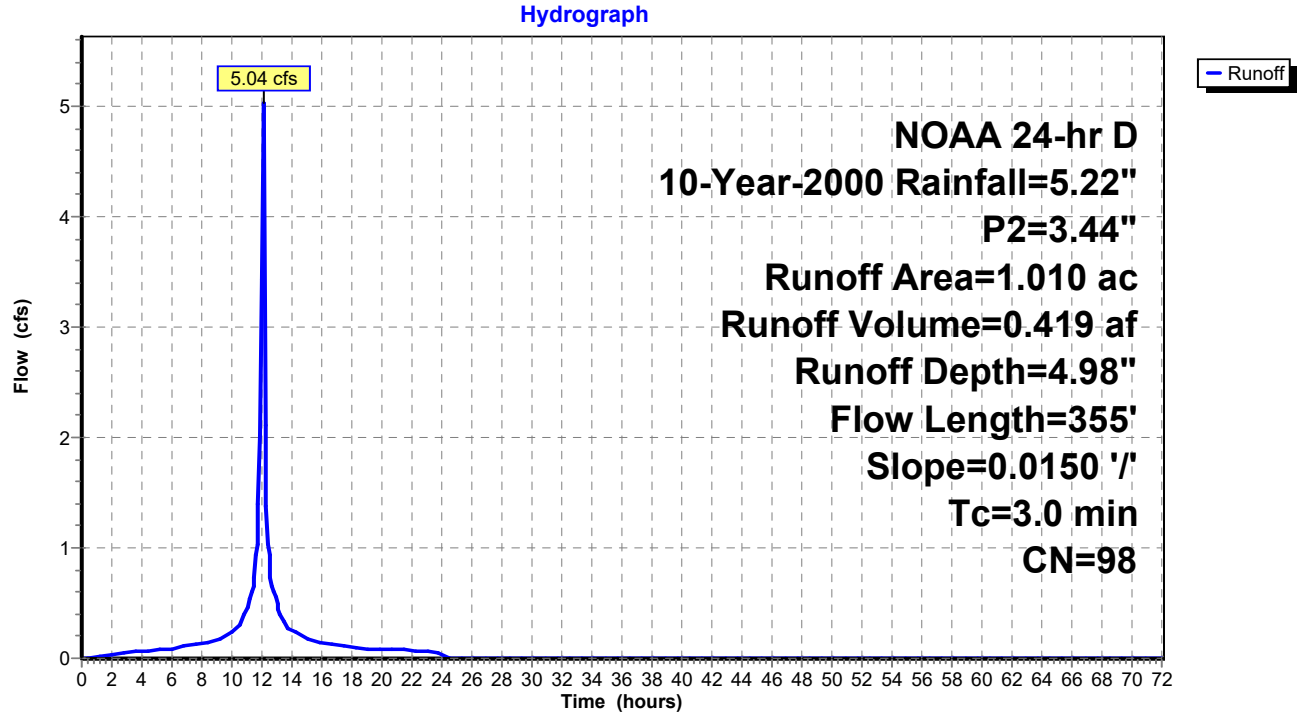
Runoff = 5.04 cfs @ 12.08 hrs, Volume= 0.419 af, Depth= 4.98"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.44"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

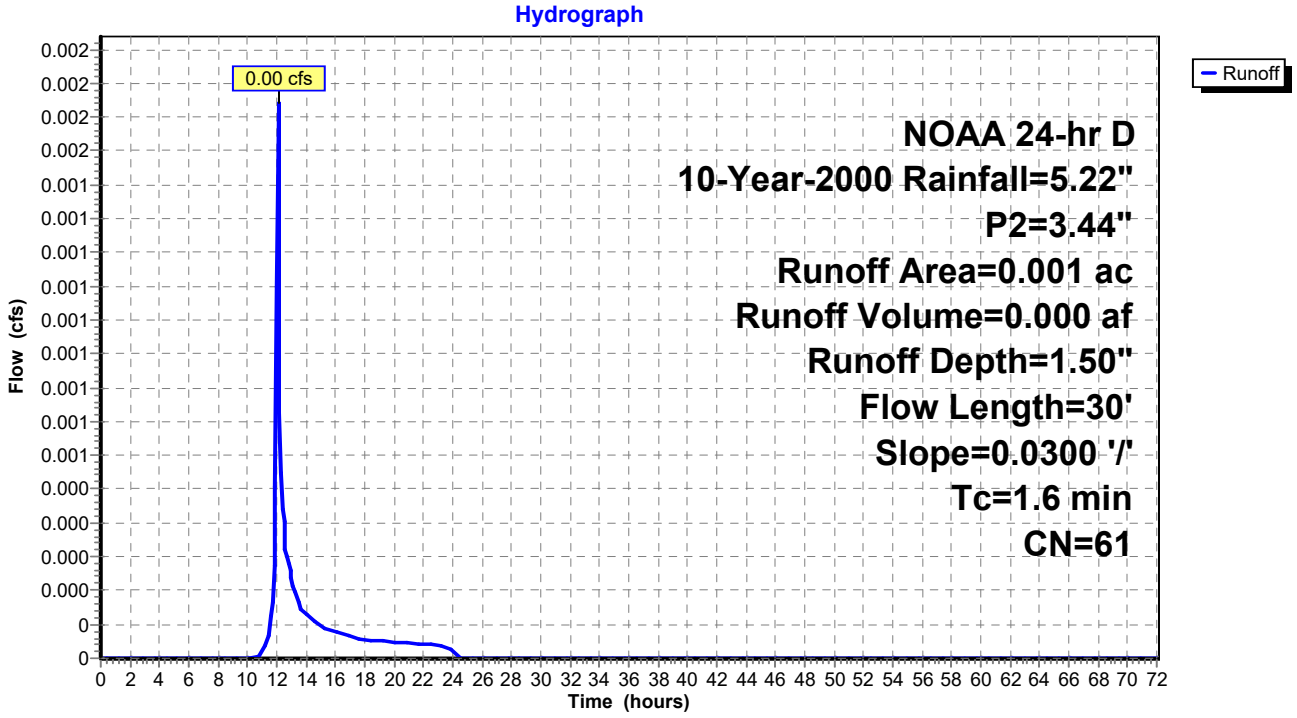
Runoff = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af, Depth= 1.50"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.44"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

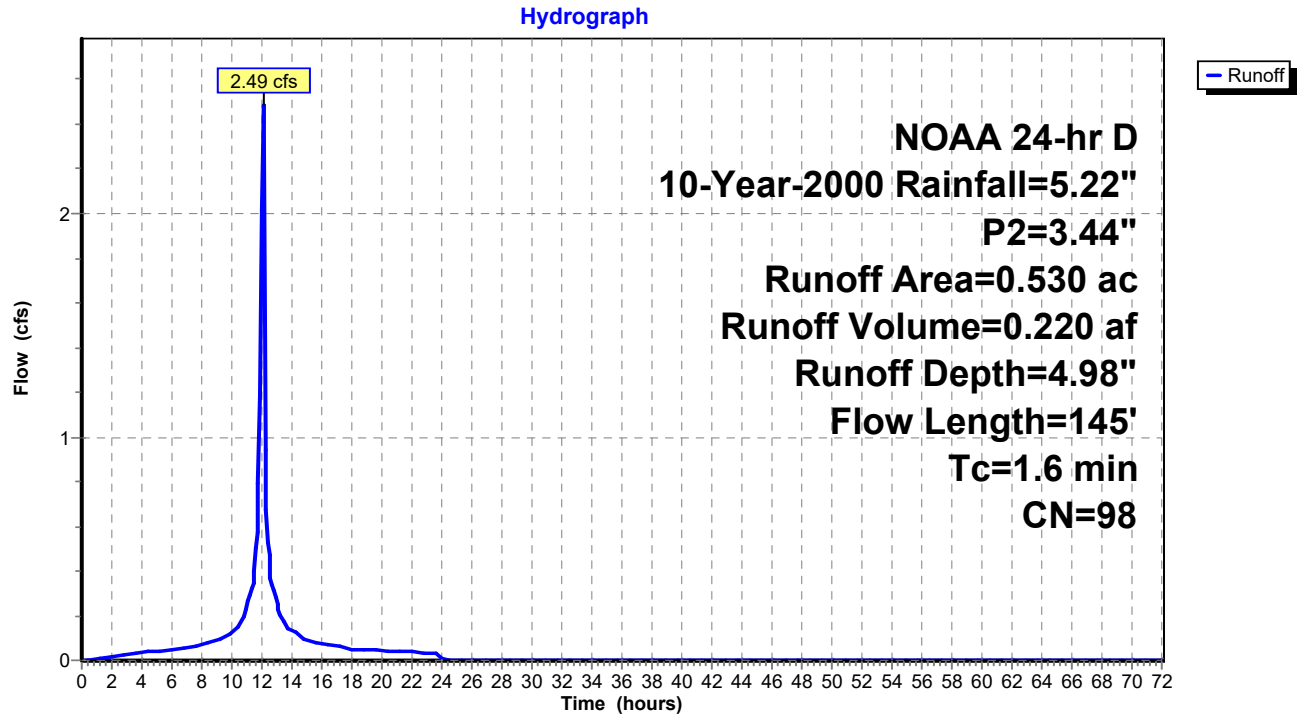
Runoff = 2.49 cfs @ 12.07 hrs, Volume= 0.220 af, Depth= 4.98"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

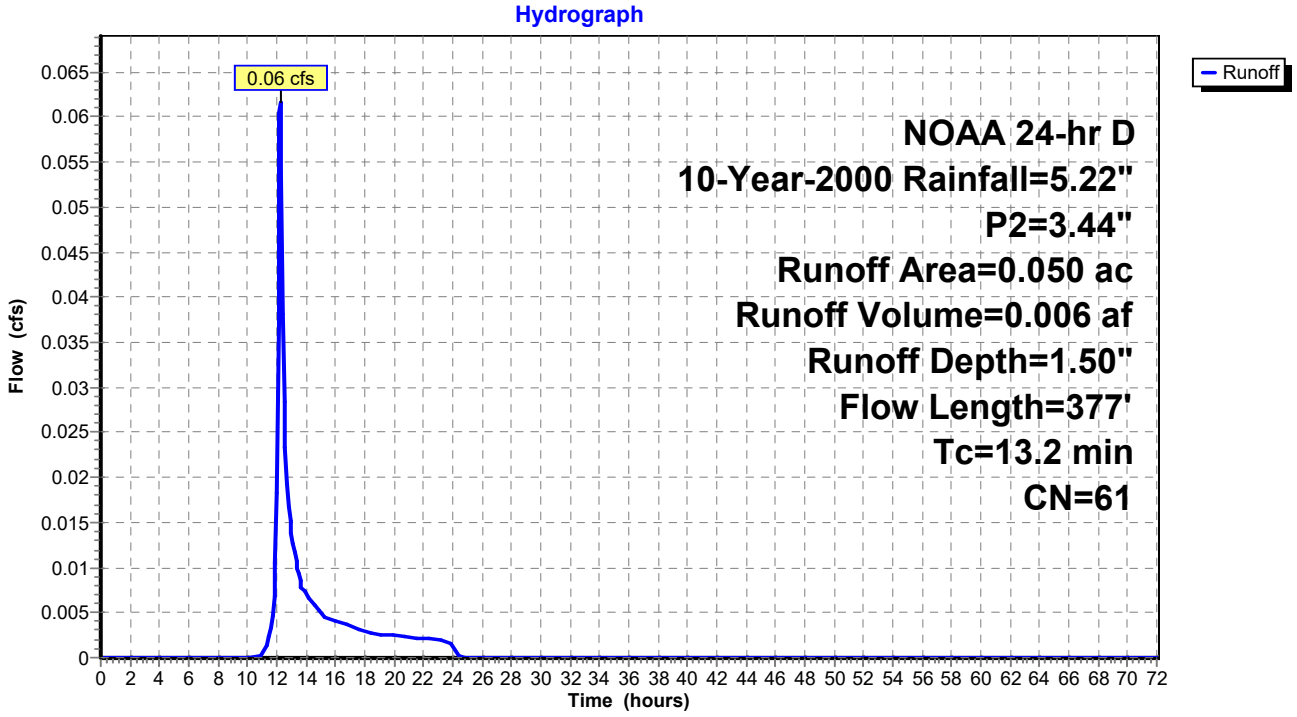
Runoff = 0.06 cfs @ 12.23 hrs, Volume= 0.006 af, Depth= 1.50"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

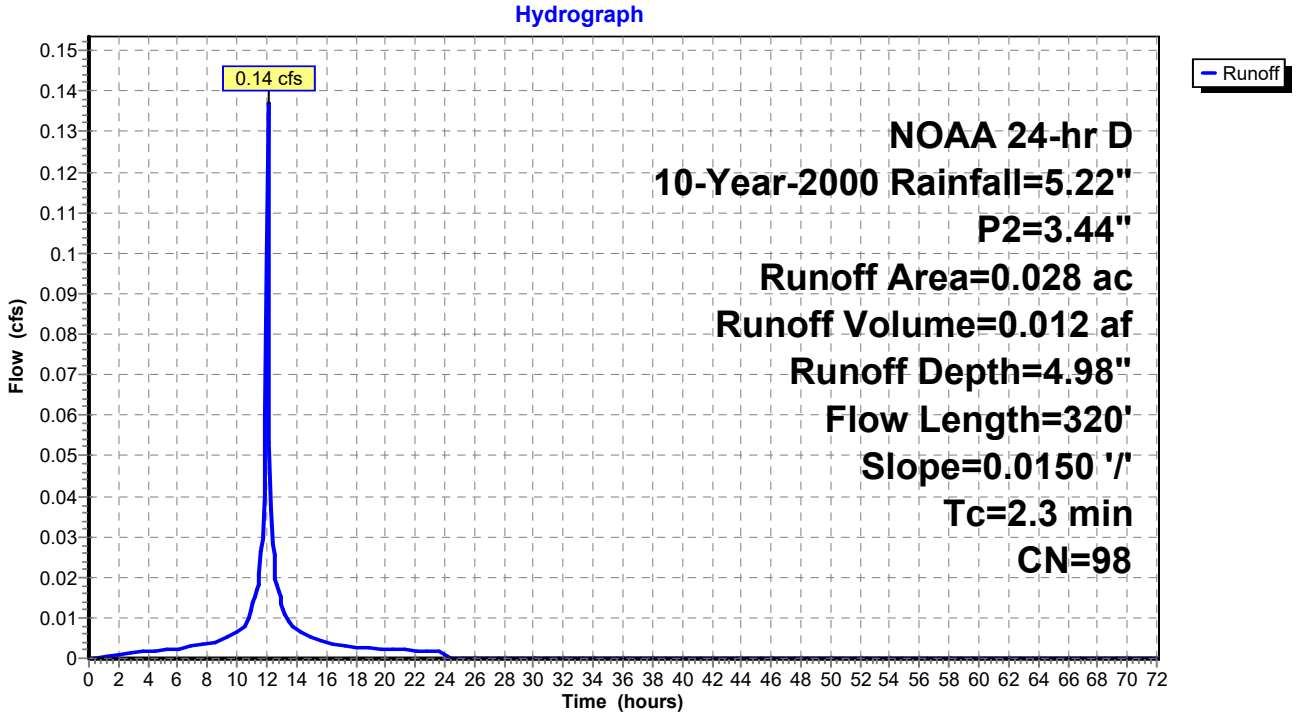
Runoff = 0.14 cfs @ 12.08 hrs, Volume= 0.012 af, Depth= 4.98"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.44"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

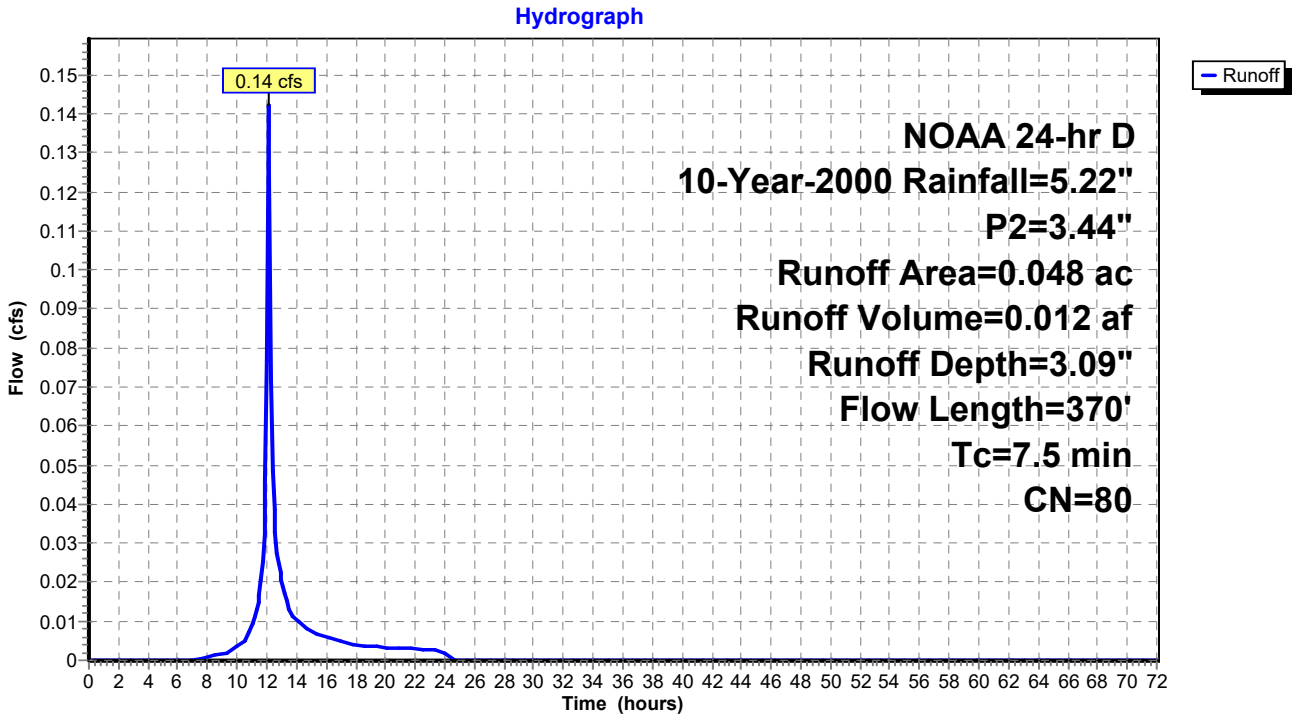
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 0.012 af, Depth= 3.09"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.44"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

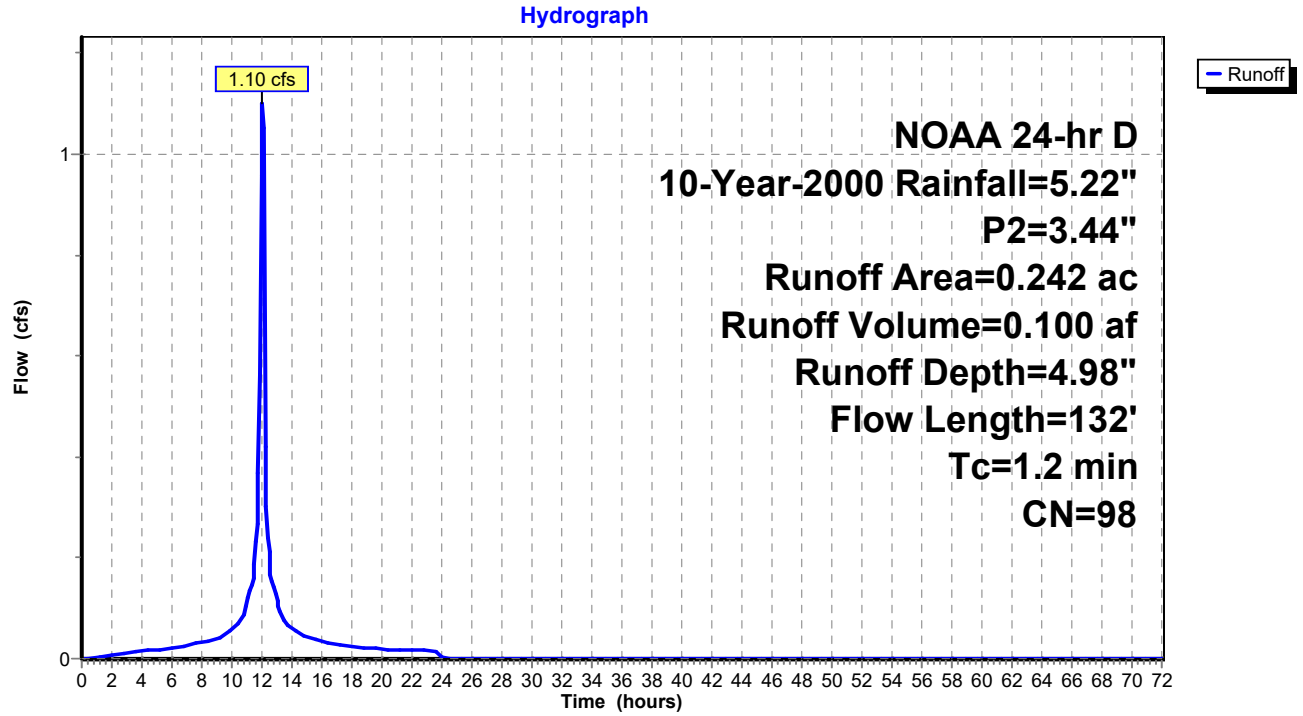
Runoff = 1.10 cfs @ 12.06 hrs, Volume= 0.100 af, Depth= 4.98"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.56		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.44"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

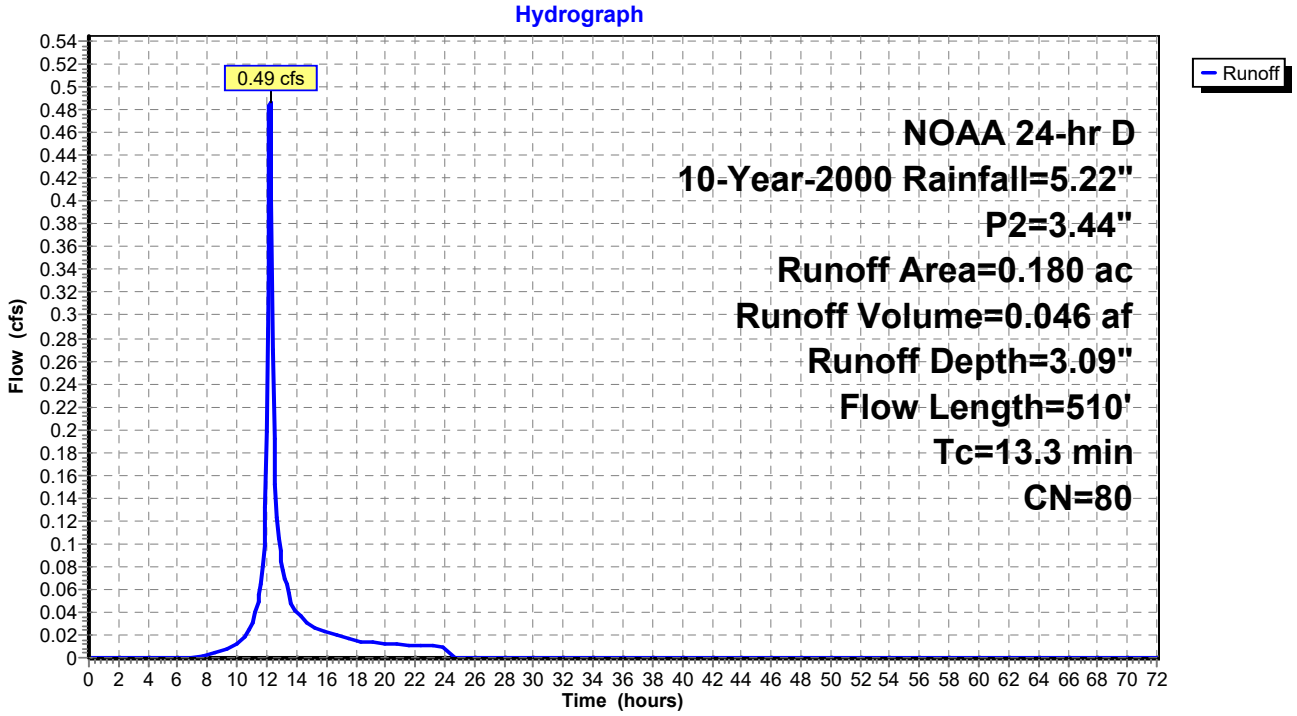
Runoff = 0.49 cfs @ 12.21 hrs, Volume= 0.046 af, Depth= 3.09"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

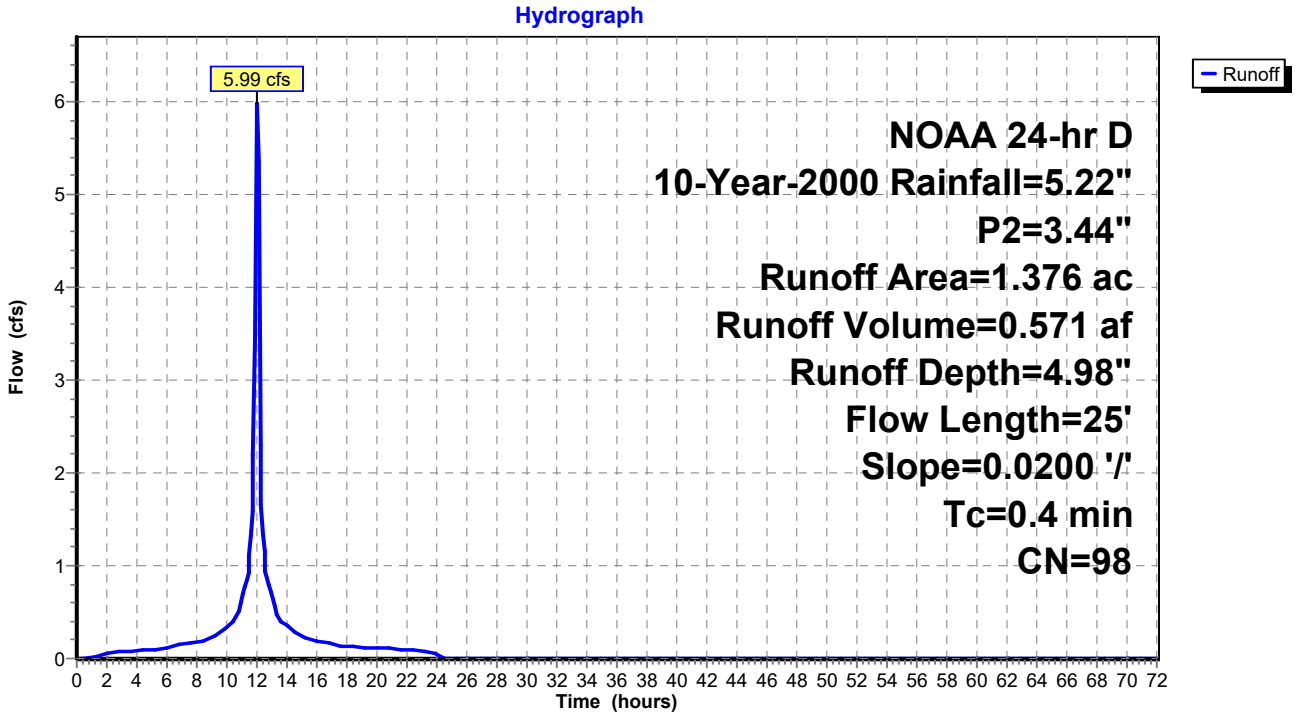
Runoff = 5.99 cfs @ 12.03 hrs, Volume= 0.571 af, Depth= 4.98"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.08		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.44"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

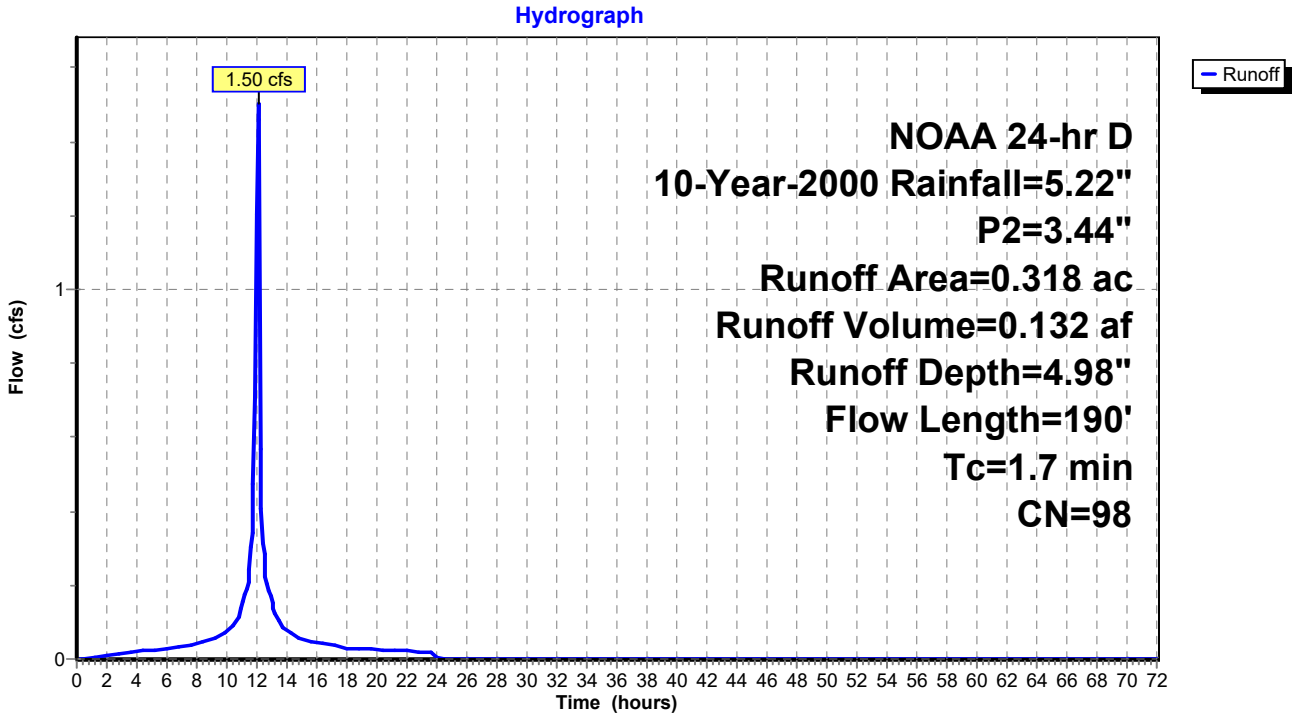
Runoff = 1.50 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 4.98"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

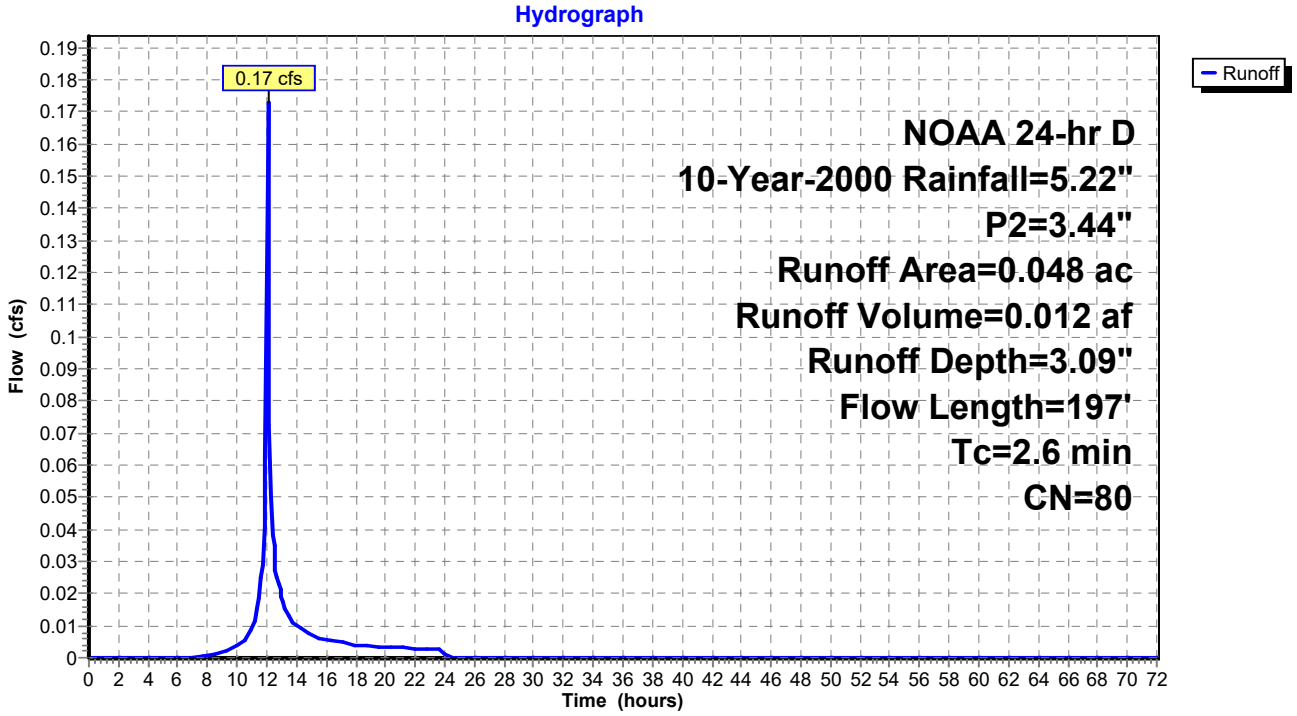
Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.012 af, Depth= 3.09"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2000 Rainfall=5.22", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 4.98" for 10-Year-2000 event
Inflow = 5.99 cfs @ 12.03 hrs, Volume= 0.571 af
Outflow = 1.37 cfs @ 12.41 hrs, Volume= 0.454 af, Atten= 77%, Lag= 22.3 min
Primary = 1.37 cfs @ 12.41 hrs, Volume= 0.454 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 132.27' @ 12.41 hrs Surf.Area= 10,094 sf Storage= 13,668 cf

Plug-Flow detention time= 311.3 min calculated for 0.453 af (79% of inflow)
Center-of-Mass det. time= 228.9 min (972.3 - 743.3)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

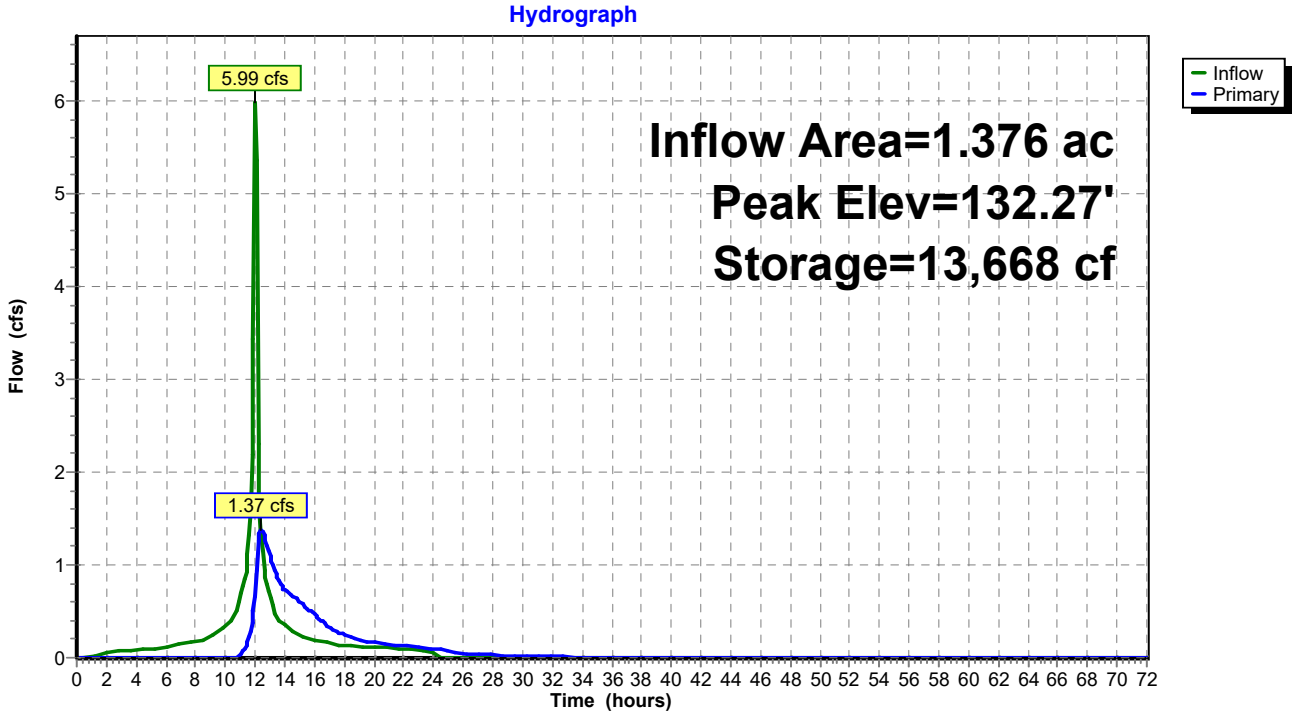
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.37 cfs @ 12.41 hrs HW=132.27' (Free Discharge)
└─**1=Culvert** (Passes 1.37 cfs of 8.28 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.90 cfs @ 4.32 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.47 cfs @ 1.47 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

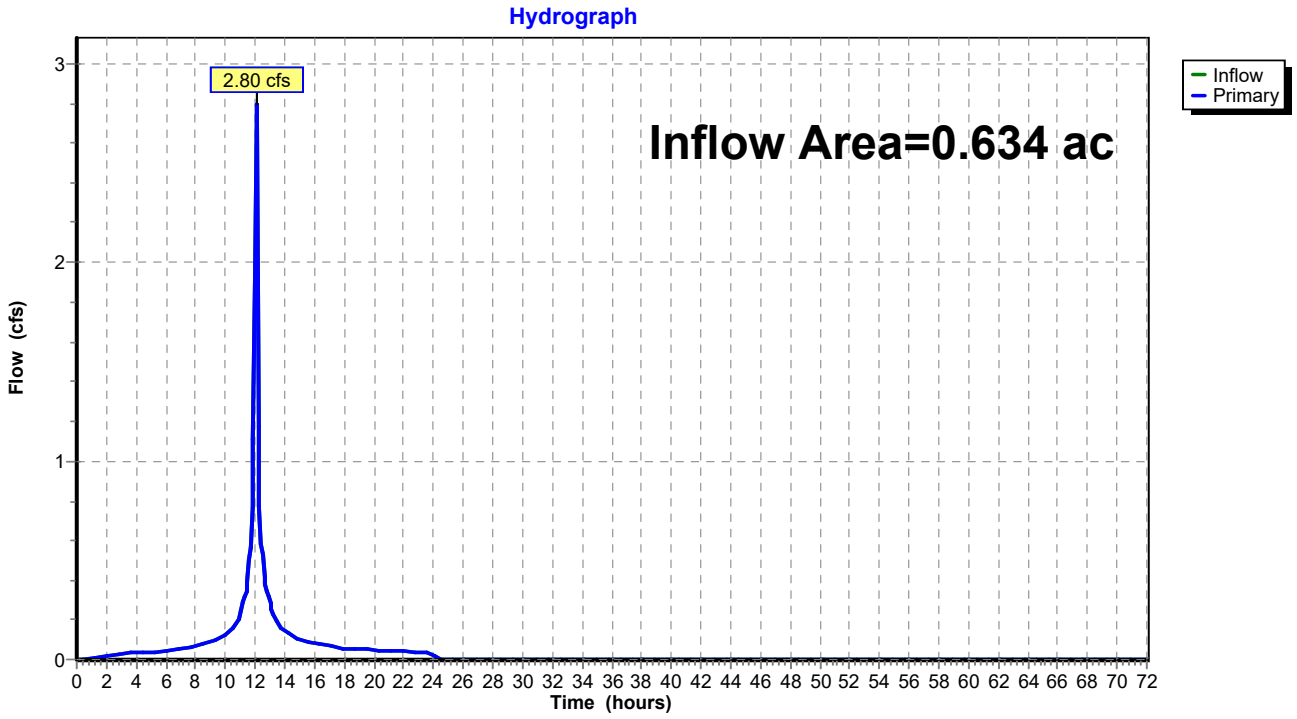


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 4.40" for 10-Year-2000 event
Inflow = 2.80 cfs @ 12.08 hrs, Volume= 0.233 af
Primary = 2.80 cfs @ 12.08 hrs, Volume= 0.233 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

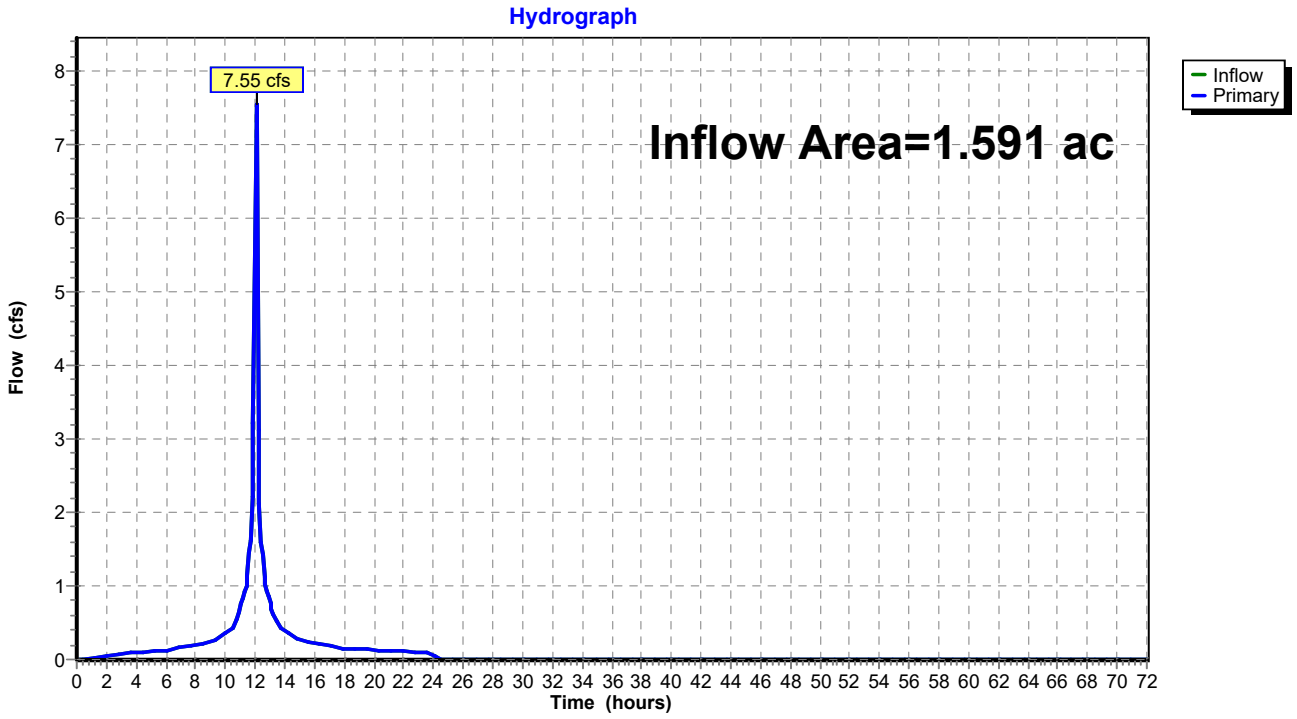


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 4.87" for 10-Year-2000 event
Inflow = 7.55 cfs @ 12.08 hrs, Volume= 0.646 af
Primary = 7.55 cfs @ 12.08 hrs, Volume= 0.646 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

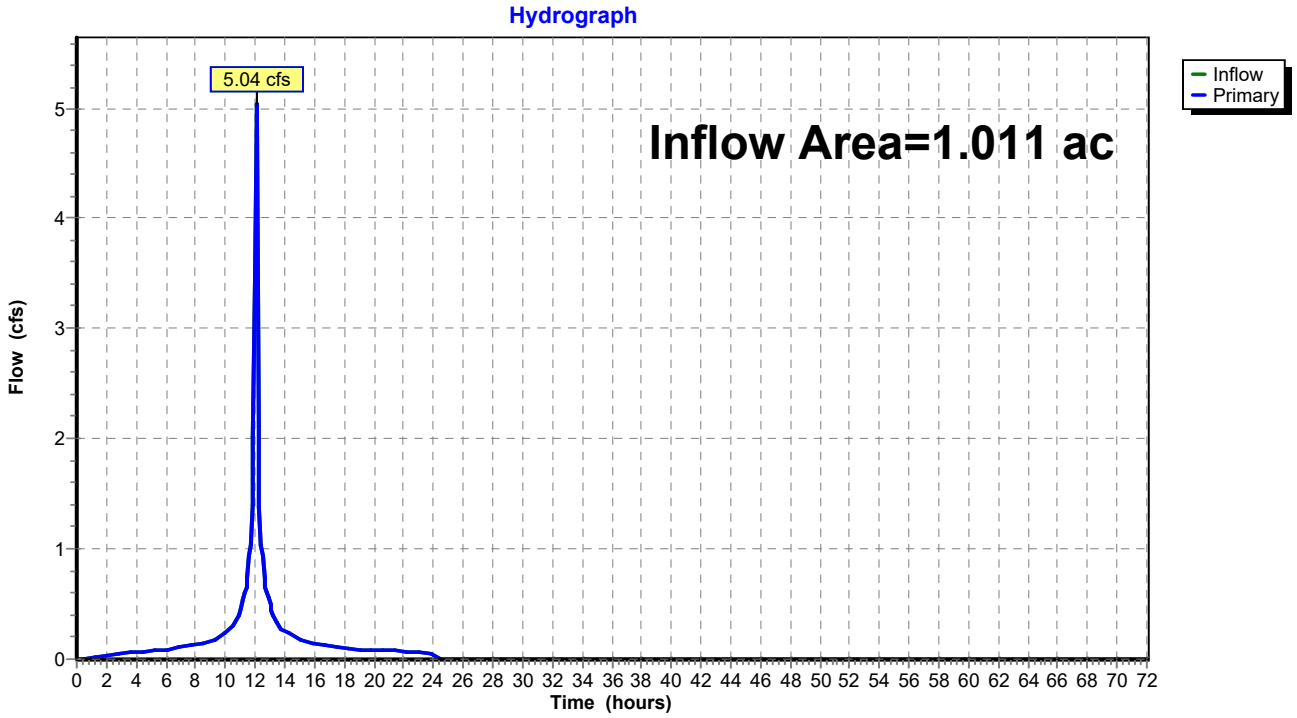


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 4.98" for 10-Year-2000 event
Inflow = 5.04 cfs @ 12.08 hrs, Volume= 0.420 af
Primary = 5.04 cfs @ 12.08 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

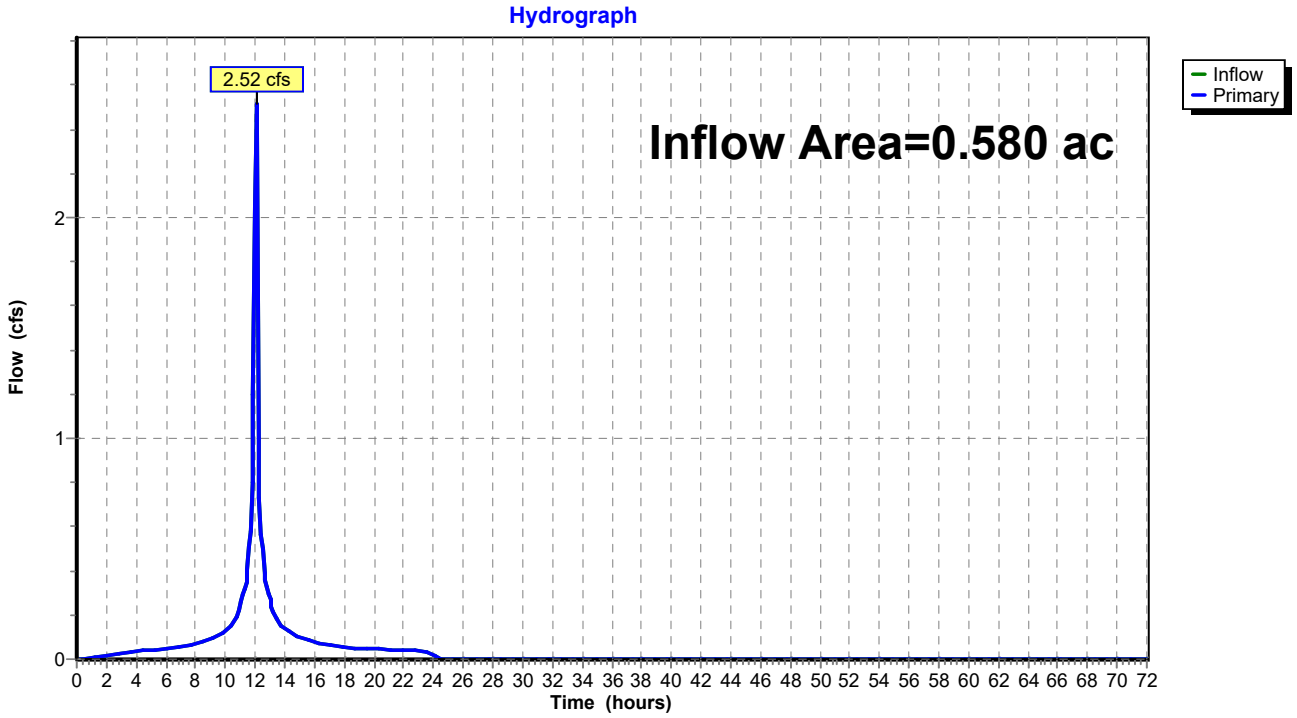


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 4.68" for 10-Year-2000 event
Inflow = 2.52 cfs @ 12.07 hrs, Volume= 0.226 af
Primary = 2.52 cfs @ 12.07 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

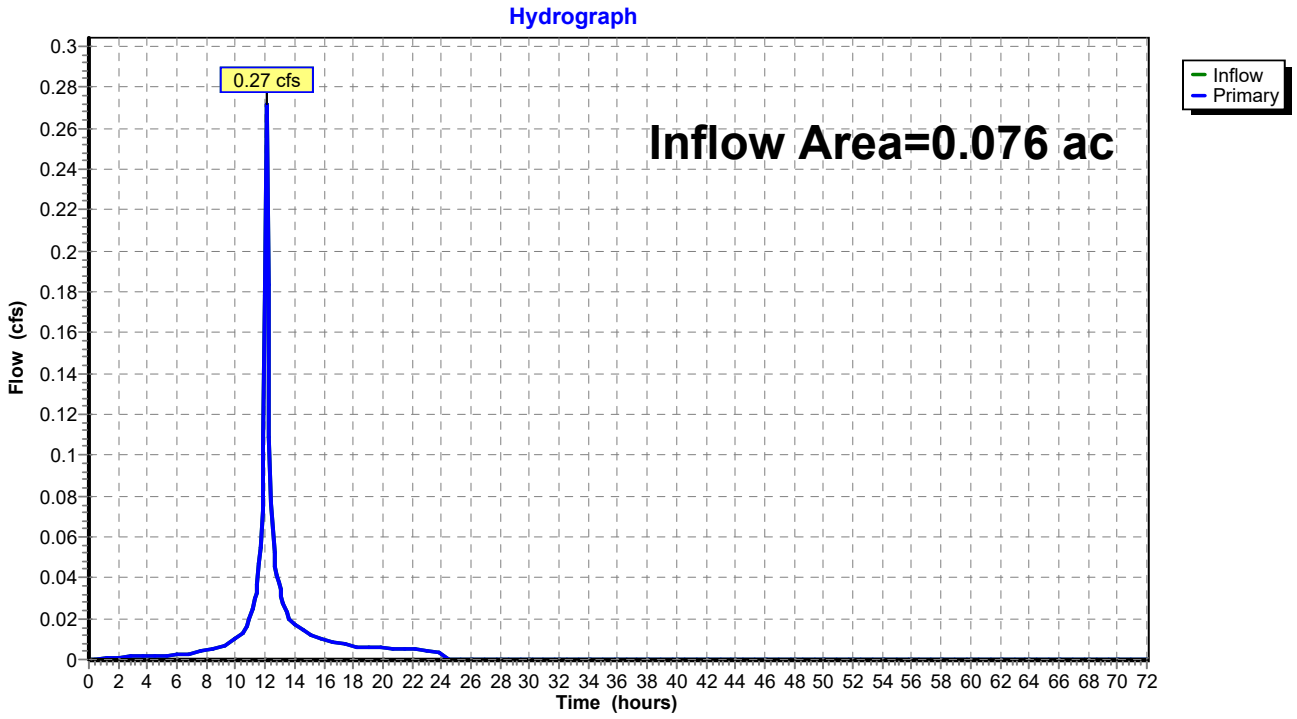


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 3.78" for 10-Year-2000 event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 0.024 af
Primary = 0.27 cfs @ 12.10 hrs, Volume= 0.024 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

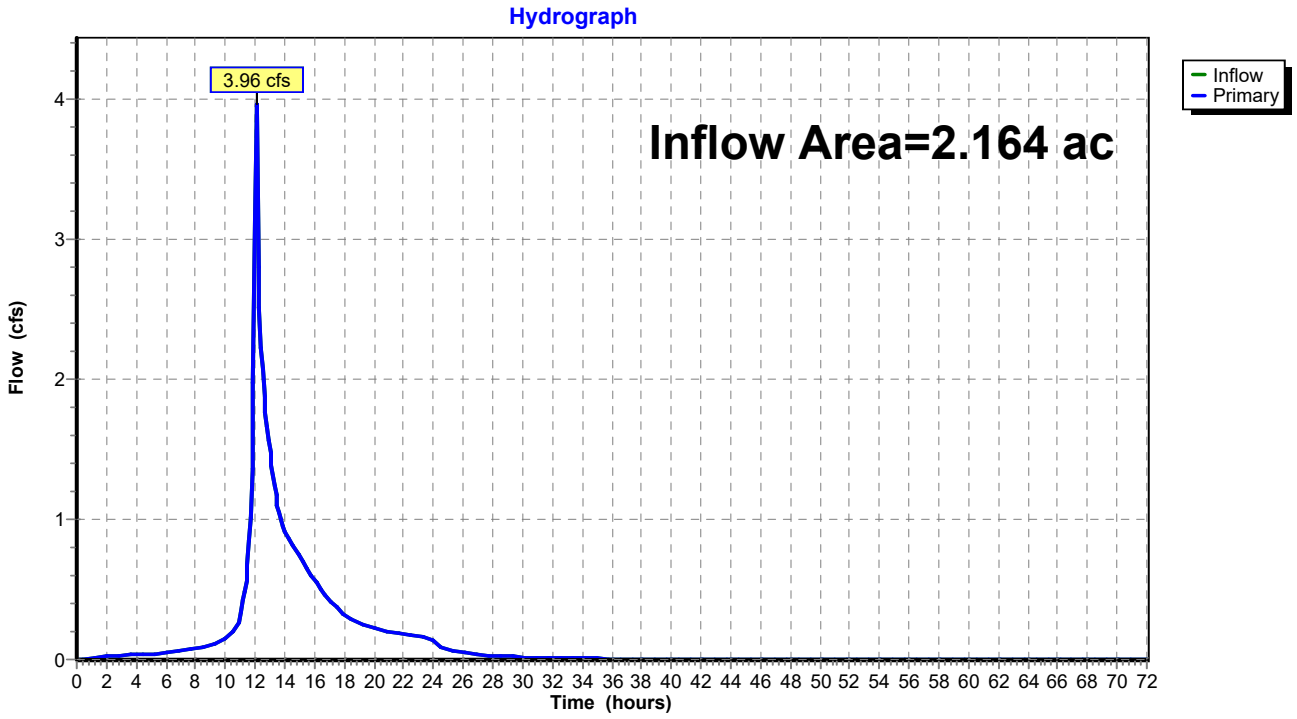


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 4.13" for 10-Year-2000 event
Inflow = 3.96 cfs @ 12.09 hrs, Volume= 0.745 af
Primary = 3.96 cfs @ 12.09 hrs, Volume= 0.745 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

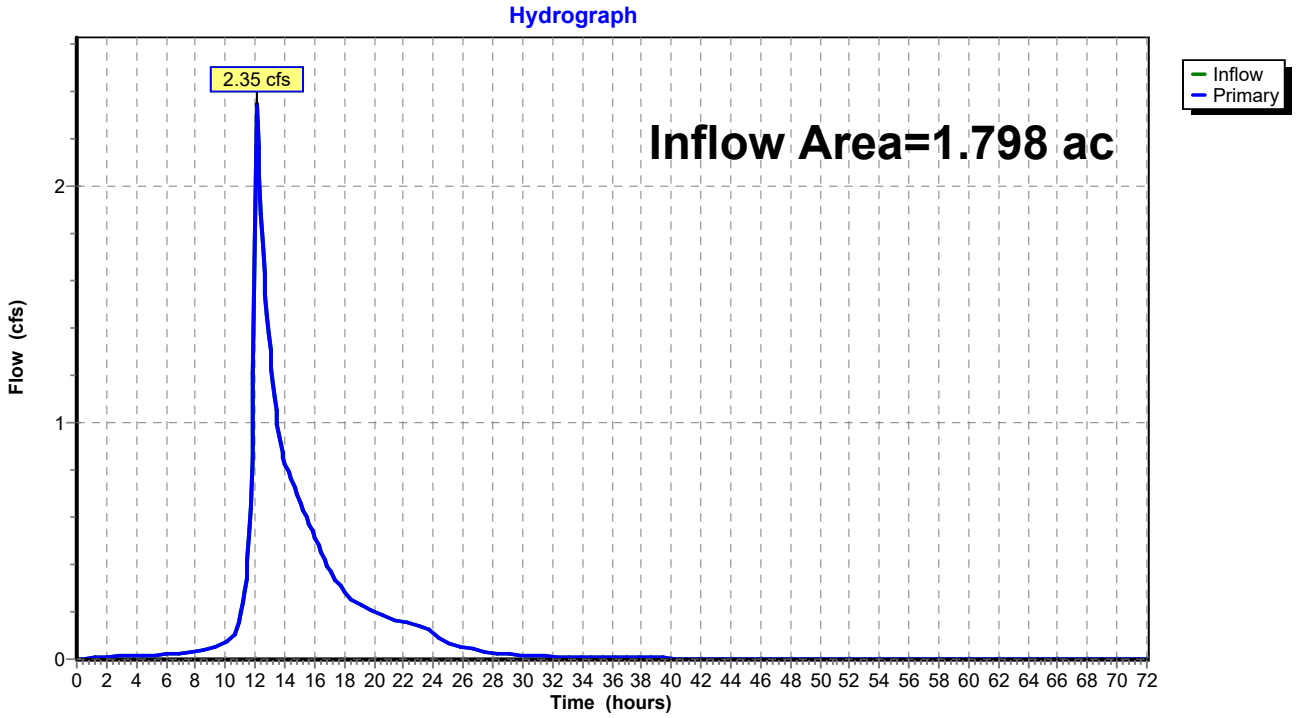


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 4.01" for 10-Year-2000 event
Inflow = 2.35 cfs @ 12.13 hrs, Volume= 0.600 af
Primary = 2.35 cfs @ 12.13 hrs, Volume= 0.600 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

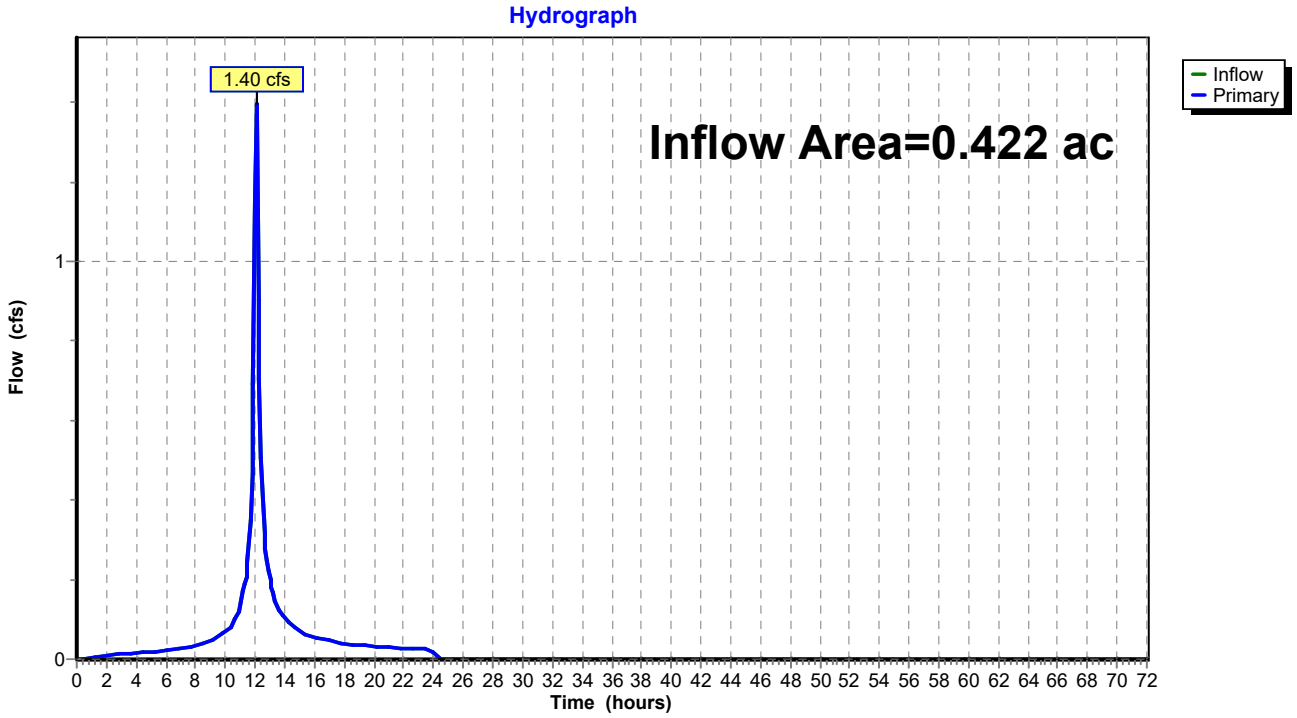


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 4.17" for 10-Year-2000 event
Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.147 af
Primary = 1.40 cfs @ 12.08 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

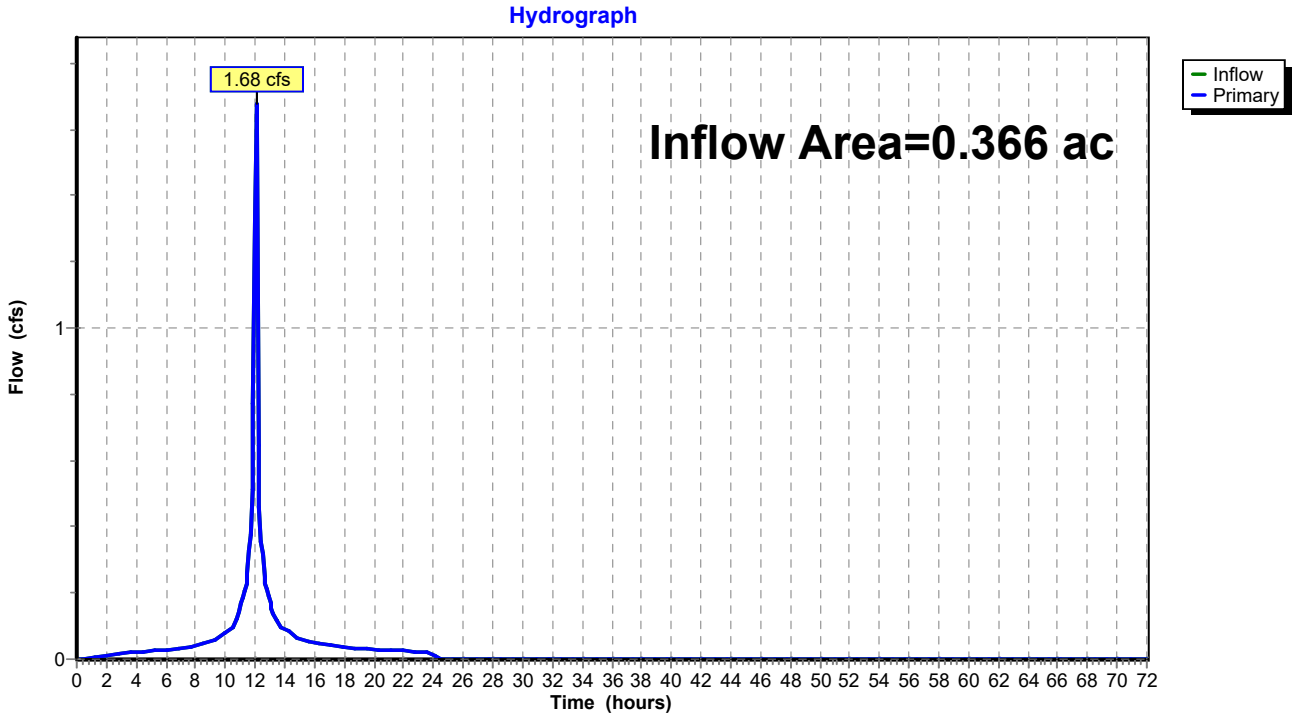


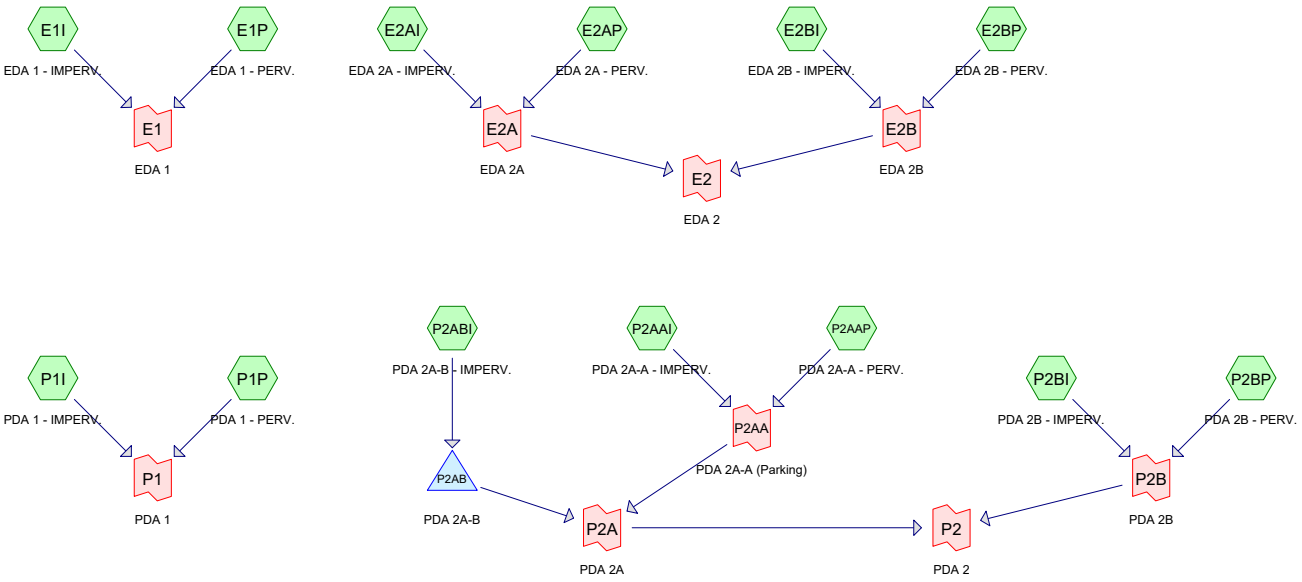
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 4.73" for 10-Year-2000 event
Inflow = 1.68 cfs @ 12.07 hrs, Volume= 0.144 af
Primary = 1.68 cfs @ 12.07 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

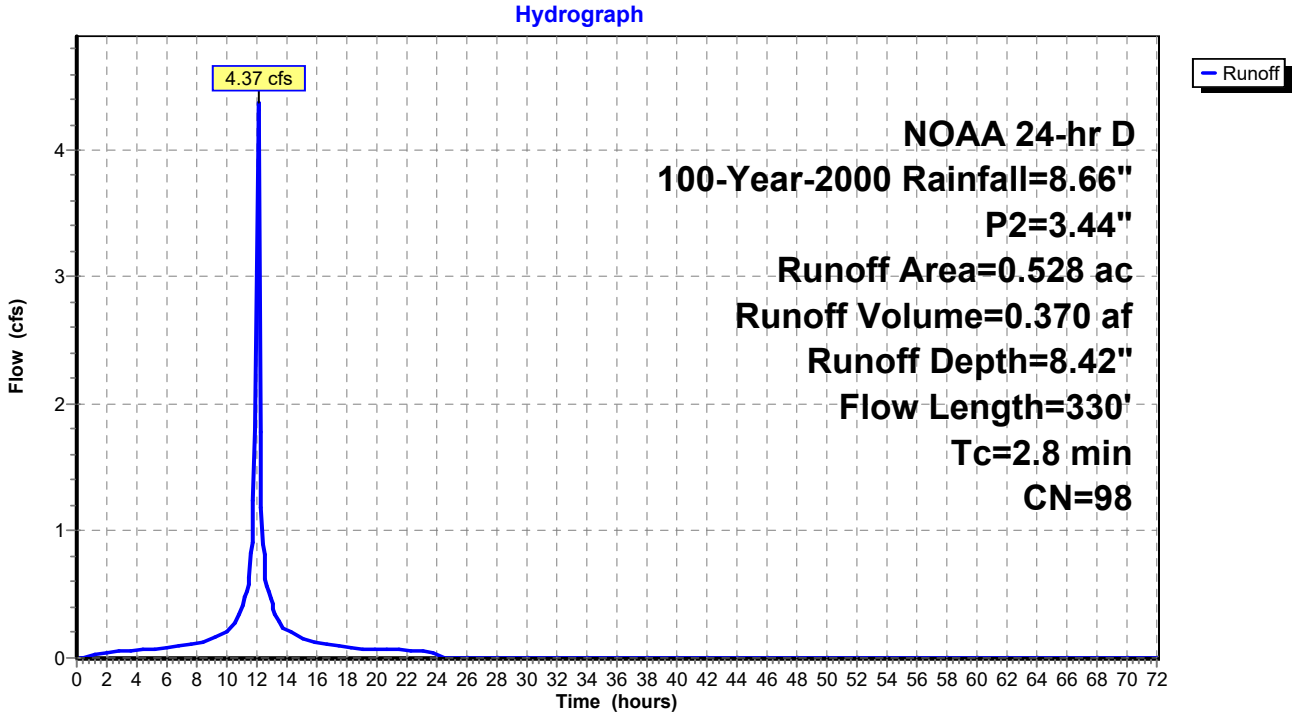
Runoff = 4.37 cfs @ 12.08 hrs, Volume= 0.370 af, Depth= 8.42"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.44"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

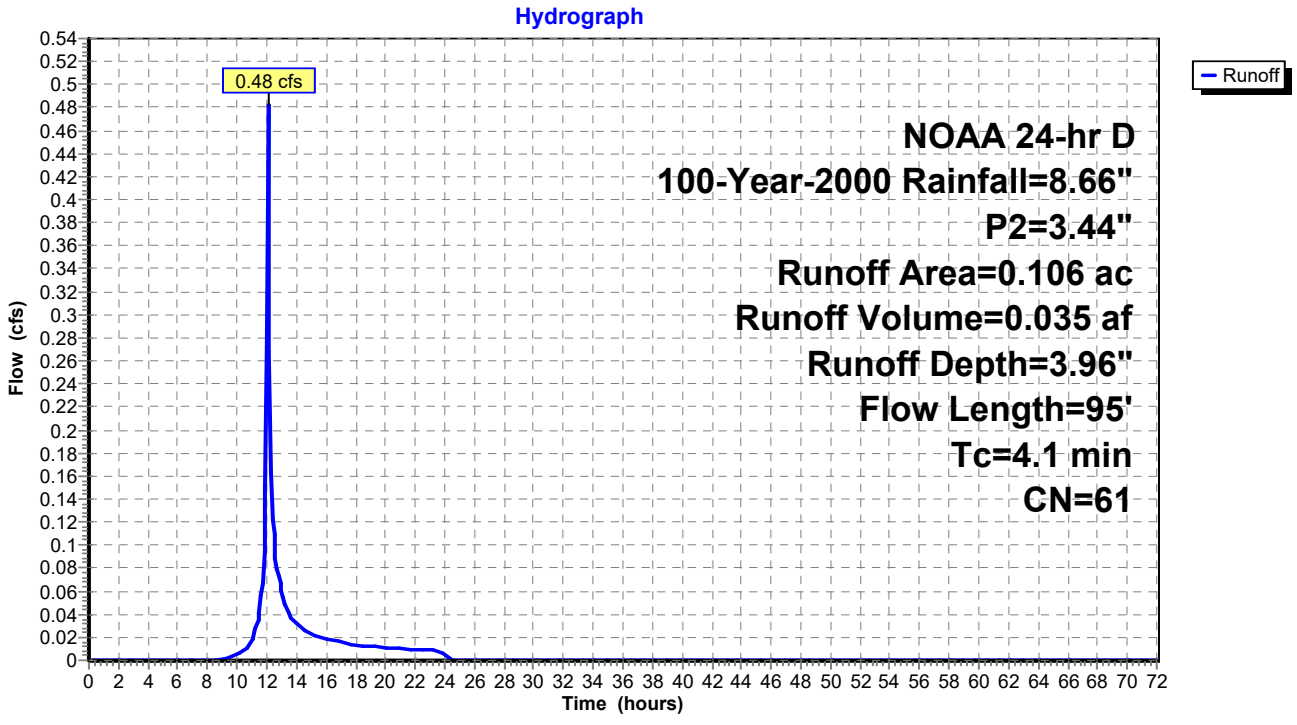
Runoff = 0.48 cfs @ 12.10 hrs, Volume= 0.035 af, Depth= 3.96"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.44"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

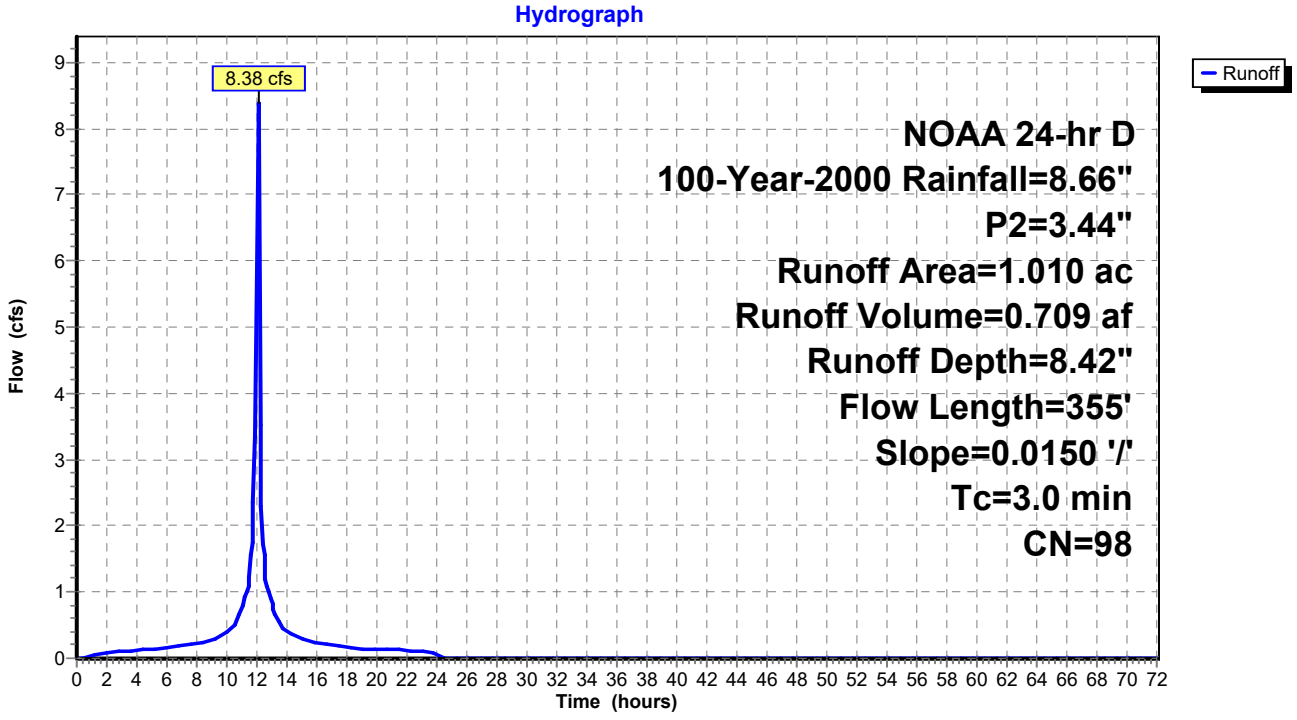
Runoff = 8.38 cfs @ 12.08 hrs, Volume= 0.709 af, Depth= 8.42"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.44"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

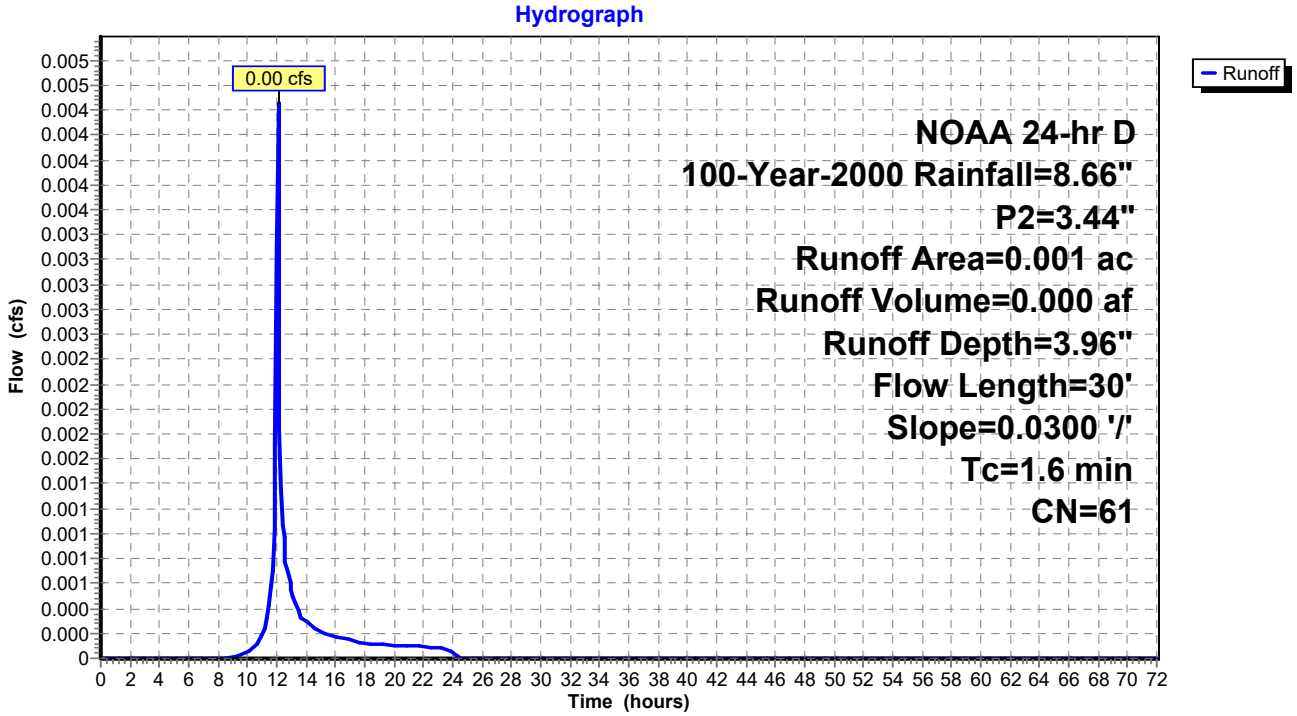
Runoff = 0.00 cfs @ 12.08 hrs, Volume= 0.000 af, Depth= 3.96"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.44"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

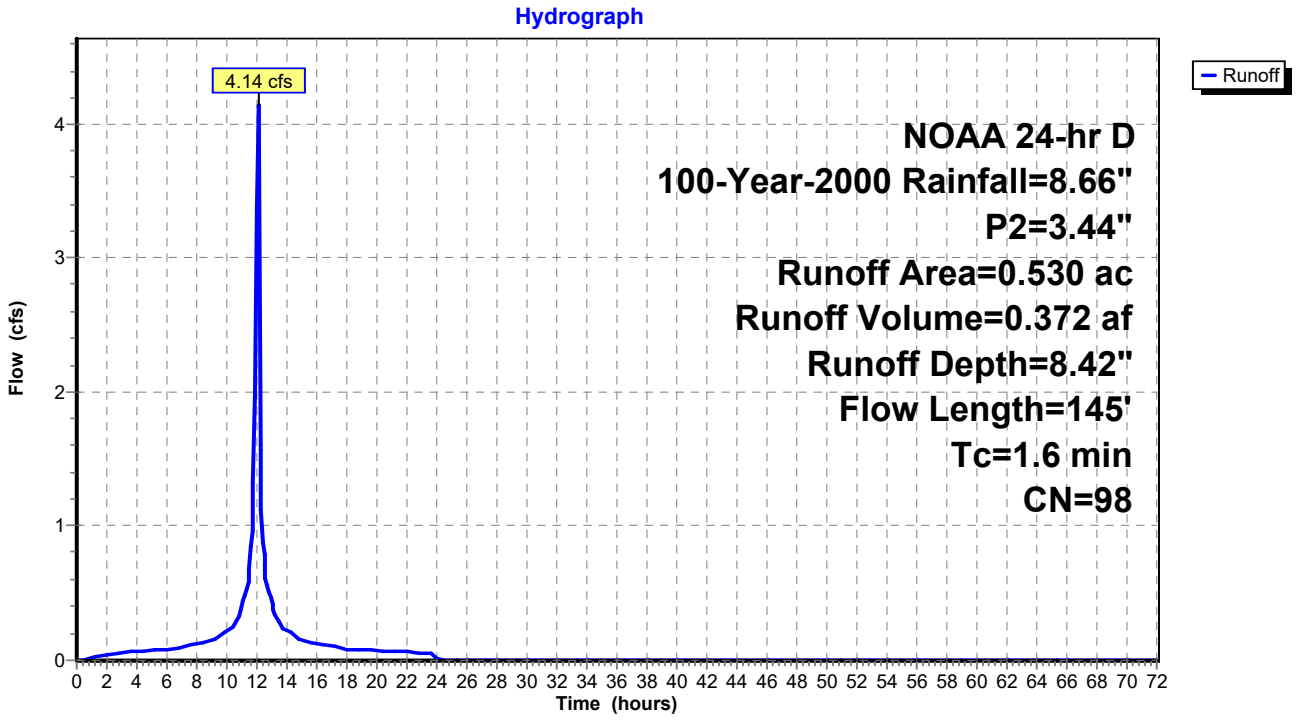
Runoff = 4.14 cfs @ 12.07 hrs, Volume= 0.372 af, Depth= 8.42"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

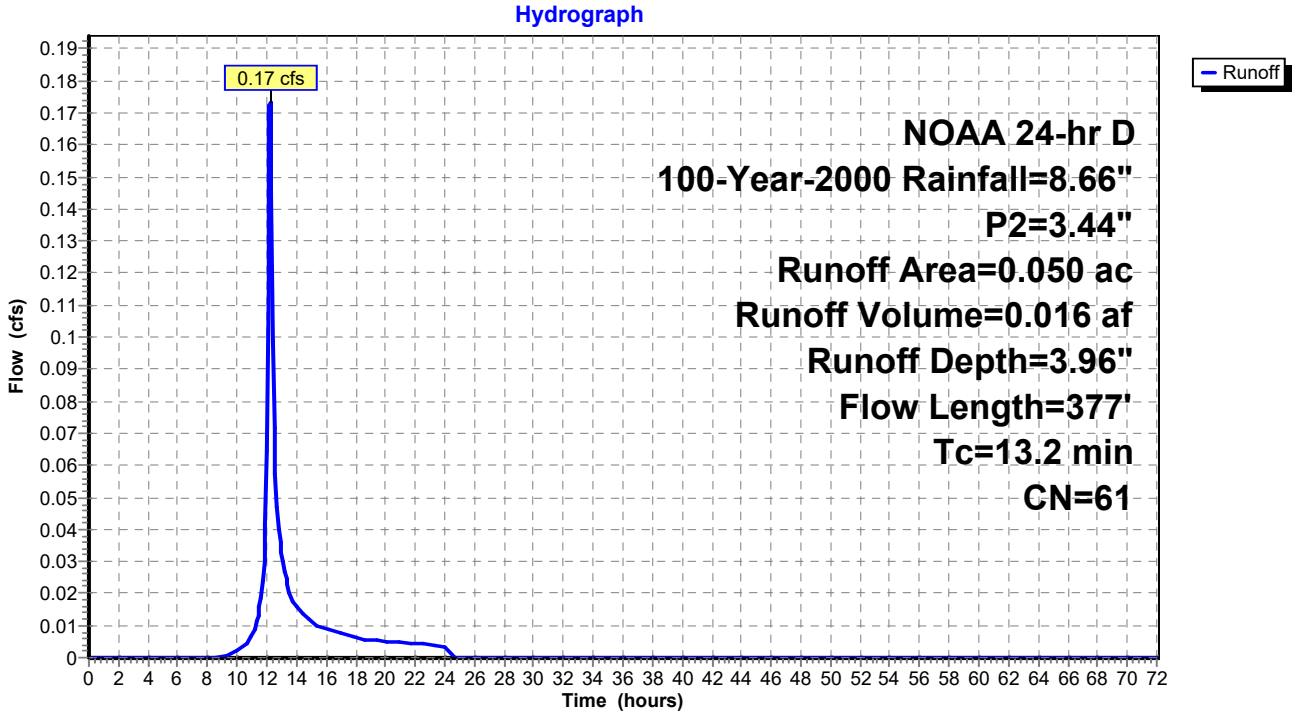
Runoff = 0.17 cfs @ 12.22 hrs, Volume= 0.016 af, Depth= 3.96"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

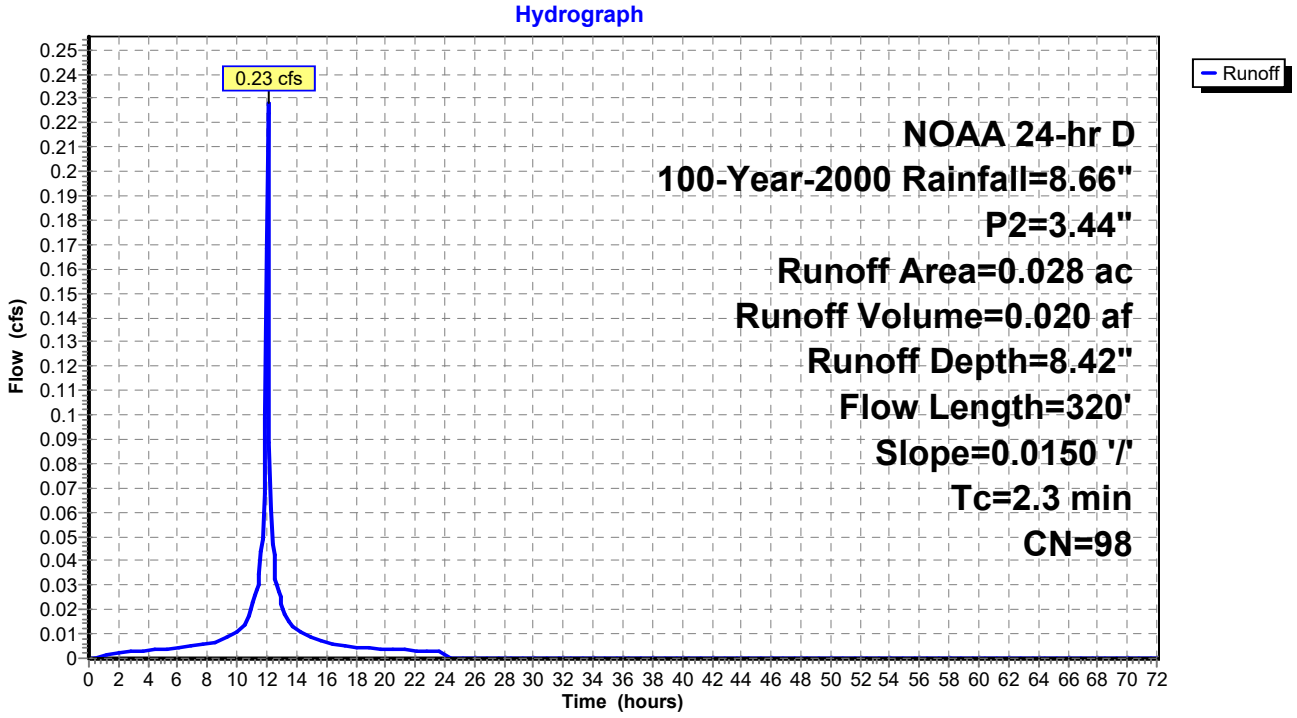
Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.020 af, Depth= 8.42"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.44"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

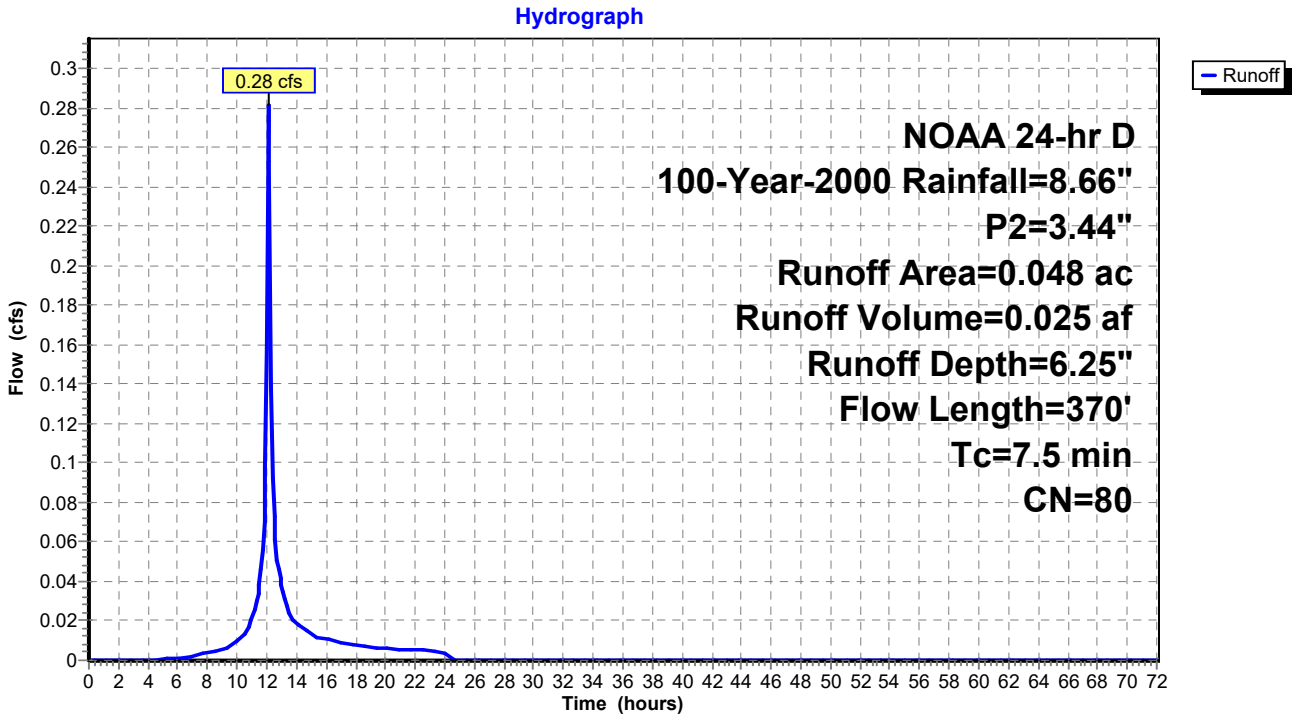
Runoff = 0.28 cfs @ 12.14 hrs, Volume= 0.025 af, Depth= 6.25"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.44"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

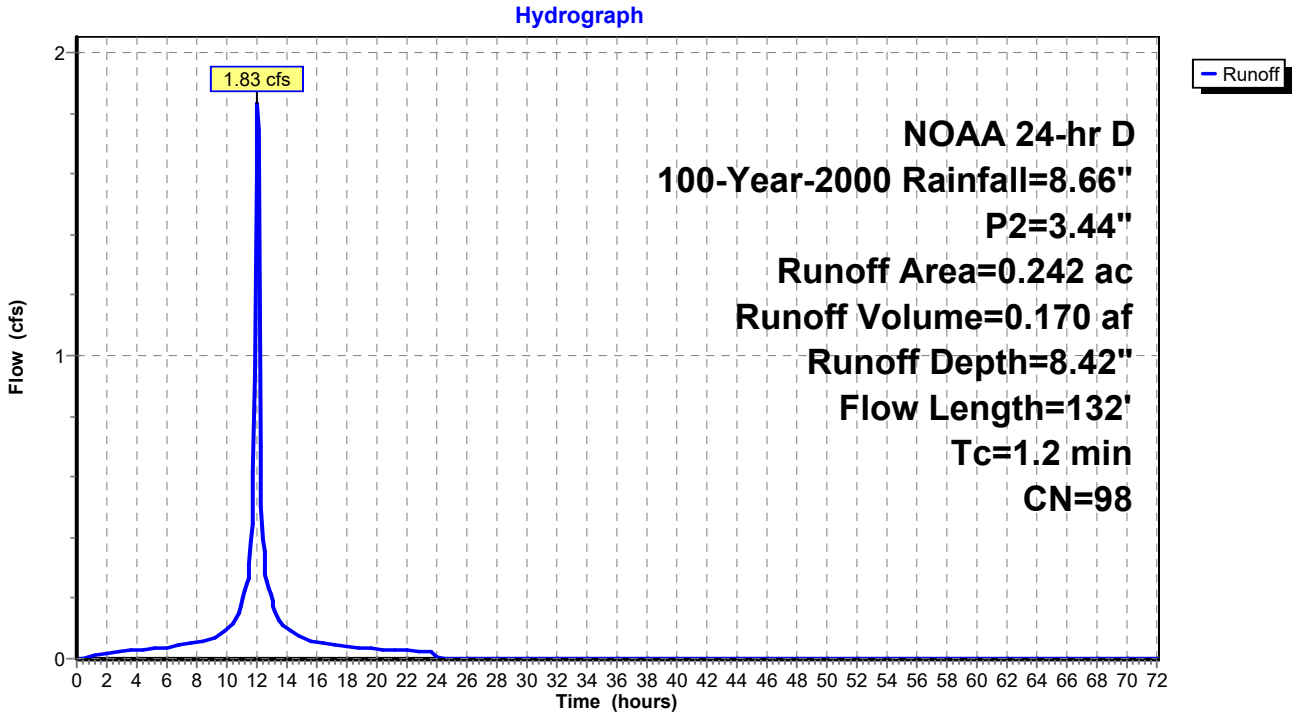
Runoff = 1.83 cfs @ 12.06 hrs, Volume= 0.170 af, Depth= 8.42"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.56		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.44"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

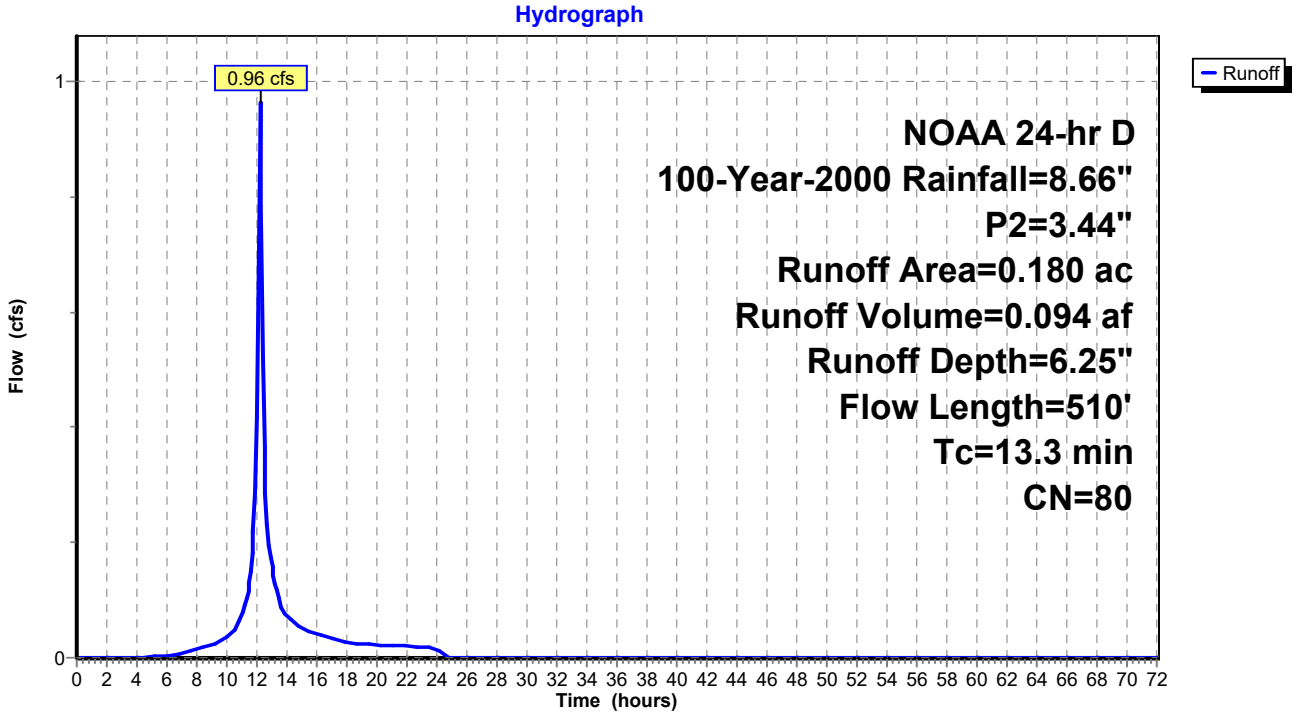
Runoff = 0.96 cfs @ 12.21 hrs, Volume= 0.094 af, Depth= 6.25"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

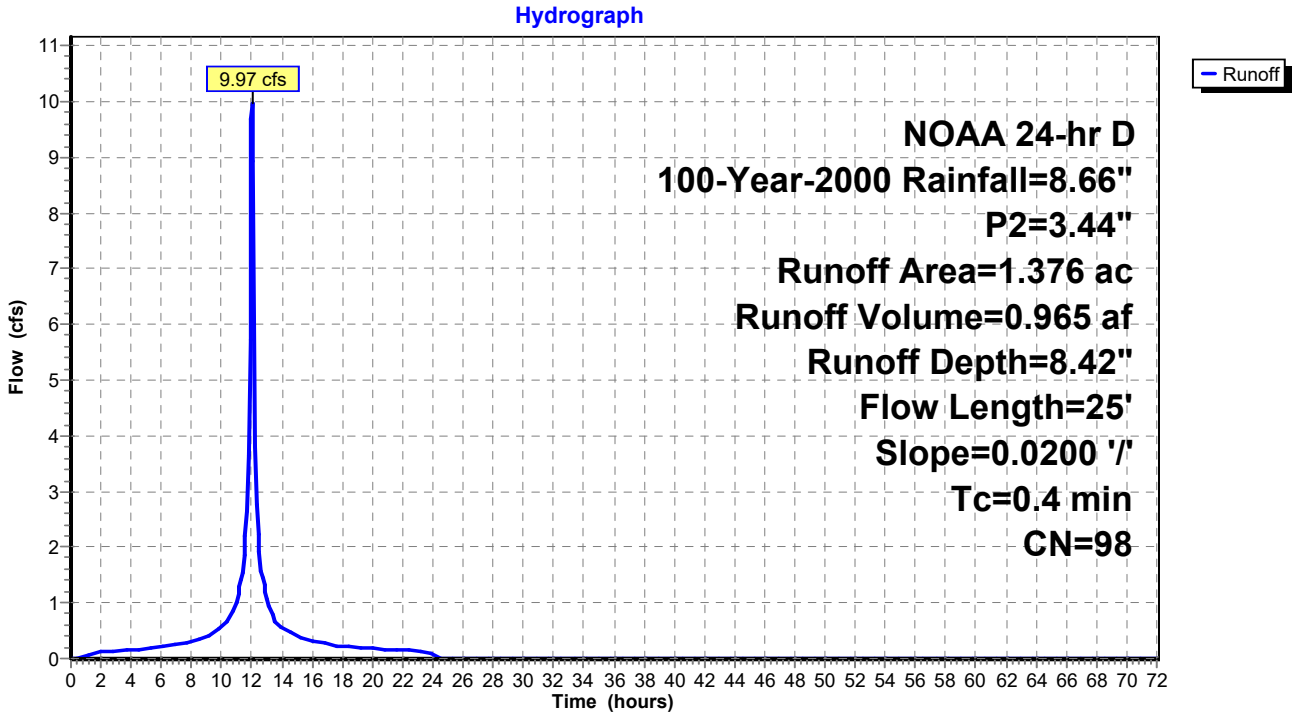
Runoff = 9.97 cfs @ 12.03 hrs, Volume= 0.965 af, Depth= 8.42"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.08		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.44"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

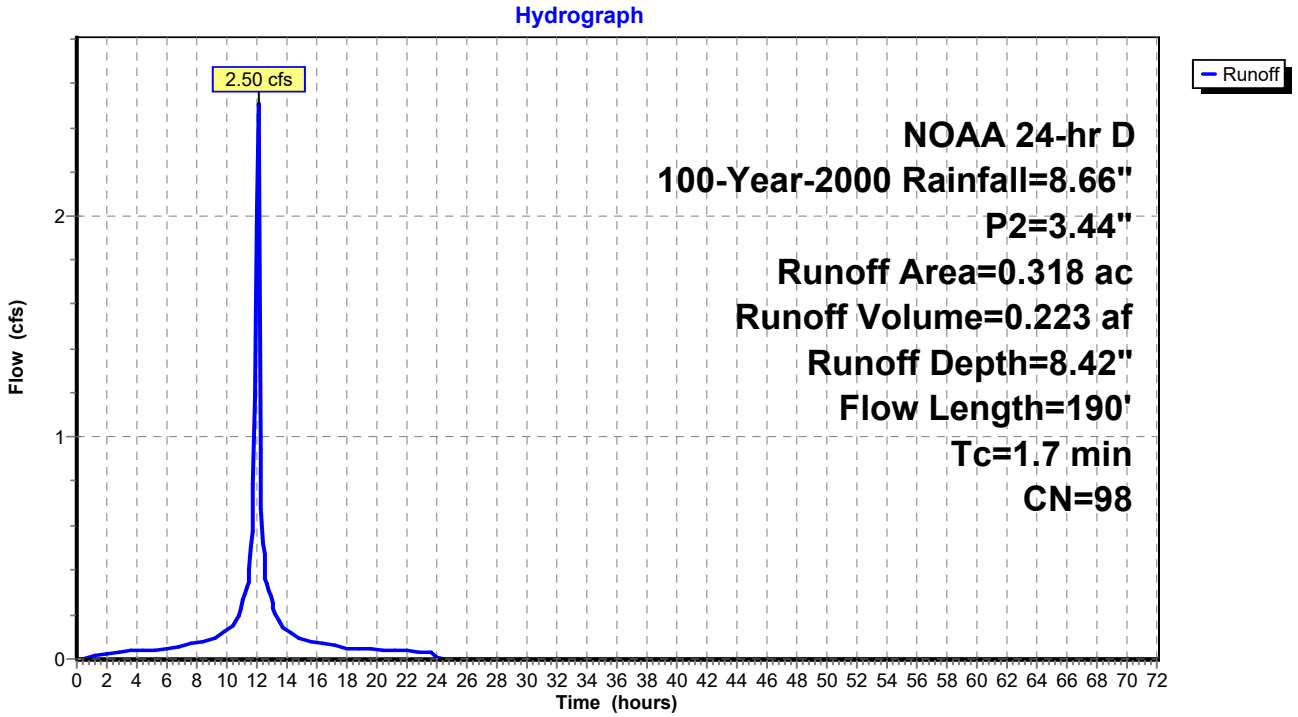
Runoff = 2.50 cfs @ 12.07 hrs, Volume= 0.223 af, Depth= 8.42"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

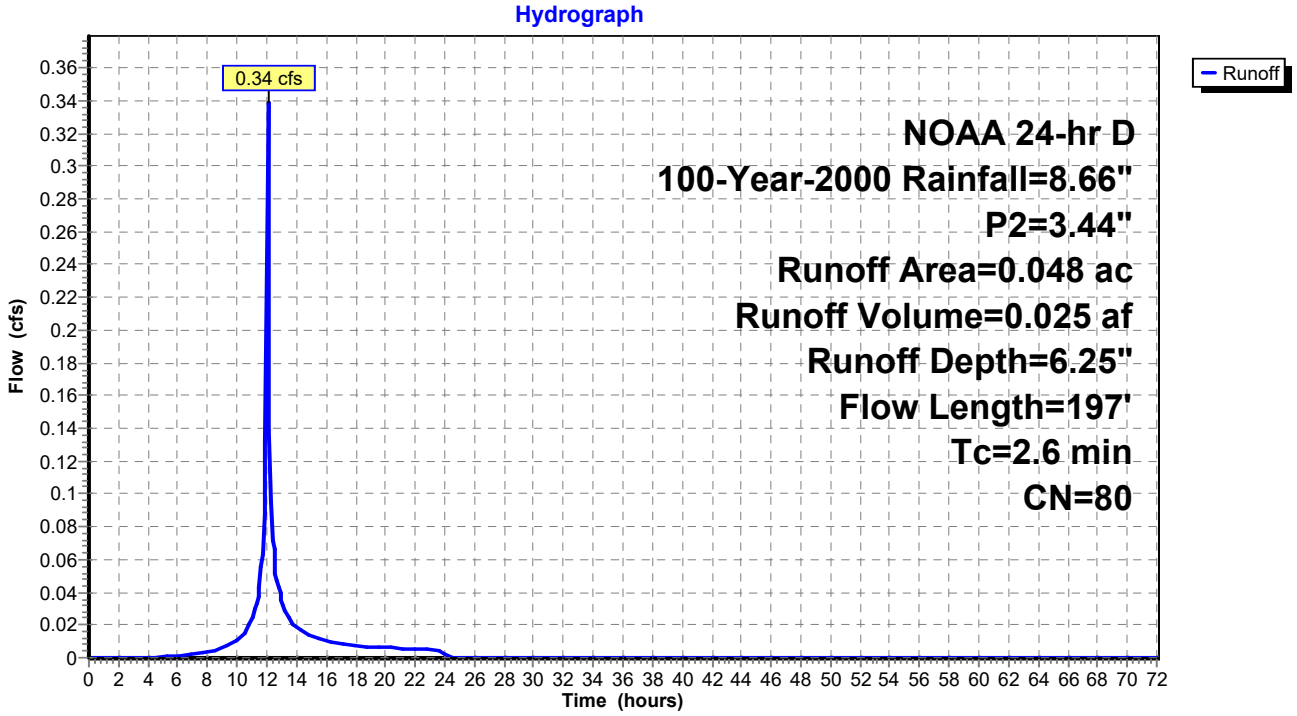
Runoff = 0.34 cfs @ 12.08 hrs, Volume= 0.025 af, Depth= 6.25"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2000 Rainfall=8.66", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 8.42" for 100-Year-2000 event
Inflow = 9.97 cfs @ 12.03 hrs, Volume= 0.965 af
Outflow = 4.44 cfs @ 12.22 hrs, Volume= 0.848 af, Atten= 55%, Lag= 11.1 min
Primary = 4.44 cfs @ 12.22 hrs, Volume= 0.848 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 132.88' @ 12.22 hrs Surf.Area= 9,833 sf Storage= 18,686 cf

Plug-Flow detention time= 239.1 min calculated for 0.848 af (88% of inflow)
Center-of-Mass det. time= 176.5 min (912.3 - 735.8)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

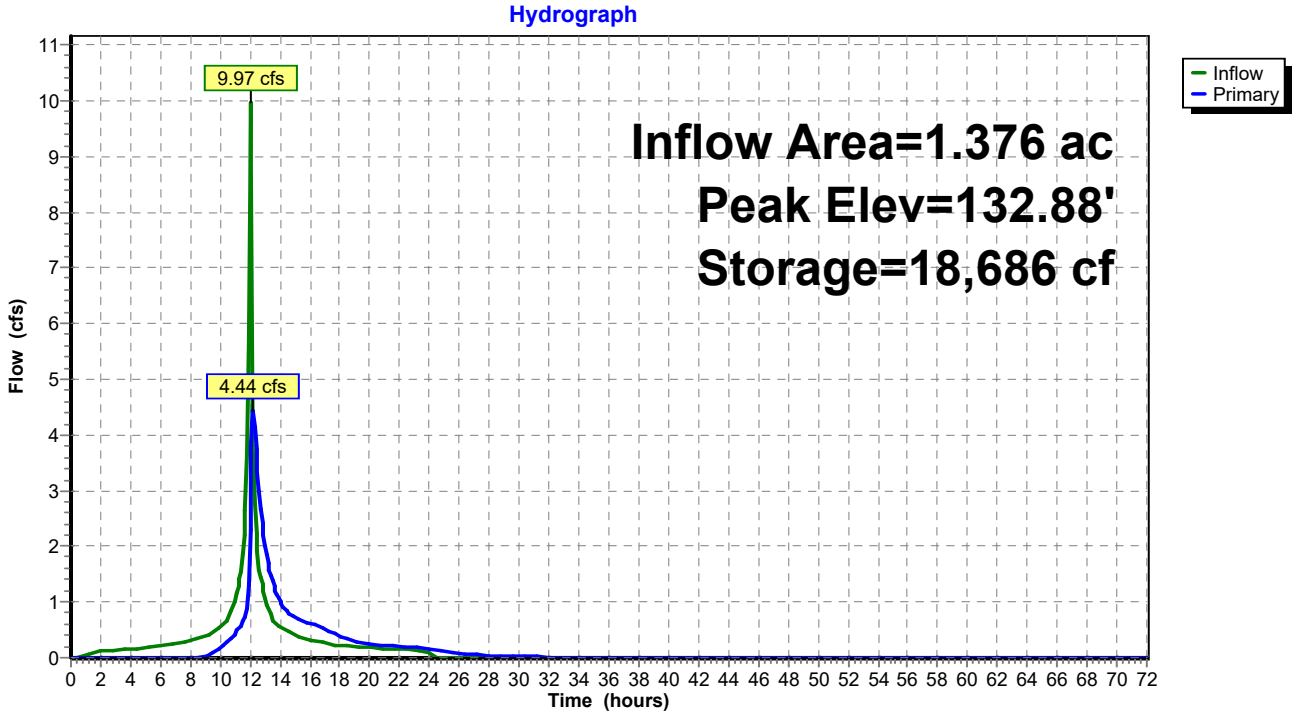
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.37 cfs @ 12.22 hrs HW=132.86' (Free Discharge)
└─**1=Culvert** (Passes 4.37 cfs of 9.92 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.19 cfs @ 5.70 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 3.18 cfs @ 3.07 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

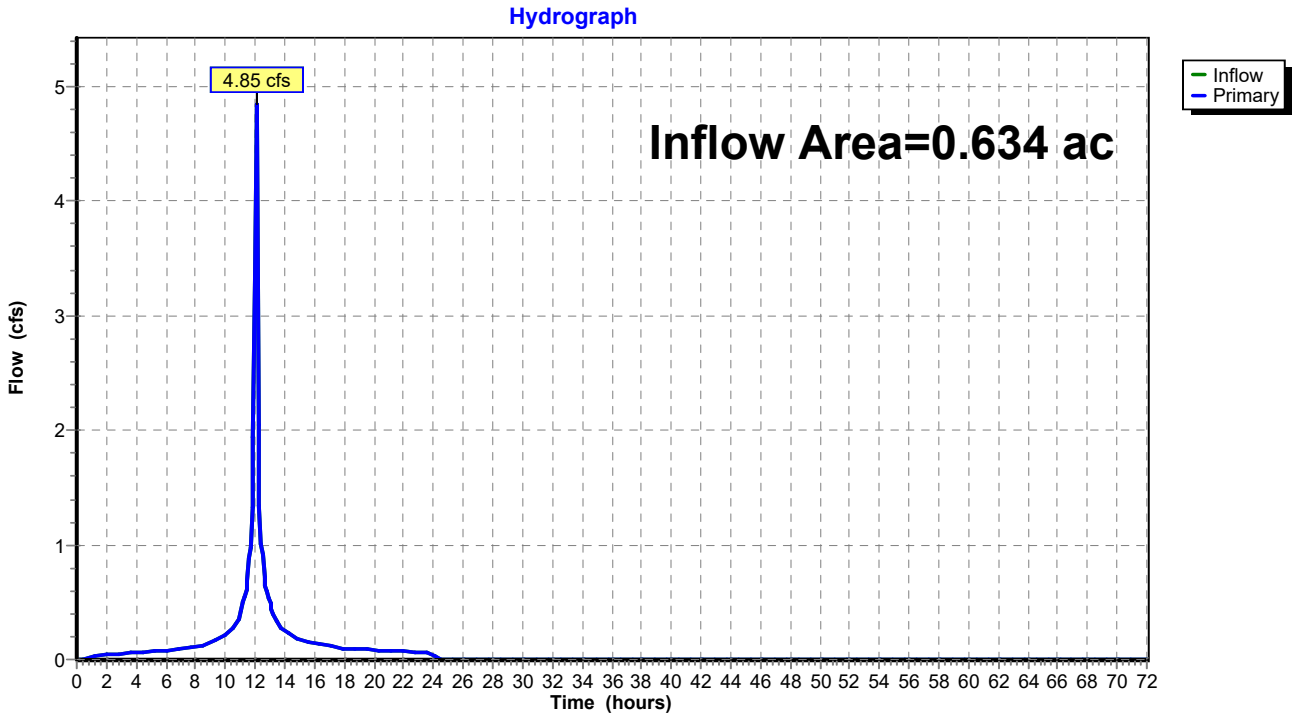


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 7.67" for 100-Year-2000 event
Inflow = 4.85 cfs @ 12.09 hrs, Volume= 0.405 af
Primary = 4.85 cfs @ 12.09 hrs, Volume= 0.405 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

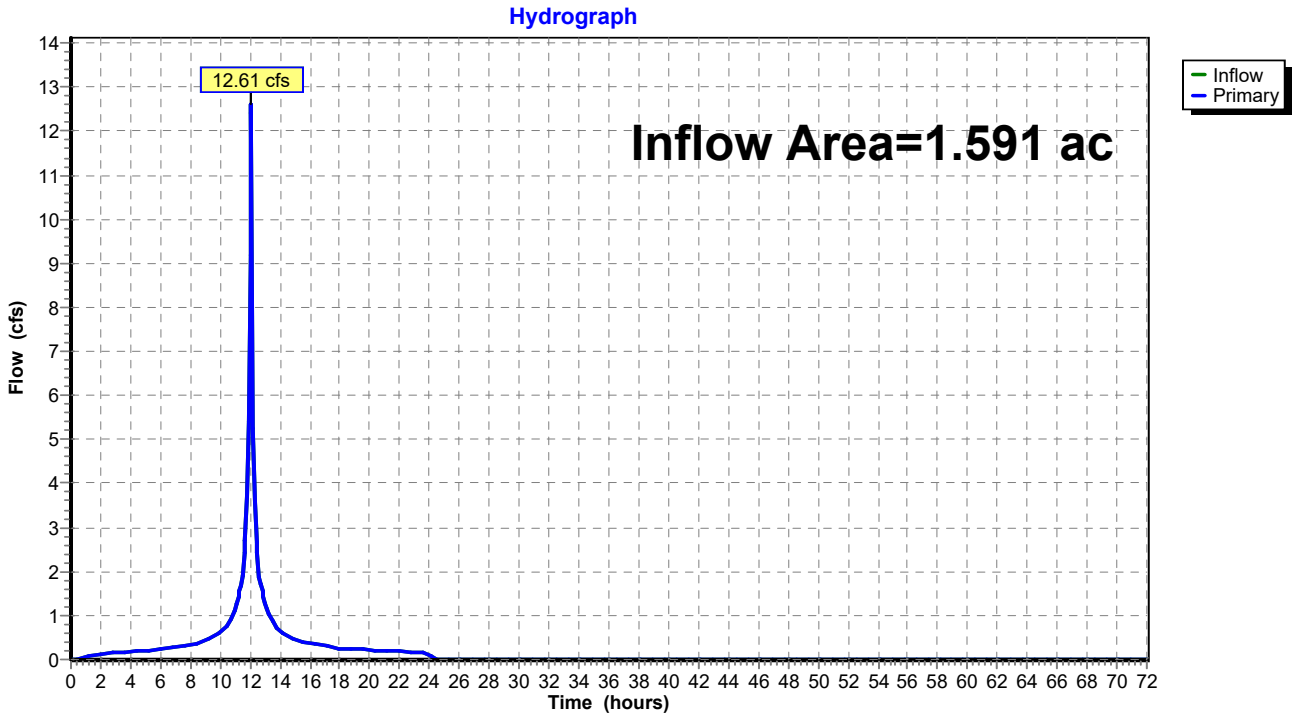


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 8.28" for 100-Year-2000 event
Inflow = 12.61 cfs @ 12.08 hrs, Volume= 1.097 af
Primary = 12.61 cfs @ 12.08 hrs, Volume= 1.097 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

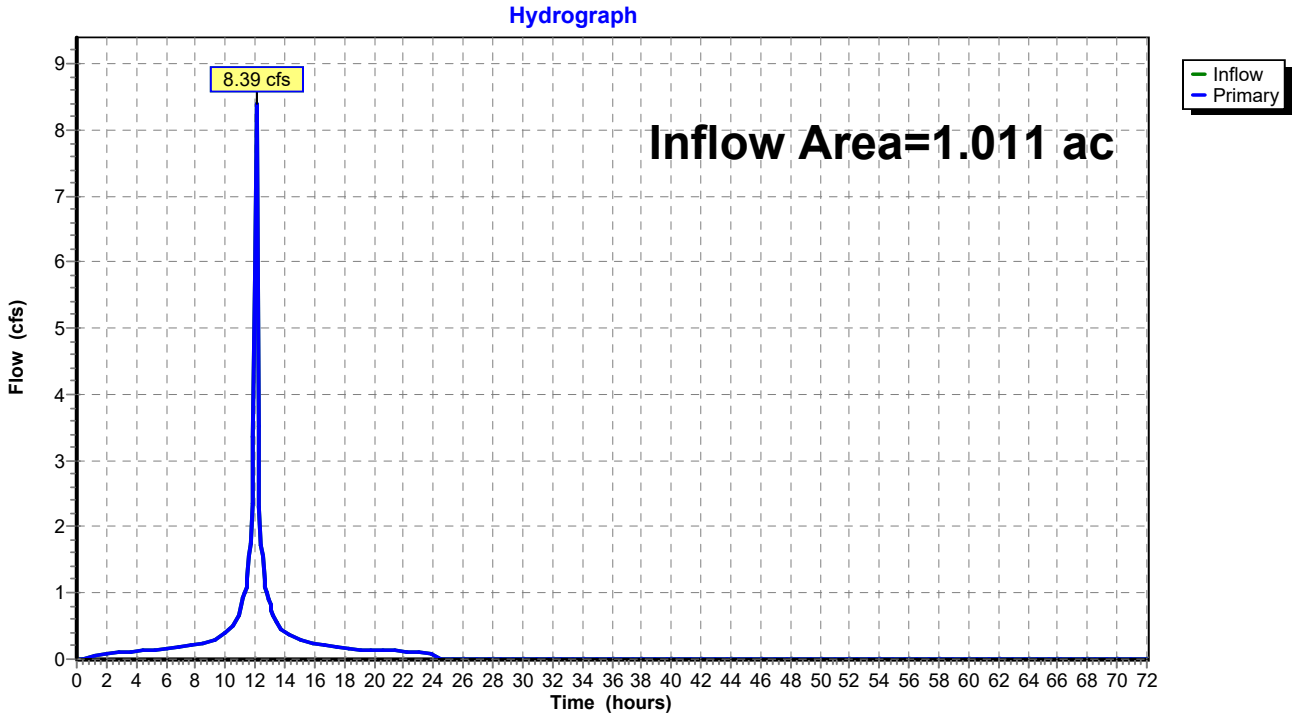


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 8.42" for 100-Year-2000 event
Inflow = 8.39 cfs @ 12.08 hrs, Volume= 0.709 af
Primary = 8.39 cfs @ 12.08 hrs, Volume= 0.709 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

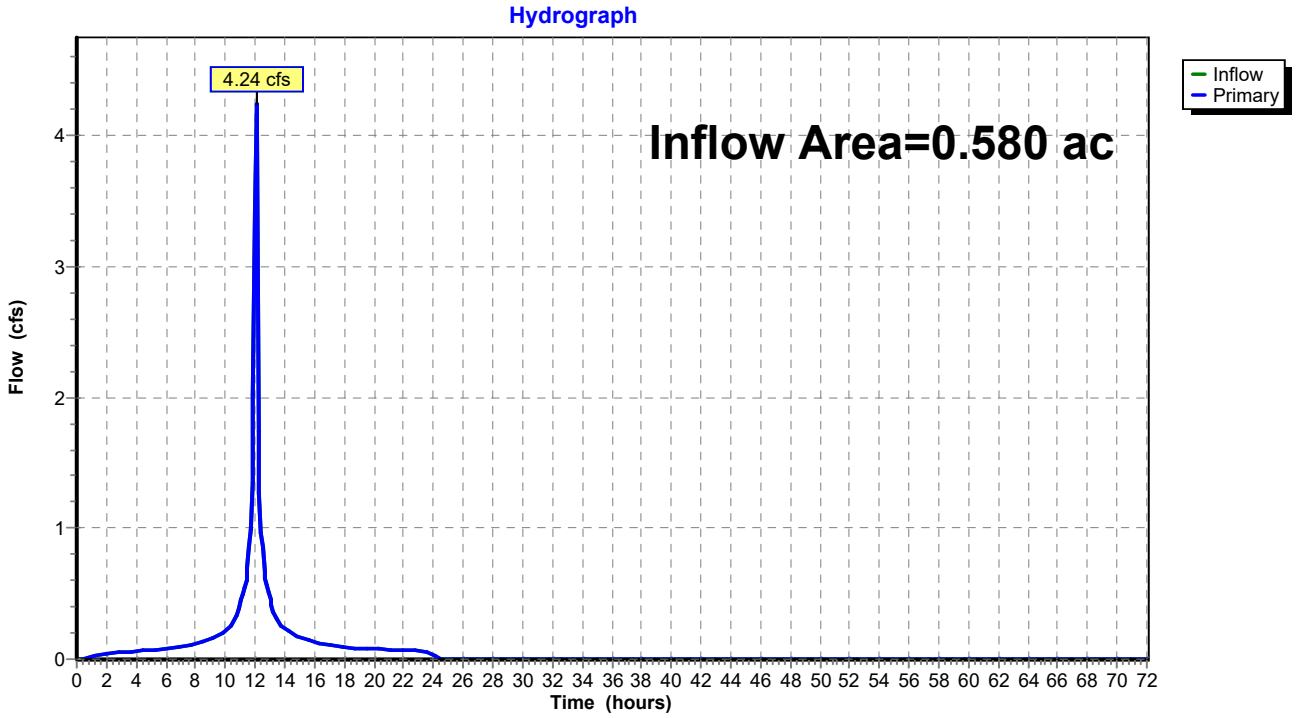


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 8.03" for 100-Year-2000 event
Inflow = 4.24 cfs @ 12.07 hrs, Volume= 0.388 af
Primary = 4.24 cfs @ 12.07 hrs, Volume= 0.388 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

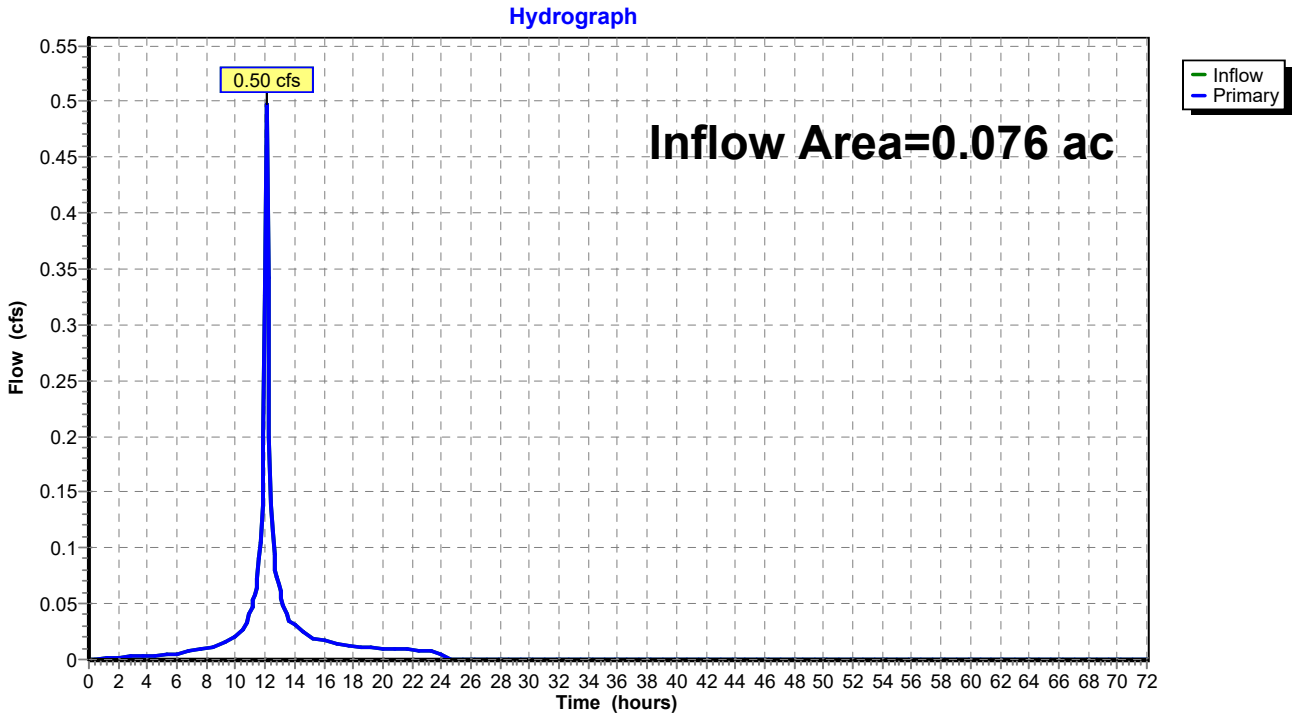


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 7.05" for 100-Year-2000 event
Inflow = 0.50 cfs @ 12.10 hrs, Volume= 0.045 af
Primary = 0.50 cfs @ 12.10 hrs, Volume= 0.045 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

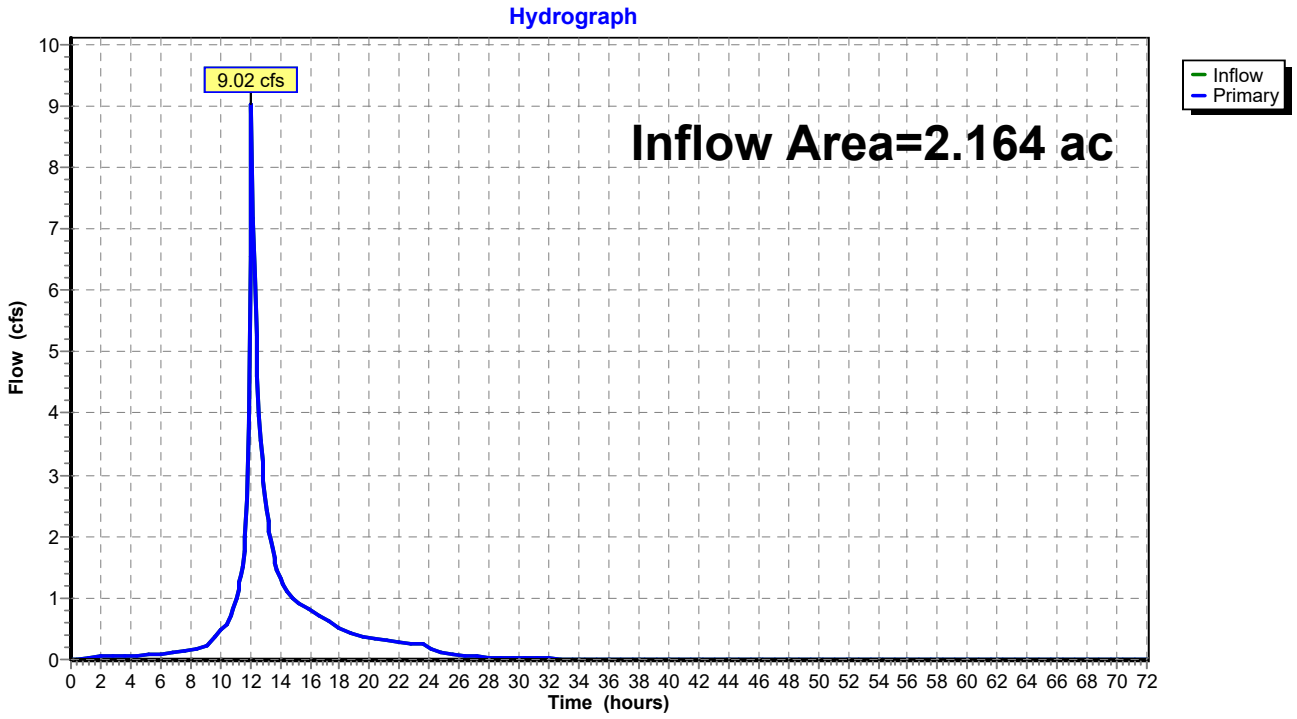


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 7.54" for 100-Year-2000 event
Inflow = 9.02 cfs @ 12.11 hrs, Volume= 1.359 af
Primary = 9.02 cfs @ 12.11 hrs, Volume= 1.359 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

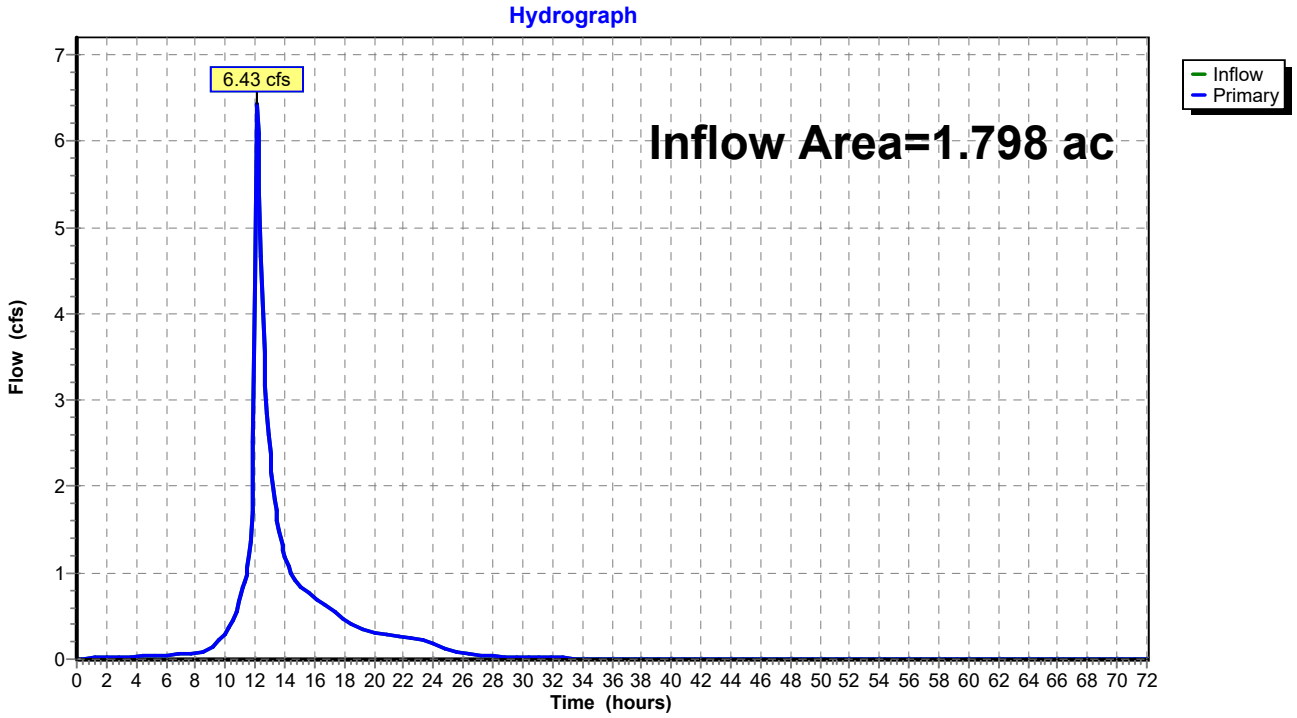


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 7.42" for 100-Year-2000 event
Inflow = 6.43 cfs @ 12.14 hrs, Volume= 1.111 af
Primary = 6.43 cfs @ 12.14 hrs, Volume= 1.111 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

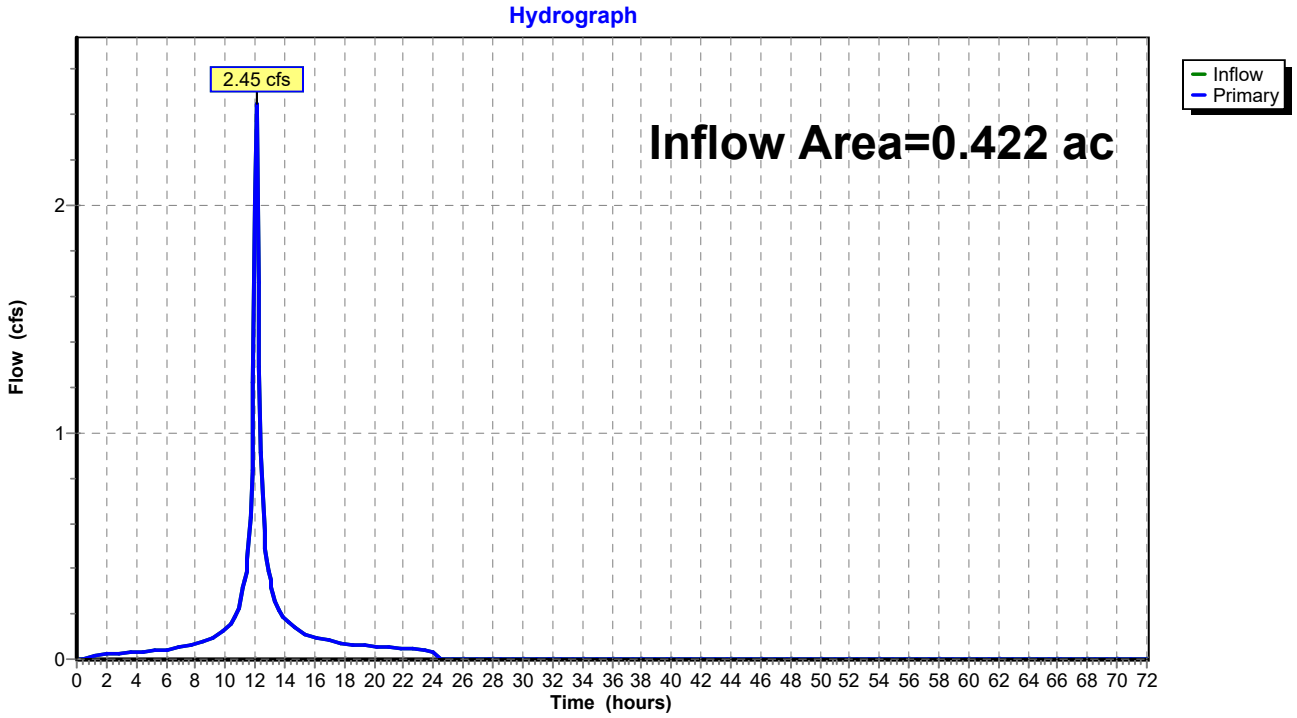


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 7.49" for 100-Year-2000 event
Inflow = 2.45 cfs @ 12.09 hrs, Volume= 0.263 af
Primary = 2.45 cfs @ 12.09 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

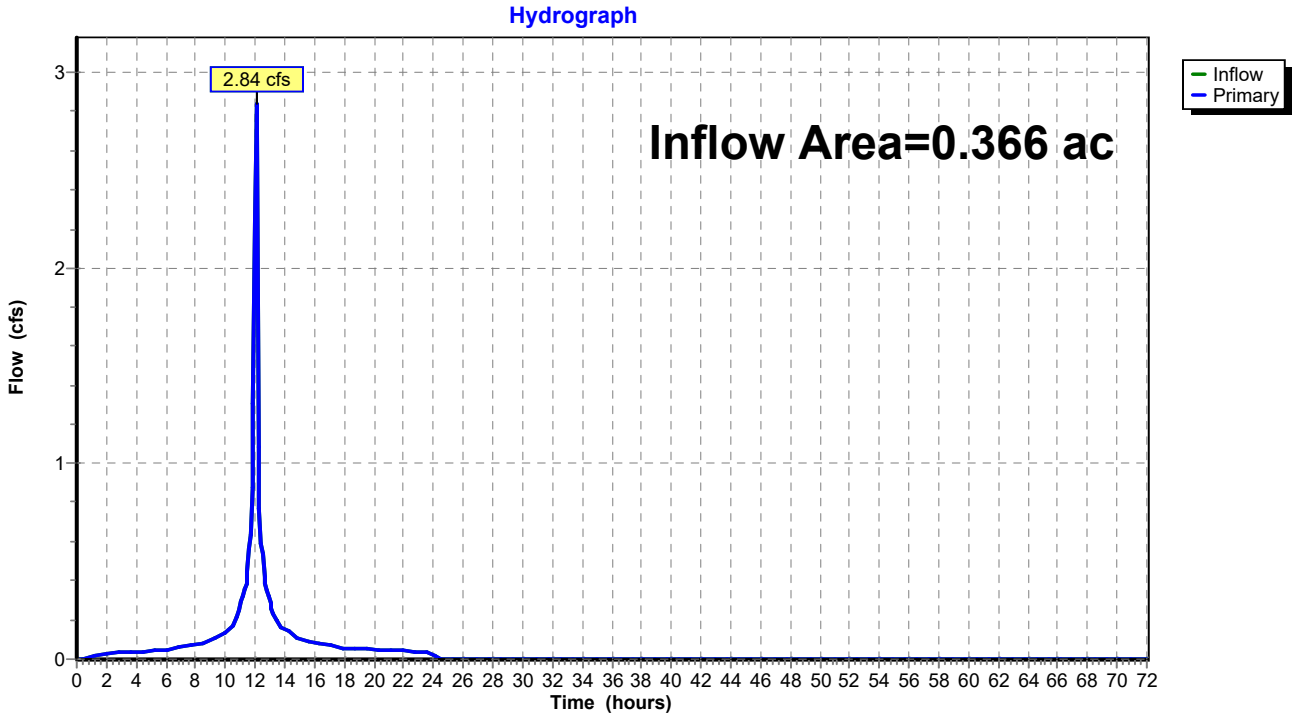


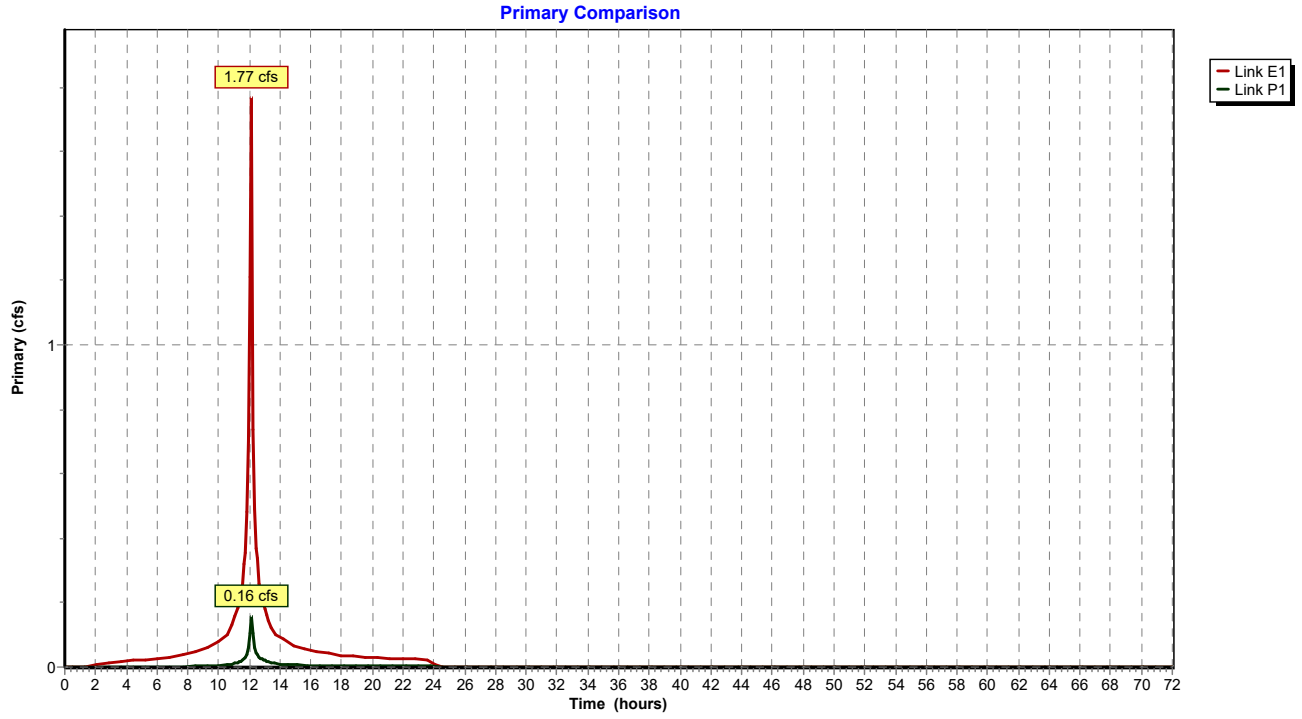
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 8.13" for 100-Year-2000 event
Inflow = 2.84 cfs @ 12.07 hrs, Volume= 0.248 af
Primary = 2.84 cfs @ 12.07 hrs, Volume= 0.248 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

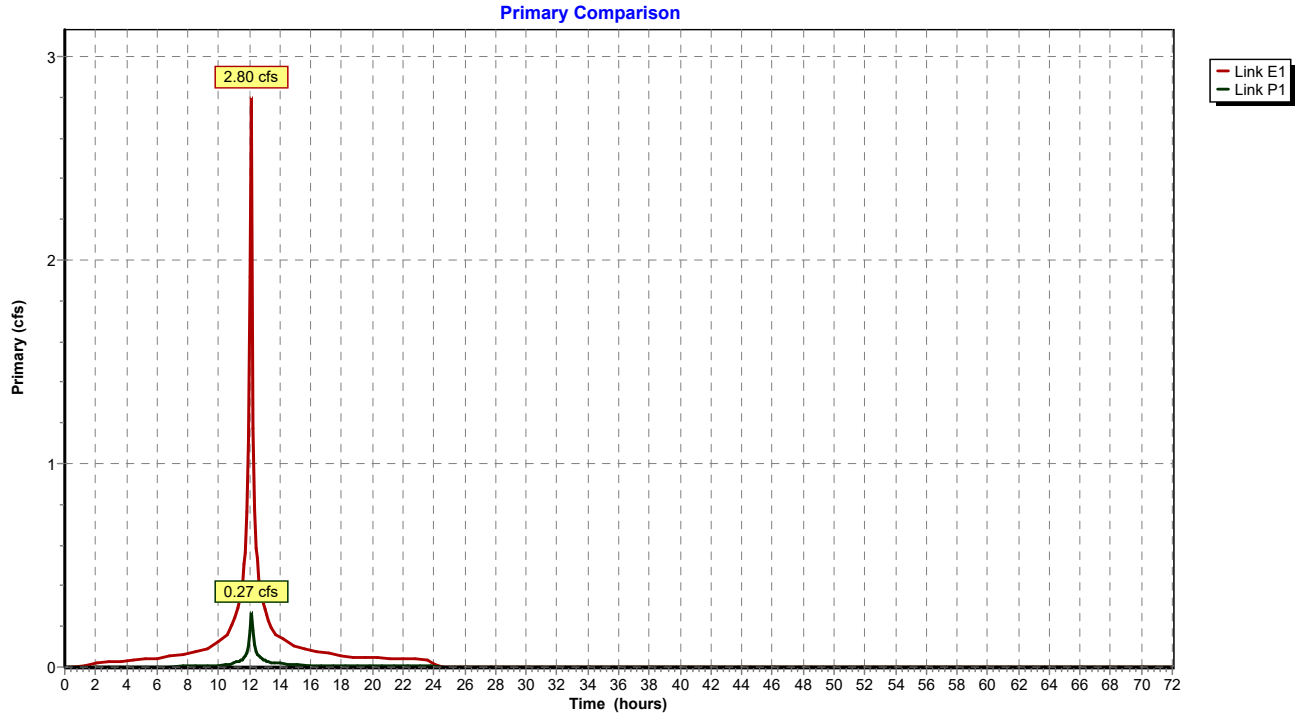
Link P2B: PDA 2B




Primary Comparison
1.77 cfs
0.16 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	26.00	0.00	0.00	52.00	0.00	0.00
0.50	0.00	0.00	26.50	0.00	0.00	52.50	0.00	0.00
1.00	0.00	0.00	27.00	0.00	0.00	53.00	0.00	0.00
1.50	0.00	0.00	27.50	0.00	0.00	53.50	0.00	0.00
2.00	0.01	0.00	28.00	0.00	0.00	54.00	0.00	0.00
2.50	0.01	0.00	28.50	0.00	0.00	54.50	0.00	0.00
3.00	0.01	0.00	29.00	0.00	0.00	55.00	0.00	0.00
3.50	0.02	0.00	29.50	0.00	0.00	55.50	0.00	0.00
4.00	0.02	0.00	30.00	0.00	0.00	56.00	0.00	0.00
4.50	0.02	0.00	30.50	0.00	0.00	56.50	0.00	0.00
5.00	0.02	0.00	31.00	0.00	0.00	57.00	0.00	0.00
5.50	0.02	0.00	31.50	0.00	0.00	57.50	0.00	0.00
6.00	0.03	0.00	32.00	0.00	0.00	58.00	0.00	0.00
6.50	0.03	0.00	32.50	0.00	0.00	58.50	0.00	0.00
7.00	0.03	0.00	33.00	0.00	0.00	59.00	0.00	0.00
7.50	0.04	0.00	33.50	0.00	0.00	59.50	0.00	0.00
8.00	0.04	0.00	34.00	0.00	0.00	60.00	0.00	0.00
8.50	0.05	0.00	34.50	0.00	0.00	60.50	0.00	0.00
9.00	0.05	0.00	35.00	0.00	0.00	61.00	0.00	0.00
9.50	0.07	0.00	35.50	0.00	0.00	61.50	0.00	0.00
10.00	0.08	0.01	36.00	0.00	0.00	62.00	0.00	0.00
10.50	0.10	0.01	36.50	0.00	0.00	62.50	0.00	0.00
11.00	0.15	0.01	37.00	0.00	0.00	63.00	0.00	0.00
11.50	0.25	0.02	37.50	0.00	0.00	63.50	0.00	0.00
12.00	**1.21**	**0.10**	38.00	0.00	0.00	64.00	0.00	0.00
12.50	**0.34**	**0.04**	38.50	0.00	0.00	64.50	0.00	0.00
13.00	0.18	0.02	39.00	0.00	0.00	65.00	0.00	0.00
13.50	0.12	0.01	39.50	0.00	0.00	65.50	0.00	0.00
14.00	0.09	0.01	40.00	0.00	0.00	66.00	0.00	0.00
14.50	0.08	0.01	40.50	0.00	0.00	66.50	0.00	0.00
15.00	0.06	0.01	41.00	0.00	0.00	67.00	0.00	0.00
15.50	0.06	0.01	41.50	0.00	0.00	67.50	0.00	0.00
16.00	0.05	0.01	42.00	0.00	0.00	68.00	0.00	0.00
16.50	0.05	0.01	42.50	0.00	0.00	68.50	0.00	0.00
17.00	0.04	0.01	43.00	0.00	0.00	69.00	0.00	0.00
17.50	0.04	0.00	43.50	0.00	0.00	69.50	0.00	0.00
18.00	0.04	0.00	44.00	0.00	0.00	70.00	0.00	0.00
18.50	0.03	0.00	44.50	0.00	0.00	70.50	0.00	0.00
19.00	0.03	0.00	45.00	0.00	0.00	71.00	0.00	0.00
19.50	0.03	0.00	45.50	0.00	0.00	71.50	0.00	0.00
20.00	0.03	0.00	46.00	0.00	0.00	72.00	0.00	0.00
20.50	0.03	0.00	46.50	0.00	0.00			
21.00	0.03	0.00	47.00	0.00	0.00			
21.50	0.03	0.00	47.50	0.00	0.00			
22.00	0.03	0.00	48.00	0.00	0.00			
22.50	0.02	0.00	48.50	0.00	0.00			
23.00	0.02	0.00	49.00	0.00	0.00			
23.50	0.02	0.00	49.50	0.00	0.00			
24.00	0.02	0.00	50.00	0.00	0.00			
24.50	0.00	0.00	50.50	0.00	0.00			
25.00	0.00	0.00	51.00	0.00	0.00			
25.50	0.00	0.00	51.50	0.00	0.00			


Primary Comparison
2.80 cfs
0.27 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.04	0.00	10.40	0.14	0.01
0.10	0.00	0.00	5.30	0.04	0.00	10.50	0.15	0.01
0.20	0.00	0.00	5.40	0.04	0.00	10.60	0.17	0.01
0.30	0.00	0.00	5.50	0.04	0.00	10.70	0.18	0.02
0.40	0.00	0.00	5.60	0.04	0.00	10.80	0.20	0.02
0.50	0.00	0.00	5.70	0.04	0.00	10.90	0.21	0.02
0.60	0.00	0.00	5.80	0.04	0.00	11.00	0.23	0.02
0.70	0.00	0.00	5.90	0.04	0.00	11.10	0.26	0.02
0.80	0.00	0.00	6.00	0.04	0.00	11.20	0.29	0.03
0.90	0.00	0.00	6.10	0.04	0.00	11.30	0.32	0.03
1.00	0.00	0.00	6.20	0.05	0.00	11.40	0.35	0.03
1.10	0.01	0.00	6.30	0.05	0.00	11.50	0.39	0.04
1.20	0.01	0.00	6.40	0.05	0.00	11.60	0.50	0.05
1.30	0.01	0.00	6.50	0.05	0.00	11.70	0.56	0.05
1.40	0.01	0.00	6.60	0.05	0.00	11.80	0.77	0.07
1.50	0.01	0.00	6.70	0.05	0.00	11.90	1.11	0.11
1.60	0.01	0.00	6.80	0.05	0.00	12.00	1.92	0.18
1.70	0.01	0.00	6.90	0.05	0.00	12.10	**2.77**	**0.27**
1.80	0.02	0.00	7.00	0.06	0.00	12.20	1.18	0.18
1.90	0.02	0.00	7.10	0.06	0.00	12.30	0.78	0.11
2.00	0.02	0.00	7.20	0.06	0.00	12.40	0.58	0.08
2.10	0.02	0.00	7.30	0.06	0.00	12.50	0.53	0.06
2.20	0.02	0.00	7.40	0.06	0.00	12.60	0.41	0.05
2.30	0.02	0.00	7.50	0.06	0.00	12.70	0.38	0.05
2.40	0.02	0.00	7.60	0.06	0.00	12.80	0.35	0.04
2.50	0.02	0.00	7.70	0.07	0.00	12.90	0.31	0.04
2.60	0.02	0.00	7.80	0.07	0.00	13.00	0.28	0.03
2.70	0.02	0.00	7.90	0.07	0.00	13.10	0.25	0.03
2.80	0.02	0.00	8.00	0.07	0.00	13.20	0.24	0.03
2.90	0.03	0.00	8.10	0.07	0.00	13.30	0.22	0.03
3.00	0.03	0.00	8.20	0.07	0.00	13.40	0.20	0.02
3.10	0.03	0.00	8.30	0.07	0.00	13.50	0.18	0.02
3.20	0.03	0.00	8.40	0.07	0.01	13.60	0.17	0.02
3.30	0.03	0.00	8.50	0.08	0.01	13.70	0.16	0.02
3.40	0.03	0.00	8.60	0.08	0.01	13.80	0.16	0.02
3.50	0.03	0.00	8.70	0.08	0.01	13.90	0.15	0.02
3.60	0.03	0.00	8.80	0.08	0.01	14.00	0.15	0.02
3.70	0.03	0.00	8.90	0.08	0.01	14.10	0.14	0.02
3.80	0.03	0.00	9.00	0.08	0.01	14.20	0.14	0.02
3.90	0.03	0.00	9.10	0.09	0.01	14.30	0.13	0.02
4.00	0.03	0.00	9.20	0.09	0.01	14.40	0.13	0.02
4.10	0.03	0.00	9.30	0.10	0.01	14.50	0.12	0.01
4.20	0.03	0.00	9.40	0.10	0.01	14.60	0.12	0.01
4.30	0.03	0.00	9.50	0.10	0.01	14.70	0.11	0.01
4.40	0.04	0.00	9.60	0.11	0.01	14.80	0.11	0.01
4.50	0.04	0.00	9.70	0.11	0.01	14.90	0.10	0.01
4.60	0.04	0.00	9.80	0.12	0.01	15.00	0.10	0.01
4.70	0.04	0.00	9.90	0.12	0.01	15.10	0.10	0.01
4.80	0.04	0.00	10.00	0.13	0.01	15.20	0.09	0.01
4.90	0.04	0.00	10.10	0.13	0.01	15.30	0.09	0.01
5.00	0.04	0.00	10.20	0.13	0.01	15.40	0.09	0.01
5.10	0.04	0.00	10.30	0.14	0.01	15.50	0.09	0.01

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.09	0.01	20.80	0.05	0.01	26.00	0.00	0.00
15.70	0.09	0.01	20.90	0.04	0.01	26.10	0.00	0.00
15.80	0.09	0.01	21.00	0.04	0.01	26.20	0.00	0.00
15.90	0.08	0.01	21.10	0.04	0.01	26.30	0.00	0.00
16.00	0.08	0.01	21.20	0.04	0.01	26.40	0.00	0.00
16.10	0.08	0.01	21.30	0.04	0.01	26.50	0.00	0.00
16.20	0.08	0.01	21.40	0.04	0.01	26.60	0.00	0.00
16.30	0.08	0.01	21.50	0.04	0.01	26.70	0.00	0.00
16.40	0.08	0.01	21.60	0.04	0.01	26.80	0.00	0.00
16.50	0.08	0.01	21.70	0.04	0.00	26.90	0.00	0.00
16.60	0.07	0.01	21.80	0.04	0.00	27.00	0.00	0.00
16.70	0.07	0.01	21.90	0.04	0.00	27.10	0.00	0.00
16.80	0.07	0.01	22.00	0.04	0.00	27.20	0.00	0.00
16.90	0.07	0.01	22.10	0.04	0.00	27.30	0.00	0.00
17.00	0.07	0.01	22.20	0.04	0.00	27.40	0.00	0.00
17.10	0.07	0.01	22.30	0.04	0.00	27.50	0.00	0.00
17.20	0.07	0.01	22.40	0.04	0.00	27.60	0.00	0.00
17.30	0.07	0.01	22.50	0.04	0.00	27.70	0.00	0.00
17.40	0.06	0.01	22.60	0.04	0.00	27.80	0.00	0.00
17.50	0.06	0.01	22.70	0.04	0.00	27.90	0.00	0.00
17.60	0.06	0.01	22.80	0.04	0.00	28.00	0.00	0.00
17.70	0.06	0.01	22.90	0.04	0.00	28.10	0.00	0.00
17.80	0.06	0.01	23.00	0.04	0.00	28.20	0.00	0.00
17.90	0.06	0.01	23.10	0.04	0.00	28.30	0.00	0.00
18.00	0.06	0.01	23.20	0.04	0.00	28.40	0.00	0.00
18.10	0.05	0.01	23.30	0.04	0.00	28.50	0.00	0.00
18.20	0.05	0.01	23.40	0.04	0.00	28.60	0.00	0.00
18.30	0.05	0.01	23.50	0.04	0.00	28.70	0.00	0.00
18.40	0.05	0.01	23.60	0.04	0.00	28.80	0.00	0.00
18.50	0.05	0.01	23.70	0.04	0.00	28.90	0.00	0.00
18.60	0.05	0.01	23.80	0.03	0.00	29.00	0.00	0.00
18.70	0.05	0.01	23.90	0.03	0.00	29.10	0.00	0.00
18.80	0.05	0.01	24.00	0.03	0.00	29.20	0.00	0.00
18.90	0.05	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.05	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.05	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.05	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.05	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.05	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.05	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.05	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.05	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.05	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.05	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.05	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.05	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.05	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.05	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.05	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.05	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.05	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.05	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

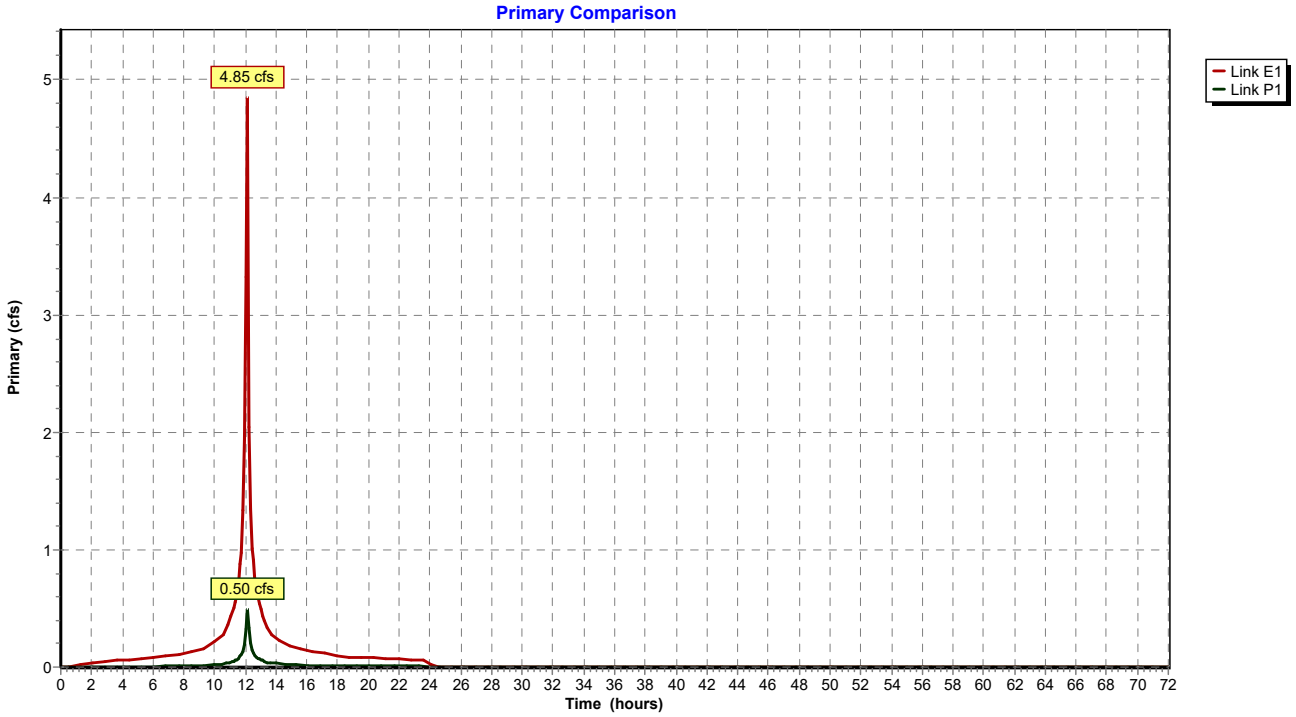
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			


Primary Comparison
4.85 cfs
0.50 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0 1 2 3 4 5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.07	0.00	10.40	0.25	0.03
0.10	0.00	0.00	5.30	0.07	0.00	10.50	0.26	0.03
0.20	0.00	0.00	5.40	0.07	0.00	10.60	0.29	0.03
0.30	0.00	0.00	5.50	0.07	0.00	10.70	0.32	0.03
0.40	0.00	0.00	5.60	0.07	0.00	10.80	0.34	0.04
0.50	0.00	0.00	5.70	0.07	0.00	10.90	0.37	0.04
0.60	0.01	0.00	5.80	0.08	0.00	11.00	0.40	0.04
0.70	0.01	0.00	5.90	0.08	0.01	11.10	0.45	0.05
0.80	0.01	0.00	6.00	0.08	0.01	11.20	0.50	0.05
0.90	0.02	0.00	6.10	0.08	0.01	11.30	0.56	0.06
1.00	0.02	0.00	6.20	0.08	0.01	11.40	0.61	0.06
1.10	0.02	0.00	6.30	0.08	0.01	11.50	0.68	0.07
1.20	0.03	0.00	6.40	0.09	0.01	11.60	0.88	0.09
1.30	0.03	0.00	6.50	0.09	0.01	11.70	0.98	0.11
1.40	0.03	0.00	6.60	0.09	0.01	11.80	1.33	0.14
1.50	0.03	0.00	6.70	0.09	0.01	11.90	1.93	0.20
1.60	0.03	0.00	6.80	0.09	0.01	12.00	3.32	0.33
1.70	0.04	0.00	6.90	0.10	0.01	12.10	**4.80**	**0.50**
1.80	0.04	0.00	7.00	0.10	0.01	12.20	2.05	0.34
1.90	0.04	0.00	7.10	0.10	0.01	12.30	1.35	0.20
2.00	0.04	0.00	7.20	0.10	0.01	12.40	1.01	0.14
2.10	0.04	0.00	7.30	0.10	0.01	12.50	0.92	0.12
2.20	0.04	0.00	7.40	0.11	0.01	12.60	0.71	0.09
2.30	0.05	0.00	7.50	0.11	0.01	12.70	0.65	0.08
2.40	0.05	0.00	7.60	0.11	0.01	12.80	0.59	0.07
2.50	0.05	0.00	7.70	0.11	0.01	12.90	0.54	0.07
2.60	0.05	0.00	7.80	0.11	0.01	13.00	0.49	0.06
2.70	0.05	0.00	7.90	0.12	0.01	13.10	0.44	0.05
2.80	0.05	0.00	8.00	0.12	0.01	13.20	0.41	0.05
2.90	0.05	0.00	8.10	0.12	0.01	13.30	0.38	0.05
3.00	0.05	0.00	8.20	0.12	0.01	13.40	0.35	0.04
3.10	0.05	0.00	8.30	0.13	0.01	13.50	0.32	0.04
3.20	0.06	0.00	8.40	0.13	0.01	13.60	0.29	0.04
3.30	0.06	0.00	8.50	0.13	0.01	13.70	0.28	0.03
3.40	0.06	0.00	8.60	0.13	0.01	13.80	0.27	0.03
3.50	0.06	0.00	8.70	0.13	0.01	13.90	0.26	0.03
3.60	0.06	0.00	8.80	0.14	0.01	14.00	0.25	0.03
3.70	0.06	0.00	8.90	0.14	0.01	14.10	0.25	0.03
3.80	0.06	0.00	9.00	0.14	0.01	14.20	0.24	0.03
3.90	0.06	0.00	9.10	0.15	0.01	14.30	0.23	0.03
4.00	0.06	0.00	9.20	0.16	0.01	14.40	0.22	0.03
4.10	0.06	0.00	9.30	0.16	0.02	14.50	0.21	0.03
4.20	0.06	0.00	9.40	0.17	0.02	14.60	0.20	0.02
4.30	0.06	0.00	9.50	0.18	0.02	14.70	0.20	0.02
4.40	0.07	0.00	9.60	0.19	0.02	14.80	0.19	0.02
4.50	0.07	0.00	9.70	0.19	0.02	14.90	0.18	0.02
4.60	0.07	0.00	9.80	0.20	0.02	15.00	0.17	0.02
4.70	0.07	0.00	9.90	0.21	0.02	15.10	0.16	0.02
4.80	0.07	0.00	10.00	0.22	0.02	15.20	0.16	0.02
4.90	0.07	0.00	10.10	0.23	0.02	15.30	0.16	0.02
5.00	0.07	0.00	10.20	0.23	0.02	15.40	0.16	0.02
5.10	0.07	0.00	10.30	0.24	0.02	15.50	0.15	0.02

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.15	0.02	20.80	0.08	0.01	26.00	0.00	0.00
15.70	0.15	0.02	20.90	0.08	0.01	26.10	0.00	0.00
15.80	0.15	0.02	21.00	0.08	0.01	26.20	0.00	0.00
15.90	0.14	0.02	21.10	0.08	0.01	26.30	0.00	0.00
16.00	0.14	0.02	21.20	0.07	0.01	26.40	0.00	0.00
16.10	0.14	0.02	21.30	0.07	0.01	26.50	0.00	0.00
16.20	0.14	0.02	21.40	0.07	0.01	26.60	0.00	0.00
16.30	0.14	0.02	21.50	0.07	0.01	26.70	0.00	0.00
16.40	0.13	0.02	21.60	0.07	0.01	26.80	0.00	0.00
16.50	0.13	0.02	21.70	0.07	0.01	26.90	0.00	0.00
16.60	0.13	0.02	21.80	0.07	0.01	27.00	0.00	0.00
16.70	0.13	0.02	21.90	0.07	0.01	27.10	0.00	0.00
16.80	0.12	0.01	22.00	0.07	0.01	27.20	0.00	0.00
16.90	0.12	0.01	22.10	0.07	0.01	27.30	0.00	0.00
17.00	0.12	0.01	22.20	0.07	0.01	27.40	0.00	0.00
17.10	0.12	0.01	22.30	0.07	0.01	27.50	0.00	0.00
17.20	0.11	0.01	22.40	0.07	0.01	27.60	0.00	0.00
17.30	0.11	0.01	22.50	0.07	0.01	27.70	0.00	0.00
17.40	0.11	0.01	22.60	0.07	0.01	27.80	0.00	0.00
17.50	0.11	0.01	22.70	0.07	0.01	27.90	0.00	0.00
17.60	0.10	0.01	22.80	0.07	0.01	28.00	0.00	0.00
17.70	0.10	0.01	22.90	0.06	0.01	28.10	0.00	0.00
17.80	0.10	0.01	23.00	0.06	0.01	28.20	0.00	0.00
17.90	0.10	0.01	23.10	0.06	0.01	28.30	0.00	0.00
18.00	0.10	0.01	23.20	0.06	0.01	28.40	0.00	0.00
18.10	0.09	0.01	23.30	0.06	0.01	28.50	0.00	0.00
18.20	0.09	0.01	23.40	0.06	0.01	28.60	0.00	0.00
18.30	0.09	0.01	23.50	0.06	0.01	28.70	0.00	0.00
18.40	0.09	0.01	23.60	0.06	0.01	28.80	0.00	0.00
18.50	0.09	0.01	23.70	0.06	0.01	28.90	0.00	0.00
18.60	0.09	0.01	23.80	0.06	0.01	29.00	0.00	0.00
18.70	0.09	0.01	23.90	0.06	0.01	29.10	0.00	0.00
18.80	0.09	0.01	24.00	0.05	0.01	29.20	0.00	0.00
18.90	0.09	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.09	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.09	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.09	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.09	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.09	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.08	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.08	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.08	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.08	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.08	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.08	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.08	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.08	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.08	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.08	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.08	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.08	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.08	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

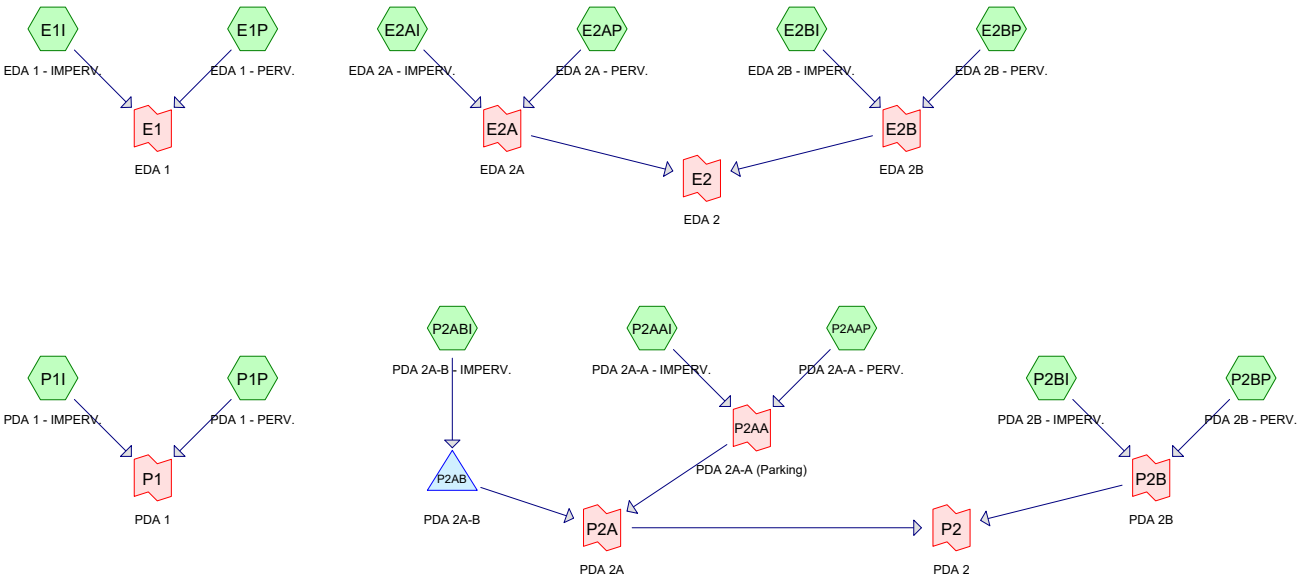
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			

B. PRE- vs. POST-DEVELOPMENT HYDROGRAPHS - Current Adjusted Precipitation Depths

- **2-Year Storm Event**
- **10-Year Storm Event**
- **100-Year Storm Event**
- **Pre- vs. Post Comparison**



Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

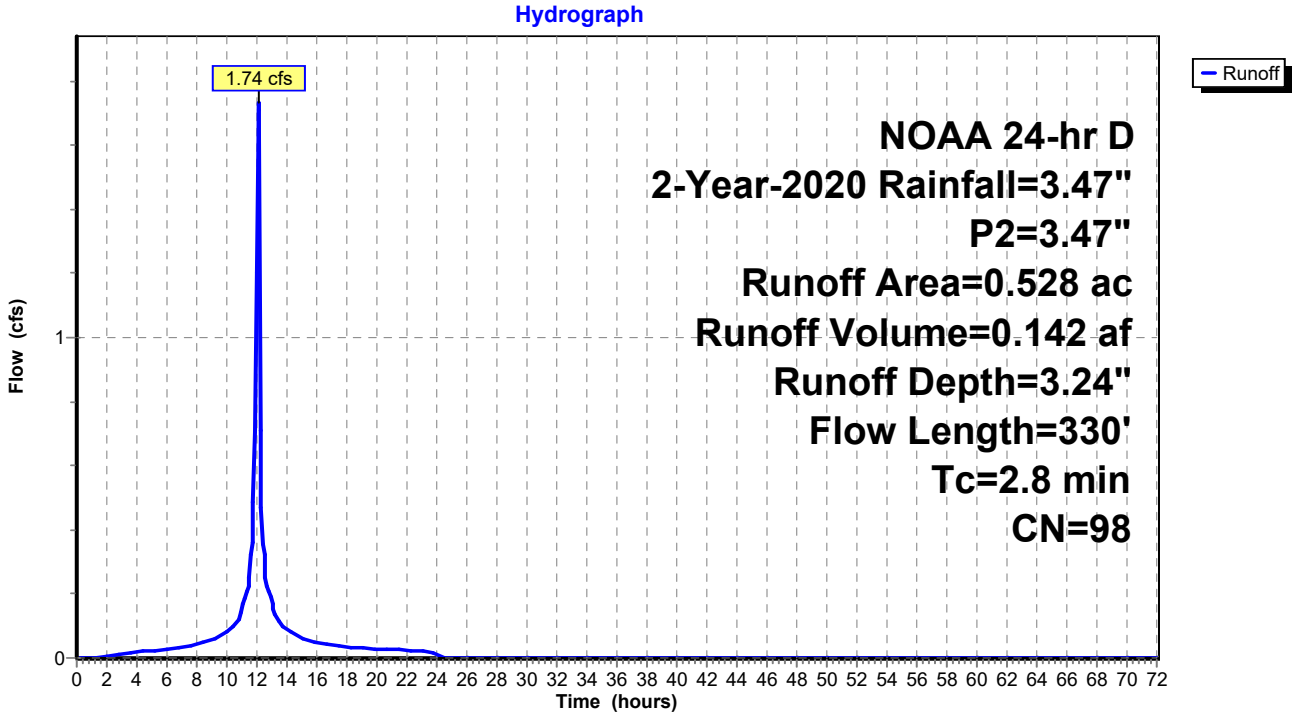
Runoff = 1.74 cfs @ 12.08 hrs, Volume= 0.142 af, Depth= 3.24"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.47"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

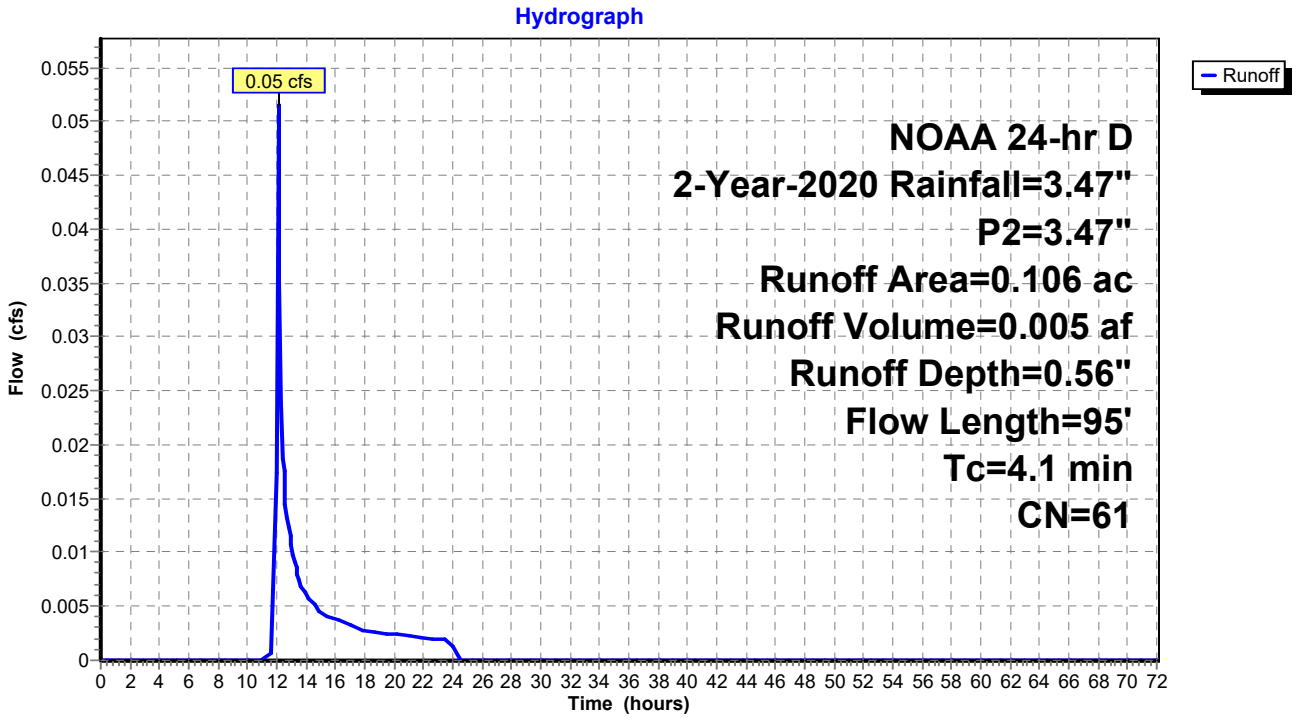
Runoff = 0.05 cfs @ 12.12 hrs, Volume= 0.005 af, Depth= 0.56"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.47"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

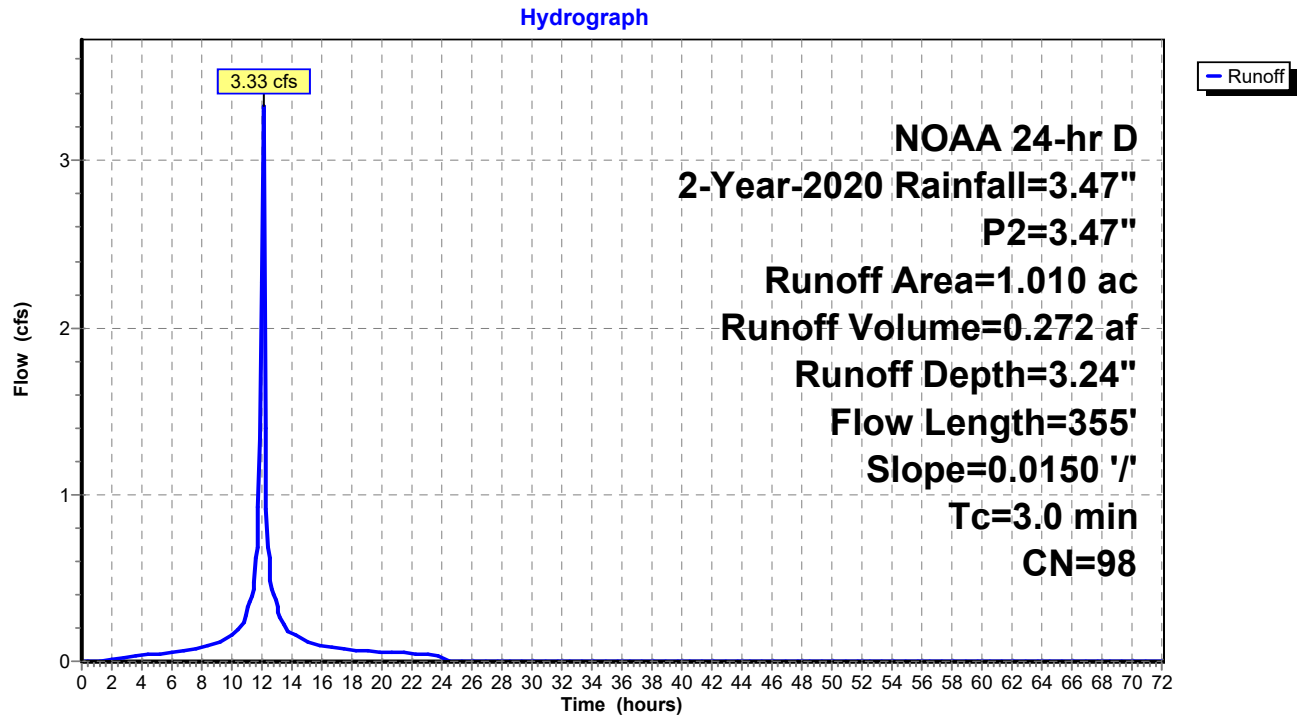
Runoff = 3.33 cfs @ 12.09 hrs, Volume= 0.272 af, Depth= 3.24"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.47"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

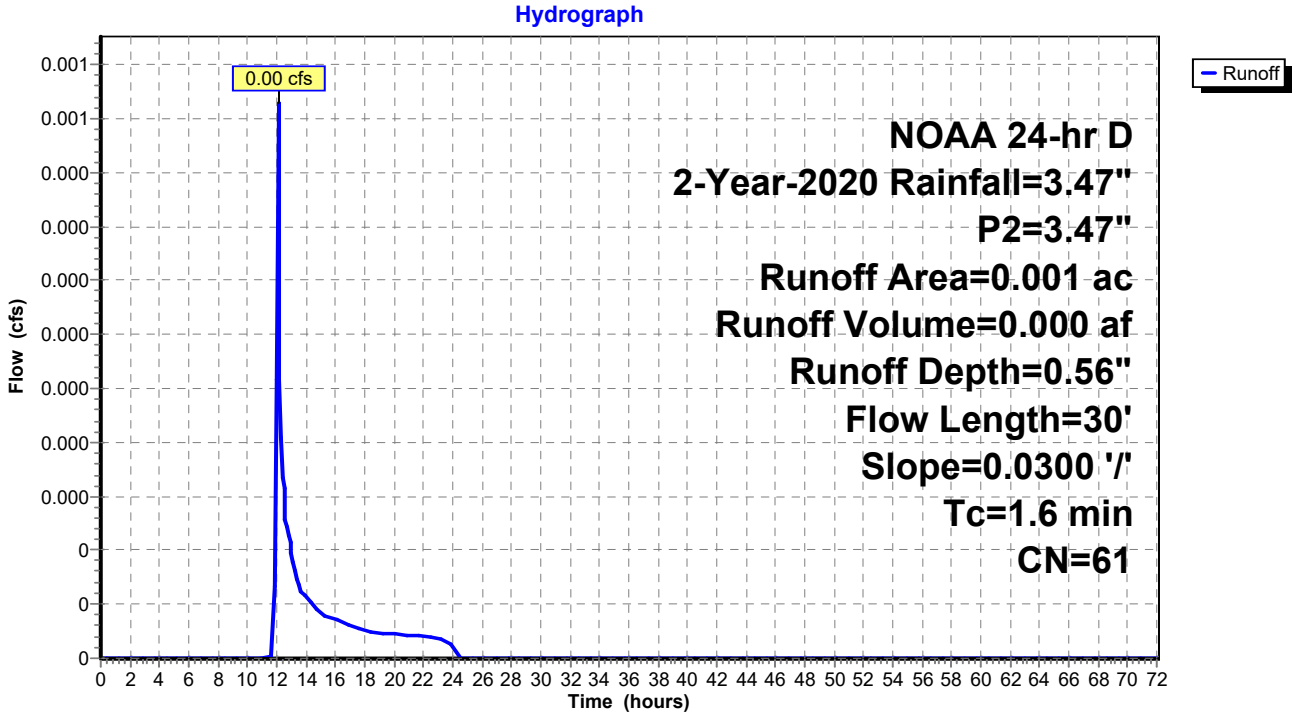
Runoff = 0.00 cfs @ 12.10 hrs, Volume= 0.000 af, Depth= 0.56"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.47"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

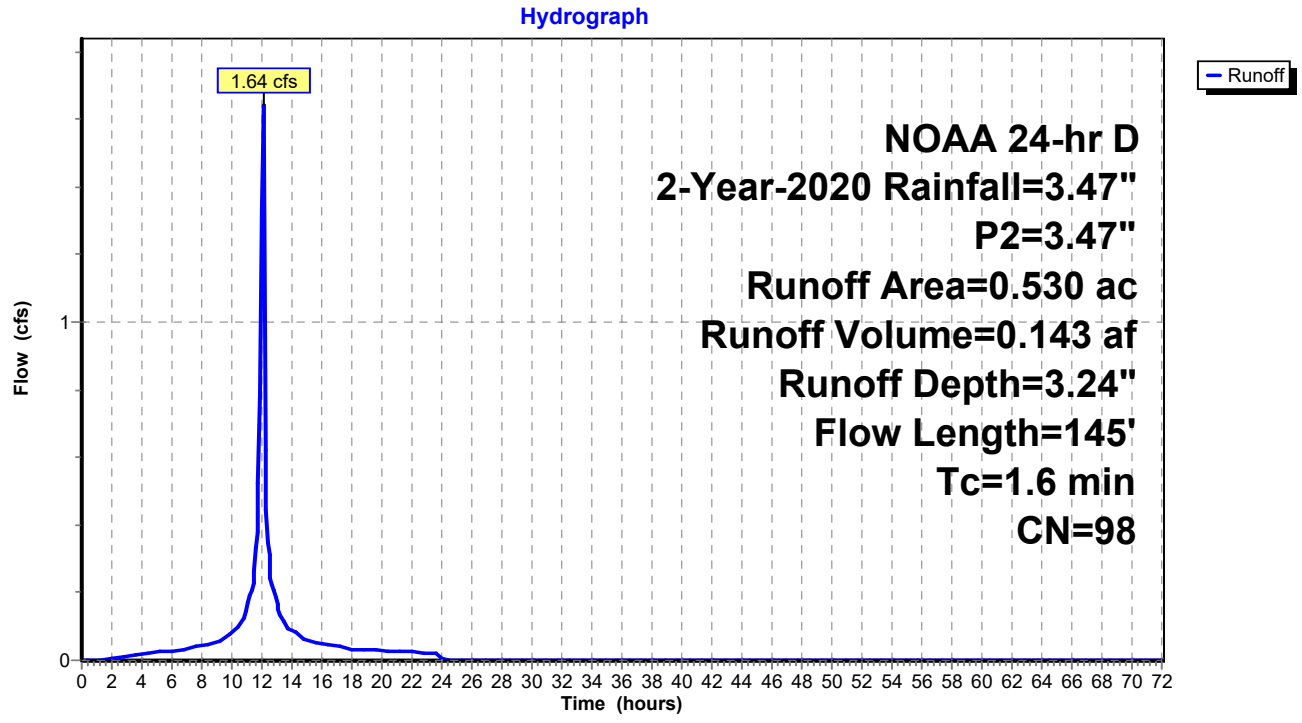
Runoff = 1.64 cfs @ 12.07 hrs, Volume= 0.143 af, Depth= 3.24"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

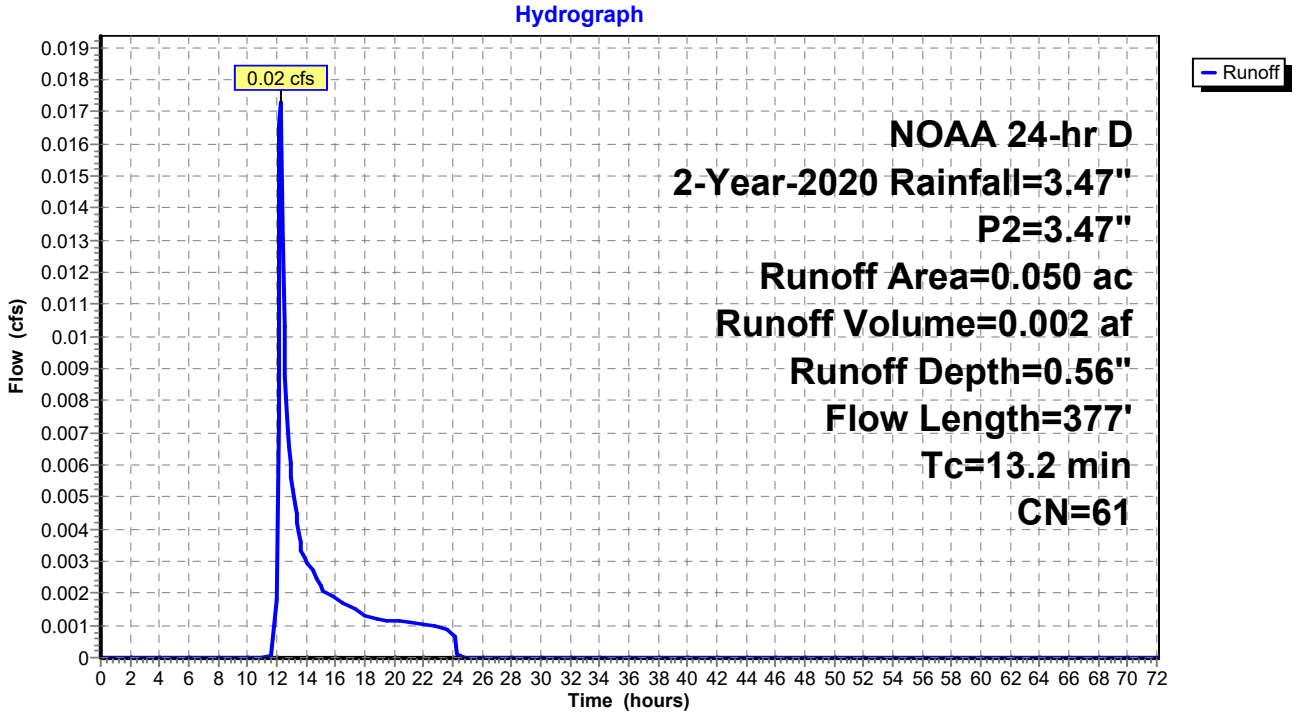
Runoff = 0.02 cfs @ 12.26 hrs, Volume= 0.002 af, Depth= 0.56"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

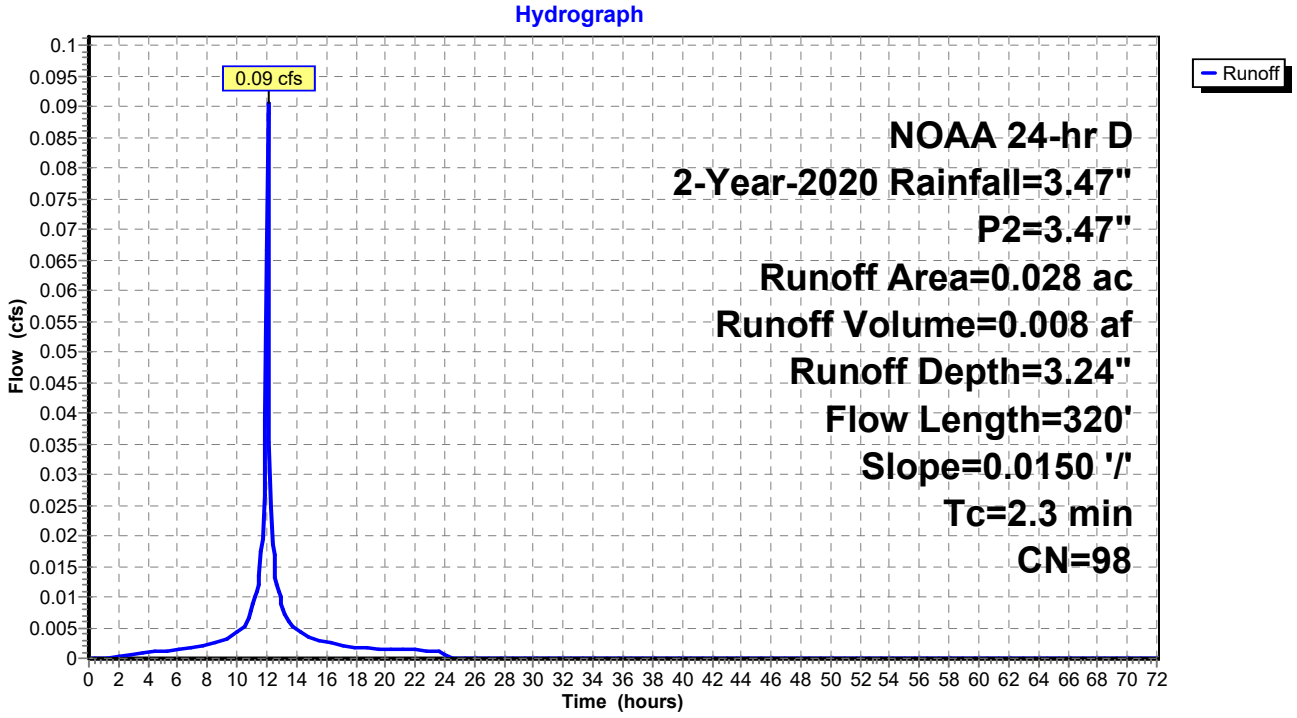
Runoff = 0.09 cfs @ 12.08 hrs, Volume= 0.008 af, Depth= 3.24"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.47"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

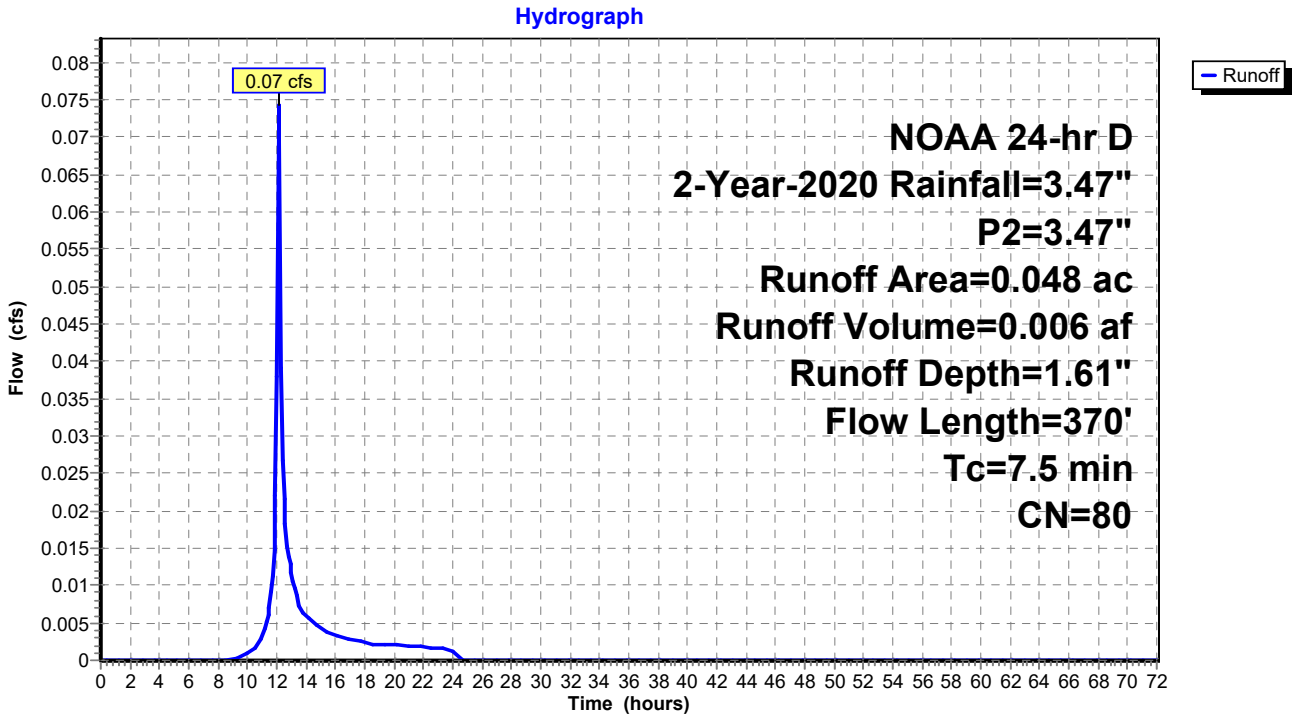
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.006 af, Depth= 1.61"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.47"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

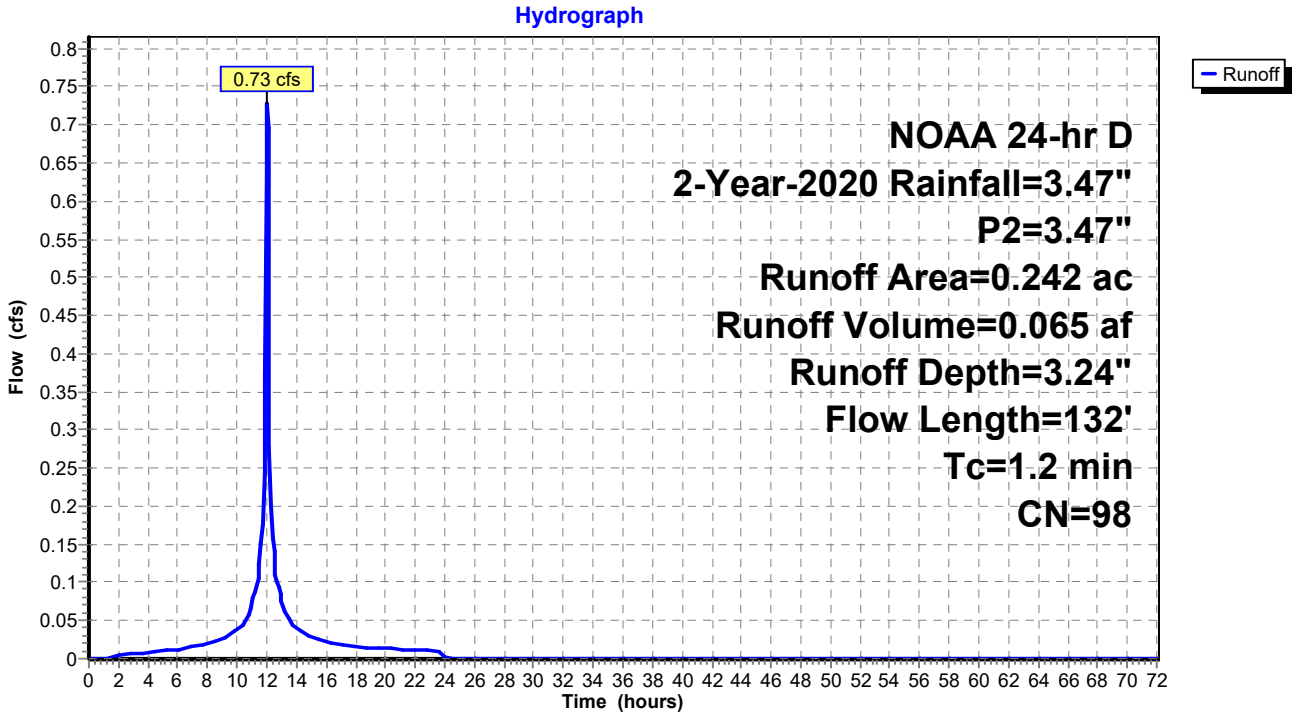
Runoff = 0.73 cfs @ 12.06 hrs, Volume= 0.065 af, Depth= 3.24"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.57		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.47"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

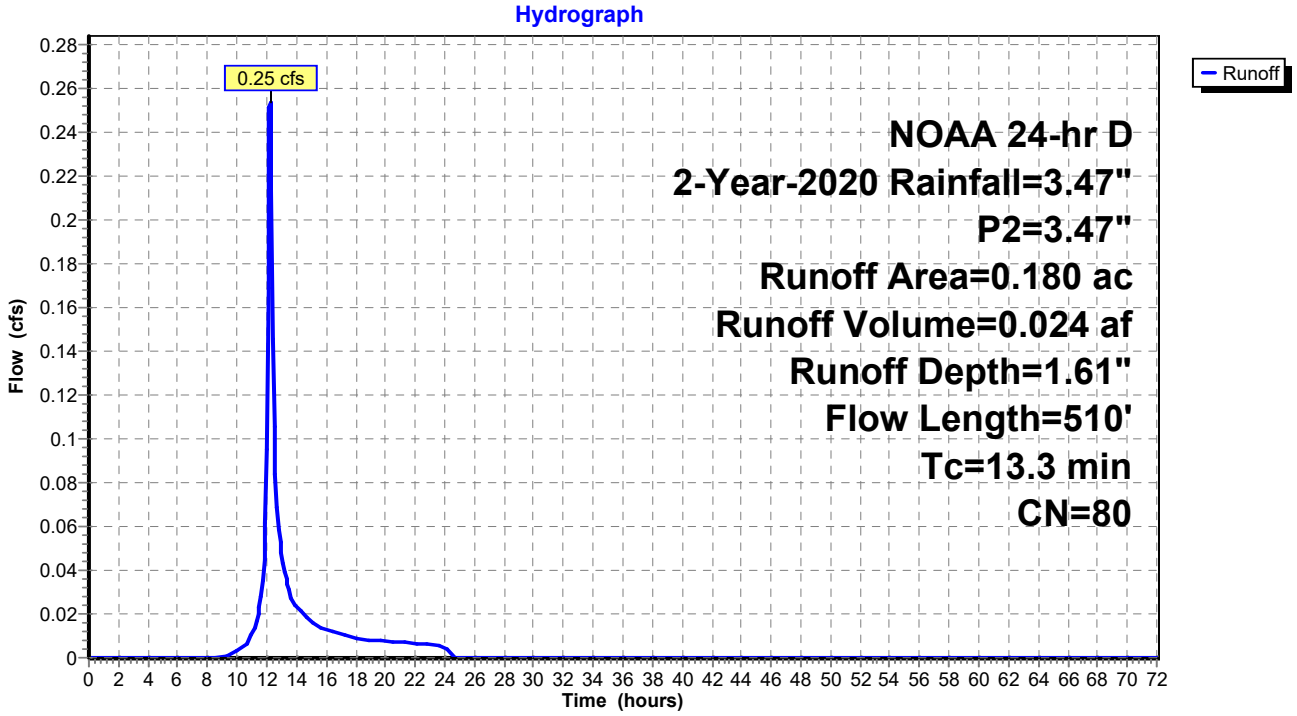
Runoff = 0.25 cfs @ 12.22 hrs, Volume= 0.024 af, Depth= 1.61"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

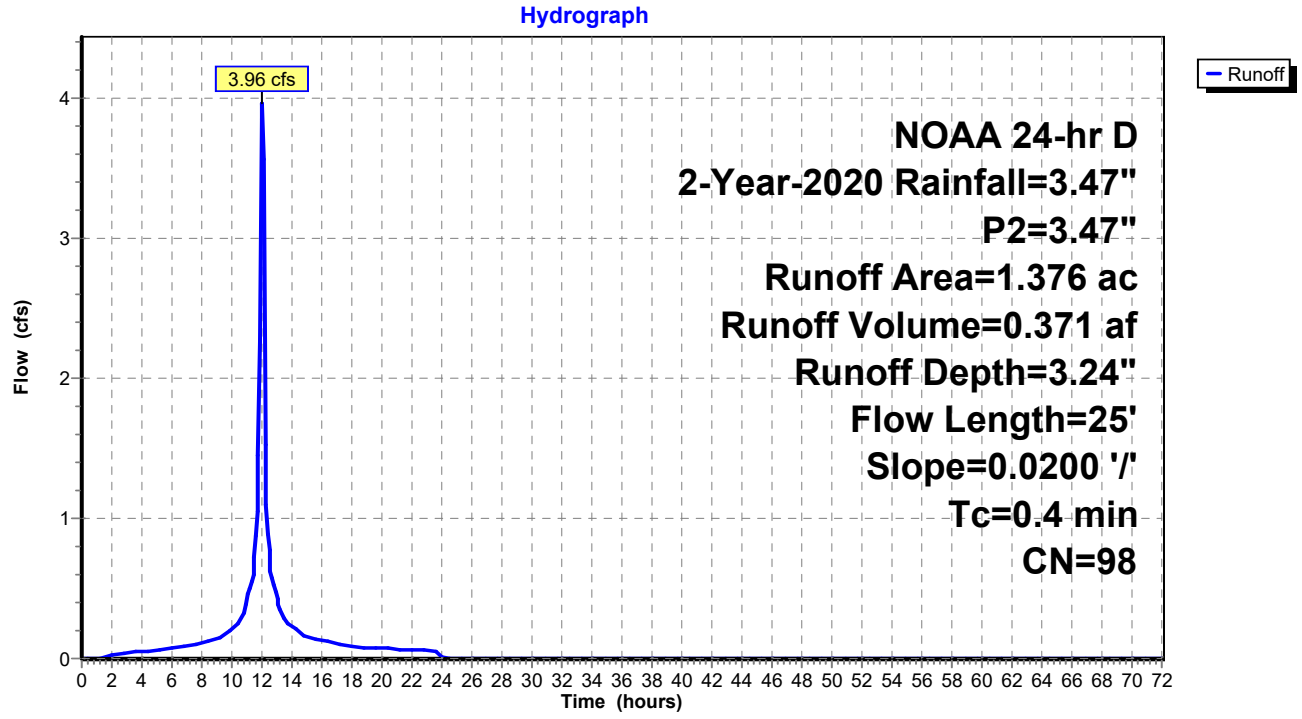
Runoff = 3.96 cfs @ 12.03 hrs, Volume= 0.371 af, Depth= 3.24"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.09		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.47"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

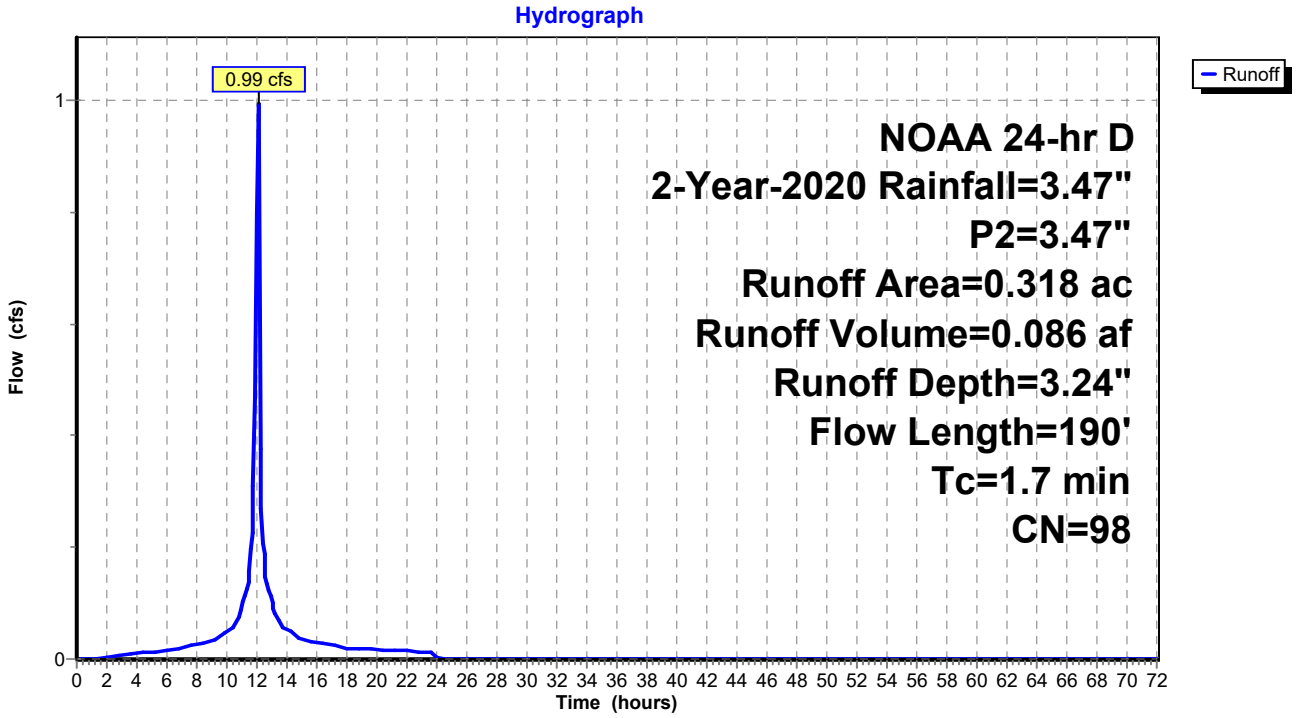
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.086 af, Depth= 3.24"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

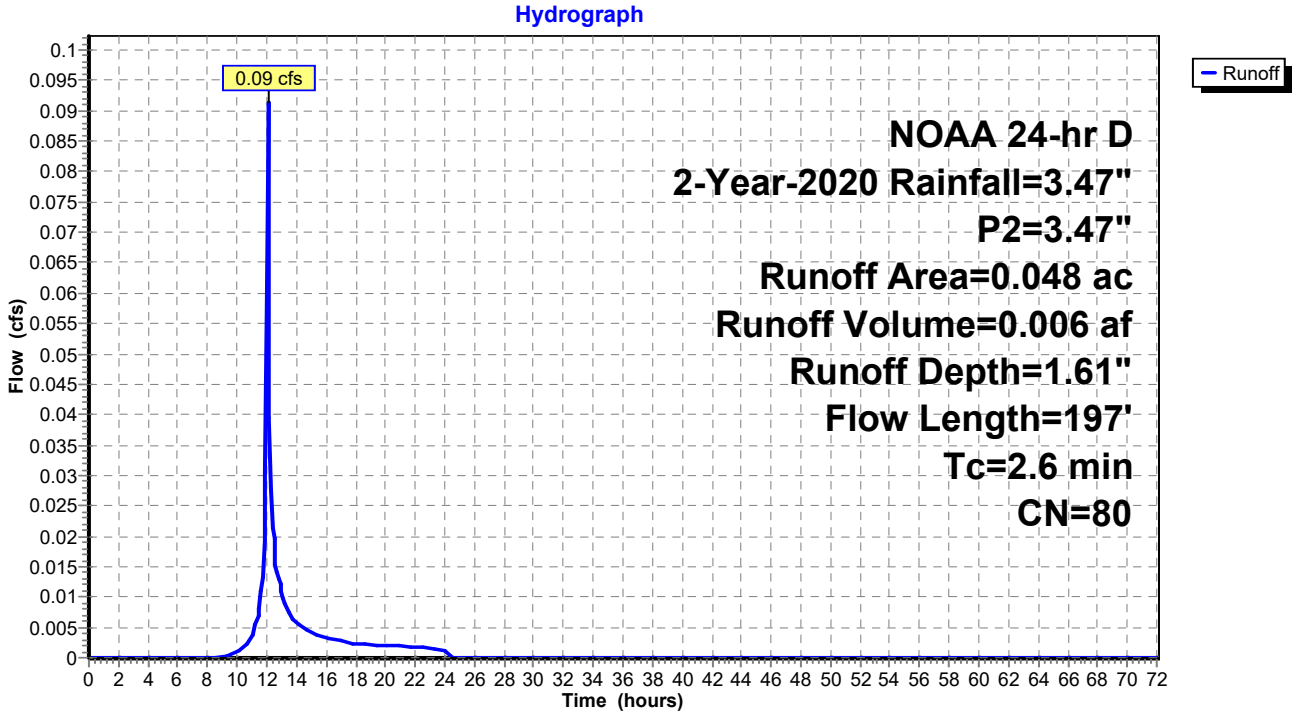
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 1.61"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 3.24" for 2-Year-2020 event
Inflow = 3.96 cfs @ 12.03 hrs, Volume= 0.371 af
Outflow = 0.58 cfs @ 12.69 hrs, Volume= 0.253 af, Atten= 85%, Lag= 39.3 min
Primary = 0.58 cfs @ 12.69 hrs, Volume= 0.253 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 131.80' @ 12.69 hrs Surf.Area= 10,137 sf Storage= 9,776 cf

Plug-Flow detention time= 375.0 min calculated for 0.253 af (68% of inflow)
Center-of-Mass det. time= 272.6 min (1,024.0 - 751.3)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

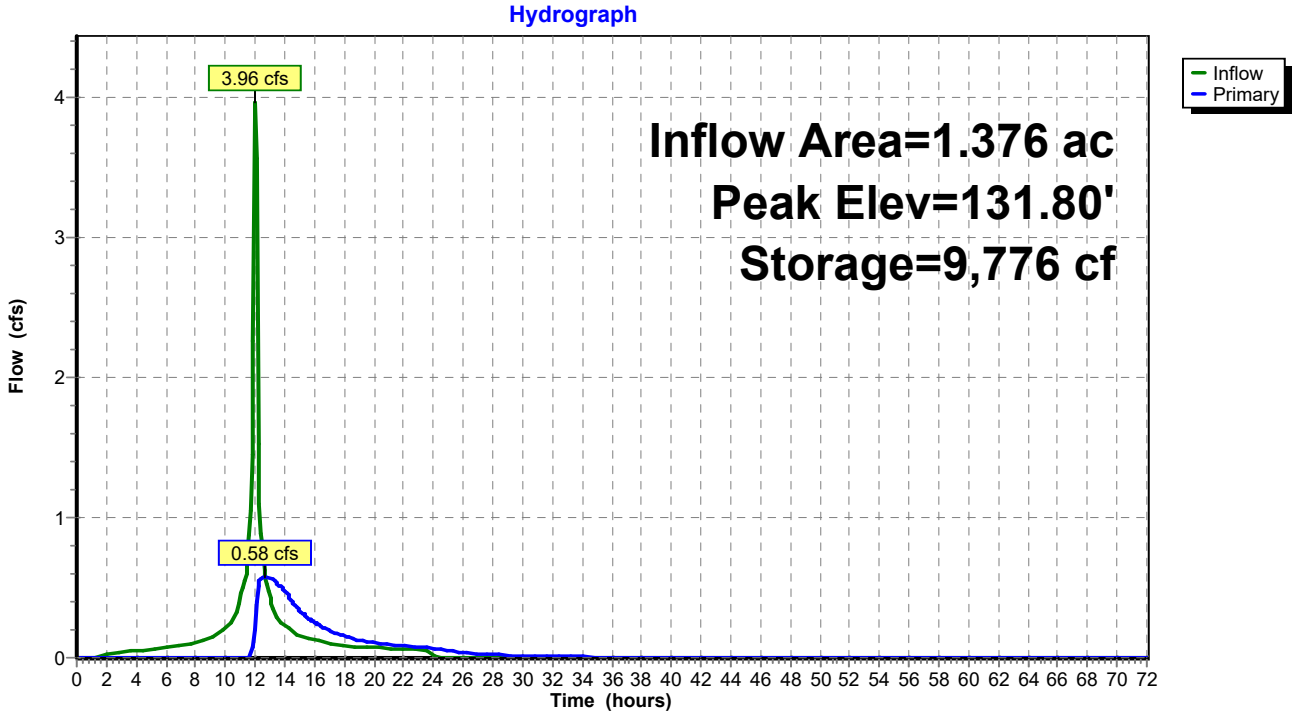
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.58 cfs @ 12.69 hrs HW=131.80' (Free Discharge)
└─**1=Culvert** (Passes 0.58 cfs of 6.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.58 cfs @ 2.78 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

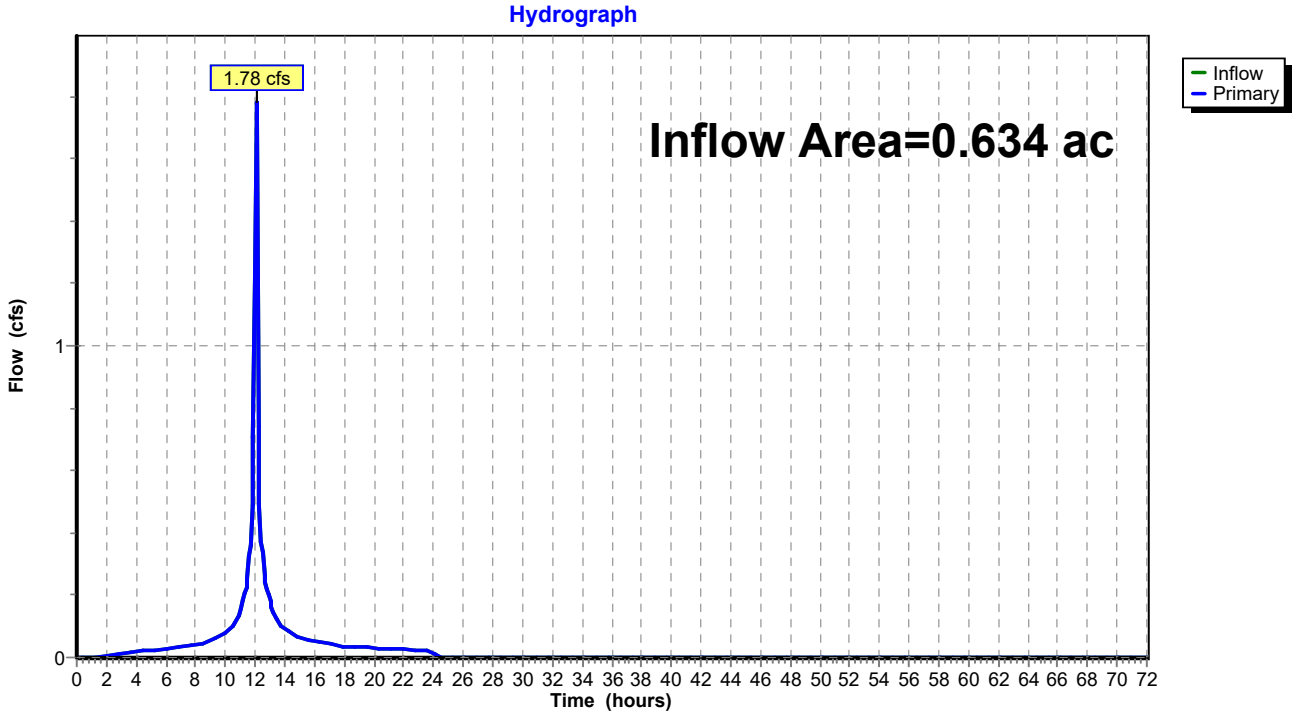


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 2.79" for 2-Year-2020 event
Inflow = 1.78 cfs @ 12.08 hrs, Volume= 0.147 af
Primary = 1.78 cfs @ 12.08 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 E1: EDA 1

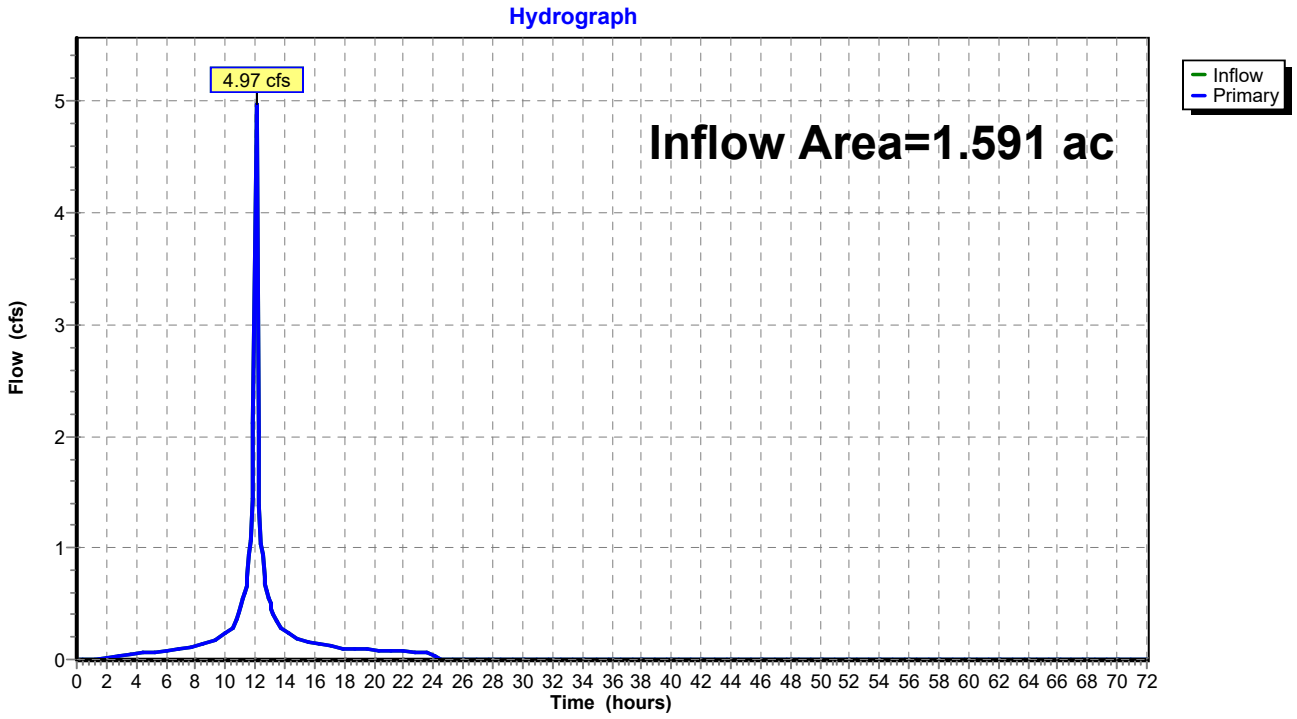


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 3.15" for 2-Year-2020 event
Inflow = 4.97 cfs @ 12.08 hrs, Volume= 0.418 af
Primary = 4.97 cfs @ 12.08 hrs, Volume= 0.418 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

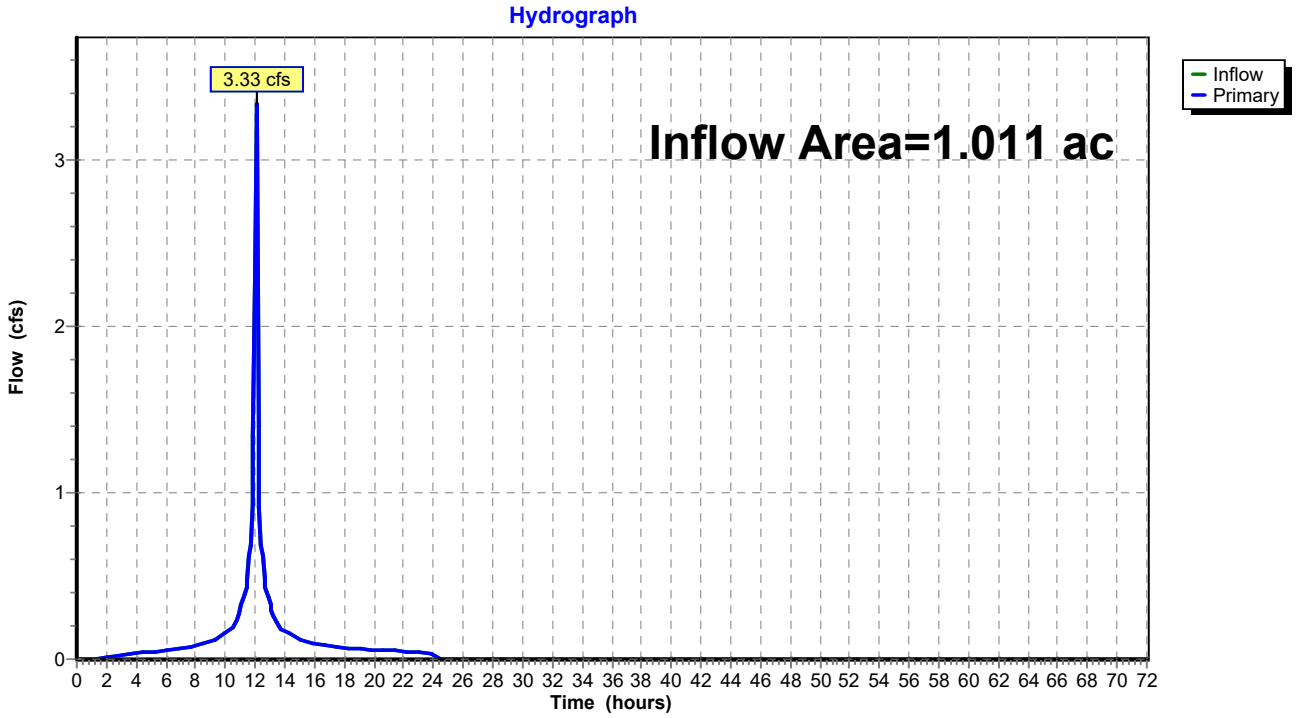


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 3.23" for 2-Year-2020 event
Inflow = 3.33 cfs @ 12.09 hrs, Volume= 0.272 af
Primary = 3.33 cfs @ 12.09 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

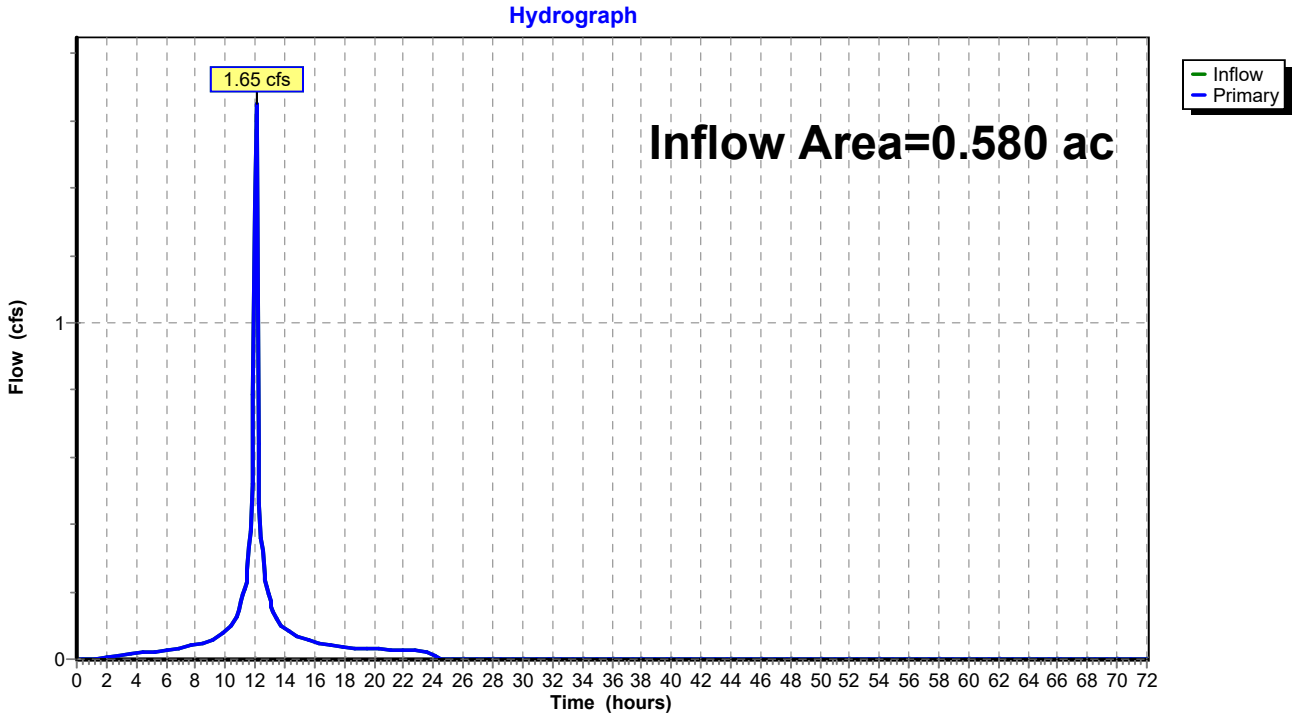


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 3.01" for 2-Year-2020 event
Inflow = 1.65 cfs @ 12.07 hrs, Volume= 0.145 af
Primary = 1.65 cfs @ 12.07 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

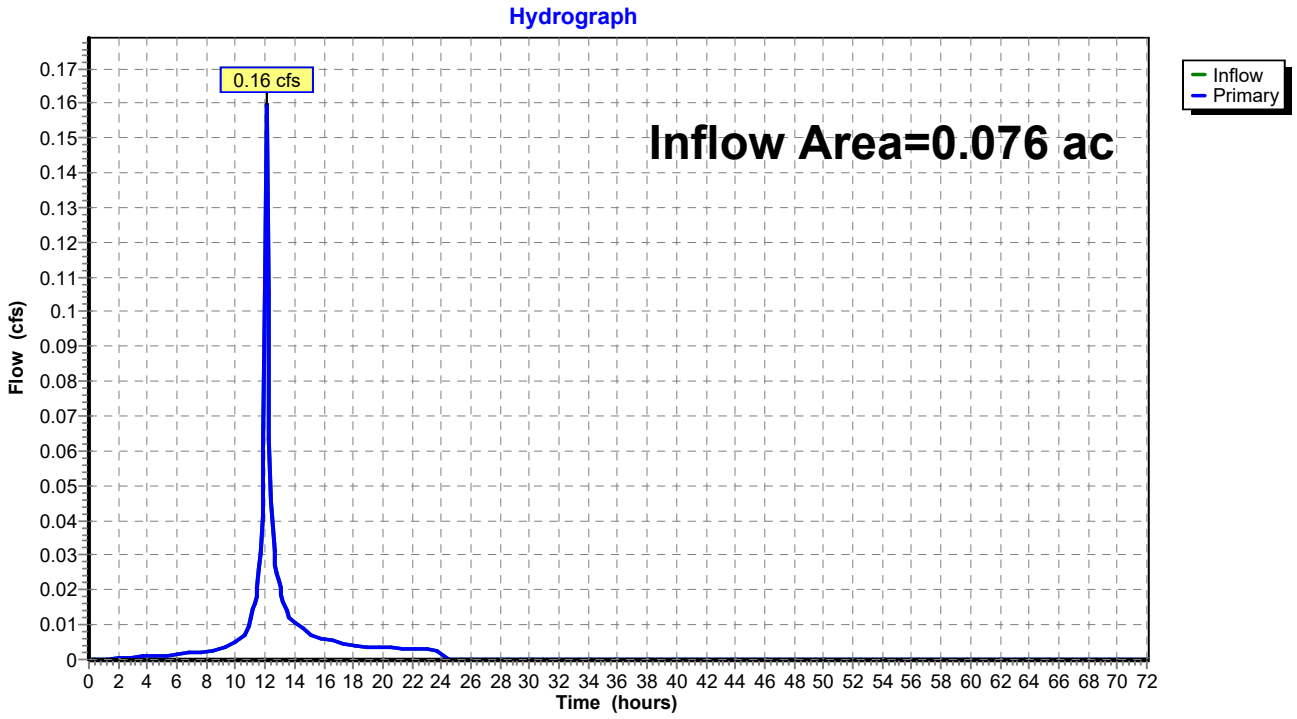


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 2.21" for 2-Year-2020 event
Inflow = 0.16 cfs @ 12.10 hrs, Volume= 0.014 af
Primary = 0.16 cfs @ 12.10 hrs, Volume= 0.014 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

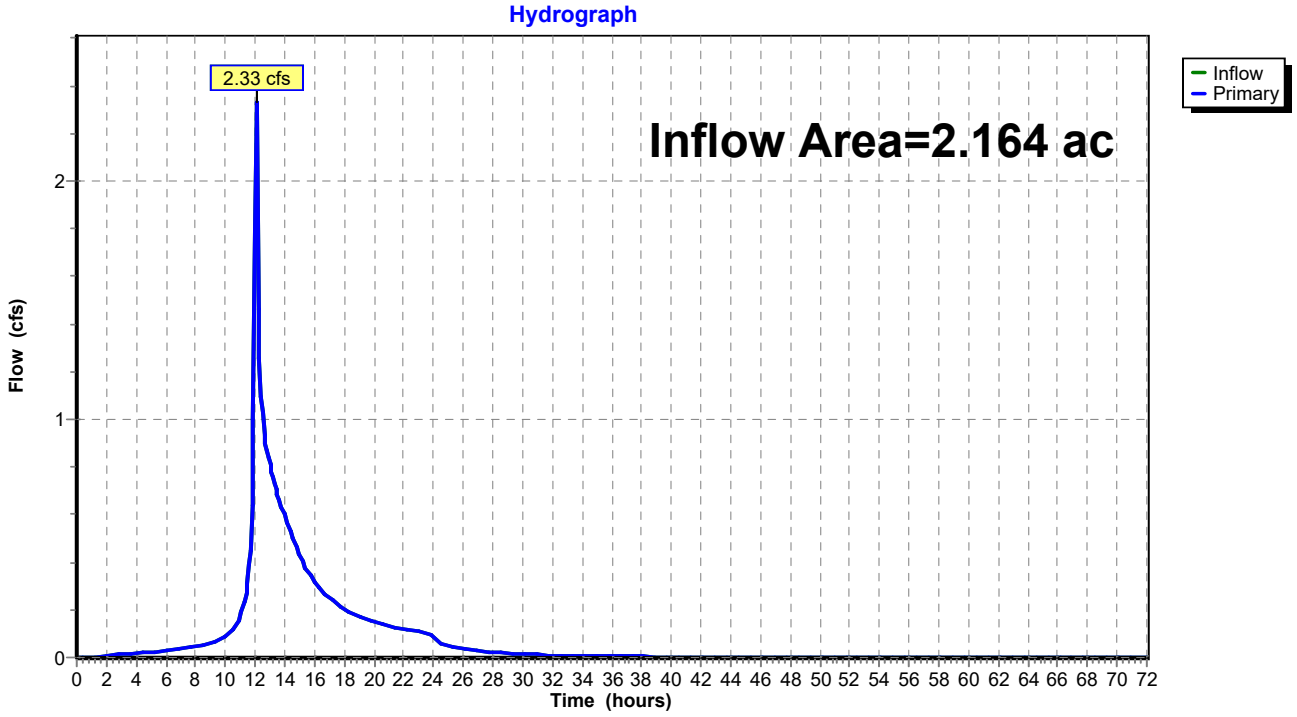


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 2.41" for 2-Year-2020 event
Inflow = 2.33 cfs @ 12.09 hrs, Volume= 0.435 af
Primary = 2.33 cfs @ 12.09 hrs, Volume= 0.435 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

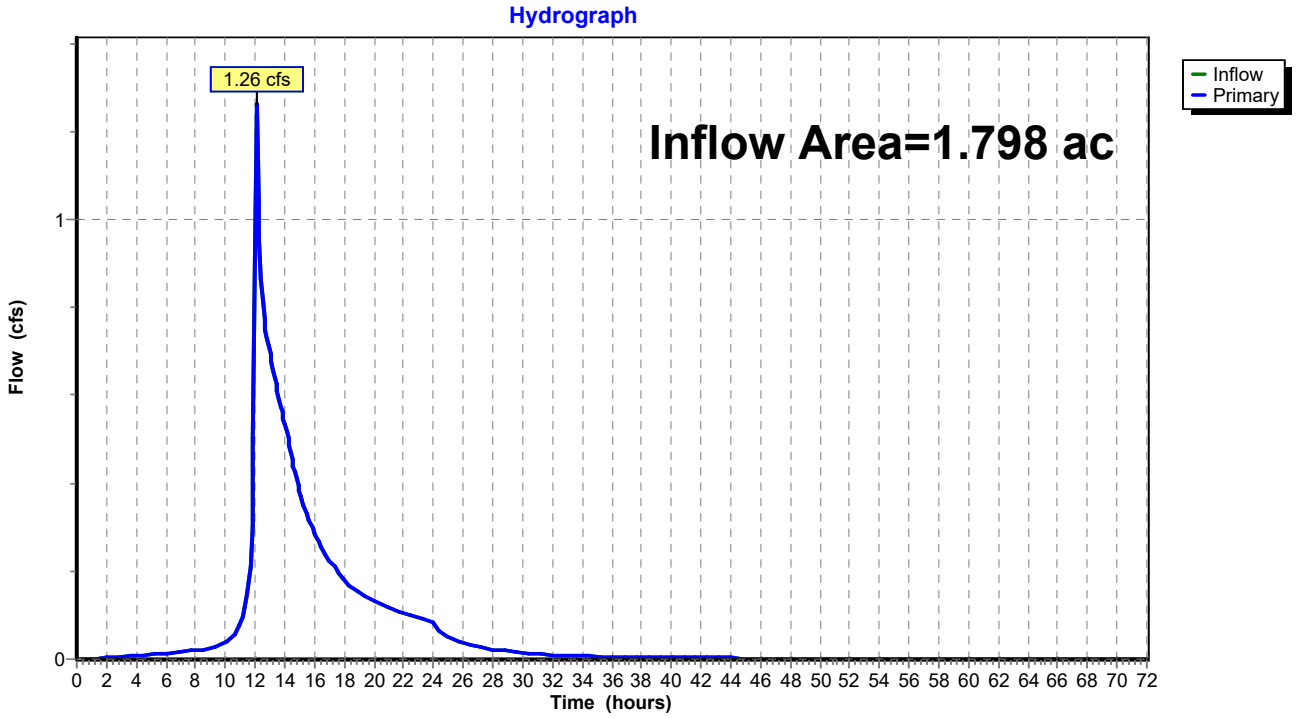


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 2.29" for 2-Year-2020 event
Inflow = 1.26 cfs @ 12.11 hrs, Volume= 0.343 af
Primary = 1.26 cfs @ 12.11 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

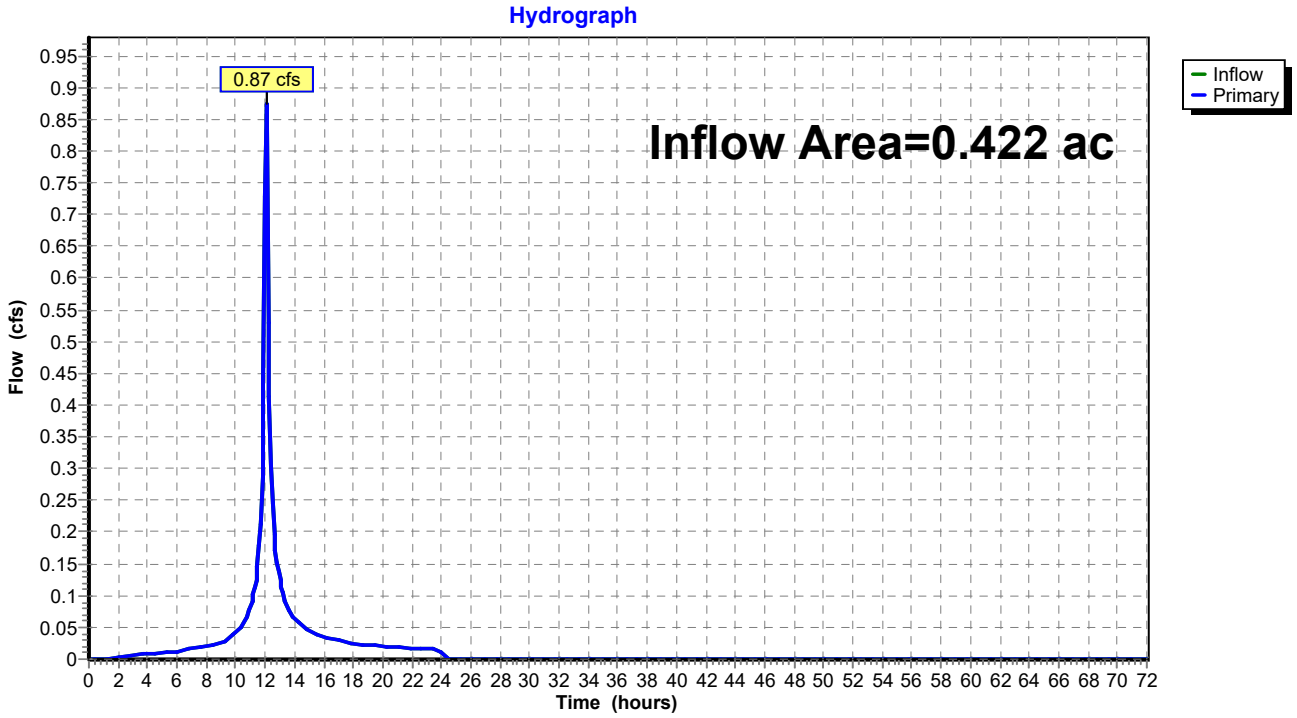


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 2.54" for 2-Year-2020 event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 0.089 af
Primary = 0.87 cfs @ 12.08 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

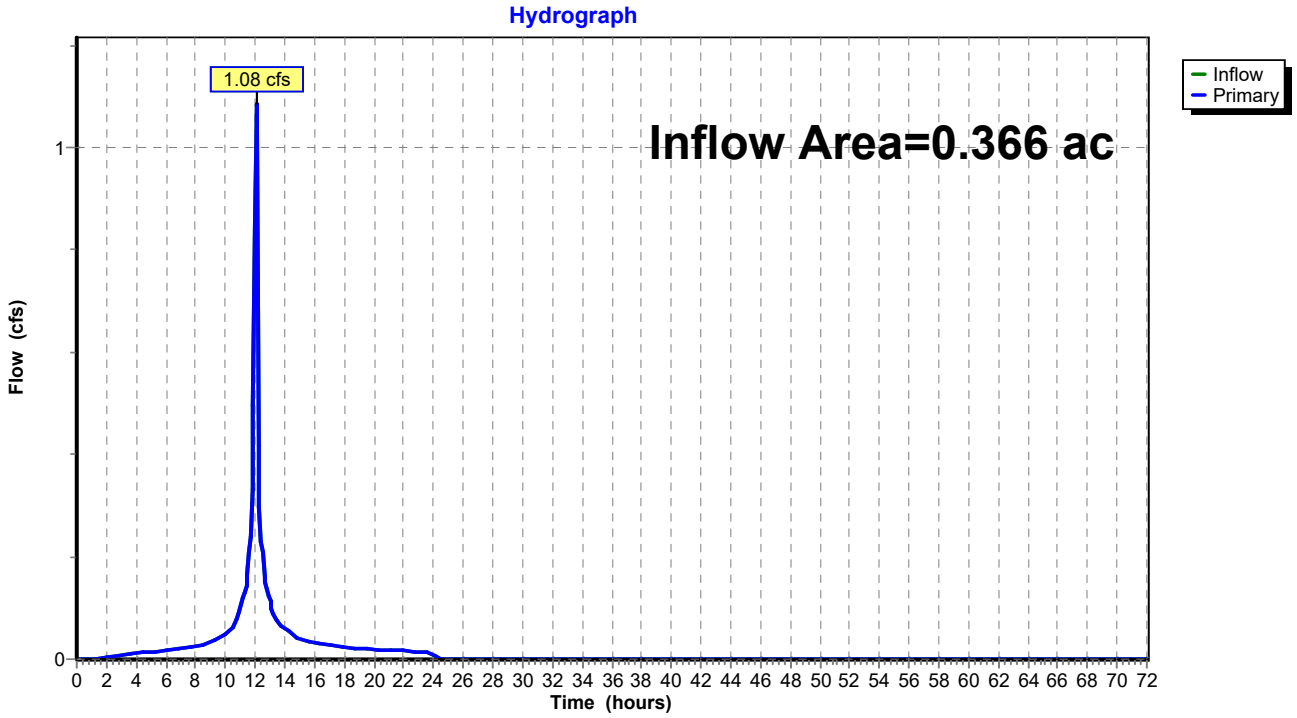


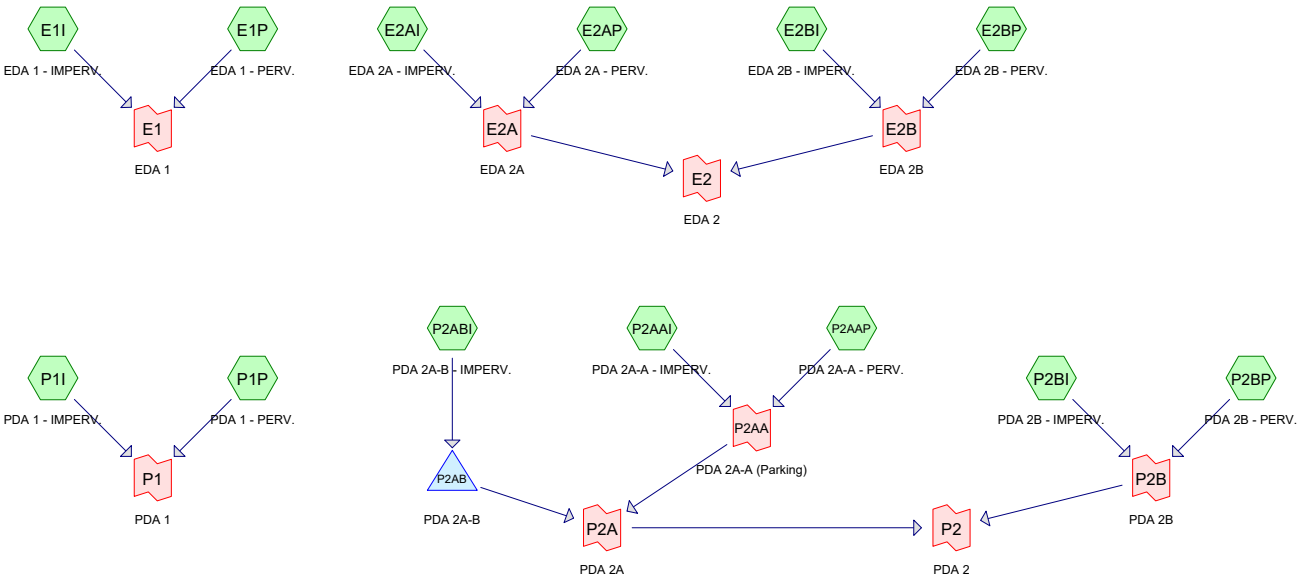
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 3.02" for 2-Year-2020 event
Inflow = 1.08 cfs @ 12.07 hrs, Volume= 0.092 af
Primary = 1.08 cfs @ 12.07 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

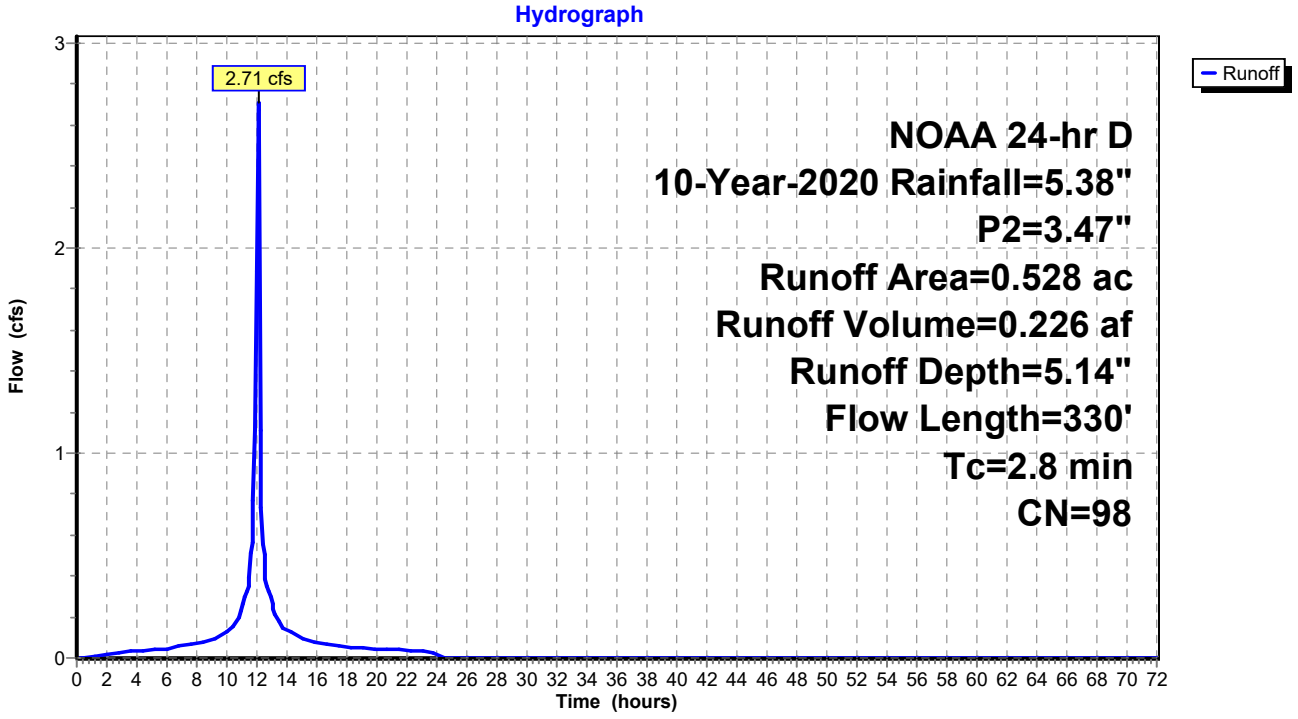
Runoff = 2.71 cfs @ 12.08 hrs, Volume= 0.226 af, Depth= 5.14"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.47"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

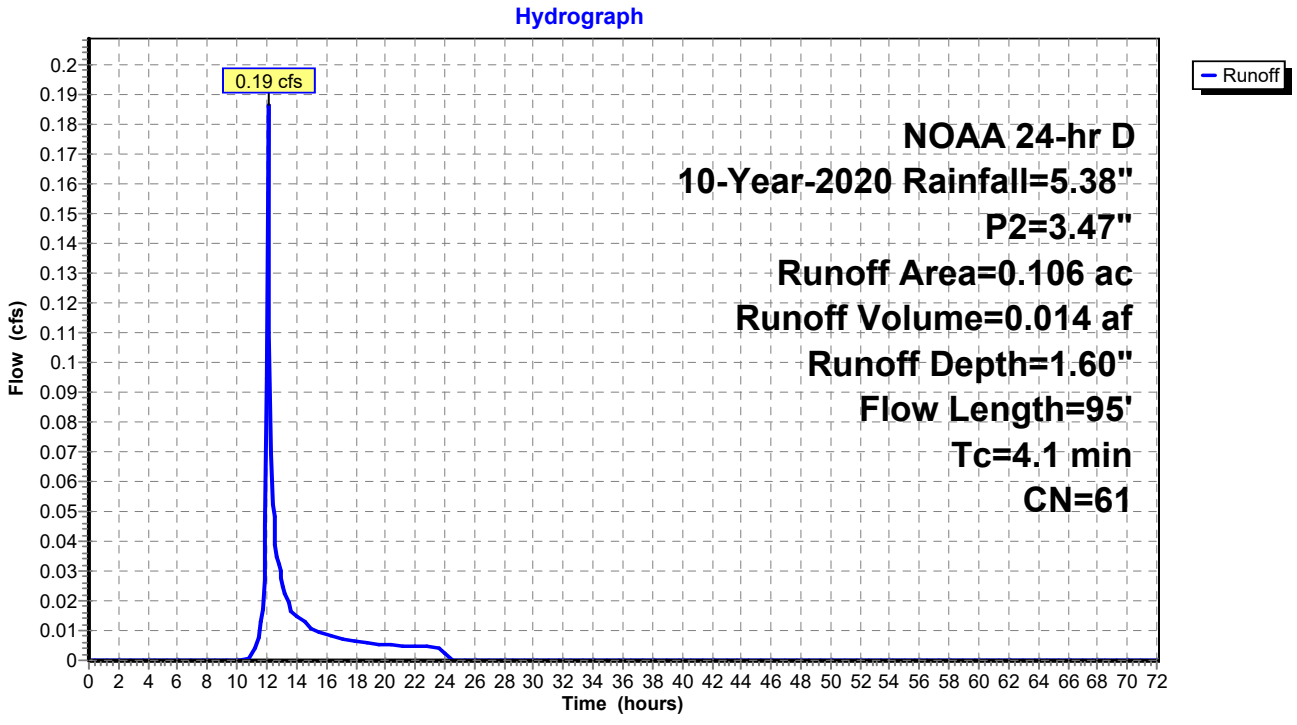
Runoff = 0.19 cfs @ 12.10 hrs, Volume= 0.014 af, Depth= 1.60"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.47"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

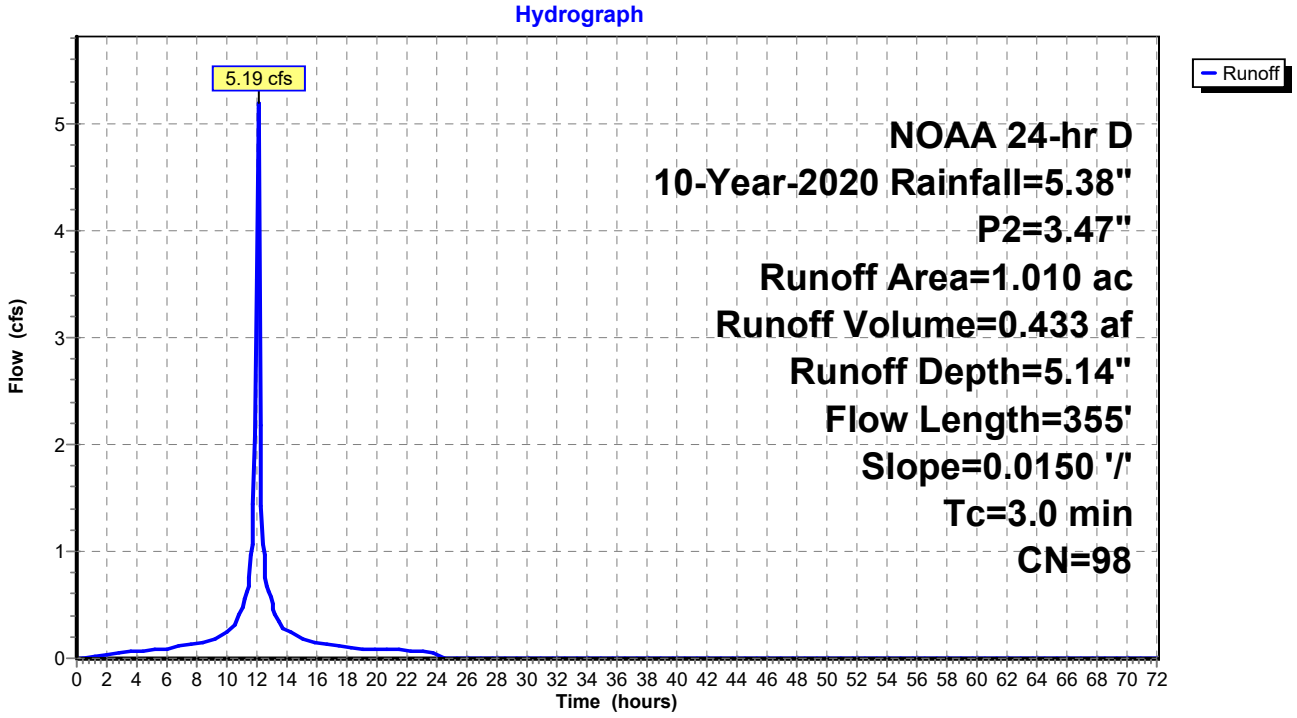
Runoff = 5.19 cfs @ 12.08 hrs, Volume= 0.433 af, Depth= 5.14"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.47"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

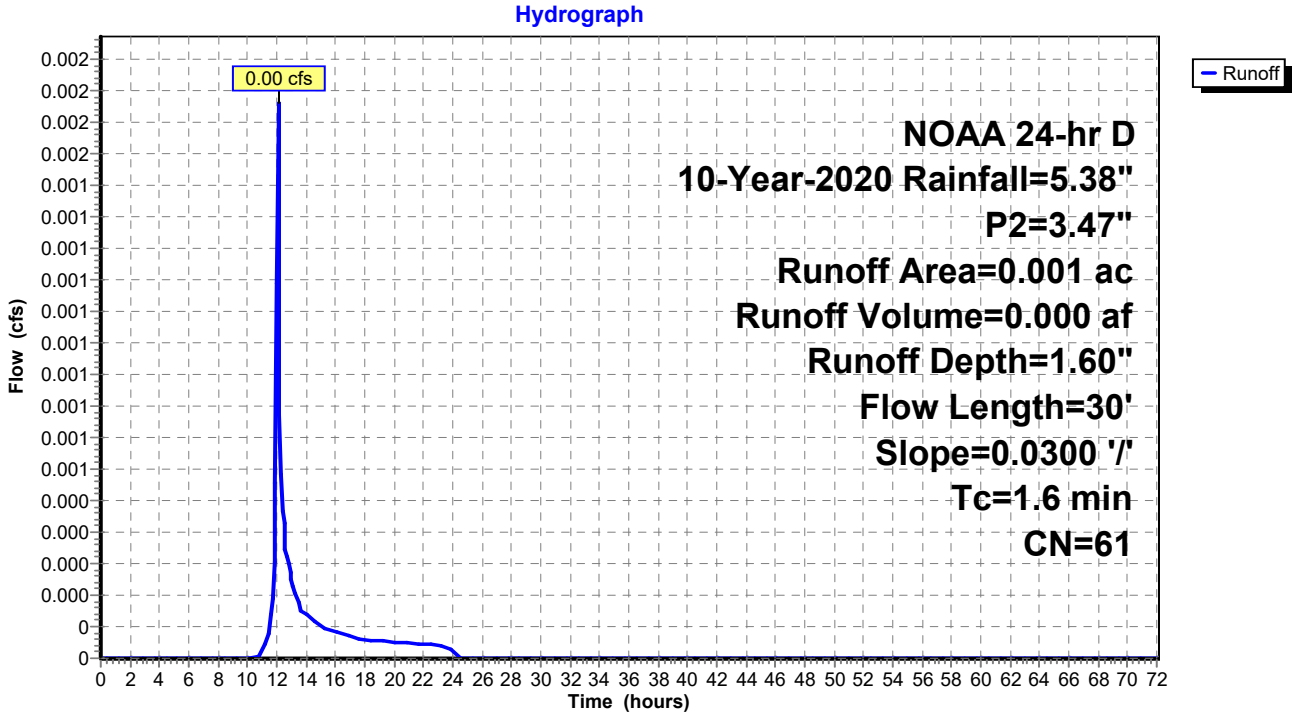
Runoff = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af, Depth= 1.60"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.47"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

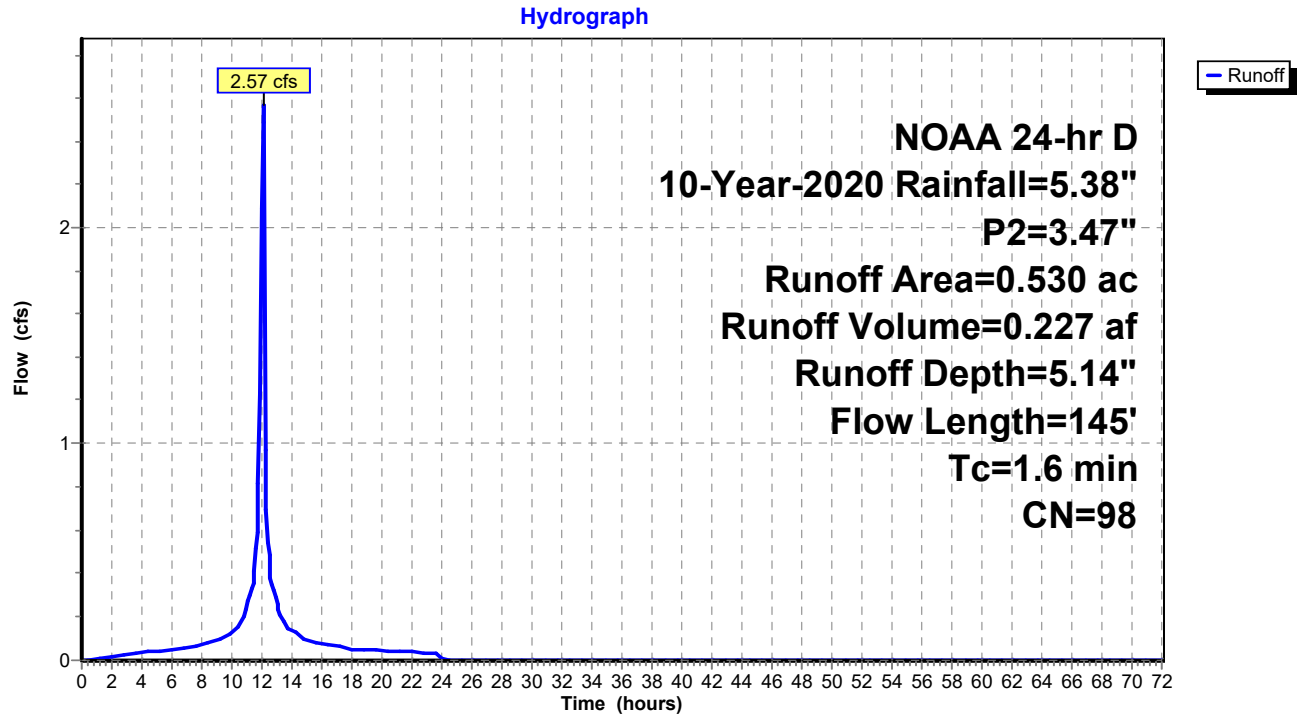
Runoff = 2.57 cfs @ 12.07 hrs, Volume= 0.227 af, Depth= 5.14"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

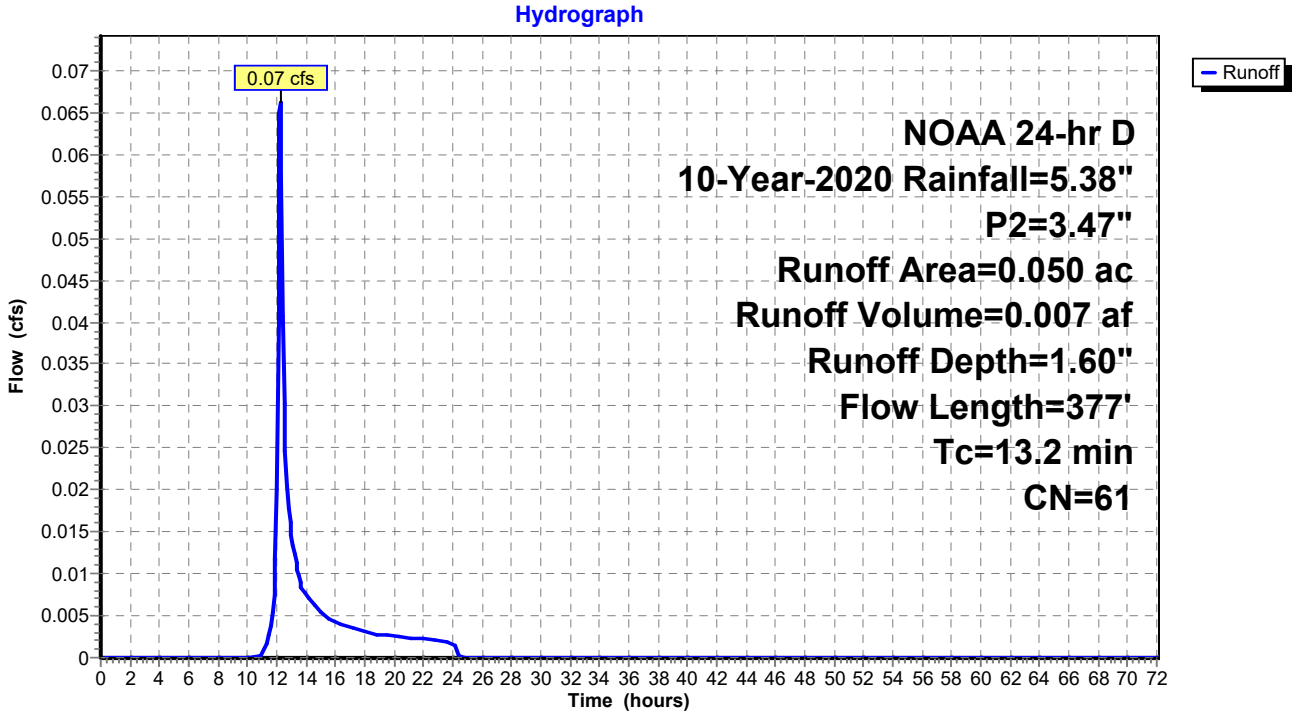
Runoff = 0.07 cfs @ 12.23 hrs, Volume= 0.007 af, Depth= 1.60"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

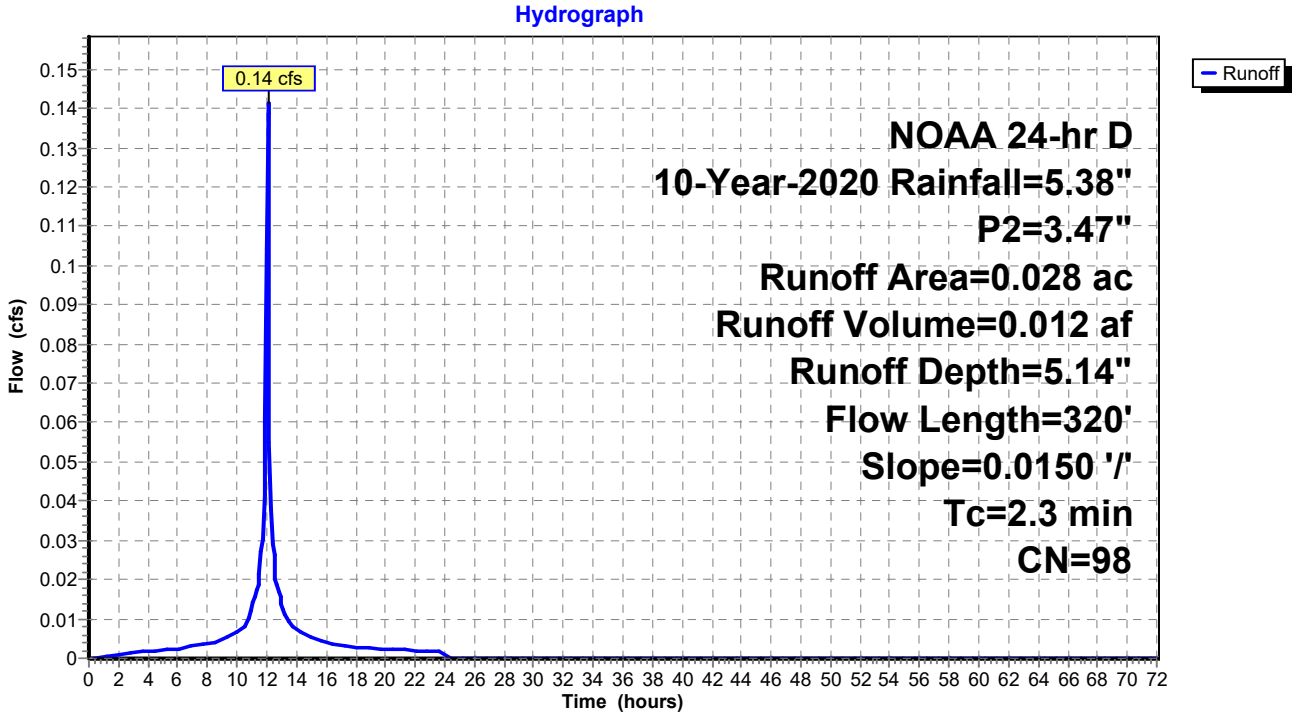
Runoff = 0.14 cfs @ 12.08 hrs, Volume= 0.012 af, Depth= 5.14"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.47"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

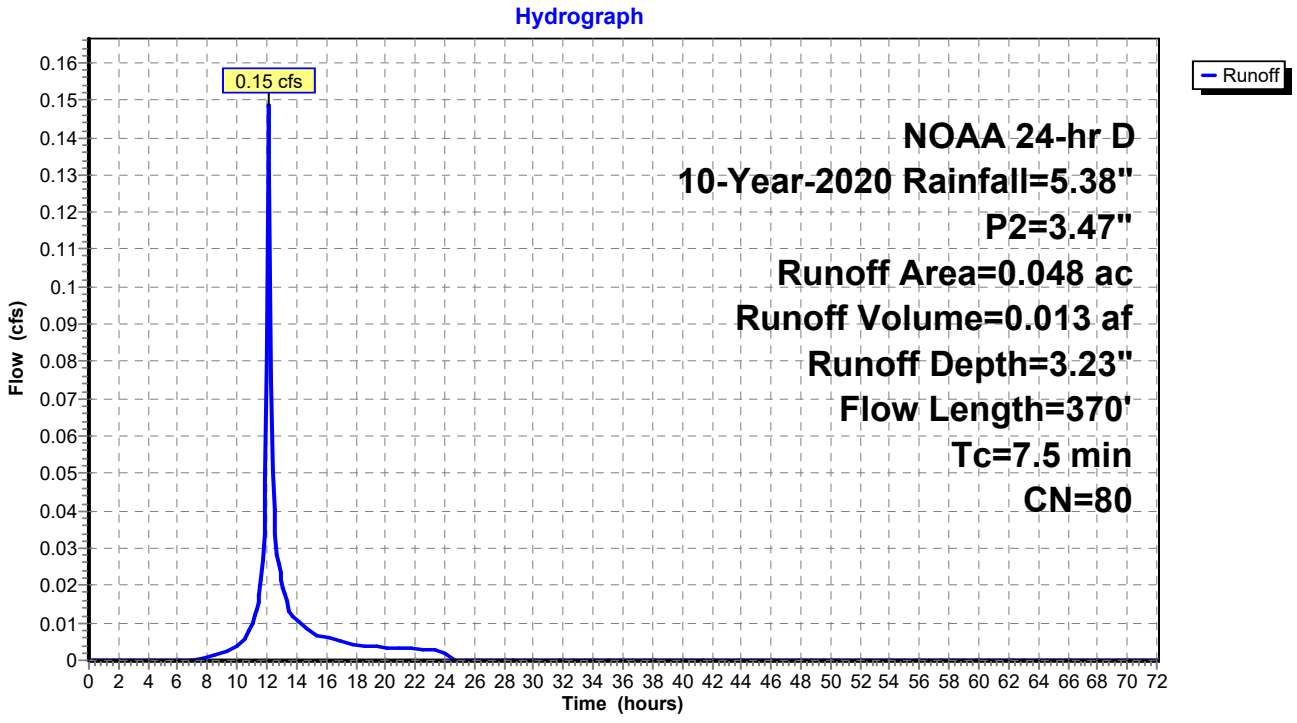
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 0.013 af, Depth= 3.23"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.47"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

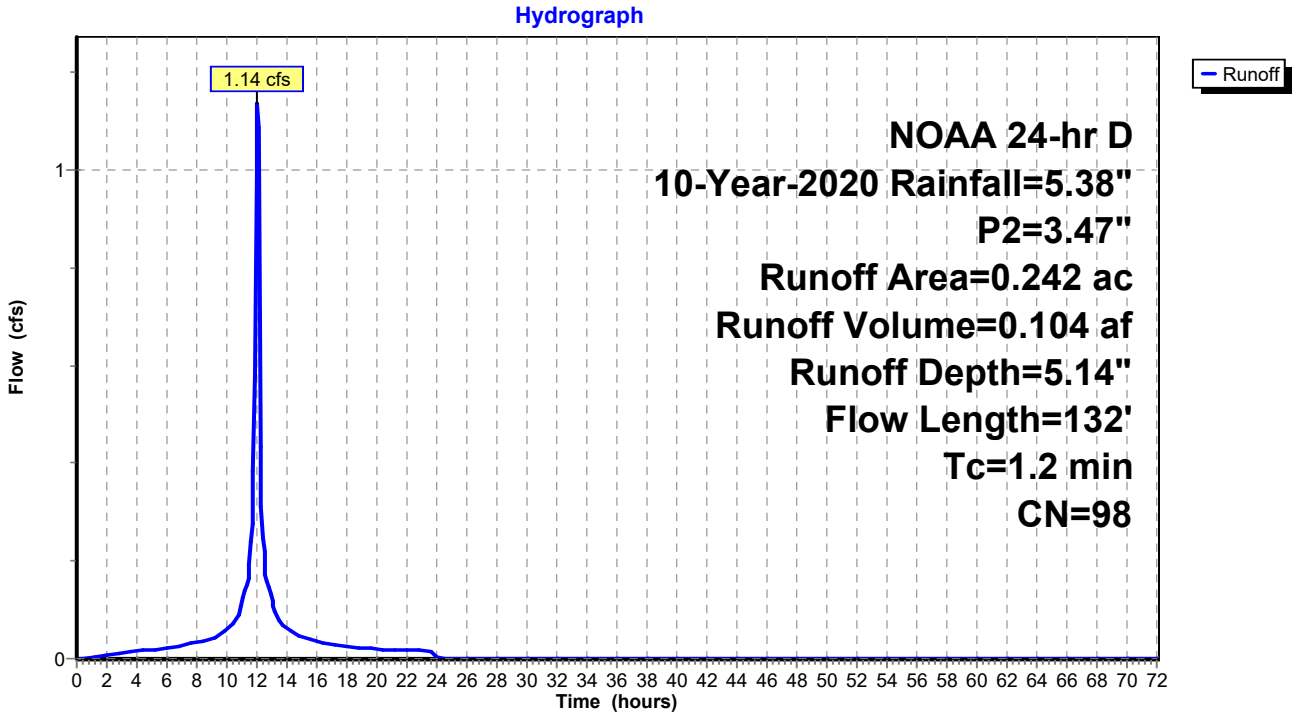
Runoff = 1.14 cfs @ 12.06 hrs, Volume= 0.104 af, Depth= 5.14"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.57		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.47"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

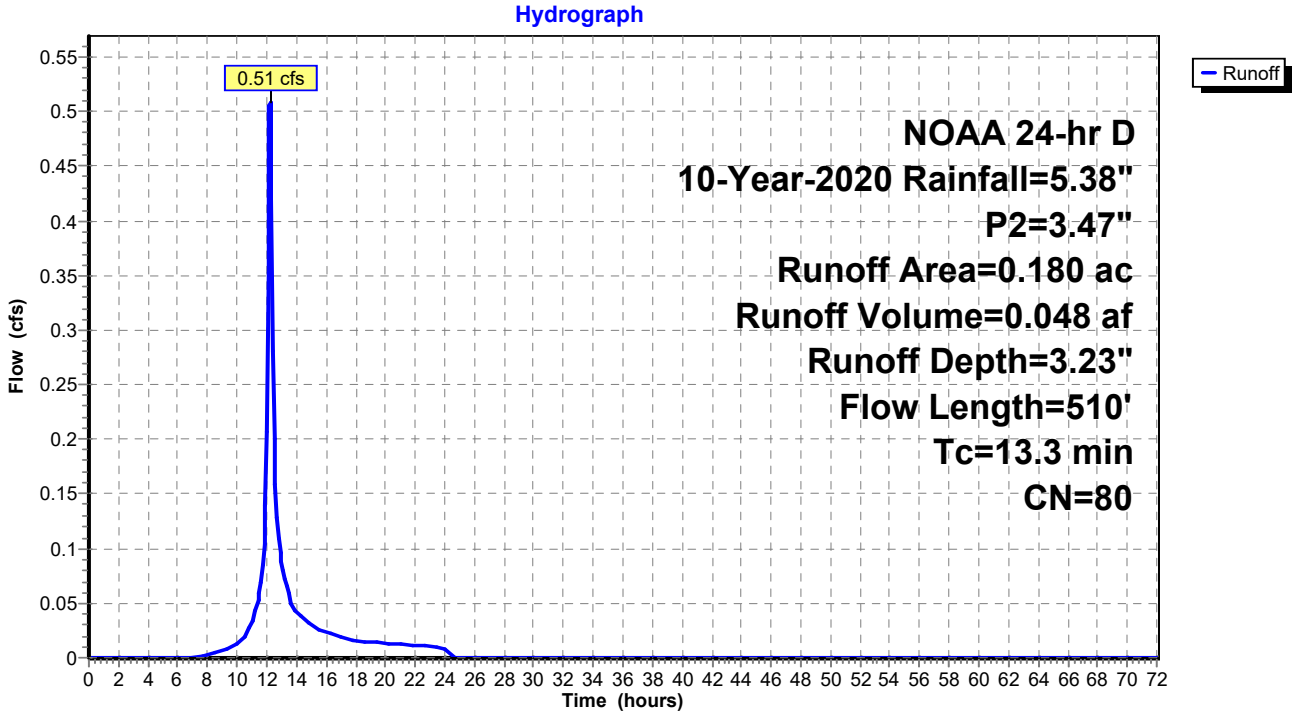
Runoff = 0.51 cfs @ 12.21 hrs, Volume= 0.048 af, Depth= 3.23"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

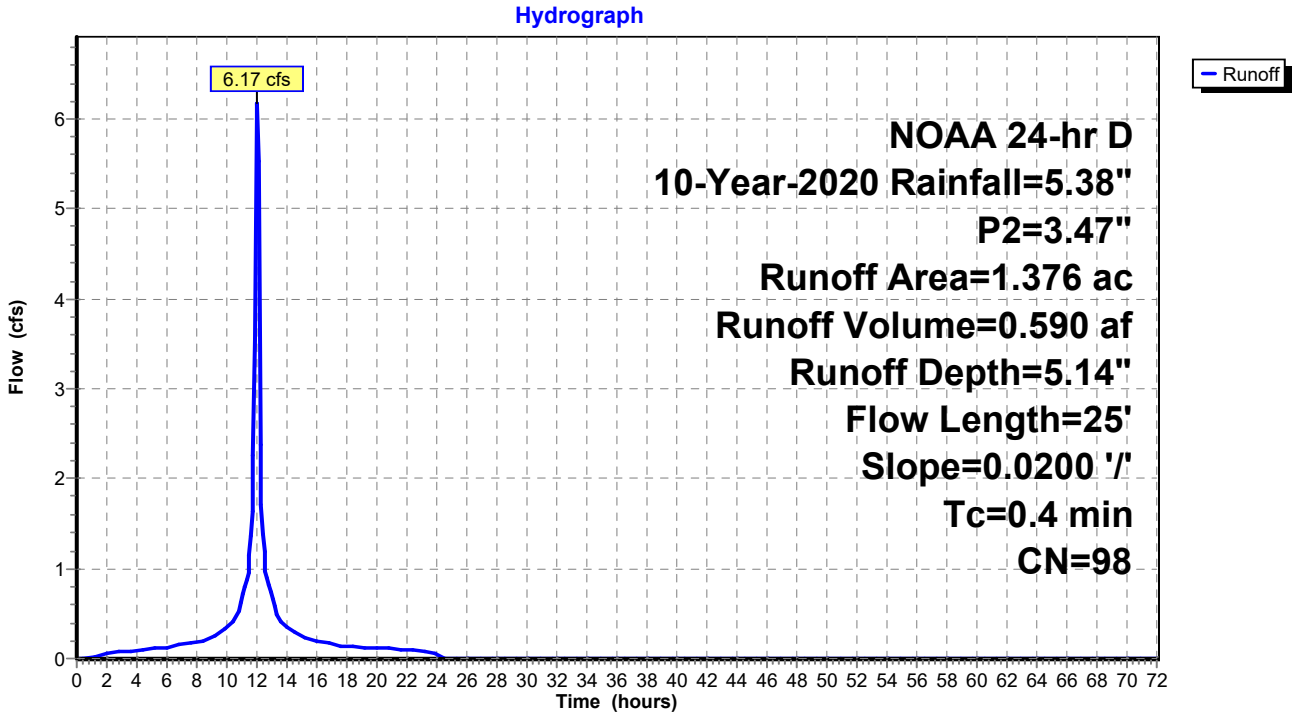
Runoff = 6.17 cfs @ 12.03 hrs, Volume= 0.590 af, Depth= 5.14"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.09		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.47"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

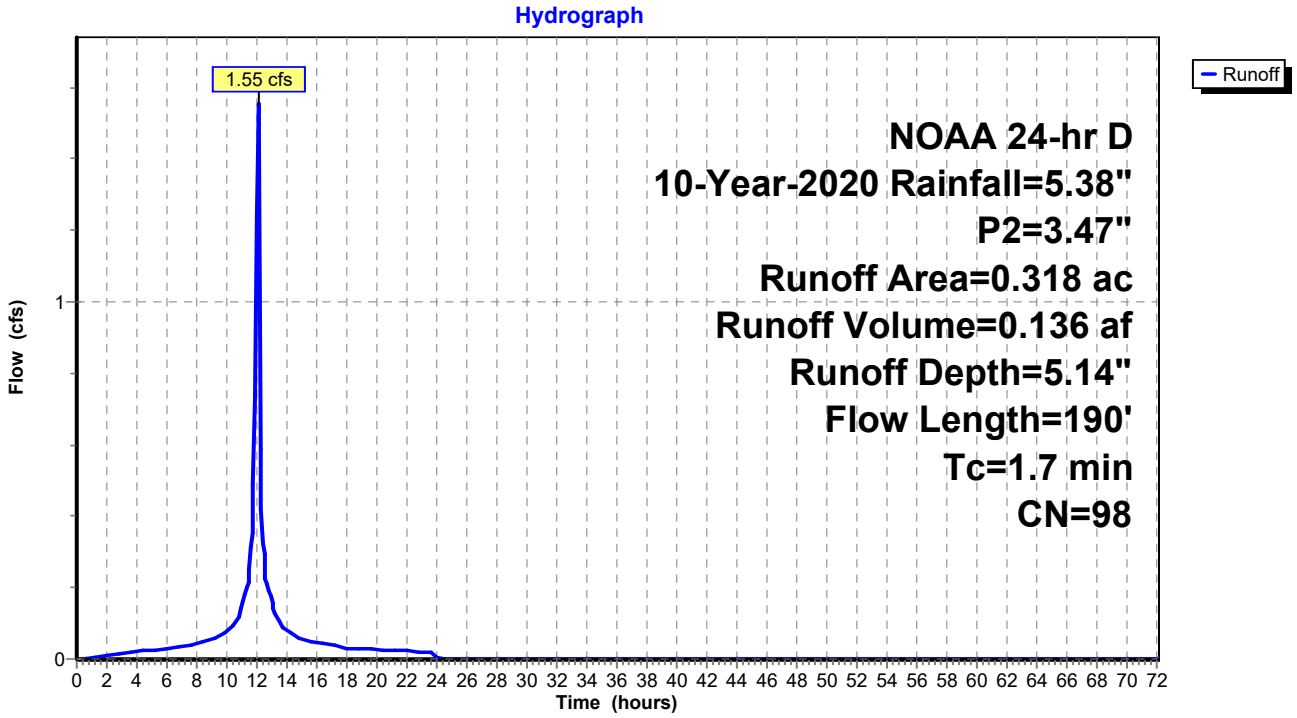
Runoff = 1.55 cfs @ 12.07 hrs, Volume= 0.136 af, Depth= 5.14"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

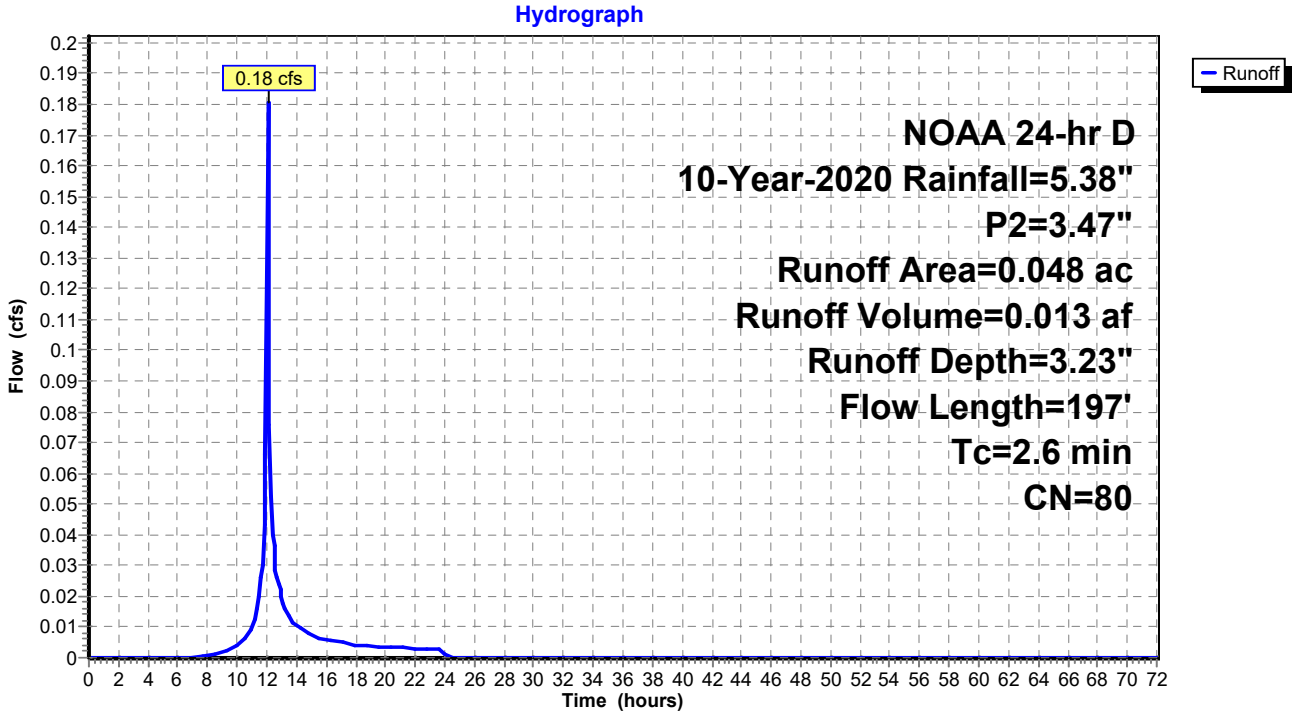
Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af, Depth= 3.23"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 5.14" for 10-Year-2020 event
Inflow = 6.17 cfs @ 12.03 hrs, Volume= 0.590 af
Outflow = 1.48 cfs @ 12.38 hrs, Volume= 0.472 af, Atten= 76%, Lag= 20.7 min
Primary = 1.48 cfs @ 12.38 hrs, Volume= 0.472 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 132.30' @ 12.38 hrs Surf.Area= 10,087 sf Storage= 13,944 cf

Plug-Flow detention time= 309.9 min calculated for 0.472 af (80% of inflow)
Center-of-Mass det. time= 225.4 min (968.2 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

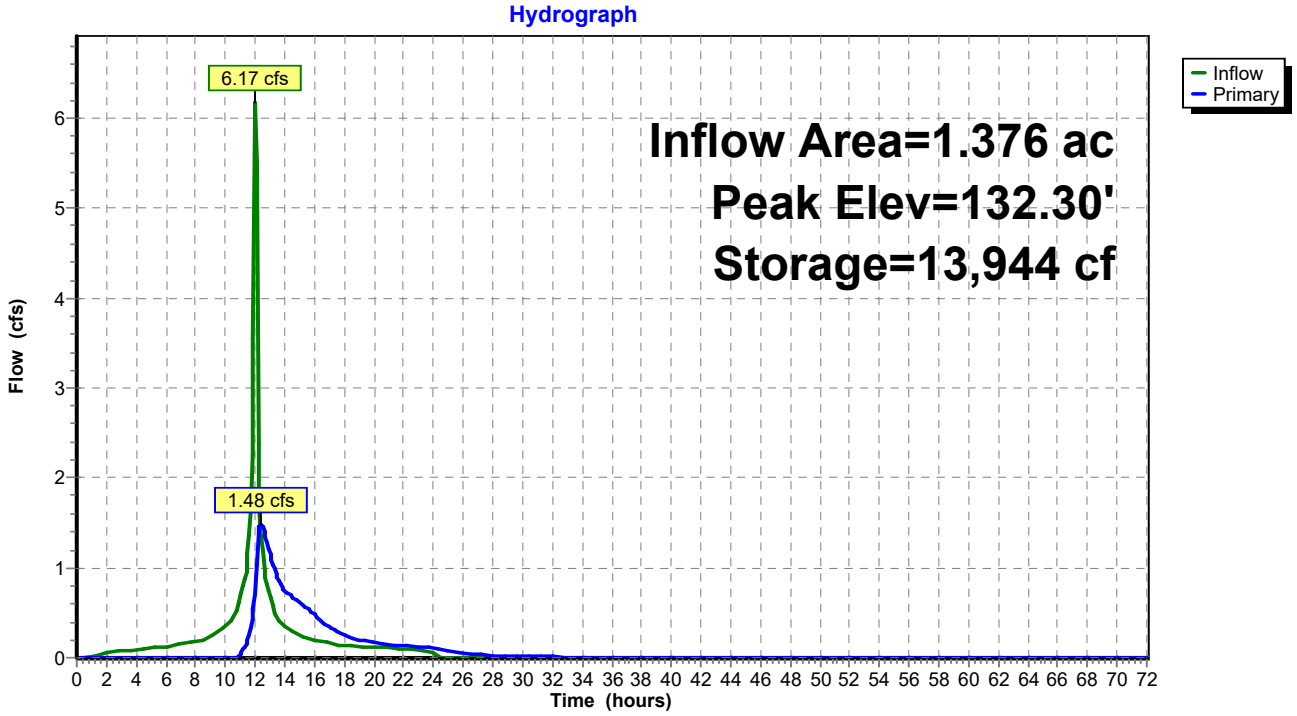
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.48 cfs @ 12.38 hrs HW=132.30' (Free Discharge)
└─**1=Culvert** (Passes 1.48 cfs of 8.38 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 4.40 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.56 cfs @ 1.56 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

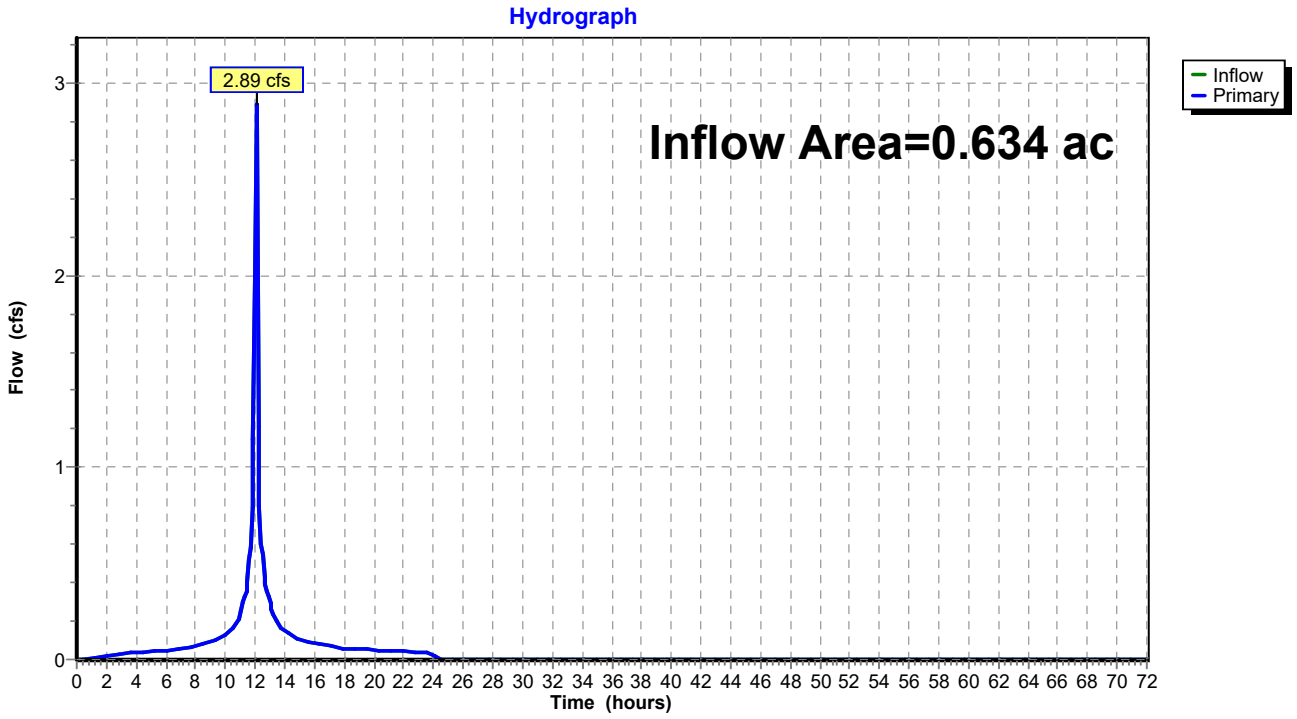


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 4.55" for 10-Year-2020 event
Inflow = 2.89 cfs @ 12.08 hrs, Volume= 0.240 af
Primary = 2.89 cfs @ 12.08 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 E1: EDA 1

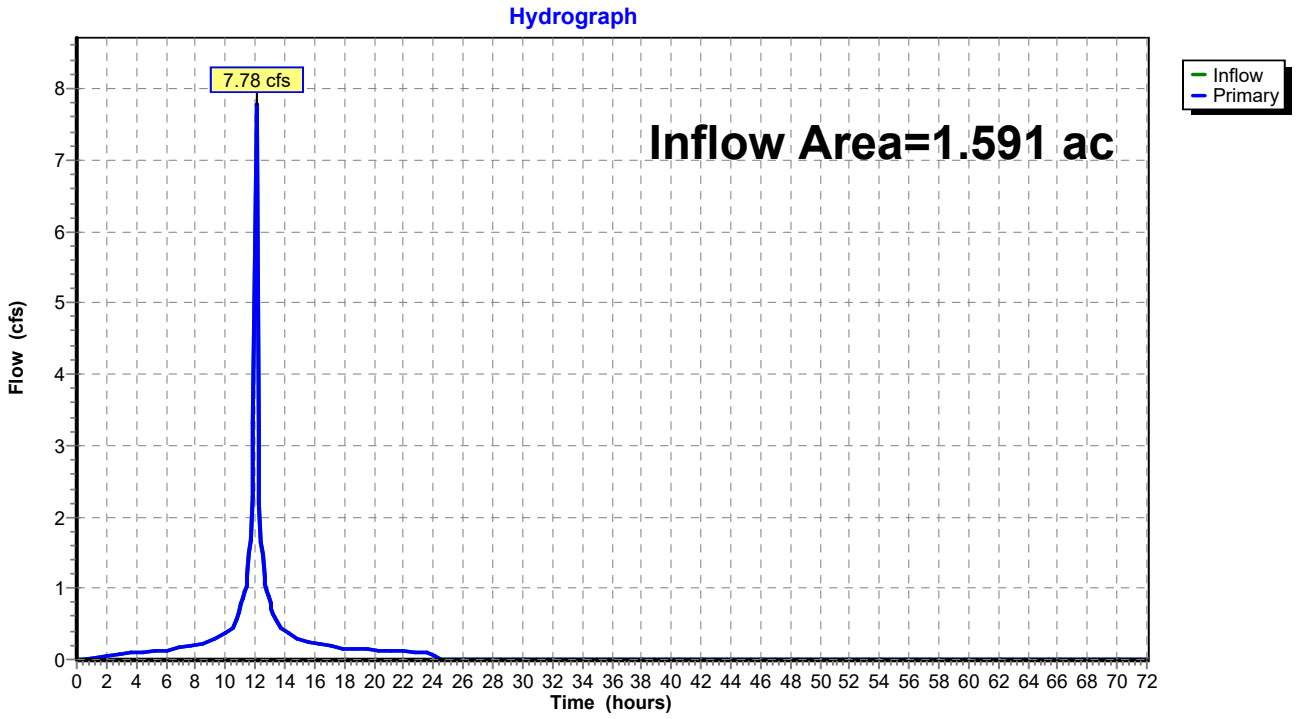


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 5.03" for 10-Year-2020 event
Inflow = 7.78 cfs @ 12.08 hrs, Volume= 0.667 af
Primary = 7.78 cfs @ 12.08 hrs, Volume= 0.667 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

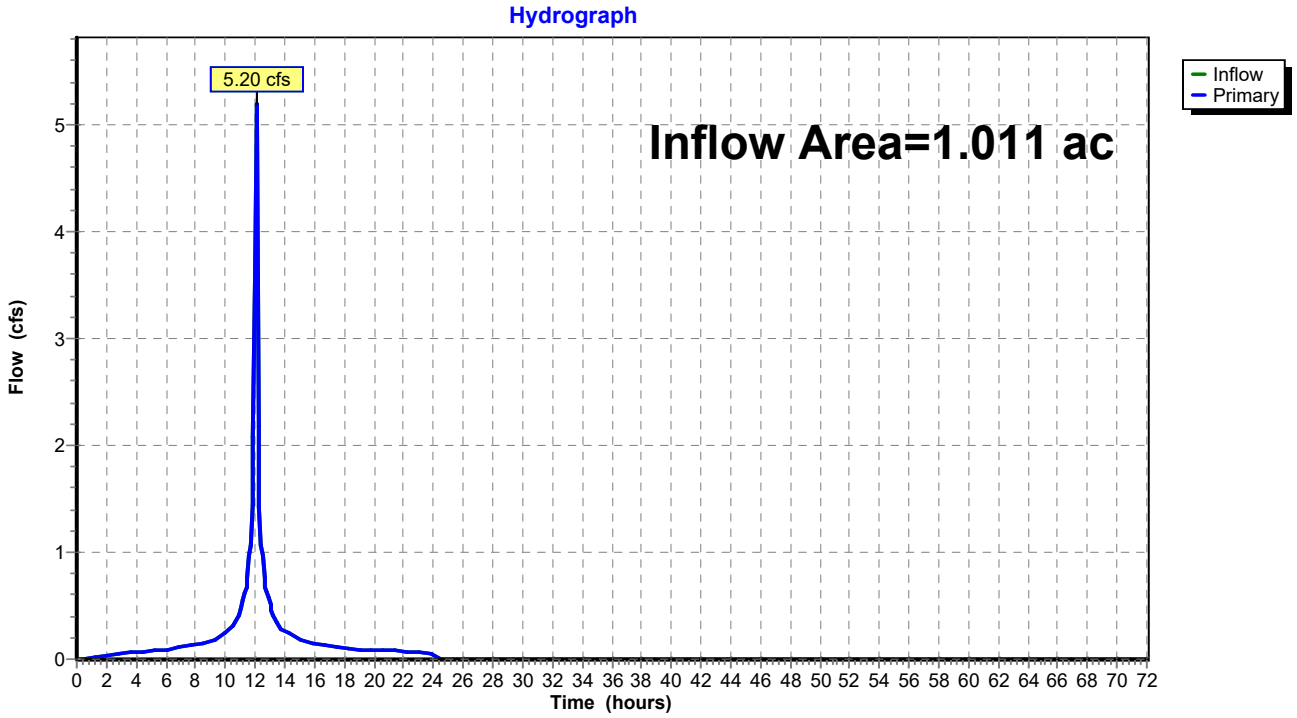


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 5.14" for 10-Year-2020 event
Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.433 af
Primary = 5.20 cfs @ 12.08 hrs, Volume= 0.433 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

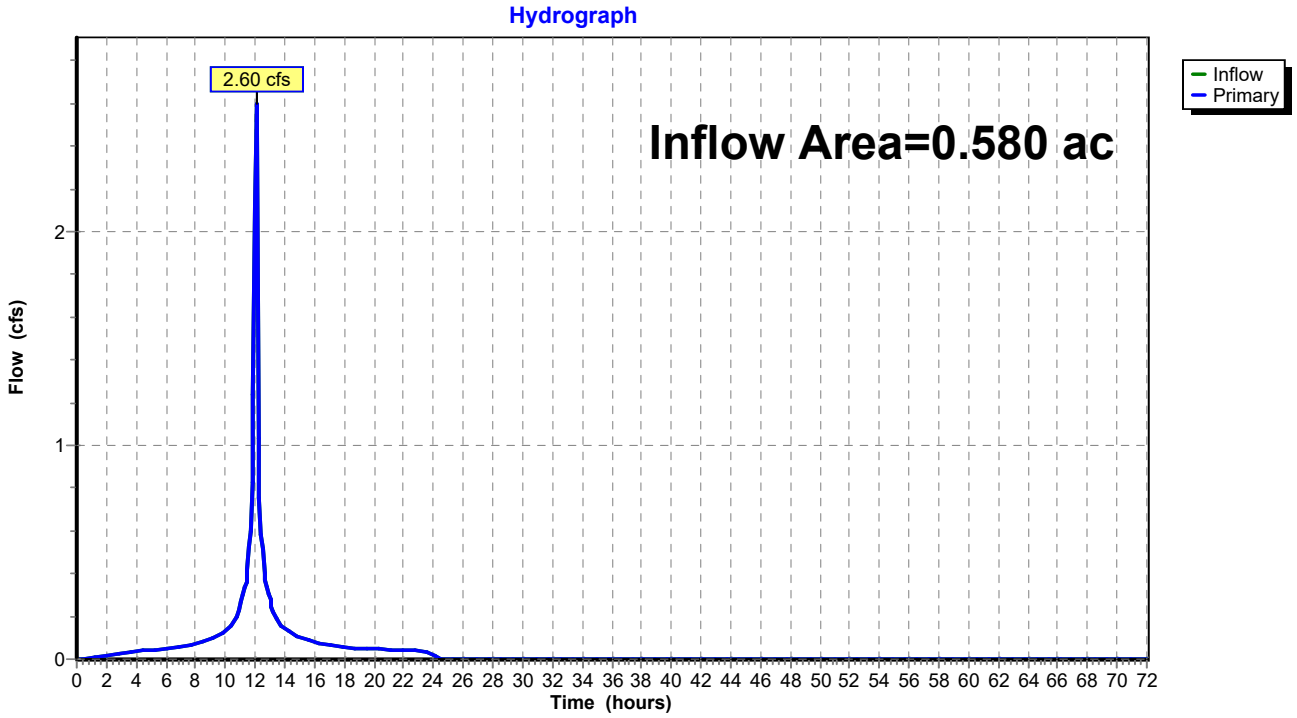


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 4.84" for 10-Year-2020 event
Inflow = 2.60 cfs @ 12.07 hrs, Volume= 0.234 af
Primary = 2.60 cfs @ 12.07 hrs, Volume= 0.234 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

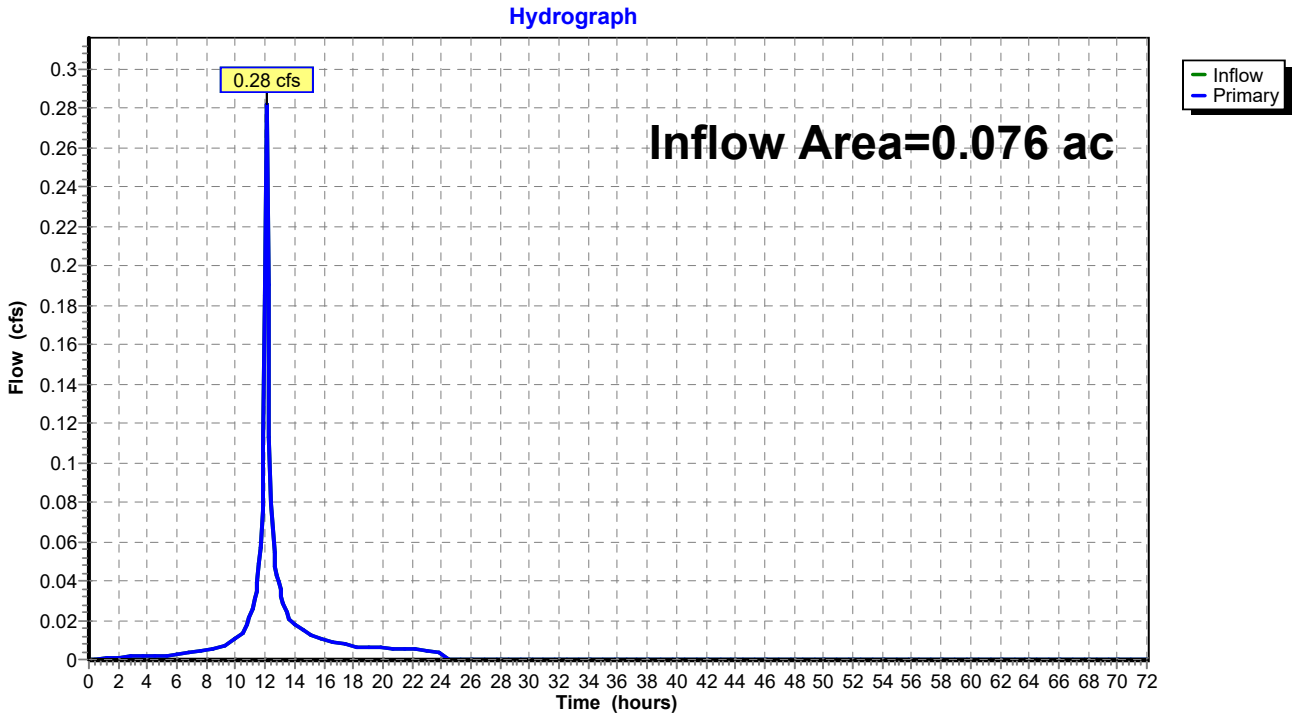


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 3.93" for 10-Year-2020 event
Inflow = 0.28 cfs @ 12.10 hrs, Volume= 0.025 af
Primary = 0.28 cfs @ 12.10 hrs, Volume= 0.025 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

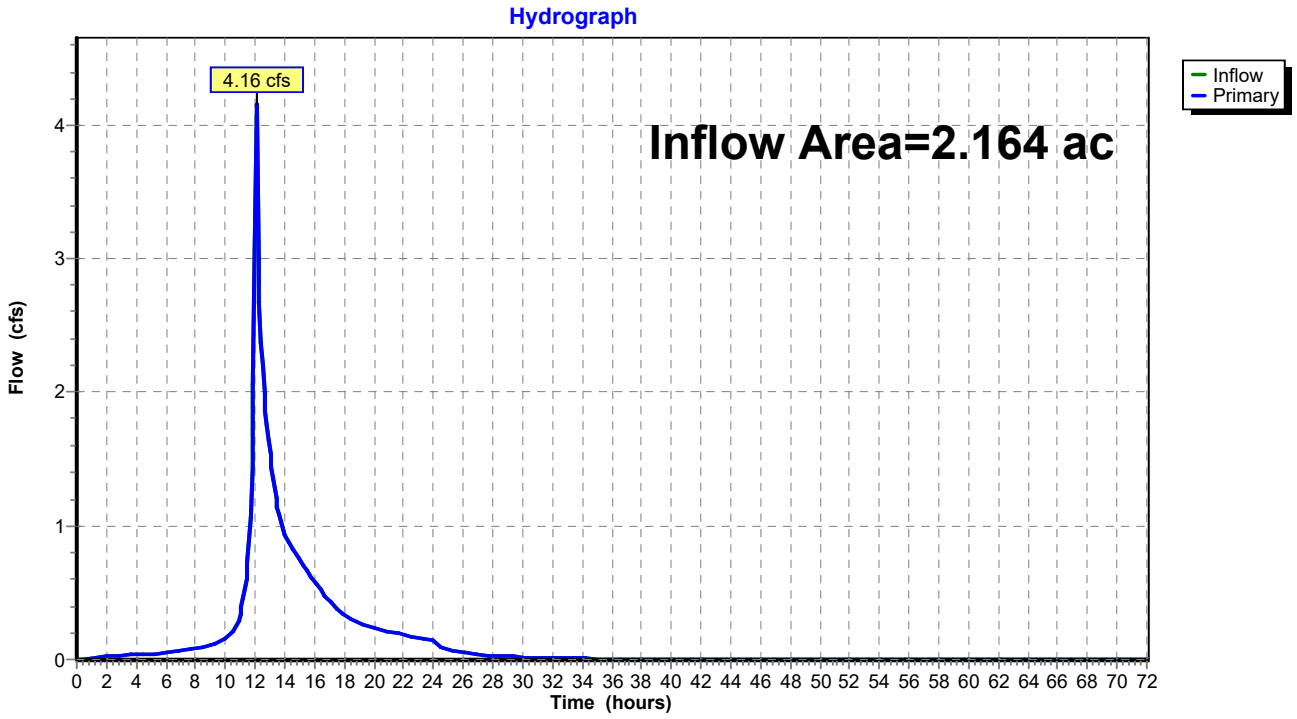


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 4.29" for 10-Year-2020 event
Inflow = 4.16 cfs @ 12.09 hrs, Volume= 0.773 af
Primary = 4.16 cfs @ 12.09 hrs, Volume= 0.773 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

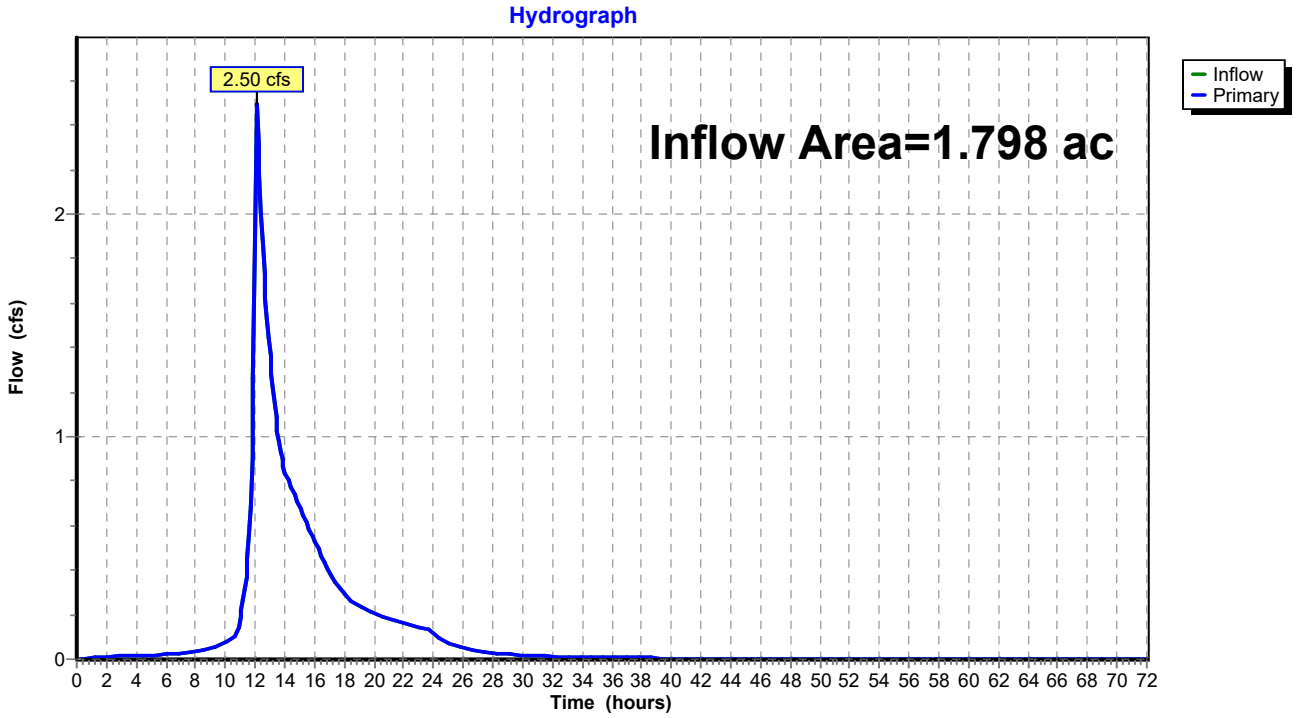


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 4.16" for 10-Year-2020 event
Inflow = 2.50 cfs @ 12.13 hrs, Volume= 0.624 af
Primary = 2.50 cfs @ 12.13 hrs, Volume= 0.624 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

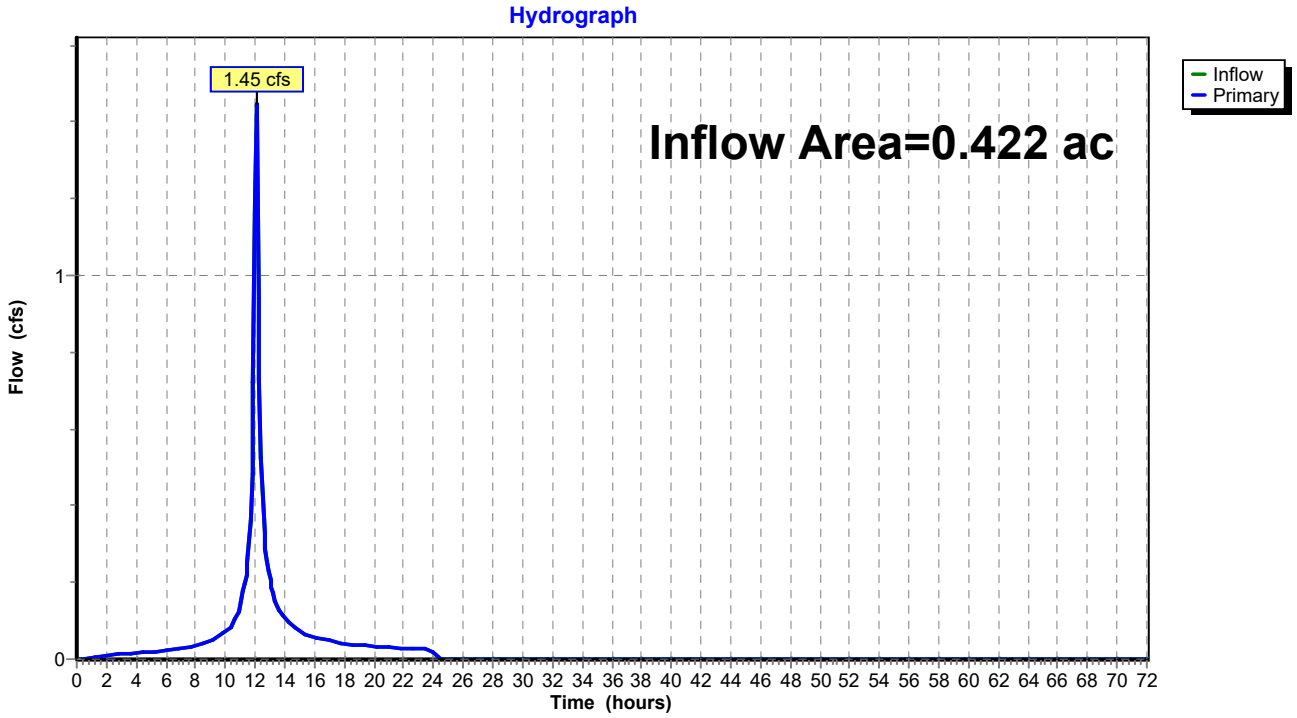


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 4.33" for 10-Year-2020 event
Inflow = 1.45 cfs @ 12.08 hrs, Volume= 0.152 af
Primary = 1.45 cfs @ 12.08 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

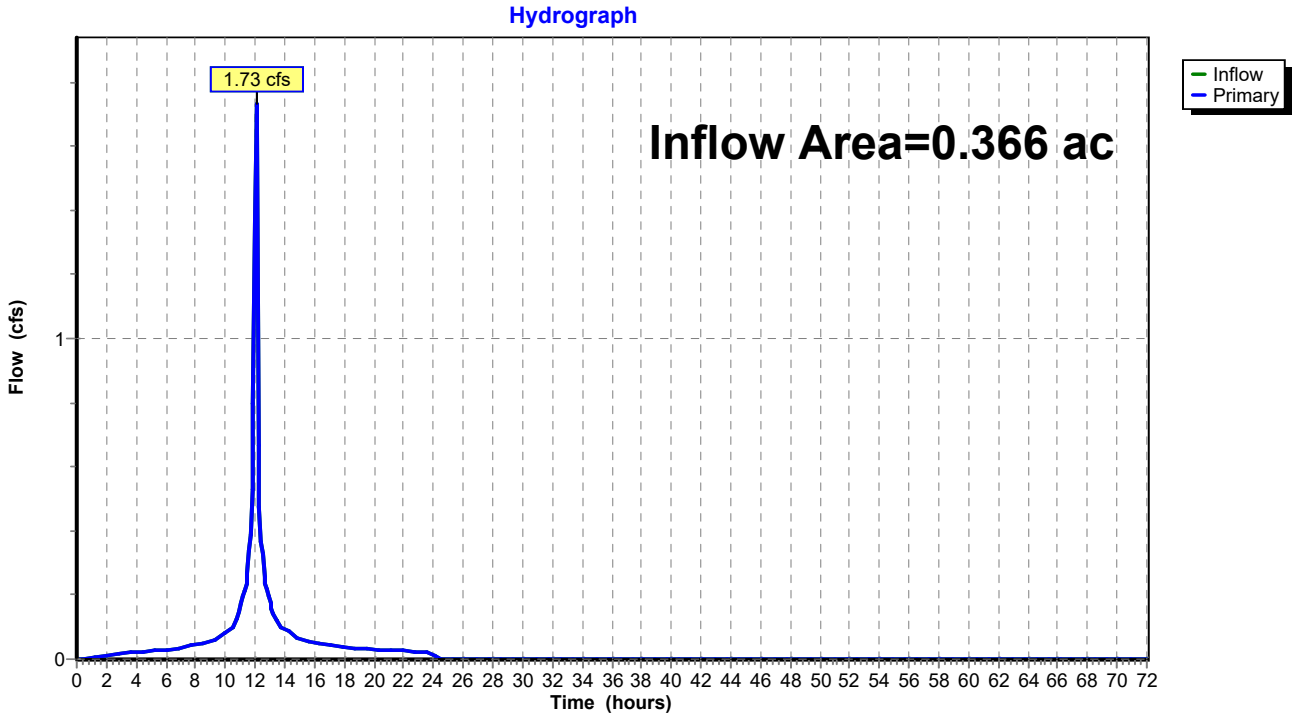


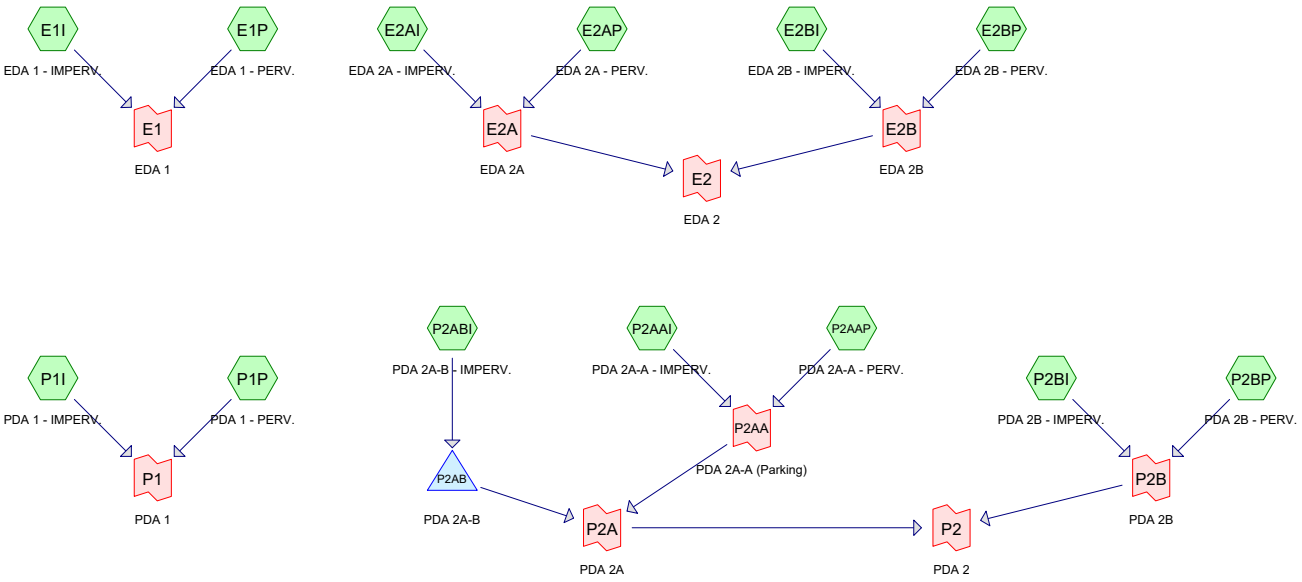
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 4.89" for 10-Year-2020 event
Inflow = 1.73 cfs @ 12.07 hrs, Volume= 0.149 af
Primary = 1.73 cfs @ 12.07 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

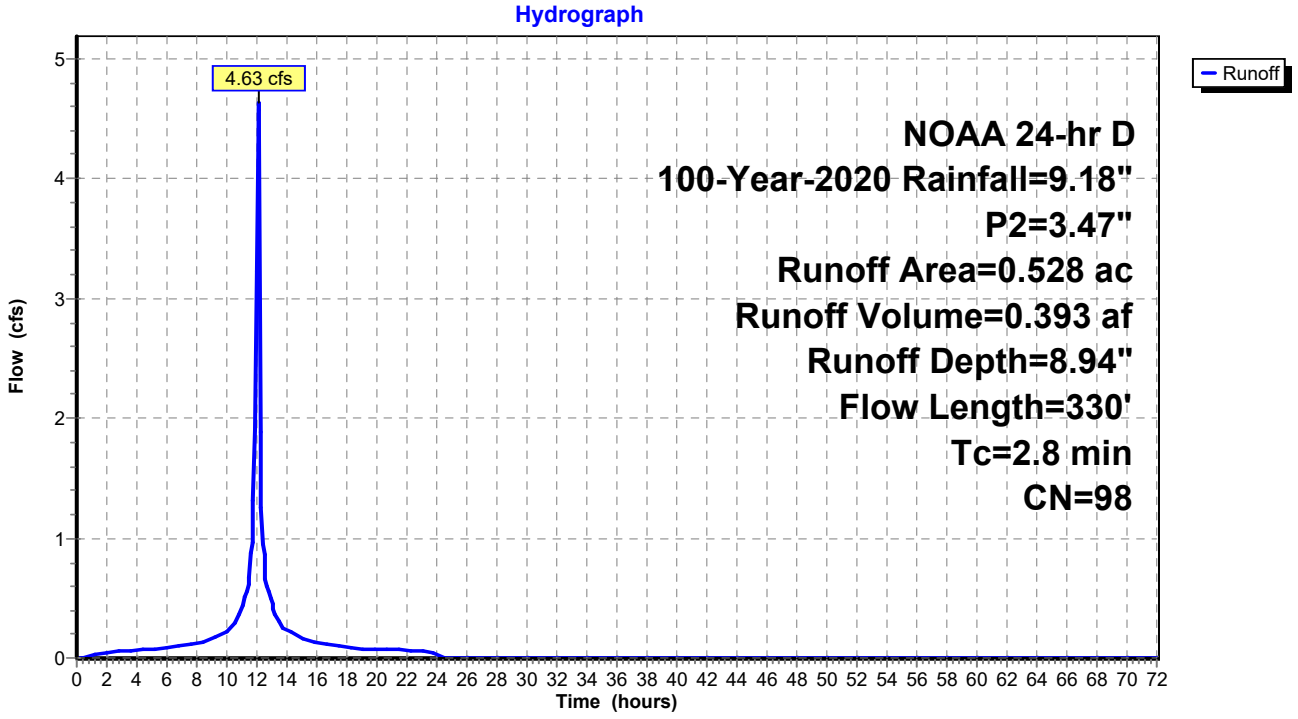
Runoff = 4.63 cfs @ 12.08 hrs, Volume= 0.393 af, Depth= 8.94"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.47"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

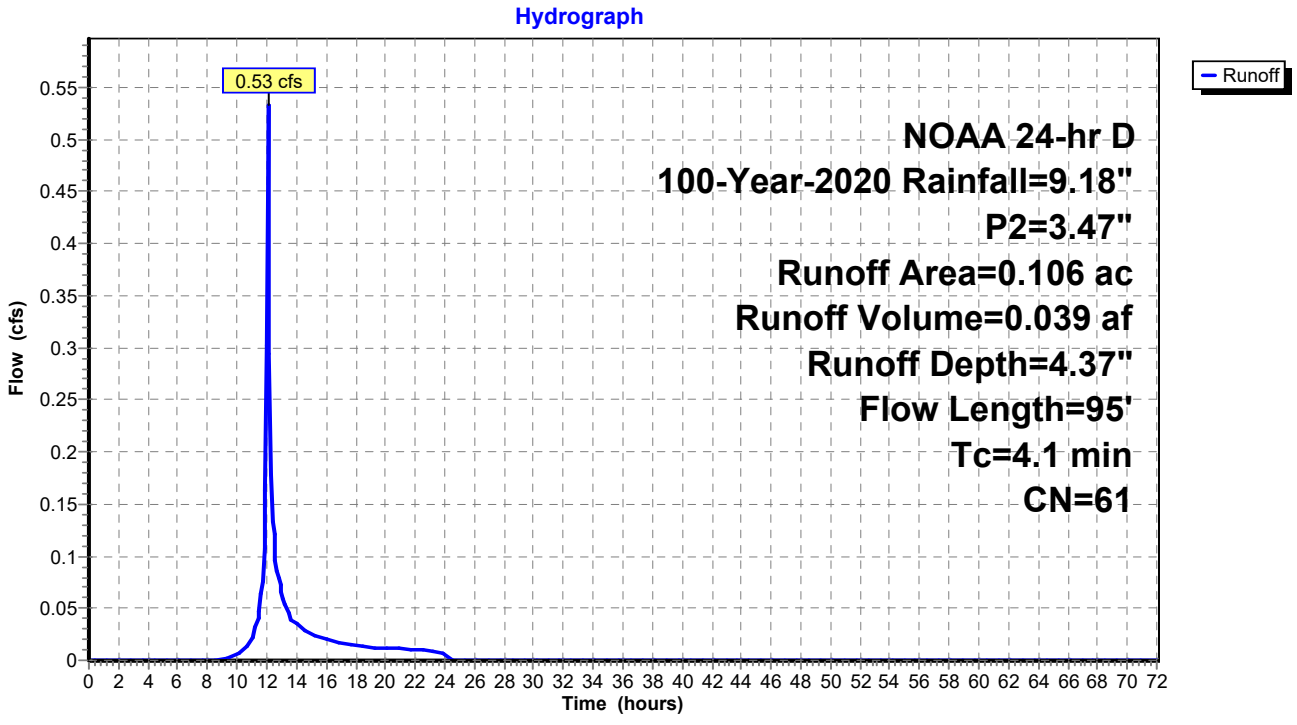
Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af, Depth= 4.37"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.47"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

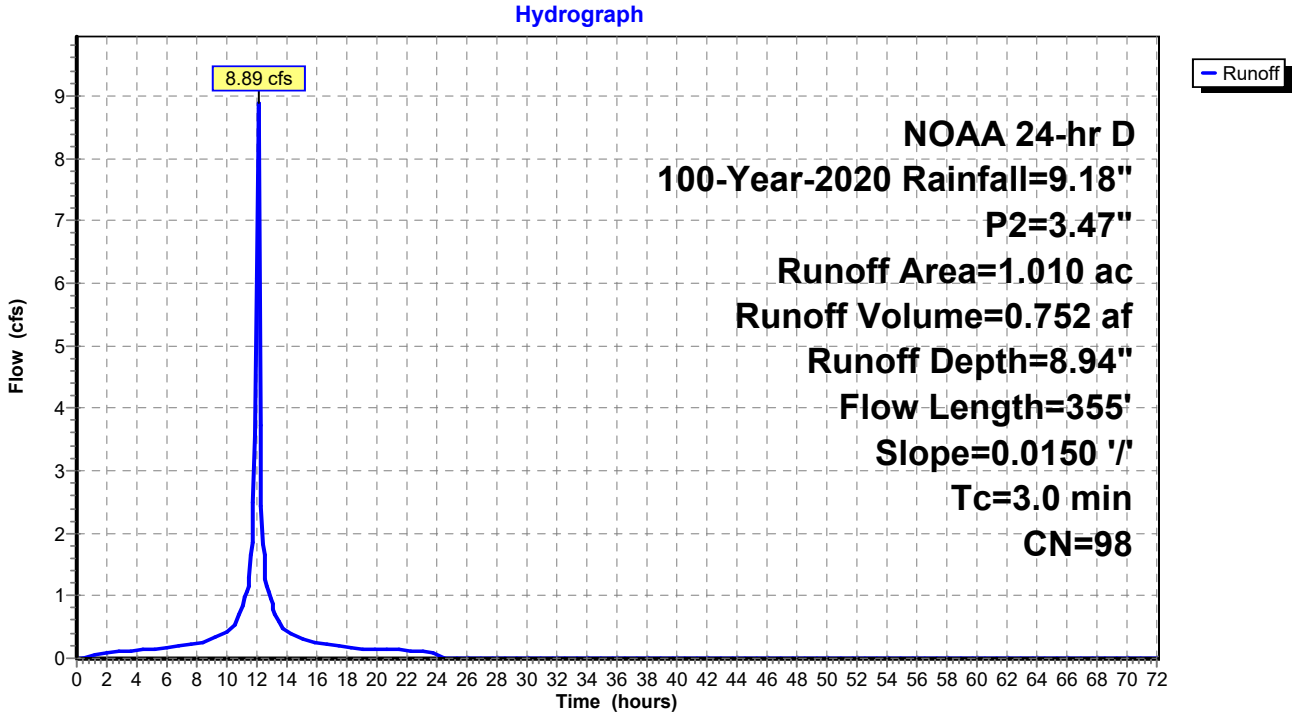
Runoff = 8.89 cfs @ 12.08 hrs, Volume= 0.752 af, Depth= 8.94"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.47"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

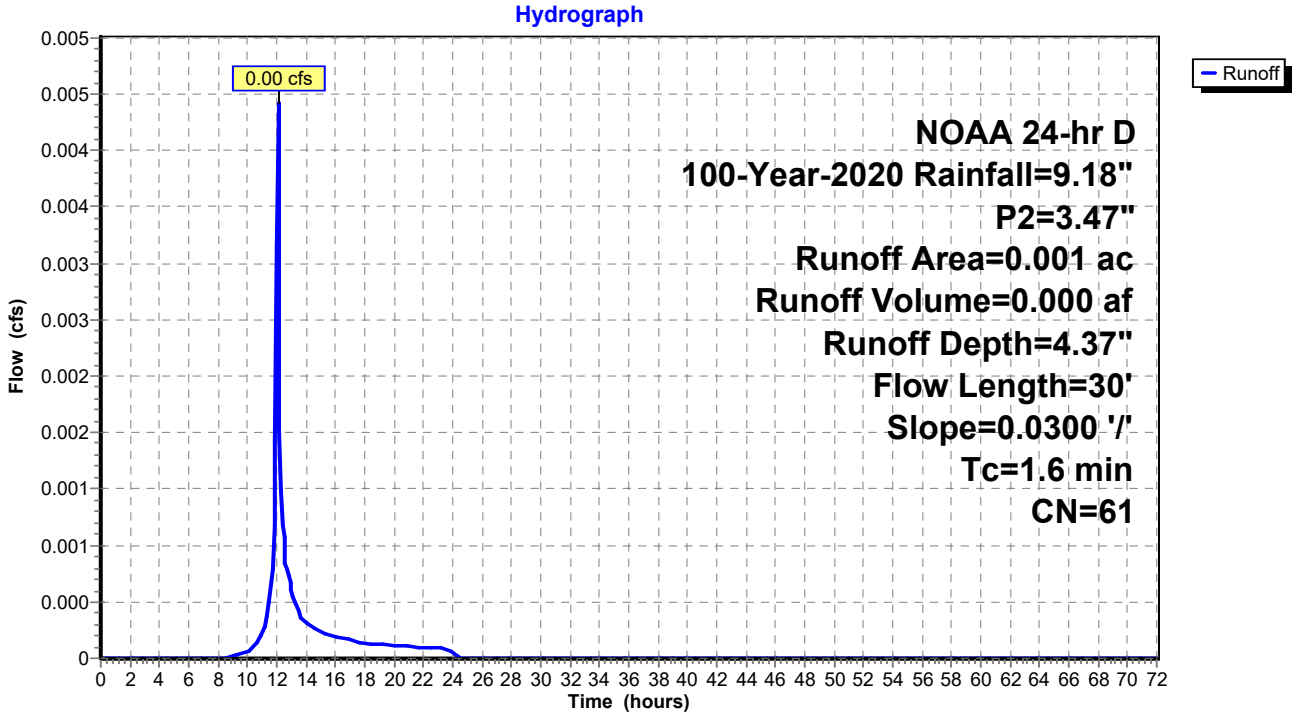
Runoff = 0.00 cfs @ 12.08 hrs, Volume= 0.000 af, Depth= 4.37"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.47"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.47"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

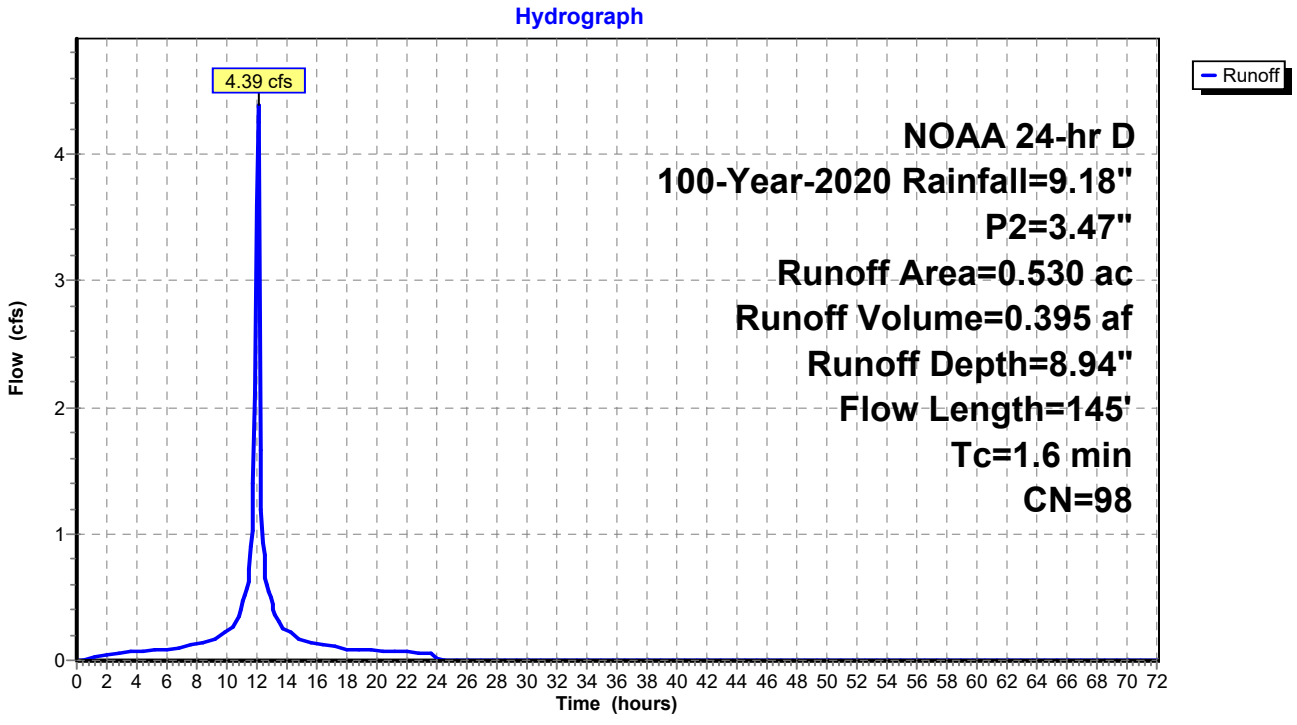
Runoff = 4.39 cfs @ 12.07 hrs, Volume= 0.395 af, Depth= 8.94"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

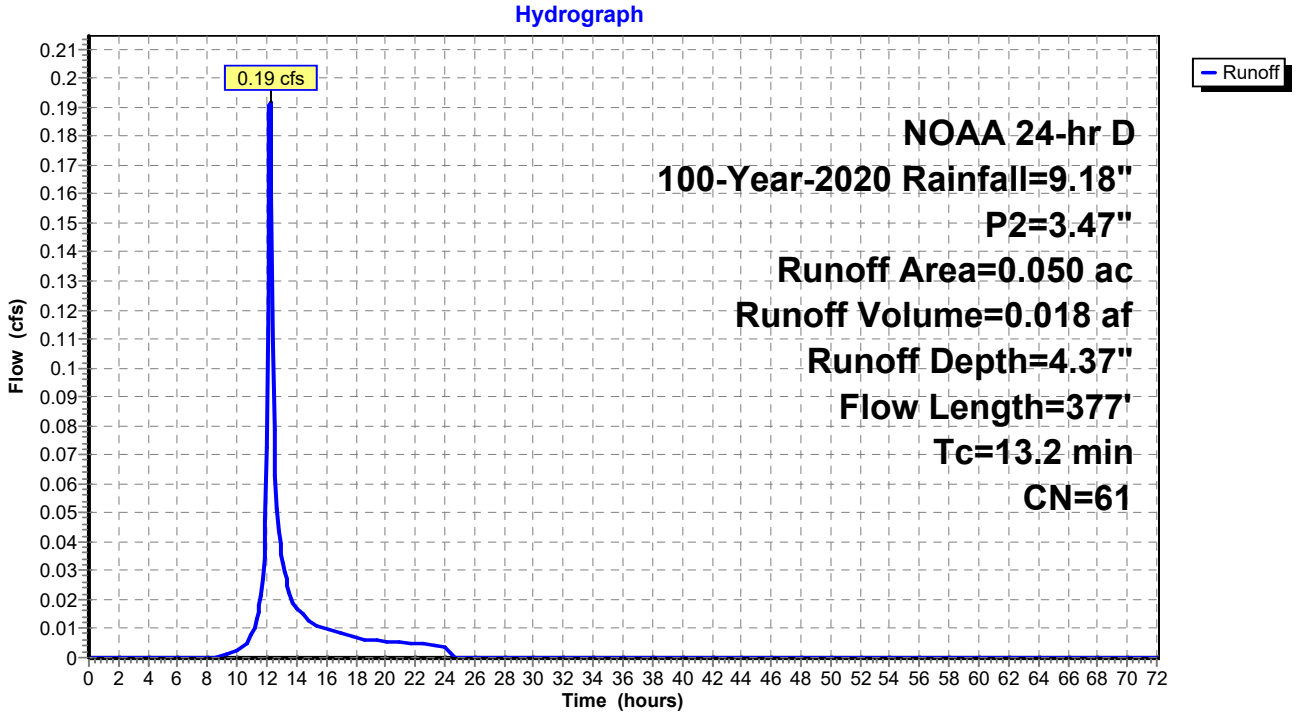
Runoff = 0.19 cfs @ 12.22 hrs, Volume= 0.018 af, Depth= 4.37"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

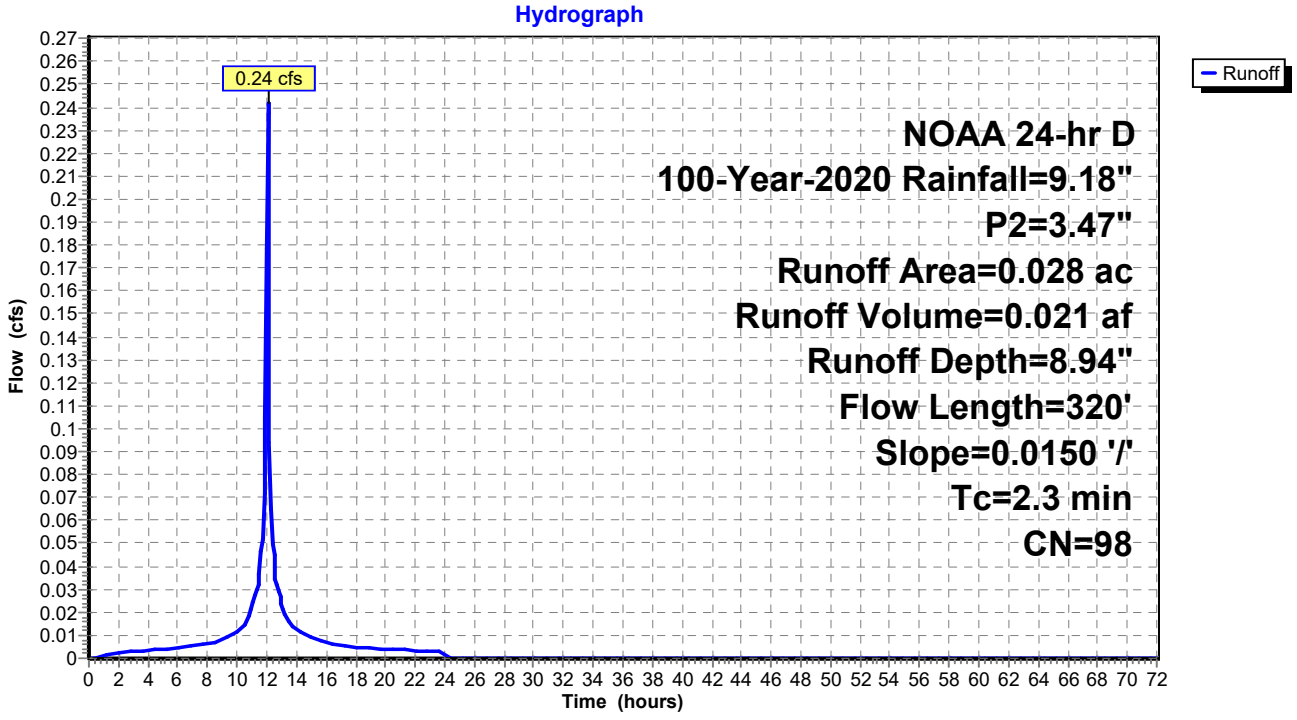
Runoff = 0.24 cfs @ 12.08 hrs, Volume= 0.021 af, Depth= 8.94"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.47"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

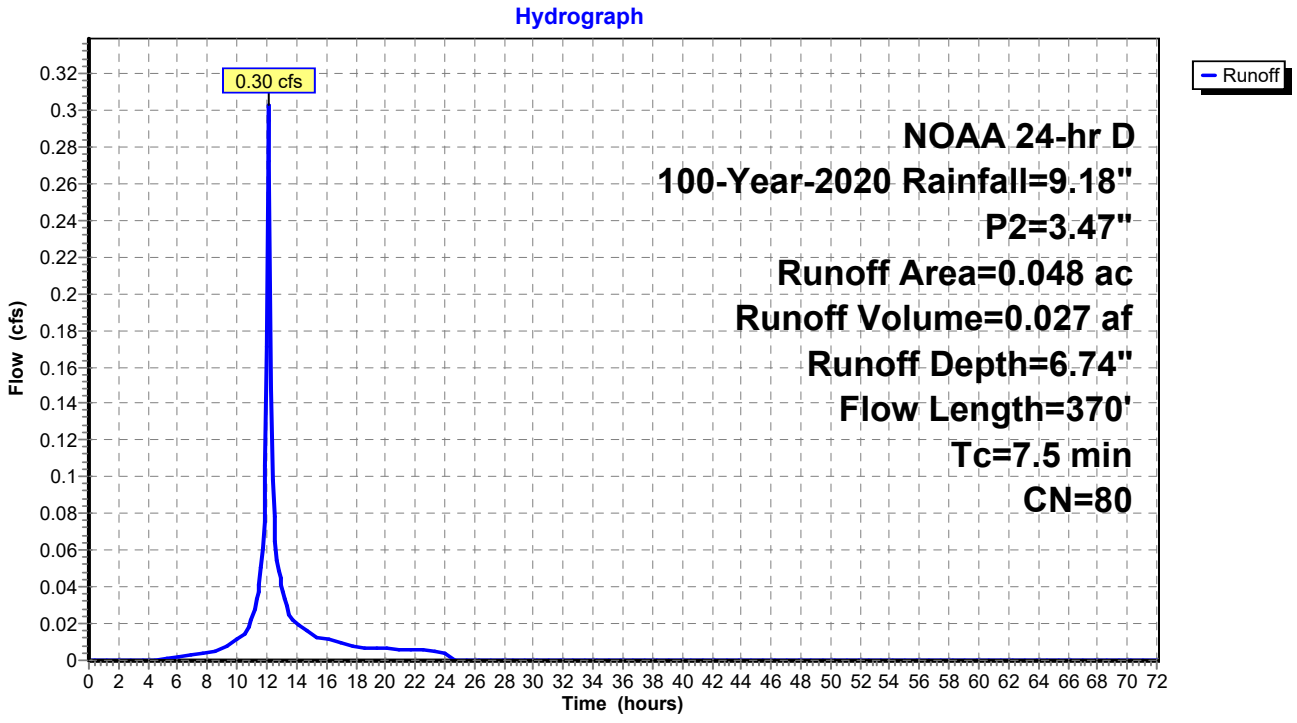
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 0.027 af, Depth= 6.74"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.47"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

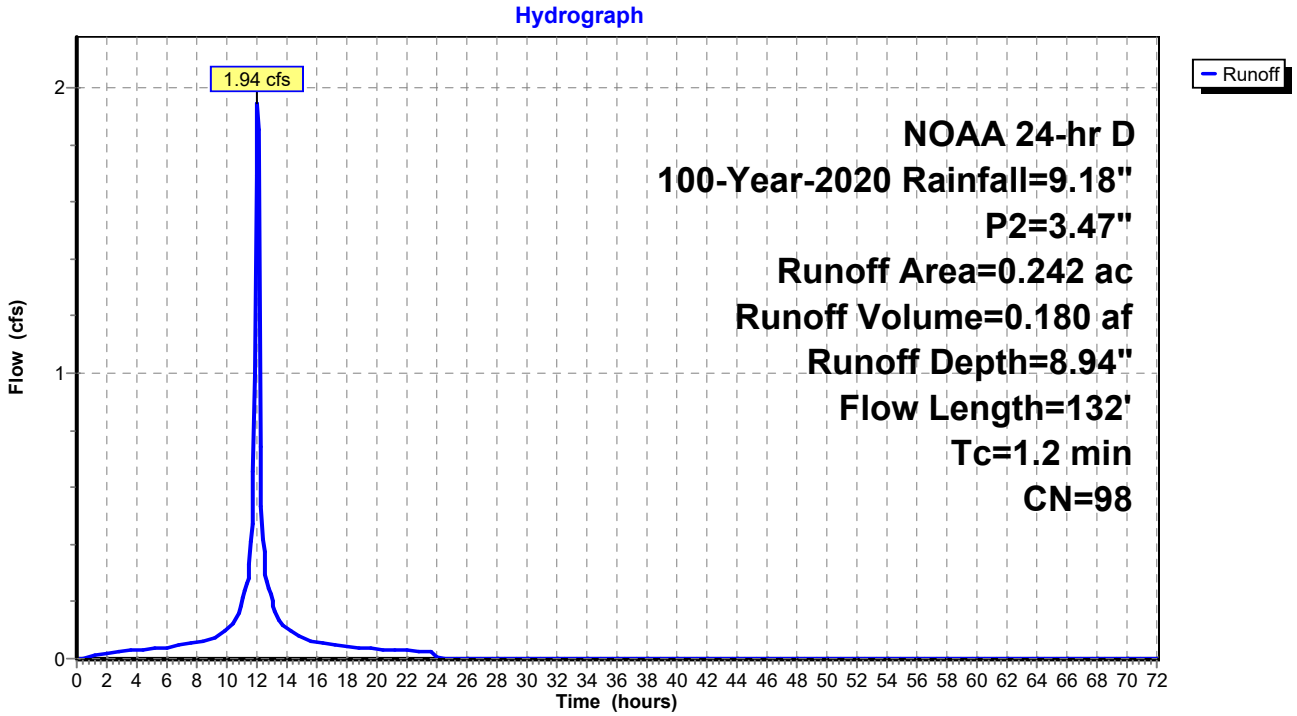
Runoff = 1.94 cfs @ 12.06 hrs, Volume= 0.180 af, Depth= 8.94"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.57		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.47"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

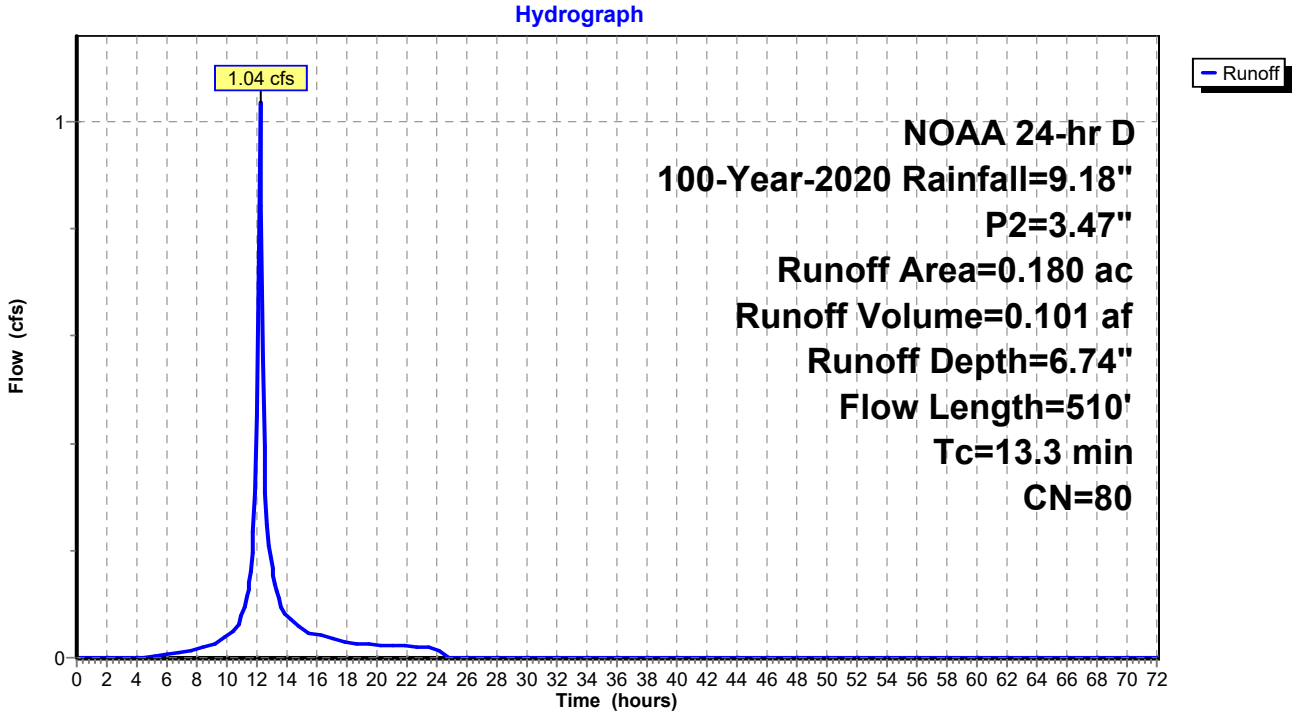
Runoff = 1.04 cfs @ 12.21 hrs, Volume= 0.101 af, Depth= 6.74"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.47" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

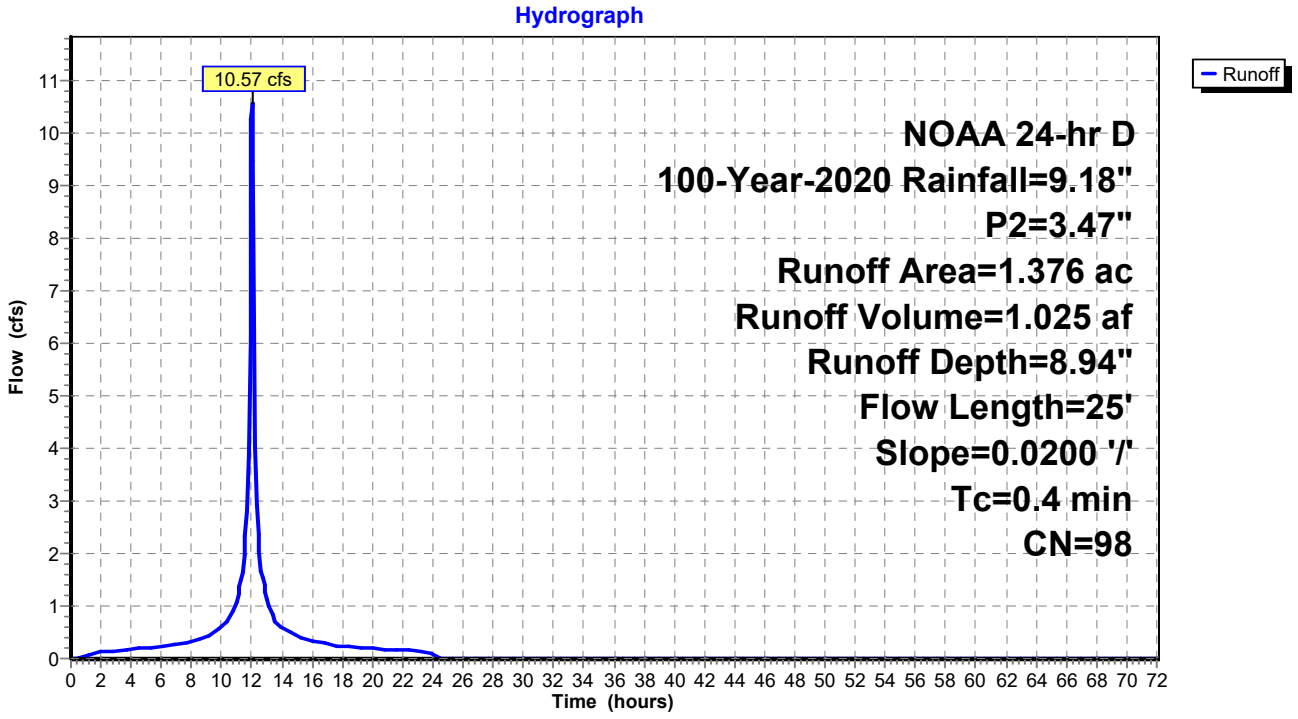
Runoff = 10.57 cfs @ 12.03 hrs, Volume= 1.025 af, Depth= 8.94"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.09		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.47"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

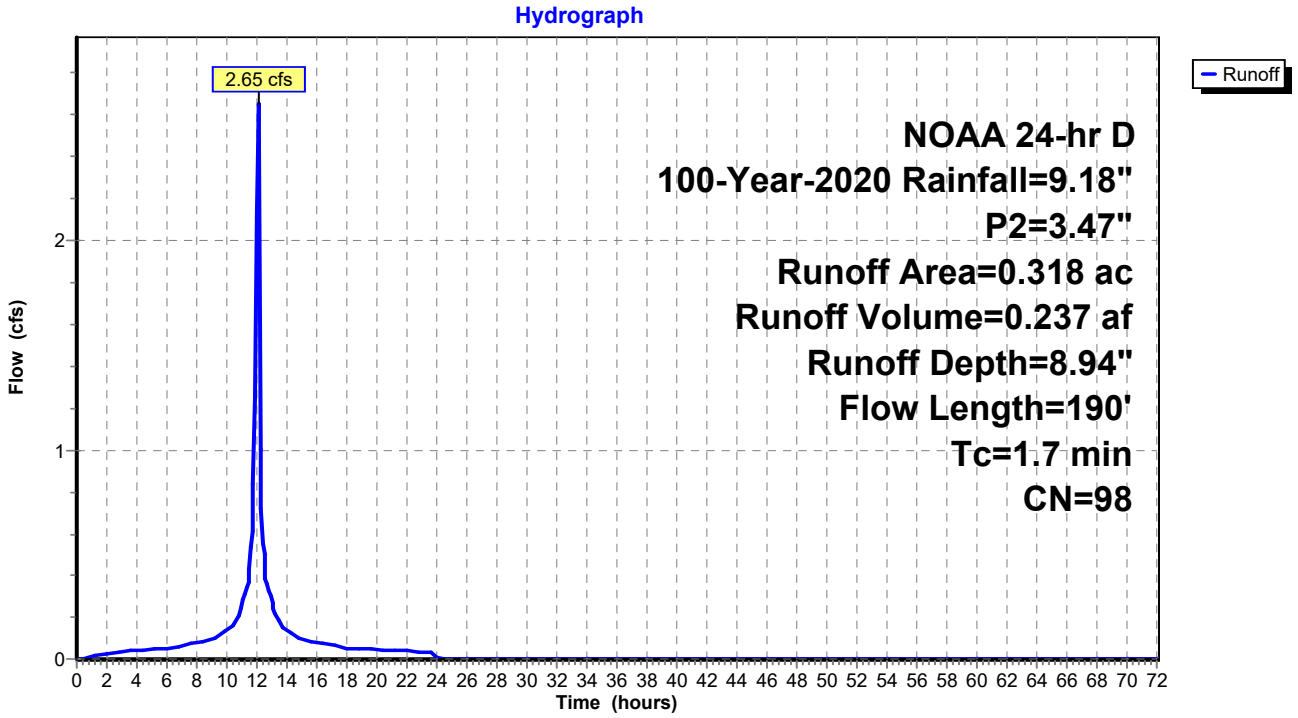
Runoff = 2.65 cfs @ 12.07 hrs, Volume= 0.237 af, Depth= 8.94"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.28		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.47"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

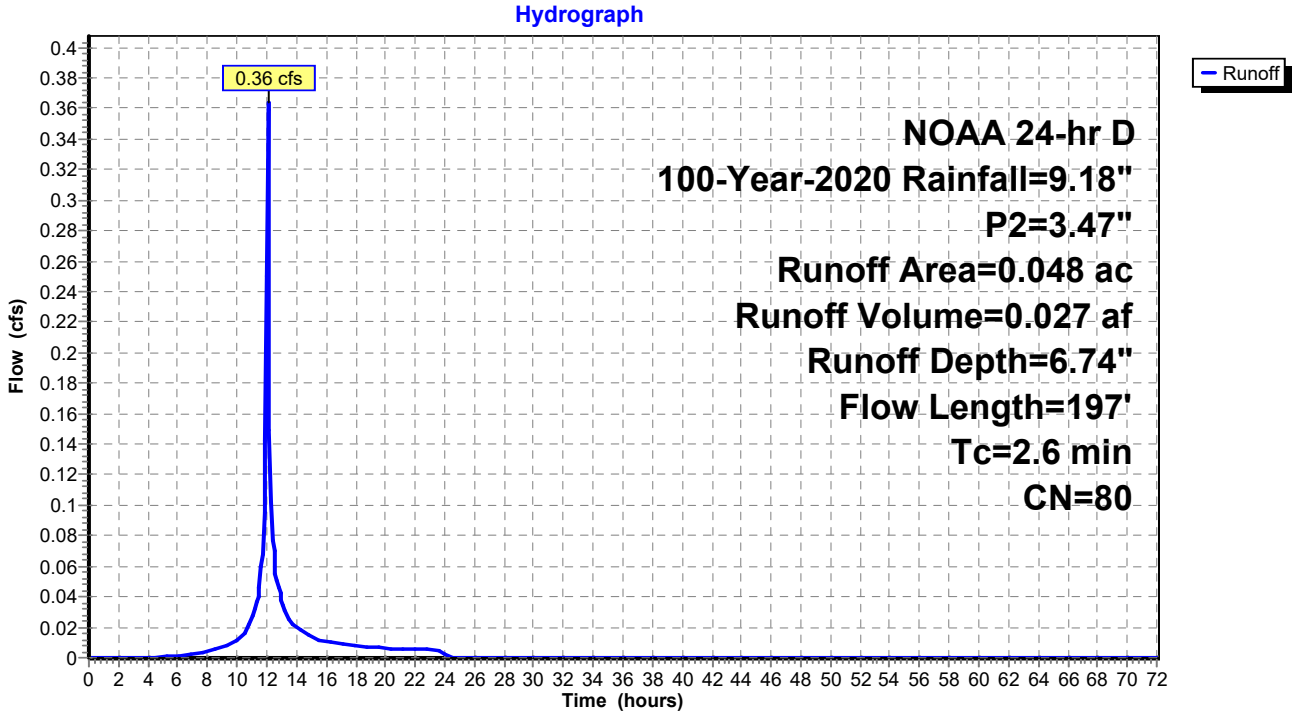
Runoff = 0.36 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 6.74"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.47"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 8.94" for 100-Year-2020 event
Inflow = 10.57 cfs @ 12.03 hrs, Volume= 1.025 af
Outflow = 4.90 cfs @ 12.21 hrs, Volume= 0.907 af, Atten= 54%, Lag= 10.8 min
Primary = 4.90 cfs @ 12.21 hrs, Volume= 0.907 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 132.95' @ 12.21 hrs Surf.Area= 9,833 sf Storage= 19,284 cf

Plug-Flow detention time= 231.5 min calculated for 0.907 af (89% of inflow)
Center-of-Mass det. time= 171.3 min (906.4 - 735.1)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

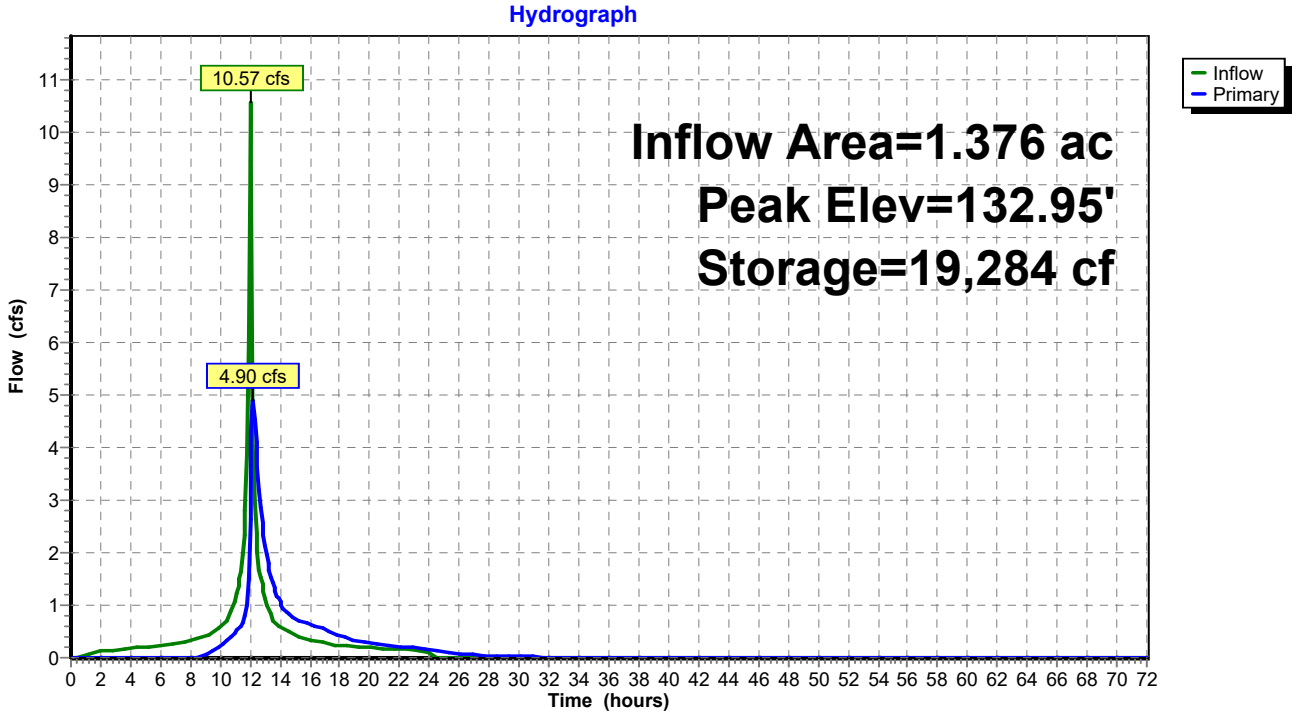
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.85 cfs @ 12.21 hrs HW=132.94' (Free Discharge)
└─**1=Culvert** (Passes 4.85 cfs of 10.11 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.22 cfs @ 5.86 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 3.62 cfs @ 3.21 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

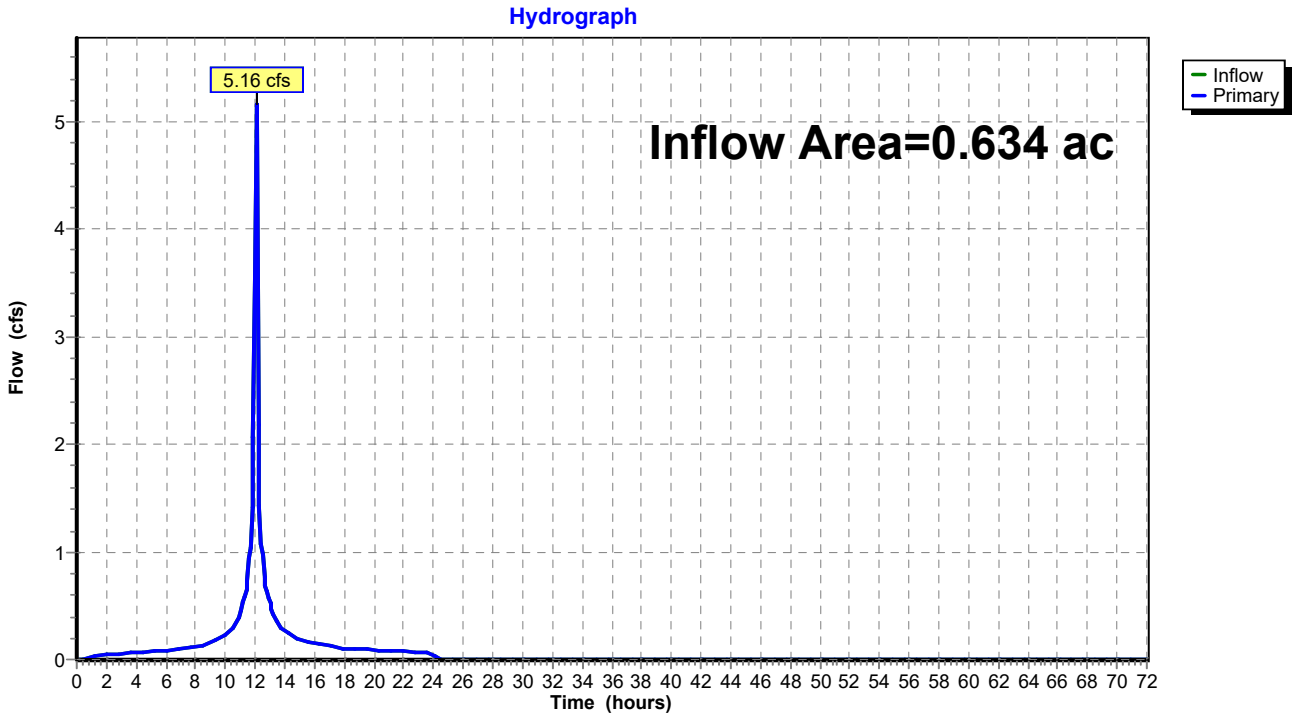


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 8.18" for 100-Year-2020 event
Inflow = 5.16 cfs @ 12.09 hrs, Volume= 0.432 af
Primary = 5.16 cfs @ 12.09 hrs, Volume= 0.432 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

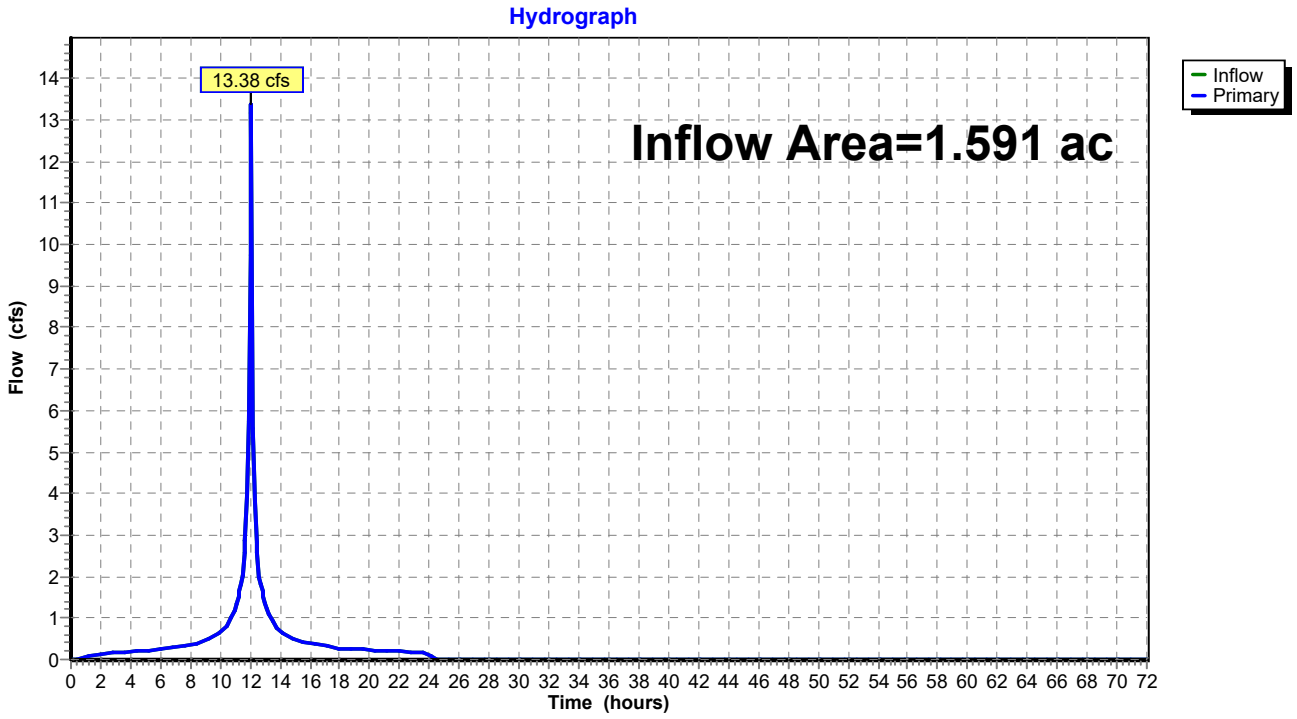


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 8.79" for 100-Year-2020 event
Inflow = 13.38 cfs @ 12.08 hrs, Volume= 1.166 af
Primary = 13.38 cfs @ 12.08 hrs, Volume= 1.166 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

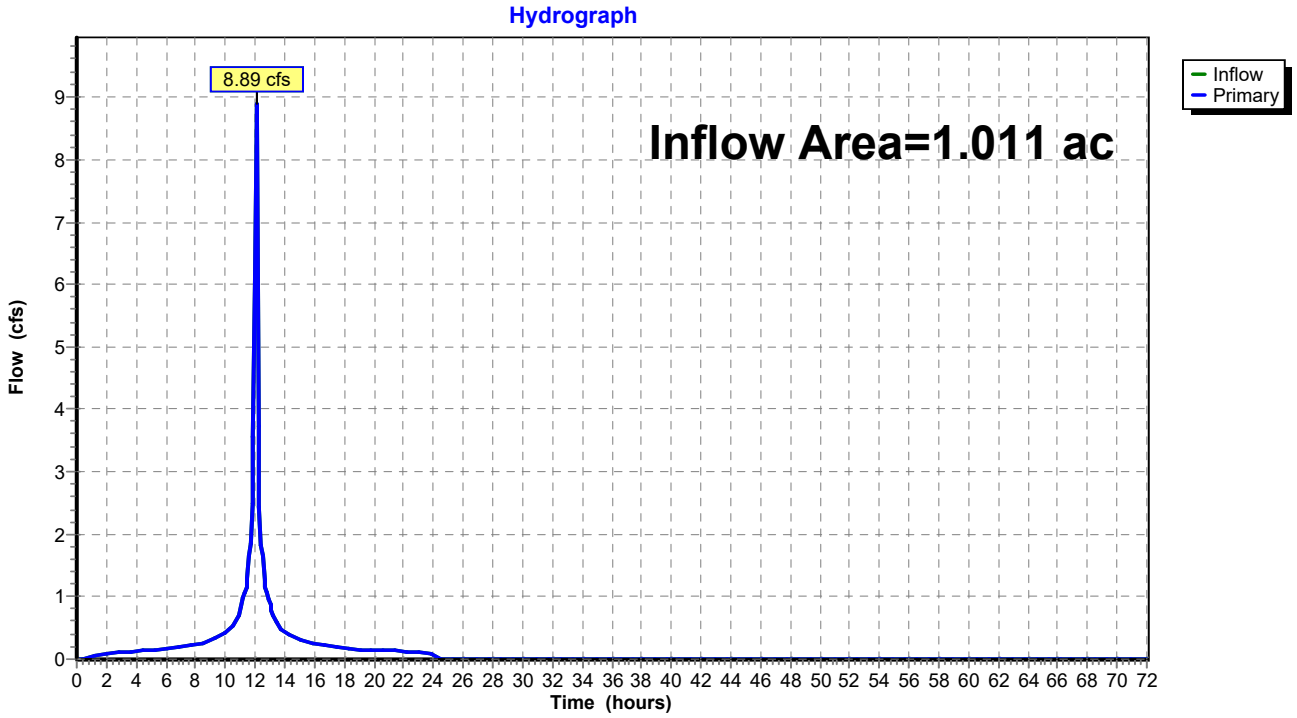


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 8.94" for 100-Year-2020 event
Inflow = 8.89 cfs @ 12.08 hrs, Volume= 0.753 af
Primary = 8.89 cfs @ 12.08 hrs, Volume= 0.753 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

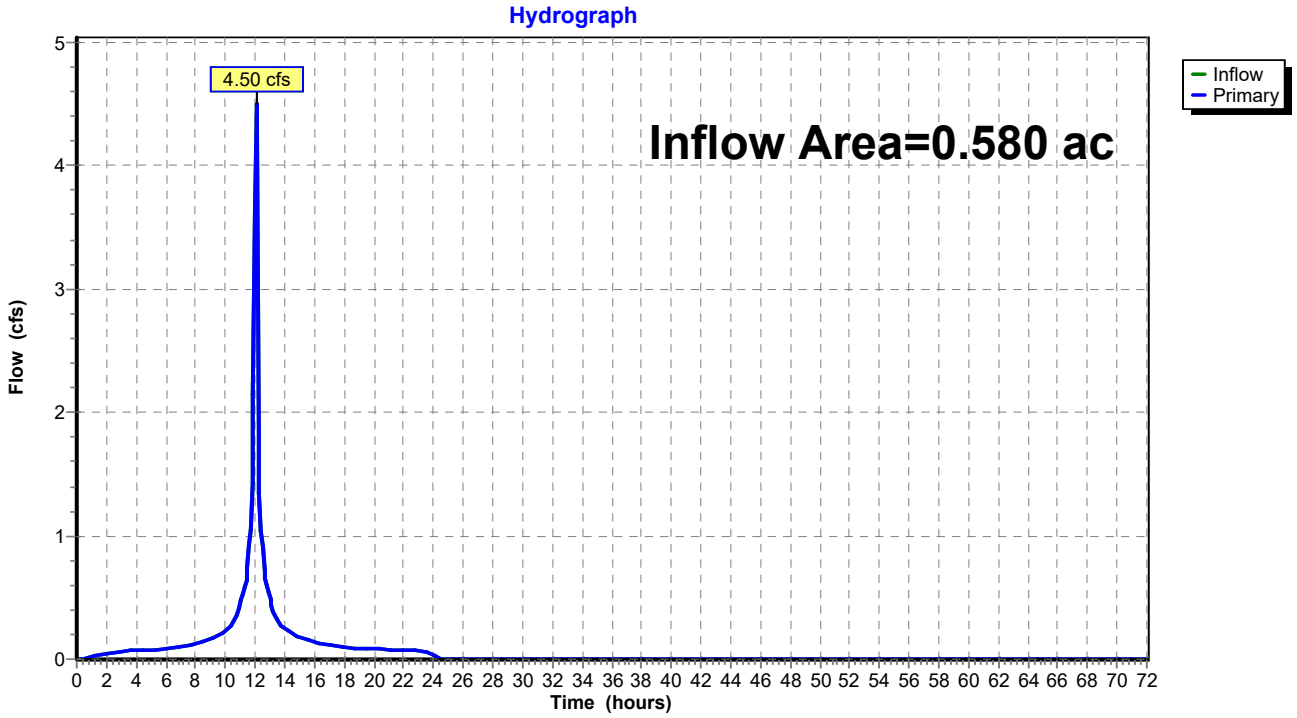


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 8.55" for 100-Year-2020 event
Inflow = 4.50 cfs @ 12.07 hrs, Volume= 0.413 af
Primary = 4.50 cfs @ 12.07 hrs, Volume= 0.413 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

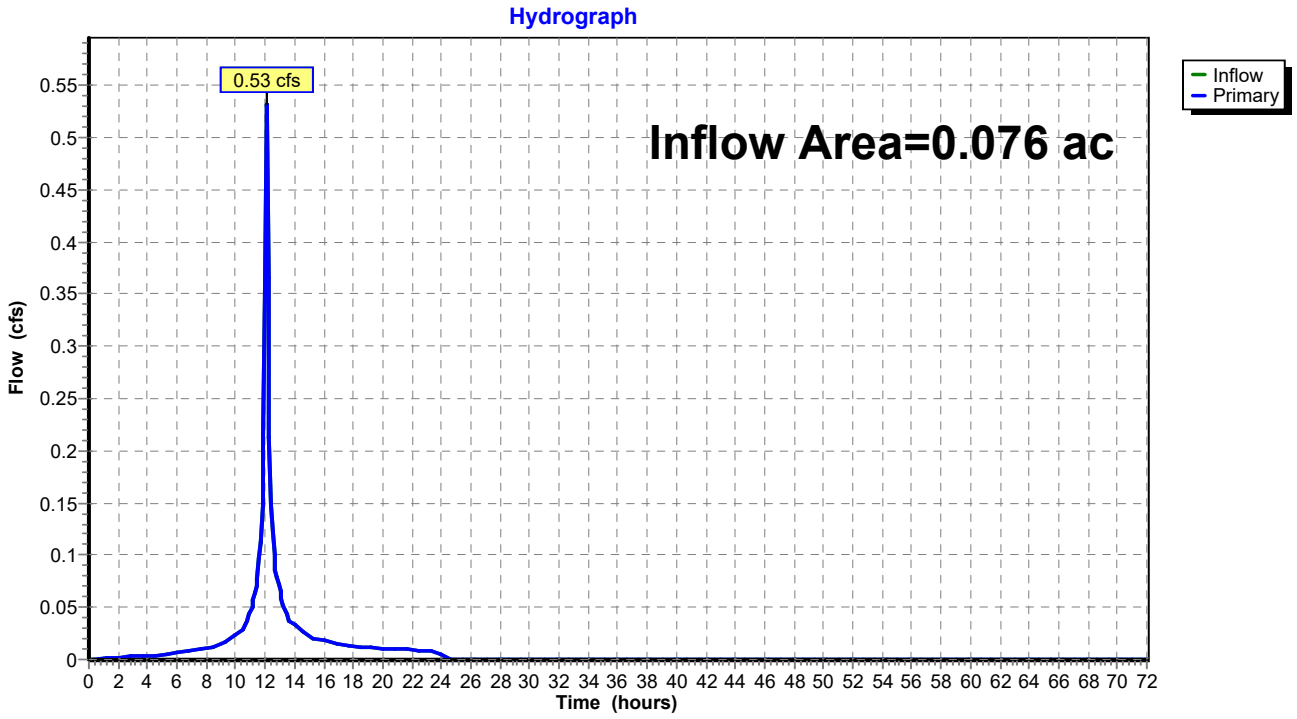


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 7.55" for 100-Year-2020 event
Inflow = 0.53 cfs @ 12.10 hrs, Volume= 0.048 af
Primary = 0.53 cfs @ 12.10 hrs, Volume= 0.048 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

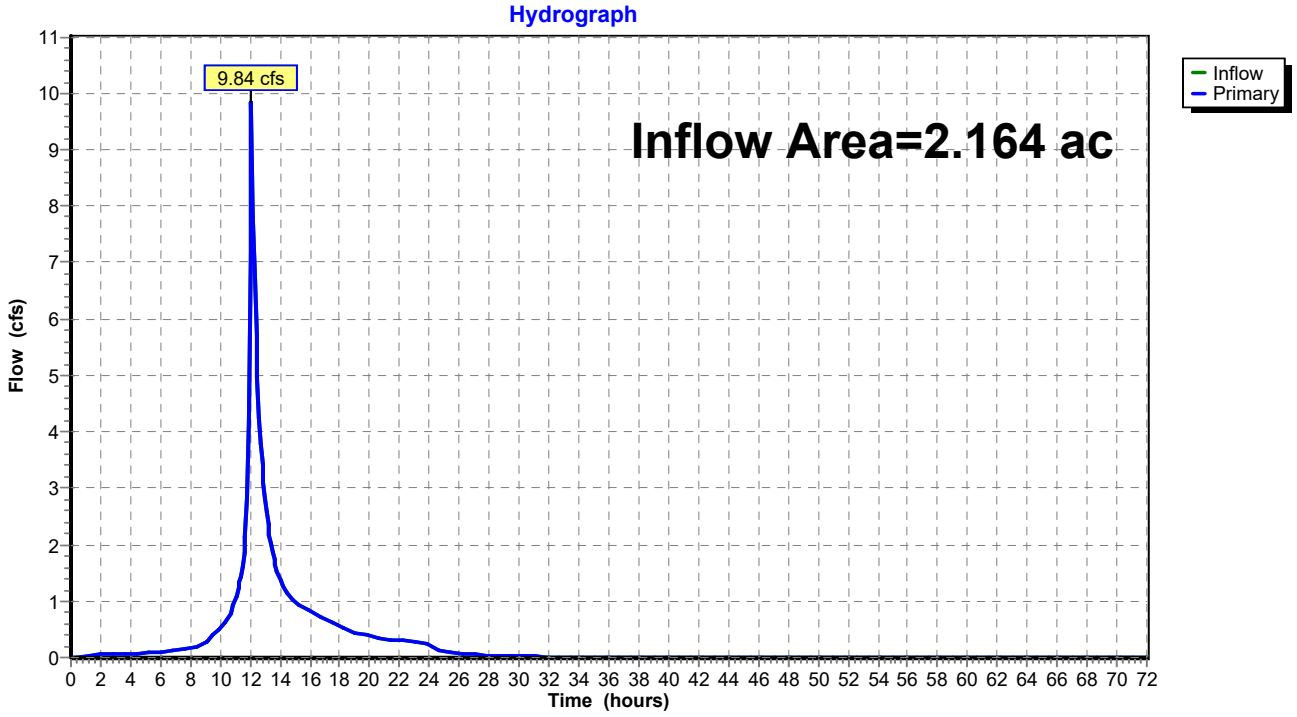


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 8.05" for 100-Year-2020 event
Inflow = 9.84 cfs @ 12.11 hrs, Volume= 1.452 af
Primary = 9.84 cfs @ 12.11 hrs, Volume= 1.452 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

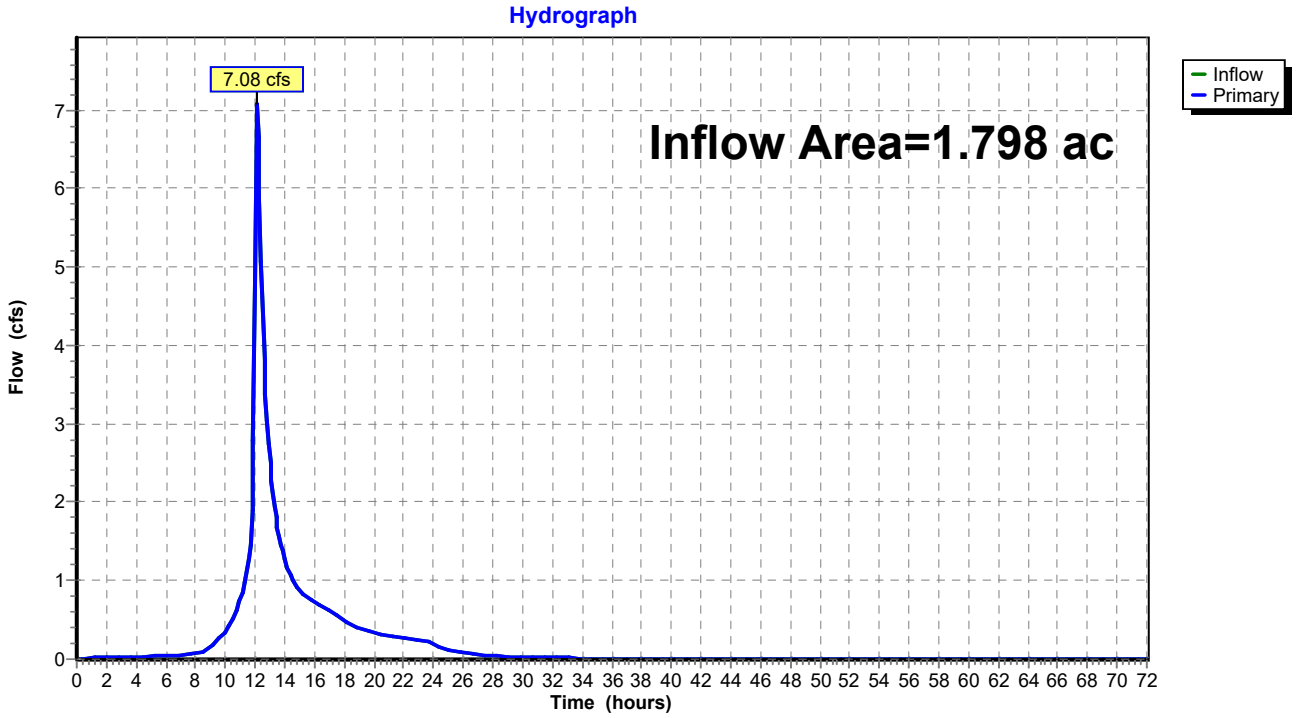


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 7.93" for 100-Year-2020 event
Inflow = 7.08 cfs @ 12.14 hrs, Volume= 1.189 af
Primary = 7.08 cfs @ 12.14 hrs, Volume= 1.189 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

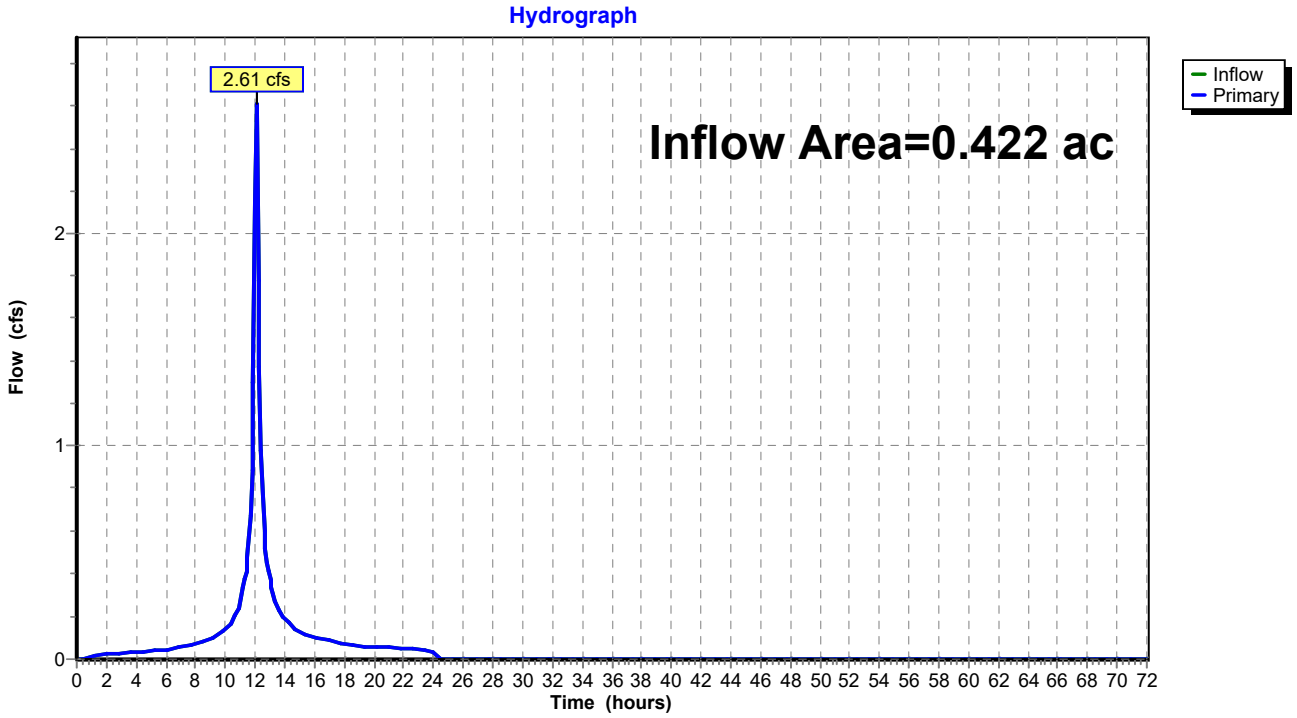


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 8.00" for 100-Year-2020 event
Inflow = 2.61 cfs @ 12.09 hrs, Volume= 0.281 af
Primary = 2.61 cfs @ 12.09 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

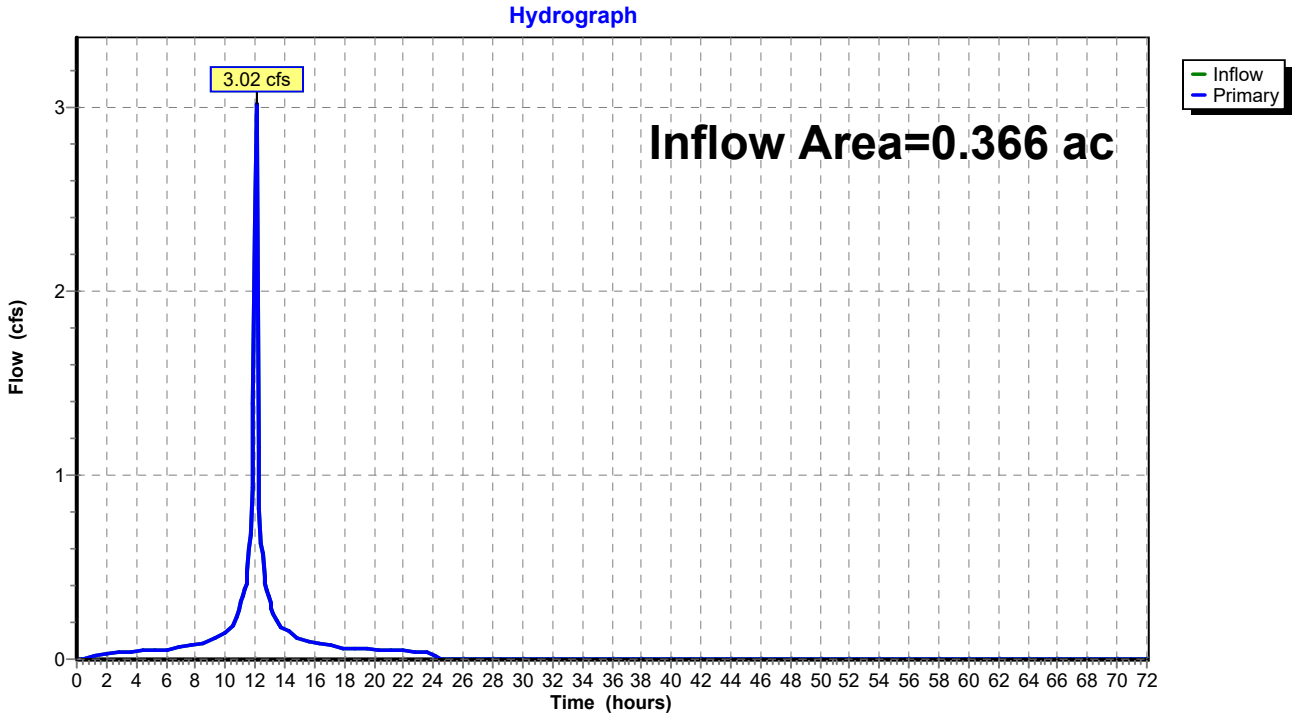


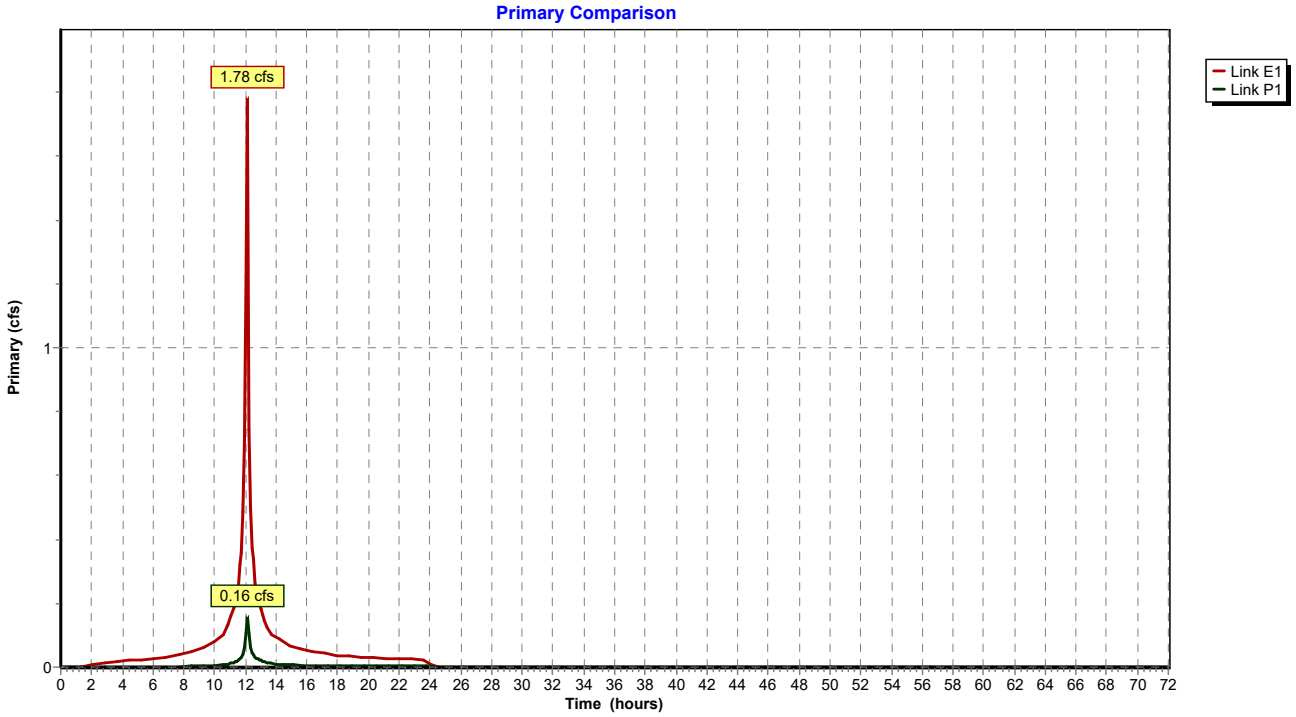
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 8.65" for 100-Year-2020 event
Inflow = 3.02 cfs @ 12.07 hrs, Volume= 0.264 af
Primary = 3.02 cfs @ 12.07 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B




Primary Comparison
1.78 cfs
0.16 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.02	0.00	10.40	0.09	0.01
0.10	0.00	0.00	5.30	0.02	0.00	10.50	0.10	0.01
0.20	0.00	0.00	5.40	0.02	0.00	10.60	0.11	0.01
0.30	0.00	0.00	5.50	0.02	0.00	10.70	0.12	0.01
0.40	0.00	0.00	5.60	0.02	0.00	10.80	0.13	0.01
0.50	0.00	0.00	5.70	0.02	0.00	10.90	0.14	0.01
0.60	0.00	0.00	5.80	0.03	0.00	11.00	0.15	0.01
0.70	0.00	0.00	5.90	0.03	0.00	11.10	0.17	0.01
0.80	0.00	0.00	6.00	0.03	0.00	11.20	0.19	0.01
0.90	0.00	0.00	6.10	0.03	0.00	11.30	0.21	0.02
1.00	0.00	0.00	6.20	0.03	0.00	11.40	0.22	0.02
1.10	0.00	0.00	6.30	0.03	0.00	11.50	0.25	0.02
1.20	0.00	0.00	6.40	0.03	0.00	11.60	0.32	0.03
1.30	0.00	0.00	6.50	0.03	0.00	11.70	0.36	0.03
1.40	0.00	0.00	6.60	0.03	0.00	11.80	0.49	0.04
1.50	0.00	0.00	6.70	0.03	0.00	11.90	0.71	0.06
1.60	0.00	0.00	6.80	0.03	0.00	12.00	1.22	0.10
1.70	0.01	0.00	6.90	0.03	0.00	12.10	**1.77**	**0.16**
1.80	0.01	0.00	7.00	0.03	0.00	12.20	0.74	0.10
1.90	0.01	0.00	7.10	0.04	0.00	12.30	0.50	0.06
2.00	0.01	0.00	7.20	0.04	0.00	12.40	0.37	0.05
2.10	0.01	0.00	7.30	0.04	0.00	12.50	0.34	0.04
2.20	0.01	0.00	7.40	0.04	0.00	12.60	0.26	0.03
2.30	0.01	0.00	7.50	0.04	0.00	12.70	0.24	0.03
2.40	0.01	0.00	7.60	0.04	0.00	12.80	0.22	0.02
2.50	0.01	0.00	7.70	0.04	0.00	12.90	0.20	0.02
2.60	0.01	0.00	7.80	0.04	0.00	13.00	0.18	0.02
2.70	0.01	0.00	7.90	0.04	0.00	13.10	0.16	0.02
2.80	0.01	0.00	8.00	0.04	0.00	13.20	0.15	0.02
2.90	0.01	0.00	8.10	0.04	0.00	13.30	0.14	0.02
3.00	0.01	0.00	8.20	0.05	0.00	13.40	0.13	0.01
3.10	0.01	0.00	8.30	0.05	0.00	13.50	0.12	0.01
3.20	0.01	0.00	8.40	0.05	0.00	13.60	0.11	0.01
3.30	0.01	0.00	8.50	0.05	0.00	13.70	0.10	0.01
3.40	0.02	0.00	8.60	0.05	0.00	13.80	0.10	0.01
3.50	0.02	0.00	8.70	0.05	0.00	13.90	0.10	0.01
3.60	0.02	0.00	8.80	0.05	0.00	14.00	0.09	0.01
3.70	0.02	0.00	8.90	0.05	0.00	14.10	0.09	0.01
3.80	0.02	0.00	9.00	0.05	0.00	14.20	0.09	0.01
3.90	0.02	0.00	9.10	0.06	0.00	14.30	0.09	0.01
4.00	0.02	0.00	9.20	0.06	0.00	14.40	0.08	0.01
4.10	0.02	0.00	9.30	0.06	0.00	14.50	0.08	0.01
4.20	0.02	0.00	9.40	0.06	0.00	14.60	0.08	0.01
4.30	0.02	0.00	9.50	0.07	0.00	14.70	0.07	0.01
4.40	0.02	0.00	9.60	0.07	0.00	14.80	0.07	0.01
4.50	0.02	0.00	9.70	0.07	0.00	14.90	0.07	0.01
4.60	0.02	0.00	9.80	0.08	0.00	15.00	0.06	0.01
4.70	0.02	0.00	9.90	0.08	0.01	15.10	0.06	0.01
4.80	0.02	0.00	10.00	0.08	0.01	15.20	0.06	0.01
4.90	0.02	0.00	10.10	0.08	0.01	15.30	0.06	0.01
5.00	0.02	0.00	10.20	0.09	0.01	15.40	0.06	0.01
5.10	0.02	0.00	10.30	0.09	0.01	15.50	0.06	0.01

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.06	0.01	20.80	0.03	0.00	26.00	0.00	0.00
15.70	0.06	0.01	20.90	0.03	0.00	26.10	0.00	0.00
15.80	0.05	0.01	21.00	0.03	0.00	26.20	0.00	0.00
15.90	0.05	0.01	21.10	0.03	0.00	26.30	0.00	0.00
16.00	0.05	0.01	21.20	0.03	0.00	26.40	0.00	0.00
16.10	0.05	0.01	21.30	0.03	0.00	26.50	0.00	0.00
16.20	0.05	0.01	21.40	0.03	0.00	26.60	0.00	0.00
16.30	0.05	0.01	21.50	0.03	0.00	26.70	0.00	0.00
16.40	0.05	0.01	21.60	0.03	0.00	26.80	0.00	0.00
16.50	0.05	0.01	21.70	0.03	0.00	26.90	0.00	0.00
16.60	0.05	0.01	21.80	0.03	0.00	27.00	0.00	0.00
16.70	0.05	0.01	21.90	0.03	0.00	27.10	0.00	0.00
16.80	0.05	0.01	22.00	0.03	0.00	27.20	0.00	0.00
16.90	0.05	0.01	22.10	0.03	0.00	27.30	0.00	0.00
17.00	0.04	0.01	22.20	0.03	0.00	27.40	0.00	0.00
17.10	0.04	0.00	22.30	0.03	0.00	27.50	0.00	0.00
17.20	0.04	0.00	22.40	0.03	0.00	27.60	0.00	0.00
17.30	0.04	0.00	22.50	0.03	0.00	27.70	0.00	0.00
17.40	0.04	0.00	22.60	0.03	0.00	27.80	0.00	0.00
17.50	0.04	0.00	22.70	0.02	0.00	27.90	0.00	0.00
17.60	0.04	0.00	22.80	0.02	0.00	28.00	0.00	0.00
17.70	0.04	0.00	22.90	0.02	0.00	28.10	0.00	0.00
17.80	0.04	0.00	23.00	0.02	0.00	28.20	0.00	0.00
17.90	0.04	0.00	23.10	0.02	0.00	28.30	0.00	0.00
18.00	0.04	0.00	23.20	0.02	0.00	28.40	0.00	0.00
18.10	0.03	0.00	23.30	0.02	0.00	28.50	0.00	0.00
18.20	0.03	0.00	23.40	0.02	0.00	28.60	0.00	0.00
18.30	0.03	0.00	23.50	0.02	0.00	28.70	0.00	0.00
18.40	0.03	0.00	23.60	0.02	0.00	28.80	0.00	0.00
18.50	0.03	0.00	23.70	0.02	0.00	28.90	0.00	0.00
18.60	0.03	0.00	23.80	0.02	0.00	29.00	0.00	0.00
18.70	0.03	0.00	23.90	0.02	0.00	29.10	0.00	0.00
18.80	0.03	0.00	24.00	0.02	0.00	29.20	0.00	0.00
18.90	0.03	0.00	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.03	0.00	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.03	0.00	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.03	0.00	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.03	0.00	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.03	0.00	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.03	0.00	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.03	0.00	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.03	0.00	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.03	0.00	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.03	0.00	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.03	0.00	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.03	0.00	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.03	0.00	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.03	0.00	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.03	0.00	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.03	0.00	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.03	0.00	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.03	0.00	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

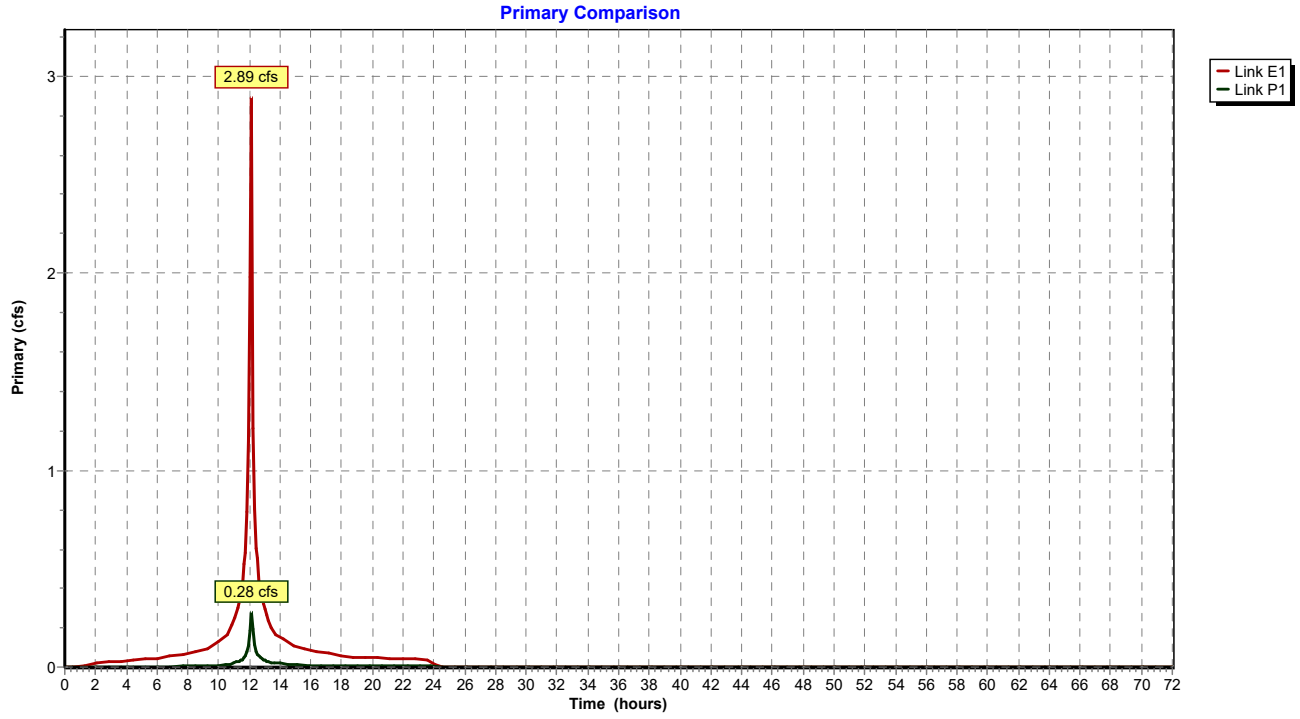
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			


Primary Comparison
2.89 cfs
0.28 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.04	0.00	10.40	0.15	0.01
0.10	0.00	0.00	5.30	0.04	0.00	10.50	0.15	0.01
0.20	0.00	0.00	5.40	0.04	0.00	10.60	0.17	0.01
0.30	0.00	0.00	5.50	0.04	0.00	10.70	0.19	0.02
0.40	0.00	0.00	5.60	0.04	0.00	10.80	0.20	0.02
0.50	0.00	0.00	5.70	0.04	0.00	10.90	0.22	0.02
0.60	0.00	0.00	5.80	0.04	0.00	11.00	0.24	0.02
0.70	0.00	0.00	5.90	0.04	0.00	11.10	0.27	0.02
0.80	0.00	0.00	6.00	0.04	0.00	11.20	0.30	0.03
0.90	0.00	0.00	6.10	0.05	0.00	11.30	0.33	0.03
1.00	0.01	0.00	6.20	0.05	0.00	11.40	0.36	0.03
1.10	0.01	0.00	6.30	0.05	0.00	11.50	0.40	0.04
1.20	0.01	0.00	6.40	0.05	0.00	11.60	0.52	0.05
1.30	0.01	0.00	6.50	0.05	0.00	11.70	0.58	0.06
1.40	0.01	0.00	6.60	0.05	0.00	11.80	0.79	0.08
1.50	0.01	0.00	6.70	0.05	0.00	11.90	1.15	0.11
1.60	0.01	0.00	6.80	0.06	0.00	12.00	1.98	0.18
1.70	0.02	0.00	6.90	0.06	0.00	12.10	**2.86**	**0.28**
1.80	0.02	0.00	7.00	0.06	0.00	12.20	1.22	0.19
1.90	0.02	0.00	7.10	0.06	0.00	12.30	0.81	0.11
2.00	0.02	0.00	7.20	0.06	0.00	12.40	0.60	0.08
2.10	0.02	0.00	7.30	0.06	0.00	12.50	0.55	0.07
2.20	0.02	0.00	7.40	0.06	0.00	12.60	0.43	0.05
2.30	0.02	0.00	7.50	0.06	0.00	12.70	0.39	0.05
2.40	0.02	0.00	7.60	0.07	0.00	12.80	0.36	0.04
2.50	0.02	0.00	7.70	0.07	0.00	12.90	0.32	0.04
2.60	0.02	0.00	7.80	0.07	0.00	13.00	0.29	0.04
2.70	0.03	0.00	7.90	0.07	0.00	13.10	0.26	0.03
2.80	0.03	0.00	8.00	0.07	0.00	13.20	0.24	0.03
2.90	0.03	0.00	8.10	0.07	0.00	13.30	0.23	0.03
3.00	0.03	0.00	8.20	0.07	0.00	13.40	0.21	0.03
3.10	0.03	0.00	8.30	0.08	0.01	13.50	0.19	0.02
3.20	0.03	0.00	8.40	0.08	0.01	13.60	0.17	0.02
3.30	0.03	0.00	8.50	0.08	0.01	13.70	0.17	0.02
3.40	0.03	0.00	8.60	0.08	0.01	13.80	0.16	0.02
3.50	0.03	0.00	8.70	0.08	0.01	13.90	0.16	0.02
3.60	0.03	0.00	8.80	0.08	0.01	14.00	0.15	0.02
3.70	0.03	0.00	8.90	0.08	0.01	14.10	0.15	0.02
3.80	0.03	0.00	9.00	0.09	0.01	14.20	0.14	0.02
3.90	0.03	0.00	9.10	0.09	0.01	14.30	0.14	0.02
4.00	0.03	0.00	9.20	0.09	0.01	14.40	0.13	0.02
4.10	0.04	0.00	9.30	0.10	0.01	14.50	0.13	0.02
4.20	0.04	0.00	9.40	0.10	0.01	14.60	0.12	0.01
4.30	0.04	0.00	9.50	0.11	0.01	14.70	0.12	0.01
4.40	0.04	0.00	9.60	0.11	0.01	14.80	0.11	0.01
4.50	0.04	0.00	9.70	0.12	0.01	14.90	0.11	0.01
4.60	0.04	0.00	9.80	0.12	0.01	15.00	0.10	0.01
4.70	0.04	0.00	9.90	0.13	0.01	15.10	0.10	0.01
4.80	0.04	0.00	10.00	0.13	0.01	15.20	0.10	0.01
4.90	0.04	0.00	10.10	0.13	0.01	15.30	0.10	0.01
5.00	0.04	0.00	10.20	0.14	0.01	15.40	0.09	0.01
5.10	0.04	0.00	10.30	0.14	0.01	15.50	0.09	0.01

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.09	0.01	20.80	0.05	0.01	26.00	0.00	0.00
15.70	0.09	0.01	20.90	0.05	0.01	26.10	0.00	0.00
15.80	0.09	0.01	21.00	0.05	0.01	26.20	0.00	0.00
15.90	0.09	0.01	21.10	0.05	0.01	26.30	0.00	0.00
16.00	0.09	0.01	21.20	0.05	0.01	26.40	0.00	0.00
16.10	0.08	0.01	21.30	0.04	0.01	26.50	0.00	0.00
16.20	0.08	0.01	21.40	0.04	0.01	26.60	0.00	0.00
16.30	0.08	0.01	21.50	0.04	0.01	26.70	0.00	0.00
16.40	0.08	0.01	21.60	0.04	0.01	26.80	0.00	0.00
16.50	0.08	0.01	21.70	0.04	0.01	26.90	0.00	0.00
16.60	0.08	0.01	21.80	0.04	0.01	27.00	0.00	0.00
16.70	0.08	0.01	21.90	0.04	0.01	27.10	0.00	0.00
16.80	0.07	0.01	22.00	0.04	0.01	27.20	0.00	0.00
16.90	0.07	0.01	22.10	0.04	0.00	27.30	0.00	0.00
17.00	0.07	0.01	22.20	0.04	0.00	27.40	0.00	0.00
17.10	0.07	0.01	22.30	0.04	0.00	27.50	0.00	0.00
17.20	0.07	0.01	22.40	0.04	0.00	27.60	0.00	0.00
17.30	0.07	0.01	22.50	0.04	0.00	27.70	0.00	0.00
17.40	0.07	0.01	22.60	0.04	0.00	27.80	0.00	0.00
17.50	0.06	0.01	22.70	0.04	0.00	27.90	0.00	0.00
17.60	0.06	0.01	22.80	0.04	0.00	28.00	0.00	0.00
17.70	0.06	0.01	22.90	0.04	0.00	28.10	0.00	0.00
17.80	0.06	0.01	23.00	0.04	0.00	28.20	0.00	0.00
17.90	0.06	0.01	23.10	0.04	0.00	28.30	0.00	0.00
18.00	0.06	0.01	23.20	0.04	0.00	28.40	0.00	0.00
18.10	0.06	0.01	23.30	0.04	0.00	28.50	0.00	0.00
18.20	0.06	0.01	23.40	0.04	0.00	28.60	0.00	0.00
18.30	0.06	0.01	23.50	0.04	0.00	28.70	0.00	0.00
18.40	0.06	0.01	23.60	0.04	0.00	28.80	0.00	0.00
18.50	0.05	0.01	23.70	0.04	0.00	28.90	0.00	0.00
18.60	0.05	0.01	23.80	0.04	0.00	29.00	0.00	0.00
18.70	0.05	0.01	23.90	0.04	0.00	29.10	0.00	0.00
18.80	0.05	0.01	24.00	0.03	0.00	29.20	0.00	0.00
18.90	0.05	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.05	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.05	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.05	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.05	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.05	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.05	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.05	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.05	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.05	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.05	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.05	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.05	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.05	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.05	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.05	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.05	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.05	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.05	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

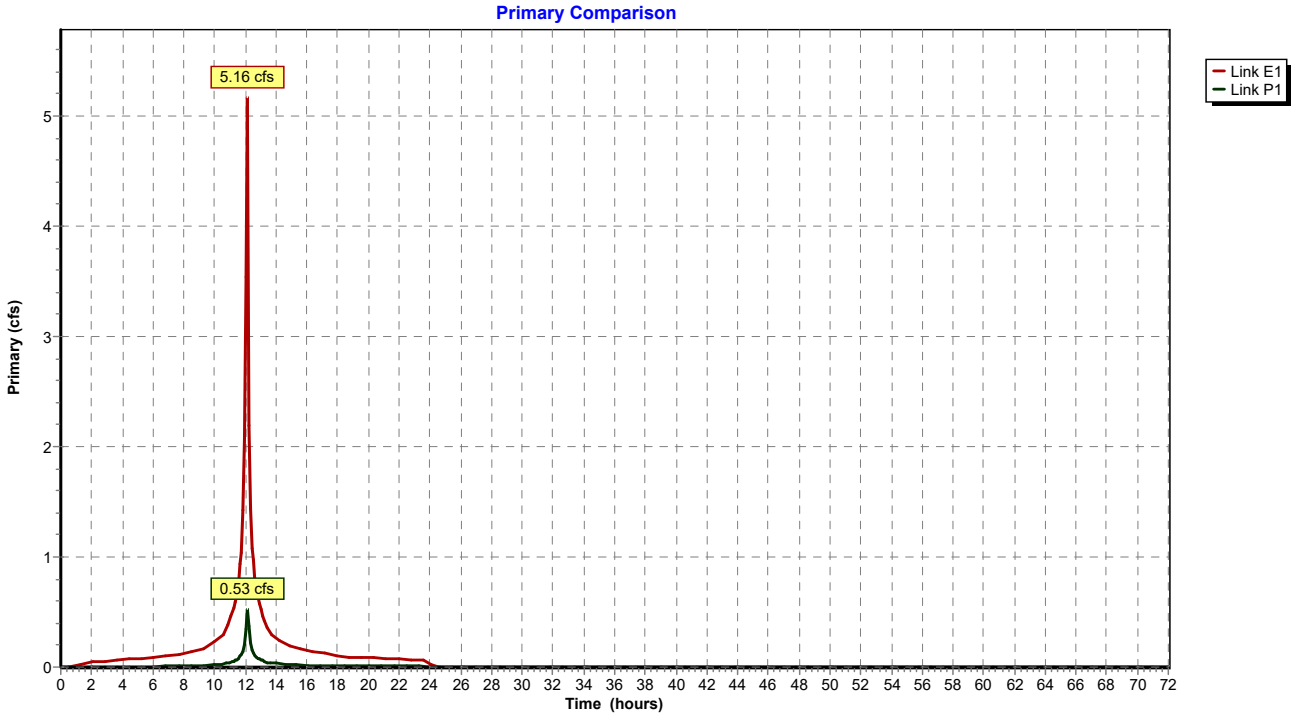
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			


Primary Comparison
5.16 cfs
0.53 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
3
4
5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.08	0.00	10.40	0.27	0.03
0.10	0.00	0.00	5.30	0.08	0.00	10.50	0.28	0.03
0.20	0.00	0.00	5.40	0.08	0.01	10.60	0.31	0.03
0.30	0.00	0.00	5.50	0.08	0.01	10.70	0.34	0.03
0.40	0.00	0.00	5.60	0.08	0.01	10.80	0.37	0.04
0.50	0.00	0.00	5.70	0.08	0.01	10.90	0.40	0.04
0.60	0.01	0.00	5.80	0.08	0.01	11.00	0.43	0.05
0.70	0.01	0.00	5.90	0.08	0.01	11.10	0.48	0.05
0.80	0.02	0.00	6.00	0.08	0.01	11.20	0.54	0.06
0.90	0.02	0.00	6.10	0.08	0.01	11.30	0.59	0.06
1.00	0.02	0.00	6.20	0.09	0.01	11.40	0.65	0.07
1.10	0.03	0.00	6.30	0.09	0.01	11.50	0.73	0.08
1.20	0.03	0.00	6.40	0.09	0.01	11.60	0.94	0.10
1.30	0.03	0.00	6.50	0.09	0.01	11.70	1.04	0.11
1.40	0.03	0.00	6.60	0.10	0.01	11.80	1.42	0.15
1.50	0.04	0.00	6.70	0.10	0.01	11.90	2.06	0.21
1.60	0.04	0.00	6.80	0.10	0.01	12.00	3.53	0.35
1.70	0.04	0.00	6.90	0.10	0.01	12.10	**5.11**	**0.53**
1.80	0.04	0.00	7.00	0.10	0.01	12.20	2.19	0.37
1.90	0.04	0.00	7.10	0.11	0.01	12.30	1.44	0.21
2.00	0.05	0.00	7.20	0.11	0.01	12.40	1.08	0.15
2.10	0.05	0.00	7.30	0.11	0.01	12.50	0.98	0.12
2.20	0.05	0.00	7.40	0.11	0.01	12.60	0.76	0.10
2.30	0.05	0.00	7.50	0.12	0.01	12.70	0.69	0.09
2.40	0.05	0.00	7.60	0.12	0.01	12.80	0.63	0.08
2.50	0.05	0.00	7.70	0.12	0.01	12.90	0.58	0.07
2.60	0.05	0.00	7.80	0.12	0.01	13.00	0.52	0.06
2.70	0.05	0.00	7.90	0.12	0.01	13.10	0.47	0.06
2.80	0.06	0.00	8.00	0.13	0.01	13.20	0.43	0.05
2.90	0.06	0.00	8.10	0.13	0.01	13.30	0.40	0.05
3.00	0.06	0.00	8.20	0.13	0.01	13.40	0.37	0.05
3.10	0.06	0.00	8.30	0.13	0.01	13.50	0.34	0.04
3.20	0.06	0.00	8.40	0.14	0.01	13.60	0.31	0.04
3.30	0.06	0.00	8.50	0.14	0.01	13.70	0.30	0.04
3.40	0.06	0.00	8.60	0.14	0.01	13.80	0.29	0.03
3.50	0.06	0.00	8.70	0.14	0.01	13.90	0.28	0.03
3.60	0.06	0.00	8.80	0.15	0.01	14.00	0.27	0.03
3.70	0.06	0.00	8.90	0.15	0.01	14.10	0.26	0.03
3.80	0.07	0.00	9.00	0.15	0.01	14.20	0.25	0.03
3.90	0.07	0.00	9.10	0.16	0.02	14.30	0.24	0.03
4.00	0.07	0.00	9.20	0.17	0.02	14.40	0.23	0.03
4.10	0.07	0.00	9.30	0.17	0.02	14.50	0.23	0.03
4.20	0.07	0.00	9.40	0.18	0.02	14.60	0.22	0.03
4.30	0.07	0.00	9.50	0.19	0.02	14.70	0.21	0.03
4.40	0.07	0.00	9.60	0.20	0.02	14.80	0.20	0.02
4.50	0.07	0.00	9.70	0.21	0.02	14.90	0.19	0.02
4.60	0.07	0.00	9.80	0.22	0.02	15.00	0.18	0.02
4.70	0.07	0.00	9.90	0.22	0.02	15.10	0.17	0.02
4.80	0.07	0.00	10.00	0.23	0.02	15.20	0.17	0.02
4.90	0.07	0.00	10.10	0.24	0.02	15.30	0.17	0.02
5.00	0.07	0.00	10.20	0.25	0.03	15.40	0.17	0.02
5.10	0.08	0.00	10.30	0.26	0.03	15.50	0.16	0.02

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.16	0.02	20.80	0.08	0.01	26.00	0.00	0.00
15.70	0.16	0.02	20.90	0.08	0.01	26.10	0.00	0.00
15.80	0.16	0.02	21.00	0.08	0.01	26.20	0.00	0.00
15.90	0.15	0.02	21.10	0.08	0.01	26.30	0.00	0.00
16.00	0.15	0.02	21.20	0.08	0.01	26.40	0.00	0.00
16.10	0.15	0.02	21.30	0.08	0.01	26.50	0.00	0.00
16.20	0.15	0.02	21.40	0.08	0.01	26.60	0.00	0.00
16.30	0.14	0.02	21.50	0.08	0.01	26.70	0.00	0.00
16.40	0.14	0.02	21.60	0.08	0.01	26.80	0.00	0.00
16.50	0.14	0.02	21.70	0.08	0.01	26.90	0.00	0.00
16.60	0.14	0.02	21.80	0.08	0.01	27.00	0.00	0.00
16.70	0.13	0.02	21.90	0.08	0.01	27.10	0.00	0.00
16.80	0.13	0.02	22.00	0.07	0.01	27.20	0.00	0.00
16.90	0.13	0.02	22.10	0.07	0.01	27.30	0.00	0.00
17.00	0.13	0.02	22.20	0.07	0.01	27.40	0.00	0.00
17.10	0.12	0.01	22.30	0.07	0.01	27.50	0.00	0.00
17.20	0.12	0.01	22.40	0.07	0.01	27.60	0.00	0.00
17.30	0.12	0.01	22.50	0.07	0.01	27.70	0.00	0.00
17.40	0.12	0.01	22.60	0.07	0.01	27.80	0.00	0.00
17.50	0.11	0.01	22.70	0.07	0.01	27.90	0.00	0.00
17.60	0.11	0.01	22.80	0.07	0.01	28.00	0.00	0.00
17.70	0.11	0.01	22.90	0.07	0.01	28.10	0.00	0.00
17.80	0.11	0.01	23.00	0.07	0.01	28.20	0.00	0.00
17.90	0.10	0.01	23.10	0.07	0.01	28.30	0.00	0.00
18.00	0.10	0.01	23.20	0.07	0.01	28.40	0.00	0.00
18.10	0.10	0.01	23.30	0.07	0.01	28.50	0.00	0.00
18.20	0.10	0.01	23.40	0.07	0.01	28.60	0.00	0.00
18.30	0.10	0.01	23.50	0.07	0.01	28.70	0.00	0.00
18.40	0.10	0.01	23.60	0.06	0.01	28.80	0.00	0.00
18.50	0.10	0.01	23.70	0.06	0.01	28.90	0.00	0.00
18.60	0.10	0.01	23.80	0.06	0.01	29.00	0.00	0.00
18.70	0.09	0.01	23.90	0.06	0.01	29.10	0.00	0.00
18.80	0.09	0.01	24.00	0.06	0.01	29.20	0.00	0.00
18.90	0.09	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.09	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.09	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.09	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.09	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.09	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.09	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.09	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.09	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.09	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.09	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.09	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.09	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.09	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.08	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.08	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.08	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.08	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.08	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

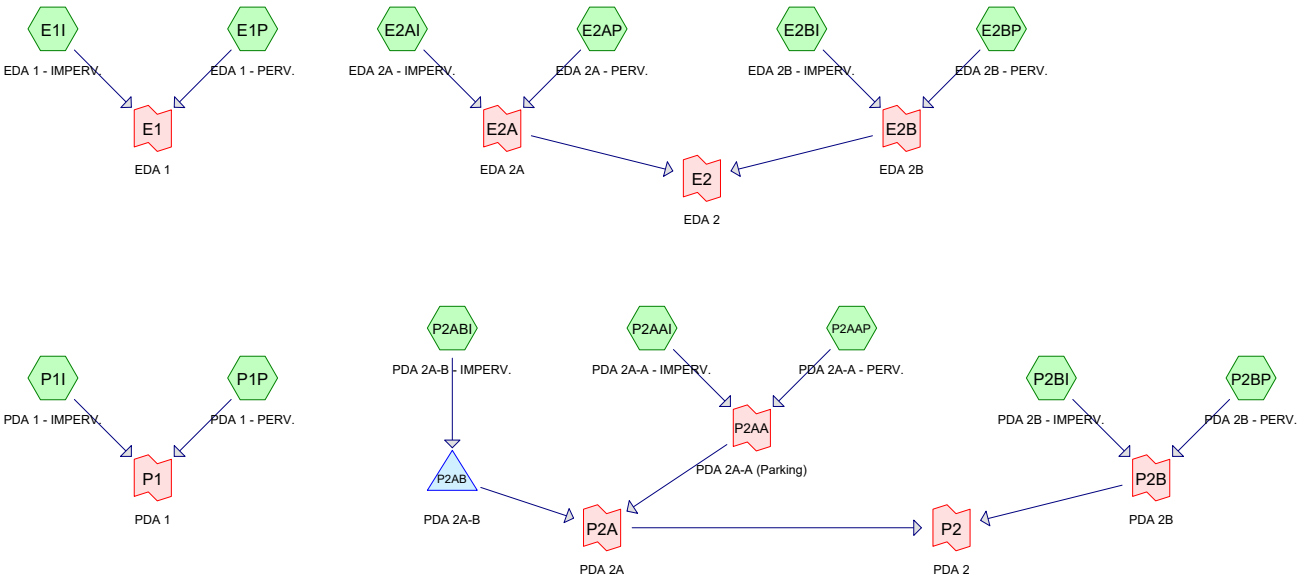
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			

C. PRE- vs. POST-DEVELOPMENT HYDROGRAPHS - Future Adjusted Precipitation Depths

- **2-Year Storm Event**
- **10-Year Storm Event**
- **100-Year Storm Event**
- **Pre- vs. Post Comparison**



Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

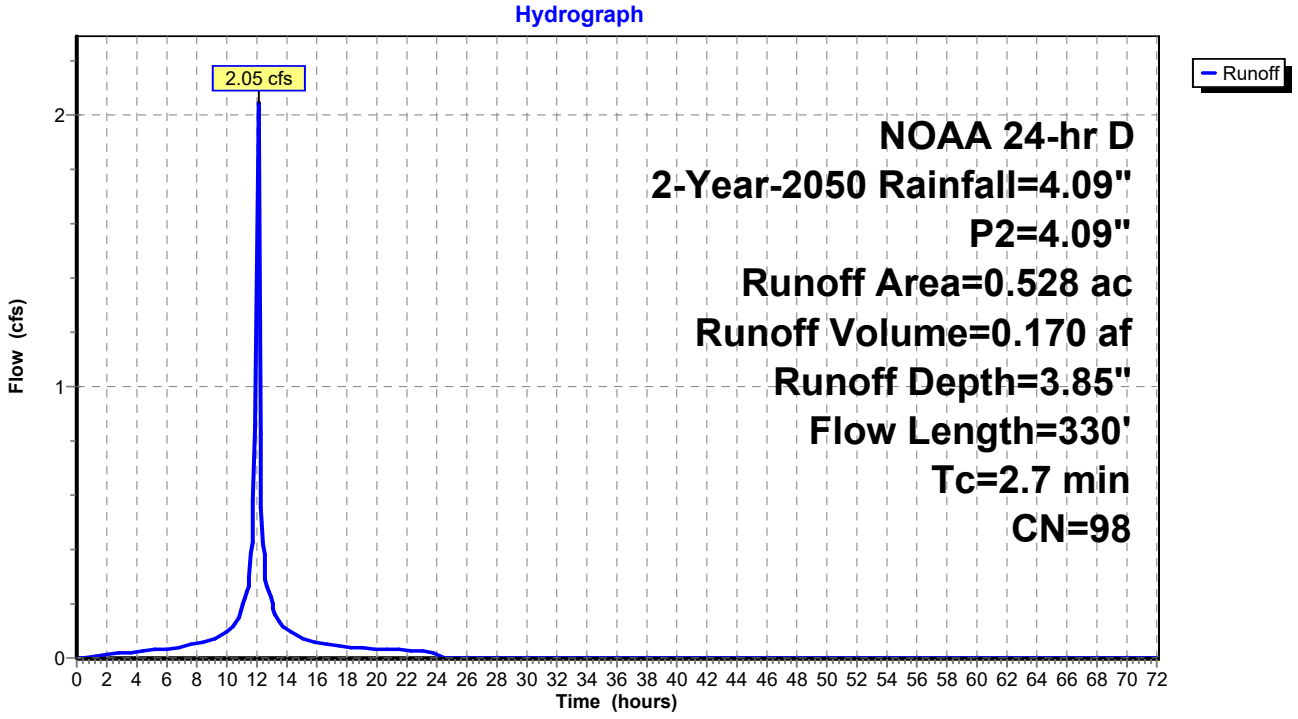
Runoff = 2.05 cfs @ 12.08 hrs, Volume= 0.170 af, Depth= 3.85"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.56		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 4.09"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.7	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

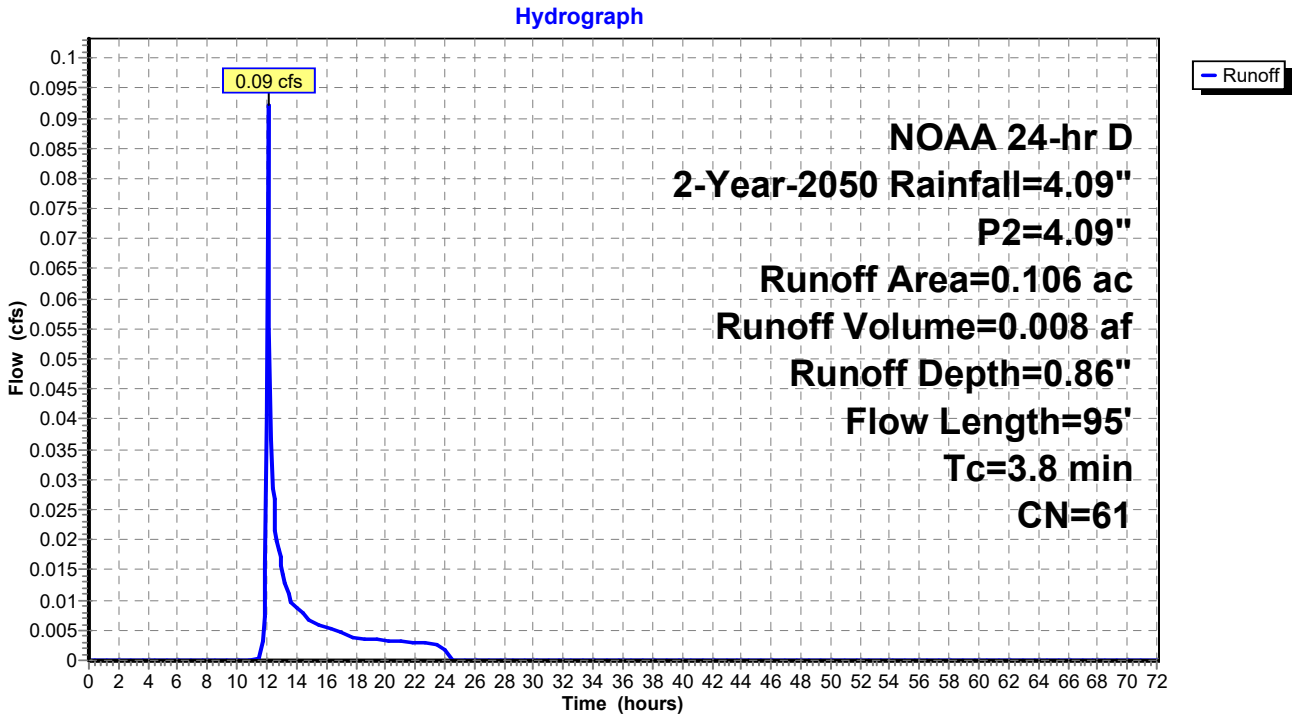
Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.008 af, Depth= 0.86"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0100	0.11		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 4.09"
0.2	20	0.0325	1.37		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 4.09"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
3.8	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

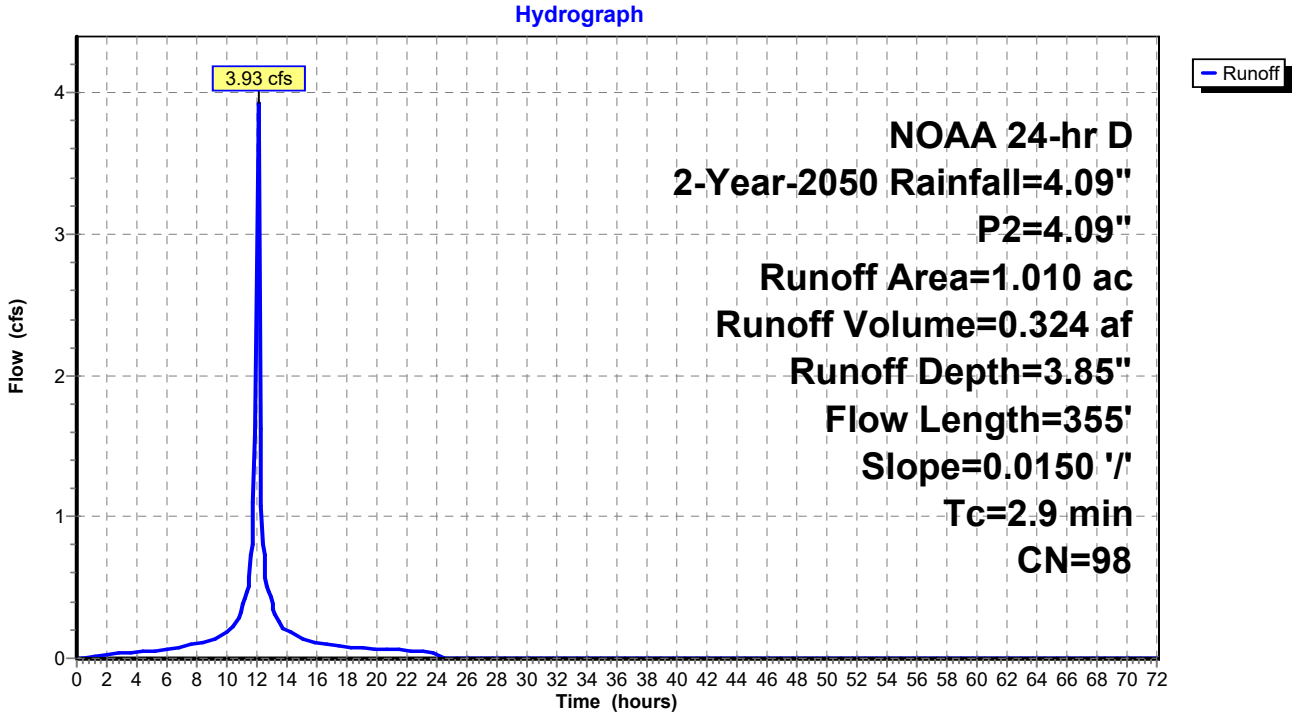
Runoff = 3.93 cfs @ 12.08 hrs, Volume= 0.324 af, Depth= 3.85"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 4.09"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
2.9	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

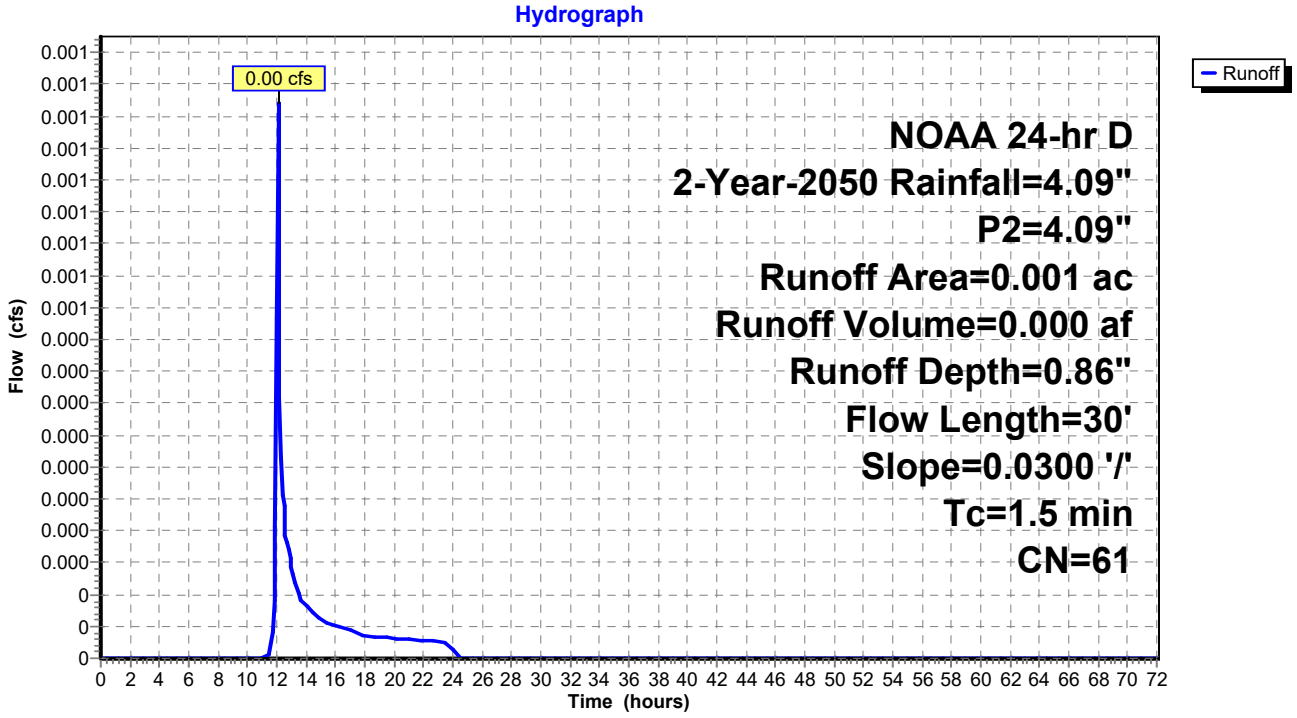
Runoff = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af, Depth= 0.86"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	10	0.0300	0.14		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 4.09"
0.3	20	0.0300	1.33		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 4.09"
1.5	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

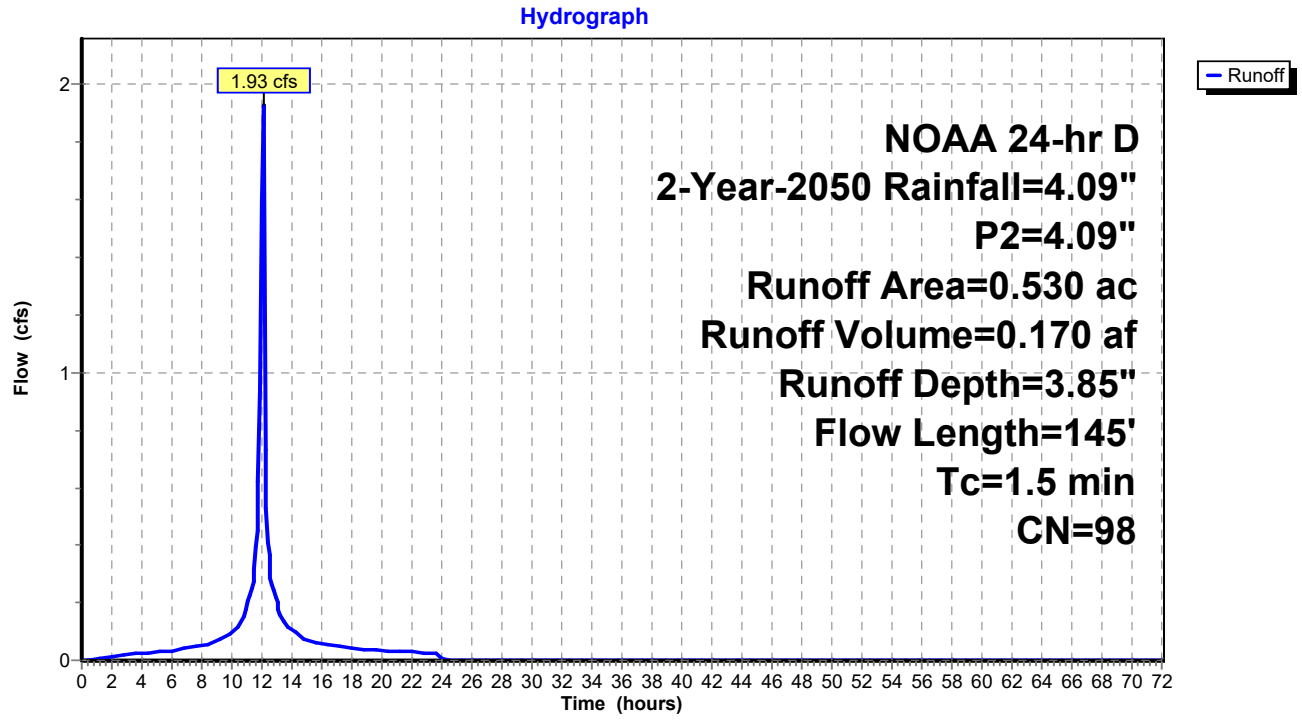
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 0.170 af, Depth= 3.85"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.5	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

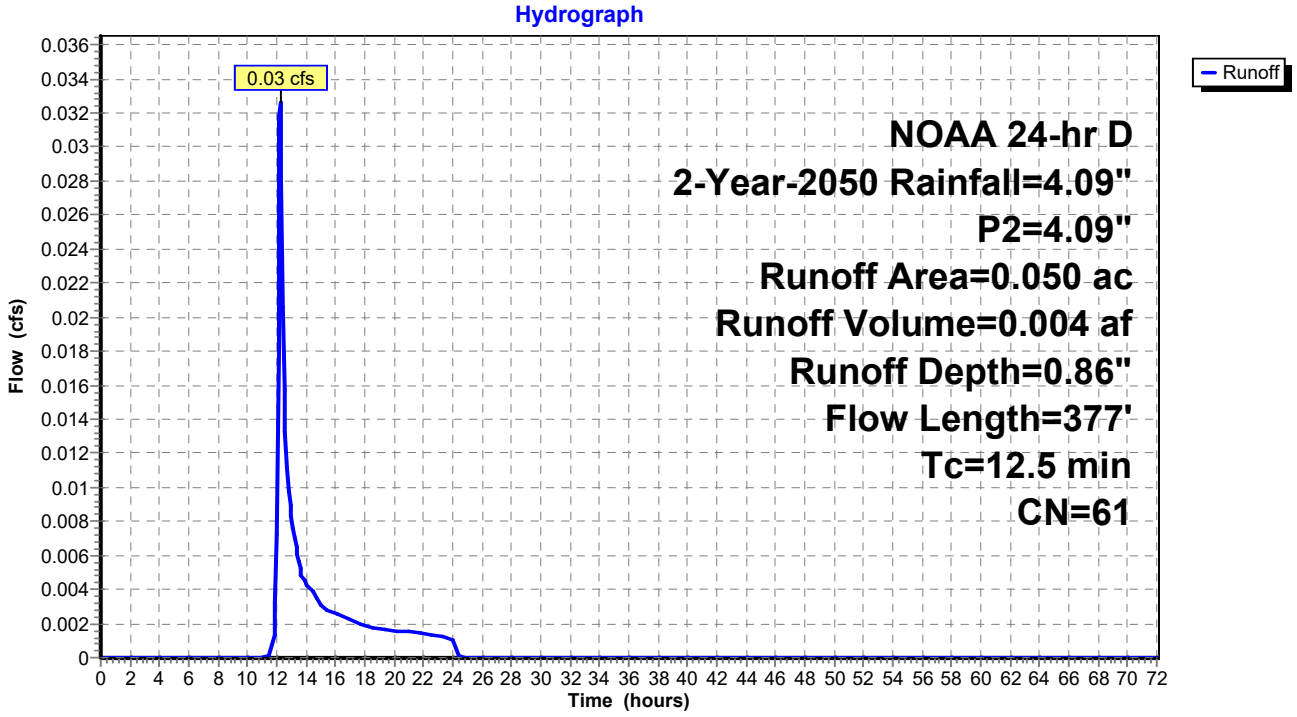
Runoff = 0.03 cfs @ 12.23 hrs, Volume= 0.004 af, Depth= 0.86"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
12.5	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

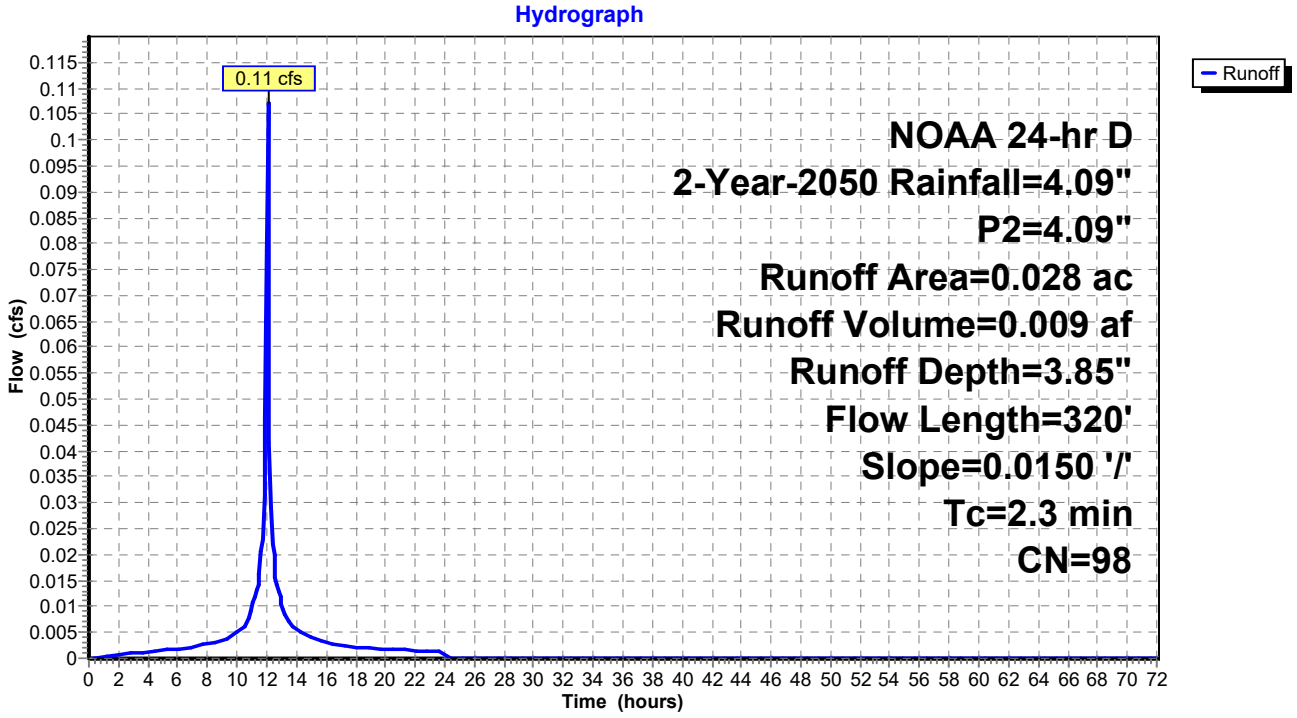
Runoff = 0.11 cfs @ 12.08 hrs, Volume= 0.009 af, Depth= 3.85"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.95		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 4.09"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

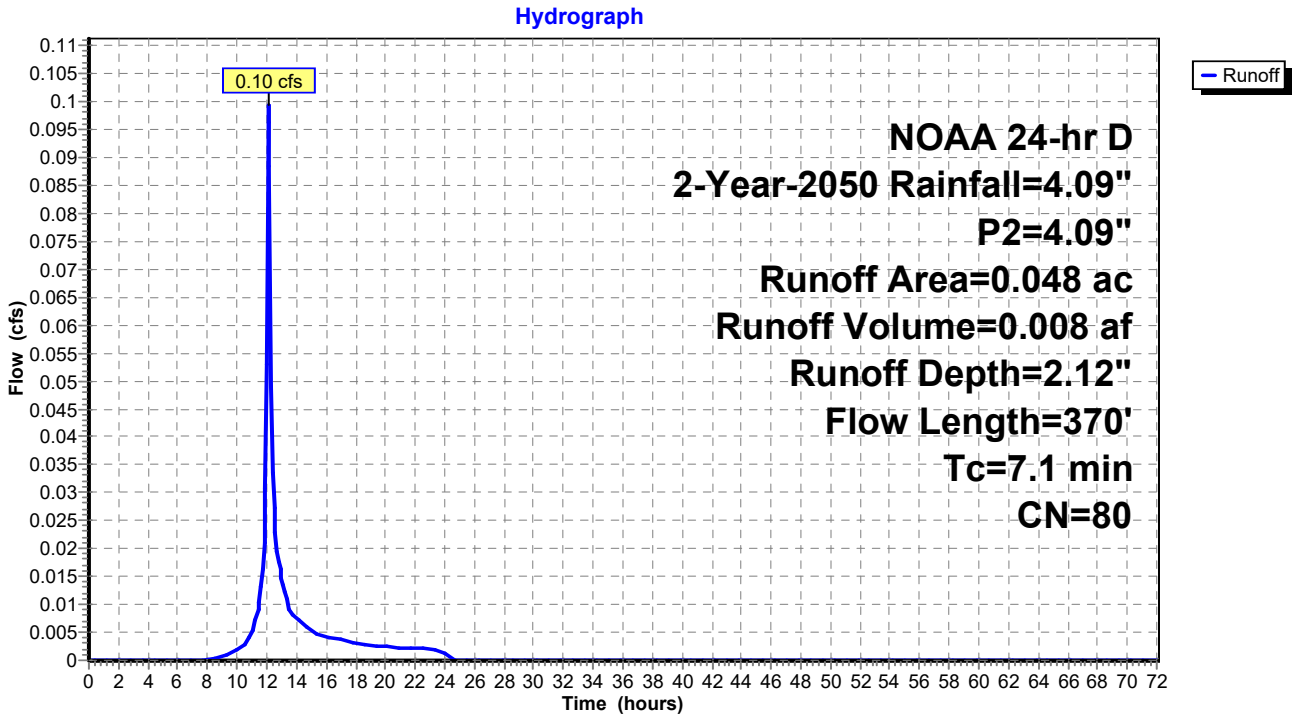
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth= 2.12"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 4.09"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.1	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

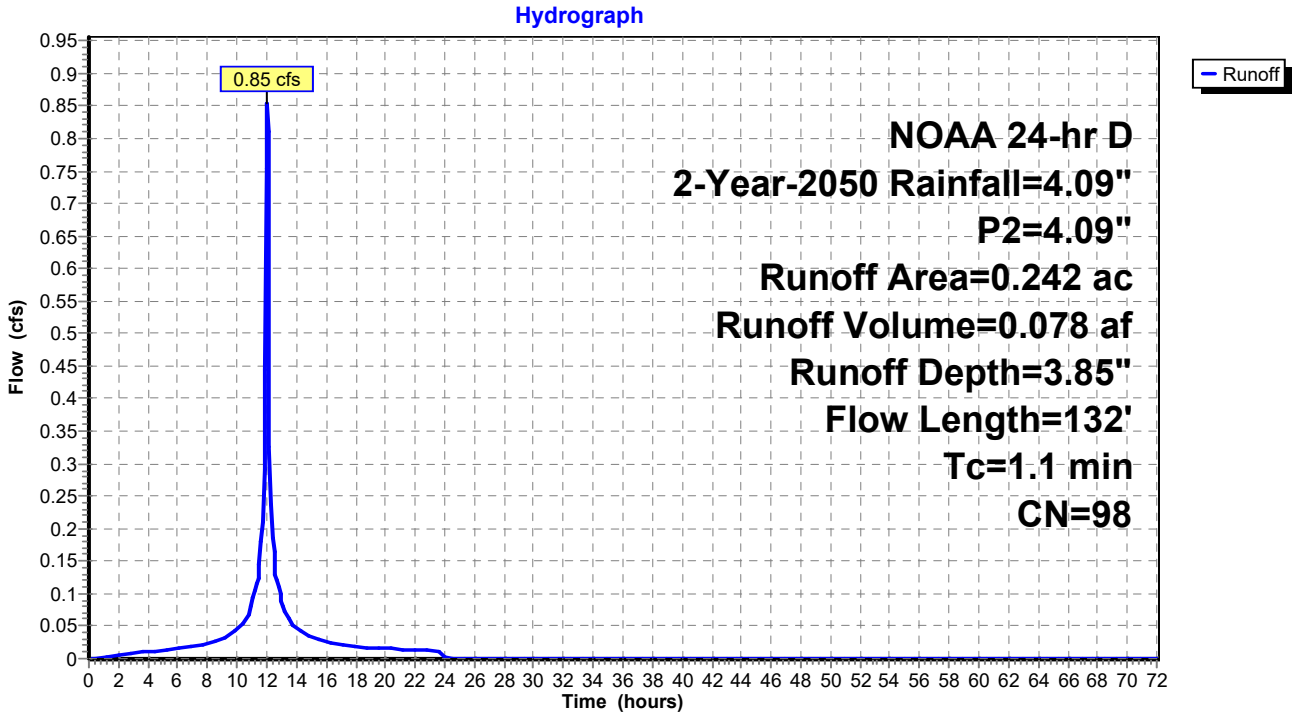
Runoff = 0.85 cfs @ 12.06 hrs, Volume= 0.078 af, Depth= 3.85"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0250	1.70		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 4.09"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.1	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

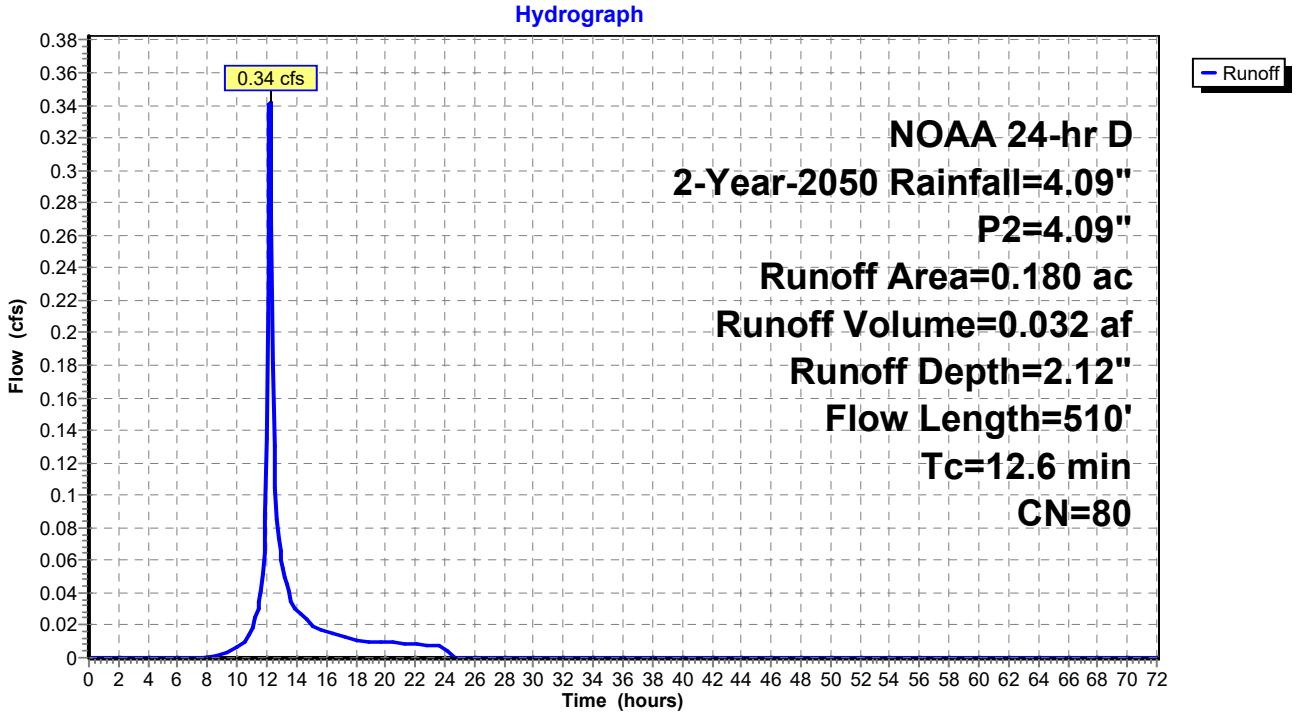
Runoff = 0.34 cfs @ 12.21 hrs, Volume= 0.032 af, Depth= 2.12"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
12.6	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

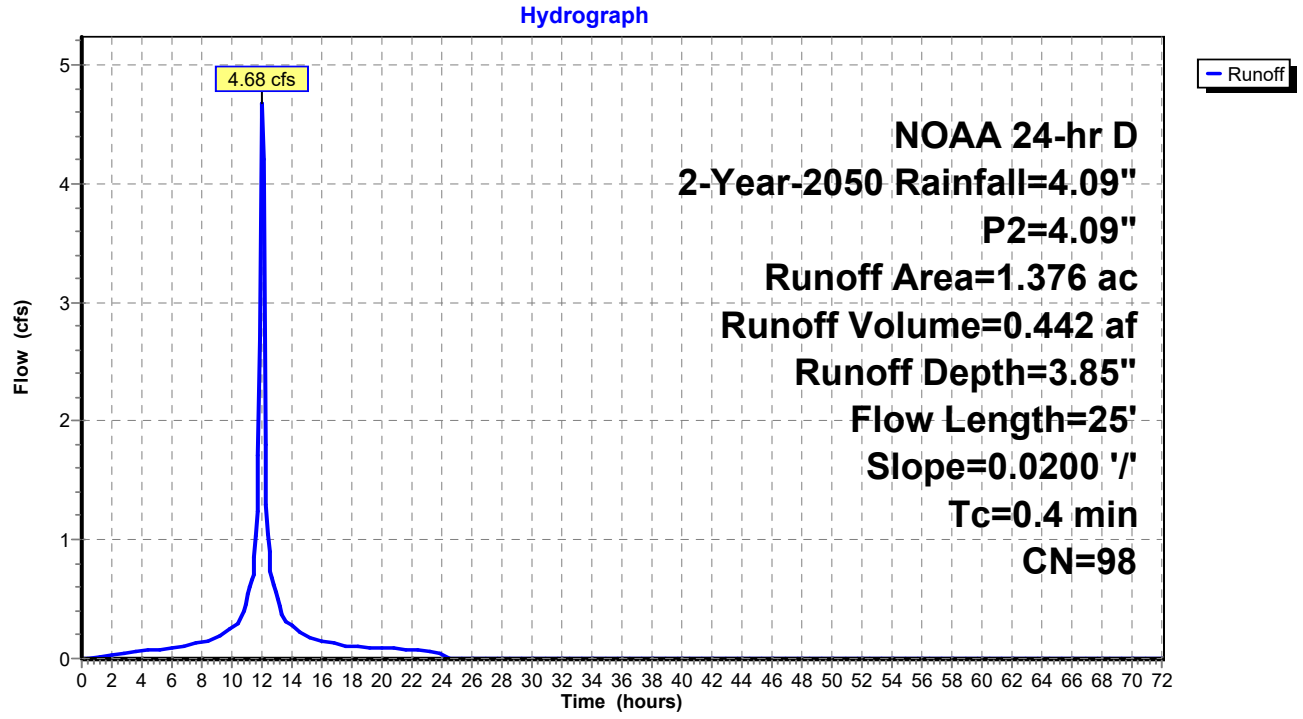
Runoff = 4.68 cfs @ 12.03 hrs, Volume= 0.442 af, Depth= 3.85"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.18		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 4.09"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

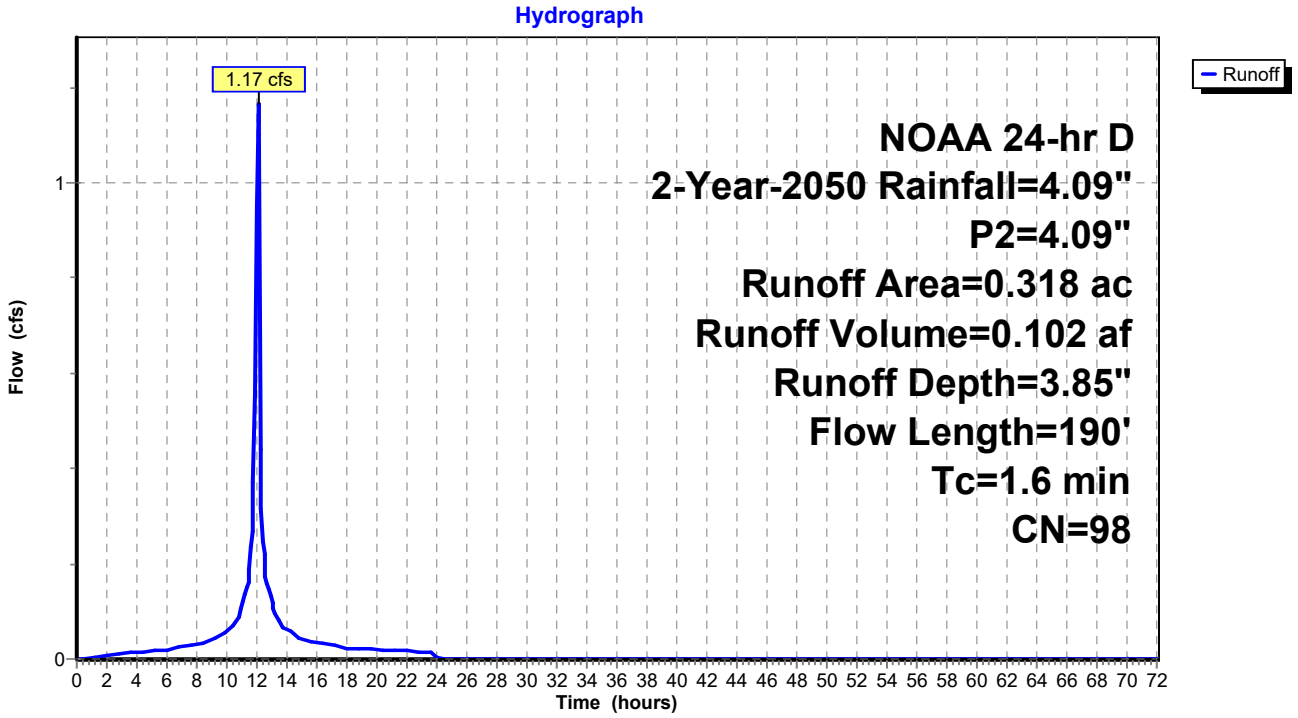
Runoff = 1.17 cfs @ 12.07 hrs, Volume= 0.102 af, Depth= 3.85"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

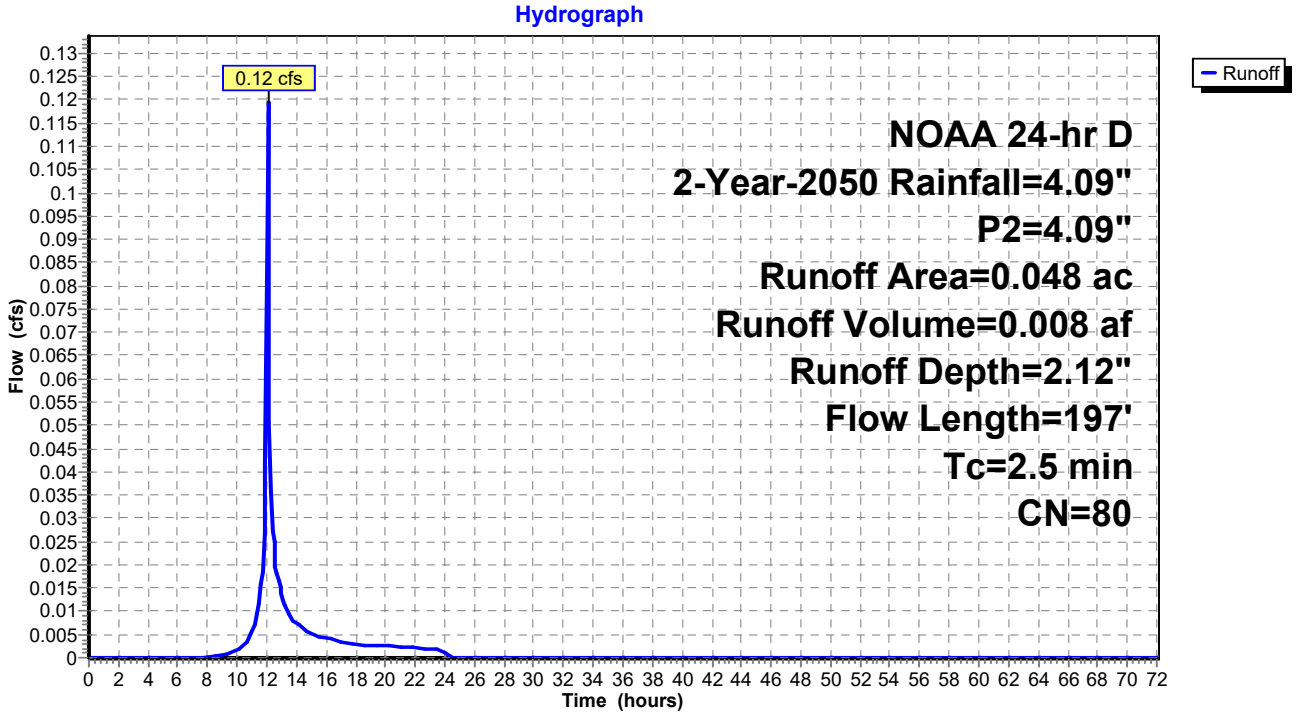
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 2.12"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0200	0.12		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.5	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 3.85" for 2-Year-2050 event
Inflow = 4.68 cfs @ 12.03 hrs, Volume= 0.442 af
Outflow = 0.73 cfs @ 12.63 hrs, Volume= 0.324 af, Atten= 84%, Lag= 35.7 min
Primary = 0.73 cfs @ 12.63 hrs, Volume= 0.324 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 131.99' @ 12.63 hrs Surf.Area= 10,128 sf Storage= 11,381 cf

Plug-Flow detention time= 353.5 min calculated for 0.324 af (73% of inflow)
Center-of-Mass det. time= 255.7 min (1,003.6 - 747.9)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

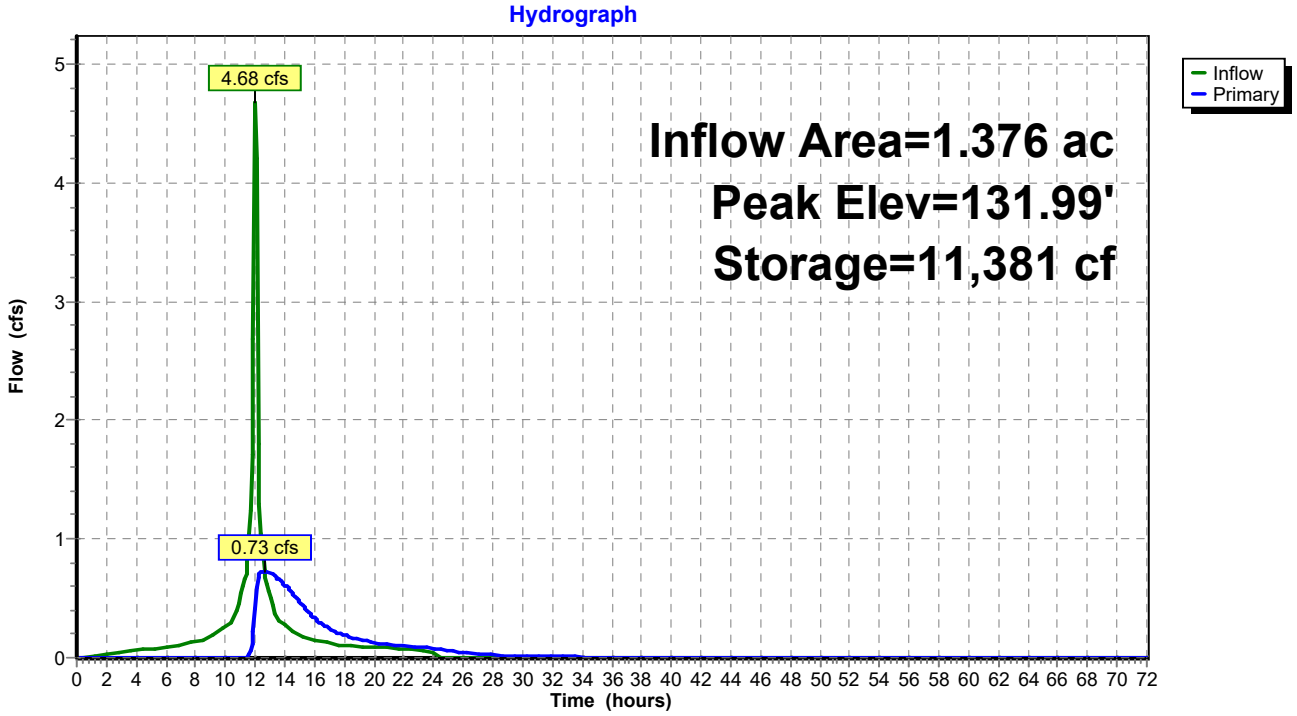
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.73 cfs @ 12.63 hrs HW=131.99' (Free Discharge)
└─**1=Culvert** (Passes 0.73 cfs of 7.42 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.73 cfs @ 3.50 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

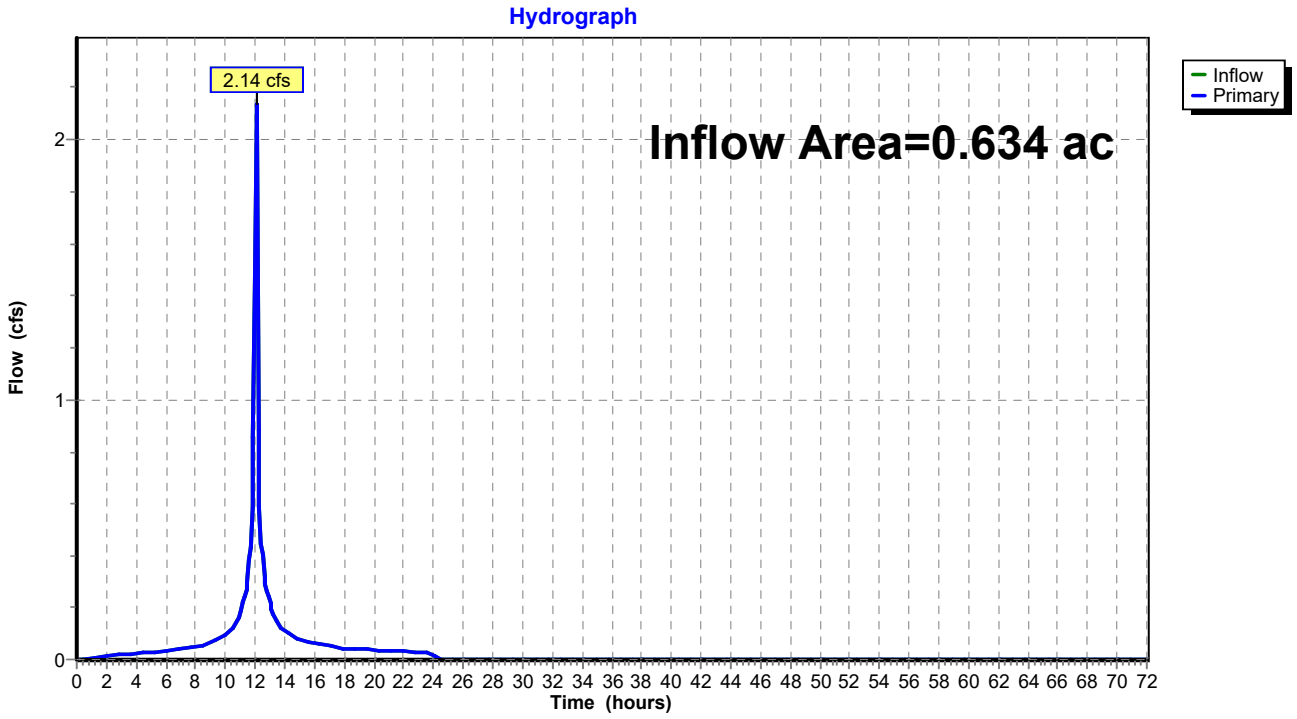


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 3.35" for 2-Year-2050 event
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 0.177 af
Primary = 2.14 cfs @ 12.08 hrs, Volume= 0.177 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

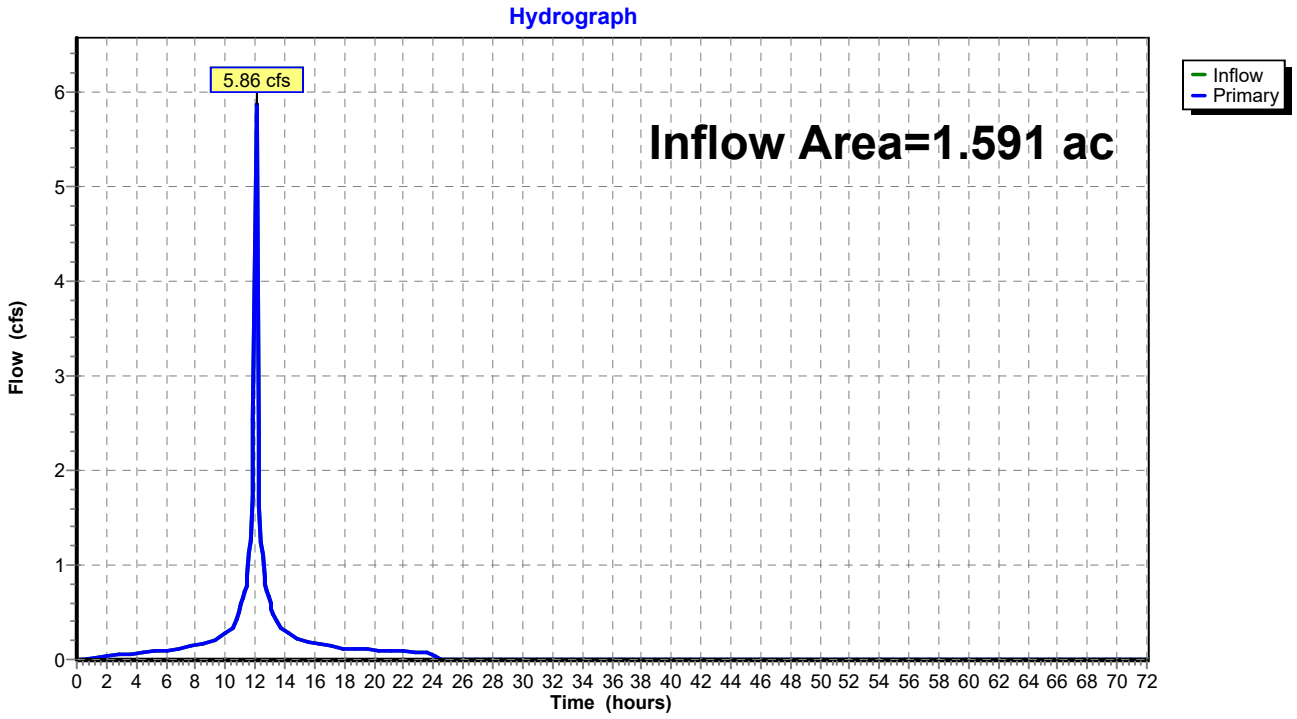


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 3.76" for 2-Year-2050 event
Inflow = 5.86 cfs @ 12.08 hrs, Volume= 0.498 af
Primary = 5.86 cfs @ 12.08 hrs, Volume= 0.498 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

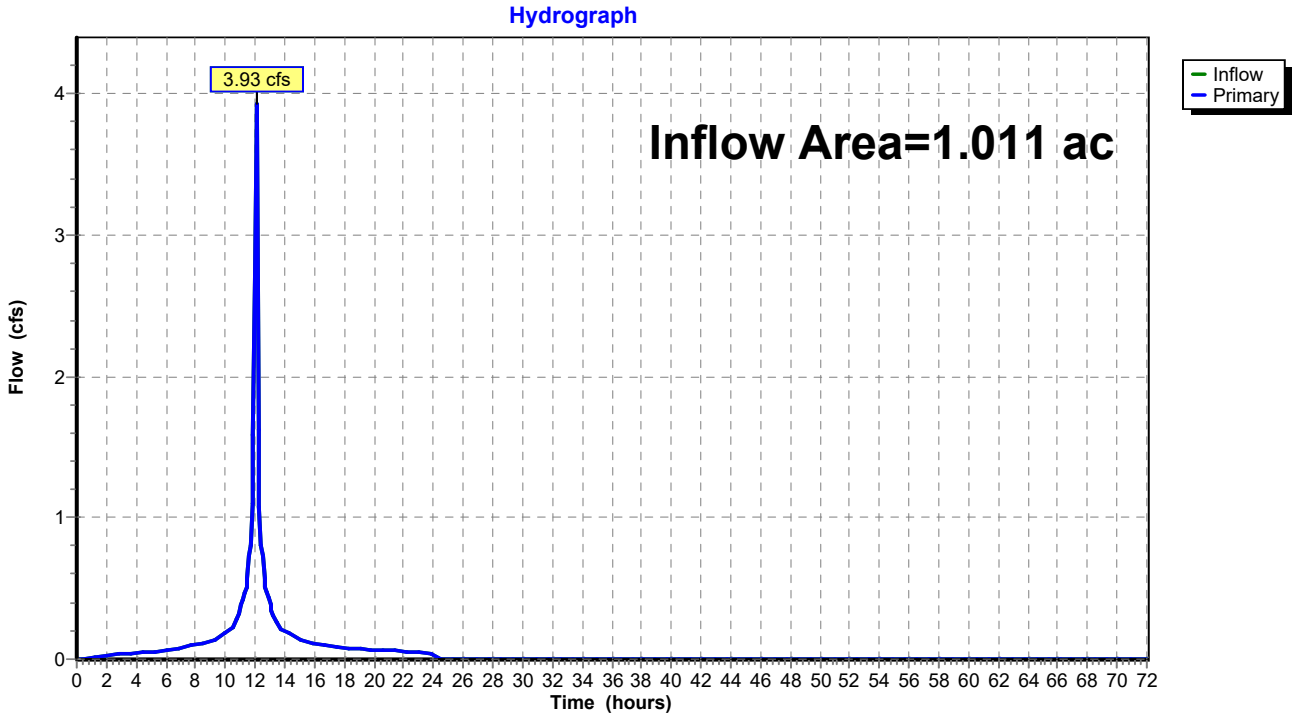


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 3.85" for 2-Year-2050 event
Inflow = 3.93 cfs @ 12.08 hrs, Volume= 0.325 af
Primary = 3.93 cfs @ 12.08 hrs, Volume= 0.325 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

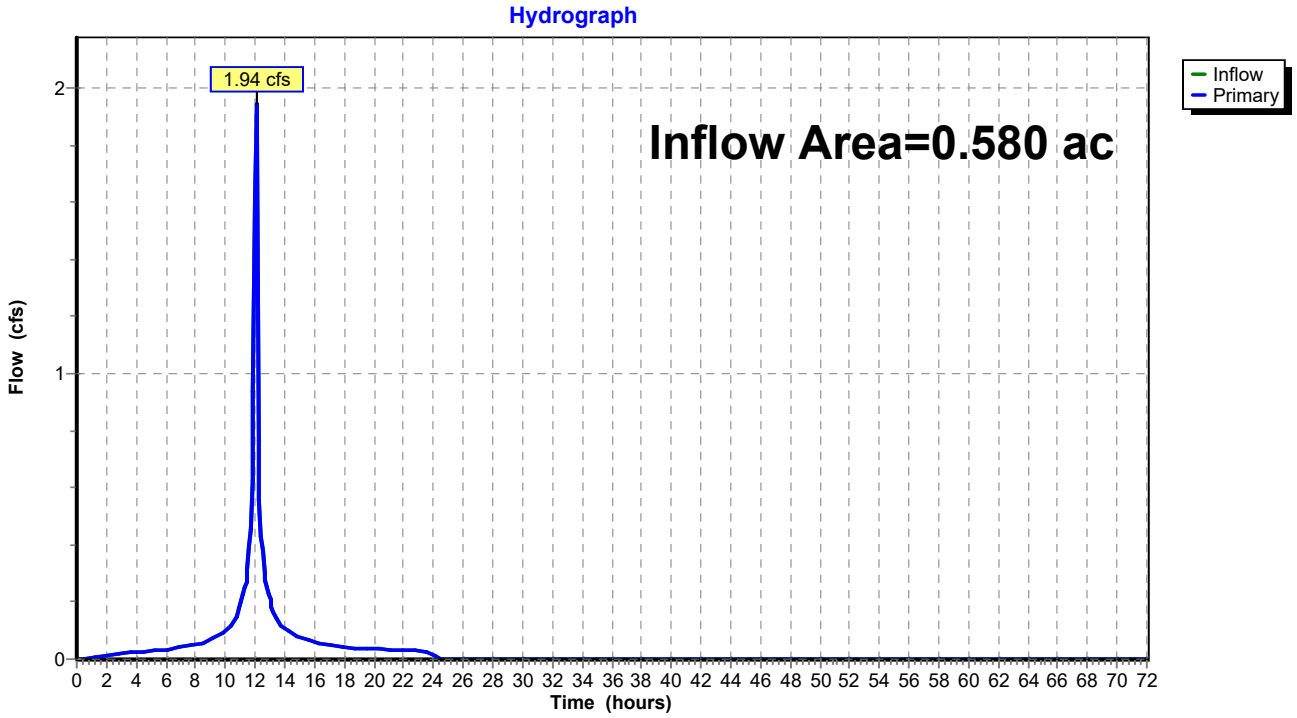


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 3.60" for 2-Year-2050 event
Inflow = 1.94 cfs @ 12.07 hrs, Volume= 0.174 af
Primary = 1.94 cfs @ 12.07 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

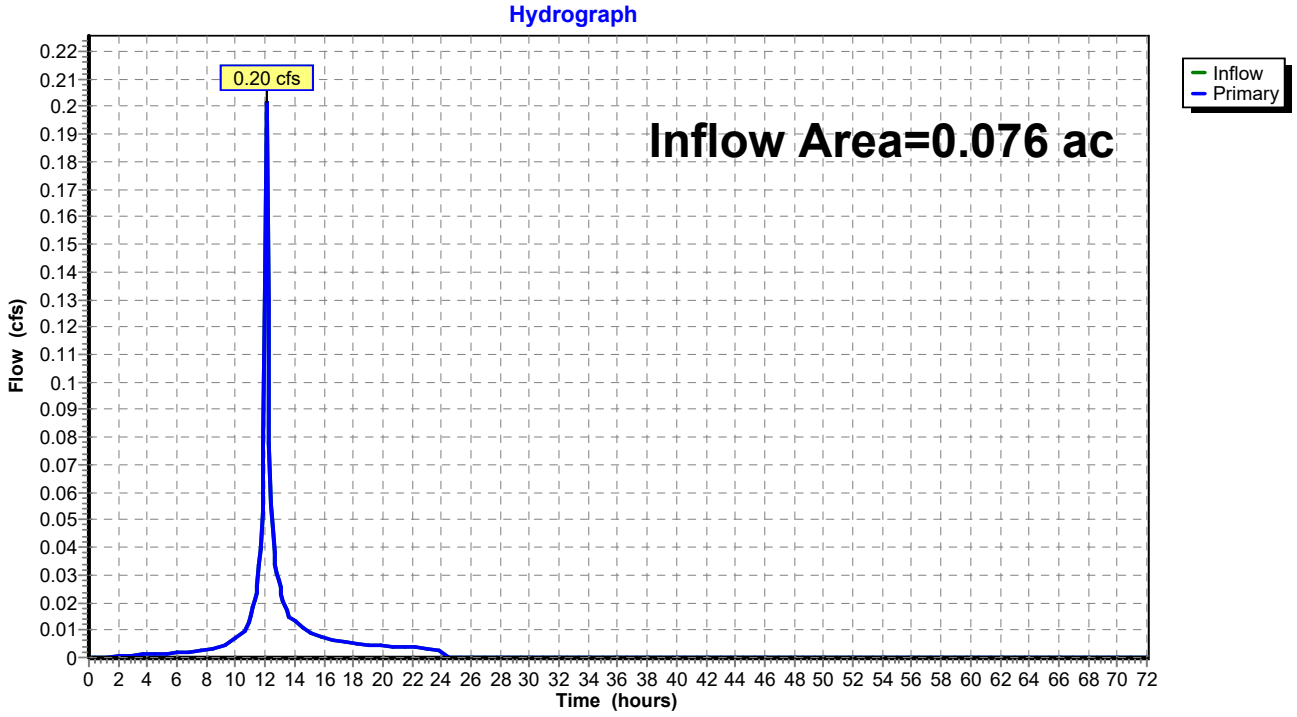


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 2.76" for 2-Year-2050 event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 0.017 af
Primary = 0.20 cfs @ 12.10 hrs, Volume= 0.017 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

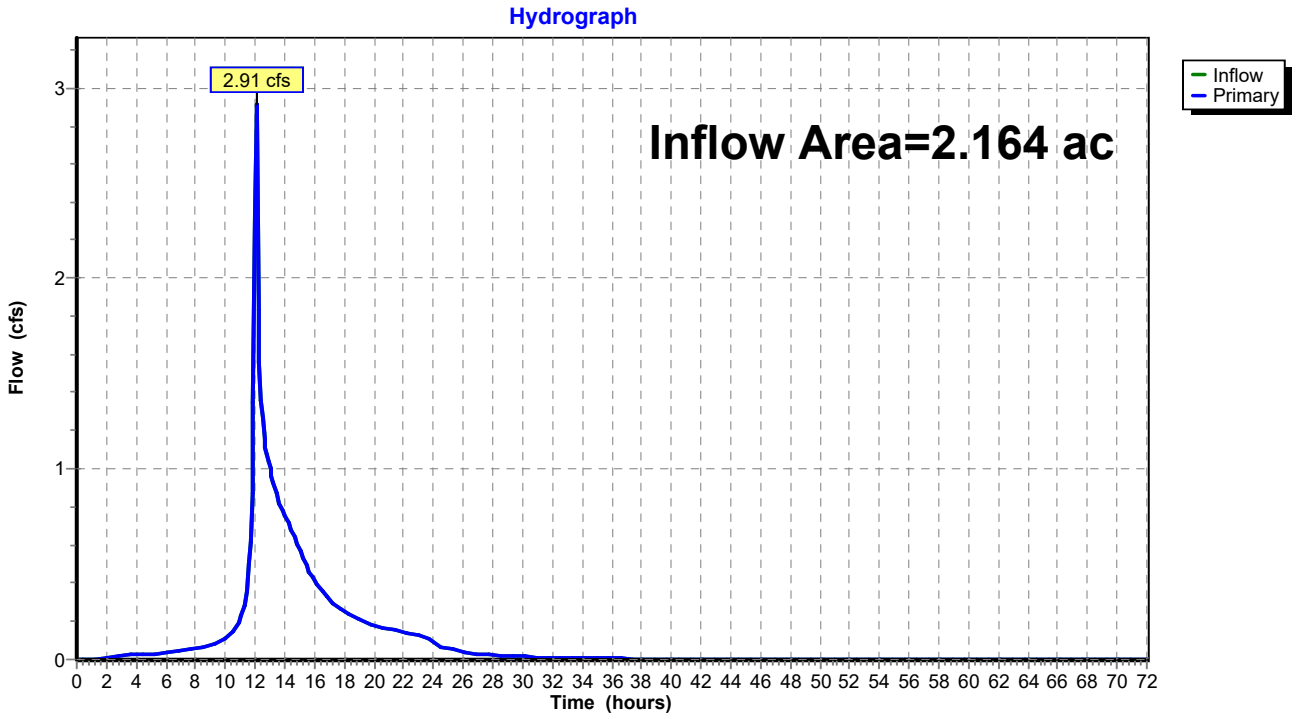


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 3.02" for 2-Year-2050 event
Inflow = 2.91 cfs @ 12.08 hrs, Volume= 0.544 af
Primary = 2.91 cfs @ 12.08 hrs, Volume= 0.544 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

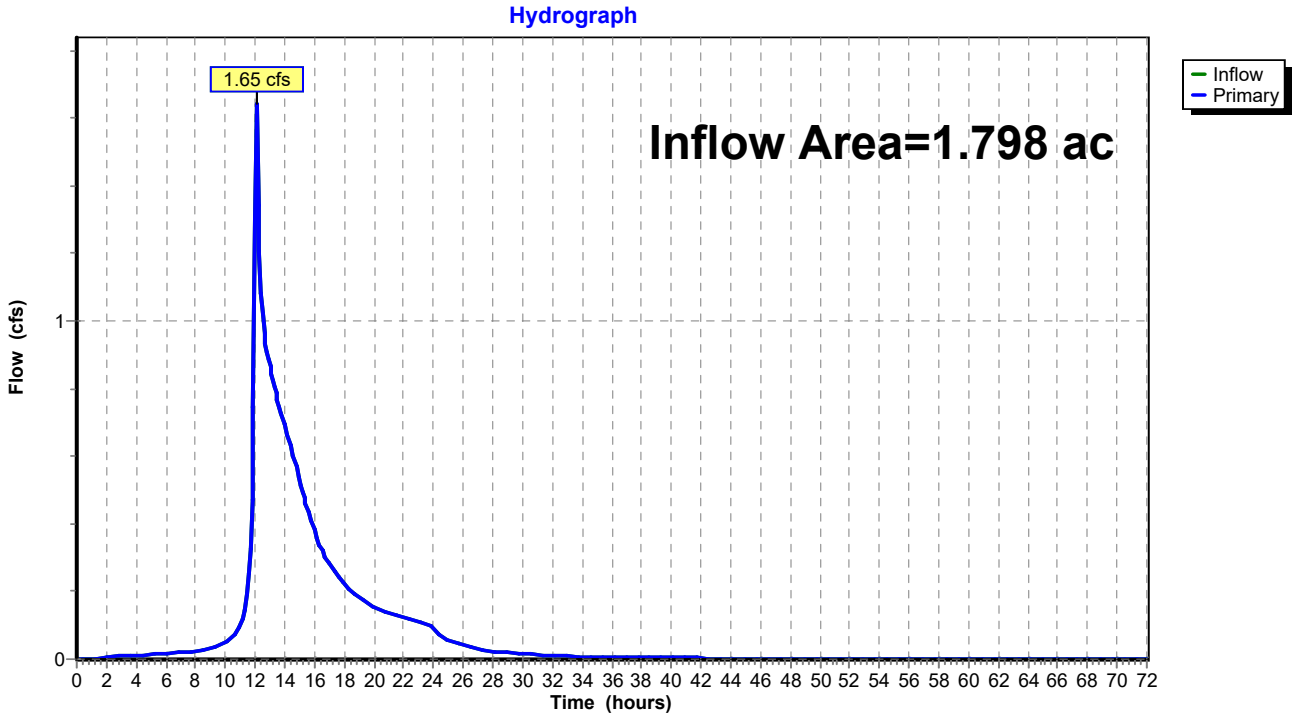


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 2.89" for 2-Year-2050 event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.434 af
Primary = 1.65 cfs @ 12.10 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

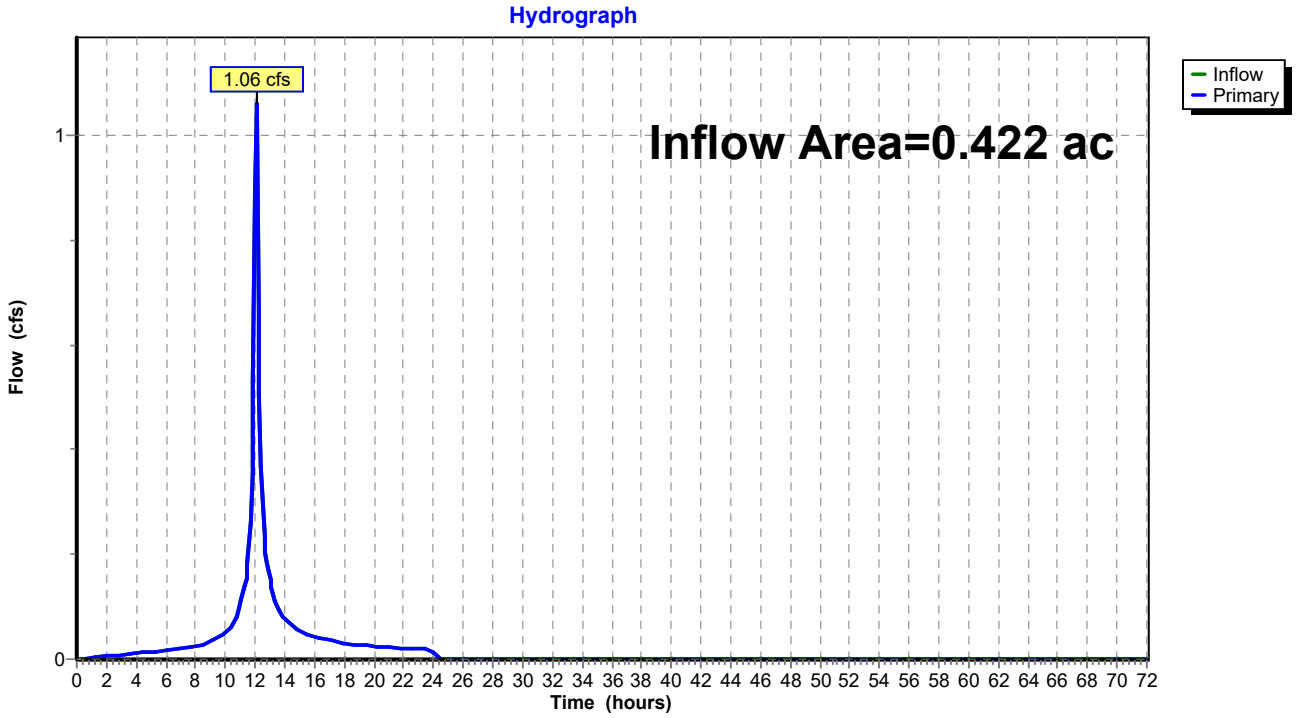


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 3.11" for 2-Year-2050 event
Inflow = 1.06 cfs @ 12.08 hrs, Volume= 0.109 af
Primary = 1.06 cfs @ 12.08 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

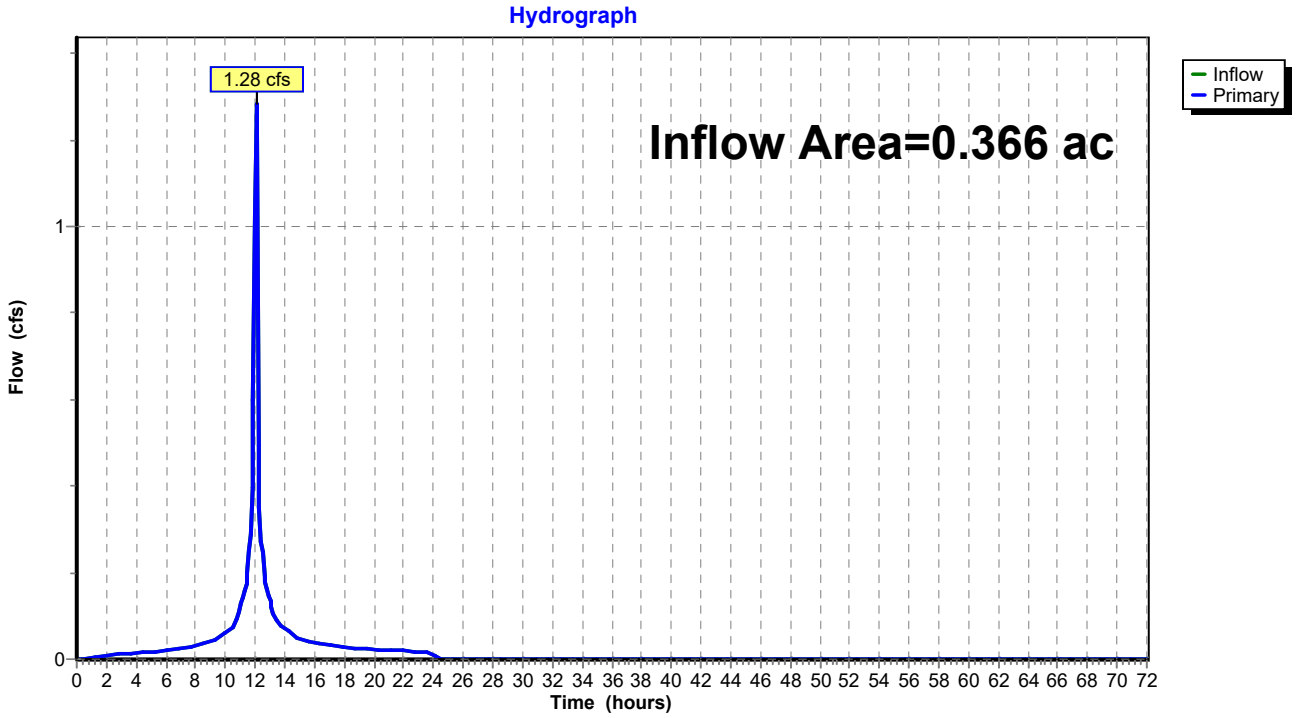


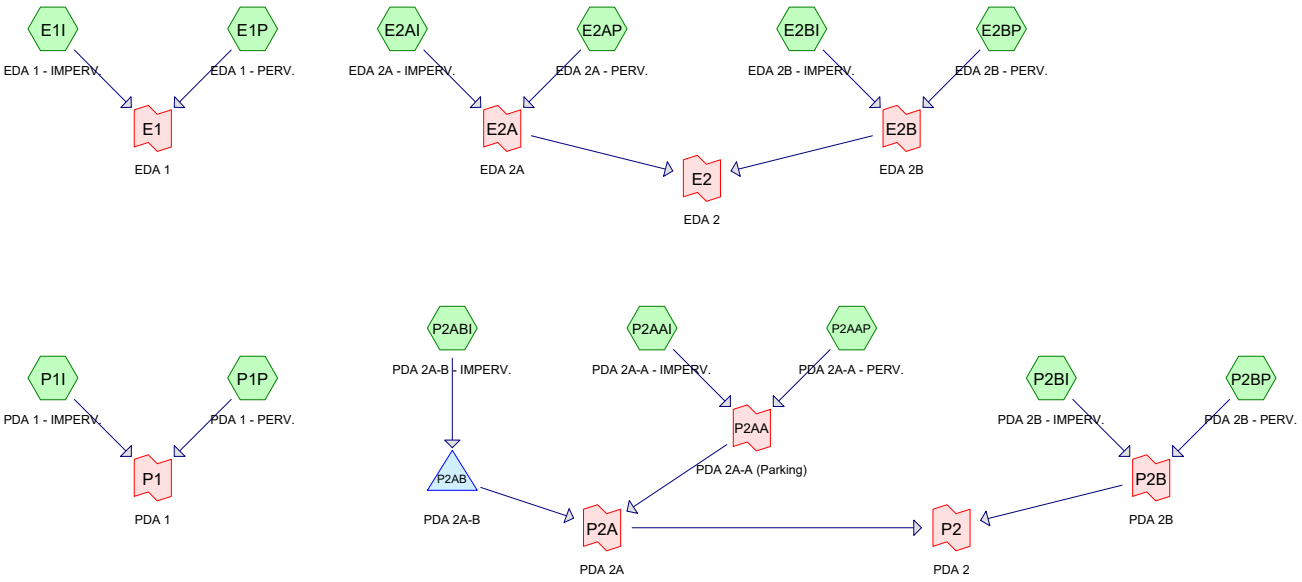
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 3.63" for 2-Year-2050 event
Inflow = 1.28 cfs @ 12.07 hrs, Volume= 0.111 af
Primary = 1.28 cfs @ 12.07 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
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Summary for Subcatchment E1I: EDA 1 - IMPERV.

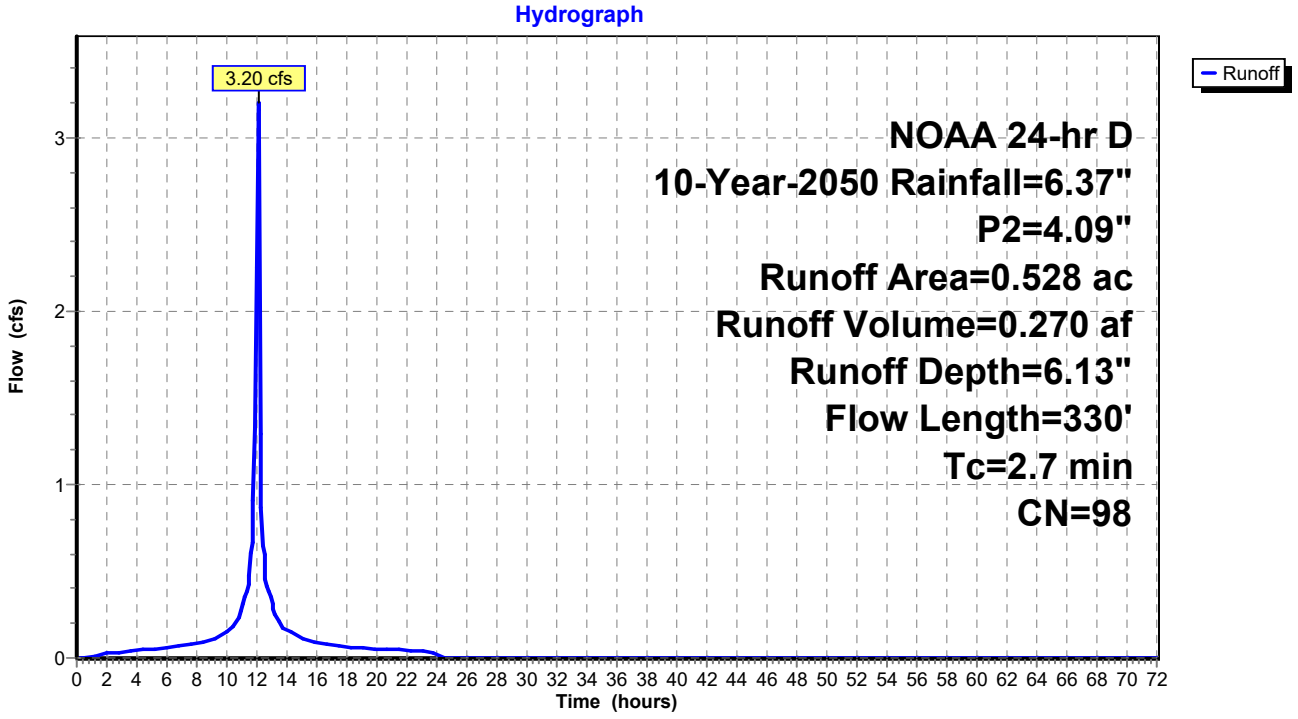
Runoff = 3.20 cfs @ 12.08 hrs, Volume= 0.270 af, Depth= 6.13"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.56		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 4.09"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.7	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

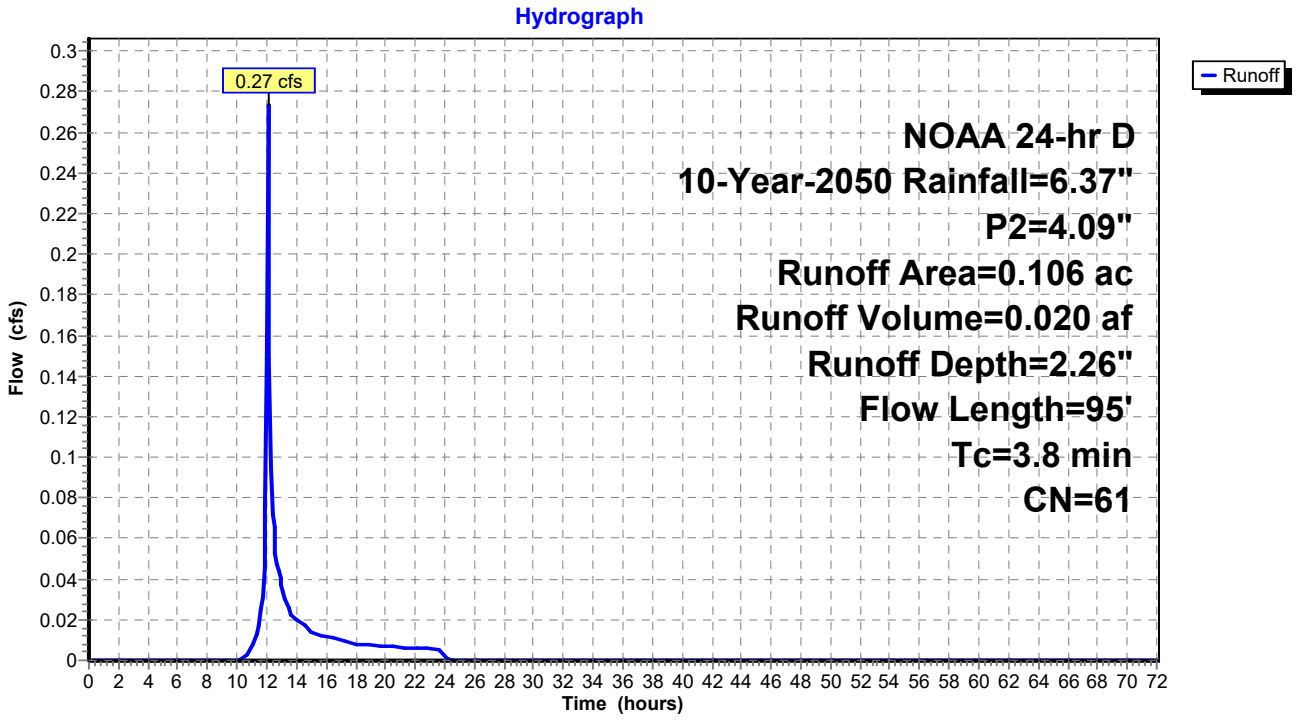
Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af, Depth= 2.26"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0100	0.11		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 4.09"
0.2	20	0.0325	1.37		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 4.09"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
3.8	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

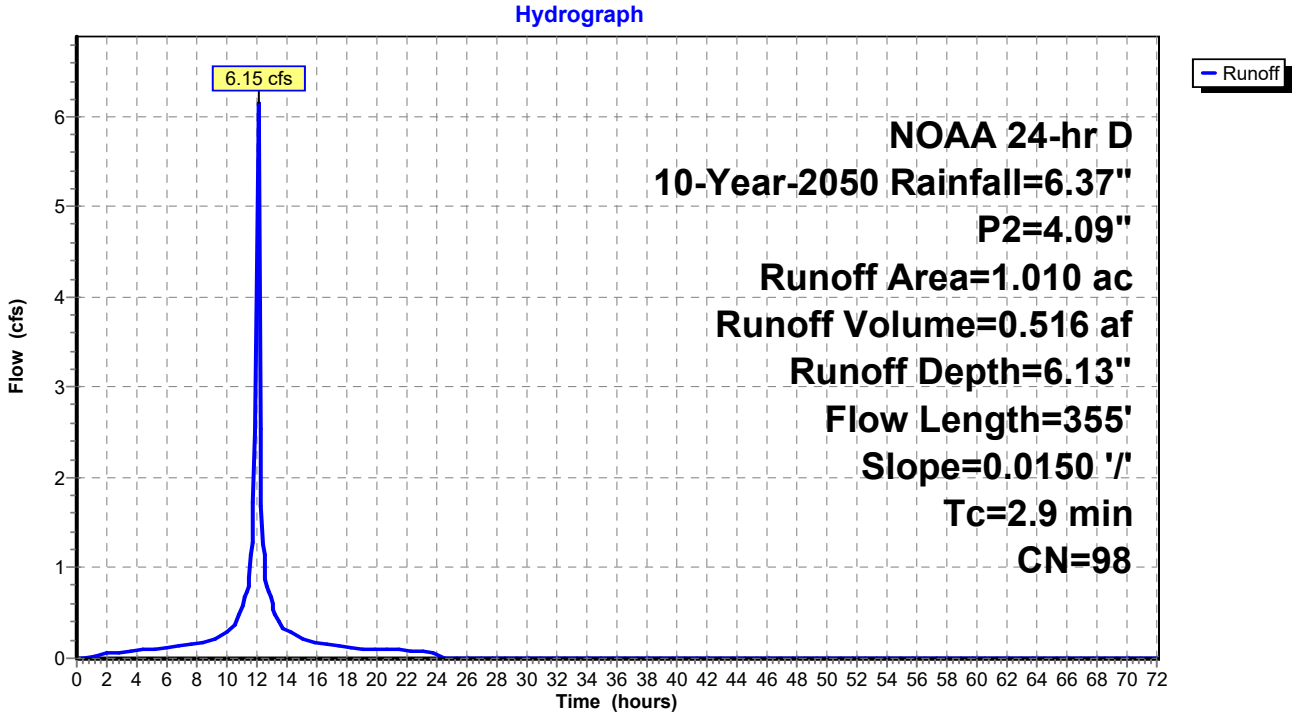
Runoff = 6.15 cfs @ 12.08 hrs, Volume= 0.516 af, Depth= 6.13"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 4.09"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
2.9	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

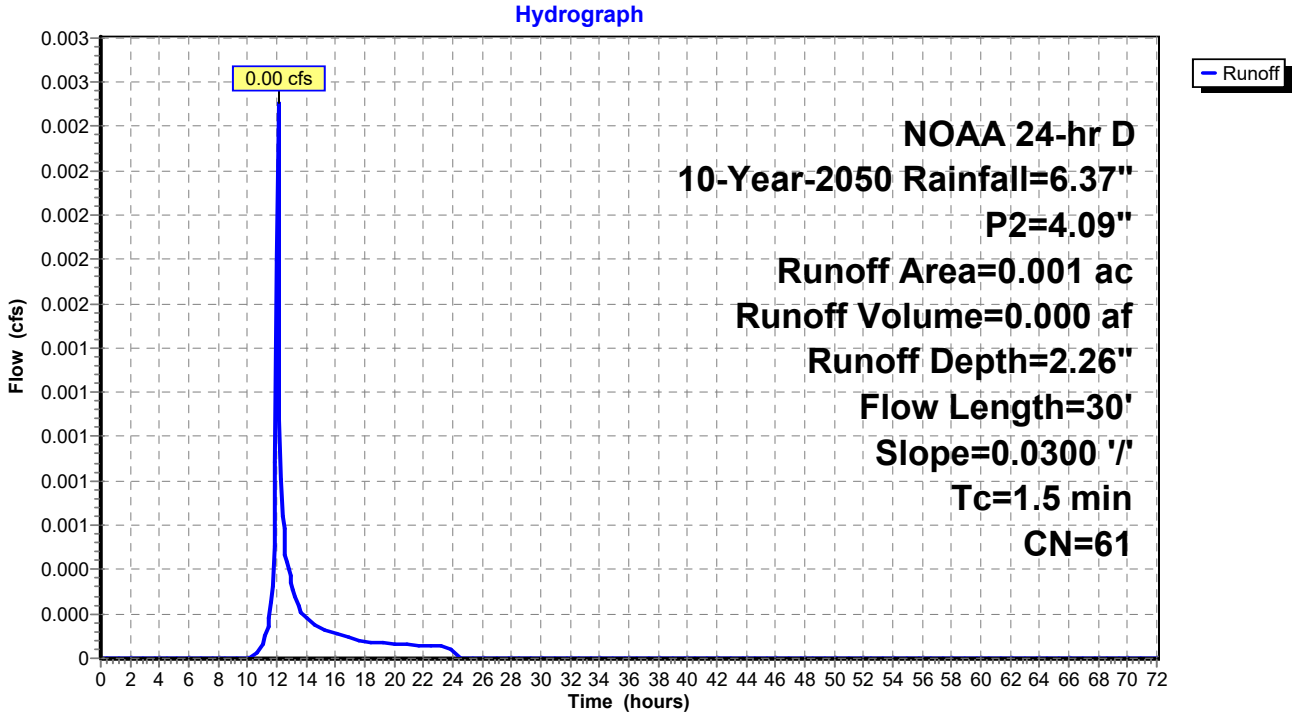
Runoff = 0.00 cfs @ 12.08 hrs, Volume= 0.000 af, Depth= 2.26"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	10	0.0300	0.14		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 4.09"
0.3	20	0.0300	1.33		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 4.09"
1.5	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

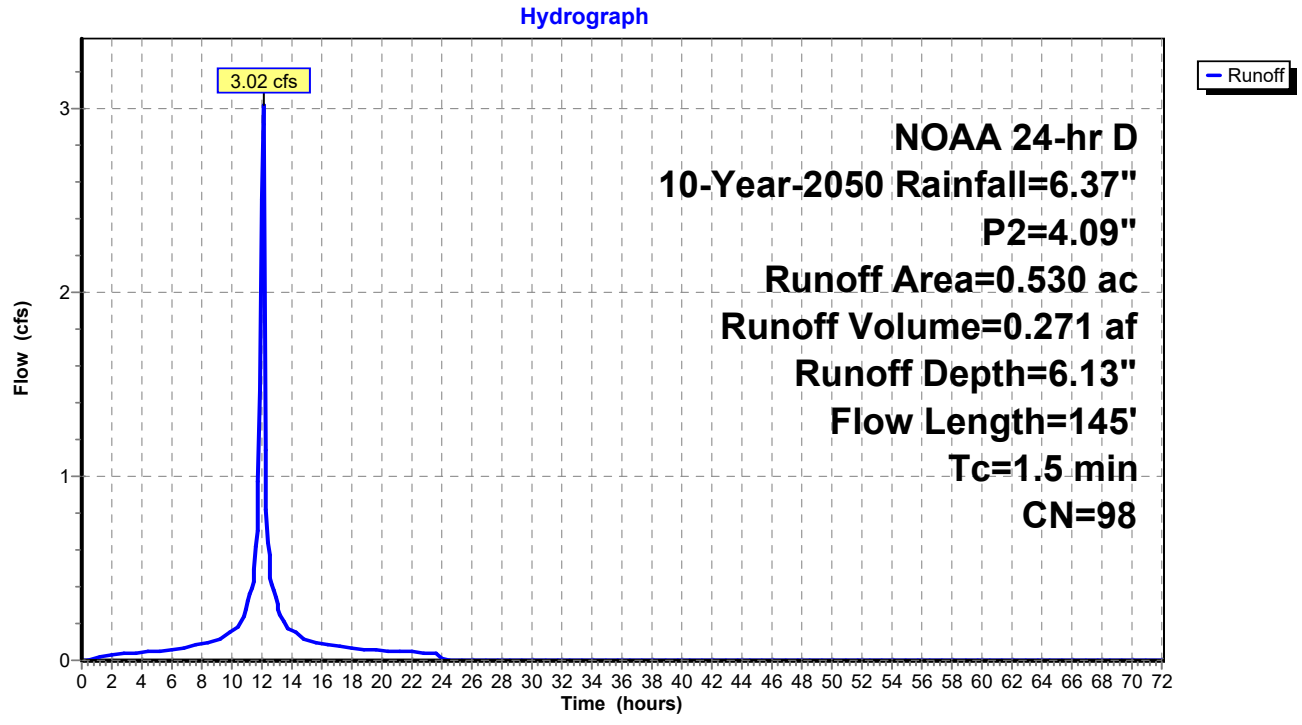
Runoff = 3.02 cfs @ 12.07 hrs, Volume= 0.271 af, Depth= 6.13"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.5	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

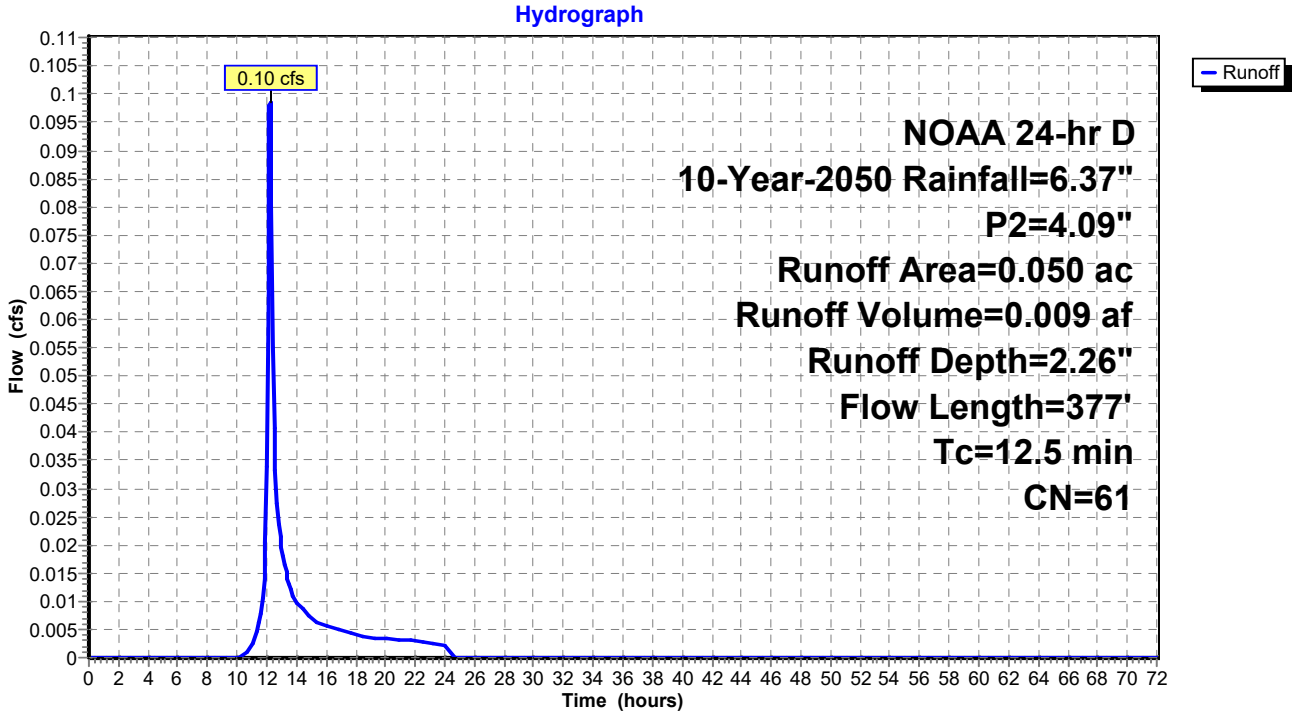
Runoff = 0.10 cfs @ 12.22 hrs, Volume= 0.009 af, Depth= 2.26"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
12.5	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

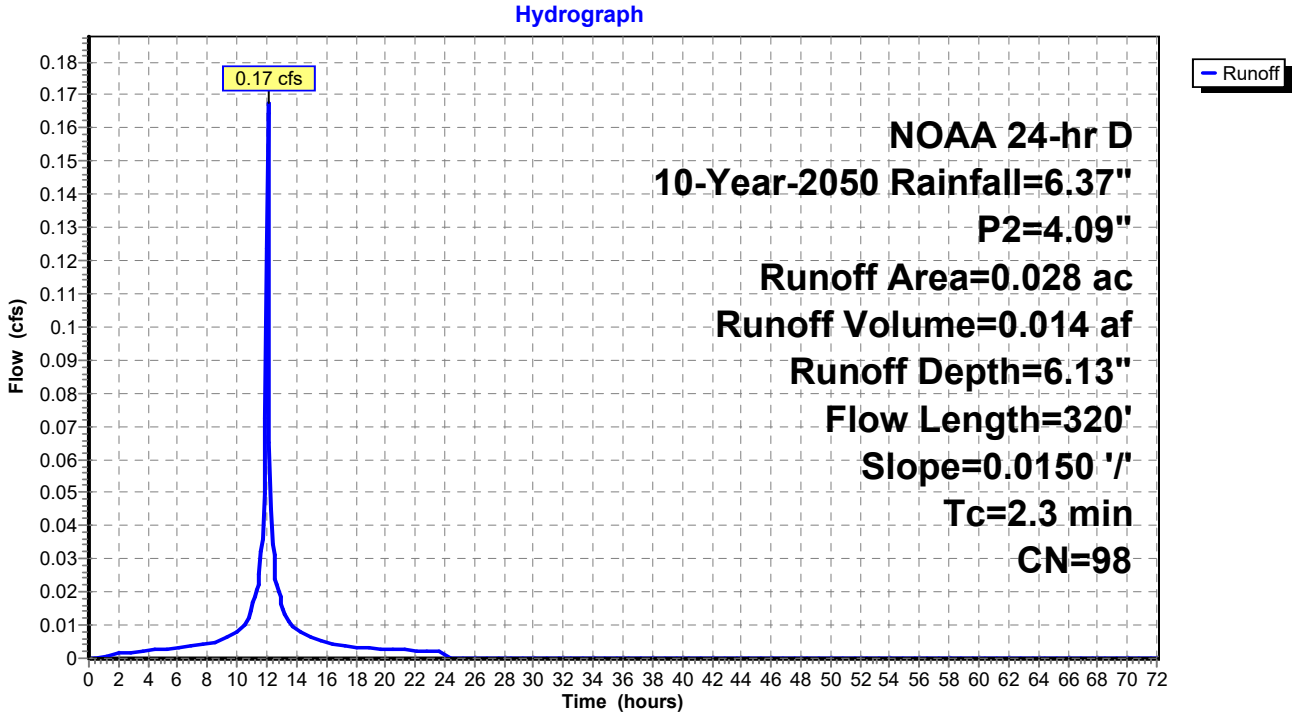
Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Depth= 6.13"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.95		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 4.09"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

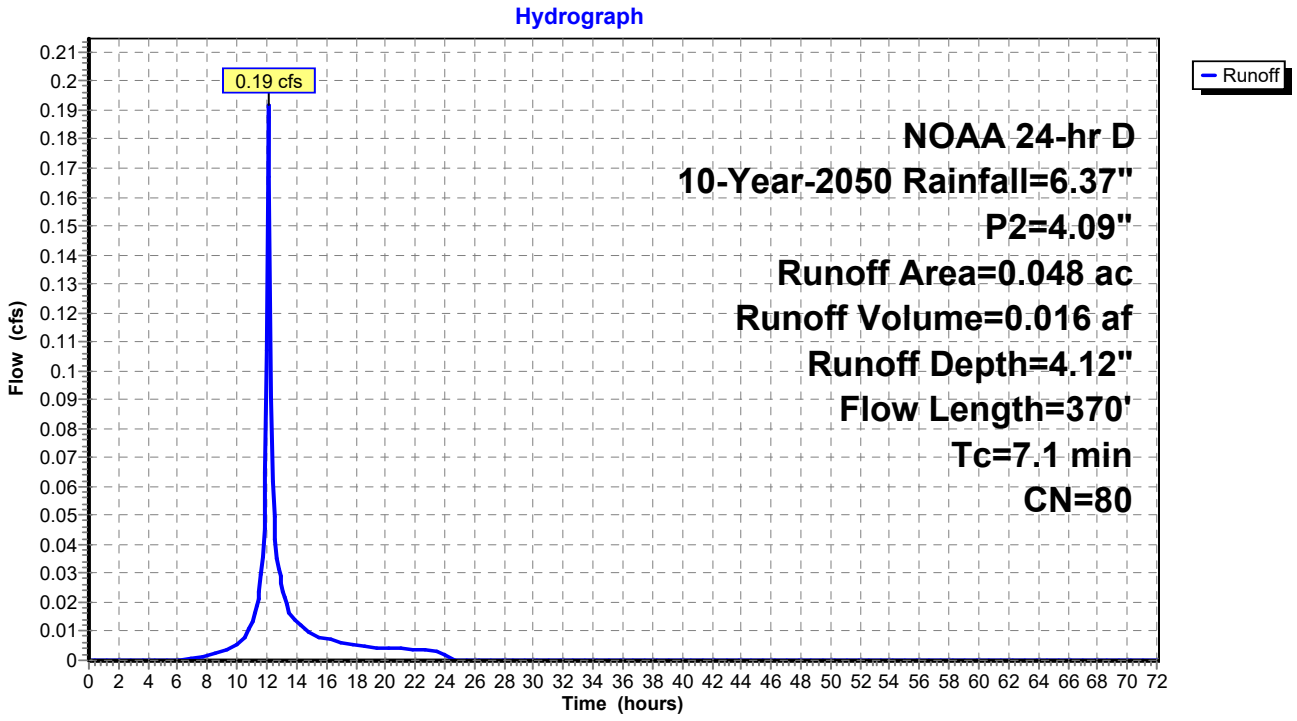
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.016 af, Depth= 4.12"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 4.09"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.1	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

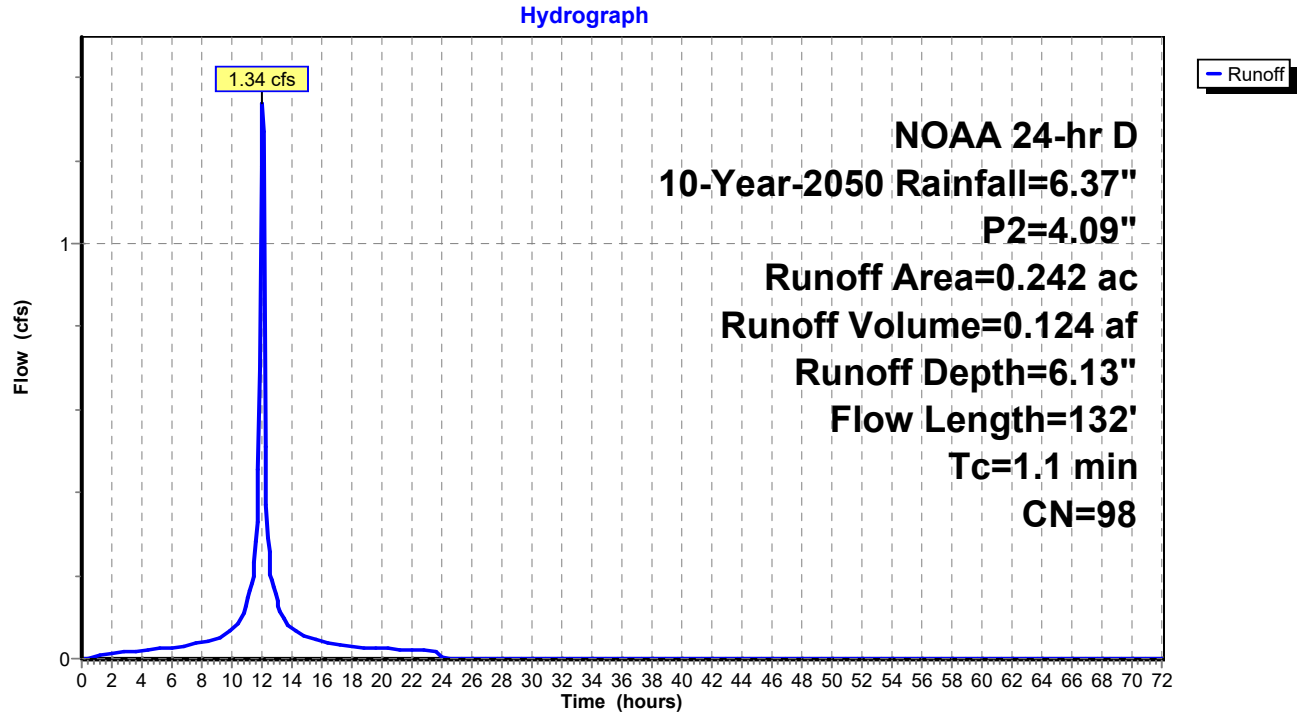
Runoff = 1.34 cfs @ 12.06 hrs, Volume= 0.124 af, Depth= 6.13"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0250	1.70		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 4.09"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.1	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

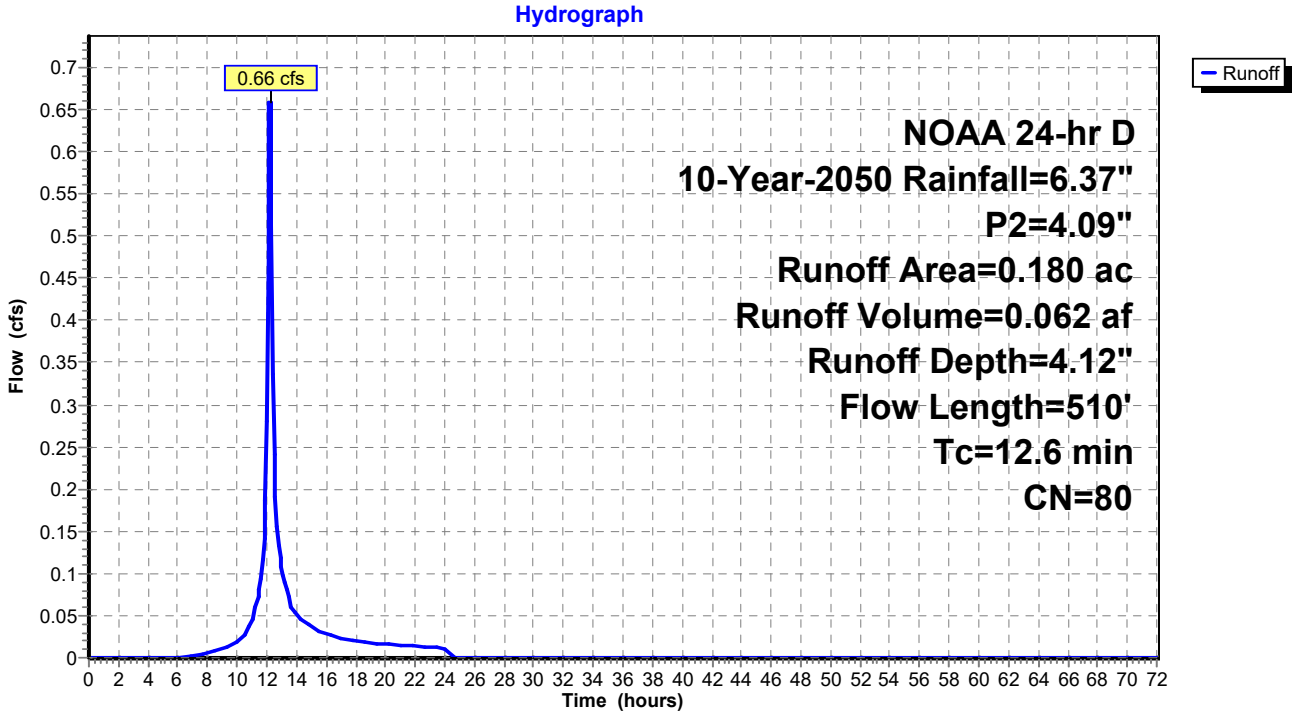
Runoff = 0.66 cfs @ 12.21 hrs, Volume= 0.062 af, Depth= 4.12"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
12.6	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

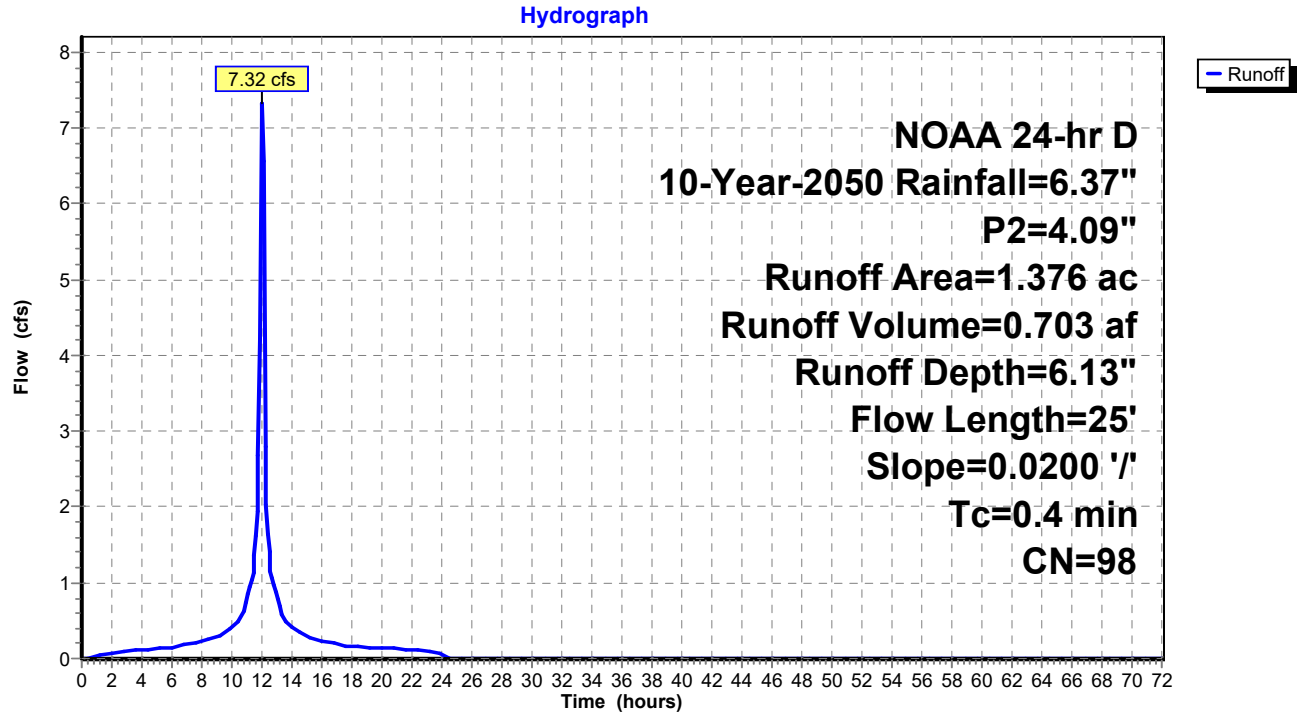
Runoff = 7.32 cfs @ 12.03 hrs, Volume= 0.703 af, Depth= 6.13"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.18		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 4.09"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

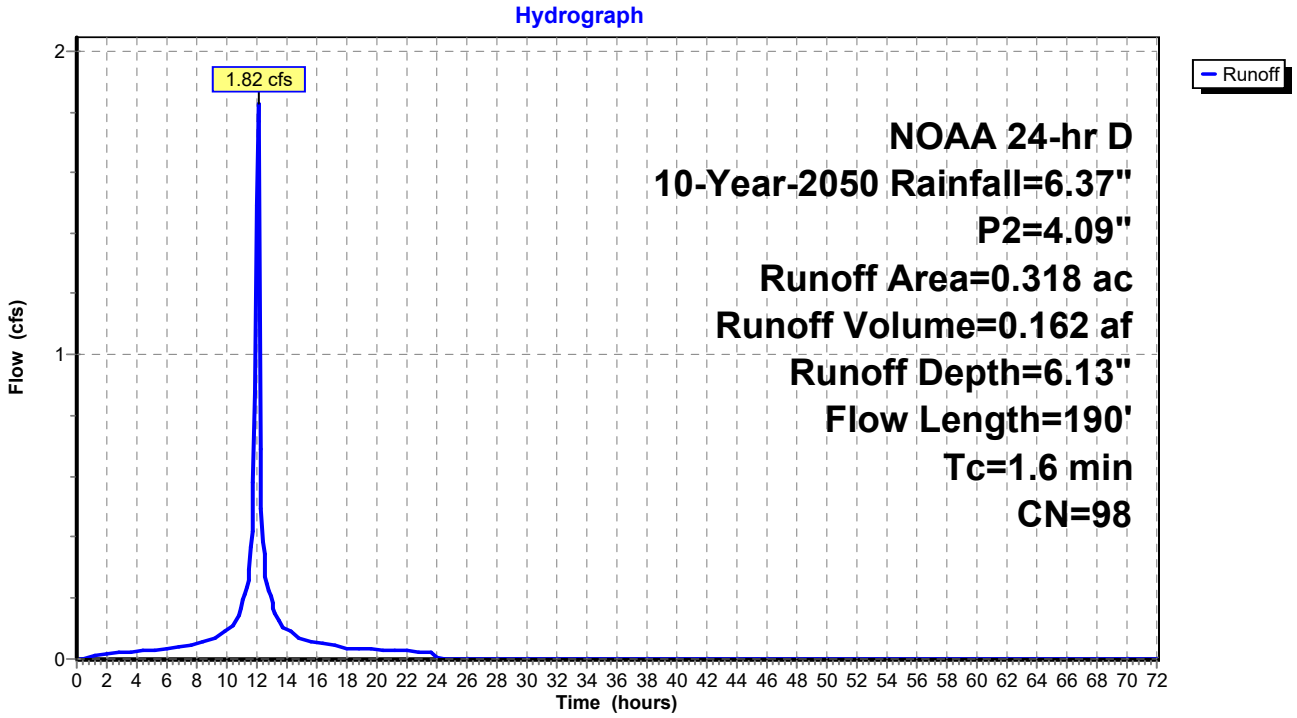
Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.162 af, Depth= 6.13"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

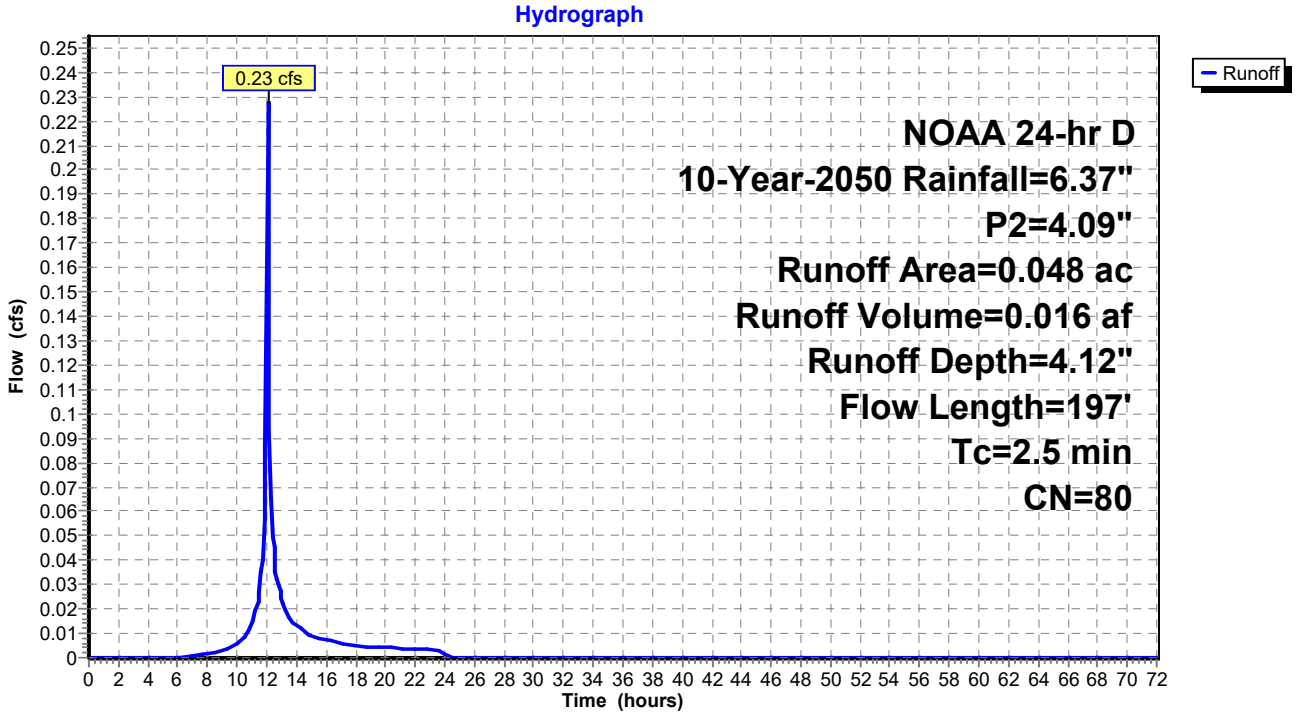
Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 4.12"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0200	0.12		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.5	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 6.13" for 10-Year-2050 event
Inflow = 7.32 cfs @ 12.03 hrs, Volume= 0.703 af
Outflow = 2.26 cfs @ 12.28 hrs, Volume= 0.585 af, Atten= 69%, Lag= 14.8 min
Primary = 2.26 cfs @ 12.28 hrs, Volume= 0.585 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 132.49' @ 12.28 hrs Surf.Area= 10,037 sf Storage= 15,552 cf

Plug-Flow detention time= 283.1 min calculated for 0.585 af (83% of inflow)
Center-of-Mass det. time= 206.6 min (946.6 - 740.1)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

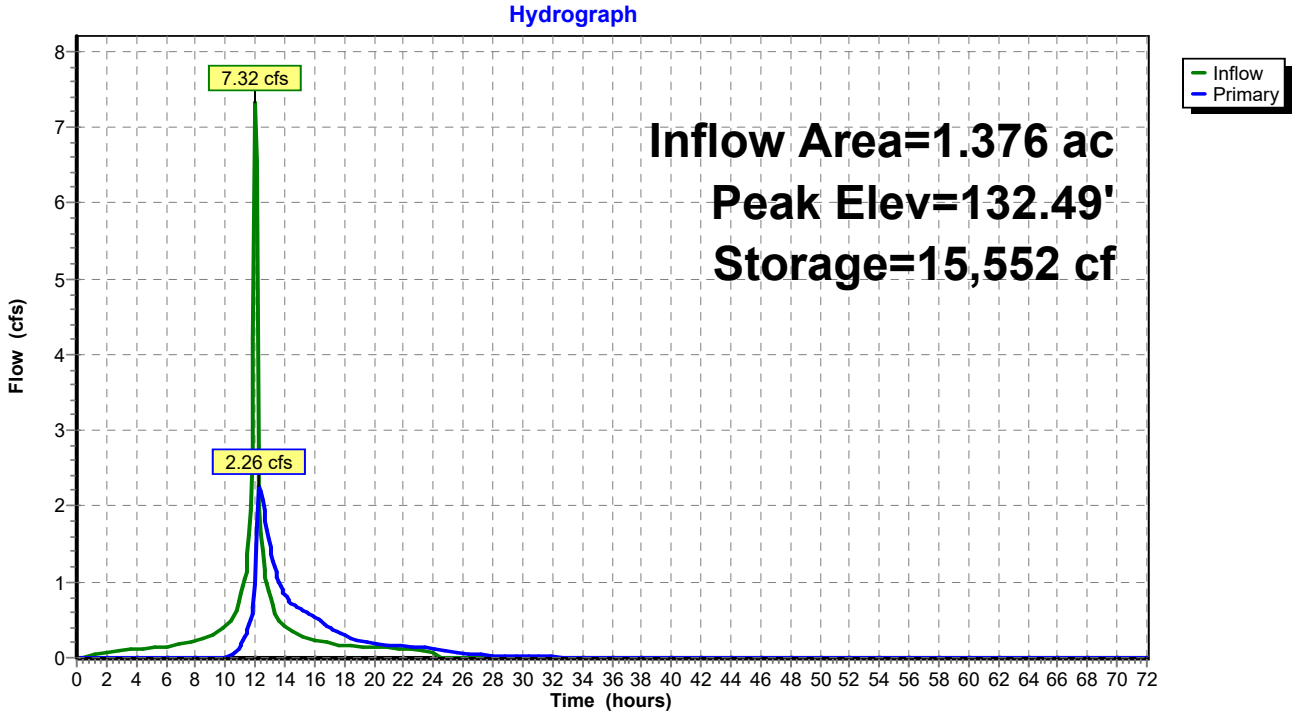
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.25 cfs @ 12.28 hrs HW=132.49' (Free Discharge)
└─**1=Culvert** (Passes 2.25 cfs of 8.93 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 4.88 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.24 cfs @ 2.10 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

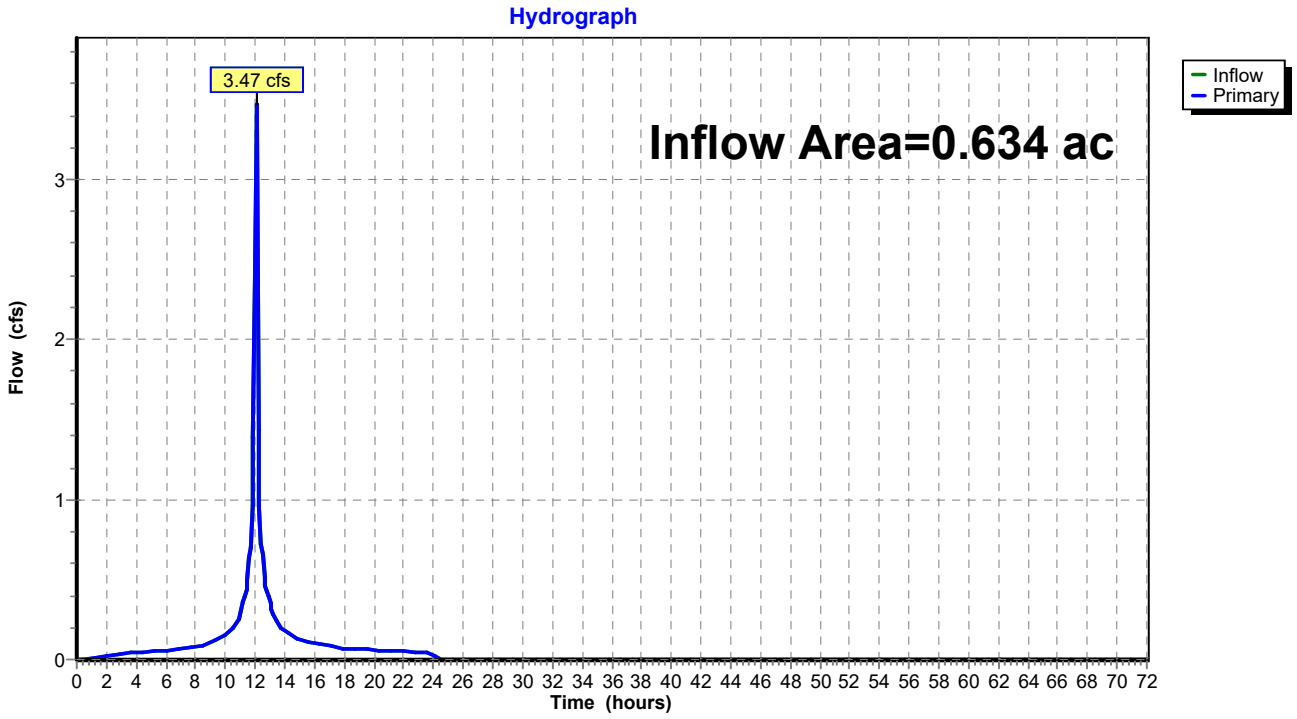


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 5.48" for 10-Year-2050 event
Inflow = 3.47 cfs @ 12.08 hrs, Volume= 0.290 af
Primary = 3.47 cfs @ 12.08 hrs, Volume= 0.290 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

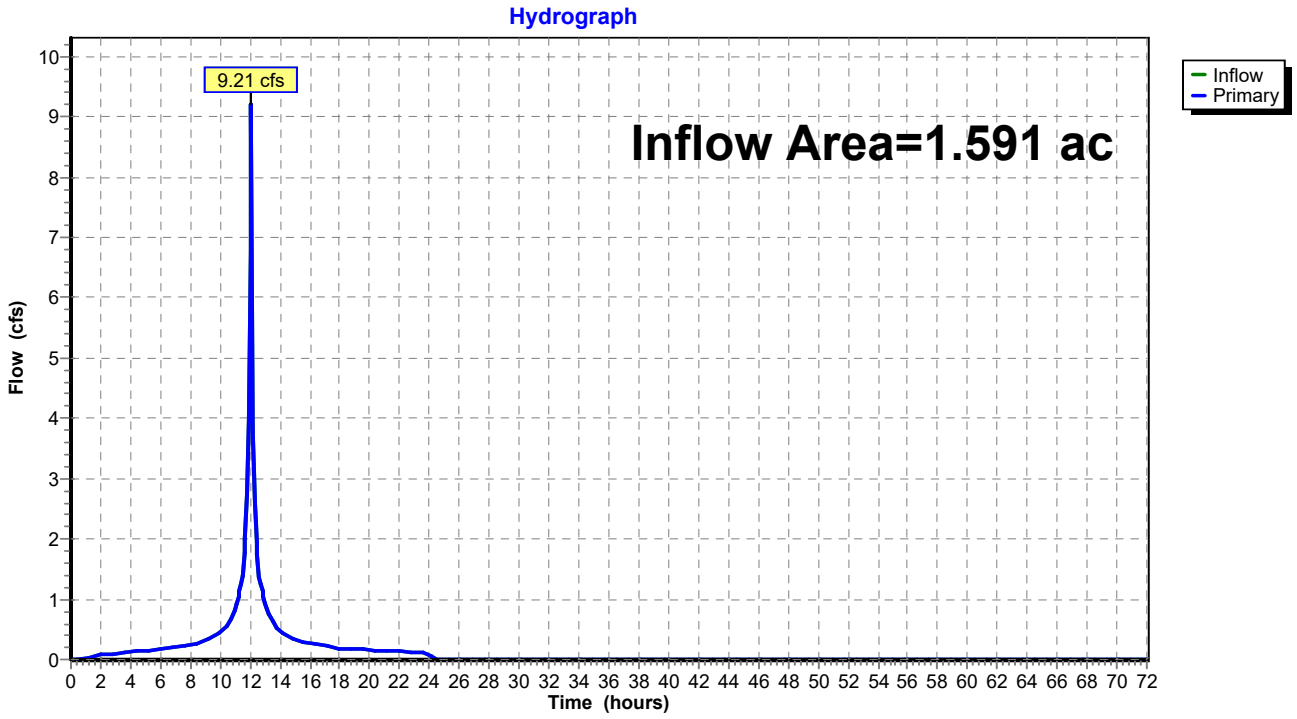


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 6.01" for 10-Year-2050 event
Inflow = 9.21 cfs @ 12.08 hrs, Volume= 0.796 af
Primary = 9.21 cfs @ 12.08 hrs, Volume= 0.796 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

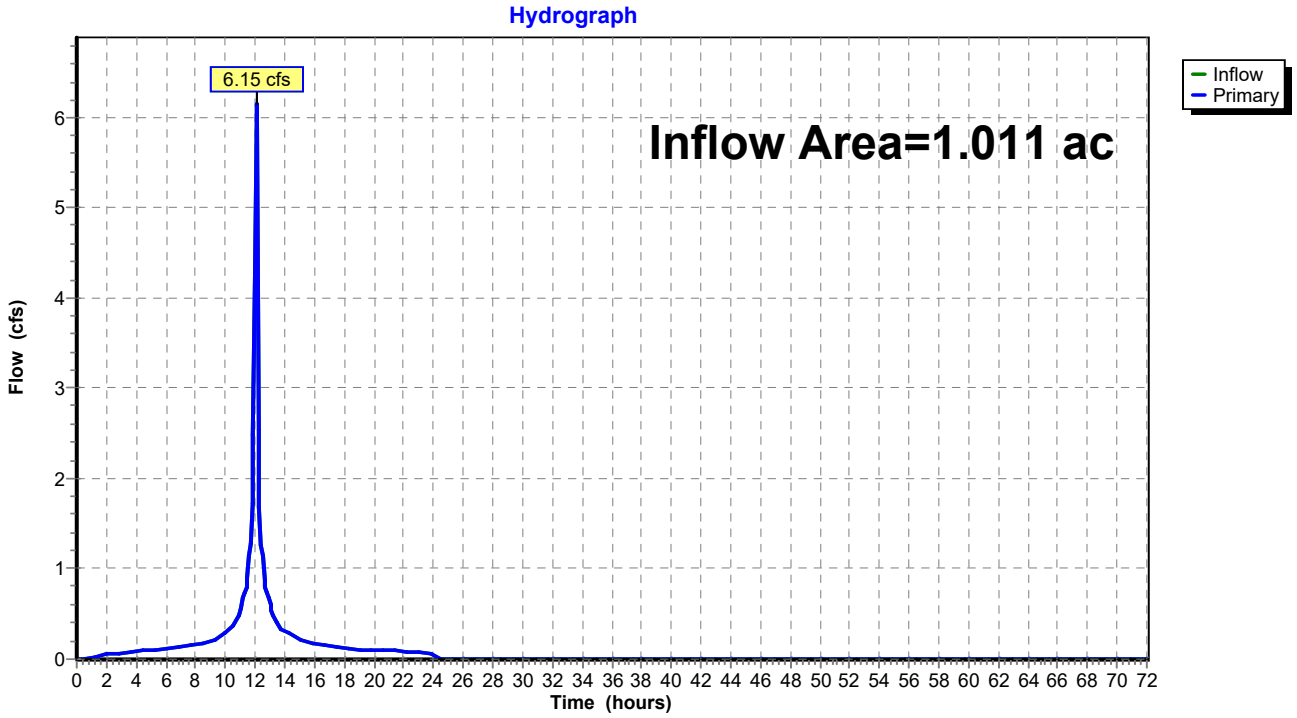


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 6.13" for 10-Year-2050 event
Inflow = 6.15 cfs @ 12.08 hrs, Volume= 0.516 af
Primary = 6.15 cfs @ 12.08 hrs, Volume= 0.516 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

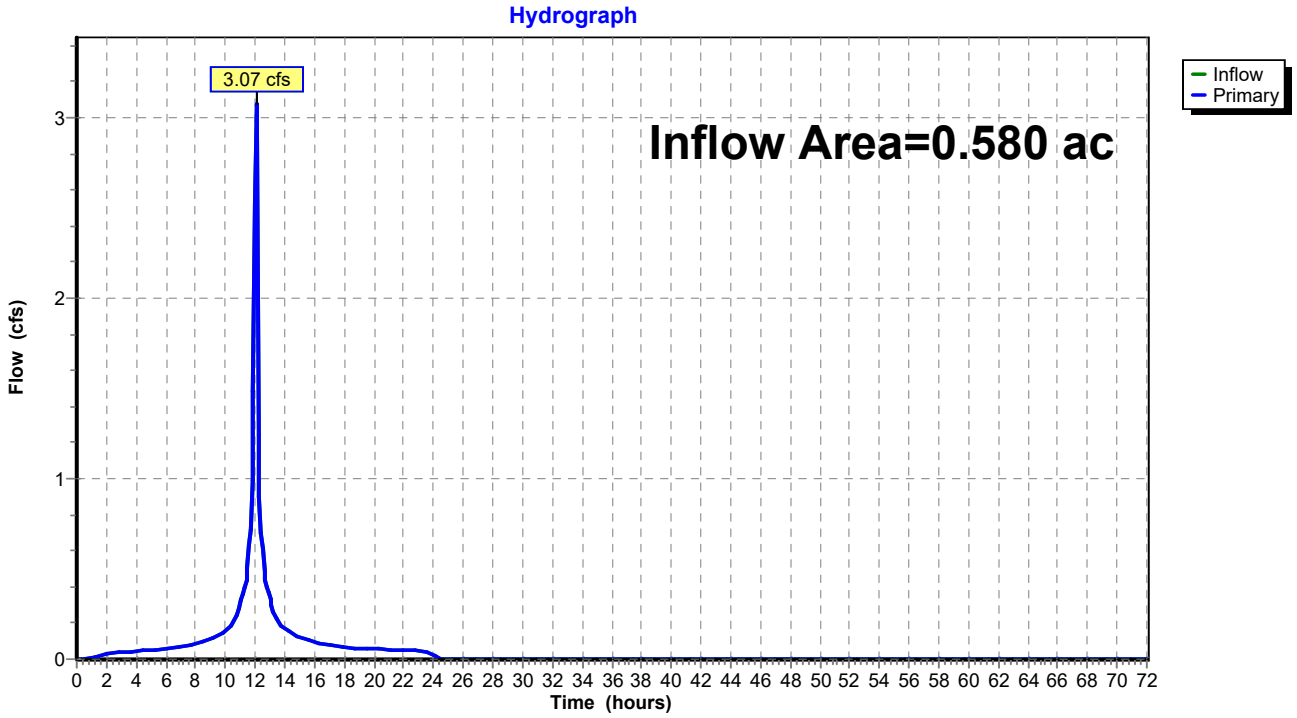


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 5.80" for 10-Year-2050 event
Inflow = 3.07 cfs @ 12.07 hrs, Volume= 0.280 af
Primary = 3.07 cfs @ 12.07 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

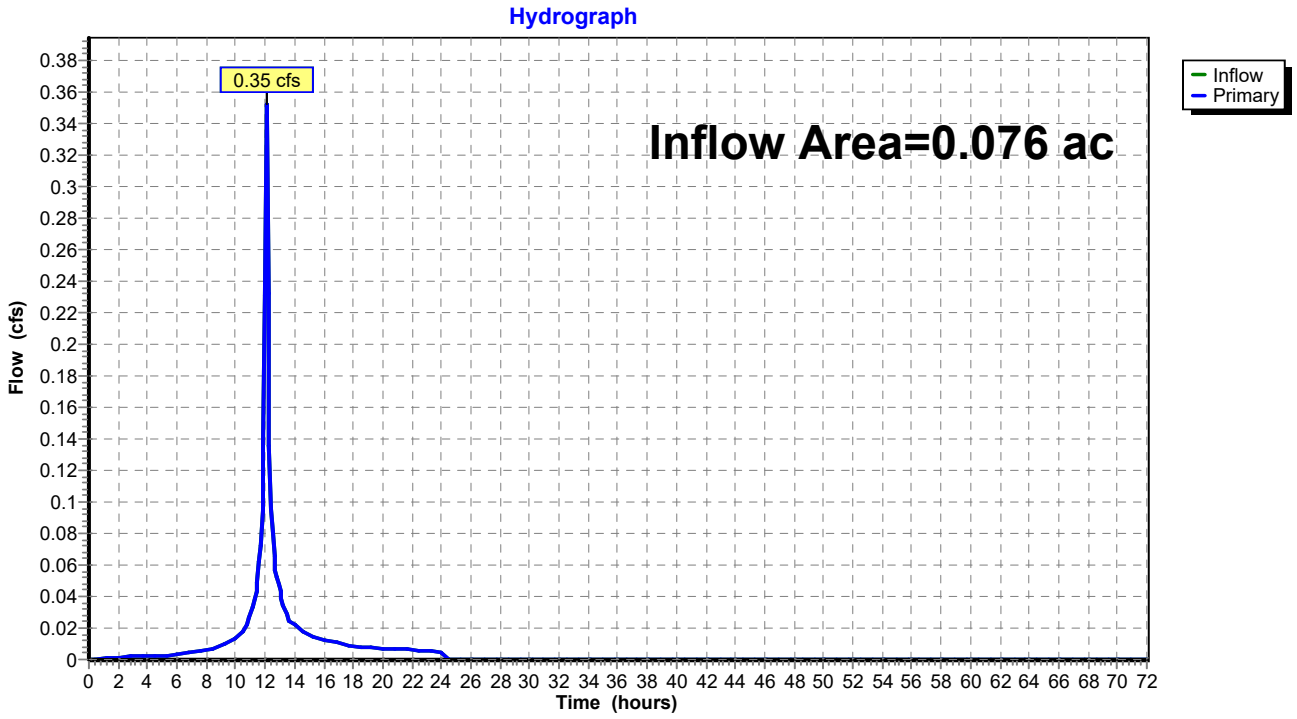


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 4.86" for 10-Year-2050 event
Inflow = 0.35 cfs @ 12.10 hrs, Volume= 0.031 af
Primary = 0.35 cfs @ 12.10 hrs, Volume= 0.031 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

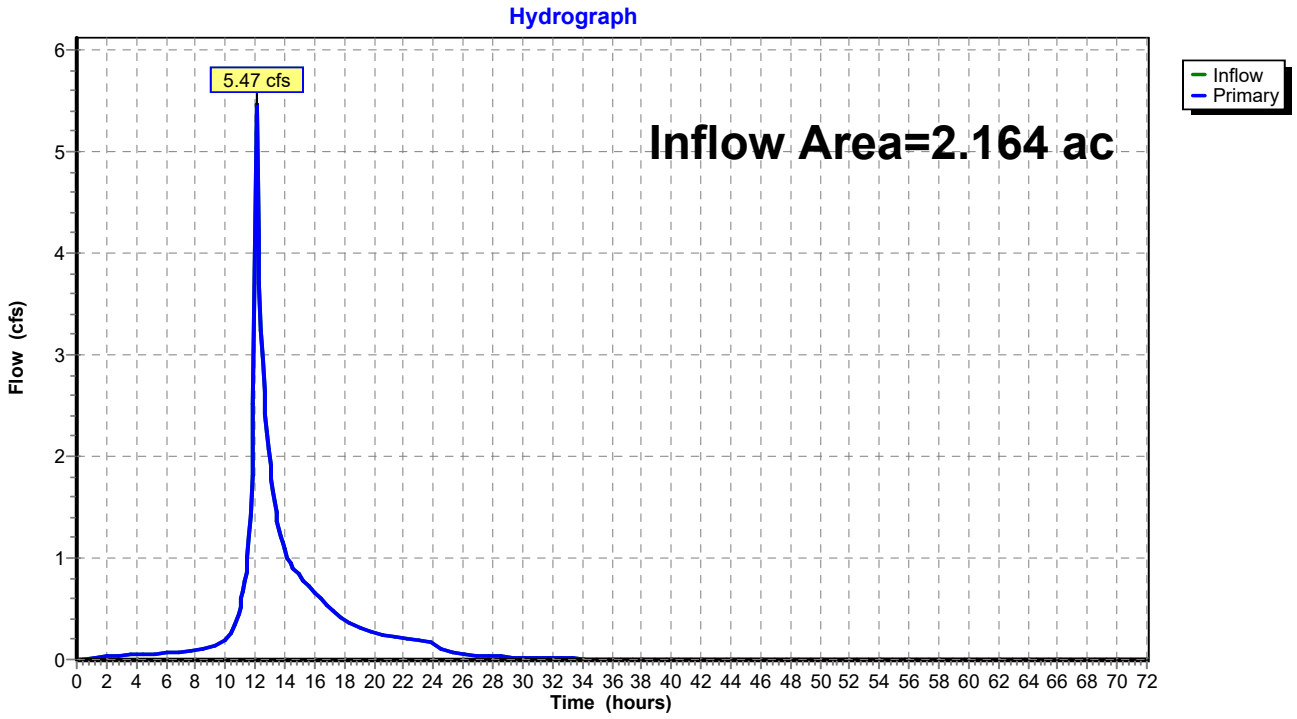


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 5.27" for 10-Year-2050 event
Inflow = 5.47 cfs @ 12.10 hrs, Volume= 0.950 af
Primary = 5.47 cfs @ 12.10 hrs, Volume= 0.950 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

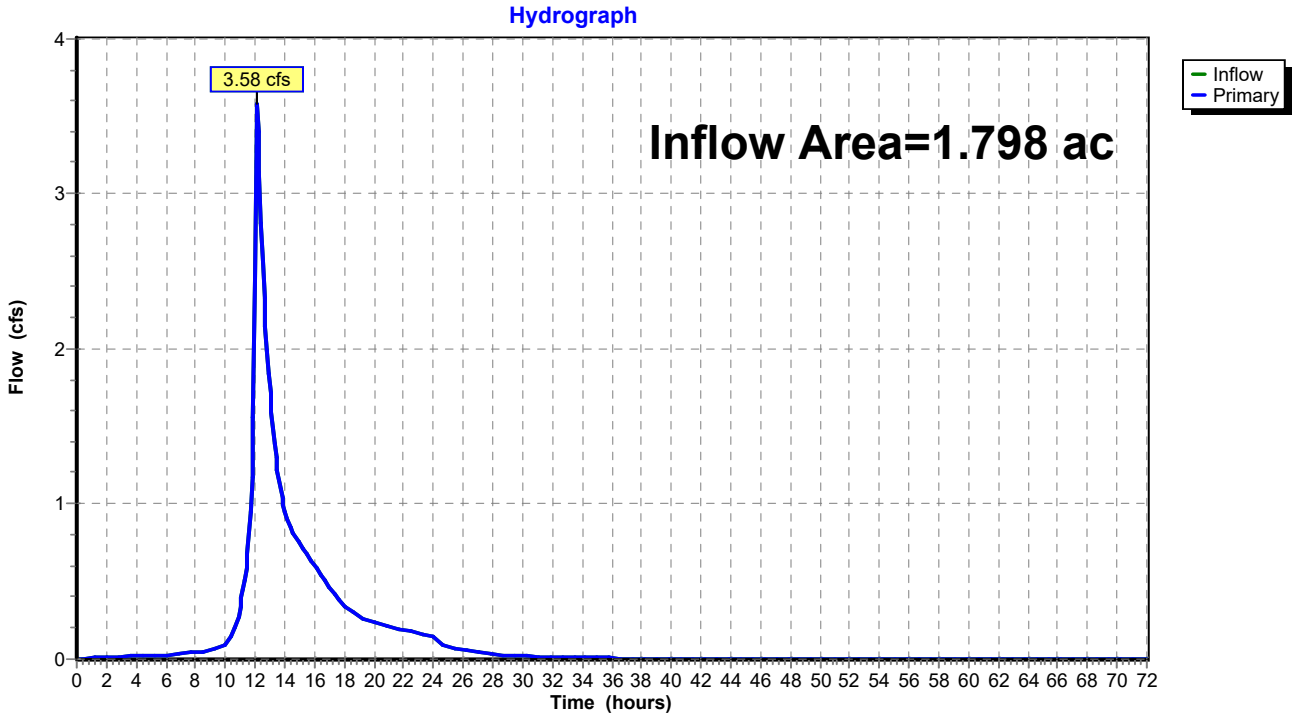


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 5.14" for 10-Year-2050 event
Inflow = 3.58 cfs @ 12.14 hrs, Volume= 0.771 af
Primary = 3.58 cfs @ 12.14 hrs, Volume= 0.771 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

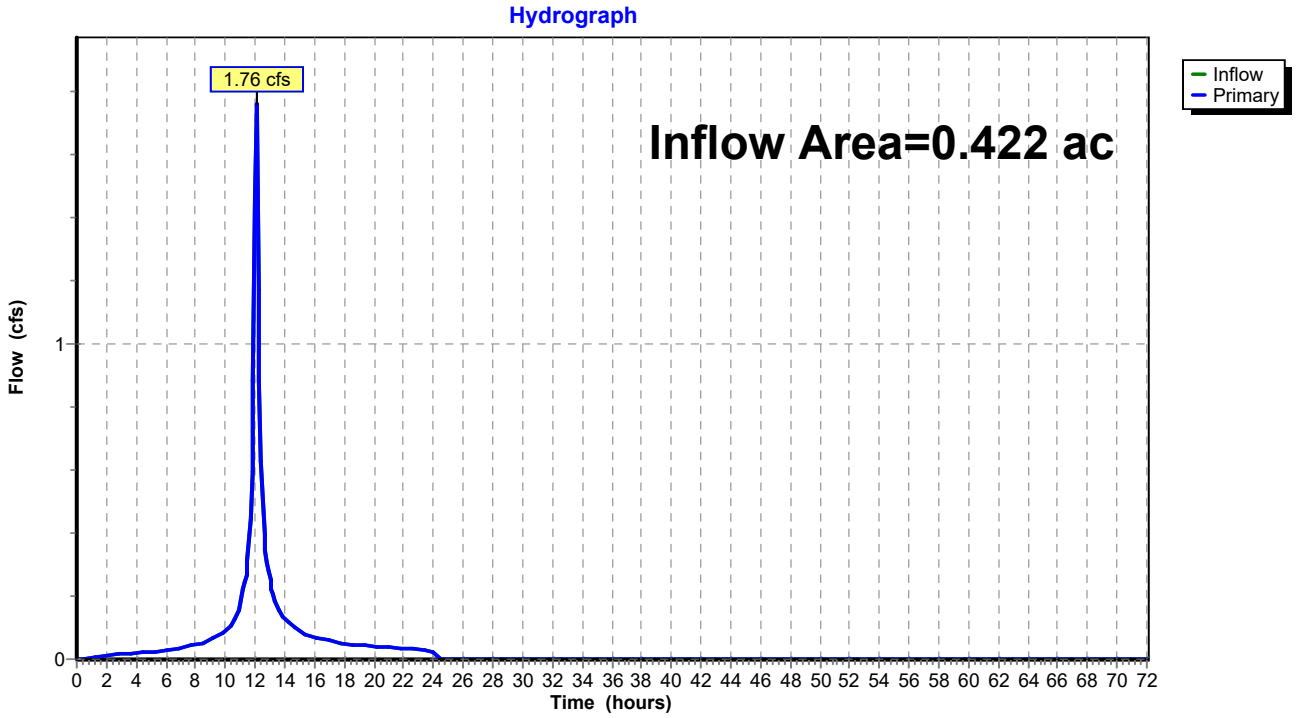


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 5.27" for 10-Year-2050 event
Inflow = 1.76 cfs @ 12.08 hrs, Volume= 0.185 af
Primary = 1.76 cfs @ 12.08 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

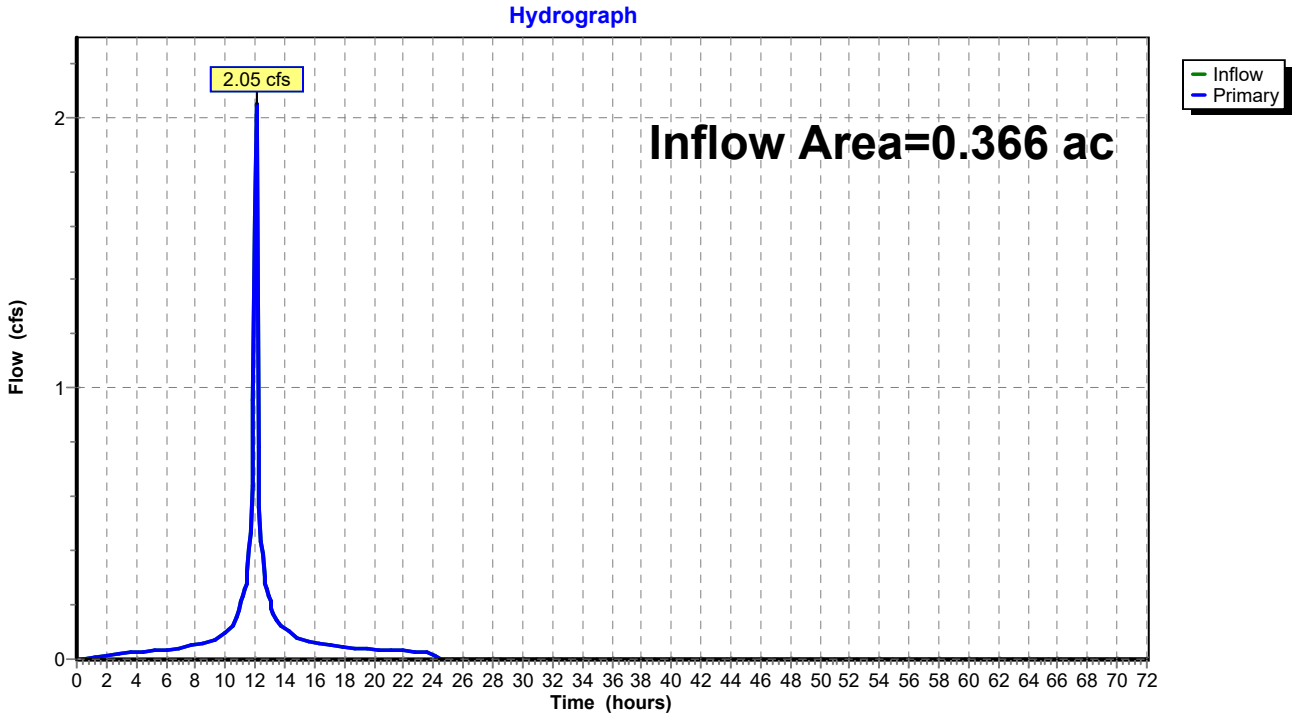


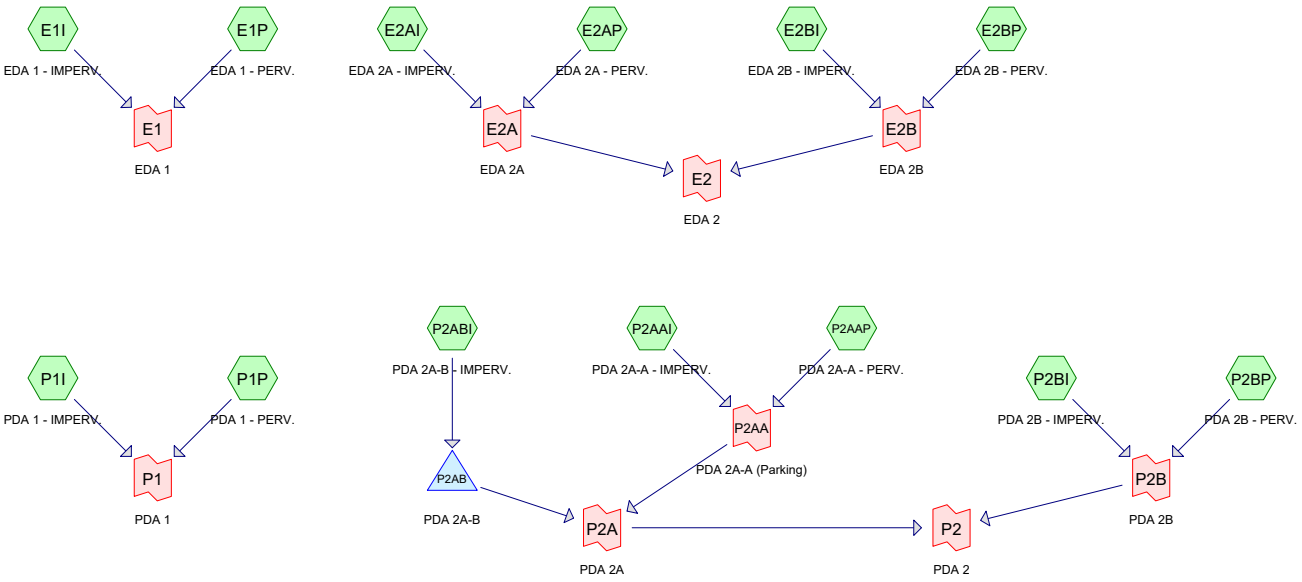
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 5.87" for 10-Year-2050 event
Inflow = 2.05 cfs @ 12.07 hrs, Volume= 0.179 af
Primary = 2.05 cfs @ 12.07 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B





Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

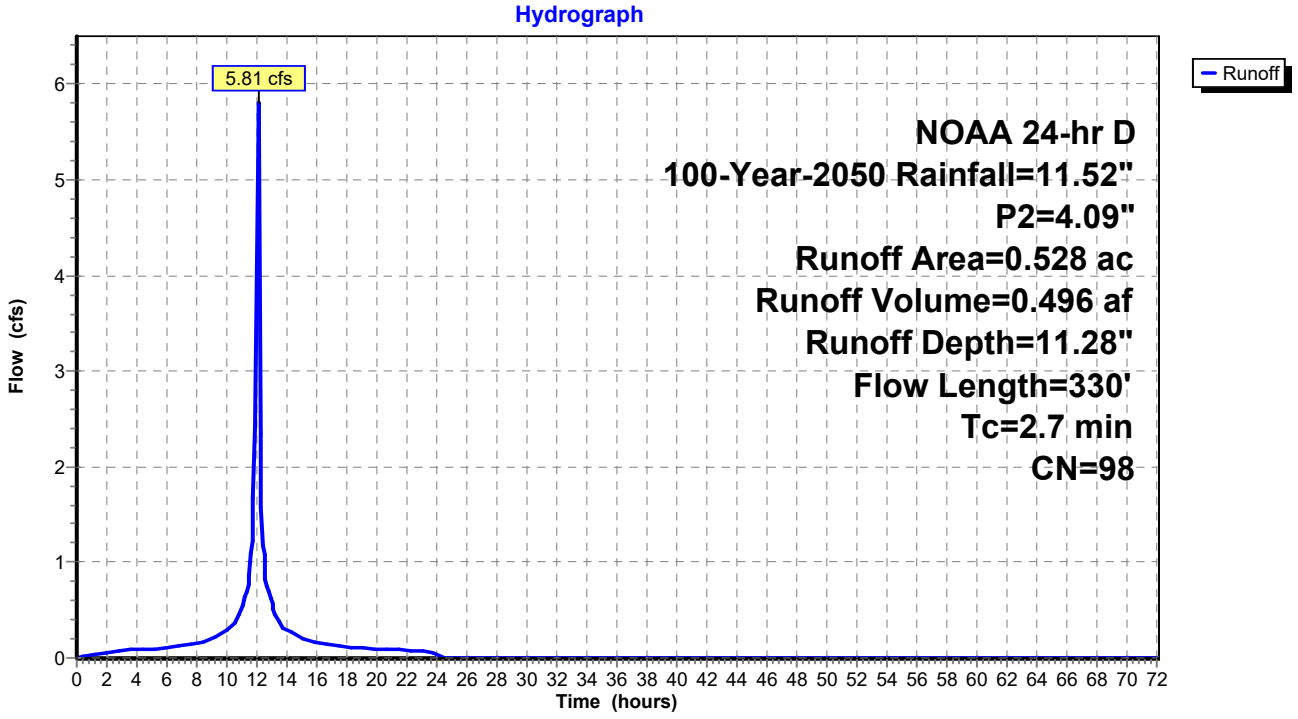
Runoff = 5.81 cfs @ 12.08 hrs, Volume= 0.496 af, Depth=11.28"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.56		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 4.09"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.7	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

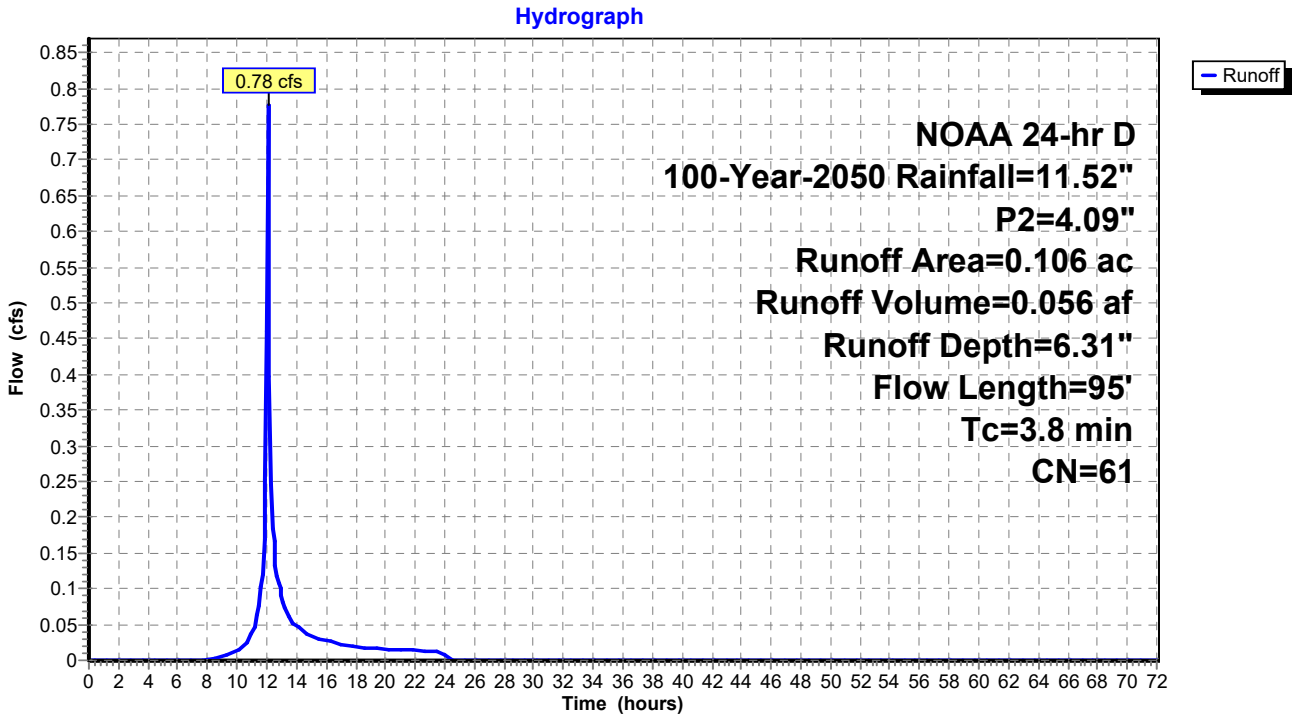
Runoff = 0.78 cfs @ 12.10 hrs, Volume= 0.056 af, Depth= 6.31"
Routed to Link E1 : EDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	20	0.0100	0.11		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 4.09"
0.2	20	0.0325	1.37		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 4.09"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
3.8	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

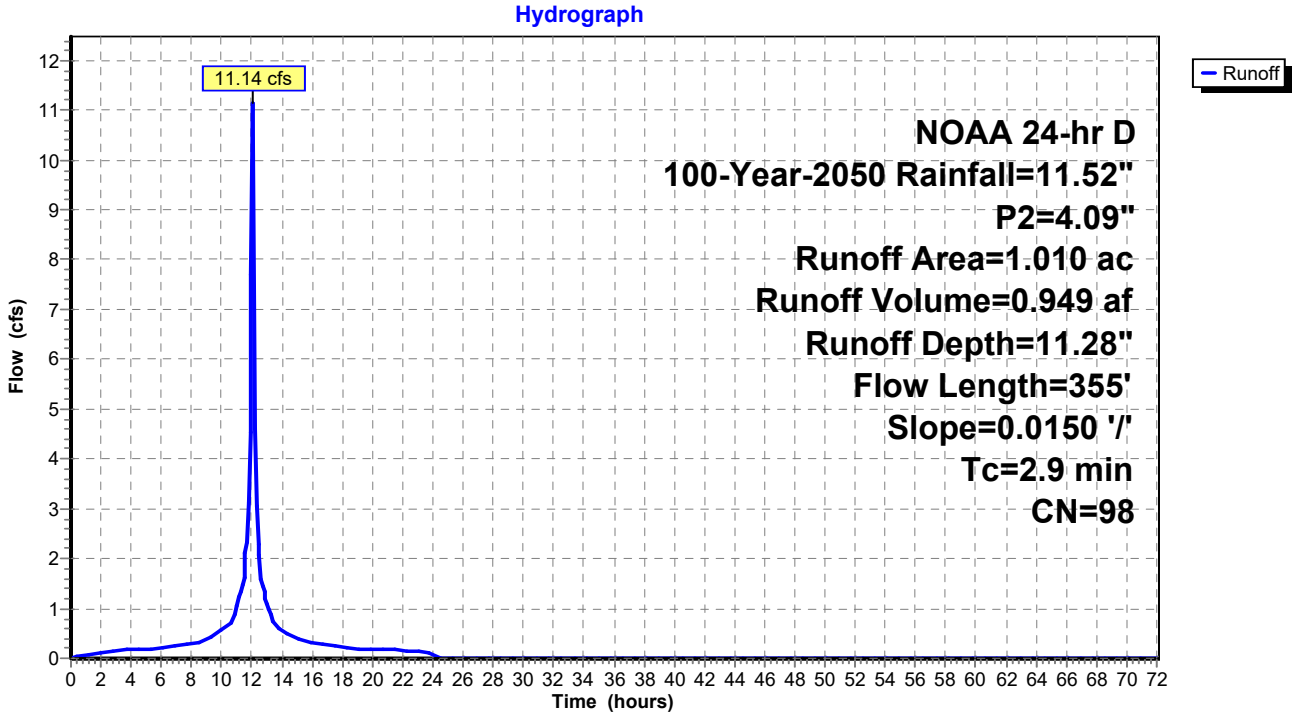
Runoff = 11.14 cfs @ 12.08 hrs, Volume= 0.949 af, Depth=11.28"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 4.09"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
2.9	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

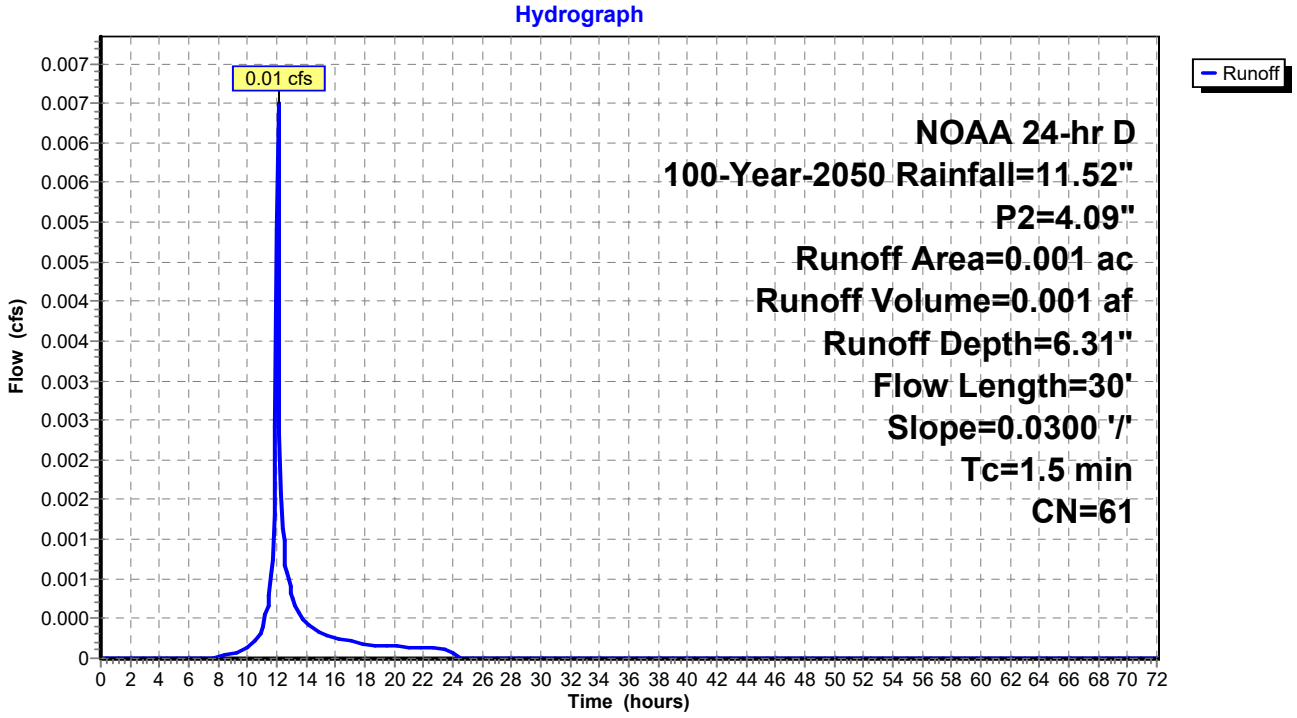
Runoff = 0.01 cfs @ 12.08 hrs, Volume= 0.001 af, Depth= 6.31"
Routed to Link E2A : EDA 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	10	0.0300	0.14		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 4.09"
0.3	20	0.0300	1.33		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 4.09"
1.5	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

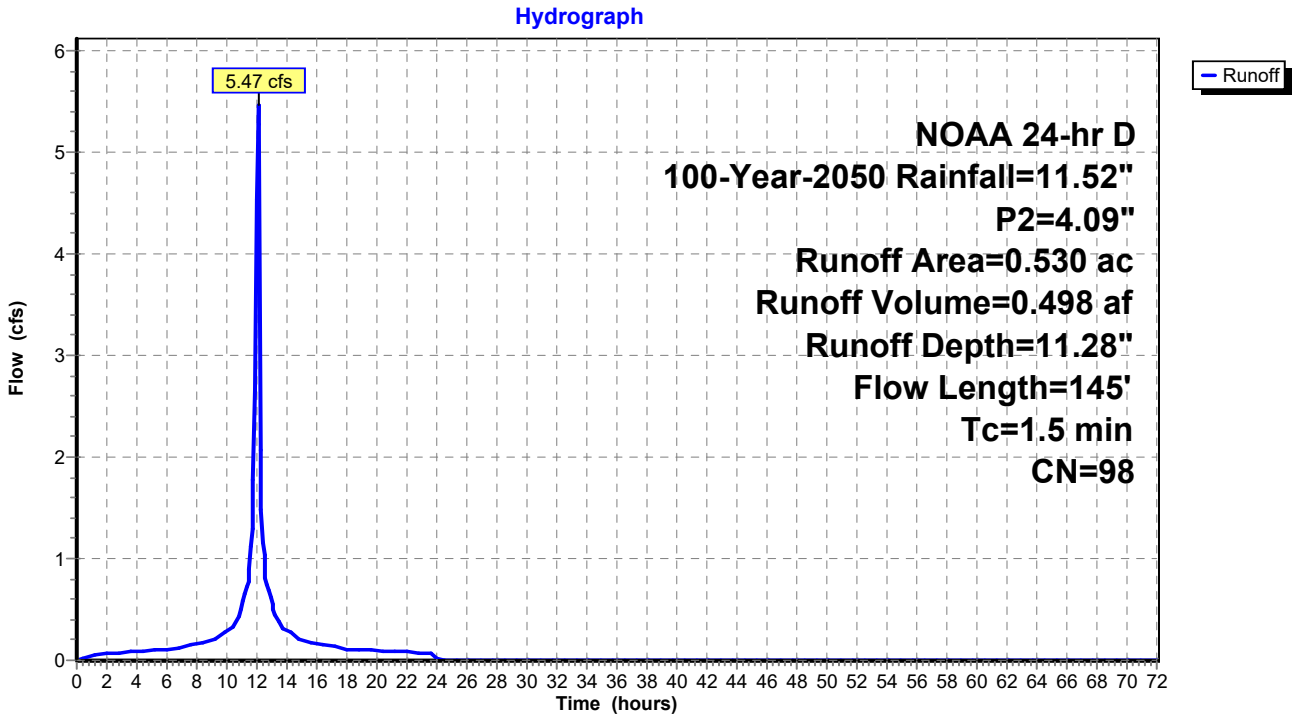
Runoff = 5.47 cfs @ 12.07 hrs, Volume= 0.498 af, Depth=11.28"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.5	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

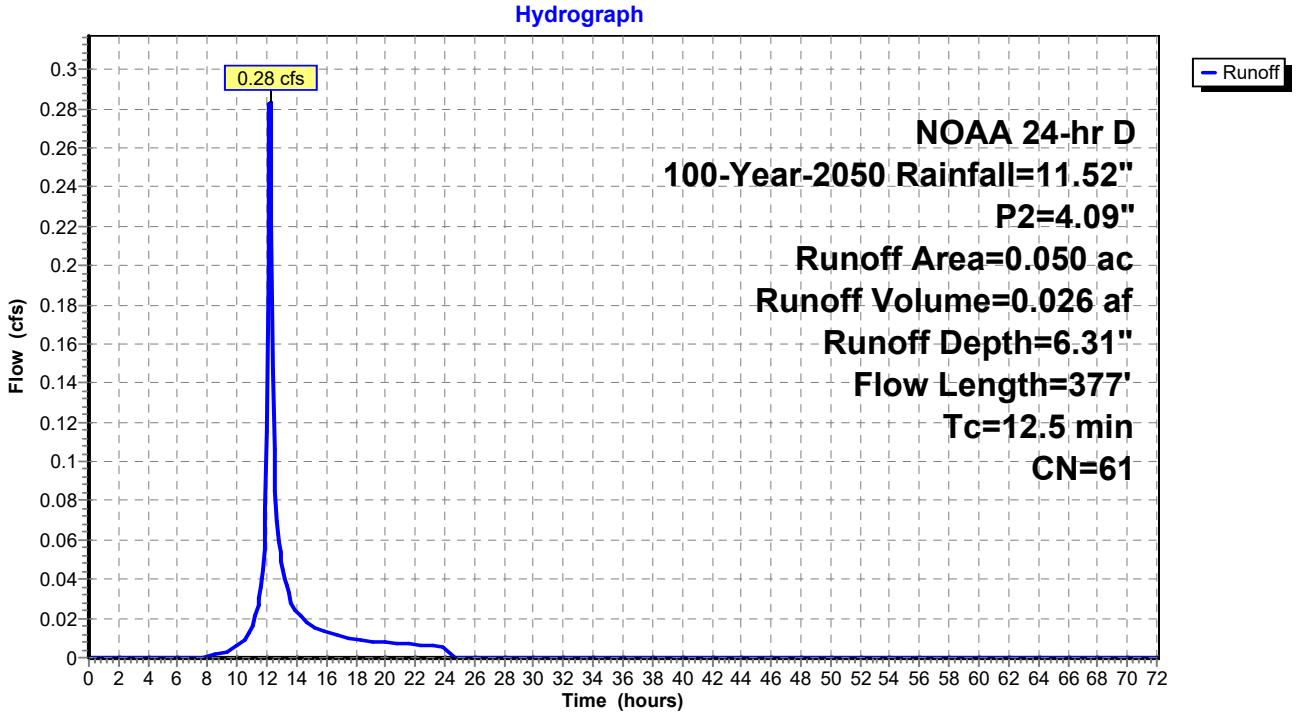
Runoff = 0.28 cfs @ 12.21 hrs, Volume= 0.026 af, Depth= 6.31"
Routed to Link E2B : EDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
12.5	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

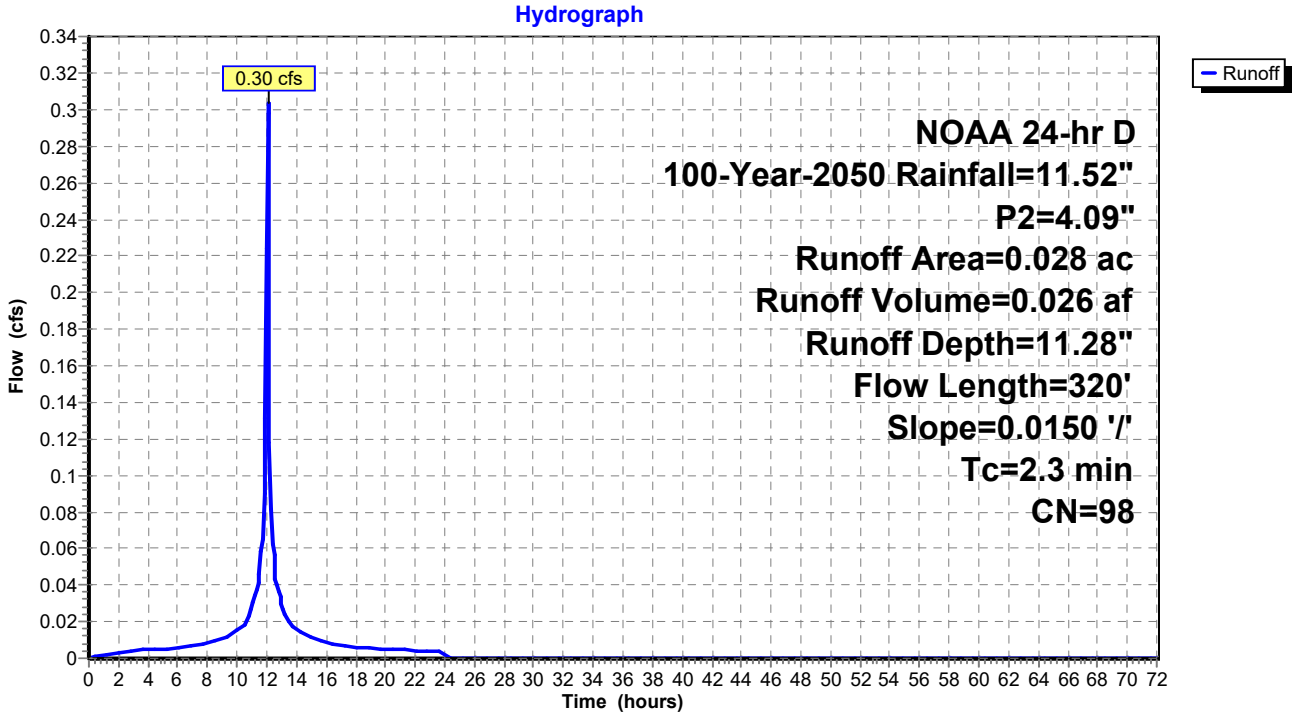
Runoff = 0.30 cfs @ 12.08 hrs, Volume= 0.026 af, Depth=11.28"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.95		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 4.09"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

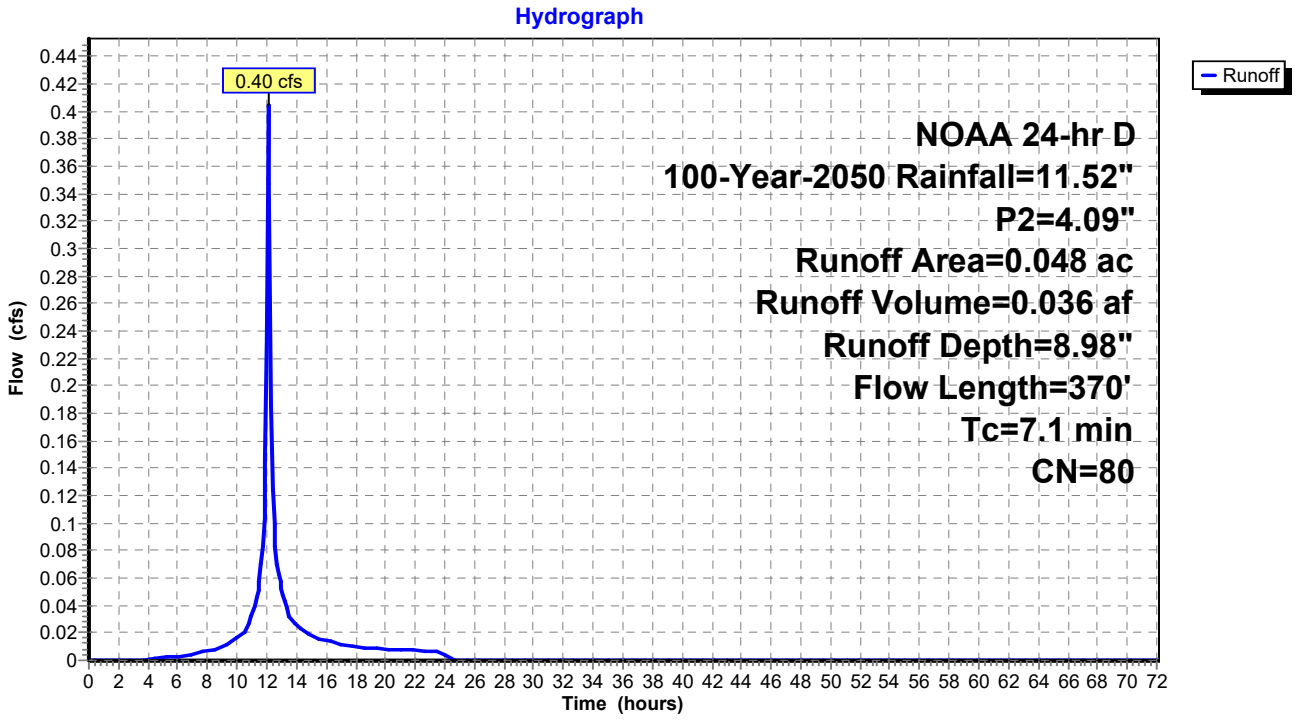
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.036 af, Depth= 8.98"
Routed to Link P1 : PDA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 4.09"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.1	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

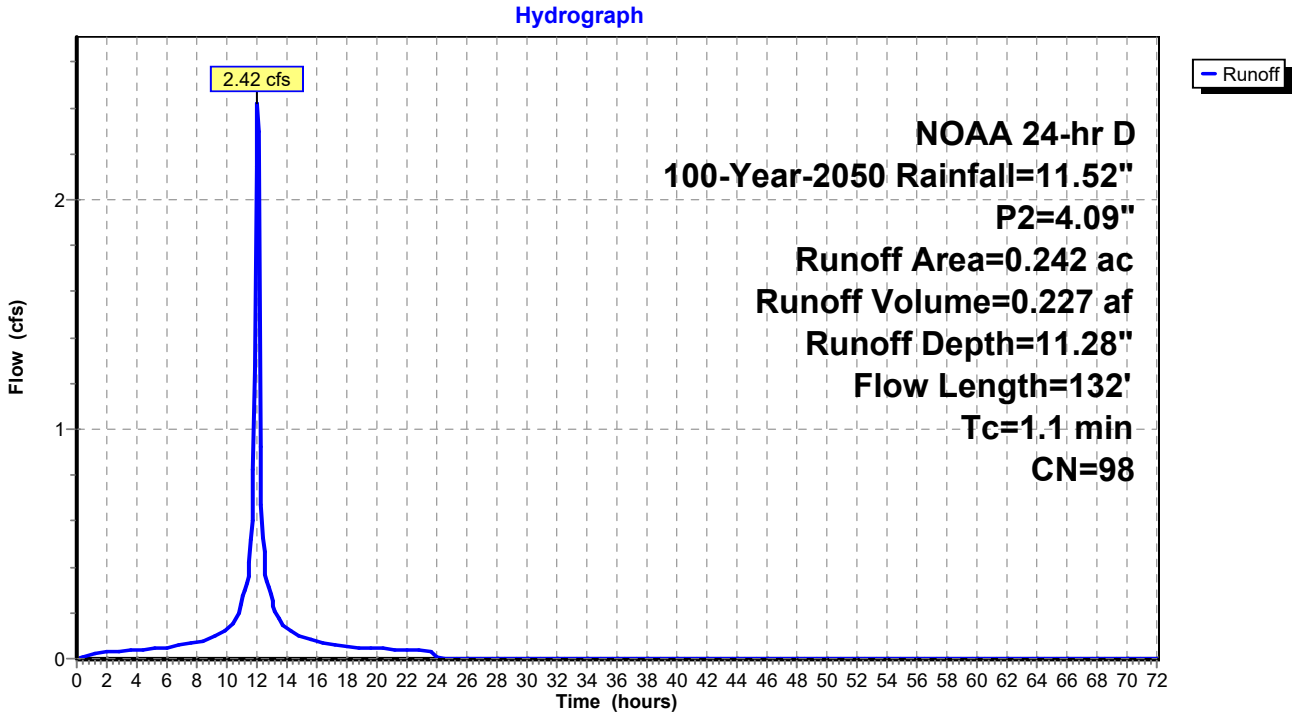
Runoff = 2.42 cfs @ 12.06 hrs, Volume= 0.227 af, Depth=11.28"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0250	1.70		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 4.09"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.1	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

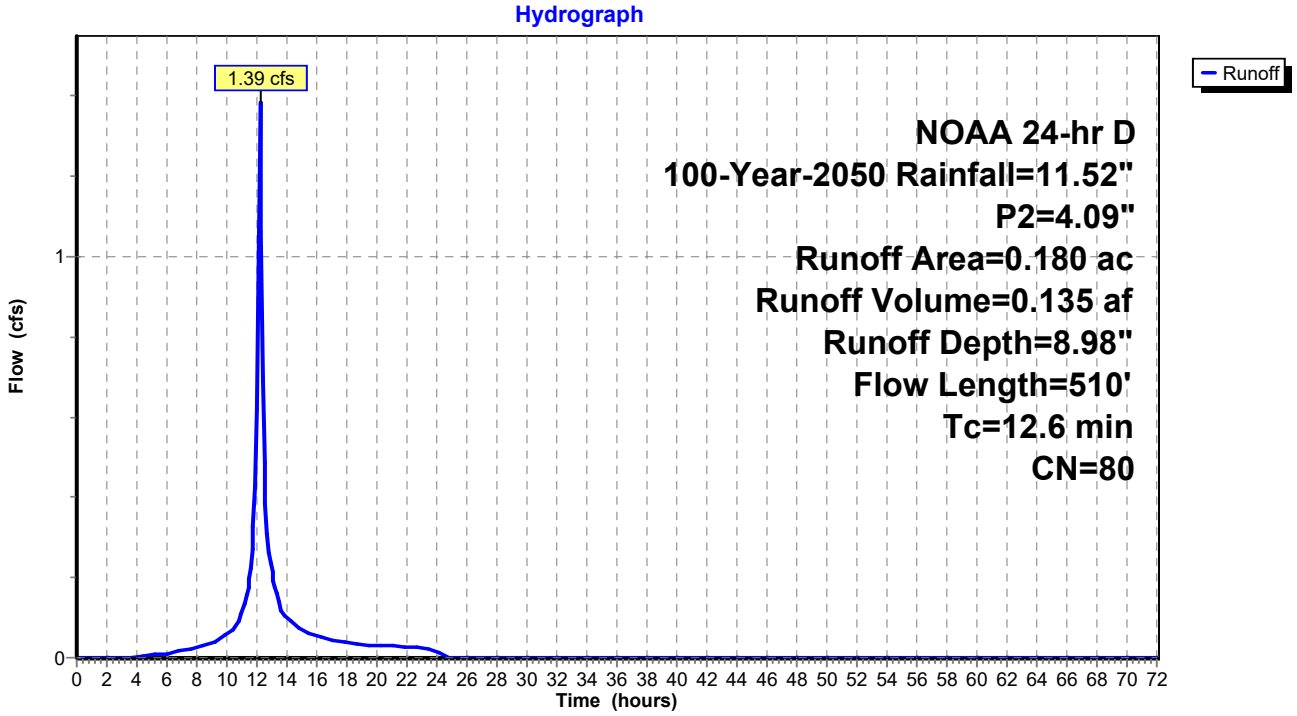
Runoff = 1.39 cfs @ 12.20 hrs, Volume= 0.135 af, Depth= 8.98"
Routed to Link P2AA : PDA 2A-A (Parking)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	82	0.0150	0.16		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 4.09" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
12.6	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

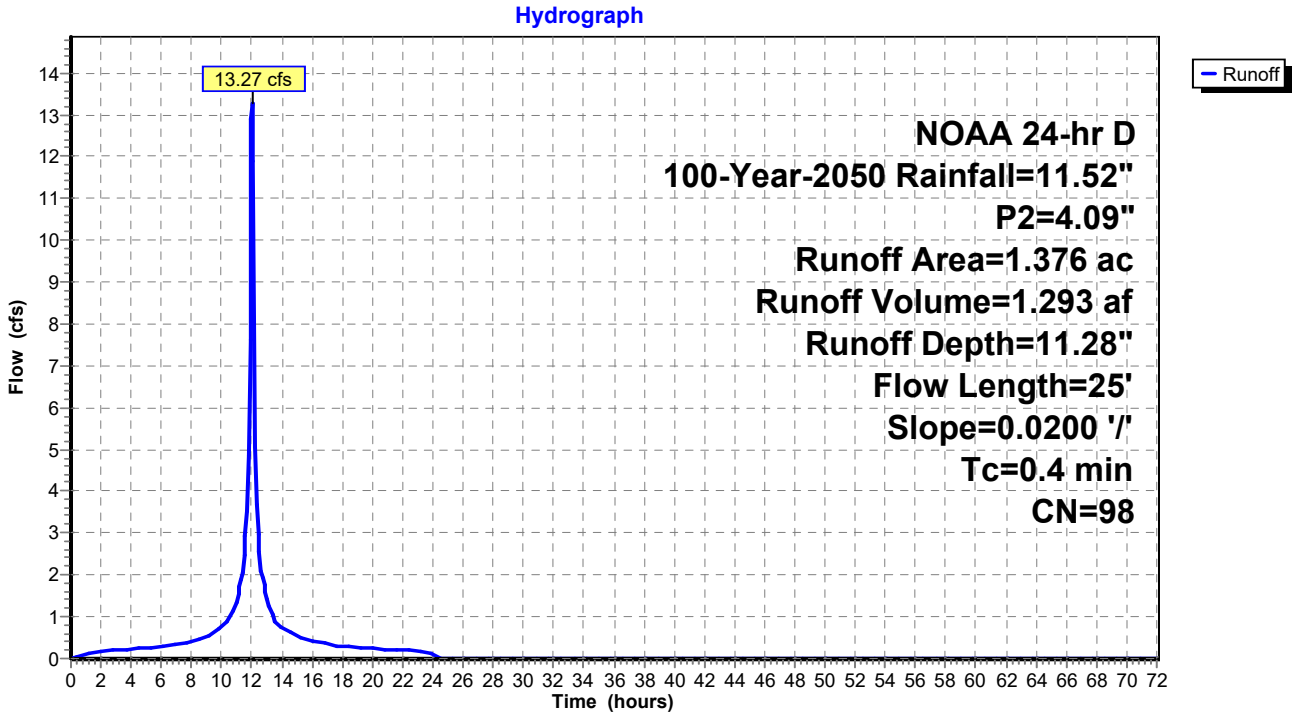
Runoff = 13.27 cfs @ 12.03 hrs, Volume= 1.293 af, Depth=11.28"
Routed to Pond P2AB : PDA 2A-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.18		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 4.09"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

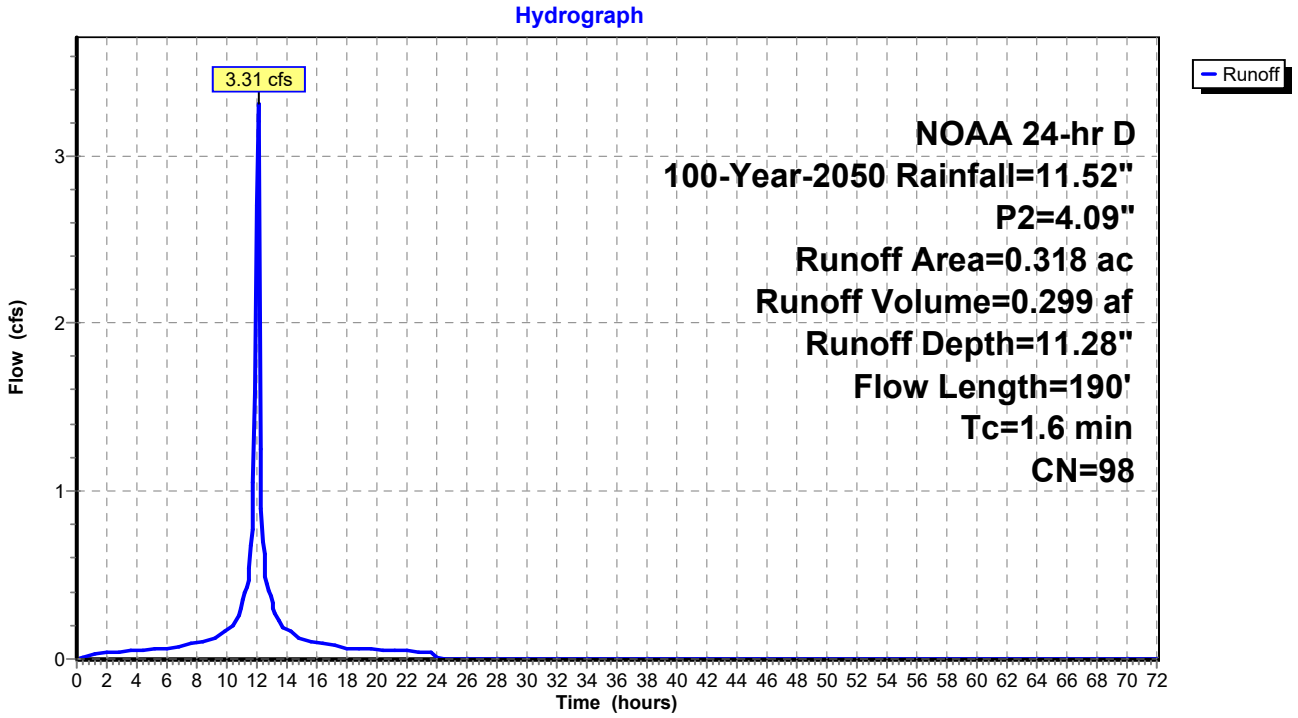
Runoff = 3.31 cfs @ 12.07 hrs, Volume= 0.299 af, Depth=11.28"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.39		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 4.09"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

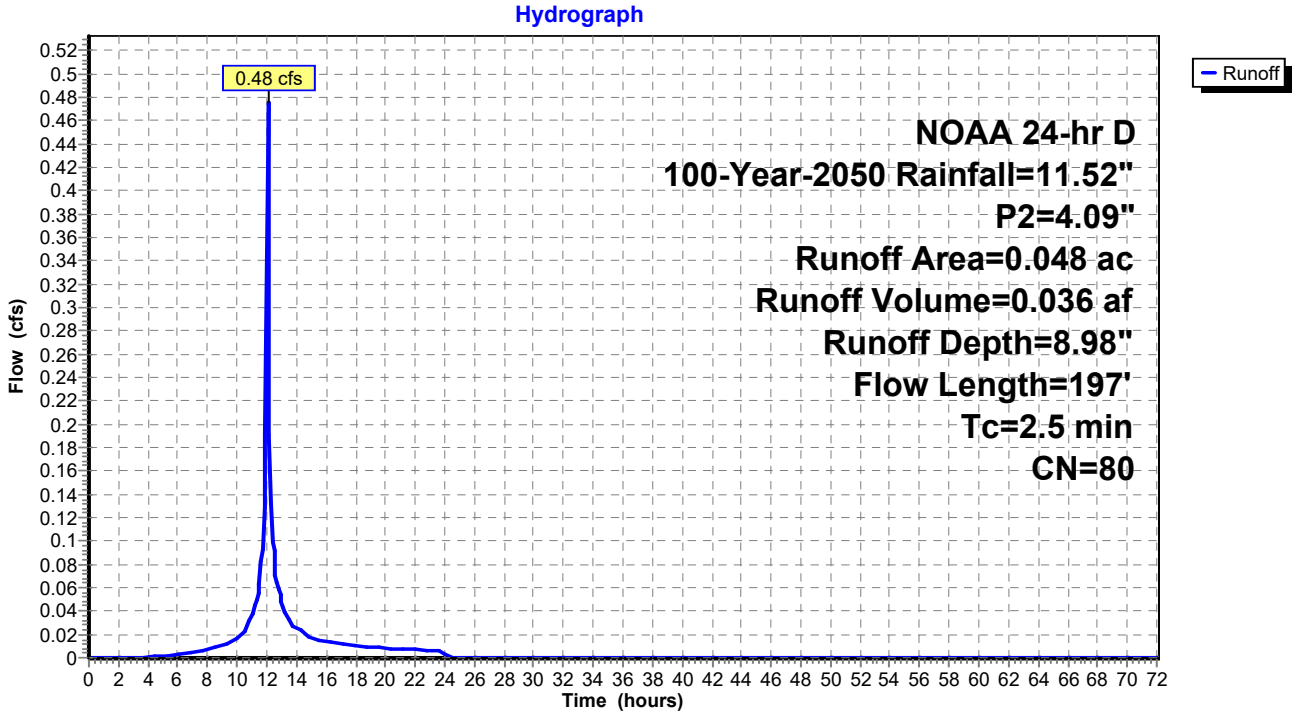
Runoff = 0.48 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 8.98"
Routed to Link P2B : PDA 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	10	0.0200	0.12		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 4.09"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.5	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 11.28" for 100-Year-2050 event
Inflow = 13.27 cfs @ 12.03 hrs, Volume= 1.293 af
Outflow = 7.28 cfs @ 12.20 hrs, Volume= 1.175 af, Atten= 45%, Lag= 9.7 min
Primary = 7.28 cfs @ 12.20 hrs, Volume= 1.175 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 133.26' @ 12.19 hrs Surf.Area= 9,833 sf Storage= 21,642 cf

Plug-Flow detention time= 203.9 min calculated for 1.175 af (91% of inflow)
Center-of-Mass det. time= 152.9 min (885.5 - 732.6)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

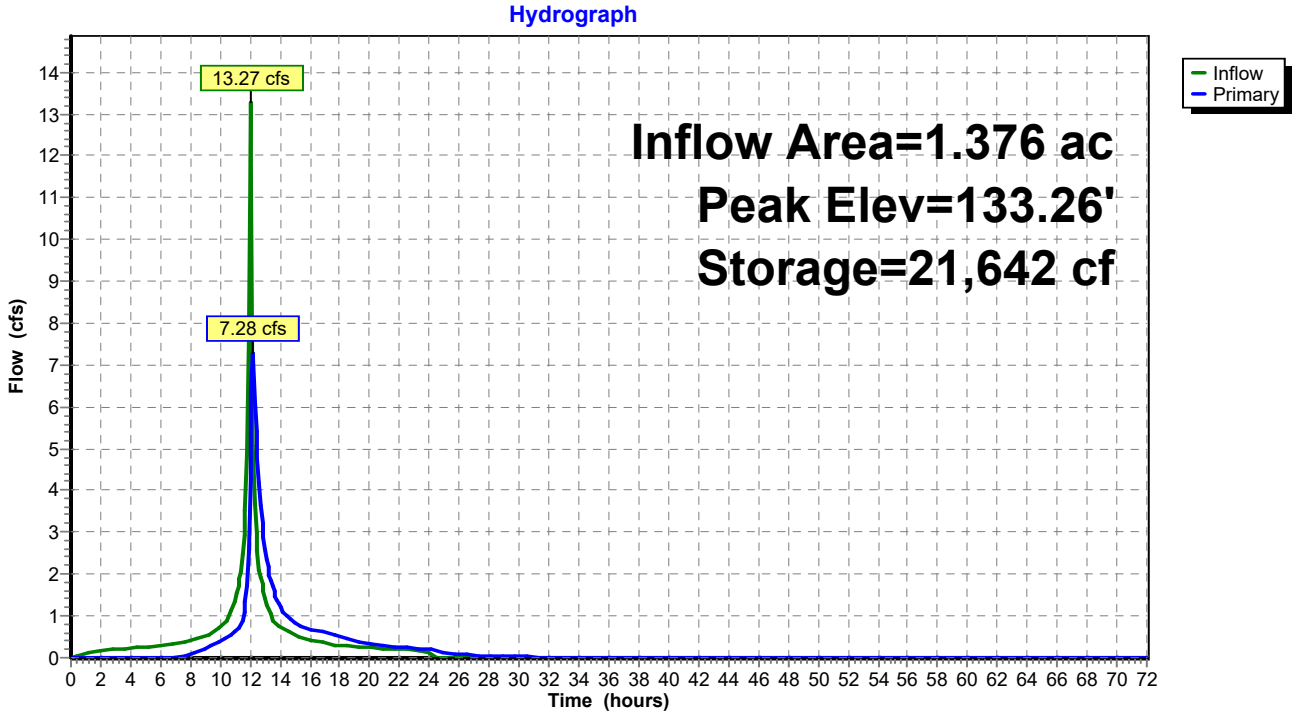
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.22 cfs @ 12.20 hrs HW=133.26' (Free Discharge)
└─**1=Culvert** (Passes 7.22 cfs of 10.86 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.34 cfs @ 6.45 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.61 cfs @ 3.72 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.91 fps)

Pond P2AB: PDA 2A-B

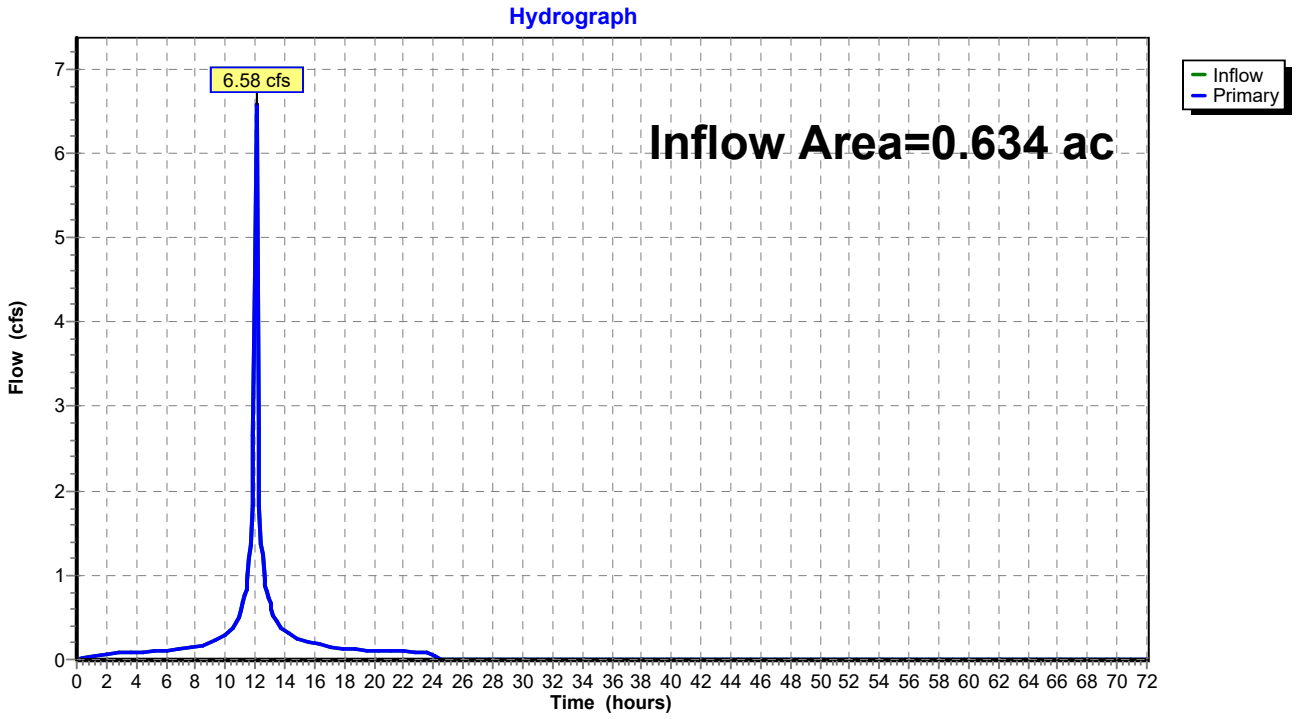


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 10.45" for 100-Year-2050 event
Inflow = 6.58 cfs @ 12.08 hrs, Volume= 0.552 af
Primary = 6.58 cfs @ 12.08 hrs, Volume= 0.552 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

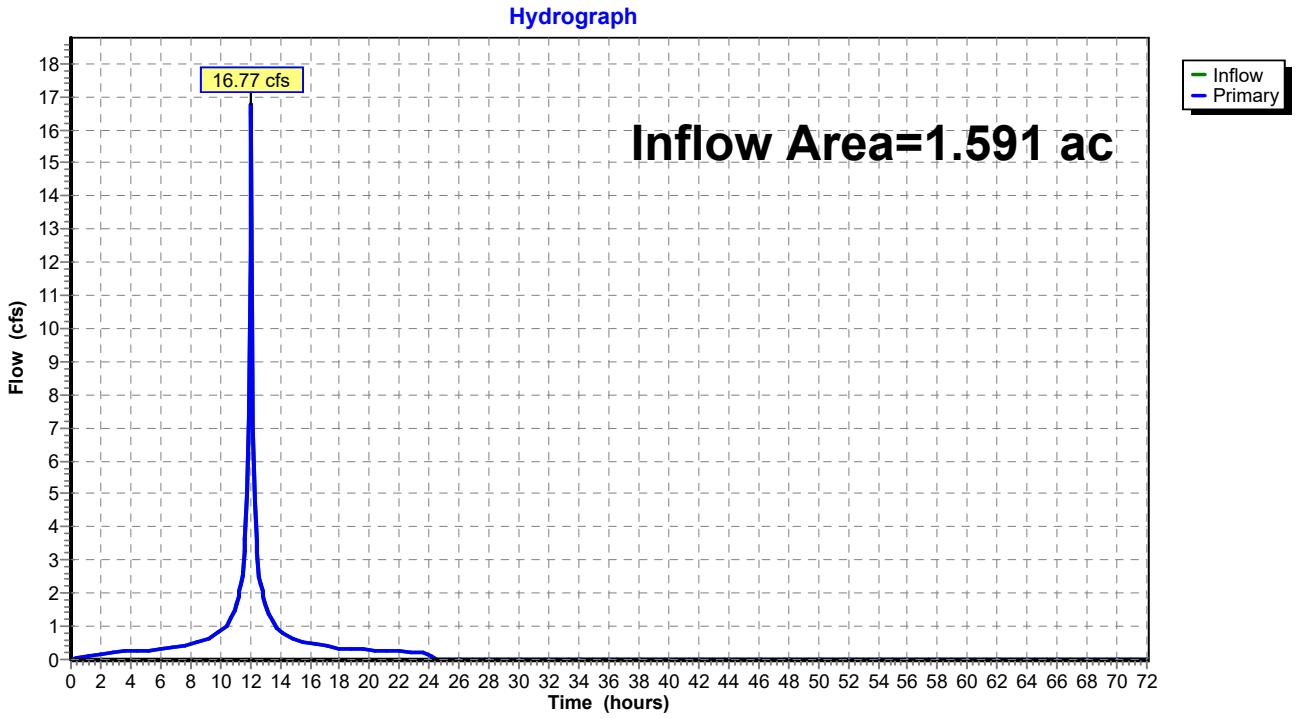


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 11.12" for 100-Year-2050 event
Inflow = 16.77 cfs @ 12.08 hrs, Volume= 1.474 af
Primary = 16.77 cfs @ 12.08 hrs, Volume= 1.474 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

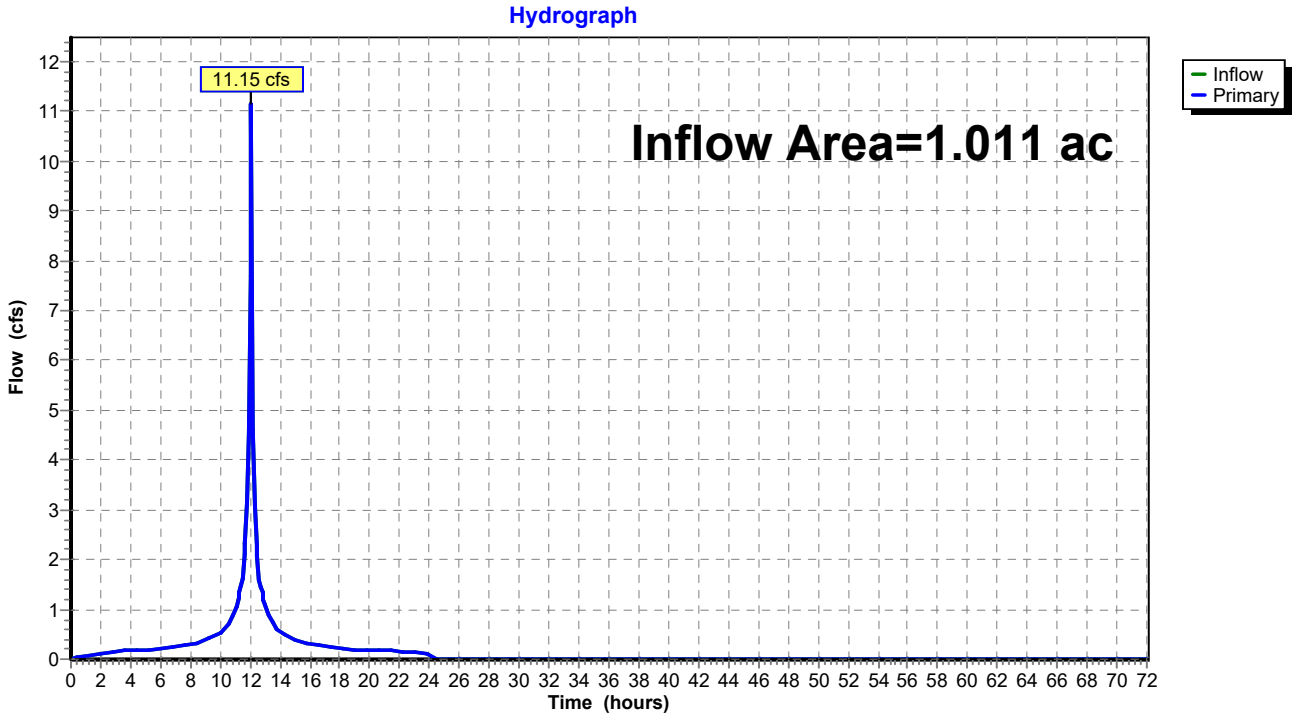


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 11.27" for 100-Year-2050 event
Inflow = 11.15 cfs @ 12.08 hrs, Volume= 0.950 af
Primary = 11.15 cfs @ 12.08 hrs, Volume= 0.950 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

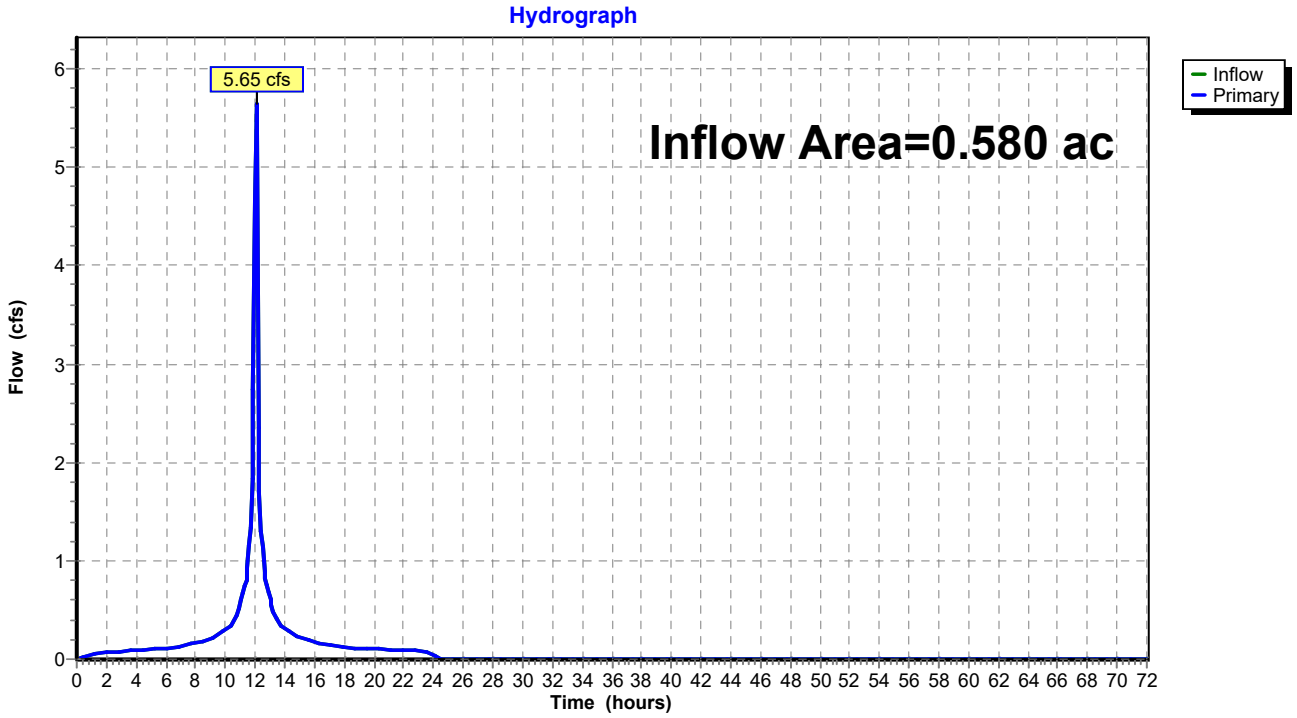


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 10.85" for 100-Year-2050 event
Inflow = 5.65 cfs @ 12.07 hrs, Volume= 0.524 af
Primary = 5.65 cfs @ 12.07 hrs, Volume= 0.524 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

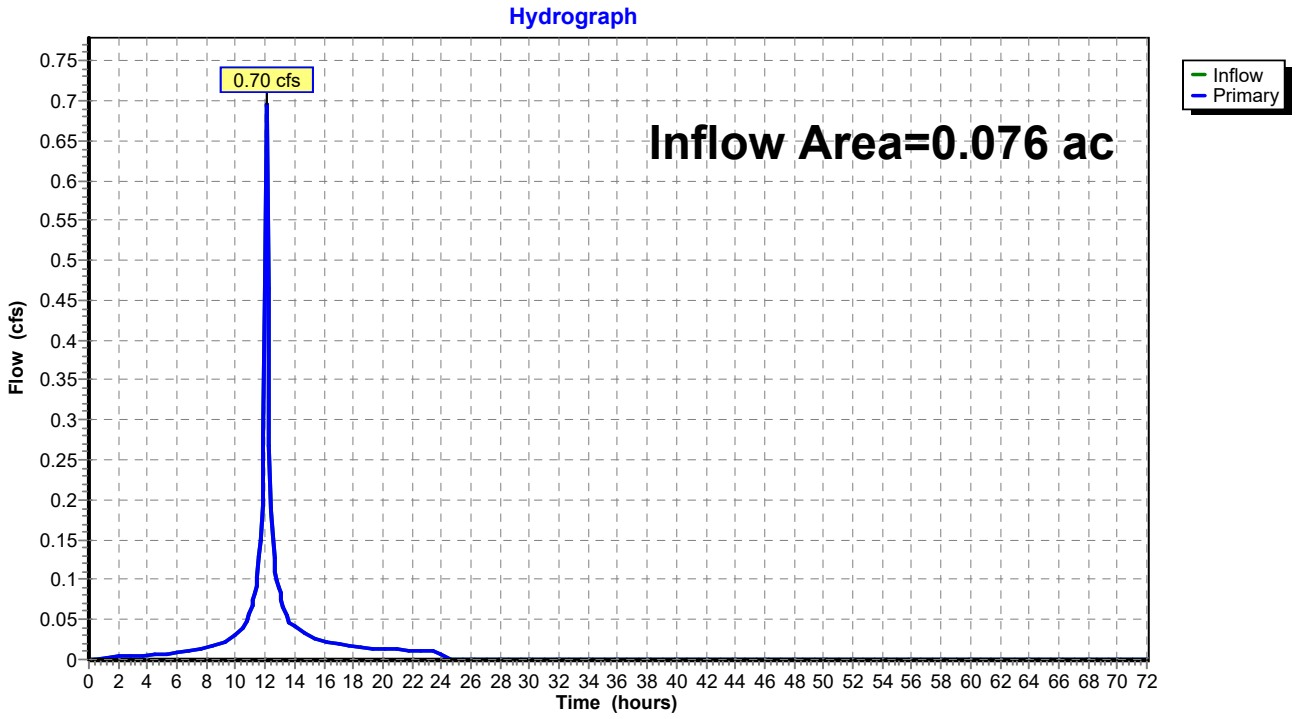


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 9.83" for 100-Year-2050 event
Inflow = 0.70 cfs @ 12.10 hrs, Volume= 0.062 af
Primary = 0.70 cfs @ 12.10 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 P1: PDA 1

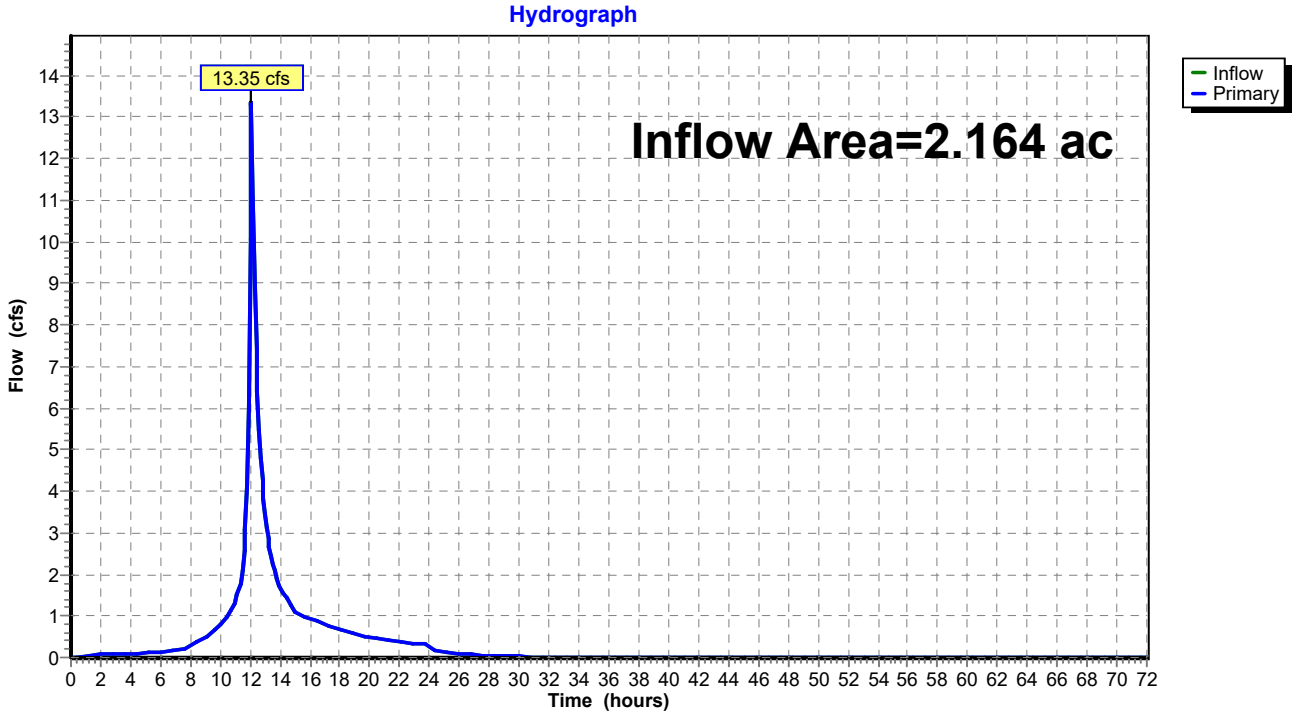


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 10.38" for 100-Year-2050 event
Inflow = 13.35 cfs @ 12.11 hrs, Volume= 1.872 af
Primary = 13.35 cfs @ 12.11 hrs, Volume= 1.872 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

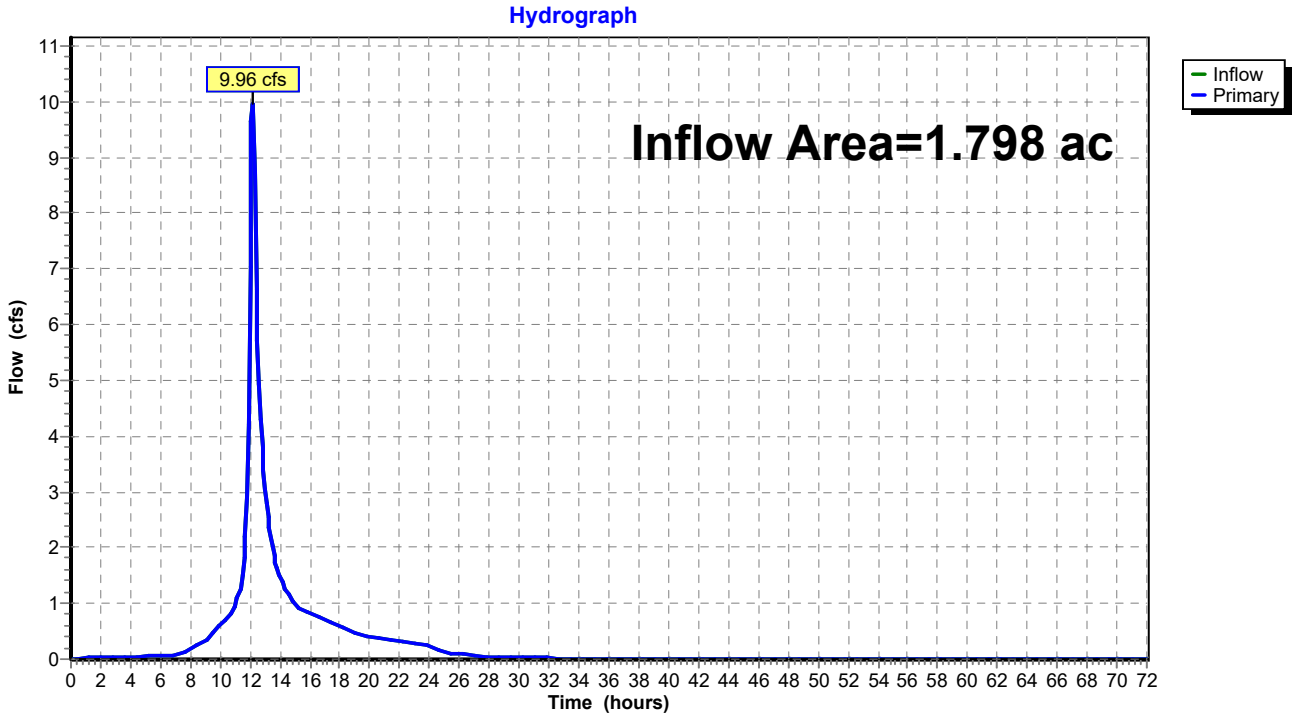


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 10.26" for 100-Year-2050 event
Inflow = 9.96 cfs @ 12.15 hrs, Volume= 1.538 af
Primary = 9.96 cfs @ 12.15 hrs, Volume= 1.538 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

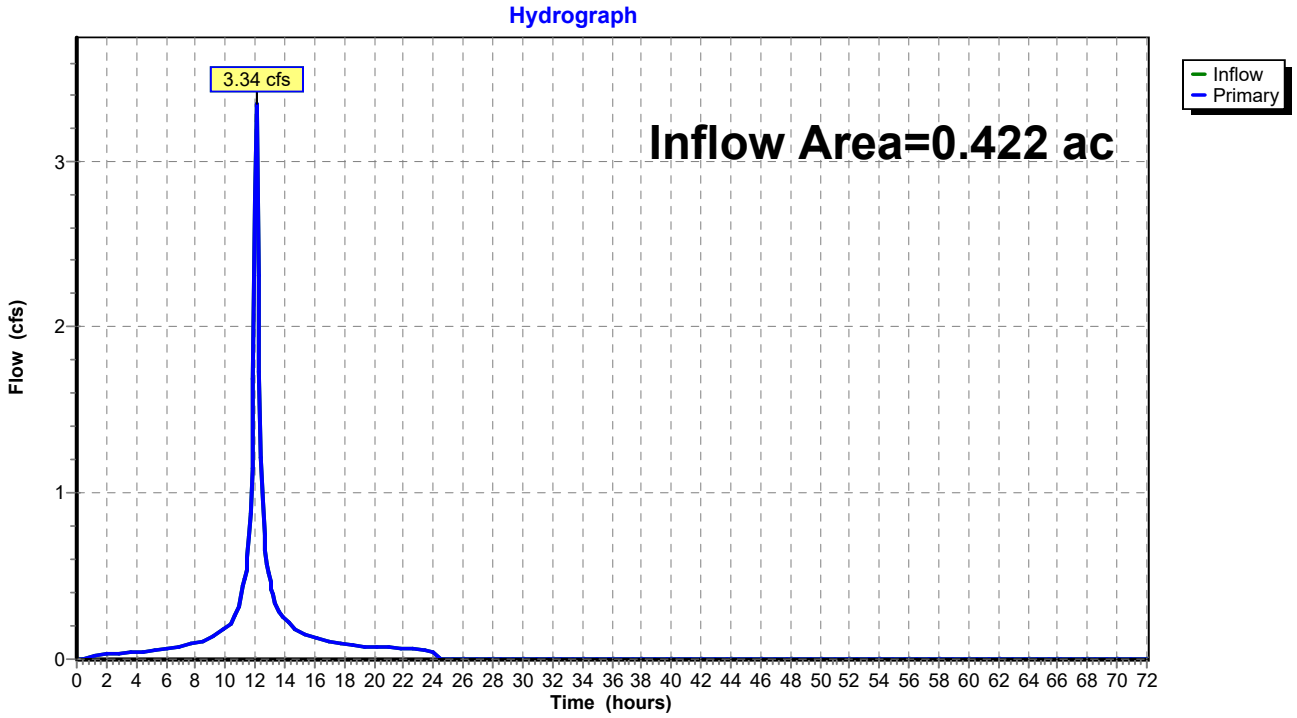


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 10.30" for 100-Year-2050 event
Inflow = 3.34 cfs @ 12.09 hrs, Volume= 0.362 af
Primary = 3.34 cfs @ 12.09 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

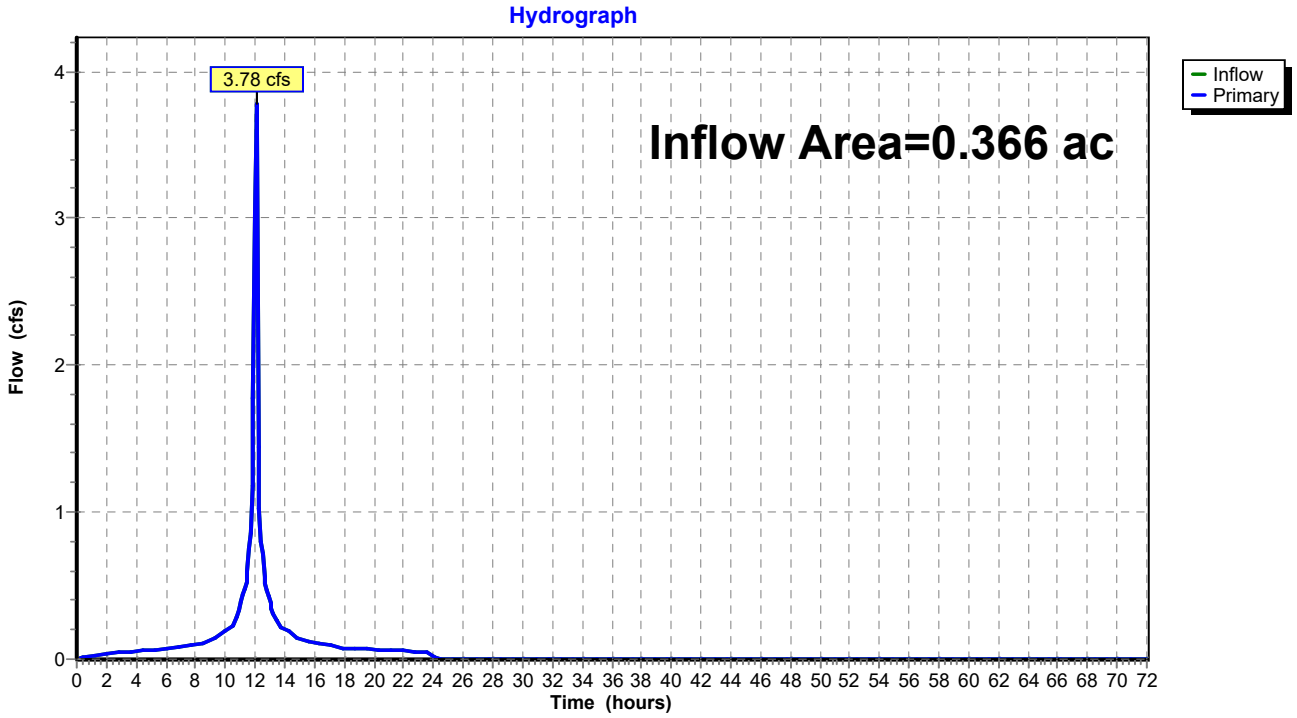


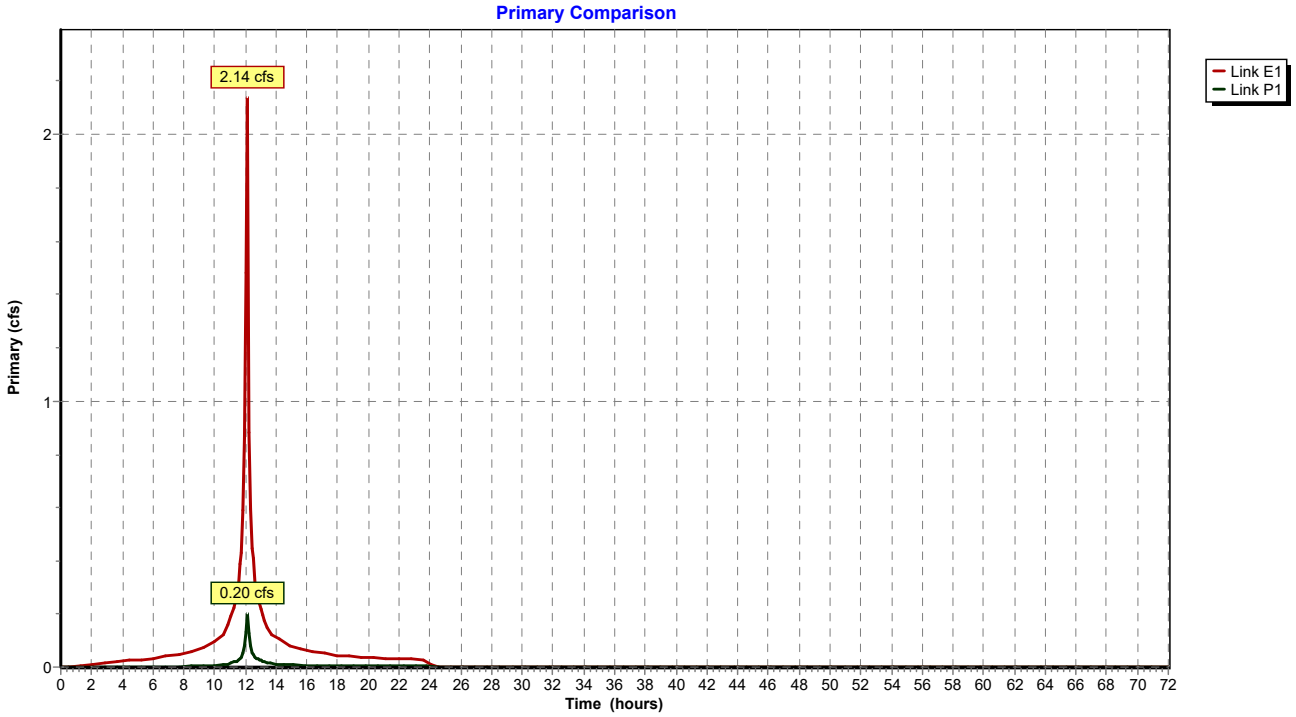
Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 10.98" for 100-Year-2050 event
Inflow = 3.78 cfs @ 12.07 hrs, Volume= 0.335 af
Primary = 3.78 cfs @ 12.07 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B




Primary Comparison
2.14 cfs
0.20 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.03	0.00	10.40	0.11	0.01
0.10	0.00	0.00	5.30	0.03	0.00	10.50	0.12	0.01
0.20	0.00	0.00	5.40	0.03	0.00	10.60	0.13	0.01
0.30	0.00	0.00	5.50	0.03	0.00	10.70	0.14	0.01
0.40	0.00	0.00	5.60	0.03	0.00	10.80	0.15	0.01
0.50	0.00	0.00	5.70	0.03	0.00	10.90	0.17	0.01
0.60	0.00	0.00	5.80	0.03	0.00	11.00	0.18	0.01
0.70	0.00	0.00	5.90	0.03	0.00	11.10	0.20	0.02
0.80	0.00	0.00	6.00	0.03	0.00	11.20	0.22	0.02
0.90	0.00	0.00	6.10	0.03	0.00	11.30	0.24	0.02
1.00	0.00	0.00	6.20	0.03	0.00	11.40	0.27	0.02
1.10	0.00	0.00	6.30	0.04	0.00	11.50	0.30	0.03
1.20	0.00	0.00	6.40	0.04	0.00	11.60	0.39	0.03
1.30	0.00	0.00	6.50	0.04	0.00	11.70	0.43	0.04
1.40	0.01	0.00	6.60	0.04	0.00	11.80	0.59	0.05
1.50	0.01	0.00	6.70	0.04	0.00	11.90	0.86	0.08
1.60	0.01	0.00	6.80	0.04	0.00	12.00	1.48	0.13
1.70	0.01	0.00	6.90	0.04	0.00	12.10	**2.11**	**0.20**
1.80	0.01	0.00	7.00	0.04	0.00	12.20	0.88	0.13
1.90	0.01	0.00	7.10	0.04	0.00	12.30	0.59	0.08
2.00	0.01	0.00	7.20	0.04	0.00	12.40	0.45	0.06
2.10	0.01	0.00	7.30	0.05	0.00	12.50	0.41	0.05
2.20	0.01	0.00	7.40	0.05	0.00	12.60	0.31	0.04
2.30	0.01	0.00	7.50	0.05	0.00	12.70	0.29	0.03
2.40	0.01	0.00	7.60	0.05	0.00	12.80	0.26	0.03
2.50	0.01	0.00	7.70	0.05	0.00	12.90	0.24	0.03
2.60	0.02	0.00	7.80	0.05	0.00	13.00	0.22	0.03
2.70	0.02	0.00	7.90	0.05	0.00	13.10	0.19	0.02
2.80	0.02	0.00	8.00	0.05	0.00	13.20	0.18	0.02
2.90	0.02	0.00	8.10	0.05	0.00	13.30	0.17	0.02
3.00	0.02	0.00	8.20	0.05	0.00	13.40	0.15	0.02
3.10	0.02	0.00	8.30	0.06	0.00	13.50	0.14	0.02
3.20	0.02	0.00	8.40	0.06	0.00	13.60	0.13	0.02
3.30	0.02	0.00	8.50	0.06	0.00	13.70	0.12	0.01
3.40	0.02	0.00	8.60	0.06	0.00	13.80	0.12	0.01
3.50	0.02	0.00	8.70	0.06	0.00	13.90	0.12	0.01
3.60	0.02	0.00	8.80	0.06	0.00	14.00	0.11	0.01
3.70	0.02	0.00	8.90	0.06	0.00	14.10	0.11	0.01
3.80	0.02	0.00	9.00	0.06	0.00	14.20	0.11	0.01
3.90	0.02	0.00	9.10	0.07	0.00	14.30	0.10	0.01
4.00	0.02	0.00	9.20	0.07	0.00	14.40	0.10	0.01
4.10	0.02	0.00	9.30	0.07	0.00	14.50	0.10	0.01
4.20	0.02	0.00	9.40	0.08	0.01	14.60	0.09	0.01
4.30	0.02	0.00	9.50	0.08	0.01	14.70	0.09	0.01
4.40	0.03	0.00	9.60	0.08	0.01	14.80	0.08	0.01
4.50	0.03	0.00	9.70	0.09	0.01	14.90	0.08	0.01
4.60	0.03	0.00	9.80	0.09	0.01	15.00	0.08	0.01
4.70	0.03	0.00	9.90	0.09	0.01	15.10	0.07	0.01
4.80	0.03	0.00	10.00	0.10	0.01	15.20	0.07	0.01
4.90	0.03	0.00	10.10	0.10	0.01	15.30	0.07	0.01
5.00	0.03	0.00	10.20	0.10	0.01	15.40	0.07	0.01
5.10	0.03	0.00	10.30	0.11	0.01	15.50	0.07	0.01

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.07	0.01	20.80	0.03	0.00	26.00	0.00	0.00
15.70	0.07	0.01	20.90	0.03	0.00	26.10	0.00	0.00
15.80	0.07	0.01	21.00	0.03	0.00	26.20	0.00	0.00
15.90	0.06	0.01	21.10	0.03	0.00	26.30	0.00	0.00
16.00	0.06	0.01	21.20	0.03	0.00	26.40	0.00	0.00
16.10	0.06	0.01	21.30	0.03	0.00	26.50	0.00	0.00
16.20	0.06	0.01	21.40	0.03	0.00	26.60	0.00	0.00
16.30	0.06	0.01	21.50	0.03	0.00	26.70	0.00	0.00
16.40	0.06	0.01	21.60	0.03	0.00	26.80	0.00	0.00
16.50	0.06	0.01	21.70	0.03	0.00	26.90	0.00	0.00
16.60	0.06	0.01	21.80	0.03	0.00	27.00	0.00	0.00
16.70	0.06	0.01	21.90	0.03	0.00	27.10	0.00	0.00
16.80	0.06	0.01	22.00	0.03	0.00	27.20	0.00	0.00
16.90	0.05	0.01	22.10	0.03	0.00	27.30	0.00	0.00
17.00	0.05	0.01	22.20	0.03	0.00	27.40	0.00	0.00
17.10	0.05	0.01	22.30	0.03	0.00	27.50	0.00	0.00
17.20	0.05	0.01	22.40	0.03	0.00	27.60	0.00	0.00
17.30	0.05	0.01	22.50	0.03	0.00	27.70	0.00	0.00
17.40	0.05	0.01	22.60	0.03	0.00	27.80	0.00	0.00
17.50	0.05	0.01	22.70	0.03	0.00	27.90	0.00	0.00
17.60	0.05	0.01	22.80	0.03	0.00	28.00	0.00	0.00
17.70	0.05	0.01	22.90	0.03	0.00	28.10	0.00	0.00
17.80	0.04	0.01	23.00	0.03	0.00	28.20	0.00	0.00
17.90	0.04	0.01	23.10	0.03	0.00	28.30	0.00	0.00
18.00	0.04	0.00	23.20	0.03	0.00	28.40	0.00	0.00
18.10	0.04	0.00	23.30	0.03	0.00	28.50	0.00	0.00
18.20	0.04	0.00	23.40	0.03	0.00	28.60	0.00	0.00
18.30	0.04	0.00	23.50	0.03	0.00	28.70	0.00	0.00
18.40	0.04	0.00	23.60	0.03	0.00	28.80	0.00	0.00
18.50	0.04	0.00	23.70	0.03	0.00	28.90	0.00	0.00
18.60	0.04	0.00	23.80	0.03	0.00	29.00	0.00	0.00
18.70	0.04	0.00	23.90	0.03	0.00	29.10	0.00	0.00
18.80	0.04	0.00	24.00	0.02	0.00	29.20	0.00	0.00
18.90	0.04	0.00	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.04	0.00	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.04	0.00	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.04	0.00	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.04	0.00	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.04	0.00	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.04	0.00	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.04	0.00	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.04	0.00	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.04	0.00	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.04	0.00	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.04	0.00	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.04	0.00	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.04	0.00	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.04	0.00	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.04	0.00	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.04	0.00	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.04	0.00	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.03	0.00	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

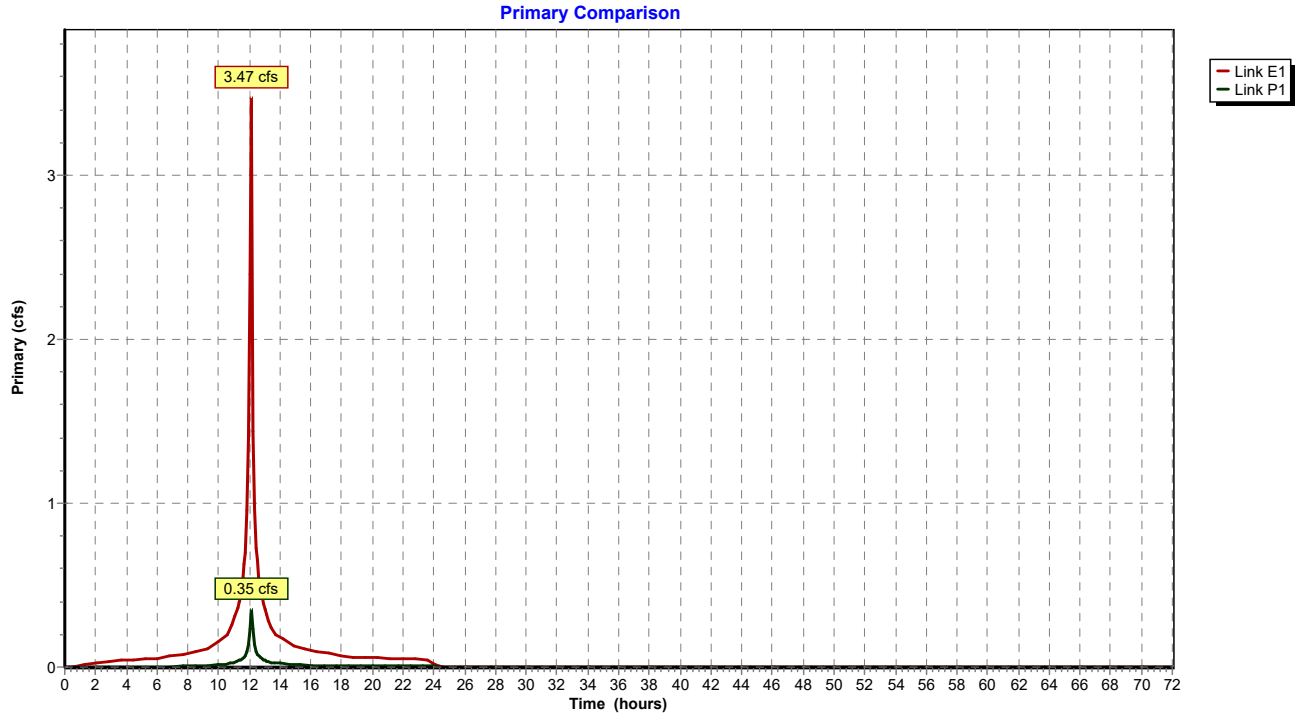
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			


Primary Comparison
3.47 cfs
0.35 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.05	0.00	10.40	0.18	0.02
0.10	0.00	0.00	5.30	0.05	0.00	10.50	0.19	0.02
0.20	0.00	0.00	5.40	0.05	0.00	10.60	0.21	0.02
0.30	0.00	0.00	5.50	0.05	0.00	10.70	0.23	0.02
0.40	0.00	0.00	5.60	0.05	0.00	10.80	0.25	0.02
0.50	0.00	0.00	5.70	0.05	0.00	10.90	0.27	0.03
0.60	0.00	0.00	5.80	0.05	0.00	11.00	0.29	0.03
0.70	0.00	0.00	5.90	0.05	0.00	11.10	0.32	0.03
0.80	0.00	0.00	6.00	0.05	0.00	11.20	0.36	0.04
0.90	0.01	0.00	6.10	0.06	0.00	11.30	0.40	0.04
1.00	0.01	0.00	6.20	0.06	0.00	11.40	0.43	0.04
1.10	0.01	0.00	6.30	0.06	0.00	11.50	0.49	0.05
1.20	0.01	0.00	6.40	0.06	0.00	11.60	0.63	0.06
1.30	0.02	0.00	6.50	0.06	0.00	11.70	0.70	0.07
1.40	0.02	0.00	6.60	0.06	0.00	11.80	0.96	0.09
1.50	0.02	0.00	6.70	0.07	0.00	11.90	1.40	0.14
1.60	0.02	0.00	6.80	0.07	0.00	12.00	2.40	0.23
1.70	0.02	0.00	6.90	0.07	0.00	12.10	**3.43**	**0.35**
1.80	0.02	0.00	7.00	0.07	0.00	12.20	1.44	0.23
1.90	0.02	0.00	7.10	0.07	0.00	12.30	0.96	0.14
2.00	0.03	0.00	7.20	0.07	0.00	12.40	0.72	0.10
2.10	0.03	0.00	7.30	0.07	0.00	12.50	0.66	0.08
2.20	0.03	0.00	7.40	0.08	0.01	12.60	0.51	0.07
2.30	0.03	0.00	7.50	0.08	0.01	12.70	0.47	0.06
2.40	0.03	0.00	7.60	0.08	0.01	12.80	0.43	0.05
2.50	0.03	0.00	7.70	0.08	0.01	12.90	0.39	0.05
2.60	0.03	0.00	7.80	0.08	0.01	13.00	0.35	0.04
2.70	0.03	0.00	7.90	0.08	0.01	13.10	0.32	0.04
2.80	0.03	0.00	8.00	0.09	0.01	13.20	0.29	0.04
2.90	0.03	0.00	8.10	0.09	0.01	13.30	0.27	0.03
3.00	0.04	0.00	8.20	0.09	0.01	13.40	0.25	0.03
3.10	0.04	0.00	8.30	0.09	0.01	13.50	0.23	0.03
3.20	0.04	0.00	8.40	0.09	0.01	13.60	0.21	0.03
3.30	0.04	0.00	8.50	0.09	0.01	13.70	0.20	0.02
3.40	0.04	0.00	8.60	0.10	0.01	13.80	0.20	0.02
3.50	0.04	0.00	8.70	0.10	0.01	13.90	0.19	0.02
3.60	0.04	0.00	8.80	0.10	0.01	14.00	0.18	0.02
3.70	0.04	0.00	8.90	0.10	0.01	14.10	0.18	0.02
3.80	0.04	0.00	9.00	0.10	0.01	14.20	0.17	0.02
3.90	0.04	0.00	9.10	0.11	0.01	14.30	0.17	0.02
4.00	0.04	0.00	9.20	0.11	0.01	14.40	0.16	0.02
4.10	0.04	0.00	9.30	0.12	0.01	14.50	0.15	0.02
4.20	0.04	0.00	9.40	0.12	0.01	14.60	0.15	0.02
4.30	0.04	0.00	9.50	0.13	0.01	14.70	0.14	0.02
4.40	0.05	0.00	9.60	0.13	0.01	14.80	0.14	0.02
4.50	0.05	0.00	9.70	0.14	0.01	14.90	0.13	0.02
4.60	0.05	0.00	9.80	0.14	0.01	15.00	0.12	0.01
4.70	0.05	0.00	9.90	0.15	0.01	15.10	0.12	0.01
4.80	0.05	0.00	10.00	0.16	0.01	15.20	0.12	0.01
4.90	0.05	0.00	10.10	0.16	0.01	15.30	0.11	0.01
5.00	0.05	0.00	10.20	0.17	0.02	15.40	0.11	0.01
5.10	0.05	0.00	10.30	0.17	0.02	15.50	0.11	0.01

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.11	0.01	20.80	0.06	0.01	26.00	0.00	0.00
15.70	0.11	0.01	20.90	0.06	0.01	26.10	0.00	0.00
15.80	0.11	0.01	21.00	0.05	0.01	26.20	0.00	0.00
15.90	0.10	0.01	21.10	0.05	0.01	26.30	0.00	0.00
16.00	0.10	0.01	21.20	0.05	0.01	26.40	0.00	0.00
16.10	0.10	0.01	21.30	0.05	0.01	26.50	0.00	0.00
16.20	0.10	0.01	21.40	0.05	0.01	26.60	0.00	0.00
16.30	0.10	0.01	21.50	0.05	0.01	26.70	0.00	0.00
16.40	0.10	0.01	21.60	0.05	0.01	26.80	0.00	0.00
16.50	0.09	0.01	21.70	0.05	0.01	26.90	0.00	0.00
16.60	0.09	0.01	21.80	0.05	0.01	27.00	0.00	0.00
16.70	0.09	0.01	21.90	0.05	0.01	27.10	0.00	0.00
16.80	0.09	0.01	22.00	0.05	0.01	27.20	0.00	0.00
16.90	0.09	0.01	22.10	0.05	0.01	27.30	0.00	0.00
17.00	0.09	0.01	22.20	0.05	0.01	27.40	0.00	0.00
17.10	0.08	0.01	22.30	0.05	0.01	27.50	0.00	0.00
17.20	0.08	0.01	22.40	0.05	0.01	27.60	0.00	0.00
17.30	0.08	0.01	22.50	0.05	0.01	27.70	0.00	0.00
17.40	0.08	0.01	22.60	0.05	0.01	27.80	0.00	0.00
17.50	0.08	0.01	22.70	0.05	0.01	27.90	0.00	0.00
17.60	0.08	0.01	22.80	0.05	0.01	28.00	0.00	0.00
17.70	0.07	0.01	22.90	0.05	0.01	28.10	0.00	0.00
17.80	0.07	0.01	23.00	0.05	0.01	28.20	0.00	0.00
17.90	0.07	0.01	23.10	0.05	0.01	28.30	0.00	0.00
18.00	0.07	0.01	23.20	0.05	0.01	28.40	0.00	0.00
18.10	0.07	0.01	23.30	0.05	0.01	28.50	0.00	0.00
18.20	0.07	0.01	23.40	0.04	0.01	28.60	0.00	0.00
18.30	0.07	0.01	23.50	0.04	0.01	28.70	0.00	0.00
18.40	0.07	0.01	23.60	0.04	0.01	28.80	0.00	0.00
18.50	0.07	0.01	23.70	0.04	0.01	28.90	0.00	0.00
18.60	0.07	0.01	23.80	0.04	0.01	29.00	0.00	0.00
18.70	0.06	0.01	23.90	0.04	0.01	29.10	0.00	0.00
18.80	0.06	0.01	24.00	0.04	0.00	29.20	0.00	0.00
18.90	0.06	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.06	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.06	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.06	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.06	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.06	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.06	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.06	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.06	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.06	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.06	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.06	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.06	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.06	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.06	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.06	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.06	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.06	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.06	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

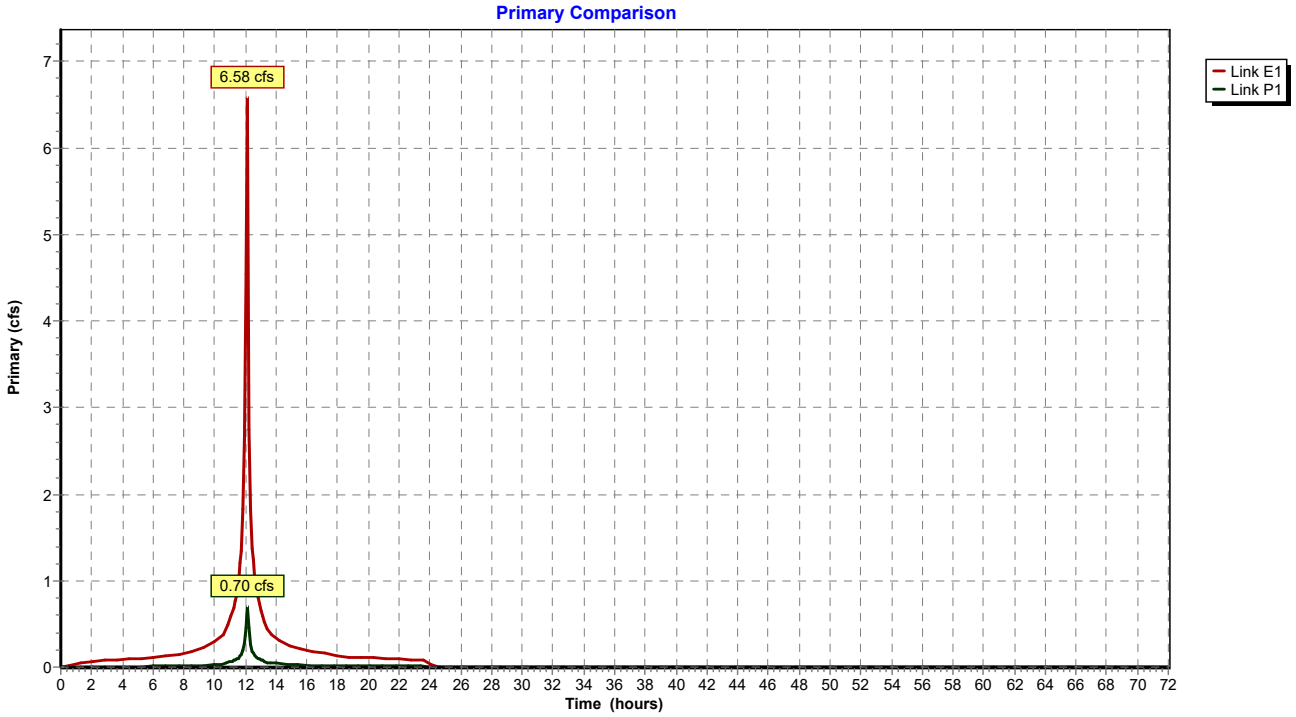
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			


Primary Comparison
6.58 cfs
0.70 cfs
Link E1
Link P1
Primary (cfs)
Time (hours)
0
1
2
3
4
5
6
7
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Primary Comparison

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
0.00	0.00	0.00	5.20	0.10	0.01	10.40	0.34	0.04
0.10	0.00	0.00	5.30	0.10	0.01	10.50	0.36	0.04
0.20	0.00	0.00	5.40	0.10	0.01	10.60	0.39	0.04
0.30	0.00	0.00	5.50	0.10	0.01	10.70	0.43	0.05
0.40	0.00	0.00	5.60	0.10	0.01	10.80	0.47	0.05
0.50	0.01	0.00	5.70	0.10	0.01	10.90	0.51	0.06
0.60	0.02	0.00	5.80	0.10	0.01	11.00	0.55	0.06
0.70	0.02	0.00	5.90	0.10	0.01	11.10	0.62	0.07
0.80	0.03	0.00	6.00	0.10	0.01	11.20	0.69	0.08
0.90	0.03	0.00	6.10	0.11	0.01	11.30	0.76	0.08
1.00	0.04	0.00	6.20	0.11	0.01	11.40	0.83	0.09
1.10	0.04	0.00	6.30	0.11	0.01	11.50	0.93	0.10
1.20	0.04	0.00	6.40	0.12	0.01	11.60	1.20	0.13
1.30	0.05	0.00	6.50	0.12	0.01	11.70	1.34	0.15
1.40	0.05	0.00	6.60	0.12	0.01	11.80	1.83	0.19
1.50	0.05	0.00	6.70	0.12	0.01	11.90	2.65	0.28
1.60	0.05	0.00	6.80	0.13	0.01	12.00	4.55	0.46
1.70	0.06	0.00	6.90	0.13	0.01	12.10	**6.51**	**0.70**
1.80	0.06	0.00	7.00	0.13	0.01	12.20	2.74	0.46
1.90	0.06	0.00	7.10	0.13	0.01	12.30	1.82	0.27
2.00	0.06	0.00	7.20	0.14	0.01	12.40	1.36	0.19
2.10	0.06	0.00	7.30	0.14	0.01	12.50	1.24	0.16
2.20	0.07	0.00	7.40	0.14	0.01	12.60	0.96	0.13
2.30	0.07	0.00	7.50	0.15	0.01	12.70	0.87	0.11
2.40	0.07	0.00	7.60	0.15	0.01	12.80	0.80	0.10
2.50	0.07	0.00	7.70	0.15	0.01	12.90	0.73	0.09
2.60	0.07	0.00	7.80	0.16	0.01	13.00	0.66	0.08
2.70	0.07	0.00	7.90	0.16	0.02	13.10	0.59	0.07
2.80	0.07	0.00	8.00	0.16	0.02	13.20	0.55	0.07
2.90	0.08	0.00	8.10	0.16	0.02	13.30	0.51	0.06
3.00	0.08	0.00	8.20	0.17	0.02	13.40	0.47	0.06
3.10	0.08	0.00	8.30	0.17	0.02	13.50	0.43	0.05
3.20	0.08	0.00	8.40	0.17	0.02	13.60	0.39	0.05
3.30	0.08	0.00	8.50	0.18	0.02	13.70	0.38	0.05
3.40	0.08	0.00	8.60	0.18	0.02	13.80	0.37	0.04
3.50	0.08	0.00	8.70	0.18	0.02	13.90	0.35	0.04
3.60	0.08	0.00	8.80	0.19	0.02	14.00	0.34	0.04
3.70	0.08	0.00	8.90	0.19	0.02	14.10	0.33	0.04
3.80	0.08	0.00	9.00	0.19	0.02	14.20	0.32	0.04
3.90	0.09	0.01	9.10	0.20	0.02	14.30	0.31	0.04
4.00	0.09	0.01	9.20	0.21	0.02	14.40	0.30	0.04
4.10	0.09	0.01	9.30	0.23	0.02	14.50	0.29	0.03
4.20	0.09	0.01	9.40	0.24	0.02	14.60	0.28	0.03
4.30	0.09	0.01	9.50	0.25	0.03	14.70	0.26	0.03
4.40	0.09	0.01	9.60	0.26	0.03	14.80	0.25	0.03
4.50	0.09	0.01	9.70	0.27	0.03	14.90	0.24	0.03
4.60	0.09	0.01	9.80	0.28	0.03	15.00	0.23	0.03
4.70	0.09	0.01	9.90	0.29	0.03	15.10	0.22	0.03
4.80	0.09	0.01	10.00	0.30	0.03	15.20	0.22	0.03
4.90	0.10	0.01	10.10	0.31	0.03	15.30	0.21	0.03
5.00	0.10	0.01	10.20	0.32	0.03	15.40	0.21	0.03
5.10	0.10	0.01	10.30	0.33	0.04	15.50	0.21	0.03

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
15.60	0.20	0.02	20.80	0.10	0.01	26.00	0.00	0.00
15.70	0.20	0.02	20.90	0.10	0.01	26.10	0.00	0.00
15.80	0.20	0.02	21.00	0.10	0.01	26.20	0.00	0.00
15.90	0.19	0.02	21.10	0.10	0.01	26.30	0.00	0.00
16.00	0.19	0.02	21.20	0.10	0.01	26.40	0.00	0.00
16.10	0.19	0.02	21.30	0.10	0.01	26.50	0.00	0.00
16.20	0.19	0.02	21.40	0.10	0.01	26.60	0.00	0.00
16.30	0.18	0.02	21.50	0.10	0.01	26.70	0.00	0.00
16.40	0.18	0.02	21.60	0.10	0.01	26.80	0.00	0.00
16.50	0.18	0.02	21.70	0.10	0.01	26.90	0.00	0.00
16.60	0.17	0.02	21.80	0.10	0.01	27.00	0.00	0.00
16.70	0.17	0.02	21.90	0.10	0.01	27.10	0.00	0.00
16.80	0.17	0.02	22.00	0.09	0.01	27.20	0.00	0.00
16.90	0.16	0.02	22.10	0.09	0.01	27.30	0.00	0.00
17.00	0.16	0.02	22.20	0.09	0.01	27.40	0.00	0.00
17.10	0.16	0.02	22.30	0.09	0.01	27.50	0.00	0.00
17.20	0.15	0.02	22.40	0.09	0.01	27.60	0.00	0.00
17.30	0.15	0.02	22.50	0.09	0.01	27.70	0.00	0.00
17.40	0.15	0.02	22.60	0.09	0.01	27.80	0.00	0.00
17.50	0.14	0.02	22.70	0.09	0.01	27.90	0.00	0.00
17.60	0.14	0.02	22.80	0.09	0.01	28.00	0.00	0.00
17.70	0.14	0.02	22.90	0.09	0.01	28.10	0.00	0.00
17.80	0.13	0.02	23.00	0.09	0.01	28.20	0.00	0.00
17.90	0.13	0.02	23.10	0.09	0.01	28.30	0.00	0.00
18.00	0.13	0.02	23.20	0.08	0.01	28.40	0.00	0.00
18.10	0.13	0.02	23.30	0.08	0.01	28.50	0.00	0.00
18.20	0.12	0.02	23.40	0.08	0.01	28.60	0.00	0.00
18.30	0.12	0.01	23.50	0.08	0.01	28.70	0.00	0.00
18.40	0.12	0.01	23.60	0.08	0.01	28.80	0.00	0.00
18.50	0.12	0.01	23.70	0.08	0.01	28.90	0.00	0.00
18.60	0.12	0.01	23.80	0.08	0.01	29.00	0.00	0.00
18.70	0.12	0.01	23.90	0.08	0.01	29.10	0.00	0.00
18.80	0.12	0.01	24.00	0.07	0.01	29.20	0.00	0.00
18.90	0.12	0.01	24.10	0.00	0.00	29.30	0.00	0.00
19.00	0.12	0.01	24.20	0.00	0.00	29.40	0.00	0.00
19.10	0.12	0.01	24.30	0.00	0.00	29.50	0.00	0.00
19.20	0.12	0.01	24.40	0.00	0.00	29.60	0.00	0.00
19.30	0.12	0.01	24.50	0.00	0.00	29.70	0.00	0.00
19.40	0.11	0.01	24.60	0.00	0.00	29.80	0.00	0.00
19.50	0.11	0.01	24.70	0.00	0.00	29.90	0.00	0.00
19.60	0.11	0.01	24.80	0.00	0.00	30.00	0.00	0.00
19.70	0.11	0.01	24.90	0.00	0.00	30.10	0.00	0.00
19.80	0.11	0.01	25.00	0.00	0.00	30.20	0.00	0.00
19.90	0.11	0.01	25.10	0.00	0.00	30.30	0.00	0.00
20.00	0.11	0.01	25.20	0.00	0.00	30.40	0.00	0.00
20.10	0.11	0.01	25.30	0.00	0.00	30.50	0.00	0.00
20.20	0.11	0.01	25.40	0.00	0.00	30.60	0.00	0.00
20.30	0.11	0.01	25.50	0.00	0.00	30.70	0.00	0.00
20.40	0.11	0.01	25.60	0.00	0.00	30.80	0.00	0.00
20.50	0.11	0.01	25.70	0.00	0.00	30.90	0.00	0.00
20.60	0.11	0.01	25.80	0.00	0.00	31.00	0.00	0.00
20.70	0.10	0.01	25.90	0.00	0.00	31.10	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
31.20	0.00	0.00	36.40	0.00	0.00	41.60	0.00	0.00
31.30	0.00	0.00	36.50	0.00	0.00	41.70	0.00	0.00
31.40	0.00	0.00	36.60	0.00	0.00	41.80	0.00	0.00
31.50	0.00	0.00	36.70	0.00	0.00	41.90	0.00	0.00
31.60	0.00	0.00	36.80	0.00	0.00	42.00	0.00	0.00
31.70	0.00	0.00	36.90	0.00	0.00	42.10	0.00	0.00
31.80	0.00	0.00	37.00	0.00	0.00	42.20	0.00	0.00
31.90	0.00	0.00	37.10	0.00	0.00	42.30	0.00	0.00
32.00	0.00	0.00	37.20	0.00	0.00	42.40	0.00	0.00
32.10	0.00	0.00	37.30	0.00	0.00	42.50	0.00	0.00
32.20	0.00	0.00	37.40	0.00	0.00	42.60	0.00	0.00
32.30	0.00	0.00	37.50	0.00	0.00	42.70	0.00	0.00
32.40	0.00	0.00	37.60	0.00	0.00	42.80	0.00	0.00
32.50	0.00	0.00	37.70	0.00	0.00	42.90	0.00	0.00
32.60	0.00	0.00	37.80	0.00	0.00	43.00	0.00	0.00
32.70	0.00	0.00	37.90	0.00	0.00	43.10	0.00	0.00
32.80	0.00	0.00	38.00	0.00	0.00	43.20	0.00	0.00
32.90	0.00	0.00	38.10	0.00	0.00	43.30	0.00	0.00
33.00	0.00	0.00	38.20	0.00	0.00	43.40	0.00	0.00
33.10	0.00	0.00	38.30	0.00	0.00	43.50	0.00	0.00
33.20	0.00	0.00	38.40	0.00	0.00	43.60	0.00	0.00
33.30	0.00	0.00	38.50	0.00	0.00	43.70	0.00	0.00
33.40	0.00	0.00	38.60	0.00	0.00	43.80	0.00	0.00
33.50	0.00	0.00	38.70	0.00	0.00	43.90	0.00	0.00
33.60	0.00	0.00	38.80	0.00	0.00	44.00	0.00	0.00
33.70	0.00	0.00	38.90	0.00	0.00	44.10	0.00	0.00
33.80	0.00	0.00	39.00	0.00	0.00	44.20	0.00	0.00
33.90	0.00	0.00	39.10	0.00	0.00	44.30	0.00	0.00
34.00	0.00	0.00	39.20	0.00	0.00	44.40	0.00	0.00
34.10	0.00	0.00	39.30	0.00	0.00	44.50	0.00	0.00
34.20	0.00	0.00	39.40	0.00	0.00	44.60	0.00	0.00
34.30	0.00	0.00	39.50	0.00	0.00	44.70	0.00	0.00
34.40	0.00	0.00	39.60	0.00	0.00	44.80	0.00	0.00
34.50	0.00	0.00	39.70	0.00	0.00	44.90	0.00	0.00
34.60	0.00	0.00	39.80	0.00	0.00	45.00	0.00	0.00
34.70	0.00	0.00	39.90	0.00	0.00	45.10	0.00	0.00
34.80	0.00	0.00	40.00	0.00	0.00	45.20	0.00	0.00
34.90	0.00	0.00	40.10	0.00	0.00	45.30	0.00	0.00
35.00	0.00	0.00	40.20	0.00	0.00	45.40	0.00	0.00
35.10	0.00	0.00	40.30	0.00	0.00	45.50	0.00	0.00
35.20	0.00	0.00	40.40	0.00	0.00	45.60	0.00	0.00
35.30	0.00	0.00	40.50	0.00	0.00	45.70	0.00	0.00
35.40	0.00	0.00	40.60	0.00	0.00	45.80	0.00	0.00
35.50	0.00	0.00	40.70	0.00	0.00	45.90	0.00	0.00
35.60	0.00	0.00	40.80	0.00	0.00	46.00	0.00	0.00
35.70	0.00	0.00	40.90	0.00	0.00	46.10	0.00	0.00
35.80	0.00	0.00	41.00	0.00	0.00	46.20	0.00	0.00
35.90	0.00	0.00	41.10	0.00	0.00	46.30	0.00	0.00
36.00	0.00	0.00	41.20	0.00	0.00	46.40	0.00	0.00
36.10	0.00	0.00	41.30	0.00	0.00	46.50	0.00	0.00
36.20	0.00	0.00	41.40	0.00	0.00	46.60	0.00	0.00
36.30	0.00	0.00	41.50	0.00	0.00	46.70	0.00	0.00

Primary Comparison (continued)

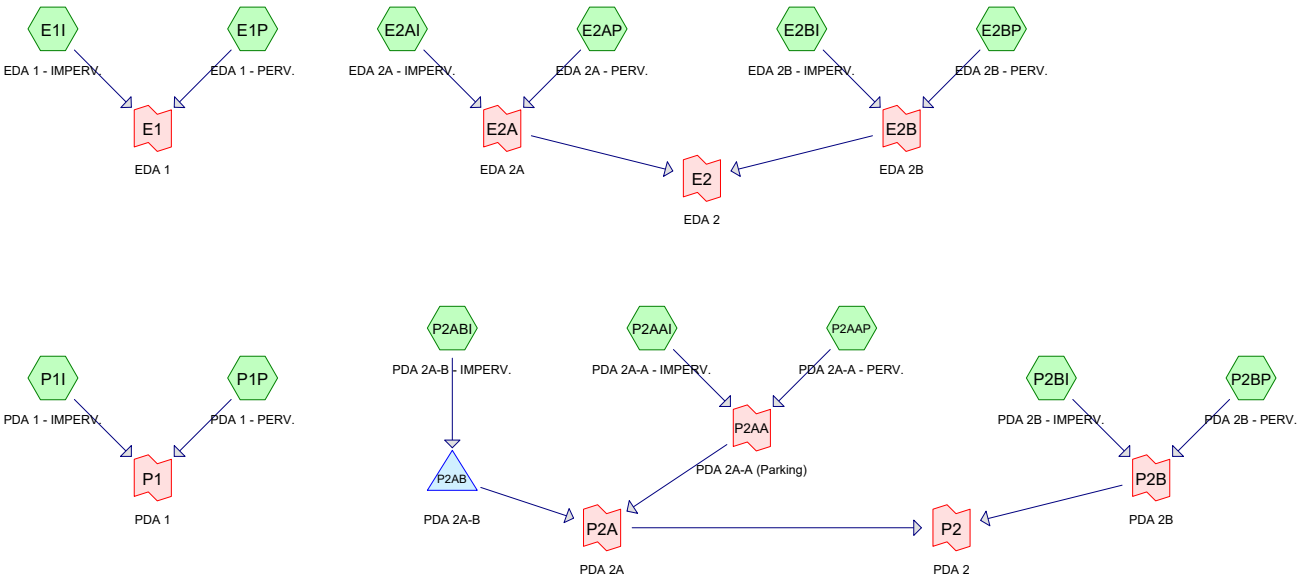
Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
46.80	0.00	0.00	52.00	0.00	0.00	57.20	0.00	0.00
46.90	0.00	0.00	52.10	0.00	0.00	57.30	0.00	0.00
47.00	0.00	0.00	52.20	0.00	0.00	57.40	0.00	0.00
47.10	0.00	0.00	52.30	0.00	0.00	57.50	0.00	0.00
47.20	0.00	0.00	52.40	0.00	0.00	57.60	0.00	0.00
47.30	0.00	0.00	52.50	0.00	0.00	57.70	0.00	0.00
47.40	0.00	0.00	52.60	0.00	0.00	57.80	0.00	0.00
47.50	0.00	0.00	52.70	0.00	0.00	57.90	0.00	0.00
47.60	0.00	0.00	52.80	0.00	0.00	58.00	0.00	0.00
47.70	0.00	0.00	52.90	0.00	0.00	58.10	0.00	0.00
47.80	0.00	0.00	53.00	0.00	0.00	58.20	0.00	0.00
47.90	0.00	0.00	53.10	0.00	0.00	58.30	0.00	0.00
48.00	0.00	0.00	53.20	0.00	0.00	58.40	0.00	0.00
48.10	0.00	0.00	53.30	0.00	0.00	58.50	0.00	0.00
48.20	0.00	0.00	53.40	0.00	0.00	58.60	0.00	0.00
48.30	0.00	0.00	53.50	0.00	0.00	58.70	0.00	0.00
48.40	0.00	0.00	53.60	0.00	0.00	58.80	0.00	0.00
48.50	0.00	0.00	53.70	0.00	0.00	58.90	0.00	0.00
48.60	0.00	0.00	53.80	0.00	0.00	59.00	0.00	0.00
48.70	0.00	0.00	53.90	0.00	0.00	59.10	0.00	0.00
48.80	0.00	0.00	54.00	0.00	0.00	59.20	0.00	0.00
48.90	0.00	0.00	54.10	0.00	0.00	59.30	0.00	0.00
49.00	0.00	0.00	54.20	0.00	0.00	59.40	0.00	0.00
49.10	0.00	0.00	54.30	0.00	0.00	59.50	0.00	0.00
49.20	0.00	0.00	54.40	0.00	0.00	59.60	0.00	0.00
49.30	0.00	0.00	54.50	0.00	0.00	59.70	0.00	0.00
49.40	0.00	0.00	54.60	0.00	0.00	59.80	0.00	0.00
49.50	0.00	0.00	54.70	0.00	0.00	59.90	0.00	0.00
49.60	0.00	0.00	54.80	0.00	0.00	60.00	0.00	0.00
49.70	0.00	0.00	54.90	0.00	0.00	60.10	0.00	0.00
49.80	0.00	0.00	55.00	0.00	0.00	60.20	0.00	0.00
49.90	0.00	0.00	55.10	0.00	0.00	60.30	0.00	0.00
50.00	0.00	0.00	55.20	0.00	0.00	60.40	0.00	0.00
50.10	0.00	0.00	55.30	0.00	0.00	60.50	0.00	0.00
50.20	0.00	0.00	55.40	0.00	0.00	60.60	0.00	0.00
50.30	0.00	0.00	55.50	0.00	0.00	60.70	0.00	0.00
50.40	0.00	0.00	55.60	0.00	0.00	60.80	0.00	0.00
50.50	0.00	0.00	55.70	0.00	0.00	60.90	0.00	0.00
50.60	0.00	0.00	55.80	0.00	0.00	61.00	0.00	0.00
50.70	0.00	0.00	55.90	0.00	0.00	61.10	0.00	0.00
50.80	0.00	0.00	56.00	0.00	0.00	61.20	0.00	0.00
50.90	0.00	0.00	56.10	0.00	0.00	61.30	0.00	0.00
51.00	0.00	0.00	56.20	0.00	0.00	61.40	0.00	0.00
51.10	0.00	0.00	56.30	0.00	0.00	61.50	0.00	0.00
51.20	0.00	0.00	56.40	0.00	0.00	61.60	0.00	0.00
51.30	0.00	0.00	56.50	0.00	0.00	61.70	0.00	0.00
51.40	0.00	0.00	56.60	0.00	0.00	61.80	0.00	0.00
51.50	0.00	0.00	56.70	0.00	0.00	61.90	0.00	0.00
51.60	0.00	0.00	56.80	0.00	0.00	62.00	0.00	0.00
51.70	0.00	0.00	56.90	0.00	0.00	62.10	0.00	0.00
51.80	0.00	0.00	57.00	0.00	0.00	62.20	0.00	0.00
51.90	0.00	0.00	57.10	0.00	0.00	62.30	0.00	0.00

Primary Comparison (continued)

Time (hours)	Link E1 (cfs)	Link P1 (cfs)	Time (hours)	Link E1 (cfs)	Link P1 (cfs)
62.40	0.00	0.00	67.60	0.00	0.00
62.50	0.00	0.00	67.70	0.00	0.00
62.60	0.00	0.00	67.80	0.00	0.00
62.70	0.00	0.00	67.90	0.00	0.00
62.80	0.00	0.00	68.00	0.00	0.00
62.90	0.00	0.00	68.10	0.00	0.00
63.00	0.00	0.00	68.20	0.00	0.00
63.10	0.00	0.00	68.30	0.00	0.00
63.20	0.00	0.00	68.40	0.00	0.00
63.30	0.00	0.00	68.50	0.00	0.00
63.40	0.00	0.00	68.60	0.00	0.00
63.50	0.00	0.00	68.70	0.00	0.00
63.60	0.00	0.00	68.80	0.00	0.00
63.70	0.00	0.00	68.90	0.00	0.00
63.80	0.00	0.00	69.00	0.00	0.00
63.90	0.00	0.00	69.10	0.00	0.00
64.00	0.00	0.00	69.20	0.00	0.00
64.10	0.00	0.00	69.30	0.00	0.00
64.20	0.00	0.00	69.40	0.00	0.00
64.30	0.00	0.00	69.50	0.00	0.00
64.40	0.00	0.00	69.60	0.00	0.00
64.50	0.00	0.00	69.70	0.00	0.00
64.60	0.00	0.00	69.80	0.00	0.00
64.70	0.00	0.00	69.90	0.00	0.00
64.80	0.00	0.00	70.00	0.00	0.00
64.90	0.00	0.00	70.10	0.00	0.00
65.00	0.00	0.00	70.20	0.00	0.00
65.10	0.00	0.00	70.30	0.00	0.00
65.20	0.00	0.00	70.40	0.00	0.00
65.30	0.00	0.00	70.50	0.00	0.00
65.40	0.00	0.00	70.60	0.00	0.00
65.50	0.00	0.00	70.70	0.00	0.00
65.60	0.00	0.00	70.80	0.00	0.00
65.70	0.00	0.00	70.90	0.00	0.00
65.80	0.00	0.00	71.00	0.00	0.00
65.90	0.00	0.00	71.10	0.00	0.00
66.00	0.00	0.00	71.20	0.00	0.00
66.10	0.00	0.00	71.30	0.00	0.00
66.20	0.00	0.00	71.40	0.00	0.00
66.30	0.00	0.00	71.50	0.00	0.00
66.40	0.00	0.00	71.60	0.00	0.00
66.50	0.00	0.00	71.70	0.00	0.00
66.60	0.00	0.00	71.80	0.00	0.00
66.70	0.00	0.00	71.90	0.00	0.00
66.80	0.00	0.00	72.00	0.00	0.00
66.90	0.00	0.00			
67.00	0.00	0.00			
67.10	0.00	0.00			
67.20	0.00	0.00			
67.30	0.00	0.00			
67.40	0.00	0.00			
67.50	0.00	0.00			

D. WATER QUALITY

- **Water Quality Storm Hydrograph**
- **Water Quality Storm Basin Drain Time**



Subcat Reach Pond Link

Routing Diagram for EX-PR
Prepared by Bohler Engineers, Printed 5/24/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment E1I: EDA 1 - IMPERV.

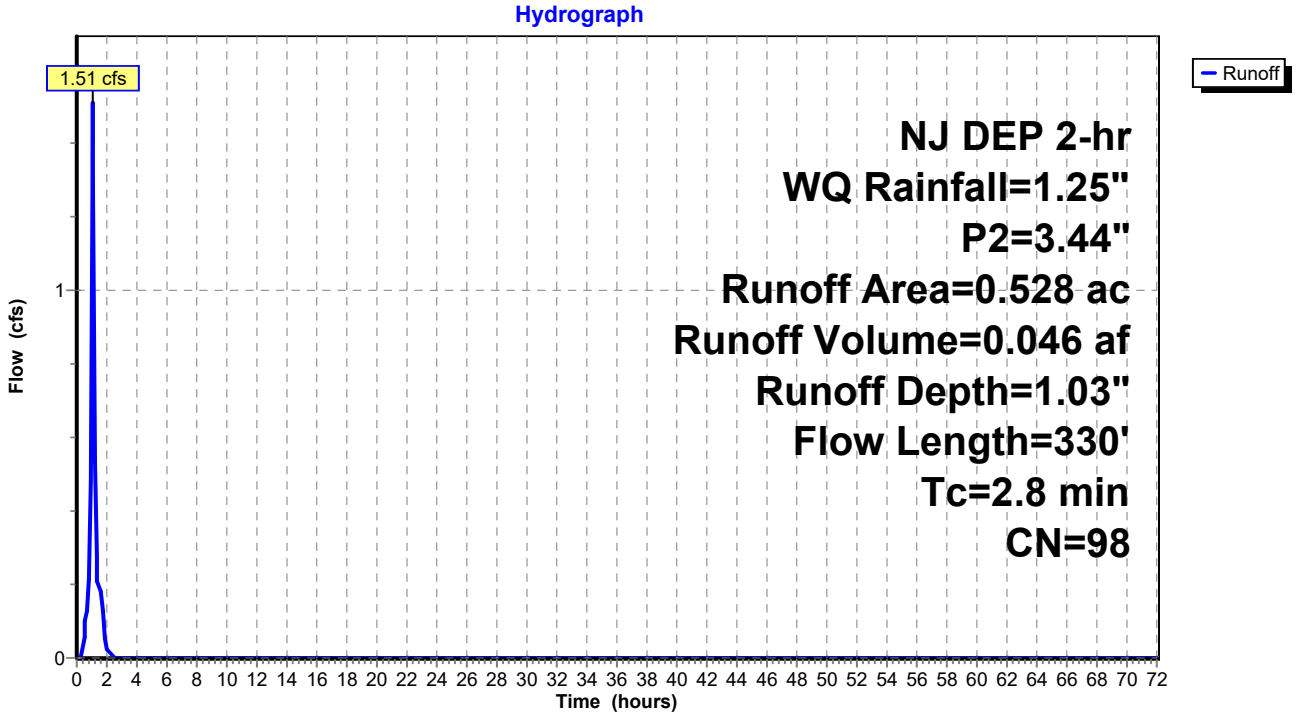
Runoff = 1.51 cfs @ 1.05 hrs, Volume= 0.046 af, Depth= 1.03"
Routed to Link E1 : EDA 1

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", P2=3.44"

Area (ac)	CN	Description
0.528	98	Paved parking, HSG B
0.528		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.43		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.44"
0.3	65	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
0.9	110	0.0100	2.03		**Shallow Concentrated Flow, C-F** Paved Kv= 20.3 fps
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
2.8	330	Total			

Subcatchment E1I: EDA 1 - IMPERV.



Summary for Subcatchment E1P: EDA 1 - PERV.

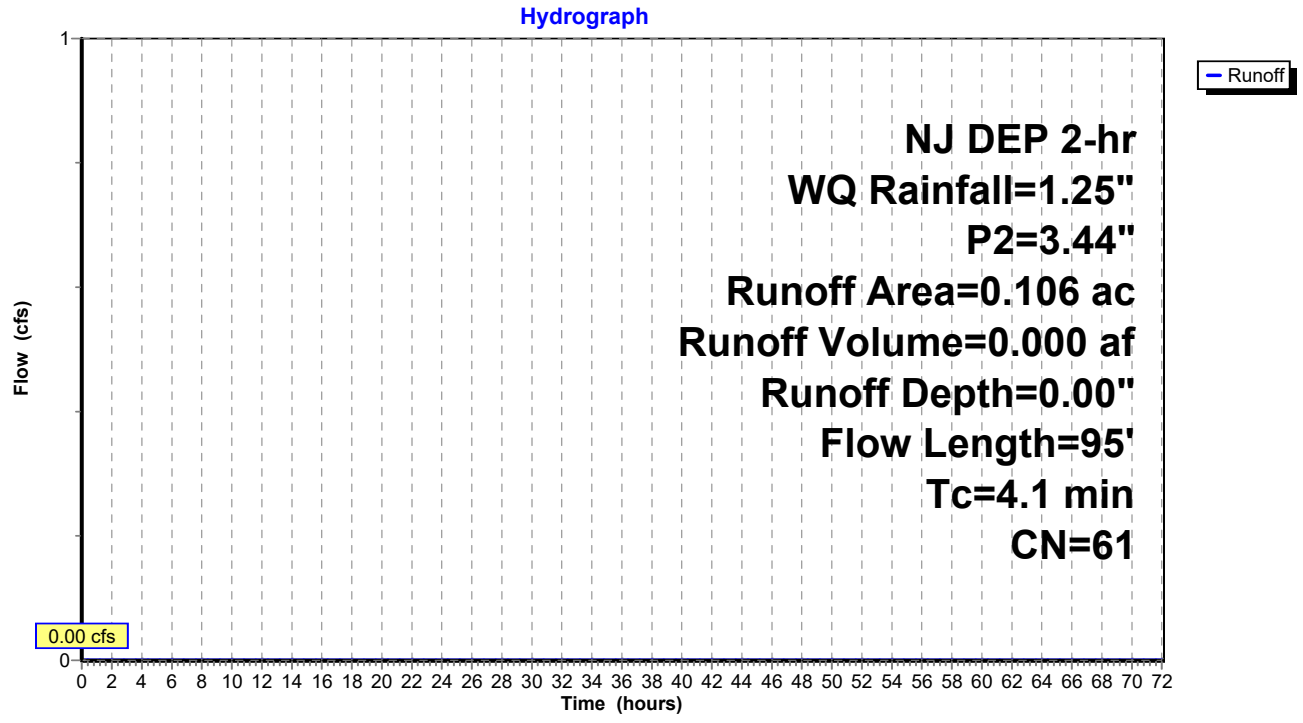
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Link E1 : EDA 1

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", P2=3.44"

Area (ac)	CN	Description
0.106	61	>75% Grass cover, Good, HSG B
0.106		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	20	0.0100	0.10		**Sheet Flow, D-E** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0325	1.26		**Sheet Flow, E-F** Smooth surfaces n= 0.011 P2= 3.44"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow, F-POA 1** Paved Kv= 20.3 fps
4.1	95	Total			

Subcatchment E1P: EDA 1 - PERV.



Summary for Subcatchment E2AI: EDA 2A - IMPERV.

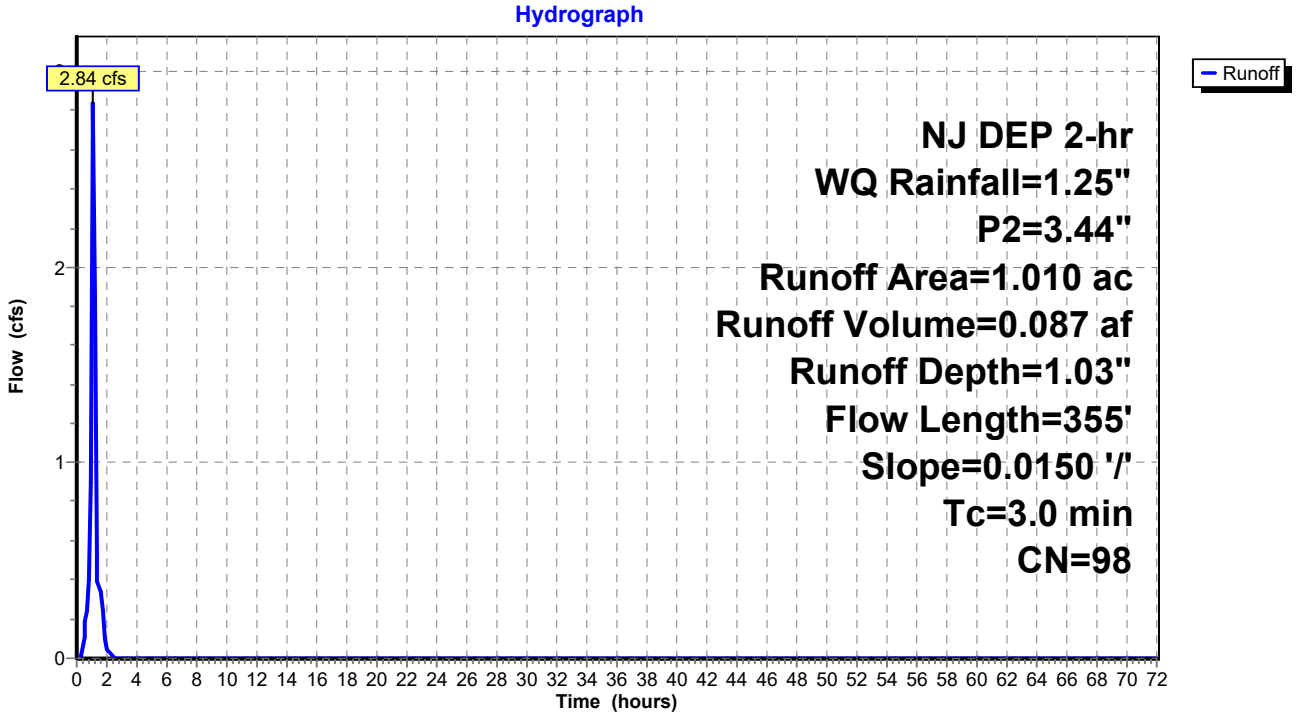
Runoff = 2.84 cfs @ 1.05 hrs, Volume= 0.087 af, Depth= 1.03"
Routed to Link E2A : EDA 2A

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", P2=3.44"

Area (ac)	CN	Description
1.010	98	Paved parking, HSG B
1.010		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, G-H** Smooth surfaces n= 0.011 P2= 3.44"
1.7	255	0.0150	2.49		**Shallow Concentrated Flow, H-POA 2A** Paved Kv= 20.3 fps
3.0	355	Total			

Subcatchment E2AI: EDA 2A - IMPERV.



Summary for Subcatchment E2AP: EDA 2A - PERV.

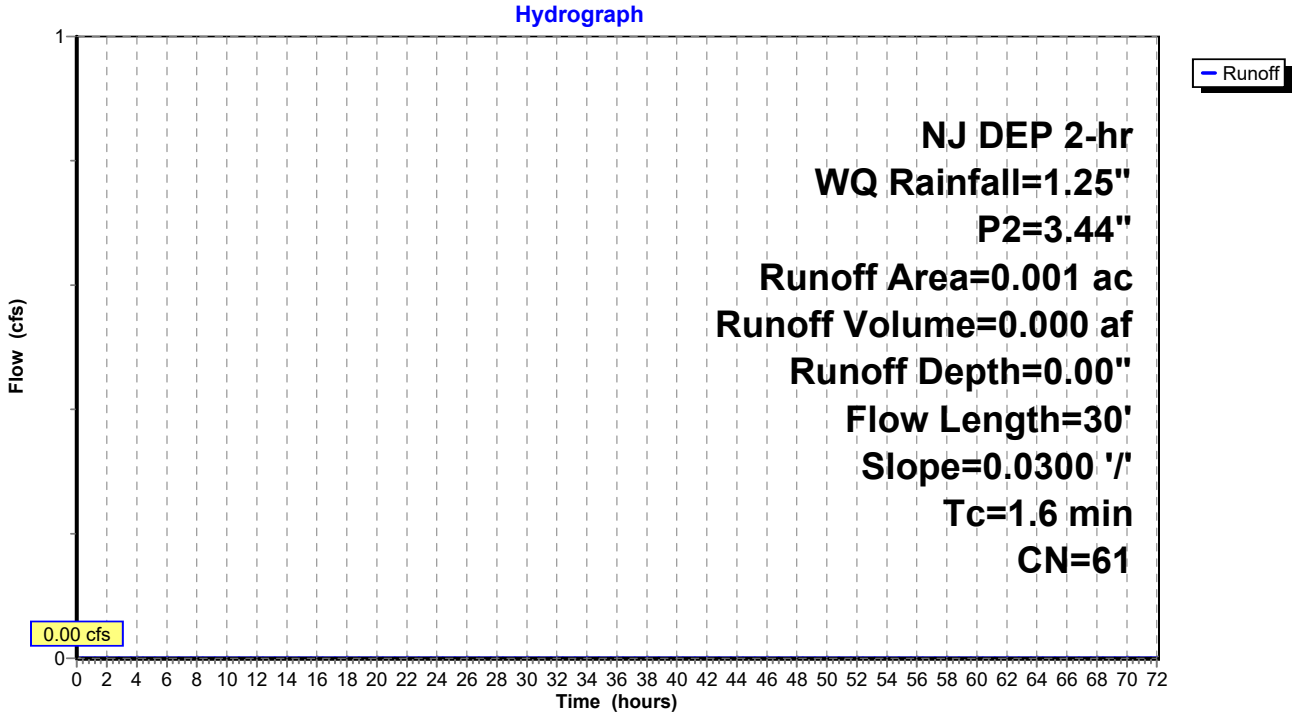
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Link E2A : EDA 2A

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", P2=3.44"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	10	0.0300	0.13		**Sheet Flow, I-J** Grass: Short n= 0.150 P2= 3.44"
0.3	20	0.0300	1.22		**Sheet Flow, J-POA 2A** Smooth surfaces n= 0.011 P2= 3.44"
1.6	30	Total			

Subcatchment E2AP: EDA 2A - PERV.



Summary for Subcatchment E2BI: EDA 2B - IMPERV.

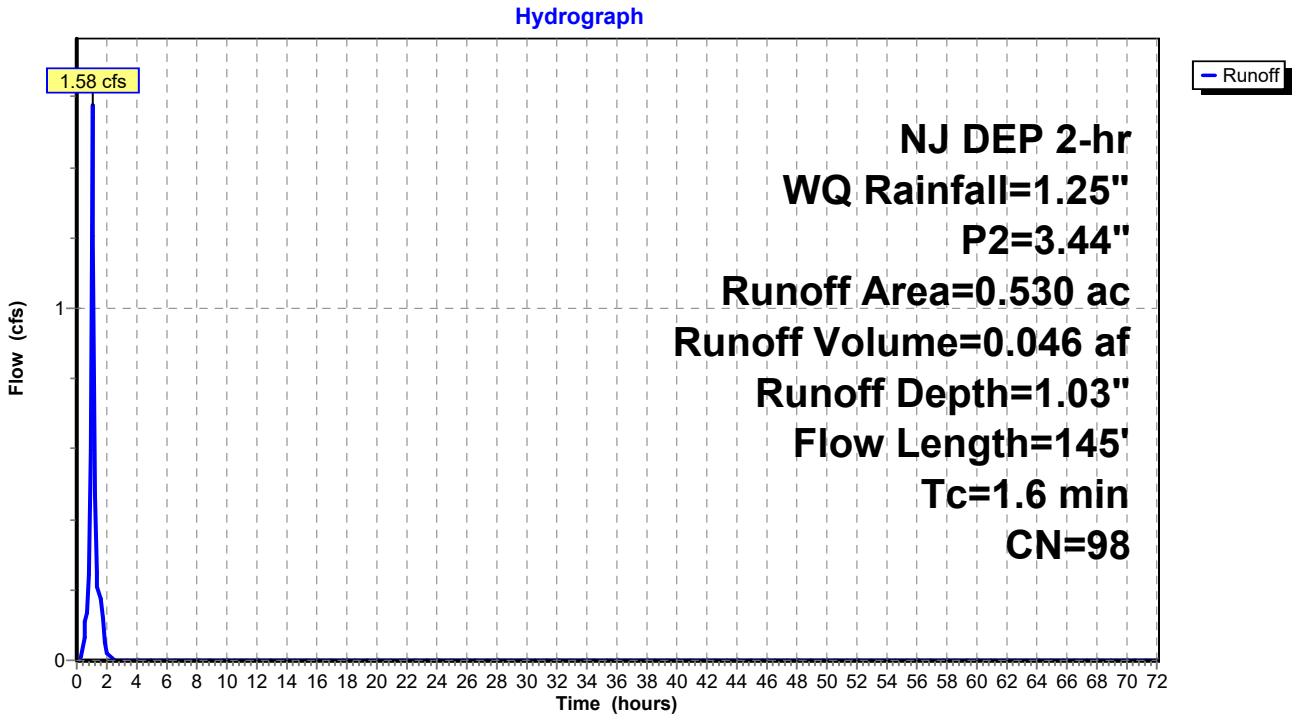
Runoff = 1.58 cfs @ 1.02 hrs, Volume= 0.046 af, Depth= 1.03"
Routed to Link E2B : EDA 2B

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", P2=3.44"

Area (ac)	CN	Description
0.530	98	Paved parking, HSG B
0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	20	0.0425	4.18		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
1.6	145	Total			

Subcatchment E2BI: EDA 2B - IMPERV.



Summary for Subcatchment E2BP: EDA 2B - PERV.

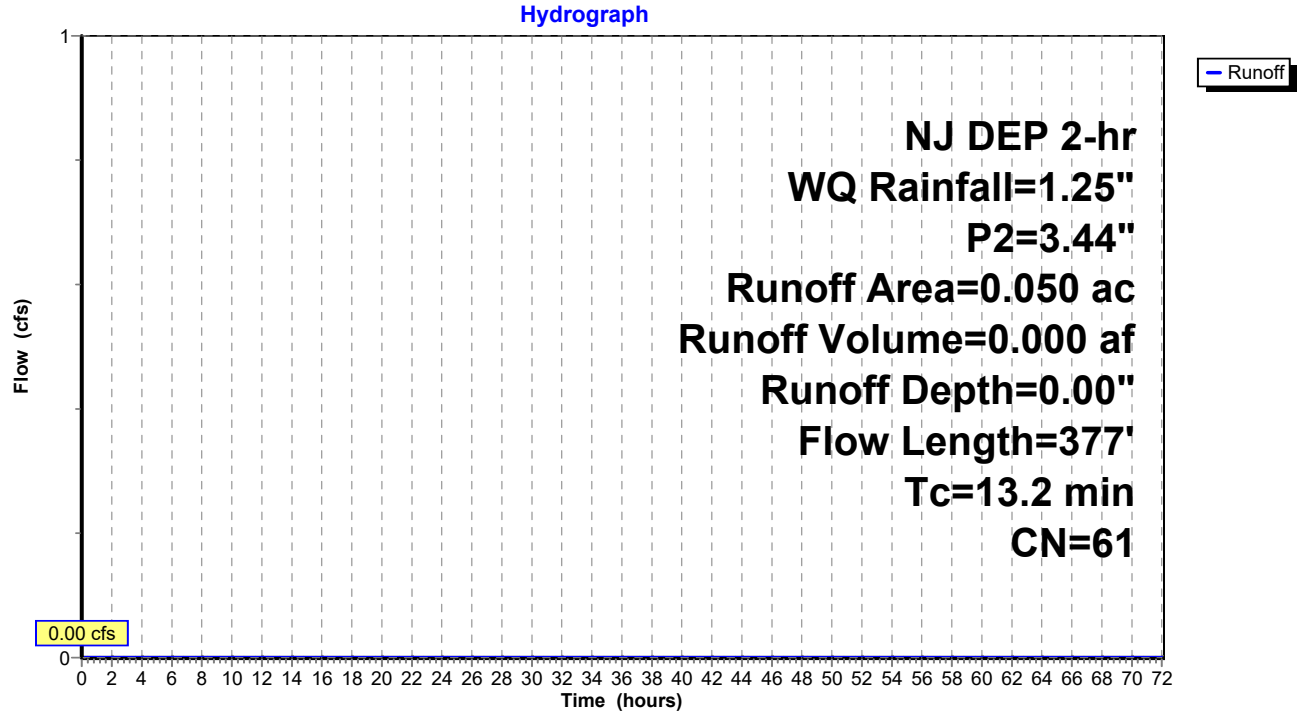
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Link E2B : EDA 2B

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", P2=3.44"

Area (ac)	CN	Description
0.050	61	>75% Grass cover, Good, HSG B
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
0.9	45	0.0150	0.86		**Shallow Concentrated Flow, N-O** Short Grass Pasture Kv= 7.0 fps
3.1	225	0.0035	1.20		**Shallow Concentrated Flow, O-P** Paved Kv= 20.3 fps
0.2	25	0.0130	2.31		**Shallow Concentrated Flow, P-POA 2A** Paved Kv= 20.3 fps
13.2	377	Total			

Subcatchment E2BP: EDA 2B - PERV.



Summary for Subcatchment P1I: PDA 1 - IMPERV.

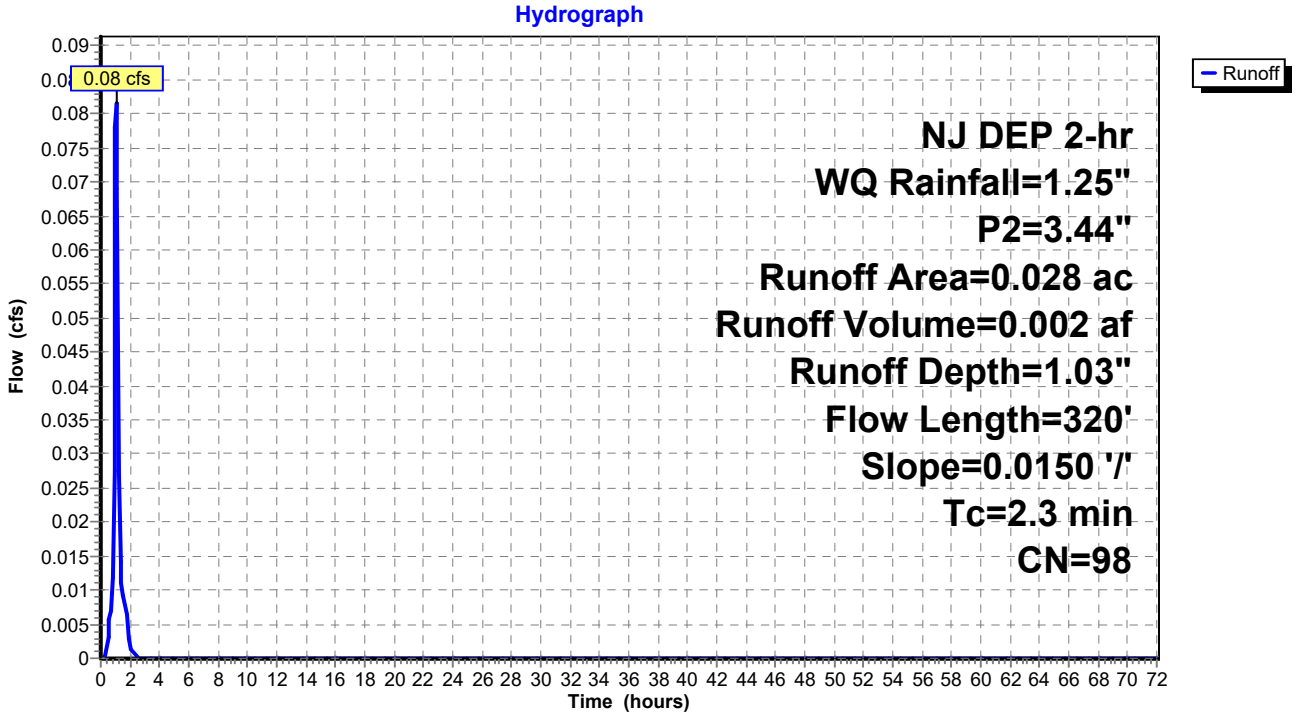
Runoff = 0.08 cfs @ 1.03 hrs, Volume= 0.002 af, Depth= 1.03"
Routed to Link P1 : PDA 1

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", P2=3.44"

Area (ac)	CN	Description
0.028	98	Paved parking, HSG D
0.028		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0150	0.87		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.44"
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
2.3	320	Total			

Subcatchment P1I: PDA 1 - IMPERV.



Summary for Subcatchment P1P: PDA 1 - PERV.

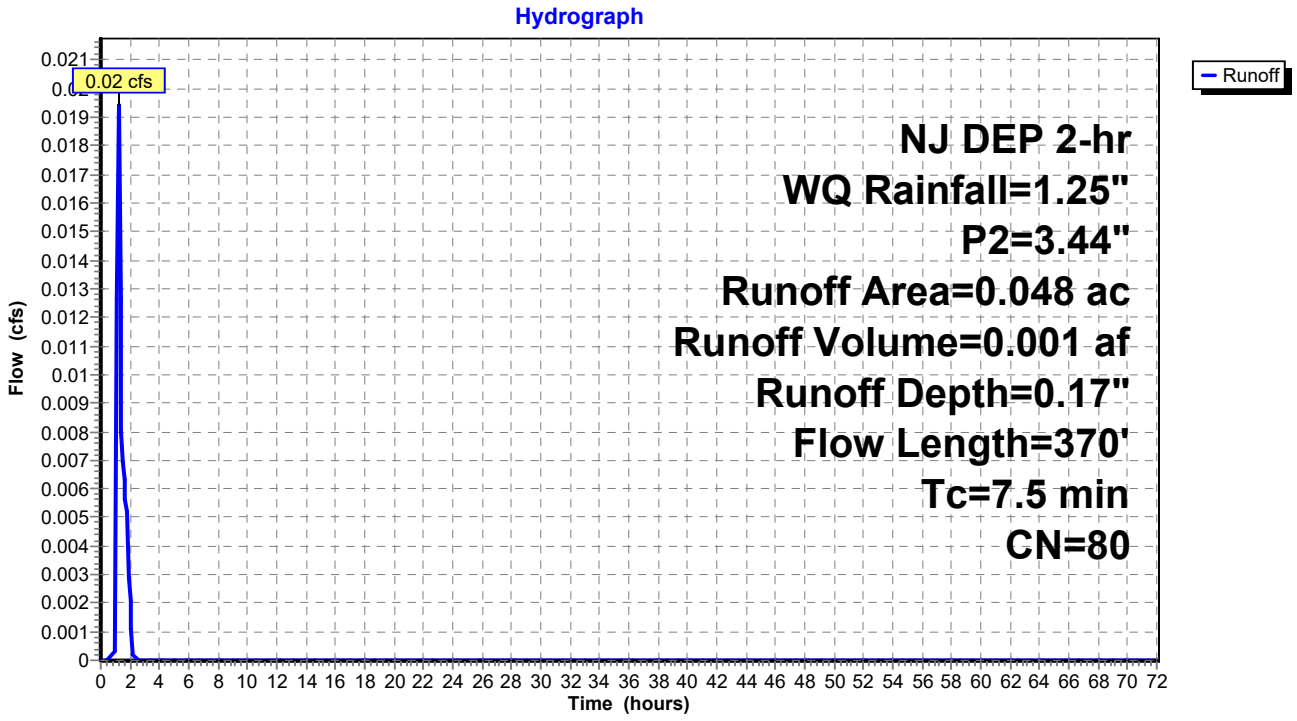
Runoff = 0.02 cfs @ 1.20 hrs, Volume= 0.001 af, Depth= 0.17"
Routed to Link P1 : PDA 1

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", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.44"
0.1	15	0.0150	2.49		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
2.0	305	0.0150	2.49		**Shallow Concentrated Flow, C-POA 1** Paved Kv= 20.3 fps
7.5	370	Total			

Subcatchment P1P: PDA 1 - PERV.



Summary for Subcatchment P2AAI: PDA 2A-A - IMPERV.

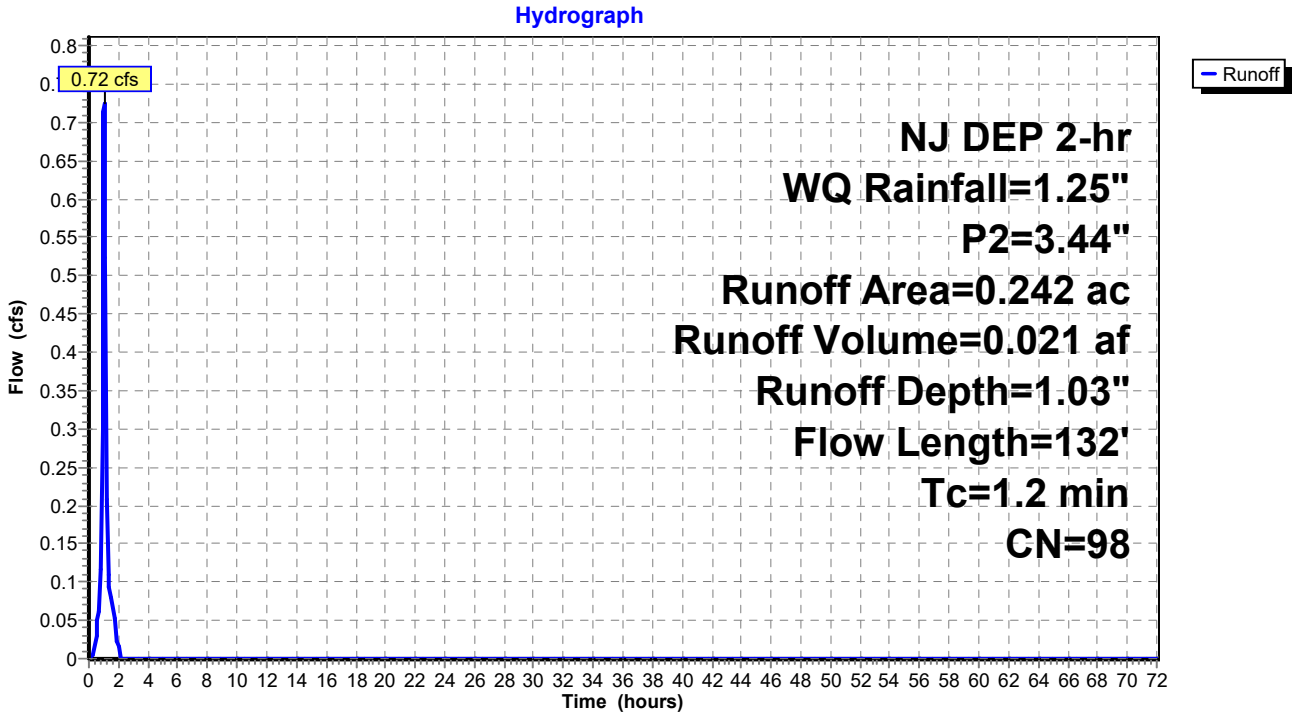
Runoff = 0.72 cfs @ 1.02 hrs, Volume= 0.021 af, Depth= 1.03"
Routed to Link P2AA : PDA 2A-A (Parking)

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", P2=3.44"

Area (ac)	CN	Description
0.242	98	Paved parking, HSG D
0.242		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.56		**Sheet Flow, J-I** Smooth surfaces n= 0.011 P2= 3.44"
0.1	32	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
1.2	132	Total			

Subcatchment P2AAI: PDA 2A-A - IMPERV.



Summary for Subcatchment P2AAP: PDA 2A-A - PERV.

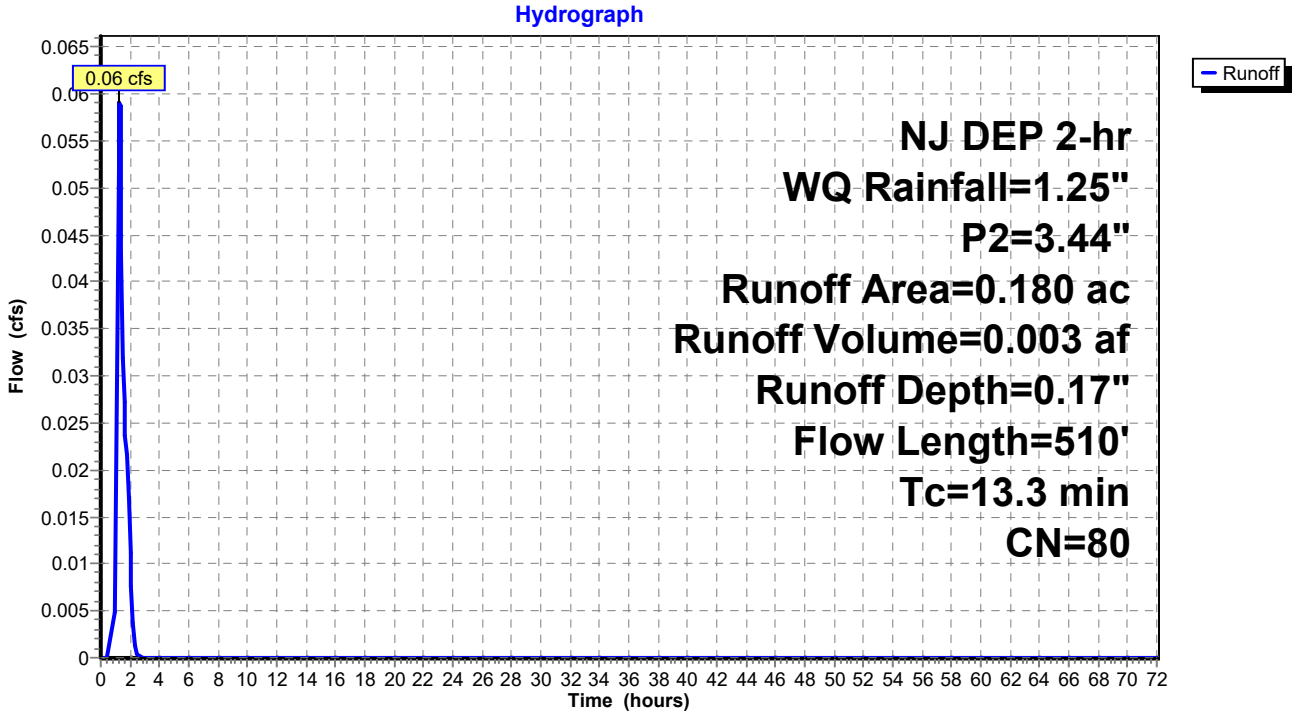
Runoff = 0.06 cfs @ 1.28 hrs, Volume= 0.003 af, Depth= 0.17"
Routed to Link P2AA : PDA 2A-A (Parking)

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", P2=3.44"

Area (ac)	CN	Description
0.180	80	>75% Grass cover, Good, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	82	0.0150	0.15		**Sheet Flow, D-F** Grass: Short n= 0.150 P2= 3.44" Using McCuen-Spiess flow length
3.3	170	0.0150	0.86		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.3	61	0.0050	3.21	2.52	**Pipe Channel, G-H** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	75	0.0050	3.72	4.57	**Pipe Channel, G-H** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
0.3	99	0.0100	5.94	10.50	**Pipe Channel, H-I** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
0.1	23	0.0100	5.94	10.50	**Pipe Channel, I-POA 2A** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
13.3	510	Total			

Subcatchment P2AAP: PDA 2A-A - PERV.



Summary for Subcatchment P2ABI: PDA 2A-B - IMPERV.

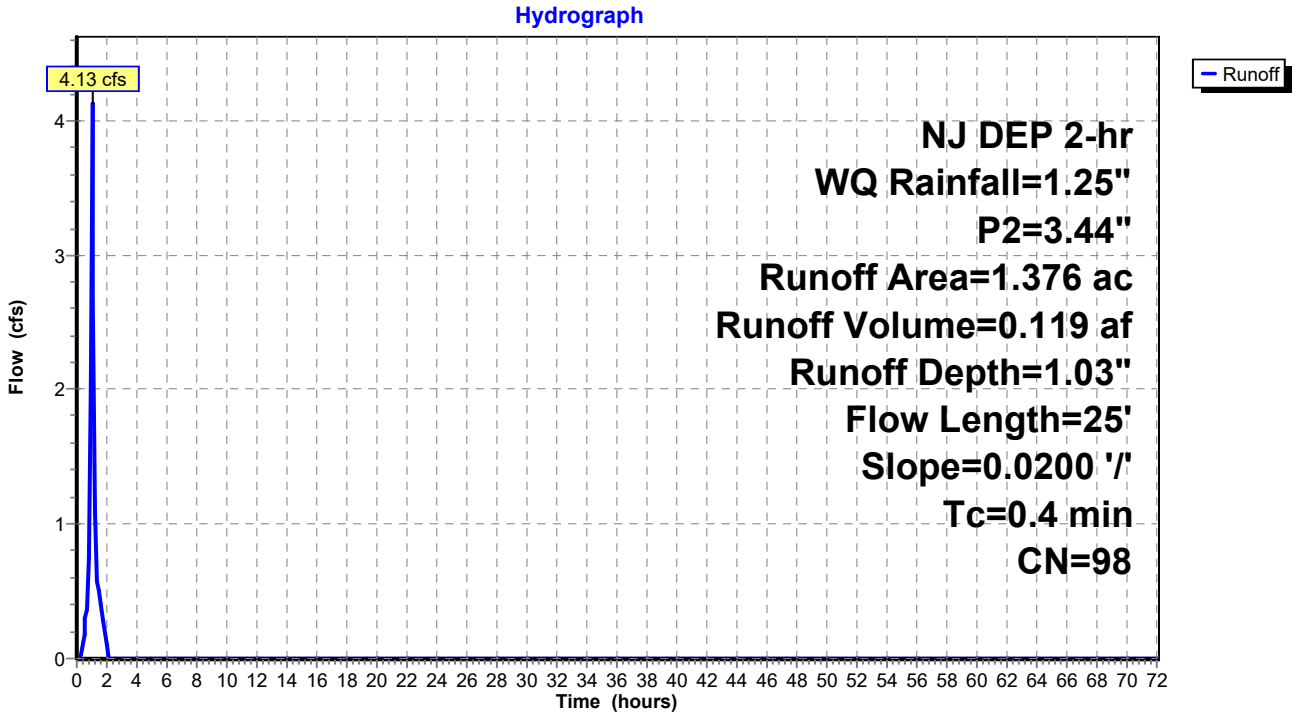
Runoff = 4.13 cfs @ 1.01 hrs, Volume= 0.119 af, Depth= 1.03"
Routed to Pond P2AB : PDA 2A-B

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", P2=3.44"

Area (ac)	CN	Description
1.376	98	Roofs, HSG D
1.376		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.08		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.44"

Subcatchment P2ABI: PDA 2A-B - IMPERV.



Summary for Subcatchment P2BI: PDA 2B - IMPERV.

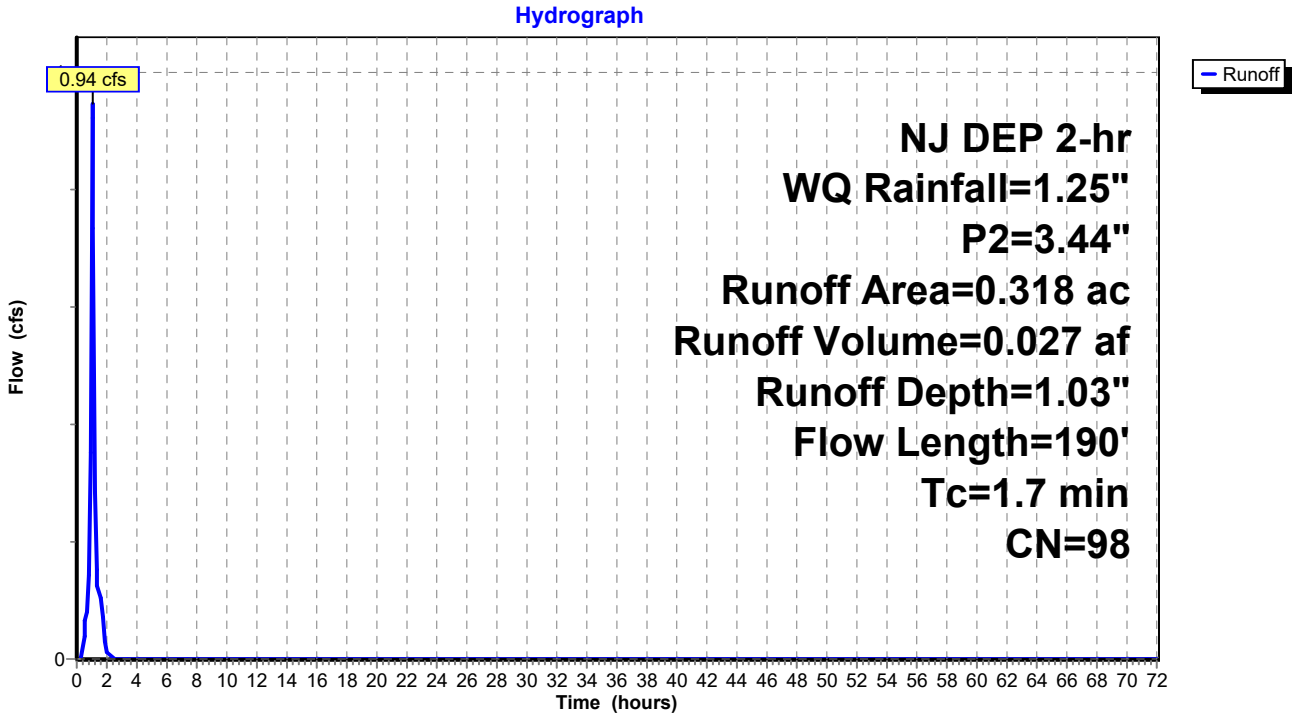
Runoff = 0.94 cfs @ 1.03 hrs, Volume= 0.027 af, Depth= 1.03"
Routed to Link P2B : PDA 2B

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", P2=3.44"

Area (ac)	CN	Description
0.318	98	Paved parking, HSG D
0.318		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.27		**Sheet Flow, K-L** Smooth surfaces n= 0.011 P2= 3.44"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, L-P** Paved Kv= 20.3 fps
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	190	Total			

Subcatchment P2BI: PDA 2B - IMPERV.



Summary for Subcatchment P2BP: PDA 2B - PERV.

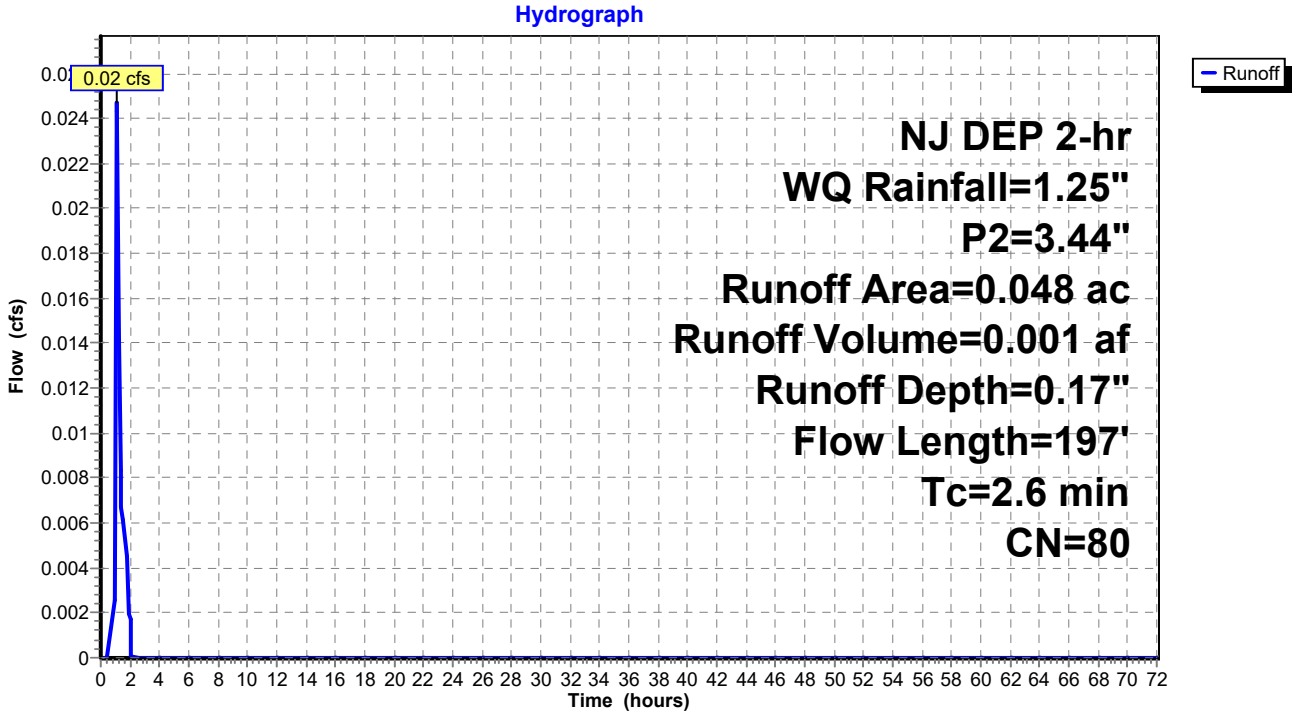
Runoff = 0.02 cfs @ 1.12 hrs, Volume= 0.001 af, Depth= 0.17"
Routed to Link P2B : PDA 2B

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", P2=3.44"

Area (ac)	CN	Description
0.048	80	>75% Grass cover, Good, HSG D
0.048		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow, M-N** Grass: Short n= 0.150 P2= 3.44"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, N-O** Paved Kv= 20.3 fps
0.0	9	0.0050	4.84	5.94	**Pipe Channel, O-P** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.2	59	0.0050	4.84	5.94	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.1	19	0.0050	3.72	4.57	**Pipe Channel, P-POA 2B** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Concrete pipe, bends & connections
2.6	197	Total			

Subcatchment P2BP: PDA 2B - PERV.



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 1.03" for WQ event
Inflow = 4.13 cfs @ 1.01 hrs, Volume= 0.119 af
Outflow = 0.00 cfs @ 2.10 hrs, Volume= 0.001 af, Atten= 100%, Lag= 65.5 min
Primary = 0.00 cfs @ 2.10 hrs, Volume= 0.001 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 131.25' @ 2.10 hrs Surf.Area= 10,098 sf Storage= 5,167 cf

Plug-Flow detention time= 631.3 min calculated for 0.001 af (1% of inflow)
Center-of-Mass det. time= 589.7 min (654.8 - 65.1)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

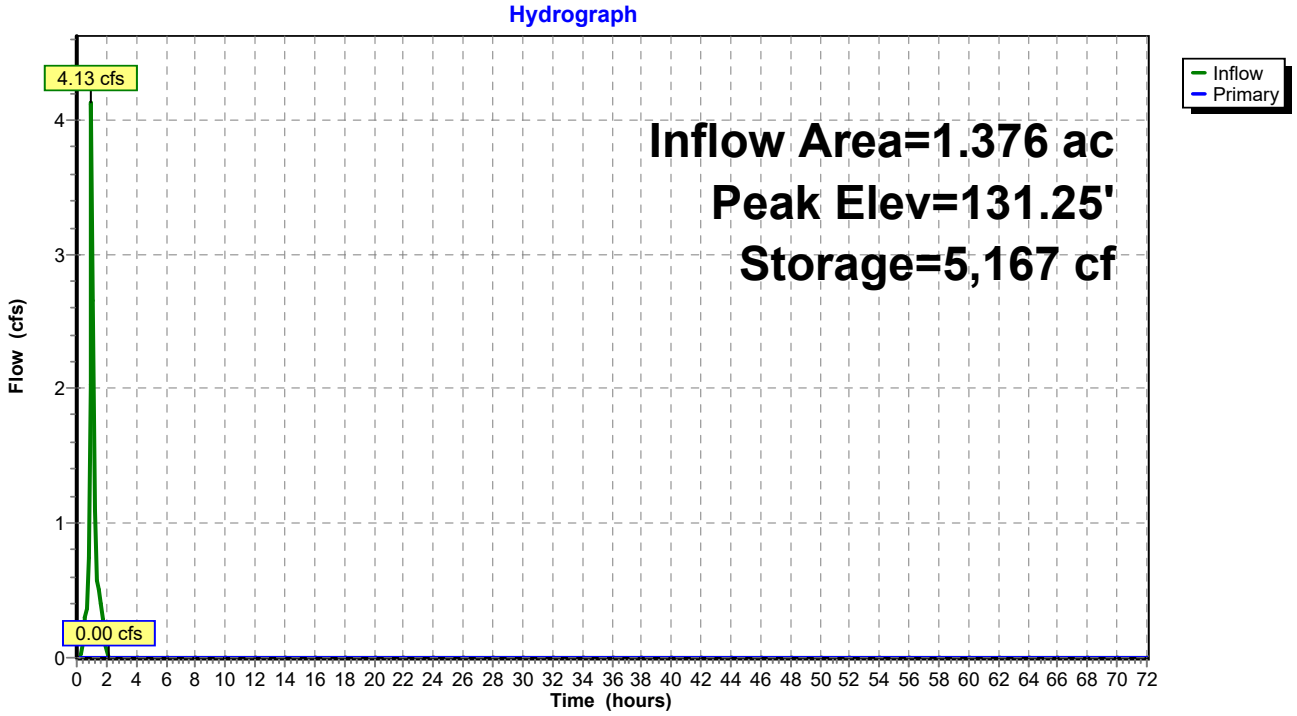
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 2.10 hrs HW=131.25' (Free Discharge)
└─**1=Culvert** (Passes 0.00 cfs of 4.94 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.22 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P2AB: PDA 2A-B

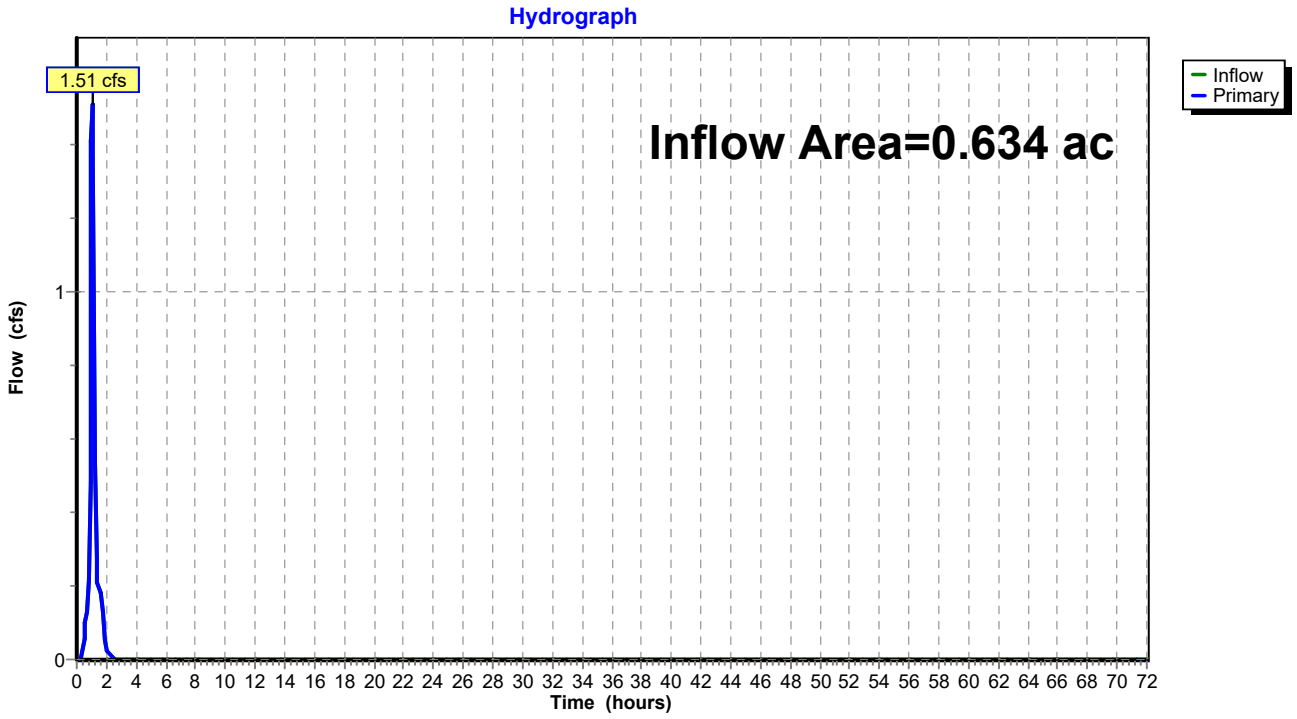


Summary for Link E1: EDA 1

Inflow Area = 0.634 ac, 83.28% Impervious, Inflow Depth = 0.86" for WQ event
Inflow = 1.51 cfs @ 1.05 hrs, Volume= 0.046 af
Primary = 1.51 cfs @ 1.05 hrs, Volume= 0.046 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

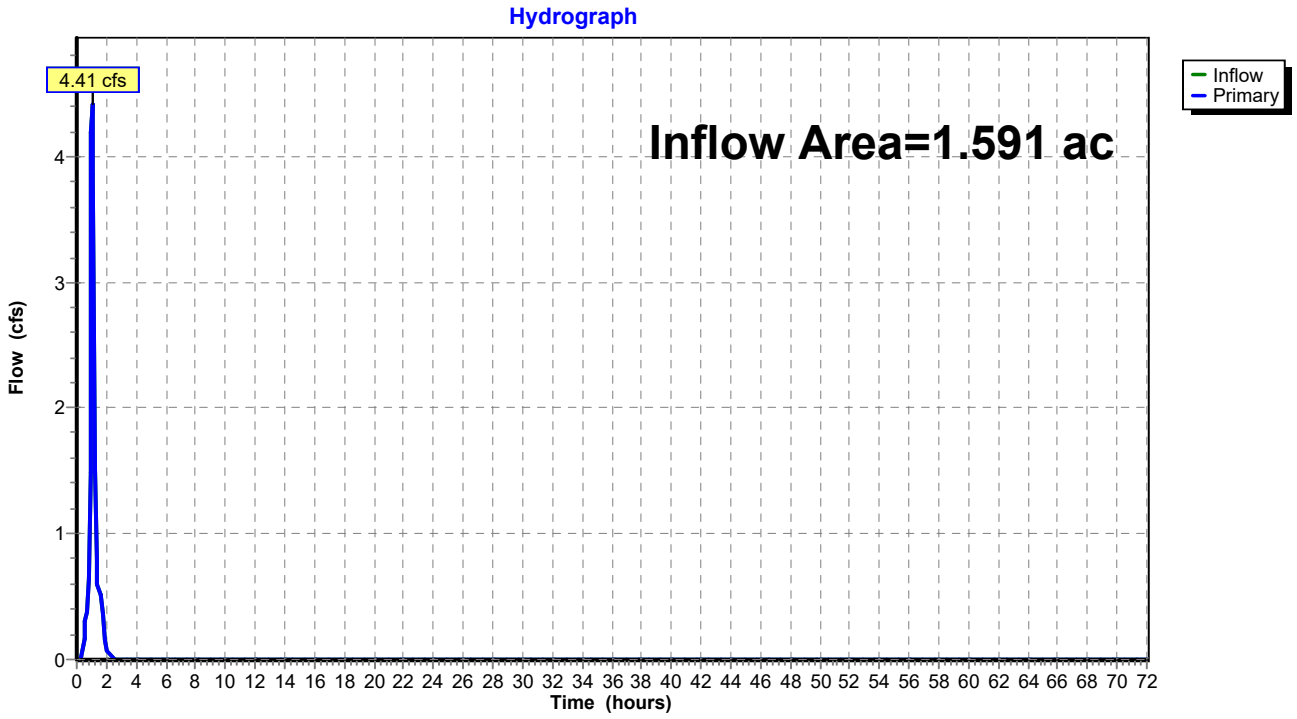


Summary for Link E2: EDA 2

Inflow Area = 1.591 ac, 96.79% Impervious, Inflow Depth = 1.00" for WQ event
Inflow = 4.41 cfs @ 1.04 hrs, Volume= 0.133 af
Primary = 4.41 cfs @ 1.04 hrs, Volume= 0.133 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

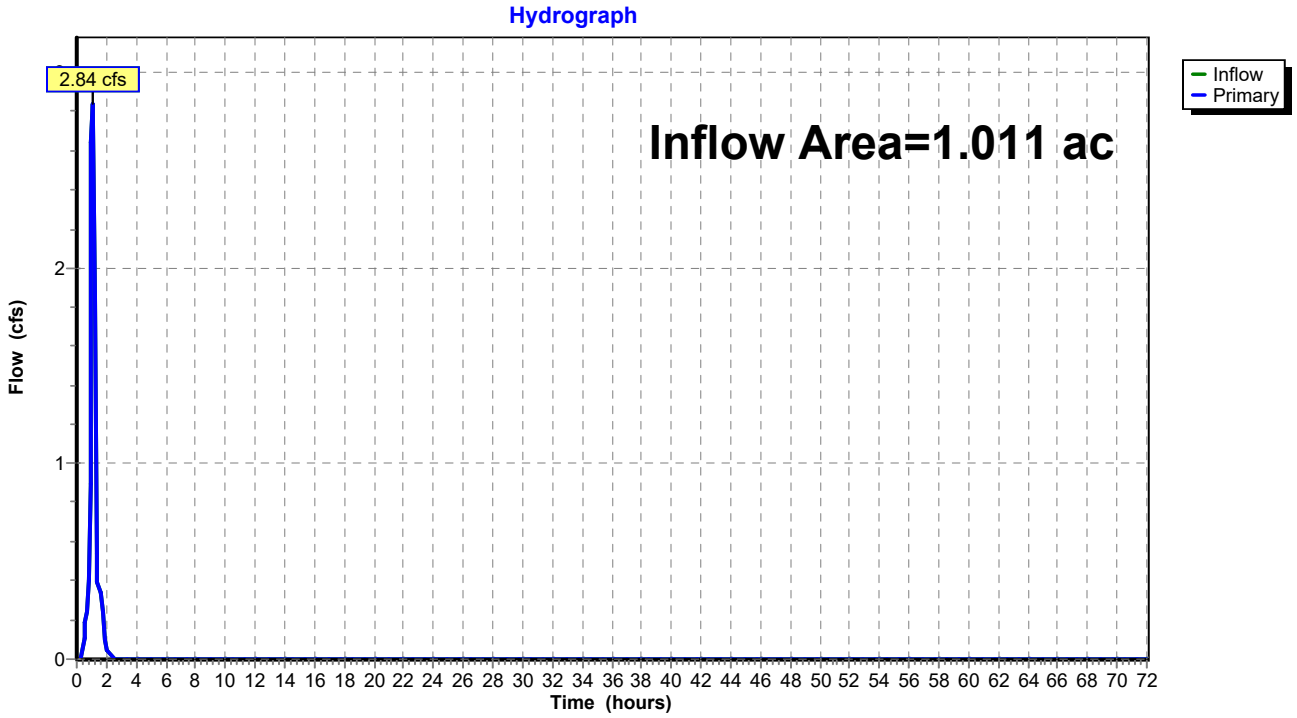


Summary for Link E2A: EDA 2A

Inflow Area = 1.011 ac, 99.90% Impervious, Inflow Depth = 1.03" for WQ event
Inflow = 2.84 cfs @ 1.05 hrs, Volume= 0.087 af
Primary = 2.84 cfs @ 1.05 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2A: EDA 2A

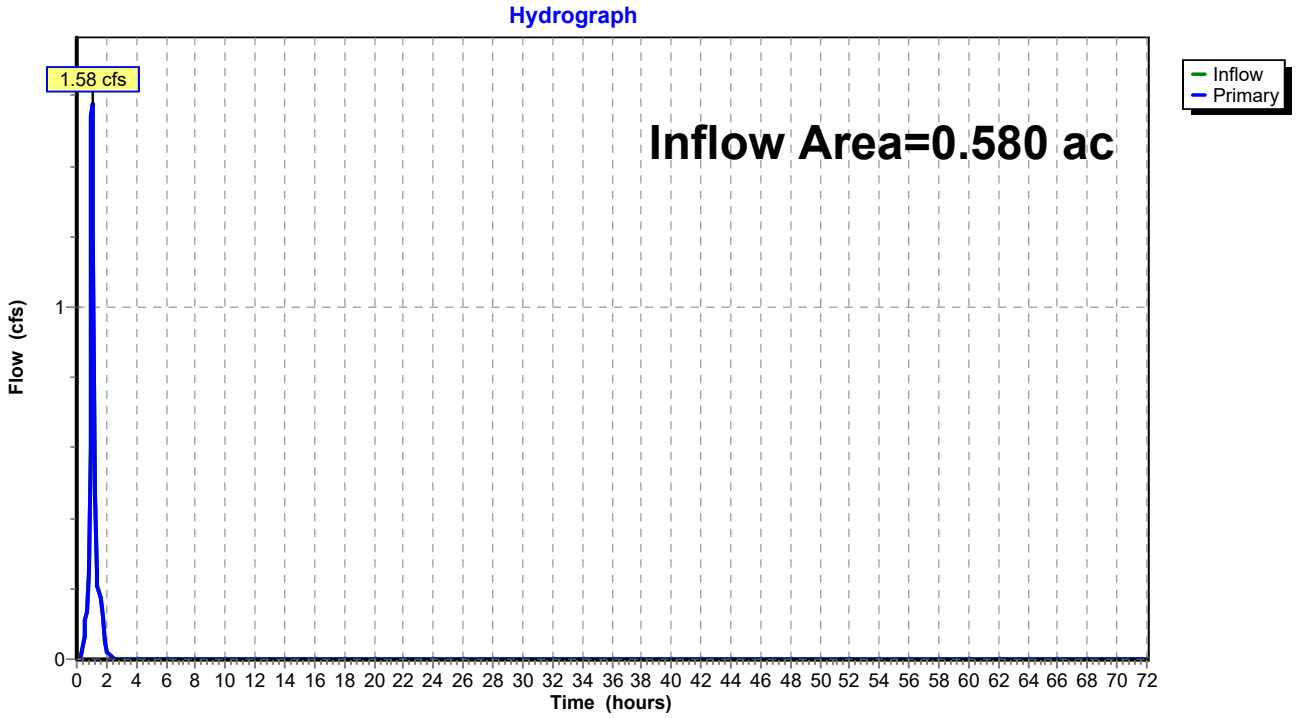


Summary for Link E2B: EDA 2B

Inflow Area = 0.580 ac, 91.38% Impervious, Inflow Depth = 0.95" for WQ event
Inflow = 1.58 cfs @ 1.02 hrs, Volume= 0.046 af
Primary = 1.58 cfs @ 1.02 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

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

Link E2B: EDA 2B

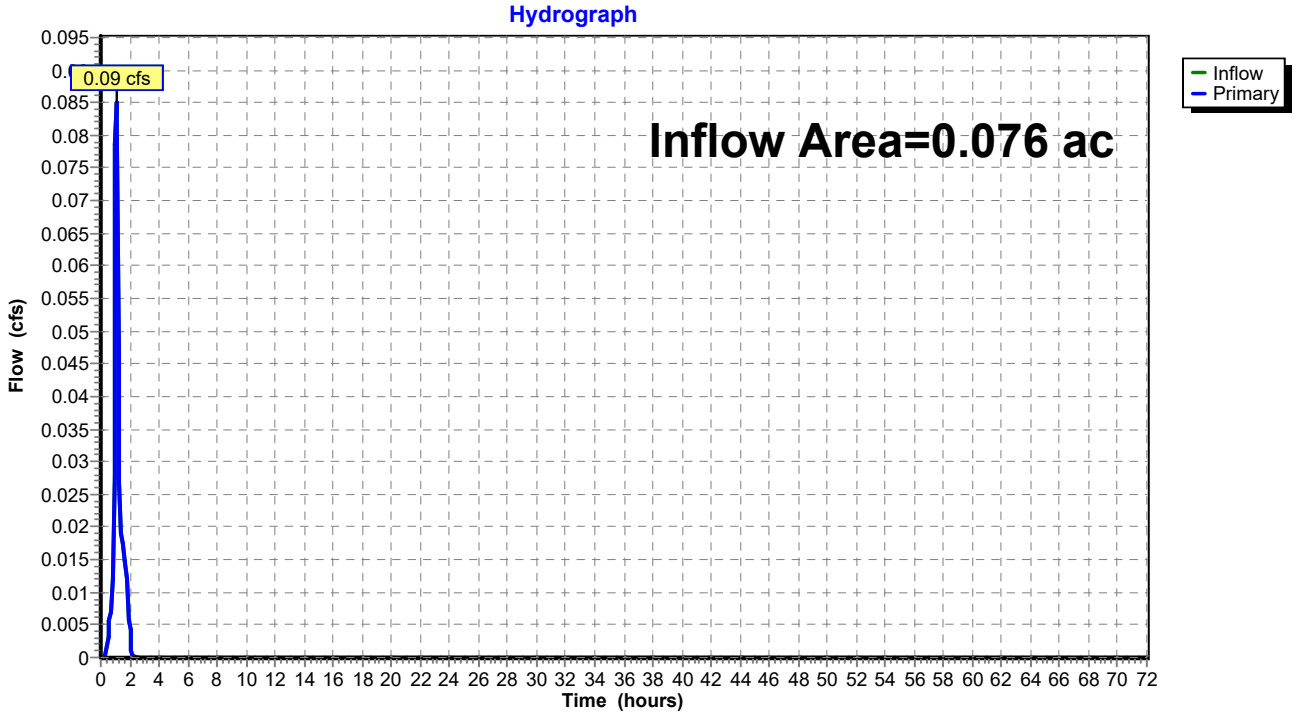


Summary for Link P1: PDA 1

Inflow Area = 0.076 ac, 36.84% Impervious, Inflow Depth = 0.49" for WQ event
Inflow = 0.09 cfs @ 1.06 hrs, Volume= 0.003 af
Primary = 0.09 cfs @ 1.06 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 P1: PDA 1

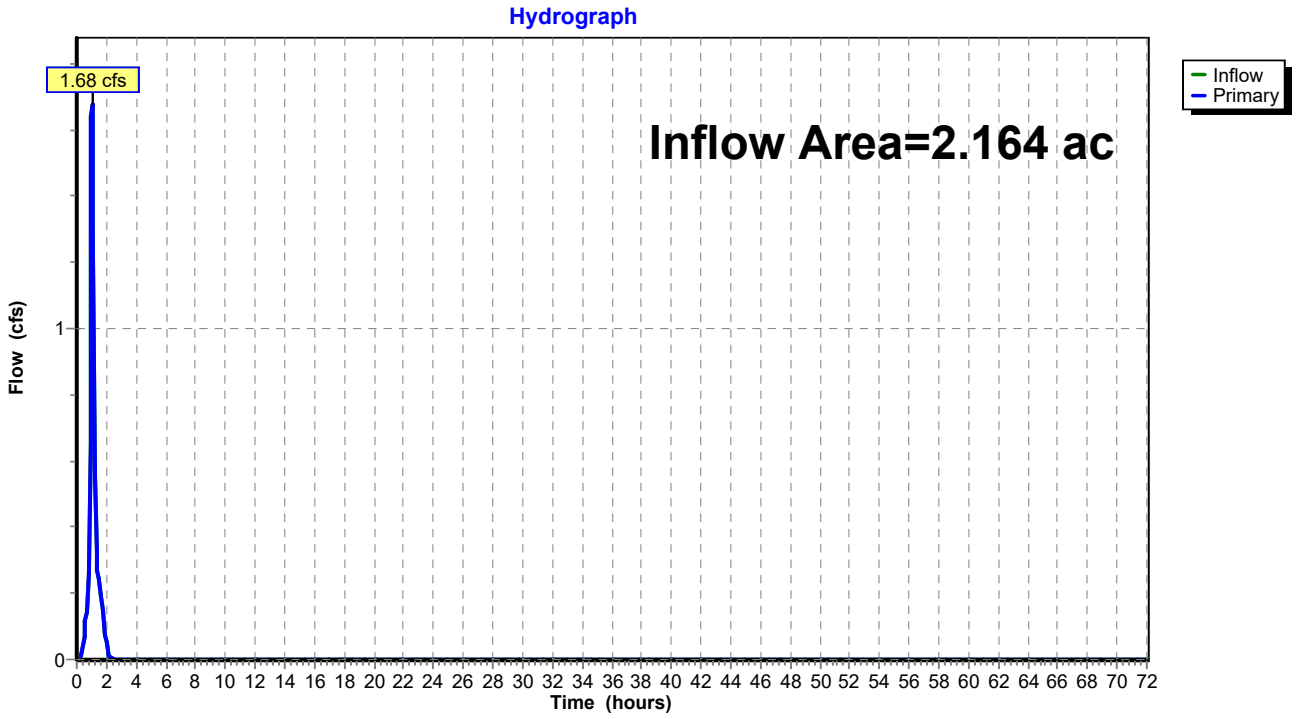


Summary for Link P2: PDA 2

Inflow Area = 2.164 ac, 89.46% Impervious, Inflow Depth = 0.29" for WQ event
Inflow = 1.68 cfs @ 1.02 hrs, Volume= 0.052 af
Primary = 1.68 cfs @ 1.02 hrs, Volume= 0.052 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

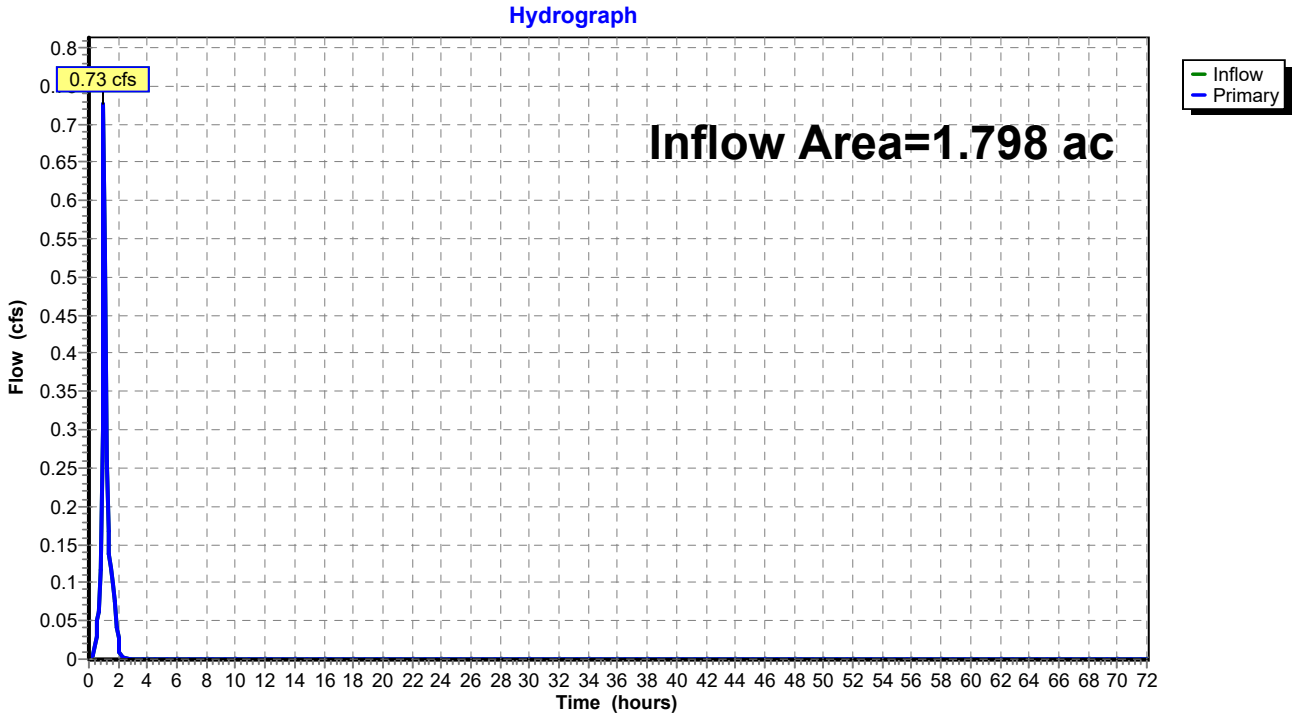


Summary for Link P2A: PDA 2A

Inflow Area = 1.798 ac, 89.99% Impervious, Inflow Depth = 0.16" for WQ event
Inflow = 0.73 cfs @ 1.02 hrs, Volume= 0.024 af
Primary = 0.73 cfs @ 1.02 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2A: PDA 2A

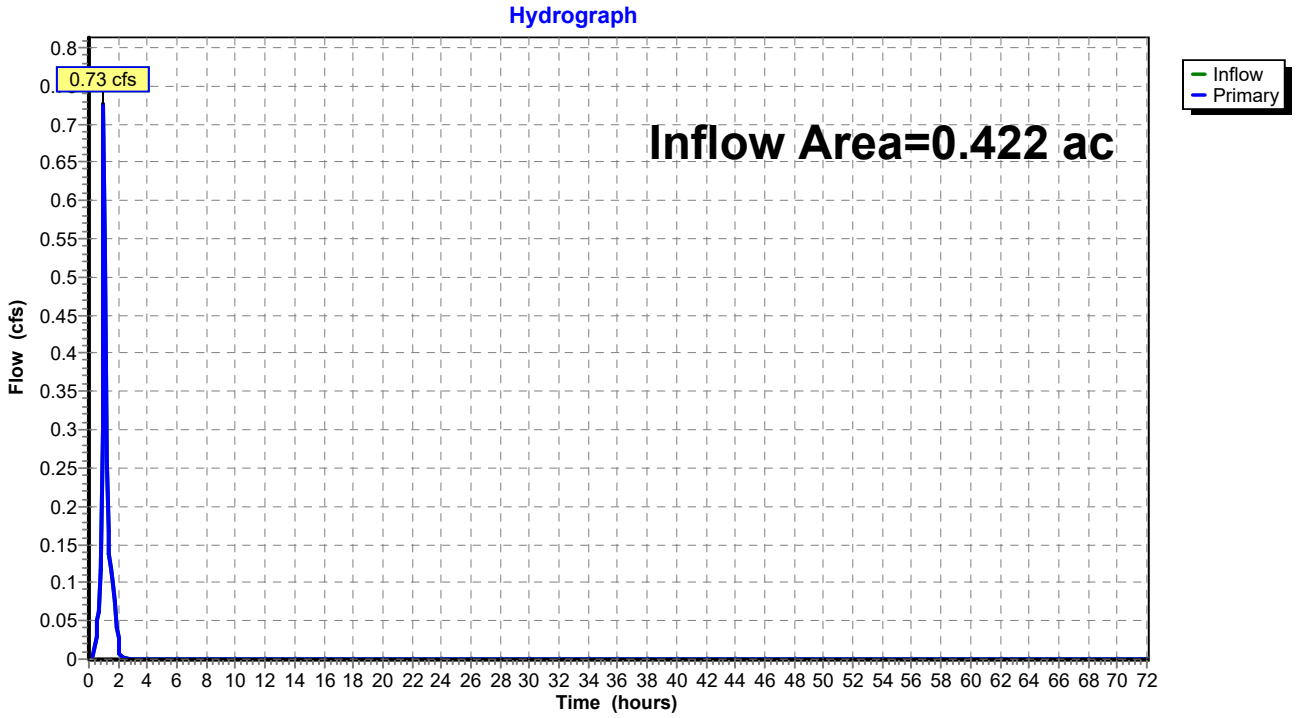


Summary for Link P2AA: PDA 2A-A (Parking)

Inflow Area = 0.422 ac, 57.35% Impervious, Inflow Depth = 0.67" for WQ event
Inflow = 0.73 cfs @ 1.02 hrs, Volume= 0.023 af
Primary = 0.73 cfs @ 1.02 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2A : PDA 2A

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

Link P2AA: PDA 2A-A (Parking)

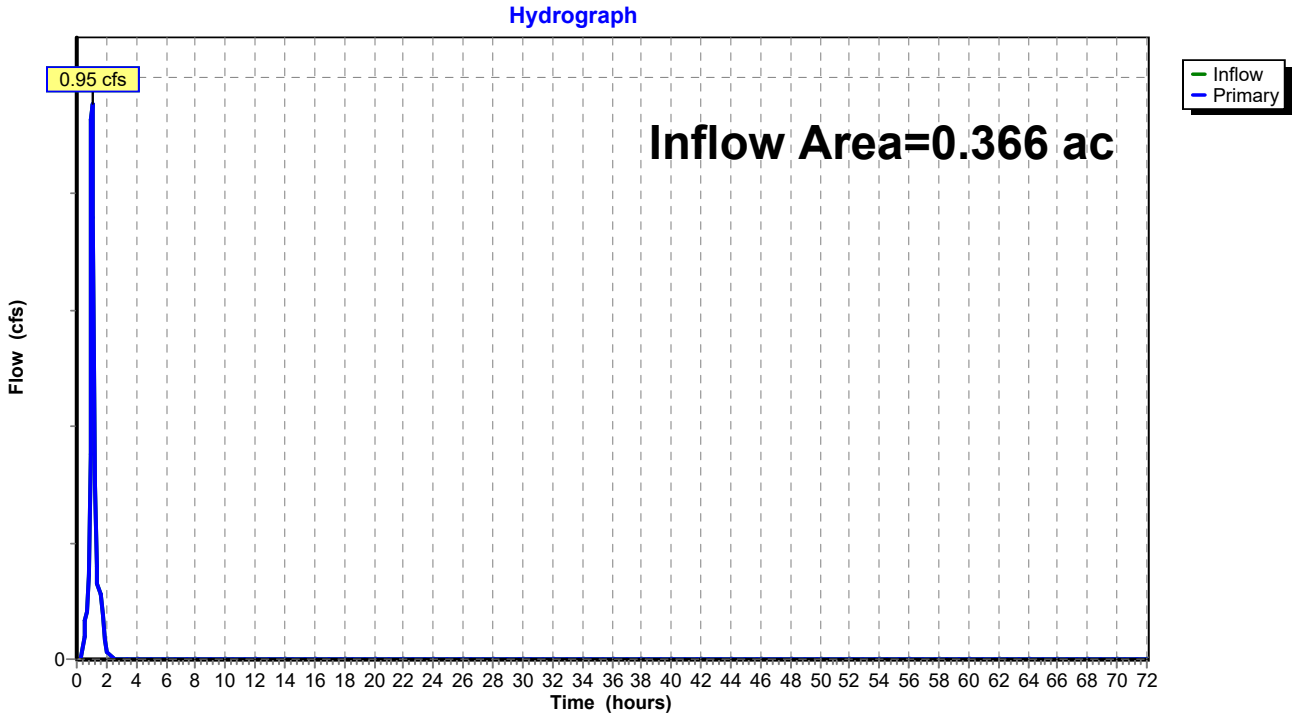


Summary for Link P2B: PDA 2B

Inflow Area = 0.366 ac, 86.89% Impervious, Inflow Depth = 0.92" for WQ event
Inflow = 0.95 cfs @ 1.03 hrs, Volume= 0.028 af
Primary = 0.95 cfs @ 1.03 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

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

Link P2B: PDA 2B



Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 1.03" for WQ event
Inflow = 4.13 cfs @ 1.01 hrs, Volume= 0.119 af
Outflow = 0.50 cfs @ 1.46 hrs, Volume= 0.119 af, Atten= 88%, Lag= 27.2 min
Discarded = 0.50 cfs @ 1.46 hrs, Volume= 0.119 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 131.00' @ 1.46 hrs Surf.Area= 10,036 sf Storage= 3,073 cf

Plug-Flow detention time= 58.2 min calculated for 0.118 af (100% of inflow)
Center-of-Mass det. time= 58.2 min (123.3 - 65.1)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Discarded	130.50'	**4.300 in/hr Exfiltration X 0.50 over Surface area**
#3	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	132.00'	**1.2' 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	133.15'	**2.8' 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

Discarded OutFlow Max=0.50 cfs @ 1.46 hrs HW=131.00' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.50 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.50' (Free Discharge)
└─**1=Culvert** (Passes 0.00 cfs of 1.58 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Hydrograph for Pond P2AB: PDA 2A-B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	130.50	0.00	0.00	**0.00**
0.20	0.00	0	130.50	0.00	0.00	0.00
0.40	0.09	11	130.50	0.04	0.04	0.00
0.60	0.29	59	130.51	0.22	0.22	0.00
0.80	0.75	139	130.54	0.49	0.49	0.00
1.00	**4.11**	1,394	130.80	0.49	0.49	0.00
1.20	1.09	2,928	130.99	0.50	0.50	0.00
1.40	0.54	**3,068**	**131.00**	**0.50**	**0.50**	0.00
1.60	0.41	**3,051**	**131.00**	**0.50**	**0.50**	0.00
1.80	0.15	2,939	130.99	0.50	0.50	0.00
2.00	0.08	2,669	130.95	0.50	0.50	0.00
2.20	0.00	2,324	130.91	0.50	0.50	0.00
2.40	0.00	1,966	130.87	0.50	0.50	0.00
2.60	0.00	1,609	130.83	0.50	0.50	0.00
2.80	0.00	1,254	130.78	0.49	0.49	0.00
3.00	0.00	900	130.73	0.49	0.49	0.00
3.20	0.00	548	130.64	0.49	0.49	0.00
3.40	0.00	195	130.55	0.49	0.49	0.00
3.60	0.00	13	130.50	0.05	0.05	0.00
3.80	0.00	1	130.50	0.00	0.00	0.00
4.00	0.00	0	130.50	0.00	0.00	0.00
4.20	0.00	0	130.50	0.00	0.00	
4.40	0.00	0	130.50	0.00	0.00	
4.60	0.00	0	130.50	0.00	0.00	
4.80	0.00	0	130.50	0.00	0.00	
5.00	0.00	0	130.50	0.00	0.00	
5.20	0.00	0	130.50	0.00	0.00	
5.40	0.00	0	130.50	0.00	0.00	0.00
5.60	0.00	0	130.50	0.00	0.00	0.00
5.80	0.00	0	130.50	0.00	0.00	0.00
6.00	0.00	0	130.50	0.00	0.00	0.00
6.20	0.00	0	130.50	0.00	0.00	0.00
6.40	0.00	0	130.50	0.00	0.00	0.00
6.60	0.00	0	130.50	0.00	0.00	0.00
6.80	0.00	0	130.50	0.00	0.00	0.00
7.00	0.00	0	130.50	0.00	0.00	0.00
7.20	0.00	0	130.50	0.00	0.00	0.00
7.40	0.00	0	130.50	0.00	0.00	0.00
7.60	0.00	0	130.50	0.00	0.00	0.00
7.80	0.00	0	130.50	0.00	0.00	0.00
8.00	0.00	0	130.50	0.00	0.00	0.00
8.20	0.00	0	130.50	0.00	0.00	0.00
8.40	0.00	0	130.50	0.00	0.00	0.00
8.60	0.00	0	130.50	0.00	0.00	0.00
8.80	0.00	0	130.50	0.00	0.00	0.00
9.00	0.00	0	130.50	0.00	0.00	0.00
9.20	0.00	0	130.50	0.00	0.00	0.00
9.40	0.00	0	130.50	0.00	0.00	0.00
9.60	0.00	0	130.50	0.00	0.00	0.00
9.80	0.00	0	130.50	0.00	0.00	0.00
10.00	0.00	0	130.50	0.00	0.00	0.00

BASIN DRAIN TIME (WQ STORM):
3.80 HRS - 1.40 HRS = 2.40 HRS
2.40 HRS < 72 HRS, OKAY

E. DESIGN CALCULATIONS

- **Basin Drain Time**
- **Groundwater Mounding Analysis**

Summary for Pond P2AB: PDA 2A-B

Inflow Area = 1.376 ac,100.00% Impervious, Inflow Depth = 11.28" for 100-Year-2050 event
Inflow = 13.27 cfs @ 12.03 hrs, Volume= 1.293 af
Outflow = 7.28 cfs @ 12.20 hrs, Volume= 1.175 af, Atten= 45%, Lag= 9.7 min
Primary = 7.28 cfs @ 12.20 hrs, Volume= 1.175 af
Routed to Link P2A : PDA 2A

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 133.26' @ 12.19 hrs Surf.Area= 9,833 sf Storage= 21,642 cf

Plug-Flow detention time= 203.9 min calculated for 1.175 af (91% of inflow)
Center-of-Mass det. time= 152.9 min (885.5 - 732.6)

Volume	Invert	Avail.Storage	Storage Description
#1	130.50'	2,179 cf	**Custom Stage Data (A) (Prismatic)** Listed below (Recalc) 17,366 cf Overall - 11,919 cf Embedded = 5,447 cf x 40.0% Voids
#2	130.75'	5,578 cf	**Ferguson R-Tank XD 15 (A)** x 780 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 780 Chambers in 13 Rows
#3	130.75'	3,433 cf	**Ferguson R-Tank XD 15 (A)** x 480 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 480 Chambers in 12 Rows
#4	130.75'	1,716 cf	**Ferguson R-Tank XD 15 (A)** x 240 Inside #1 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 240 Chambers in 24 Rows
#5B	130.50'	1,209 cf	**23.69'W x 102.43'L x 3.21'H Field B** 7,789 cf Overall - 4,767 cf Embedded = 3,021 cf x 40.0% Voids
#6B	130.75'	4,291 cf	**Ferguson R-Tank XD 15** x 600 Inside #5 Inside= 19.7"W x 29.5"H => 3.63 sf x 1.97'L = 7.2 cf Outside= 19.7"W x 29.5"H => 4.04 sf x 1.97'L = 7.9 cf 600 Chambers in 12 Rows
#7C	130.50'	1,056 cf	**22.04'W x 90.61'L x 3.37'H Field C** 6,741 cf Overall - 4,102 cf Embedded = 2,639 cf x 40.0% Voids
#8C	130.75'	3,692 cf	**Ferguson R-Tank XD 16** x 484 Inside #7 Inside= 19.7"W x 31.5"H => 3.88 sf x 1.97'L = 7.6 cf Outside= 19.7"W x 31.5"H => 4.31 sf x 1.97'L = 8.5 cf 484 Chambers in 11 Rows
#9	130.75'	69 cf	**24.0" Round C-A CONNECTION** L= 22.0'
#10	130.75'	173 cf	**24.0" Round A-OCS CONNECTION** L= 55.0'
#11	130.75'	44 cf	**24.0" Round B-MH CONNECTION** L= 14.0'
#12	130.75'	192 cf	**24.0" Round MH-OCS CONNECTION** L= 61.0'
		23,630 cf	Total Available Storage

Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.50	5,410	0	0
133.71	5,410	17,366	17,366

Device	Routing	Invert	Outlet Devices
#1	Primary	129.80'	**15.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 129.80' / 129.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	131.25'	**6.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	132.00'	**1.2' 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	133.15'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.22 cfs @ 12.20 hrs HW=133.26' (Free Discharge)
└─**1=Culvert** (Passes 7.22 cfs of 10.86 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.34 cfs @ 6.45 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.61 cfs @ 3.72 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.91 fps)

Hydrograph for Pond P2AB: PDA 2A-B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	130.50	0.00
0.20	0.00	0	130.50	0.00
0.40	0.02	3	130.50	0.00
0.60	0.05	28	130.51	0.00
0.80	0.08	74	130.52	0.00
1.00	0.10	139	130.54	0.00
1.20	0.12	217	130.56	0.00
1.40	0.13	306	130.58	0.00
1.60	0.14	405	130.60	0.00
1.80	0.15	513	130.63	0.00
2.00	0.16	628	130.66	0.00
2.20	0.17	749	130.69	0.00
2.40	0.18	876	130.72	0.00
2.60	0.19	1,009	130.75	0.00
2.80	0.19	1,146	130.77	0.00
3.00	0.20	1,289	130.79	0.00
3.20	0.21	1,435	130.81	0.00
3.40	0.21	1,586	130.82	0.00
3.60	0.22	1,741	130.84	0.00
3.80	0.22	1,899	130.86	0.00
4.00	0.23	2,061	130.88	0.00
4.20	0.23	2,227	130.90	0.00
4.40	0.24	2,396	130.92	0.00
4.60	0.24	2,569	130.94	0.00
4.80	0.25	2,745	130.96	0.00
5.00	0.25	2,924	130.99	0.00
5.20	0.26	3,106	131.01	0.00
5.40	0.26	3,291	131.03	0.00
5.60	0.26	3,479	131.05	0.00
5.80	0.27	3,670	131.08	0.00
6.00	0.27	3,865	131.10	0.00
6.20	0.29	4,068	131.12	0.00
6.40	0.30	4,281	131.15	0.00
6.60	0.32	4,504	131.18	0.00
6.80	0.33	4,738	131.20	0.00
7.00	0.35	4,982	131.23	0.00
7.20	0.36	5,236	131.26	0.00
7.40	0.38	5,495	131.29	0.02
7.60	0.39	5,754	131.32	0.03
7.80	0.40	6,009	131.35	0.06
8.00	0.42	6,257	131.38	0.08
8.20	0.43	6,497	131.41	0.11
8.40	0.45	6,728	131.44	0.13
8.60	0.46	6,949	131.47	0.16
8.80	0.48	7,160	131.49	0.19
9.00	0.50	7,362	131.52	0.22
9.20	0.55	7,570	131.54	0.25
9.40	0.60	7,790	131.57	0.29
9.60	0.65	8,021	131.59	0.32
9.80	0.70	8,259	131.62	0.37
10.00	0.75	8,504	131.65	0.41

Hydrograph for Pond P2AB: PDA 2A-B (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
10.20	0.80	8,753	131.68	0.45
10.40	0.85	9,011	131.71	0.49
10.60	1.00	9,307	131.75	0.53
10.80	1.19	9,699	131.79	0.57
11.00	1.40	10,196	131.85	0.62
11.20	1.73	10,851	131.93	0.68
11.40	2.05	11,690	132.03	0.78
11.60	2.95	12,826	132.17	1.07
11.80	4.88	14,524	132.37	1.74
12.00	**12.91**	18,477	132.85	4.29
12.20	5.08	**21,640**	**133.26**	**7.27**
12.40	2.98	19,926	133.03	5.41
12.60	2.08	18,323	132.83	4.17
12.80	1.75	17,061	132.68	3.21
13.00	1.43	16,126	132.56	2.59
13.20	1.20	15,360	132.47	2.16
13.40	1.02	14,726	132.39	1.83
13.60	0.86	14,171	132.33	1.58
13.80	0.81	13,708	132.27	1.39
14.00	0.76	13,329	132.23	1.24
14.20	0.71	13,007	132.19	1.13
14.40	0.66	12,721	132.15	1.04
14.60	0.61	12,459	132.12	0.96
14.80	0.56	12,213	132.09	0.89
15.00	0.51	11,976	132.07	0.83
15.20	0.48	11,748	132.04	0.79
15.40	0.47	11,539	132.01	0.75
15.60	0.45	11,342	131.99	0.73
15.80	0.44	11,147	131.97	0.71
16.00	0.43	10,954	131.94	0.69
16.20	0.41	10,763	131.92	0.68
16.40	0.40	10,574	131.90	0.66
16.60	0.38	10,387	131.88	0.64
16.80	0.37	10,203	131.85	0.62
17.00	0.36	10,022	131.83	0.61
17.20	0.34	9,844	131.81	0.59
17.40	0.33	9,668	131.79	0.57
17.60	0.31	9,496	131.77	0.55
17.80	0.30	9,328	131.75	0.53
18.00	0.28	9,165	131.73	0.51
18.20	0.28	9,007	131.71	0.49
18.40	0.27	8,862	131.69	0.47
18.60	0.27	8,728	131.68	0.45
18.80	0.27	8,606	131.66	0.43
19.00	0.26	8,497	131.65	0.41
19.20	0.26	8,398	131.64	0.39
19.40	0.26	8,308	131.63	0.37
19.60	0.25	8,227	131.62	0.36
19.80	0.25	8,153	131.61	0.35
20.00	0.25	8,085	131.60	0.34
20.20	0.24	8,022	131.59	0.33

Hydrograph for Pond P2AB: PDA 2A-B (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
20.40	0.24	7,964	131.59	0.32
20.60	0.24	7,911	131.58	0.31
20.80	0.23	7,861	131.58	0.30
21.00	0.23	7,814	131.57	0.29
21.20	0.22	7,769	131.56	0.28
21.40	0.22	7,728	131.56	0.28
21.60	0.22	7,688	131.55	0.27
21.80	0.21	7,650	131.55	0.26
22.00	0.21	7,614	131.55	0.26
22.20	0.21	7,579	131.54	0.25
22.40	0.20	7,546	131.54	0.25
22.60	0.20	7,513	131.53	0.24
22.80	0.20	7,482	131.53	0.24
23.00	0.19	7,451	131.53	0.23
23.20	0.19	7,421	131.52	0.23
23.40	0.18	7,391	131.52	0.23
23.60	0.18	7,363	131.52	0.22
23.80	0.18	7,335	131.51	0.22
24.00	0.10	7,294	131.51	0.21
24.20	0.00	7,166	131.49	0.19
24.40	0.00	7,034	131.48	0.17
24.60	0.00	6,915	131.46	0.16
24.80	0.00	6,806	131.45	0.14
25.00	0.00	6,707	131.44	0.13
25.20	0.00	6,617	131.43	0.12
25.40	0.00	6,534	131.42	0.11
25.60	0.00	6,458	131.41	0.10
25.80	0.00	6,387	131.40	0.09
26.00	0.00	6,323	131.39	0.09
26.20	0.00	6,263	131.39	0.08
26.40	0.00	6,207	131.38	0.07
26.60	0.00	6,156	131.37	0.07
26.80	0.00	6,107	131.37	0.06
27.00	0.00	6,063	131.36	0.06
27.20	0.00	6,021	131.36	0.06
27.40	0.00	5,982	131.35	0.05
27.60	0.00	5,945	131.35	0.05
27.80	0.00	5,911	131.34	0.05
28.00	0.00	5,879	131.34	0.04
28.20	0.00	5,849	131.34	0.04
28.40	0.00	5,820	131.33	0.04
28.60	0.00	5,793	131.33	0.04
28.80	0.00	5,768	131.33	0.03
29.00	0.00	5,744	131.32	0.03
29.20	0.00	5,721	131.32	0.03
29.40	0.00	5,699	131.32	0.03
29.60	0.00	5,679	131.32	0.03
29.80	0.00	5,660	131.31	0.03
30.00	0.00	5,642	131.31	0.02
30.20	0.00	5,625	131.31	0.02
30.40	0.00	5,609	131.31	0.02

Hydrograph for Pond P2AB: PDA 2A-B (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
30.60	0.00	5,593	131.31	0.02
30.80	0.00	5,578	131.30	0.02
31.00	0.00	5,564	131.30	0.02
31.20	0.00	5,550	131.30	0.02
31.40	0.00	5,537	131.30	0.02
31.60	0.00	5,524	131.30	0.02
31.80	0.00	5,512	131.30	0.02
32.00	0.00	5,500	131.29	0.02
32.20	0.00	5,489	131.29	0.02
32.40	0.00	5,478	131.29	0.01
32.60	0.00	5,468	131.29	0.01
32.80	0.00	5,458	131.29	0.01
33.00	0.00	5,449	131.29	0.01
33.20	0.00	5,440	131.29	0.01
33.40	0.00	5,431	131.29	0.01
33.60	0.00	5,423	131.29	0.01
33.80	0.00	5,415	131.28	0.01
34.00	0.00	5,408	131.28	0.01
34.20	0.00	5,400	131.28	0.01
34.40	0.00	5,393	131.28	0.01
34.60	0.00	5,387	131.28	0.01
34.80	0.00	5,380	131.28	0.01
35.00	0.00	5,374	131.28	0.01
35.20	0.00	5,368	131.28	0.01
35.40	0.00	5,363	131.28	0.01
35.60	0.00	5,357	131.28	0.01
35.80	0.00	5,352	131.28	0.01
36.00	0.00	5,347	131.28	0.01
36.20	0.00	5,343	131.28	0.01
36.40	0.00	5,338	131.27	0.01
36.60	0.00	5,333	131.27	0.01
36.80	0.00	5,329	131.27	0.01
37.00	0.00	5,324	131.27	0.01
37.20	0.00	5,320	131.27	0.01
37.40	0.00	5,316	131.27	0.01
37.60	0.00	5,312	131.27	0.01
37.80	0.00	5,308	131.27	0.01
38.00	0.00	5,304	131.27	0.01
38.20	0.00	5,300	131.27	0.01
38.40	0.00	5,296	131.27	0.01
38.60	0.00	5,292	131.27	0.01
38.80	0.00	5,289	131.27	0.00
39.00	0.00	5,285	131.27	0.00
39.20	0.00	5,282	131.27	0.00
39.40	0.00	5,278	131.27	0.00
39.60	0.00	5,275	131.27	0.00
39.80	0.00	5,272	131.27	0.00
40.00	0.00	5,269	131.27	0.00
40.20	0.00	5,266	131.27	0.00
40.40	0.00	5,263	131.27	0.00
40.60	0.00	5,260	131.27	0.00

BASIN DRAIN TIME
(100-Year Future Adj. Storm):
38.80 HRS - 12.20 HRS = 26.60 HRS
26.60 HRS < 72 HRS, OKAY

Basin - Groundwater Mounding

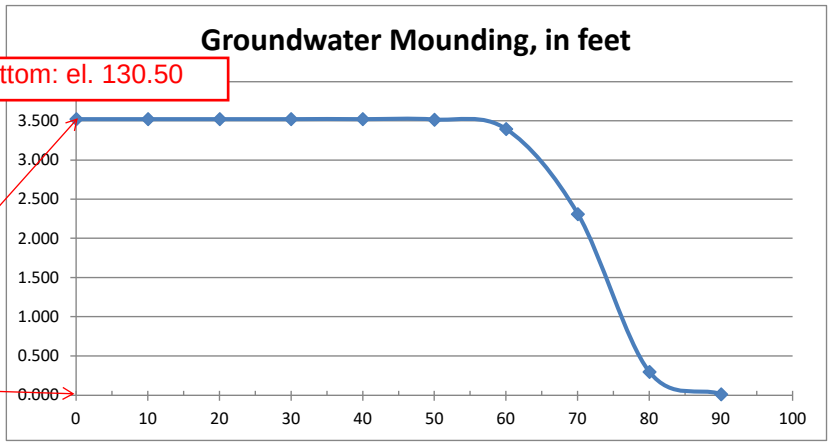
Input Values

2.15	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
2.15	Kh	Kh = 5xRecharge Rate (R) in the coastal plain; Kh=R outside the coastal plain
72.000	x	1/2 length of basin (x direction, in feet)
106.000	y	1/2 width of basin (y direction, in feet)
2.95	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.524	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.524	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.524	0
3.524	10
3.524	20
3.524	30
3.524	40
3.518	50
3.398	60
2.312	70
0.300	80
0.014	90

Re-Calculate Now



Basin Bottom: el. 130.50

Top of Groundwater Mounding: el. 127.50

Estimated Seasonal High: el. 124.00 (SPP-1)

Disclaimer

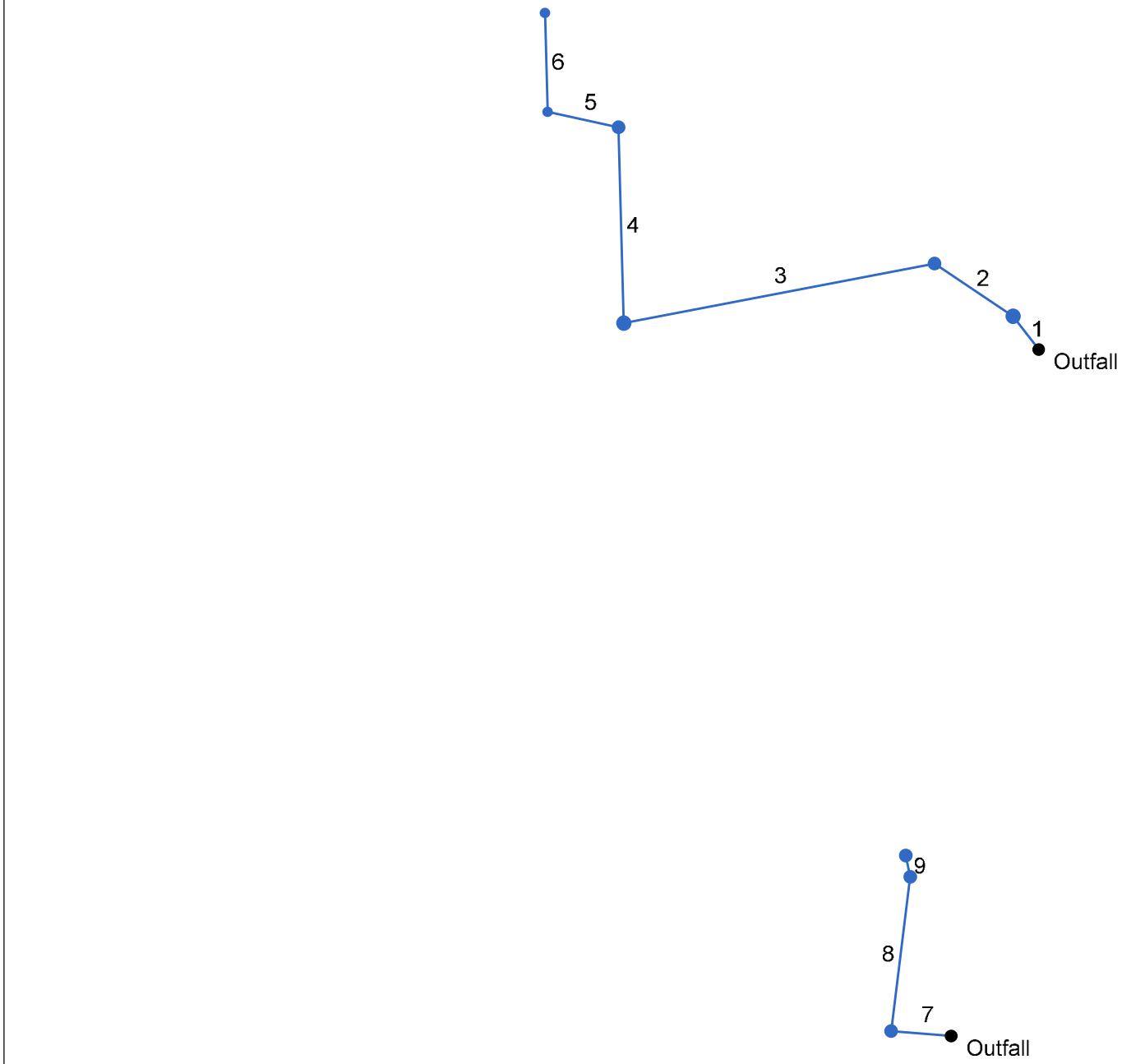
This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

SEPARATION FROM GROUNDWATER MOUNDING
EL. 130.50 - EL. 127.50 = 3.0'
OKAY, GROUNDWATER MOUNDING DOES NOT INTERACT WITH BASIN

F. CONVEYANCE CALCULATIONS

- **Pipe Sizing**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Pipe Sizing.stm	Number of lines: 9	Date: 5/30/2024

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	14.974	0.00	0.29	0.00	0.00	0.24	10.0	13.7	6.9	9.05	10.55	8.65	15	2.67	127.50	127.90	128.39	129.06	129.02	130.34	POA 2A - 2A.1
2	1	31.412	0.14	0.29	0.99	0.14	0.24	10.0	13.6	6.9	9.06	10.43	6.40	18	0.99	128.00	128.31	129.08	129.47	130.34	130.54	2A.1-2A.2
3	2	98.335	0.00	0.15	0.00	0.00	0.10	10.0	13.2	7.0	8.11	10.48	5.94	18	1.00	128.41	129.39	129.47	130.49	130.54	133.43	2A.2-2A.3
4	3	74.643	0.02	0.15	0.99	0.02	0.10	10.0	11.3	7.4	0.77	4.55	0.97	15	0.50	129.49	129.86	130.49	130.50	133.43	133.03	2A.3-2A.4
5	4	22.577	0.01	0.13	0.65	0.01	0.08	10.0	10.8	7.5	0.63	2.49	1.54	12	0.49	129.96	130.07	130.53	130.54	133.03	133.89	2A.4-2.5
6	5	37.721	0.12	0.12	0.65	0.08	0.08	10.0	10.0	7.7	0.60	2.53	2.26	12	0.50	130.17	130.36	130.61	130.68	133.89	133.20	2A.5-2A.6
7	End	18.565	0.12	0.32	0.99	0.12	0.32	10.0	11.0	7.4	2.35	4.50	3.71	15	0.48	125.85	125.94	126.49	126.58	130.00	129.68	2B.1-2B.2
8	7	59.000	0.10	0.20	0.99	0.10	0.20	10.0	10.2	7.6	1.51	4.60	2.13	15	0.51	126.04	126.34	126.90	126.94	129.68	129.62	2B.2-2B.3
9	8	8.289	0.10	0.10	0.99	0.10	0.10	10.0	10.0	7.7	0.76	11.21	2.13	15	3.02	126.44	126.69	126.99	127.03	129.62	129.72	2B.3-2B.4

Project File: Pipe Sizing.stm

Number of lines: 9

Run Date: 5/30/2024

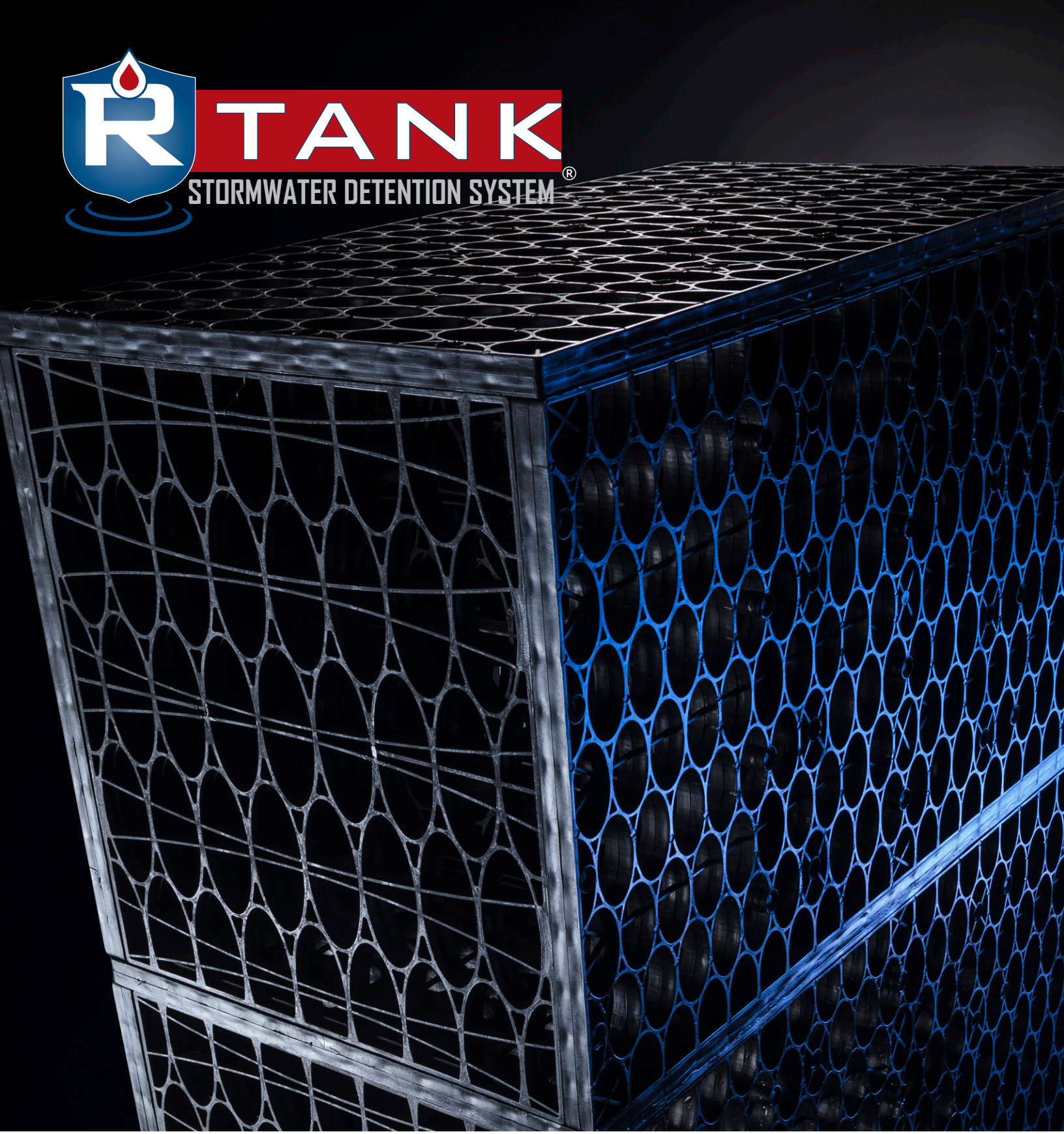
NOTES:Intensity = 545.78 / (Inlet time + 28.60) ^ 1.17; Return period =Yrs. 100 ; c = cir e = ellip b = box

G. SUPPORTING DOCUMENTS

- **Underground Basin Manufacturer Specifications**
- **Geotechnical Report**

RTANK®

STORMWATER DETENTION SYSTEM



LD HD SD UD XD

LET'S GET IT DONE®

ACF ENVIRONMENTAL



STORMWATER MANAGEMENT

IS YOUR STORMWATER SYSTEM TAKING UP TOO MUCH SPACE?

Reduce the size with the R-Tank System, an efficient and versatile underground stormwater storage system. This system will reduce your underground stormwater storage system footprint to resolve a utility conflict or free up space for a future expansion.

It will also provide additional options for vehicular loading and cover depths, and deliver greater installation versatility.

DOES YOUR PROJECT REQUIRE A UNIQUE SOLUTION DUE TO DEPTH OR TRAFFIC LOADS?

With five different module configurations, R-Tank provides system height options from 2” to over 7’ deep. It also delivers support for HS-20 and HS-25 traffic, with cover depths from 6” to over 16’.

With an unlimited array of system footprints and configurations, R-Tank solves tough stormwater problems by adapting to the needs of your site - whether your’re designing a project at the beach with minimal depth over a water table or a deep system in the hills.

R TANK®

R-TANK®

BENEFITS

HIGH CAPACITY
- 95% void internal area

STRENGTH
- Easily supports traffic loading from parking lots and roads
- Module options for HS-20 and HS-25 rating with cover depths from 6 inches to 16 feet

DESIGN & CONSTRUCTION VERSATILITY
- Modules can be combined into various shapes efficiently and effectively use space
- Varied height from 2 inches to 7 feet

INCREASED INFILTRATION AND EXILFILTRATION
- Outer shell is 90% open
- Increases groundwater recharge, reducing post-construction discharge volumes

EASY TO TRANSPORT
- Can be supplied unassembled for reduced delivery costs

LIGHTWEIGHT AND QUICK TO INSTALL
- Installed by hand; no cranes required
- Reduces site access delays

RECYCLED CONTENT
- Manufactured with recycled polypropylene



R-TANK LD

- Light Duty module (30 psi)
- Ideal for applications in green space
- Not rated for vehicular traffic
- 12” Minimum cover, 36” maximum cover
- Four internal plates

R-TANK HD

- Heavy Duty module (33.4 psi)
- Standard module for HS-20 traffic applications
- 20” Minimum cover,
- 84” Maximum cover
- Five internal plates



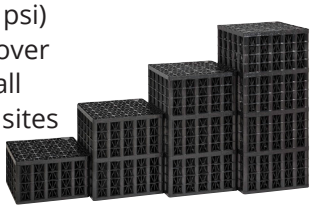
R-TANK SD

- Super Duty module (42.9 psi)
- Higher safety factors for shallow traffic applications and deeper cover
- 18” Minimum cover,
- 120” Maximum cover
- Five internal plates



R-TANK UD

- Ultra Duty module (134.2 psi)
- Traffic loads with 12” of cover
- Available from 14” – 66” tall
- Ideal for high water table sites



R-TANK XD

- Extreme Duty module (240.2 psi)
- Traffic loads with 6” cover
- 16.5’ maximum cover
- Available from 2” - 10’ tall
- 90% void



DESIGN CONSIDERATIONS

Many factors will influence the design of the R-Tank® system. While this list is not intended to be all-inclusive, the following design considerations are worth highlighting:

1. PRE-TREATMENT

Removing pollutants from runoff before they enter an underground detention system is the smart way to design & build a system. Trash Guard Plus® (see page 6) is a great tool for this. Be sure the system you select will remove, heavy sediments, gross pollutants (trash) and biodegradable debris.

2. BACKFILL MATERIALS

Backfill materials should be stone (<1.5" in diameter) or soil (GW, GP SW or SP per the Unified Soil Classification System). Material must be free from lumps, debris and sharp objects that could cut the geotextile. See the R-Tank® narrative specification section 2.03 for additional information.

3. RUNOFF REDUCTION

Most designs incorporate an outlet to drain the system at a controlled rate and/or an overflow to prevent flooding in extreme events. Any infiltration that can be achieved on the site should also be taken advantage of. Consider raising the invert of your outlet or creating a sump to capture and infiltrate the water quality volume whenever possible.

4. WATER TABLE

While installing R-Tank® below the water table is manageable, a stable base must be created to account for the system's ability to drain water out or limit its ability to enter the system. If a liner is used to prevent ground water from entering, measures must be taken to prevent the system from floating.

5. CONSTRUCTION LOADS

Construction loads are often the heaviest loads the system will experience. Care must be taken during backfilling and compaction (see specification section 3.05), and post-installation construction traffic should be routed around the system (Install Guide step 12).

6. LATERAL LOADS

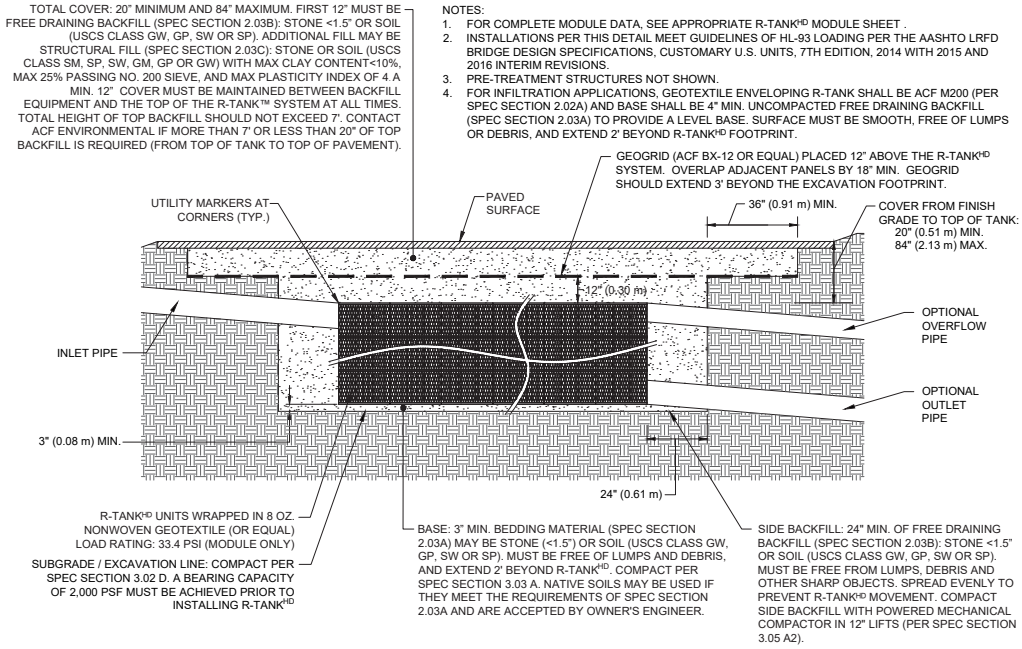
As systems get deeper, the loads acting on the sides of the tank increase. While vertical loads often control the design, lateral loads should also be considered.

7. R-TANK MODULES

Selecting the right module for your application is critical. See page 3 and the specs on the back of this brochure, for details. Our team is also here to help!

8. LOAD MODELING

A safety factor of >1.75 is required when designing an R-Tank System using the AASHTO LRFD Bridge Design Specifications. It is also necessary to run your own loading model with specific site requirements. Example models can be found in our Tech Note on loading capabilities, and minimum cover requirements can be found in the specs on the back of this brochure.



LOW IMPACT DESIGN & GREEN INFRASTRUCTURE

As much of the nation's Gray Infrastructure continues to decay, new concepts for rebuilding it are emerging through Green Infrastructure (GI) and Low Impact Development (LID). This type of reconstruction moves beyond traditional systems that do one thing well, to systems that accomplish multiple objectives simultaneously.

ACF Environmental has several technologies that dovetail with the goals of LID and GI and can play a significant role in the redevelopment process.

R-TANK®

SPACE EFFICIENT SUBSURFACE STORAGE

Pipe and stone are used in traditional systems to move and store runoff. R-Tank accomplishes the same purpose with several additional benefits.

- Stores and moves runoff
- Moves water slowly, increasing time of concentration
- Open system encourages infiltration
- Fully accessible for maintenance
- Stores 138% more water than stone
- Maximizes storage potential of GI practices
- Easily handles traffic loads
- Ships flat to reduce site disturbance

PERMEABLE PAVEMENTS

RUNOFF REDUCTION TECHNIQUES

Traditional pavements move vehicles efficiently, but are easily damaged by stormwater. ACF Environmental specializes in permeable pavements that handle traffic loads, while providing surface infiltration rates 10x higher than traditional pervious pavements, helping reduce the expense of long-term maintenance.

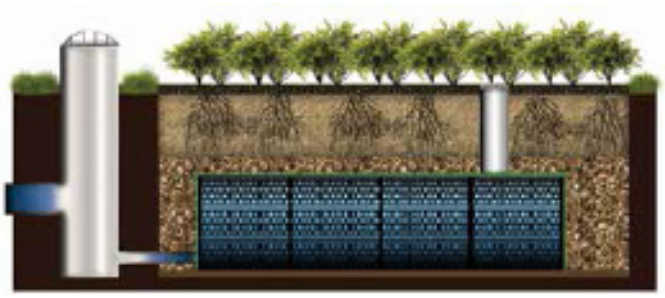
- Handles all vehicular loads
- Drains ten times faster than competing pervious pavements
- Reduces long-term maintenance costs
- Encourages infiltration
- Pair with R-Tank® to maximize water storage and transport

FOCALPOINT

VEGETATED/ BIOLOGICAL TREATMENT SYSTEM

Traditional landscaping adds aesthetic value to projects, but has more potential. Many developers turn to bioretention, but are forced to surrender massive land areas and dedicate significant future funds to maintenance. FocalPoint reduces the space requirements and maintenance costs of bioretention by up to 90% while providing similar pollutant removal.

- Adds aesthetic value to properties
- Cleans runoff to improve water quality
- Reduces space requirements and maintenance costs of traditional bioretention systems
- Encourages infiltration to reduce volume of water discharged
- Pairs with R-Tank® to maximize water storage and transport



R-Tank maximizes the storage capabilities of bioretention and permeable pavement systems.

MAINTENANCE

DESIGNING AN R-TANK SYSTEM WITH LONGEVITY & MAINTENANCE IN MIND IS A THREE-STEP PROCESS:

1. PREVENT

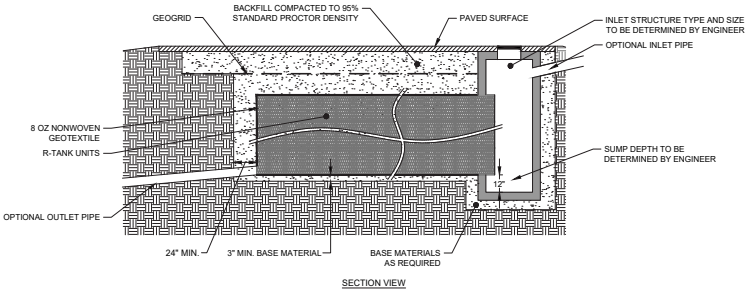
Keep debris and sediment out of the system by pre-treating runoff with the Trash Guard Plus® unit (see below). For a more centralized approach, you could consider having the R-Tank units penetrate the connecting structure, which allows the use of the R-Tank® as its own trash screen. This works best with a structure that includes a sump (see Inlet Connection drawing below).

2. ISOLATE

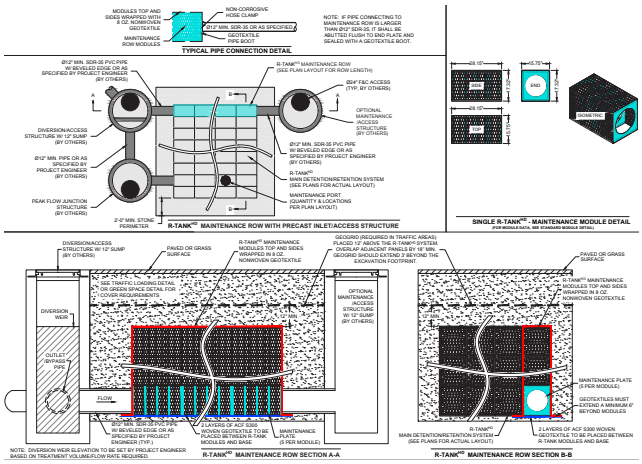
Trap solid pollutants inside the maintenance row (see Maintenance Row drawing below) where they can be easily removed, using the Maintenance Modules (available in LD, HD, and UD only). These modules are wrapped in geotextile to retain solids and are fully accessible by conventional jet-vac systems to remove captured pollutants.

3. PROTECT

Ensure a long system life by including maintenance ports to remove any pollutants that evade the pre-treatment system and maintenance row. Maintenance ports should be specified within 10’ of inlet and outlet connections, and roughly 50’ on center (see detail on page 7).



INLET CONNECTION



MAINTENANCE ROW

MAINTENANCE PREVENTION

TRASH GUARD PLUS ®

Trash Guard Plus® is a patented stormwater pretreatment device that captures debris, sediment and floatables. Easy to install and maintain, it is a fraction of the cost of other pretreatment devices.

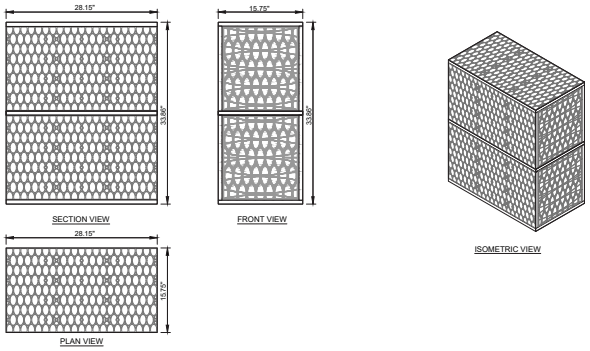
BENEFITS

- Simple retrofit to existing catch basins
- Installs without heavy equipment
- Quick and easy assembly
- Adjusts to irregular catch basin bottoms and/or walls
- Eliminates stormwater trash at public parks, beaches, and waterways
- Removes harmful nutrients and regulated metals



TYPICAL DESIGN

MODULE DRAWING - DOUBLE



MODULE DATA

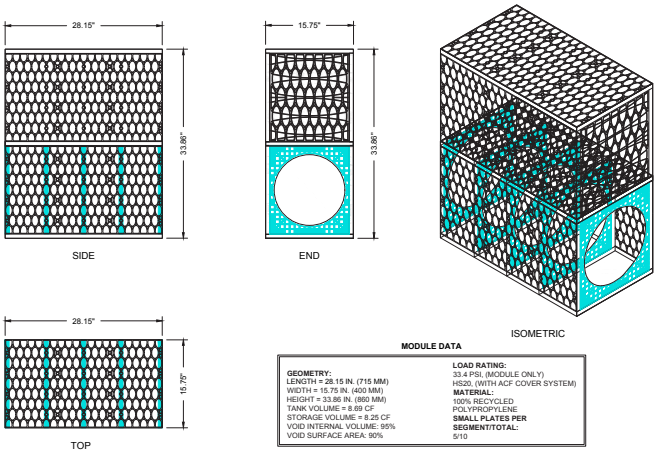
GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 33.86 IN. (860 MM)
TANK VOLUME = 8.69 CF
STORAGE VOLUME = 8.25 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS25, (WITH ACF COVER SYSTEM)

MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES PER SEGMENT/TOTAL: 5/10

MAINTENANCE MODULE - DOUBLE

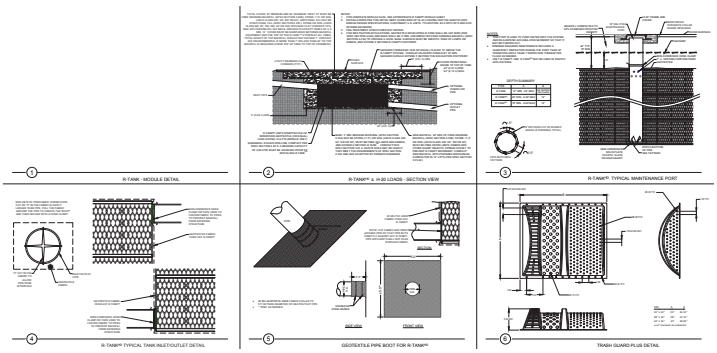


MODULE DATA

GEOMETRY:
LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 33.86 IN. (860 MM)
TANK VOLUME = 8.69 CF
STORAGE VOLUME = 8.25 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING:
33.4 PSI, (MODULE ONLY)
HS20, (WITH ACF COVER SYSTEM)
MATERIAL:
100% RECYCLED POLYPROPYLENE
SMALL PLATES PER SEGMENT/TOTAL:
5/10

COMPOSITE DETAILS

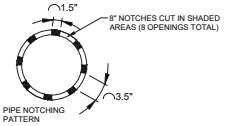


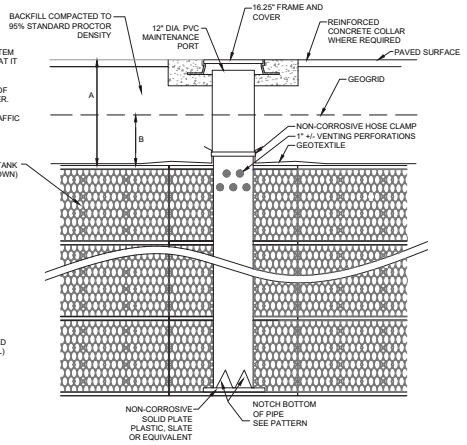
MAINTENANCE PORT

NOTES
- THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
- MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
- ONLY R-TANK® AND R-TANK® MAY BE USED IN TRAFFIC APPLICATIONS.

DEPTH SUMMARY

TYPE	A	B
R-TANK	12" MIN - 36" MAX	AS SHOWN ON PLANS
R-TANK®	20" MIN - 6.99' MAX	12"
R-TANK®	18" MIN - 9.99' MAX	12"





SELECTING THE RIGHT R-TANK MODULE

Cover Depth (inches)*	LD	HD	SD	UD	XD
Min. 6"	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	HS-20
12"	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	HS-20**	HS-20
14"	Green Space - No Traffic	Green Space - No Traffic	Green Space - No Traffic	HS-20	HS-20
18"	Green Space - No Traffic	Green Space - No Traffic	HS-20	HS-20	HS-20
20"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20
24"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20
36"	Green Space - No Traffic	HS-20	HS-20	HS-20	HS-20
48"		HS-20	HS-20	HS-20	HS-20
60"		HS-20	HS-20	HS-20	HS-20
72"		HS-20	HS-20		HS-20
84"			HS-20		HS-20
120"			HS-20		HS-20
160"					HS-20
Max. 200"					HS-20

HS-20 designation based on AASHTO LRFD Bridge Design Spec for single lane traffic. HS-25 loading is available. Call ACF for details.
*Cover depth is measured from top of module to finished grade or top of pavement
**The UD module requires STONE backfill (not soil) on sides at this depth

R-TANK SPECIFICATIONS

DIMENSIONS & CAPACITY

Module (Segments)	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight* (lbs)
Mini	15.75	28.15	9.45”/0.79’	2.42	2.30	10.1/10.9
Single(1)	15.75	28.15	17.32”/1.44’	4.44	4.22	15.7/17.3
Single + Mini(1.5)	15.75	28.15	25.98”/2.17’	6.67	6.33	23.6/25.9
Double (2)	15.75	28.15	33.86”/2.82’	8.69	8.25	29.1/32.3
Double + Mini(2.5)	15.75	28.15	42.52”/3.54’	10.91	10.36	37.0/41.0
Triple (3)	15.75	28.15	50.39”/4.20’	12.93	12.28	42.5/47.4
Triple + Mini(3.5)	15.75	28.15	59.06”/4.92’	15.15	14.39	50.4/56.0
Quad(4)	15.75	28.15	66.93”/5.58’	17.17	16.31	55.9/62.4
Quad + Mini(4.5)	15.75	28.15	75.59”/6.30’	19.39	18.42	63.8/71.0
Pent(5)	15.75	28.15	83.46”/6.96’	21.41	20.34	69.3/77.4

*Weights shown are for LD/HD modules.

DIMENSIONS & CAPACITY

Module (Segments)	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight (lbs)
Single (1)	15.75	28.15	9.45”/0.79’	2.42	2.30	10.95
Double (2)	15.75	28.15	18.12”/1.51’	4.64	4.41	19.58
Triple (3)	15.75	28.15	26.79”/2.23’	6.86	6.52	28.21
Quad (4)	15.75	28.15	35.46”/2.96’	9.08	8.63	36.84
Pent (5)	15.75	28.15	44.13”/3.68’	11.30	10.74	45.47
Hex (6)	15.75	28.15	52.80”/4.40’	13.52	12.84	54.10
Septa (7)	15.75	28.15	61.47”/5.12’	15.74	14.95	62.73
Octo (8)	15.75	28.15	70.14”/5.85’	17.96	17.06	71.36
Nono (9)	15.75	28.15	78.81”/6.57’	20.18	19.17	79.99
Decka (10)	15.75	28.15	87.48”/7.29’	22.40	21.28	88.62

DIMENSIONS & CAPACITY

Module (Segments)	Width (inch)	Length (inch)	Height (in/ft)	Volume (cf)	Capacity (cf)	Weight (lbs)
Single (1)	23.62	23.62	14.17”/1.18’	4.57	4.35	21.2
Double (2)	23.62	23.62	27.17”/2.26’	8.77	8.33	39.0
Triple (3)	23.62	23.62	40.16”/3.35’	12.97	12.32	56.8
Quad (4)	23.62	23.62	53.15”/4.43’	17.16	16.30	74.6
Pent (5)	23.62	23.62	66.14”/5.5’	21.35	20.29	92.4

DIMENSIONS & CAPACITY

Module (Segments)	Width (inch)	Length (inch)	Height (inch)	Volume (cf)	Capacity (cf)	Weight (lbs)
Single (1)	19.68	23.62	1.97	0.53	0.48	4
Double (2)	19.68	23.62	3.94	1.06	0.95	8
Triple (3)	19.68	23.62	5.91	1.59	1.43	12
Quad (4)	19.68	23.62	7.87	2.12	1.91	16
Pent (5)	19.68	23.62	9.84	2.65	2.38	20

Note: XD modules may be stacked up to 10’ tall (60 layers).

SPECIFICATIONS

Item	Description	LD	HD	SD	UD	XD
		Value	**Value**	**Value**	**Value**	**Value**
Void Area	Volume available for water storage	95%	95%	95%	95%	90%
Surface Area Void	% of exterior available for infiltration	90%	90%	90%	90%	90%
Compressive Strength	ASTM D 2412/ ASTM F 2318	30.0 psi	33.4 psi	42.9 psi	134.2 psi	240.2 psi
Unit Weight	Weight of plastic per cubic foot of tank	3.29 lbs/cf	3.62 lbs/cf	3.96 lbs/cf	4.33 lbs/cf	7.55 lbs/cf
Rib Thickness	Thickness of load-bearing members	0.18”	0.18”	0.18”	-	-
Service Temperature	Safe temperature range for use	-14 - 167º F	-14 - 167º F	-14 - 167º F	-14 - 167º F	-14 - 167º F
Recycled Content	Use of recycled polypropylene	100%	100%	100%	100%	100%
Minimum Cover	Cover required for HS-20 loading	Not traffic rated	20”	18”	12” - 14”	6”
	Cover required for HS-25 loading	Not traffic rated	24”	18”	15” - 17”	6”
Maximum Cover	Maximum allowable cover depth	36”	6.99’	9.99’	5.0’	16.7’

WHITESTONE
An Employee-Owned Company

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
908.668.7777
whitestoneassoc.com

March 26, 2024

via email

BOHLER ENGINEERING NJ, LLC
30 Independence Avenue
Suite 200
Warren, New Jersey 07059

Attention: Bradford A. Bohler, PE, CRE
Principal

Regarding: STORMWATER MANAGEMENT AREA EVALUATION
PROPOSED MIXED-USE DEVELOPMENT
BLOOMFIELD AVENUE & PARK STREET
BLOOMFIELD, ESSEX COUNTY, NEW JERSEY
WHITESTONE PROJECT NO.: GJ2117908.001

Dear Mr. Bohler:

Whitestone Associates, Inc. (Whitestone) is pleased to submit this *Stormwater Management* (SWM) *Area Evaluation* in support of the proposed redevelopment referenced above. This report is based on information provided by Bohler Engineering NJ, LLC (Bohler) including the December 12, 2022 *Concept Plan 'A'* prepared by Bohler and correspondence with Bohler.

1.0 PROJECT DESCRIPTION

The subject property located southeast of the Bloomfield Avenue and Park Street intersection in Bloomfield, Essex County, New Jersey currently houses a multi-story learning center/church, pavements, and utilities.

The proposed redevelopment is anticipated to include demolishing the existing site structure and constructing an approximately 51,431-square feet (maximum footprint), four-story, mixed-use building with new SWM facilities, at-grade parking, and utilities. The proposed building is not anticipated to include a basement/cellar or below-grade level.

2.0 FIELD EXPLORATION

Field exploration of the project site was conducted by means of six soil profile pits (identified as SPP-1 through SPP-6) excavated using a track-mounted excavator conducted within accessible portions of the proposed SWM facilities identified by Bohler. The locations of the subsurface tests are shown on the *Test Location Plan* included as Figure 1. *Records of Subsurface Exploration* are provided in Appendix A.

The subsurface tests were conducted in the presence of a Whitestone engineer who conducted field tests, recorded visual classifications, and collected samples of the various strata encountered. The subsurface tests were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet.

Groundwater level observations, although not encountered, were recorded during and immediately after the completion of field operations prior to backfilling the test locations. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater levels.

3.0 SUMMARY OF FINDINGS

General: Soil profile pits (SPP-1 through SPP-6) were conducted within accessible portions of the proposed SWM facilities. The subsurface tests were terminated at depths ranging from approximately 4.6 feet below ground surface (fbgs) to 12 fbgs.

Estimated Seasonal High Groundwater Levels: The methods used in determining the estimated seasonal high groundwater level (ESHGW) included evaluating the soil morphology within a test excavation and identifying irregular spots or blotches of different colors or minerals unlike that of the surrounding soil (mottles). A summary of the estimated seasonal high groundwater observations, although not encountered, and infiltration test results associated with this investigation are included in the following table.

INFILTRATION TEST SUMMARY				
Test Location	**ESHGW (fbgs)**	**USDA Classification @ Test Depth**	**Infiltration Test Results**	
			Depth (fbgs)	**Rate (in/hour)**
SPP-1	Not Encountered	Loamy Sand	3.0	4.3
SPP-2	Not Encountered	Loamy Sand	3.0	4.0
SPP-3	Not Encountered	NT	NT	NT
SPP-4	Not Encountered	Loamy Sand	3.0	5.0
SPP-5	Not Encountered	Loamy Sand	3.5	3.3
SPP-6	Not Encountered	Loamy Sand	6.0	4.0

USDA - United States Department of Agriculture; NT - Not Tested

Soil Infiltration Rates: In-situ infiltration tests were conducted within the proposed SWM areas at the soil profile pits. In-situ infiltration testing was conducted using the single ring infiltration test methodology in general accordance with standards presented in the *New Jersey Stormwater Best Management Practices Manual* (BMP Manual). The tests resulted in field infiltration rates ranging from approximately 3.3 inches per hour (iph) to five iph. In-situ infiltration testing was not conducted at SPP-3 due to the presence of a below-grade slab underlying existing fill. In-situ infiltration test results associated with the investigation are provided in Appendix B, *Soil Profile Pit Logs* are included in Appendix A.

4.0 CLOSING

Whitestone appreciates the opportunity to be of continued service to Bohler Engineering NJ, LLC. Please contact us with any questions or comments regarding the information herein.

Sincerely,

WHITESTONE ASSOCIATES, INC.

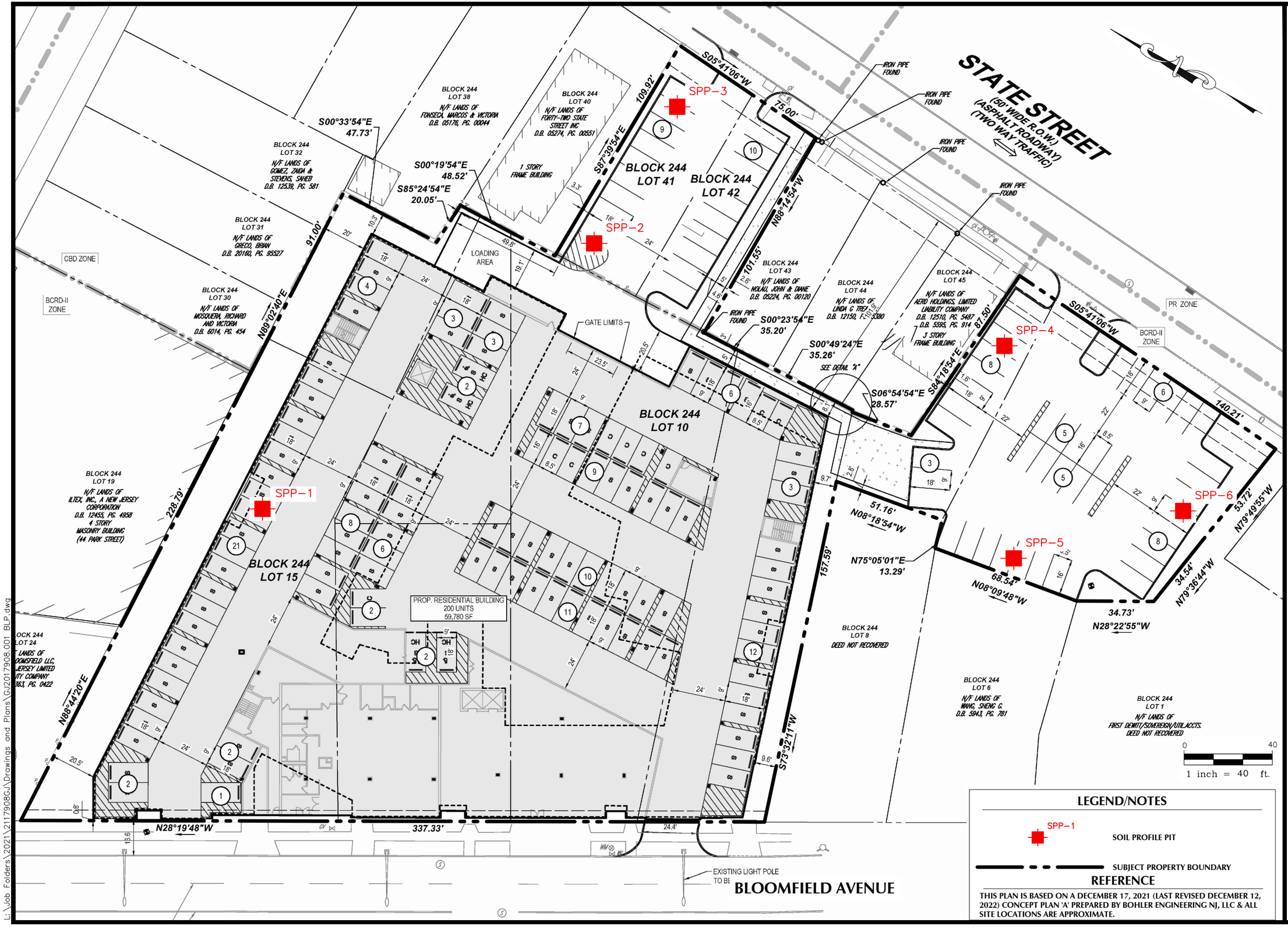
Mudar Khantamr, P.E.
Senior Associate

Laurence W. Keller, P.E.
Vice President

CN/ml L:\Job Folders\2021\2117908GJ\Reports and Submittals\17908.001 SWM.docx
Enclosures
Copy: Alexander Lomei, P.E., Bohler Engineering NJ, LLC
Allison Kopacz, Bohler Engineering NJ, LLC

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FIGURE 1
Test Location Plan



LEGEND/NOTES

SPP-1 — SOIL PROFILE PIT

SUBJECT PROPERTY BOUNDARY

REFERENCE

THIS PLAN IS BASED ON A DECEMBER 17, 2021 (LAST REVISED DECEMBER 12, 2022) CONCEPT PLAN 'A' PREPARED BY BOHLER ENGINEERING NJ, LLC & ALL SITE LOCATIONS ARE APPROXIMATE.

WHITESTONE
An Employee-Owned Company
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DRAWING TITLE: **TEST LOCATION PLAN**

CLIENT: **BOHLER ENGINEERING NJ, LLC**

PROJECT: **PROPOSED MIXED-USE DEVELOPMENT**
BLOOMFIELD AVENUE & PARK STREET
BLOOMFIELD, ESSEX COUNTY, NJ

PROJECT #: GJ2117908.001	
DESIGNED BY: GR	PROJ. MGR.: MK
DATE: 3/25/24	FIGURE: 1
SCALE: 1" = 40'	

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APPENDIX A
Records of Subsurface Exploration

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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-1

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex 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:**	3/11/2024	**During:**	NE | ---		
Termination Depth:	11.0 feet bgs	**Date Completed:**	3/11/2024	**At Completion:**	NE | ---	**At Completion:**	NE | ---
Proposed Location:	Porous Pavement	**Logged By:**	AM	**24 Hours:**	--- | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	MC				
Test Method:	Visual Observation	**Rig Type:**	Deere				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.5	PAVEMENT	3" Asphalt, 3" Gravel Subbase	
			1.0	0.5 - 1.5	FILL	Dark Reddish-Brown (2.5 YR 3/4) LOAM,10% Gravel, Moist, Moderate, Fine, Crumb, Friable, No Roots, Trace Debris	Brick Debris
			2.0	1.5 - 10	RESIDUAL	Reddish-Brown (2.5 YR 4/4) LOAMY SAND, 15% Gravel, 20% Cobbles, Moist, Moderate, Medium, Granular, Friable, No Roots	
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0	10 -11	WEATHERED ROCK	Reddish-Brown (2.5 YR 4/4) WEATHERED ROCK, Dry, Coarse, Strong, Platy, Hard	
			12.0			Soil Profile Pit SPP-1 Terminated at a Depth of 11.0 Feet Below Ground Surface due to Bucket Refusal	
			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-2

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	3/11/2024		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	3/11/2024				
Proposed Location:	Porous Pavement	**Logged By:**	AM	**During:**	NE	---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE	---	**At Completion:** NE / ---
Test Method:	Visual Observation	**Rig Type:**	Deere	**24 Hours:**	---	---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.5	PAVEMENT	2" Gravel, 4" Gravel Subbase	Wood Debris
			1.0	0.5 - 2	FILL	Dark Reddish-Brown (2.5 YR 3/4) LOAM, 10% Gravel, Moist, Moderate, Fine, Crumb, Friable, No Roots, Trace Debris	
			2.0	2 - 12	RESIDUAL	Reddish- Brown (2.5 YR 4/4) LOAMY SAND, 15% Gravel, 20% Cobbles, Moderate, Medium, Granular, Friable No Roots	
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0			Soil Profile Pit SPP-2 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-3

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	3/11/2024		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	4.6 feet bgs	**Date Completed:**	3/11/2024				
Proposed Location:	Porous Pavement	**Logged By:**	AM	**During:**	NE	---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE	---	**At Completion:** NE / ---
Test Method:	Visual Observation	**Rig Type:**	Deere	**24 Hours:**	---	---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.5	PAVEMENT	2" Gravel, 4" Gravel Subbase	
				0.5 - 4.6	FILL	Reddish-Brown (2.5 YR 4/4) LOAMY SAND, 10% Gravel, 10% Cobbles, Moist, Moderate, Medium, Granular, Friable, No Roots, Heavy Amounts of Debris	Apparent Existing Cinderblock Wall
			1.0				
			2.0				
			3.0				
			4.0				
			4.6				
			5.0			Soil Profile Pit SPP-3 Terminated at a Depth of 4.6 Feet Below Ground Surface due to Bucket Refusal on Apparent Concrete Slab	
			6.0				
			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

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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-4

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	3/11/2024		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	3/11/2024				
Proposed Location:	Porous Pavement	**Logged By:**	AM	**During:**	NE	---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE	---	**At Completion:** NE / ---
Test Method:	Visual Observation	**Rig Type:**	Deere	**24 Hours:**	---	---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.7	PAVEMENT	3" Asphalt, No Gravel Subbase 5" Concrete Slab	
			1.0	0.7 - 2.5	FILL	Dark Reddish-Brown (2.5YR 3/4) SANDY LOAM, 10% Gravel, 10% Cobbles, Moist, Moderate, Medium, Granular, Loose, No Roots, Some Debris	Brick
			2.0				
				2.5 - 12	RESIDUAL	Reddish-Brown (2.5 YR 4/4) LOAMY SAND, 15% Gravel, 20% Cobbles, Moist, Moderate, Medium, Granular, Friable, No Roots	
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
						Soil Profile Pit SPP-4 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-5

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex 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:**	3/11/2024		
Termination Depth:	12.0 feet bgs	**Date Completed:**	3/11/2024		
Proposed Location:	Porous Pavement	**Logged By:**	AM	**During:** NE | ---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:** NE | ---	**At Completion:** NE | ---
Test Method:	Visual Observation	**Rig Type:**	Deere	**24 Hours:** --- | ---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.5	PAVEMENT	4" Asphalt, 2" Gravel Subbase	
				0.5 - 3	FILL	Dark Reddish-Brown (2.5 YR 3/4) SANDY LOAM, 10% Gravel, 10% Cobbles, Moist, Moderate, Medium, Granular, Loose, No Roots, Some Debris	Brick
			1.0				
			2.0				
			3.0				
				3 -12	RESIDUAL	Reddish-Brown (2.5 YR 4/4) LOAMY SAND, 15% Gravel, 20% Cobbles, Moist, Moderate, Medium, Granular, Friable, No Roots	
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
						Soil Profile Pit SPP-5 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-6

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.001
Location:	Bloomfield Avenue & Park Street, Bloomfield, Essex County, New Jersey	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	3/11/2024		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	3/11/2024				
Proposed Location:	Porous Pavement	**Logged By:**	AM	**During:**	NE	---	
Excavating Method:	Test Pit Excavation	**Contractor:**	MC	**At Completion:**	NE	---	**At Completion:** NE / ---
Test Method:	Visual Observation	**Rig Type:**	Deere	**24 Hours:**	---	---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
				0 - 0.5	PAVEMENT	3" Asphalt, 3" Gravel Subbase	
				0.5 - 5.5	FILL	Dark Reddish-Brown (2.5 YR 3/4) SANDY LOAM, 10% Gravel, 10% Cobbles, Moist, Moderate, Medium, Granular, Loose, No Roots, Heavy Amounts of Debris	Brick & Concrete
			1.0				
			2.0				
			3.0				
			4.0				
			5.0				
				5.5 - 12	RESIDUAL	Reddish-Brown (2.5 YR 4/4) LOAMY SAND, 15% Gravel, 20% Cobbles, Moist, Moderate, Medium, Granular, Friable, No Roots	
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
						Soil Profile Pit SPP-6 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

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APPENDIX B
Infiltration Test Results

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INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-1

Project: Proposed Mixed-Use Development

Date: 3/11/2024

Location: Bloomfield Avenue & Park Street

Weather: Sunny

Bloomfield , Essex County, New Jersey

Surface Elevation: NS

File No. GJ2117908.001

Test Depth (Feet): 3.0

Field Engineer: AM

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			
PS	9:00	9:10	3.0	0.0	3.0	0.167	---
1	9:10	9:24	3.0	2.0	1.0	0.233	4.3
2	9:24	9:38	3.0	2.0	1.0	0.233	4.3
3	9:38	9:52	3.0	2.0	1.0	0.233	4.3

Remarks: i = 4.3 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-2

Project: Proposed Mixed-Use Development

Date: 3/11/2024

Location: Bloomfield Avenue & Park Street

Weather: Sunny

Bloomfield , Essex County, New Jersey

Surface Elevation: NS

File No. GJ2117908.001

Test Depth (Feet): 3.0

Field Engineer: AM

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			
PS	10:10	10:21	3.0	0.0	3.0	0.183	---
1	10:21	10:36	3.0	2.0	1.0	0.25	4.0
2	10:36	10:51	3.0	2.0	1.0	0.25	4.0
3	10:51	11:06	3.0	2.0	1.0	0.25	4.0

Remarks: i = 4.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Project: Proposed Mixed-Use Development

Location: Bloomfield Avenue & Park Street

Bloomfield , Essex County, New Jersey

File No. GJ2117908.001

Field Engineer: AM

Test Hole No.: SPP-4

Date: 3/11/2024

Weather: Sunny

Surface Elevation: NS

Test Depth (Feet): 3.0

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			
PS	1:30	1:38	3.0	0.0	3.0	0.133	---
1	1:38	1:50	3.0	2.0	1.0	0.2	5.0
2	1:50	2:02	3.0	2.0	1.0	0.2	5.0
3	2:02	2:14	3.0	2.0	1.0	0.2	5.0

Remarks:

i = 5.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Test Hole No.: SPP-5

Project: Proposed Mixed-Use Development

Date: 3/11/2024

Location: Bloomfield Avenue & Park Street

Weather: Sunny

Bloomfield , Essex County, New Jersey

Surface Elevation: NS

File No. GJ2117908.001

Test Depth (Feet): 3.5

Field Engineer: AM

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			
PS	12:00	12:12	3.0	0.0	3.0	0.2	---
1	12:12	12:30	3.0	2.0	1.0	0.3	3.33
2	12:30	12:48	3.0	2.0	1.0	0.3	3.33
3	12:48	1:06	3.0	2.0	1.0	0.3	3.33

Remarks:

i = 3.3 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Bohler Engineering NJ, LLC

Project: Proposed Mixed-Use Development

Location: Bloomfield Avenue & Park Street

Bloomfield , Essex County, New Jersey

File No. GJ2117908.001

Field Engineer: AM

Test Hole No.: SPP-6

Date: 3/11/2024

Weather: Sunny

Surface Elevation: NS

Test Depth (Feet): 6.0

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			
PS	2:40	2:50	3.0	0.0	3.0	0.167	---
1	2:50	3:05	3.0	2.0	1.0	0.25	4.0
2	3:05	3:20	3.0	2.0	1.0	0.25	4.0
3	3:20	3:35	3.0	2.0	1.0	0.24	4.0

Remarks:

i = 4.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

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APPENDIX C
Supplemental Information (USCS, Terms & Symbols)

WHITESTONE
An Employee-Owned Company

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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.*

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WHITESTONE
An Employee-Owned Company

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
908.668.7777
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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		

WHITESTONE
ASSOCIATES, INC.
Environmental & Geotechnical Engineers & Consultants

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May 3, 2021

via email

BOHLER ENGINEERING NJ, LLC
30 Independence Boulevard
Suite 200
Warren, New Jersey 07059

Attention: Bradford A. Bohler, P.E., CRE
Principal

Regarding: PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
BLOOMFIELD AVENUE & PARK STREET
BLOOMFIELD, ESSEX COUNTY, NEW JERSEY
WHITESTONE PROJECT NO.: GJ2117908.000

Dear Mr. Bohler:

Whitestone Associates, Inc. (Whitestone) has completed a preliminary geotechnical investigation at the above referenced site. The results of the limited evaluation and preliminary recommendations presented below are based on the soil conditions disclosed from a limited number of soil borings performed during Whitestone's field investigation. Recommendations for further investigation also are included herein.

The purpose of the preliminary subsurface soils investigation was to assess anticipated geologic features, shallow groundwater and/or rock, refusal depths, existing fill, and the potential feasibility of shallow foundations and/or expected earthwork requirements. While the scope of this preliminary investigation will not be sufficient to formulate detailed design recommendations and a more comprehensive geotechnical investigation ultimately will be required, this preliminary investigation may be used to assess potentially development impactive geotechnical issues to support preliminary studies regarding the feasibility of developing the property.

1.0 SUMMARY OF FINDINGS

In general, the subsurface conditions preliminarily indicate conditions suitable for shallow foundation design. The exploration indicated the presence of moisture-sensitive soils throughout the site that will impact the planned construction. Based on past experience with similar soils, earthwork activities will require stringent soil moisture control efforts. Depending on the time of year of construction, site work should anticipate overexcavation of moisture sensitive soils in structural areas, using mechanical and/or chemical subgrade stabilization techniques, and exercising detailed attention to construction methods while maintaining strict moisture control. In addition, existing fill was encountered to a depth of up to four feet below ground surface (fbgs) that will require overexcavation below proposed foundations, if encountered at or below proposed foundation bearing elevations. Limited overexcavation of existing fill may also be anticipated for proposed floor slab and pavement areas as well. In addition, weathered rock was encountered at variable depths that will present excavation difficulties.

2.0 PROJECT DESCRIPTION

2.1 Site Location and Existing Conditions

The subject site is located southeast of the intersection of Bloomfield Avenue and Park Avenue in Bloomfield, Essex County, New Jersey. At the time of Whitestone's exploration, the existing site housed a multi-story learning center/church with associated pavements and utilities. The existing structures were observed to be in relatively fair structural condition with no observed areas of significant cracking. The existing pavements were observed to be in fair to poor structural condition with multiple areas of variable cracking.

2.2 Site Geology

The site is located within the Piedmont Physiographic Providence of New Jersey. Specifically, the subject site is underlain by the Lower Jurassic-aged and Upper Triassic-aged Sandstone and Siltstone members of the Passaic Formation, which is part of the Brunswick Group. These members generally consist of reddish-brown to brownish-purple and grayish-red sandstone and siltstone. The overburden materials at the site include late Wisconsinan glaciofluvial deposits including sand, gravel, and silt as well as residual soils associated with the underlying weathered rock/bedrock. Overburden materials also include man-made fill associated with past and present development of the subject site.

2.3 Proposed Construction

Based on the July 13, 2018 *Conceptual Study* prepared by Lessard Design, Inc., the proposed redevelopment is anticipated to include demolition of existing site structures and construction of an approximately 51,431-square feet (maximum footprint), four-story mixed-use building with at-grade parking and utilities. The proposed building is not anticipated to include a basement/cellar or below-grade level. No new retaining walls or stormwater management areas are anticipated for redevelopment.

Detailed grading or structural loading information have not been finalized at this time. Whitestone anticipates that the site will be redeveloped at or near existing site grades with maximum cut and fill on the order of one foot to three feet. Based on Whitestone's experience with similar structures, the maximum design loads are anticipated to be less than the following: column load - 300 kips, wall load - 4.0 kips/foot, and floor load - 125 pounds per square foot.

3.0 FIELD EXPLORATION & LABORATORY TESTING

3.1 Field Exploration

Field exploration at the project site was conducted by means of five soil borings (identified as B-1 through B-4 and offset B-1A) performed with a truck-mounted drill rig using hollow stem augers and split-spoon sampling techniques. The soil borings were performed within accessible portions of the proposed building footprint to depths ranging from approximately 6.9 fbgs to 17.5 fbgs. Soil borings were backfilled to the surface with excavated soils from the investigation and were surficially restored with asphaltic pavement cold patch, as necessary. The locations of the soil borings are shown on the *Boring Location Plan* included as Figure 1. *Records of Subsurface Exploration* are provided in Appendix A.

The subsurface tests were conducted in the presence of a Whitestone engineer who performed field tests, recorded visual classifications, and collected samples of the various strata encountered. The tests were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet.

Soil borings and Standard Penetration Tests (SPTs) were conducted in general accordance with ASTM International (ASTM) designation D 1586. The SPT resistance value (N) can be used as an indicator of the consistency of fine-grained soils and the relative density of coarse-grained soils. The N-value for various soil types can be correlated with the engineering behavior of earthworks and foundations.

Groundwater level observations, where encountered, were recorded during and immediately after the completion of field operations prior to backfilling the borings. Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater levels.

3.2 Laboratory Program

Representative samples of a selected strata encountered were subjected to a laboratory program that included Atterberg limits determination (ASTM D-4318), moisture content determinations (ASTM D-2216), and washed gradation analyses (ASTM D-422) in order to perform supplementary engineering soil classifications in general accordance with ASTM D-2487. The soil stratum tested was classified by the Unified Soil Classification System (USCS) and results of the laboratory testing are summarized in the following table. Quantitative test results are provided in Appendix B.

PHYSICAL/TEXTURAL ANALYSES SUMMARY							
Boring	**Sample**	**Depth (fbgs)**	**% Passing No. 200 Sieve**	**Moisture Content (%)**	**Liquid Limit (%)**	**Plastic Index (%)**	**USCS Classification**
B-1	S-4	6.0 - 6.9	22.8	7.9	Non-Plastic		GM
B-3	S-3	4.0 - 6.0	57.2	19.3	25	4	CL-ML

4.0 SUBSURFACE CONDITIONS

The subsurface soil conditions encountered within the soil borings performed consisted of the following generalized strata in order of increasing depth. *Records of Subsurface Exploration* are provided in Appendix A.

Surface Materials: The soil borings were performed within existing paved areas and encountered approximately three inches to five inches of asphaltic concrete pavement at the surface underlain by approximately two inches to four inches of gravel subbase materials.

Existing Fill: Beneath the surface cover, the borings encountered existing fill that generally consisted of silty sand with variable amounts of gravel, sandy silt with variable amounts of gravel, and/or silty gravel. The existing fill extended to a depth of approximately four fbgs. SPT N-values within the existing fill

ranged between four blows per foot (bpf) and refusal (refusal defined as greater than 50 blows per six inches of split-spoon sampler advancement) and averaged approximately 15 bpf.

Residual Soils: Underlying the existing fill, the soil borings encountered natural residual soils generally consisting of sandy silt (USCS: ML) with variable amounts of gravel-sized weathered rock fragments and/or sandy silty clay (USCS: CL-ML). The residual soils extended to depths ranging from approximately six fbgs to 16 fbgs. Pocket penetrometer tests performed within fine-grained portions of this stratum resulted in unconfined compressive strengths ranging between approximately one ton per square foot (tsf) and two tsf, generally indicating stiff to very stiff consistency.

Weathered Rock/Bedrock: Beneath the residual soils, the borings encountered weathered rock materials. The top of weathered rock was encountered at depths ranging from approximately six fbgs to 16 fbgs. The borings were terminated within the weathered rock materials or weathered rock/bedrock interface at depths ranging from approximately 6.9 fbgs to 17.5 fbgs. SPT N-values within this stratum consistently were in the refusal range.

Groundwater: Static groundwater was not encountered within the borings performed with the deepest depth explored of approximately 17.5 fbgs. However, apparent perched/trapped groundwater was encountered within boring B-2 at a depth of 0.5 fbgs. Seasonal variations, temperature effects, and recent rainfall conditions may influence the levels of the groundwater. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater level.

5.0 CONCLUSIONS AND PRELIMINARY RECOMMENDATIONS

The following discussion is based on the subsurface conditions encountered during Whitestone's limited subsurface investigation for the proposed redevelopment and is intended to provide general characteristics of the subsurface conditions for preliminary planning purposes and should not be utilized for final design of structural foundations, floor slabs, or pavements. These preliminary considerations and site development options should be confirmed or revised upon development of the final project design concept and completion of a site-specific subsurface investigation and engineering analyses.

Foundations: Whitestone preliminarily anticipates that the structures may be supported on conventional spread and continuous wall footings designed to bear either within the underlying natural materials and/or controlled structural fill materials that are properly evaluated, placed, compacted, and prepared in order to control their moisture content. Existing fill should be overexcavated where encountered at or below proposed foundation bearing elevations and the resulting excavation should be restored with controlled structural backfill. Foundations bearing within the above materials may be preliminarily designed to impart a bearing pressure in the range of 2,000 pounds per square foot (psf) to 4,000 psf, depending on final design column and wall loading, column spacing, settlement tolerances, and the final geotechnical investigation. Reuse of the existing fill for foundation support will be contingent upon supplemental evaluation, as recommended herein.

Floor Slabs and Pavements: Whitestone preliminarily anticipates that the properly evaluated, prepared and approved existing fill, natural site subgrade soils, and/or controlled structural imported fill will be suitable for support of the proposed floor slabs and pavements. At least limited overexcavation of existing fill may be required due to the variability that exists within existing fill. Subgrade stabilization and protection may also be necessary during wet conditions to obtain a stable surface. Subgrade stabilization may be achieved through the use of separation geotextiles, geogrids, and/or the addition of lime-cement to the subgrade.

On-Site Soil Reusability: Whitestone preliminarily anticipates that the majority of the existing fill and natural site soils will be suitable for selective reuse as structural fill and/or backfill where free of objectionable debris and moisture contents are controlled within two percent of the optimum and the soils are placed during favorable weather conditions. Based on the conditions disclosed by the subsurface exploration and the results of the laboratory test results, the majority of the on-site natural soils contain an appreciable amount of fines and are not anticipated to be immediately suitable for reuse as structural fill and/or backfill due to high moisture content characteristics. Disturbance of these soils should be minimized. The on-site moisture sensitive soils, while stable and often hard when in a dry natural state, will degrade when wetted or disturbed. Whitestone anticipates that the sandy and/or less plastic site soils, where encountered, may be suitable for reuse as structural fill and/or backfill provided moisture contents are controlled within two percent of the optimum only during favorable weather conditions. Due to moisture sensitivity, use of portions of the on-site soils should expect mixing with a granular material, extensive moisture conditioning, and/or drying to facilitate their reuse, workability, and compaction in fill areas. These materials will become increasingly difficult to reuse and compact where wetted beyond the optimum moisture content. Materials that become exceedingly wet likely will require discing and aerating and extended time to dry during favorable weather.

Cobble- and boulder-sized weathered rock/bedrock materials or similarly sized materials greater than three inches in diameter will need to be separated from on-site soils to be placed as structural fill or backfill. Cobble-sized materials between three inches to 12 inches may be crushed or individually placed in structural fill or backfill layers deeper than two feet below proposed foundation and pavement subgraded levels. Care must be taken to individually seat any large particles and to compact soil around large particles with hand operated equipment to minimize risk of void formation. Boulder-sized greater than 12 inches in diameter need to be crushed prior to replacement as structural fill materials. Materials greater than three inches in size should be placed a minimum of three feet from utilities.

Excavation Difficulties: Weathered rock and bedrock were encountered across the subject property at variable depths that can present difficult excavation. Removal of weathered rock may be required within deeper site utilities and foundation excavations, depending on final grading. Bedrock removal is not anticipated to be required. Heavy excavating equipment with ripping tools will typically be effective in removing dense/hard weathered soils, transition materials, and cobble/boulder-sized rock fragments during site mass grading. The speed and ease of excavation will depend on the type of grading equipment, the skill of the equipment operators, and the geologic structure of the material itself, such as the direction of planes of weakness and spacing between discontinuities. Planned excavation in confined excavations, such as for footing and utility trenches, may require ripping tools, pneumatic hammers, pre-spitting and/or expansive grout.

Groundwater Control: Static groundwater was not encountered within the borings performed and therefore, Whitestone anticipates that static groundwater will be deeper than site excavations. However, perched/trapped groundwater was encountered as shallow as 0.5 fbgs and may be encountered within the existing fill, at the existing fill/natural soil interface, within fine-grained portions of the natural materials, and at the natural soil/weathered rock interface, especially following precipitation events. As such, construction phase dewatering of perched/trapped groundwater through the use of gravity fed sump pumps should be anticipated during excavation activities for this site.

Supplemental Borings: A supplemental subsurface investigation designed to address site-specific conditions for proposed construction should be performed following demolition of the existing site structures and the finalization of the design concept, grading, and general site layout. The final subsurface investigation and geotechnical evaluation should be performed to obtain subsurface information across the site at more closely spaced intervals within the proposed building, pavements, and

utility alignments, etc. Additional borings should be completed in accordance with the New Jersey Building Code requirements as the proposed building is anticipated to be four stories.

6.0 CLOSING

Whitestone appreciates the opportunity to be of continued service to Bohler Engineering NJ, LLC. Please note that Whitestone has the capability to perform the additional geotechnical engineering services recommended herein. Please contact us at (908) 668-7777 with any questions or comments regarding this report.

Sincerely,

WHITESTONE ASSOCIATES, INC.

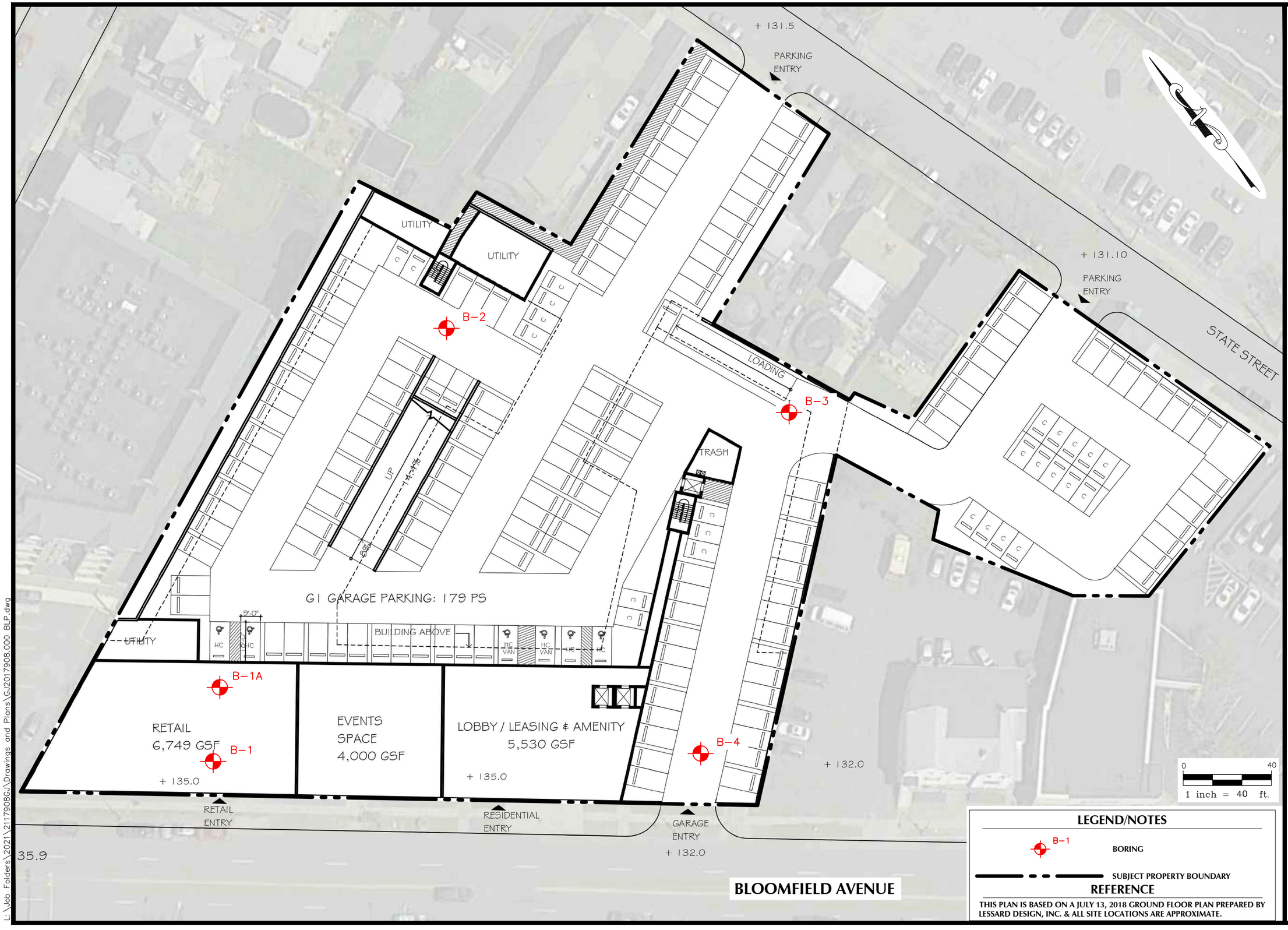
Mudar Khantamr, P.E.
Project Manager

Laurence W. Keller, P.E.
Principal, Geotechnical Services

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Enclosures

WHITESTONE
ASSOCIATES, INC.

FIGURE 1
Boring Location Plan



LEGEND/NOTES

B-1 BORING

SUBJECT PROPERTY BOUNDARY

REFERENCE

THIS PLAN IS BASED ON A JULY 13, 2018 GROUND FLOOR PLAN PREPARED BY LESSARD DESIGN, INC. & ALL SITE LOCATIONS ARE APPROXIMATE.

WHITESTONE ASSOCIATES, INC.

Environmental & Geotechnical Engineers & Consultants

30 INDEPENDENCE BOULEVARD, SUITE 250, WARREN, NJ 07059
908.668.7777 WHITESTONEASSOC.COM

DRAWING TITLE: **BORING LOCATION PLAN**

CLIENT: **BOHLER ENGINEERING NJ, LLC**

PROJECT: **PROPOSED MIXED-USE DEVELOPMENT**
BLOOMFIELD AVENUE & PARK STREET
BLOOMFIELD, ESSEX COUNTY, NJ

PROJECT #: GJ2117908.000	
DESIGNED BY: GR	PROJ. MGR.: MK
DATE: 4/30/21	FIGURE: 1
SCALE: 1" = 40'	

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WHITESTONE ASSOCIATES, INC.

APPENDIX A
Records of Subsurface Exploration

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-1

Page 1 of 1

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.000
Location:	Bloomfield Avenue & Park Street; Bloomfield, Essex County, NJ	**Client:**	Bohler Engineering NJ, LLC

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	fi NS feet	**Date Started:**	4/16/2021		
Termination Depth:	6.9 feet bgs	**Date Completed:**	4/16/2021		
Proposed Location:	Building	**Logged By:**	CN	**During:** NE | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	AD	**At Completion:** --- | ---	**At Completion:** 4.0 | ---
		Equipment:	CME	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
							PAVEMENT		5" Asphalt, 2" Gravel Subbase	
0.5 - 2	S-1		2 - 2 - 2	8	4	0.6	FILL		Reddish-Brown Silty Sand with Gravel, Moist (FILL)	
2 - 3.4	S-2		4 - 5 - 50/5"	6	55/11"				As Above (FILL)	
						4.0				
4 - 6	S-3		11 - 17 - 46 - 28	18	63	5.0	RESIDUAL		Reddish-Brown Sandy Silt with Gravel, Slightly Moist, Very Stiff (ML)	Qu = 2.0 tsf Subangular WR Fragments
						6.0				
6 - 6.9	S-4		33 - 50/5"	12	50/5"	6.9	WR		Reddish-Brown Weathered Rock, Moist, Very Dense (WR)	
									Boring Log B-1 Terminated at a Depth of 6.9 Feet Below Ground Surface Due to Spoon/Auger Refusal; Offset to B-1A	
						10.0				
						15.0				
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-1A

Page 1 of 1

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.000
Location:	Bloomfield Avenue & Park Street; Bloomfield, Essex County, NJ	**Client:**	Bohler Engineering NJ, LLC

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	4/16/2021		
Termination Depth:	16.0 feet bgs	**Date Completed:**	4/16/2021		
Proposed Location:	Building	**Logged By:**	CN	**During:** NE | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	AD	**At Completion:** --- | ---	**At Completion:** 11.0 | ---
		Equipment:	CME	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0		Augered to 7.0 fbgs Offset from B-1 20' East	
						5.0			
						7.0			
7 - 8.9	S-1	X	39 - 40 - 45 - 50/5"	12	85		WEATHERED ROCK	Dark Reddish-Brown Weathered Rock, Moist, Very Dense (WR)	
						10.0			
13 - 14.3	S-2	X	23 - 50 - 50/3"	12	100/9"			As Above (WR)	
						15.0			Hard Augering @ 13.0 fbgs
						16.0			
16 - 16	S-3	X	50/0"	NR	50/0"			Boring Log B-1A Terminated at a Depth of 16.0 Feet Below Ground Surface Due to Spoon/Auger Refusal	
						20.0			
						25.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-2

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.000
Location:	Bloomfield Avenue & Park Street; Bloomfield, Essex County, NJ	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	4/16/2021		**Water Depth | Elevation (feet bgs) | (feet)**		**Cave-In Depth | Elevation (feet bgs) | (feet)**
Termination Depth:	16.0 feet bgs	**Date Completed:**	4/16/2021				
Proposed Location:	Building	**Logged By:**	CN	**During:**	0.5(P) | ---		
Drill / Test Method:	HSA / SPT	**Contractor:**	AD	**At Completion:**	NE | ---	**At Completion:**	12.5 | ---
		Equipment:	CME	**24 Hours:**	--- | ---	**24 Hours:**	--- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
						0.5	PAVEMENT		4" Asphalt, 2" Gravel Subbase	
0.5 - 2	S-1		8 - 4 - 4	NR	12		FILL		No Recovery, Presumed As Below (FILL)	Perched Water Visible in Borehole @ 0.5 fbgs
2 - 4	S-2		2 - 5 - 7 - 11	8	12	4.0			Dark Reddish-Brown Silty Sand with Gravel, Wet to Moist (FILL)	
4 - 6	S-3		9 - 14 - 11 - 10	12	25	5.0	RESIDUAL		Dark Reddish-Brown Sandy Silt with Gravel, Moist, Very Stiff (ML)	Qu = 2.0 tsf
6 - 8	S-4		12 - 13 - 17 - 28	12	30				As Above, Stiff (ML)	Qu = 1.5 tsf
8 - 10	S-5		19 - 27 - 38 - 40	18	65	10.0			As Above (ML)	Qu = 1.5 tsf Subangular Weathered Rock Fragments
13 - 15	S-6		19 - 12 - 13 - 27	18	25	15.0			As Above (ML)	Qu = 1.0 tsf
						16.0				Hard Augering @ 15.0 fbgs
16 - 16	S-7		50/0"	NR	50/0"				Boring Log B-2 Terminated at a Depth of 16.0 Feet Below Ground Surface Due to Spoon/Auger Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-3

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.000
Location:	Bloomfield Avenue & Park Street; Bloomfield, Essex County, NJ	**Client:**	Bohler Engineering NJ, LLC

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	4/16/2021		
Termination Depth:	12.0 feet bgs	**Date Completed:**	4/16/2021		
Proposed Location:	Building	**Logged By:**	CN	**During:** NE | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	AD	**At Completion:** --- | ---	**At Completion:** 12.0 | ---
		Equipment:	CME	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
						0.4	PAVEMENT		3" Asphalt, 2" Gravel Subbase	
0.5 - 2	S-1		11 - 11 - 10	6	21		FILL		Dark Reddish-Brown Sandy Silt, Very Moist (FILL)	
2 - 4	S-2		4 - 4 - 6 - 7	12	10				As Above, with Gravel, Moist (FILL)	
						4.0				
4 - 6	S-3		12 - 16 - 11 - 17	12	27	5.0	RESIDUAL		Dark Reddish-Brown Sandy Silty Clay, Moist, Stiff (CL-ML)	LL = 25, PI = 4 Qu = 1.5 tsf Hard Augering @ 6.0 fbgs
6 - 8	S-4		29 - 21 - 22 - 20	12	43				As Above (CL-ML)	Qu = 1.5 tsf
8 - 10	S-5		37 - 44 - 21 - 14	18	65				As Above, Very Stiff (CL-ML)	Qu = 2.0 tsf
						10.0				Hard Augering @ 10.0 fbgs
						12.0				
12 - 12	S-6		50/0"	NR	50/0"				Boring Log B-3 Terminated at a Depth of 12.0 Feet Below Ground Surface Due to Spoon/Auger Refusal	
						15.0				
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-4

Project:	Proposed Mixed-Use Development	**WAI Project No.:**	GJ2117908.000
Location:	Bloomfield Avenue & Park Street; Bloomfield, Essex County, NJ	**Client:**	Bohler Engineering NJ, LLC

Surface Elevation:	± NS feet	**Date Started:**	4/16/2021	**Water Depth | Elevation (feet bgs) | (feet)**		**Cave-In Depth | Elevation (feet bgs) | (feet)**	
Termination Depth:	17.5 feet bgs	**Date Completed:**	4/16/2021				
Proposed Location:	Building	**Logged By:**	CN	**During:**	NE | ---		
Drill / Test Method:	HSA / SPT	**Contractor:**	AD	**At Completion:**	--- | ---	**At Completion:**	13.5 | ---
		Equipment:	CME	**24 Hours:**	--- | ---	**24 Hours:**	--- | ---

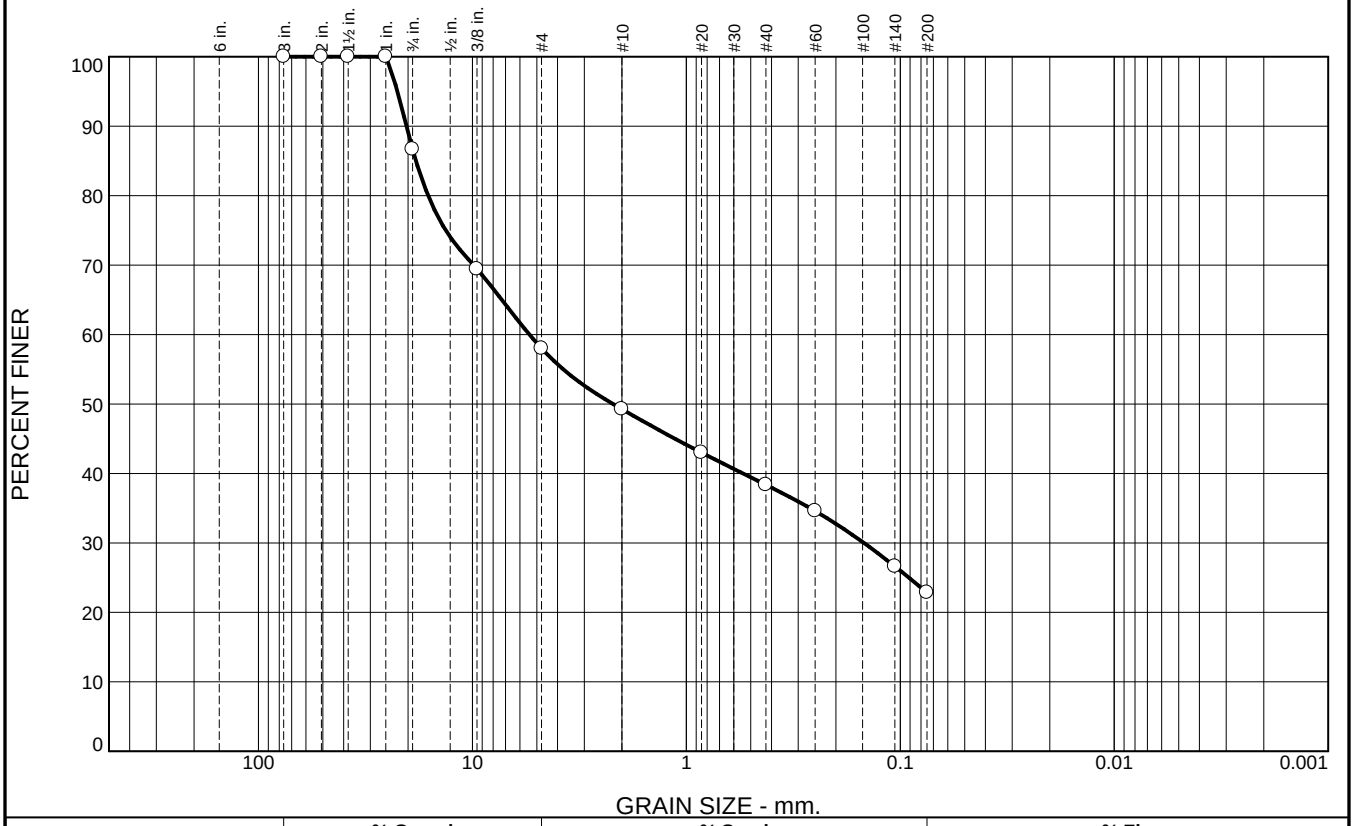
SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
							PAVEMENT		3" Asphalt, 4" Gravel Subbase	
0.5 - 2	S-1		2 - 3 - 2	4	5	0.6	FILL		Grayish-Black Silty Gravel, Slightly Moist (FILL)	
						2.0				
2 - 4	S-2		2 - 3 - 2 - 5	4	5				Dark Reddish-Brown Sandy Silt with Gravel, Moist (FILL)	
						4.0				
4 - 6	S-3		9 - 8 - 14 - 6	6	22	5.0	RESIDUAL		Dark Reddish-Brown Sandy Silt with Gravel, Slightly Moist (ML)	
6 - 8	S-4		14 - 22 - 19 - 15	12	41				As Above (ML)	
						8.0				
8 - 9.3	S-5		22 - 31 - 50/4"	12	81/10"		WEATHERED ROCK		Reddish-Brown Weathered Rock, Moist, Very Dense (WR)	
						10.0				
13 - 14.3	S-6		14 - 47 - 50/4"	18	97/10"				As Above (WR)	
						15.0				Hard Augering @ 15.0 fbgs
						17.5				
17.5 - 17.5	S-7		50/0"	NR	50/0"				Boring Log B-4 Terminated at a Depth of 17.5 Feet Below Ground Surface Due to Spoon/Auger Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

APPENDIX B
Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.3	28.7	8.7	10.9	15.6	22.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	86.7		
.375	69.4		
#4	58.0		
#10	49.3		
#20	43.0		
#40	38.4		
#60	34.6		
#140	26.6		
#200	22.8		

* (no specification provided)

Material Description

Silty Gravel with Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 20.3467 D_{85}= 18.3696 D_{60}= 5.4159
D_{50}= 2.1993 D_{30}= 0.1480 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

W_n = 7.9 %

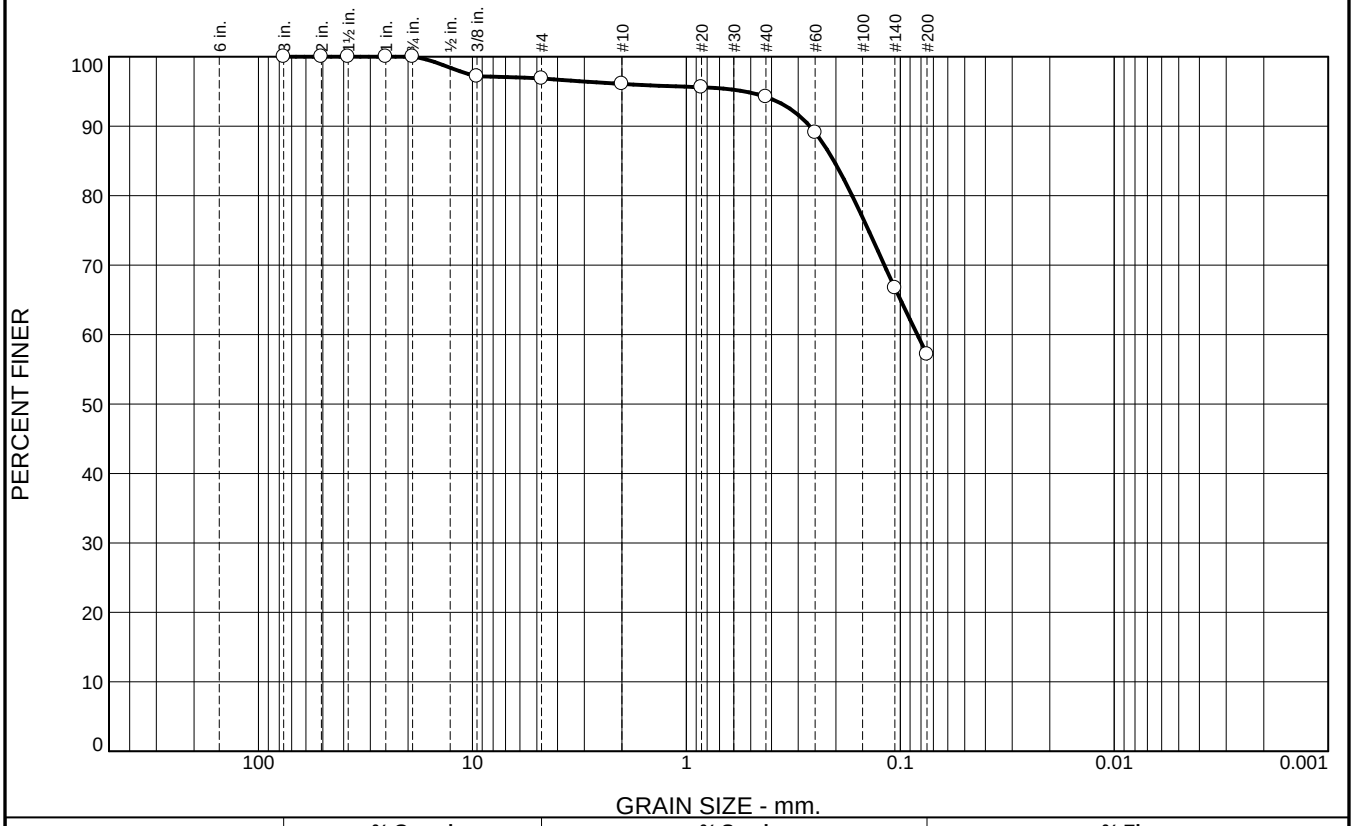
Source of Sample: B-1 **Depth:** 6.0' - 6.9'
Sample Number: S-4

Date: 04/26/2021

WHITESTONE ASSOCIATES, INC.
Warren, New Jersey

Client: Bohler Engineering NJ, LLC
Project: Proposed Mixed-Use Development
Bloomfield Ave & Park St, Bloomfield, Essex County, NJ
Project No: GJ2117908.000 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.1	0.8	1.9	37.0	57.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	97.2		
#4	96.9		
#10	96.1		
#20	95.6		
#40	94.2		
#60	89.1		
#140	66.7		
#200	57.2		

* (no specification provided)

Material Description

Sandy Silty Clay

Atterberg Limits

PL= 21 LL= 25 PI= 4

Coefficients

D_{90}= 0.2649 D_{85}= 0.2045 D_{60}= 0.0833
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(0)

Remarks

W_n = 19.3 %

Source of Sample: B-3 **Depth:** 4.0' - 6.0'
Sample Number: S-3

Date: 04/26/2021

WHITESTONE ASSOCIATES, INC.
Warren, New Jersey

Client: Bohler Engineering NJ, LLC
Project: Proposed Mixed-Use Development
Bloomfield Ave & Park St, Bloomfield, Essex County, NJ
Project No: GJ2117908.000 **Figure**

WHITESTONE ASSOCIATES, INC.

APPENDIX C
Supplemental Information (USCS, Terms and Symbols)

WHITESTONE ASSOCIATES, INC.
Environmental & Geotechnical Engineers & Consultants

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
908.668.7777
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

Other Office Locations:

CHALFONT, PA 215.712.2700
SOUTHBOROUGH, MA 508.485.0755
ROCKY HILL, CT 860.726.7889
WALL, NJ 732.592.2101
PHILADELPHIA, PA 215.848.2323

WHITESTONE ASSOCIATES, INC.
Environmental & Geotechnical Engineers & Consultants

30 INDEPENDENCE BOULEVARD
SUITE 250
WARREN, NJ 07059
908.668.7777
whitestoneassoc.com

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		

Other Office Locations:

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SOUTHBOROUGH, MA 508.485.0755
ROCKY HILL, CT 860.726.7889
WALL, NJ 732.592.2101
PHILADELPHIA, PA 215.848.2323

H. MAPS

- **Tax Map**
- **Aerial Map**
- **Soil Map**
- **State Planning Area Map**
- **Depth to Water Table Map**
- **USGS Map**
- **HUC14 Map**
- **FEMA FIRM Map**
- **State Study Stream Plan & Profile**
- **Drainage Area Maps**
- **Drainage Area Maps**
  - **Existing Drainage Area Map**
  - **Proposed Drainage Area Map**
  - **Inlet Drainage Area Map**



Tax Map

Source: Bloomfield Township Tax Map, Sheet #11

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
Street Address: Bloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
BENJ #J210631	
Prepared by: DT	Date: 5/30/2024
Checked by: AK	Scale: NTS
	BOHLER



Aerial Map

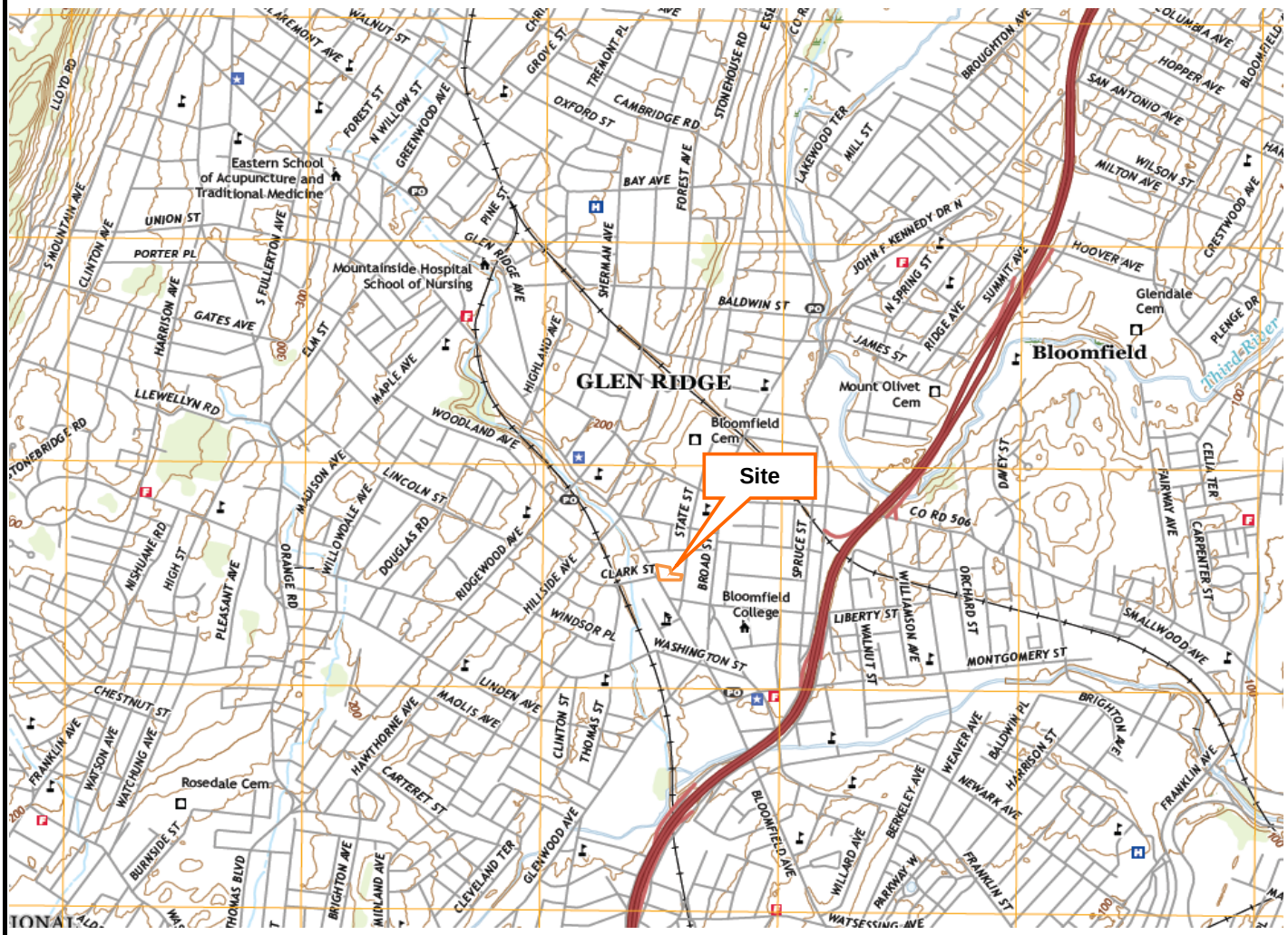
Source: NJ GeoWeb

Date Access: 04/29/2024

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BOHLER



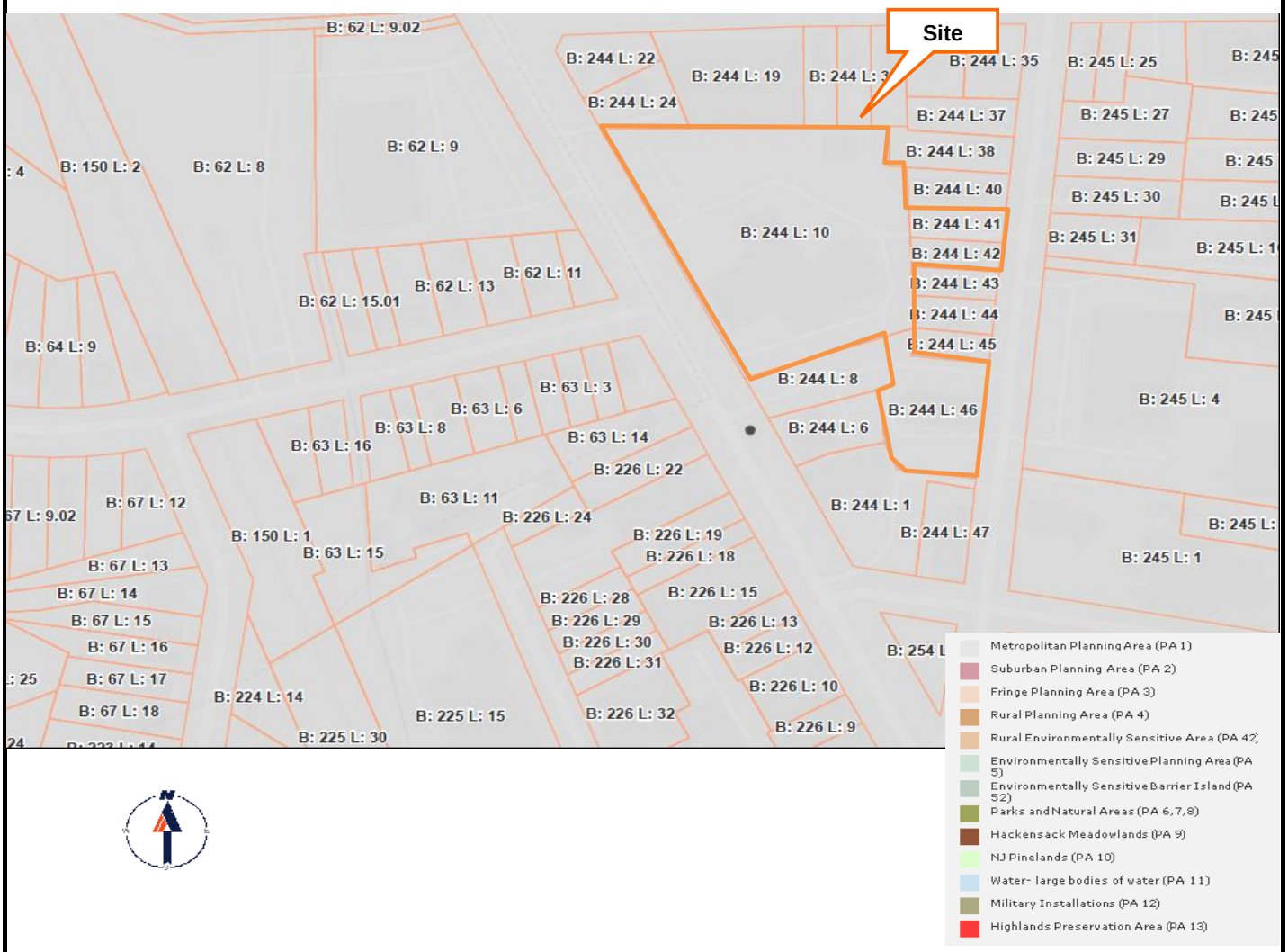
USGS Map
575,348-ft E; 715,332-ft N
Orange Quadrangle

Source: USGS, 2019

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
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BENJ #J210631	
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Checked by: AK	Scale: NTS

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State Planning Area Map

Source: NJ GeoWeb

Date Access: 04/29/2024

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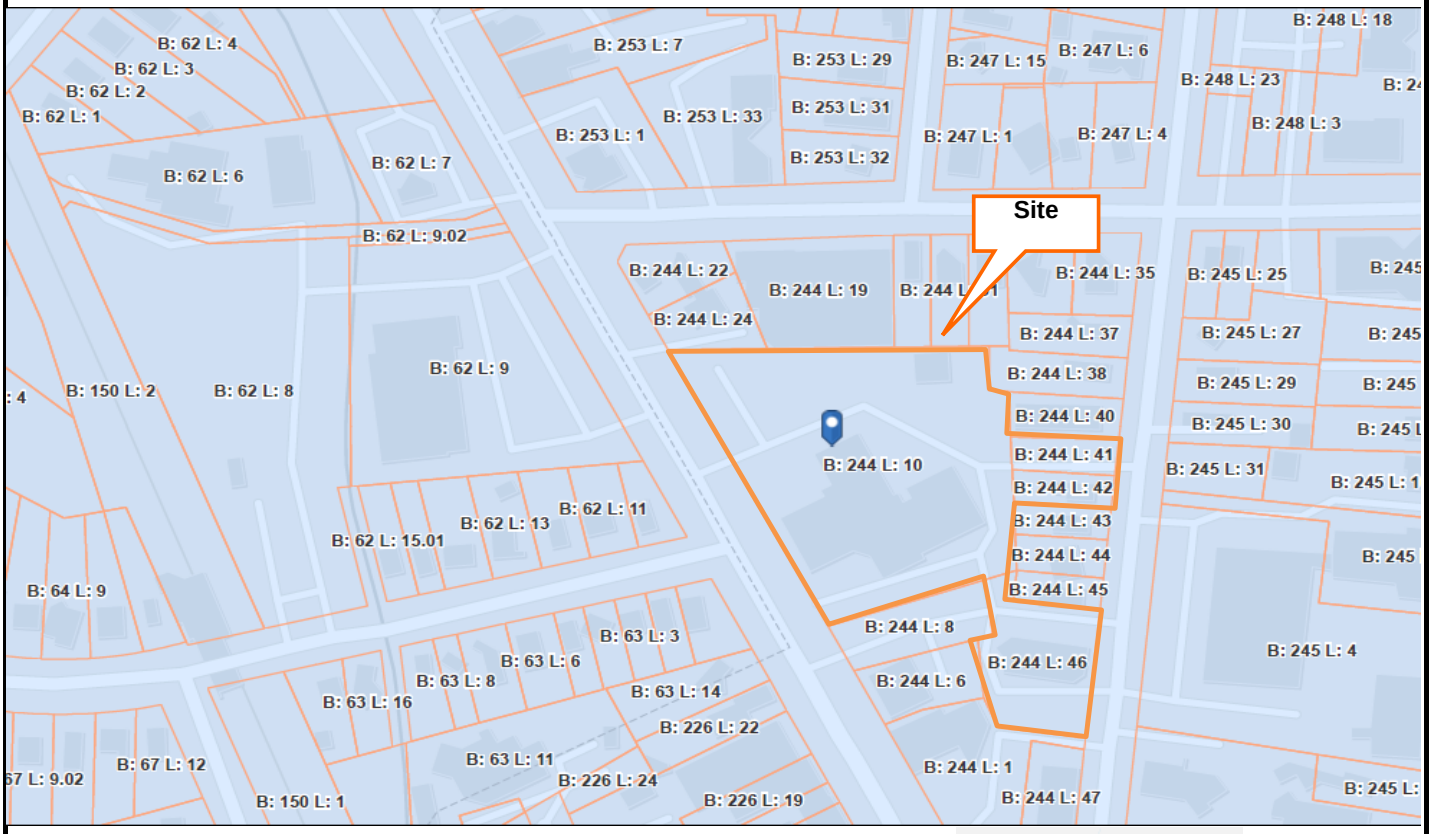
NJDEP Stream Map

Source: NJ GeoWeb

Date Access: 04/29/2024

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BENJ #J210631	
Prepared by: DT	Date: 5/30/2024
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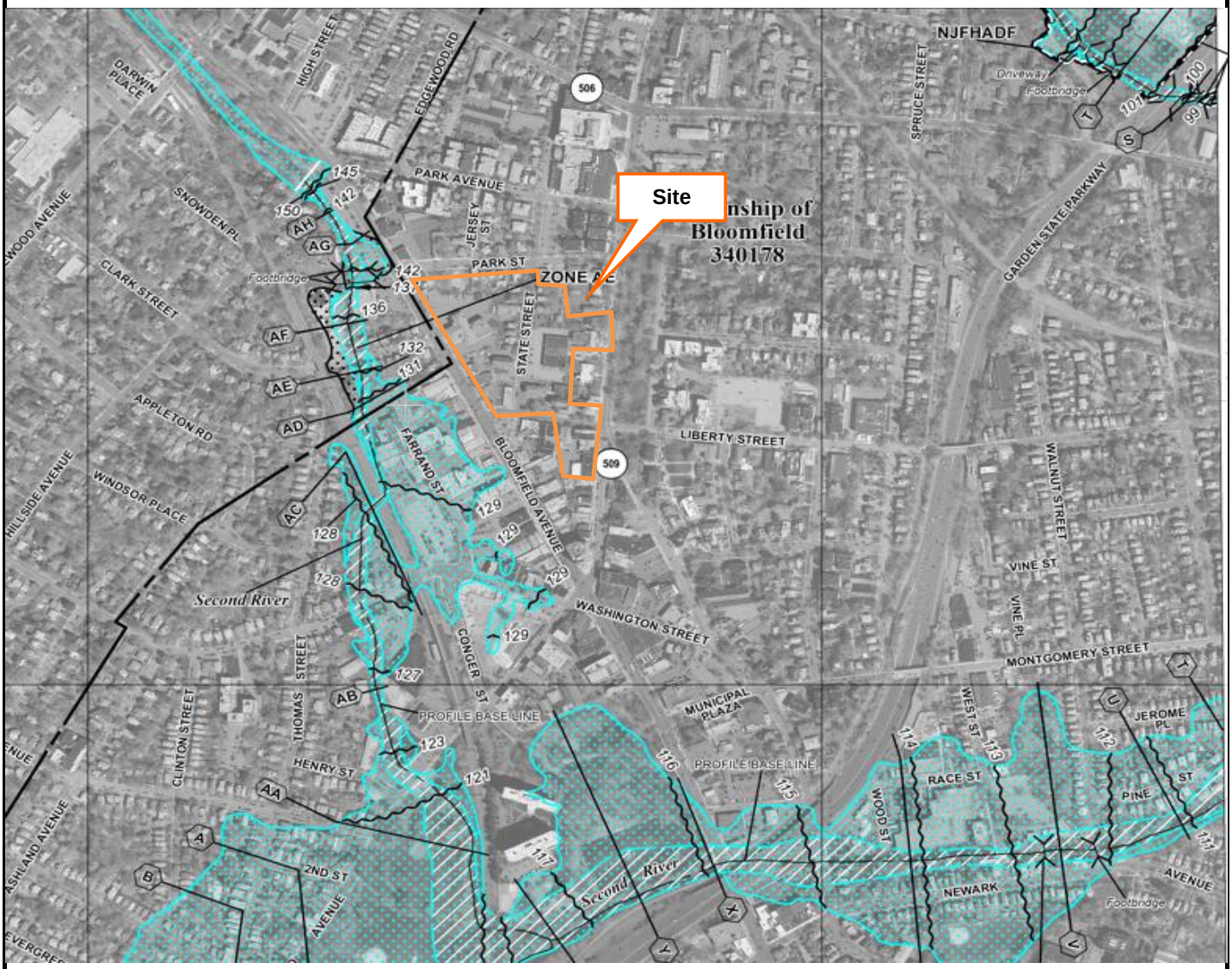
HUC-14 Sub-Watershed Map

Source: NJ GeoWeb

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
Street Address: Bloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
BENJ #J210631	
Prepared by: DT	Date: 5/30/2024
Checked by: AK	Scale: NTS

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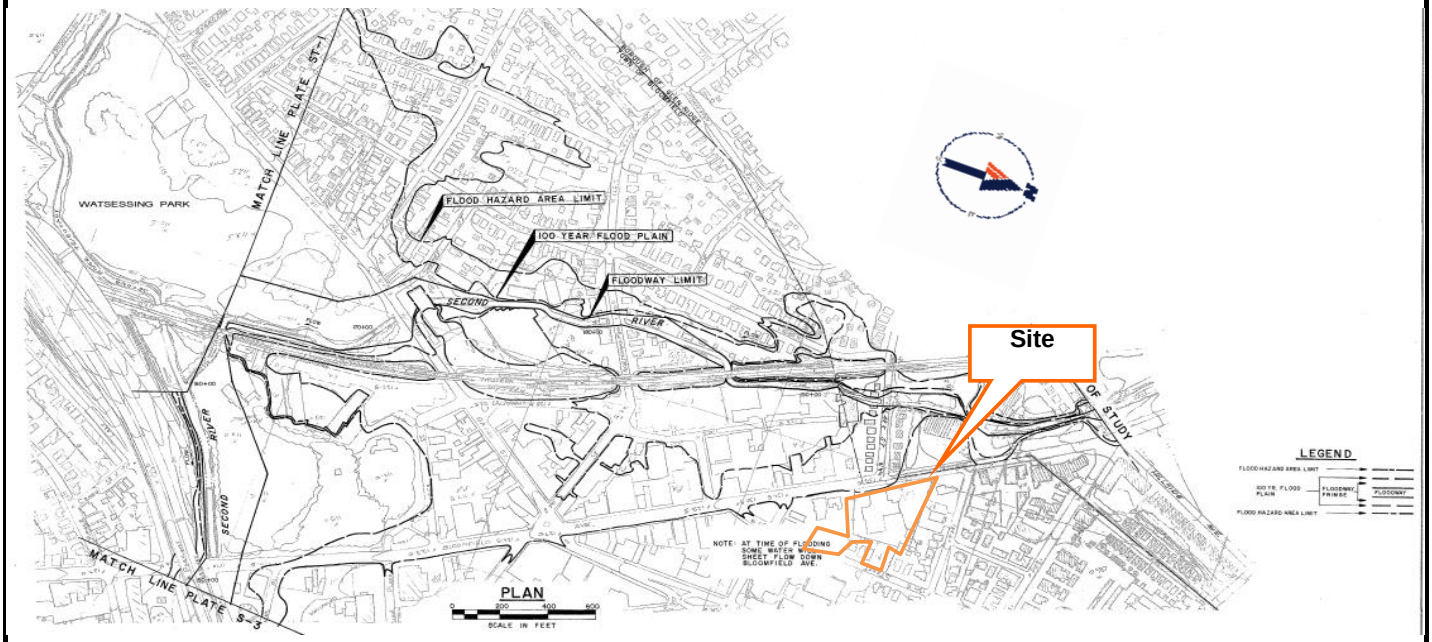
FEMA Flood Map

Source:FEMA FIRM Map #34013C0112G, Date 04/03/2020

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
Street Address: Bloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
BENJ #J210631	
Prepared by: DT	Date: 5/30/2024
Checked by: AK	Scale: NTS

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NJDEP Department Flood Hazard Map

Source:FEMA FIRM Map #34013C0112G, Date 04/03/2020

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
Street Address: Bloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
BENJ #J210631	
Prepared by: DT — Date: 5/30/2024	BOHLER
Checked by: AK — Scale: NTS	



Soils Map

Source: NRCS Web Soil Survey, 2012

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC	
Street Address: Bloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
BENJ #J210631	
Prepared by: DT	Date: 5/30/2024
Checked by: AK	Scale: NTS

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Depth to Seasonal High Water Table

Source: NRCS Web Soil Survey, 2012

Date Access: 04/29/2024

CBD Bloomfield Developer Urban Renewal, LLC

Street Addreloomfield Ave & State St **Block 244; Lots 10, 41 & 46**	**Township of Bloomfield, Essex County, NJ**
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